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GEO-ENVIRONMENTAL & GEOTECHNICAL ASSESSMENT (GROUND INVESTIGATION) REPORT

BLOWERS WOOD SITE
HEMPSTEAD
GILLINGHAM
ME7 3DT

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Report Title: **Geo-environmental & Geotechnical Assessment Ground Investigation Report for Blowers Wood Site, Hempstead, Gillingham, ME7 3DT**

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QUALITY CONTROL - PREVIOUS VERSIONS

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EXECUTIVE SUMMARY

Site Details	**Site Address**	Blowers Wood Site, Hempstead, Gillingham, ME7 3DT
	National Grid	E: 579826, N: 163018
	Site Area	3.84Ha (approx.)
	Proposed Development	It is understood that a ground investigation was required to inform the detailed design for a proposed residential development to include private gardens, access roads and associated infrastructure.
Encountered Conditions	**Scope of Works**	The assessment incorporated a desk study to determine the site's setting to inform a preliminary risk assessment followed by an intrusive investigation to confirm the ground and groundwater conditions and support the development of a geotechnical and geo-environmental assessment.
	Ground Conditions	The ground conditions encountered were broadly consistent with those anticipated from the desk study, and comprised a veneer of topsoil underlain by a high strength clay of the Clay-With-Flints Formation, proven to depths of up to 1.2-2.7m (but in some places >3.5m); underlain by varyingly weathered deposits of the Seaford Chalk Formation to the base of the boreholes (maximum depth of 6.0m).
	Groundwater	Groundwater was not reported during the intrusive works. During return monitoring, all 6No. wells were reported as dry to depths of between 2.65m and 6.01m bgl.
Geo-environmental Assessment Summary and Recommendations		Following generic risk assessments, no elevated concentrations of common chemical contaminants were detected in soils in excess of generic assessment criteria for the protection of human health within a human health end-use scenario. No asbestos fibres were detected in the samples analysed in the laboratory. The risk to end users associated with vapour risk inhalation from soils is considered negligible. The risk to controlled waters from soils is considered negligible. A significant risk to plant growth has not been identified. Based on the calculated GSVs, and in consideration of the conceptual site model, the site is classified as Characteristic Situation 1 (CS1) and no formal gas protection measures are currently considered to be necessary. Upgraded potable water supply pipe materials are unlikely to be required. The water supply pipe requirements for this site should be discussed at an early stage with the relevant Utility provider. Following the land contamination assessment, no further assessment or risk mitigation is required, and the site can be considered suitable for the proposed use. As with any ground investigation, the presence of further hotspots between sampling points cannot be ruled out, and caution must be exercised during construction works. Should any contamination be encountered, a suitably qualified environmental consultant should be informed immediately, so that adequate measures may be recommended.

Geotechnical Considerations	**Foundations**	Based on the ground and groundwater conditions encountered, traditional strip/trench-fill foundations up to 1m wide may be formed within the underlying Clay-with-flints Formation at a minimum depth of 1.0m for an allowable bearing capacity of 100kPa. Foundations may need to be deepened further where building near trees, in accordance with NHBC requirements, for soils of high volume change potential. Heave precautions are required for soils of high volume change potential.
	Ground Floor Slabs	Given the presence of shrinkable soils, it is recommended that suspended floor slabs are used with an adequate void designed according to NHBC Standards. As a guide, initial modelling indicates a requirement for a sub-floor void of at least 300mm due to the presence of shrinkable soils of high volume change potential.
	Sulphates	Buried concrete for foundations should be designed to Class DS-1 (AC1).
	Excavations	Temporary excavations within the cohesive soils are likely to remain relatively stable in the short term though some spalling may be anticipated. Based on this investigation, groundwater is considered unlikely to be encountered during the works. Subject to seasonal variations, surface water encountered during site works could likely be dealt with by conventional pumping from a sump used to collate waters.
	Pavement and Subgrade	A preliminary CBR design value of 4% is recommended for pavements constructed within the Clay-With-Flints Formation.
	Soakaways	It is considered that conventional soakaways may be suitable for discharging storm water run-off to the ground within the chalk. However, these would require careful design given the variable infiltration rates calculated. It should be noted that surface settlement and instability of local areas is possible when soakaways are formed in superficial deposits overlying chalk. Soakaways installed directly within the chalk should be positioned as far away as possible from the proposed buildings, and it would be preferable to drain surface water to multiple smaller soakaways, to avoid concentrating a large volume of water in one or two locations.
Recommended Further Work		The following works are recommended: • Seek confirmation of the water supply pipe requirements by the appropriate service provider.
This Executive Summary is intended to provide a brief summary of the main findings and conclusions of the investigation. For detailed information, the reader is referred to the full text.		

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Redrow Homes Limited ("The Client") has commissioned Jomas Associates Ltd ('Jomas') to undertake an investigation of the geotechnical and geo-environmental factors pertaining to the proposed development at a site referred to as Blowers Wood Site, Hempstead, Gillingham, ME7 3DT (herein referred to as 'the site'). The site's location is presented in Figure 1.

1.1.2 A Phase 1 Desk Study has been produced for the site and issued separately (detailed in Table 1.1 below), followed by an intrusive investigation (detailed in this report).

1.1.3 Relevant reports prepared by or supplied to Jomas Associates prior to the commencement of this investigation are detailed in Table 1.1:

Table 1.1: Previous/Supplied Reports

Title	Author	Reference	Date
Desk Study/Preliminary Risk Assessment Report for Blowers Wood Site, Hempstead, Gillingham, ME7 3DT	Jomas Associates Ltd	P4266J2508/AB/Rev1	30th May 2022

1.1.4 An intrusive investigation has been undertaken in accordance with Jomas' proposal dated 30th March 2022.

1.2 Proposed Development

1.2.1 It is understood the existing land is to be developed to form low-rise residential building, including private gardens. A proposed development plan is included in Appendix 1.

1.2.2 For the purpose of geotechnical assessment, it is considered that the project could be classified as a Geotechnical Category (GC) 2 site in accordance with BS EN 1997.

1.3 Objectives

1.3.1 The objectives of Jomas' investigation are as follows:

- To undertake an intrusive investigation, to determine the ground and groundwater conditions as well as to assess the nature and extent of contaminants (if any) potentially present at the site;
- To establish the presence of significant pollutant linkages, in accordance with the procedures set out within Part IIA of the Environmental Protection Act 1990, associated statutory guidance and current best practice including the Land Contamination Risk Management (LCRM); and,
- To determine soil/rock properties to inform the geotechnical assessment for foundations, drainage, excavation stability, pavement design and buried concrete and recommendations for further action (if required).

1.4 Scope of Works

1.4.1 The following tasks were undertaken to achieve the objectives listed above:

- Intrusive ground investigation to determine shallow ground conditions, and potential for contamination at the site;
- Undertaking of laboratory chemical and geotechnical testing upon samples obtained;
- Return ground gas/groundwater monitoring;
- The compilation of this report, which collects and discusses the above data, and presents an assessment of the site conditions, conclusions and recommendations.

1.5 Limitations

1.5.1 Jomas has prepared this report for the sole use of Redrow Homes Limited, in accordance with the generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon by any other party without the explicit written agreement of Jomas. No other third party warranty, expressed or implied, is made as to the professional advice included in this report. This report must be used in its entirety.

1.5.2 The records search was limited to information available from public sources; this information is changing continually and frequently incomplete. Unless Jomas has actual knowledge to the contrary, information obtained from public sources or provided to Jomas by site personnel and other information sources, have been assumed to be correct. Jomas does not assume any liability for the misinterpretation of information or for items not visible, accessible or present on the subject property at the time of this study.

1.5.3 Whilst every effort has been made to ensure the accuracy of the data supplied, and any analysis derived from it, there may be conditions at the site that have not been disclosed by the investigation, and could not therefore be taken into account. As with any site, there may be differences in soil conditions between exploratory hole positions. Furthermore, it should be noted that groundwater conditions may vary due to seasonal and other effects and may at times be significantly different from those measured by the investigation. No liability can be accepted for any such variations in these conditions.

1.5.4 Any reports provided to Jomas have been reviewed in good faith. Jomas cannot be held liable for any errors or omissions in these reports, or for any incorrect interpretation contained within them.

1.5.5 This investigation and report has been carried out in accordance with the relevant standards and guidance in place at the time of the works. Future changes to these may require a re-assessment of the recommendations made within this report.

1.5.6 This report is not an engineering design and the figures and calculations contained in the report should be used by the Structural Engineer, taking note that variations may apply, depending on variations in design loading, in techniques used, and in site conditions. Our recommendations should therefore not supersede the Engineer's design.

2 DESK STUDY SUMMARY

2.1 Site Information

2.1.1 The site location plan is appended to this report in Figure 1, Appendix 1.

Table 2.1: Site Information

Name of Site	Blowers Wood Site
Address of Site	Hempstead Gillingham ME7 3DT
Approx. National Grid Ref.	579826 163018
Site Area (Approx)	3.84ha
Site Occupation	Open field
Local Authority	Medway Council

2.2 Summary of Preliminary Risk Assessment (Desk Study)

2.2.1 As detailed in Table 1.1, a Phase 1 Desk Study report has been produced for the site and issued separately (Jomas Associates Ltd - P4266J2508/AB/Rev1 – 30th May 2022). The findings of the Phase 1 Desk Study are presented in the following section. Reference should be made to the original reports and documents for further details. Where appropriate, this information will be used in the later sections of this report as supplementary information to assist in the evaluation of the ground conditions and aid the identification of geotechnical and geochemical constraints and hazards that could impact on the scheme.

2.2.2 A review of earliest available (1865) historical maps indicates that the site was undeveloped and has remained so to present day.

2.2.3 The site was surrounded by woodland and agricultural land. There were some quarries and chalk pits noted between 1866 and 1895 150 -250m from the site. Other land uses in the area include tanks, a pumping station, reservoirs and electricity substations. Presently the site is surrounded by residential properties to the north and east, with undeveloped fields to the south and west. Significant road construction was undertaken to the east and south of the site prior to 1965.

2.2.4 Information provided by the British Geological Survey indicates that the site is directly underlain by superficial deposits of the Clay with Flints Formation. These superficial deposits are underlain by solid deposits of the Seaford Chalk Formation. No artificial deposits are reported within the site.

2.2.5 The superficial deposits underlying the site are identified as an Unproductive Aquifer with the underlying solid deposits identified as a Principal Aquifer.

2.2.6 A review of the Enviro+Geoinsight Report indicates the site is within a type 3 source protection zone.

2.2.7 There are 3No groundwater and potable water abstractions reported within 1km of the site. The closest refers to a historical abstraction for direct potable water supply located 1.94km east.

2.2.8 There are no surface water abstractions reported within 1km of the site.

2.2.9 There are 2no surface water features reported on site. There are no Environment Agency Zone 2 or 3 floodplains reported within 250m of the site.

2.2.10 The desk study recommends that an intrusive investigation is undertaken to assess the extent of made ground soils present at the site and to provide geotechnical information, and to inform possible waste soil management options. A preliminary investigation may comprise a series of cable percussive boreholes, window sampler holes and / or trial pits. At this stage risks associated with ground gases are considered to be low due to the lack of significant sources of identified. However, it is noted that the site has remained undeveloped but lies close to sites of significant road construction, which historically frequently generated spoil that could have been spread on adjoining undeveloped land. The possibility of a significant thickness of disturbed ground or made ground cannot be ruled out at this stage, and should evidence of such be identified during a ground investigation, ground gas monitoring and risk assessment may be required.

2.2.11 The conceptual site model is reproduced in Table 2.2 overleaf.

Table 2.2: Preliminary Risk Assessment for the Site

Sources	Pathways (P)	Receptors	Consequence of Impact	Probability of Impact	Risk Estimation	Hazard Assessment
• Current and previous industrial use – off site within 200m (S1) - Quarry 150m W - Electricity substation 150m E, 200m N • Potentially infilled land uses – off site within 200m (S2) - Quarry 150m W • Potentially disturbed or made ground on site (S3)	• Ingestion and dermal contact with contaminated soil (P1) • Inhalation or contact with potentially contaminated dust and vapours (P2) • Permeation of water pipes and attack on concrete foundations by aggressive soil conditions (P6)	• Construction workers (R1) • Maintenance workers (R2) • Neighbouring site users (R3) • Future site users (R4) • Building foundations and on site buried services (water mains, electricity and sewer) (R5)	Medium	Low likelihood/ Unlikely	Moderate / low	GI – Ground Investigation
	• Accumulation and migration of soil gases (P5)		Severe	Unlikely	Low	
	• Leaching through permeable soils, migration within the vadose zone (i.e., unsaturated soil above the water table) and/or lateral migration within surface water, as a result of cracked hardstanding or via service pipe/corridors and surface water runoff. (P3) • Horizontal and vertical migration of contaminants within groundwater (P4)	• Neighbouring site users (R3) • Building foundations and on site buried services (water mains, electricity and sewer) (R5) • Controlled waters (R6) - Principal aquifer - Inland river/drain on site	Medium	Unlikely	Low	

3 GROUND INVESTIGATION

3.1 Scope of Works

3.1.1 A ground investigation was undertaken on the 19th & 20th April 2022.

3.1.2 A summary of the fieldwork carried out at the site, with justifications for exploratory hole positions, is presented in Table 3.1 below.

Table 3.1: Scope of Intrusive Investigation

Investigation Type	Number of Exploratory Holes Achieved	Exploratory Hole Designation	Depth Achieved	Justification
Windowless Sample Boreholes	6	WS1, WS3, WS4, WS5, WS7, WS8	Up to 6m bgl	Obtain samples for laboratory chemical and geotechnical testing. To allow in-situ geotechnical testing.
Super Heavy Dynamic Probing	5	WS1, WS3, WS4, WS5, WS7	Up to 12m bgl	To explore for potential evidence of dissolution features.
Monitoring Wells	6	WS1, WS3, WS4, WS5, WS7, WS8	Up to 6m bgl	Ground gas and groundwater monitoring wells.
California Bearing Ratio (DCP Method)	8	CBR1-8	Up to 1m bgl	To provide CBR % value and inform roadway design.
Machine Excavated Trial Pits	14	TP1-14	Up to 3.5m bgl	To obtain samples for laboratory chemical and geotechnical testing.
Soil Infiltration testing	6	TP2, TP3, TP5, TP6, TP7, TP10	Up to 3.5m bgl	To allow calculation of soil infiltration rate and understand permeability of soils.

3.1.3 The ground investigation was undertaken in accordance with British Standard BS5930:2015+A1:2020 "Code of practice for ground investigations", British Standard BS10175:2011+A2:2017 "Investigation of potentially contaminated sites - code of practice", NHBC Standards, Chapter 4.1 and AGS Guidelines for Good Practice in Site Investigations.

3.1.4 Exploratory hole positions are shown on the exploratory hole location plan presented in Figure 2, Appendix 1. The exploratory hole records are included in Appendix 2.

3.1.5 Where monitoring well installations were not installed, the exploratory holes were backfilled with the arisings (in the reverse order in which they were drilled). Trial pits were left slightly mounded to allow for some subsequent settlement.

3.2 In-situ Geotechnical Testing

3.2.1 In-situ geotechnical testing included Standard Penetration Tests. The determined 'N' values have been used to determine the relative density of granular materials and have been used

with standard correlations to infer various other derived geotechnical parameters including the undrained shear strength of the cohesive strata. The results of the individual tests are on the appropriate exploratory hole logs in Appendix 2.

3.2.2 A number of the windowless sampling locations were extended using Super Heavy Dynamic Probing (DPSH) techniques. This technique uses a cone advanced using similar equipment as the SPT and can be considered as a continuous SPT. These results are comparable to the N value obtained using the SPT technique. Copies of the test records are provided in Appendix 5.

3.2.3 In-situ California Bearing Ratios (CBRs) were determined using a dynamic cone penetrometer (DCP) and the methodology laid out in IAN 73/06. The CBR values have then been calculated using the methodology laid out in both IAN 73/06 and TRL 587. Copies of the test results and calculations are provided in Appendix 6.

3.2.4 The determination of infiltration rates for the underlying ground was undertaken by carrying out tests in general accordance with BRE 365. Copies of the results and calculations are provided in Appendix 7.

3.3 Laboratory Analysis

3.3.1 A programme of laboratory testing, scheduled by Jomas Associates Limited, was carried out on selected samples of Made Ground and natural strata.

Chemical Testing

3.3.2 Soil samples were submitted to i2 Analytical (a UKAS and MCerts accredited laboratory) for analysis.

3.3.3 The samples were analysed for a wide range of contaminants as shown in Table 3.2 below:

Table 3.2: Chemical Tests Scheduled

	No. of tests	
Test Suite	**Topsoil**	**Natural**
Jomas Suite S3	10	4
Total Organic Carbon	8	2
Asbestos Screen & ID	14	0

3.3.4 The determinands contained in the Jomas Suite 3 are as detailed in Table 3.3 below.

Table 3.3: Basic Suite of Determinands

DETERMINAND	LIMIT OF DETECTION (mg/kg)	UKAS ACCREDITATION	TECHNIQUE
Arsenic	1	Y (MCERTS)	ICPMS
Cadmium	0.2	Y (MCERTS)	ICPMS
Chromium	1	Y (MCERTS)	ICPMS
Chromium (Hexavalent)	4	Y (MCERTS)	Colorimetry
Lead	1	Y (MCERTS)	ICPMS

Mercury	0.3	Y (MCERTS)	ICPMS
Nickel	1	Y (MCERTS)	ICPMS
Selenium	1	Y (MCERTS)	ICPMS
Copper	1	Y (MCERTS)	ICPMS
Zinc	1	Y (MCERTS)	ICPMS
Boron (Water Soluble)	0.2	Y (MCERTS)	ICPMS
pH Value	0.1 units	Y (MCERTS)	Electrometric
Sulphate (Water Soluble)	0.0125g/l	Y (MCERTS)	Ion Chromatography
Total Cyanide	1	Y (MCERTS)	Colorimetry
Speciated/Total PAH	0.05/0.80	Y (MCERTS)	GCFID
Phenols	1	Y (MCERTS)	HPLC
Total Petroleum Hydrocarbons (banded)	-	N Y (MCERTS)	Gas Chromatography

3.3.5 To support the selection of appropriate tier 1 screening values, 10No. samples were analysed for total organic carbon.

3.3.6 The chemical laboratory test results are included in Appendix 3.

Geotechnical Laboratory Testing

3.3.7 In addition to the contamination assessment, soil samples were submitted to the UKAS Accredited laboratory of i2 Analytical Ltd. for a series of analyses.

3.3.8 This testing was designed to classify the samples; and to obtain parameters (either directly or sufficient to allow relevant correlations to be used) relevant to the technical objectives of the investigation.

3.3.9 The following laboratory geotechnical testing was carried out:

Table 3.4 Laboratory Geotechnical Analysis

Methodology	Test Description	Number of tests
BS1377:1990	Moisture Content Determination	11
BS1377:1990	Liquid and Plastic Limit Determination (Atterberg Limits)	10
BS1377:1990	Particle Size Distribution - Sieving	7
BS1377:1990	Particle Size Distribution - Sedimentation	1
BS1377:1990	Saturation Moisture Content Of Chalk	4

3.3.10 In addition, 15No. soil samples were analysed for a modified BRE Special Digest 1 suite (acid and water soluble sulphate, total sulphur and pH) to assist with the ACEC classification for buried concrete.

3.3.11 The geotechnical laboratory test results are included in Appendix 4.

4 GROUND CONDITIONS ENCOUNTERED

4.1 General

4.1.1 A summary of the conditions encountered during the physical investigation of the site is presented in the following section.

4.2 Ground Conditions

4.2.1 The ground conditions encountered were broadly consistent with those anticipated, i.e. a thickness of topsoil overlying superficial deposits of Clay-With-Flints Formation overlying solid deposits of the Seaford Chalk Formation, and are summarised in Table 4.1 below.

Table 4.1 : Ground Conditions Encountered

Stratum and Description	Encountered from (mbgl)	Base of strata (mbgl)	Thickness range (m)
Grass over dark brown silty very gravelly sand with rootlets. Sand is fine to medium. Gravel consists of fine to coarse, angular to sub-angular flint. (TOPSOIL)	0.0	0.20– 0.3	0.20 – 0.30
Stiff** brown locally sandy, gravelly CLAY. Gravel consists of fine to coarse angular to sub-angular flint and occasional chalk. (CLAY-WITH-FLINTS FORMATION) *Base not proven in TP3, TP4, TP7 & TP9*	0.2 – 0.3	1.2 - >3.5	0.9 - >3.2
White structureless CHALK variably recovered as SILT, SAND and GRAVEL with medium cobble content. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk and occasional angular flint. (SEAFORD CHALK FORMATION)	1.2 - 2.7	>2.9 - >6.0 [base not proven]	>0.7 - >4.5 [thickness not proven]

***Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature*

4.2.2 Ground conditions were fairly consistent across the site.

4.2.3 No visual or olfactory evidence of potential contamination was identified within the investigation positions.

4.3 Groundwater

4.3.1 Groundwater was not encountered during the course of the investigation.

4.3.2 It should be noted that changes in groundwater levels can occur for a number of reasons including seasonal effects and variations in drainage. Such fluctuations may only be recorded by the measurement of the groundwater level within a standpipe or piezometer installed within appropriate response zones. Changes in groundwater level can have a direct effect on excavation stability and dewatering requirements, and cohesive soils can soften under rising or high groundwater levels.

4.4 Limitations

4.4.1 WS7 was terminated at a depth of 2.9m due to refusal of the sample barrel in hard natural ground.

4.4.2 TP3 and TP9 could not be excavated deeper than 2.8m and 3.0m bgl respectively. This was due to a high cobble content at the bases of these trial pits.

4.4.3 The possible presence of unidentified natural and/or manmade obstructions elsewhere on site cannot be discounted.

4.5 Geotechnical Testing Results

4.5.1 Five windowless sampler boreholes were extended to 12m bgl by Super Heavy Dynamic Probe (DPSH) testing. The results included in Appendix 5. Dynamic probing was undertaken to explore for hard or soft spots within the ground.

4.5.2 The equivalent SPT "N" blow counts were correlated from the dynamic tests. Generally, these test results ranged between equivalent SPT 'N' values of N=19 to N=>50. Although no soils are recovered from this method, it is assumed these tests were undertaken in the Seaford Chalk Formation as all test began in this stratum at the base of the windowless sampling boreholes, and the chalk is generally >50m thick.

4.5.3 Standard Penetration Tests (SPT) were undertaken in the windowless sampler borehole locations to a maximum depth of 6.0m bgl. SPT 'N' values generally ranged between N=19 and N=27 within the Clay-With-Flints Formation and between N=15 and N=29 within the Seaford Chalk Formation. This correlates to medium to high strength cohesive soils (based on correlations postulated by Stroud & Butler, 1975 and Stroud, 1989).

4.5.4 A single N value of >50 was recorded as the SPT refused at 2.9m bgl in WS7, although all other results were generally consistent across the site and with depth. This test may have encountered an obstruction (such as a cobble) and therefore the result has been excluded from the tables below as an anomaly.

4.5.5 The results of geotechnical laboratory testing undertaken from the recovered samples of the Clay-With-Flints Formation and Seaford Chalk Formation are summarised in Table 4.2.

Table 4.2: Summary of Geotechnical Test Results

Parameter		Clay-With-Flints Formation	Seaford Chalk Formation
Moisture Content (%)		16 - 31	23 - 28
Saturation Moisture Content (%)		-	28 - 33
Liquid Limit (%)		68 - 91	29 - 33
Plastic Limit (%)		26 - 42	22 - 25
Plasticity Index (%)		32 - 52	7 - 8
Modified Plasticity Index (%)		24 - 48	7 - 8
Volume Change Potential [NHBC and BRE]		Medium to High	Non Shrinkable
Particle Size Distribution	Gravel (%)	0 - 10	14 - 69
	Sand (%)	3 - 13	6 - 10

Parameter		Clay-With-Flints Formation	Seaford Chalk Formation
	Clay/Silt (%)	85 - 96	25 - 76
pH		5.2 - 7.7	8.4 - 8.7
Water soluble sulphate (g/l)		0.0046 - 0.039	0.0013 - 0.0023
Acid soluble sulphate (%)		0.010 - 0.045	0.028 - 0.033
Total Sulphur (%)		<0.005 - 0.019	0.010 - 0.011
SPT (N)		19 - 27	15 - 29

4.6 Summary of General Derived Properties

4.6.1 Based on the analysis of the ground investigation data and past experience with similar deposits, the general parameters given in Table 4.3, have been derived for the Clay-With-Flints Formation and Seaford Chalk Formation materials.

Table 4.3: Derived Parameters for Clay-With-Flints Formation and Seaford Chalk Formation

Property*	Clay-With-Flints Formation	Seaford Chalk Formation
Unit Weight	18	18
Drained Friction, φ' (◦)[1)]	20 - 23	30 - 31
Drained Cohesion, c' (kPa)	0	0
SPT 'N' Value	19 - 27	15 - 29
Undrained Young's Modulus, E_u (MPa)[2)]	23 - 32	18 - 35
Drained Young's Modulus E' (MPa)[3)]	17.1 – 24.3	13.5 – 26.1
Undrained Shear Strength, c_u (kPa)[4)]	85 - 121	75 - 145
Plasticity Index (%)	32 - 52	7 - 8
Modified Plasticity Index (%)	24 - 48	7 - 8
Volume Change Potential [NHBC]	Medium to High	Non Shrinkable
Modulus of Volume Compressibility, m_v (m^2/MN)[5)]	0.082 - 0.101	0.077 - 0.148

[1)] Calculated from: $\varphi' = (42° - 12.5\log10I_p)$ for $5\% \leq I_p \leq 100\%$ Where, I_p is the soil's plasticity index (BS8002:2015).
[2)] Calculated from: E_u = 1.2 N MPa, based on the guidance given in CIRIA Report 143.
[3)] Calculated from E' = 0.9 N MPa, based on the guidance given in CIRIA Report 143.
[4)] The undrained shear strength (c_u) of the cohesive soils was correlated to the SPT "N" values using Stroud (1974), where $c_u=f_1N$ and f_1 is factor related to the Plasticity Index (PI) of the clay (a value of f_1 equal to 5.0 for PI ≤ 25% and a value of f_1 value equal to 4.5 for PI>25).
[5)] Calculated from: $m_v = 1/f_2$ N m^2/MN, f_2 is a coefficient proposed by Stroud and Butler (1975) and varies with Plasticity Index (PI) and presented in Figure 27 of CIRIA Report 27.
*These reported values are not considered as '*Characteristic Values*'.

4.6.2 Whilst solution features can be present within the Chalk, no evidence of any such features was identified within initial excavations, in-situ testing or observed as surface features such as localised depressions. Nonetheless, if any abnormal conditions, such as sudden changes in ground conditions, are encountered during the course of the construction works it would be

prudent for them to be inspected by a Geotechnical Engineer. Remedial treatment may include over-excavation and infilling with mass-fill concrete, additional reinforcement or the like.

5 RISK ASSESSMENT – ANALYTICAL FRAMEWORK

5.1 Context and Objectives

5.1.1 This section seeks to evaluate the level of chronic risk pertaining to human health and the environment which may result from both the existing use and proposed future use of the site. It makes use of the ground investigation findings, as described in the previous sections, to evaluate further the potential pollutant linkages identified in the desk study. A combination of qualitative and quantitative techniques is used, as described below.

5.1.2 The purpose of generic quantitative risk assessment is to compare concentrations of contaminants found on site against generic assessment criteria (GAC) to establish whether there are actual or potential unacceptable risks. It also determines whether further detailed assessment is required. The approaches detailed all broadly fit within a tiered assessment structure in line with the framework set out in the Department of Environment, Food and Rural Affairs (DEFRA), EA and Institute for Environment and Health Publication, Guidelines for Environmental Risk Assessment and Management.

5.2 Analytical Framework – Soils

5.2.1 There is no single methodology that covers all the various aspects of the assessment of potentially contaminated land and groundwater. Therefore, the analytical framework adopted for this investigation is made up of a number of procedures, which are outlined below. All of these are based on a Risk Assessment methodology centred on the identification and analysis of Source – Pathway – Receptor linkages.

5.2.2 The CLEA model provides a methodology for quantitative assessment of the long term risks posed to human health by exposure to contaminated soils. Toxicological data have been used to calculate Soil Guideline Values (SGV) for individual contaminants, based on the proposed site use; these represent minimal risk concentrations and may be used as screening values.

5.2.3 In the absence of any published SGVs for certain substances, or where the assumptions made in generating the SGVs do not apply to the site, Jomas Associates Limited have compared the soil analytical results to other available GAC, including the LQM/CIEH S4ULs and DEFRA C4SL. Site-specific assessments are undertaken wherever possible and/or applicable. All assessments are carried out in accordance with the CLEA protocol.

5.2.4 The assessment criteria used for the screening of determinands within soils are identified within Table 5.1.

Table 5.1: Selected Assessment Criteria – Contaminants in Soils

Substance Group	Determinand(s)	Assessment Criteria Selected
Organic Substances		
Non-halogenated Hydrocarbons	Total Petroleum Hydrocarbons (TPHCWG banded)	S4UL
	Total Phenols	S4UL
Polycyclic Aromatic Hydrocarbons (PAH-16)	Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, Benzo(ghi)perylene	S4UL
Volatile Organic Compounds (VOCs/sVOCs).	Toluene, Ethylbenzene, Benzene, Xylenes	S4UL
Inorganic Substances		
Heavy Metals and Metalloids	Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Copper, Zinc	S4UL
	Copper, Zinc, Nickel	BS: 3882 (2015).
Cyanides	Free Cyanide	CLEA v1.06
Sulphates	Water Soluble Sulphate	BRE Special Digest 1:2005

5.2.5 It is understood that the site is to be developed to provide residential units, including private gardens. As a result, the site has been assessed with regards to a residential with plant uptake end use scenario.

5.2.6 GAC have been selected with consideration to the Soil Organic Matter content of the soil. From the soils analytical results, the value for Total Organic Carbon for the Topsoil ranges between 0.6-3.8%, which gives an equivalent SOM range of 1.0-6.5%. Therefore, published GAC have been selected as those derived assuming a SOM of 1%.

5.3 BRE

5.3.1 The BRE Special Digest 1:2005, 'Concrete in Aggressive Ground' is used with soluble sulphate and pH results to assess the aggressive chemical environment of future underground concrete structures at the site.

6 GENERIC QUANTITATIVE RISK ASSESSMENT – SOIL DATA

6.1 Screening of Soil Chemical Analysis Results – Human Health Risk Assessment

6.1.1 Laboratory analysis for soils are summarised in Tables 6.1 to 6.3. Raw laboratory data is included in Appendix 3.

Table 6.1: Soil Laboratory Analysis Results – Metals, Metalloids, Phenol, Cyanide

Determinand	Unit	No. samples tested	Screening Criteria		Min	Max	No. Exceeding
Arsenic	mg/kg	14	S4UL	37	9.9	29	0
Cadmium	mg/kg	14	S4UL	11	<0.2	1.2	0
Chromium	mg/kg	14	S4UL	910	23	69	0
Lead	mg/kg	14	C4SL	200	20	140	0
Mercury	mg/kg	14	S4UL	40	<0.3	1.6	0
Nickel	mg/kg	14	S4UL	180	16	88	0
Copper	mg/kg	14	S4UL	2400	14	51	0
Zinc	mg/kg	14	S4UL	3700	42	150	0
Total Cyanide [A]	mg/kg	14	CLEA v 1.06	33	<1.0	<1.0	0
Selenium	mg/kg	14	S4UL	250	<1.0	<1.0	0
Boron Water Soluble	mg/kg	14	S4UL	290	<0.2	0.9	0
Phenols	mg/kg	14	S4UL	120	<1.0	<1.0	0

Notes: [A] Generic assessment criteria derived for free inorganic cyanide.

Table 6.2: Soil Laboratory Analysis Results – Polycyclic Aromatic Hydrocarbons (PAHs)

Determinand	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
Naphthalene	mg/kg	14	S4UL	2.3	<0.05	<0.05	0
Acenaphthylene	mg/kg	14	S4UL	170	<0.05	<0.05	0
Acenaphthene	mg/kg	14	S4UL	210	<0.05	<0.05	0
Fluorene	mg/kg	14	S4UL	170	<0.05	0.32	0
Phenanthrene	mg/kg	14	S4UL	95	<0.05	3.9	0
Anthracene	mg/kg	14	S4UL	2400	<0.05	0.74	0
Fluoranthene	mg/kg	14	S4UL	280	<0.05	3.2	0
Pyrene	mg/kg	14	S4UL	620	<0.05	2.5	0
Benzo(a)anthracene	mg/kg	14	S4UL	7.2	<0.05	1.7	0
Chrysene	mg/kg	14	S4UL	15	<0.05	1.3	0

Determinand	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
Benzo(b)fluoranthene	mg/kg	14	S4UL	2.6	<0.05	1.3	0
Benzo(k)fluoranthene	mg/kg	14	S4UL	77	<0.05	0.73	0
Benzo(a)pyrene	mg/kg	14	S4UL	2.2	<0.05	1.1	0
Indeno(123-cd)pyrene	mg/kg	14	S4UL	27	<0.05	0.9	0
Dibenzo(ah)anthracene	mg/kg	14	S4UL	0.24	<0.05	<0.05	0
Benzo(ghi)perylene	mg/kg	14	S4UL	320	<0.05	1.2	0
Total PAH	mg/kg	14	-	-	<0.80	18.8	-

Table 6.3: Soil Laboratory Analysis Results – Total Petroleum Hydrocarbons (TPH)

TPH Band	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
C_8-C_{10}	mg/kg	6	S4UL	27	<0.1	<0.1	0
>C_{10}-C_{12}	mg/kg	6	S4UL	74	<2.0	<2.0	0
>C_{12}-C_{16}	mg/kg	6	S4UL	140	<4.0	5.3	0
>C_{16}-C_{21}	mg/kg	6	S4UL	260	<1.0	12	0
>C_{21}-C_{35}	mg/kg	6	S4UL	1100	<10	<10	0
Total TPH	mg/kg	6	-	-	<17.1	<29.4	-

Note: *The lower value of guidelines for Aromatic/Aliphatics has been selected

6.2 Asbestos in Soil

6.2.1 14No. samples were screened in the laboratory for the presence of asbestos.

6.2.2 No asbestos fibres were reported in samples analysed in the laboratory.

6.3 Vapour Risk Assessment from a Soil Source

6.3.1 As outlined in Tables 6.2 & 6.3, no polyaromatic hydrocarbons or petroleum hydrocarbon fractions have been found in excess of their generic screening criteria for the protection of human health within a 'residential with plant uptake' end-use scenario.

6.3.2 The generic screening criteria considers all possible pathways between the source and the receptor. Therefore, it is considered that there is a negligible risk to end users of the proposed development associated with vapour risk inhalation from soils.

6.4 Summary of Human Health Generic Quantitative Risk Assessment

6.4.1 In summary, no exceedances of contaminants above the GAC were recorded in any of the soil samples tested.

6.5 Screening of Soil Chemical Analysis Results – Potential Risks to Plant Growth

6.5.1 Zinc, copper and nickel are phytotoxins and could therefore inhibit plant growth in soft landscaped areas. Concentrations measured in soil for these determinands have been compared with the pH dependent values given in BS:3882 (2015). This does not constitute a full BS:3882 topsoil test.

6.5.2 Table 6.4 shows the soil analytical results compared with the relevant screening values, adopting a pH value of less than 6, as this is the most conservative screening criteria based on the results of the laboratory analysis (pH of 5.2 - 8.7).

Table 6.4: Soil Laboratory Analysis Results – Phytotoxic Determinands

Determinand	Threshold level (mg/kg)	Min (mg/kg)	Max (mg/kg)	No. Exceeding
Nickel	<60	16	88	2No.: TP6 at 1.0m bgl TP10 at 0.5m bgl
Copper	100	14	51	0
Zinc	200	42	150	0

6.5.3 Two samples have recorded nickel in excess of the threshold level. The current topsoil may not satisfy the requirements of BS:3882 but as no signs of dieback or vegetation distress were observed, it is not considered to be significantly detrimental to plant growth.

6.6 Screening for Water Pipes Materials

6.6.1 The results of the analysis have been assessed for potential impact upon water supply pipes. Table 6.5 below summarises the findings of the assessment:

Table 6.5: Screening Guide for Water Pipes

Determinand	No. of tests	Threshold adopted for PE (mg/kg)	Value for site data (mg/kg)		No of Exceedances
			Min	Max	
Total VOCs	0	0.5	N/A	N/A	-
BTEX	0	0.1	N/A	N/A	-
MTBE	0	0.1	N/A	N/A	-
EC5-EC10	14	1	<0.1*	<0.1*	0
EC10-EC16	14	10	<6.0*	<7.3	0
EC16-EC40	14	500	<11*	<22	0
Naphthalene	14	5	<0.05*	<0.05*	0
Phenols	14	2	<1.0*	<1.0*	0

*Laboratory detection limit

6.6.3 Determinands marked “N/A” were not analysed for as no evidence of their presence was obtained from the Desk Study.

6.6.4 The above suggests that upgraded pipe work is unlikely to be required.

6.6.5 The water supply pipe requirements for this site should be discussed at an early stage with the relevant Utility provider.

6.7 Assessment of Soil Analytical Data with Respect to Controlled Waters

6.7.1 At the Preliminary Risk Assessment (Desk Study) stage, risk to controlled waters were considered to be low.

6.7.2 The following controlled waters receptors were identified:

- Principal aquifer within the Seaford Chalk Formation
- Principal Inland river/drain on site

6.7.3 The ground conditions encountered are considered to confirm the expected geological succession. Soils encountered were predominantly cohesive and therefore relatively impermeable (see Section 9.7). This confirms the lack of pathways for migration of leachable / mobile contamination.

6.7.4 Furthermore, no visual / olfactory evidence of potentially mobile contamination was encountered, and this was reinforced by low concentrations of hydrocarbons detected in soils. Therefore, a pollutant linkage to controlled waters is not considered to exist.

6.8 Waste Characterisation

6.8.1 The classification of materials for waste disposal purposes was outside the scope of this report. Should quantities of material require off-site disposal, waste classification will be required to determine whether soils may be treated as hazardous or non-hazardous.

6.8.2 Note that Waste Acceptance Criteria (WAC) analysis may then be required by the landfill operator to determine whether materials can be disposed of at either an inert, stable non-reactive hazardous or hazardous landfill.

7 SOIL GAS RISK ASSESSMENT

7.1 Soil Gas Results

7.1.1 Four return monitoring visits have been undertaken between 13th May and 10th June 2022, to monitor wells installed within boreholes at the site for soil gas concentrations and groundwater levels.

7.1.2 During these visits atmospheric pressure ranged between 990mb and 1006mb. During these visits pressure trends observed were falling and rising.

7.1.3 The results of the monitoring undertaken are summarised in Table 7.1 below, with the monitoring records presented in Appendix 8.

Table 7.1: Summary of Gas Monitoring Data

Hole No.	Number of monitoring events	CH_4 (%)	CO_2 (%)	O_2 (%)	VOCs (ppm)	Steady Flow Rate (l/hr)	Peak Flow Rate (l/hr)	Depth to water (m bgl)	Well Response Zone as installed (top / bottom) (m bgl)	Strata targeted by response zone
WS1	3	0.1 - 0.3	0.2 - 0.7	19.2 - 21.3	0.2 - 0.5	0.0 - 0.1	0.1	Dry	1.0 - 6.0	Clay-With-Flints Formation and Seaford Chalk Formation
WS3	4	0.1 - 0.3	0.1 - 0.4	19.9 - 21.6	0.2 - 0.4	0.0 - 0.1	0.1			
WS4	3	0.1 - 0.4	0.6 - 1.2	17.9 - 20.4	0.2 - 0.4	0.0 - 0.2	0.2			
WS5	3	0.1 - 0.4	0.2 - 0.8	20.1 - 20.7	0.2 - 0.6	0.1 - 0.2	0.2			
WS7	3	0.1 - 0.3	0.7 - 2.1	18.4 - 20.5	0.2 - 0.6	0.0 - 0.1	0.1		1.0 - 2.9	
WS8	4	0.1 - 0.3	0.0 - 0.2	20.0 - 21.4	0.1 - 0.5	0.0 - 0.1	0.1		1.0 - 4.6	

7.2 Screening of Results

7.2.1 As shown in Table 7.1, methane has been reported to a maximum concentration of 0.4% v/v. Carbon dioxide has been reported to a maximum concentration of 2.1% v/v. Screening of the monitoring well headspaces with a photo-ionisation detector (PID) has detected maximum Volatile Organic Compound (VOC) concentration to a maximum level of 0.6 ppm. A maximum flow rate of 0.2l/hr has been reported.

7.2.2 In the assessment of risks posed by hazardous ground gases and selection of appropriate mitigation measures, BS8485 (2015) + A1 (2019) identifies four types of development, termed Type A to Type D.

7.2.3 Type A buildings are defined as

> *"private ownership with no building management controls on alternations to the internal structure, the use of rooms, the ventilation of rooms or the structural fabric of the building. Some small rooms present. Probably conventional building construction (rather than civil engineering). Examples include private housing and some retail premises."*

7.2.4 Type A has been adopted as the relevant category for the proposed development.

7.2.5 The soil gas assessment method is based on that proposed by Wilson & Card (1999), which was a development of a method proposed in CIRIA publication R149 (CIRIA, 1995). The method uses both gas concentrations and borehole flow rates to define a characteristic situation based on the limiting borehole gas volume flow for methane and carbon dioxide. In both these methods, the limiting borehole gas volume flow is renamed as the Gas Screening Value (GSV).

7.2.6 The Gas Screening Value (litres of gas per hour) is calculated by using the following equation

GSV = (Concentration/100) X Flow rate

Where concentration is measured in percent (%)
and flow rate is measured in litres per hour (l/hr)

7.2.7 To accord with C665, worst case conditions are used in the calculation of GSVs for the site. These have been summarised below in Table 7.2.

7.2.8 The Characteristic Situation is then determined from Table 8.5 of CIRIA C665.

Table 7.2: Summary of Gas Monitoring Data

Gas	Concentration (v/v %)	Peak Flow Rate (l/hr)	GSV (l/hr)	Characteristic Situation (after CIRIA C665)
CO_2	2.1	0.2	**0.0042**	**1**
CH_4	0.4	0.2	**0.0008**	**1**

7.2.9 Based on the calculated GSVs, and in consideration of the conceptual site model, the site is classified as Characteristic Situation 1 (CS1) and no formal gas protection measures are currently considered to be necessary.

7.2.10 BS 8576:2013 has been used to derive threshold levels for carbon monoxide and volatile organic compounds.

7.2.11 Given the recorded levels it is not considered that additional protection measures need to be incorporated to protect end users from the recorded carbon monoxide concentrations.

7.2.12 PID screening of the monitoring well headspace has revealed concentrations of VOCs of <1ppm. Therefore, it is considered that the PID screening of monitoring well confirms the assessment that risks to human health receptors via vapour inhalation pathways are negligible.

8 GEO-ENVIRONMENTAL ASSESSMENT SUMMARY AND RECOMMENDATIONS

8.1 Land Quality Impact Summary

8.1.1 Following the ground investigation, the following is noted:

- It is proposed to build a new residential housing development which will include private gardens.
- Following generic risk assessments, no elevated concentrations of common chemical contaminants were detected in soils in excess of generic assessment criteria for the protection of human health within a human health end-use scenario.
- No asbestos fibres were detected in the samples analysed in the laboratory.
- The risk to end users associated with vapour risk inhalation from soils is considered negligible.
- The risk to controlled waters from soils is considered negligible.
- A significant risk to plant growth has not been identified.
- Based on the calculated GSVs, and in consideration of the conceptual site model, the site is classified as Characteristic Situation 1 (CS1) and no formal gas protection measures are currently considered to be necessary.
- Upgraded potable water supply pipe materials are unlikely to be required. The water supply pipe requirements for this site should be discussed at an early stage with the relevant Utility provider
- Following the land contamination assessment, no further assessment or risk mitigation is required, and the site can be considered suitable for the proposed use.
- As with any ground investigation, the presence of further hotspots between sampling points cannot be ruled out. Should any contamination be encountered, a suitably qualified environmental consultant should be informed immediately, so that adequate measures may be recommended.

8.1.2 The above conclusions are made subject to approval by the statutory regulatory bodies.

8.2 Review of Pollutant Linkages Following Ground Investigation

8.2.1 The site CSM has been revised and updated from that suggested in the desk study in view of the ground investigation data, including soil laboratory analysis results. Table 8.1 highlights whether pollutant linkages identified in the original CSM are still relevant following the risk assessment, or whether pollutant linkages, not previously identified, exist.

Table 8.1: Plausible Pollutants Linkages Summary

Potential Source (from desk study)	Pathway	Receptor	Relevant Pollutant Linkage?	Comment
• Current and previous industrial use – off site within 200m (S1) - Quarry 150m W - Electricity substation 150m E, 200m N • Potentially infilled land uses – off site within 200m (S2) - Quarry 150m W • Potentially disturbed or made ground on site (S3)	• Ingestion and dermal contact with contaminated soil (P1) • Inhalation or contact with potentially contaminated dust and vapours (P2) • Permeation of water pipes and attack on concrete foundations by aggressive soil conditions (P6)	• Construction workers (R1) • Maintenance workers (R2) • Neighbouring site users (R3) • Future site users (R4) • Building foundations and on site buried services (water mains, electricity and sewer) (R5)	**X**	A significant possibility of significant harm to human health has not been identified. The findings of this report should be included in the construction health and safety file, with adequate measures put in place for the protection of construction and maintenance workers. Contact should be made with relevant utility providers to confirm if upgraded materials are required. The concrete classification to protect buried concrete is discussed in Section 9.3
	• Accumulation and migration of soil gases (P5)		**X**	The site has been characterised as CS1 and no gas protection measures are deemed necessary.
	• Leaching through permeable soils, migration within the vadose zone (i.e., unsaturated soil above the water table) and/or lateral migration within surface water, as a result of cracked hardstanding or via service pipe/corridors and surface water runoff. (P3) • Horizontal and vertical migration of contaminants within groundwater (P4)	• Neighbouring site users (R3) • Building foundations and on site buried services (water mains, electricity and sewer) (R5) • Controlled waters (R6) - Principal aquifer - Inland river/drain on site	**X**	A significant risk of impact to controlled waters has not been identified. The concrete classification to protect buried concrete is discussed in Section 9.3

9 GEOTECHNICAL ENGINEERING RECOMMENDATIONS

9.1 General

9.1.1 Subsequent to intrusive investigation of the site and receipt of the laboratory test results, the following geotechnical assessments have been made.

9.2 Proposed Foundations

General

9.2.1 Topsoil/Made Ground are not considered to provide suitable bearing strata due to their variability and the unacceptable risk of total and differential settlement.

9.2.2 All topsoil should be stripped from beneath proposed structures ahead of development.

9.2.3 All foundations should be deepened beneath these deposits, soft clay, root or desiccated zones, or disturbed ground, and founded within underlying competent strata.

Conventional Foundations

9.2.4 Based on the ground and groundwater conditions encountered, conventional shallow foundations are likely to be suitable for the proposed development.

9.2.5 It is considered that traditional strip/trench-fill foundations up to 1m wide may be formed within the underlying Clay-with-flints Formation at a minimum depth of 1.0m for an allowable bearing capacity of 100kPa. Total and differential settlements should be contained within tolerable limits.

9.2.6 This depth, however, does not take into account the depth of Made Ground or the distance to and species of any previous, existing and proposed trees, and foundations may need to be deepened further accordingly, in accordance with NHBC requirements, for soils of high volume change potential.

9.2.7 Where foundations need to change levels as a result, the foundations should be stepped and reinforced. These steps should be no deeper than half of the width of the foundation and each step should not exceed 0.5m.

9.2.8 As soils of high volume change potential are present, heave precautions will be required against the side of foundations and ground beams in accordance with the requirements set out in NHBC Standards Chapter 4.2.

9.2.9 If foundations span different strata, e.g. sand and clay, they should either be deepened to terminate in a single soil stratum, or suitable reinforcement included (to be detailed by the Structural Engineer).

9.2.10 Foundations greater than 2.50m deep would require structure-specific design by a structural engineer.

9.2.11 Where any unexpected or soft ground conditions are encountered during the groundworks, works in that area should cease and the advice of a suitably qualified geotechnical engineer sought.

9.2.12 In the event that conventional foundations are not suitable, e.g. due to the required depth of construction and/or where tree influence would dictate conventional foundations exceeding 2.5m bgl, alternative such as piled foundations would be considered suitable. Deeper boreholes would be required to inform their design.

9.3 Sulphates

9.3.1 Sulphate attack on building foundations occurs where sulphate solutions react with the various products of hydration in Ordinary Portland Cement (OPC) or converted High-Alumina Cement (HAC). The reaction is expansive, and therefore disruptive, not only due to the formation of minute cracks, but also due to loss of cohesion in the matrix.

9.3.2 In accordance with BRE Special Digest 1, the characteristic values of sulphate used to determine the concrete classification are determined using the methodology summarised in the table below.

Table 9.1: Concrete in the Ground Characteristic Value Determination

No Samples in the dataset	Method for determining the sulphate characteristic value
1 - 4	Highest value
5-9	Mean of the top 2No highest results
10 or greater	Mean of the top 20% highest results

9.3.3 Table 9.2 summarises the analysis of the aggressive nature of the ground for each of the strata encountered within the ground investigation.

Table 9.2: Concrete in the Ground Classes

Stratum	No Samples	pH range	Characteristic WS Sulphate (mg/l)	Design Sulphate Class	ACEC Class
Topsoil	10	6.0 - 7.3	18.15	DS-1	AC-1
Clay-With-Flints Formation	11	5.2 - 7.7	33	DS-1	AC-1
Seaford Chalk Formation	4	8.4 - 8.7	2.3	DS-1	AC-1

9.3.4 The analysis indicated that the soils beneath the site do not contain appreciable concentrations of oxidisable sulphides, therefore there is no likelihood of sulphate concentrations increasing in the future due to disturbance of soils and exposure to air.

9.3.5 The concrete structures, including foundations, will need to be designed in accordance with BS EN 1992-1-1:2004+A1:2014. It is recommended that the advice of this publication be taken for the design and specification of all sub-surface concrete.

9.4 Ground Floor Slabs

9.4.1 Given the presence of shrinkable soils, it is recommended that suspended floor slabs are used with an adequate void designed according to NHBC Standards. As a guide, initial modelling indicates a requirement for a sub-floor void of at least 300mm due to the presence of shrinkable soils of high volume change potential.

9.5 Excavations

9.5.1 Temporary excavations within the topsoil and granular soils are unlikely to remain stable and some form of temporary support or battering back to a safe angle and dewatering are likely to be required.

9.5.2 Temporary excavations within the cohesive soils are likely to remain relatively stable in the short term though some spalling may be anticipated.

9.5.3 Ground works should always be designed in such a manner to avoid entry into excavations by construction or maintenance personnel. However, in the event that such works cannot be avoided or designed out, they should only be undertaken in accordance with a safe system of work, following an appropriate risk assessment and in accordance with any legislative requirements, e.g. Confined Spaces Regulations.

9.5.4 Subject to seasonal variations, surface water/groundwater encountered during site works could likely be dealt with by conventional pumping from a sump used to collate waters.

9.6 Pavement and Subgrade

9.6.1 Eight in-situ California Bearing Ratio (CBR) tests were undertaken across the site using a Dynamic Penetrometer (DCP). Table 9.3 summarises the results of the in-situ CBR testing.

Table 9.3 – Summary of CBR Test Results

Position	Depth Range (mm)	Stratum	Average DCP CBR (%)
CBR1	100 - 200	Topsoil	5.1
	200 - 600	Topsoil/Clay-With-Flints Formation	11.6
	600 - 1000	Clay-With-Flints Formation	20.9
CBR2	100 - 400	Topsoil	7.6
	400 - 800	Clay-With-Flints Formation	14.9
	800 - 1000	Clay-With-Flints Formation	22.2
CBR3	100 - 300	Topsoil	7.6
	300 - 600	Clay-With-Flints Formation	12.0
	600 - 1000	Clay-With-Flints Formation	16.2
CBR4	100 - 200	Topsoil	2.5
	200 - 300	Topsoil	7.7
	300 - 700	Clay-With-Flints Formation	10.9
	700 - 1000	Clay-With-Flints Formation	16.4

Position	Depth Range (mm)	Stratum	Average DCP CBR (%)
CBR5	100 - 300	Topsoil	10.3
	300 - 600	Clay-With-Flints Formation	10.3
	600 - 1000	Clay-With-Flints Formation	14.9
CBR6	100 - 200	Topsoil	2.5
	200 - 300	Topsoil	12.9
	300 - 500	Clay-With-Flints Formation	6.3
	600 - 1000	Clay-With-Flints Formation	17.5
CBR7	100 - 300	Topsoil	6.3
	300 - 700	Clay-With-Flints Formation	11.6
	700 - 1000	Clay-With-Flints Formation	19.9
CBR8	100 - 500	Topsoil/Clay-With-Flints Formation	8.9
	500 - 600	Clay-With-Flints Formation	15.5
	600 - 800	Clay-With-Flints Formation	26.2
	800 - 1000	Clay-With-Flints Formation	12.9

9.6.2 Furthermore, CBR values were estimated based on the Atterberg Limit Test results and the Transport and Road Research Laboratory Report (LR1132) entitled 'The Structural Design of Bituminous Roads' (1984) cites estimated equilibrium suction indices of between 2% and 4% for sandy silty clay with Plasticity Indices ranging between 30% and 50%, such as those of the Clay-With-Flints Formation at anticipated formation depth, under average construction conditions and a presumed low water table. It is considered that the DCP results gave higher CBR values due to the presence of some gravel within the formation and variation in test method.

9.6.3 Based on both the estimated CBR value and the results of the in-situ testing, it is recommended that a preliminary CBR design value of 4% is adopted for the Clay-With-Flints Formation.

9.6.4 Additional CBR testing should be undertaken after detailed design is complete to confirm suitability.

9.7 Soakaways

BRE 365 Soakage Tests

9.7.1 Table 9.4 summarises the soakage rates, which were calculated based on the results of the soakage testing:

Table 9.4 – Summary of BRE 365 Soakage Test Results

Position	Geology	Calculated Infiltration Rates (m/s)		
		1st cycle	2nd Cycle	3rd Cycle
TP2	Seaford Chalk Formation	1.31×10^{-4}	1.77×10^{-4}	-
TP3	Clay-With-Flints Formation	N/D	-	-
TP5	Seaford Chalk Formation	7.81×10^{-6}	-	-
TP6*	Clay-With-Flints Formation/Seaford Chalk Formation	7.02×10^{-6}	2.84×10^{-5}	-
TP7	Clay-With-Flints Formation	N/D	-	-
TP10	Seaford Chalk Formation	8.84×10^{-6}	-	-

N/D: *Not determined due to insufficient fall in head over two-day period*

***** *Pit depth had reduced by 0.4m due to spalling overnight between 1st and 2nd test cycles.*

9.7.2 There was insufficient fall in water level in TP3 and TP7 to calculate or estimate an infiltration rate. This corresponds with tests that were undertaken entirely within deposits of Clay-With-Flints Formation, which were logged on site as having a higher fines content compared to the Seaford Chalk Formation.

9.7.3 Based on the above results and ground conditions encountered on site, it is considered that conventional soakaways may be suitable for discharging storm water run-off to the ground. However, these would require careful design given the variable infiltration rates calculated. The permeability chalk is governed by fracture flow; hence the permeability results are likely to alter across the site with changes in the fractures across the area. Testing is recommended at the precise depth and location of proposed soakaways, once this is known, to confirm the infiltration rate.

9.7.4 It should be noted that surface settlement and instability of local areas is possible when soakaways are formed in superficial deposits overlying chalk.

9.7.5 Soakaways installed directly within the chalk should be positioned as far away as possible from the proposed buildings, and it would be preferable to drain surface water to multiple smaller soakaways, to avoid concentrating a large volume of water in one or two locations.

9.7.6 Soakaways should be designed in accordance with the recommendations provided in BRE digest DG 365 (2016).

10 REFERENCES

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APPENDICES

APPENDIX 1 – FIGURES

PROJECT NAME	Blowers Wood	**CLIENT**	Redrow Homes Limited
TITLE	Site Location Plan	**PROJECT NO.**	P4266J2508
DATE	March 2022	**FIGURE NO.**	1

PROJECT NAME	Blowers Wood	**CLIENT**	Redrow Homes Limited
TITLE	Completed Exploratory Hole Plan	**PROJECT NO.**	P4266J2508
DATE	April 2022	**FIGURE NO.**	2

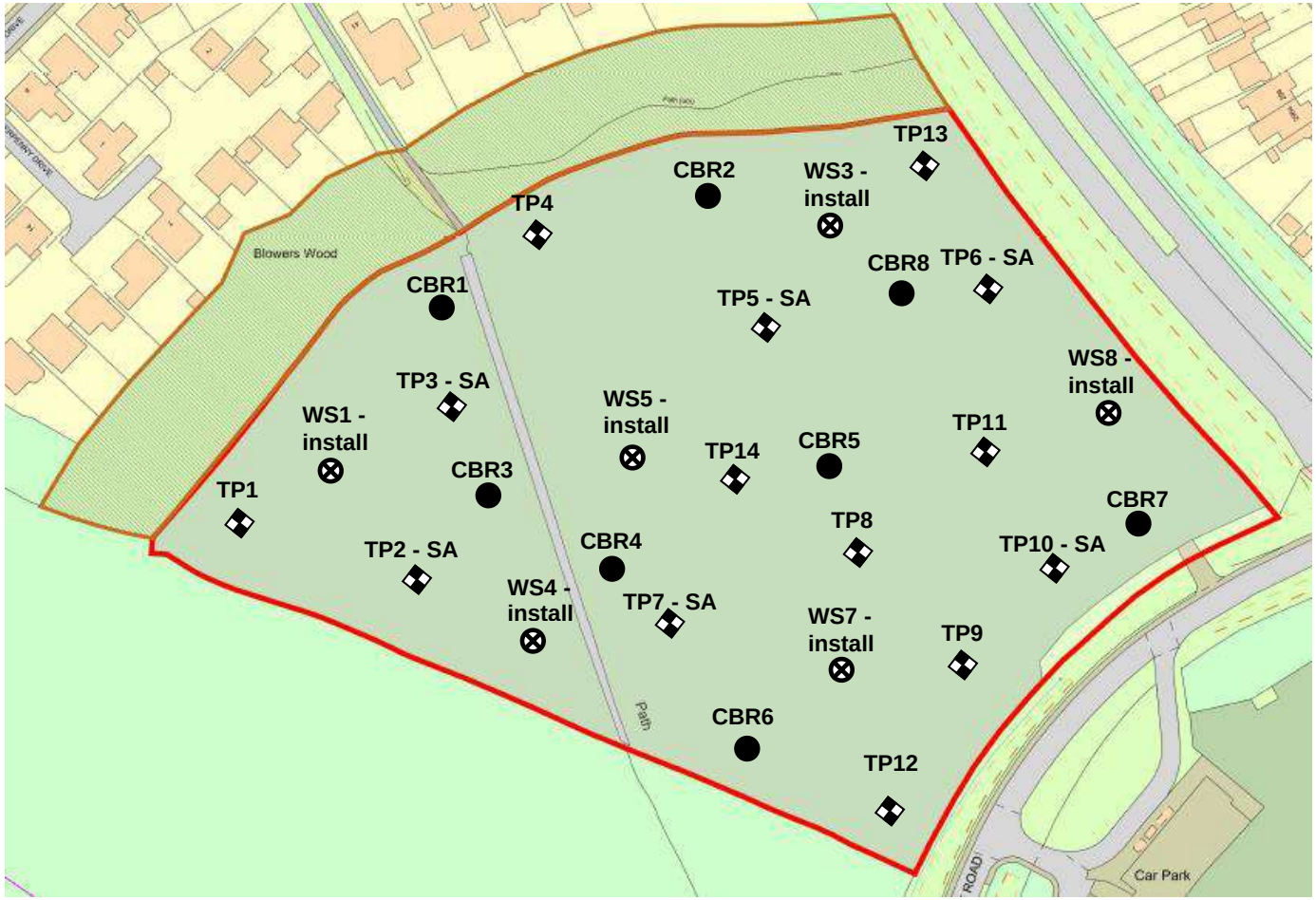

Figure 3 - Proposed Development Plan

APPENDIX 2 – EXPLORATORY HOLE RECORDS

WINDOW/WINDOWLESS SAMPLING BOREHOLE RECORD

Exploratory Hole No:	WS1		
Site Address:	Blowers Wood Site, Hempstead, Gillingham ME7 3DT	Project No:	P4266J2508
Client:	Redrow Homes	Ground Level:	0.00
Logged By:	MD	Date Commenced:	20/04/2022
Checked By:	SL	Date Completed:	20/04/2022
Type and diameter of equipment:	Windowless Sampler Rig	Sheet No:	1 Of 2

Water levels recorded during boring, m

Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks

1: No groundwater reported.

2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

3:

4:

Sample or Tests										Strata				
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description	Installation
		75	75	75	75	75	75	N						
									0.00					
ES	0.20										0.30		Grass over dark brown silty very gravelly sand with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)	
D	0.50								0.50				Stiff** brown slightly gravelly CLAY. Gravel consists of medium to coarse angular flints. (CLAY-WITH-FLINTS FORMATION)	
ES	0.70													
SPT	1.00	6		4	5	3	7	19	1.00					
D	1.50								1.50					
											1.90			
SPT	2.00	5		4	4	6	6	20	2.00				White structureless CHALK recovered as gravelly SILT with occasional cobbles. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE Dm)	
D	2.50								2.50					
SPT	3.00	4		2	3	4	6	15	3.00					
D	3.50								3.50					
SPT	4.00	6		4	5	5	5	19	4.00					
D	4.50								4.50					
SPT	5.00	7		5	5	6	6	22	5.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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WINDOW/WINDOWLESS SAMPLING BOREHOLE RECORD

Exploratory Hole No:	WS1		
Site Address:	Blowers Wood Site, Hempstead, Gillingham ME7 3DT	Project No:	P4266J2508
Client:	Redrow Homes	Ground Level:	0.00
Logged By:	MD	Date Commenced:	20/04/2022
Checked By:	SL	Date Completed:	20/04/2022
Type and diameter of equipment:	Windowless Sampler Rig	Sheet No:	2 Of 2

Water levels recorded during boring, m

Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks

1: No groundwater reported.

2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

3:

4:

Sample or Tests										Strata				
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description	Installation
		75	75	75	75	75	75	N						
SPT	5.00	7		5	5	6	6	22	5.00				White structureless CHALK recovered as gravelly SILT with occasional cobbles. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE Dm)	
D	5.50								5.50					
SPT	6.00	6		5	7	7	7	26	6.00		6.00			
									6.50					
									7.00					
									7.50					
									8.00					
									8.50					
									9.00					
									9.50					
									10.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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WINDOW/WINDOWLESS SAMPLING BOREHOLE RECORD

		Exploratory Hole No:	WS3
Site Address:	Blowers Wood Site, Hempstead, Gillingham ME7 3DT	Project No:	P4266J2508
Client:	Redrow Homes	Ground Level:	0.00
Logged By:	MD	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	Windowless Sampler Rig	Sheet No:	1 Of 2

Water levels recorded during boring, m

Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks

1: No groundwater reported.

2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

3:

4:

Sample or Tests										Strata				
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description	Installation
		75	75	75	75	75	75	N						
									0.00				Grass over dark brown silty very gravelly sand with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)	
ES	0.20										0.20			
													Stiff** brown slightly gravelly CLAY. Gravel consists of medium to coarse angular flints. (CLAY-WITH-FLINTS FORMATION)	
D	0.50								0.50					
ES	0.70													
									1.00					
SPT	1.20	6		6	6	7	6	25						
D	1.50								1.50		1.50			
													White structureless CHALK recovered as gravelly SILT with occasional cobbles. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE Dm)	
SPT	2.00	4		5	5	5	5	20	2.00					
D	2.50								2.50					
SPT	3.00	5		5	6	6	7	24	3.00					
D	3.50								3.50					
SPT	4.00	6		6	7	7	7	27	4.00					
D	4.50								4.50					
SPT	5.00	8		6	6	7	7	26	5.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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WINDOW/WINDOWLESS SAMPLING BOREHOLE RECORD

Exploratory Hole No:	WS3		
Site Address:	Blowers Wood Site, Hempstead, Gillingham ME7 3DT	Project No:	P4266J2508
Client:	Redrow Homes	Ground Level:	0.00
Logged By:	MD	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	Windowless Sampler Rig	Sheet No:	2 Of 2

Water levels recorded during boring, m

Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks

1: No groundwater reported.

2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

3:

4:

Sample or Tests									Strata				
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description	Installation
		75	75	75	75	75	75	N						
SPT	5.00	8		6	6	7	7	26	5.00				White structureless CHALK recovered as gravelly SILT with occasional cobbles. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE Dm)	
D	5.50								5.50					
SPT	6.00	7		6	7	8	8	29	6.00		6.00			
									6.50					
									7.00					
									7.50					
									8.00					
									8.50					
									9.00					
									9.50					
									10.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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WINDOW/WINDOWLESS SAMPLING BOREHOLE RECORD

Exploratory Hole No:	WS4		
Site Address:	Blowers Wood Site, Hempstead, Gillingham ME7 3DT	Project No:	P4266J2508
Client:	Redrow Homes	Ground Level:	0.00
Logged By:	MD	Date Commenced:	20/04/2022
Checked By:	SL	Date Completed:	20/04/2022
Type and diameter of equipment:	Windowless Sampler Rig	Sheet No:	1 Of 2

Water levels recorded during boring, m

Date:	22/04/2022					
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks

1: No groundwater reported.

2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

3:

4:

Sample or Tests										Strata				
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description	Installation
		75	75	75	75	75	75	N						
									0.00					
ES	0.20										0.30		Grass over dark brown silty very gravelly sand with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)	
D	0.50								0.50				Stiff** brown slightly gravelly CLAY. Gravel consists of medium to coarse angular flints. (CLAY-WITH-FLINTS FORMATION)	
ES	0.70													
SPT	1.00	6		5	5	6	6	22	1.00					
D	1.50								1.50					
											1.90			
SPT	2.00	5		4	4	4	5	17	2.00				White structureless CHALK recovered as gravelly SILT with occasional cobbles. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE Dm)	
D	2.50								2.50					
SPT	3.00	4		3	3	4	5	15	3.00					
D	3.50								3.50					
SPT	4.00	5		5	5	5	6	21	4.00					
D	4.50								4.50					
SPT	5.00	6		6	5	5	6	22	5.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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WINDOW/WINDOWLESS SAMPLING BOREHOLE RECORD

Exploratory Hole No:	WS4		
Site Address:	Blowers Wood Site, Hempstead, Gillingham ME7 3DT	Project No:	P4266J2508
Client:	Redrow Homes	Ground Level:	0.00
Logged By:	MD	Date Commenced:	20/04/2022
Checked By:	SL	Date Completed:	20/04/2022
Type and diameter of equipment:	Windowless Sampler Rig	Sheet No:	2 Of 2

Water levels recorded during boring, m

Date:	22/04/2022					
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks

1: No groundwater reported.

2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

3:

4:

Sample or Tests										Strata				
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description	Installation
		75	75	75	75	75	75	N						
SPT	5.00	6		6	5	5	6	22	5.00				White structureless CHALK recovered as gravelly SILT with occasional cobbles. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE Dm)	
D	5.50								5.50					
SPT	6.00	4		6	7	7	7	27	6.00		6.00			
									6.50					
									7.00					
									7.50					
									8.00					
									8.50					
									9.00					
									9.50					
									10.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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WINDOW/WINDOWLESS SAMPLING BOREHOLE RECORD

		Exploratory Hole No:	WS5
Site Address:	Blowers Wood Site, Hempstead, Gillingham ME7 3DT	Project No:	P4266J2508
Client:	Redrow Homes	Ground Level:	0.00
Logged By:	MD	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	Windowless Sampler Rig	Sheet No:	1 Of 2

Water levels recorded during boring, m

Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks

1: No groundwater reported.

2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

3:

4:

Sample or Tests										Strata				
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description	Installation
		75	75	75	75	75	75	N						
									0.00				Grass over dark brown silty very gravelly sand with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)	
ES	0.20										0.20			
													Stiff** brown slightly gravelly CLAY. Gravel consists of medium to coarse angular flints (CLAY-WITH-FLINTS FORMATION)	
D	0.50								0.50					
ES	0.70													
SPT	1.00	4		6	6	7	7	26	1.00					
D	1.50								1.50					
											1.70			
													White structureless CHALK recovered as gravelly SILT with occasional cobbles. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE Dm)	
SPT	2.00	4		4	5	5	5	19	2.00					
D	2.50								2.50					
SPT	3.00	6		6	6	6	6	24	3.00					
D	3.50								3.50					
SPT	4.00	8		4	5	6	7	22	4.00					
D	4.50								4.50					
SPT	5.00	8		5	6	7	7	25	5.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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WINDOW/WINDOWLESS SAMPLING BOREHOLE RECORD

Exploratory Hole No:	WS5		
Site Address:	Blowers Wood Site, Hempstead, Gillingham ME7 3DT	Project No:	P4266J2508
Client:	Redrow Homes	Ground Level:	0.00
Logged By:	MD	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	Windowless Sampler Rig	Sheet No:	2 Of 2

Water levels recorded during boring, m

Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks

1: No groundwater reported.

2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

3:

4:

Sample or Tests										Strata				
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description	Installation
		75	75	75	75	75	75	N						
SPT	5.00	8		5	6	7	7	25	5.00				White structureless CHALK recovered as gravelly SILT with occasional cobbles. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE Dm)	
D	5.50								5.50					
SPT	6.00	7		6	7	8	8	29	6.00		6.00			
									6.50					
									7.00					
									7.50					
									8.00					
									8.50					
									9.00					
									9.50					
									10.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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WINDOW/WINDOWLESS SAMPLING BOREHOLE RECORD

		Exploratory Hole No:	WS7
Site Address:	Blowers Wood Site, Hempstead, Gillingham ME7 3DT	Project No:	P4266J2508
Client:	Redrow Homes	Ground Level:	0.00
Logged By:	MD	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	Windowless Sampler Rig	Sheet No:	1 Of 1

Water levels recorded during boring, m

Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks

1: No groundwater reported.

2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

3:

4:

Sample or Tests									Strata				
Type	Depth (mbgl)	Result							Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description	Installation
		75	75	75	75	75	75	N					
										0.00			
ES	0.20									0.20		Grass over dark brown silty very gravelly sand with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)	
D	0.50									0.50		Stiff** brown slightly gravelly CLAY. Gravel consists of medium to coarse angular flints. (CLAY-WITH-FLINTS FORMATION)	
ES	0.70												
SPT	1.00	6		6	7	7	7	27		1.00			
D	1.50									1.50			
SPT	2.00	7		6	6	7	7	26		2.00			
										2.20		White structureless CHALK recovered as gravelly SILT with occasional cobbles. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE Dm)	
D	2.50									2.50			
SPT	2.90	20		23	27			50		2.90			
	105mm for 50									3.00			
										3.50			
										4.00			
										4.50			
										5.00			

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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WINDOW/WINDOWLESS SAMPLING BOREHOLE RECORD

		Exploratory Hole No:	WS8
Site Address:	Blowers Wood Site, Hempstead, Gillingham ME7 3DT	Project No:	P4266J2508
Client:	Redrow Homes	Ground Level:	0.00
Logged By:	MD	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	Windowless Sampler Rig	Sheet No:	1 Of 1

Water levels recorded during boring, m

Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks

1: No groundwater reported.

2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

3:

4:

Sample or Tests										Strata				
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description	Installation
		75	75	75	75	75	75	N						
SPT	0.00								0.00				Grass over dark brown silty very gravelly sand with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)	
ES	0.20										0.20			
D	0.50								0.50				Stiff** brown gravelly CLAY. Gravel consists of medium to coarse angular flints. (CLAY-WITH-FLINTS FORMATION)	
ES	0.70													
SPT	1.20	4		5	7	7	6	25	1.00					
D	1.50								1.50					
SPT	2.00	5		4	4	5	9	22	2.00					
D	2.50								2.50		2.50		White structureless CHALK recovered as gravelly SILT with occasional cobbles. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE Dm)	
SPT	3.00	6		4	4	6	6	20	3.00					
D	3.50								3.50					
SPT	4.00	7		6	5	7	7	25	4.00					
									4.50		4.60			
									5.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP1		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	20/04/2022
Checked By:	SL	Date Completed:	20/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.30	Width:	0.60	Depth:	3.50

Remarks

1: *Field description

2: No groundwater strike recorded

3:

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			1.50		Firm* dark reddish brown very gravelly CLAY with high cobble content. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00			3.50		White structureless CHALK recovered as SAND and GRAVEL with medium cobble content. Sand is fine to coarse. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE DM)
D	3.00					

0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP2		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	20/04/2022
Checked By:	SL	Date Completed:	20/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.00	Width:	0.60	Depth:	3.50

Remarks

1: *Field description

2: No groundwater strike recorded

3:

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			1.40		Firm* dark reddish brown very gravelly CLAY with high cobble content. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00			3.50		White structureless CHALK recovered as SAND and GRAVEL with medium cobble content. Sand is fine to coarse. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE DM)
D	3.00					

0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP3		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	20/04/2022
Checked By:	SL	Date Completed:	20/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.30	Width:	0.60	Depth:	2.80

Remarks

1: *Field description

2: No groundwater strike recorded

3: Excavator could not get deeper due to layer of angular flint cobbles from 2.7 - 2.8 mbgl

4:

Sample or Tests				Strata			
Type	Depth (mbgl)	Result		Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25		0.00		0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00		0.50		2.80		Stiff* dark reddish brown slightly sandy very gravelly CLAY with high cobble content. Sand is fine. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00		1.00				
			1.50				
			2.00				
			2.50				
			3.00				
			3.50				
			4.00				
			4.50				
			5.00				

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP4		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	20/04/2022
Checked By:	SL	Date Completed:	20/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.40	Width:	0.60	Depth:	3.50

Remarks

1: No groundwater strike recorded
2:
3:
4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			3.50		Orangeish brown sandy gravelly CLAY with high cobble content. Sand is coarse. Gravel consists of fine to coarse angular to sub-rounded flint. Cobbles consist of angular to sub-angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00					
D	3.00					

0.00 — 0.50 — 1.00 — 1.50 — 2.00 — 2.50 — 3.00 — 3.50 — 4.00 — 4.50 — 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP5		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	20/04/2022
Checked By:	SL	Date Completed:	20/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.20	Width:	0.60	Depth:	3.50

Remarks

1: No groundwater strike recorded

2:

3:

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
				0.00		
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			0.50		Dark reddish brown slightly sandy gravelly CLAY with high cobble content. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. Cobbles consist of angular flint.
D	2.00			1.00		
				1.50		
				2.00		
				2.30		
D	3.00			2.50		White structureless CHALK recovered as SAND and GRAVEL with medium cobble content. Sand is fine to coarse. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE DM)
				3.00		
				3.50		
				4.00		
				4.50		
				5.00		

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP6		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.30	Width:	0.60	Depth:	3.50

Remarks

1: No groundwater strike recorded
2:
3:
4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			2.70		Reddish brown sandy gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00					
D	3.00			3.50		WWhite structureless CHALK recovered as SAND and GRAVEL with medium cobble content. Sand is fine to coarse. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE DM)

0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP7		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.20	Width:	0.60	Depth:	3.50

Remarks

1: *Field description

2: No groundwater strike recorded

3: Cobble content increases with depth

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
				0.00		
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	0.50			0.50		Stiff* orangeish brown silty gravelly CLAY with medium cobble content. Gravel consists of fine to coarse angular flint and chalk fragments. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
				1.00		
				1.50		
				2.00		
D	2.50			2.50		
				3.00		
D	3.50			3.50		
				4.00		
				4.50		
				5.00		

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP8		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.10	Width:	0.60	Depth:	3.50

Remarks

1: *Field description

2: No groundwater strike recorded

3:

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			1.80		Stiff* dark reddish brown slightly sandy very gravelly CLAY with high cobble content. Sand is fine. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00			3.50		White structureless CHALK recovered as SAND and GRAVEL with medium cobble content. Sand is fine to coarse. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE DM)
D	3.00					

0.00 — 0.50 — 1.00 — 1.50 — 2.00 — 2.50 — 3.00 — 3.50 — 4.00 — 4.50 — 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP9		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.10	Width:	0.60	Depth:	3.00

Remarks

1: *Field description

2: No groundwater strike recorded

3: Excavator could not get deeper due to layer of angular flint cobbles from 2.6 - 3.0 mbgl

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			3.00		Firm* dark reddish brown slightly sandy very gravelly CLAY with high cobble content. Sand is fine. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00					
D	3.00					

0.00 — 0.50 — 1.00 — 1.50 — 2.00 — 2.50 — 3.00 — 3.50 — 4.00 — 4.50 — 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP10		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.00	Width:	0.60	Depth:	3.50

Remarks

1: *Field description

2: No groundwater strike recorded

3:

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	0.50			1.50		Stiff* dark reddish brown slightly sandy very gravelly CLAY with high cobble content. Sand is fine. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.50			3.50		White structureless CHALK recovered as SAND and GRAVEL with medium cobble content. Sand is fine to coarse. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE DM)
D	3.50					

0.00 — 0.50 — 1.00 — 1.50 — 2.00 — 2.50 — 3.00 — 3.50 — 4.00 — 4.50 — 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP11		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.00	Width:	0.60	Depth:	3.50

Remarks

1: *Field description

2: No groundwater strike recorded

3:

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			1.70		Stiff* dark reddish brown slightly sandy very gravelly CLAY with high cobble content. Sand is fine. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00			3.50		WWhite structureless CHALK recovered as SAND and GRAVEL with medium cobble content. Sand is fine to coarse. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE DM)
D	3.00					

0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP12		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	19/04/2022
Checked By:	SL	Date Completed:	19/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.00	Width:	0.60	Depth:	3.50

Remarks

1: *Field description

2: No groundwater strike recorded

3:

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			1.30		Stiff* dark reddish brown very gravelly CLAY with high cobble content. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00			3.50		White structureless CHALK recovered as SAND and GRAVEL with medium cobble content. Sand is fine to coarse. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE DM)
D	3.00					

0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP13		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	0.00
Logged By:	JRO	Date Commenced:	20/04/2022
Checked By:	SL	Date Completed:	20/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.20	Width:	0.60	Depth:	3.50

Remarks

1: *Field description

2: No groundwater strike recorded

3:

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			1.20		Stiff* dark reddish brown slightly sandy very gravelly CLAY with high cobble content. Sand is fine. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00			3.50		WWhite structureless CHALK recovered as SAND and GRAVEL with medium cobble content. Sand is fine to coarse. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE DM)
D	3.00					

0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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TRIAL PIT RECORD

Exploratory Hole No:	TP14		
Site Address:	Blowers Wood Site, Maidstone Road	Project No:	P4266J2508
Client:	Redrow Homes Limited	Ground Level:	
Logged By:	JRO	Date Commenced:	19/04/2022
Checked By:		Date Completed:	19/04/2022
Type and diameter of equipment:	JCB 3CX	Sheet No:	1 Of 1

Pit Dimension:	Length:	2.00	Width:	0.60	Depth:	3.50

Remarks

1: *Field description

2: No groundwater strike recorded

3:

4:

Sample or Tests			Strata			
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25			0.30		Grass over dark brown silty very gravelly SAND with rootlets. Sand is fine to medium. Gravel consists of fine to coarse angular to sub-angular flint. (TOPSOIL)
ES	1.00			1.50		Stiff* dark reddish brown slightly sandy very gravelly CLAY with high cobble content. Sand is fine. Gravel consists of medium to coarse angular flint. Cobbles consist of angular flint. (CLAY-WITH-FLINTS FORMATION)
D	2.00			3.50		White structureless CHALK recovered as SAND and GRAVEL with medium cobble content. Sand is fine to coarse. Gravel consists of fine to coarse angular to sub-rounded chalk fragments. Cobbles consist of angular chalk fragments and occasional angular flint. (SEAFORD CHALK FORMATION - GRADE DM)
D	3.00					

0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

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APPENDIX 3 – CHEMICAL LABORATORY TEST RESULTS

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e: Jomas Associates -

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Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

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Analytical Report Number : 22-54022

Project / Site name:	Blowers Wood Site, Maidstone Road	**Samples received on:**	25/04/2022
Your job number:	JJ2508	**Samples instructed on/ Analysis started on:**	25/04/2022
Your order number:	P4266JJ2508.11	**Analysis completed by:**	03/05/2022
Report Issue Number:	1	**Report issued on:**	03/05/2022
Samples Analysed:	29 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252066	2252067	2252068	2252069	2252070
Sample Reference				TP1	TP2	TP3	TP4	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.25	0.25	0.25	0.25
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	26	-	< 0.1	32	40
Moisture Content	%	0.01	NONE	11	-	12	14	9.3
Total mass of sample received	kg	0.001	NONE	1.3	-	1.3	1.3	1.3
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KSZ	KSZ	KSZ	KSZ	KSZ
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.1	-	6.5	6.5	7.0
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	430	-	290	450	310
Total Sulphate as SO4	%	0.005	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013	-	0.004	0.013	0.012
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	12.7	-	4	12.5	12
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1	-	0.8	2.6	1.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	0.32	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	3.9	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	0.74	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	3.2	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-	2.5	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	1.7	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	1.3	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	1.3	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	0.73	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	1.1	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	0.9	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	1.2	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	-	18.8	< 0.80	< 0.80

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252066	2252067	2252068	2252069	2252070
Sample Reference				TP1	TP2	TP3	TP4	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.25	0.25	0.25	0.25
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	-	11	9.9	11
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	-	< 0.2	0.5	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	-	0.5	0.6	0.4
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	-	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	-	30	23	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	-	15	19	20
Lead (aqua regia extractable)	mg/kg	1	MCERTS	66	-	44	58	49
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	-	17	17	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	55	-	51	74	69
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	-	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	-	5.3	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	-	12	< 1.0	< 1.0
TPH (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	-	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252071	2252072	2252073	2252074	2252075
Sample Reference				TP6	TP7	TP8	TP10	TP11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.50	0.25	0.50	0.25
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	17	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	15	11	22	11
Total mass of sample received	kg	0.001	NONE	1.3	1.3	1.3	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	KSZ	N/A	KSZ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.3	7.0	7.2	7.4	7.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	450	210	430	140	420
Total Sulphate as SO4	%	0.005	MCERTS	0.045	-	-	0.014	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.039	0.0052	0.009	0.022	0.012
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	39.1	5.2	9	21.5	11.5
Total Sulphur	mg/kg	50	MCERTS	190	-	-	62	-
Total Sulphur	%	0.005	MCERTS	0.019	-	-	0.006	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	0.6	-	1	1.3

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

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Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252071	2252072	2252073	2252074	2252075
Sample Reference				TP6	TP7	TP8	TP10	TP11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.50	0.25	0.50	0.25
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	12	15	29	12
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.8	0.9	0.8	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.2	< 0.2	0.9	1.2	0.9
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	61	35	31	69	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	46	14	36	51	33
Lead (aqua regia extractable)	mg/kg	1	MCERTS	32	20	110	28	88
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.9	< 0.3	1.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	76	16	27	88	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	42	93	150	80
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252076	2252077	2252078	2252079	2252080
Sample Reference				TP12	TP13	TP14	WS5	WS7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.25	0.25	0.20	0.20
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	25	< 0.1	-	46	32
Moisture Content	%	0.01	NONE	12	14	-	9.5	18
Total mass of sample received	kg	0.001	NONE	0.8	0.8	-	0.4	0.4
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KSZ	KSZ	KSZ	KSZ	KSZ
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.0	6.9	-	7.3	6.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	470	470	-	440	390
Total Sulphate as SO4	%	0.005	MCERTS	-	0.047	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013	0.011	-	0.019	0.018
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	12.7	10.5	-	18.5	17.8
Total Sulphur	mg/kg	50	MCERTS	-	230	-	-	-
Total Sulphur	%	0.005	MCERTS	-	0.023	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.2	-	-	1.5	3.8
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.25	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.35	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.31	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.3	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.25	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	-	1.46	< 0.80

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252076	2252077	2252078	2252079	2252080
Sample Reference				TP12	TP13	TP14	WS5	WS7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.25	0.25	0.20	0.20
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	14	-	11	11
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.6	-	0.3	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	0.7	-	< 0.2	0.7
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	-	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	49	34	-	25	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27	39	-	39	35
Lead (aqua regia extractable)	mg/kg	1	MCERTS	73	97	-	140	130
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.7	-	1	1.2
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	22	-	17	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	89	95	-	73	85
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	-	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	-	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
TPH (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	-	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252081	2252082	2252083	2252084	2252085
Sample Reference				WS8	TP7	TP6	TP1	TP3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.70	0.25	0.25	1.00	1.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	6.9	-	-	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	-	-	20	21
Total mass of sample received	kg	0.001	NONE	0.4	-	-	0.8	0.4
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	KSZ	KSZ	N/A	N/A
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6	-	-	7.7	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Total Sulphate as SO4	mg/kg	50	MCERTS	97	-	-	170	120
Total Sulphate as SO4	%	0.005	MCERTS	0.01	-	-	0.017	0.012
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.005	-	-	0.0046	0.016
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	5	-	-	4.6	15.5
Total Sulphur	mg/kg	50	MCERTS	< 50	-	-	57	< 50
Total Sulphur	%	0.005	MCERTS	< 0.005	-	-	0.006	< 0.005
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	-	-	-	-

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252081	2252082	2252083	2252084	2252085
Sample Reference				WS8	TP7	TP6	TP1	TP3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.70	0.25	0.25	1.00	1.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	68	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	41	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	92	-	-	-	-
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	-	-	-	-
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252086	2252087	2252088	2252089	2252090
Sample Reference				TP4	TP7	TP8	TP9	TP11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	2.50	2.00	3.00	1.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	24	< 0.1	38	31
Moisture Content	%	0.01	NONE	13	16	23	13	18
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.4	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.2	6.4	8.7	6.8	7.4
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Total Sulphate as SO4	mg/kg	50	MCERTS	280	150	300	120	170
Total Sulphate as SO4	%	0.005	MCERTS	0.028	0.015	0.03	0.012	0.017
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.027	0.016	0.0013	0.026	0.012
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	26.9	15.9	1.3	26.4	12.2
Total Sulphur	mg/kg	50	MCERTS	96	56	100	< 50	58
Total Sulphur	%	0.005	MCERTS	0.01	0.006	0.01	< 0.005	0.006
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	-	-	-

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252086	2252087	2252088	2252089	2252090
Sample Reference				TP4	TP7	TP8	TP9	TP11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	2.50	2.00	3.00	1.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	-
Chromium (hexavalent)	mg/kg	4	NONE	-	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	-	-	-	-	-
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	-	-	-	-	-
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	-	-	-	-	-
TPH (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252091	2252092	2252093	2252094
Sample Reference				TP14	WS1	WS3	WS4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	3.50	2.50	0.50
Date Sampled				Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	37
Moisture Content	%	0.01	NONE	24	20	22	12
Total mass of sample received	kg	0.001	NONE	0.5	0.6	0.6	0.6
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4	8.7	8.6	7.5
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-
Total Sulphate as SO4	mg/kg	50	MCERTS	330	280	330	110
Total Sulphate as SO4	%	0.005	MCERTS	0.033	0.028	0.033	0.011
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0023	0.0014	0.0021	0.017
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	2.3	1.4	2.1	17.1
Total Sulphur	mg/kg	50	MCERTS	110	100	110	65
Total Sulphur	%	0.005	MCERTS	0.011	0.01	0.011	0.007
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	-	-

Analytical Report Number: 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road
Your Order No: P4266JJ2508.11

Lab Sample Number				2252091	2252092	2252093	2252094
Sample Reference				TP14	WS1	WS3	WS4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	3.50	2.50	0.50
Date Sampled				Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-
Chromium (hexavalent)	mg/kg	4	NONE	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-
Petroleum Hydrocarbons							
Petroleum Range Organics (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	-	-	-	-
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	-	-	-	-
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	-	-	-	-
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	-	-	-	-
TPH (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2252066	TP1	None Supplied	0.25	Brown loam and clay with stones and vegetation.
2252068	TP3	None Supplied	0.25	Brown clay and loam with vegetation and gravel
2252069	TP4	None Supplied	0.25	Brown loam and clay with stones and vegetation.
2252070	TP5	None Supplied	0.25	Brown loam and clay with stones and vegetation.
2252071	TP6	None Supplied	1	Brown clay and sand with stones and gravel
2252072	TP7	None Supplied	0.5	4.4.3.17
2252073	TP8	None Supplied	0.25	Brown loam and clay with vegetation and gravel
2252074	TP10	None Supplied	0.5	Brown clay with gravel.
2252075	TP11	None Supplied	0.25	Brown loam and clay with vegetation and gravel
2252076	TP12	None Supplied	0.25	Brown loam and clay with stones and vegetation.
2252077	TP13	None Supplied	0.25	Brown loam and clay with gravel and vegetation.
2252079	WS5	None Supplied	0.2	Brown loam and clay with stones and vegetation.
2252080	WS7	None Supplied	0.2	Brown loam and clay with stones and vegetation.
2252081	WS8	None Supplied	0.7	Brown clay with stones and gravel
2252084	TP1	None Supplied	1	Brown clay with gravel and vegetation.
2252085	TP3	None Supplied	1	Brown clay and sand with vegetation and gravel
2252086	TP4	None Supplied	1	Light brown clay and sand with gravel.
2252087	TP7	None Supplied	2.5	Brown clay and sand with stones and gravel
2252088	TP8	None Supplied	2	Beige clay with chalk.
2252089	TP9	None Supplied	3	Brown clay and sand with stones and gravel
2252090	TP11	None Supplied	1	Brown clay and sand with gravel and stones.
2252091	TP14	None Supplied	2	10.2.8.17
2252092	WS1	None Supplied	3.5	Beige clay with chalk and vegetation.
2252093	WS3	None Supplied	2.5	Beige clay with chalk and vegetation.
2252094	WS4	None Supplied	0.5	Brown clay with gravel and stones.

Analytical Report Number : 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
PRO (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report

Analytical Report Number : 22-54022
Project / Site name: Blowers Wood Site, Maidstone Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP1	None Supplied	S	2252066	a	None Supplied	None Supplied	None Supplied
TP1	None Supplied	S	2252084	a	None Supplied	None Supplied	None Supplied
TP10	None Supplied	S	2252074	a	None Supplied	None Supplied	None Supplied
TP11	None Supplied	S	2252075	a	None Supplied	None Supplied	None Supplied
TP11	None Supplied	S	2252090	a	None Supplied	None Supplied	None Supplied
TP12	None Supplied	S	2252076	a	None Supplied	None Supplied	None Supplied
TP13	None Supplied	S	2252077	a	None Supplied	None Supplied	None Supplied
TP14	None Supplied	S	2252078	a	None Supplied	None Supplied	None Supplied
TP14	None Supplied	S	2252091	a	None Supplied	None Supplied	None Supplied
TP2	None Supplied	S	2252067	a	None Supplied	None Supplied	None Supplied
TP3	None Supplied	S	2252068	a	None Supplied	None Supplied	None Supplied
TP3	None Supplied	S	2252085	a	None Supplied	None Supplied	None Supplied
TP4	None Supplied	S	2252069	a	None Supplied	None Supplied	None Supplied
TP4	None Supplied	S	2252086	a	None Supplied	None Supplied	None Supplied
TP5	None Supplied	S	2252070	a	None Supplied	None Supplied	None Supplied
TP6	None Supplied	S	2252071	a	None Supplied	None Supplied	None Supplied
TP6	None Supplied	S	2252083	a	None Supplied	None Supplied	None Supplied
TP7	None Supplied	S	2252072	a	None Supplied	None Supplied	None Supplied
TP7	None Supplied	S	2252082	a	None Supplied	None Supplied	None Supplied
TP7	None Supplied	S	2252087	a	None Supplied	None Supplied	None Supplied
TP8	None Supplied	S	2252073	a	None Supplied	None Supplied	None Supplied
TP8	None Supplied	S	2252088	a	None Supplied	None Supplied	None Supplied
TP9	None Supplied	S	2252089	a	None Supplied	None Supplied	None Supplied
WS1	None Supplied	S	2252092	a	None Supplied	None Supplied	None Supplied
WS3	None Supplied	S	2252093	a	None Supplied	None Supplied	None Supplied
WS4	None Supplied	S	2252094	a	None Supplied	None Supplied	None Supplied
WS5	None Supplied	S	2252079	a	None Supplied	None Supplied	None Supplied
WS7	None Supplied	S	2252080	a	None Supplied	None Supplied	None Supplied
WS8	None Supplied	S	2252081	a	None Supplied	None Supplied	None Supplied

APPENDIX 4 – GEOTECHNICAL LABORATORY TEST RESULTS

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

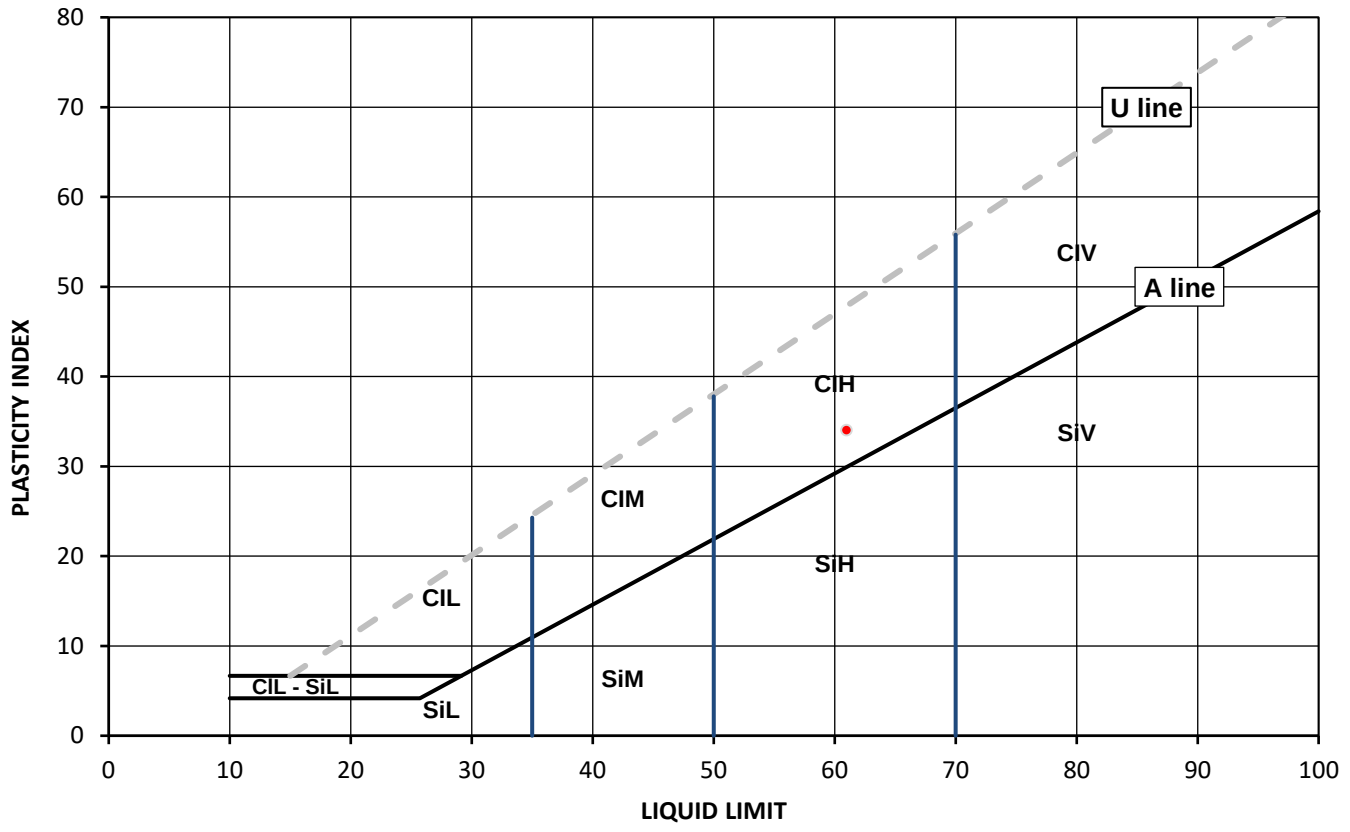
Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260696	Depth Top [m]:	2.00
Hole No.:	TP3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
16	61	27	34	71



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

 Date Reported: 12/05/2022 **GF 232.12**

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

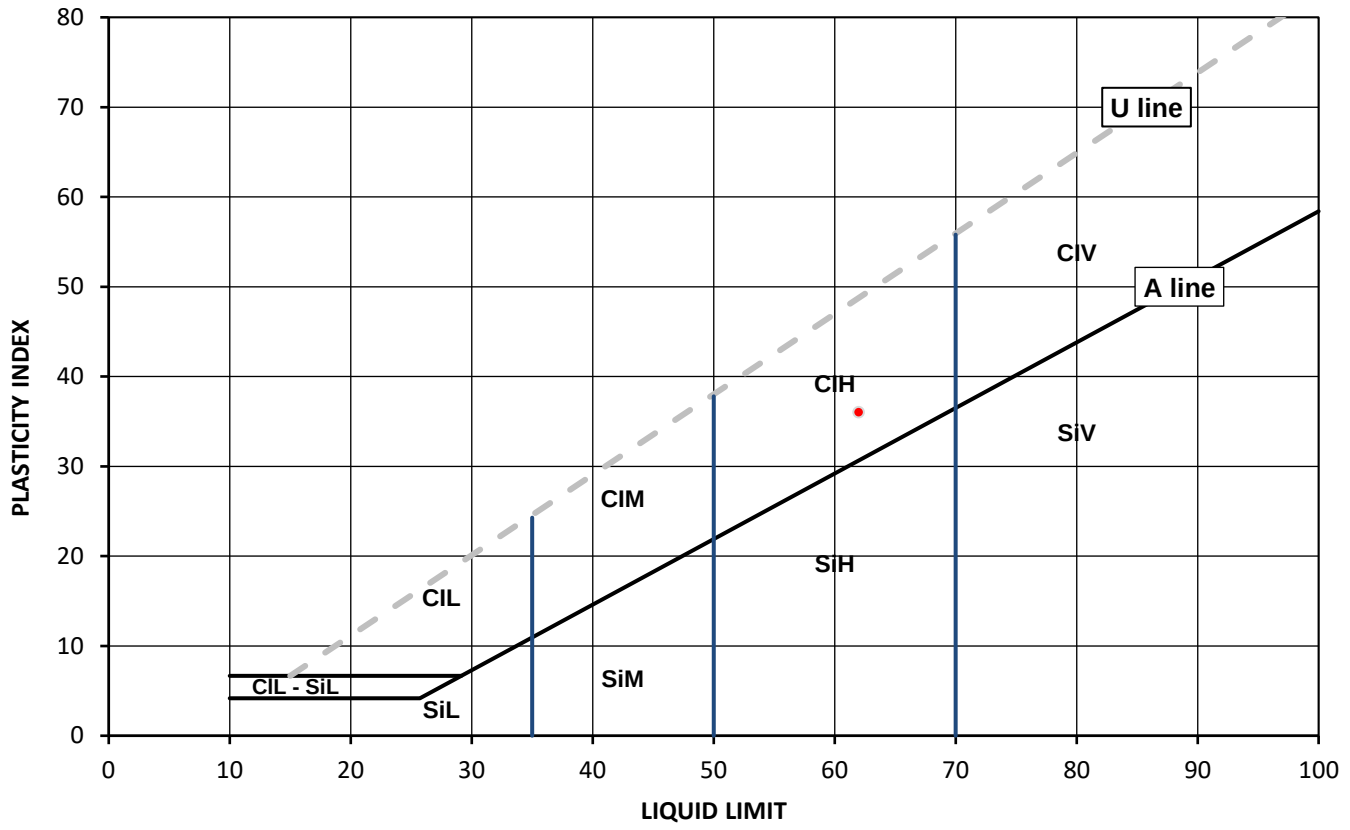
Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260700	Depth Top [m]:	3.50
Hole No.:	TP7	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
31	62	26	36	68



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

 Date Reported: 12/05/2022 **GF 232.12**

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

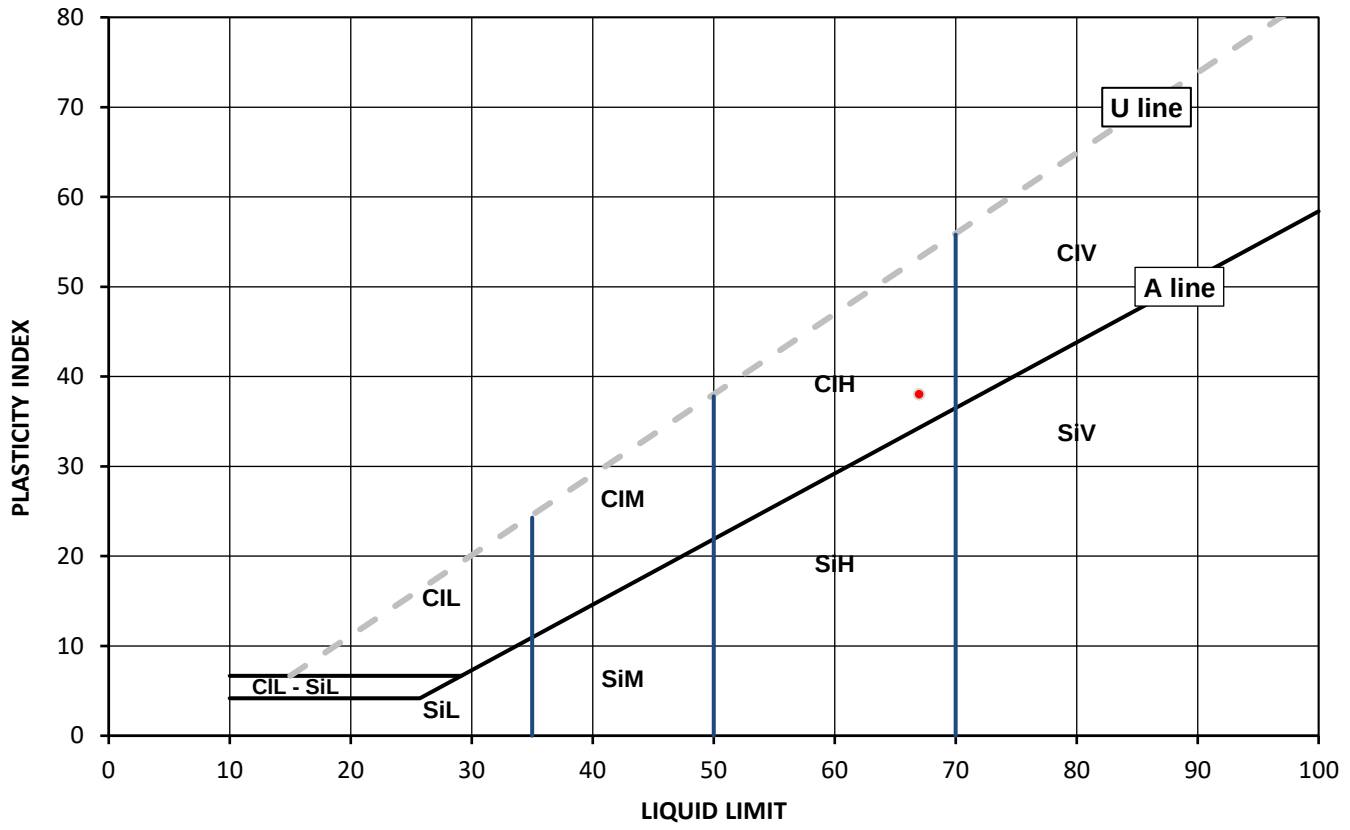
Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260701	Depth Top [m]:	1.00
Hole No.:	TP9	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Yellowish brown CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
30	67	29	38	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

 Date Reported: 12/05/2022 **GF 232.12**

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

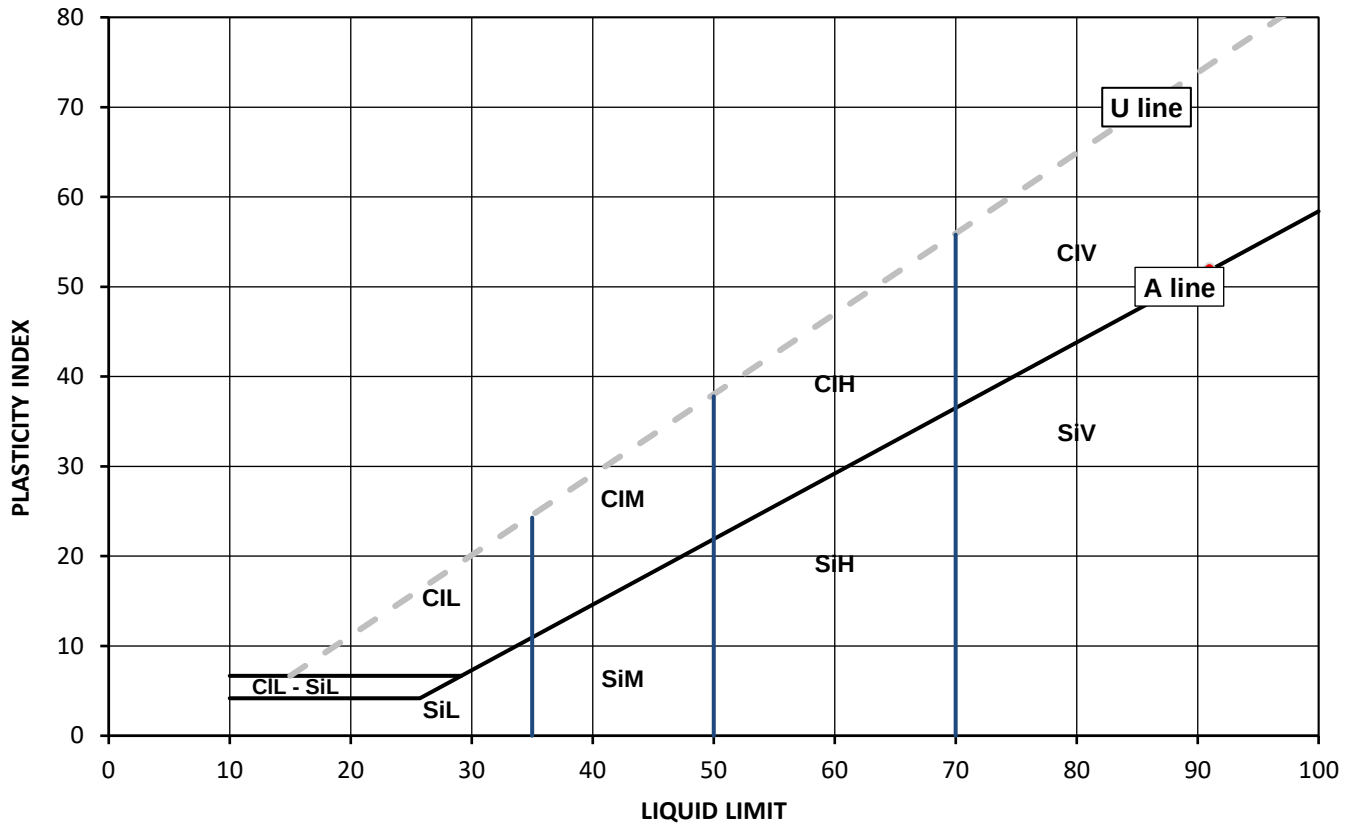
Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260702	Depth Top [m]:	1.50
Hole No.:	WS1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown slightly gravelly CLAY with fragments of chalk		
Sample Preparation:	Tested after washing to remove >425um		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
20	91	39	52	72



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

 Date Reported: 12/05/2022 **GF 232.12**

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

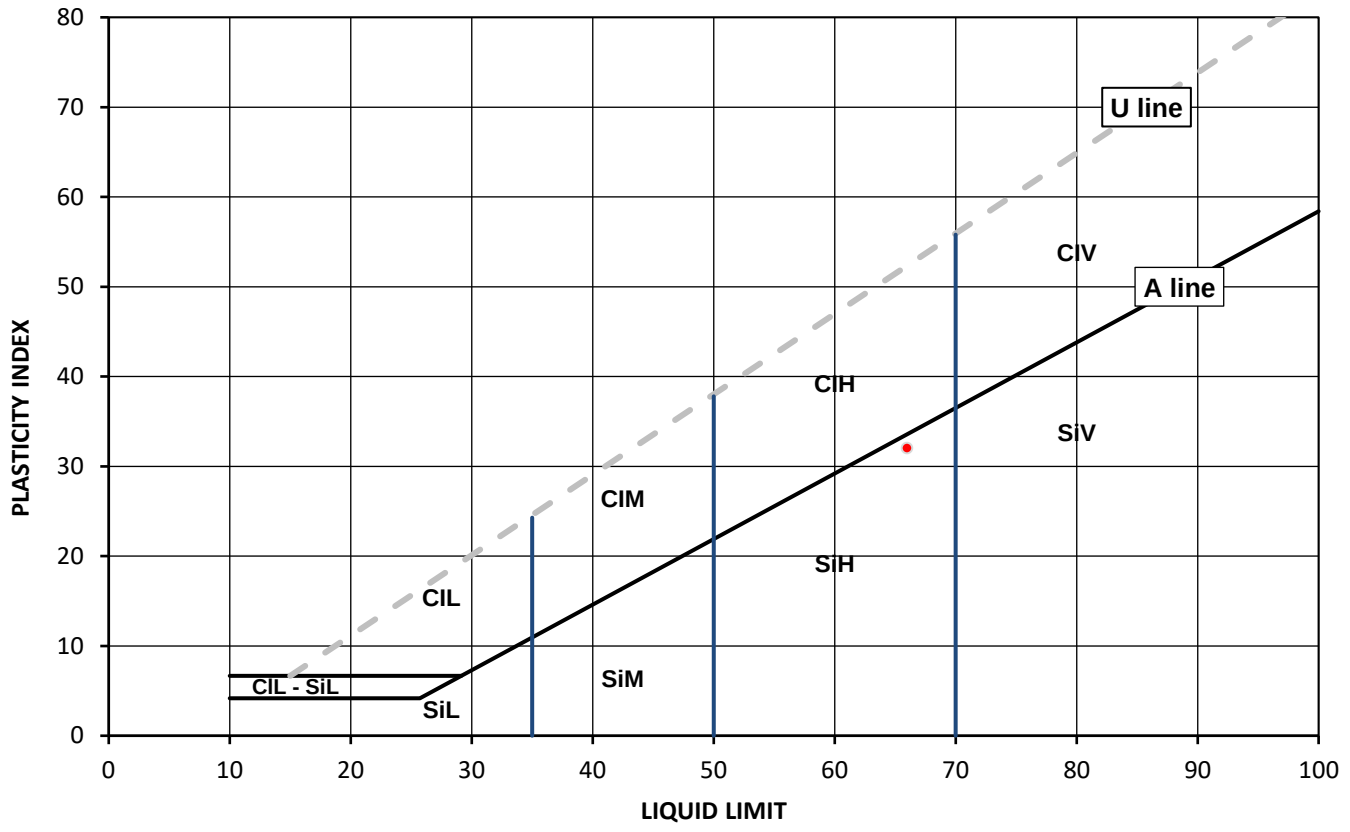
Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260703	Depth Top [m]:	0.50
Hole No.:	WS3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
19	66	34	32	89



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

 Date Reported: 12/05/2022 **GF 232.12**

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

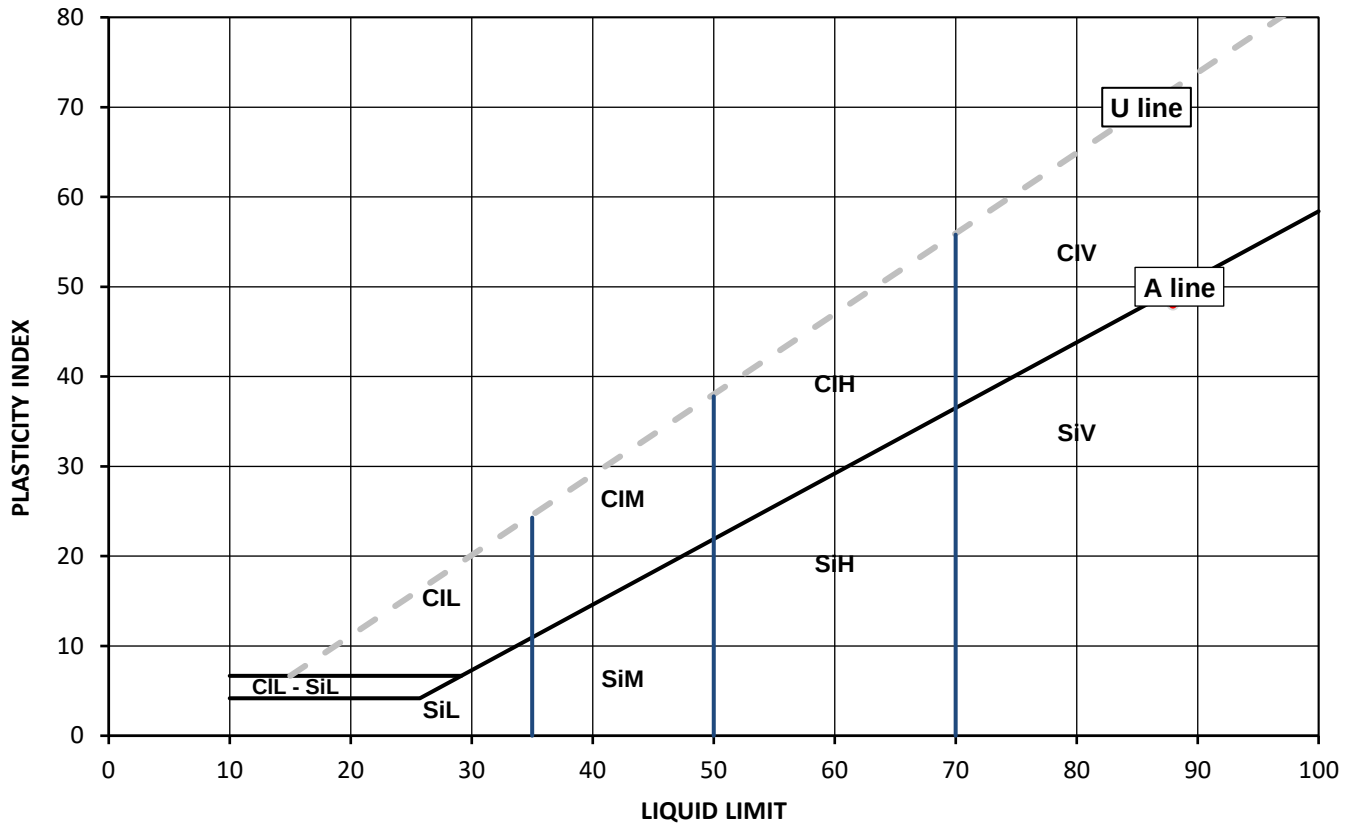
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260704	Depth Top [m]:	1.50
Hole No.:	WS4	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown CLAY		

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
31	88	40	48	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

 Date Reported: 12/05/2022 **GF 232.12**

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

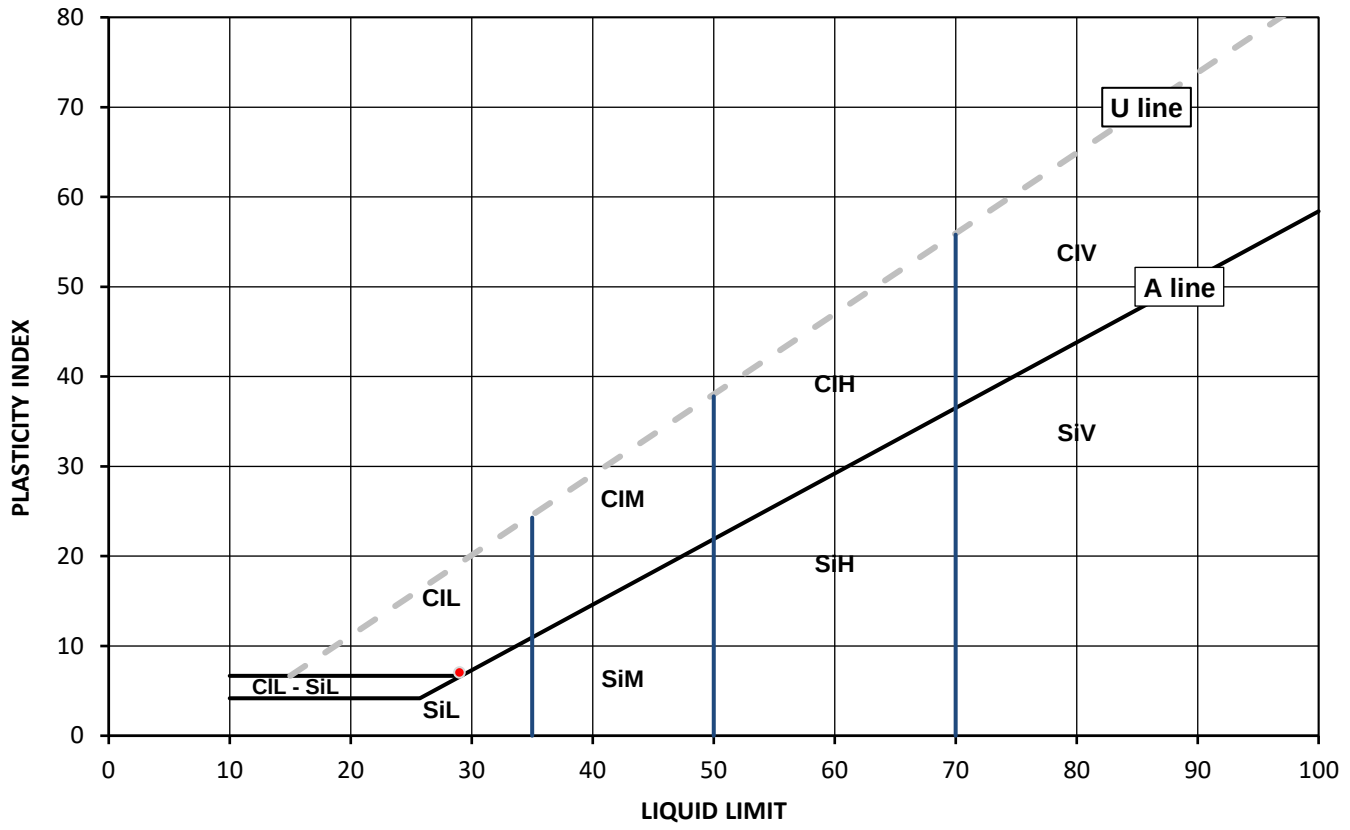
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260705	Depth Top [m]:	1.50
Hole No.:	WS7	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	White CHALK		

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
23	29	22	7	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

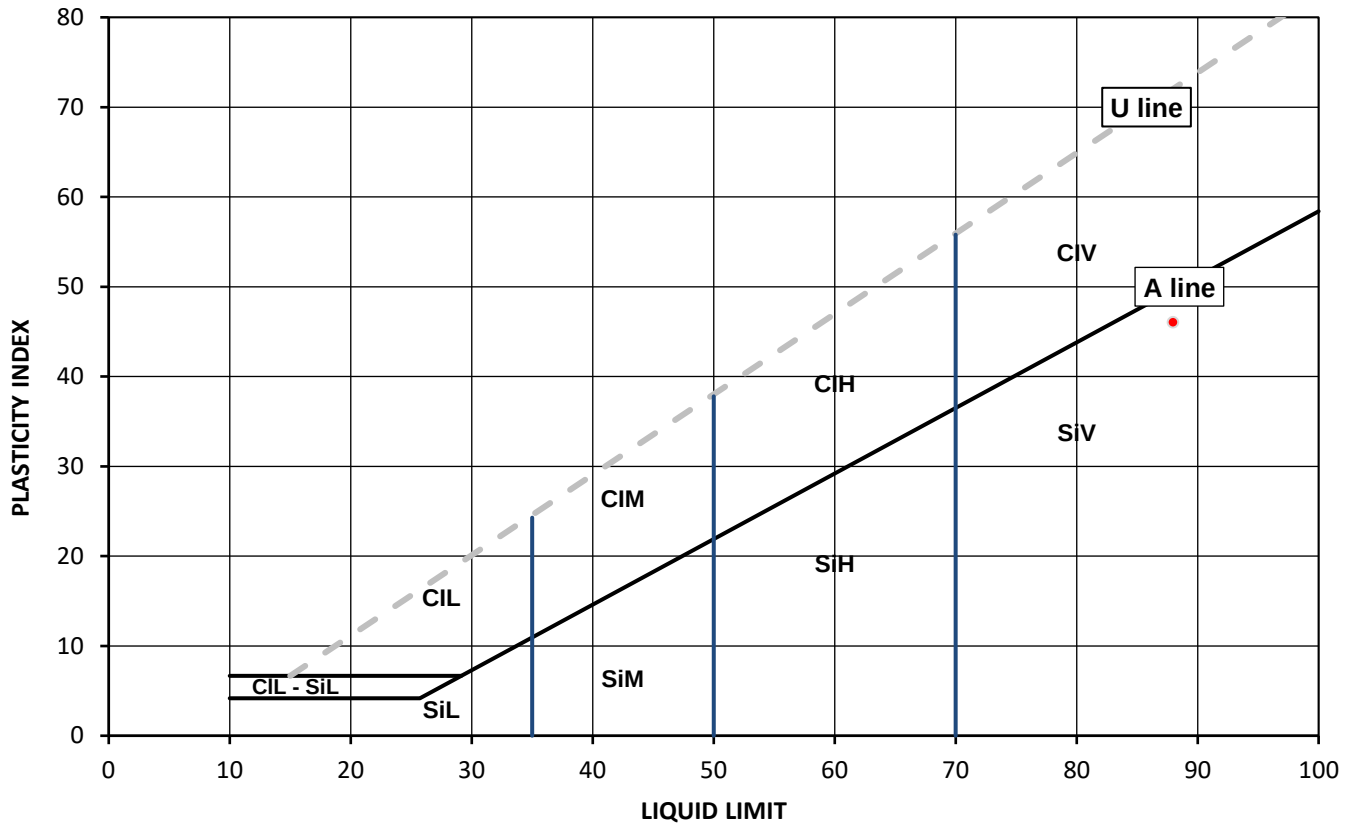
Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260706	Depth Top [m]:	1.50
Hole No.:	WS8	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown slightly gravelly CLAY with fragments of chalk		
Sample Preparation:	Tested after washing to remove >425um		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
25	88	42	46	87



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzińska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

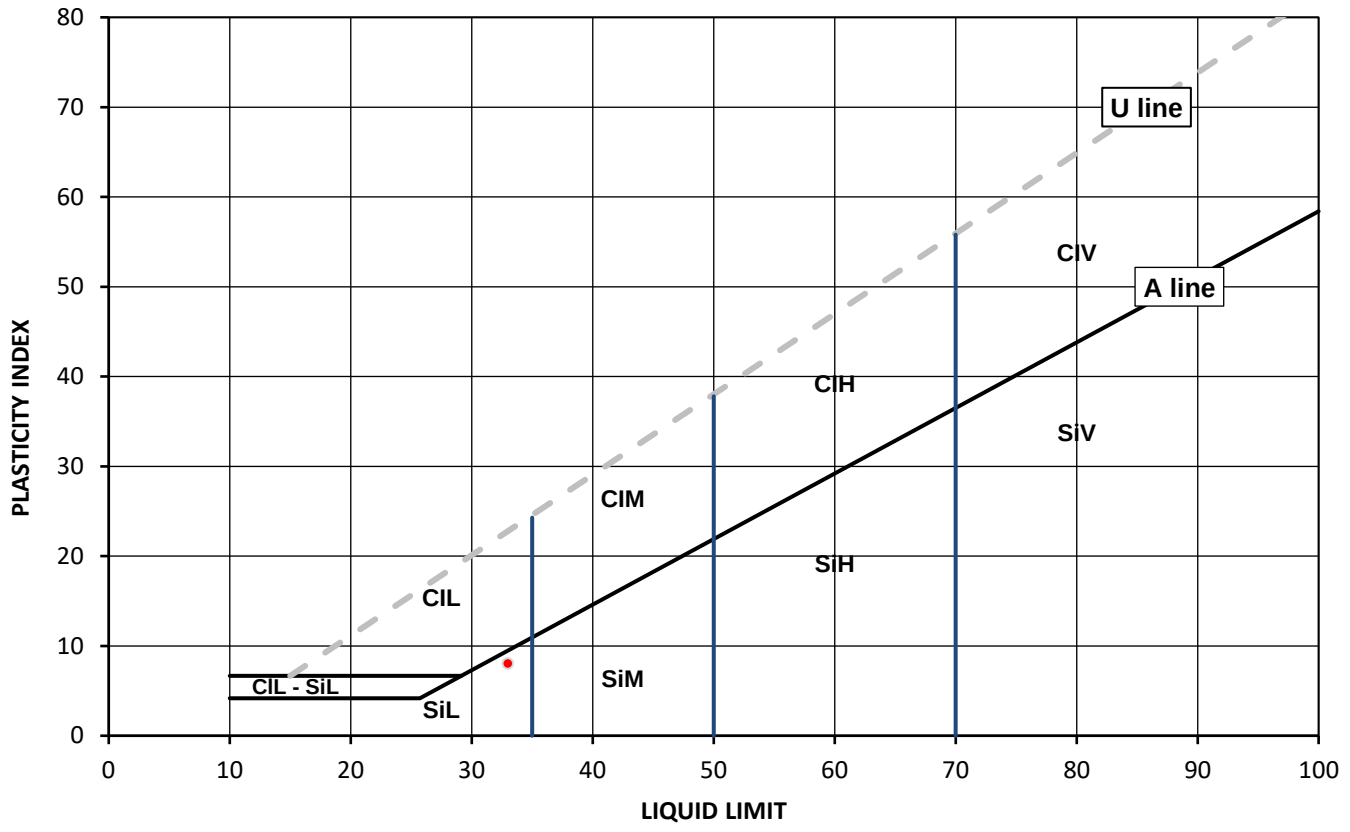
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260708	Depth Top [m]:	4.50
Hole No.:	WS3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	White CHALK		

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
24	33	25	8	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

 Date Reported: 12/05/2022 **GF 232.12**

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

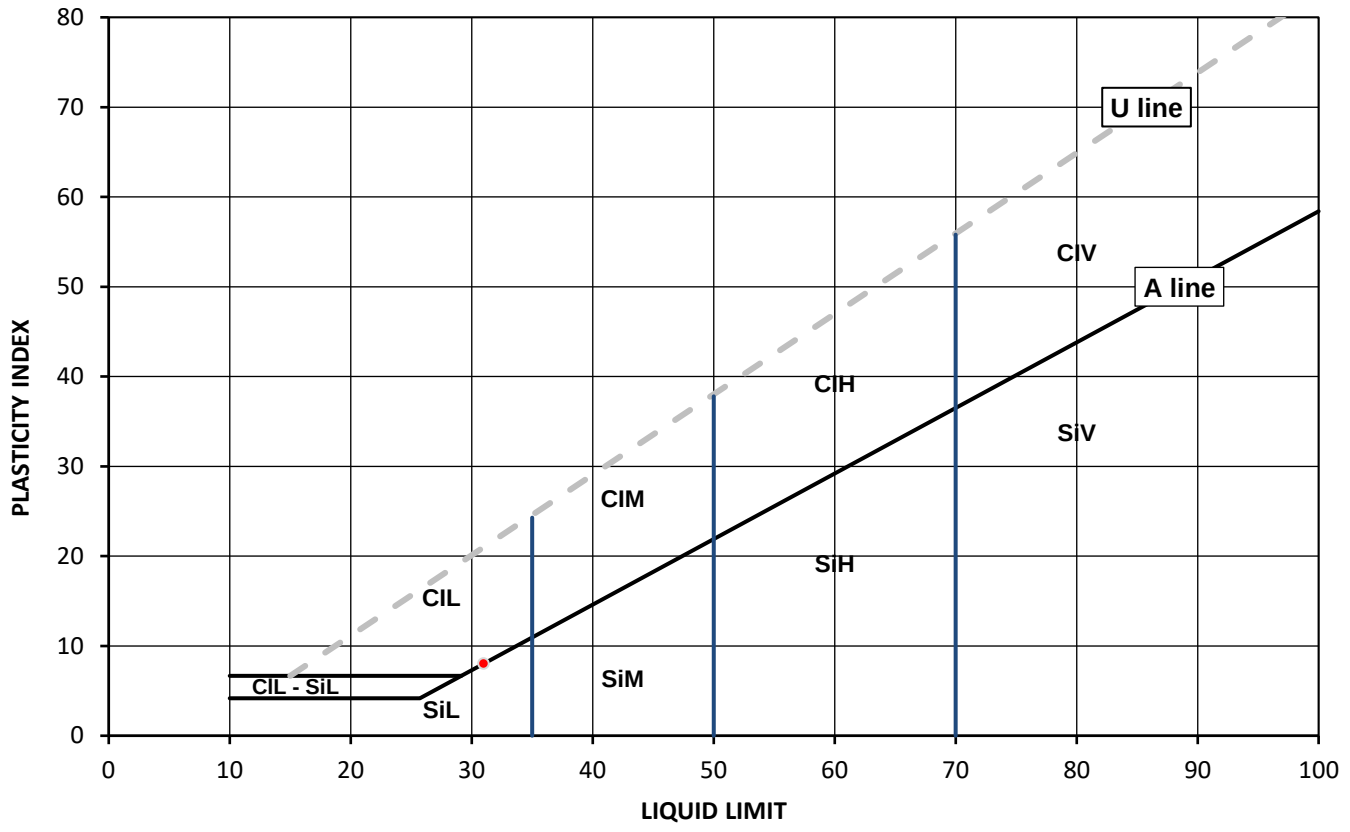
Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260711	Depth Top [m]:	3.50
Hole No.:	WS8	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	White and brown clayey CHALK		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
25	31	23	8	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzińska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 232.12

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Jomas Associates Ltd

Client Address: Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Contact: Alice Barrington

Site Address: Blowers Wood Site Maidstone Road

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Client Reference: JJ2508
Job Number: 22-55675
Date Sampled: Not Given
Date Received: 22/04/2022
Date Tested: 09/05/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W]	Water Content BS EN ISO 17892-1 [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
2260696	TP3	Not Given	2.00	Not Given	D	Brown slightly gravelly CLAY	Atterberg 1 Point	16		71	61	27	34						
2260700	TP7	Not Given	3.50	Not Given	D	Brown slightly gravelly CLAY	Atterberg 1 Point	31		68	62	26	36						
2260701	TP9	Not Given	1.00	Not Given	D	Yellowish brown CLAY	Atterberg 1 Point	30		100	67	29	38						
2260702	WS1	Not Given	1.50	Not Given	B	Brown slightly gravelly CLAY with fragments of chalk	Atterberg 1 Point	20		72	91	39	52						
2260703	WS3	Not Given	0.50	Not Given	D	Brown slightly gravelly CLAY	Atterberg 1 Point	19		89	66	34	32						
2260708	WS3	Not Given	4.50	Not Given	D	White CHALK	Atterberg 1 Point	24		100	33	25	8						
2260704	WS4	Not Given	1.50	Not Given	D	Brown CLAY	Atterberg 1 Point	31		100	88	40	48						
2260709	WS4	Not Given	3.50	Not Given	D	White CHALK		26											
2260705	WS7	Not Given	1.50	Not Given	D	White CHALK	Atterberg 1 Point	23		100	29	22	7						
2260706	WS8	Not Given	1.50	Not Given	B	Brown slightly gravelly CLAY with fragments of chalk	Atterberg 1 Point	25		87	88	42	46						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 234.14

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Jomas Associates Ltd

Client Address: Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Contact: Alice Barrington

Site Address: Blowers Wood Site Maidstone Road

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Client Reference: JJ2508
Job Number: 22-55675
Date Sampled: Not Given
Date Received: 22/04/2022
Date Tested: 09/05/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W]	Water Content BS EN ISO 17892-1 [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
2260711	WS8	Not Given	3.50	Not Given	B	White and brown clayey CHALK	Atterberg 1 Point	25		100	31	23	8						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 234.14

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Jomas Associates Ltd

Client Address: Lakeside House, 1 Furzeground Way,
Stockley Park, UB11 1BD

Contact: Alice Barrington

Site Address: Blowers Wood Site Maidstone Road

Client Reference: JJ2508
Job Number: 22-55675
Date Sampled: Not Given
Date Received: 22/04/2022
Date Tested: 09/05/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type			%				
2260696	TP3	Not Given	2.00	Not Given	D	Brown slightly gravelly CLAY		16	Sample was quartered, oven dried at 108.7 °C			
2260700	TP7	Not Given	3.50	Not Given	D	Brown slightly gravelly CLAY		31	Sample was quartered, oven dried at 108.7 °C			
2260701	TP9	Not Given	1.00	Not Given	D	Yellowish brown CLAY		30	Sample was quartered, oven dried at 108.7 °C			
2260702	WS1	Not Given	1.50	Not Given	B	Brown slightly gravelly CLAY with fragments of chalk		20	Sample was quartered, oven dried at 108.7 °C			
2260703	WS3	Not Given	0.50	Not Given	D	Brown slightly gravelly CLAY		19	Sample was quartered, oven dried at 108.7 °C			
2260708	WS3	Not Given	4.50	Not Given	D	White CHALK		24	Sample was quartered, oven dried at 108.7 °C			
2260704	WS4	Not Given	1.50	Not Given	D	Brown CLAY		31	Sample was quartered, oven dried at 108.7 °C			
2260709	WS4	Not Given	3.50	Not Given	D	White CHALK		26	Sample was quartered, oven dried at 108.7 °C			
2260705	WS7	Not Given	1.50	Not Given	D	White CHALK		23	Sample was quartered, oven dried at 108.7 °C			
2260706	WS8	Not Given	1.50	Not Given	B	Brown slightly gravelly CLAY with fragments of chalk		25	Sample was quartered, oven dried at 108.7 °C			

Comments:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 099.16

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Jomas Associates Ltd

Client Address: Lakeside House, 1 Furzeground Way,
Stockley Park, UB11 1BD

Contact: Alice Barrington

Site Address: Blowers Wood Site Maidstone Road

Client Reference: JJ2508
Job Number: 22-55675
Date Sampled: Not Given
Date Received: 22/04/2022
Date Tested: 09/05/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type			%				
2260711	WS8	Not Given	3.50	Not Given	B	White and brown clayey CHALK		25	Sample was quartered, oven dried at 108.7 °C			

Comments:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 099.16

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

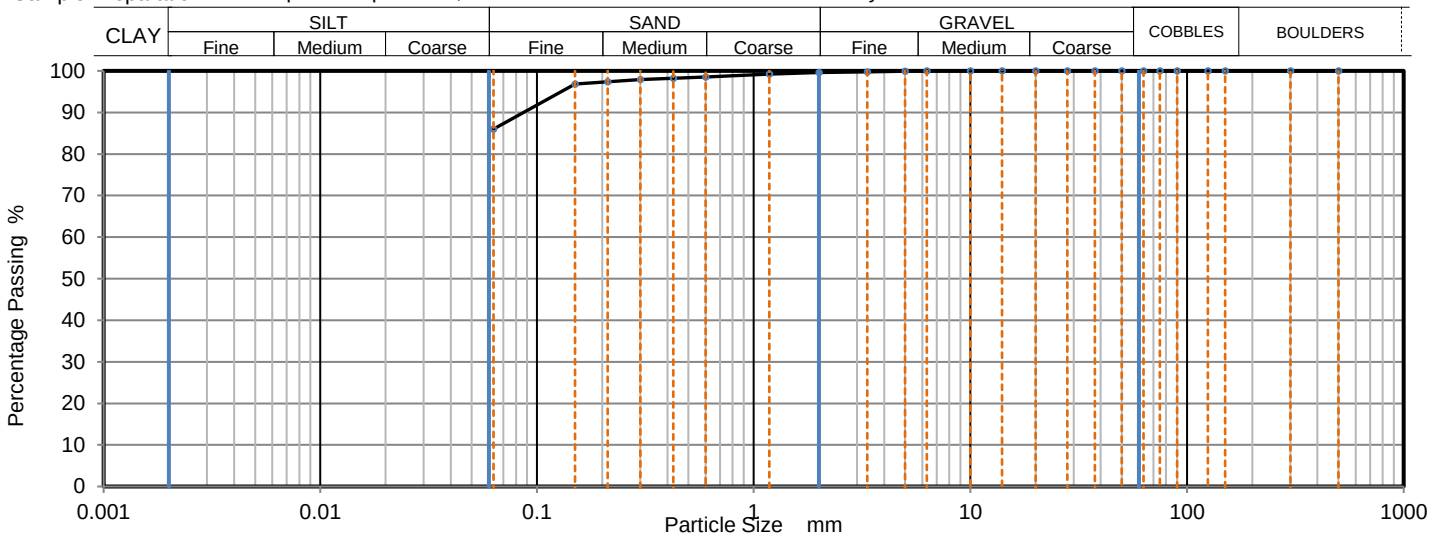
Environmental Science

Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260697	Depth Top [m]:	3.00
Hole No.:	TP4	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Light brown sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.7 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	99		
0.425	98		
0.3	98		
0.212	97		
0.15	97		
0.063	87		

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	13
Fines <0.063mm	87

Grading Analysis		
D100	mm	6.3
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

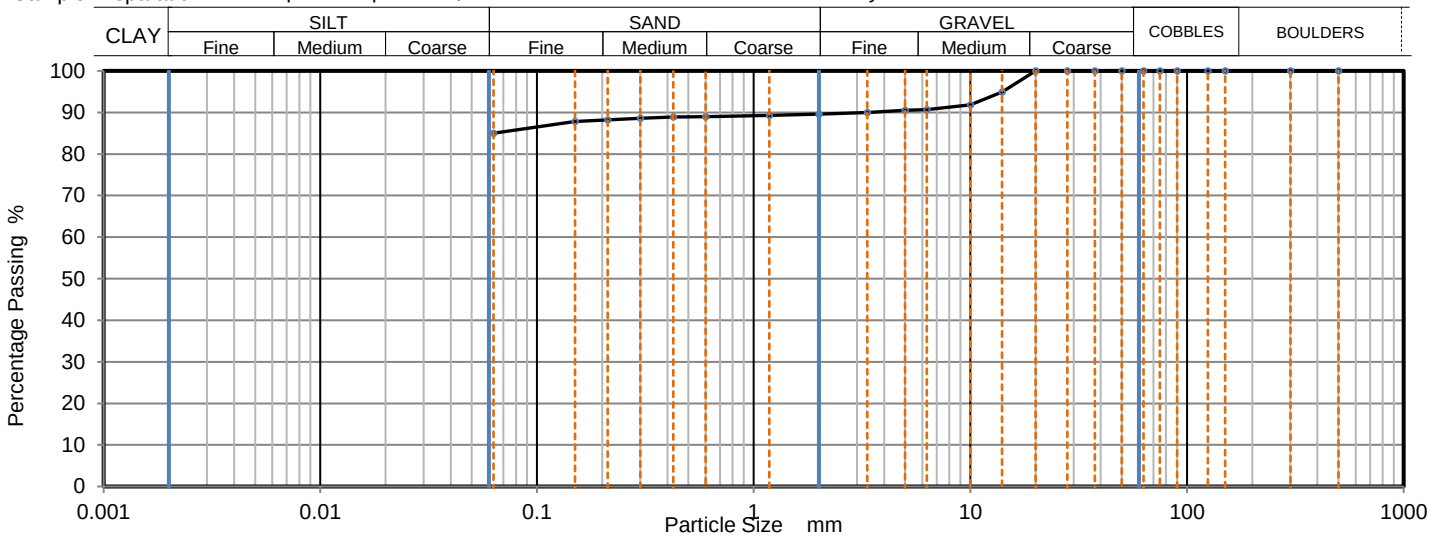
4041

Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260698	Depth Top [m]:	2.00
Hole No.:	TP5	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly sandy gravelly CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.7 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	95		
10	92		
6.3	91		
5	91		
3.35	90		
2	90		
1.18	89		
0.6	89		
0.425	89		
0.3	89		
0.212	88		
0.15	88		
0.063	85		

Sample Proportions	% dry mass
Very coarse	0
Gravel	10
Sand	4
Fines <0.063mm	85

Grading Analysis		
D100	mm	20
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

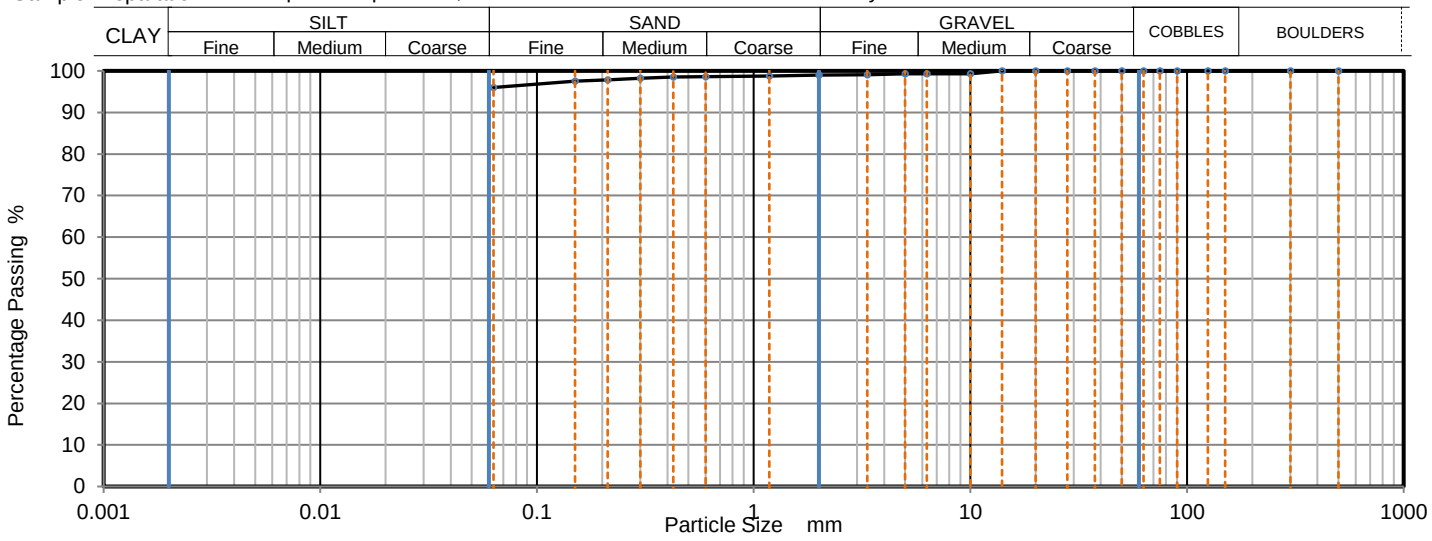
4041

Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260699	Depth Top [m]:	2.00
Hole No.:	TP6	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Yellowish brown slightly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.7 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	99		
3.35	99		
2	99		
1.18	99		
0.6	99		
0.425	99		
0.3	98		
0.212	98		
0.15	98		
0.063	97		

Sample Proportions	% dry mass
Very coarse	0
Gravel	1
Sand	3
Fines <0.063mm	96

Grading Analysis		
D100	mm	14
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

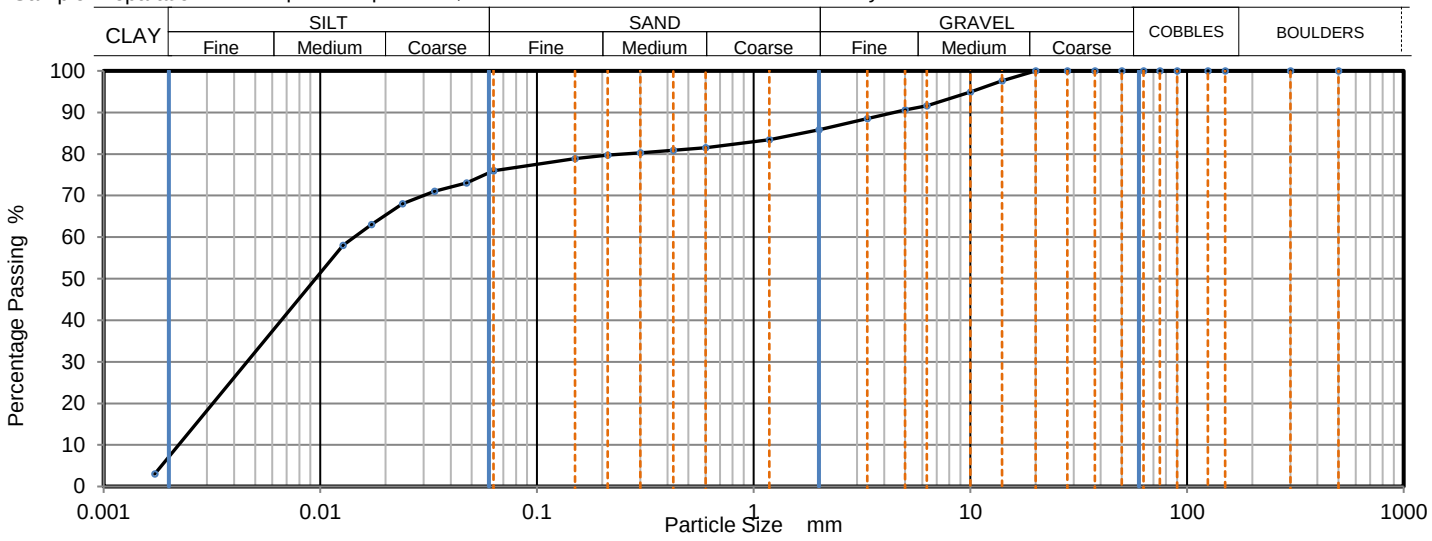
4041

Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260709	Depth Top [m]:	3.50
Hole No.:	WS4	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	White CHALK		
Sample Preparation:	Sample was quartered, oven dried at 108.7 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	76
300	100	0.0473	73
150	100	0.0337	71
125	100	0.0240	68
90	100	0.0172	63
75	100	0.0127	58
63	100	0.0017	3
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	95		
6.3	92		
5	91		
3.35	89	Particle density	(assumed)
2	86	2.65	Mg/m3
1.18	83		
0.6	82		
0.425	81		
0.3	80		
0.212	80		
0.15	79		
0.063	76		

Sample Proportions	% dry mass
Very coarse	0
Gravel	14
Sand	10
Silt	69
Clay	7

Grading Analysis		
D100	mm	20
D60	mm	0.0143
D30	mm	0.00463
D10	mm	0.00225
Uniformity Coefficient		6.4
Curvature Coefficient		0.67

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

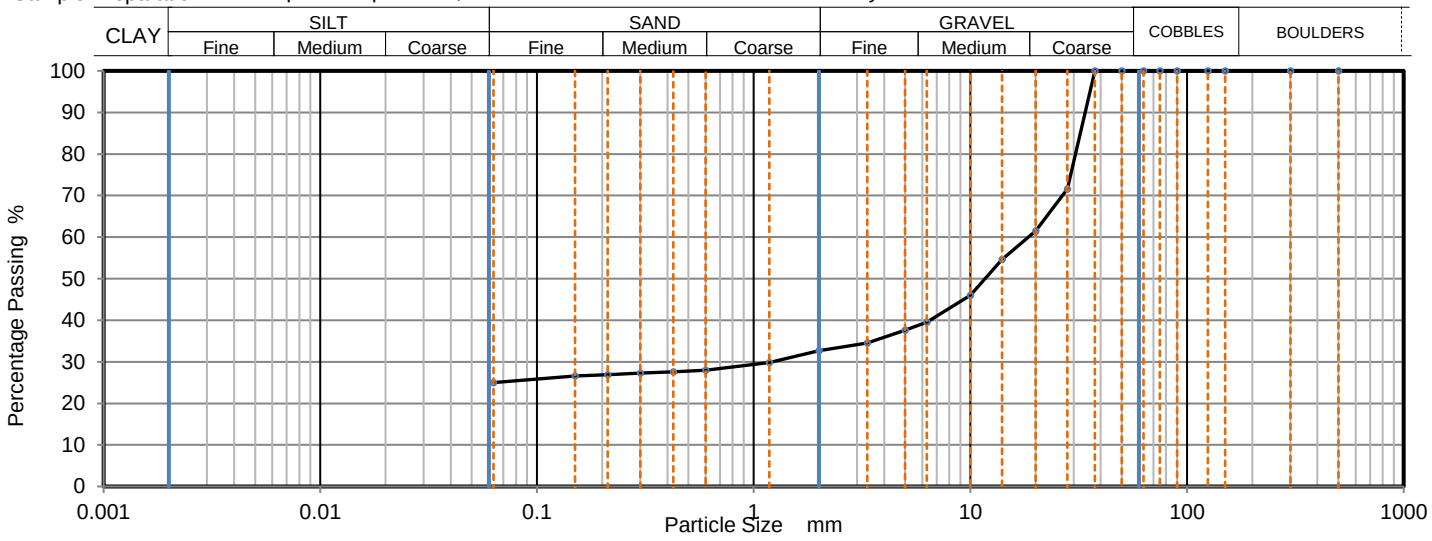
Environmental Science

Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260712	Depth Top [m]:	3.00
Hole No.:	TP1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	White CHALK		
Sample Preparation:	Sample was quartered, oven dried at 108.7 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	72		
20	62		
14	55		
10	46		
6.3	40		
5	38		
3.35	35		
2	33		
1.18	30		
0.6	28		
0.425	28		
0.3	27		
0.212	27		
0.15	27		
0.063	25		

Sample Proportions	% dry mass
Very coarse	0
Gravel	67
Sand	7
Fines <0.063mm	25

Grading Analysis		
D100	mm	37.5
D60	mm	18.5
D30	mm	1.23
D10	mm	
Uniformity Coefficient		> 290
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

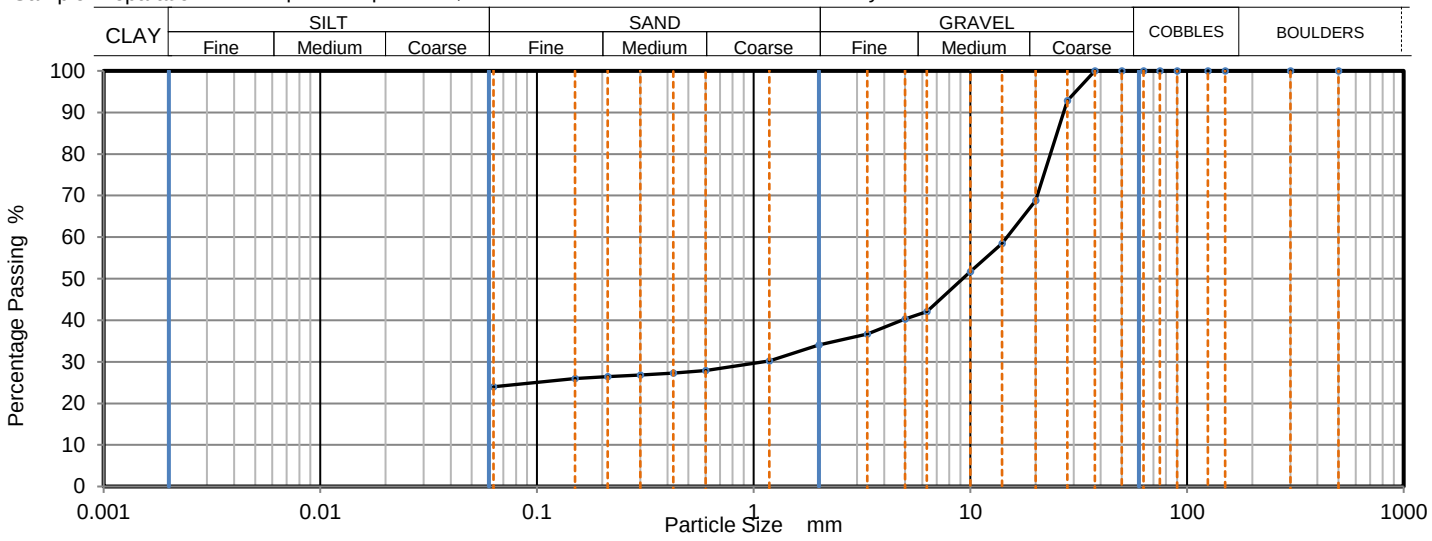
4041

Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260713	Depth Top [m]:	3.00
Hole No.:	TP2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	White CHALK		
Sample Preparation:	Sample was quartered, oven dried at 108.7 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	69		
14	59		
10	52		
6.3	42		
5	40		
3.35	37		
2	34		
1.18	30		
0.6	28		
0.425	27		
0.3	27		
0.212	26		
0.15	26		
0.063	25		

Sample Proportions	% dry mass
Very coarse	0
Gravel	66
Sand	9
Fines <0.063mm	25

Grading Analysis		
D100	mm	37.5
D60	mm	14.7
D30	mm	1.12
D10	mm	
Uniformity Coefficient		> 230
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

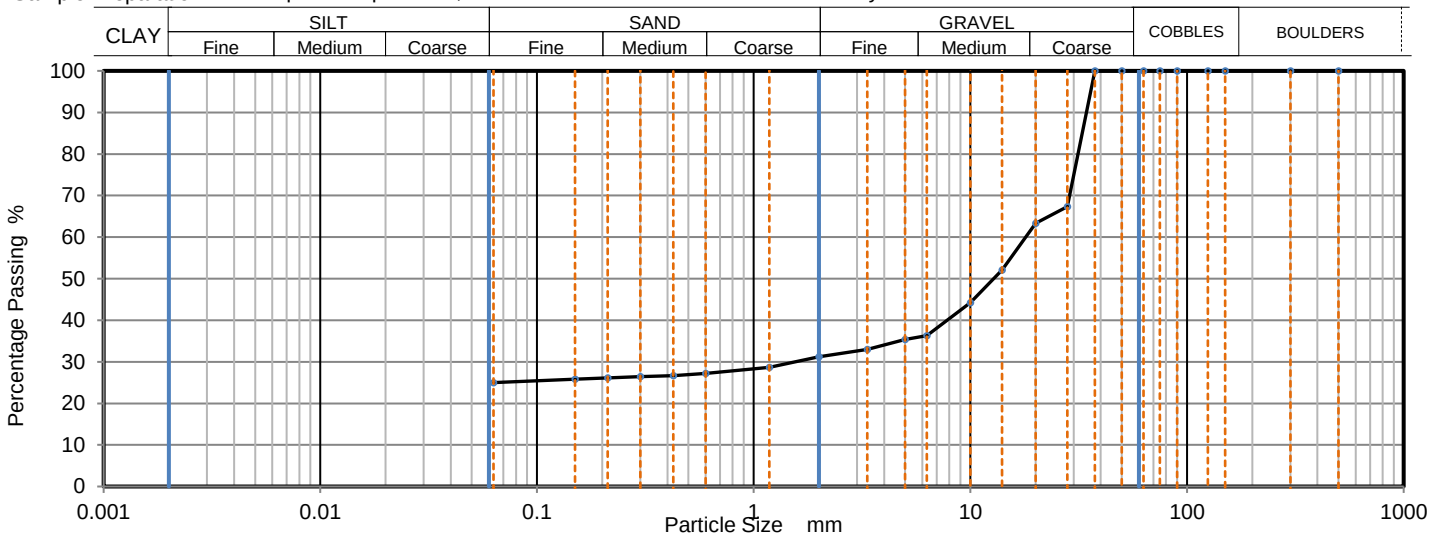
Environmental Science

Client:	Jomas Associates Ltd	Client Reference:	JJ2508
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Number:	22-55675
		Date Sampled:	Not Given
		Date Received:	22/04/2022
Contact:	Alice Barrington	Date Tested:	09/05/2022
Site Address:	Blowers Wood Site Maidstone Road	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2260714	Depth Top [m]:	3.50
Hole No.:	TP10	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	White CHALK		
Sample Preparation:	Sample was quartered, oven dried at 108.7 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	67		
20	63		
14	52		
10	44		
6.3	36		
5	35		
3.35	33		
2	31		
1.18	29		
0.6	27		
0.425	27		
0.3	26		
0.212	26		
0.15	26		
0.063	25		

Sample Proportions	% dry mass
Very coarse	0
Gravel	69
Sand	6
Fines <0.063mm	25

Grading Analysis		
D100	mm	37.5
D60	mm	18
D30	mm	1.55
D10	mm	
Uniformity Coefficient		> 290
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 100.21

SUMMARY REPORT

METHOD FOR SATURATION MOISTURE CONTENT OF CHALK

Tested in Accordance with: BS 1377-2: 1990: Clause 3.3

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Jomas Associates Ltd

Client Address: Lakeside House, 1 Furzeground Way,
Stockley Park, UB11 1BD

Contact: Alice Barrington

Site Address: Blowers Wood Site Maidstone Road

Client Reference: JJ2508
Job Number: 22-55675
Date Sampled: Not Given
Date Received: 22/04/2022
Date Tested: 09/05/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	SMC	Bulk density	Dry density	MC	Preparation
		Reference	Depth Top m	Depth Base m	Type			%	Mg/m3	Mg/m3	%	
2260707	WS1	Not Given	2.50	Not Given	B	White CHALK		30	1.91	1.49	28	
2260708	WS3	Not Given	4.50	Not Given	D	White CHALK	Supplied lump of chalk fails to comply with volume requirements as per BS1377:2 Clause 3.3.5.1	28	1.90	1.53	24	
2260709	WS4	Not Given	3.50	Not Given	D	White CHALK	Supplied lump of chalk fails to comply with volume requirements as per BS1377:2 Clause 3.3.5.1	33	1.80	1.43	26	
2260710	WS7	Not Given	2.50	Not Given	D	White slightly gravelly CHALK	Supplied lump of chalk fails to comply with volume requirements as per BS1377:2 Clause 3.3.5.1	31	1.86	1.47	27	

Note: SMC - Saturation Moisture Content; MC - Moisture Content

Comments:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 12/05/2022

GF 132.14

APPENDIX 5 – DPSH RECORDS

DPSH

JOMAS ENGINEERING ENVIRONMENTAL

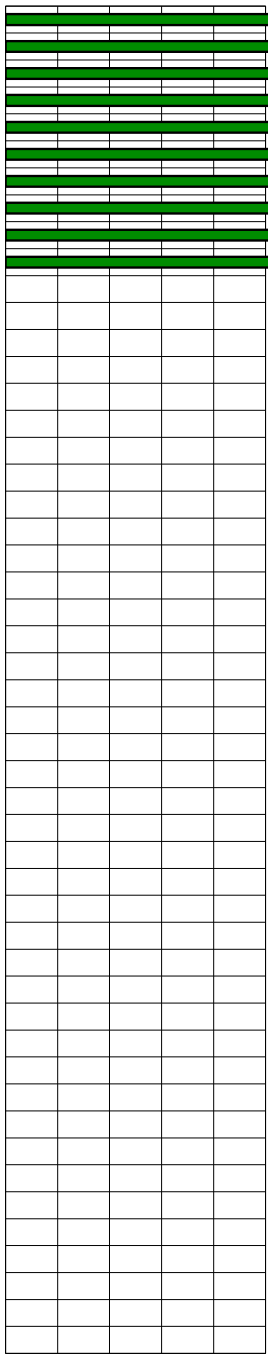
Site Address: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508
Client: Redrow Homes Limited

Test Location: WS1
Date of Test: 20/04/2022

Note: DPSH 'N' and SPT 'N' directly correlate. SPT'N'(300) calculated as sum of DPSH'N' over 300mm

Calculating Engineer: AB **Date:** 29/04/2022
Approved by: SC **Date:** 11/05/2022

Depth mbgl	DPSH N(100)	SPT N(300)
6.0	6	
6.1	7	20
6.2	7	22
6.3	8	23
6.4	8	26
6.5	10	28
6.6	10	32
6.7	12	34
6.8	12	38
6.9	14	42
7.0	16	48
7.1	18	54
7.2	20	58
7.3	20	62
7.4	22	60
7.5	18	56
7.6	16	48
7.7	14	42
7.8	12	38
7.9	12	38
8.0	14	44
8.1	18	54
8.2	22	60
8.3	20	63
8.4	21	63
8.5	22	65
8.6	22	67
8.7	23	65
8.8	20	64
8.9	21	63
9.0	22	62
9.1	19	59
9.2	18	54
9.3	17	50
9.4	15	44
9.5	12	42
9.6	15	35
9.7	8	33
9.8	10	36
9.9	18	48
10.0	20	58
10.1	20	61
10.2	21	59
10.3	18	59
10.4	20	59
10.5	21	63
10.6	22	63
10.7	20	63
10.8	21	63
10.9	22	65
11.0	22	64
11.1	20	60
11.2	18	58
11.3	20	57
11.4	19	58
11.5	19	53
11.6	15	52
11.7	18	51
11.8	18	56
11.9	20	59
12.0	21	



DPSH

JOMAS ENGINEERING ENVIRONMENTAL

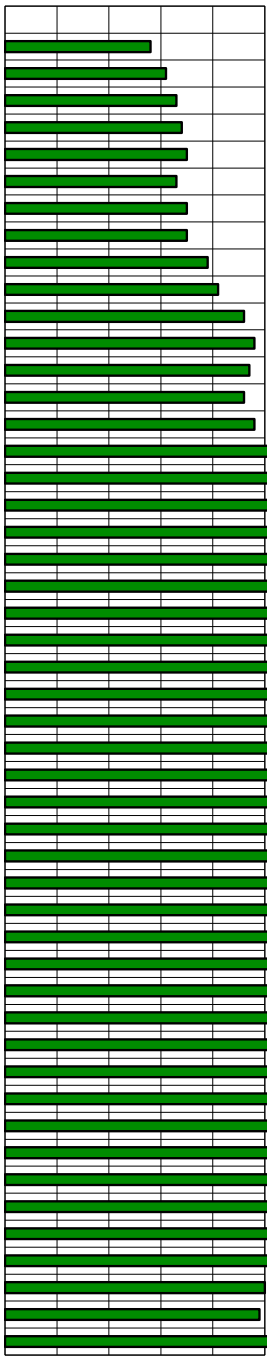
Site Address: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508
Client: Redrow Homes Limited

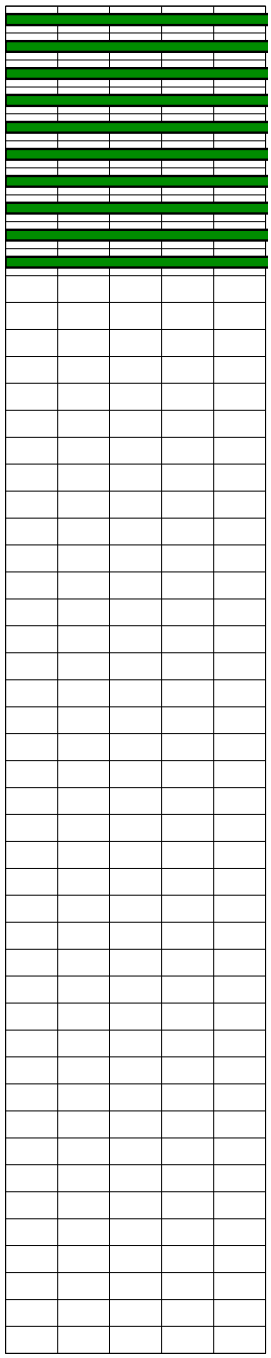
Test Location: WS3
Date of Test: 19/04/2022

Note: DPSH 'N' and SPT 'N' directly correlate. SPT'N'(300) calculated as sum of DPSH'N' over 300mm

Calculating Engineer: AB **Date:** 29/04/2022
Approved by: SC **Date:** 05/11/2022

Depth mbgl	DPSH N(100)	SPT N(300)
6.0	8	
6.1	10	28
6.2	10	31
6.3	11	33
6.4	12	34
6.5	11	35
6.6	12	33
6.7	10	35
6.8	13	35
6.9	12	39
7.0	14	41
7.1	15	46
7.2	17	48
7.3	16	47
7.4	14	46
7.5	16	48
7.6	18	53
7.7	19	57
7.8	20	61
7.9	22	61
8.0	19	58
8.1	17	56
8.2	20	59
8.3	22	60
8.4	18	58
8.5	18	58
8.6	22	64
8.7	24	72
8.8	26	78
8.9	28	79
9.0	25	73
9.1	20	63
9.2	18	60
9.3	22	60
9.4	20	62
9.5	20	61
9.6	21	63
9.7	22	67
9.8	24	71
9.9	25	74
10.0	25.0	67
10.1	17.0	62
10.2	20	57
10.3	20	61
10.4	21	63
10.5	22	61
10.6	18	54
10.7	14	50
10.8	18	49
10.9	17	55
11.0	20	59
11.1	22	56
11.2	18	56
11.3	16	53
11.4	19	56
11.5	21	63
11.6	23	68
11.7	24	67
11.8	20	62
11.9	18	56
12.0	18	





DPSH

JOMAS ENGINEERING ENVIRONMENTAL

Site Address: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508
Client: Redrow Homes Limited

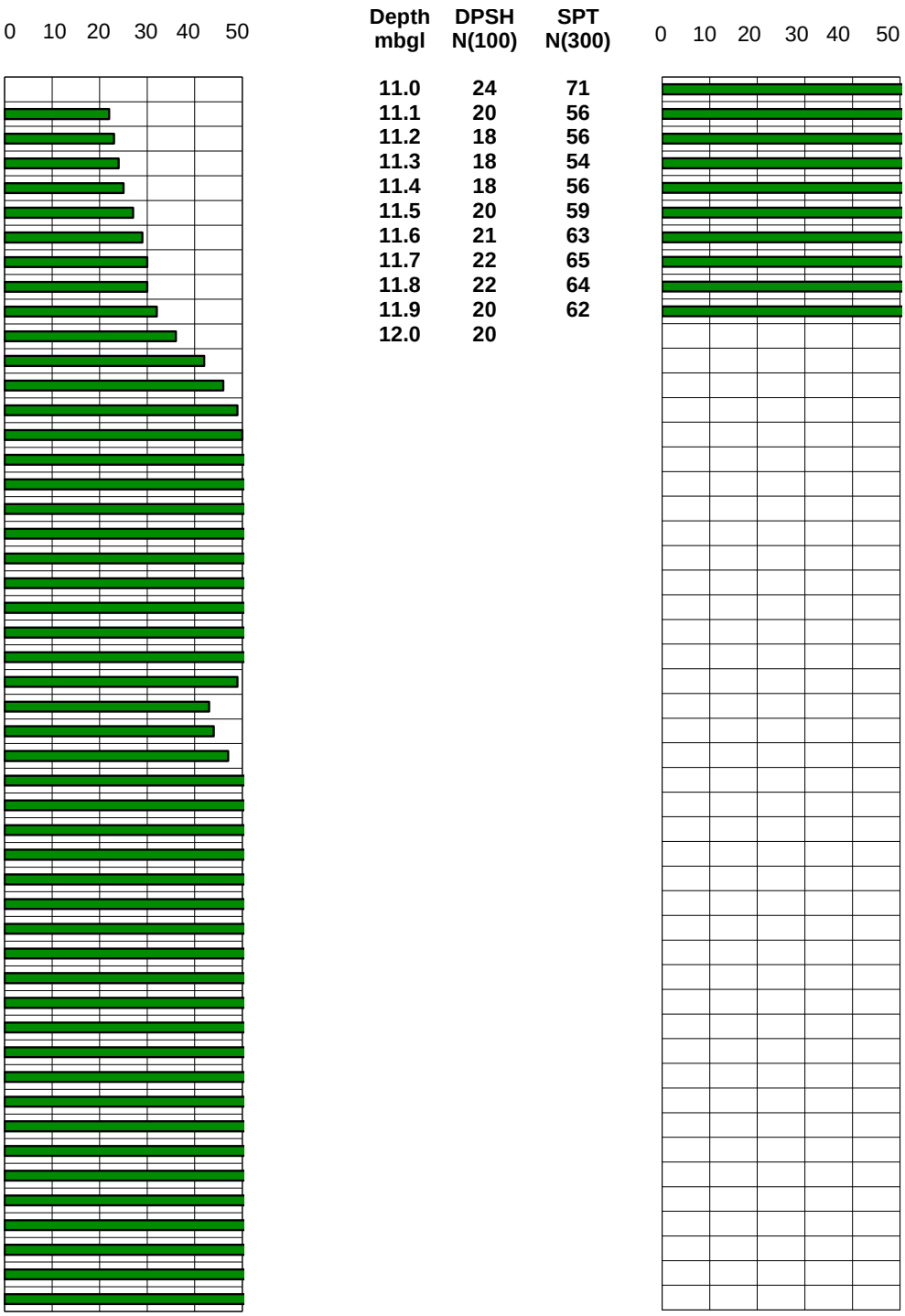
Test Location: WS4
Date of Test: 20/04/2022

Note: DPSH 'N' and SPT 'N' directly correlate. SPT'N'(300) calculated as sum of DPSH'N' over 300mm

Calculating Engineer: AB **Date:** 29/04/2022
Approved by: SC **Date:** 05/11/2022

Depth mbgl	DPSH N(100)	SPT N(300)
6.0	7	
6.1	7	22
6.2	8	23
6.3	8	24
6.4	8	25
6.5	9	27
6.6	10	29
6.7	10	30
6.8	10	30
6.9	10	32
7.0	12	36
7.1	14	42
7.2	16	46
7.3	16	49
7.4	17	50
7.5	17	51
7.6	17	52
7.7	18	55
7.8	20	58
7.9	20	59
8.0	19	59
8.1	20	59
8.2	20	59
8.3	19	54
8.4	15	49
8.5	15	43
8.6	13	44
8.7	16	47
8.8	18	54
8.9	20	60
9.0	22	66
9.1	24	70
9.2	24	70
9.3	22	66
9.4	20	62
9.5	20	61
9.6	21	59
9.7	18	57
9.8	18	53
9.9	17	51
10.0	16.0	51
10.1	18.0	53
10.2	19	57
10.3	20	61
10.4	22	64
10.5	22	68
10.6	24	72
10.7	26	78
10.8	28	81
10.9	27	79

Depth mbgl	DPSH N(100)	SPT N(300)
11.0	24	71
11.1	20	56
11.2	18	56
11.3	18	54
11.4	18	56
11.5	20	59
11.6	21	63
11.7	22	65
11.8	22	64
11.9	20	62
12.0	20	



DPSH

JOMAS ENGINEERING ENVIRONMENTAL

Site Address:	Blowers Wood, Gillingham	**Test Location:**	WS5
Jomas Job No.:	P4266J2508	**Date of Test:**	19/04/2022
Client:	Redrow Homes Limited		

Note: DPSH 'N' and SPT 'N' directly correlate. SPT'N'(300) calculated as sum of DPSH'N' over 300mm

Calculating Engineer: AB **Date:** 29/04/2022
Approved by: SC **Date:** 05/11/2022

Depth mbgl	DPSH N(100)	SPT N(300)
6.0		
6.1	9	
6.2	8	28
6.3	11	29
6.4	10	34
6.5	13	33
6.6	10	35
6.7	12	33
6.8	11	37
6.9	14	41
7.0	16	44
7.1	14	45
7.2	15	47
7.3	18	53
7.4	20	55
7.5	17	56
7.6	19	56
7.7	20	57
7.8	18	58
7.9	20	54
8.0	16	53
8.1	17	57
8.2	24	59
8.3	18	62
8.4	20	57
8.5	19	60
8.6	21	66
8.7	26	68
8.8	21	71
8.9	24	75
9.0	30	71
9.1	17	66
9.2	19	58
9.3	22	65
9.4	24	65
9.5	19	66
9.6	23	58
9.7	16	57
9.8	18	56
9.9	22	65
10.0	25.0	69
10.1	22	66
10.2	19	67
10.3	26	73
10.4	28	76
10.5	22	69
10.6	19	62
10.7	21	65
10.8	25	64
10.9	18	59
11.0	16	60
11.1	26	64
11.2	22	66
11.3	18	56
11.4	16	54
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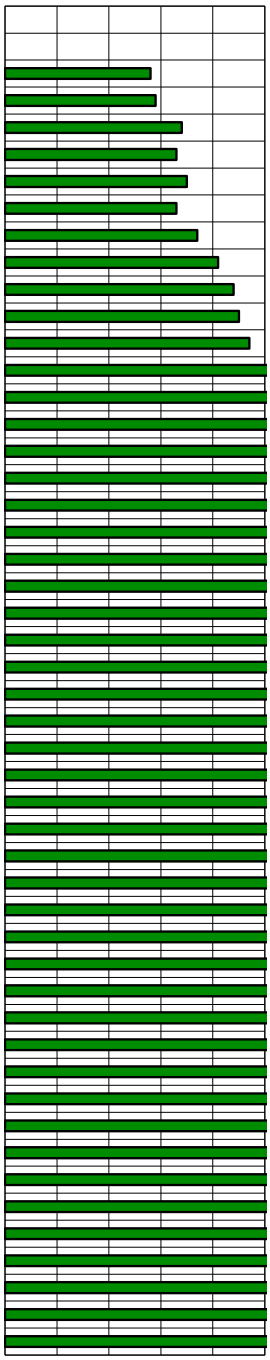
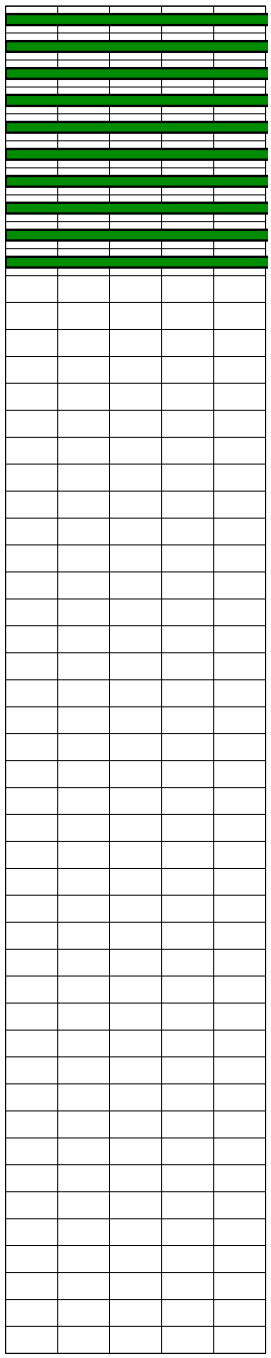
11.6	28	71
11.7	23	71
11.8	20	60
11.9	17	62
12.0	25	





DPSH

JOMAS ENGINEERING ENVIRONMENTAL

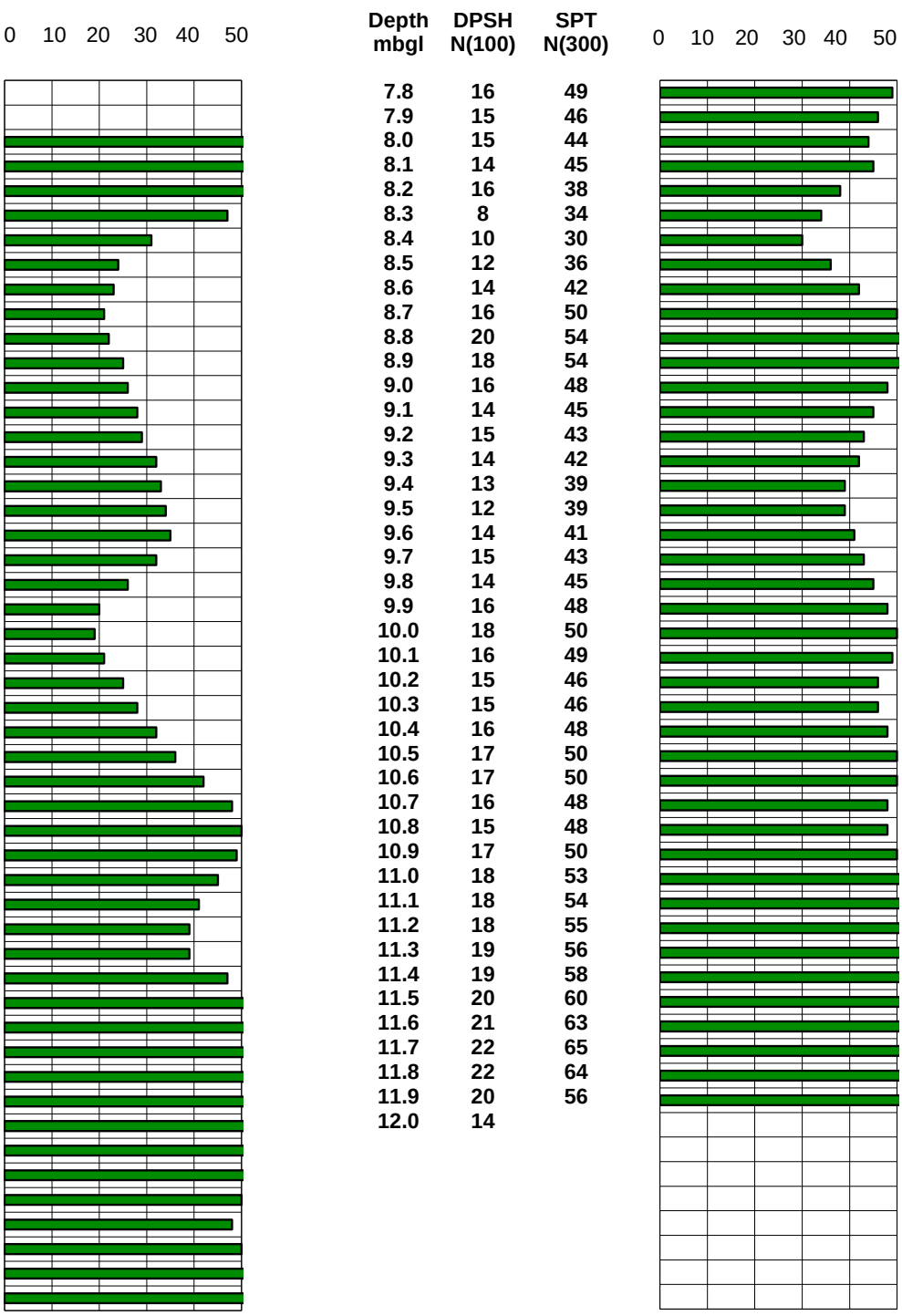
Site Address: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508
Client: Redrow Homes Limited

Test Location: WS7
Date of Test: 19/04/2022

Note: DPSH 'N' and SPT 'N' directly correlate. SPT'N'(300) calculated as sum of DPSH'N' over 300mm

Calculating Engineer: AB **Date:** 29/04/2022
Approved by: SC **Date:** 05/11/2022

Depth mbgl	DPSH N(100)	SPT N(300)
2.8		
2.9	30	
3.0	35	103
3.1	38	98
3.2	25	77
3.3	14	47
3.4	8	31
3.5	9	24
3.6	7	23
3.7	7	21
3.8	7	22
3.9	8	25
4.0	10	26
4.1	8	28
4.2	10	29
4.3	11	32
4.4	11	33
4.5	11	34
4.6	12	35
4.7	12	32
4.8	8	26
4.9	6	20
5.0	6	19
5.1	7	21
5.2	8	25
5.3	10	28
5.4	10	32
5.5	12	36
5.6	14	42
5.7	16	48
5.8	18	50
5.9	16	49
6.0	15	45
6.1	14	41
6.2	12	39
6.3	13	39
6.4	14	47
6.5	20	56
6.6	22	62
6.7	20	60
6.8	18.0	54
6.9	16	52
7.0	18	54
7.1	20	57
7.2	19	54
7.3	15	50
7.4	16	48
7.5	17	50
7.6	17	52
7.7	18	51
7.8	16	49
7.9	15	46
8.0	15	44
8.1	14	45
8.2	16	38
8.3	8	34
8.4	10	30
8.5	12	36
8.6	14	42
8.7	16	50
8.8	20	54
8.9	18	54
9.0	16	48
9.1	14	45
9.2	15	43
9.3	14	42
9.4	13	39
9.5	12	39
9.6	14	41
9.7	15	43
9.8	14	45
9.9	16	48
10.0	18	50
10.1	16	49
10.2	15	46
10.3	15	46
10.4	16	48
10.5	17	50
10.6	17	50
10.7	16	48
10.8	15	48
10.9	17	50
11.0	18	53
11.1	18	54
11.2	18	55
11.3	19	56
11.4	19	58
11.5	20	60
11.6	21	63
11.7	22	65
11.8	22	64
11.9	20	56
12.0	14	



APPENDIX 6 – CALIFORNIA BEARING RATIO TEST RESULTS (DCP METHOD)

CBR Calculation

Jomas Job: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508

Test Location: CBR1
Date of Test: 19/04/2022

Calculating Engineer: AB
Approved by: SC

Date: 29/04/2022
Date: 11/05/2022

Depth (mm)	Nr Blow	Cumulative blows
50		
100	1	1
150		
200	2	3
250		
300	4	7
350		
400	4	11
450		
500	5	16
550		
600	5	21
650		
700	7	28
750		
800	7	35
850		
900	9	44
950		
1000	9	53

Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR (%)		E (MPa)
				IAN 73/06	TRL 587	
CBR1-Test 1	100	200	50.0	4.8	5.3	48.03
CBR1-Test 2	200	600	22.2	11.4	11.8	83.55
CBR1-Test 3	600	1000	12.5	20.9	20.8	123.14

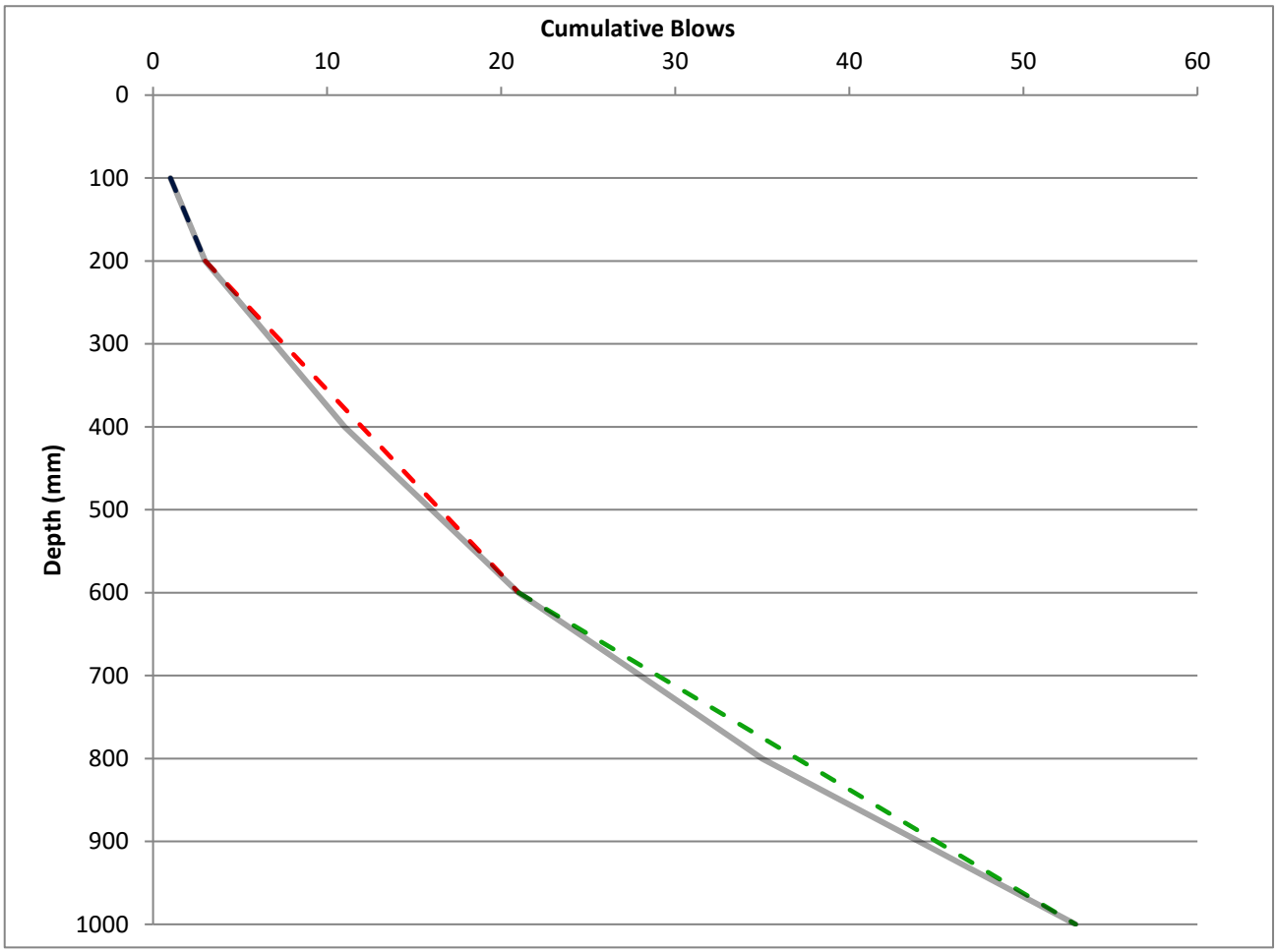
Test Notes:

Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm.

Colour of text refers to the modelled gradient on graph below.

CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587.

Characteristic MC% ? N



CBR Calculation

Jomas Job: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508

Test Location: CBR2
Date of Test: 19/04/2022

Calculating Engineer: AB
Approved by: SC

Date: 29/04/2022
Date: 11/05/2022

Depth (mm)	Nr Blow	Cumulative blows
50		
100	2	2
150		
200	2	4
250		
300	3	7
350		
400	4	11
450		
500	5	16
550		
600	6	22
650		
700	6	28
750		
800	6	34
850		
900	8	42
950		
1000	9	51

Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR (%)		E (MPa)
				IAN 73/06	TRL 587	
CBR2-Test 1	100	400	33.3	7.4	7.9	63.36
CBR2-Test 2	400	800	17.4	14.8	15.0	98.74
CBR2-Test 3	800	1000	11.8	22.3	22.1	128.36

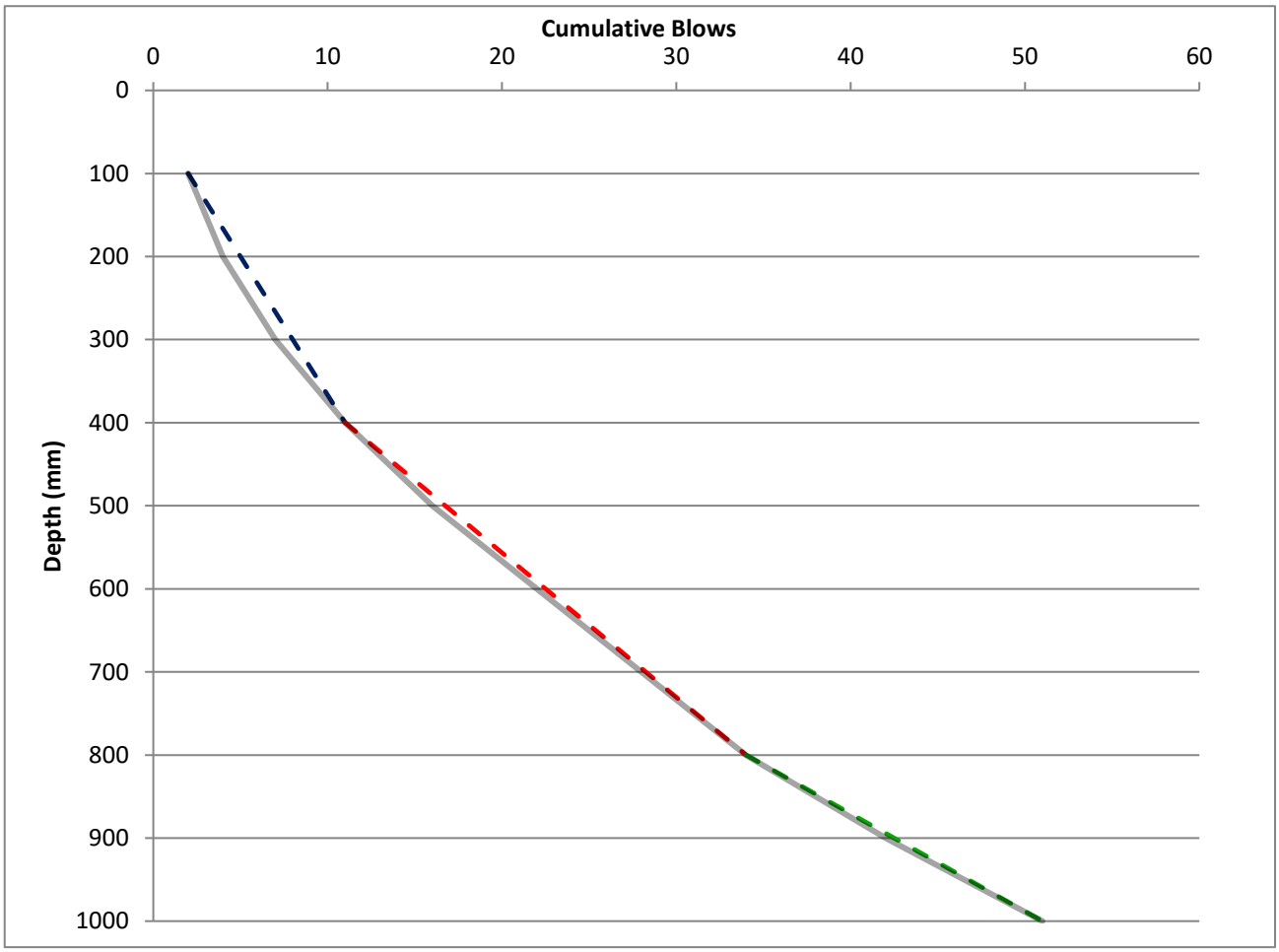
Test Notes:

Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm.

Colour of text refers to the modelled gradient on graph below.

CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587.

Characteristic MC% ? N



CBR Calculation

Jomas Job: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508

Test Location: CBR3
Date of Test: 19/04/2022

Calculating Engineer: AB
Approved by: SC

Date: 29/04/2022
Date: 11/05/2022

Depth (mm)	Nr Blow	Cumulative blows
50		
100	2	2
150		
200	3	5
250		
300	3	8
350		
400	4	12
450		
500	5	17
550		
600	5	22
650		
700	6	28
750		
800	6	34
850		
900	6	40
950		
1000	7	47

Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR (%)		E (MPa)
				IAN 73/06	TRL 587	
CBR3-Test 1	100	300	33.3	7.4	7.9	63.36
CBR3-Test 2	300	600	21.4	11.8	12.3	85.41
CBR3-Test 3	600	1000	16.0	16.1	16.3	104.2

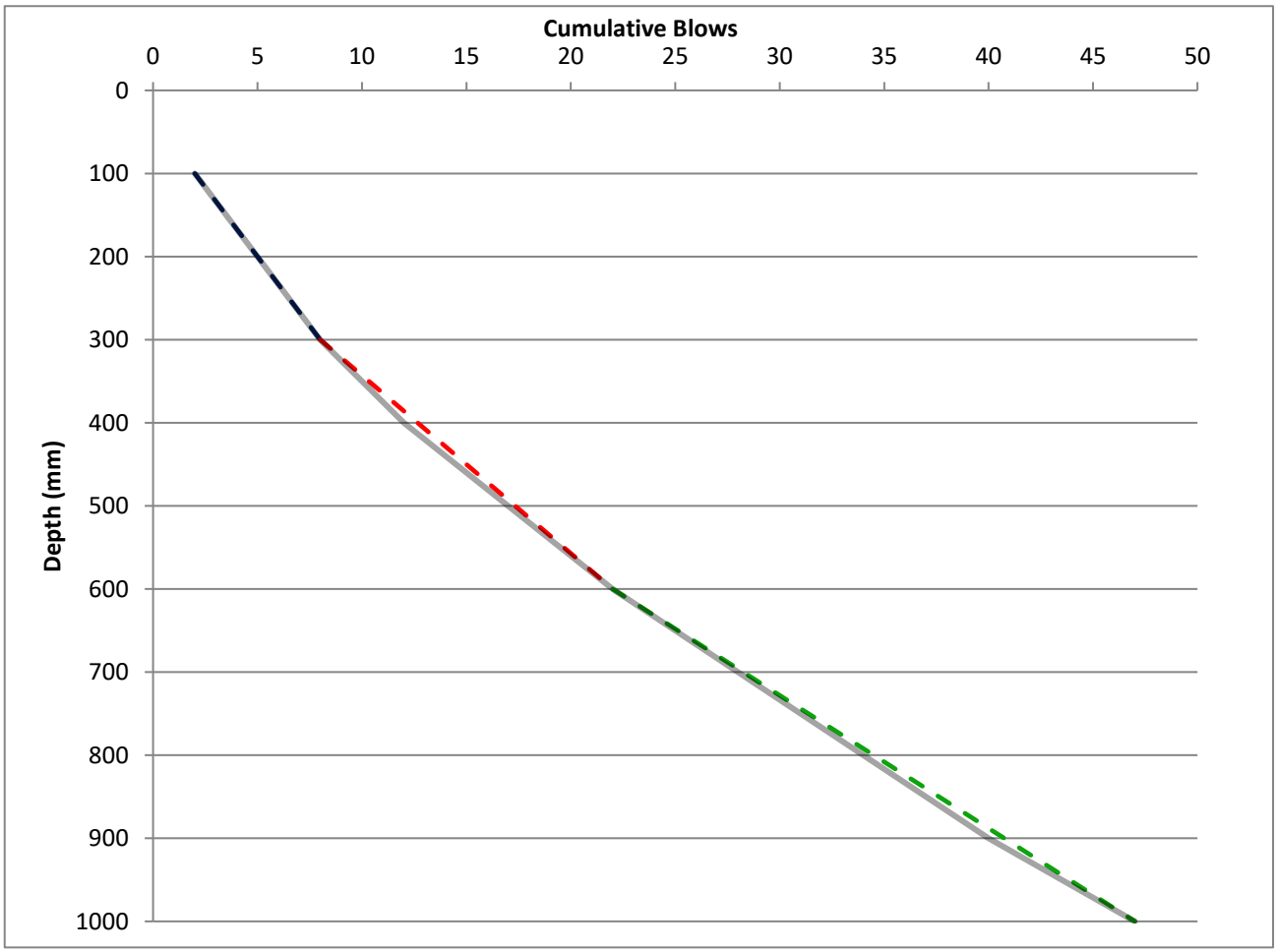
Test Notes:

Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm.

Colour of text refers to the modelled gradient on graph below.

CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587.

Characteristic MC% ? N



CBR Calculation

Jomas Job: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508

Test Location: CBR4
Date of Test: 19/04/2022

Calculating Engineer: AB
Approved by: SC

Date: 29/04/2022
Date: 11/05/2022

Depth (mm)	Nr Blow	Cumulative blows
50		
100	1	1
150		
200	1	2
250		
300	3	5
350		
400	4	9
450		
500	4	13
550		
600	4	17
650		
700	5	22
750		
800	6	28
850		
900	6	34
950		
1000	7	41

Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR (%)		E (MPa)
				IAN 73/06	TRL 587	
CBR4-Test 1	100	200	100.0	2.3	2.7	29.99
CBR4-Test 2	200	300	33.3	7.4	7.9	63.36
CBR4-Test 3	300	700	23.5	10.7	11.2	80.23
CBR4-Test 4	700	1000	15.8	16.3	16.5	105.03

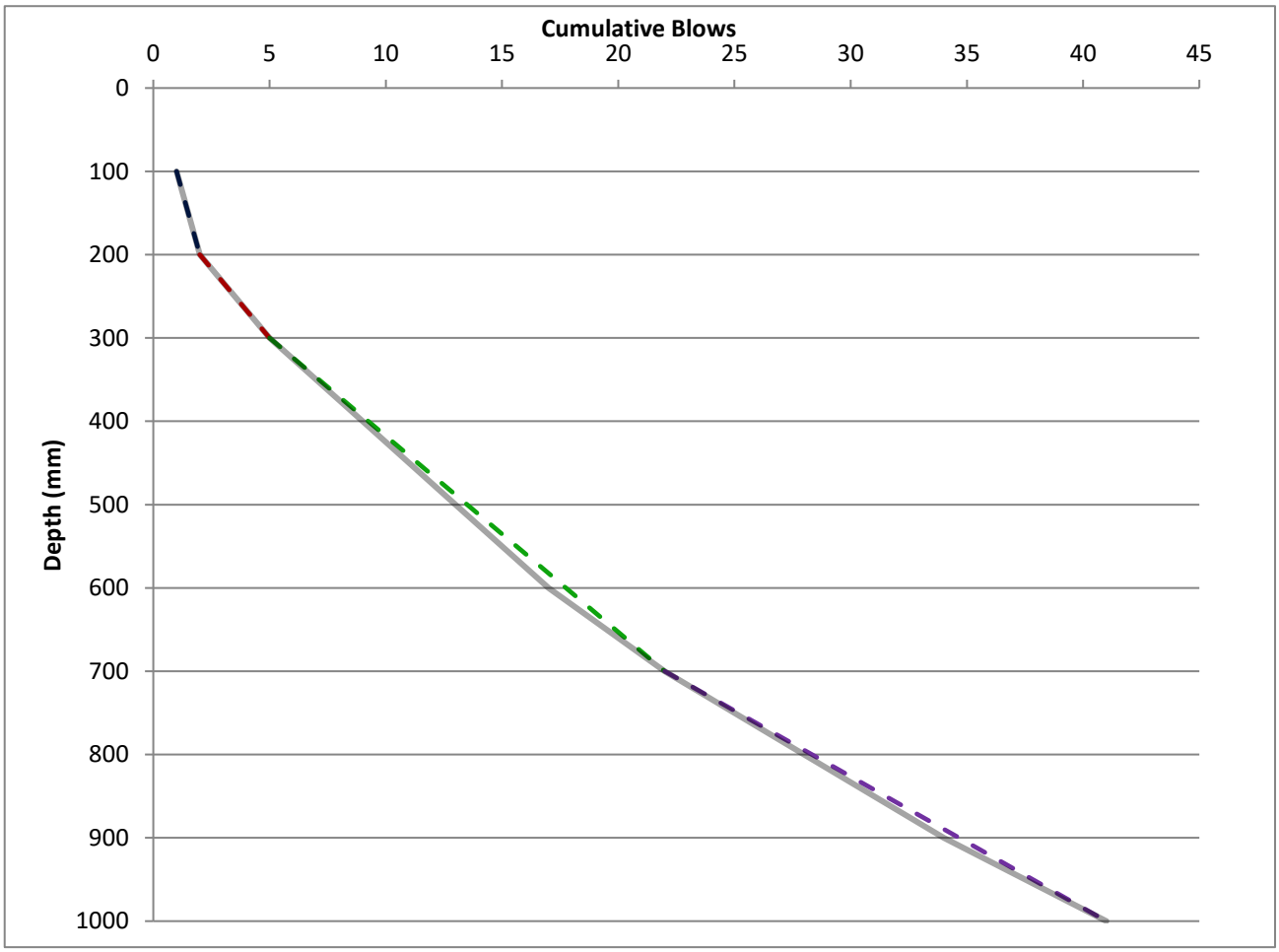
Test Notes:

Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm.

Colour of text refers to the modelled gradient on graph below.

CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587.

Characteristic MC% ? N



CBR Calculation

Jomas Job: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508

Test Location: CBR5
Date of Test: 19/04/2022

Calculating Engineer: AB
Approved by: SC

Date: 29/04/2022
Date: 11/05/2022

Depth (mm)	Nr Blow	Cumulative blows
50		
100	2	2
150		
200	3	5
250		
300	5	10
350		
400	4	14
450		
500	4	18
550		
600	4	22
650		
700	5	27
750		
800	6	33
850		
900	6	39
950		
1000	6	45

Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR (%)		E (MPa)
				IAN 73/06	TRL 587	
CBR5-Test 1	100	300	25.0	10.1	10.5	77.32
CBR5-Test 2	300	600	25.0	10.1	10.5	77.32
CBR5-Test 3	600	1000	17.4	14.8	15.0	98.74

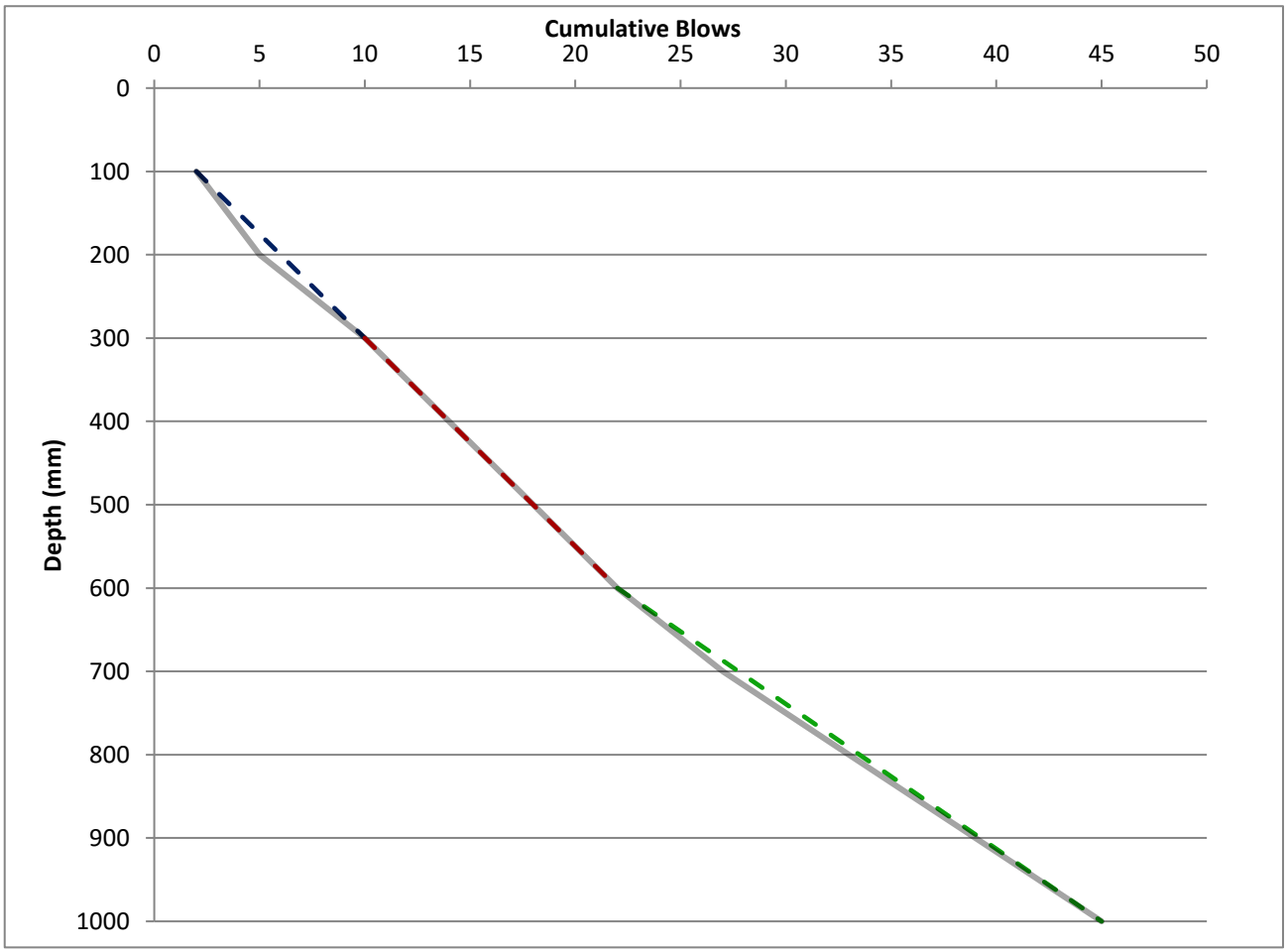
Test Notes:

Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm.

Colour of text refers to the modelled gradient on graph below.

CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587.

Characteristic MC% ? N



CBR Calculation

Jomas Job: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508

Test Location: CBR6
Date of Test: 19/04/2022

Calculating Engineer: AB
Approved by: SC

Date: 29/04/2022
Date: 11/05/2022

Depth (mm)	Nr Blow	Cumulative blows
50		
100	1	1
150		
200	1	2
250		
300	5	7
350		
400	2	9
450		
500	3	12
550		
600	4	16
650		
700	5	21
750		
800	6	27
850		
900	8	35
950		
1000	8	43

Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR (%)		E (MPa)
				IAN 73/06	TRL 587	
CBR6-Test 1	100	200	100.0	2.3	2.7	29.99
CBR6-Test 2	200	300	20.0	12.7	13.1	89.53
CBR6-Test 3	300	500	40.0	6.1	6.6	55.99
CBR6-Test 4	600	1000	14.8	17.5	17.6	109.92

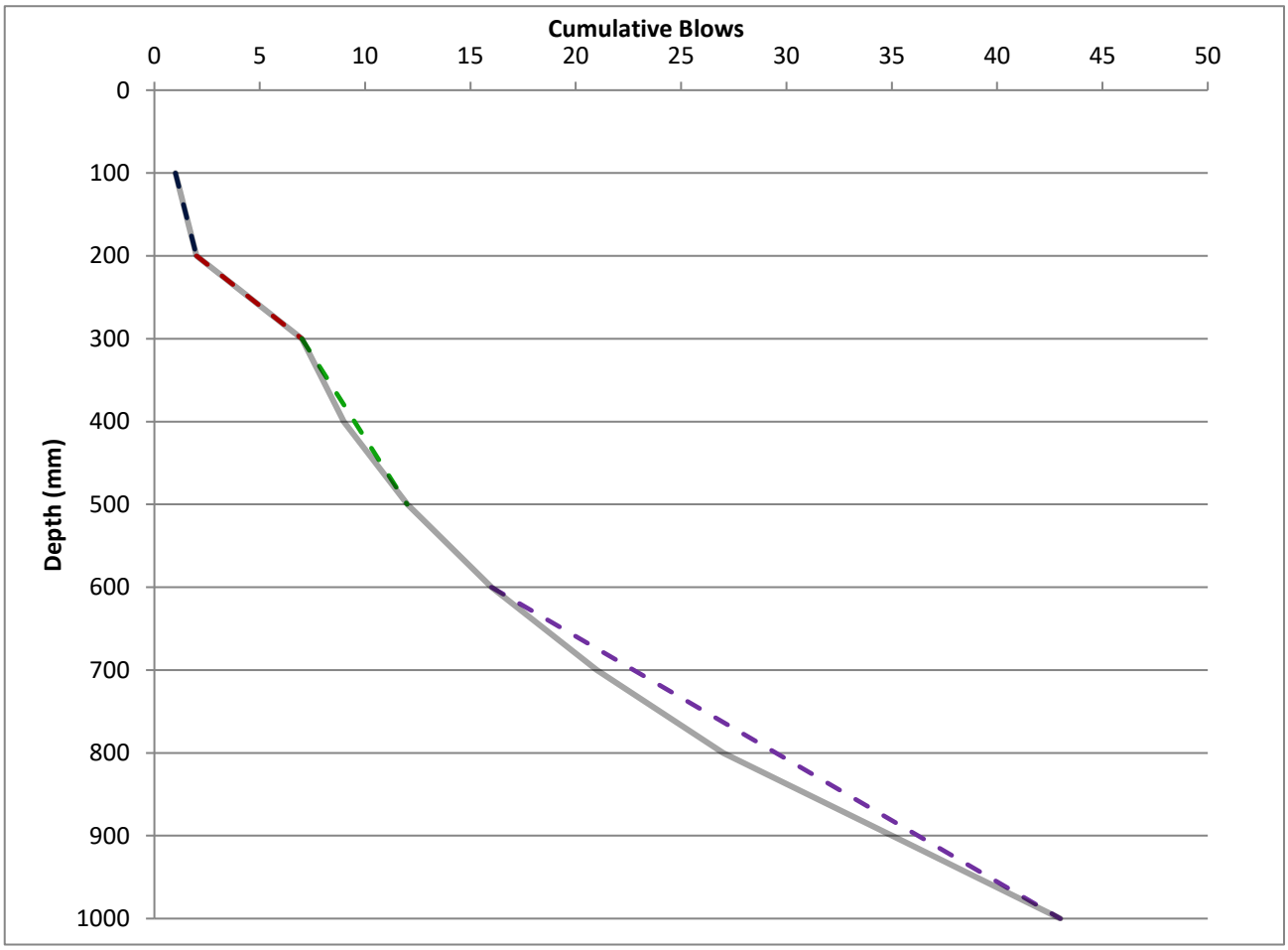
Test Notes:

Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm.

Colour of text refers to the modelled gradient on graph below.

CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587.

Characteristic MC% ? N



CBR Calculation

Jomas Job: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508

Test Location: CBR7
Date of Test: 19/04/2022

Calculating Engineer: AB
Approved by: SC

Date: 29/04/2022
Date: 11/05/2022

Depth (mm)	Nr Blow	Cumulative blows
50		
100	1	1
150		
200	2	3
250		
300	3	6
350		
400	4	10
450		
500	4	14
550		
600	5	19
650		
700	5	24
750		
800	7	31
850		
900	8	39
950		
1000	8	47

Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR (%)		E (MPa)
				IAN 73/06	TRL 587	
CBR7-Test 1	100	300	40.0	6.1	6.6	55.99
CBR7-Test 2	300	700	22.2	11.4	11.8	83.55
CBR7-Test 3	700	1000	13.0	20	19.9	119.72

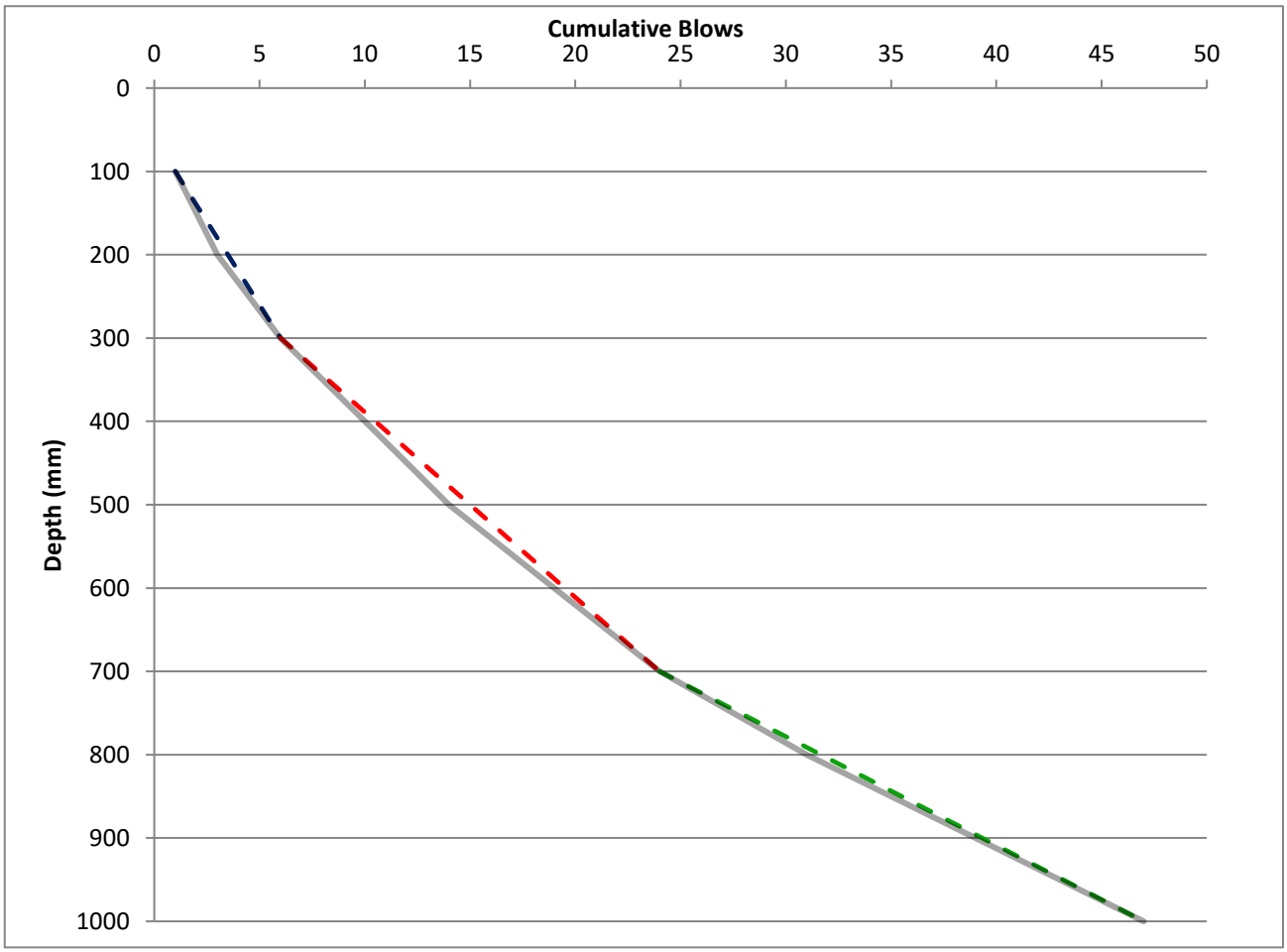
Test Notes:

Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm.

Colour of text refers to the modelled gradient on graph below.

CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587.

Characteristic MC% ? N



CBR Calculation

Jomas Job: Blowers Wood, Gillingham
Jomas Job No.: P4266J2508

Test Location: CBR8
Date of Test: 19/04/2022

Calculating Engineer: AB
Approved by: SC

Date: 29/04/2022
Date: 11/05/2022

Depth (mm)	Nr Blow	Cumulative blows
50		
100	1	1
150		
200	3	4
250		
300	4	8
350		
400	3	11
450		
500	4	15
550		
600	6	21
650		
700	10	31
750		
800	10	41
850		
900	6	47
950		
1000	4	51

Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR (%)		E (MPa)
				IAN 73/06	TRL 587	
CBR8-Test 1	100	500	28.6	8.7	9.2	70.28
CBR8-Test 2	500	600	16.7	15.4	15.7	101.28
CBR8-Test 3	600	800	10.0	26.5	25.9	143.35
CBR8-Test 4	800	1000	20.0	12.7	13.1	89.53

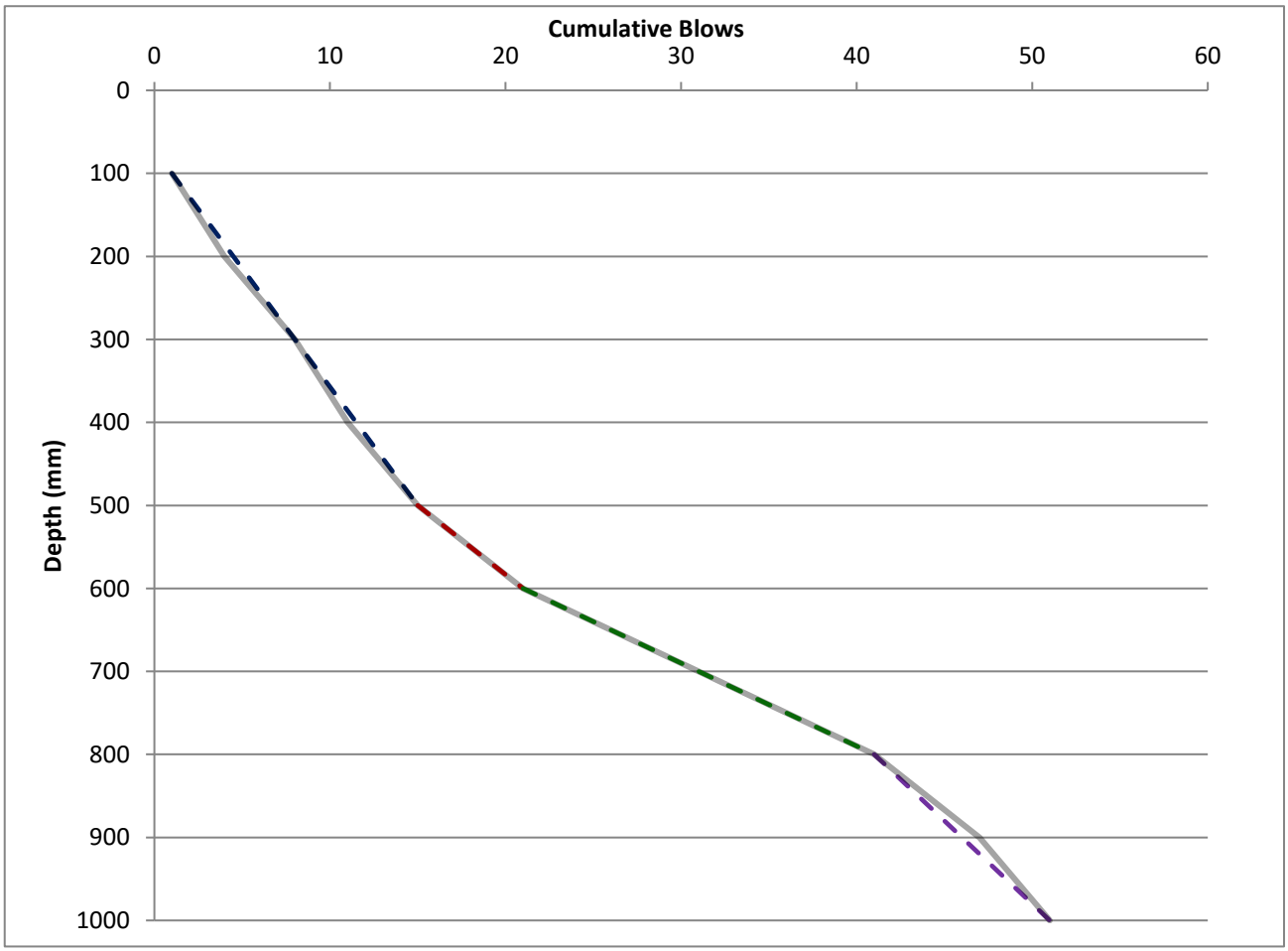
Test Notes:

Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm.

Colour of text refers to the modelled gradient on graph below.

CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587.

Characteristic MC% ? N



APPENDIX 7 – SOIL INFILTRATION TEST RESULTS

BRE 365 INFILTRATION TESTS

JOMAS JOB NAME: Blowers Wood Site, Maidstone Road

CALCULATING ENGINEER: JRO **DATE:** 21 April 2022

APPROVED BY: SC **DATE:** 11 May 2022

JOMAS JOB NO.: P4266J2508

TEST LOCATION: TP2

DATE OF TEST: 20 April 2022

Pit Details

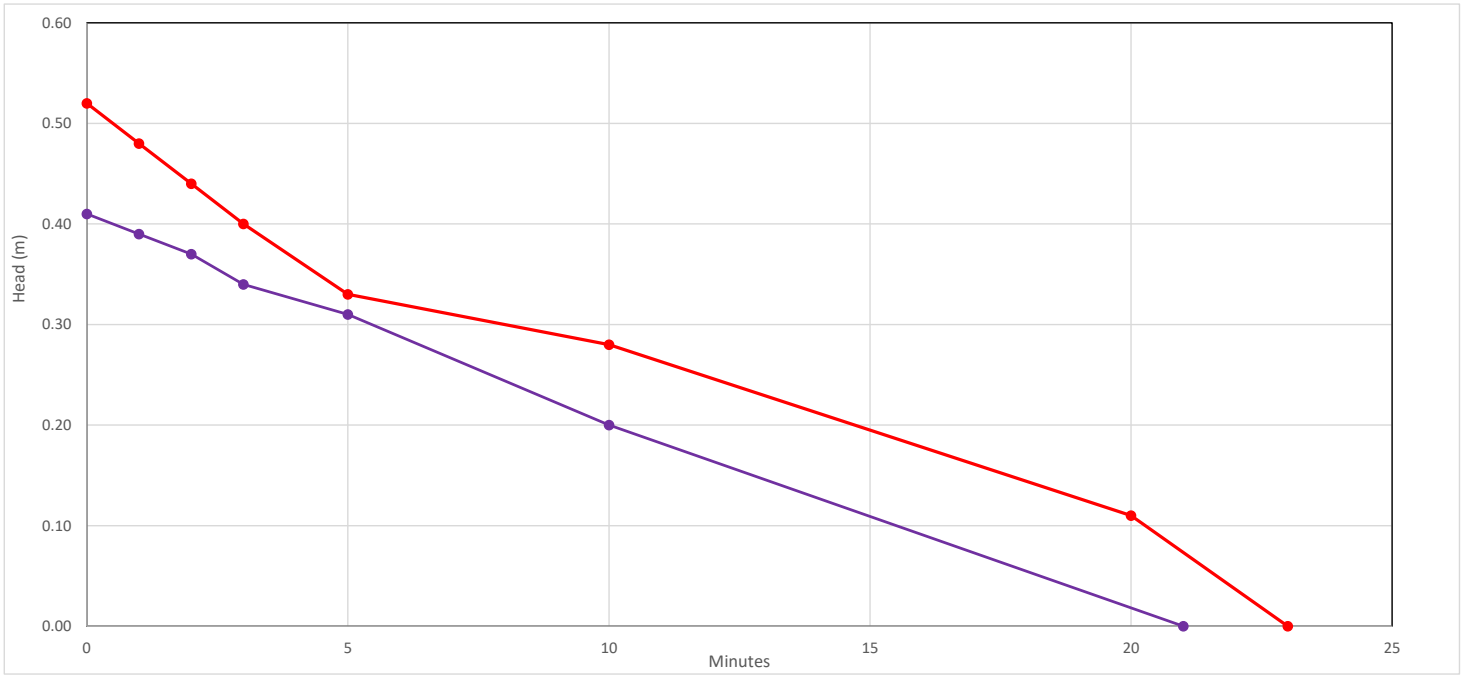
Length	2.0 m
Breadth	0.6 m
Depth	3.5 m
Groundwater?	N
Filled With Gravel?	N

	TP2 - Test 1	TP2 - Test 2	TP2 - Test 3
Dg 75% (m)	0.39	0.31	
Tp 75%	3.29	5.11	
Dg 25%	0.13	0.10	
Tp 25%	18.82	15.36	
Vp75% - Vp25% (m^3)	0.31	0.25	
ap50% (m^2)	2.55	2.27	
Tp75-Tp25 (min)	15.54	10.25	
Soil infiltration rate (m/sec)	1.31E-04	1.77E-04	
Permeability Description	Medium	Medium	
Drainage Condtions	Good	Good	

Notes:

Dw = depth to water

Dg = head of water in the pit



TP2 - Test 1			TP2 - Test 2			TP2 - Test 3		
Min	Dw	Dg	Min	Dw	Dg	Min	Dw	Dg
0	2.98	0.52	0	3.09	0.41			
1	3.02	0.48	1	3.11	0.39			
2	3.06	0.44	2	3.13	0.37			
3	3.10	0.40	3	3.16	0.34			
5	3.17	0.33	5	3.19	0.31			
10	3.22	0.28	10	3.30	0.20			
20	3.39	0.11	21	3.50	0.00			
23	3.50	0.00						

	Min	Dg		Min	Dg		Min	Dg
	Interpolated			Interpolated				
75%	3.286	0.39	75%	5.114	0.308	75%		
	Interpolated			Interpolated				
25%	18.82	0.13	25%	15	0.103	25%		

BRE 365 INFILTRATION TESTS

JOMAS JOB NAME: Blowers Wood Site, Maidstone Road

CALCULATING ENGINEER: JRO **DATE:** 21 April 2022

APPROVED BY: SC **DATE:** 11 May 2022

JOMAS JOB NO.: P4266J2508

TEST LOCATION: TP3

DATE OF TEST: 20 April 2022

Pit Details

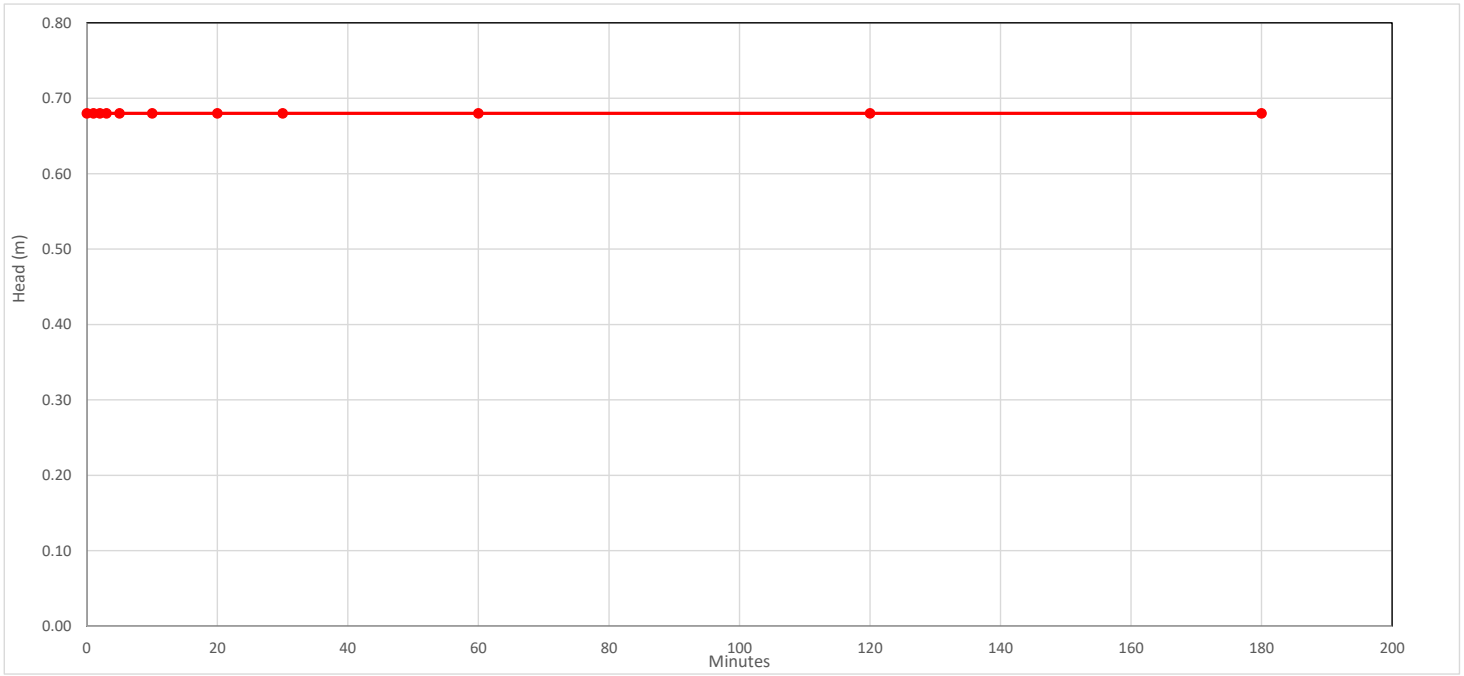
Length	2.3 m
Breadth	0.6 m
Depth	2.8 m
Groundwater?	N
Filled With Gravel?	N

	TP3 - Test 1	TP3 - Test 2	TP3 - Test 3
Dg 75% (m)	0.51		
Tp 75%			
Dg 25%	0.17		
Tp 25%			
Vp75% - Vp25% (m^3)	0.47		
ap50% (m^2)	3.35		
Tp75-Tp25 (min)			
Soil infiltration rate (m/sec)	Insuff. Drain		
Permeability Description			
Drainage Condtions			

Notes:

Dw = depth to water

Dg = head of water in the pit



TP3 - Test 1			TP3 - Test 2			TP3 - Test 3		
Min	Dw	Dg	Min	Dw	Dg	Min	Dw	Dg
0	2.12	0.68						
1	2.12	0.68						
2	2.12	0.68						
3	2.12	0.68						
5	2.12	0.68						
10	2.12	0.68						
20	2.12	0.68						
30	2.12	0.68						
60	2.12	0.68						
120	2.12	0.68						
180	2.12	0.68						

	Min	Dg		Min	Dg		Min	Dg
	Insuff. Drain							
75%		0.51	75%			75%		
	Insuff. Drain							
25%		0.17	25%			25%		

BRE 365 INFILTRATION TESTS

JOMAS JOB NAME: Blowers Wood Site, Maidstone Road

CALCULATING ENGINEER: JRO **DATE:** 21 April 2022

APPROVED BY: SC **DATE:** 11 May 2022

JOMAS JOB NO.: P4266J2508

TEST LOCATION: TP5

DATE OF TEST: 20 April 2022

Pit Details

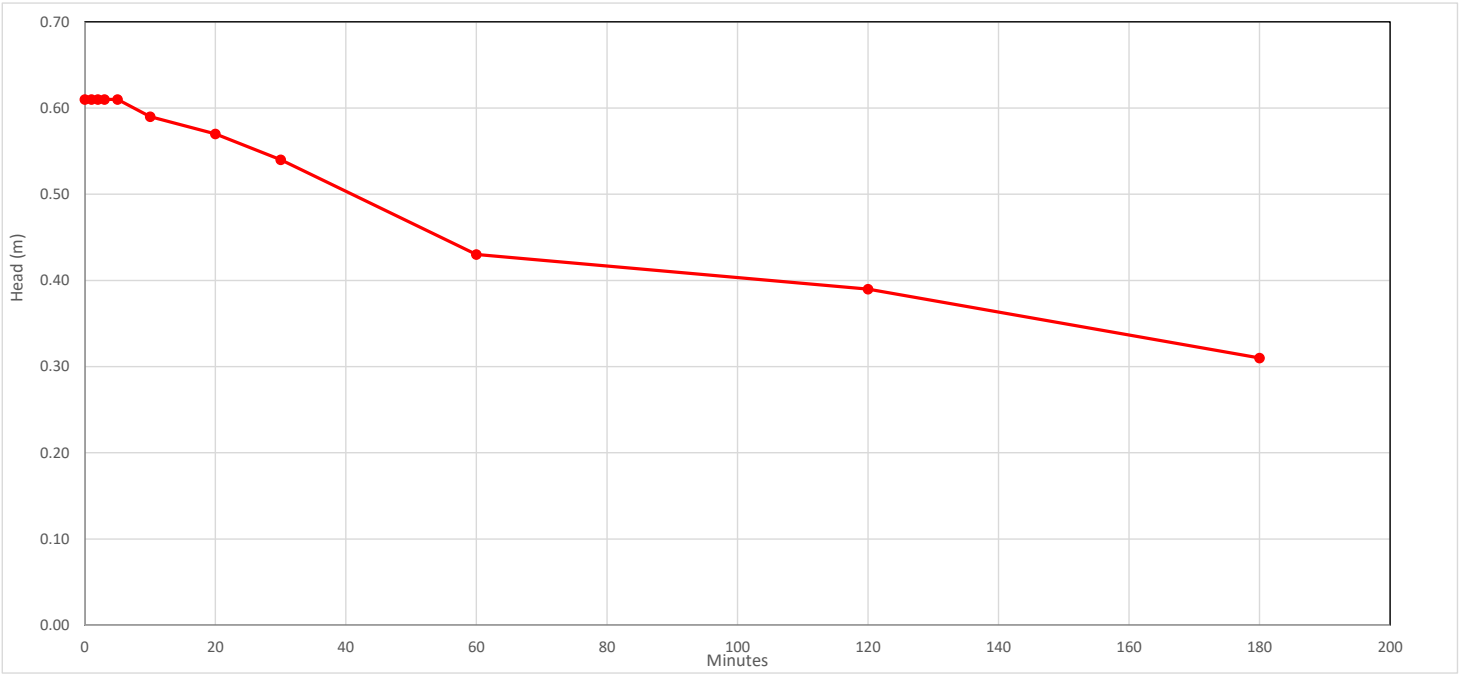
Length	2.2 m
Breadth	0.6 m
Depth	3.5 m
Groundwater?	N
Filled With Gravel?	N

	TP5 - Test 1	TP5 - Test 2	TP5 - Test 3
Dg 75% (m)	0.46		
Tp 75%	52.50		
Dg 25%	0.15		
Tp 25%	336.16		
Vp75% - Vp25% (m^3)	0.40		
ap50% (m^2)	3.03		
Tp75-Tp25 (min)	283.66		
Soil infiltration rate (m/sec)	7.81E-06		
Permeability Description	Low		
Drainage Condtions	Poor		

Notes:

Dw = depth to water

Dg = head of water in the pit



TP5 - Test 1			TP5 - Test 2			TP5 - Test 3		
Min	Dw	Dg	Min	Dw	Dg	Min	Dw	Dg
0	2.89	0.61						
1	2.89	0.61						
2	2.89	0.61						
3	2.89	0.61						
5	2.89	0.61						
10	2.91	0.59						
20	2.93	0.57						
30	2.96	0.54						
60	3.07	0.43						
120	3.11	0.39						
180	3.19	0.31						

	Min	Dg		Min	Dg		Min	Dg
	Interpolated							
75%	52.5	0.458	75%			75%		
	Extrapolated							
25%	336.2	0.153	25%			25%		

BRE 365 INFILTRATION TESTS

JOMAS JOB NAME: Blowers Wood Site, Maidstone Road
CALCULATING ENGINEER: JRO **DATE:** 21 April 2022
APPROVED BY: SC **DATE:** 11 May 2022

JOMAS JOB NO.: P4266J2508
TEST LOCATION: TP6
DATE OF TEST: 20 April 2022

Pit Details

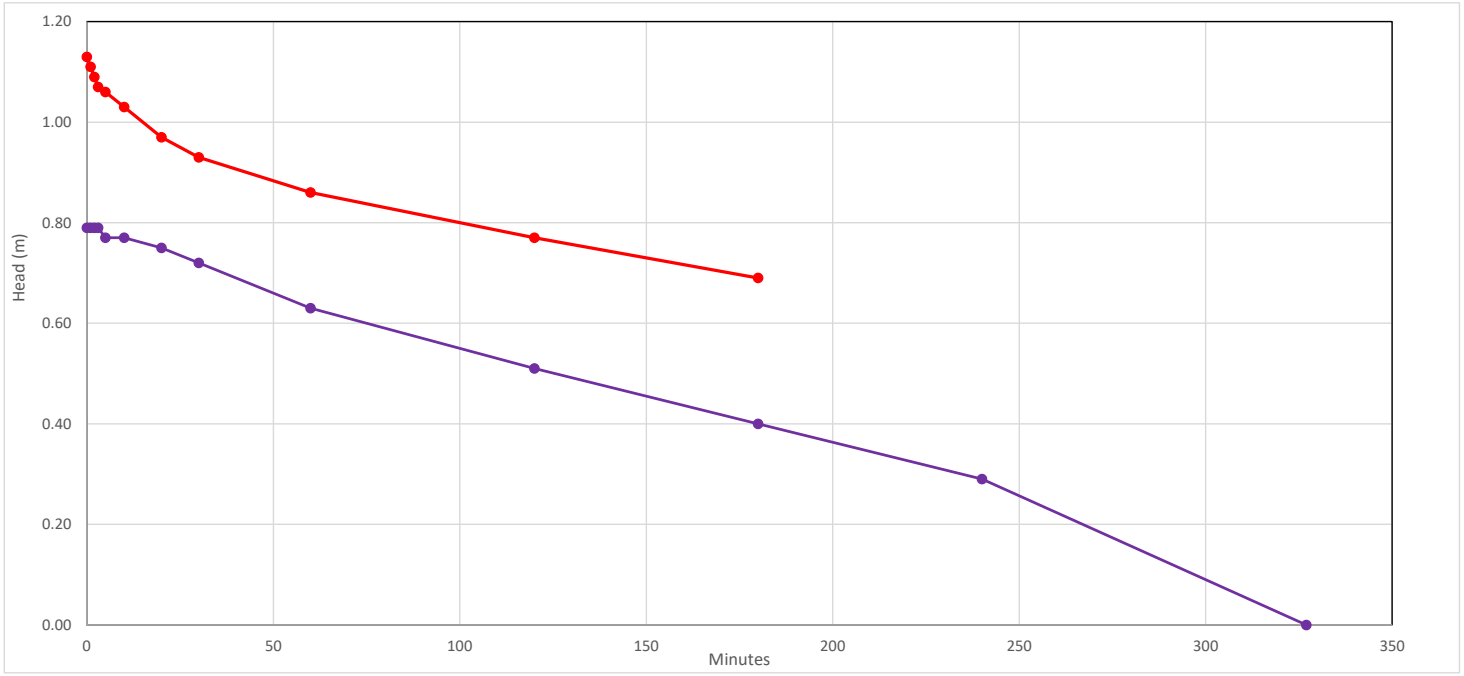
Length	2.3 m
Breadth	0.6 m
Depth (Test 1)	3.5 m
Depth (Test 2)	3.1 m
Groundwater?	N
Filled With Gravel?	N

	TP6 - Test 1	TP6 - Test 2	TP6 - Test 3
Dg 75% (m)	0.85	0.59	
Tp 75%	68.33	240.00	
Dg 25%	0.28	0.20	
Tp 25%	466.07	327.00	
Vp75% - Vp25% (m^3)	0.78	0.55	
ap50% (m^2)	4.66	3.67	
Tp75-Tp25 (min)	397.74	87.00	
Soil infiltration rate (m/sec)	7.02E-06	2.84E-05	
Permeability Description	Low	Medium	
Drainage Condtions	Poor	Good	

Notes:

Dw = depth to water
Dg = head of water in the pit

Test 1 undertaken 19/04/22
Test 2 undertaken 20/04/22, by which point pit depth had collapsed to 3.1m bgl



TP6 - Test 1			TP6 - Test 2			TP6 - Test 3		
Min	Dw	Dg	Min	Dw	Dg	Min	Dw	Dg
0	2.37	1.13	0	2.31	0.79			
1	2.39	1.11	1	2.31	0.79			
2	2.41	1.09	2	2.31	0.79			
3	2.43	1.07	3	2.31	0.79			
5	2.44	1.06	5	2.33	0.77			
10	2.47	1.03	10	2.33	0.77			
20	2.53	0.97	20	2.35	0.75			
30	2.57	0.93	30	2.38	0.72			
60	2.64	0.86	60	2.47	0.63			
120	2.73	0.77	120	2.59	0.51			
180	2.81	0.69	180	2.70	0.40			
			240	2.81	0.29			
			327	3.10	0.00			

	Min	Dg		Min	Dg		Min	Dg
	Interpolated			Interpolated				
75%	68.33	0.848	75%	240	0.593	75%		
	Extrapolated			Interpolated				
25%	466.1	0.283	25%	327	0.198	25%		

BRE 365 INFILTRATION TESTS

JOMAS JOB NAME: Blowers Wood Site, Maidstone Road

CALCULATING ENGINEER: JRO **DATE:** 21 April 2022

APPROVED BY: SC **DATE:** 11 May 2022

JOMAS JOB NO.: P4266J2508
TEST LOCATION: TP7
DATE OF TEST: 20 April 2022

Pit Details

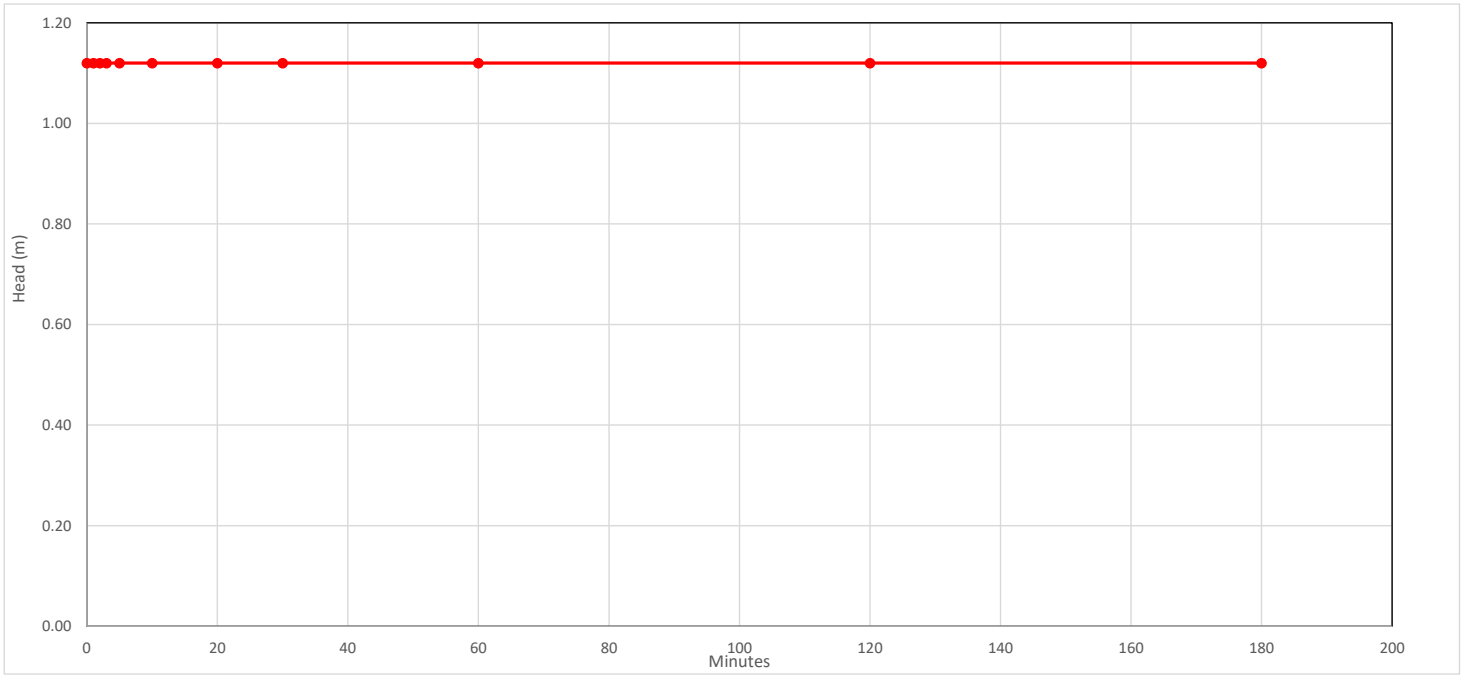
Length	2.2 m
Breadth	0.6 m
Depth	3.5 m
Groundwater?	N
Filled With Gravel?	N

	TP7 - Test 1	TP7 - Test 2	TP7 - Test 3
Dg 75% (m)	0.84		
Tp 75%			
Dg 25%	0.28		
Tp 25%			
Vp75% - Vp25% (m^3)	0.74		
ap50% (m^2)	4.46		
Tp75-Tp25 (min)			
Soil infiltration rate (m/sec)	Insuff. Drain		
Permeability Description			
Drainage Condtions			

Notes:

Dw = depth to water
Dg = head of water in the pit

Depth to water was measured as 2.42m the morning after first test (approx. 18 hours later)



TP7 - Test 1			TP7 - Test 2			TP7 - Test 3		
Min	Dw	Dg	Min	Dw	Dg	Min	Dw	Dg
0	2.38	1.12						
1	2.38	1.12						
2	2.38	1.12						
3	2.38	1.12						
5	2.38	1.12						
10	2.38	1.12						
20	2.38	1.12						
30	2.38	1.12						
60	2.38	1.12						
120	2.38	1.12						
180	2.38	1.12						

	Min	Dg		Min	Dg		Min	Dg
	Insuff. Drain							
75%		0.84	75%			75%		
	Insuff. Drain							
25%		0.28	25%			25%		

BRE 365 INFILTRATION TESTS

JOMAS JOB NAME: Blowers Wood Site, Maidstone Road

CALCULATING ENGINEER: JRO **DATE:** 21 April 2022

APPROVED BY: SC **DATE:** 11 May 2022

JOMAS JOB NO.: P4266J2508

TEST LOCATION: TP10

DATE OF TEST: 20 April 2022

Pit Details

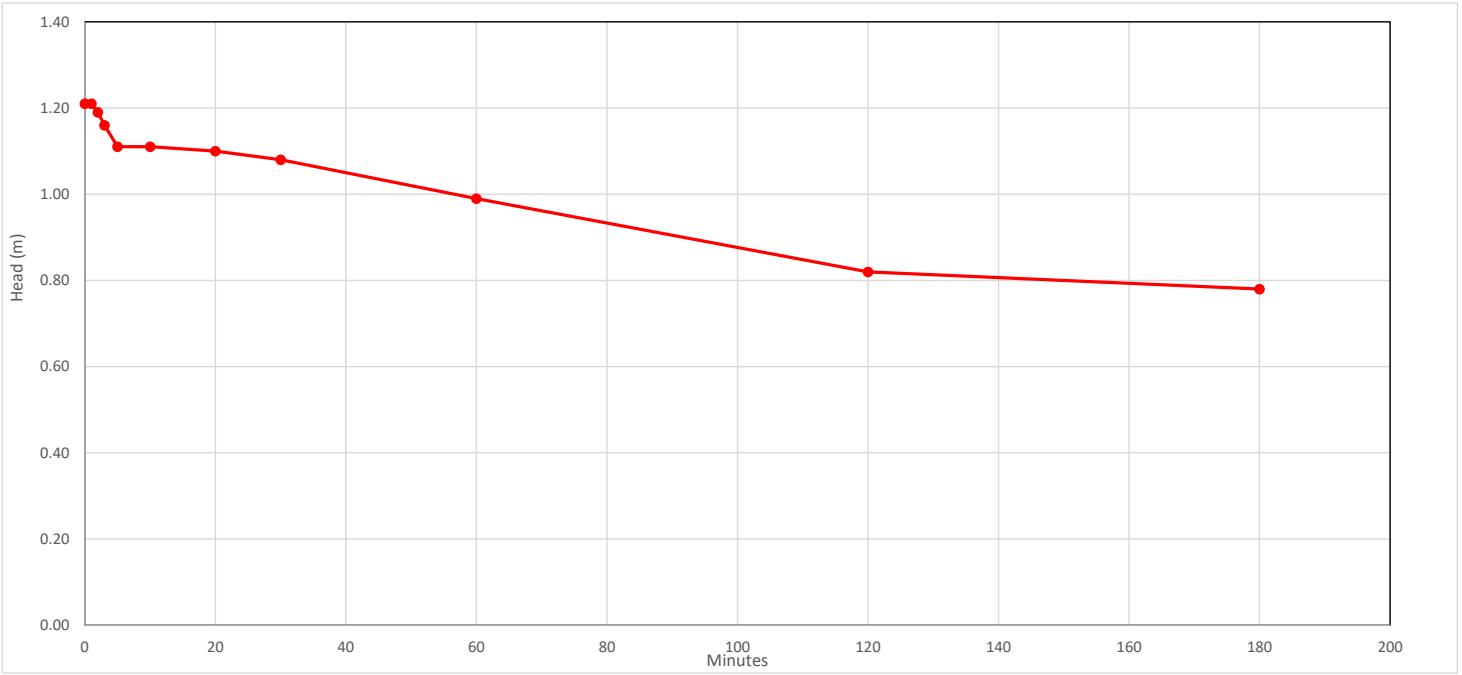
Length	2.0 m
Breadth	0.6 m
Depth	3.5 m
Groundwater?	N
Filled With Gravel?	N

	TP10 - Test 1	TP10 - Test 2	TP10 - Test 3
Dg 75% (m)	0.91		
Tp 75%	89.12		
Dg 25%	0.30		
Tp 25%	404.18		
Vp75% - Vp25% (m^3)	0.73		
ap50% (m^2)	4.35		
Tp75-Tp25 (min)	315.06		
Soil infiltration rate (m/sec)	8.84E-06		
Permeability Description	Low		
Drainage Condtions	Poor		

Notes:

Dw = depth to water

Dg = head of water in the pit



TP10 - Test 1			TP10 - Test 2			TP10 - Test 3		
Min	Dw	Dg	Min	Dw	Dg	Min	Dw	Dg
0	2.29	1.21						
1	2.29	1.21						
2	2.31	1.19						
3	2.34	1.16						
5	2.39	1.11						
10	2.39	1.11						
20	2.40	1.10						
30	2.42	1.08						
60	2.51	0.99						
120	2.68	0.82						
180	2.72	0.78						

	Min	Dg		Min	Dg		Min	Dg
	Interpolated							
75%	89.12	0.908	75%			75%		
	Extrapolated							
25%	404.2	0.303	25%			25%		

APPENDIX 8 – SOIL GAS AND GROUNDWATER MONITORING RECORDS

GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET

Site: Blowers wood Site, Maidstone Road	**Operative(s):** HAH	**Date:** 13/05/2022	**Time:** 16:00	**Round: 1**	**Page:** 1

MONITORING EQUIPMENT

Instrument Type	Instrument Make	Serial No.	Date Last Calibrated
Analox	GA5000	G505801	01/10/2021
PID	Phocheck tiger	T-106448	01/03/2021
Dip Meter	GeoTech		

MONITORING CONDITIONS

Weather Conditions: Sunny	**Ground Conditions:** Dry	**Temperature**: 22°C
Barometric Pressure (mbar): 1006	**Barometric Pressure Trend (24hr):** Steady	**Ambient Concentration:** 0.3 %CH_4, 0.1 %CO_2,20.4 %O_2

MONITORING RESULTS

Monitoring Point Location	Flow		Atmospheric Pressure (mbar)	CH_4 %	CH_4 % LEL	CO_2 %	O_2 %	VOC (ppm)		H_2S (ppm)	CO (ppm)	Depth to product (mbgl)	Depth to water (mbgl)	Depth to base of well (mbgl)
	Peak	Steady						Peak	Steady					
WS3	0.0	0.0	1006	0.1	-	0.1	20.0	0.4	0.4	0	2	-	DRY	5.17
WS7	0.0	0.0	1006	0.2	-	2.1	18.4	0.6	0.6	0	2	-	DRY	2.65
WS8	0.0	0.0	1006	0.2	-	0.0	20.2	0.2	0.2	0	1	-	DRY	4.40

GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET

Site: Blowers wood Site, Maidstone Road	**Operative(s):** RAY	**Date:** 20/05/2022	**Time:** 09:30	**Round: 2**	**Page:** 1

MONITORING EQUIPMENT

Instrument Type	**Instrument Make**	**Serial No.**	**Date Last Calibrated**
Analox	GA5000	G505801	01/10/2021
PID	Phocheck tiger	T-106448	01/03/2021
Dip Meter	GeoTech		

MONITORING CONDITIONS

Weather Conditions: Rainy	**Ground Conditions:** Wet	**Temperature**: 13°C
Barometric Pressure (mbar): 1004	**Barometric Pressure Trend (24hr):** Falling	**Ambient Concentration:** 0.1 %CH_4, 0.2 %CO_2,21.3 %O_2

MONITORING RESULTS

Monitoring Point Location	Flow		Atmospheric Pressure (mbar)	CH_4 %	CH_4 % LEL	CO_2 %	O_2 %	VOC (ppm)		H_2S (ppm)	CO (ppm)	Depth to product (mbgl)	Depth to water (mbgl)	Depth to base of well (mbgl)
	Peak	Steady						Peak	Steady					
WS1	0.1	0.1	1004	0.1	-	0.3	21.2	0.2	0.2	0	0	-	DRY	4.81
WS3	0.1	0.1	1004	0.1	-	0.4	21.65	0.3	0.3	0	0	-	DRY	5.11
WS4	0.2	0.2	1004	0.1	-	0.7	20.4	0.3	0.2	0	0	-	DRY	5.57
WS5	0.1	0.1	1004	0.1	-	0.2	20.7	0.6	0.6	0	0	-	DRY	4.48
WS8	0.1	0.1	1004	0.1	-	0.2	21.4	0.2	0.2	0	0	-	DRY	4.42

GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET

Site: Blowers wood Site, Maidstone Road	**Operative(s):** RAY / JAR	**Date:** 24/05/2022	**Time:** 10:00	**Round: 3**	**Page:** 1

MONITORING EQUIPMENT

Instrument Type	**Instrument Make**	**Serial No.**	**Date Last Calibrated**
Analox	GA5000	G505801	01/10/2021
PID	Phocheck tiger	T-106448	01/03/2021
Dip Meter	GeoTech		

MONITORING CONDITIONS

Weather Conditions: Rainy	**Ground Conditions:** Wet	**Temperature**: 12°C
Barometric Pressure (mbar): 990	**Barometric Pressure Trend (24hr):** Rising	**Ambient Concentration:** 0.1 %CH_4, 0.2 %CO_2,21.2 %O_2

MONITORING RESULTS

Monitoring Point Location	Flow		Atmospheric Pressure (mbar)	CH_4 %	CH_4 % LEL	CO_2 %	O_2 %	VOC (ppm)		H_2S (ppm)	CO (ppm)	Depth to product (mbgl)	Depth to water (mbgl)	Depth to base of well (mbgl)
	Peak	Steady						Peak	Steady					
WS1	0.0	0.0	992	0.1	-	0.2	21.3	0.4	0.3	0	0	-	DRY	4.84
WS3	0.0	0.0	992	0.1	-	0.2	21.2	0.2	0.2	0	0	-	DRY	5.16
WS4	0.0	0.0	992	0.1	-	0.6	20.1	0.4	0.3	0	0	-	DRY	6.01
WS5	0.2	0.2	991	0.1	-	0.6	20.5	0.4	0.3	0	0	-	DRY	4.70
WS7	0.0	0.0	991	0.1	-	0.7	20.5	0.2	0.2	0	0	-	DRY	2.62
WS8	0.0	0.0	990	0.1	-	0.2	21.1	0.2	0.1	0	0	-	DRY	4.40

GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET

Site: Blowers wood Site, Maidstone Road	**Operative(s):** SEJ	**Date:** 10/06/2022	**Time:** 09:30	**Round: 4**	**Page:** 1

MONITORING EQUIPMENT

Instrument Type	**Instrument Make**	**Serial No.**	**Date Last Calibrated**
Analox	GA5000	G505801	01/10/2021
PID	Phocheck tiger	T-106448	01/03/2021
Dip Meter	GeoTech		

MONITORING CONDITIONS

Weather Conditions: Sun & cloud	**Ground Conditions:** Damp grass	**Temperature**: 19°C
Barometric Pressure (mbar): 1005	**Barometric Pressure Trend (24hr):** Rising	**Ambient Concentration:** 0.4 %CH_4, 0.1%CO_2, 20.2%O_2

MONITORING RESULTS

Monitoring Point Location	Flow		Atmospheric Pressure (mbar)	CH_4 %	CH_4 % LEL	CO_2 %	O_2 %	VOC (ppm)		H_2S (ppm)	CO (ppm)	Depth to product (mbgl)	Depth to water (mbgl)	Depth to base of well (mbgl)
	Peak	Steady						Peak	Steady					
WS1	0.1	0.1	1006	0.3	-	0.7	19.2	0.5	0.2	0	1	-	DRY	4.84
WS3	0.1	0.1	1005	0.4	-	0.3	19.9	0.3	0.2	0	2	-	DRY	5.16
WS4	0.2	0.2	1007	0.4	-	1.2	17.9	0.4	.0.2	0	1	-	DRY	6.01
WS5	0.1	0.1	1006	0.3	-	0.8	20.1	0.3	0.2	0	1	-	DRY	4.70
WS7	0.1	0.1	1007	0.3	-	1.6	19.9	0.4	0.3	0	1	-	DRY	2.62
WS8	0.1	0.1	1006	0.3	-	0.0	20.0	0.5	0.2	0	2	-	DRY	4.40

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