

Our Ref GJB/15542VA/Admin
Your Ref

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

RSA GEOTECHNICS LTD

20 October 2023

Redbourne Homes (Creeting) Ltd
Flordon Road
Creeting St Mary
Ipswich
Suffolk
IP6 8NH



www.rsa-geotechnics.co.uk

For the attention of Ralph Daff & Dominic Gravener

By Email only –



Dear Dominic,

SAMPLING AND TESTING OF CLEAN COVER SOILS: ALDER MEADOW, FLORDON ROAD, CREETING ST MARY, SUFFOLK, IP6 8NH - PLOTS 22, 24, 30 – 33, TOPSOIL AND SUBSOIL STOCKPILES AND DEPTH CHECKS AND IMPORTED TYPE 1 CROSSCHECKS

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.

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 sampling and testing of imported clean cover soils associated with soft landscaped areas of Plots 22, 24 and 30 - 33 at the above site in August and October 2023.

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

Site visits were made on 11 August 2023 to obtain samples from imported stockpiled subsoil and on 10 October 2023 to obtain samples from imported stockpiled topsoil. A third visit was undertaken on the 16 October 2023 to inspect the areas where the soils had been or were to be placed (Plots 22 and 24). The approximate locations of validation sampling are illustrated on attached drawing number 15542VA/1 Ver.C. and drawing numbers 15542VA/3 and 15542VA/4 relating to the subsoil and topsoil stockpiles respectively. Photographs taken during the sampling and validation exercise have been attached to this letter report.

A total of five composite samples of topsoil and ten composite samples of subsoil were obtained. A single composite sample was obtained from each of the new Type 1 source stockpiles, those used for general type 1, and those used for adopted highway.

3. Laboratory Testing

Five samples of topsoil, six samples of subsoil and the two composite samples of new Type 1 were scheduled for chemical analysis to determine concentrations of a suite of commonly occurring determinands in soil, including heavy metals, polycyclic aromatic hydrocarbons (PAH), phenol, cyanide, sulphate and pH. The samples were also submitted for screening for the presence of asbestos. PID screening of each sample headspace was undertaken to measure concentrations of volatile organic compounds and the results are attached. The topsoil and Type 1 concentrations were below the detection limit of the meter, of 0.1 ppm, but the subsoil ranged from 0.2 ppm to a maximum of 0.4 ppm. No samples were therefore subsequently analysed for TPH or VOC. The chemical contamination analyses were carried out between 14 August and 17 October 2023 by DETS Ltd, which has UKAS, ISO17025 and MCERTS accreditation.

The results of the laboratory testing are presented in the report certificates appended to this report (DETS Report No: 23-10384 and 23-12603).

4. Discussion of Inspection and Test Results

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

- Topsoil Source

Handford Homes Site, Downham Boulevard, Ravenswood, Ipswich IP39UX imported under a Environment Agency U1 Waste Exemption Reference WEX359143 (170504 – Soil and Stone, up to 1000 Tonnes)

- New Topsoil Source

SRC Aggregates (SRC Group) – Crown Quarry, Old Ipswich Road, Ardleigh, Colchester, Essex CO7 7QR – 0 to 15 mm Screened BS3882 Topsoil

- Subsoil Source

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

- Type 1 Sources

TARS (Total Aggregate Recycling Solutions Ltd) – Martins Farm, St Osyth, Essex CO16 8HN – General Type 1 Crushed Concrete

TRU Agg - Kesgrave Quarry, Sinks Pit, Kesgrave, Ipswich IP5 2PE – Recycled Adoptable Type 1

The topsoil was generally found to comprise light and dark brown silty very sandy clayey topsoil with occasional to some fine-cobble size flint gravel and some roots and rootlets.

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 of the laboratory analyses from the samples recovered by RSA Geotechnics from the stockpiled imported clean cover topsoil and subsoil and stockpiled imported Type 1 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.

The screening values and the source from which each screening value was derived are presented in Table 1, as appended. For the organic determinands, a soil organic matter content of 1% for the topsoil, subsoil and Type 1 have been adopted in the derivation of the screening values.

4.1 Human Health

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

The Type 1 stockpiles were also both found to be suitable for use on a residential development with recorded concentrations below the derived Tier 1 screening values, and no asbestos was detected.

RSA Geotechnics returned to site on the 16 October 2023 to undertake depth checks on completed clean cover soil systems on Plots 30 to 33. The clean cover soil systems on Plots 22 and 24, were partially completed, but the basal membrane had been placed at a sufficient depth, that once complete with subsoil and topsoil these plots would be compliant. The below table and attached photographs highlight the inspection results.

Table 4.1 - 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)
VA25 (22)	Will be 400	Will be 300	Will be 700	600	Y	Y
VA26 (24)	Will be 300	520	Will be 700		Y	Y
VA27 (30)	140	500	640		Y	Y
VA28 (31)	350	420	770		Y	Y
VA29 (32)	350	450	800		Y	Y
VA30 (33)	250	450	700		Y	Y

Based on the initial inspections, there was more than a sufficient thickness of clean cover soil on all of the completed plots. The basal membrane was present in all locations, and on the basis of the depth of membrane below finished level and partially placed subsoil, the total thickness of clean cover on Plots 22 and 24 was also more than sufficient. The clean cover system on the above plots was therefore found to be compliant with the Remediation Method Statement (RMS).

4.2 Plant Health

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. An elevated concentration of 284 mg/kg of copper was recorded in the imported adopted Type 1 sample, but this is to be used beneath permanent hardstanding, not planting, so a negligible risk to plant health was considered from the Type 1.

5. Conclusions

Sampling and laboratory analysis of the imported soils and Type 1 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 topsoil and subsoil and Type 1 are chemically appropriate for use in the residential development as part of the clean cover soil system and beneath hardstanding as appropriate.

Further validation sampling and depth checks for the incomplete areas of soft landscaping will be required prior to completion and the issue of a final Verification Report for the development.

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



Gavin Bell, BSc, MSc, CGeol FGS
Principal Engineer



Phil Gawne, Bsc, MSc, DIC, FGS
Technical Director

- Encs
- Photographs taken during inspection visits on 10 and 16 October 2023
 - PID Headspace Screening Results
 - Chemical Contamination Analyses Results (DETS Report No: 23-10384 and 23-12603)
 - Human Health Screening Values – Table 1
 - Validation Sample Location Plan – Drawing Number 15542VA/1 Ver.C
 - Sketch Plan – Subsoil Stockpile – Drawing Number 15542VA/3
 - Sketch Plan – Topsoil Stockpile – Drawing Number 15542VA/4

Topsoil Stockpile – 10 October 2023



Subsoil Stockpile – 10 October 2023



Type 1 Crush Stockpile – 10 October 2023



Adoptable Recycled Type 1 Stockpile – 10 October 2023





VA25 – Plot 22, Membrane placed at 700 mm below FFL



VA26 – Plot 24, Membrane placed at 820 mm below FFL, Partially Subsoiled/Topsoiled



VA27 – Plot 30, 140 mm TS, 500 mm SS, Membrane



VA28 – Plot 31, 350 mm TS, 420 mm SS, Membrane



VA29 – Plot 32, 350 mm TS, 450 mm SS, Membrane



VA30 – Plot 33, 250 mm TS, 450 mm SS, Membrane

HEADSPACE MONITORING RECORD SHEET

Type of Test: Photoionisation Detector (PID)

Date	Location	Sample Ref	Depth (m)	Volatile (ppm)
11/08/23	VA1	D1	0.6	0.3
	VA2	D1	0.6	0.4
	VA3	D1	0.6	0.4
	VA4	D1	0.8	0.2
	VA5	D1	0.8	0.3
	VA6	D1	0.6	0.4
	VA7	D1	0.9	0.4
	VA8	D1	0.9	0.4
	VA9	D1	0.8	0.4
	VA10	D1	0.7	0.4
10/10/23	TSSPVA1	D1	Composite	<0.1
	TSSPVA2	D1	Composite	<0.1
	TSSPVA3	D1	Composite	<0.1
	TSSPVA4	D1	Composite	<0.1
	TSSPVA5	D1	Composite	<0.1
	T1ASP	D1	Composite	<0.1
	T1CSP	D1	Composite	<0.1

Project
 ALDER MEADOW, BREHENY'S YARD, FLORDON ROAD,
 CREETING ST MARY, IPSWICH, SUFFOLK IP6 8NH

Job No. 15542VA
 Date OCTOBER 2023



Phil Gawne
RSA Geotechnics Ltd
Ashburnham House
1 Maitland Road
Lion Barn Estate
Needham Market
Suffolk
IP6 8NZ

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN

DETS Report No: 23-10384

Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH

Project / Job Ref: 15542VA

Order No: None Supplied

Sample Receipt Date: 14/08/2023

Sample Scheduled Date: 14/08/2023

Report Issue Number: 1

Reporting Date: 22/08/2023

Authorised by:

[REDACTED]
Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN



Soil Analysis Certificate					
DETS Report No: 23-10384	Date Sampled	11/08/23	11/08/23	11/08/23	11/08/23
RSA Geotechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH	TP / BH No	Subsoil	Subsoil	Subsoil	Subsoil
Project / Job Ref: 15542VA	Additional Refs	VA1	VA3	VA5	VA6
Order No: None Supplied	Depth (m)	0.60	0.60	0.80	0.60
Reporting Date: 22/08/2023	DETS Sample No	669463	669464	669465	669466

Determinand	Unit	RL	Accreditation	11/08/23	11/08/23	11/08/23	11/08/23	11/08/23
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	8.6	8.7	8.4	8.6	8.3
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	55	45	34	36	< 10
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.05	0.05	0.03	0.04	< 0.01
Elemental Sulphur	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Organic Matter (SOM)	%	< 0.1	MCERTS	0.4	0.5	0.4	0.2	0.2
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	0.2	0.3	0.3	0.1	0.1
Arsenic (As)	mg/kg	< 2	MCERTS	6	6	5	2	3
Barium (Ba)	mg/kg	< 2.5	MCERTS	16	20	11	11	7
Beryllium (Be)	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	5	6	4	2	2
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	6	11	5	< 4	< 4
Lead (Pb)	mg/kg	< 3	MCERTS	6	7	4	< 3	< 3
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	5	5	4	< 3	< 3
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Vanadium (V)	mg/kg	< 1	MCERTS	9	8	6	4	4
Zinc (Zn)	mg/kg	< 3	MCERTS	19	29	14	12	7
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion Subcontracted analysis (S)



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN



Soil Analysis Certificate			
DETS Report No: 23-10384	Date Sampled	11/08/23	
RSA Geotechnics Ltd	Time Sampled	None Supplied	
Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH	TP / BH No	Subsoil	
Project / Job Ref: 15542VA	Additional Refs	VA10	
Order No: None Supplied	Depth (m)	0.70	
Reporting Date: 22/08/2023	DETS Sample No	669468	

Determinand	Unit	RL	Accreditation				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected			
pH	pH Units	N/a	MCERTS	8.7			
Total Cyanide	mg/kg	< 1	NONE	< 1			
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	< 10			
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	< 0.01			
Elemental Sulphur	mg/kg	< 10	NONE	< 10			
Organic Matter (SOM)	%	< 0.1	MCERTS	0.3			
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	0.2			
Arsenic (As)	mg/kg	< 2	MCERTS	3			
Barium (Ba)	mg/kg	< 2.5	MCERTS	8			
Beryllium (Be)	mg/kg	< 0.5	MCERTS	< 0.5			
W/S Boron	mg/kg	< 1	NONE	< 1			
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2			
Chromium (Cr)	mg/kg	< 2	MCERTS	3			
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2			
Copper (Cu)	mg/kg	< 4	MCERTS	< 4			
Lead (Pb)	mg/kg	< 3	MCERTS	< 3			
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1			
Nickel (Ni)	mg/kg	< 3	MCERTS	< 3			
Selenium (Se)	mg/kg	< 2	MCERTS	< 2			
Vanadium (V)	mg/kg	< 1	MCERTS	4			
Zinc (Zn)	mg/kg	< 3	MCERTS	11			
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion Subcontracted analysis (S)



DETS Ltd
Unit 1, Rose Lane Industrial Estate
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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 23-10384	Date Sampled	11/08/23	11/08/23	11/08/23	11/08/23	11/08/23
RSA Geotechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH	TP / BH No	Subsoil	Subsoil	Subsoil	Subsoil	Subsoil
Project / Job Ref: 15542VA	Additional Refs	VA1	VA3	VA5	VA6	VA8
Order No: None Supplied	Depth (m)	0.60	0.60	0.80	0.60	0.90
Reporting Date: 22/08/2023	DETS Sample No	669463	669464	669465	669466	669467

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6



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 Lenham Heath
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 Kent ME17 2JN



Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 23-10384	Date Sampled	11/08/23				
RSA Geotechnics Ltd	Time Sampled	None Supplied				
Site Reference: Alder Meadow, Flordon Road, Creting St Mary, Suffolk, IP6 8NH	TP / BH No	Subsoil				
Project / Job Ref: 15542VA	Additional Refs	VA10				
Order No: None Supplied	Depth (m)	0.70				
Reporting Date: 22/08/2023	DETS Sample No	669468				

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1			
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6			



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 23-10384	
RSA Geotechnics Ltd	
Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH	
Project / Job Ref: 15542VA	
Order No: None Supplied	
Reporting Date: 22/08/2023	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
669463	Subsoil	VA1	0.60	7.4	Brown sandy clay
669464	Subsoil	VA3	0.60	9.2	Brown sandy clay
669465	Subsoil	VA5	0.80	8.5	Brown sandy clay
669466	Subsoil	VA6	0.60	6.1	Brown sandy clay
669467	Subsoil	VA8	0.90	5.6	Brown sandy clay
669468	Subsoil	VA10	0.70	4.9	Brown sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample ^{1/5}
Unsuitable Sample ^{4/5}

Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 23-10384

RSA Geotechnics Ltd

Site Reference: Alder Meadow, Flordon Road, Creting St Mary, Suffolk, IP6 8NH

Project / Job Ref: 15542VA

Order No: None Supplied

Reporting Date: 22/08/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1.5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCS	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



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List of HWOL Acronyms and Operators

DETS Report No: 23-10384
RSA Geotechnics Ltd
Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH
Project / Job Ref: 15542VA
Order No: None Supplied
Reporting Date: 22/08/2023

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym



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Derwentside Environmental Testing Services Ltd
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DETS Report No: 23-12603

Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH

Project / Job Ref: 15542VA

Order No: None Supplied

Sample Receipt Date: 11/10/2023

Sample Scheduled Date: 11/10/2023

Report Issue Number: 1

Reporting Date: 17/10/2023

Authorised by:



Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

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Soil Analysis Certificate

DETS Report No: 23-12603	Date Sampled	10/10/23	10/10/23	10/10/23	10/10/23	10/10/23
RSA Geotechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH	TP / BH No	TSSPVA1	TSSPVA2	TSSPVA3	TSSPVA4	TSSPVA5
Project / Job Ref: 15542VA	Additional Refs	D1	D1	D1	D1	D1
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 17/10/2023	DETS Sample No	679350	679351	679352	679353	679354

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	6.8	7.2	7.0	7.0	7.1
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	< 10	15	12	11	11
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	< 0.01	0.01	0.01	0.01	0.01
Elemental Sulphur	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Organic Matter (SOM)	%	< 0.1	MCERTS	1.6	1.7	1.7	2.1	1.8
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	0.9	1	1	1.2	1
Arsenic (As)	mg/kg	< 2	MCERTS	7	8	7	7	7
Barium (Ba)	mg/kg	< 2.5	MCERTS	20	22	22	22	20
Beryllium (Be)	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	8	8	8	8	8
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	9	10	11	10	9
Lead (Pb)	mg/kg	< 3	MCERTS	21	23	24	24	21
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	4	4	4	4	4
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Vanadium (V)	mg/kg	< 1	MCERTS	17	19	19	18	18
Zinc (Zn)	mg/kg	< 3	MCERTS	32	37	37	37	34
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

Soil Analysis Certificate

DETS Report No: 23-12603	Date Sampled	10/10/23	10/10/23		
RSA Geotechnics Ltd	Time Sampled	None Supplied	None Supplied		
Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH	TP / BH No	T1ASP	T1CSP		
Project / Job Ref: 15542VA	Additional Refs	D1	D1		
Order No: None Supplied	Depth (m)	None Supplied	None Supplied		
Reporting Date: 17/10/2023	DETS Sample No	679355	679356		

Determindand	Unit	RL	Accreditation	(n)	(n)		
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected		
pH	pH Units	N/a	MCERTS	8.0	9.8		
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1		
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	346	395		
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.35	0.39		
Elemental Sulphur	mg/kg	< 10	NONE	< 10	< 10		
Organic Matter (SOM)	%	< 0.1	MCERTS	2.3	1		
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	1.3	0.6		
Arsenic (As)	mg/kg	< 2	MCERTS	6	4		
Barium (Ba)	mg/kg	< 2.5	MCERTS	119	122		
Beryllium (Be)	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5		
W/S Boron	mg/kg	< 1	NONE	< 1	< 1		
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.8	1.4		
Chromium (Cr)	mg/kg	< 2	MCERTS	24	17		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2		
Copper (Cu)	mg/kg	< 4	MCERTS	36	282		
Lead (Pb)	mg/kg	< 3	MCERTS	30	35		
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS	35	14		
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2		
Vanadium (V)	mg/kg	< 1	MCERTS	19	10		
Zinc (Zn)	mg/kg	< 3	MCERTS	206	299		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs

DETS Report No: 23-12603	Date Sampled	10/10/23	10/10/23	10/10/23	10/10/23	10/10/23
RSA Geotechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Alder Meadow, Flordon Road, Creting St Mary, Suffolk, IP6 8NH	TP / BH No	TSSPVA1	TSSPVA2	TSSPVA3	TSSPVA4	TSSPVA5
Project / Job Ref: 15542VA	Additional Refs	D1	D1	D1	D1	D1
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 17/10/2023	DETS Sample No	679350	679351	679352	679353	679354

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.11
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



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Soil Analysis Certificate - Speciated PAHs					
DETS Report No: 23-12603	Date Sampled	10/10/23	10/10/23		
RSA Geotechnics Ltd	Time Sampled	None Supplied	None Supplied		
Site Reference: Alder Meadow, Flordon Road, Creting St Mary, Suffolk, IP6 8NH	TP / BH No	T1ASP	T1CSP		
Project / Job Ref: 15542VA	Additional Refs	D1	D1		
Order No: None Supplied	Depth (m)	None Supplied	None Supplied		
Reporting Date: 17/10/2023	DETS Sample No	679355	679356		

Determinand	Unit	RL	Accreditation	(n)	(n)
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.48	0.71
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.19
Fluoranthene	mg/kg	< 0.1	MCERTS	0.60	0.88
Pyrene	mg/kg	< 0.1	MCERTS	0.59	0.79
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.36	0.46
Chrysene	mg/kg	< 0.1	MCERTS	0.38	0.38
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.39	0.43
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.14	0.12
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.32	0.38
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.29
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.24
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	3.3	4.9



DETS Ltd
Unit 1, Rose Lane Industrial Estate
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Maidstone



Soil Analysis Certificate - Sample Descriptions

DETS Report No: 23-12603	
RSA Geotechnics Ltd	
Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH	
Project / Job Ref: 15542VA	
Order No: None Supplied	
Reporting Date: 17/10/2023	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
679350	TSSPVA1	D1	None Supplied	8.9	Brown sand
679351	TSSPVA2	D1	None Supplied	7.8	Brown sand
679352	TSSPVA3	D1	None Supplied	9.2	Brown sand
679353	TSSPVA4	D1	None Supplied	9.7	Brown sand
679354	TSSPVA5	D1	None Supplied	7.2	Brown sand with stones
679355	T1ASP	D1	None Supplied	2.9	Light brown sand with stones and concrete
679356	T1CSP	D1	None Supplied	3.4	Light brown sand with stones

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/5}

Unsuitable Sample ^{4/5}

Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 23-12603

RSA Geotechnics Ltd

Site Reference: Alder Meadow, Flordon Road, Creting St Mary, Suffolk, IP6 8NH

Project / Job Ref: 15542VA

Order No: None Supplied

Reporting Date: 17/10/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1.5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCS	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN



List of HWOL Acronyms and Operators

DETS Report No: 23-12603

RSA Geotechnics Ltd

Site Reference: Alder Meadow, Flordon Road, Creeting St Mary, Suffolk, IP6 8NH

Project / Job Ref: 15542VA

Order No: None Supplied

Reporting Date: 17/10/2023

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym

GENERIC SCREENING VALUES ADOPTED IN THE ASSESSMENT

HUMAN HEALTH SCREENING VALUES

Table 1 – Soil Screening Values, Residential with Homegrown Produce End Use

Determinand	Screening Value (mg/kg)			Source
	Soil Organic Matter Content			
	1%	2.5%	6%	
Arsenic	37	37	37	LQM/CIEH 2015
Barium	1300*	1300*	1300*	CL:AIRE GAC 2010
Beryllium	1.7	1.7	1.7	LQM/CIEH 2015
Boron	290	290	290	LQM/CIEH 2015
Cadmium	11	11	11	LQM/CIEH 2015
Chromium (III)	910	910	910	LQM/CIEH 2015
Chromium (VI)	6	6	6	LQM/CIEH 2015
Copper	2400	2400	2400	LQM/CIEH 2015
Lead	200	200	200	DEFRA 2014
Mercury	40	40	40	LQM/CIEH 2015
Nickel	130	130	130	LQM/CIEH 2015
Selenium	250	250	250	LQM/CIEH 2015
Vanadium	410	410	410	LQM/CIEH 2015
Zinc	3700	3700	3700	LQM/CIEH 2015
Cyanide	34	34	34	ATRISK SOIL
Phenol	120	200	380	LQM/CIEH 2015**
Benzene	0.087	0.17	0.37	LQM/CIEH 2015**
Toluene	130	290	660	LQM/CIEH 2015**
Ethylbenzene	47	110	260	LQM/CIEH 2015**
Xylenes	56	130	310	LQM/CIEH 2015**
MTBE	49	84	160	CL:AIRE GAC 2010
TPH CWG - Aliphatic >C5-C6	42	78	160	LQM/CIEH 2015**
TPH CWG - Aliphatic >C6-C8	100	230	530	LQM/CIEH 2015**
TPH CWG - Aliphatic >C8-C10	27	65	150	LQM/CIEH 2015**
TPH CWG - Aliphatic >C10-C12	130	330	760	LQM/CIEH 2015**
TPH CWG - Aliphatic >C12-C16	1100	2400	4300	LQM/CIEH 2015**
TPH CWG - Aliphatic >C16-C35	65000	92000	110000	LQM/CIEH 2015**
TPH CWG - Aliphatic >C35-C44	65000	92000	110000	LQM/CIEH 2015**
TPH CWG - Aromatic >C5-C7	70	140	300	LQM/CIEH 2015**
TPH CWG - Aromatic >C7-C8	130	290	660	LQM/CIEH 2015**
TPH CWG - Aromatic >C8-C10	34	83	190	LQM/CIEH 2015**
TPH CWG - Aromatic >C10-C12	74	180	380	LQM/CIEH 2015**
TPH CWG - Aromatic >C12-C16	140	330	660	LQM/CIEH 2015**
TPH CWG - Aromatic >C16-C21	260	540	930	LQM/CIEH 2015**
TPH CWG - Aromatic >C21-C35	1100	1500	1700	LQM/CIEH 2015**
TPH CWG - Aromatic >C35-C44	1100	1500	1700	LQM/CIEH 2015**

Table 1 – Soil Screening Values, Residential with Homegrown Produce End Use continued

Determinand	Screening Value (mg/kg)			Source
	Soil Organic Matter Content			
	1%	2.5%	6%	
Naphthalene	2.3	5.6	13	LQM/CIEH 2015**
Acenaphthylene	170	420	920	LQM/CIEH 2015**
Acenaphthene	210	510	1100	LQM/CIEH 2015**
Fluorene	170	400	860	LQM/CIEH 2015**
Phenanthrene	95	220	440	LQM/CIEH 2015**
Anthracene	2400	5400	11000	LQM/CIEH 2015**
Fluoranthene	280	560	890	LQM/CIEH 2015**
Pyrene	620	1200	2000	LQM/CIEH 2015**
Benzo(a)anthracene	7.2	11	13	LQM/CIEH 2015**
Chrysene	15	22	27	LQM/CIEH 2015**
Benzo(b)fluoranthene	2.6	3.3	3.7	LQM/CIEH 2015**
Benzo(k)fluoranthene	77	93	100	LQM/CIEH 2015**
Benzo(a)pyrene	2.2	2.7	3.0	LQM/CIEH 2015**
Indeno(1,2,3-cd)pyrene	27	36	41	LQM/CIEH 2015**
Di-benzo(a,h)anthracene	0.24	0.28	0.3	LQM/CIEH 2015**
Benzo(g,h,i)perylene	320	340	350	LQM/CIEH 2015**
Chloromethane	0.0083	0.0098	0.013	CL:AIRE GAC 2010
Chloroethane	8.3	11	18	CL:AIRE GAC 2010
Vinyl Chloride	0.00064	0.00087	0.0014	LQM/CIEH 2015**
1,1-dichloroethene	0.23	0.4	0.82	CL:AIRE GAC 2010
Cis-1,2-dichloroethene	0.11	0.19	0.37	CL:AIRE GAC 2010
1,1-dichloroethane	2.4	3.9	7.4	CL:AIRE GAC 2010
Trichloromethane	0.91	1.7	3.4	LQM/CIEH 2015**
1,1,1-Trichloroethane	8.8	18	39	LQM/CIEH 2015**
Trans-1,2-dichloroethene	0.19	0.34	0.7	CL:AIRE GAC 2010
Tetrachloromethane	0.026	0.056	0.13	LQM/CIEH 2015**
1,2-dichloropropane	0.024	0.042	0.084	CL:AIRE GAC 2010
Trichloroethene	0.016	0.034	0.075	LQM/CIEH 2015**
Bromodichloromethane	0.016	0.03	0.061	CL:AIRE GAC 2010
1,1,2-Trichloroethane	0.6	1.2	2.7	CL:AIRE GAC 2010
Tetrachloroethene	0.18	0.39	0.9	LQM/CIEH 2015**
Chlorobenzene	0.46	1	2.4	LQM/CIEH 2015**
1,1,1,2-Tetrachloroethane	1.2	2.8	6.4	LQM/CIEH 2015**
Styrene	8.1	19	43	CL:AIRE GAC 2010
1,1,2,2-Tetrachloroethane	1.6	3.4	7.5	LQM/CIEH 2015**
Isopropylbenzene	11	27	64	CL:AIRE GAC 2010
Bromobenzene	0.87	2	4.7	CL:AIRE GAC 2010
N-Propylbenzene	34	82	190	CL:AIRE GAC 2010
1,2,4-Trimethylbenzene	0.35	0.85	2	CL:AIRE GAC 2010
1,2,3-Trichlorobenzene	1.5	3.6	8.6	LQM/CIEH 2015**
1,3-Dichlorobenzene	0.4	1	2.3	LQM/CIEH 2015**
1,2-Dichlorobenzene	23	55	130	LQM/CIEH 2015**
1,4-Dichlorobenzene	61	150	350	LQM/CIEH 2015**
Hexachloroethane	0.2	0.48	1.1	CL:AIRE GAC 2010

Table 1 – Soil Screening Values, Residential with Homegrown Produce End Use continued

Determinand	Screening Value (mg/kg)			Source
	Soil Organic Matter Content			
	1%	2.5%	6%	
2,4-Dimethylphenol	19	43	97	CL:AIRE GAC 2010
1,2,4-Trichlorobenzene	2.6	6.4	15	LQM/CIEH 2015**
Hexachlorobutadiene	0.29	0.7	1.6	LQM/CIEH 2015**
2-Chloronaphthalene	3.7	9.2	22	CL:AIRE GAC 2010
2,6-Dinitrotoluene	0.78	1.7	3.9	CL:AIRE GAC 2010
2,4-Dinitrotoluene	1.5	3.2	7.2	CL:AIRE GAC 2010
Diethyl phthalate	120	260	570	CL:AIRE GAC 2010
Hexachlorobenzene	1.8	3.3	4.9	LQM/CIEH 2015**
Butyl benzyl phthalate	1400	3300	7200	CL:AIRE GAC 2010
Di-n-octylphthalate	2300	2800	3100	CL:AIRE GAC 2010
Bis(2-ethylhexyl)phthalate	280	610	1100	CL:AIRE GAC 2010
Pentachlorophenol	0.22	0.52	1.2	LQM/CIEH 2015**

* Based on residential without home grown produce

** Assumes no free product

HOUSE TYPE SCHEDULE: ORIGINAL SCHEME

HOUSE TYPE	TYPE	QUANTITY
AFFORDABLE		
1 BED FLAT AFFORDABLE	TYPE 1A	2
1 BED FLAT AFFORDABLE	TYPE 1B	2
2 BED AFFORDABLE	TYPE 2	10
3 BED AFFORDABLE	TYPE 3	4
		18
OPEN MARKET		
2 BED BUNGALOW	TYPE 4	6
2 BED HOUSE	TYPE 5	6
3 BED	TYPE 6	13
4 BED HOUSE	TYPE 7	4
4 BED HOUSE	TYPE 8	5
		34
OVERALL TOTAL		52

Original Scheme Affordable Units:

- (Plots 1-18)
- 4 No. 1 Bedroom 2 Person Apartments @ 48sqm - Plots 4-7
- 6 No. 2 Bedroom 4 Person Houses @ 76sqm - Plots 1-3 & 9-10
- 4 No. 3 Bedroom 5 Person Houses @ 85sqm - Plots 11-12 & 17-18
- Shared Ownership
- 4 No. 2 Bedroom 4 Person Houses @ 76sqm - Plots 13-16

SCHEME DESCRIPTION

This proposal provides additional housing on land to the rear of the existing offices.

The existing approved layout remains as approved

The affordable housing shifts so that the majority lie in the extended area.

Highway extended with a new turning head.

None of the existing design proposals require any alteration under this proposal.

SECTION 106 AGREEMENT FOR THE PREVIOUSLY APPROVED SITE, TO BE SUBJECT TO AMENDMENT, TO REDUCE THE NUMBER OF AFFORDABLE AND SHARED OWNERSHIP HOUSES ON THE ORIGINALLY APPROVED SITE BUT PROPORTIONALLY INCREASE THE NUMBERS ACROSS THE COMBINED SITE.

EXISTING APPROVED LAYOUT TO REMAIN AS DRAWN

Not Completed/Constructed as of 16 October 2023

Affordable housing within original scheme to stay as such in new proposals

PROPOSED SCHEME EXTENSION :

- Affordable Units (Plots A-N)**
- 2 No. 1 Bedroom 2 Person Apartments @ 48sqm - Plots A-B
 - 7 No. 2 Bedroom 4 Person Houses @ 76sqm - Plots C-H & J
 - 4 No. 3 Bedroom 5 Person Houses @ 85sqm - Plots K,L,M&N

- Open Market Residential Units**
- 1 No 2 Bedroom 4 Person House @ 76sqm - Plot P
 - 2 No. 1 Bedroom 2 Person Apartments @ 48sqm - Plots Q, &R

- 13 Affordable Dwellings, Plots A-M
- 3 Open Market Dwellings, Plots P-R

Total 18 No Additional Dwellings

ORIGINAL SCHEME

- Existing Approved Houses to remain as Affordable PLOTS 1-10**
- 3 No 2 Bedroom 4 Person Houses @ 76sqm - Plots 1-3
 - 4 No. 1 Bedroom 2 Person Apartments @ 48sqm - Plots 4-7
 - 3 No 2 Bedroom 4 Person Houses @ 76sqm - Plots 8-10

- Originally Approved Affordable Housing to become Open Market**
- 4 No 3 Bed Houses @ 85sqm, Plots 11-12 & 17-18
 - 4 No 2 Bed Houses @ 76sqm, Plots 13-16

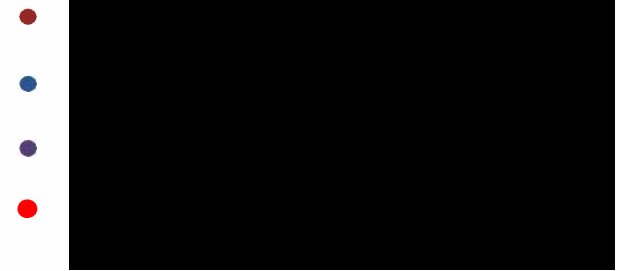
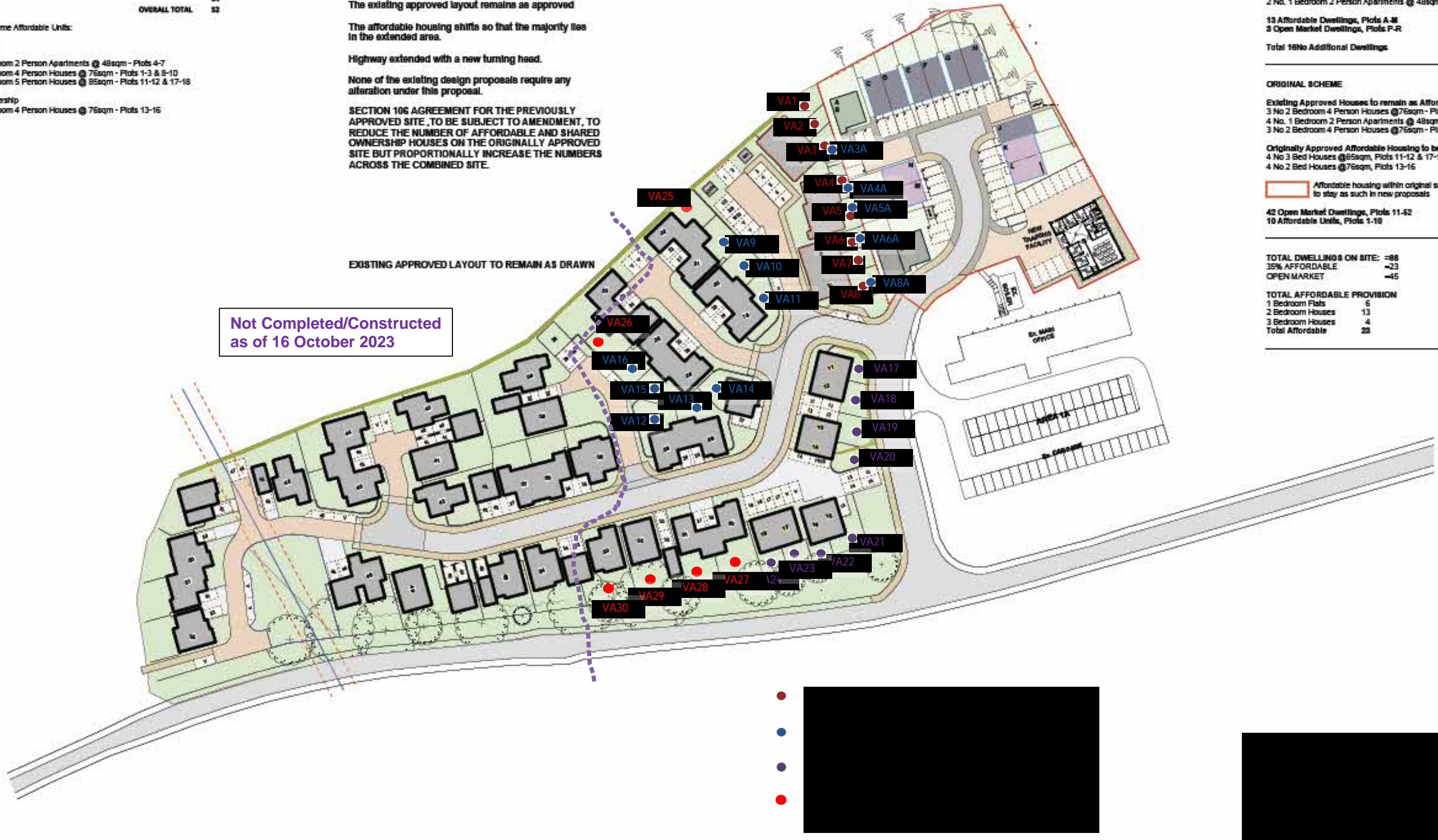
Affordable housing within original scheme to stay as such in new proposals

- 42 Open Market Dwellings, Plots 11-52
- 10 Affordable Units, Plots 1-10

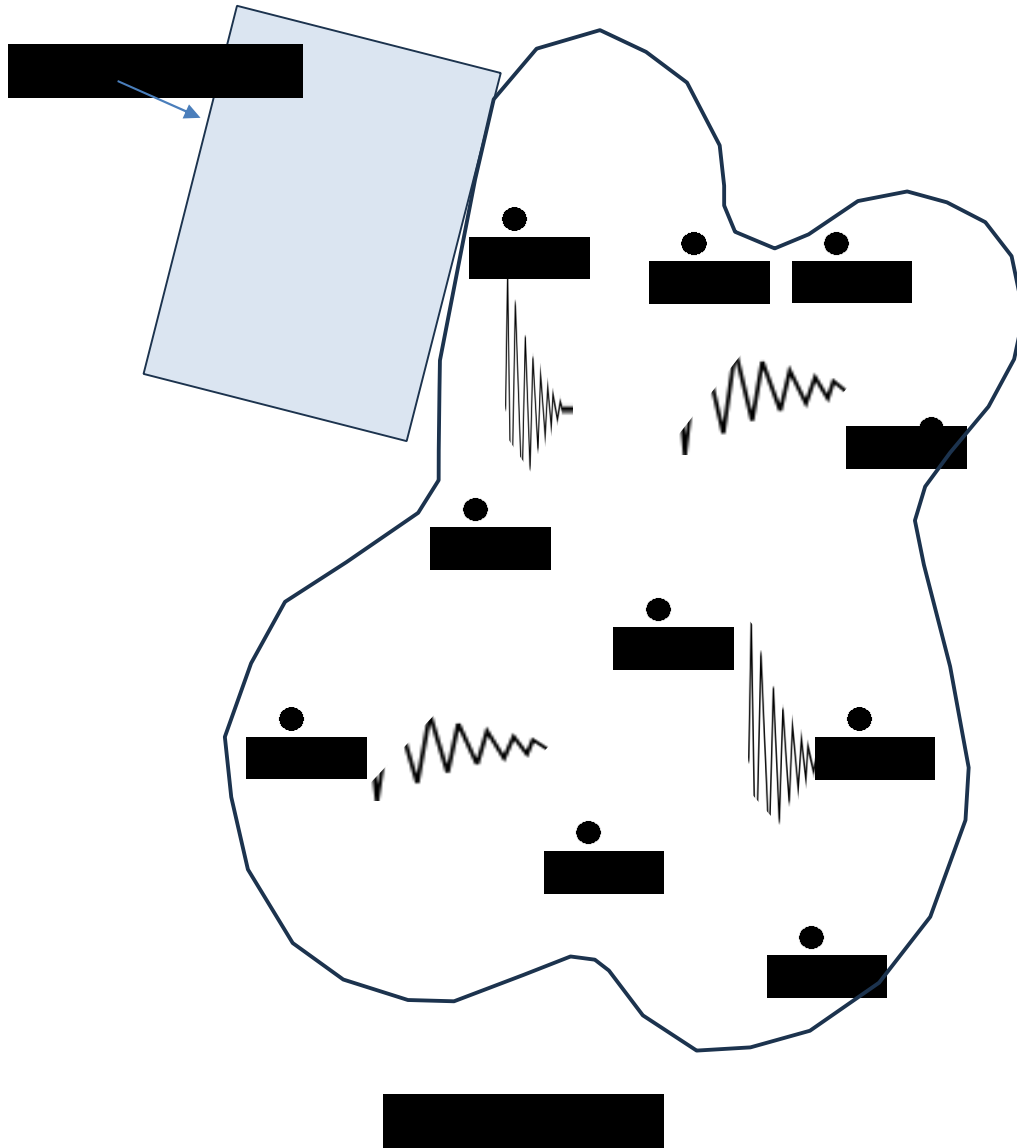
TOTAL DWELLINGS ON SITE: =88
 35% AFFORDABLE =23
 OPEN MARKET =45

TOTAL AFFORDABLE PROVISION

- 1 Bedroom Flats 6
- 2 Bedroom Houses 13
- 3 Bedroom Houses 4
- Total Affordable 23**



<p>VALIDATION SAMPLE LOCATION PLAN (Based upon Wincer Kievenaar drawing number FE100 Rev A) "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</p> <p>Date 20 OCTOBER 2023</p>
	<p>Scale NOT TO SCALE</p>
<p>Drawing No 15542VA/1 Version C</p>	



NOTE: All dimensions are approximate

SKETCH PLAN, STOCKPILE (SUBSOIL)

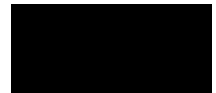
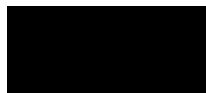
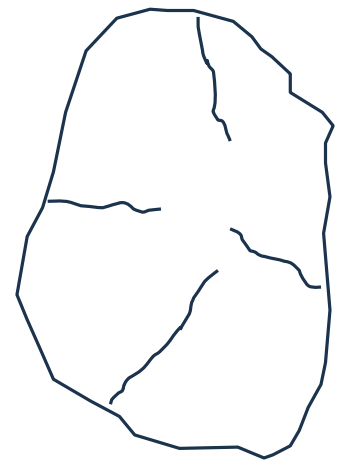
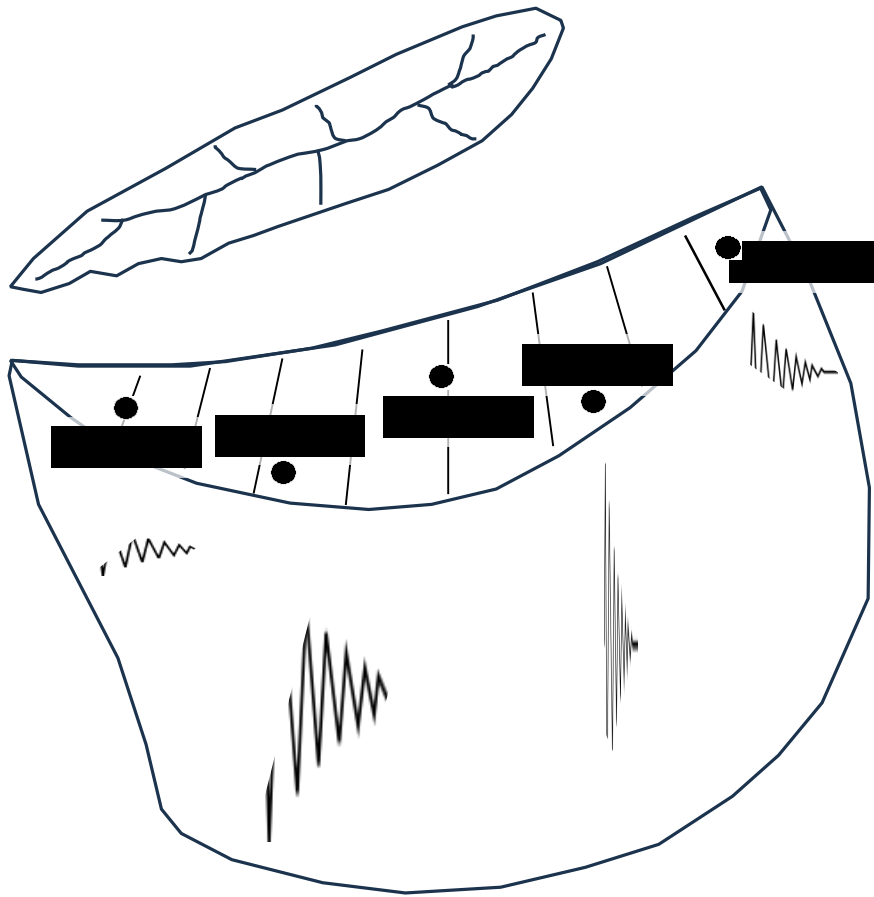
Date 20 OCTOBER 2023

ALDER MEADOW, CREETING ST MARY

Scale NOT TO SCALE

RSA GEOTECHNICS LIMITED

Drawing No 15542VA/3



NOTE: All dimensions are approximate

SKETCH PLAN, STOCKPILE (TOPSOIL)

Date 20 OCTOBER 2023

ALDER MEADOW, CREETING ST MARY

Scale NOT TO SCALE

RSA GEOTECHNICS LIMITED

Drawing No 15542VA/4