

**DESK STUDY AND PRELIMINARY CONTAMINATION
ASSESSMENT
AT
LAND AT THE CORNER OF MEADOW ROAD AND
ADDISON ROAD
CAVERSHAM, READING
RG1 8EN**

CLIENT: NATTA HOMES LIMITED/MR ROBERT BELCHER

DATE: 20 MARCH 2018

REF: G/031850/001

K F GEOTECHNICAL

CONSULTING GEOTECHNICAL
ENGINEERS

W. J. C. WALLACE B.Eng (Hons.)

70a Lysons Road
Aldershot
Hants
GU11 3ED

Email: info@kfgeotechnical.co.uk

Consultant
G. L. Martin B.Sc., M.Sc., C.Eng., M.I.C.E.

DESK STUDY AND PRELIMINARY CONTAMINATION ASSESSMENTS AT LAND AT THE CORNER OF MEADOW ROAD AND ADDISON ROAD, READING

CONTENTS

Section 1	-	Introduction
Section 2	-	The Site
Section 3	-	Desk Study
Section 4	-	Site Work
Section 5	-	Laboratory Work
Section 6	-	Discussion

APPENDICES

Site Location Plan

Borehole Logs

Contamination Test Results

DESK STUDY AND PRELIMINARY CONTAMINATION ASSESSMENTS AT LAND AT THE CORNER OF MEADOW ROAD AND ADDISON ROAD, READING

1. INTRODUCTION

- 1.1 We were instructed by Natta Homes Limited to carry out a desk study and preliminary contamination testing, together with a borehole investigation, at a site occupying a corner plot at the junction of Meadow Road and Addison Road, Caversham. The desk study and testing is to assist in the discharge of a planning condition for the redevelopment of the site for a residential end use.

2. THE SITE

- 2.1 Addison Road is a residential road in the southern part of Caversham to the south of The Thames in Reading. It marks the western edge of a housing estate consisting in the main of terraced Victorian or early Edwardian houses. To the west of the road there is an industrial estate and the site in question appears to be an old industrial site which has been fallow for some years. The site is currently cleared with a secure fence marking the boundaries with the two roads and is clad in a mixture of hardcore, tarmac and concrete. There are currently no trees or other significant vegetation on the site.
- 2.2 The site is basically level.
- 2.3 The Geology of Great Britain indicates that the naturally occurring subsoil is Langley Silt Member or Brickearth overlying Upper Chalk.

3. DESK STUDY

- 3.1 We carried out an internet based desk study including a study of historical maps.

3.2 Historical Maps

- 3.2.1 We have accessed maps to the 1:2500 and 1:10560 (later 1:10000) scale extending back to 1879 on the 1:2500 scale, with the latest map being 2017 on the 1:10000 scale. We will refer primarily to the 1:2500 scale maps only referring to the 1:10560 (later 1:10000) scale maps if these show anything materially different.

DESK STUDY AND PRELIMINARY CONTAMINATION ASSESSMENTS AT LAND AT THE CORNER OF MEADOW ROAD AND ADDISON ROAD, READING

- 3.2.2 The 1879 map shows the site being open fields. The nearest development is approximately 200m to the east where there are malthouses and timber yards. Approximately 200m to the south is a main line railway. There is no change on the 1881 map.
- 3.2.3 The next available map is 1899. This still shows the site as being open fields but there is high density housing within 50m to the east.
- 3.2.4 The next available map is 1912. This shows the houses along Addison Road as they are to the present day. Meadow Road is also in existence although this is undeveloped at this time. There is a printing works to the south of Meadow Road. The site itself is shown as a rectangular vacant plot adjacent to recently constructed terraced housing. This housing is still in existence.
- 3.2.5 The next available map is 1932. This still shows the site as vacant but shows the first signs of development along Meadow Road itself apart from the printing works on the southern edge.
- 3.2.6 The next available map is 1957. This now appears to show the site forming part of a works recently constructed adjacent to the site to the west.
- 3.2.7 The 1988 map shows a rectangular building on the site along the northern edge adjacent to the terraced housing. By this time the industrial estate, of which Meadow Road forms a part, is becoming more extensive. The site still appears to be associated with a works adjacent to the site to the east.
- 3.2.8 The last available map to this scale is 1993 and this shows the site as it was in 1988.
- 3.2.9 The 1:10560 (later 1:10000) maps shows nothing that is particularly different or relevant other than it confirms that most of the site throughout its history has not been built on and would appear to have been used for storage and parking. The only building indicated on either set of maps is a rectangular building on the northern edge of the site.

DESK STUDY AND PRELIMINARY CONTAMINATION ASSESSMENTS AT LAND AT THE CORNER OF MEADOW ROAD AND ADDISON ROAD, READING

3.3 Environmental Data Sheets

- 3.3.1 Dealing now with the Envirocheck Data Sheets. The detailed sheets are appended at the rear of this report but the salient points are as follows.
- 3.3.2 The nearest surface water feature is at 264m to the south.
- 3.3.3 The nearest discharge consent is at 319m and there is a prosecution relating to control waters but not within 710m.
- 3.3.4 The nearest integrated pollution control is at 885m and the nearest integrated pollution prevention and control is at 505m. There is a local authority pollution prevention and control measure in force at a respraying business at 234m.
- 3.3.5 There was a pollution incident to controlled waters at 152m relating to unknown chemicals. This was in 1996 and categorised as a minor incident.
- 3.3.6 The nearest water abstraction relates to Manrose Manufacturing at 139m to the southwest and is for non-evaporative cooling.
- 3.3.7 The bedrock is classified as a principle aquifer and this will relate to the underlying chalk. The superficial deposits, which relate to the Langley Silt Member, are classified as unproductive strata.
- 3.3.8 The site does not lie within a source protection zone with the nearest being Reading University at 620m.
- 3.3.9 There is no risk of tidal or fluvial flooding on the site.
- 3.3.10 There are no landfill sites either current or historic within 250m of the site.
- 3.3.11 The site does not lie within a coal mining affected area.
- 3.3.12 There are no natural cavities nearer than 717m.

DESK STUDY AND PRELIMINARY CONTAMINATION ASSESSMENTS AT LAND AT THE CORNER OF MEADOW ROAD AND ADDISON ROAD, READING

3.3.13 There is no hazard from collapsible ground or compressible ground or running sand. There is a very low potential for ground dissolution, landslide or shrinking or swelling clay.

3.3.14 The site does not lie in a radon protection area and no radon protection measures are necessary in the construction of new dwellings or extensions.

3.3.15 The contemporary trade directory has many entries within the vicinity due to the area to the west of the site being a light industrial estate. The nearest is Manrose which is a manufacturers of ventilators and ventilation systems and this is put at 34m. The next nearest active trade is an ornamental metal work business and then at 105m there is a road haulage services company. There is a screen printers at 157m and a garage workshop at 164m.

3.4 Risk Assessment and Conceptual Model

3.4.1 The desk study, in particular the historical maps, indicates this site has been largely vacant since the 1860s and before, but for many decades has now formed part of a factory unit which is currently occupied by Manrose ventilation systems and used, presumably for storage and car parking associated with these works. The historical maps show a rectangular building along the northern edge of the site.

3.4.2 Considering its industrial history there is a potential for contamination on this site from various sources. The first and most obvious would be from fill material brought in to make up areas of hardstanding etc and this is a potential source of heavy metals and PAH. In addition to this there is the potential of contamination from stored materials and/or disposal of contaminative substances on the site. Once more this is a likely source of heavy metals and PAH and possibly TPH. If the site has been used for parking of vehicles then there is the potential of hydrocarbon contamination from fuel and oil spillages.

DESK STUDY AND PRELIMINARY CONTAMINATION ASSESSMENTS AT LAND AT THE CORNER OF MEADOW ROAD AND ADDISON ROAD, READING

3.4.3 The proposed development is for residential with gardens and based on this we give below a graphical representation of our conceptual model.

Table 1 – Conceptual Model

Potential Contamination Source	Potential Contaminands	Potential Pathways	Likely Receptors
Fill Material	• Heavy metals • PAH	• Digestion • Ingestion • Dermal contact	• End users • Groundworkers • Services
Fuel Spillages	• Heavy metals • PAH • TPH	• Digestion • Ingestion • Dermal contact	• End users • Groundworkers • Services vapours
Storage and Disposal of Industrial Materials	• Heavy metals • PAH • TPH	• Digestion • Ingestion • Dermal contact	• End users • Groundworkers • Services vapours

3.4.4 The proposed development is for houses with gardens and the most at risk group would be end users of the site, especially small children that might come into long term contact with the soil in proposed garden areas. Considering the history of the site we would consider the risk of contamination on this site as moderate to high and hence the risk of harm to this particular group as moderate to high without remediation.

3.4.5 The underlying bedrock is chalk which is a major aquifer but this is overlain by Brickearth and Head Material which is classified as non-production strata. It is not envisioned that there would be any new pathway to the chalk from the new development and therefore we would consider the risk of harm to the aquifer from the proposed change of use from industrial to residential as negligible, especially in the light of the fact that there are no recorded incidences from its current or past use.

3.4.6 There are no landfill sites within 250m and therefore no realistic risk of soil gas other than that which might be present locally due to any hydrocarbons in the ground.

DESK STUDY AND PRELIMINARY CONTAMINATION ASSESSMENTS AT LAND AT THE CORNER OF MEADOW ROAD AND ADDISON ROAD, READING

- 3.4.7 We would recommend carrying out sampling and contamination testing on a series of samples taken from proposed garden areas. This sampling can take place during the site investigation to determine ground conditions for design purposes.

4. SITE WORK

- 4.1 The site work took place on the 5 March 2018 and consisted of the augering by hand of 3 No. boreholes within the footprint of the proposed houses together with the taking of near surface samples at six locations in the proposed garden areas.
- 4.2 Borehole 1 was put down close to the Meadow Road end of the site and this revealed fill material down to 1.95m. This is initially a medium dense sand with gravel, asphalt and brick changing at 230mm to a loose silty sand with gravel, asphalt, bricks and chalk fragments. Below 1.95m the soil appears to be natural except that there is a loose layer of clayey sand between 2.3m and 2.7m which makes us believe that it might be reworked material. Clearly natural ground consisting of a medium dense clayey sand and gravel was encountered at 2.7m and proved to the base of the borehole at 3.5m. Water was struck at 2.7m and was standing at 2.5m on completion.
- 4.3 Borehole 2 had hardcore near the surface which was too dense to prove below 1.2m by hand auger. A Mackintosh Probe was driven from this depth to an overall depth of 3.0m and revealed generally loose material down to 2.8m. The blow counts below this depth are consistent with sand and gravel as found at similar depths in borehole 1.
- 4.4 Borehole 3 at the northern end of the site revealed fill material to 2.4m over a firm sandy clay which was proved to the base of the borehole at 3.0m. The fill material starts off initially as medium dense to 1.2m but then is a loose silty clayey sand with gravel and bricks to 2.1m. There is then a 300mm layer of ash and clinker.
- 4.5 Disturbed samples were taken of the natural ground but no soil testing has been carried out at this stage.

5. LABORATORY WORK

5.2 Contamination Analysis

5.2.1 Each of the six samples was placed in a suitable sealed container and sent via coolbox to our specialist laboratories, Chemtest, for analysis.

5.2.2 Each sample was tested for the range of common toxic metals and metalloids, phytotoxic elements and organics, pH, sulphates and total petroleum hydrocarbons. The results are appended.

5.2.3 There has been recent updated Soil Guideline Values (SGV) issued for arsenic, cadmium, mercury, nickel, selenium and phenol. The results have been compared against appropriate SGV for these determinands. Where new values have not been issued, then the results have been compared against previous SGVs, which relate to lead and chromium or against Generic Assessment Criteria (GAC) based on the CLEA model produced by LQM and others.

5.2.4 The proposed development is residential with gardens and the most appropriate SGVs, C4SLs etc is Residential with the potential for Plant Uptake.

5.2.5 When the results of the contamination analysis are compared against the appropriate thresholds there are undue concentrations of:

Arsenic. The threshold is 32mg/kg and this is exceeded in samples taken from S1 with 33mg/kg, S3 with 34mg/kg and S4 with 40mg/kg.

Lead. The C4SL is currently 200mg/kg and this is exceeded in all samples with concentrations ranging from a low of 980mg/kg up to a high of 3000mg/kg.

Benzo[a]pyrene. The threshold is currently in the region of 5mg/kg and this is exceeded in all samples with a low of 6.2mg/kg and a high of 28mg/kg.

Total Petroleum Hydrocarbons (TPH). There is a high value of TPH in sample S5 of 13000mg/kg and again in S6 with 1300mg/kg.

6. DISCUSSION

6.1 Geotechnical Aspects

- 6.1.1 The site investigation has revealed fill material down to between 2.7m and 3.0m overlying either a firm silty sandy clay or clayey sand and gravel. This latter material is consistent with Brickearth or Head Material. The chalk was not encountered.
- 6.1.2 The desk study did not indicate any historical quarries or pits in this area and therefore the extent and the depth of fill material is somewhat surprising. It is possible that the natural ground was exploited to provide building material for the terraced houses nearby which is why the site was never similarly developed.
- 6.1.3 Clearly the depth of the natural ground precludes the use of standard shallow foundations for the proposed houses. The alternatives might be a raft, some form of ground improvement or piling.
- 6.1.4 We would not recommend a raft. Rafts tend to work well on poor quality but generally homogeneous soil. Fill material by definition is not homogenous and here has been found to be loose to some depth. The use of some form of ground improvement technique such as stone columns, vibroflotation etc might be an option but specialist operators would need to be consulted and furnished with our logs.
- 6.1.5 On the face of it the most suitable form of foundation would be piles and beams or a piled raft with the piles being taken down probably to the chalk and sleeved through the fill material. As stated above the chalk was not encountered during our site investigation and therefore at least one deep borehole is required to determine the soil profile to depth so that good pile parameters can be obtained. We would recommend a single borehole to 20.0m at the approximate centre of the site. Based on the loose nature of the fill material and the presence of water in borehole 1, the most likely form of pile will be a CFA. An alternative might be a driven pile but there tends to be resistance to such piling close to residential areas due to noise and vibration issues.

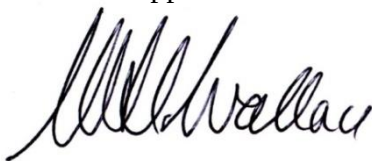
DESK STUDY AND PRELIMINARY CONTAMINATION ASSESSMENTS AT LAND AT THE CORNER OF MEADOW ROAD AND ADDISON ROAD, READING

6.2 Contamination Aspects.

6.2.1 The contamination testing revealed undue concentrations of several contaminants and it is clear from this that remediation will be required. Considering the depth of the fill material the most likely form of remediation will be the removal of the top 750mm of the existing ground and the replacement with clean inert subsoil and topsoil together with an hydraulic break between the residual contaminated soil in the ground and the new clean subsoil. This consists of a 150mm deep layer of single stone aggregate sandwiched between two layers of geotextile.

6.2.2 It might also be necessary to carry out some gas and vapour monitoring because of the excessive hydrocarbons in certain samples. If a further borehole is to be put down for foundation design then we would recommend the installation of a gas and water monitoring standpipe to allow for on-going monitoring. The alternative to continuing monitoring would be to provide a gas and vapour membrane within the construction of the floor of the houses subject to the approval of the local authority.

6.2.3 We attach a specimen remediation method statement for the garden areas which should be forwarded with this report and the desk study to the local authority for their approval.



W J C Wallace

K F Geotechnical

70a Lysons Road
Aldershot
Hants
GU11 3ED

SITE LOCATION PLAN

Ref: G/031850/101

Sheet:

1 of 1

Scale:

N/A

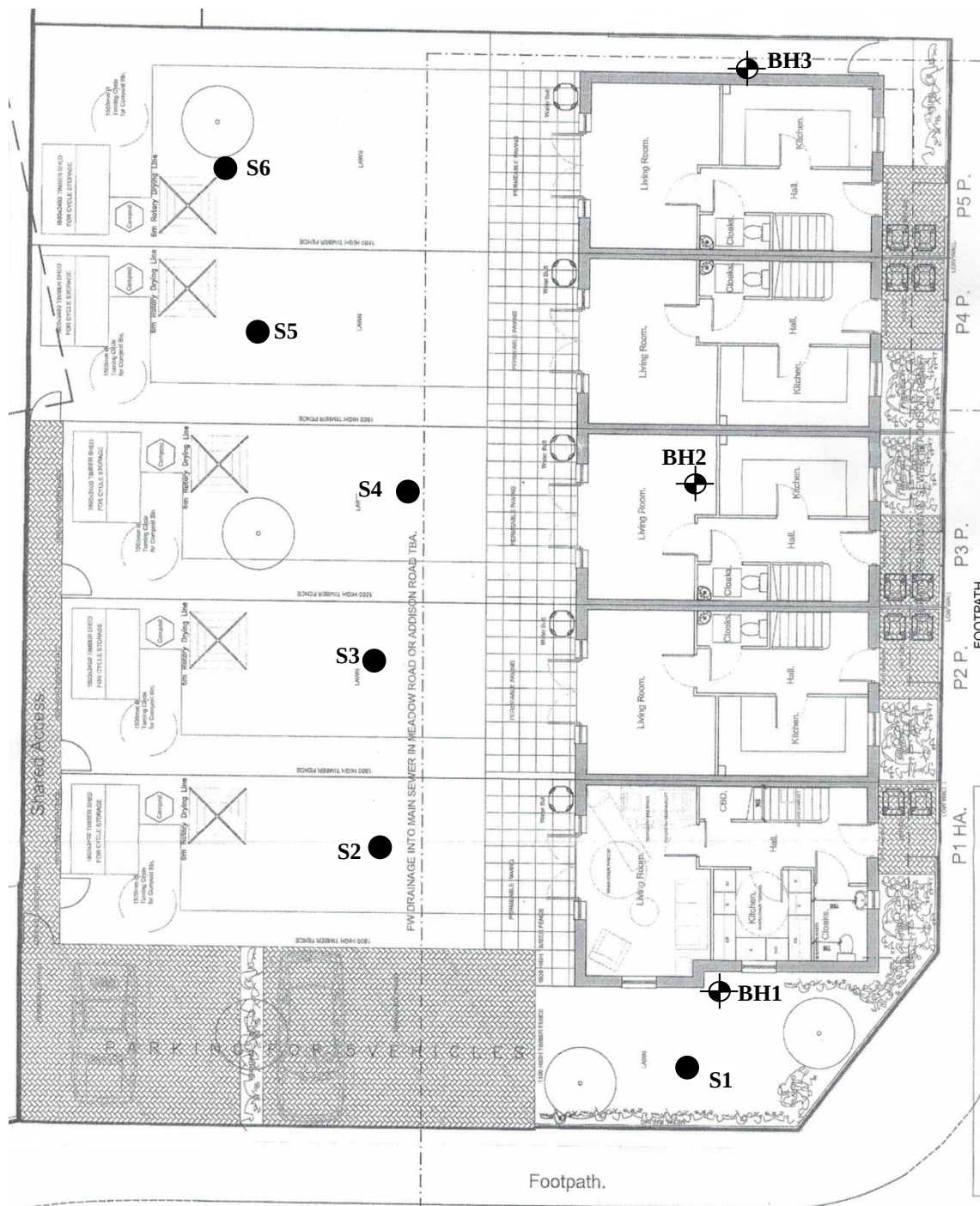
Date:

5 March 2018

Client:

Natta Homes/Mr Robert Belcher

Location: **ADDISON ROAD, READING, RG1 8EN**



Remarks:

Key:

- | | | | | | |
|--|-----------|-----|----------------|----|-----------------------------|
| | Borehole | SVP | Soil Vent Pipe | MH | Manhole |
| | Trial pit | RWP | Rainwater Pipe | G | Gully |
| | Samples | | Soakaway (SA) | | Tree/Bush (approx. ht in m) |

K. F. Geotechnical		Borehole 1		Ref: G031850				
85 Alexandra Road Farnborough Hants GU14 6BN		Tel : (01252) 518821 Fax : (01252) 370394 Email : kfgroup@fbro.demon.co.uk	Sheet: 1	Scale: 1:20	Date: 6/3/18			
Equipment & Method : Hand Auger		Client: NATTA HOMES LTD						
		Location: ADDISON ROAD READING						
Description of Strata [thickness]	Reduced Level	Legend	Depth	Samples		Tests		Field Notes
				Type	Depth	Type	Value	
MADE GROUND: medium dense black silty sand with syones, asphalt and brick (0.23)	-0.23	[Pattern]	0.23					
MADE GROUND: loose black/dark brown silty sand with gravel, asphalt, brick and chlak fragments (1.72)								
Firm brown/orange/grey silty sandy CLAY (0.35)	-1.95	[Pattern]	1.95	D	2.00	V	68	
Loose brown silty clayey SAND (0.40)	-2.30	[Pattern]	2.30	D	2.30	V	40	
Medium dense brown silty clayey gravelly SAND (0.80)	-2.70	[Pattern]	2.70	D	2.70	M	10,19,24,36	Water strike at 2.7m
Base of Borehole	-3.50		3.50					
Where 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given. (Not the N value) All depths and reduced levels are in metres. Water level observations during boring are given on the last sheet of the log.				Remarks Water standing at 2.5m on completion Borehole collapsing from 2.5m				
U Undisturbed Sample S Standard Penetration Test D Disturbed Sample V Vane Test B Bulk Sample MP Mackintosh Probe W Water Sample								

K. F. Geotechnical 85 Alexandra Road Farnborough Hants GU14 6BN Tel : (01252) 518821 Fax : (01252) 370394 Email : kfgroup@fbro.demon.co.uk		Borehole 2		Ref: G031850				
		Sheet: 1	Scale: 1:20	Date: 6/3/18				
		Client: NATTA HOMES LTD						
Equipment & Method : Hand Auger		Location: ADDISON ROAD READING						
Description of Strata [thickness]	Reduced Level	Legend	Depth	Samples		Tests		Field Notes
				Type	Depth	Type	Value	
MADE GROUND: medium dense black silty sand with stones, asphalt and brick (1.20)								
Base of Borehole	-1.20		1.20	D	1.20	M	7,7,9,9	
					1.50	M	6,2,7,8	
					1.80	M	6,5,5,5	
					2.10	M	5,5,4,4	
					2.40	M	4,4,4,4	
					2.70	M	5,18,21,22	
Where 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given. (Not the N value) All depths and reduced levels are in metres. Water level observations during boring are given on the last sheet of the log.				Remarks Too dense to auger through hardcore at surface. Mackintosh Probe driven to 3m				
U Undisturbed Sample S Standard Penetration Test D Disturbed Sample V Vane Test B Bulk Sample MP Mackintosh Probe W Water Sample								

K. F. Geotechnical 85 Alexandra Road Farnborough Hants GU14 6BN Tel : (01252) 518821 Fax : (01252) 370394 Email : kfgroup@fbro.demon.co.uk		Borehole 3		Ref: G031850				
		Sheet: 1	Scale: 1:20	Date: 6/3/18				
		Client: NATTA HOMES LTD						
Equipment & Method : Hand Auger		Location: ADDISON ROAD READING						
Description of Strata [thickness]	Reduced Level	Legend	Depth	Samples		Tests		Field Notes
				Type	Depth	Type	Value	
MADE GROUND: medium dense dark brown silty sand with gravel, asphalt, brick and chlak fragments (1.20)								
MADE GROUND: loose dark grey/black silty clayey sand with gravel and brick (0.90)	-1.20		1.20		1.20	M	6,4,9,10	
					1.50	M	13,7,5,5	
					1.80	M	4,5,5,5	
MADE GROUND: medium dense ash and clinker (0.30)	-2.10		2.10		2.10	M	10,8	
Firm blue/green/brown silty sandy CLAY (0.60)	-2.40		2.40					
				D	2.50	V	72	
Base of Borehole	-3.00		3.00					
Where 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given. (Not the N value) All depths and reduced levels are in metres. Water level observations during boring are given on the last sheet of the log.				Remarks Borehole dry and open on completion				
U Undisturbed Sample S Standard Penetration Test D Disturbed Sample V Vane Test B Bulk Sample MP Mackintosh Probe W Water Sample								

Final Report

Report No.:	18-06260-1		
Initial Date of Issue:	13-Mar-2018		
Client	KF Geotechnical		
Client Address:	70a Lysons Road Aldershot Hampshire GU11 EED		
Contact(s):	Ann Richardson		
Project	Addison Road Reading		
Quotation No.:		Date Received:	07-Mar-2018
Order No.:		Date Instructed:	07-Mar-2018
No. of Samples:	6		
Turnaround (Wkdays):	5	Results Due:	13-Mar-2018
Date Approved:	13-Mar-2018		
Approved By:			
			
Details:	Martin Dyer, Laboratory Manager		

Results - Soil

Project: Addison Road Reading

Client: KF Geotechnical	Chemtest Job No.:		18-06260	18-06260	18-06260	18-06260	18-06260	18-06260
Quotation No.:	Chemtest Sample ID.:		587582	587583	587584	587585	587586	587587
Order No.:	Client Sample Ref.:		S1	S2	S3	S4	S5	S6
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):		0.30	0.30	0.30	0.30	0.30	0.30
	Date Sampled:		05-Mar-2018	05-Mar-2018	05-Mar-2018	05-Mar-2018	05-Mar-2018	05-Mar-2018
Determinand	Accred.	SOP	Units	LOD				
Moisture	N	2030	%	0.020	14	13	15	14
Stones and Removed Materials	N	2030	%	0.020	< 0.020	< 0.020	< 0.020	< 0.020
pH	U	2010	N/A	7.8	8.1	8.1	8.4	7.9
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.98	0.46	1.6	1.1
Sulphate (2:1 Water Soluble) as SO ₄	U	2120	g/l	0.010	< 0.010	0.017	0.021	0.046
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	1.9
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	0.60	1.7	3.1
Thiocyanate	U	2300	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Sulphide (Easily Liberatable)	U	2325	mg/kg	0.50	7.3	9.8	28	27
Sulphate (Total)	U	2430	%	0.010	0.11	0.14	0.21	0.19
Arsenic	U	2450	mg/kg	1.0	33	30	34	40
Cadmium	U	2450	mg/kg	0.10	0.62	2.0	1.9	1.5
Chromium	U	2450	mg/kg	1.0	31	59	67	48
Copper	U	2450	mg/kg	0.50	160	1200	880	500
Mercury	U	2450	mg/kg	0.10	3.4	11	11	4.6
Nickel	U	2450	mg/kg	0.50	46	37	77	59
Lead	U	2450	mg/kg	0.50	1000	1600	1800	3000
Selenium	U	2450	mg/kg	0.20	0.66	< 0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	400	470	470	310
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	6.0	6.9	6.7	9.3
Total TPH >C6-C40	U	2670	mg/kg	10	[C] 410	[C] 120	[C] 480	[C] 380
Naphthalene	U	2700	mg/kg	0.10	0.70	0.45	0.75	0.28
Acenaphthylene	U	2700	mg/kg	0.10	1.1	0.22	1.6	0.72
Acenaphthene	U	2700	mg/kg	0.10	0.34	0.25	4.1	1.5
Fluorene	U	2700	mg/kg	0.10	0.51	0.28	3.4	1.3
Phenanthrene	U	2700	mg/kg	0.10	8.4	3.1	38	21
Anthracene	U	2700	mg/kg	0.10	2.9	1.1	12	6.0
Fluoranthene	U	2700	mg/kg	0.10	24	8.9	66	48
Pyrene	U	2700	mg/kg	0.10	22	8.2	67	45
Benzo[a]anthracene	U	2700	mg/kg	0.10	12	5.1	31	22
Chrysene	U	2700	mg/kg	0.10	14	6.1	37	26
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	20	9.2	42	29
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	7.1	2.9	16	11
Benzo[a]pyrene	U	2700	mg/kg	0.10	14	6.2	31	21
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	11	5.3	22	15
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	2.8	1.4	5.4	3.7
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	10	4.8	19	13
Total Of 16 PAH's	U	2700	mg/kg	2.0	150	64	400	260
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils (Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 800' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 800' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C8–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols. Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.co.uk