



Your Environment

STAGE 2: SITE INVESTIGATION - 3 QUEENS ROAD, WATERLOOVILLE, PO7 7SB

Mr G Cook

Your Environment

Head Office, Chilgrove Business Centre, Chilgrove Park Road, Chilgrove, Nr
Chichester, PO18 9HU
Tel: 01243 787150

Report Number: YE3118, Date: June 2017

Rob Lewis

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	Name	Position	Signature	Date
Prepared & Reviewed by:	Rob Lewis	Geotechnical Engineer		June 2017
Approved:	Colin Hiscock	Director		June 2017
For and on behalf of YourEnvironment				

Issue	Date	Description	Prepared	Reviewed	Approved
00	14.6.2017	Final Report	RL	RL	CH

Executive Summary

YourEnvironment (YE) was instructed by Mr G Cook (Quote No: 2947, Dated: May 8th 2017) to conduct a Site Investigation (SI) at a site identified as 3 Queens Road, Waterloooville, PO7 7SB. The purpose of this investigation was to provide a factual and interpretative report on our findings in respect to works completed at the site by YE, which comprised three (3no.) windowless sampler boreholes with associated SPTs with geotechnical laboratory testing.

We understand from reference to the Local Planning Department and current plans provided by the client that development of the site includes:

- Erection of a low rise residential property;
- Creation of a driveway, car parking hardstanding and integral garage; and
- Inclusion of discrete areas of soft landscaping.

The relevant British Geological Survey (BGS) online mapping information indicates the site to be devoid of superficial deposits. The site is recorded as being underlain by the Thanet Formation which comprises a fine grained that is often glauconitic and containing nodular flint.

A review of the ground conditions within the boreholes indicates the presence of variable Made Ground deposits to up to 0.3m depth. The Made Ground comprised locally present brick, topsoil and sand.

Underlying the made ground orange brown becoming grey silty clay was encountered to full depth of the boreholes at 5.0mbgl.

Reference to the Standard Penetration Tests results also shows a degree of variability but with generally increase in “N” value with depth indicating increasing strength/relative density with depth. N values of between N=5 and N=8 were recorded at 1.0m depth, N=11 to 15 at 2.0m depth, N=13 to 17 at 3.0m depth, N=18 to 21 at 4.0m depth and N=19 to 22 at 5.0m depth.

The made ground and topsoil are not considered suitable for the construction of shallow foundations due to the risk of unacceptable total and differential settlement occurring under moderately light surface loading.

The investigation revealed initially weaker deposits which were noted to increase with depth. The proposed development is likely to be capable of being constructed on conventional shallow spread/trench fill foundations. These could be placed at depths from 2.00m in soils described in a firm in situ condition. It is considered that spread foundations constructed within the underlying clays could be designed assuming an allowable increase in load given in Table 2: Allowable Increase in Stress.

Reference to BRE Special Digest 1 and the test results indicates the results from the fall within Design Sulphate Class DS-1. Consequently concrete may be designed to AC-1s concrete classification.

We trust this is sufficient for your requirements and should you have any questions please do not hesitate to contact the undersigned.

For YourEnvironment



Rob Lewis
Geotechnical Engineer



Colin Hiscock
Director

1.0 Introduction

YourEnvironment (YE) was instructed by Mr G Cook (Quote No: 2947, Dated: May 8th 2017) to conduct a Site Investigation (SI) at a site identified as 3 Queens Road, Waterlooville, PO7 7SB.

The purpose of this investigation was to provide a factual and interpretative report on our findings in respect to works completed at the site by YE, which comprised three (3no.) windowless sampler boreholes with associated SPTs with geotechnical laboratory testing.

This report presents a full factual record of all site works carried out, the results of *insitu* testing and subsequent laboratory testing of selected samples obtained during these works. The report has been formulated in accordance with BS10175:2015 '*Investigation into Potentially Contaminated Sites - Code of Practice*' and CLR11 - '*Model Procedures for the Management of Land Contamination*' and from the National Planning Policy Framework.

YE take no responsibility for conditions which have not been revealed by the windowless sampler boreholes, or which occur between windowless sampler boreholes. Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative and liability cannot be accepted for its accuracy.

The information contained in this report is intended for the use of the named client (or their approved contractors). Should a third party rely on any part of this report, that party does so wholly at its own risk and YE disclaim any liability to such parties. Should the purposes for which the report is used, or the proposed use of the site change, this report may no longer be valid and further use of reliance upon the report in those circumstances shall be at the client's sole and own risk. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. YE should in all such altered circumstances be commissioned to review and update this report accordingly.

2.0 Proposed Development

We understand from reference to the Local Planning Department and current plans provided by the client that development of the site includes:

- Erection of a low rise residential property;
- Creation of a driveway, car parking hardstanding and integral garage; and
- Inclusion of discrete areas of soft landscaping.

The proposed redevelopment plans for the site can be reviewed within **Appendix A**.

3.0 Physical Setting

3.1 Site Information

The site is located within the southern limits of the village/small town of Waterlooville, which is located approximately 5km north of Havant. The approximately rectangular shaped site is enclosed by the property at 3 Queens Road with access to the property via Queens Road and is surrounded by residential properties. Mature hedges and trees are growing along all the site boundaries. The site is currently occupied by a garden of a residential house.

3.2 Geology

The relevant British Geological Survey (BGS) online mapping information indicates the site to be devoid of superficial deposits. The site is recorded as being underlain by the London Clay Formation.

4.0 Fieldworks

4.1 Site Investigation

All SI works were completed on May 26th 2017 under the supervision of a Geo-Environmental Engineer contracted from YE. In summary the investigation included:

- A two man team ascertained the routes of any below ground services in close proximity to the proposed exploratory hole positions, using a CAT scan and lifting up of any man hole covers. Following the CAT scan, hand dug starter pits were completed to a depth of 1.2 metres below ground level (mbgl).
- Three (3no.) windowless sampler boreholes (WS1 to WS3) were completed, by means of a competitor dart rig, to depths of 5.00mbgl. The locations of exploratory positions were selected relative to the historic land use and the current proposed redevelopment plans for the site.
- The windowless sampler boreholes were logged with any groundwater conditions noted and representative soil samples removed in accordance with current guidelines.
- Soil samples were removed from shallow sub surface locations, with further samples taken at depth at every 0.5mbgl or when the underlying stratum changed. Samples were subsequently placed in suitable containers including 1kg tubs and 250ml glass jars and placed in cool boxes with cool packs prior to storage within our *in-house* laboratory fridges and then subsequent forwarding to our designated laboratory for analysis.
- Standard Penetration Tests were undertaken during the drilling to provide an assessment of the strength of the underlying deposits with depth.
- Upon completion, all exploratory holes were back filled, compacted and made good to existing levels and finishes, with any surplus spoil bagged up and removed from site.

The positions of exploratory holes in relation to the existing site layout can be reviewed within [Appendix B](#). Exploratory windowless sampler borehole logs are located in [Appendix C](#).

5.0 Geology & Ground Conditions

A review of the ground conditions within the boreholes indicates the presence of variable Made Ground deposits to up to 0.3m depth. The Made Ground comprised locally present brick, topsoil and sand.

Underlying the made ground orange brown becoming grey silty clay was encountered to full depth of the boreholes at 5.0mbgl.

Reference to the Standard Penetration Tests results also shows a degree of variability but with generally increase in “N” value with depth indicating increasing strength/relative density with depth. N values of between N=5 and N=8 were recorded at 1.0m depth, N=11 to 15 at 2.0m depth, N=13 to 17 at 3.0m depth, N=18 to 21 at 4.0m depth and N=19 to 22 at 5.0m depth.

6.0 Groundwater Conditions

The boreholes were dry when drilled (dry to maximum depth of 5.00m depth).

It should be noted that groundwater levels are dependent upon seasonal variations and can change after periods of prolonged rainfall or drought.

7.0 Visual and Olfactory Observations

With the exception of general anthropogenic material identified, no visual and/or olfactory evidence of potential contamination was noted within any soils encountered as part of the investigative works undertaken.

8.0 Geotechnical Soil Laboratory Testing

Three (3no.) soil samples were forwarded to a UKAS & MCERTS accredited laboratory facility (Messrs QTS) with Three (2no.) soil samples forwarded to YourGeotechnical Ltd (YG). The testing comprised the following:

8.1 Sulphates and pH

Three (3no.) samples of the underlying naturally occurring deposits were submitted for assessment of water-soluble sulphate, total sulphate, pH value and total sulphur concentrations.

Water-soluble sulphate concentrations of between 12mg/l and 19mg/l were recorded, total (acid) sulphate concentrations of 0.03% and 0.05%, total sulphur concentrations of <0.02%, with pH values varying between 6.9 and 7.4 units. Total Potential Sulphates were 0.06%.

8.2 Atterberg Limits and Natural Moisture Content

Three (3no.) samples from the naturally occurring deposits were submitted for determination of their Natural Moisture Content and Plasticity Index. The investigative positions from which samples were analysed are shown in the below table.

Exploratory Hole	Depth (mbgl)	Stratum
WS1	2.00	Clay
WS2	4.00	Clay
WS3	1.20	Clay

Table 1: Atterberg Limits and NMC testing depths

Natural Moisture Contents of these samples were between 22% and 28%.

Modified Plasticity Indices of between 27% and 37% were recorded for the results. As a consequence the deposits encountered can be generally classed as ranging being of medium volume change potential, in accordance with NHBC guidelines.

All geotechnical laboratory certificates can be reviewed within [Appendix D](#).

9.0 Discussion of Ground Conditions

9.1 General

We understand that current redevelopment plans for the site are to include:

- Erection of a low rise residential property;
- Creation of a driveway, car parking hardstanding and integral garage; and
- Inclusion of discrete areas of soft landscaping.

The proposed redevelopment plans for the site can be reviewed within **Appendix A**

9.2 Construction Consideration

The made ground and topsoil are not considered suitable for the construction of shallow foundations due to the risk of unacceptable total and differential settlement occurring under moderately light surface loading.

The investigation revealed initially weaker deposits which were noted to increase with depth. The proposed development is likely to be capable of being constructed on conventional shallow spread/trench fill foundations. These could be placed at depths from 2.00m in soils described in a firm in situ condition. It is considered that spread foundations constructed within the underlying clays could be designed assuming an allowable increase in load given below in Table 2: Allowable Increase in Stress.

Foundation Type	Strip Foundations (m)			Spread Foundations (m)		
Foundation Width	0.6	1.0	1.5	1.0	2.0	3.0
Foundation Depth	2.0			2.0		
Allowable increase in stress (kN/m ²)	95	90	85	145	130	125

Table 2: Allowable Increase in Stress

The allowable increase in stress given above assumes a factor of safety of 3 against general shear failure, with cohesion of 40kN/m² at the foundation depths. Settlements at the above loading intensities should remain within tolerable limits for the type of structure proposed provided that the underlying soils are carefully inspected immediately final trimming has taken place. Should any soft or weak material be encountered they should be locally removed and replaced with lean-mix concrete or compacted granular soil.

Any existing structures and foundations if found should be grubbed up and replaced with a suitable engineered granular backfill and should be compacted in layers.

The excavator must be set up with care and operated correctly to ensure trench walls are vertical and base horizontal as any slight inclination will result in eccentric loading on such deep trench fill footings.

9.3 Floor Slabs

IN view of the weak near surface soils all floors should be suspended.

9.3 Sulphates

Reference to BRE Special Digest 1 and the test results indicates the results from the fall within Design Sulphate Class DS-1. Consequently concrete may be designed to AC-1s concrete classification.

9.4 Excavations

No Groundwater was encountered during the investigation. However, it should be appreciated that groundwater levels are subject to seasonal variation or changes on local drainage conditions.

Groundwater is unlikely to represent a particular problem to the construction of the development at this site. However, it should be recognized that slight seepages and minor water entries may combine in any long trench excavations to create a significant volume of water which may cause local problems during the construction phase. Any minor groundwater seepages or significant standing water within excavations made upon this site may be removed by using a simple form of de-watering. Such a system could include the excavation of sumps from which the water could be pumped. Advice on Groundwater Control is given in CIRIA Report No 515 - Groundwater Control Design and Practice.

The stability of the excavation faces cannot be guaranteed thus temporary support to the excavation faces may become necessary unless the foundations are constructed using trench-fill techniques. In this method the foundation trenches should be excavated, inspected and backfilled with concrete as a continuous operation. Under no circumstances should operatives be allowed to enter unsupported excavations.

Subject to space constraints, excavations could be battered back to a suitable angle of repose (typically 1:2 for a 2.00m deep excavation). Alternatively, if there is a requirement to protect nearby structures or services, appropriate supports may be required. Due to the cohesive nature of the soils encountered, it is likely that any support required could be installed following excavation. Advice on excavation support is given in CIRIA Report No 97 - Trenching Practice.

9.5 Groundworks Watching Brief

We would recommend that a watching brief be maintained during the course of the development, particularly during the ground works stage.

During construction works visual and olfactory appraisal of the underlying soils should be made. If during construction works any material is noted to show visual and/or olfactory signs of contamination an environmental consultant should be contacted to supervise/guide further works. This material should be stockpiled separately and tested prior to its appropriate removal off site or re-use as necessary.

If any landscaping materials are to be imported on site they should be tested to check that they are suitable for the intended use. Clean, uncontaminated rock, subsoil brick rubble, crushed concrete, ceramics and topsoil only should be permitted as infill material.

9.6 Services

Given that new services will be installed as part of the redevelopment of the site, we would recommend the local water board be contacted to determine their specification for the type of pipework, which should be used on this site.

All services and in particular potable water supply pipework should comprise of material that is resistant to attack and degradation to chemical attack.

Further information can be found within the published guidance for the '*Selection of Water Supply Pipes to be used in Brownfield Sites*', issued in January 2011 by the UK

Water Industry Research (UKWIR), this supersedes the Water Regulations Advisory Scheme (WRAS) Information and Guidance Note - '*Laying Pipes in Contaminated Land*' which has been withdrawn.

9.7 Muckaway

If any soils are to be removed off site, a copy of the laboratory results should be given to the waste contractors and/or landfill operators involved to ascertain their requirements with regards to removal of soils from this area of the site and the acceptance of the waste at landfill. It may be prudent to undertake Waste Acceptance Criteria (WAC) analyses on the soils to be removed.

All materials must be transported in compliance with the Duty of Care Regulations by authorising movements with Carrier's individually numbered Duty of Care conveyance notes, complete with the appropriate EWC Codes. All relevant dockets will need to be kept to provide evidence of the removal as these may be required as part of a Validation Report.

10.0 Limitations

YE have prepared this report with all reasonable skill, care and diligence. The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources.

The opinions given in this report have been dictated by the finite data on which are they based and are relevant only to the purpose for which the report was commissioned.

Information reviewed should not be considered exhaustive and has accepted in good faith as providing true and representative data with respect to site conditions. Should additional information become available which may influence the opinion expressed in this report, YE reserves the right to review such information and, if warranted, to alter the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed.

The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted industry practices at this time and as such are not a guarantee that the study site is free of hazardous conditions.

This report has been prepared solely for the use of the named client, and may not be relied upon by other parties without written consent from YE. YE disclaim any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

APPENDIX A: Proposed Redevelopment Plans



NOTES:

This drawing has been prepared for the purposes of concept and design development and is not to be used for any other purpose. Dimensions are indicative and should be referenced against measured surveys only.
This drawing is the property of Martin Ralph and must not be reproduced, in part or whole, or deviated from, without their permission.

Amendment

Landscape buffer alongside no.1 Queens Road has been increased in depth to between 1200 / 1500 along the length of the proposed new drive as recommended by the Planners.

New Tree survey has been carried out due to work having taken place on trees within and outside the development boundary.
Survey carried out by N J Trowell Esq.

AMENDMENTS	DATE
F General amendment	21.01.16
E Site Plans amended following a revised Tree survey	13.01.16
D PLANNING amendment	21.01.15
C PLANNING SUBMISSION	21.11.14
B Layout updated	10.11.14
A Layout updated	27.09.14

CLIENT
Mr. Gary Cook
3 Queens Road
Waterlooville
Hants

PROJECT
NEW RESIDENTIAL UNIT
Rear of 3 Queens Road

DRAWING TITLE
SITE PLAN
AS EXISTING

DATE
09.04.2014

SCALE
1:250 @ A3

DRAWING No.
14A_025 003

REVISION
F

MARTIN RALPH GROUP



CHARTERED SURVEYORS
ARCHITECTS & ENGINEERS

11 Dragon House
Hussar Court
Brambles Business Park
Portsmouth
Hampshire
PO7 7SF
www.martinralph.co.uk
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SITE PLAN AS EXISTING 1:500



SITE PLAN AS PROPOSED 1:500

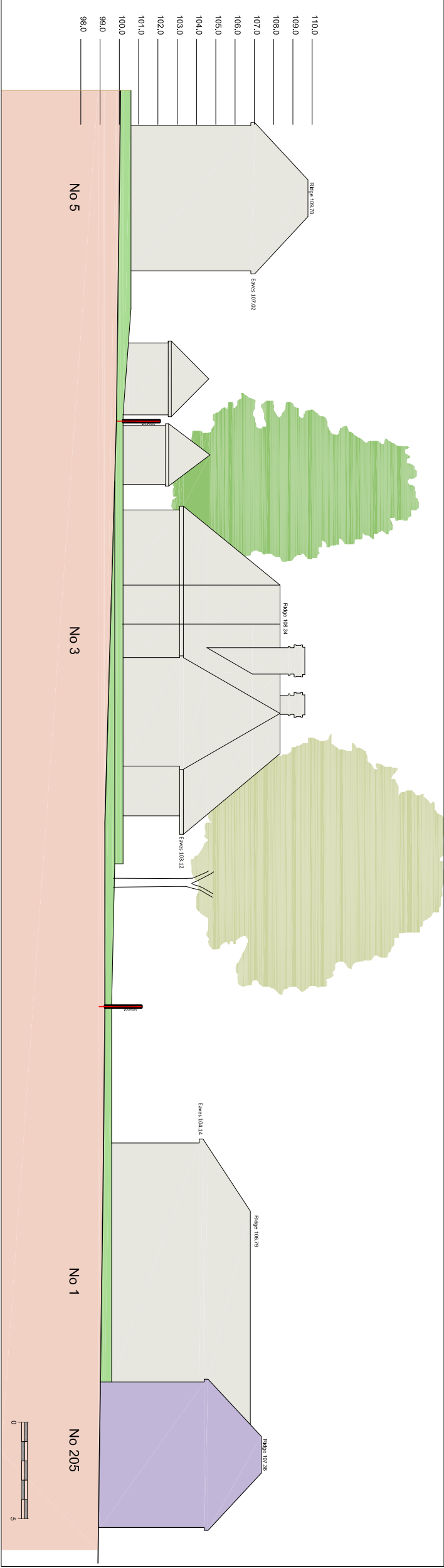
Refer to key on drawings 004 and 005

3 QUEENS ROAD, WATERLOOVILLE

NOTES:

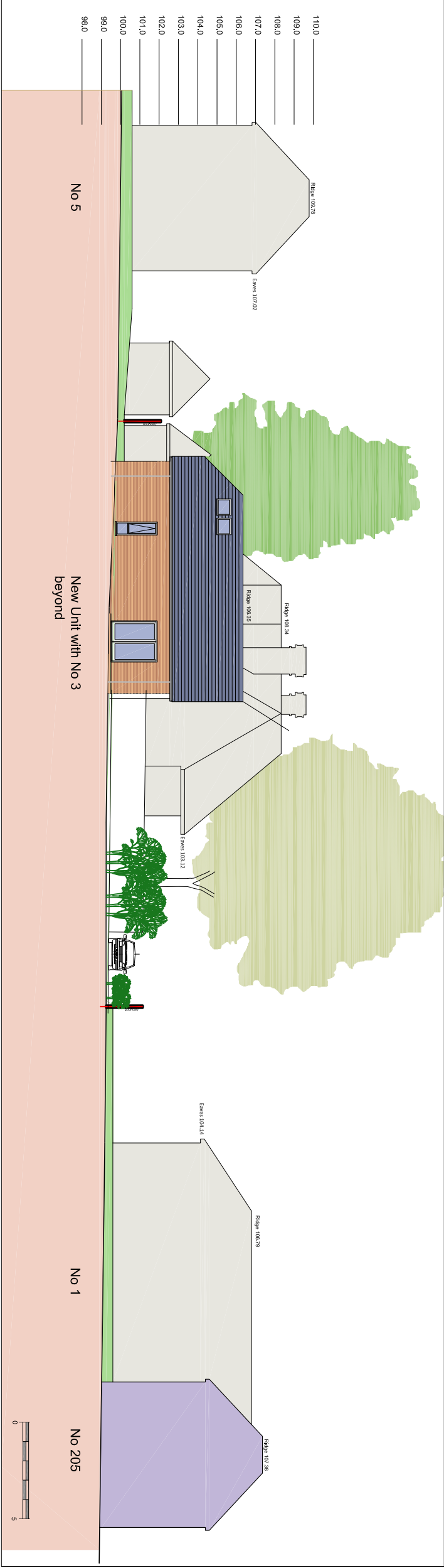
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This drawing is the property of Martin Ralph and must not be reproduced, in part or whole, or deviated from, without their permission.



SITE SECTION A-A - AS EXISTING

1:250



SITE SECTION A-A - AS PROPOSED

1:250

SITE SECTIONS

3 QUEENS ROAD, WATERLOOVILLE

AMENDMENTS		DATE
C	Re Issue	22.01.16
B	PLANNING UPDATE	30.11.14
A	PLANNING SUBMISSION	21.11.14

CLIENT

Mr. Gary Cook
3 Queens Road
Waterlooville
Hants

PROJECT

NEW RESIDENTIAL UNIT
Rear of 3 Queens Road

DRAWING TITLE

SITE SECTIONS A-A
EXISTING AND PROPOSED

DATE

29.09.2014

SCALE

1:250 @ A3

DRAWING No.

14A_025 008

REVISION

C



RICs

CHARTERED SURVEYORS
ARCHITECTS & ENGINEERS

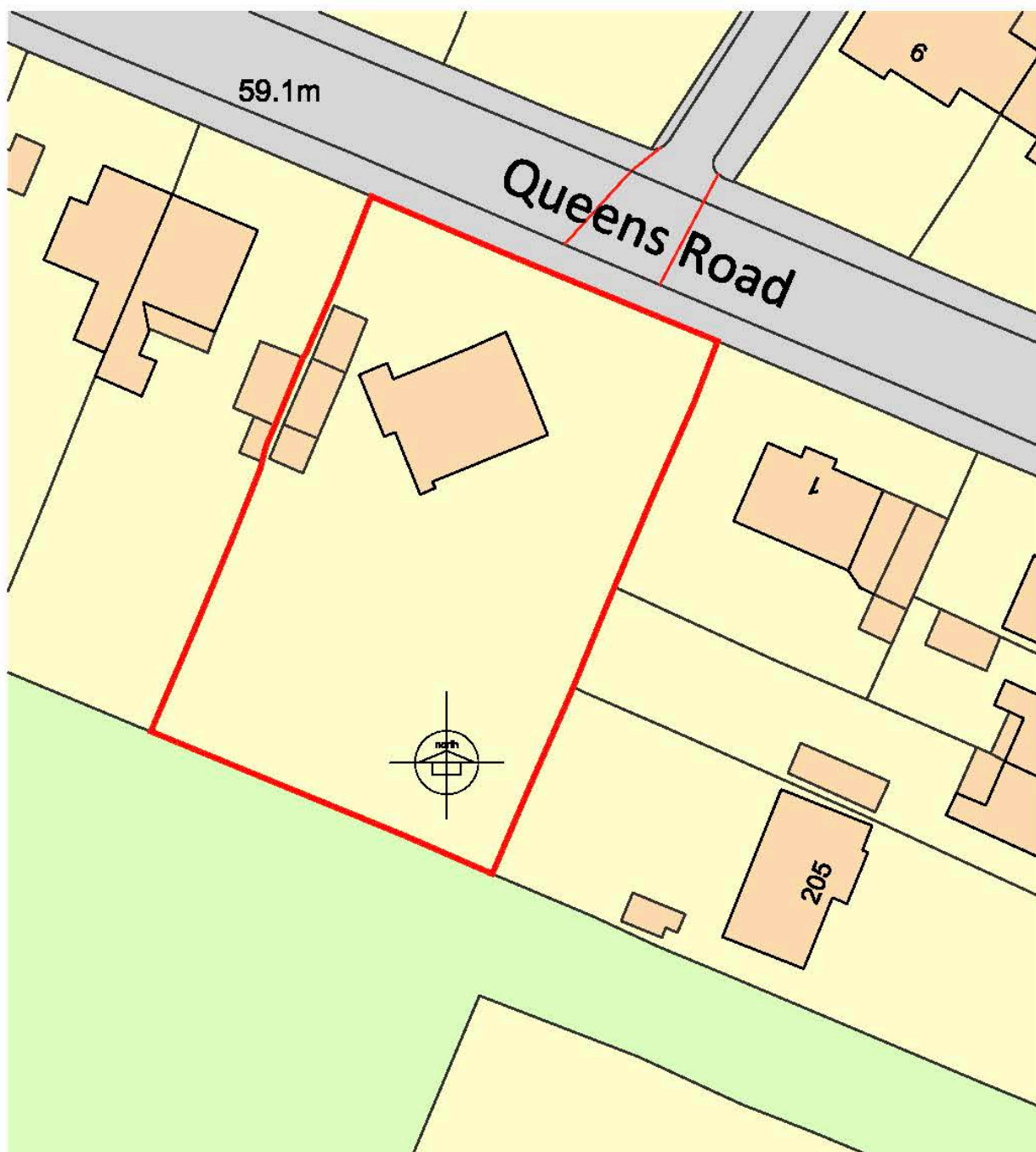
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APPENDIX B: Site Investigation Plan





Title: **Investigation Location Plan**



Site Name:
3 Queens Road

Job No:
YE3118

APPENDIX C: Borehole Logs



Borehole Log Sheet

LOCATION: WATERLOOVILLE	RIG TYPE & No. Competitor Dart	BOREHOLE NO: BHMM02
JOB No: YE3118	DRILLERS: Phil Higham	BOREHOLE DIA: 150MM - 10M
CLIENT: YE		CASING DIA: 150MM - 6.00M
DATE: 26.5.17		SHEET No. 1 OF 1

SAMPLES			U100		SPT - CPT BLOWS - 75mm										STRATA	DESCRIPTION	Piezometer Installation
DEPTH (M) FROM TO		TYPE	BLOWS	LENGTH	S - C	75	75	LENGTH	75	75	75	75	LENGTH	DEPTH			
0.20	0			1.20	1.65	1	1		1	2	2	2			WS1		
0.50	0			2.00	2.45	2	3		3	3	3	3		GL-0.2m	SOIL / BRICK FILL		
1.20	0			3.00	3.45	2	2		4	4	3	2		0.2-4.8	ORANGE SANDY CLAY (NATURAL)		
2.00	0			4.00	4.45	3	3		4	5	4	5		4.8-5.0	GREY SILTY CLAY		
3.00	0			5.00	5.45	4	3		4	5	5	5			WATER IM		
4.00	0																
5.00	0																
															WS2		
0.20	0			1.20	1.65	1	1		1	1	1	2		GL-0.3	SOIL / BRICK FILL		
0.50	0			2.00	2.45	1	2		3	4	4	4		0.3-4.4	ORANGE SANDY CLAY (NATURAL)		
1.20	0			3.00	3.45	3	3		3	4	5	5		4.4-5.0	GREY SILTY CLAY.		
2.00	0			4.00	4.45	3	4		4	5	6	6					
3.00	0			5.00	5.45	4	4		5	5	6	6					
4.00	0																
5.00	0																
															WS3		
0.20	0			1.20	1.65	1	1		2	2	2	2		GL-0.3	SOIL / BRICK FILL		
0.50	0			2.00	2.45	2	2		2	3	3	3		0.3-4.4	ORANGE SANDY CLAY		
1.20	0			3.00	3.45	2	2		3	4	4	4		4.4-5.0	GREY SILTY CLAY.		
2.00	0			4.00	4.45	2	4		5	5	5	6					
3.00	0			5.00	5.45	3	4		3	5	6	6					
4.00	0																
5.00	0																

WATER STRIKE				TRIAL PIT to 1.2M	YES	GENERAL COMMENTS AND DELAYS
				REINSTATEMENT	NO	
DEPTH CASSED				MOVEMENT IN WATER LEVEL		
				LEVEL IN (M) B G L		
DEPTH SEALED				5 min		
				10 min		
DEPTH WATER				15 min		

APPENDIX D: Geotechnical Lab Results



Job No:

YE 3118

Site:

3 Queens Rd, Waterloo

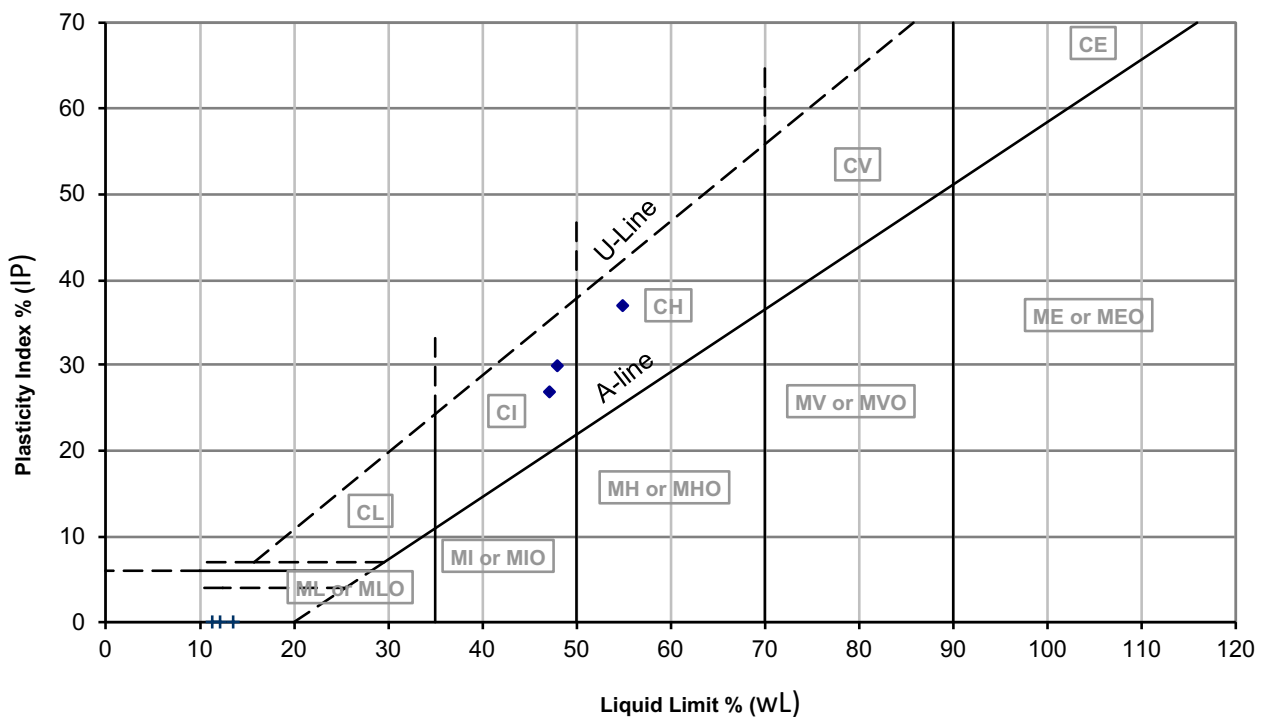
Date:

13/06/2017

Sheet:

Interpretation of Moisture Content, Liquid and Plastic Limits

Location	Depth	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	Retained by 425mm	Modified (w)	Modified (I _p)	Liquidity/ Consistency		Casagrande Class	N.H.B.C Class
		(w)	(w _L)	(w _P)	(I _P)	(w')	(I _P ')	(I _L)	(I _C)			
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)			
WS1	2.00	22	48	18	30	0	22	30	0.1	0.9	C I	MEDIUM
WS2	4.00	34	47	20	27	0	34	27	0.5	0.5	C I	MEDIUM
WS3	1.20	28	55	18	37	0	28	37	0.3	0.7	C H	MEDIUM





Colin Hiscock
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t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 17-59882

Site Reference: 3 Queens Road, Waterloooville

Project / Job Ref: YE 3118

Order No: None Supplied

Sample Receipt Date: 07/06/2017

Sample Scheduled Date: 07/06/2017

Report Issue Number: 1

Reporting Date: 13/06/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate						
QTS Environmental Report No: 17-59882	Date Sampled	06/06/17	06/06/17	06/06/17		
Your Environment	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: 3 Queens Road, Waterloooville	TP / BH No	WS1	WS2	WS3		
Project / Job Ref: YE 3118	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	0.70	2.00	3.00		
Reporting Date: 13/06/2017	QTSE Sample No	272585	272586	272587		

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	7.4	6.9	6.9		
Total Sulphate as SO ₄	mg/kg	< 200	NONE	518	297	475		
Total Sulphate as SO ₄	%	< 0.02	NONE	0.05	0.03	0.05		
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	19	12	16		
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.02	0.01	0.02		
Total Sulphur	%	< 0.02	NONE	< 0.02	< 0.02	< 0.02		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis ^(S)



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 17-59882	
Your Environment	
Site Reference: 3 Queens Road, Waterlooville	
Project / Job Ref: YE 3118	
Order No: None Supplied	
Reporting Date: 13/06/2017	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
272585	WS1	None Supplied	0.70	19.6	Grey clay
272586	WS2	None Supplied	2.00	17	Green clayey sand
272587	WS3	None Supplied	3.00	18	Orange clayey sand

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



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Methodology & Miscellaneous Information	
QTS Environmental Report No: 17-59882	
Your Environment	
Site Reference: 3 Queens Road, Waterlooville	
Project / Job Ref: YE 3118	
Order No: None Supplied	
Reporting Date: 13/06/2017	

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received