

RIDGE

PROPERTY & CONSTRUCTION CONSULTANTS



GROUND CONDITION ASSESSMENT

QUEENSMEAD SCHOOL, RUISLIP

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November 2018

Prepared for

Queensmead School

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EXECUTIVE SUMMARY

This executive summary contains an overview of the key findings and conclusions within the report. No reliance should be placed on any part of the Executive Summary until the whole of the report has been reviewed. Parts of the report may contain information that puts into context the findings that are summarised in the executive summary.

Instructions	Prepare a Ground Condition Assessment for a site comprising Queensmead School, Ruislip, Middlesex, HA4 0LS.
Proposal	Development of the site with a two-storey block school together with associated infrastructure.
Previous Reports	Desk Study Report - 2018
Exploration & Laboratory Testing	7 x windowless lined boreholes Geotechnical and contamination testing undertaken.
Findings (Geotechnical)	Made Ground / Topsoil to depths between 0.40-1.40m. London Clay to depths between 2.45 and 5.0m. Clay found to be of medium volume change potential. No groundwater was recorded during excavations, however subsequent monitoring found groundwater at 0.99m depth.
Recommendations (Geotechnical)	Based on the scale of the proposed building, SPT N values and lack of groundwater recorded at typical founding depths for traditional foundations, it is considered that the ground conditions revealed are suitable bearing strata for traditional foundations for the proposed building. Due to the presence of made ground and shrinkable clay, it will be necessary for a suspended / suspendable ground floor slab to be utilised within the proposed building. pH and water soluble sulphate testing classify the aggressive environment for concrete as Design Sulphate Class DS-1, and Aggressive Chemical Environment for Concrete AC-1.
Recommendations (Contamination)	No elevated contaminants detected. Made Ground classified as inert.
Further Site Investigation	Based on results of investigation none required.

1. INTRODUCTION

1.1. Introduction

Ridge and Partners LLP (Ridge) was commissioned by Queensmead School to undertake a Ground Condition Assessment in relation to the proposed construction of a two storey block at Queensmead School, Queens Walk, South Ruislip HA4 0LS (hereafter referred to as “the site”). A site location plan is included as Figure 1.

Ridge were briefed to undertake a Ground Investigation to determine ground conditions to aid in the assessment of a foundation solution, and additionally, carry out a contaminant screen. This report provides an assessment of the materials present beneath the development site and presents characteristic parameters that should be used in design of geotechnical facets of the proposed development.

Intrusive investigative works comprised windowless sample boreholes and Dynamic Cone Penetrometer tests for conversion to California Bearing Ratio.

This report is prepared in line with the agreed brief and is subject to the report conditions shown in Appendix 1.

1.2. Methodology

The investigation was carried out in general accordance with statutory guidance including BS5930:1999 *Code of Practice for Site Investigations (Amendment 3: 2015)* and BS10175:2011+A1:2013 *Investigation of Potentially Contaminated Sites: Code of Practice*.

1.3. Proposed Use

Current development plans indicate the erection of a two storey block, together with associated infrastructure. We also note the plans to include the demolition of the existing school (Block B). Further details are provided within Figure 2.

1.4. Sources of Information

The information and documents received and reviewed to provide some background information for the preparation of this report are listed below:

- British Geological Survey website
- Desk Top Study (2018) - Ridge

1.5. Report Scope and Limitation

The report presents an interpretation of site and laboratory data provided by the Ridge site investigations undertaken on 22 August 2018 and 23 October 2018.

This information has been collated, processed and used to provide an interpretation of the ground conditions.

The recommendations and opinions expressed in this report are based on the strata observed in the exploratory holes, the results of the site and laboratory tests, and information obtained or provided by others. Ridge takes no responsibility for conditions that have not been revealed by the exploratory holes, or which occur between them.

Whilst efforts have been made to interpret ground conditions between investigation locations, such information is only indicative and liability cannot be accepted for its accuracy. Information provided from other sources is taken in good faith and Ridge cannot guarantee its accuracy. It should also be acknowledged that the findings of the investigation may be more widespread than identified by the investigation.

The information contained in this report is intended for the use of Queensmead School and Ridge can take no responsibility for the use of this information by any other party or for uses other than that described in this report.

2. SITE CONDITIONS

The following descriptions are based on the site status at the time of the Ground Investigations.

2.1. Site Location and Description

Table 2.1: Site Details

Site Address	Queensmead School, Queens Walk, South Ruislip HA4 0LS
National Grid Reference	511763, 185541
Site Area	Approximately 500 x 300m
Site Occupier	Queensmead School
Site Access	Gated access from Queens Walk to the east
Site Boundaries	North – residential land use beyond fencing
	East – metal palisade fencing with residential beyond
	South – hedging/ fencing and public car parks beyond Victoria Road
	West – hedging/ fencing and commercial beyond
Ground Cover	Approximately 60% soft landscaping, with 40% hardstanding or build footprint
Site Topography and Elevation	Approximately 35mAOD and relatively flat across the site

The site is accessed directly from Queens Walk to the east. The site is an operational 11-18 co-educational academy.

The majority of buildings are situated in the southern portion of the site with car parks to the immediate north and south. School playing fields make-up a large portion of the north and west of the site.

The specific development area is centred on 511729, 185498 positioned in the centre of the cluster of school buildings.

2.2. Surroundings

Areas to the north and east are primarily residential, however Field End Infant School is also located to the north of the site. Commercial properties are situated to the south and west.

3. PHYSICAL SETTING

3.1. Published Geology

The following observations are taken from the British Geological Survey (BGS) Geology of Britain Viewer (2018).

The British Geological Survey (BGS) Geology of Britain Viewer (2018) indicates that the site is underlain by Bedrock Geology of the London Clay Formation. There are no recorded Superficial Deposits.

- London Clay Formation – Clay, Silt and Sand

3.1.1. Artificial Ground

There are no records of artificial ground within 500m of the site boundary, although Made Ground/ fill is anticipated on site.

3.2. Historical Boreholes

A borehole (Ref: TQ18NW13) was drilled at the site in 1979. The borehole recorded 0.4m of macadam, 1.2m of Made Ground, 3m of weathered London Clay, 1.9m of London Clay then 13.6m of Reading Beds.

4. FIELDWORKS

4.1. Site Management and Preparation

Suitably experienced Ridge staff monitored the investigations which were undertaken on 22 August 2018 and 23 October 2018. Methods employed during the investigation were carried out generally in accordance with statutory guidance including BS5930:1999 *Code of Practice for Site Investigations (Amendment 3: 2015)* and BS10175:2011+A1:2013 *Investigation of Potentially Contaminated Sites: Code of Practice*.

Engineering Logs are presented in Appendix 2. Photographs relating to the Ground Investigation are presented in Appendix 3.

4.2. Rationale and Summary of Scope

The scope and rationale of the ground investigation undertaken is presented below.

- 5no. Dynamic Cone Penetrometer (DCP01-DCP05) tests to allow subsequent conversion to California Bearing Ratio (CBR) value;
- 7no. windowless sample boreholes (WS1-WS7) advanced with a tracked dynamic sampling rig to a maximum depth of 5.0mbgl; and
- 2no. monitoring wells installed into the windowless sample boreholes (WS1 & WS2) to a maximum depth of 4.45mbgl.

Table 4.1: Exploratory Hole Location Rationale

Location ID	Rationale	Date Undertaken	Max Depth (mbgl)
WS1	Assessment of shallow soils on site and to allow coverage of the development area.	22/08/2018	4.45
WS2		22/08/2018	4.45
WS3		22/08/2018	2.45
WS4		23/10/2018	5.0
WS5		23/10/2018	5.0
WS6		23/10/2018	5.0
WS7		23/10/2018	5.0

The layout of the exploratory hole positions is presented in Figure 3. Test positions without installations were backfilled with arisings upon completion.

5. GROUND CONDITIONS ENCOUNTERED

5.1. Soil

Ground conditions encountered during the ground investigation were consistent with those identified in the published literature and in summary comprised Made Ground or topsoil over Bedrock of the London Clay Formation.

A summary of ground conditions and variations in strata thicknesses is shown in Table 6.1 below. Engineering logs are presented in Appendix 2.

Table 5.1: Summary of encountered ground conditions

Strata	Depth Encountered (mbgl)		Typical Description/ Details
	Top	Bottom	
Topsoil	GL	0.10 – 0.80	Identified in all exploratory holes except for WS3 and WS4 generally comprising grass over dark brown silt TOPSOIL with occasional chert and flint gravels.
Made Ground	GL – 0.80	0.50 – 1.40	Identified in WS1, WS3 & WS4 generally comprising brown reworked silt/clay with gravel of angular to sub rounded fine and medium brick, concrete, flint and chalk.
London Clay Formation	0.50 – 1.40	2.45-5.00	Identified in all exploratory holes generally comprising firm to stiff brownish grey slightly sandy slightly silty CLAY with rare ironstone and flint.

5.2. Groundwater

No groundwater was encountered during the investigations.

5.3. Roots

Occasional (grass and rough vegetation) rootlets were identified in topsoil/ shallow Made Ground only.

6. GEOTECHNICAL ASSESSMENT

6.1. Introduction

This geotechnical assessment and the subsequent foundation design recommendations will use the findings of the ground investigation and the results of the in-situ and laboratory geotechnical testing carried out in the boreholes and on representative samples of the materials encountered across the site.

6.2. Geotechnical Tests

Geotechnical laboratory testing was carried out on representative samples collected from the strata encountered during the ground investigation. Details of the specific procedure used in each case are shown below in Table 6.1 and the geotechnical test certificates are presented in Appendix 4.

Table 6.1: Summary of Geotechnical Testing

Test	Standard (BS1377:1990) unless otherwise indicated	No.
Chemical Tests		
pH value	Part 3, Clause 9.0	4
Sulphate content	Part 3, Clause 5.3	4
Physical Tests		
Natural Moisture Content	BS 1377: Part 2: 3.2	4
Liquid & Plastic Limits	Part 2, Clauses 4.3, 5.3 & 5.4	4

6.3. Geotechnical and Geological Parameters

This section discusses the key geotechnical characteristics of each encountered stratum as determined from field observations, in-situ and laboratory geotechnical testing. The stratigraphy revealed during the ground investigation comprised Topsoil and Made Ground over the London Clay Formation which forms the basal unit revealed. Each of these strata will be discussed separately in the following Sections.

6.3.1. Topsoil

Encountered in all boreholes except for WS3 & WS4 to depths between GL and 0.40m.

6.3.2. Made Ground

The Ground Investigation identified Made Ground in WS1, WS3 & WS4 to depths between GL (WS1) and 1.40m (WS2).

The stratum typically comprised brown reworked silt/clay with gravel of angular to sub rounded fine and medium brick, concrete, flint and chalk.

6.3.3. London Clay Formation

The Ground Investigation identified the London Clay Formation in all exploratory holes to depths of 5.0m.

The stratum typically comprised firm to stiff brownish grey slightly sandy slightly silty CLAY with rare ironstone and flint.

6.3.4. In – Situ Testing

Standard Penetration Testing (SPT)

SPT was carried out in the boreholes and gave SPT 'N' values of between 4 and 14 in the London Clay Formation.

The distribution of SPT N-Values for is shown in Table 6.2. Windowless sample logs showing the full test results are included in Appendix 2.

Table 6.2: Distribution of Equivalent SPT N Values

WS No.	Depth (mbgl)	Strata	SPT N Value	Main Constituent
WS1	4.0	London Clay	14	Stiff brownish grey CLAY.
WS2	4.0	London Clay	11	Firm to stiff brown CLAY.
WS3	1.0	Made Ground	33	Fill of brick and concrete with brown SILT matrix.
	2	London Clay	13	Stiff brownish grey slightly sandy CLAY.
WS4	1.2	London Clay	5	Stiff brownish grey slightly sandy CLAY.
	2.0	London Clay	9	Stiff brownish grey slightly sandy CLAY.
	3.0	London Clay	10	Stiff brownish grey slightly sandy CLAY.
	4.0	London Clay	9	Stiff brownish grey slightly sandy CLAY.
	5.0	London Clay	12	Stiff brownish grey slightly sandy CLAY.
WS5	1.2	London Clay	4	Stiff brownish grey slightly sandy CLAY.
	2.0	London Clay	7	Stiff brownish grey slightly sandy CLAY.
	3.0	London Clay	8	Stiff brownish grey slightly sandy CLAY.

	4.0	London Clay	8	Stiff brownish grey slightly sandy CLAY.
	5.0	London Clay	11	Stiff brownish grey slightly sandy CLAY.
WS6	1.2	London Clay	12	Stiff brownish grey slightly sandy CLAY.
	2.0	London Clay	8	Stiff brownish grey slightly sandy CLAY.
	3.0	London Clay	9	Stiff brownish grey slightly sandy CLAY.
	4.0	London Clay	11	Stiff brownish grey slightly sandy CLAY.
	5.0	London Clay	12	Stiff brownish grey slightly sandy CLAY.
WS7	1.2	London Clay	9	Stiff brownish grey slightly sandy CLAY.
	2.0	London Clay	9	Stiff brownish grey slightly sandy CLAY.
	3.0	London Clay	10	Stiff brownish grey slightly sandy CLAY.
	4.0	London Clay	10	Stiff brownish grey slightly sandy CLAY.
	5.0	London Clay	14	Stiff brownish grey slightly sandy CLAY.

TRL DCP

Dynamic Cone Penetration testing was carried out from ground level in five locations. This test provides a CBR value (%) but is not a CBR test and gave values of between 1.6% and 20.9%. The depth range of the tests was between 0.31 and 0.90m, so predominantly within Made Ground.

The distribution of DCP Values for is shown in Table 6.3. Logs showing the full test results are included in Appendix 2.

Table 6.3: Distribution of Equivalent DCP Values

ID	Depth (mbgl)	CBR Value
DCP01	31	8.0
	58	9.3
	84	9.6
	101	15.1
	117	16.1
	135	14.2
	151	16.1
	167	16.1
	186	13.4
	203	15.1
	219	16.1
	245	9.6
	266	12.1
	290	10.5
	325	7.0
	345	12.7
	361	16.1
	375	18.6
	387	21.8
	396	29.6
	399	94.6
	410	76.5
	490	23.0
	545	14.0
	725	4.0
	825	1.6

ID	Depth (mbgl)	CBR Value
DCP02	45	5.4
	66	12.1
	90	10.5
	113	11.0
	144	8.0
	176	7.7
	218	5.8
	247	8.6
	276	8.6
	310	7.3
	360	4.8
	416	4.3
	472	4.3
	540	3.5
	602	3.8
	677	3.1
	730	4.5
	762	7.7
	814	4.6
	850	6.8
	884	7.3

ID	Depth (mbgl)	CBR Value
DCP03	46	5.3
	62	16.1
	116	4.5
	152	6.8
	175	11.0
	219	5.5
	257	6.5
	306	4.9
	345	6.3
	375	8.3
	392	15.1
	405	20.1
	417	21.8
	446	8.6
	483	6.6
	525	5.8
	570	5.4
	640	3.4
	753	2.0
	842	2.6

ID	Depth (mbgl)	CBR Value
DCP04	70	3.4
	125	4.4
	160	7.0
	185	10.1
	205	12.7
	224	13.4
	242	14.2
	258	16.1
	278	12.7
	297	13.4
	317	12.7
	335	14.2
	354	13.4
	374	12.7
	397	11.0
	420	11.0
	442	11.5
	462	12.7
	471	29.6
	475	69.8
	485	26.5
	565	9.4
	614	4.9
	676	3.8
	736	4.0

ID	Depth (mbgl)	CBR Value
DCP05	53	4.5
	90	6.6
	124	7.3
	150	9.6
	175	10.1
	196	12.1
	210	18.6
	227	15.1
	250	11.0
	270	12.7
	294	10.5
	316	11.5
	341	10.1
	365	10.5
	385	12.7
	412	9.3
	442	8.3
	510	11.2
	627	4.1
	721	2.5

6.3.5. Groundwater and Gas Monitoring

During the second phase of the ground investigation a round of ground and gas monitoring was undertaken from wells installed in WS1 and WS2. Groundwater was identified in both exploratory holes to depths of 0.99m (WS2) and 1.2m (WS1). Full gas monitoring results are displayed in Table 6.4.

Table 6.4: Monitoring Results

Date	Location	Depth to Water (mbgl)	Depth to Base (mbgl)	Atmospheric Pressure (mb)	Gas Flow (L/hr)	Methane (%v)	Carbon Dioxide (%v)	Oxygen (%v)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
23/10/2018	WS1	1.2	3.80	1028	0	0	1.4	19.8	1	0
	WS2	0.99	3.19	1028	0	0	1.4	19.9	1	0

6.3.6. Classification Testing

Atterberg tests

Four representative samples from the exploratory holes underwent Atterberg limits testing to determine the consistency limits. The results are shown in Table 6.5 below.

Table 6.5: Consistency Limits

Location	Strata	Depth (mbgl)	Natural Moisture Content, w (%)	Liquid Limit w _L (%)	Plastic Limit w _P (%)	Plasticity Index I _P (%)
WS1	Silty Clay	1.0	19	48	18	30
WS2	Gravelly Silty Clay	1.0	21	49	20	29
WS2	Gravelly Silty Clay	1.9	24	50	19	31
WS3	Silty Clay	2.0	23	52	17	35

The Atterberg limits testing returned plasticity indices in the range 29-35% which are indicative of medium plasticity which is defined as medium volume change potential in accordance with NHBC guidelines.

6.4. Aggressive Ground Soil Chemistry

Chemical testing was carried out on four samples of the encountered materials in accordance with Box C10, BRE Special Digest 1. The results are summarised in Table 6.6 below.

Table 6.6: Summary of the Results of Chemical Testing for Concrete Classification

Test	WS1	WS2	WS2	WS3
	1.0m	1.0m	1.9m	2.0m
pH	8.01	7.86	7.69	7.93
Soluble Sulphate (g/l)	0.03	0.02	0.03	0.02

Based on the maximum determined sulphate content Table C1 of BRE SD1 (brownfield ground locations) gives a Design Sulphate Classification of DS-1 and an Aggressive Chemical Environment for Concrete (ACEC) Class of AC-1 assuming mobile groundwater conditions.

6.5. Characteristic Geotechnical Parameters

Based on the laboratory test results, in-situ testing and subsequent analysis a range of characteristic geotechnical parameters, which should be used in the subsequent geotechnical and foundation design calculations are presented in Table 6.7.

Table 6.7: Characteristic Geotechnical Parameters

Stratum	Parameter		Source	Value
Made Ground & Topsoil	Not used in foundation design			
London Clay Formation	Unit Weight (kN/m ³)		BS8002	21kN/m ³
	Undrained Shear Strength	c_u (kN/m ²)	BS8002	75kN/m ² to 150kN/m ²

7. FOUNDATION AND GROUND ENGINEERING

7.1. Introduction

The geotechnical assessment below relates to the details of the proposed development. It is understood that a two storey building is to be constructed at the site. At the time of writing no site specific structural loads had been made available; therefore this section of the Report will take a more generic approach.

The ground investigation has shown that the site is underlain by Topsoil or Made Ground which in WS3 extends to 1.4m. The natural strata of London Clay Formation comprised firm to very stiff brown silty CLAY from below approximately 0.8m extending to a maximum investigation depth of 5.0m.

Groundwater inflows were not recorded during the investigatory works.

7.2. Strip Foundations

The selection and design of foundations and ground-floor slab construction is beyond the scope of current instructions and is the responsibility of the designers of the proposed building. The following recommendations, deriving from observations made during the investigation and testing are provided to assist the design process.

Based on the thickness of made ground, SPT[N] values recorded in the shallow materials & London Clay and depth to groundwater, it is considered that the ground conditions identified are suitable for traditional foundations for the proposed development.

Whilst it is acknowledged that the proposed structure is not residential, due to the cohesive nature of the materials encountered it is recommended that guidance published by the NHBC is followed, particularly Chapter 4.2 Building near trees.

For soils of medium shrinkage potential the minimum foundation depth allowing for restricted new planting is 1.25m.

At this depth it is considered that an allowable bearing pressure of 100kPa is appropriate for foundations up to 1m wide. Care should be taken that all foundations are founded in similar materials and deepened where necessary to achieve this. Should softer pockets of clay be encountered at formation, excavations should be deepened to found at least 0.15m into firm or stiffer clay.

7.3. Ground Floor Construction

Due to the presence of shrinkable clay, it will be necessary for a suspended / suspendable ground floor slab to be utilised within the proposed building. Any organic material should be removed from beneath the proposed building.

Heave can take place in a shrinkable soil when it takes up moisture and swells after the felling or removal of trees and hedgerows.

7.4. Drainage

Due to the nature of the ground revealed at shallow depths (London Clay) it is considered that the use of soakaways for surface water drainage is unlikely to be feasible. The existing building is currently connected to the public sewer system. Enquiries and investigations should be made regarding the location of these drains, and the possibility of connecting the new build to them.

7.5. Other Geotechnical Considerations

7.5.1. CBR Values / Proposed areas of hardstanding

TRL/DCPs yielded CBR values of between 1.6% and 20.9% up to 1m depth. Aside from one value, all CBR results are above the minimum requirement of 2%. For pavement design an estimated 190mm of subbase is recommended for pavement design (HD 25/94) for pavement excavated to 400mm. The Made Ground is underlain by firm to stiff silty CLAY.

7.5.2. Further Investigation

Based on the findings of the works carried out to date no further geotechnical investigation is considered necessary at this time.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1. Geotechnical

The ground investigation revealed Topsoil and / or Made Ground in all exploratory hole locations. The Made Ground was fairly limited in thickness, extending to 1.4m in WS3. Indigenous London Clay was revealed in all exploratory holes and proven to a depth of 5.0m in WS4, WS5, WS6 and WS7. The strength of the London Clay was found to typically increase with depth.

Based on the thickness of made ground, SPT(N) values and depth to groundwater it is considered that a traditional foundation solution is suitable for the proposed building.

Whilst no groundwater was encountered during the course of drilling water was subsequently found at relatively shallow depth during the monitoring round. This is considered to be perched water potentially migrating through sandy seams in the London Clay. Some pumping of water from foundation excavations may be required during construction depending upon weather conditions during this time.

The clay has been found to be of medium shrinkage potential and subsequent foundation and floor slab designs should take this shrinkability into account.

The materials encountered are not considered suitable for the use of soakaway drains for surface water disposal. It is recommended that the existing drainage network is investigated and capacity assessed to establish if surface water from the proposed building can be accommodated.

New road design should take the results of the TRL DCP tests into account. Made ground has been encountered at depths extending to between GL and 1.40m. An estimated 190mm of subbase is recommended for pavement design (HD 25/94). This should be used as a guide only and CBR testing should be undertaken at formation level to determine the exact level of subbase required.

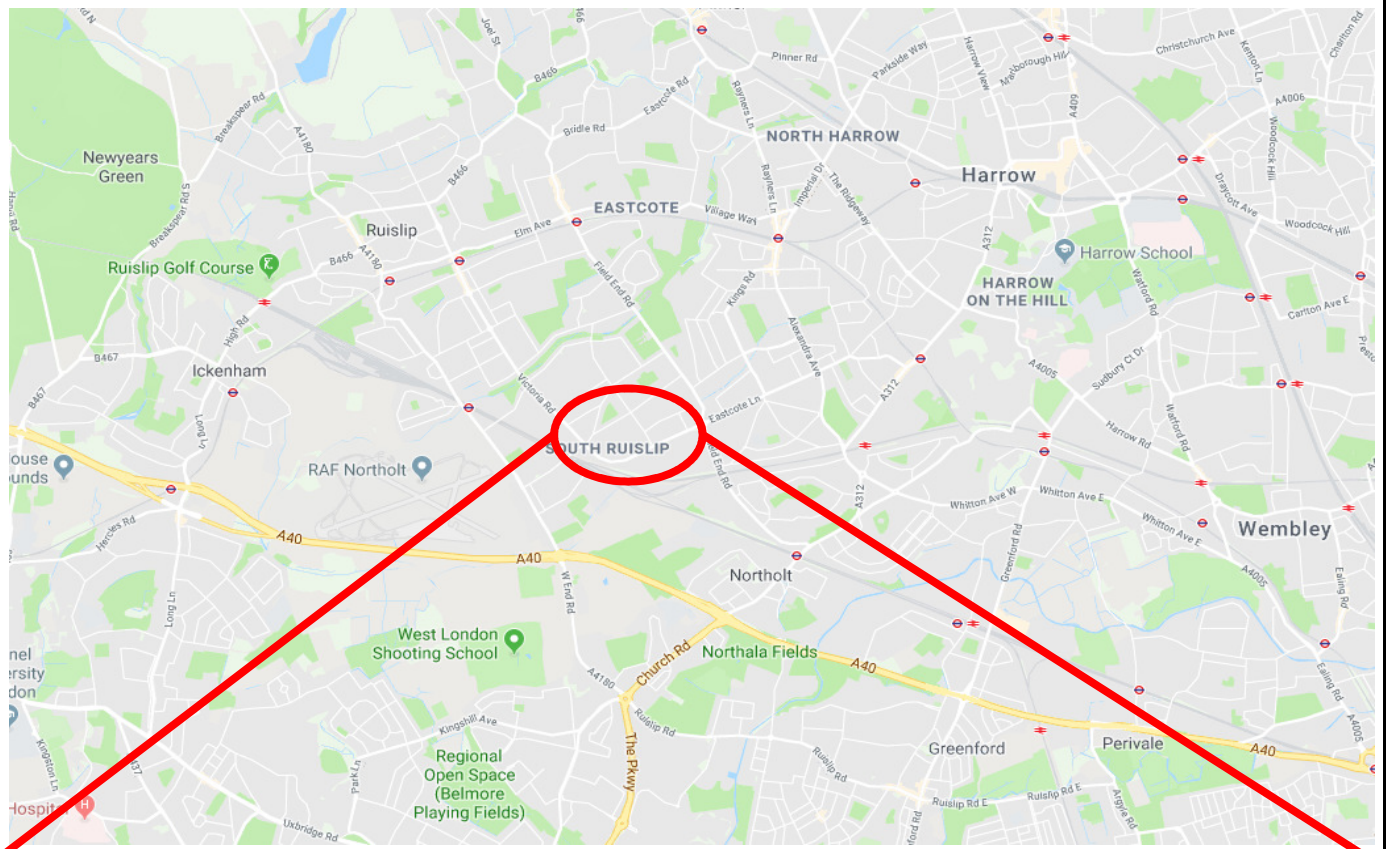
8.2. Contamination

One sample of typical made ground (WS03 0.50m) was tested for a suite of typical contaminants. No elevated results have been detected and therefore no particular recommendations are required for remediation or protection of site workers during construction. The results of testing are included as Appendix 5.

WAC testing on the same sample indicates that this material would be classified as inert. It is recommended that the results of the testing are provided to hauliers and landfill operators to ensure correct disposal.

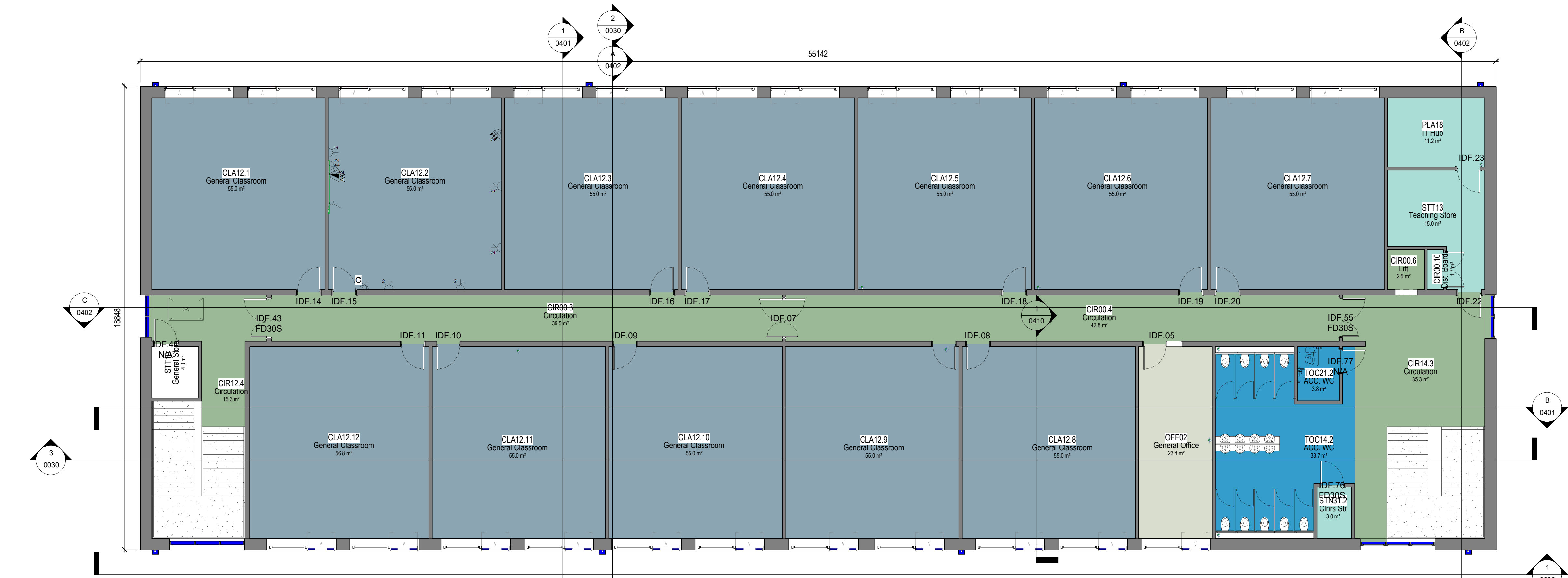
Based on the results of the investigation and the round of monitoring undertaken no gas protection is considered necessary for the proposed building.

FIGURE 1 – SITE LOCATION PLAN

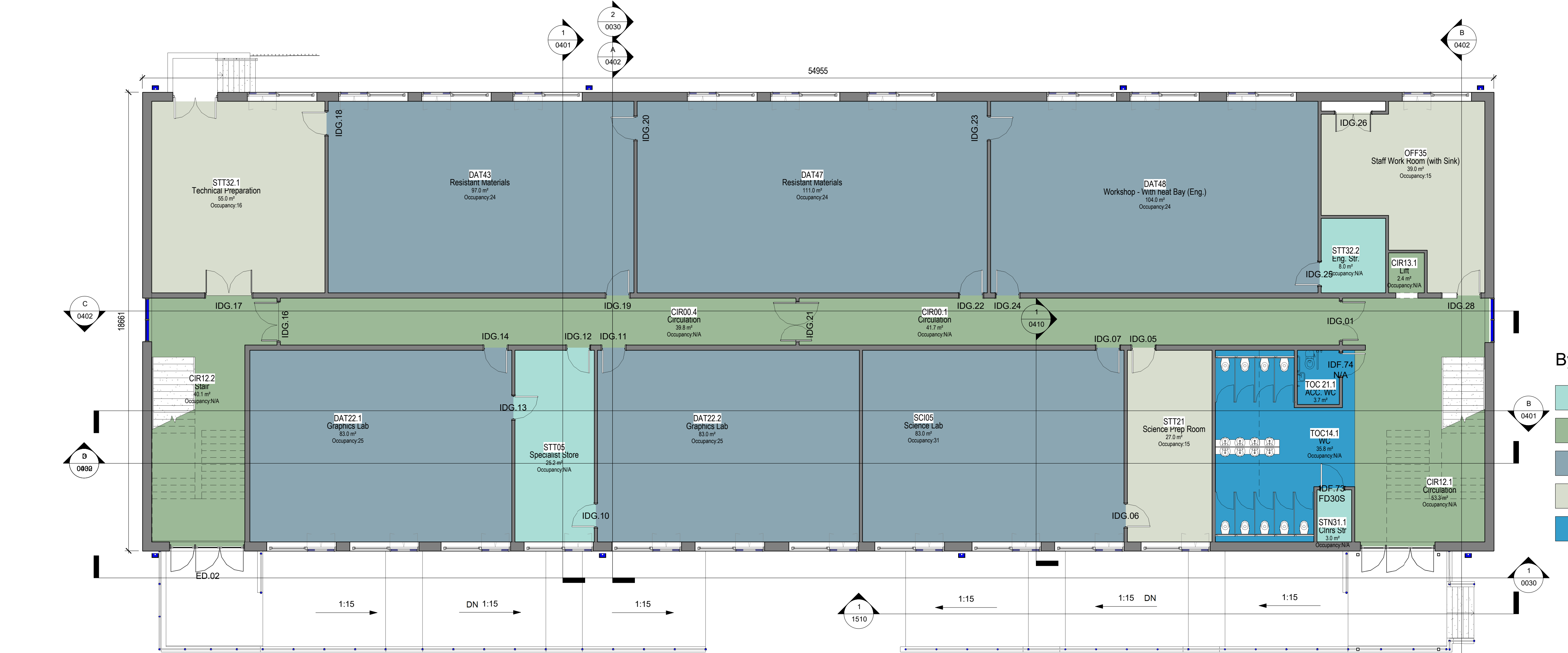


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			Queensmead School	NTS	19/09/2018		PB	RJH
			TITLE					
SITE LOCATION PLAN								
REV								

FIGURE 2 – DEVELOPMENT PLANS



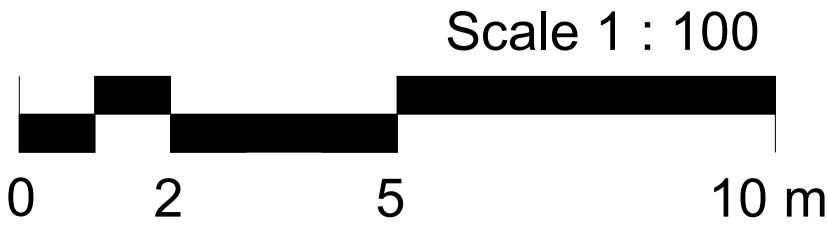
General Arrangement - First Floor
1 : 100



General Arrangement - Ground Floor
1 : 100

By Department Legend

- Ancillary
- Circulation
- Learning
- Staff
- WC & Cloaks



LUNGFISH

Lungfish Architects
2nd Floor, City Gate West
Tollhouse Hill
Nottingham
NG1 5AT
Tel: 0115 7841223
Fax: 0115 9583232
e-mail: hello@lungfish-architects.co.uk
Web: www.lungfish-architects.co.uk

© 2020

- NOTES**
- Do not scale from this drawing.
 - All measurements are in millimetres unless stated otherwise.
 - This drawing is to be read in conjunction with the contract documentation, specification and all relevant Architectural, Electrical, Mechanical, Landscape and Structural drawings.
 - Any discrepancies between documents to be reported to the architectural team for review and clarification, prior to works commencing on site.
 - All coordinates and dimensions to be checked and confirmed on site, prior to works commencing.
 - Lungfish drawings are provided as design intent. The detail shown is demonstrative of principle; all components, fixings and seals etc are to be provided and installed to the satisfaction of each relevant manufacturer's recommendations to maintain thermal, air and fire resistances where applicable.
- The information on this drawing is subject to the final co-ordination of structure/sub-structure, M&E

..... Indicates extent of existing building that will be demolished

Name	Area
Ground Floor GIA	962.2 m ²
First Floor GIA	962.2 m ²
Plant GIA	56.5 m ²
Total GIA	1981.0 m ²

Rev	Description	Date	Dm.	Chk.
P05	Stage 3 Issue	21.02.2020	KR	NW
P04	Layout updated to accommodate Services zone	10.01.2020	NW	CRT
P03	Updated Layout Issue for Comment	09.01.2020	NW	CRT
P02	Issued for Pre-application advice	19.12.19	NW	CRT
P01	Issued for CEM 01	29.11.19	NW	CRT

Rev	Description	Date	Dm.	Chk.
P05	Stage 3 Issue	21.02.2020	KR	NW
P04	Layout updated to accommodate Services zone	10.01.2020	NW	CRT
P03	Updated Layout Issue for Comment	09.01.2020	NW	CRT
P02	Issued for Pre-application advice	19.12.19	NW	CRT
P01	Issued for CEM 01	29.11.19	NW	CRT

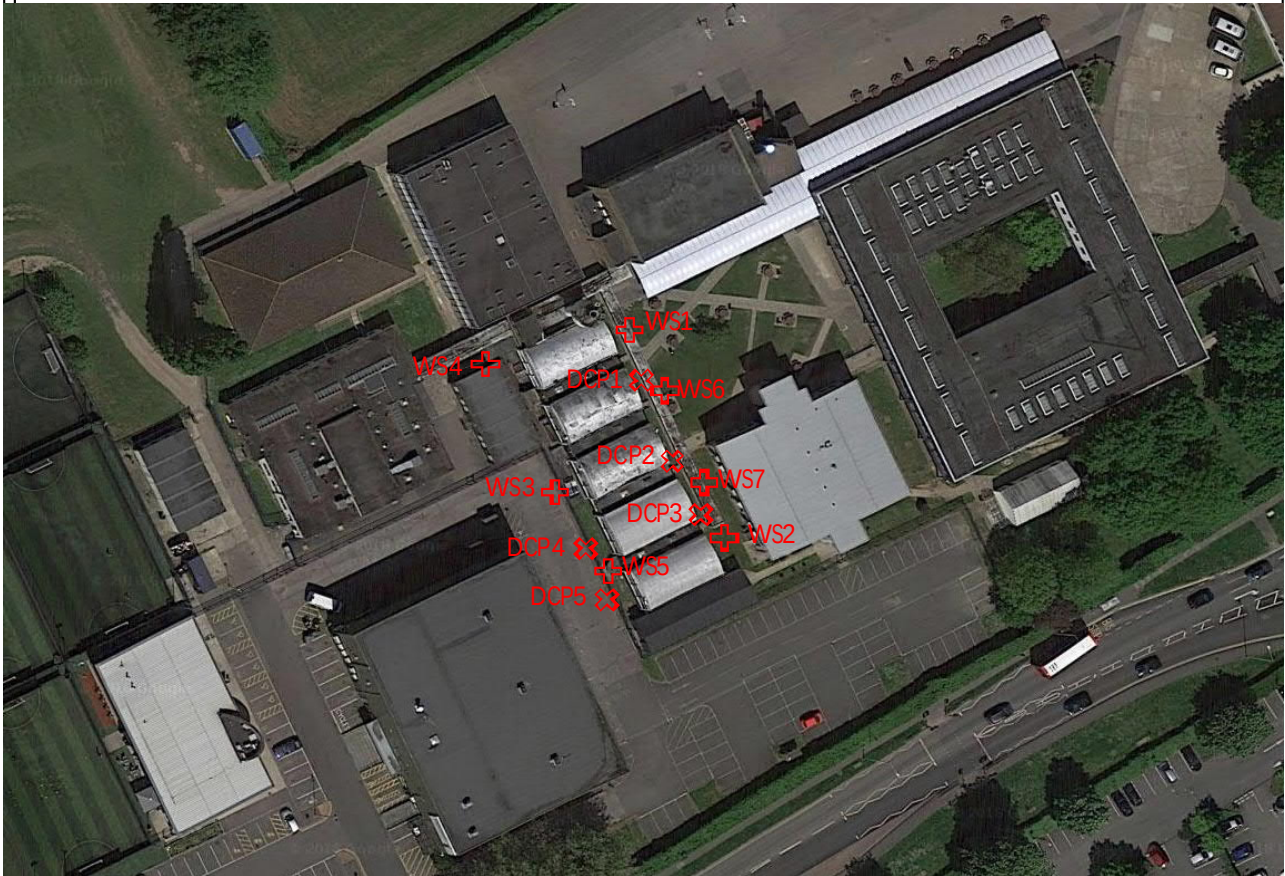
CLIENT
CONTRACTOR
Morgan Sindall 1st floor, 1 Falcon Gate Shire Park Welwyn Garden City AL7 1TW

PROJECT
Queensmead Academy Queens Walk South Ruislip, Middlesex HA4 0LS

TITLE
Proposed General Arrangement Floor Plans

DRAWN BY:	NW	DATE:	29/11/19
CHECKED BY:	YN	SCALE:	1 : 100 @ A1
STATUS	For Costing		
PROJ - ORIGIN - ZONE - LEVEL - TYPE - ROLE - NUMBER	STATU	REV	
53X009 - LFA - 01 - ZZ - DR - A - 0200	D2	P05	

FIGURE 3: TEST LOCATION PLAN



REF	DATE	REVISION	DRAWN	CHECKED					
SURVEY PRODUCED UNDER ORDNANCE SURVEY CROWN COPYRIGHT 2011. ALL RIGHTS RESERVED LICENCE NUMBER 1000023183									
PROJECT Queensmead School			DRAWING 5000407-03						
RIDGE PARTNERSHIP HOUSE TEL: 01962 834400 MOORSIDE ROAD FAX: 01993 815001 WINCHESTER HAMPSHIRE, SO23 7RX www.ridge.co.uk Also at Reading, Bristol, London & Leicester		CLIENT Queensmead School		SCALE NTS	DATE 01/11/2018			DRAWN BY PB	CHECKED BY RJH
				TITLE TEST LOCATION PLAN					
				REV -					

APPENDIX 1 – REPORT CONDITIONS

This report is produced solely for the benefit of **Queensmead School** and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

This report is based on a visual site inspection, study of readily accessible referenced historical records, information supplied by those parties noted in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented in good faith without exhaustive clarification. Where ground contamination is suspected but no physical site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to detailed activities related to the site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, not revealed by this research cannot be discounted.

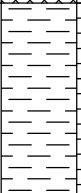
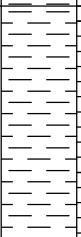
Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categoric assurances that they will be accepted by Authorities or Funds etc. without question, as such bodies may have unpublished, often more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Ridge and Partners LLP. In time improved practices or amended legislation may necessitate a re-assessment.

The report is necessarily limited to those aspects of land contamination specifically reported on and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents that may occur. The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous use and abuse of the site and adjacent sites. The report concentrates on the site as defined in the report and provides an opinion on surrounding sites. If migrating pollution or contamination (past or present) exists this can only practically be better assessed following extensive on and off site intrusive investigations and monitoring.

APPENDIX 2 – ENGINEERING LOGS

EXPLORATORY HOLE LOG

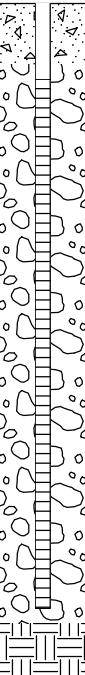
Project Queensmead School				EX. HOLE No WS1	
Job No 5000407	Date 22-08-18 22-08-18	Ground Level (m)	Co-Ordinates ()		
Contractor ADP				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		
0.30	ES	N14			0.10	Grass over dark brown Silt TOPSOIL.			
					(0.40) 0.50	MADE GROUND: Brown reworked Silt/ Clay with gravel of angular to sub rounded fine and medium brick, concrete, flint and chalk.			
0.70	ES			(1.30)	(Stiff to very stiff) brown slightly silty CLAY with occasional sub angular fine Siltstone and rare ironstone and flint. From 1.50m - occasional bands of sandy CLAY and gravelly CLAY. Gravel is sub angular fine and medium Siltstone.				
1.00	D								
1.90	D			(1.10)	Stiff brown and in parts mottled light brown/ grey/ orange very sandy CLAY. Sand is fine and medium.				
2.50	D								
3.50	D			(1.55)	Stiff grey and in parts brown CLAY. Slightly moist.				
4.00									
						4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											Borehole advanced with tracked dynamic sampling rig to 4.45m. Groundwater not encountered. Installed with 50mm diameter standpipe with response zone from 0.50 to 4.45m, and reinstated with flush metal cover.
All dimensions in metres Scale 1:50			Client Queensmead School			Method/ Plant Used Dynamic sampling rig.			Logged By MS		

EXPLORATORY HOLE LOG

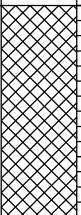
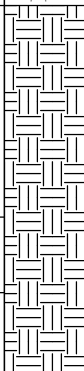
Project Queensmead School				EX. HOLE No WS2	
Job No 5000407	Date 22-08-18 22-08-18	Ground Level (m)	Co-Ordinates ()		
Contractor ADP				Sheet 1 of 1	

SAMPLES & TESTS			Water	Reduced Level	Legend	Depth (Thick-ness)	STRATA DESCRIPTION	Geology	Instrument/ Backfill
Depth	Type No	Test Result							
0.20	ES	N11				(0.40) 0.40	Grass over dark brown Silt TOPSOIL with occasional chert and flint gravels.		
0.60	ES						Firm brown and mottled light brown/ orange slightly silty CLAY with occasional sub angular fine Siltstone and rare ironstone and flint.		
1.00	D					(1.30) 1.70	Firm to stiff brown and in parts mottled light brown/ grey/ orange very sandy CLAY. Sand is fine and medium.		
1.90	D					(1.10) 2.80	Firm to stiff grey and in parts brown CLAY. Slightly moist.		
2.90	D					(1.65) 4.45	Firm to stiff grey and in parts brown CLAY. Slightly moist.		
4.00-4.45 4.00	D					4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											Initial refusal on concrete at 1.50m, re-located. BH advanced with dynamic sampling rig to 4.45m. GW not encountered. Installed w/ 50mm diameter pipe-response zone from 0.50 to 4.45m, reinstated with flush metal cover.
All dimensions in metres Scale 1:50			Client Queensmead School			Method/ Plant Used Dynamic sampling rig.			Logged By MS		

EXPLORATORY HOLE LOG

Project Queensmead School				EX. HOLE No WS3	
Job No 5000407	Date 22-08-18 22-08-18	Ground Level (m)	Co-Ordinates ()		
Contractor ADP				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill	
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)			DESCRIPTION
0.50	ES	N33				(1.40)	Grass over fill materials of whole brick, brick fragments and concrete with brown Silt matrix. Occasional areas of slate fill.		
1.00-1.45 1.00	D					1.40			
2.00-2.45 2.00	D	N13				(0.55)	2.45	Stiff brown and in parts mottled light brown/ grey/ orange sandy CLAY. Sand is fine and medium.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											Multiple hand pits advanced and refused due to relic brick walls and concrete blocks. Borehole advanced with tracked dynamic sampling rig to 2,45m prior to refusal. Groundwater not encountered. Backfilled with arisings.

All dimensions in metres Scale 1:50	Client Queensmead School	Method/ Plant Used Dynamic sampling rig.	Logged By MS
--	------------------------------------	---	------------------------

EXPLORATORY HOLE LOG

Project Queensmead School				EX. HOLE No WS4	
Job No 5000407	Date 23-10-18 23-10-18	Ground Level (m)	Co-Ordinates ()		
Contractor ADP				Sheet 1 of 1	

SAMPLES & TESTS			Water				STRATA	Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		
1.20 <									

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											Borehole advanced with tracked dynamic sampling rig to 5m Backfilled with arisings

All dimensions in metres Scale 1:50	Client Queensmead School	Method/ Plant Used	Logged By
--	-----------------------------	-----------------------	-----------

EXPLORATORY HOLE LOG

Project Queensmead School				EX. HOLE No WS5
Job No 5000407	Date 23-10-18 23-10-18	Ground Level (m)	Co-Ordinates ()	
Contractor ADP				Sheet 1 of 1

SAMPLES & TESTS			Water			Depth (Thick- ness)	STRATA	Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend		DESCRIPTION		
						(0.80) 0.80	TOPSOIL- Brown friable silty clay		
1.20		N4				(3.20) 4.00	Firm orangish brown slightly silty slightly sandy CLAY.		
2.00		N7				(3.20) 4.00	Firm orangish brown slightly silty slightly sandy CLAY.		
3.00		N8				(3.20) 4.00	Firm orangish brown slightly silty slightly sandy CLAY.		
4.00		N8				(1.00) 5.00	Stiff orangish brown slightly silty slightly sandy CLAY.		
5.00		N11							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											Borehole advanced with tracked dynamic sampling rig to 5m Backfilled with arisings

EXPLORATORY HOLE LOG

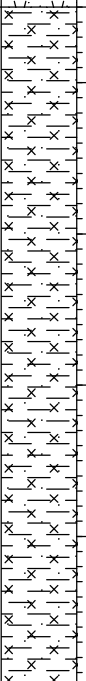
Project Queensmead School				EX. HOLE No WS6	
Job No 5000407	Date 23-10-18 23-10-18	Ground Level (m)	Co-Ordinates ()		
Contractor ADP				Sheet 1 of 1	

SAMPLES & TESTS			Water	Reduced Level	Legend	Depth (Thickness)	STRATA	Geology	Instrument/ Backfill
Depth	Type No	Test Result					DESCRIPTION		
						(0.50) 0.50	TOPSOIL- Brown friable clay		
1.20		N12					Firm to stiff greyish brown slightly silty slightly sandy CLAY. Becoming darker grey with depth.		
2.00		N8							
3.00		N9			(4.50)				
4.00		N11							
5.00		N12				5.00			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											Borehole advanced with tracked dynamic sampling rig to 5m Backfilled with arisings
All dimensions in metres Scale 1:50			Client Queensmead School			Method/ Plant Used				Logged By	

EXPLORATORY HOLE LOG

Project Queensmead School				EX. HOLE No WS7	
Job No 5000407	Date 23-10-18 23-10-18	Ground Level (m)	Co-Ordinates ()		
Contractor ADP				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)		
1.00		N9			(0.50) 0.50	TOPSOIL- friable brown clay.		
					(4.50) 5.00	Firm to stiff greyish brown slightly silty slightly sandy CLAY. Becoming darker grey with depth.		
2.00		N9						
3.00		N10						
4.00		N10						
5.00		N14						

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											Borehole advanced with tracked dynamic sampling rig to 5m Backfilled with arisings

All dimensions in metres Scale 1:50	Client Queensmead School	Method/ Plant Used	Logged By
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APPENDIX 3 – PHOTOGRAPHS

PHOTOGRAPHIC RECORD – QUEENSMEAD SCHOOL - 5000407



Plate 1. Arisings from WS1 – Ground Level to 1m depth



Plate 2. WS1 arisings

PHOTOGRAPHIC RECORD – QUEENSMEAD SCHOOL - 5000407



Plate 3. WS1 arisings



Plate 4. WS3 location following drilling

PHOTOGRAPHIC RECORD – QUEENSMEAD SCHOOL - 5000407



Plate 5. Installation of WS2



Plate 6. Installation of WS1

APPENDIX 4 – GEOTECHNICAL TEST CERTIFICATES



Laboratory Report



Contract Number: 40521

Client Ref: **5000407**

Report Date: **08-09-2018**

Client PO: **5000407**

Client **Ridge**
Partnership House
Moorside Road
Winchester
SO23 7RX

Contract Title: **Queensmead School, Ruislip**
For the attention of: **Max Smeeth**

Date Received: **28-08-2018**
Date Commenced: **28-08-2018**
Date Completed: **08-09-2018**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	4
4 Point Liquid & Plastic Limit (LL/PL) BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	4
Water Soluble Sulphate 2:1 extract BS 1377:1990 - Part 3 : 5 - @ Non Accredited Test	4
pH value of soil BS 1377-3:1990 Cl9 - @ Non Accredited Test	4
Disposal of samples for job	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

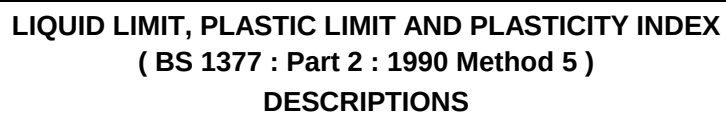
This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Alex Wynn (Associate Director) - Ben Sharp (Contracts Manager) - Emma Sharp (Office Manager)

Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) - Sean Penn (Administrative/Accounts Assistant)

Wayne Honey (Administrative/Quality Assistant)



40521

Queensmead School, Ruislip

Operators	Checked	07/09/2018	Wayne Honey	
RO/MH	Approved	08/09/2018	Ben Sharp	



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377 : Part 2 : 1990 Method 5)

Contract Number

40521

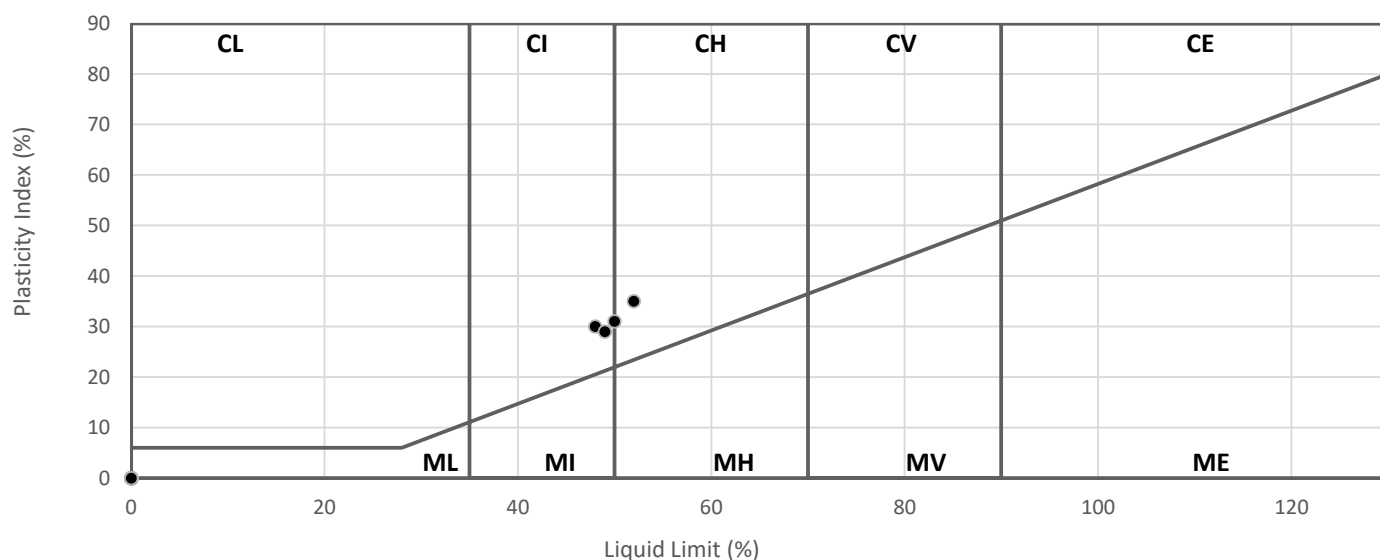
Site Name

Queensmead School, Ruislip

[illegible]

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION



Operators	Checked	07/09/2018	Wayne Honey	
DB	Approved	08/09/2018	Ben Sharp	

[Signature]

APPENDIX 5 – CONTAMINATION TEST CERTIFICATES



Max Smeeth
Ridge
Partnership House
Moorside Road
Winchester
SO23 7RX

DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

DETS Report No: 18-81250

Site Reference: Queensmead School, Ruislip

Project / Job Ref: 5000407

Order No: 5000407-815

Sample Receipt Date: 24/08/2018

Sample Scheduled Date: 24/08/2018

Report Issue Number: 1

Reporting Date: 31/08/2018

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services



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



Soil Analysis Certificate						
DETS Report No: 18-81250	Date Sampled	22/08/18				
Ridge	Time Sampled	None Supplied				
Site Reference: Queensmead School, Ruislip	TP / BH No	WS3				
Project / Job Ref: 5000407	Additional Refs	None Supplied				
Order No: 5000407-815	Depth (m)	0.50				
Reporting Date: 31/08/2018	QTSE Sample No	356186				

Determinand	Unit	RL	Accreditation				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected			
pH	pH Units	N/a	MCERTS	7.9			
Total Cyanide	mg/kg	< 2	NONE	< 2			
Organic Matter	%	< 0.1	MCERTS	2.6			
Arsenic (As)	mg/kg	< 2	MCERTS	11			
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.7			
Chromium (Cr)	mg/kg	< 2	MCERTS	29			
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2			
Copper (Cu)	mg/kg	< 4	MCERTS	73			
Lead (Pb)	mg/kg	< 3	MCERTS	92			
Mercury (Hg)	mg/kg	< 1	NONE	< 1			
Nickel (Ni)	mg/kg	< 3	MCERTS	20			
Selenium (Se)	mg/kg	< 3	NONE	< 3			
Zinc (Zn)	mg/kg	< 3	MCERTS	196			
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

Subcontracted analysis (S)



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



Soil Analysis Certificate - Speciated PAHs

DETS Report No: 18-81250	Date Sampled	22/08/18				
Ridge	Time Sampled	None Supplied				
Site Reference: Queensmead School, Ruislip	TP / BH No	WS3				
Project / Job Ref: 5000407	Additional Refs	None Supplied				
Order No: 5000407-815	Depth (m)	0.50				
Reporting Date: 31/08/2018	QTSE Sample No	356186				

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	0.53			
Anthracene	mg/kg	< 0.1	MCERTS	0.15			
Fluoranthene	mg/kg	< 0.1	MCERTS	1.89			
Pyrene	mg/kg	< 0.1	MCERTS	1.66			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	1.14			
Chrysene	mg/kg	< 0.1	MCERTS	0.92			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	1.44			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.48			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	1.04			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.62			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.52			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	10.4			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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



Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 18-81250	Date Sampled	22/08/18				
Ridge	Time Sampled	None Supplied				
Site Reference: Queensmead School, Ruislip	TP / BH No	WS3				
Project / Job Ref: 5000407	Additional Refs	None Supplied				
Order No: 5000407-815	Depth (m)	0.50				
Reporting Date: 31/08/2018	QTSE Sample No	356186				

Determinand	Unit	RL	Accreditation				
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01			
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05			
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2			
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2			
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3			
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3			
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10			
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21			
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01			
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05			
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2			
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2			
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2			
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3			
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10			
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21			
Total >C5 - C35	mg/kg	< 42	NONE	< 42			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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



Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 18-81250	Date Sampled	22/08/18				
Ridge	Time Sampled	None Supplied				
Site Reference: Queensmead School, Ruislip	TP / BH No	WS3				
Project / Job Ref: 5000407	Additional Refs	None Supplied				
Order No: 5000407-815	Depth (m)	0.50				
Reporting Date: 31/08/2018	QTSE Sample No	356186				

Determinand	Unit	RL	Accreditation				
Benzene	ug/kg	< 2	MCERTS	< 2			
Toluene	ug/kg	< 5	MCERTS	< 5			
Ethylbenzene	ug/kg	< 2	MCERTS	< 2			
p & m-xylene	ug/kg	< 2	MCERTS	< 2			
o-xylene	ug/kg	< 2	MCERTS	< 2			
MTBE	ug/kg	< 5	MCERTS	< 5			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Waste Acceptance Criteria Analytical Certificate - BS EN 12457/2																																							
DETS Report No: 18-81250		Date Sampled	22/08/18		<table border="1"> <thead> <tr> <th colspan="3">Landfill Waste Acceptance Criteria Limits</th> </tr> <tr> <th>Inert Waste Landfill</th> <th>Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill</th> <th>Hazardous Waste Landfill</th> </tr> </thead> <tbody> <tr> <td>3%</td> <td>5%</td> <td>6%</td> </tr> <tr> <td>--</td> <td>--</td> <td>10%</td> </tr> <tr> <td>6</td> <td>--</td> <td>--</td> </tr> <tr> <td>1</td> <td>--</td> <td>--</td> </tr> <tr> <td>500</td> <td>--</td> <td>--</td> </tr> <tr> <td>100</td> <td>--</td> <td>--</td> </tr> <tr> <td>--</td> <td>>6</td> <td>--</td> </tr> <tr> <td>--</td> <td>To be evaluated</td> <td>To be evaluated</td> </tr> </tbody> </table>					Landfill Waste Acceptance Criteria Limits			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	3%	5%	6%	--	--	10%	6	--	--	1	--	--	500	--	--	100	--	--	--	>6	--	--	To be evaluated	To be evaluated
Landfill Waste Acceptance Criteria Limits																																							
Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill																																					
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Ridge		Time Sampled	None Supplied																																				
Site Reference: Queensmead School, Ruislip		TP / BH No	WS3																																				
Project / Job Ref: 5000407		Additional Refs	None Supplied																																				
Order No: 5000407-815		Depth (m)	0.50																																				
Reporting Date: 31/08/2018		QTSE Sample No	356186																																				
Determinand	Unit	MDL																																					
TOC ^{MD}	%	< 0.1	1.5																																				
Loss on Ignition	%	< 0.01	4.40																																				
BTEX ^{MD}	mg/kg	< 0.05	< 0.05																																				
Sum of PCBs	mg/kg	< 0.1	< 0.1																																				
Mineral Oil ^{MD}	mg/kg	< 10	< 10																																				
Total PAH ^{MD}	mg/kg	< 1.7	10.4																																				
pH ^{MD}	pH Units	N/a	7.9																																				
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1																																				
Eluate Analysis			10:1 mg/l			Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)																																
Arsenic ^U		< 0.01			< 0.1	0.5	2	25																															
Barium ^U		< 0.02			< 0.2	20	100	300																															
Cadmium ^U		< 0.0005			< 0.005	0.04	1	5																															
Chromium ^U		< 0.005			< 0.05	0.5	10	70																															
Copper ^U		< 0.01			< 0.1	2	50	100																															
Mercury ^U		< 0.0005			< 0.01	0.01	0.2	2																															
Molybdenum ^U		0.002			0.02	0.5	10	30																															
Nickel ^U		< 0.007			< 0.07	0.4	10	40																															
Lead ^U		< 0.005			< 0.05	0.5	10	50																															
Antimony ^U		< 0.005			< 0.05	0.06	0.7	5																															
Selenium ^U		< 0.005			< 0.05	0.1	0.5	7																															
Zinc ^U		< 0.005			< 0.05	4	50	200																															
Chloride ^U		1			13	800	15000	25000																															
Fluoride ^U		< 0.5			< 5	10	150	500																															
Sulphate ^U		2			24	1000	20000	50000																															
TDS		66			660	4000	60000	100000																															
Phenol Index		< 0.01			< 0.1	1	-	-																															
DOC		11.2			112	500	800	1000																															
Leach Test Information																																							
Sample Mass (kg)		0.10																																					
Dry Matter (%)		88.3																																					
Moisture (%)		13.2																																					
Stage 1																																							
Volume Eluate L10 (litres)		0.89																																					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and QTS Environmental cannot be held responsible for any discrepancies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 18-81250	
Ridge	
Site Reference: Queensmead School, Ruislip	
Project / Job Ref: 5000407	
Order No: 5000407-815	
Reporting Date: 31/08/2018	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
356186	WS3	None Supplied	0.50	11.7	Brown sandy clay with stones

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

Insufficient Sample ^{1/5}

Unsuitable Sample ^{1/5}

Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 18-81250

Ridge

Site Reference: Queensmead School, Ruislip

Project / Job Ref: 5000407

Order No: 5000407-815

Reporting Date: 31/08/2018

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 dphenylcarbazine 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

Project Name:	Queensmead School Feasibility Project
Project Reference:	5000407



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