PHASE 2 REPORT ON A SITE INVESTIGATION

Site

63 SANDYCOMBE ROAD, RICHMOND, GREATER LONDON TW9 2EP

Client

WOODCROFT DEVELOPMENTS

Report Ref
19/11527/KJC
REV 1

Issued
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The recommendations made and opinions expressed in this Report are based on the strata conditions revealed by the fieldworks as indicated on the exploratory records, together with an assessment of the data from in situ and laboratory tests. No liability can be accepted for conditions which have not been revealed by the fieldworks, for example, between exploratory positions. While this Report may offer opinions on the possible configuration of strata, both between the excavations and below the maximum depth achieved by the investigation, these comments are for guidance only and no liability can be accepted for their accuracy. The data obtained relate to the conditions which are relevant at the time of the investigation.

The groundwater observations entered on exploratory records are those noted at the time of the investigation. The normal rate of progress does not usually permit the recording of any equilibrium water level for any one water strike. It should be noted that groundwater levels are prone to seasonal variation and to changes in local drainage conditions. The word 'none' indicates that groundwater was sealed off by the borehole casing or that no water was observed in the exploratory hole upon completion.

TABLE OF CONTENTS

FIGURES

APPENDICES

1 INTRODUCTION

The Client proposes to construct two mixed use buildings at 63 Sandycombe Road, Richmond ("the site"). A Phase 1 Desk Study has been completed for the site by Land Science, dated June 2016. Consequently, a Phase 2 site investigation has been undertaken in order to ascertain the nature and engineering properties of the soils underlying the proposed development site and to obtain data which will assist in the formulation of a safe and economical foundation solution. In addition, a geo-environmental appraisal of the site has also been carried out. At the time of the site works, the site was not in use and the existing buildings were still present.

The programme of this investigation comprised the construction of six boreholes using a composite rig that is able to obtain intact samples and complete in situ testing using DPSH techniques. During this work samples were recovered for further examination and laboratory testing. This report describes the work undertaken, presents the information obtained and discusses the ground conditions with respect to foundation design, construction and potential contamination.

2 FIELDWORKS

The six boreholes were constructed on 19th March 2019 at locations as shown on the site plan, drawing no. 19/11527/1, which is presented as Figure 1. The exploratory positions were located in order to provide adequate site coverage taking into account the existing buildings and the nature of the proposed redevelopment.

The depths and descriptions of the strata encountered in the boreholes are given on the records which comprise Appendix 1 to this report. These records note the depths at which samples were taken, the results of in situ tests and the groundwater observations noted at the time of the fieldworks.

3 GROUND CONDITIONS

3.1 Geology

Reference has been made to the published 1:50,000 scale British Geological Survey (BGS) mapping of the area. The site is indicated as being underlain by the Kempton Park Gravel Member of Recent age. These superficial deposits are underlain at depth by the London Clay Formation of Eocene age.

3.2 Stratigraphy

Consideration of the borehole records indicates that made ground varying in composition from surface concrete to dark grey sand/ash with gravel was noted at the investigatory locations and was proved to depths of between 0.3m and 1.5m.

Granular soils generally comprising either brown sandy gravel or brown sand were encountered beneath the made ground and were noted to extend to the concluding depth of the boreholes at 3m and 3.5m. The Desk Study report includes a borehole record for 11 Sandycombe Road, which indicates that the Kempton Park Gravel Member extends to at least 5m depth.

3.3 Groundwater

No groundwater strikes were recorded during the siteworks. Consequently, no short-term standing water levels upon completion of the boreholes were recorded.

3.4 In Situ Testing

During the construction of the boreholes in situ Standard Penetration Tests [SPT] were performed. The test results are presented in terms of the number of blows to achieve a seating drive for 150mm of penetration, recorded as two 75mm increments and the test drive over 300mm recorded as four 75mm increments. The test drive is used to derive the penetration resistance for that soil layer and is recorded as the uncorrected SPT *N* value. Penetration resistances or *N* values ranging between 11 blows/300mm to 19 blows/300mm were recorded in the made ground. *N* values increasing from 13 blows/100mm to 79 blows/100mm were noted within the Kempton Park Gravel Member which, using established correlations, infers a medium dense to very dense condition in situ for a granular soil.

4 LABORATORY TESTING

A programme of laboratory testing has been undertaken and the results are presented as Appendix 2 to this report. The geotechnical soil testing was undertaken by Albury S.I. Ltd, whilst representative samples were submitted for geochemical testing at the UKAS accredited laboratories operated by Chemtest Ltd. Each type of test is summarised below and the results obtained have been used to assist in the formulation of the discussion.

4.1 Particle Size Distribution

Samples of the granular soils encountered at this site have been subjected to sieve analysis in order to determine the soils' particle size distribution. The results of this work are presented in the form of grading curves.

4.2 Chemical Testing – Soluble Sulphates & pH

Samples of the soils encountered at this site have been subjected to chemical analyses in order to determine their soluble sulphate contents and pH values. Under the conditions of this work low to moderate concentrations of soluble sulphate have been recorded in association with near neutral pH values.

4.3 Geochemical Testing

Measurement of soil vapours [VOC] was carried out on the samples of the soils taken using a PhoCheck Tiger PID meter in the laboratory. A composite sample was placed within a sealed plastic bag with a limited air space (headspace) which allows vapours to enter following agitation of the sample bag. The headspace is then measured using the PID meter and the results recorded in ppm as an indicative total VOC. The maximum TVOC recorded during this work was 0.4ppm, which is typical of normal background concentrations. Moreover, no visual or olfactory evidence of contamination was apparent during the testing. Following this work selected samples of the made ground have been submitted to the UKAS accredited laboratories operated by Chemtest Ltd. The testing comprises a suite of typical inorganic and organic priority contaminants including metals, PAH, TPH CWG and an asbestos screen. Following the initial round of analysis, additional samples have been submitted for arsenic, lead and zinc analysis together with asbestos screening.

5 GEOTECHNICAL DISCUSSION

5.1 Foundations

The Client proposes to construct two buildings of mixed use following demolition of the existing structures. The proposed layout is shown in Figure 2. At the time of the preparation of this report no information had been provided with regard to the anticipated structural loads. However, drawings were supplied that indicate that the two blocks will comprise commercial usage at ground floor level with residential use at first and second floor. Minimal soft landscaping will be incorporated in the redevelopment.

It cannot be recommended that major structural foundations be located within the made ground revealed by this investigation. Soils of this origin are frequently present in a weak and variable condition such that unacceptable settlement could occur even under the action of light loading intensities. Therefore, it will be necessary to continue foundation excavations through these undesirable materials where they are of less than 1m in thickness to this minimum depth in order to avoid that zone of soil which is subject to normal seasonal moisture variation or frost action. The above precautions need not necessarily be applied to light ancillary structures, which will be formed structurally discrete from the main development and in which a greater degree of settlement can be tolerated.

Interpretation of the data derived from this investigation indicates that strip or spread foundations, constructed at a minimum depth of 1m within the coarse granular soils associated with the Kempton Park Gravel Member, can be designed to accept a maximum increase in load of 150kPa. At this loading intensity a factor of safety of 3 against general shear failure will be operative. Moreover, settlements should remain within tolerable limits for the type of structure proposed. These movements are likely to be sensibly complete during a normal construction period due to the free draining nature of the underlying soils. It should be noted that increased thicknesses of made ground were noted within the southern part of the site and in this area the excavations will need to be extended to depths of the order of 1.5m in order to reveal the underlying naturally occurring granular soils associated with the Kempton Park Gravel Member.

5.2 Stability of Excavations

Excavations of less than 1m depth should not require temporary support to their sides. However, as foundation excavations will be extended below this level, adequate temporary support or shoring should be provided in order to comply with current statutory safety regulations and to maintain the stability of the excavation sides.

5.3 Groundwater

No groundwater was observed at the time of the fieldworks which suggest that this phenomenon will not represent an engineering problem at this site. Any minor seepages or surface water entering excavations is likely to dissipate through the bases of excavations.

5.4 Ground Floor Slabs

The thickness of made ground revealed by this investigation, commonly in excess of 0.6m, infers that a system of non-suspended floor slabs is likely to prove uneconomical and impractical. Therefore, it is recommended that fully suspended floor slabs should be incorporated within the proposed structures.

5.5 Buried Concrete

The information obtained from this investigation has been compared with the criteria proposed in BRE Special Digest 1, 2005 Edition, Concrete in Aggressive Ground. Using the information in Table C1 (natural ground) of this publication the Aggressive Chemical Environment for Concrete Classification is AC-1s, which coincides with a Design Sulphate Class DS-2. This Design Sulphate Class can be used to establish the design mix for buried concrete in accordance with Part D of the Digest.

6 GROUND CONTAMINATION

Reference has been made to the Conceptual Site Model formulated for this site as part of the Phase 1 Desk Study by Land Science, which informed the current Phase 2 intrusive investigation. The CSM produced as part of the Desk Study is presented in Appendix 3.

6.1 Human Health

A preliminary assessment of the chronic or long-term risk to human health from soil contamination has been made using the available generic screening criteria. The screening values include the Category 4 Screening Levels [C4SLs] (DEFRA, 2014) and Suitable for Use Levels [S4ULs] (LQM/CIEH, 2014) derived using the CLEA software. It should be appreciated that these do not consider the short-term or acute risks, such as to construction workers or SI personnel.

The proposed use is for commercial at ground floor level with minimal soft landscaping and residential flats above. The test results have been compared against the LQM S4UL and where appropriate C4SL generic assessment criteria [GAC] for Public Open Spaces (Residential) and 1% SOM. This is believed to be the closest non-standard land use and is considered to be a conservative approach given the mixed use development. Elevated levels of arsenic, lead and PAH's have been noted within the made ground. Asbestos has also been recorded within one test sample (borehole 3 @ 0.1m) and gravimetric analysis recorded a result of 0.002%, which implies trace levels.

The site will predominantly be made over to hard cover within minimal soft landscaping. On the assumption that no great difference in level is proposed, it is likely that a significant amount of contaminated soils will be removed in order to accommodate new ground floor slabs and paved areas. Moreover, under hard cover no pathway will exist between receptors, i.e. end users, and any residually contaminated soils. Therefore, remedial measures are only likely to be required in the proposed areas of soft landscaping. In these

areas it is recommended that the soils are removed to 0.6m depth and replaced by a cover of clean material incorporating a suitable thickness of topsoil to act as a growing medium.

6.2 Groundwater

The site is underlain by an unconfined Secondary A or minor aquifer associated with the Kempton Park Gravel Member and groundwater was not encountered during the course of this investigation, which concluded at 3-3.5m. The depth to groundwater is believed to be somewhere below 5m, based upon the historical borehole record within the Desk Study. No source protection zone (SPZ) or potable groundwater abstractions were identified within the Desk Study as being present in the locality.

Given the anticipated thickness of the vadose zone, specific investigation and assessment of the underlying groundwater is not considered warranted based upon the findings of this investigation. Similarly, the specific assessment of vapours generated from any organic contamination of the groundwater at depth, to a low sensitivity commercial ground floor end-use, is not considered warranted based upon the findings of this investigation.

6.3 Vegetation

The metals boron, copper, nickel and zinc are phytotoxic at certain levels, with their availability being dependent upon soil pH. These levels may not pose a significant long-term health risk to humans, but could be detrimental to plant growth or function. The results obtained suggest that the near surface soils at this site will not be suitable for re-use in landscaped areas and, as indicated above, should be removed.

6.4 Preliminary Waste Assessment

It is likely that, if excavated soils cannot be re-used or retained on site, these surplus materials will require off site disposal. It may be possible to divert the unwanted material to a soil treatment hub where it can be recycled. Where material cannot be re-used or recycled then disposal at a licensed landfill site can be considered. It will then be necessary to classify the spoil as inert, non-hazardous or hazardous. A discussion of the current regime for the classification and treatment of waste soils is included in Appendix 4.

An initial assessment of the geochemical results obtained from this investigation has been carried out to provide a preliminary classification of the surplus materials. The Atkins CAT-WASTE tool determines whether waste soil should be classified as being non-hazardous or hazardous. The output from the CAT-WASTE assessment is located in Appendix 4. Based on the output waste soil arisings from boreholes 2 and 4 at this site have been tentatively identified as being non-hazardous waste. The spoil from boreholes 1, 3, 5 and 6 will need to

be treated as hazardous due the elevated levels of lead, copper and zinc. It should be noted that borehole 6 lies outside the footprint of the building in this area and is within an area of parking. Hence, only limited excavation of material in this area is likely to accommodate the new pavement construction. The underlying natural sand/sand and gravel is considered to be inert for disposal purposes. Trace asbestos was detected in one of the samples screened (borehole 3 at 0.1m). However, the gravimetric percentage recorded was 0.002% and analysis of samples from greater depth revealed no asbestos. It is suggested, therefore, that it may not need special consideration.

This assessment is preliminary and based upon the information obtained from the investigation. Where made ground is excavated then these materials should be stockpiled and segregated. Further sampling, testing and characterisation to accurately classify waste soil arisings may be required. Given that no exceedances of human health soil guidance values were recorded, it is likely that material can be retained and re-used on site.

It should be appreciated that it is the responsibility of the waste producer to sufficiently characterise their waste. Moreover, the agreement of the waste acceptor should be sought. If significant quantities of inert material is to be disposed at a licensed waste landfill site then supplementary waste acceptance criteria [WAC] testing may also be required. Confirmation should be sought from the relevant licensed waste handler or landfill operator.

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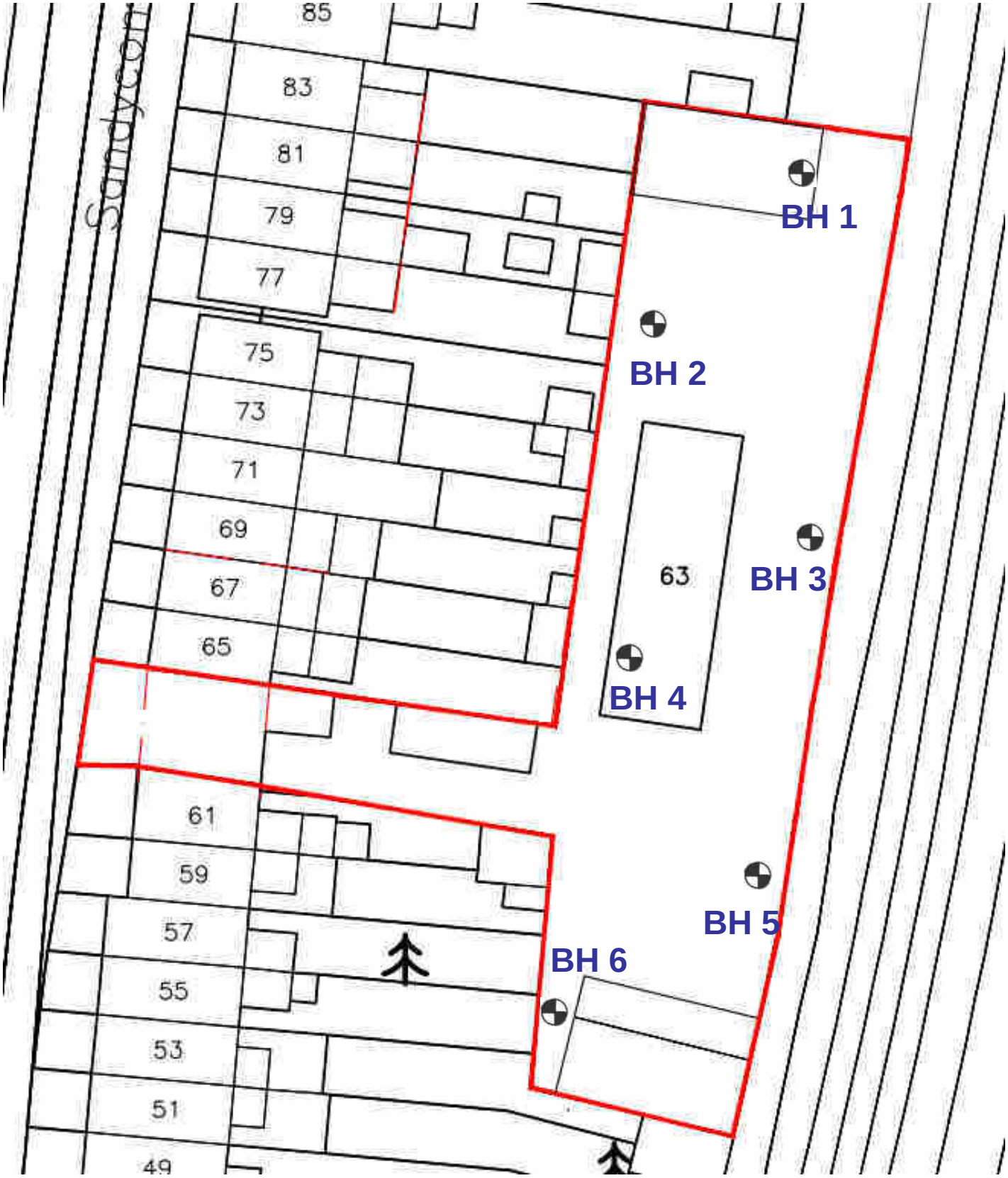
LIST OF ABBREVIATIONS

AOD	-	Above Ordnance Datum
ACM	-	Asbestos-containing Material
AST	-	Above-ground Storage Tank
BGS	-	British Geological Survey
BH	-	Borehole
BRE	-	Building Research Establishment
BSI	-	British Standards Institution
BS	-	British Standard
C4SL	-	Category Four Screening Level
CIRIA	-	Construction Industry Research and Information Association
CP	-	Cable Percussive
DPH	-	Dynamic Probing Heavy
DPSH	-	Dynamic Probing Super Heavy
EA	-	Environment Agency
GAC	-	Generic Assessment Criteria
LL	-	Liquid Limit
mAOD	-	Metres Above Ordnance Datum
mBGL	-	Metres Below Ground Level
mOD	-	Metres Ordnance Datum
OS	-	Ordnance Survey
PAH	-	Polycyclic Aromatic Hydrocarbons
PCB	-	Polychlorinated Biphenyl
PID	-	Photo Ionisation Detector
PL	-	Plastic Limit
PSD	-	Particle Size Distribution
SGV	-	Soil Guideline Value
SOM	-	Soil Organic Matter
SPT	-	Standard Penetration Test
SPZ	-	Source Protection Zone
SVOC	-	Semi-volatile Organic Compounds
TPH	-	Total Petroleum Hydrocarbon
UST	-	Underground Storage Tank
UXB	-	Unexploded Bombs
UXO	-	Unexploded Ordnance
VOC	-	Volatile Organic Compound

FIGURE 1

SITE LAYOUT PLAN



Title:	Site Layout Plan
Dwg No:	19/11527/1
Client:	Woodcroft Developments
Contract:	Sandycombe Road, Richmond
Job Ref:	19/11527/KJC
Scale:	NTS
Revision:	0
Issue Date:	28/03/2019

Legend:

- Borehole Location
- Trial Pit Location
- Site Boundary

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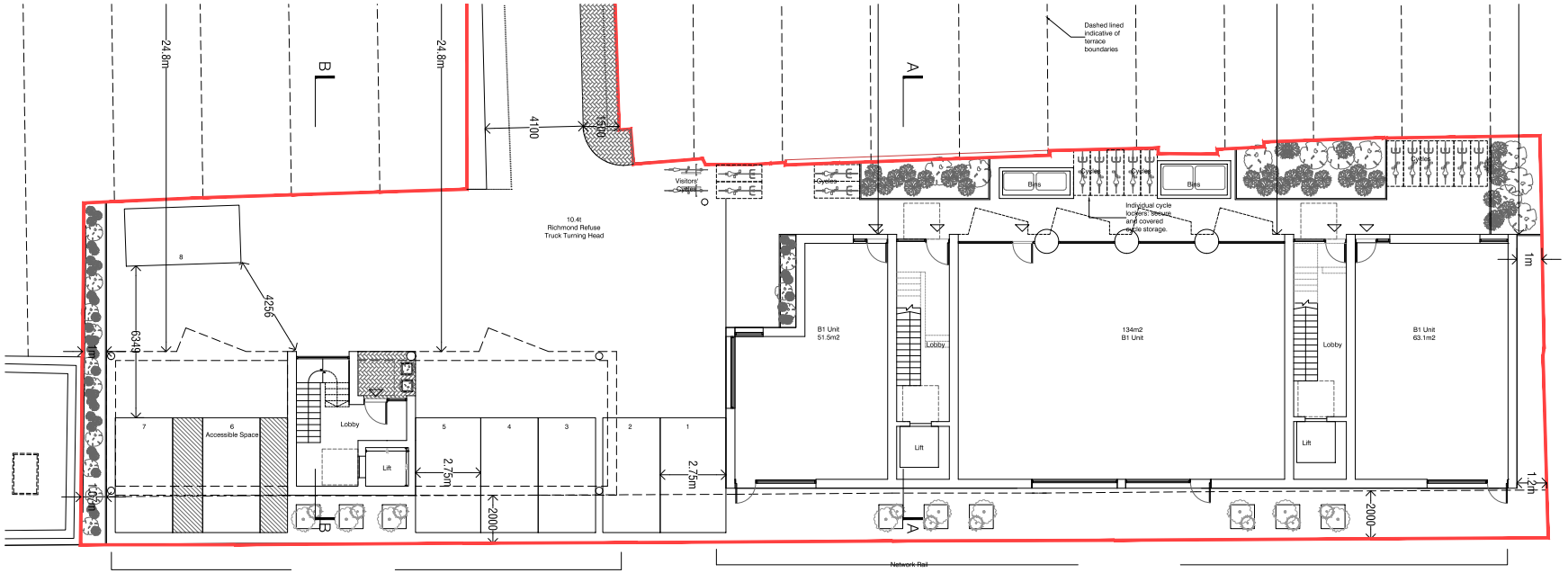
Miltons Yard,
Petworth Road,
Witley,
Surrey GU8 5LH

FIGURE 2

PROPOSED LAYOUT



Proposed Ground Floor Plan

Proposed First Floor Plan

N

0m 1 5 10 20 30

1:100 @ A1 SCALE

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THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK OF ANY KIND. NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

1. THE BOUNDARIES SHOWN ARE BASED ON INFORMATION BY OTHERS. ALL BOUNDARIES TO BE VERIFIED INDEPENDENTLY PRIOR TO PURCHASE OR CONSTRUCTION.
2. TOPOGRAPHICAL LEVELS TO BE CONFIRMED.
3. DESIGN & QUOTED AREAS ARE SUBJECT TO DESIGN DEVELOPMENT & STATUTORY CONSENTS.
4. ALL SURVEY INFORMATION SHOWN IS SUBJECT TO FURTHER SITE INVESTIGATION DURING DEMOLITION.
5. HOUSES TO SANDYCOMBE ROAD AREA SHOWN APPROXIMATELY AND ARE SUBJECT TO DETAILED SURVEY MEASUREMENTS.

REV	DATE	REVISIONS	CHECKED
-	-	-	-

mohsin cooper ARCHITECTS

STATUS:
PLANNING SUBMISSION

PROJECT :
63 SANDYCOMBE ROAD, RICHMOND

CLIENT :
MR & MRS TAYLOR

DRAWING TITLE :
PROPOSED GROUND AND FIRST FLOOR PLANS

NUMBER: 0184-P302

REVISION: -

SCALE : 1:100 @A1
DRAWN : MC **DATE :** NOV 18
CHECKED : MC **DATE :** NOV 18

APPENDIX 1

EXPLORATORY RECORDS

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE	1
Contract	Sandycombe Road, Richmond	**Report Ref**	19/11527/KJC
Client	Woodcroft Developments	**Ground Level**	mAOD
Site Address	63 Sandycombe Road, Richmond, Greater London TW9 2EP	**Date Commenced** **Date Completed**	28/03/2019 28/03/2019
Type & Diameter of Boring	Terrier Rig: 100mm diameter	**Sheet No**	1 of 1

Water Strikes, m		Water levels recorded during boring, m						
1	none	Date						
2		Hole Depth						
3		Casing Depth						
4		Water Level						

Remarks

Excavation of starter pit to clear services

Samples or Tests		Standard Penetration Tests			Depth m	Legend	Strata Description
Type	Depth, m	Seat	Test Drive	*N*			
D	0.10				0.10		MADE GROUND (concrete)
D	0.30						MADE GROUND (dark grey sand with ash and brick)
D	0.50				0.80		
D	1.00-1.45	3,3	2,3,4,4	13			Medium dense brown clayey SAND with occasional gravel
T	1.00-2.00						
T	2.00-2.45	9,10	10,12,13,14	49	2.00		Dense to very dense brown SAND
	2.50-2.95	14,16	16,17,20,20	73			
					3.00		END OF BOREHOLE

Sample Code: U - Intact 100mm Ø B - Large Disturbed D - Small Disturbed W- Water Sample (U) - Non-recovery of Intact 100mm Ø sample [+] - extrapolated SPT N value*

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE	2
Contract	Sandycombe Road, Richmond	**Report Ref**	19/11527/KJC
Client	Woodcroft Developments	**Ground Level**	mAOD
Site Address	63 Sandycombe Road, Richmond, Greater London TW9 2EP	**Date Commenced** **Date Completed**	28/03/2019 28/03/2019
Type & Diameter of Boring	Terrier Rig: 100mm diameter	**Sheet No**	1 of 1

Water Strikes, m		Water levels recorded during boring, m						
1	none	Date						
2		Hole Depth						
3		Casing Depth						
4		Water Level						

Remarks

Excavation of starter pit to clear services

Samples or Tests		Standard Penetration Tests			Depth m	Legend	Strata Description
Type	Depth, m	Seat	Test Drive	*N*			
D	0.10				0.30		MADE GROUND (dark grey sand)
D	0.30						
D	0.50				0.80		Brown SAND with occasional gravel
D	1.00-1.45	3,3	4,4,3,5	16			Medium dense brown SAND AND GRAVEL
T	1.00-2.00						
T	2.00-2.45	10,12	14,12,13,12	51	2.00		Dense to very dense sandy GRAVEL
	2.50-2.95	14,16	16,15,19,20	70			
					3.00		END OF BOREHOLE

Sample Code: U - Intact 100mm Ø B - Large Disturbed D - Small Disturbed W- Water Sample (U) - Non-recovery of Intact 100mm Ø sample [+] - extrapolated SPT N value*

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE	3
Contract	Sandycombe Road, Richmond	**Report Ref**	19/11527/KJC
Client	Woodcroft Developments	**Ground Level**	mAOD
Site Address	63 Sandycombe Road, Richmond, Greater London TW9 2EP	**Date Commenced** **Date Completed**	28/03/2019 28/03/2019
Type & Diameter of Boring	Terrier Rig: 100mm diameter	**Sheet No**	1 of 1

Water Strikes, m		Water levels recorded during boring, m						
1	none	Date						
2		Hole Depth						
3		Casing Depth						
4		Water Level						

Remarks

Excavation of starter pit to clear services

Samples or Tests		Standard Penetration Tests			Depth m	Legend	Strata Description
Type	Depth, m	Seat	Test Drive	*N*			
D	0.10						MADE GROUND (dark grey sand/ash with gravel)
D	0.30						
D	0.50						
D	1.00-1.45	1,2	4,5,5,5	19	1.00		
T	1.00-2.00						MADE GROUND (dark grey/brown sand with gravel)
					1.40		
							Dense pale brown SAND with gravel
	2.00-2.45	10,11	10,12,13,12	47			
T	2.00-3.00						
					2.50		
							Very dense brown SAND AND GRAVEL
	3.00-3.45	11,14	13,15,16,15	59			
					3.50		
							END OF BOREHOLE

Sample Code: U - Intact 100mm Ø B - Large Disturbed D - Small Disturbed W- Water Sample (U) - Non-recovery of Intact 100mm Ø sample [+] - extrapolated SPT N value*

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE	4
Contract	Sandycombe Road, Richmond	**Report Ref**	19/11527/KJC
Client	Woodcroft Developments	**Ground Level**	mAOD
Site Address	63 Sandycombe Road, Richmond, Greater London TW9 2EP	**Date Commenced** **Date Completed**	28/03/2019 28/03/2019
Type & Diameter of Boring	Terrier Rig: 100mm diameter	**Sheet No**	1 of 1

Water Strikes, m		Water levels recorded during boring, m						
1	none	Date						
2		Hole Depth						
3		Casing Depth						
4		Water Level						

Remarks

Excavation of starter pit to clear services

Samples or Tests		Standard Penetration Tests			Depth m	Legend	Strata Description
Type	Depth, m	Seat	Test Drive	*N*			
D	0.10						MADE GROUND (concrete/dark grey sand with ash and gravel)
D	0.30						
D	0.50						
D	1.00-1.45	1,2	2,3,3,3	11	1.00		
T	1.00-2.00						MADE GROUND (dark grey/brown sand with gravel)
					1.50		
							Dense brown SAND with gravel; becoming sandy GRAVEL
T	2.00-2.45	10,12	12,13,14,13	52			
	2.50-2.95	13,15	16,20,20,20	76			
					3.00		
							END OF BOREHOLE

Sample Code: U - Intact 100mm Ø B - Large Disturbed D - Small Disturbed W- Water Sample (U) - Non-recovery of Intact 100mm Ø sample [+] - extrapolated SPT N value*

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE	5
Contract	Sandycombe Road, Richmond	**Report Ref**	19/11527/KJC
Client	Woodcroft Developments	**Ground Level**	mAOD
Site Address	63 Sandycombe Road, Richmond, Greater London TW9 2EP	**Date Commenced** **Date Completed**	28/03/2019 28/03/2019
Type & Diameter of Boring	Terrier Rig: 100mm diameter	**Sheet No**	1 of 1

Water Strikes, m		Water levels recorded during boring, m						
1	none	Date						
2		Hole Depth						
3		Casing Depth						
4		Water Level						

Remarks

Excavation of starter pit to clear services

Samples or Tests		Standard Penetration Tests			Depth m	Legend	Strata Description
Type	Depth, m	Seat	Test Drive	*N*			
D	0.10						MADE GROUND (dark grey sand with ash and gravel)
D	0.30						
D	0.50						
D	1.00-1.45	1,1	2,3,4,4	13	1.00		
T	1.00-2.00						MADE GROUND (dark grey/brown sand with gravel)
					1.40		Dense to very dense brown SAND with gravel at depth
T	2.00-2.45	9,11	14,15,17,16	52			
	2.50-2.95	15,16	17,19,20,20	78			
					3.00		END OF BOREHOLE

Sample Code: U - Intact 100mm Ø B - Large Disturbed D - Small Disturbed W- Water Sample (U) - Non-recovery of Intact 100mm Ø sample [+] - extrapolated SPT N value*

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE	6
Contract	Sandycombe Road, Richmond	**Report Ref**	19/11527/KJC
Client	Woodcroft Developments	**Ground Level**	mAOD
Site Address	63 Sandycombe Road, Richmond, Greater London TW9 2EP	**Date Commenced** **Date Completed**	28/03/2019 28/03/2019
Type & Diameter of Boring	Terrier Rig: 100mm diameter	**Sheet No**	1 of 1

Water Strikes, m		Water levels recorded during boring, m						
1	none	Date						
2		Hole Depth						
3		Casing Depth						
4		Water Level						

Remarks

Excavation of starter pit to clear services

Samples or Tests		Standard Penetration Tests			Depth m	Legend	Strata Description
Type	Depth, m	Seat	Test Drive	*N*			
D	0.10						MADE GROUND (concrete/dark grey sand with ash and gravel)
D	0.30						
D	0.50						
D	1.00-1.45	1,1	2,2,4,3	11			
T	1.00-2.00				1.20		Medium dense to very dense brown SAND AND GRAVEL
T	2.00-2.45	8,12	12,16,15,15	58			
	2.50-2.95	14,13	14,16,19,20	79			
					3.00		END OF BOREHOLE

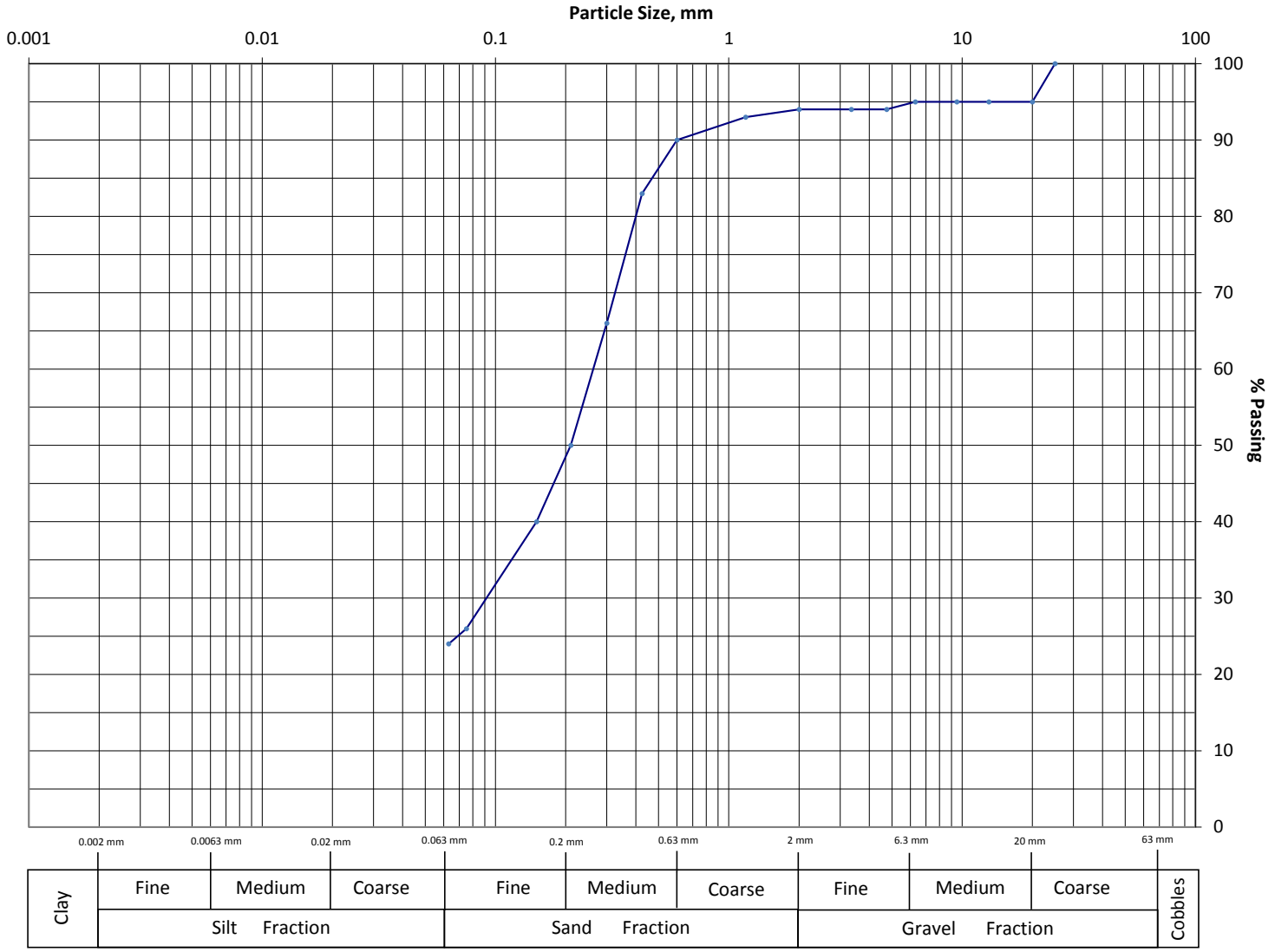
Sample Code: U - Intact 100mm Ø B - Large Disturbed D - Small Disturbed W- Water Sample (U) - Non-recovery of Intact 100mm Ø sample [+] - extrapolated SPT N value*

APPENDIX 2

LABORATORY TEST RESULTS

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2, 9.3 : 1990 Particle Size Distribution by Wet/Dry Sieving Method



BS Test Sieve Aperture Size (mm)	Percentage Passing
75	
63	
50	
37.5	
25	100
20	95
13	95
9.5	95
6.3	95
4.75	94
3.35	94
2	94
1.18	93
0.6	90
0.425	83
0.3	66
0.21	50
0.15	40
0.075	26
0.063	24

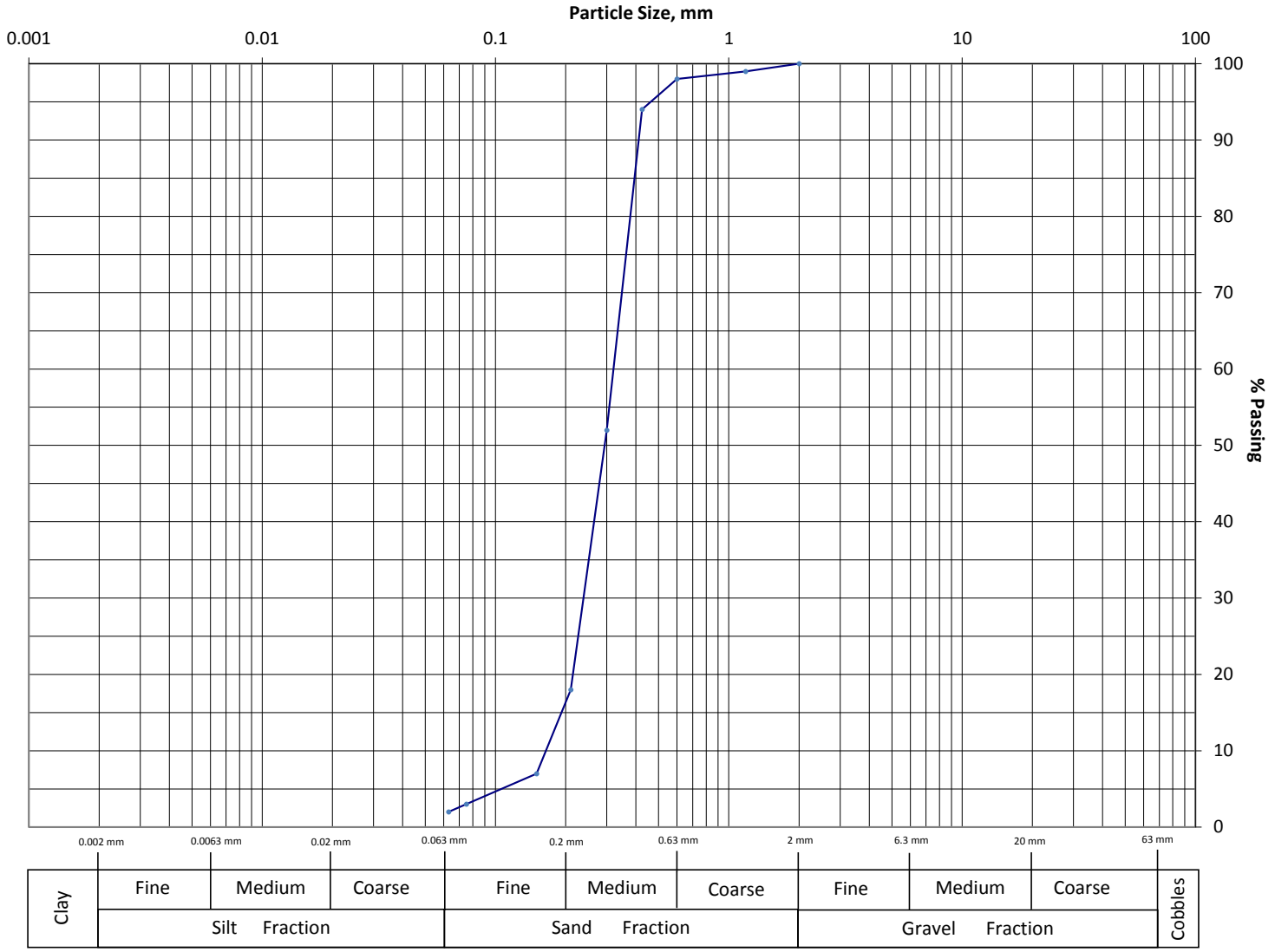
Particle Proportions (%)	
Cobbles	0
Gravel	6
Sand	70
Silt & Clay	24

BH/TP No.	**BH 1**	**Depth, m**	1.00	**Report Ref**	19/11527/KJC
Visual Description	Brown clayey sand with occasional gravel			**Contract**	Sandycombe Road, Richmond

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2, 9.3 : 1990 Particle Size Distribution by Wet/Dry Sieving Method



BS Test Sieve Aperture Size (mm)	Percentage Passing
75	
63	
50	
37.5	
25	
20	
13	
9.5	
6.3	
4.75	
3.35	
2	100
1.18	99
0.6	98
0.425	94
0.3	52
0.21	18
0.15	7
0.075	3
0.063	2

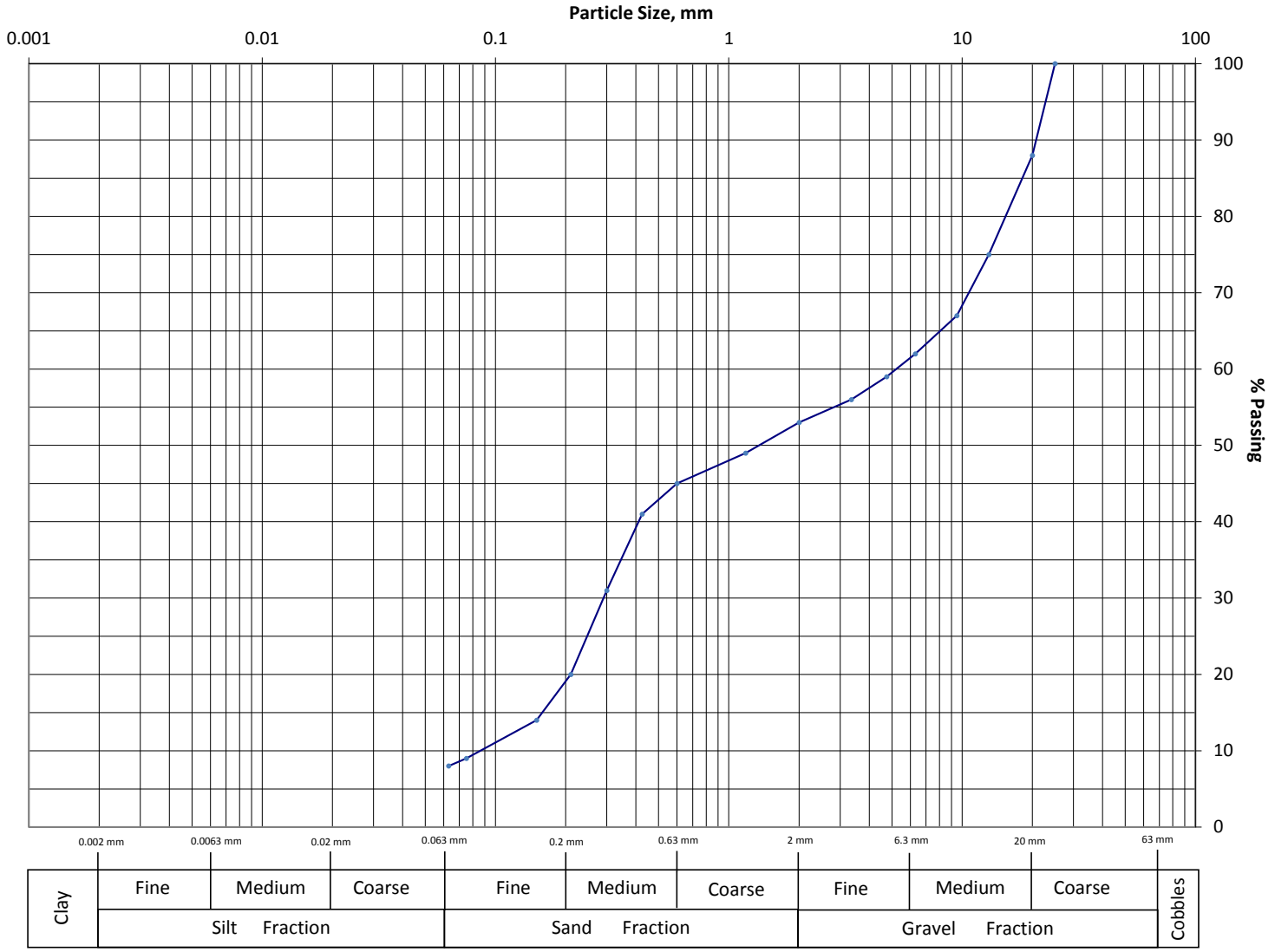
Particle Proportions (%)	
Cobbles	0
Gravel	0
Sand	98
Silt & Clay	2

BH/TP No.	**BH 1**	**Depth, m**	2.00 - 2.50	**Report Ref**	19/11527/KJC
Visual Description	Brown sand			**Contract**	Sandycombe Road, Richmond

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2, 9.3 : 1990 Particle Size Distribution by Wet/Dry Sieving Method



BS Test Sieve Aperture Size (mm)	Percentage Passing
75	
63	
50	
37.5	
25	100
20	88
13	75
9.5	67
6.3	62
4.75	59
3.35	56
2	53
1.18	49
0.6	45
0.425	41
0.3	31
0.21	20
0.15	14
0.075	9
0.063	8

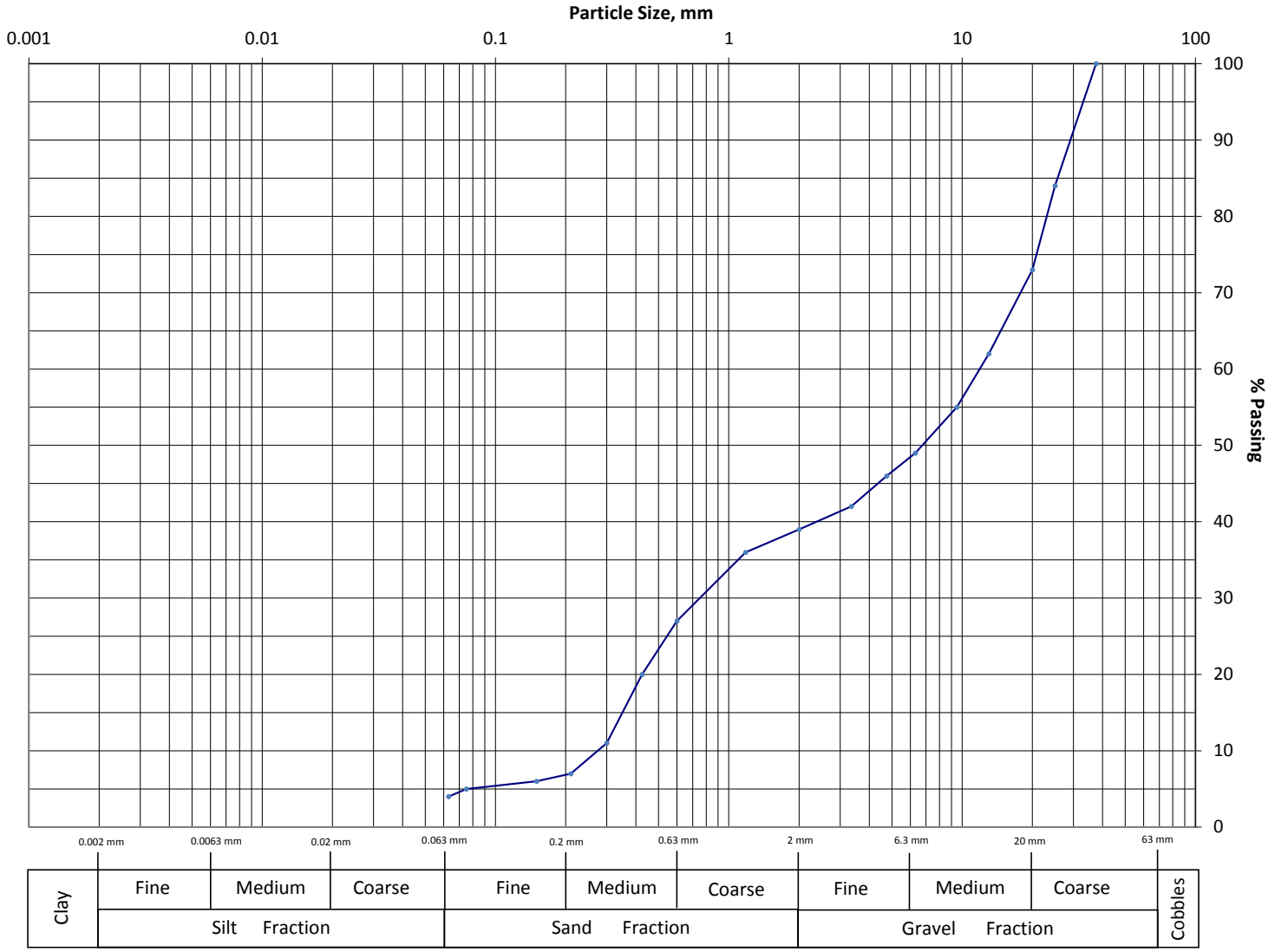
Particle Proportions (%)	
Cobbles	0
Gravel	47
Sand	45
Silt & Clay	8

BH/TP No.	**BH 2**	**Depth, m**	1.00	**Report Ref**	19/11527
Visual Description	Brown sand and gravel			**Contract**	Sandycombe Road, Richmond

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2, 9.3 : 1990 Particle Size Distribution by Wet/Dry Sieving Method



BS Test Sieve Aperture Size (mm)	Percentage Passing
75	
63	
50	
37.5	100
25	84
20	73
13	62
9.5	55
6.3	49
4.75	46
3.35	42
2	39
1.18	36
0.6	27
0.425	20
0.3	11
0.21	7
0.15	6
0.075	5
0.063	4

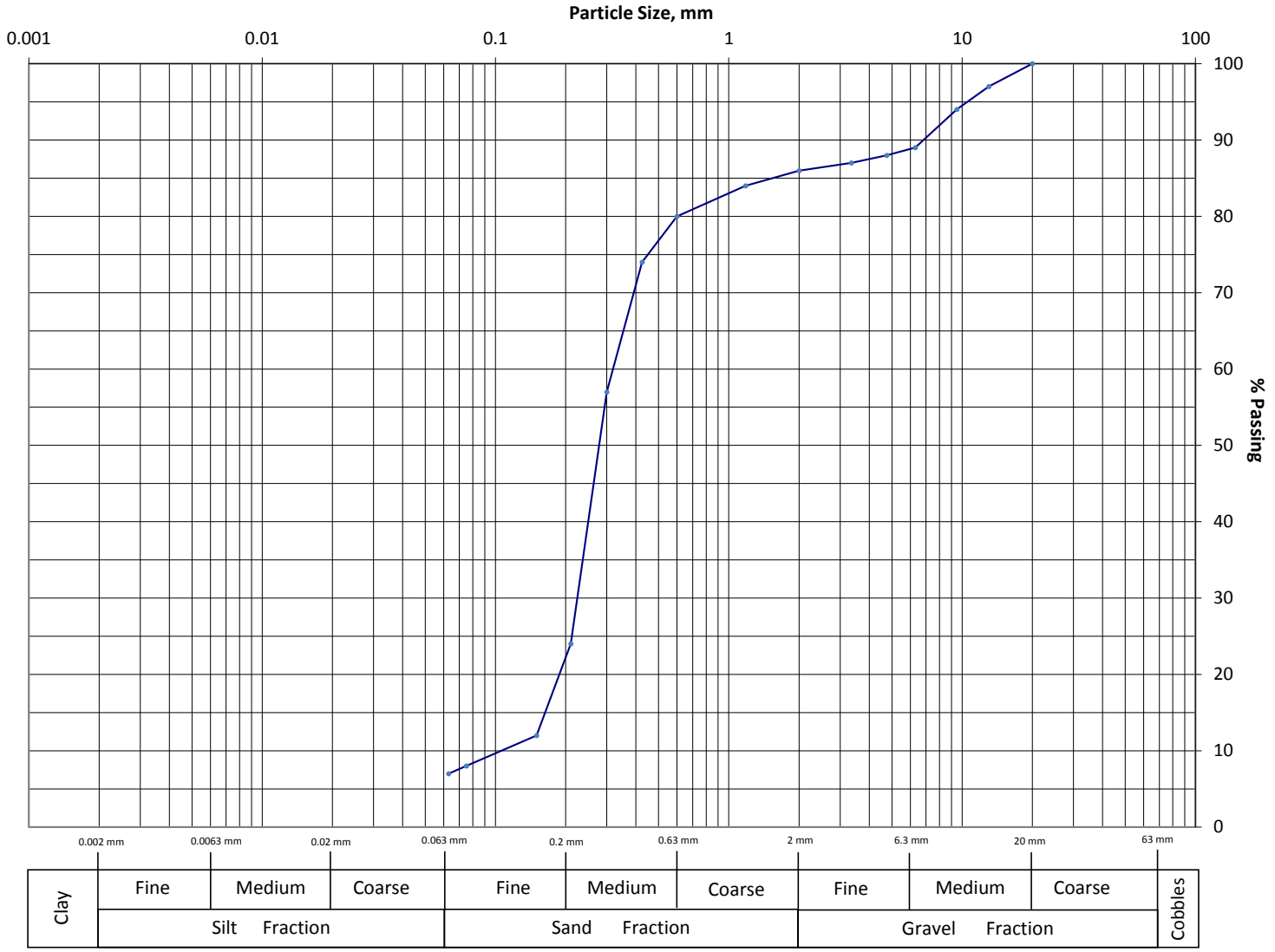
Particle Proportions (%)	
Cobbles	0
Gravel	61
Sand	35
Silt & Clay	4

BH/TP No.	**BH 2**	**Depth, m**	2.00- 2.50m	**Report Ref**	19/11527/KJC
Visual Description	Brown sandy gravel			**Contract**	Sandycombe Road, Richmond

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2, 9.3 : 1990 Particle Size Distribution by Wet/Dry Sieving Method



BS Test Sieve Aperture Size (mm)	Percentage Passing
75	
63	
50	
37.5	
25	
20	100
13	97
9.5	94
6.3	89
4.75	88
3.35	87
2	86
1.18	84
0.6	80
0.425	74
0.3	57
0.21	24
0.15	12
0.075	8
0.063	7

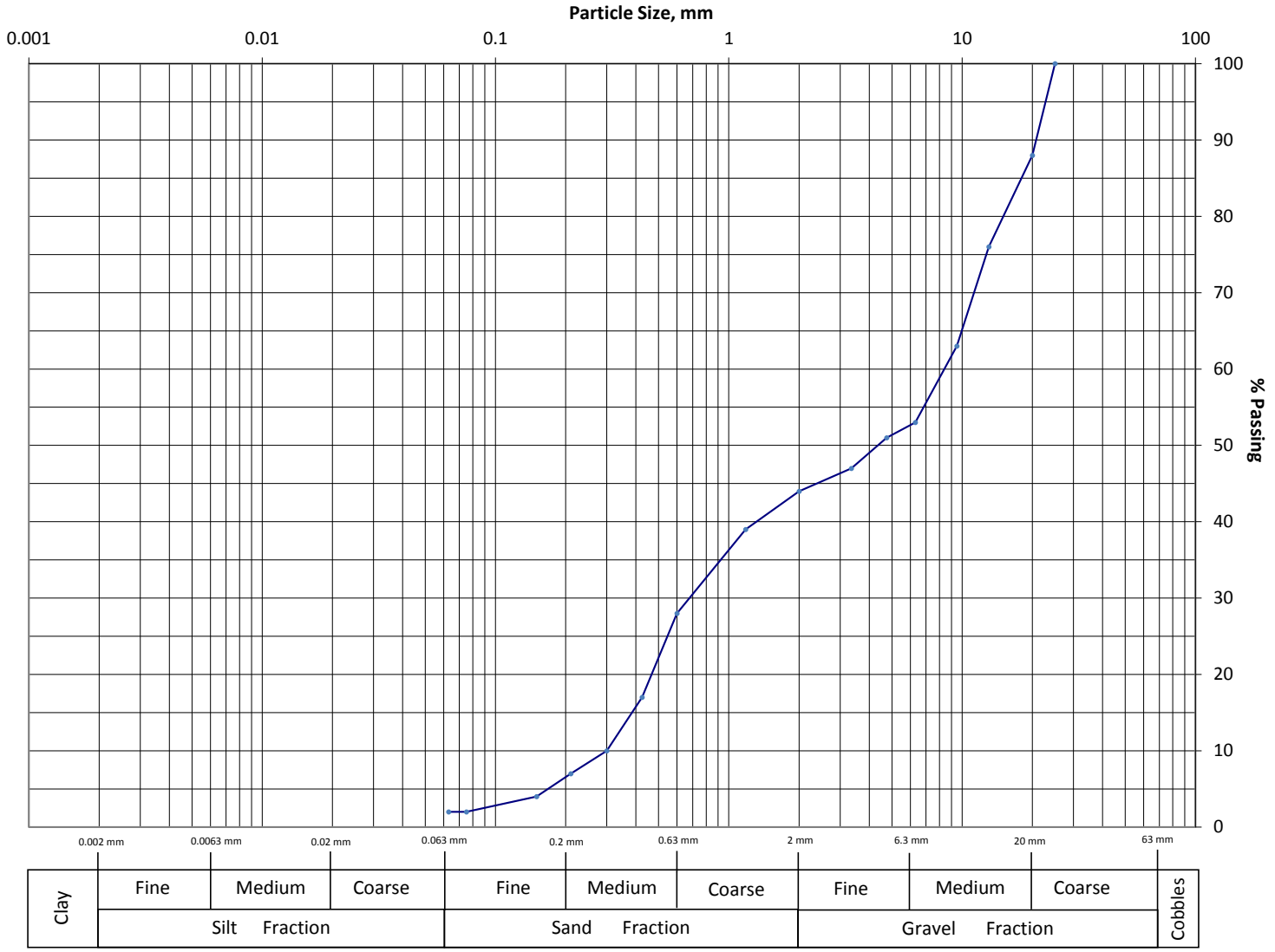
Particle Proportions (%)	
Cobbles	0
Gravel	14
Sand	79
Silt & Clay	7

BH/TP No.	**BH 3**	**Depth, m**	2.00	**Report Ref**	19/11527/KJC
Visual Description	Pale brown sand with gravel			**Contract**	Sandycombe Road, Richmond

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2, 9.3 : 1990 Particle Size Distribution by Wet/Dry Sieving Method



BS Test Sieve Aperture Size (mm)	Percentage Passing
75	
63	
50	
37.5	
25	100
20	88
13	76
9.5	63
6.3	53
4.75	51
3.35	47
2	44
1.18	39
0.6	28
0.425	17
0.3	10
0.21	7
0.15	4
0.075	2
0.063	2

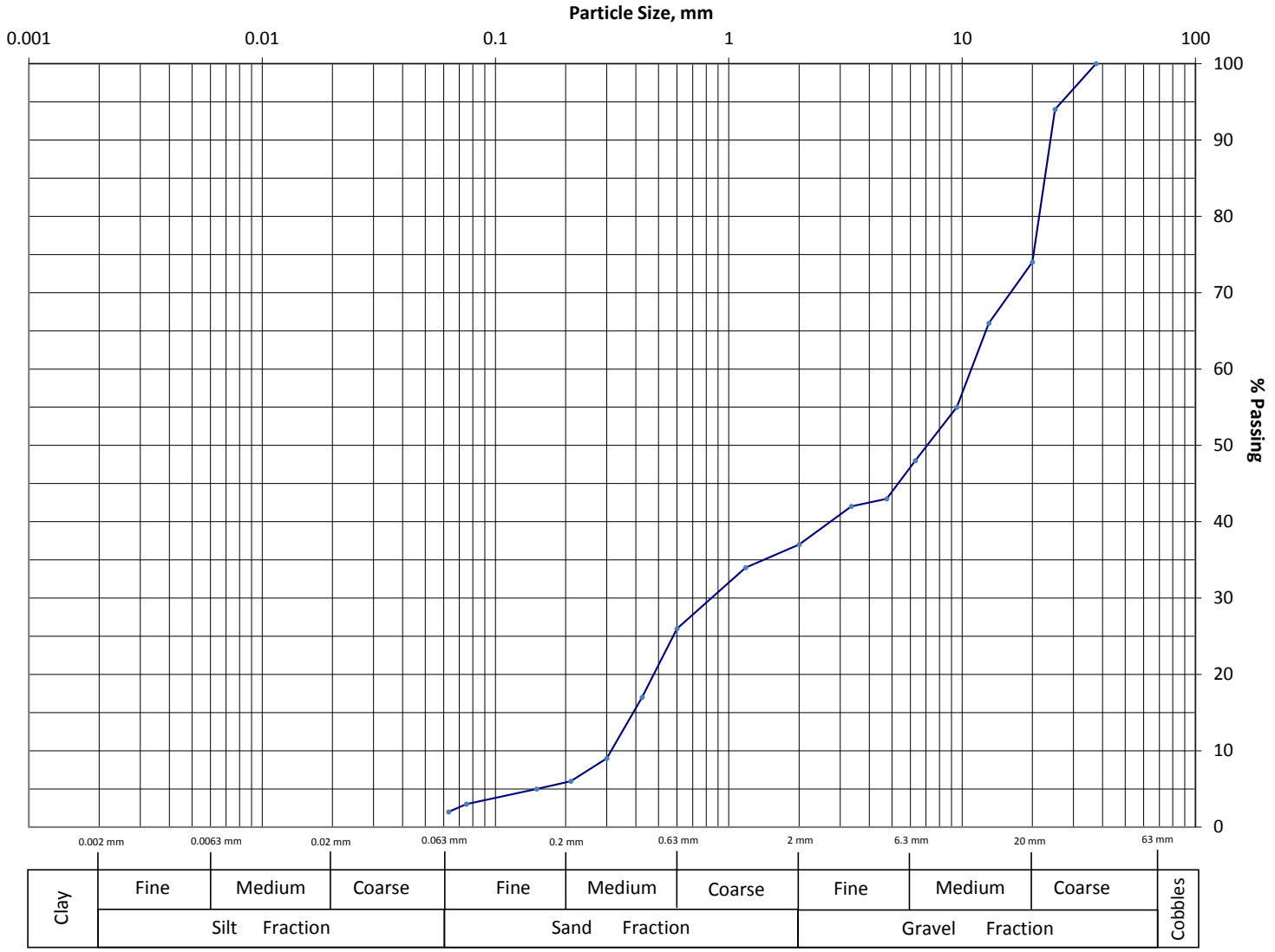
Particle Proportions (%)	
Cobbles	0
Gravel	56
Sand	42
Silt & Clay	2

BH/TP No.	**BH 3**	**Depth, m**	3.00	**Report Ref**	19/11527/KJC
Visual Description	Brown sand and gravel			**Contract**	Sandycombe Road, Richmond

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2, 9.3 : 1990 Particle Size Distribution by Wet/Dry Sieving Method



BS Test Sieve Aperture Size (mm)	Percentage Passing
75	
63	
50	
37.5	100
25	94
20	74
13	66
9.5	55
6.3	48
4.75	43
3.35	42
2	37
1.18	34
0.6	26
0.425	17
0.3	9
0.21	6
0.15	5
0.075	3
0.063	2

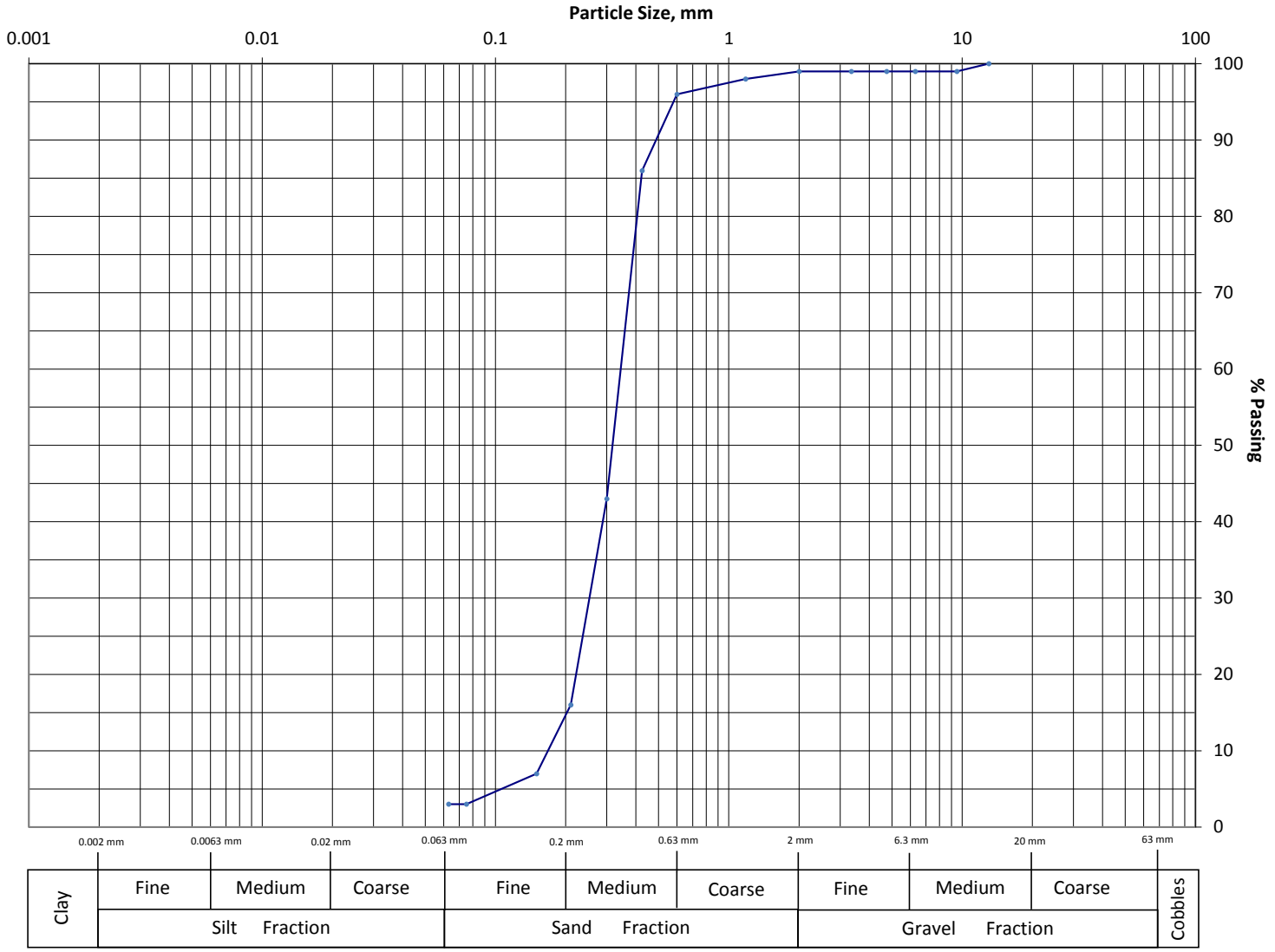
Particle Proportions (%)	
Cobbles	0
Gravel	63
Sand	35
Silt & Clay	2

BH/TP No.	**BH 4**	**Depth, m**	2.00 - 2.50	**Report Ref**	19/11527/KJC
Visual Description	Brown sandy gravel			**Contract**	Sandycombe Road, Richmond

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2, 9.3 : 1990 Particle Size Distribution by Wet/Dry Sieving Method



BS Test Sieve Aperture Size (mm)	Percentage Passing
75	
63	
50	
37.5	
25	
20	
13	100
9.5	99
6.3	99
4.75	99
3.35	99
2	99
1.18	98
0.6	96
0.425	86
0.3	43
0.21	16
0.15	7
0.075	3
0.063	3

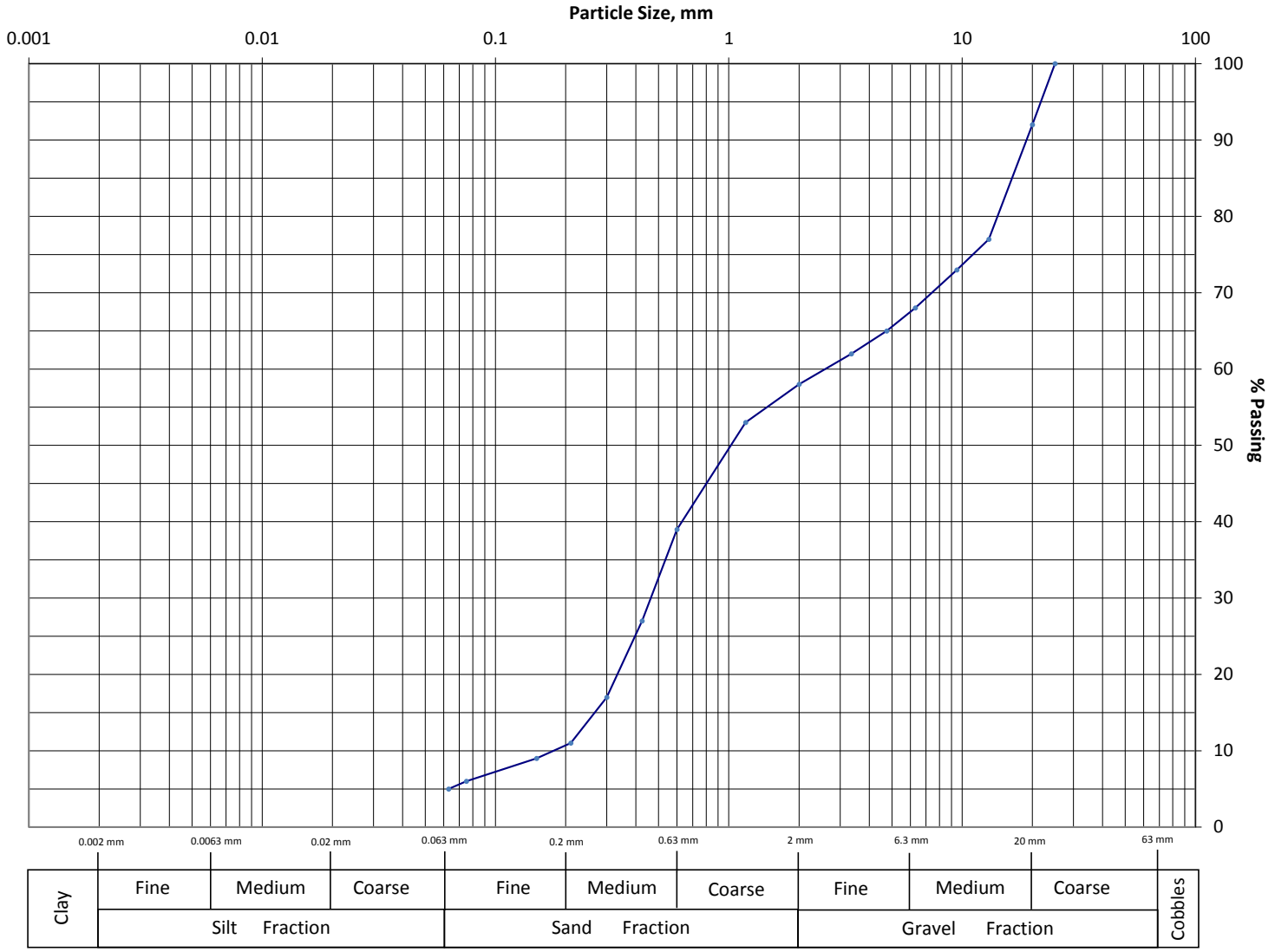
Particle Proportions (%)	
Cobbles	0
Gravel	1
Sand	96
Silt & Clay	3

BH/TP No.	**BH 5**	**Depth, m**	2.00- 2.50m	**Report Ref**	19/11527/KJC
Visual Description	Brown sand			**Contract**	Sandycombe Road, Richmond

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 : Part 2 : Clauses 9.2, 9.3 : 1990 Particle Size Distribution by Wet/Dry Sieving Method



BS Test Sieve Aperture Size (mm)	Percentage Passing
75	
63	
50	
37.5	
25	100
20	92
13	77
9.5	73
6.3	68
4.75	65
3.35	62
2	58
1.18	53
0.6	39
0.425	27
0.3	17
0.21	11
0.15	9
0.075	6
0.063	5

Particle Proportions (%)	
Cobbles	0
Gravel	42
Sand	53
Silt & Clay	5

BH/TP No.	**BH 6**	**Depth, m**	2.00	**Report Ref**	19/11527/KJC
Visual Description	Brown sand and gravel			**Contract**	Sandycombe Road, Richmond

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

SUMMARY OF CHEMICAL ANALYSES

BS 1377 : Part 3 : 1990. Clauses 3, 5 and 9

Determination of Soluble Sulphate Contents of Soil and Groundwater, Organic Matter Content and pH Value

Report Ref	19/11527/KJC	**Contract**	Sandycombe Road, Richmond

BH/TP No.	**Sample**		**Concentration of Sulphates expressed as SO_4**		**pH Value**	**Organic Content %**
	Depth m	Soil Type	2:1 Water:Soil Extract g/l	Groundwater g/l		
BH 1	1.00	Clayey sand	< 0.25		7.1	
BH 2	1.00	Sand and gravel	< 0.25		7.3	
BH 3	1.00	Made ground	0.71		7.4	
BH 4	1.00	Made ground	< 0.25		7.6	
BH 5	1.00	Made ground	0.25		7.7	
BH 6	1.00	Made ground	0.49		7.3	
	2.00	Sand and gravel	< 0.25		7.7	

Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	19-11407-1		
Initial Date of Issue:	10-Apr-2019		
Client	Albury SI		
Client Address:	Miltons Yard Petworth Road Witley Surrey GU8 5LH		
Contact(s):	Keith Clark		
Project	19/11527/KJC Sandycombe Road, Richmond		
Quotation No.:	Q16-07234	**Date Received:**	02-Apr-2019
Order No.:	13148	**Date Instructed:**	02-Apr-2019
No. of Samples:	6		
Turnaround (Wkdays):	7	**Results Due:**	10-Apr-2019
Date Approved:	10-Apr-2019		
Approved By:			
Details:	Robert Monk, Technical Manager		

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 19/11527/KJC Sandycombe Road, Richmond

Client: Albury SI		**Chemtest Job No.:**			19-11407	19-11407	19-11407	19-11407	19-11407	19-11407
Quotation No.: Q16-07234		**Chemtest Sample ID.:**			804011	804012	804013	804014	804015	804016
		Sample Location:			BH1	BH2	BH3	BH4	BH5	BH6
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.1	0.3	0.1	0.3	0.1	0.3
		Date Sampled:			27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	-	-	Fibres/Clumps	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	Chrysotile	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	Stereo Microscopy	-	-	-
Asbestos by Gravimetry	U	2192	%	0.001			0.002			
Total Asbestos	N	2192	%	0.001			0.002			
Moisture	N	2030	%	0.020	8.7	10	11	13	14	17
Soil Colour	N	2040		N/A	Brown	Beige	Black	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand
Chromatogram (TPH)	N			N/A	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached
pH	M	2010		N/A	8.0	8.0	8.3	9.4	8.4	8.2
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	32	1.6	1.1	3.5	2.4	1.4
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.78	0.028	0.020	0.89	0.19	0.015
Sulphur (Elemental)	M	2180	mg/kg	1.0	6.4	1.9	15	6.7	14	26
Cyanide (Total)	M	2300	mg/kg	0.50	0.90	< 0.50	2.7	< 0.50	18	2.2
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	7.7	6.1	4.7	12	2.8	21
Sulphate (Total)	M	2430	%	0.010	0.44	0.020	0.27	0.47	0.45	0.13
Arsenic	M	2450	mg/kg	1.0	35	13	100	30	95	34
Beryllium	U	2450	mg/kg	1.0	< 1.0	< 1.0	1.9	1.0	1.1	2.7
Cadmium	M	2450	mg/kg	0.10	3.4	< 0.10	2.0	0.14	7.3	0.86
Chromium	M	2450	mg/kg	1.0	41	17	41	25	56	22
Copper	M	2450	mg/kg	0.50	510	16	630	53	750	230
Mercury	M	2450	mg/kg	0.10	0.84	0.10	7.5	0.58	4.3	1.9
Nickel	M	2450	mg/kg	0.50	35	14	97	26	200	34
Lead	M	2450	mg/kg	0.50	6700	120	1900	290	2200	690
Selenium	M	2450	mg/kg	0.20	0.53	0.23	4.3	0.31	3.4	0.54
Vanadium	U	2450	mg/kg	5.0	72	31	45	43	220	48
Zinc	M	2450	mg/kg	0.50	4000	190	1400	170	3200	720
Chromium (Trivalent)	N	2490	mg/kg	1.0	41	17	41	25	56	22
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Organic Carbon	M	2625	%	0.20	3.6	0.60	7.9	2.4	7.9	5.5
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	2.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	4.9	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	19	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

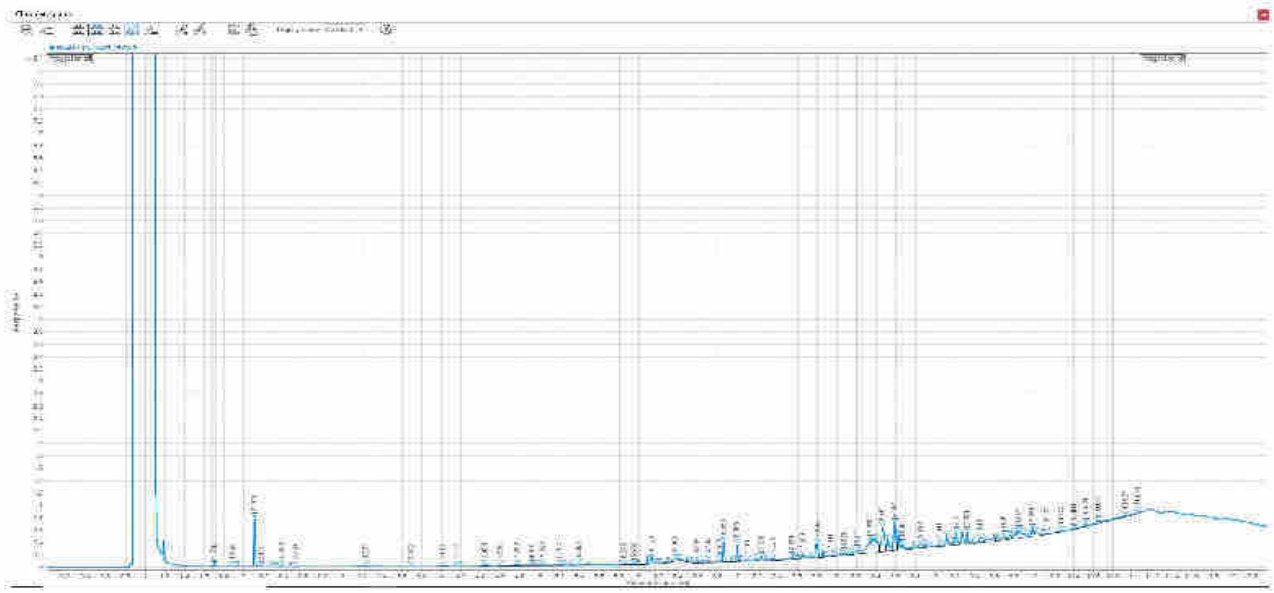
Chemtest
The right chemistry to deliver results

Results - Soil

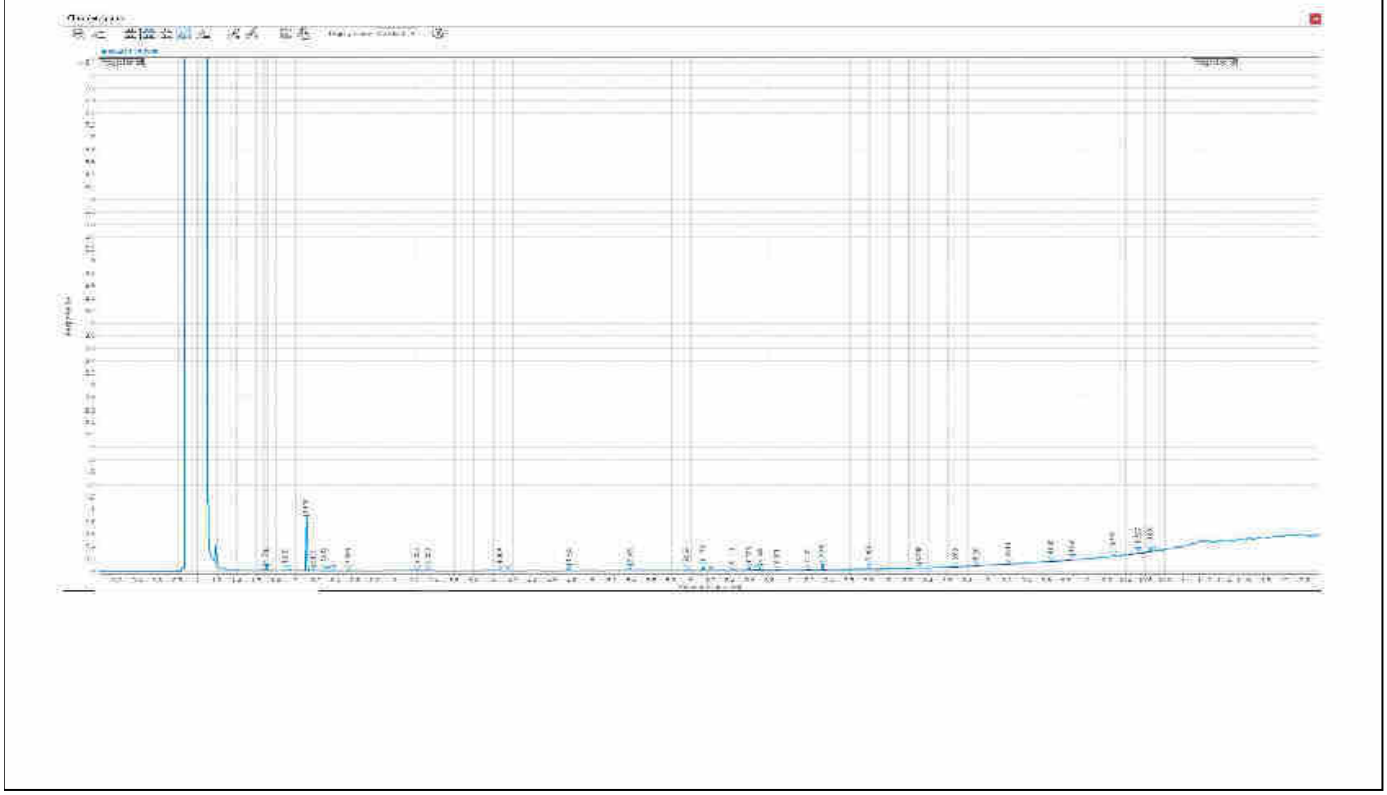
Project: 19/11527/KJC Sandycombe Road, Richmond

Client: Albury SI		**Chemtest Job No.:**			19-11407	19-11407	19-11407	19-11407	19-11407	19-11407
Quotation No.: Q16-07234		**Chemtest Sample ID.:**			804011	804012	804013	804014	804015	804016
		Sample Location:			BH1	BH2	BH3	BH4	BH5	BH6
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.1	0.3	0.1	0.3	0.1	0.3
		Date Sampled:			27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	120	< 1.0	7.4	< 1.0	10	20
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	140	< 5.0	7.4	< 5.0	10	21
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	2.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	9.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	31	< 1.0	2.9	< 1.0	< 1.0	31
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	330	< 1.0	61	< 1.0	86	260
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	17
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	380	< 5.0	64	< 5.0	86	310
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	520	< 10	71	< 10	97	330
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	2.4	< 0.10	0.86	0.91
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	1.9	< 0.10	2.3	1.5
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	0.72	< 0.10	0.42	0.73
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10	1.4	< 0.10	0.39	1.2
Phenanthrene	M	2700	mg/kg	0.10	2.7	< 0.10	11	0.93	3.7	16
Anthracene	M	2700	mg/kg	0.10	0.53	< 0.10	2.6	0.17	0.86	4.4
Fluoranthene	M	2700	mg/kg	0.10	7.7	< 0.10	11	1.7	6.6	26
Pyrene	M	2700	mg/kg	0.10	8.0	< 0.10	10	1.7	6.7	24
Benzo[a]anthracene	M	2700	mg/kg	0.10	4.9	< 0.10	4.7	0.99	3.9	13
Chrysene	M	2700	mg/kg	0.10	4.3	< 0.10	4.4	1.0	4.7	11
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	5.9	< 0.10	4.9	< 0.10	5.5	14
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	2.7	< 0.10	2.3	< 0.10	2.6	6.9
Benzo[a]pyrene	M	2700	mg/kg	0.10	5.6	< 0.10	4.6	< 0.10	4.5	13
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	4.3	< 0.10	3.3	< 0.10	4.9	8.7
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	0.74	< 0.10	0.56	< 0.10	1.1	1.6
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	4.7	< 0.10	4.1	< 0.10	5.5	9.4
Total Of 16 PAH's	M	2700	mg/kg	2.0	52	< 2.0	70	6.5	55	150
Total Phenols	M	2920	mg/kg	0.30	0.39	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

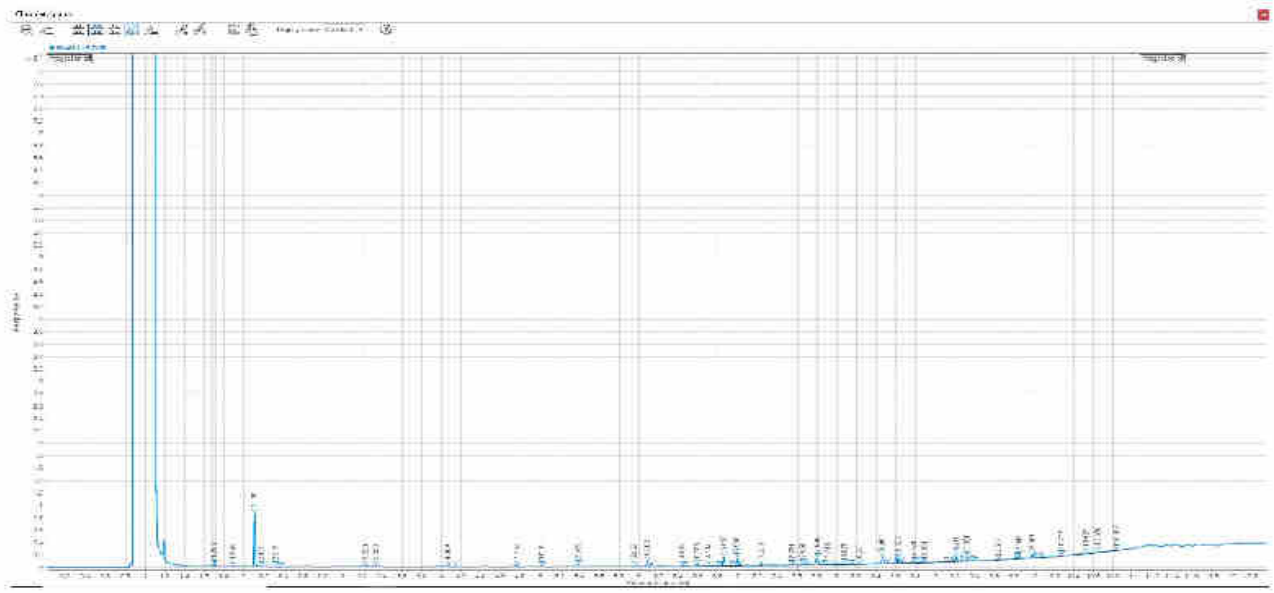
TPH Chromatogram on Soil Sample: 804011



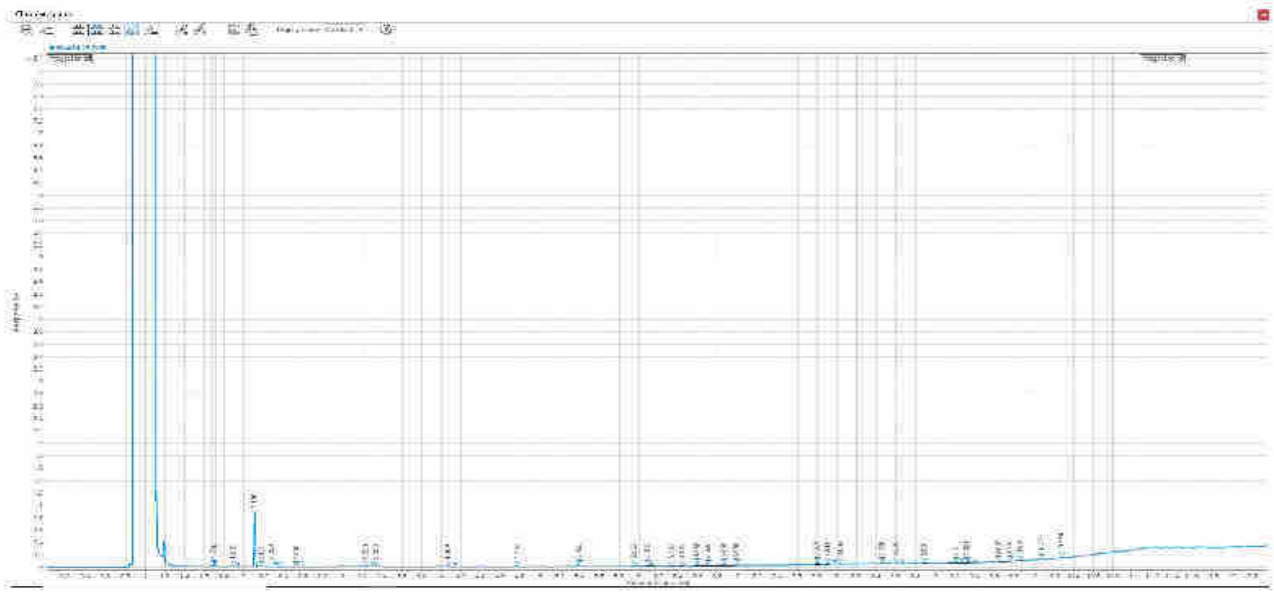
TPH Chromatogram on Soil Sample: 804012



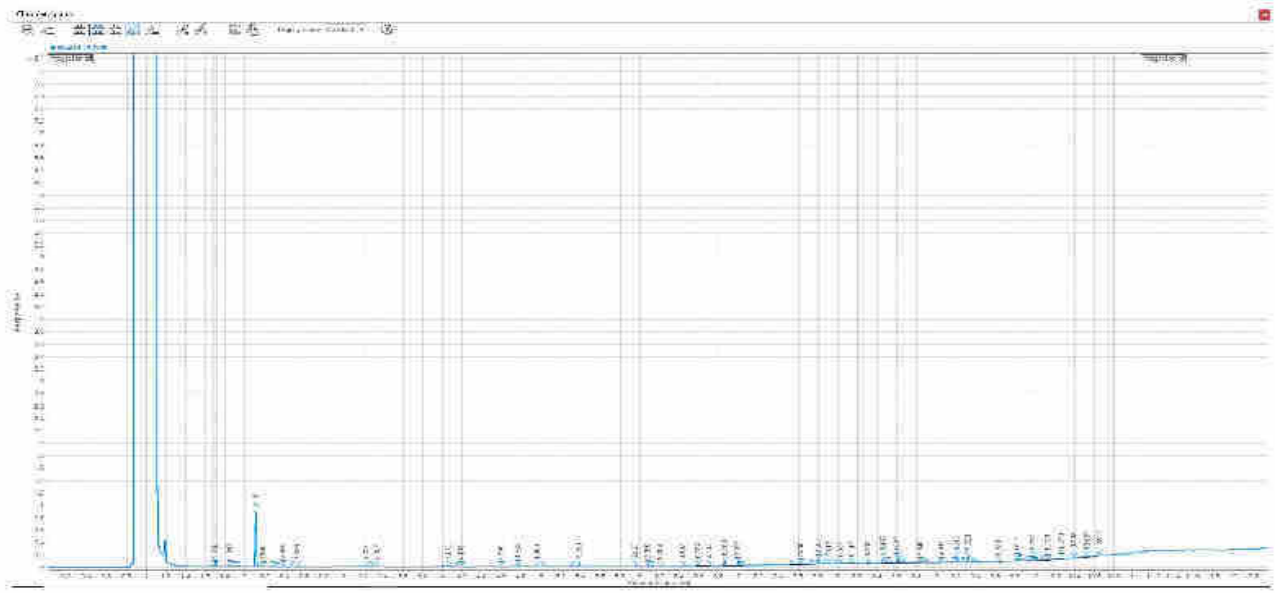
TPH Chromatogram on Soil Sample: 804013



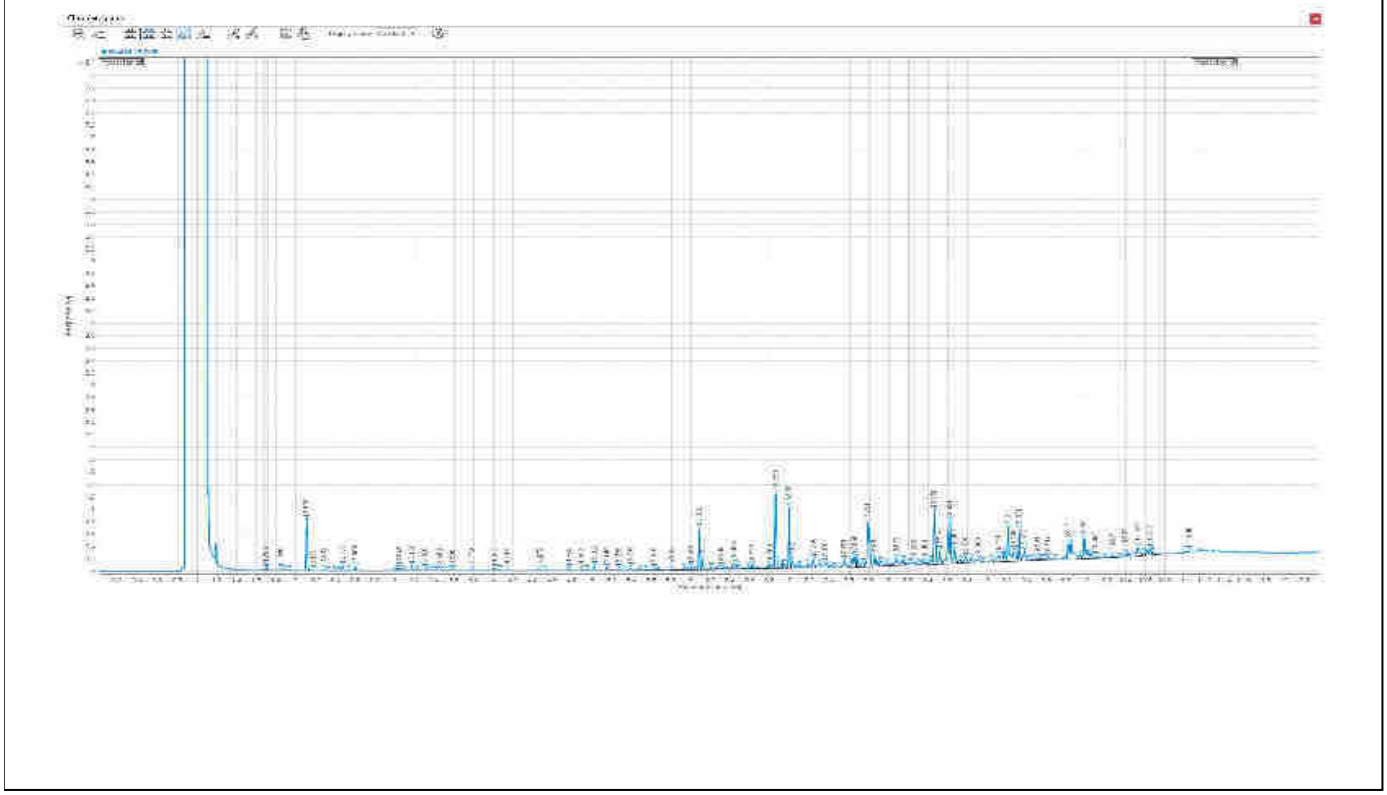
TPH Chromatogram on Soil Sample: 804014



TPH Chromatogram on Soil Sample: 804015



TPH Chromatogram on Soil Sample: 804016



Test Methods

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.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' 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 600' 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.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
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; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

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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.com

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Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	19-12707-1
Initial Date of Issue:	17-Apr-2019
Client	Albury SI
Client Address:	Miltons Yard Petworth Road Witley Surrey GU8 5LH
Contact(s):	Keith Clark
Project	19/11527 Sandycombe Road, Richmond

Quotation No.:	Q16-07234	**Date Received:**	12-Apr-2019
Order No.:	13148	**Date Instructed:**	12-Apr-2019
No. of Samples:	8		
Turnaround (Wkdays):	7	**Results Due:**	24-Apr-2019
Date Approved:	17-Apr-2019		

Approved By:

Details: Glynn Harvey, Laboratory Manager

Chemtest
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Results - Soil

Project: 19/11527 Sandycombe Road, Richmond

Client: Albury SI		**Chemtest Job No.:**			19-12707	19-12707	19-12707	19-12707	19-12707	19-12707	19-12707	19-12707
Quotation No.: Q16-07234		**Chemtest Sample ID.:**			810208	810209	810210	810211	810212	810213	810214	810215
		Sample Location:			BH1	BH1	BH3	BH3	BH4	BH5	BH5	BH6
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.3	0.5	0.3	0.5	0.5	0.3	0.5	0.5
		Date Sampled:			27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019	27-Mar-2019
		Asbestos Lab:					DURHAM	DURHAM				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A			-	-				
Asbestos Identification	U	2192	%	0.001			No Asbestos Detected	No Asbestos Detected				
ACM Detection Stage	U	2192		N/A			-	-				
Moisture	N	2030	%	0.020	14	11	13	16	15	9.3	15	21
Soil Colour	N	2040		N/A	Brown,	Brown,	Brown,	Brown,	Brown,	Brown, ,	Brown,	Brown,
Other Material	N	2040		N/A	Stones,	Stones,	Stones,	Stones,	Stones,	Stones,	Stones,	Stones,
Soil Texture	N	2040		N/A	Sand,	Sand,	Sand,	Sand,	Sand,	Sand,	Sand,	Sand,
Arsenic	M	2450	mg/kg	1.0	14	11	46	70	70	96	45	64
Lead	M	2450	mg/kg	0.50	560	210	1700	3400	670	880	600	1500
Zinc	M	2450	mg/kg	0.50	240	89	850	860	200	860	220	2400

Test Methods

SOP	Title	Parameters included	Method summary
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.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.

Report Information

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U	UKAS accredited
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All results are expressed on a dry weight basis
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If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

APPENDIX 3

CONCEPTUAL SITE MODEL

4.0 CONCEPTUAL SITE MODEL

4.1 General

A preliminary geo-environmental Conceptual Site Model (CSM) was formulated for the site in light of the proposed development. In accordance with best practice, the model has been used to identify possible contamination risks following a source-pathway-receptor ('SPR') approach.

The model may require revision where the development proposals differ, and should be reviewed in light of any ground investigation data or where unexpected conditions are encountered.

4.2 Potential Sources

Identified sources of possible contamination on site and in the immediate vicinity are summarised on the following table. The table identifies where contaminants may exist in the soil.

Soil Source	Description	Contaminants
Made Ground	Made Ground may exist under the existing buildings and previous buildings. The site has been redeveloped in several phases. Fill may also occur under buildings and hardstandings etc. The provenance of such materials is unknown and may be contaminated.	Wide range of possible metals, non-metals, organic contaminants, asbestos, etc.
Industrial land uses on site	Potentially contaminative land uses were identified on site: • Vehicle storage, maintenance and repairs, including car body repairs. • Cellulose spraying.	Contaminants associated with these uses may include*: • Metals and Speciated PAH's • Inorganic Compounds. • Asbestos • Solvents, fuels and oils • PCBs, BTEX, MTBE, VOCs and SVOCs
Historical land uses on site	Potentially contaminative land uses were identified on site: • Timber Merchants • Nursery • Railway Land	Contaminants associated with these uses may include*: • Metals, solvents and PCBs • Asbestos • Herbicides and Pesticides
Historical land uses off site	Potentially contaminative activities may be carried out including: • Steam Engine works • Nursery • Railway Land	Contaminants associated with these uses may include*: • Metals, PCBs and Speciated PAH's • Inorganic Compounds. • Asbestos • Herbicides and Pesticides • Fuels and Oils

*Relevant Depart of the Environment Industry Profiles are available in Appendix E.

Groundwater in this instance is considered to primarily be a receptor. The potential for leaching out into groundwater is limited by the proportion of hard cover proposed. The potential for vapours generated from organic contaminants in groundwater cannot be discarded, especially considering the proximity. Chemical attack is relevant as the groundwater table may rise (as implied by the BGS).

Other potential sources were identified, including the historic gas works, but were deemed to not pose a significant risk to the site. No other sources of contamination have been identified. In particular, no sources of ground gas contamination were identified, either on site or in the immediate vicinity.

4.3 Identified Receptors

Potential receptors associated with the site and the proposed development are summarised on the following table:

Receptor	Description	Notes
End users	Occupants of the proposed redevelopment.	Residential development
Building materials	Built elements in contact with the ground.	Water supply pipework and buried structural concrete susceptible to chemical attack.
Adjacent land users	Sensitive land uses identified locally	Residential properties were identified immediately adjacent to the north and south, and railway land was noted to the east.
Ground water	Water below ground in permeable strata.	The site overlies a Secondary A Aquifer.

The following receptors have not been identified:

Receptor	Description	Notes
Soft landscaping	Areas of planting including lawns, shrubs, trees, etc.	No significant areas of communal soft landscaping are proposed (planted borders only).
Surface water	Surface water in lakes and rivers etc.	No significant surface water bodies have been identified in the immediate vicinity.
Site workers	Persons involved in construction works	Any risks posed to site workers would be controlled through other regimes including Health & Safety legislation, the CDM regulations and COSHH regulations etc.
Ecological receptors	Statutory protected species or wildlife areas	An assessment of such risks was outside the scope of this report.

4.4 Source-Pathway-Receptor Linkages

Whilst the various possible sources and receptors have been identified, the following matrix illustrates the identified pathways by which a contaminant linkage might plausibly exist. Off-site sources impacting on off-site receptors have not been considered.

		Sources		
		Soils	**Gases**	**Groundwater**
Receptors	**End users**	Ingestion, dermal contact, inhalation	None	Inhalation
	Building materials	Chemical attack	Not applicable	Chemical attack
	Adjacent land users	Lateral migration, inhalation, ignition	None	None
	Groundwater	Leaching, downward migration	None	Not applicable

4.5 Other Factors

The following other areas of possible concern were identified, but were outside the geo-environmental risk assessment:

Asbestos	Asbestos may exist within buildings on site, including for instance in cement boarding. An appropriate survey should be undertaken to assess the presence of asbestos within the building fabric.

Other factors

APPENDIX 4

WASTE

WASTE CLASSIFICATION

The European Waste Framework Directive is implemented in the UK by the 2002 Landfill Regulations, together with a number of other acts and regulations. A key part of this process is to establish the hazardous properties of potential waste. The classification and definition of hazardous waste is interpreted within the Environment Agency guidance WM3 and all wastes require classifying in accordance with the European Waste Catalogue [EWC]. The EWC is a detailed list of typical industry waste types and each has a 6 digit code. Typically the appropriate EWC codes for excavated soil being disposed off site are:

17 05 03* soil and stones containing dangerous substances, or
17 05 04 soil and stones other than those mentioned in 17 05 03

If excavated soils are to be discarded or exported from site then they would be considered controlled waste and require classification. However, if soils can be re-used on site then they are not considered to be controlled waste. A Desk Study, soil descriptions, laboratory chemical analysis and risk assessment can all contribute to basic waste characterisation. Depending upon the chemical composition or levels of contaminants in the waste (e.g. metals, TPH, asbestos), soil and stones can either be hazardous or non-hazardous. Waste Acceptance Criteria [WAC] test results are used to determine the suitability of the waste intended for disposal against the acceptance criteria for a particular class of landfill site. WAC tests are not used for the classification of waste soils and are only required for inert or hazardous excavated material which is destined for landfill.

Wastes containing asbestos with a concentration of >0.10% weight/weight (w/w) are generally considered to be hazardous. While waste with <0.10% w/w of asbestos are considered non-hazardous. Where free fibres or fibrous asbestos is present at concentrations of >0.001% then these are considered to pose a risk to human health and are deemed hazardous waste. These waste materials also require a suitably licensed company to handle them.

Waste Treatment

It is a requirement of the 2002 Landfill Regulations that all wastes must undergo some form of pre-treatment prior to disposal at an appropriately licensed landfill. Treatment is defined using a 'three-point test' and can include physical, chemical, biological or thermal processes, which must change the characteristics of the waste in order to:

- reduce its volume, or
- reduce its hazardous nature, or
- facilitate its handling, or
- enhance its recovery.

The exceptions to this are:

- inert waste for which treatment is not technically feasible.
- it is waste other than inert waste and treatment would not reduce its quantity or its hazards to human health or the environment.

The waste producer should either treat their own waste or ensure that the waste will be treated by a subsequent handler. The waste producer should record the type and amount of pre-treatment undertaken prior to disposal.

Examples of treatment include mechanical segregation or sorting, compositing, soil treatment hubs and incineration. This can include physical sorting of waste soil types into separate stockpiles at the producer site, e.g. topsoil, made ground and natural clay, sand or gravels.

ATKINS CatWasteSoil

Classification Assessment Tool of Soil Wastes - Hazard Summary Sheet

Site Name	Sandycombe Road
Location	Richmond
Site ID	
Job Number	19/11527/KJC
Date	18/04/2019
User Name	
Company Name	Albury S.I Ltd

Hole ID	Sample Depth	Hazardous Waste Y/N	HP1	HP2	HP3	HP4	HP5	HP6	HP7	HP8	HP9	HP10	HP11	HP12	HP13	HP14	HP15	HP16
BH1	0.1	Y	No	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	No	No
BH2	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH3	0.1	Y	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No
BH4	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH5	0.1	Y	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No
BH6	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH 1	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH1	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH3	0.3	Y	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No
BH3	0.5	Y	No	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	No	No
BH4	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH5	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH5	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH6	0.5	Y	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No

ATKINS CatWasteSoil

Classification Assessment Tool of Soil Wastes - Individual Compound Information

Site Name	Sandycombe Road
Location	Richmond
Site ID	
Job Number	19/11527/KJC
Date	18/04/2019
User Name	
Company Name	Albury S.I Ltd

Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Property	Individual Hazard Statements Exceeded	Cumulative Hazard Statements Exceeded	Additional Hazard Statements (see notes section)
BH1	0.1	pH	0.00000	N				
BH1	0.1	Naphthalenene	0.00000	N				H228 test
BH1	0.1	Acenaphthylene	0.00000	N				
BH1	0.1	Acenaphthene	0.00000	N				
BH1	0.1	Fluorene	0.00000	N				
BH1	0.1	Phenanthrene	0.00027	N				
BH1	0.1	Anthracene	0.00005	N				
BH1	0.1	Fluoranthene	0.00077	N				
BH1	0.1	Pyrene	0.00080	N				
BH1	0.1	Benzo(a)anthracene	0.00049	N				
BH1	0.1	Chrysene	0.00043	N				
BH1	0.1	Benzo(b)fluoranthene	0.00059	N				
BH1	0.1	Benzo(k)fluoranthene	0.00027	N				
BH1	0.1	Benzo(a)pyrene	0.00056	N				
BH1	0.1	Indeno(1,2,3-cd)pyrene	0.00043	N				
BH1	0.1	Di-benz(a,h,)anthracene	0.00007	N				
BH1	0.1	Benzo(g,h,i)perylene	0.00047	N				
BH1	0.1	Phenol	0.00004	N				
BH1	0.1	hydrocarbon/oil with marker	0.05200	N				H225 test
BH1	0.1	Arsenic	0.00537	N				
BH1	0.1	Boron	0.07407	N				
BH1	0.1	Cadmium	0.00063	N				
BH1	0.1	Hexavalent Chromium	0.00000	N				
BH1	0.1	Chromium (Total)	0.00599	N				
BH1	0.1	Copper	0.12811	Y	HP14		H410	
BH1	0.1	Lead	0.00000	N				
BH1	0.1	Leadx	0.67000	Y	HP10, HP14	H360	H410	
BH1	0.1	Mercury	0.00008	N				
BH1	0.1	Nickel	0.00923	N				
BH1	0.1	Selenuim	0.00020	N				
BH1	0.1	Zinc	0.00000	N				
BH1	0.1	Zincx	0.98765	Y	HP14		H410	
BH1	0.1	Vanadium	0.01285	N				
BH2	0.3	pH	0.00000	N				
BH2	0.3	Naphthalenene	0.00000	N				H228 test
BH2	0.3	Acenaphthylene	0.00000	N				
BH2	0.3	Acenaphthene	0.00000	N				
BH2	0.3	Fluorene	0.00000	N				
BH2	0.3	Phenanthrene	0.00000	N				
BH2	0.3	Anthracene	0.00000	N				
BH2	0.3	Fluoranthene	0.00000	N				
BH2	0.3	Pyrene	0.00000	N				
BH2	0.3	Benzo(a)anthracene	0.00000	N				
BH2	0.3	Chrysene	0.00000	N				
BH2	0.3	Benzo(b)fluoranthene	0.00000	N				
BH2	0.3	Benzo(k)fluoranthene	0.00000	N				
BH2	0.3	Benzo(a)pyrene	0.00000	N				
BH2	0.3	Indeno(1,2,3-cd)pyrene	0.00000	N				

ATKINS CatWasteSoil

Classification Assessment Tool of Soil Wastes - Individual Compound Information

Site Name	Sandycombe Road
Location	Richmond
Site ID	
Job Number	19/11527/KJC
Date	18/04/2019
User Name	
Company Name	Albury S.I Ltd

Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Property	Individual Hazard Statements Exceeded	Cumulative Hazard Statements Exceeded	Additional Hazard Statements (see notes section)
BH2	0.3	Di-benz(a,h,)anthracene	0.00000	N				
BH2	0.3	Benzo(g,h,i)perylene	0.00000	N				
BH2	0.3	Phenol	0.00000	N				
BH2	0.3	hydrocarbon/oil with marker	0.00000	N				H225 test
BH2	0.3	Arsenic	0.00199	N				
BH2	0.3	Boron	0.00370	N				
BH2	0.3	Cadmium	0.00000	N				
BH2	0.3	Hexavalent Chromium	0.00000	N				
BH2	0.3	Chromium (Total)	0.00248	N				
BH2	0.3	Copper	0.00402	N				
BH2	0.3	Lead	0.00000	N				
BH2	0.3	Leadx	0.01200	N				
BH2	0.3	Mercury	0.00001	N				
BH2	0.3	Nickel	0.00369	N				
BH2	0.3	Selenuim	0.00009	N				
BH2	0.3	Zinc	0.00000	N				
BH2	0.3	Zincx	0.04691	N				
BH2	0.3	Vanadium	0.00553	N				
BH3	0.1	pH	0.00000	N				
BH3	0.1	Naphthalenene	0.00024	N				H228 test
BH3	0.1	Acenaphthylene	0.00019	N				
BH3	0.1	Acenaphthene	0.00007	N				
BH3	0.1	Fluorene	0.00014	N				
BH3	0.1	Phenanthrene	0.00110	N				
BH3	0.1	Anthracene	0.00026	N				
BH3	0.1	Fluoranthene	0.00110	N				
BH3	0.1	Pyrene	0.00100	N				
BH3	0.1	Benzo(a)anthracene	0.00047	N				
BH3	0.1	Chrysene	0.00044	N				
BH3	0.1	Benzo(b)fluoranthene	0.00049	N				
BH3	0.1	Benzo(k)fluoranthene	0.00023	N				
BH3	0.1	Benzo(a)pyrene	0.00046	N				
BH3	0.1	Indeno(1,2,3-cd)pyrene	0.00033	N				
BH3	0.1	Di-benz(a,h,)anthracene	0.00006	N				
BH3	0.1	Benzo(g,h,i)perylene	0.00041	N				
BH3	0.1	Phenol	0.00000	N				
BH3	0.1	hydrocarbon/oil with marker	0.00710	N				H225 test
BH3	0.1	Arsenic	0.01534	N				
BH3	0.1	Boron	0.00255	N				
BH3	0.1	Cadmium	0.00037	N				
BH3	0.1	Hexavalent Chromium	0.00000	N				
BH3	0.1	Chromium (Total)	0.00599	N				
BH3	0.1	Copper	0.15825	Y	HP14		H410	
BH3	0.1	Lead	0.00000	N				
BH3	0.1	Leadx	0.19000	Y	HP14		H410	
BH3	0.1	Mercury	0.00075	N				
BH3	0.1	Nickel	0.02557	N				
BH3	0.1	Selenuim	0.00162	N				

ATKINS CatWasteSoil

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BH3	0.1	Zinc	0.00000	N				
BH3	0.1	Zincx	0.34568	Y	HP14		H410	
BH3	0.1	Vanadium	0.00803	N				
BH4	0.3	pH	0.00000	N				
BH4	0.3	Naphthalenene	0.00000	N				H228 test
BH4	0.3	Acenaphthylene	0.00000	N				
BH4	0.3	Acenaphthene	0.00000	N				
BH4	0.3	Fluorene	0.00000	N				
BH4	0.3	Phenanthrene	0.00009	N				
BH4	0.3	Anthracene	0.00002	N				
BH4	0.3	Fluoranthene	0.00017	N				
BH4	0.3	Pyrene	0.00017	N				
BH4	0.3	Benzo(a)anthracene	0.00010	N				
BH4	0.3	Chrysene	0.00010	N				
BH4	0.3	Benzo(b)fluoranthene	0.00000	N				
BH4	0.3	Benzo(k)fluoranthene	0.00000	N				
BH4	0.3	Benzo(a)pyrene	0.00000	N				
BH4	0.3	Indeno(1,2,3-cd)pyrene	0.00000	N				
BH4	0.3	Di-benz(a,h,)anthracene	0.00000	N				
BH4	0.3	Benzo(g,h,i)perylene	0.00000	N				
BH4	0.3	Phenol	0.00000	N				
BH4	0.3	hydrocarbon/oil with marker	0.00000	N				H225 test
BH4	0.3	Arsenic	0.00460	N				
BH4	0.3	Boron	0.00810	N				
BH4	0.3	Cadmium	0.00003	N				
BH4	0.3	Hexavalent Chromium	0.00000	N				
BH4	0.3	Chromium (Total)	0.00365	N				
BH4	0.3	Copper	0.01331	N				
BH4	0.3	Lead	0.00000	N				
BH4	0.3	Leadx	0.02900	N				
BH4	0.3	Mercury	0.00006	N				
BH4	0.3	Nickel	0.00685	N				
BH4	0.3	Selenuim	0.00012	N				
BH4	0.3	Zinc	0.00000	N				
BH4	0.3	Zincx	0.04198	N				
BH4	0.3	Vanadium	0.00768	N				
BH5	0.1	pH	0.00000	N				
BH5	0.1	Naphthalenene	0.00009	N				H228 test
BH5	0.1	Acenaphthylene	0.00023	N				
BH5	0.1	Acenaphthene	0.00004	N				
BH5	0.1	Fluorene	0.00004	N				
BH5	0.1	Phenanthrene	0.00037	N				
BH5	0.1	Anthracene	0.00009	N				
BH5	0.1	Fluoranthene	0.00066	N				
BH5	0.1	Pyrene	0.00067	N				
BH5	0.1	Benzo(a)anthracene	0.00039	N				
BH5	0.1	Chrysene	0.00047	N				
BH5	0.1	Benzo(b)fluoranthene	0.00055	N				

ATKINS CatWasteSoil

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Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Property	Individual Hazard Statements Exceeded	Cumulative Hazard Statements Exceeded	Additional Hazard Statements (see notes section)
BH5	0.1	Benzo(k)fluoranthene	0.00026	N				
BH5	0.1	Benzo(a)pyrene	0.00045	N				
BH5	0.1	Indeno(1,2,3-cd)pyrene	0.00049	N				
BH5	0.1	Di-benz(a,h,)anthracene	0.00011	N				
BH5	0.1	Benzo(g,h,i)perylene	0.00055	N				
BH5	0.1	Phenol	0.00000	N				
BH5	0.1	hydrocarbon/oil with marker	0.00970	N				H225 test
BH5	0.1	Arsenic	0.01457	N				
BH5	0.1	Boron	0.00556	N				
BH5	0.1	Cadmium	0.00135	N				
BH5	0.1	Hexavalent Chromium	0.00000	N				
BH5	0.1	Chromium (Total)	0.00818	N				
BH5	0.1	Copper	0.18839	Y	HP14		H410	
BH5	0.1	Lead	0.00000	N				
BH5	0.1	Leadx	0.22000	Y	HP14		H410	
BH5	0.1	Mercury	0.00043	N				
BH5	0.1	Nickel	0.05273	N				
BH5	0.1	Selenuim	0.00128	N				
BH5	0.1	Zinc	0.00000	N				
BH5	0.1	Zincx	0.79012	Y	HP14		H410	
BH5	0.1	Vanadium	0.03928	N				
BH6	0.3	pH	0.00000	N				
BH6	0.3	Naphthalenene	0.00009	N				H228 test
BH6	0.3	Acenaphthylene	0.00015	N				
BH6	0.3	Acenaphthene	0.00007	N				
BH6	0.3	Fluorene	0.00012	N				
BH6	0.3	Phenanthrene	0.00160	N				
BH6	0.3	Anthracene	0.00044	N				
BH6	0.3	Fluoranthene	0.00260	N				
BH6	0.3	Pyrene	0.00240	N				
BH6	0.3	Benzo(a)anthracene	0.00130	N				
BH6	0.3	Chrysene	0.00110	N				
BH6	0.3	Benzo(b)fluoranthene	0.00140	N				
BH6	0.3	Benzo(k)fluoranthene	0.00069	N				
BH6	0.3	Benzo(a)pyrene	0.00130	N				
BH6	0.3	Indeno(1,2,3-cd)pyrene	0.00087	N				
BH6	0.3	Di-benz(a,h,)anthracene	0.00016	N				
BH6	0.3	Benzo(g,h,i)perylene	0.00094	N				
BH6	0.3	Phenol	0.00000	N				
BH6	0.3	hydrocarbon/oil with marker	0.03300	N				H225 test
BH6	0.3	Arsenic	0.00522	N				
BH6	0.3	Boron	0.00324	N				
BH6	0.3	Cadmium	0.00016	N				
BH6	0.3	Hexavalent Chromium	0.00000	N				
BH6	0.3	Chromium (Total)	0.00322	N				
BH6	0.3	Copper	0.05777	N				
BH6	0.3	Lead	0.00000	N				
BH6	0.3	Leadx	0.06900	N				

ATKINS CatWasteSoil

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BH6	0.3	Mercury	0.00019	N				
BH6	0.3	Nickel	0.00896	N				
BH6	0.3	Selenuim	0.00020	N				
BH6	0.3	Zinc	0.00000	N				
BH6	0.3	Zincx	0.17778	N				
BH6	0.3	Vanadium	0.00857	N				
BH 1	0.3	Lead	0.00000	N				
BH 1	0.3	Leadx	0.05600	N				
BH 1	0.3	Zinc	0.00000	N				
BH 1	0.3	Zincx	0.05926	N				
BH1	0.5	Lead	0.00000	N				
BH1	0.5	Leadx	0.02100	N				
BH1	0.5	Zinc	0.00000	N				
BH1	0.5	Zincx	0.02198	N				
BH3	0.3	Lead	0.00000	N				
BH3	0.3	Leadx	0.17000	Y	HP14		H410	
BH3	0.3	Zinc	0.00000	N				
BH3	0.3	Zincx	0.20988	Y	HP14		H410	
BH3	0.5	Lead	0.00000	N				
BH3	0.5	Leadx	0.34000	Y	HP10, HP14	H360	H410	
BH3	0.5	Zinc	0.00000	N				
BH3	0.5	Zincx	0.21235	Y	HP14		H410	
BH4	0.5	Lead	0.00000	N				
BH4	0.5	Leadx	0.06700	N				
BH4	0.5	Zinc	0.00000	N				
BH4	0.5	Zincx	0.04938	N				
BH5	0.3	Lead	0.00000	N				
BH5	0.3	Leadx	0.08800	N				
BH5	0.3	Zinc	0.00000	N				
BH5	0.3	Zincx	0.21235	N				
BH5	0.5	Lead	0.00000	N				
BH5	0.5	Leadx	0.06000	N				
BH5	0.5	Zinc	0.00000	N				
BH5	0.5	Zincx	0.05432	N				
BH6	0.5	Lead	0.00000	N				
BH6	0.5	Leadx	0.15000	Y	HP14		H410	
BH6	0.5	Zinc	0.00000	N				
BH6	0.5	Zincx	0.59259	Y	HP14		H410	

Notes - Additional Information on Hazard Properties

Hazardous Property	Description	Hazard Statement	Note
HP1	Explosive	H200, H201, H202, H203, H204, H240 and H241	A waste is assessed for HP1 via test methods, rather than a concentration limit. If you have substances or a mixture containing explosive properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP2	Oxidising	H270, H271, H272	A waste is assessed for HP2 via test methods, rather than a concentration limit. If you have substances or a mixture containing oxidising properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP3	Flammable	H220 to H226, H228, H242, H250, H251m H252, H260, H261	A waste is assessed for HP3 via test methods, rather than a concentration limit. If you have substances or a mixture containing flammable properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria. If a waste contains either H220, H221, H260 or H261 a calculation can be performed to identify the minimum amount of that substance that will trigger HP3.
HP5	Specific Target Organ Toxicity (STOT)	H304	Should a waste contain two or more compounds displaying H304 (Asp. Tox 1) and equal or exceed its specific concentration limit of 10%, then a waste will be hazardous by HP5 if its kinematic viscosity exceeds 20.5 mm^2/s. Guidance should be sought from the CLP Criteria.
HP9	Infectious	N/A	A waste is assessed for HP9 via further testing, rather than a concentration limit. In cases where there is the potential for toxins to be present, further testing will be required. For healthcare waste reference should be made to the Department of health guidance: Safe management of healthcare waste.
HP12	Release of acute toxic gas	EUH029, EUH031, EUH032, H260 or H261	A waste is assessed for HP12 via test methods, rather than a concentration limit. If you have substances or a mixture that may release acute toxic gas the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP15	Explosive or explosive properties	H205, EUH001, EUH019 or EUH044	A waste is assessed for HP15 via test methods, rather than a concentration limit. If you have substances or a mixture that may exhibit explosive or explosive properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP16	Persistent organic pollutants	N/A	A waste is considered hazardous if the concentration of one or more compound (persistent organic pollutant) as listed in Appendix C of Environment Agency guidance WM3 is above its assigned concentration limit. For reference for dioxins and furans, this assessment incorporates the use of specific toxicity equivalent factors.