

Photograph 9: View northwest towards Isaac's Lane



Photograph 10: Shallow surface excavation

Brookleigh School

Client: Homes England

Site Photographs
9 - 10

Job Number:	14176
Date:	17/02/2025
Drawn by:	SR
Checked by:	SRB
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Photograph 11: View northeast towards EBLR



Photograph 12: Shallow soils and pumps in background

Brookleigh School

Client: Homes England

Site Photographs
11 - 12

Job Number: 14176
Date: 17/02/2025
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Photograph 13: View southwest towards Isaac's Lane



Photograph 14: Soil bund in the north of the site

Brookleigh School

Client: Homes England

Site Photographs
13 - 14

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Photograph 15: View southeast of the soil bund and shallow excavation works



Photograph 16: Excavation with concrete filling for temporary foul drainage

Brookleigh School

Client: Homes England

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15 - 16

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Photograph 17: Concrete in c. 3m excavation



Photograph 18: View northeast from south of the site

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Client: Homes England

Site Photographs
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Photograph 19: view east of the site



Photograph 20: stockpiles adjacent to the excavation

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Client: Homes England

Site Photographs
19 - 20

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Appendix 3

Ground Investigation Information

HARRISON GROUP ENVIRONMENTAL LIMITED

Document: **Ground Investigation Factual Report**

Project: **Northern Arc, Burgess Hill P1.2**

Reference No.: **GL23484/P1.2**

Date: **August 2020**

Client: **John Sisk & Son Ltd**

Prepared For: **Campbell Reith Hill LLP**

REPORT STATUS:

		INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE
		INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE
REV0		[redacted]			
REV0					
Revision	**Comments**	**Prepared By**	**Approved By**	**Issued By**	**Audited By**

Document: Ground Investigation Factual Report

Project: GL23484 Northern Arc, Burgess Hill P1.2

Reference No: GL23484-P1.2

Date: August 2020

Client: John Sisk & Son Ltd

Prepared For: Campbell Reith Hill LLP

harrisongeotechnical
ENGINEERING



A division of Harrison Group Environmental Limited

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FOREWORD

General Conditions Relating to Site Investigation

This investigation has been devised to generally comply with the relevant principles and requirements of BS10175:2001+A2:2017 “Investigation of potentially contaminated sites - Code of practice” and where directed by the principles and application rules of Eurocode 7 (EC7 – Part 1 and Part 2). The recommendations made and opinions expressed in this report are based on the information obtained from the sources described using a methodology intended to provide reasonable consistency and robustness.

The opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between exploratory positions, these are only for guidance and no liability can be accepted for their accuracy.

Boring, sampling and field test procedures are undertaken in accordance with BS5930:2015+A1:2020 "Code of Practice for Site Investigations". Likewise, in-situ and laboratory testing comply with B.S.1377, "Methods of Tests for Soils for Civil Engineering Purposes", unless stated otherwise in the text. The groundwater conditions entered on the boring records are those observed at the time of investigation. The normal rate of boring usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions.

Some items of the investigation have been provided by third parties and whilst Harrison Group have no reason to doubt the accuracy, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report.

This report is produced for the benefit of the client alone. No responsibility can be accepted for any consequences of this information being passed to a third party who may act upon its contents/recommendations.

FACTUAL REPORT

ON A

GROUND INVESTIGATION

AT

NORTHERN ARC, BURGESS HILL P1.2

1.0 TERMS OF REFERENCE AND INTRODUCTION

The work covered by this report was undertaken on behalf of John Sisk & Son Ltd (Sisk) by Harrison Group Environmental Ltd (HGE). The work was undertaken in accordance with the relevant specification Ref. 13258-CRH-XX-XX-SP-GE-0002_REV2 GI Spec issued by Campbell Reith Hill LLP (CampbellReith) who acted as the engineer.

The site area is formed of 7 discrete areas. Site areas P1.1, P1.2, P1.3, P1.5, P1.6, P1.7 and P1.8 are located adjacent to one another in a rural setting on the north western outskirts of Burgess Hill. The purpose of the ground investigations across the site is to provide geotechnical and environmental data to inform the development of a Secondary School, Primary School and Residential developments.

This report covers the P1.2 area which is proposed to be a Primary School.

The purpose of the investigation was to provide factual geotechnical and geo-environmental data from a site walkover, fieldwork and subsequent laboratory testing, which will be used to assist with the design of the new site development.

This report presents the results of the fieldwork together with the associated geotechnical and geo-environmental laboratory testing.

2.0 LOCATION AND DESCRIPTION OF SITE

The site is located between A273 Isaac's Lane and River Adur East, north of Burgess Hill. The National Grid References are 530935E, 120875N. The nearest postcode is RH15 8RA.

In general, the area is flat/undulating greenfield area associated with farmland with field boundaries and slopes towards the existing water course (River Adur) and is vegetated and covered with trees and shrubs. At the south of the A289, the slope crest has a boundary with residential units. At the north of the carriageway, the boundary is with a farm.

A site location plan, Drawing No. GL23484-DR001 is presented in Appendix A.

3.0 EXPECTED GEOLOGY

The expected geology has been obtained from sourced historical borehole data alongside data provided by CampbellReith outlined below in Table 3.0.

Stratum	Description and Thickness
Topsoil/Reworked/Made Ground	Generally expected to be absent across the subject site but potential for either reworked natural deposits associated with agricultural use and potentially locally Made Ground - comprising a heterogenous mixture of cohesive and granular deposits from potential historical process.

Stratum	Description and Thickness
Superficial Deposits	Generally expected to be absent across the subject site with the exception for potential Alluvium/organic rich soils associated with the Tributary of the River Adur East located within the eastern area (within floodplain).
Bedrock	Weald Clay Formation anticipated to directly underlay the majority of the site formed of completely weathered to cohesive clays, transitioning into mudstones with subordinate siltstones, limestones, sandstones and clay ironstones at depth. The thickness of the formation is recorded between 122-460m on the British Geological Survey (BGS)online description. The formation is recorded to exhibit shallow geological dips of 3-5° to the south. The 'Burgess Hill Fault' is recorded to run across the main site area generally bearing northwest-southeast and dipping to the west with the near surface geology becoming the Horsham Stone Member together with the Weald Clay Formations. The Horsham Stone Member is characterised by sandstone.
Groundwater	The presence of shallow / perched groundwater on site cannot be discounted.

Table 3:0: Summary of Geology.

4.0 FIELDWORK

John Sisk & Son Ltd acted as the Principal Contractor. Harrison Group Environmental coordinated the site's ecology requirements for undertaking the ground investigation with Arcus Consulting Services Ltd who provided a site ecology tool box talk, an ecology mitigation method statement and reviewed the exploratory hole locations when they were set out.

Details of the ground investigation methods employed have been presented on the appended data sheet and a summary of the fieldwork has been presented below.

The intrusive investigation was designed to provide good coverage of the ground conditions across the site. The scope of the site works was generally in accordance with that proposed by Campbell Reith and included the following:

- Service clearing and setting out of the exploratory locations (carried out by Midland Survey Ltd)
- Cable Percussive Boreholes (1 No. to a maximum depth of 3.20mbgl)
- Dynamic Continuous Window Sampling (7 No. to a maximum depth of 2.90mbgl)
- Soil Infiltration Tests in accordance with BRE DG 365 (1 No. 1 fill) to maximum depth of 2.60mbgl)

The intrusive fieldwork was carried out by HGE between the 28th May and 15th June 2020. All exploratory locations are detailed on the appended drawing GL23484-DR002/P1.2 presented in Appendix A.

It should be noted that some positions were moved from their proposed locations mainly due to ecology restrictions, all changes were discussed and approved by CampbellReith at the time of setting out.

In addition to consulting all available service plans and lifting all available covers prior to intrusive activities taking place, service clearance was carried out using Ground Penetrating Radar (GPR). Service inspection pits were also hand dug at borehole locations to clear near surface utilities.

The sampling strategy and locations were designed and provided by CampbellReith taking into account local site constraints including reference to topography of the site, the geology encountered and the development proposals.

During and immediately following completion of the fieldwork, geotechnical samples were transported to Harrison Group's Laboratory in Norwich via in house transportation where, upon arrival, they were logged into our sample management system. Following receipt of the geotechnical

schedules, certain geotechnical samples were subsequently dispatched to laboratory subcontractors via courier.

Environmental samples were dispatched to the nominated chemical testing laboratory using cool boxes and refrigerant blocks. Chain of Custody (CoC) Sheets were prepared, copies of which accompanied the samples.

4.1 Surveying

Exploratory locations were surveyed whilst undertaking a utility clearance survey between the 19th and 20th May to establish co-ordinates and levels. Several exploratory positions were changed and were discussed and confirmed with the investigation supervisor.

The locations are presented on the exploratory location plan GL23484-DR002/P1.2 presented in Appendix A. Co-ordinates and levels are detailed, both below, and on the relevant logs presented in Appendix B.

4.2 Cable Percussive Boreholes

A single cable percussive borehole, CP7-01, was required to sample, test and log the sub-soils underlying the site. The boreholes were progressed using a 150mm diameter casing to a maximum depth of 3.20mbgl and is summarised in Table 4.2. CP7-01 was terminated before reaching its scheduled depth due to encountering hard stratum mudstone which stopped drilling progression.

Borehole No.	Easting	Northing	Surface Level (mAOD)	Depth (m)	Detail
CP7-01	530777.98	120591.29	23.72	3.20	General site coverage, sampling, logging and the installation of gas and ground water installation

Table 4.2: Summary of Cable Percussive Boreholes

A detailed description of all the strata encountered, position and types of samples and in-situ tests taken, along with any groundwater observations made at the time of drilling are included on the borehole logs presented in Appendix B. Rig certificates are presented in Appendix F.

4.3 Dynamic Continuous Sampling Boreholes

7 No. dynamic continuous sampling boreholes, WS7-01 – 07 inclusive, were drilled to a maximum depth of 2.90mbgl, using a dual-purpose tracked rig, in order to identify, sample and test the underlying sub-soils and is summarised in Table 4.3.

All 7 No. window sample boreholes were terminated before reaching their target depth due to encountering hard stratum which stopped drilling progression.

Borehole No.	Easting	Northing	Surface Level (mAOD)	Depth (m)	Detail
WS7-01	530853.19	120732.51	24.76	2.90	General site coverage, sampling, logging and the installation of gas and ground water installation
WS7-02	530799.34	120698.24	25.63	2.27	General site coverage, sampling, logging and the installation of gas and ground water installation
WS7-03	530898.83	120696.79	24.24	2.27	General site coverage, sampling, logging and the installation of gas and ground water installation
WS7-04	530869.40	120639.35	24.01	2.29	General site coverage, sampling, logging and the installation of gas and ground water installation
WS7-05	530784.73	120626.24	24.29	2.24	General site coverage, sampling, logging and the installation of gas and ground water installation
WS7-06	530830.43	120589.76	23.85	2.11	General site coverage, sampling, logging and the installation of gas and ground water installation
WS7-07	530831.31	120669.38	24.56	2.26	General site coverage, sampling, logging and the installation of gas and ground water installation

Table 4.3: Summary of Dynamic Continuous Sampling Boreholes.

A detailed description of all the strata encountered, in-situ testing undertaken, position and types of samples taken along, with any groundwater observations made at the time of drilling are included on the dynamic continuous sampling borehole records presented in Appendix B. Rig certificates are presented in Appendix F.

4.4 Soakaway Tests

A single soakaway test was carried out in IT7-01 (1 No. fill) in accordance with BRE Digest 365: 2016.

Soakaway No.	Easting	Northing	Surface Level (mAOD)	Depth (m)	Detail
IT7-01	530931.73	120744.62	24.66	2.60	General site coverage.

Table 4.4: Summary of Soakage Pits

The soakaway test results, and logs of the excavations are presented in Appendix B.

4.5 Installations

The single cable percussive boreholes and 7 No. window sample boreholes were installed with standpipes for monitoring the groundwater within the soils encountered. Table 4.5 summarises the details of these installations.

Monitoring Point I.D.	Diameter of Installation (mm)	Response Zone (mbgl)		Response Zone (mAOD)		Target Strata
		Top	Base	Top	Base	
CP7-01	50	1.00	3.20	22.72	20.52	Natural Deposits
WS7-01	50	1.00	2.00	23.76	22.76	Natural Deposits
WS7-02	50	0.90	1.90	24.73	23.73	Natural Deposits
WS7-03	50	0.90	1.90	23.34	22.34	Natural Deposits
WS7-04	50	0.90	1.90	23.11	22.11	Natural Deposits
WS7-05	50	0.90	1.90	23.39	22.39	Natural Deposits
WS7-06	50	0.80	1.80	23.05	22.05	Natural Deposits
WS7-07	50	0.90	1.90	23.66	22.66	Natural Deposits

Table 4.5: Summary of Cable Percussive Borehole Groundwater Installations.

Detailed descriptions of the installations and their corresponding backfill materials are included on the relevant exploratory hole logs presented in Appendix B.

4.6 Gas and Groundwater Monitoring

Three rounds of monitoring were undertaken in borehole installations on the following dates:

- Round 1 – 15th June 2020
- Round 2 – 1st – 2nd July 2020
- Round 3 – 15th July 2020

The gas monitoring utilised a GA5000 infrared gas analyser to record concentrations of gases including methane, carbon dioxide, oxygen and the related pressure and flow. Volatile Organic Compounds (VOCs) were monitored utilising a PID meter. The results are presented on the gas monitoring result sheets contained in Appendix C.

Groundwater levels and any free phase NPAL (DNAPL and LNAPL) were also monitored on the above dates utilising a dual phase interface meter.

Groundwater monitoring installations CP7-01 were developed on 17th June 2020 using a submersible Whale Purger Pump in general accordance with BS ISO 14686: 2003.

Groundwater samples from the installations were collected as part of the monitoring rounds on the 1st and 2nd July 2020.

The ground water monitoring results are presented in Appendix C.

5.0 GEOTECHNICAL TESTING

Use of the laboratory and field tests presented below to establish geotechnical parameters should be carried out in accordance with BS EN 1997-2 Eurocode Part 2.

5.1 In-Situ Testing

In-situ testing was undertaken for geotechnical purposes and samples were obtained for appropriate laboratory analysis. Site based geotechnical testing is presented in the Appendix B and summarised below (Table 5.1).

Test Type and Reference	Geology (No.)	Test Depth Range (m)	Results Range	Comments / Limitations
Standard Penetration Test (BS EN ISO 22476-3:2005)	Weald Clay Formation (18)	1.20 – 3.00	12 – 50 N	Standard Penetration Tests (SPTs) display a degree of scatter, with some elevated values likely to be due to encountering bricks, gravels and cobbles within the made ground or encountering a water strike. Non calibrated SPT hammers can result in a wide variance between reported results. It should be noted we report raw SPT N values rather than corrected $N_{(60)}$ values. However, calibration certificates are provided in Appendix F so as to enable $N_{(60)}$ values to be calculated if required.
Hand Vanes within trial pits (Set of 3 No.) (BS 1377: Part 9: 1990)	Weald Clay Formation (17)	0.4 - 1.00	60 - >120 kPa 1 test failed	Vane shear test is highly dependent on competence of personnel using the instruments and differences between operators can occur. The test is normal restricted to fairly uniform cohesive fully saturated soils. Results can be questionable in very stiff clays or if the soil tends to dilate on shearing or is fissured. Care must be taken to ensure that predetermined plains of failure are not being tested. Additionally if the soil is gravelly care must be taken to ensure the results are representative of shear failure and a higher readings are not recorded due to catching on gravel or other hard deposits. Value presented on logs is the average of three readings.

Test Type and Reference	Geology (No.)	Test Depth Range (m)	Results Range	Comments / Limitations
Pocket Penetrometer	Weald Clay Formation (5)	1.5 – 2.5	160 - >220 kPa 2 tests failed	The Pocket penetrometer provides an estimate of unconfined compressive strength. Such data can be used to provide an estimate of undrained shear strength, but due to operational reasons, it should be noted that the equipment is far less precise than other tests methods, especially when undertaken on samples obtained from dynamic sampling equipment. Such testing equipment is not considered sufficiently robust to enable the undrained shear strength to be determined in an absolute sense for using in bearing resistance calculations, but can provide information on relative strength which can act to assist as a secondary source of data (to supplement moisture content data) in the assessment of desiccation. Value presented on logs is the average of three readings.
BRE Soakaway Tests (BRE Digest 365)	Weald Clay Formation (1)	1.60 – 2.60	n/a	Soakage tests was performed a single time in trial pit IT7-01 in accordance with BRE Digest 365.

Table 5.1: Summary of In-Situ Geotechnical Testing

The cable percussive borehole SPT Hammer Test Report (SPT Hammer Ref: EQU061 ER: 74%) and dynamic continuous sampler SPT Hammer Test Reports (SPT Hammer Ref: RED RIG ER: 93% and DART1229 ER: 60%) are presented in Appendix F.

5.2 Geotechnical Laboratory Testing

Geotechnical laboratory testing scheduled by Campbell Reith on selected soil samples recovered from the exploratory holes, was carried out to identify the physical characteristics of the soils encountered. The results of this work are presented in Appendix D and are summarised below (Table 5.2). Any restrictions in the testing schedule were notified by the laboratory, details of which are provided in the appended records.

Test Type and Reference (BS 1377: 1990 unless stated)	No of tests	Results (Range)	Comments / Limitations
Water content (BS EN ISO 17892-1: 2014)	19	2.1 – 47.3%	Determinations on disturbed samples, including those obtained from dynamic continuous sampler boreholes may not be wholly representative due to disturbance arising from the sampling process.
Liquid Limit (Part 2: Clause 5)	10	33 - 51%	Only material passing a 425micron sieve is utilised. Therefore, the results may not be wholly representative of in-situ material.
Plastic Limit (Part 2: Clause 5)	10	20 - 28%	
Particle size distribution - wet sieving (Part 2: Clause 9.2)	2	Cobbles 0.0% Gravel 0.0 – 28.9%	The recovery of an adequate mass of coarse-grained soils for particle distribution analysis can be difficult in boreholes. In obtaining such samples from cable tool boreholes it should also

Test Type and Reference (BS 1377: 1990 unless stated)	No of tests	Results (Range)	Comments / Limitations
Particle size distribution – Pipette Sedimentation (Part 2: Clause 9.4)	2	Sand 0.7 – 11.3% Silt 49.8 – 63.9% Clay 10.0 – 35.4%	be noted that some loss of fine material generally occurs due to the nature of the sampling process. For health and safety precautions, the laboratory may be unable to undertake the test if suspected asbestos or gross contamination is identified on sample preparation.
Undrained strength of a single 102mm diameter specimen in triaxial compression without measurement of pore water pressure (Part 7: Clause 8)	1	243kPa	Sample disturbance may occur during the sampling and extraction process, especially in soft soils. Whilst this is reduced by the use of UT100 sampling equipment, it cannot be fully eliminated and will require due consideration in appraising the results, especially where an elevated number of blows were required to retrieve the sample. Determinations of undrained shear strength can also be affected by the presence of fissures. Whilst this is reduced by the application of a suitable confining pressure in the test, low strength values can still occur due to these features. Restricted Test CP7-01 2.50m due to unable to prepare intact specimen.
Organic Matter (L009-PL – I2 in house)	3	<0.1 – 0.8%	Determinations on disturbed samples, including those obtained from dynamic continuous sampler boreholes may not be wholly representative due to disturbance arising from the sampling process.
Soil pH (L099-PL - I2 in house)	9	4.3 – 7.3	Please refer to the analysis in Appendix D
Total Sulphate as SO_4 (L038-PL - I2 in house).	9	0.031 - 0.077 %	
Water Soluble Sulphate Content 2:1 Aqueous Extract (L038-PL - I2 in house).	9	0.0037 – 0.087 g/l	
Sulphur (Total) (L038-PL - I2 in house).	9	0.012 - 0.079 %	

Table 5.2: Summary of Geotechnical Laboratory Testing.

6.0 CHEMICAL LABORATORY TESTING

6.1 Environmental Laboratory Testing

Environmental laboratory testing was scheduled by Campbell Reith on selected soil, and groundwater samples recovered from the exploratory holes and monitoring wells.

The type and quantity of environmental laboratory testing undertaken is summarised below (Table 6.1). The results are presented in Appendix E.

Test Type	No. Of Tests
Soil	
s1.1 - As, Be, B, Cd, Cr, Cu, Ni, Pb, Hg, Se, V, Zn 1mg/kg, Cyanide (total), pH Unit, TPH screen (C6-C40), PAH (16 speciated), Phenol (total)	6
s1.4 - Total Organic Carbon	2
Pesticide and Herbicides suite	1
Water	
w1.1 - As, Cd, Cr, Cu, Ni, Zn, Pb, Hg, B, Se, Hex Chromium, Total Cyanide, Free Cyanide, Soluble Sulphate, Sulphide, Free Sulphur, Speciated (16) PAHs, Phenols, Thiocyanate, Total TPH, pH.	3

Table 6.1: Summary of Environmental Testing

Report Compiled by:

[redacted]

Glenn Pursey BSc (Hons) FGS
Senior Geotechnical Engineer

Report Checked by:

Martin Cooper BEng (Hons) FGS
Principal Engineer

REFERENCES

British Geological Survey Onshore GeoIndex 2020.

BSI British Standard, BS5930:2015+A1:2020 "Code of Practice for Ground Investigations".

BSI British Standard, BS1377:1990 "Methods of Test for Soils for Civil Engineering Purposes".

BS EN ISO 17892-1: 2014 "Geotechnical investigation and testing. Laboratory testing of soil. Determination of water content".

BS EN 1997-1 Eurocode 7 Part 1 "General Rules"

BS EN 1997-2 Eurocode 7 Part 2 "Ground Investigation and Testing"

BS EN ISO 22475-1:2006 & 22475-2/3:2011 "Geotechnical investigation and testing. Sampling methods and groundwater measurements".

BS EN ISO 22476:2005+A1:2011 "Geotechnical investigation and testing". Various.

BS EN ISO 14688-2:2004 "Geotechnical investigation and testing. Identification and classification of soil. Principles for a classification".

BS ISO 14686: 2003,"Hydrometric determinations. Pumping tests for water wells. Considerations and guidelines for design, performance and use".

BRE Special Digest 1:2005 "Concrete in Aggressive Ground".

BRE Digest DG365; 2016 "Soakaway design".

LIST OF APPENDICES

APPENDIX A: DRAWINGS

Site Location Plan – (GL23484 – DR001)

Exploratory Location Plan Overview – (GL23484 – DR002 - P1.2)

APPENDIX B: EXPLORATORY HOLE RECORDS

Data Sheet: Site Investigation Methods

Key to Site Investigation Records

Cable Percussive Borehole Records

Window Sampler Records

Soakaway Records

Trial Pit Plates

APPENDIX C: GAS AND GROUNDWATER MONITORING

Round 1 – 15th June 2020

Round 2 – 1st – 2nd July 2020

Round 3 – 15th July 2020

APPENDIX D: GEOTECHNICAL LABORATORY TESTING

GL23484-03 – Summary of Restricted Tests

GL23484-03 Test Report Transmittal

20-17322-2B

20-18764-2C

APPENDIX E: ENVIROMENTAL LABORATORY TESTING

20-12028-1

20-12709-1

20-12720-1

20-14505-1

20-17805-1 (water)

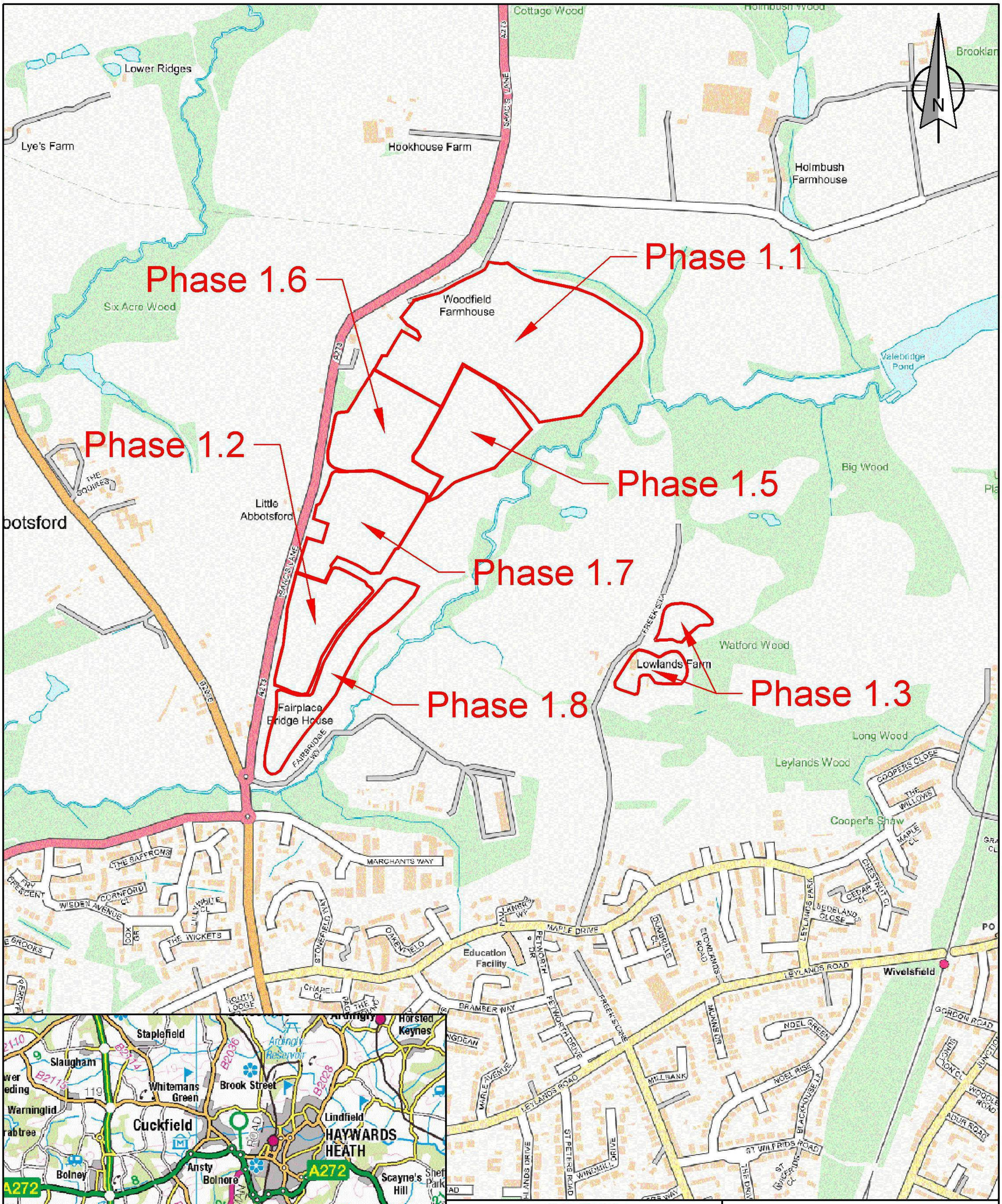
APPENDIX F RIG CERTIFICATIONS

SPT Hammer Certificates

APPENDIX A

DRAWINGS

FM-Hn-D-104 Rev B N:\NorwichProjects\London jobs\23000 Jobs\GL23484\Drawings\CAD Files\GL23484 DR001.dwg



BUILDERS SISK CONTRACTORS Established 1859

Client : John Sisk & Son Ltd	
Project : Northern Arc, Burgess Hill	
Job No : GL23484	Date : August 2020
Drawing No : GL23484 - DR001	
Scale : 1:10000 @ A4	
Drawn by : ES	Checked by : MC
Eastings : 531121	Northings : 120967

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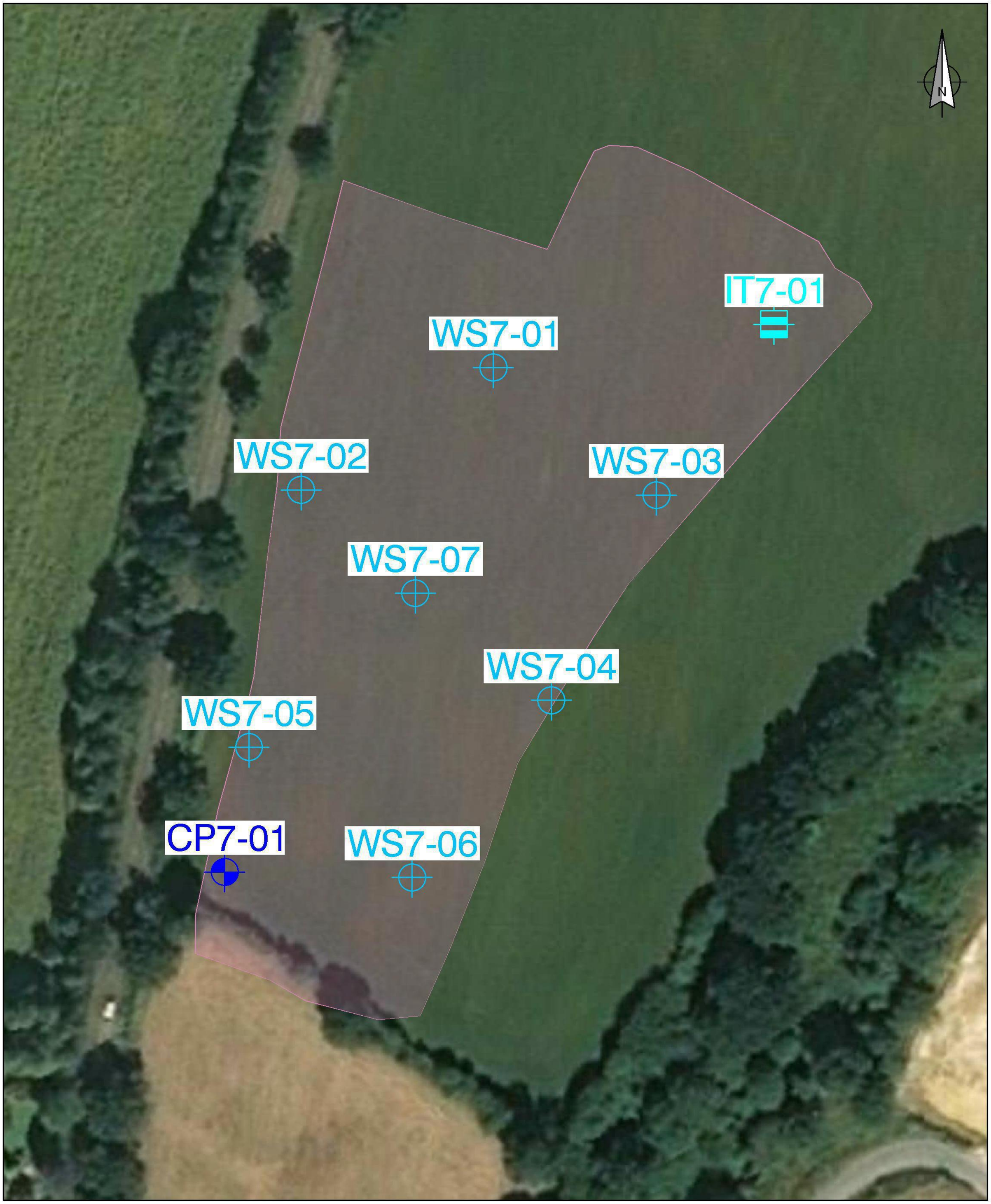
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Website: www.harrisongroupuk.com

ISOQAR REGISTERED UKAS MANAGEMENT SYSTEMS 0026 UKAS TESTING 4031

Certificate Number 5933
ISO 9001, ISO 14001

FM-Hn-D-103 Rev B N:\WorkInProjects\London Jobs\23000 Jobs\GL23484\Drawings\CAD Files\GL23484 DR002 RevE.dwg



BUILDERS SISK CONTRACTORS Established 1859

Client : John Sisk & Son Ltd

Project : Northern Arc, Burgess Hill

Job No : GL23484 Date : July 2020

Drawing Title : Proposed Fieldwork Location Plan

Drawing No : GL23484 - DR002 P1.2

Scale : 1:1000 @ A3

Drawn by : ES Checked by : MC

Eastings : 531121 Northings : 120967

Revision history

Rev	Date	Revision Data

Key :

- Phase 1.2 Site Boundary
- CP7-01 — Cable Percussive Borehole
- WS7-01 — Dynamic Continuous Sampling Borehole
- IT7-01 — Machine Excavated Trial Pit with Soakaway Test

Notes :

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APPENDIX B

EXPLORATORY HOLE RECORDS

DATA SHEET: GROUND INVESTIGATION METHODS

This datasheet provides basic details of the methods employed during the undertaking of ground investigations. Detailed method statements may be provided if requested or further information may be obtained from the relevant British Standards or other quoted publications. Investigations are generally carried out in accordance with BS 5930:2015, "Code of practice for ground investigations", BS 10175:2011+A1:2013, "Investigation of potentially contaminated sites – Code of Practice, and BS EN ISO 1997-2:2007, "Eurocode 7 – Geotechnical design – Part 2: Ground investigation and testing".

Prior to any excavation being undertaken, service plans are obtained and/or a service tracing team may be employed to locate and mark up service locations. A surface sweep using a cable avoidance tool (CAT) is undertaken, in order to avoid services and service inspection pits are generally hand excavated prior to commencing work with any mechanical plant.

CABLE PERCUSSIVE BOREHOLES

The cable percussive borehole drilling rig may be towed by a 4x4 pick up or similar vehicle and is capable of forming cased boreholes to depths of up to 50m. The hole may be formed at diameters from 300mm down to the more typical 150mm, with disturbed samples obtained direct from the drilling tools. The equipment requires a minimum 2m access width, and the rig itself is 6m long (11m including tow). A rough 3m x 5m base area is required for drilling, but each site should be considered on specifics.

The technique can penetrate dense made ground, rubble and concrete or weathered rock/thin bands of rock using a chisel. However, in some cases these materials can form obstructions.

Sampling is generally carried out in accordance with BS EN ISO 22475-1:2006, "Geotechnical investigation and testing – Sampling methods and groundwater measurements - Part 1 – Technical principles for execution". A variety of disturbed samples can be obtained for both geotechnical and environmental purposes and undisturbed samples including U100 (thick walled OS-TK/W), UT100 (thin walled OS-T/W) and piston samples (PS-T/W) may be obtained. Standard in-situ testing may include Standard or Cone Penetration Tests (SPT/CPT) to BS EN ISO 22476-3:2005+A1:2011, "Geotechnical investigation and testing – Field testing – Part 3 – Standard penetration test"; vane testing in accordance with BS 1377-9:1990, "Methods of test for soils for civil engineering purposes" and permeability testing in accordance with BS EN ISO 22282-1-6:2012, Geotechnical investigation and testing – Geohydraulic testing – Parts 1 to 6.

Instrumentation/standpipes/monitoring wells can be installed, otherwise the borehole would be backfilled with spoil, or where instructed bentonite, concrete or sand may be used. Excess spoil is either removed from site or left in a tidy heap nearby.

In wet drilling conditions (beneath groundwater level) or where water needs to be added to facilitate drilling, the spoil can spread over a wide area through splashing and flow of the spoil from the tools, unless precautions are taken to prevent this. Conversely, the system can be very clean for instance when drilling through dry clay soil.

DYNAMIC CONTINUOUS SAMPLING (WINDOW SAMPLER) BOREHOLES

The window sampler system comprises a series of varying diameter (100mm down to 36mm) steel tubes of either 1m length, and in the case of window (rather than windowless) having a slot or window cut along the side. The tubes are driven into the ground using a light percussive hammer attached to solid rods and withdrawn by use of a jack. The hammer may be machine mounted (wheeled or tracked) or for restricted access work, handheld. The soil sample is forced up into the tube during the driving, samples being obtained directly through the slot or window, or in the case of windowless, in plastic liners in the steel tube. The sampler generally achieves depths of around 5m in favourable soils. Use of a super heavy tracked rig allows samples to be retrieved in liners to depths of up to 10m in suitable ground conditions.

Sampling can be carried out from the boreholes in accordance with BS EN ISO 22475-1:2006 and SPT testing can be undertaken in accordance with BS EN ISO 22476-3:2005+A1:2011. In addition, small diameter standpipes/monitoring wells can be installed to facilitate the sampling and monitoring of gas and groundwater.

MONITORING WELL INSTALLATIONS

All types of boreholes can be fitted with monitoring wells to enable subsequent sampling and monitoring of groundwater and ground gas levels. Monitoring wells are usually of upvc or hdpe material, although steel may also be used in certain circumstances. Various diameters are available from 19mm upwards, depending upon the size of the borehole. 38mm or 50mm diameter wells are the most commonly used. Wells generally have slotted lower sections which may have a geomesh filter and then are surrounded with a filter medium such as single sized gravel. The upper sections are generally solid casing which is usually grouted to produce a seal with the surrounding ground. The top of the well is generally fitted with a removable cap that may include a gas valve to enable future gas monitoring. The installation is usually protected by a lockable cover set in a concrete base. Details of monitoring well installations and associated backfill are given on the relevant borehole records.

GROUNDWATER MONITORING

Groundwater monitoring is undertaken using an electronic dip meter, which records the depth to water in a standpipe or monitoring well. Alternatively, down-hole pressure transducers cab be utilised which can record variations over an extended period, which is particularly useful in monitoring variations due to tidal influences or when undertaking permeability tests or draw down tests or when undertaking soakaway testing. Where a non-aqueous phase liquid (e.g. floating hydrocarbon layer) is present, an interface meter is utilised to measure the thickness.

MACHINE EXCAVATED TRIAL PITS

Machine excavated trial pits are undertaken using a wheeled back-hoe or tracked 360 excavator. The hole is progressed, with the supervising Geotechnical Engineer taking samples and/ or carrying out in-situ testing as appropriate. No access may be made in to unstable/ contaminated pits, or into pits greater than 1.20m deep. Where man access is required, shoring can be provided and installed to maintain stability of the excavation. The trial pits are backfilled in compacted layers, with spoil heaped up in order to allow for future settlement. Pits may be taken to a maximum of 4.50m depth in favourable conditions.

Machine excavated trial pits require relatively large clear working areas in which to be carried out and can cause considerable disturbance to the ground surface.

HAND EXCAVATED TRIAL PITS

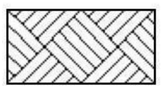
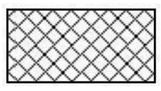
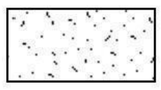
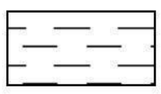
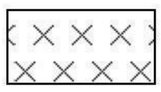
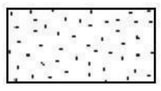
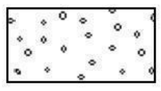
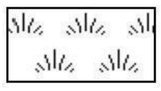
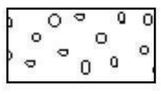
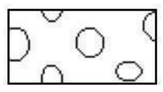
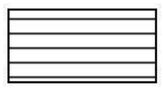
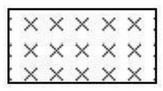
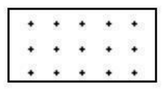
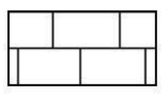
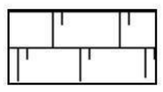
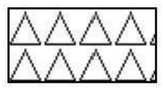
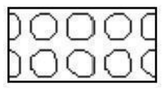
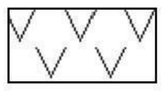
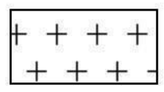
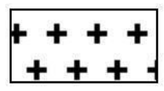
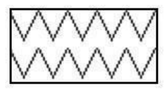
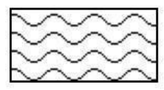
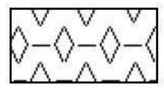
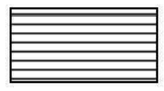
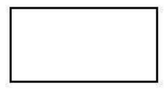
Hand excavated pits may be undertaken for a variety of reasons, which include service observation pits, obtaining near surface samples, and examining foundations of existing buildings. Pits are excavated using a shovel, postholers and other suitable equipment. Shoring is necessary where pits are to be extended greater than 1.2mbgl and deep excavations may take a considerable time to undertake. Detailed records of hand excavated pits are only normally recorded where foundation depths and detailed information is required.

TRIAL PIT SOAKAWAY TESTING

Soakaway tests are undertaken in machine excavated trial pits to determine the infiltration rate of the soils on a site in accordance with BRE Digest 365, “Soakaway design”. The trial pit is excavated using a mechanical excavator and vertical sides are trimmed square and accurate measurements of the pit dimensions are made. In granular soils the pit is backfilled with coarse single size gravel to the top of the natural soils to prevent collapse of pit sides upon filling with water. Where granular fill is used a temporary perforated monitoring well is installed over the depth of the trial pit prior to backfilling. This allows monitoring of the water level by an electronic dip-meter or pressure transducer. In cohesive soils, granular fill may not be required and a monitoring installation is replaced by a fixed datum bar placed across one end of the pit. The water level is monitored using a tape or dip-meter. The pit is rapidly filled with water from a bowser / tanker to fill the pit to its maximum effective depth in a short time. Care is taken to prevent the collapse of pit walls. The pit is filled and allowed to drain three times to 25% full where ground conditions and time constraints allow. The water level is recorded at intervals sufficiently close to define water level versus time. The three fillings should be on the same or consecutive days. The soil infiltration rate (f) is calculated from the time taken for the water level to fall from 75% to 25% effective storage depth in the pit, using the lowest f value the three tests for design.

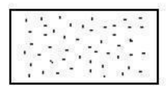
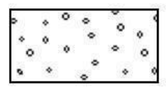
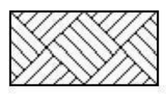
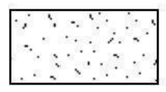
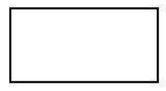
Key to Site Investigation Records

Composite Materials, Soils and Lithology

Legend	Code	Description
	101	Topsoil
	102	Made Ground or Fill
	103	Asphalt
	104	Concrete
	201	Clay
	301	Silt
	401	Sand
	501	Gravel
	601	Peat
	701	Cobbles
	730	Boulders
	801	Mudstone
	802	Siltstone
	803	Sandstone
	804	Limestone or Dolostone
	805	Chalk
	806	Coal
	807	Breccia
	808	Conglomerate
	809	Fine Grained Igneous
	810	Medium Grained Igneous
	811	Coarse Grained Igneous
	812	Fine Grained Metamorphic
	813	Medium Grained Metamorphic
	814	Coarse Grained Metamorphic
	815	Pyroclastic
	816	Gypsum or Rocksalt
	817	Shale
	998	No Recovery
	999	Void

NOTE: Composite soil types are represented by combined legends. Each type will have its own code within the AGS data.

Backfill

Legend	Code	Description
	901	Sand Filter
	902 908	Gravel Filter Ballast
	903	Bentonite
	904	Grout
	905	Arisings
	906 912	Concrete Paving Slab
	907	Asphalt
	999	Void

Installations

Legend	Description
	Plain Pipe
	Slotted Pipe
	Piezometer
	Inclinometer
	Extensometer

Please refer to logs or AGS data for further details on installations and instruments used

In-Situ Testing

Prefix	Type	Comments
SPT(S) SPT(C)	Standard Penetration Test (S) Split Spoon (C) Solid Cone	Uncorrected test results at relevant start depth Hammer ID and Energy Ratio reported on log and in relevant AGS fields
HV	In-Situ Vane Test	Undrained shear strength reported in kPa Where at least 3 results obtained at same depth, average value may be reported
PP	In-Situ Hand Penetrometer Test	Undrained shear strength reported in kPa Where at least 3 results obtained at same depth, average value may be reported
PID	On-Site Volatile Headspace Testing by Photo-Ionisation Detector	Screening reported as ppmv Head space testing undertaken as per contract documents
PRM	In-Situ Permeability Test	Permeability (k) reported in m/s Please refer to individual test sheets for data and methodology

For Rotary Boreholes:

T.C.R. Total Core Recovery %

S.C.R. Solid Core Recovery %

R.Q.D. Rock Quality Designation %

Sample Information

Prefix	Type	Comments
D	Small disturbed sample	Nominally 1kg
B	Bulk disturbed sample	Nominally 5kg
LB	Large bulk disturbed sample	Nominally 20kg, for earthworks testing
U	Undisturbed sample - driven tube	For CP, nominally 100mm diameter, 450mm length For WS, nominally 38mm diameter, 100mm length Blows to drive tube and recovery found in remarks
UT	Undisturbed sample - thin walled driven tube	Nominally 100mm diameter, 450mm length Blows to drive tube and recovery found in remarks
P	Pushed piston sample	Nominally 100mm diameter, 1000mm length Recovery found in remarks
C	Core sample	-
AMAL	Amalgamated sample	Details of samples used noted in remarks as well as relevant AGS field
W	Water sample	Not for environmental testing purposes
ES	Environmental soil sample	Multiple containers used where appropriate
EW	Environmental water sample	Multiple containers used where appropriate

Water Observations

Legend	Description
	Water strike
	Standing water level after specified time

Details are provided on each log through the Water Strike table

AGS

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Cable Percussive Borehole Record

CP7-01

Sheet 1 of 1

Project ID: **GL23484**	Client: John Sisk & Son Ltd	E: 530777.98	N: 120591.29
Location: Northern Arc, Burgess Hill	Consultant: Campbell Reith Hill LLP	Date: 28/05/2020	
	Plant used: Dando 2000 Cable Percussive Rig	SPT Hammer Serial No: EQU061 (ER: 74%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 23.72	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Date - Depth (m) Casing (Water)	Installation & Backfill
Grass over TOPSOIL. Light brown slightly sandy silty CLAY. Occasional roots and rootlets.		0.10	23.62	B1	0.10 - 0.50			
				ES1	0.20			
Stiff friable light brown occasionally mottled orangish brown and reddish brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to subangular fine to coarse flint.		0.60	23.12	D1	0.50			
				HV01	0.50	>120 kPa		
Stiff friable orangish brown and grey silty CLAY. Occasional rootlets.		0.90	22.82	B2	0.60 - 1.00			
				D2	0.60			
Firm to stiff grey mottled orangish brown occasionally slightly sandy silty CLAY. Rare rootlets.				ES2	0.70			
				B3	1.00 - 1.50			
				D3	1.00			
From 1.15m to 1.60m: Becoming firm.				ES3	1.00			
From 1.60m: Occasional brown mudstone gravel.		1.80	21.92	HV02	1.00	110 kPa		
				SPT(S)	1.20	N=17 (1,1/2,3,3,9)	- (Dry)	
Extremely weak to weak thinly laminated brown and grey MUDSTONE. Partially weathered. Occasional orangish brown staining.				D4	1.20 - 1.65			
				D5	1.50			
				UT1	1.50 - 1.95	Blows = 47. 80% recovered.		
				D6	1.95 - 2.00			
				SPT(S)	2.00	50 (8,11/15,23,12 for 10mm)	1.00 (Damp)	
Weak thinly laminated grey MUDSTONE. Partially weathered. Occasional light orangish brown staining.		2.90	20.82	B4	2.00 - 2.50			
				D7	2.00 - 2.31			
Borehole terminated at 3.20m: Hard stratum		3.20	20.52	D8	2.50			
				UT2	2.50 - 2.95	Blows = 50. 20% recovered.		
				D9	2.95 - 3.00			
				SPT(S)	3.00	50 (14,11 for 30mm/27,23 for 15mm)	1.00 (Damp)	
				D10	3.00 - 3.20			
							28/05/2020 - 3.20	
							1.00 (Damp)	

Chiselling Details		Water Added Records		Water Strike						
Depths (m)	Duration (hh:mm)	Depths (m)	Litres	Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
2.80 - 3.00	00:30									No groundwater encountered
3.00 - 3.20	00:30									

Hole Diameter by Depth		Casing Diameter by Depth	
Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)
3.20	150	1.00	150

Remarks:

1. Position swapped with WS7-07.
2. Inspection pit from GL to 1.20m.
3. Hole terminated early due to hard stratum.
4. Installation: 50mm standpipe GL to 1.00m plain, 1.00m to 3.20m slotted with geosock, fitted with gas tap, bung and tophat cover.
5. Backfill: GL to 1.00m bentonite pellets, 1.00m to 3.20m gravel.

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Dynamic Continuous Sampling Borehole Record

WS7-01

Sheet 1 of 1

Project ID: **GL23484**	Client: John Sisk & Son Ltd	E: 530853.19	N: 120732.51
Location: Northern Arc, Burgess Hill	Consultant: Campbell Reith Hill LLP	Date: 02/06/2020	
	Plant used: Premier Compact 120	SPT Hammer Serial No: RED RIG (ER: 93%)	

Geology Description	Legend	Depth (m)	Elevation (maOD)	Sample / In-Situ Test Information			Casing (Water)	Installation & Backfill
			24.76	Type	Depth	Results / Remarks		
Grass over MADE GROUND. Very stiff friable light brown slightly sandy silty CLAY. Frequent rootlets and rare brick fragments.				ES1	0.15			
				D1	0.20			
Very stiff light grey mottled orangish brown silty CLAY. Occasional rootlets.		0.30	24.46	ES2	0.40			
				B1	0.50 - 0.80			
				D2	0.50			
				HV01	0.50	>120 kPa		
From 1.00m: Becoming slightly gravelly. Gravel is subangular fine to coarse mudstone. Occasional dark reddish brown staining on gravel.				HV02	1.00	110 kPa		
				SPT(S)	1.20	N=12 (2,2/2,3,3,4)	- (Dry)	
		1.30	23.46	D3	1.20 - 1.65			
Extremely weak thinly laminated light grey mottled orangish brown MUDSTONE occasionally thinly interlaminated with light grey clay. Distinctly weathered.				D4	1.20			
				D5	1.50			
From 1.70m: Becoming dark brown and light grey.				D6	1.80			
				SPT(S)	2.00	N=30 (8,8/7,7,7,9)	- (Dry)	
				D7	2.00 - 2.45			
				D8	2.25			
				SPT(S)	2.50	50 (9,9/11,15,19,5 for 20mm)	- (Dry)	
				D9	2.50 - 2.90			
Borehole terminated at 2.90m: Hard stratum		2.90	21.86					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	1.20	2.00	0.80	100
65	2.00	2.50	0.50	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Inspection pit from GL to 1.20m.
2. Hole terminated early due to hard stratum.
3. Installation: 50mm standpipe GL to 1.00m plain, 1.00m to 2.00m slotted with geosock, fitted with gas tap, bung and tophat cover.
4. Backfill: GL to 1.00m bentonite pellets, 1.00m to 2.00m gravel, 2.00m to 2.90m bentonite pellets.

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Testing Services: 01603 416333

E-mail: info@harrisongroupuk.com
Website: www.harrisongroupuk.com

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Drilled by:	Logged by:	Checked by:	
S. Bellchambers / A. Lovell	J. Sparks	M. Cooper	**Fm-Hn-R-3068-Rev E**

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Dynamic Continuous Sampling Borehole Record

WS7-02

Sheet 1 of 1

Project ID: **GL23484**	Client: John Sisk & Son Ltd	E: 530799.34	N: 120698.24
Location: Northern Arc, Burgess Hill	Consultant: Campbell Reith Hill LLP	Date: 02/06/2020	
	Plant used: Archway Dart 1229	SPT Hammer Serial No: DART1229 (ER: 60%)	

Geology Description	Legend	Depth (m)	Elevation (maOD)	Sample / In-Situ Test Information			Casing (Water)	Installation & Backfill
			25.63	Type	Depth	Results / Remarks		
Grass over TOPSOIL. Light brown locally mottled orangish brown slightly sandy silty CLAY with rare gravel of subangular fine and medium flint. Occasional rootlets.		0.15	25.48	ES1	0.05			
Firm to stiff friable orangish brown mottled grey silty CLAY with rare gravel of subangular to subrounded fine and medium lithorelicts of mudstone.				ES2	0.30			
				B1	0.50			
				HV01	0.50	60 kPa		
From 0.70m: Becoming stiff.				D1	1.00			
				HV02	1.00	>120 kPa		
Firm to stiff friable thinly to thickly laminated light grey mottled orangish brown gravelly silty CLAY. Gravel is subangular to subrounded fine and medium mudstone.		1.10	24.53	SPT(S)	1.20	N=16 (1,2/3,3,5,5)	- (Dry)	
				D2	1.30			
Thinly to thickly interlaminated very weak brown MUDSTONE and very stiff light grey silty CLAY. Destructured and locally distinctly weathered.		1.65	23.98	D3	1.80			
				SPT(S)	1.90	50 (4,6/11,17,22 for 65mm)	- (Dry)	
Borehole terminated at 2.27m: Hard stratum		2.27	23.36					

Window or Windowless Sampling Run Details				
Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	1.20	1.90	0.63	90

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Inspection pit from GL to 1.20m.
2. Hole terminated early due to hard stratum.
3. Installation: 50mm standpipe GL to 0.90m plain, 0.90m to 1.90m slotted with geosock, fitted with gas tap, bung and tophat cover.
4. Backfill: GL to 0.90m bentonite pellets, 0.90m to 2.27m gravel.

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Cambridge Office: 01223 781585
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Dynamic Continuous Sampling Borehole Record

WS7-03

Sheet 1 of 1

Project ID: **GL23484**	Client: John Sisk & Son Ltd	E: 530898.83	N: 120696.79
Location: Northern Arc, Burgess Hill	Consultant: Campbell Reith Hill LLP	Date: 03/06/2020	
	Plant used: Archway Dart 1229	SPT Hammer Serial No: DART1229 (ER: 60%)	

Geology Description	Legend	Depth (m)	Elevation (maOD)	Sample / In-Situ Test Information			Casing (Water)	Installation & Backfill
			24.24	Type	Depth	Results / Remarks		
Grass over TOPSOIL. Light brown locally mottled orangish brown silty CLAY with rare gravel of subangular to rounded fine to coarse flint. Occasional rootlets.		0.15	24.09	ES1	0.05			
Stiff friable grey mottled orangish brown silty CLAY. Occasional rootlets.		0.40	23.84	ES2	0.30			
Stiff friable grey mottled orangish brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse mudstone with occasional siltstone.				HV01	0.50	>120 kPa		
				B1	0.60			
From 1.20m: Becoming firm to stiff.				D1	1.00			
				ES3	1.00			
From 1.40m to 1.50m: Becoming gravelly.				SPT(S)	1.20	N=16 (2,2/3,4,4,5)	- (Dry)	
At 1.50m: Becoming slightly sandy.				D2	1.50			
Thinly to thickly interlaminated weak brown MUDSTONE and very stiff brown silty CLAY. Destructured. Locally distinctly weathered.		1.80	22.44	D3	1.80			
				SPT(S)	1.90	50 (7,9/13,17,20 for 65mm)	- (Dry)	
Borehole terminated at 2.27m: Hard stratum		2.27	21.97					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	1.20	1.90	0.63	90

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Inspection pit from GL to 1.20m.
2. Hole terminated early due to hard stratum.
3. Installation: 50mm standpipe GL to 0.90m plain, 0.90m to 1.90m slotted with geosock, fitted with gas tap, bung and tophat cover.
4. Backfill: GL to 0.90m bentonite pellets, 0.90m to 2.27m gravel.

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Dynamic Continuous Sampling Borehole Record

WS7-04

Sheet 1 of 1

Project ID: **GL23484**	Client: John Sisk & Son Ltd	E: 530869.40	N: 120639.35
Location: Northern Arc, Burgess Hill	Consultant: Campbell Reith Hill LLP	Date: 03/06/2020	
	Plant used: Archway Dart 1229	SPT Hammer Serial No: DART1229 (ER: 60%)	

Geology Description	Depth (m)	Elevation (maOD)	Sample / In-Situ Test Information			Casing (Water)	Installation & Backfill
		24.01	Type	Depth	Results / Remarks		
Grass over TOPSOIL. Light brown locally mottled orangish brown slightly sandy silty CLAY with rare gravel of subrounded fine flint. Occasional rootlets.	0.15	23.86	ES1	0.05			
Light brown locally mottled light grey slightly sandy silty CLAY with rare gravel of subangular to subrounded fine and medium lithorelicts of mudstone. Occasional rootlets.	0.35	23.66	D1	0.30			
			ES2	0.30			
Firm to stiff friable grey mottled orangish brown silty CLAY with rare gravel of angular to subrounded fine and medium lithorelicts of mudstone. Reddish brown discolouring on gravel. Occasional rootlets.			HV01	0.50	70 kPa		
			B1	0.60			
From 0.65m: Becoming stiff.			D2	1.00			
			ES3	1.00			
			HV02	1.00	75 kPa		
			SPT(S)	1.20	N=16 (2,2/3,3,5,5)	- (Dry)	
From 1.40m to 1.60m: Gravel becoming abundant.			D3	1.40 - 1.60			
			PP01	1.50	160 kPa		
Very stiff friable thinly laminated grey silty CLAY occasionally thinly to thickly interlaminated with extremely weak brown MUDSTONE.	1.75	22.26	D4	1.80			
			SPT(S)	1.90	50 (6,7/10,15,19,6 for 15mm)	- (Dry)	
Borehole terminated at 2.29m: Hard stratum	2.29	21.72					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	1.20	1.90	0.63	90

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Inspection pit from GL to 1.20m.
2. Hole terminated early due to hard stratum.
3. Installation: 50mm standpipe GL to 0.90m plain, 0.90m to 1.90m slotted with geosock, fitted with gas tap, bung and tophat cover.
4. Backfill: GL to 0.90m bentonite pellets, 0.90m to 2.29m gravel.

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Dynamic Continuous Sampling Borehole Record

WS7-05

Sheet 1 of 1

Project ID: **GL23484**	Client: John Sisk & Son Ltd	E: 530784.73	N: 120626.24
Location: Northern Arc, Burgess Hill	Consultant: Campbell Reith Hill LLP	Date: 02/06/2020	
	Plant used: Archway Dart 1229	SPT Hammer Serial No: DART1229 (ER: 60%)	

Geology Description	Depth (m)	Elevation (maOD)	Sample / In-Situ Test Information			Casing (Water)	Installation & Backfill
		24.29	Type	Depth	Results / Remarks		
Grass over TOPSOIL. Light brown slightly sandy silty CLAY. Occasional rootlets.			ES1	0.05			
Stiff friable light brown locally mottled orangish brown slightly sandy silty CLAY with rare gravel of subangular to subrounded fine and medium lithorelicts of mudstone.	0.15	24.14	ES2	0.30			
			D1	0.40			
			HV01	0.50	95 kPa		
Stiff friable thinly to thickly laminated orangish brown mottled grey gravelly silty CLAY. Gravel is subangular to subrounded fine and medium mudstone.	0.60	23.69	B1	0.70			
			D2	1.00			
			ES3	1.00			
			HV02	1.00	>120 kPa		
Very weak thinly to thickly laminated brown MUDSTONE occasionally thinly to thickly interlaminated with light grey silty CLAY. Destructured. Locally distinctly weathered.	1.20	23.09	SPT(S)	1.20	N=29 (3,4/5,6,9,9)	- (Dry)	
			D3	1.30			
			PP01	1.50	>220 kPa		
			SPT(S)	1.90	50 (8,14/17,21,12 for 35mm)	- (Dry)	
Borehole terminated at 2.24m: Hard stratum	2.24	22.05					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	1.20	1.90	0.70	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Inspection pit from GL to 1.20m.
2. Hole terminated early due to hard stratum.
3. Installation: 50mm standpipe GL to 0.90m plain, 0.90m to 1.90m slotted with geosock, fitted with gas tap, bung and tophat cover.
4. Backfill: GL to 0.90m bentonite pellets, 0.90m to 2.24m gravel.

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Dynamic Continuous Sampling Borehole Record

WS7-06

Sheet 1 of 1

Project ID: **GL23484**	Client: John Sisk & Son Ltd	E: 530830.43	N: 120589.76
Location: Northern Arc, Burgess Hill	Consultant: Campbell Reith Hill LLP	Date: 03/06/2020	
	Plant used: Archway Dart 1229	SPT Hammer Serial No: DART1229 (ER: 60%)	

Geology Description	Legend	Depth (m)	Elevation (maOD)	Sample / In-Situ Test Information			Casing (Water)	Installation & Backfill
			23.85	Type	Depth	Results / Remarks		
Grass over TOPSOIL. Light brown locally mottled orangish brown slightly sandy silty CLAY. Occasional rootlets.				ES1	0.05			
		0.15	23.70					
Stiff friable light brown mottled orangish brown slightly sandy silty CLAY. Occasional rootlets.				ES2	0.30			
				D1	0.40			
				HV01	0.50	85 kPa		
		0.60	23.25					
Firm to stiff friable orangish brown locally mottled grey silty CLAY with rare gravel of subangular to subrounded fine to coarse lithorelicts of mudstone. Reddish brown staining on gravel. Occasional rootlets. *From 0.90m: Becoming stiff.* *From 1.00m: Gravel becoming abundant.*				B1	0.80			
				ES3	1.00			
				HV02	1.00	110 kPa		
		1.15	22.70	D2	1.10			
Very stiff grey mottled orangish brown gravelly silty CLAY. Locally friable and locally thinly laminated. Gravel is angular to subrounded fine to coarse mudstone with occasional siltstone.				SPT(S)	1.20	N=20 (2,2/4,5,5,6)	- (Dry)	
				D3	1.30			
		1.50	22.35					
Thinly to thickly interlaminated very weak brown MUDSTONE and very stiff grey silty CLAY. Destructured. Locally distinctly weathered.				D4	1.60			
				SPT(S)	1.80	50 (8,15/22,24,4 for 10mm)	- (Dry)	
		2.11	21.74					
Borehole terminated at 2.11m: Hard stratum								

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	1.20	1.80	0.48	80

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Inspection pit from GL to 1.20m.
2. Hole terminated early due to hard stratum.
3. Installation: 50mm standpipe GL to 0.80m plain, 0.80m to 1.80m slotted with geosock, fitted with gas tap, bung and tophat cover.
4. Backfill: GL to 0.80m bentonite pellets, 0.80m to 2.11m gravel.

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Dynamic Continuous Sampling Borehole Record

WS7-07

Sheet 1 of 1

Project ID: **GL23484**	Client: John Sisk & Son Ltd	E: 530831.31	N: 120669.38
Location: Northern Arc, Burgess Hill	Consultant: Campbell Reith Hill LLP	Date: 03/06/2020	
	Plant used: Archway Dart 1229	SPT Hammer Serial No: DART1229 (ER: 60%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 24.56	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Grass over TOPSOIL. Light brown locally mottled orangish brown slightly sandy silty CLAY. Occasional rootlets.		0.10	24.46	ES1	0.05			
Stiff friable light brown mottled orangish brown silty CLAY. Occasional rootlets.		0.30	24.26	D1 ES2	0.20 0.25			
Stiff friable orangish brown mottled grey silty CLAY with rare gravel of subangular to subrounded fine and medium lithorelicts of mudstone.				B1 HV01	0.50 0.50	75 kPa		
Firm to stiff friable grey mottled orangish brown and reddish brown gravelly silty CLAY. Gravel is angular to subrounded fine to coarse mudstone.		0.90	23.66	D2 SPT(S)	1.00 1.20	N=16 (2,2/3,4,4,5)	- (Dry)	
Thinly to thickly interlaminated very weak brown MUDSTONE and very stiff grey silty CLAY. Destructured. Locally distinctly weathered.		1.40	23.16	D3 SPT(S) D4	1.50 1.90 1.90	50 (5,11/14,18,18 for 60mm)	- (Dry)	
Borehole terminated at 2.26m: Hard stratum		2.26	22.30					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	1.20	1.90	0.63	90

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Position swapped with CP7-01.
2. Inspection pit from GL to 1.20m.
3. Hole terminated early due to hard stratum.
4. Installation: 50mm standpipe GL to 0.90m plain, 0.90m to 1.90m slotted with geosock, fitted with gas tap, bung and tophat cover.
5. Backfill: GL to 0.90m bentonite pellets, 0.80m to 2.26m gravel.

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Cambridge Office: 01223 781585
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Drilled by: D. Ypey | Logged by: C. Burke | Checked by: M. Cooper | **Fm-Hn-R-3068-Rev E**

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Trial Pit Record

IT7-01

Sheet 1 of 1

Project ID:	**GL23484**	Client:	John Sisk & Son Ltd	E: 530931.73	N: 120744.62
Location:	Northern Arc, Burgess Hill	Consultant:	Campbell Reith Hill LLP		
		Plant used:	JCB 3CX	Date:	15/06/2020

Geology Description	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
		24.66	Type	Depth	Results / Remarks	
Grass over MADE GROUND. Stiff friable light brown and yellowish brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to subangular fine to coarse flint with rare chalk and brick. Frequent rootlets.	0.30	24.36	D1	0.10		
			ES1	0.10		
			D2	0.30		
			ES2	0.40		
Very stiff grey mottled light brown and orange silty CLAY. Rare rootlets.			HV01	0.40	Material unsuitable for testing	
	0.60	24.06	HV02	0.60	>120 kPa	
At 0.30m: Vertical tension crack in Eastern face of pit. Extremely closely spaced (10-20mm), smooth, infilled with loose soil.			B1	0.70		
	0.80	23.86				
Light grey mottled orangish brown slightly sandy clayey SILT. Occasionally stiff silty clay. Rare rootlets.			D3	0.90		
			HV03	1.00	75 kPa	
Stiff friable fissured grey mottled orangish brown silty CLAY. Occasionally clayey silt. Fissures randomly oriented, closely spaced, smooth. Occasional roots.			B2	1.20 - 1.50		
			PP01	1.50	>220 kPa	
	1.60	23.06				
Stiff friable orangish brown silty CLAY with occasional mudstone lithorelicts. Occasionally slightly sandy.			D4	1.80		
	2.00	22.66	PP02	2.00	Material unsuitable for testing	
Extremely weak to very weak orangish brown SILTSTONE recovered as SAND and GRAVEL. Occasional pockets of grey clayey silt. Rare black staining.			B3	2.10 - 2.20		
			D5	2.20		
	2.30	22.36				
Extremely weak orangish brown SILTSTONE recovered as a sandy GRAVEL.			B4	2.40 - 2.60		
			D6	2.40		
	2.60	22.06	PP03	2.50	Material unsuitable for testing	
Trial pit terminated at 2.60m: Hard stratum						

Weather:	Sunny and dry
Pit Stability:	Slight instability from 0.30m to 0.60m
Shoring Used:	
Pit Dimensions:	L: 1.80m x W: 0.45m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Norwich Office: 01603 613111
London Office: 020 7537 9233
Cambridge Office: 01223 781585
Colchester Office: 01206 986675
Testing Services: 01603 416333
E-mail: info@harrisongroupuk.com
Website: www.harrisongroupuk.com

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Remarks

1. Excavation becoming hard from 2.30m. Switched to 450mm toothed bucket.
2. Pit terminated early due to hard stratum.
3. Pit left open to undertake soakaway test.
4. Backfill: GL to 2.60m arisings.

Logged by: G. Pursey | Checked by: M. Cooper | **Fm-Hn-R-3069-Rev E**

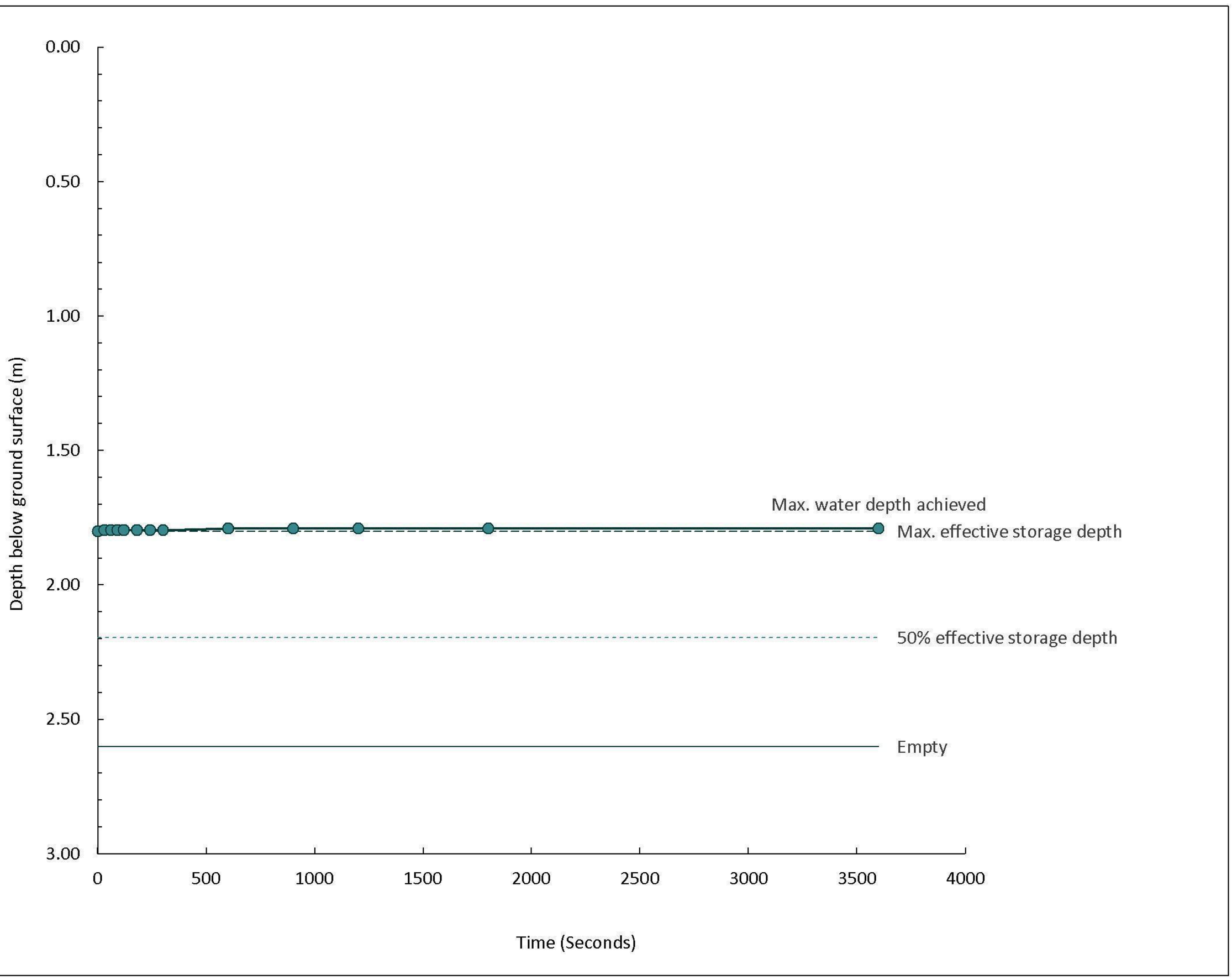
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Soakaway Test

Location ID - Test Number

IT7-01

Project ID:	**GL23484**	Client:	John Sisk & Son Ltd	E: 530931.73	N: 120744.62
Location:	Northern Arc, Burgess Hill	Consultant:	Campbell Reith Hill LLP	Ground Level:	24.66
			Infilling 1	Test Date:	16/06/2020



Soil Infiltration Rate: N/A

Pit Dimensions			
Length (m)	Width (m)	Depth at Start of Test (m)	Depth at End of Test (m)
1.80	0.45	2.60	2.60

Fill Porosity: 100%	Test Duration (hh:mm): 01:00	Soakaway Construction: Vertical sides trimmed square

Norwich Office: 01603 613111
London Office: 020 7537 9233
Cambridge Office: 01223 781585
Colchester Office: 01206 986675
Testing Services: 01603 416333

E-mail: info@harrisongroupuk.com
Website: www.harrisongroupuk.com

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Water measuring device:
Dip Meter

Weather conditions:
Sunny and dry

Test in accordance with
BRE DG 365 Revised 2016

Remarks:

Operator: G. Pursey	Checked by: M. Cooper	Approved by: M. Cooper	Fm-Hn-R-3064-Rev C

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Trial Pit Photograph Record Sheet

Project: Northern Arc, Burgess Hill

Client: John Sisk & Son Ltd

Project ID: GL23484

Exploratory Hole Reference. IT07-01

Date: 15/06/20



GL to 2.60mbgl



Spoil

Remarks	Engineer: G. Pursey	Checked By: J.Keay

Harrison Group Environmental Ltd.
Kimberley Street, Norwich, NR2 2RJ

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Trial Pit Photograph Record Sheet

Project: Northern Arc, Burgess Hill

Client: John Sisk & Son Ltd

Project ID: GL23484

Exploratory Hole Reference. IT07-01

Date: 15/06/20



At 0.30m: 10-20mm vertical tension crack.



Reinstatement

Remarks	Engineer: G. Pursey	Checked By: J.Keay

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APPENDIX C

GAS AND GROUNDWATER MONITORING

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Gas and PID Monitoring Results

AGS

Project ID:	GL23484	Client:	John Sisk & Son Ltd	Equipment	Model / Serial Number	Manufacturer's Calibration Date
Date:	15/06/2020	Location:	Northern Arc, Burgess Hill	Gas Analyser:	GA5000 / G504267	05/01/2020
Weather conditions:	Cloudy and dry			PID:	Tiger Handheld VOC Detector / T-113655	11/10/2019
Pump Running Time (Purge): Standard 30 secs. Pump Running Time (Sampling): Standard 180 secs. Flow Details: 5 sec average for 1 min.				PID Details: "<" indicates reading is under the detection limit. ">" indicates reading is over the upper limit. "*" level to be determined.		
Field engineer(s):	T. Nielsen-Earle	Remarks:				

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Air Temp (°C)	Atmospheric Pressure 48Hrs Prior to Sampling (mB)	Atmospheric Pressure 24Hrs Prior to Sampling (mB)	Atmospheric Pressure 3Hrs Prior to Sampling (mB)	Atmospheric Pressure When Sampled (mB)	Relative Pressure (mB)	Peak PID (ppm)	Stable PID (ppm)	Methane (%)	Peak Methane (%)	Methane LEL (%)	Carbon Dioxide (%)	Oxygen (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow (l/hr)	Remarks
CP7-01	PIPE1 (50mm)	15/06/2020	13:29:00	23.6	1008	1014	1016	1014	0.14	2.9	6.9	0.0	0.0	0.0	0.1	20.9	3.0	0.0	0.0	
			13:29:15							5.3		0.0			3.3	19.4	2.0	0.0	0.0	
			13:29:30							7.3		0.0			3.4	18.8	1.0	0.0	0.0	
			13:29:45							7.8		0.0			3.4	18.8	1.0	0.0	0.0	
			13:30:00							7.9		0.0			3.4	18.8	1.0	0.0	0.0	
			13:30:30							7.8		0.0			3.4	18.8	1.0	0.0	0.0	
			13:31:00							7.6		0.0			3.4	18.8	1.0	0.0	0.0	
			13:32:00							6.9		0.0			3.4	18.8	1.0	0.0	0.0	
WS7-01	PIPE1 (50mm)	15/06/2020	13:56:00	23.8	1008	1014	1016	1015	0.03	2.5	2.8	0.0	0.0	0.0	0.1	21.0	5.0	0.0	0.0	
			13:56:15							2.2		0.0			0.5	20.8	1.0	0.0	0.0	
			13:56:30							2.2		0.0			0.6	20.7	1.0	0.0	0.0	
			13:56:45							2.4		0.0			0.6	20.7	1.0	0.0	0.0	
			13:57:00							2.5		0.0			0.6	20.7	1.0	0.0	0.0	
			13:57:30							2.6		0.0			0.6	20.7	1.0	0.0	0.0	
			13:58:00							2.7		0.0			0.6	20.8	1.0	0.0	0.0	
			13:59:00							2.8		0.0			0.6	20.8	1.0	0.0	0.0	
WS7-02	PIPE1 (50mm)	15/06/2020	12:34:00	23.3	1008	1014	1016	1015	-0.07	1.4	3.3	0.0	0.0	0.0	0.1	21.5	2.0	0.0	0.1	
			12:34:15							3.0		0.0			1.8	20.3	1.0	0.0	0.0	
			12:34:30							3.7		0.0			1.8	20.0	0.0	0.0	0.0	
			12:34:45							3.9		0.0			1.8	20.0	0.0	0.0	0.0	
			12:35:00							4.0		0.0			1.9	20.0	0.0	0.0	0.0	
			12:35:30							3.8		0.0			1.9	20.0	0.0	0.0	0.0	
			12:36:00							3.6		0.0			1.9	20.0	0.0	0.0	0.0	
			12:37:00							3.3		0.0			1.9	20.0	0.0	0.0	0.0	
WS7-03	PIPE1 (50mm)	15/06/2020	12:07:00	22.7	1008	1014	1016	1015	0.09	0.7	4.5	0.1	0.1	2.0	0.0	22.2	3.0	0.0	0.0	
			12:07:15							2.6		0.1			1.0	21.5	2.0	0.0	0.0	
			12:07:30							2.5		0.1			1.0	21.4	2.0	0.0	0.0	
			12:07:45							2.8		0.1			1.0	21.4	2.0	0.0	0.0	
			12:08:00							4.0		0.1			1.0	21.4	2.0	0.0	0.0	
			12:08:30							4.4		0.1			1.0	21.4	2.0	0.0	0.0	
			12:09:00							4.6		0.1			1.0	21.4	2.0	0.0	0.0	
			12:10:00							4.5		0.1			1.0	21.4	2.0	0.0	0.0	
WS7-04	PIPE1 (50mm)	15/06/2020	12:54:00	23.4	1008	1014	1016	1015	-0.12	1.3	1.3	0.0	0.0	0.0	0.1	21.2	2.0	0.0	0.0	
			12:54:15							1.9		0.0			1.3	20.5	1.0	0.0	0.0	
			12:54:30							2.2		0.0			1.3	20.4	1.0	0.0	0.0	
			12:54:45							2.3		0.0			1.4	20.3	0.0	0.0	0.0	
			12:55:00							2.3		0.0			1.4	20.3	0.0	0.0	0.0	
			12:55:30							2.1		0.0			1.4	20.3	0.0	0.0	0.0	
			12:56:00							1.7		0.0			1.5	20.3	0.0	0.0	0.0	
			12:57:00							1.3		0.0			1.5	20.3	0.0	0.0	0.0	
WS7-05	PIPE1 (50mm)	15/06/2020	13:41:00	23.8	1008	1014	1016	1015	-0.03	2.4	3.3	0.0	0.0	0.0	0.3	20.7	6.0	0.0	0.0	
			13:41:15							3.3		0.0			1.4	19.7	2.0	0.0	0.0	
			13:41:30							3.7		0.0			1.4	19.5	1.0	0.0	0.0	
			13:41:45							3.8		0.0			1.4	19.5	1.0	0.0	0.0	
			13:42:00							3.8		0.0			1.4	19.5	1.0	0.0	0.0	
			13:42:30							3.8		0.0			1.4	19.5	1.0	0.0	0.0	
			13:43:00							3.7		0.0			1.4	19.5	1.0	0.0	0.0	
			13:44:00							3.3		0.0			1.4	19.6	1.0	0.0	0.0	

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Gas and PID Monitoring Results

AGS

Project ID:	GL23484	Client:	John Sisk & Son Ltd	Equipment	Model / Serial Number	Manufacturer's Calibration Date
Date:	15/06/2020	Location:	Northern Arc, Burgess Hill	Gas Analyser:	GA5000 / G504267	05/01/2020
Weather conditions:	Cloudy and dry			PID:	Tiger Handheld VOC Detector / T-113655	11/10/2019
Pump Running Time (Purge): Standard 30 secs. Pump Running Time (Sampling): Standard 180 secs. Flow Details: 5 sec average for 1 min.				PID Details: "<" indicates reading is under the detection limit. ">" indicates reading is over the upper limit. "*" level to be determined.		
Field engineer(s):	T. Nielsen-Earle	Remarks:				

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Air Temp (°C)	Atmospheric Pressure 48Hrs Prior to Sampling (mB)	Atmospheric Pressure 24Hrs Prior to Sampling (mB)	Atmospheric Pressure 3Hrs Prior to Sampling (mB)	Atmospheric Pressure When Sampled (mB)	Relative Pressure (mB)	Peak PID (ppm)	Stable PID (ppm)	Methane (%)	Peak Methane (%)	Methane LEL (%)	Carbon Dioxide (%)	Oxygen (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow (l/hr)	Remarks
WS7-06	PIPE1 (50mm)	15/06/2020	13:18:00	23.7	1008	1014	1016	1015	-0.07	1.7	5.2	0.0	0.0	0.0	0.1	21.2	3.0	0.0	0.0	
			13:18:15							3.8		0.0			1.0	20.5	1.0	0.0	0.0	
			13:18:30							4.5		0.0			1.0	20.4	1.0	0.0	0.0	
			13:18:45							5.0		0.0			1.0	20.3	1.0	0.0	0.0	
			13:19:00							5.3		0.0			1.0	20.3	1.0	0.0	0.0	
			13:19:30							5.5		0.0			1.0	20.3	1.0	0.0	0.0	
			13:20:00							5.6		0.0			1.0	20.3	1.0	0.0	0.0	
			13:21:00							5.2		0.0			1.1	20.3	0.0	0.0	0.0	
WS7-07	PIPE1 (50mm)	15/06/2020	12:44:00	23.6	1008	1014	1016	1015	0.00	1.7	1.6	0.0	0.0	0.0	0.2	21.4	3.0	0.0	0.0	
			12:44:15							1.5		0.0			1.3	20.5	1.0	0.0	0.0	
			12:44:30							1.5		0.0			1.3	20.3	0.0	0.0	0.0	
			12:44:45							1.6		0.0			1.3	20.3	0.0	0.0	0.0	
			12:45:00							1.7		0.0			1.3	20.3	0.0	0.0	0.0	
			12:45:30							1.8		0.0			1.3	20.3	0.0	0.0	0.0	
			12:46:00							1.7		0.0			1.3	20.3	0.0	0.0	0.0	
			12:47:00							1.6		0.0			1.4	20.2	0.0	0.0	0.0	

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Groundwater Monitoring Results

AGS

Project ID:	GL23484	Client:	John Sisk & Son Ltd	Weather conditions:	Cloudy and dry
Date:	15/06/2020	Location:	Northern Arc, Burgess Hill	Ground conditions:	-

[1] = All (m) depth measurements are recorded as meters from the top of the installation cover.

[2] = I: Inertial, S: Submersible, B: Bailer, P: Peristaltic Pump.

[3] = Purge volume standardisation: 50mm standpipe = 6 x water column, 35mm = 3.5 x water column, 19mm = 1 x water column.

Field engineer(s): T. Nielsen-Earle / J. Sparks

Remarks:

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Surface Elevation (maOD)	LNAPL Depth[1] (mbgl)	LNAPL Depth (maOD)	Water Level[1] (mbgl)	Water Level (maOD)	DNAPL Depth[1] (mbgl)	DNAPL Depth (maOD)	Depth to base[1] (mbgl)	Depth to base (maOD)	Readings: Barometric Pressure (mB)	Air Temp (°C)	Downhole Temp (°C)	pH	Electrical Conductivity (µS/cm)	DO (%)	Redox Potential (mV)	Resistivity (Ohm-cm)	Salinity (psu)	Density (g/cm³)	TDS (ppt)	Water Pressure (psi)	Sampling Method[2] (I, S, B, P)	Water Column (m)	Purged Volume[3] (L)	Sample Ref	Comments: (e.g. problems encountered, standpipe conditions, unusual odours, colour, tubidity, sheens)
CP7-01	PIPE1 (50mm)	15/06/2020	13:38:00	23.72			1.66	22.06			3.28	20.44														1.62	9.72		
WS7-01	PIPE1 (50mm)	15/06/2020	14:06:00	24.76			1.83	22.93			2.46	22.30														0.63			
WS7-02	PIPE1 (50mm)	15/06/2020	12:40:00	25.63			1.75	23.88			2.01	23.62														0.26			
WS7-03	PIPE1 (50mm)	15/06/2020	12:15:00	24.24			Dry				2.02	22.22																	
WS7-04	PIPE1 (50mm)	15/06/2020	13:04:00	24.01			Dry				1.98	22.03																	
WS7-05	PIPE1 (50mm)	15/06/2020	13:52:00	24.29			Dry				1.73	22.56																	
WS7-06	PIPE1 (50mm)	15/06/2020	13:25:00	23.85			Dry				1.91	21.94																	
WS7-07	PIPE1 (50mm)	15/06/2020	12:51:00	24.56			1.82	22.74			1.93	22.63														0.11			

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Gas and PID Monitoring Results

AGS

Project ID:	GL23484	Client:	John Sisk & Son Ltd	Equipment	Model / Serial Number	Manufacturer's Calibration Date
Date:	01/07/2020 - 02/07/2020	Location:	Northern Arc, Burgess Hill	Gas Analyser:	GA5000 / G504267	05/01/2020
Weather conditions:	Cloudy and occasionally wet			PID:	Tiger Handheld VOC Detector / T-113655	11/10/2019
Pump Running Time (Purge): Standard 30 secs. Pump Running Time (Sampling): Standard 180 secs. Flow Details: 5 sec average for 1 min.				PID Details: "<" indicates reading is under the detection limit. ">" indicates reading is over the upper limit. "*" level to be determined.		
Field engineer(s):	T. Nielsen-Earle	Remarks:				

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Air Temp (°C)	Atmospheric Pressure 48Hrs Prior to Sampling (mB)	Atmospheric Pressure 24Hrs Prior to Sampling (mB)	Atmospheric Pressure 3Hrs Prior to Sampling (mB)	Atmospheric Pressure When Sampled (mB)	Relative Pressure (mB)	Peak PID (ppm)	Stable PID (ppm)	Methane (%)	Peak Methane (%)	Methane LEL (%)	Carbon Dioxide (%)	Oxygen (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow (l/hr)	Remarks
CP7-01	PIPE1 (50mm)	01/07/2020	13:55:00	20.3	1011	1007	1005	1005	-0.07	0.7	3.6	0.0	0.0	0.0	0.1	20.6	1.0	0.0	0.0	
			13:55:15							3.6		0.0			3.6	18.5	0.0	0.0	0.0	
			13:55:30							4.0		0.0			3.6	18.3	0.0	0.0	0.0	
			13:55:45							4.3		0.0			3.6	18.3	0.0	0.0	0.0	
			13:56:00							4.3		0.0			3.6	18.3	0.0	0.0	0.0	
			13:56:30							4.2		0.0			3.6	18.3	0.0	0.0	0.0	
			13:57:00							4.1		0.0			3.6	18.3	0.0	0.0	0.0	
			13:58:00							3.6		0.0			3.6	18.3	0.0	0.0	0.0	
WS7-01	PIPE1 (50mm)	02/07/2020	10:03:00	19.0	1007	1005	1010	1009	0.07	1.0	3.5	0.0	0.0	0.0	0.2	19.9	0.0	0.0	0.0	
			10:03:15							1.9		0.0			0.8	20.0	0.0	0.0	0.0	
			10:03:30							2.5		0.0			0.8	19.8	0.0	0.0	0.0	
			10:03:45							2.7		0.0			0.8	19.8	0.0	1.0	0.0	
			10:04:00							3.0		0.0			0.8	19.8	0.0	1.0	0.0	
			10:04:30							3.4		0.0			0.8	19.8	0.0	1.0	0.0	
			10:05:00							3.4		0.0			0.8	19.8	0.0	1.0	0.0	
			10:06:00							3.5		0.0			0.8	19.8	0.0	1.0	0.0	
WS7-02	PIPE1 (50mm)	01/07/2020	13:19:00	20.6	1011	1007	1005	1005	0.02	0.8	2.7	0.0	0.0	0.0	0.1	21.1	1.0	0.0	0.0	
			13:19:15							2.3		0.0			1.6	20.2	0.0	0.0	0.0	
			13:19:30							2.9		0.0			1.6	19.9	0.0	0.0	0.0	
			13:19:45							3.1		0.0			1.6	19.9	0.0	0.0	0.0	
			13:20:00							3.1		0.0			1.7	19.9	0.0	0.0	0.0	
			13:20:30							3.0		0.0			1.7	19.9	0.0	0.0	0.0	
			13:21:00							3.0		0.0			1.7	19.9	0.0	0.0	0.0	
			13:22:00							2.7		0.0			1.7	19.8	0.0	0.0	0.0	
WS7-03	PIPE1 (50mm)	02/07/2020	09:50:00	17.7	1007	1005	1010	1009	0.00	1.2	3.3	0.0	0.0	0.0	0.2	20.2	0.0	1.0	0.0	
			09:50:15							1.9		0.0			1.1	20.0	0.0	1.0	0.0	
			09:50:30							2.4		0.0			1.1	19.8	0.0	1.0	0.0	
			09:50:45							2.8		0.0			1.1	19.7	0.0	1.0	0.0	
			09:51:00							3.0		0.0			1.1	19.7	0.0	1.0	0.0	
			09:51:30							3.2		0.0			1.1	19.7	0.0	1.0	0.0	
			09:52:00							3.3		0.0			1.1	19.7	0.0	1.0	0.0	
			09:53:00							3.3		0.0			1.1	19.8	0.0	0.0	0.0	
WS7-04	PIPE1 (50mm)	02/07/2020	10:40:00	19.6	1007	1005	1010	1009	0.02	2.0	2.2	0.0	0.0	0.0	0.2	20.2	0.0	0.0	0.0	
			10:40:15							2.4		0.0			1.7	19.6	0.0	0.0	0.0	
			10:40:30							2.5		0.0			1.7	19.5	0.0	0.0	0.0	
			10:40:45							2.4		0.0			1.7	19.4	0.0	0.0	0.0	
			10:41:00							2.5		0.0			1.7	19.4	0.0	0.0	0.0	
			10:41:30							2.4		0.0			1.7	19.4	0.0	0.0	0.0	
			10:42:00							2.3		0.0			1.7	19.5	0.0	0.0	0.0	
			10:43:00							2.2		0.0			1.8	19.4	0.0	0.0	0.0	
WS7-05	PIPE1 (50mm)	01/07/2020	13:32:00	20.7	1011	1007	1005	1005	0.07	1.3	2.4	0.0	0.0	0.0	0.3	20.6	1.0	0.0	0.0	
			13:32:15							2.1		0.0			1.2	20.0	0.0	0.0	0.0	
			13:32:30							2.4		0.0			1.2	19.9	0.0	0.0	0.0	
			13:32:45							2.5		0.0			1.2	19.8	0.0	0.0	0.0	
			13:33:00							2.6		0.0			1.2	19.8	0.0	0.0	0.0	
			13:33:30							2.6		0.0			1.2	19.8	0.0	0.0	0.0	
			13:34:00							2.6		0.0			1.2	19.8	0.0	0.0	0.0	
			13:35:00							2.4		0.0			1.2	19.8	0.0	0.0	0.0	

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Gas and PID Monitoring Results

AGS

Project ID:	GL23484	Client:	John Sisk & Son Ltd	Equipment	Model / Serial Number
Date:	01/07/2020 - 02/07/2020	Location:	Northern Arc, Burgess Hill	Gas Analyser:	GA5000 / G504267
Weather conditions:	Cloudy and occasionally wet			PID:	Tiger Handheld VOC Detector / T-113655
Pump Running Time (Purge): Standard 30 secs. Pump Running Time (Sampling): Standard 180 secs. Flow Details: 5 sec average for 1 min.				PID Details: "<" indicates reading is under the detection limit. ">" indicates reading is over the upper limit. "*" level to be determined.	
Field engineer(s):	T. Nielsen-Earle	Remarks:			

Manufacturer's Calibration Date
05/01/2020
11/10/2019

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Air Temp (°C)	Atmospheric Pressure 48Hrs Prior to Sampling (mB)	Atmospheric Pressure 24Hrs Prior to Sampling (mB)	Atmospheric Pressure 3Hrs Prior to Sampling (mB)	Atmospheric Pressure When Sampled (mB)	Relative Pressure (mB)	Peak PID (ppm)	Stable PID (ppm)	Methane (%)	Peak Methane (%)	Methane LEL (%)	Carbon Dioxide (%)	Oxygen (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow (l/hr)	Remarks
WS7-06	PIPE1 (50mm)	02/07/2020	10:31:00	18.9	1007	1005	1010	1009	0.02	1.0	4.5	0.0	0.0	0.0	0.5	20.2	0.0	0.0	0.0	
			10:31:15							3.3		0.0			1.1	19.8	0.0	0.0	0.0	
			10:31:30							3.9		0.0			1.2	19.6	0.0	0.0	0.0	
			10:31:45							4.1		0.0			1.2	19.6	0.0	0.0	0.0	
			10:32:00							4.3		0.0			1.2	19.6	0.0	0.0	0.0	
			10:32:30							4.5		0.0			1.2	19.6	0.0	0.0	0.0	
			10:33:00							4.6		0.0			1.2	19.6	0.0	0.0	0.0	
			10:34:00							4.5		0.0			1.2	19.7	0.0	0.0	0.0	
WS7-07	PIPE1 (50mm)	02/07/2020	10:20:00	19.3	1007	1005	1010	1009	0.05	2.0	1.9	0.0	0.0	0.0	0.5	20.2	1.0	0.0	0.0	
			10:20:15							1.8		0.0			0.8	20.0	0.0	0.0	0.0	
			10:20:30							1.8		0.0			0.8	19.9	0.0	0.0	0.0	
			10:20:45							1.9		0.0			0.8	19.9	0.0	0.0	0.0	
			10:21:00							1.9		0.0			0.8	19.9	0.0	0.0	0.0	
			10:21:30							1.9		0.0			0.8	19.9	0.0	0.0	0.0	
			10:22:00							1.9		0.0			0.8	19.9	0.0	0.0	0.0	
			10:23:00							1.9		0.0			0.8	19.9	0.0	0.0	0.0	

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Groundwater Monitoring Results

AGS

Project ID:	GL23484	Client:	John Sisk & Son Ltd	Weather conditions:	Cloudy and occasionally wet
Date:	01/07/2020 - 02/07/2020	Location:	Northern Arc, Burgess Hill	Ground conditions:	-

[1] = All (m) depth measurements are recorded as meters from the top of the installation cover.

[2] = I: Inertial, S: Submersible, B: Bailer, P: Peristaltic Pump.

[3] = Purge volume standardisation: 50mm standpipe = 6 x water column, 35mm = 3.5 x water column, 19mm = 1 x water column.

Field engineer(s): T. Nielsen-Earle / J. Sparks

Remarks:

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Surface Elevation (maOD)	LNAPL Depth[1] (mbgl)	LNAPL Depth (maOD)	Water Level[1] (mbgl)	Water Level (maOD)	DNAPL Depth[1] (mbgl)	DNAPL Depth (maOD)	Depth to base[1] (mbgl)	Depth to base (maOD)	Readings: SmarTROLL Multiparameter Handheld / PN0093230												Sampling Method[2] (I, S, B, P)	Water Column (m)	Purged Volume[3] (L)	Sample Ref	Comments: (e.g. problems encountered, standpipe conditions, unusual odours, colour, tubidity, sheens)
													Barometric Pressure (mB)	Air Temp (°C)	Downhole Temp (°C)	pH	Electrical Conductivity (µS/cm)	DO (%)	Redox Potential (mV)	Resistivity (Ohm-cm)	Salinity (psu)	Density (g/cm³)	TDS (ppt)	Water Pressure (psi)					
CP7-01	PIPE1 (50mm)	01/07/2020	14:10:00	23.72			1.90	21.82			3.23	20.49				8.6	1765	16.6	8.9						P	1.33		EW1-SP1	Slightly cloudy.
WS7-01	PIPE1 (50mm)	02/07/2020	10:15:00	24.76			1.75	23.01			2.50	22.26				9.7	593	20.4	-49.2						P	0.75		EW1-SP1	Slightly cloudy.
WS7-02	PIPE1 (50mm)	01/07/2020	13:40:00	25.63			1.60	24.03			2.04	23.59				8.7	1198	23.3	-38.1						P	0.44		EW1-SP1	Clear.
WS7-03	PIPE1 (50mm)	02/07/2020	09:50:00	24.24			Dry				2.03	22.21																	
WS7-04	PIPE1 (50mm)	02/07/2020	10:40:00	24.01			Dry				1.99	22.02																	
WS7-05	PIPE1 (50mm)	01/07/2020	13:32:00	24.29			Dry				1.73	22.56																	
WS7-06	PIPE1 (50mm)	02/07/2020	10:31:00	23.85			Dry				2.91	20.94																	
WS7-07	PIPE1 (50mm)	02/07/2020	10:20:00	24.56			1.71	22.85			1.95	22.61														0.24			

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Gas and PID Monitoring Results

AGS

Project ID:	GL23484	Client:	John Sisk & Son Ltd	Equipment	Model / Serial Number	Manufacturer's Calibration Date
Date:	15/07/2020	Location:	Northern Arc, Burgess Hill	Gas Analyser:	GA5000 / G504267	05/01/2020
Weather conditions:	Sunny and dry			PID:	Tiger Handheld VOC Detector / T-113655	11/10/2019
Pump Running Time (Purge): Standard 30 secs. Pump Running Time (Sampling): Standard 180 secs. Flow Details: 5 sec average for 1 min.				PID Details: "<" indicates reading is under the detection limit. ">" indicates reading is over the upper limit. "*" level to be determined.		
Field engineer(s):	T. Nielsen-Earle	Remarks:				

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Air Temp (°C)	Atmospheric Pressure 48Hrs Prior to Sampling (mB)	Atmospheric Pressure 24Hrs Prior to Sampling (mB)	Atmospheric Pressure 3Hrs Prior to Sampling (mB)	Atmospheric Pressure When Sampled (mB)	Relative Pressure (mB)	Peak PID (ppm)	Stable PID (ppm)	Methane (%)	Peak Methane (%)	Methane LEL (%)	Carbon Dioxide (%)	Oxygen (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow (l/hr)	Remarks
CP7-01	PIPE1 (50mm)	15/07/2020	13:26:00	18.3	1022	1015	1015	1014	-0.12	1.7	2.6	0.0	0.0	0.0	0.7	20.8	0.0	0.0	0.0	
			13:26:15							2.6		0.0			2.2	19.7	0.0	0.0	0.0	
			13:26:30							2.8		0.0			2.3	19.6	0.0	0.0	0.0	
			13:26:45							2.9		0.0			2.3	19.5	0.0	0.0	0.0	
			13:27:00							2.8		0.0			2.4	19.5	0.0	0.0	0.0	
			13:27:30							2.8		0.0			2.4	19.5	0.0	0.0	0.0	
			13:28:00							2.7		0.0			2.4	19.5	0.0	0.0	0.0	
			13:29:00							2.6		0.0			2.4	19.5	0.0	0.0	0.0	
WS7-01	PIPE1 (50mm)	15/07/2020	12:16:00	18.9	1022	1015	1015	1014	0.12	1.0	3.7	0.0	0.0	0.0	0.2	20.9	1.0	0.0	0.0	
			12:16:15							2.1		0.0			0.8	20.6	0.0	0.0	0.0	
			12:16:30							2.6		0.0			0.8	20.4	0.0	0.0	0.0	
			12:16:45							2.9		0.0			0.8	20.4	0.0	0.0	0.0	
			12:17:00							3.1		0.0			0.8	20.4	0.0	0.0	0.0	
			12:17:30							3.4		0.0			0.8	20.4	0.0	0.0	0.0	
			12:18:00							3.6		0.0			0.8	20.4	0.0	0.0	0.0	
			12:19:00							3.7		0.0			0.8	20.4	0.0	0.0	0.0	
WS7-02	PIPE1 (50mm)	15/07/2020	13:05:00	18.6	1022	1015	1015	1014	0.09	0.9	3.1	0.0	0.0	0.0	0.5	20.6	0.0	0.0	0.0	
			13:05:15							3.0		0.0			1.2	20.3	0.0	0.0	0.0	
			13:05:30							3.3		0.0			1.3	20.2	0.0	0.0	0.0	
			13:05:45							3.3		0.0			1.4	20.2	0.0	0.0	0.0	
			13:06:00							3.3		0.0			1.4	20.2	0.0	0.0	0.0	
			13:06:30							3.3		0.0			1.4	20.2	0.0	0.0	0.0	
			13:07:00							3.2		0.0			1.4	20.2	0.0	0.0	0.0	
			13:08:00							3.1		0.0			1.4	20.2	0.0	0.0	0.0	
WS7-03	PIPE1 (50mm)	15/07/2020	12:26:00	18.7	1022	1015	1015	1014	-0.20	1.6	2.6	0.0	0.0	0.0	0.3	20.7	1.0	0.0	0.0	
			12:26:15							2.2		0.0			0.6	20.5	0.0	0.0	0.0	
			12:26:30							2.3		0.0			0.6	20.4	0.0	0.0	0.0	
			12:26:45							2.4		0.0			0.6	20.4	0.0	0.0	0.0	
			12:27:00							2.6		0.0			0.6	20.4	0.0	0.0	0.0	
			12:27:30							2.6		0.0			0.6	20.4	0.0	0.0	0.0	
			12:28:00							2.6		0.0			0.6	20.4	0.0	0.0	0.0	
			12:29:00							2.6		0.0			0.6	20.4	0.0	0.0	0.0	
WS7-04	PIPE1 (50mm)	15/07/2020	12:46:00	18.3	1022	1015	1015	1014	0.20	1.0	2.0	0.0	0.0	0.0	1.1	20.4	1.0	0.0	0.0	
			12:46:15							2.2		0.0			1.1	20.1	0.0	0.0	0.0	
			12:46:30							2.3		0.0			1.1	20.0	0.0	0.0	0.0	
			12:46:45							2.4		0.0			1.1	20.0	0.0	0.0	0.0	
			12:47:00							2.4		0.0			1.1	20.0	0.0	0.0	0.0	
			12:47:30							2.2		0.0			1.2	20.0	0.0	0.0	0.0	
			12:48:00							2.1		0.0			1.2	20.0	0.0	0.0	0.0	
			12:49:00							2.0		0.0			1.3	20.0	0.0	0.0	0.0	
WS7-05	PIPE1 (50mm)	15/07/2020	13:15:00	18.4	1022	1015	1015	1014	-0.05	1.5	2.4	0.0	0.0	0.0	0.2	21.0	1.0	0.0	0.0	
			13:15:15							2.1		0.0			0.9	20.7	0.0	0.0	0.0	
			13:15:30							2.4		0.0			0.9	20.5	0.0	0.0	0.0	
			13:15:45							2.5		0.0			0.9	20.5	0.0	0.0	0.0	
			13:16:00							2.5		0.0			0.9	20.5	0.0	0.0	0.0	
			13:16:30							2.4		0.0			0.9	20.5	0.0	0.0	0.0	
			13:17:00							2.4		0.0			0.9	20.5	0.0	0.0	0.0	
			13:18:00							2.4		0.0			0.9	20.5	0.0	0.0	0.0	

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Gas and PID Monitoring Results

AGS

Project ID:	GL23484	Client:	John Sisk & Son Ltd	Equipment	Model / Serial Number	Manufacturer's Calibration Date
Date:	15/07/2020	Location:	Northern Arc, Burgess Hill	Gas Analyser:	GA5000 / G504267	05/01/2020
Weather conditions:	Sunny and dry			PID:	Tiger Handheld VOC Detector / T-113655	11/10/2019
Pump Running Time (Purge): Standard 30 secs. Pump Running Time (Sampling): Standard 180 secs. Flow Details: 5 sec average for 1 min.				PID Details: "<" indicates reading is under the detection limit. ">" indicates reading is over the upper limit. "*" level to be determined.		
Field engineer(s):	T. Nielsen-Earle	Remarks:				

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Air Temp (°C)	Atmospheric Pressure 48Hrs Prior to Sampling (mB)	Atmospheric Pressure 24Hrs Prior to Sampling (mB)	Atmospheric Pressure 3Hrs Prior to Sampling (mB)	Atmospheric Pressure When Sampled (mB)	Relative Pressure (mB)	Peak PID (ppm)	Stable PID (ppm)	Methane (%)	Peak Methane (%)	Methane LEL (%)	Carbon Dioxide (%)	Oxygen (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow (l/hr)	Remarks
WS7-06	PIPE1 (50mm)	15/07/2020	13:38:00	18.1	1022	1015	1015	1014	-0.03	1.8	1.3	0.0	0.0	0.0	0.4	20.9	1.0	0.0	0.0	
			13:38:15							1.5		0.0			0.5	20.8	0.0	0.0	0.0	
			13:38:30							1.4		0.0			0.6	20.7	0.0	0.0	0.0	
			13:38:45							1.5		0.0			0.6	20.6	0.0	0.0	0.0	
			13:39:00							1.4		0.0			0.7	20.6	0.0	0.0	0.0	
			13:39:30							1.5		0.0			0.7	20.6	0.0	0.0	0.0	
			13:40:00							1.4		0.0			0.7	20.6	0.0	0.0	0.0	
			13:41:00							1.3		0.0			0.8	20.6	0.0	0.0	0.0	
WS7-07	PIPE1 (50mm)	15/07/2020	12:55:00	18.4	1022	1015	1015	1014	0.00	1.5	1.6	0.0	0.0	0.0	0.2	20.9	1.0	0.0	0.0	
			12:55:15							1.4		0.0			0.7	20.5	0.0	0.0	0.0	
			12:55:30							1.5		0.0			0.7	20.4	0.0	0.0	0.0	
			12:55:45							1.5		0.0			0.7	20.3	0.0	0.0	0.0	
			12:56:00							1.6		0.0			0.7	20.4	0.0	0.0	0.0	
			12:56:30							1.6		0.0			0.7	20.4	0.0	0.0	0.0	
			12:57:00							1.6		0.0			0.7	20.4	0.0	0.0	0.0	
			12:58:00							1.6		0.0			0.7	20.4	0.0	0.0	0.0	

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Groundwater Monitoring Results

AGS

Project ID:	GL23484	Client:	John Sisk & Son Ltd	Weather conditions:	Sunny and dry
Date:	15/07/2020	Location:	Northern Arc, Burgess Hill	Ground conditions:	-

[1] = All (m) depth measurements are recorded as meters from the top of the installation cover.

[2] = I: Inertial, S: Submersible, B: Bailer, P: Peristaltic Pump.

[3] = Purge volume standardisation: 50mm standpipe = 6 x water column, 35mm = 3.5 x water column, 19mm = 1 x water column.

Field engineer(s): T. Nielsen-Earle

Remarks:

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Surface Elevation (maOD)	LNAPL Depth[1] (mbgl)	LNAPL Depth (maOD)	Water Level[1] (mbgl)	Water Level (maOD)	DNAPL Depth[1] (mbgl)	DNAPL Depth (maOD)	Depth to base[1] (mbgl)	Depth to base (maOD)	Readings: Barometric Pressure (mB)	Air Temp (°C)	Downhole Temp (°C)	pH	Electrical Conductivity (µS/cm)	DO (%)	Redox Potential (mV)	Resistivity (Ohm-cm)	Salinity (psu)	Density (g/cm³)	TDS (ppt)	Water Pressure (psi)	Sampling Method[2] (I, S, B, P)	Water Column (m)	Purged Volume[3] (L)	Sample Ref	Comments: (e.g. problems encountered, standpipe conditions, unusual odours, colour, tubidity, sheens)
CP7-01	PIPE1 (50mm)	15/07/2020	13:26:00	23.72			2.12	21.60			3.26	20.46														1.14			
WS7-01	PIPE1 (50mm)	15/07/2020	12:16:00	24.76			2.02	22.74			2.52	22.24														0.50			
WS7-02	PIPE1 (50mm)	15/07/2020	13:05:00	25.63			1.72	23.91			2.03	23.60														0.31			
WS7-03	PIPE1 (50mm)	15/07/2020	12:26:00	24.24			Dry				2.07	22.17																	
WS7-04	PIPE1 (50mm)	15/07/2020	12:46:00	24.01			Dry				2.01	22.00																	
WS7-05	PIPE1 (50mm)	15/07/2020	13:15:00	24.29			Dry				1.74	22.55																	
WS7-06	PIPE1 (50mm)	15/07/2020	13:38:00	23.85			Dry				1.95	21.90																	
WS7-07	PIPE1 (50mm)	15/07/2020	12:55:00	24.56			Damp				1.96	22.60																	

Kimberley Street, Norwich, NR2 2RJ

APPENDIX D

GEOTECHNICAL LABORATORY TESTING

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SUMMARY OF RESTRICTED TESTS

Project Name:	**Northern Arc, Burgess Hill**	Project Number:
Client Name:	**John Sisk & Son Ltd**	**GL23484-03**

Location	Depth m	Sample Ref	Test Scheduled	Reason why sample could not be tested
CP7-01	2.50	UT2	Unconsolidated Undrained Shear Strength	Unable to prepare intact test specimen of suitable height

Remarks	Approved	Date	Sheet No.:
	MW	23/07/2020	1 of 1

harrisontesting
SERVICES

Harrison Testing Services
Unit 1, Alston Road
Hellesdon Park Industrial Estate
Norwich NR6 5DS

Tel: +44 (0) 1603 416333
www.harrisongroupuk.com
Email: laboratory@harrisongroupuk.com

Harrison Group Environmental
12, Waterways Business Centre
Navigation Drive
Enfield
EN3 6JJ

For the attention of: Glenn Pursey

Project:	**Northern Arc, Burgess Hill**	Samples received:	26/06/2020
Report No:	**GL23484-03**	Instruction received:	26/06/2020
Your Ref:	**GL23484**	Testing commenced:	26/06/2020

Please find results attached as summarised below.

Item	Description	Quantity	UKAS Accredited
1	Water Content	19	Yes
2	Liquid & Plastic Limits	10	Yes
3	Particle Size Distribution - Wet Sieve Method	2	Yes
4	Particle Size Distribution - Pipette Sedimentation Method	2	Yes
5	Unconsolidated Undrained Shear Strength - Single Stage	1	Yes

Only those results indicated in this report are UKAS accredited and any opinion or interpretations expressed are outside the scope of UKAS accreditation.

Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.

This report should not be reproduced except in full without the written approval of the laboratory.

Issued by: Date Issued:

[redacted]

UKAS TESTING
4031

DETERMINATION OF WATER CONTENT

BS EN ISO 17892 - 1 : 2014

Project Name:	**Northern Arc, Burgess Hill**	Project Number:
Client Name:	**John Sisk & Son Ltd**	**GL23484**

Location	Depth	Sample Ref	Sample Description	Water Content	Remarks
	m			%	
CP7-01	0.60	D2	Light grey mottled orange brown silty CLAY.	5.7	
CP7-01	1.00	D3	Light grey mottled orange brown silty CLAY.	16.4	
CP7-01	1.20-1.65	D4	Grey and orange brown GRAVEL. Gravel is of weak mudstone.	2.1	
IT7-01	0.90	D3	Light grey mottled orange brown CLAY with occasional roots	20.5	
IT7-01	1.80	D4	Brown and grey slightly gravelly slightly sandy CLAY. Gravel is of mudstone	16.9	
WS7-01	1.20	D4	Grey and orange brown silty CLAY.	23.1	
WS7-02	1.00	D1	Grey brown silty CLAY.	22.3	
WS7-02	1.30	D2	Grey mottled orange brown silty CLAY.	20.9	
WS7-02	1.80	D3	Orange brown mottled grey silty CLAY.	22.2	
WS7-03	0.60	B1	Grey mottled orange brown slightly silty CLAY with occasional roots.	19.4	

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DETERMINATION OF WATER CONTENT

BS EN ISO 17892 - 1 : 2014

Project Name:	**Northern Arc, Burgess Hill**	Project Number:
Client Name:	**John Sisk & Son Ltd**	**GL23484**

Location	Depth	Sample Ref	Sample Description	Water Content	Remarks
	m			%	
WS7-03	1.50	D2	Brown and grey slightly sandy CLAY	47.3	
WS7-04	0.30	D1	Grey silty CLAY with occasional roots	19.6	
WS7-04	1.00	D2	Grey brown silty CLAY.	22.5	
WS7-04	1.40-1.60	D3	Grey brown silty CLAY.	19.4	
WS7-04	1.80	D4	Grey and orange brown silty CLAY.	16.2	
WS7-06	1.30	D3	Grey mottled brown silty CLAY.	15.9	
WS7-06	1.60	D4	Orange brown mottled grey silty CLAY.	13.0	
WS7-07	1.00	D2	Grey mottled brown silty CLAY.	20.4	
WS7-07	1.50	D3	Grey brown and grey silty CLAY.	15.1	

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DETERMINATION OF LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS1377 : Part 2 : 1990

Project Name:	**Northern Arc, Burgess Hill**	Project Number:
Client Name:	**John Sisk & Son Ltd**	**GL23484**

Location	Depth m	Sample Ref	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	Percentage passing 425μm %	Classification	Sample Description
CP7-01	1.20-1.65	D4	2.1	48	25	23	100	CI	Grey and orange brown GRAVEL. Gravel is of weak mudstone.
IT7-01	1.80	D4	17	33	20	13	92	CL	Brown and grey slightly gravelly slightly sandy CLAY. Gravel is of mudstone
WS7-01	1.20	D4	23	48	26	22	100	CI	Grey and orange brown slightly sandy CLAY.
WS7-02	1.30	D2	21	51	23	28	100	CH	Grey mottled orange brown silty CLAY.
WS7-03	0.60	B1	19	38	28	10	100	MI	Grey mottled orange brown slightly silty CLAY with occasional roots.
WS7-03	1.50	D2	47	43	22	21	100	CI	Brown and grey slightly sandy CLAY
WS7-04	1.80	D4	16	43	25	18	100	CI	Grey and orange brown silty CLAY.
WS7-06	1.30	D3	16	43	25	18	100	CI	Grey mottled brown silty CLAY.
WS7-06	1.60	D4	13	40	23	17	100	CI	Orange brown mottled grey silty CLAY.
WS7-07	1.00	D2	20	46	24	22	100	CI	Grey mottled brown silty CLAY.

Notes:

1) This summary sheet is provided for convenience and in no way replaces individual test result sheets which shall, without exception, be regarded as the definitive result. Please refer to the individual test result sheets for the respective methods used.
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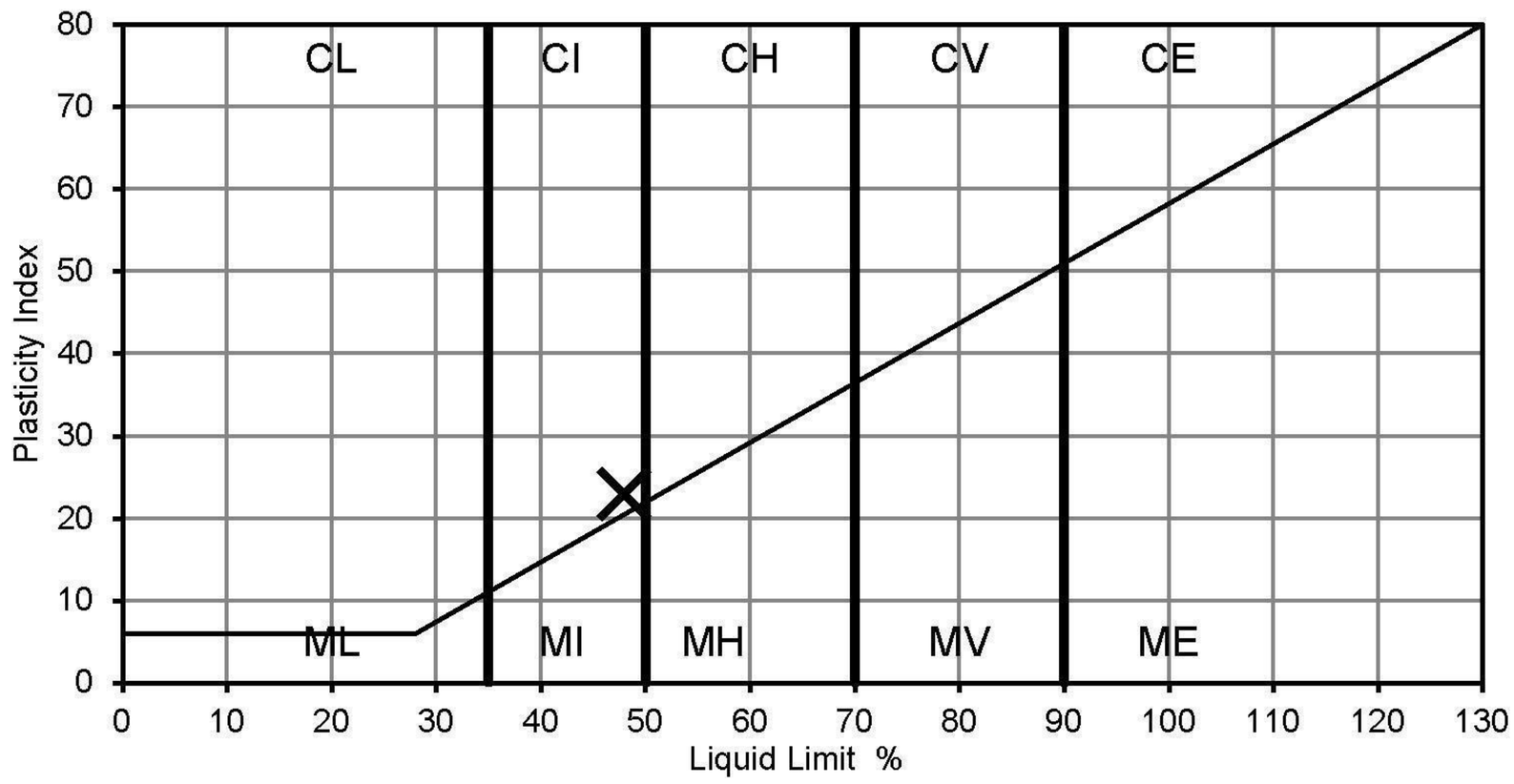
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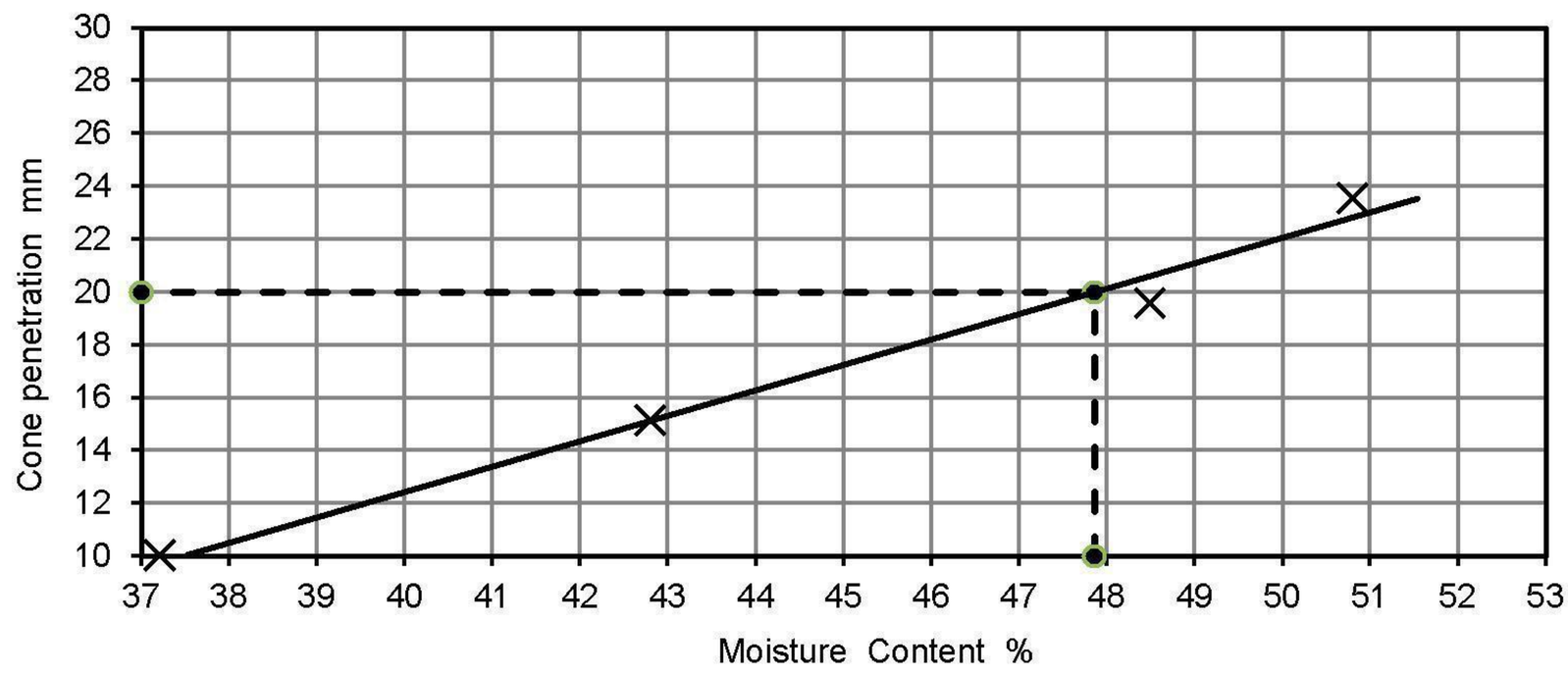
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LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX, & LIQUIDITY INDEX

BS 1377 : Part 2 : 1990, clause 4.3 and 5

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	CP7-01
Sample Description:	Grey and orange brown GRAVEL. Gravel is of weak mudstone.	Sample Depth (m)	1.20
		Sample Reference	D4





Preparation: Material was natural

Results:		
	As Received Moisture Content: (BS1377 : Part 2 : Clause 3 : 1990)	2.1 %
	Percentage Passing 425µm sieve:	100 %
	Liquid Limit:	48 %
	Plastic Limit:	25 %
	Plasticity Index:	23
	Liquidity Index:	-1.00
	Modified Plasticity Index: (NHBC Standards Chapter 4.2)	23

Notes:

1) Modified Plasticity Index: (NHBC Standards Chapter 4.2) not covered by UKAS accreditation.
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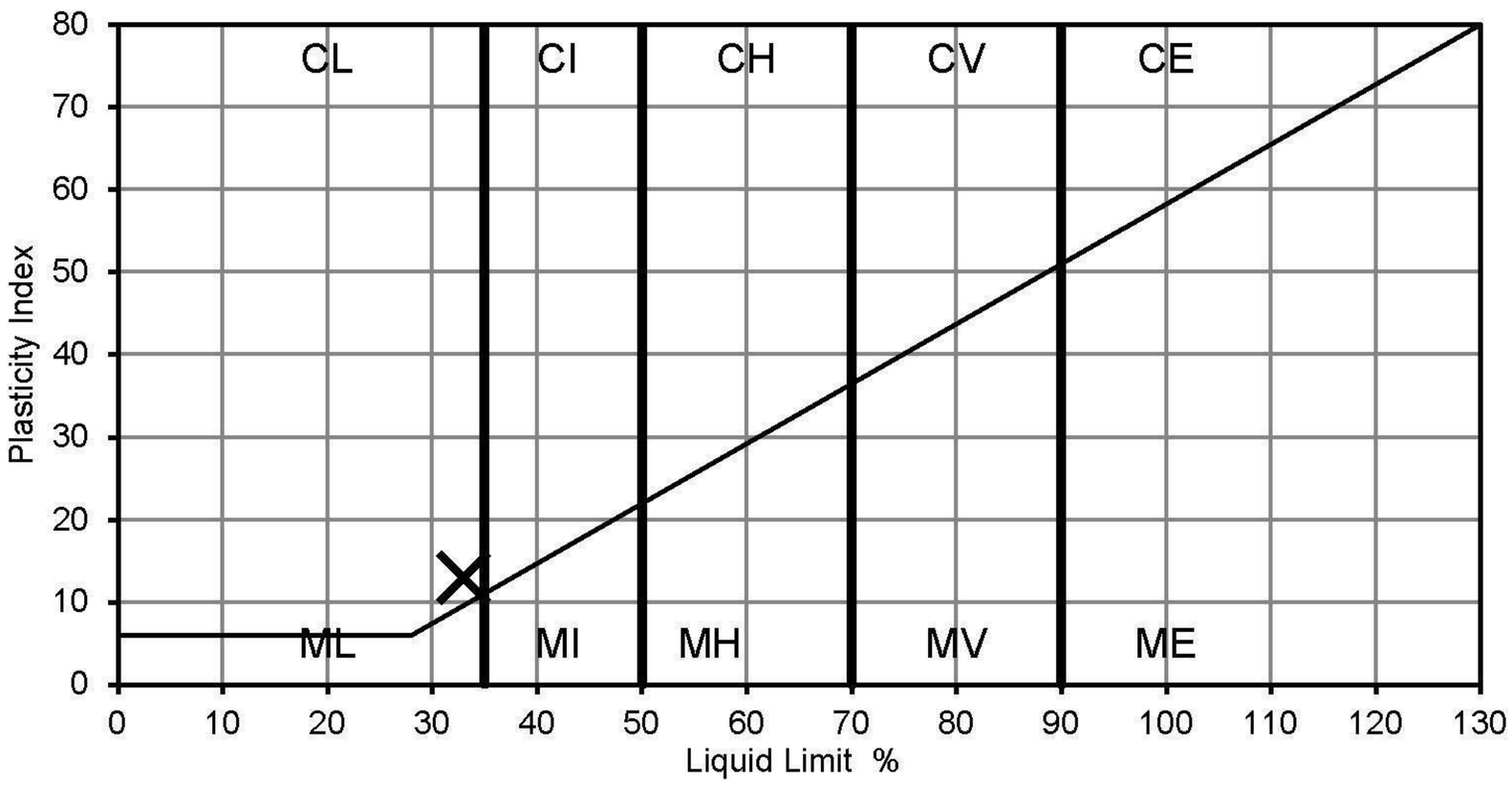
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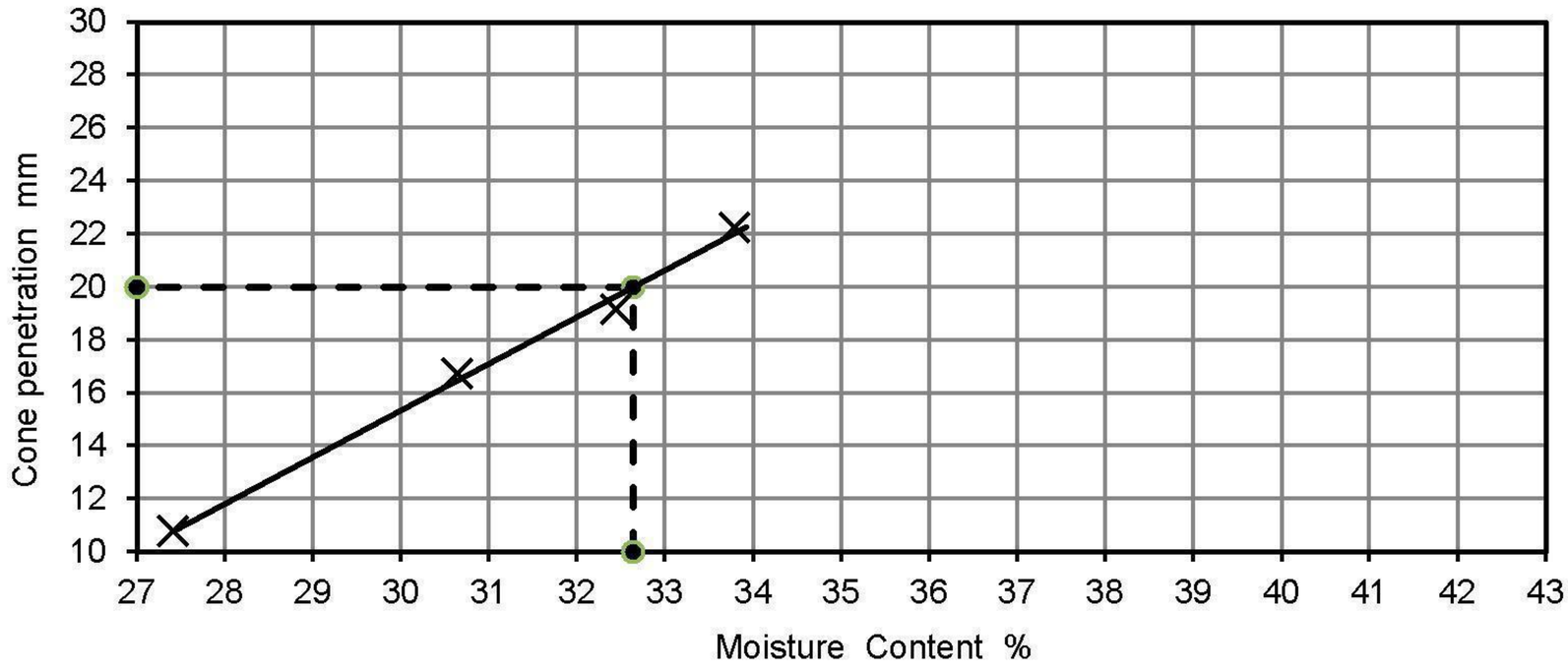
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LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX, & LIQUIDITY INDEX

BS 1377 : Part 2 : 1990, clause 4.3 and 5

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	IT7-01
Sample Description:	Brown and grey slightly gravelly slightly sandy CLAY. Gravel is of mudstone	Sample Depth (m)	1.80
		Sample Reference	D4





Preparation: Material was washed and oven dried at below 50°C

Results:		
	As Received Moisture Content: (BS1377 : Part 2 : Clause 3 : 1990)	17 %
	Percentage Passing 425µm sieve:	92 %
	Liquid Limit:	33 %
	Plastic Limit:	20 %
	Plasticity Index:	13
	Liquidity Index:	-0.23
	Modified Plasticity Index: (NHBC Standards Chapter 4.2)	12

Notes:

1) Modified Plasticity Index: (NHBC Standards Chapter 4.2) not covered by UKAS accreditation.
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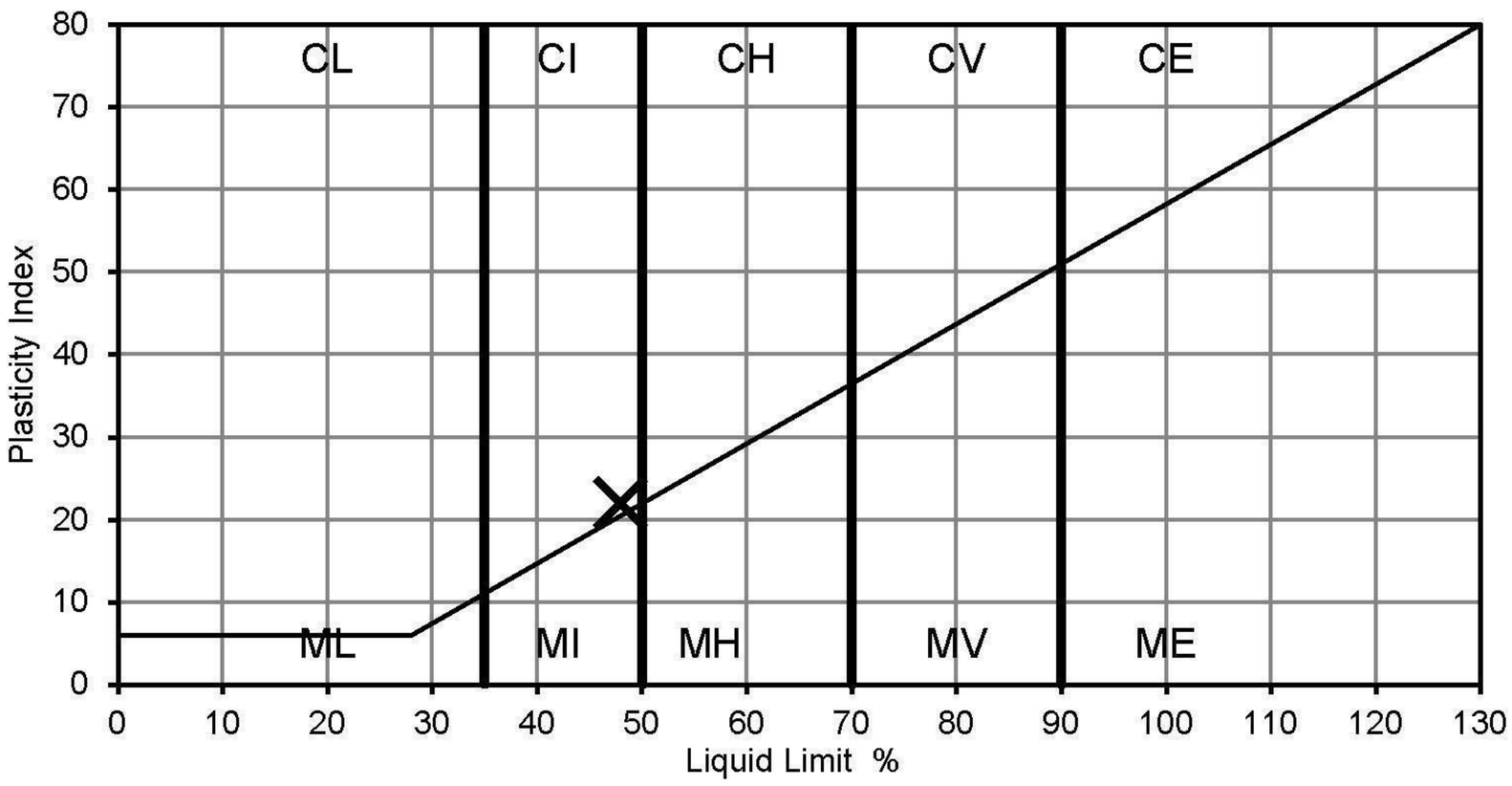
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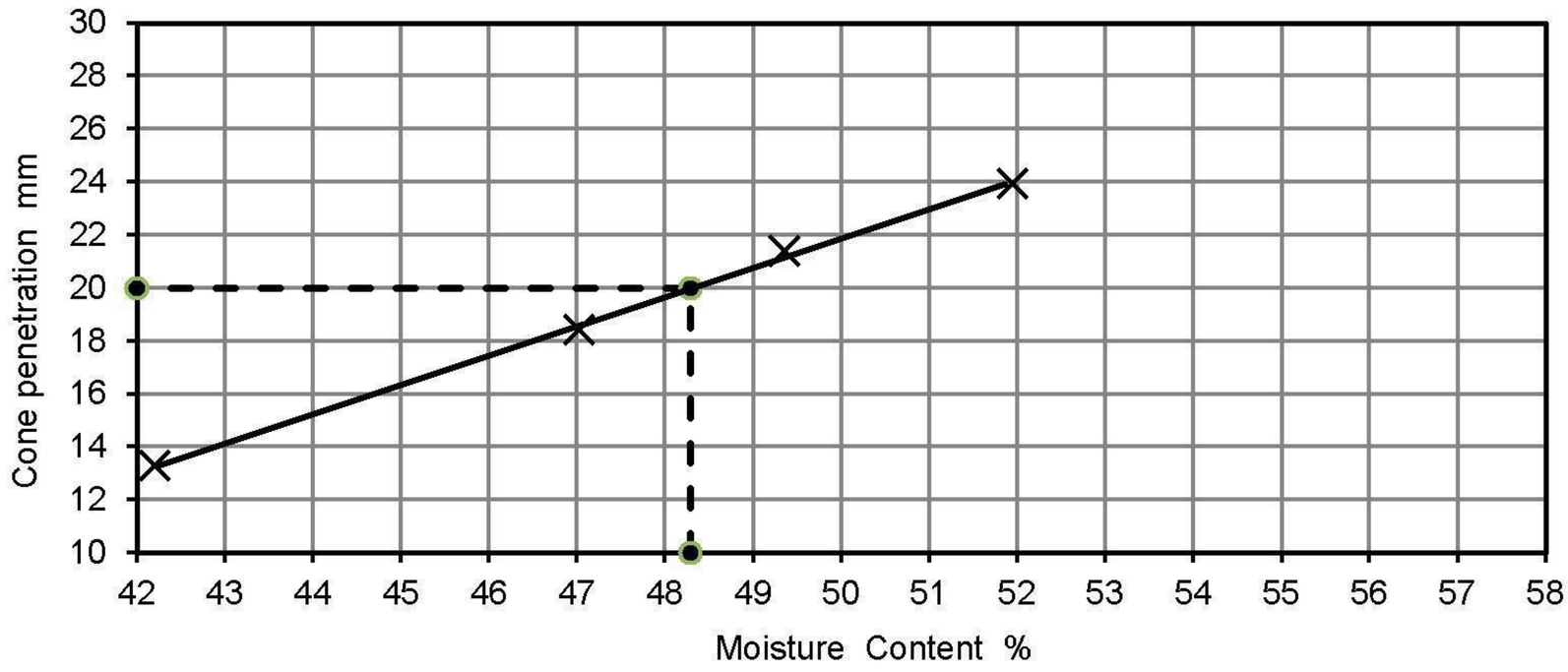
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LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX, & LIQUIDITY INDEX

BS 1377 : Part 2 : 1990, clause 4.3 and 5

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	WS7-01
Sample Description:	Grey and orange brown slightly sandy CLAY.	Sample Depth (m)	1.20
		Sample Reference	D4





Preparation: Material was natural

Results:		
	As Received Moisture Content: (BS1377 : Part 2 : Clause 3 : 1990)	23 %
	Percentage Passing 425µm sieve:	100 %
	Liquid Limit:	48 %
	Plastic Limit:	26 %
	Plasticity Index:	22
	Liquidity Index:	-0.14
	Modified Plasticity Index: (NHBC Standards Chapter 4.2)	22

Notes:

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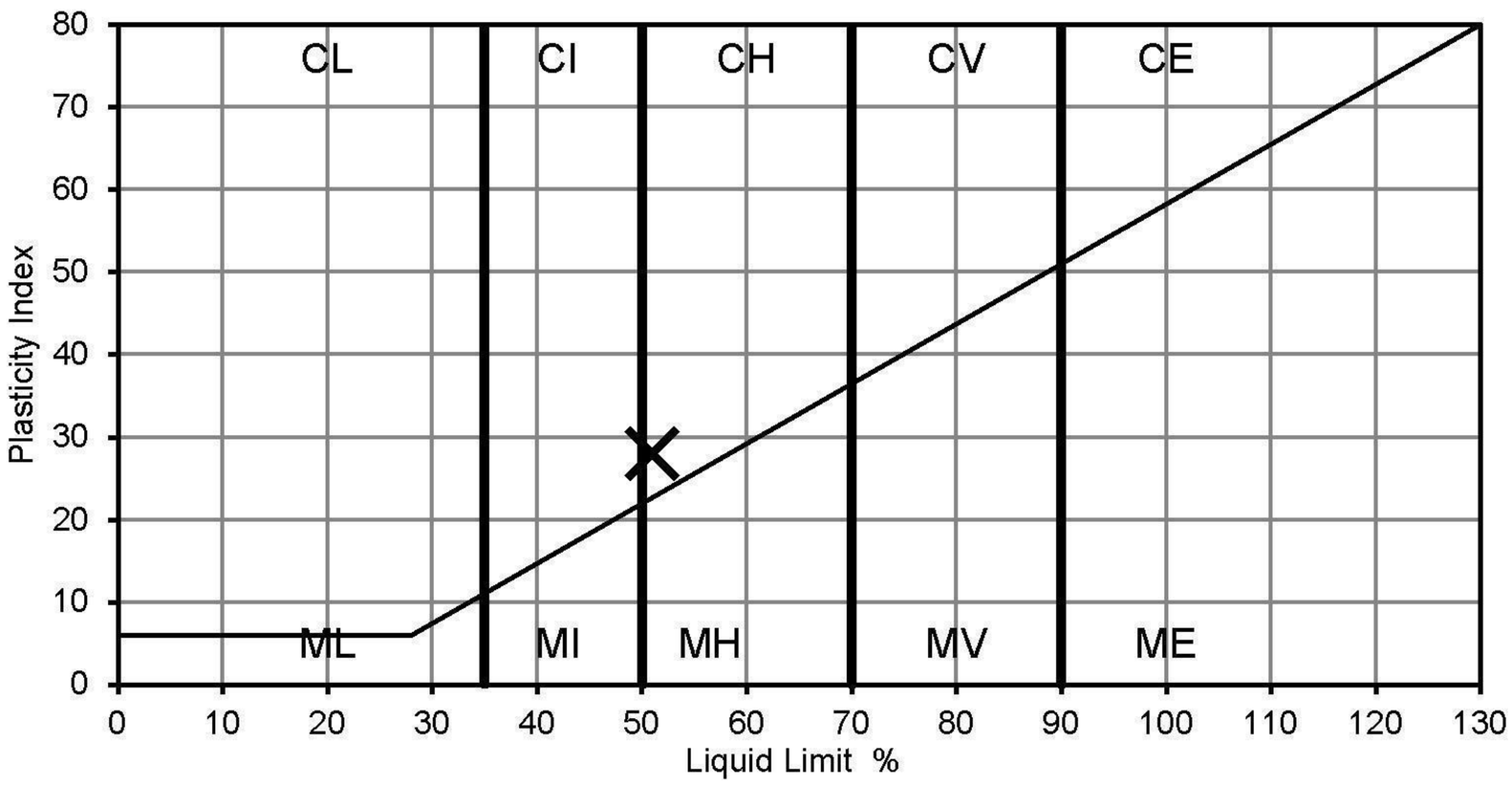
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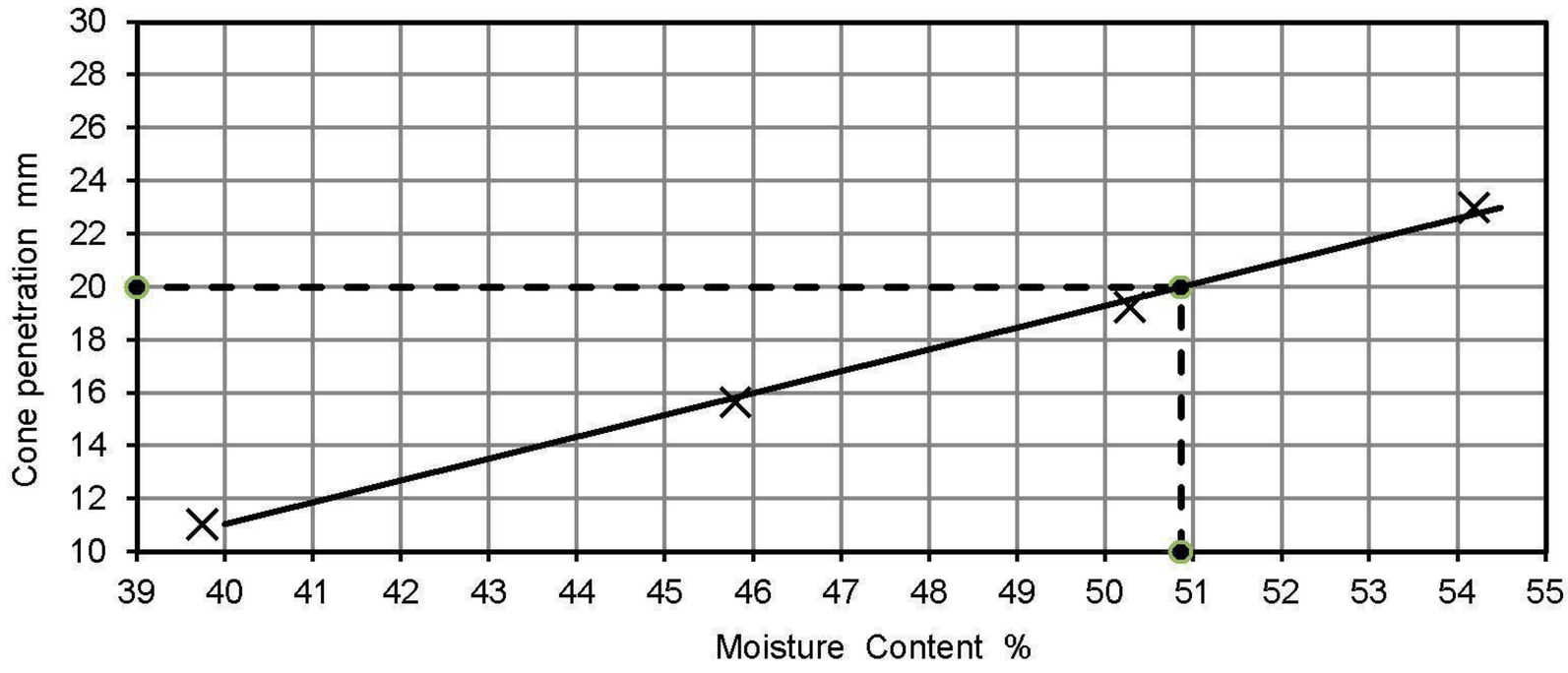
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LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX, & LIQUIDITY INDEX

BS 1377 : Part 2 : 1990, clause 4.3 and 5

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	WS7-02
Sample Description:	Grey mottled orange brown silty CLAY.	Sample Depth (m)	1.30
		Sample Reference	D2





Preparation: Material was natural

Results:		
	As Received Moisture Content: (BS1377 : Part 2 : Clause 3 : 1990)	21 %
	Percentage Passing 425µm sieve:	100 %
	Liquid Limit:	51 %
	Plastic Limit:	23 %
	Plasticity Index:	28
	Liquidity Index:	-0.07
	Modified Plasticity Index: (NHBC Standards Chapter 4.2)	28

Notes:

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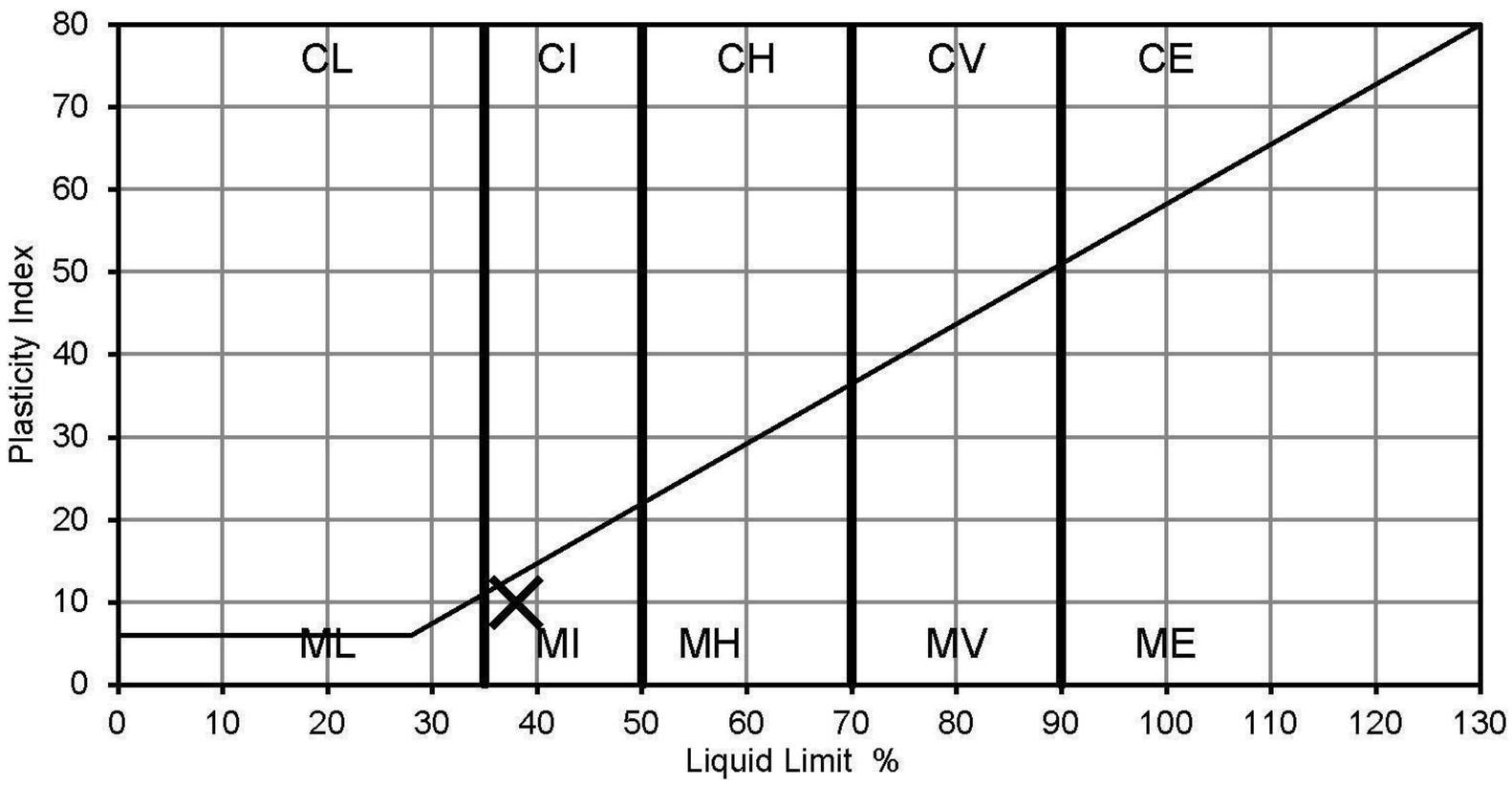
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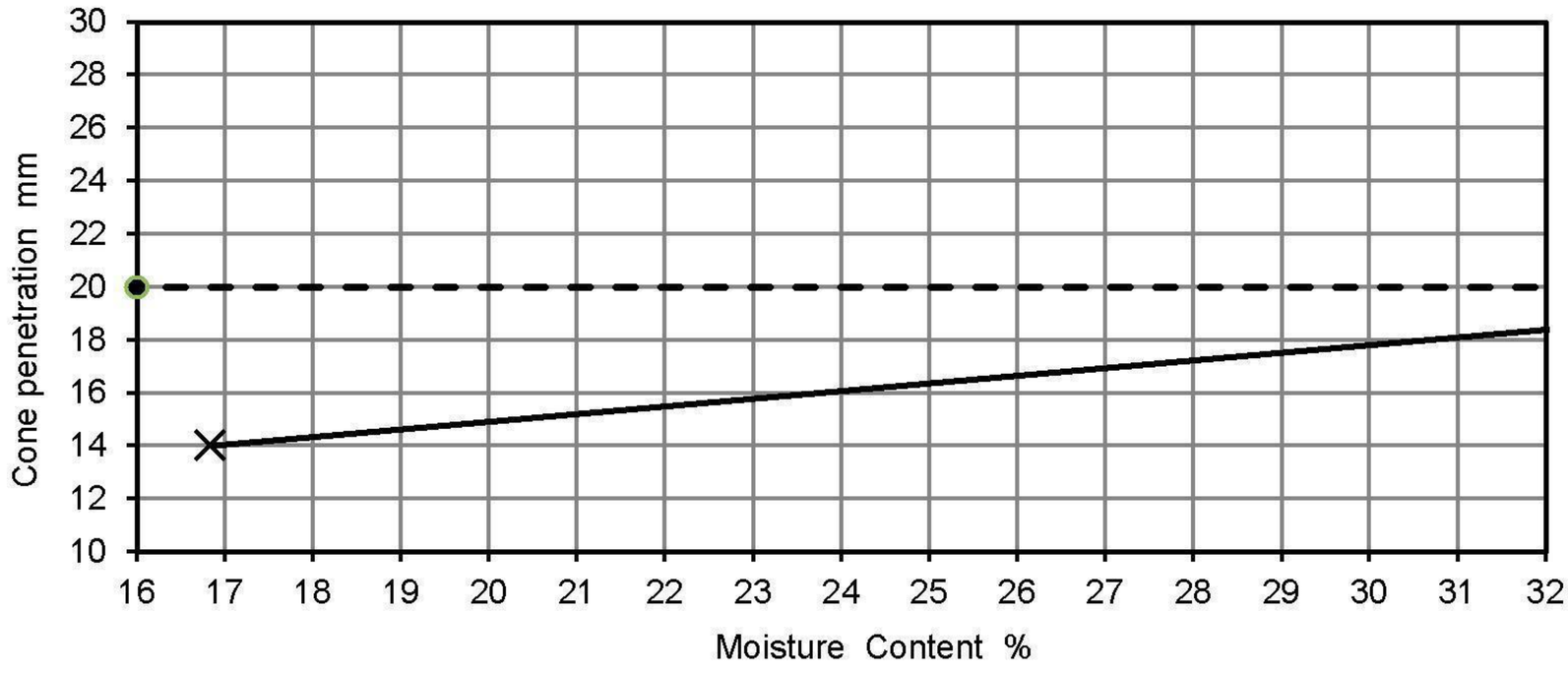
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LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX, & LIQUIDITY INDEX

BS 1377 : Part 2 : 1990, clause 4.3 and 5

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	WS7-03
Sample Description:	Grey mottled orange brown slightly silty CLAY with occasional roots.	Sample Depth (m)	0.60
		Sample Reference	B1





Preparation: Material was natural

Results:		
	As Received Moisture Content: (BS1377 : Part 2 : Clause 3 : 1990)	19 %
	Percentage Passing 425µm sieve:	100 %
	Liquid Limit:	38 %
	Plastic Limit:	28 %
	Plasticity Index:	10
	Liquidity Index:	-0.90
	Modified Plasticity Index: (NHBC Standards Chapter 4.2)	10

Notes:

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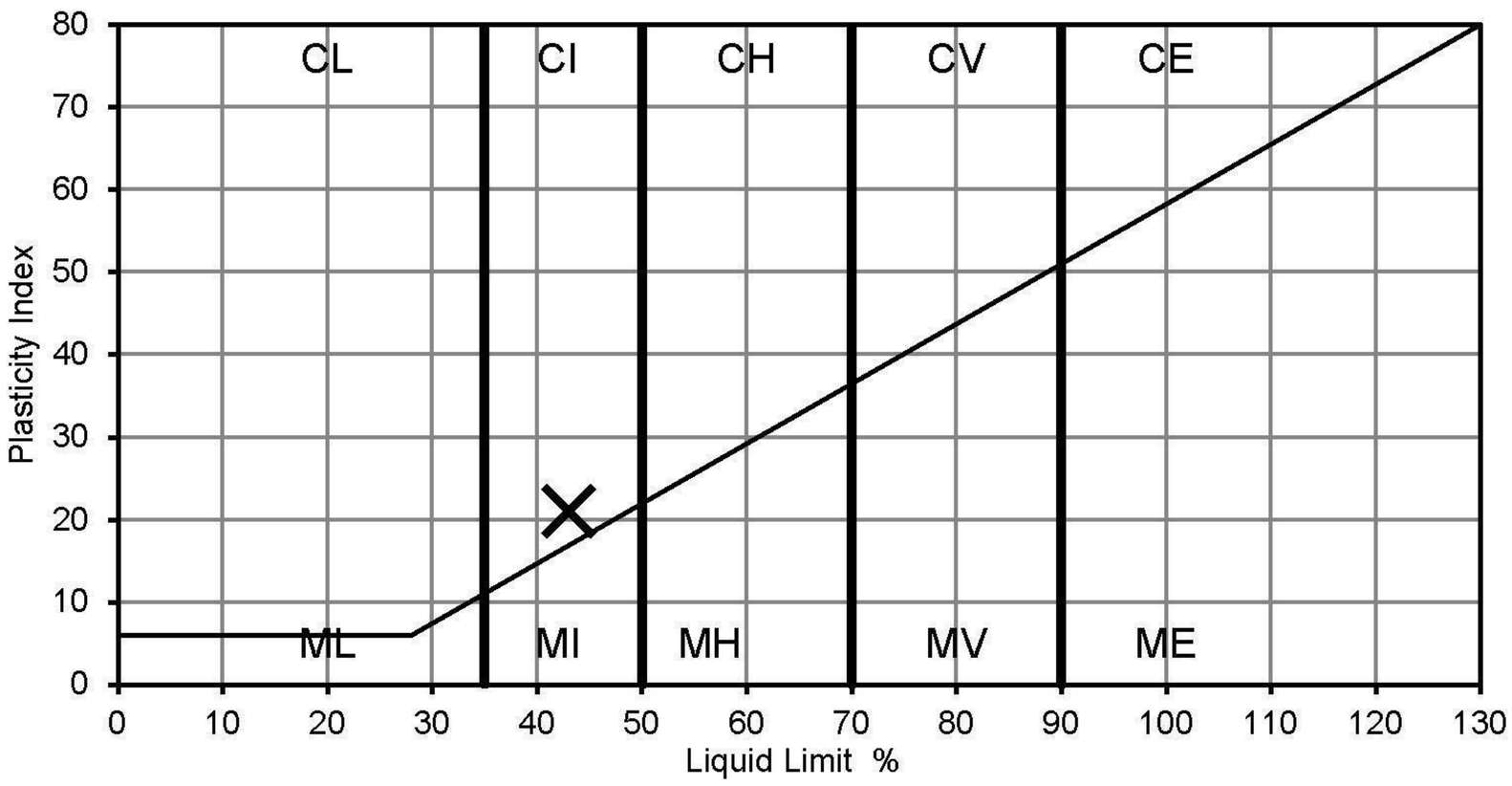
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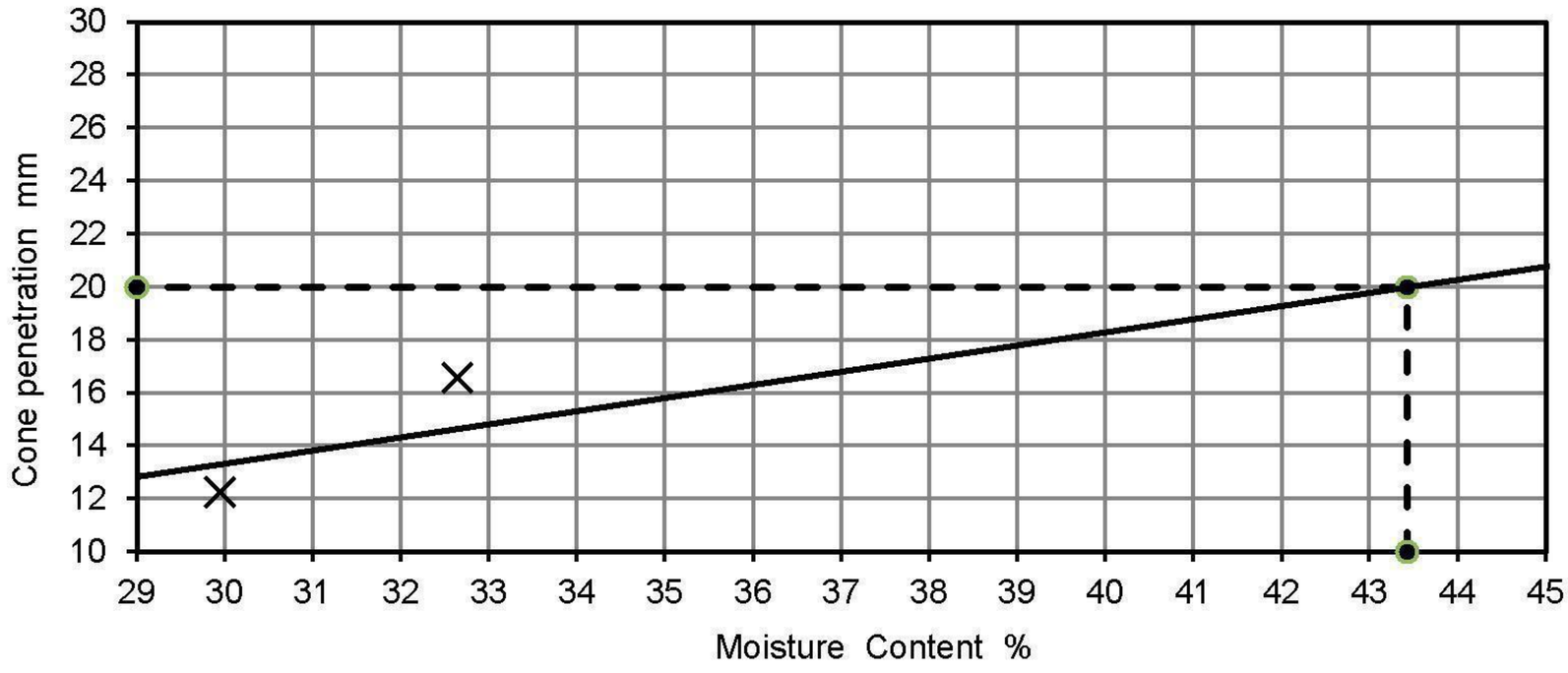
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LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX, & LIQUIDITY INDEX

BS 1377 : Part 2 : 1990, clause 4.3 and 5

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	WS7-03
Sample Description:	Brown and grey slightly sandy CLAY	Sample Depth (m)	1.50
		Sample Reference	D2





Preparation: Material was natural

Results:		
	As Received Moisture Content: (BS1377 : Part 2 : Clause 3 : 1990)	47 %
	Percentage Passing 425µm sieve:	100 %
	Liquid Limit:	43 %
	Plastic Limit:	22 %
	Plasticity Index:	21
	Liquidity Index:	1.19
	Modified Plasticity Index: (NHBC Standards Chapter 4.2)	21

Notes:

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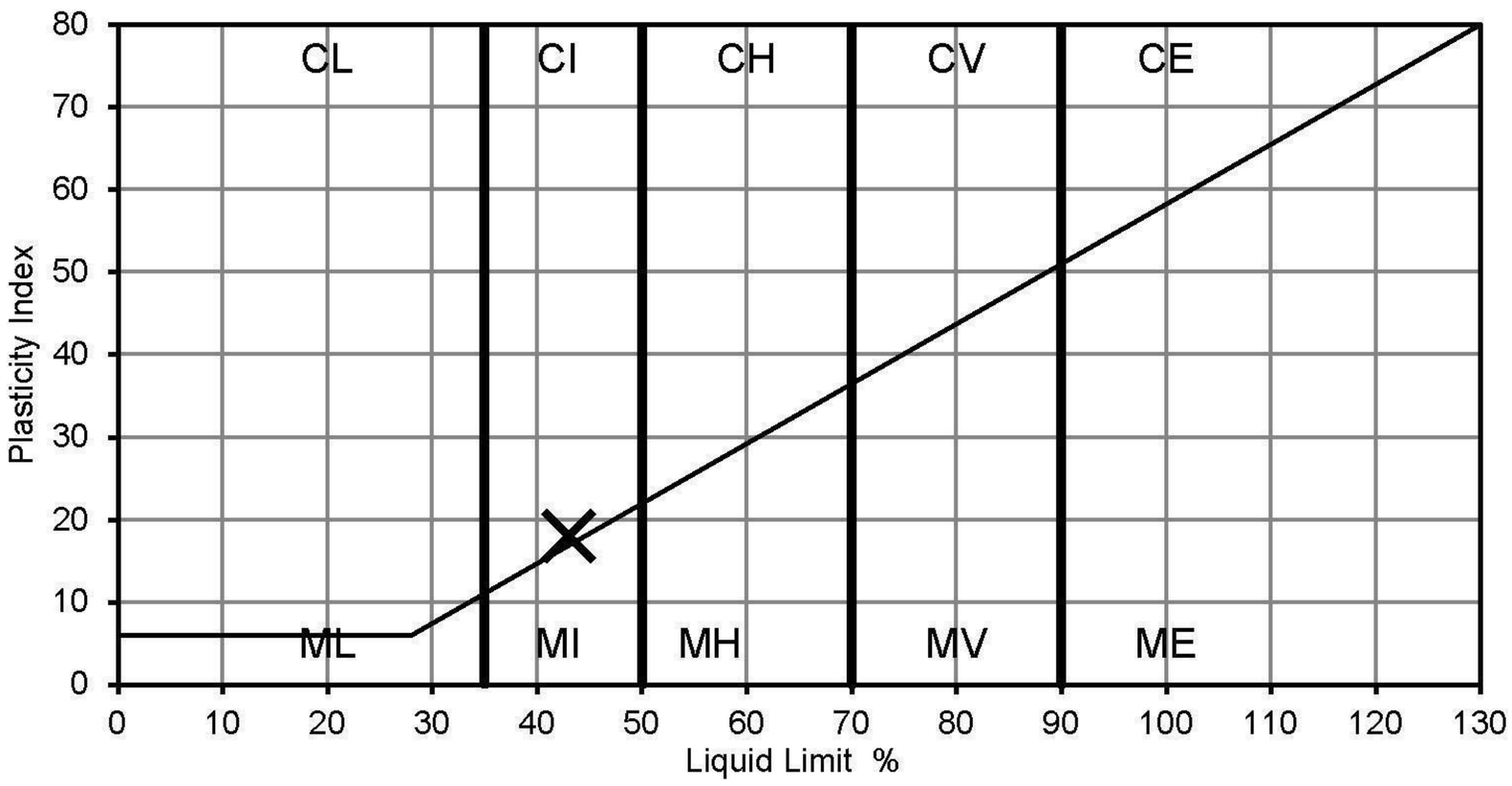
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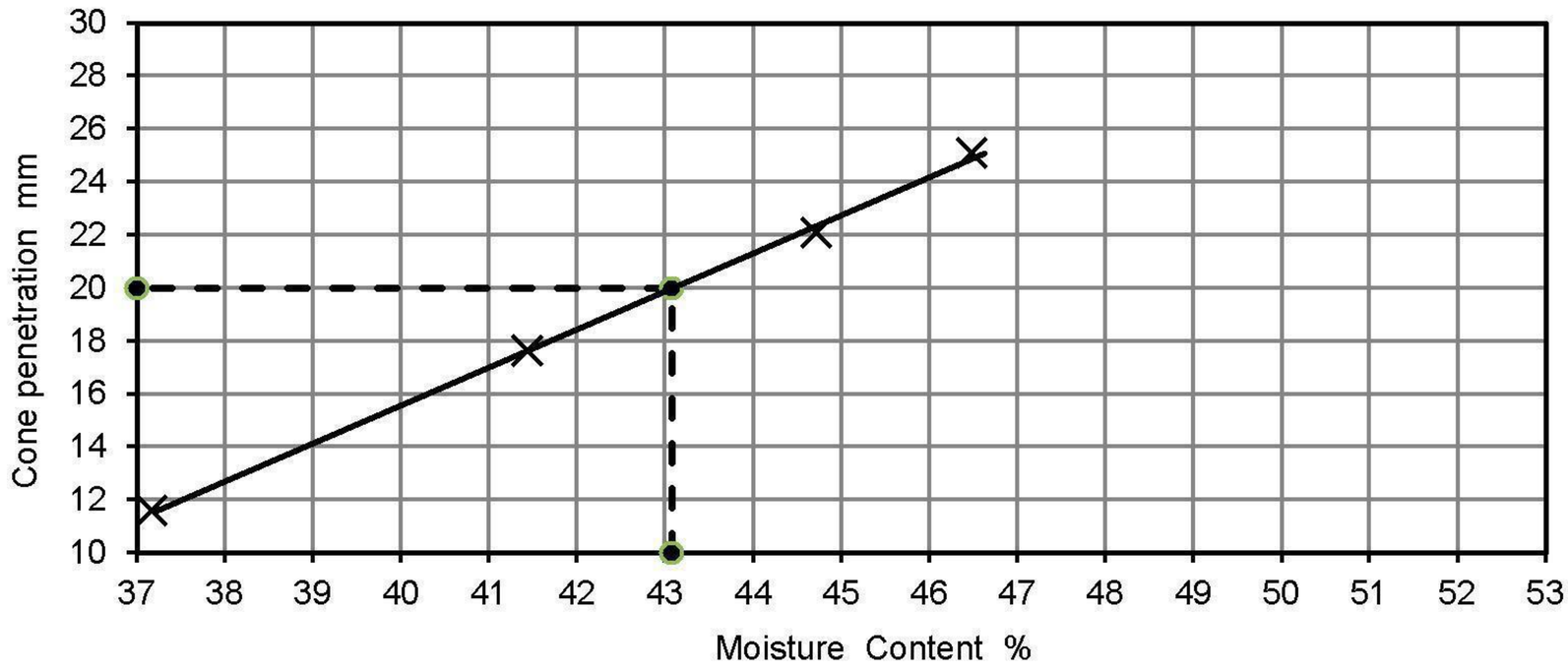
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LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX, & LIQUIDITY INDEX

BS 1377 : Part 2 : 1990, clause 4.3 and 5

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	WS7-04
Sample Description:	Grey and orange brown silty CLAY.	Sample Depth (m)	1.80
		Sample Reference	D4





Preparation: Material was natural

Results:		
	As Received Moisture Content: (BS1377 : Part 2 : Clause 3 : 1990)	16 %
	Percentage Passing 425µm sieve:	100 %
	Liquid Limit:	43 %
	Plastic Limit:	25 %
	Plasticity Index:	18
	Liquidity Index:	-0.50
	Modified Plasticity Index: (NHBC Standards Chapter 4.2)	18

Notes:

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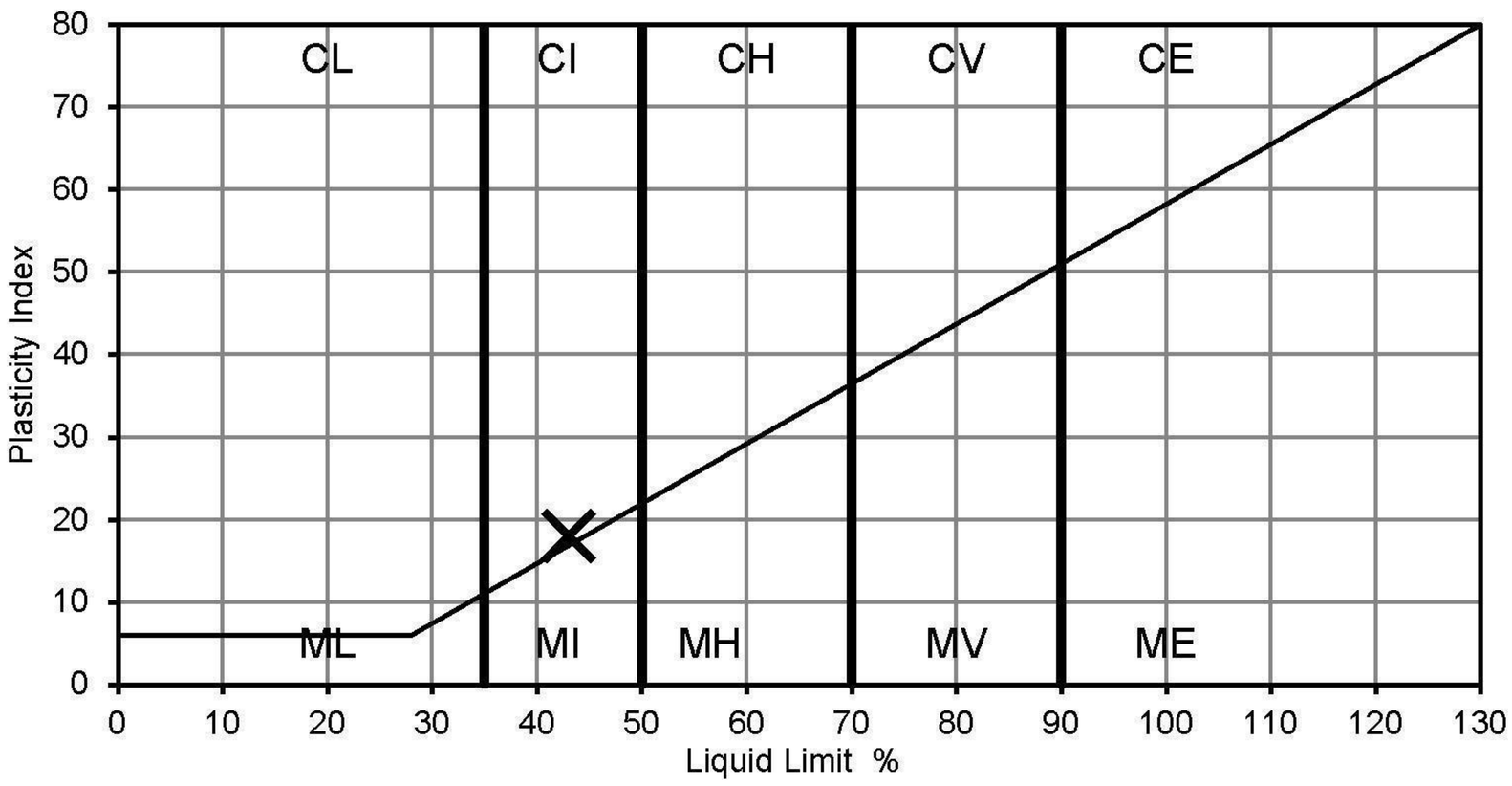
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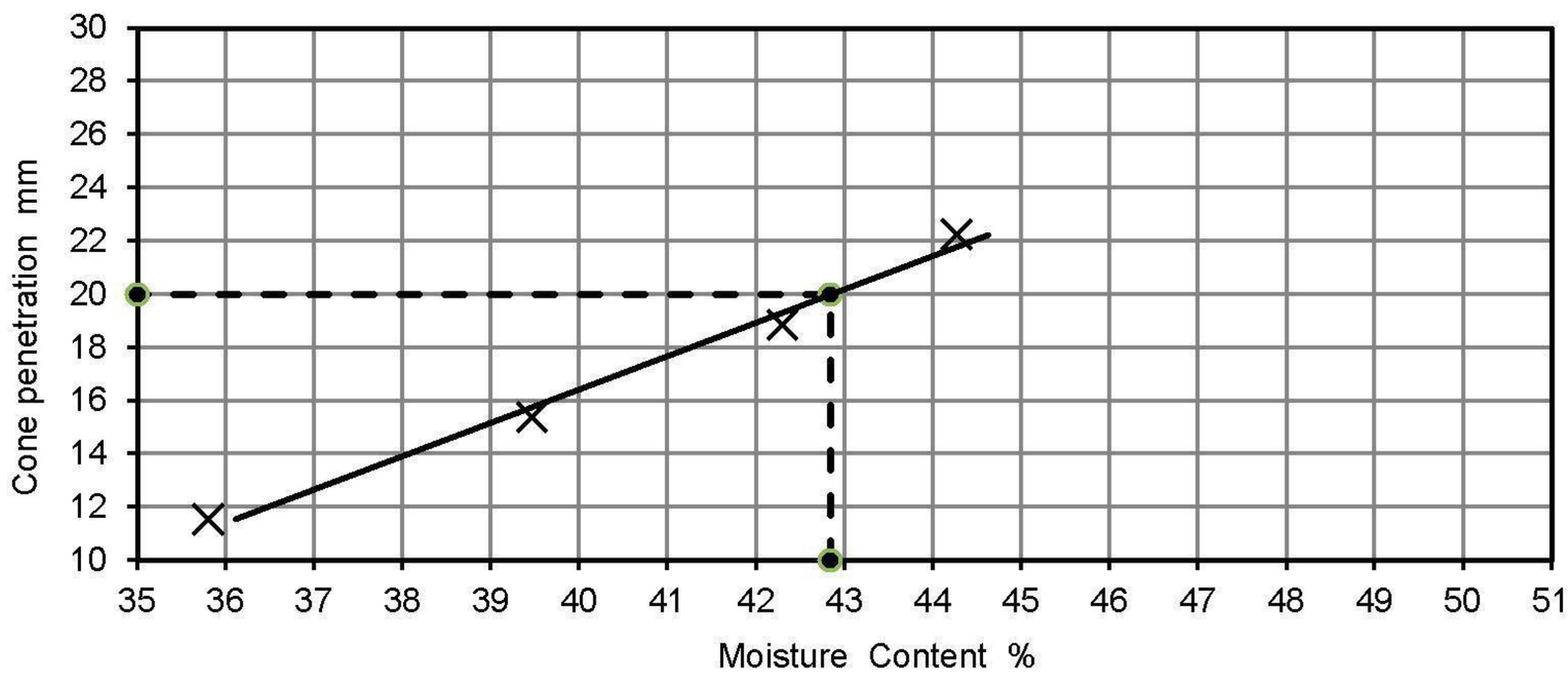
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LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX, & LIQUIDITY INDEX

BS 1377 : Part 2 : 1990, clause 4.3 and 5

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	WS7-06
Sample Description:	Grey mottled brown silty CLAY.	Sample Depth (m)	1.30
		Sample Reference	D3





Preparation: Material was natural

Results:		
	As Received Moisture Content: (BS1377 : Part 2 : Clause 3 : 1990)	16 %
	Percentage Passing 425µm sieve:	100 %
	Liquid Limit:	43 %
	Plastic Limit:	25 %
	Plasticity Index:	18
	Liquidity Index:	-0.50
	Modified Plasticity Index: (NHBC Standards Chapter 4.2)	18

Notes:

1) Modified Plasticity Index: (NHBC Standards Chapter 4.2) not covered by UKAS accreditation.
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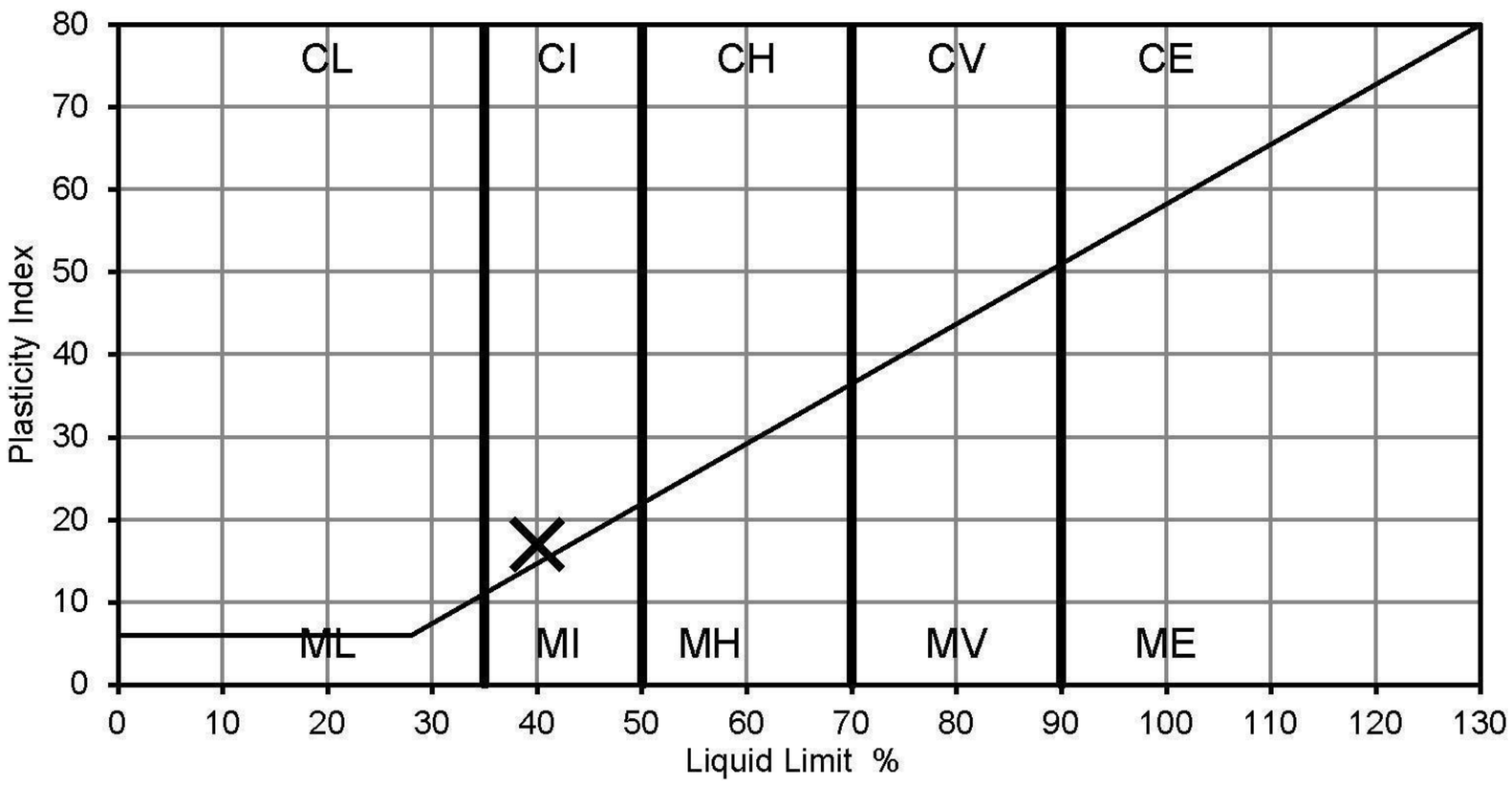
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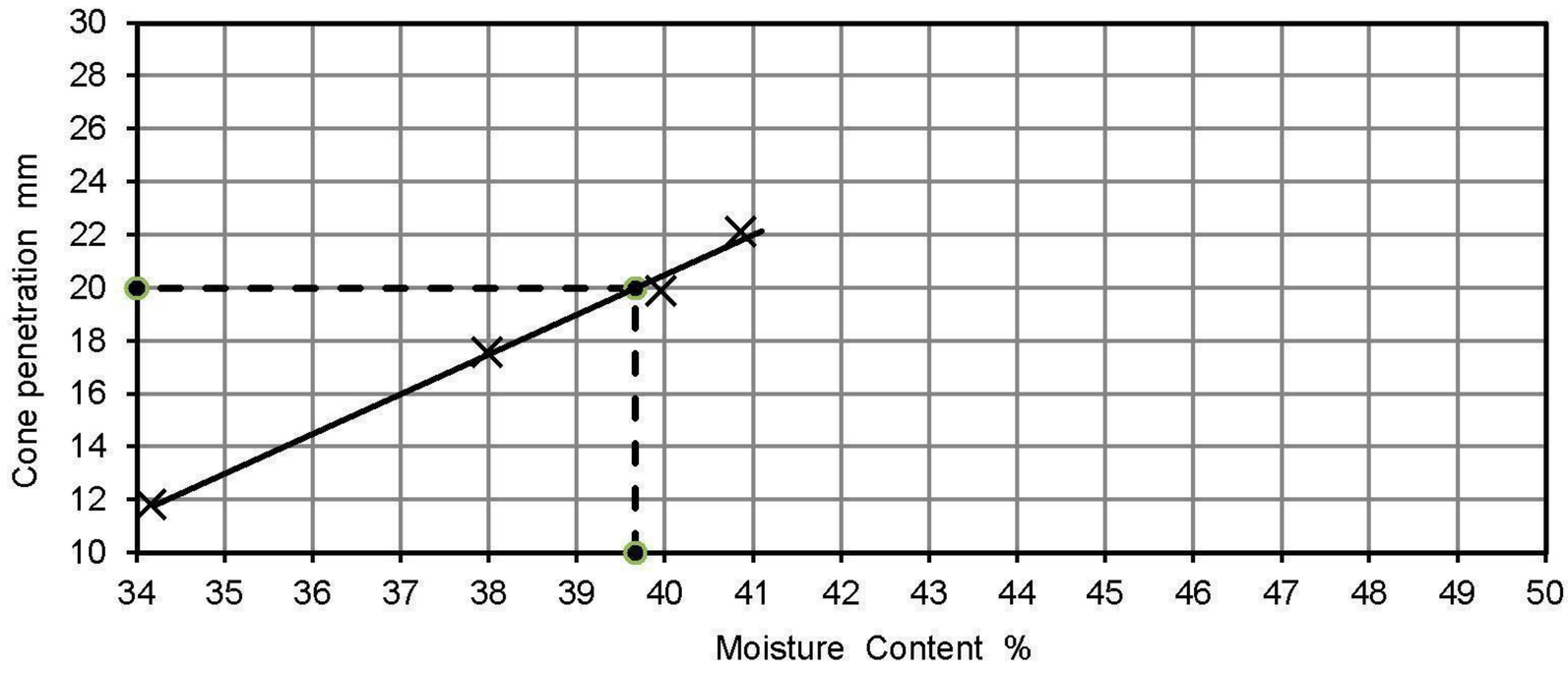
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LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX, & LIQUIDITY INDEX

BS 1377 : Part 2 : 1990, clause 4.3 and 5

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	WS7-06
Sample Description:	Orange brown mottled grey silty CLAY.	Sample Depth (m)	1.60
		Sample Reference	D4





Preparation: Material was natural

Results:

As Received Moisture Content: (BS1377 : Part 2 : Clause 3 : 1990)	13	%
Percentage Passing 425µm sieve:	100	%
Liquid Limit:	40	%
Plastic Limit:	23	%
Plasticity Index:	17	
Liquidity Index:	-0.59	
Modified Plasticity Index: (NHBC Standards Chapter 4.2)	17	

Notes:

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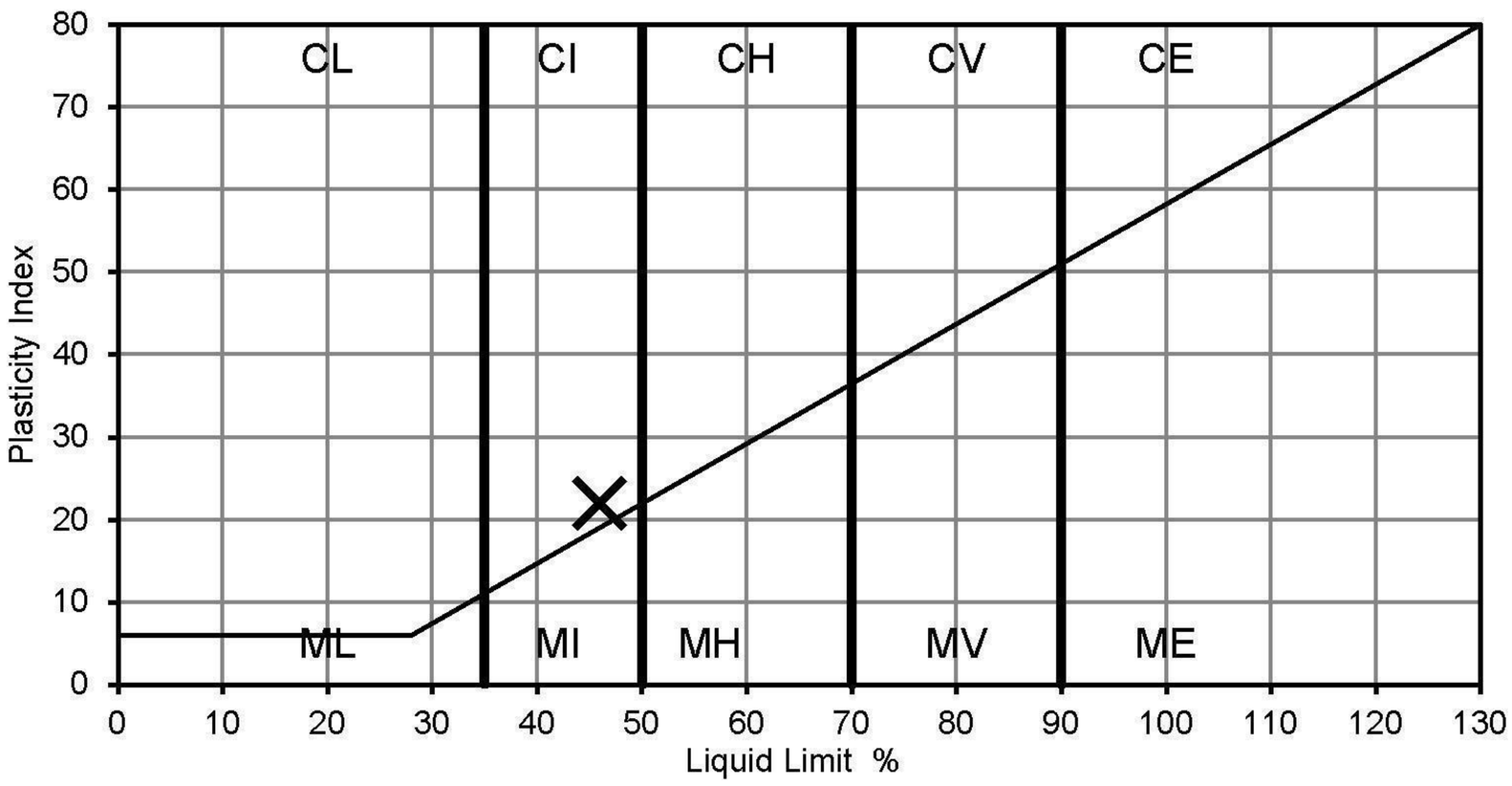
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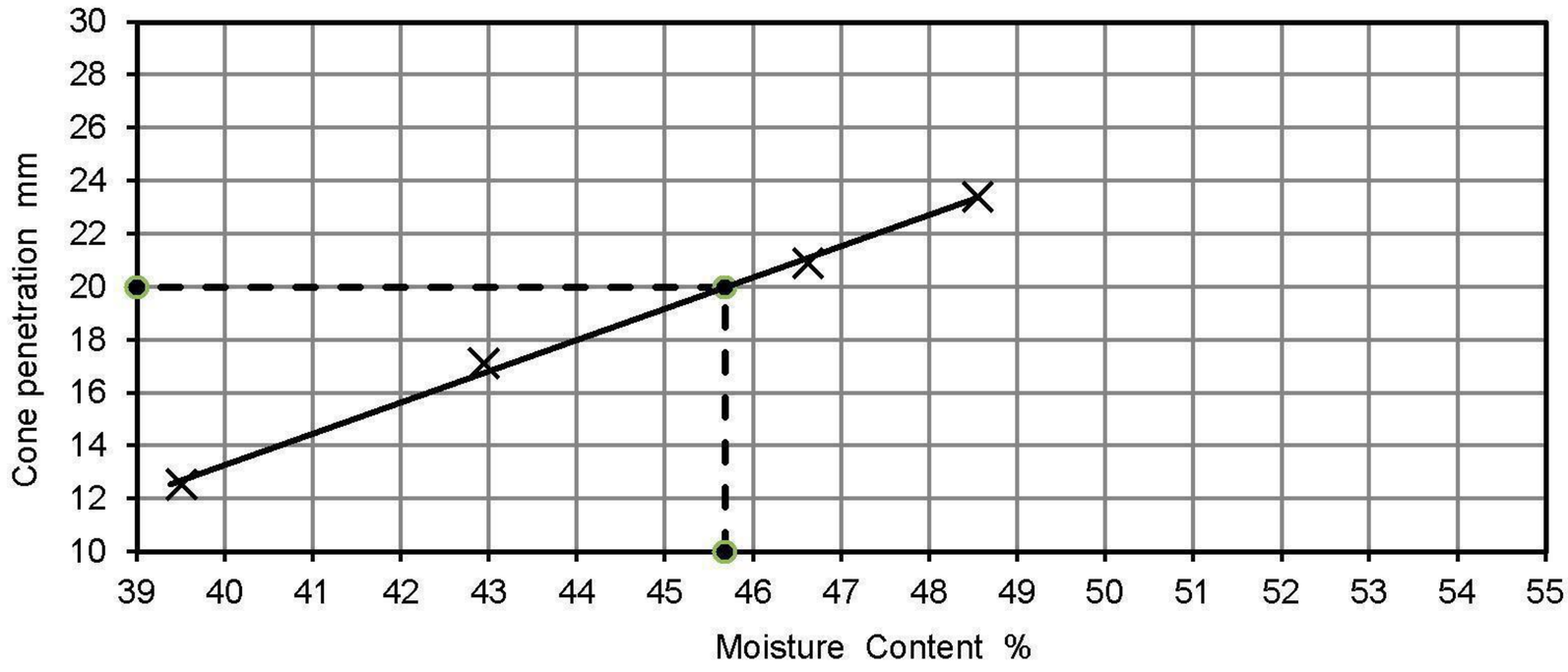
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LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX, & LIQUIDITY INDEX

BS 1377 : Part 2 : 1990, clause 4.3 and 5

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	WS7-07
Sample Description:	Grey mottled brown silty CLAY.	Sample Depth (m)	1.00
		Sample Reference	D2





Preparation: Material was natural

Results:		
	As Received Moisture Content: (BS1377 : Part 2 : Clause 3 : 1990)	20 %
	Percentage Passing 425µm sieve:	100 %
	Liquid Limit:	46 %
	Plastic Limit:	24 %
	Plasticity Index:	22
	Liquidity Index:	-0.18
	Modified Plasticity Index: (NHBC Standards Chapter 4.2)	22

Notes:

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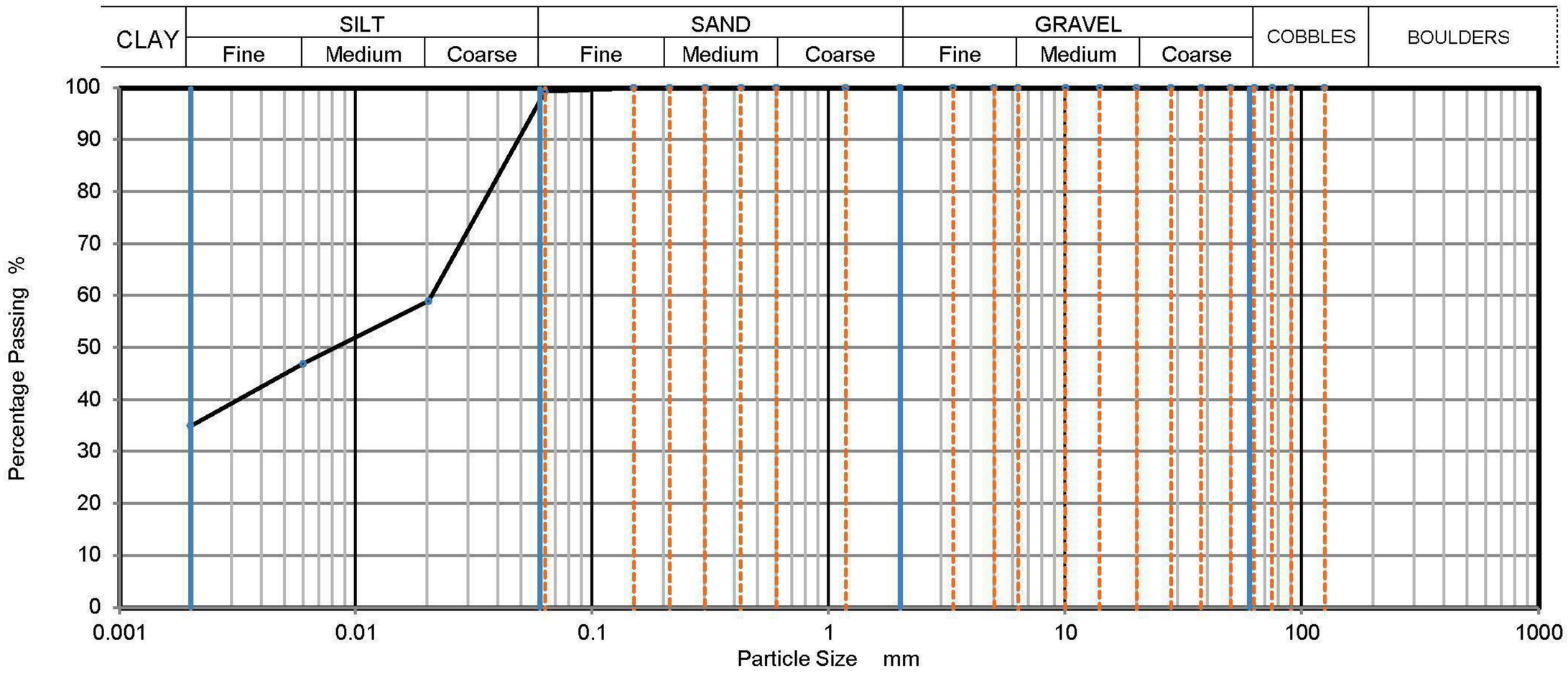
UKAS TESTING
4031

Remarks	Approved	Date	Sheet No.:
	MW M. Willson Laboratory Manager	22/07/2020	1 of 1

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

BS1377:Part 2:1990, clauses 9.2 and 9.4

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484-03**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	CP7-01
Sample Description:	Grey mottled orange brown slightly sandy silty CLAY.	Sample Depth (m)	1.00
		Sample Reference	B3



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	59
90	100	0.0060	47
75	100	0.0020	35
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	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	100		
0.212	100		
0.15	100		
0.063	99		

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	1
Silt	64
Clay	35

Grading Analysis		
D100	mm	0.021
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Notes:

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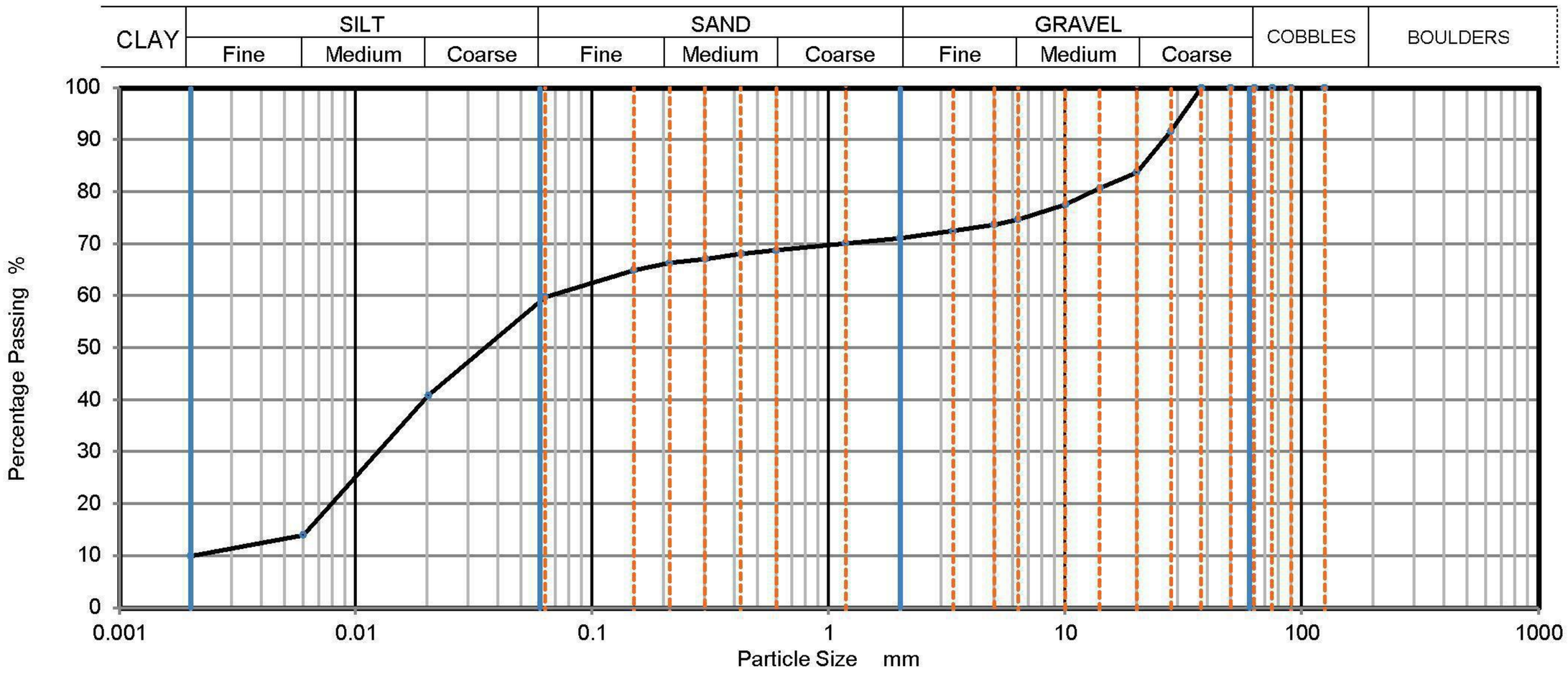
UKAS TESTING
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Remarks	Approved	Date	Sheet No.:
	MW M. Willson Laboratory Manager	23/07/2020	1 of 1

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

BS1377:Part 2:1990, clauses 9.2 and 9.4

Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484-03**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	IT7-01
Sample Description:	Light brown slightly gravelly slightly sandy clayey SILT. Gravel is of siltstone.	Sample Depth (m)	2.10
		Sample Reference	B3



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	41
90	100	0.0060	14
75	100	0.0020	10
63	100		
50	100		
37.5	100		
28	92		
20	84		
14	81		
10	78		
6.3	75		
5	74		
3.35	73		
2	71		
1.18	70		
0.6	69	Particle density	(assumed)
0.425	68	2.65	Mg/m3
0.3	67		
0.212	66		
0.15	65		
0.063	60		

Sample Proportions	% dry mass
Very coarse	0
Gravel	29
Sand	11
Silt	50
Clay	10

Grading Analysis		
D100	mm	
D60	mm	0.065
D30	mm	0.012
D10	mm	0.002
Uniformity Coefficient		32
Curvature Coefficient		1.2

Notes:

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Remarks	Approved	Date	Sheet No.:
	MW M. Willson Laboratory Manager	24/07/2020	1 of 1

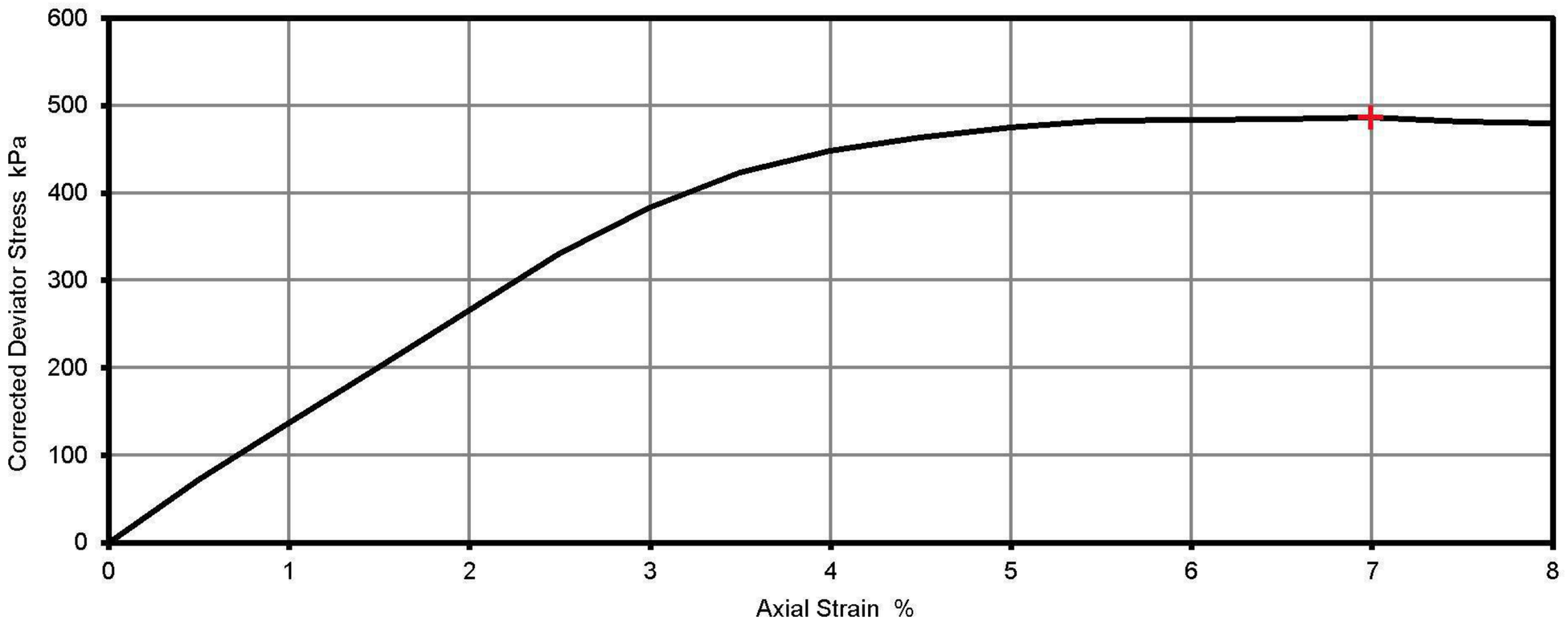
DETERMINATION OF UNDRAINED SHEAR STRENGTH - DEFINITIVE

BS1377 : Part 7 : 1990, Clause 8, Single Specimen

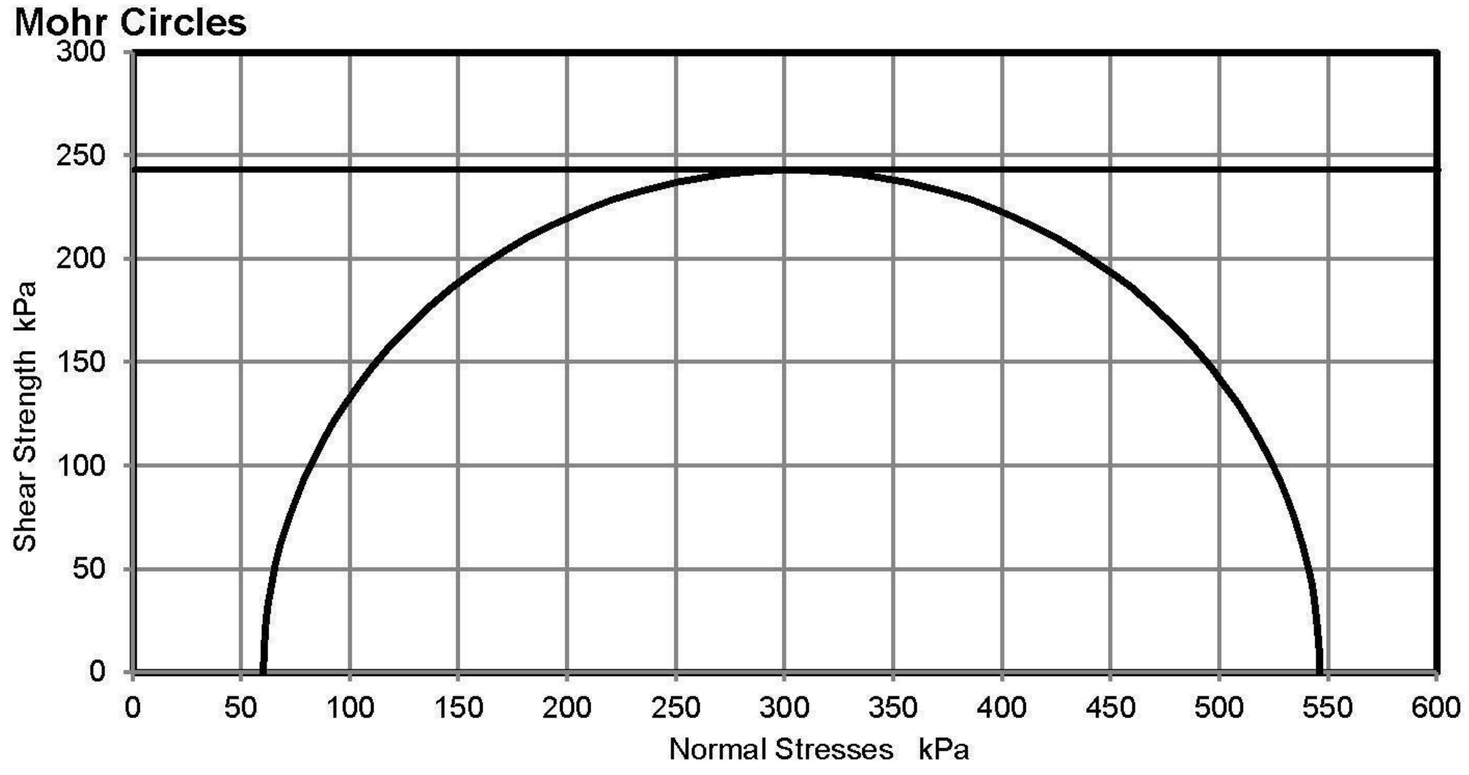
Project Name:	**Northern Arc, Burgess Hill**	Project Number:	**GL23484-03**
Client Name:	**John Sisk & Son Ltd**	Sample Location:	CP7-01
Sample Description:	Very high strength light grey brown silty CLAY.	Sample Depth (m)	1.50
		Sample Reference	UT1

Test Number		1	
Length		200.2	mm
Diameter		103.3	mm
Bulk Density		2.16	Mg/m3
Moisture Content		15.2	%
Dry Density		1.88	Mg/m3
Rate of Strain		0.7	%/min
Cell Pressure		60	kPa
At failure	Axial Strain	7.0	%
	Deviator Stress, (σ1 - σ3)f	486	kPa
	Undrained Shear Strength, cu	243	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Notes:

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Remarks	Approved	Date	Sheet No.:
	MW M. Willson Laboratory Manager	22/07/2020	1 of 1

Matthew Wilson
Harrison Group
Harrison Testing Services
Unit 1
Alston Road
Norwich
Norfolk
NR6 5DS

t: 01603 416333

e: laboratory@harrisongroupuk.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 20-17322-B

Replaces Analytical Report Number : 20-17322-B, issue no. 1

Report format change.

Project / Site name:	NORTHERN ARC. BURGESS HILL	**Samples received on:**	02/07/2020
Your job number:	GL23484	**Sample instructed/ Analysis started on:**	02/07/2020
Your order number:	PO-35577-GB	**Analysis completed by:**	08/07/2020
Report Issue Number:	2	**Report issued on:**	04/08/2020
Samples Analysed:	10 soil samples		

Signed: A. Czerwińska

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
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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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 20-17322-B

Project / Site name: NORTHERN ARC. BURGESS HILL
Your Order No: PO-35577-GB

Lab Sample Number				1550725	1550726	1550727	1550728	1550729
Sample Reference				CP7-01	CP7-01	CP7-01	WS7-01	WS7-01
Sample Number				3	5	10	2	8
Depth (m)				1.00-1.00	1.50-1.50	3.00-3.20	0.50-0.50	2.25-2.25
Date Sampled				26/06/2020	26/06/2020	26/06/2020	26/06/2020	26/06/2020
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	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.6	5.1	0.63	17	11
Total mass of sample received	kg	0.001	NONE	0.70	1.5	0.65	2.0	2.0
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	4.3	4.9	6.7	5.8
Total Sulphate as SO_4	%	0.005	MCERTS	-	0.064	0.077	0.033	0.031
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.087	0.073	0.052	0.038
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	87.0	73.4	51.9	37.5
Total Sulphur	%	0.005	MCERTS	-	0.059	0.079	0.038	0.013
Organic Matter	%	0.1	MCERTS	0.2	-	-	-	-

* Despite repeating Total Sulphate and Total Sulphur analysis, the results remain contradictory.

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Analytical Report Number: 20-17322-B

Project / Site name: NORTHERN ARC. BURGESS HILL
Your Order No: PO-35577-GB

Lab Sample Number				1550730	1550731	1550732	1550733	1550734
Sample Reference				WS7-04	WS7-04	WS7-06	WS7-06	WS7-07
Sample Number				3	4	1	4	2
Depth (m)				1.40-1.60	1.80-1.80	0.80-0.80	1.60-1.60	1.00-1.00
Date Sampled				26/06/2020	26/06/2020	26/06/2020	26/06/2020	26/06/2020
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	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	13	14	10	14
Total mass of sample received	kg	0.001	NONE	0.80	0.70	0.70	0.50	0.60
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	4.9	-	7.3	6.3
Total Sulphate as SO_4	%	0.005	MCERTS	-	0.034	-	0.031	0.049*
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.019	-	0.031	0.062
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	18.5	-	30.6	61.8
Total Sulphur	%	0.005	MCERTS	-	0.026	-	0.012	0.016*
Organic Matter	%	0.1	MCERTS	< 0.1	-	0.8	-	-

* Despite repeating Total Sulphate and Total Sulphur analysis, the results remain contradictory.

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Analytical Report Number : 20-17322-B

Project / Site name: NORTHERN ARC. BURGESS HILL

* 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 *
1550725	CP7-01	3	1.00-1.00	Brown sand with gravel.
1550726	CP7-01	5	1.50-1.50	Brown clay.
1550727	CP7-01	10	3.00-3.20	Brown clay and sand.
1550728	WS7-01	2	0.50-0.50	Brown loam and clay with gravel and vegetation.
1550729	WS7-01	8	2.25-2.25	Brown clay and sand.
1550730	WS7-04	3	1.40-1.60	Brown clay and sand.
1550731	WS7-04	4	1.80-1.80	Brown clay and sand.
1550732	WS7-06	1	0.80-0.80	Brown loam and clay with gravel and vegetation.
1550733	WS7-06	4	1.60-1.60	Brown clay and sand.
1550734	WS7-07	2	1.00-1.00	Brown clay.

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Analytical Report Number : 20-17322-B

Project / Site name: NORTHERN ARC. BURGESS HILL

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (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
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
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
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
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
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

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.

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The results included within the report relate only to the sample(s) submitted for testing.

Matthew Wilson
Harrison Group
Harrison Testing Services
Unit 1
Alston Road
Norwich
Norfolk
NR6 5DS

t: 01603 416333

e: laboratory@harrisongroupuk.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 20-18764-C

Replaces Analytical Report Number : 20-18764-C, issue no. 1

Report format change.

Project / Site name:	Norther Arc, Burgess Hill	**Samples received on:**	10/07/2020
Your job number:	GL23484	**Sample instructed/ Analysis started on:**	10/07/2020
Your order number:	PO-35619-GB	**Analysis completed by:**	16/07/2020
Report Issue Number:	2	**Report issued on:**	04/08/2020
Samples Analysed:	2 soil samples		

Signed: [redacted]

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
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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Analytical Report Number: 20-18764-C

Project / Site name: Norther Arc, Burgess Hill
Your Order No: PO-35619-GB

Lab Sample Number	1558569	1558570			
Sample Reference	WS7-03	IT7-01			
Sample Number	3	6			
Depth (m)	1.80-1.80	2.40-2.40			
Date Sampled	07/07/2020	07/07/2020			
Time Taken	None Supplied	None Supplied			

Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	12	7.6			
Total mass of sample received	kg	0.001	NONE	0.70	0.70			

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.6	6.4			
Total Sulphate as SO_4	%	0.005	MCERTS	0.038	0.040			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0085	0.0037			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	8.5	3.7			
Total Sulphur	%	0.005	MCERTS	0.013	0.014			

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Analytical Report Number : 20-18764-C

Project / Site name: Norther Arc, Burgess Hill

* 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 *
1558569	WS7-03	3	1.80-1.80	Brown loam and clay with gravel.
1558570	IT7-01	6	2.40-2.40	Brown loam and clay with gravel.

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Analytical Report Number : 20-18764-C

Project / Site name: Norther Arc, Burgess Hill

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
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
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
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
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
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

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.

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APPENDIX E

ENVIROMENTAL LABORATORY TESTING

Harrison Group
Water Ways Business Centre
Navigation Drive
South Ordnance Way
Enfield
EN3 6JJ

t: 02075379233

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 20-12028

Project / Site name:	Northern Arc, Burgess Hill	**Samples received on:**	01/06/2020
Your job number:	GL23484	**Sample instructed/ Analysis started on:**	01/06/2020
Your order number:		**Analysis completed by:**	08/06/2020
Report Issue Number:	1	**Report issued on:**	08/06/2020
Samples Analysed:	1 soil sample		

Signed: [redacted]

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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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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Analytical Report Number: 20-12028

Project / Site name: Northern Arc, Burgess Hill

Lab Sample Number				1522607				
Sample Reference				CP7-01				
Sample Number				ES1				
Depth (m)				0.20-0.20				
Date Sampled				28/05/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	12				
Total mass of sample received	kg	0.001	NONE	1.7				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.9				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.6				
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	0.25				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	0.55				
Pyrene	mg/kg	0.05	MCERTS	0.48				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.28				
Chrysene	mg/kg	0.05	MCERTS	0.28				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.43				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.19				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.27				
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	2.73				

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 20-12028

Project / Site name: Northern Arc, Burgess Hill

Lab Sample Number				1522607				
Sample Reference				CP7-01				
Sample Number				ES1				
Depth (m)				0.20-0.20				
Date Sampled				28/05/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.1				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.72				
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	42				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57				
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	< 10				
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1				
TPH C6 - C40	mg/kg	10	NONE	< 10				

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Analytical Report Number : 20-12028

Project / Site name: Northern Arc, Burgess Hill

* 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 *
1522607	CP7-01	ES1	0.20-0.20	Light brown sandy loam with vegetation and gravel.

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Analytical Report Number : 20-12028

Project / Site name: Northern Arc, Burgess Hill

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
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
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
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
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
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 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 Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
TPH C6 - C40 (soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method.	L076-PL	W	NONE
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	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.

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GL
Harrison Group
Water Ways Business Centre
Navigation Drive
South Ordnance Way
Enfield
EN3 6JJ

t: 02075379233

e: GL@harrisongroupuk.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 20-12709

Project / Site name:	Northern Arc, Burgess Hill	**Samples received on:**	05/06/2020
Your job number:	GL23484	**Sample instructed/ Analysis started on:**	05/06/2020
Your order number:		**Analysis completed by:**	12/06/2020
Report Issue Number:	1	**Report issued on:**	12/06/2020
Samples Analysed:	2 soil samples		

Signed: [redacted]

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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.

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Analytical Report Number: 20-12709

Project / Site name: Northern Arc, Burgess Hill

Lab Sample Number				1526225	1526226			
Sample Reference				WS7-06	WS7-07			
Sample Number				1	1			
Depth (m)				0.05-0.05	0.05-0.05			
Date Sampled				03/06/2020	03/06/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	15	12			
Total mass of sample received	kg	0.001	NONE	0.87	0.85			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.8	6.7			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.62			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.94			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.96			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.49			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.55			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.49			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.29			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.43			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.25			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.29			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	5.31			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.2	8.9			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.88	0.88			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	1.5			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	33	25			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	21			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	41			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	15			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	39	41			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	61	75			
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	< 10	21			
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH C6 - C40	mg/kg	10	NONE	< 10	21			

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Analytical Report Number : 20-12709

Project / Site name: Northern Arc, Burgess Hill

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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 *
1526225	WS7-06	1	0.05-0.05	Brown loam and clay with gravel and vegetation.
1526226	WS7-07	1	0.05-0.05	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 20-12709

Project / Site name: Northern Arc, Burgess Hill

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
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
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
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
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
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 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
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
TPH C6 - C40 (soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method.	L076-PL	W	NONE
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	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.

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GL
Harrison Group
Water Ways Business Centre
Navigation Drive
South Ordnance Way
Enfield
EN3 6JJ

t: 02075379233

e: GL@harrisongroupuk.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 20-12720

Project / Site name:	Northern Arc, Burgess Hill	**Samples received on:**	05/06/2020
Your job number:	GL23484	**Sample instructed/ Analysis started on:**	05/06/2020
Your order number:		**Analysis completed by:**	12/06/2020
Report Issue Number:	1	**Report issued on:**	12/06/2020
Samples Analysed:	2 soil samples		

Signed: [redacted]

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
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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Analytical Report Number: 20-12720

Project / Site name: Northern Arc, Burgess Hill

Lab Sample Number				1526273	1526274			
Sample Reference				WS7-01	WS7-02			
Sample Number				1	1			
Depth (m)				0.15-0.15	0.05-0.05			
Date Sampled				02/06/2020	02/06/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	11	12			
Total mass of sample received	kg	0.001	NONE	0.83	0.83			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.7	6.6			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.0	-			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.58			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	0.33	0.82			
Pyrene	mg/kg	0.05	MCERTS	0.39	0.82			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.43			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.45			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.39			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.20			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.37			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.27			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.32			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	4.65			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.1	9.3			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.0	0.84			
Boron (water soluble)	mg/kg	0.2	MCERTS	1.0	0.2			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	31			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	22			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34	45			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	0.4			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	15			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	47	47			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	81	90			
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10			
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH C6 - C40	mg/kg	10	NONE	< 10	< 10			

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Analytical Report Number: 20-12720

Project / Site name: Northern Arc, Burgess Hill

Lab Sample Number				1526273	1526274			
Sample Reference				WS7-01	WS7-02			
Sample Number				1	1			
Depth (m)				0.15-0.15	0.05-0.05			
Date Sampled				02/06/2020	02/06/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Herbicides								
Aldicarb	µg/kg	10	NONE	< 10	-			
Aldicarb Sulfone	µg/kg	10	NONE	< 10	-			
Aldicarb Sulfoxide	µg/kg	50	NONE	< 50	-			
Atrazine	µg/kg	10	NONE	< 10	-			
Carbaryl	µg/kg	10	NONE	< 10	-			
Carbofuran	µg/kg	10	NONE	< 10	-			
Carbofuran, 3-OH	µg/kg	20	NONE	< 20	-			
Chlortoluron	µg/kg	10	NONE	< 10	-			
Cyanazine	µg/kg	10	NONE	< 10	-			
Diflubenzuron	µg/kg	50	NONE	< 50	-			
Diuron	µg/kg	10	NONE	< 10	-			
Fluometuron	µg/kg	10	NONE	< 10	-			
Isoproturon	µg/kg	10	NONE	< 10	-			
Linuron	µg/kg	20	NONE	< 20	-			
Methiocarb	µg/kg	10	NONE	< 10	-			
Methomyl	µg/kg	10	NONE	< 10	-			
Oxamyl	µg/kg	10	NONE	< 10	-			
Prometryn	µg/kg	10	NONE	< 10	-			
Propazine	µg/kg	10	NONE	< 10	-			
Propoxur	µg/kg	10	NONE	< 10	-			
Siduron	µg/kg	10	NONE	< 10	-			
Simazine	µg/kg	10	NONE	< 10	-			
Tebuthiuron	µg/kg	10	NONE	< 10	-			
Terbuthylazine	µg/kg	10	NONE	< 10	-			
Terbutryn	µg/kg	10	NONE	< 10	-			
Thiadiazuron	µg/kg	10	NONE	< 10	-			
Trietazine	µg/kg	10	NONE	< 10	-			
Acid Herbicides								
2,3,6-TBA	µg/kg	50	NONE	< 50	-			
2,4,5-T	µg/kg	10	NONE	< 10	-			
2,4,5-TP (Fenoprop)	µg/kg	10	NONE	< 10	-			
2,4-D	µg/kg	10	NONE	< 10	-			
2,4-DB	µg/kg	10	NONE	< 10	-			
4-CPA	µg/kg	20	NONE	< 20	-			
Bromacil	µg/kg	10	NONE	< 10	-			
Bromoxynil	µg/kg	10	NONE	< 10	-			
Clopyralid	µg/kg	100	NONE	< 100	-			
Dicamba	µg/kg	20	NONE	< 20	-			
Diclofop	µg/kg	10	NONE	< 10	-			
Dichlorprop	µg/kg	10	NONE	< 10	-			
Dinoseb	µg/kg	10	NONE	< 10	-			
Flamprop	µg/kg	50	NONE	< 50	-			
Flamprop-Isopropyl	µg/kg	10	NONE	< 10	-			
Ioxynil	µg/kg	10	NONE	< 10	-			
MCPA	µg/kg	10	NONE	< 10	-			
MCPB	µg/kg	20	NONE	< 20	-			
MCPP (Mecoprop)	µg/kg	10	NONE	< 10	-			
Picloram	µg/kg	50	NONE	< 50	-			

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Analytical Report Number : 20-12720

Project / Site name: Northern Arc, Burgess Hill

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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 *
1526273	WS7-01	1	0.15-0.15	Light brown loam and clay with gravel and vegetation.
1526274	WS7-02	1	0.05-0.05	Light brown loam and clay with gravel and vegetation.

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Analytical Report Number : 20-12720

Project / Site name: Northern Arc, Burgess Hill

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid Herbicides by LC-MS	Detemination of Acid Herbicides by LC MS	In-house method	L057B-PL	W	NONE
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
Herbicides by LC-MS	Detemination of Herbicides in soil by LC MS	In-house method	L056B-PL	W	NONE
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
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
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
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
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 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 Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
TPH C6 - C40 (soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method.	L076-PL	W	NONE
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	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.

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GL
Harrison Group
Water Ways Business Centre
Navigation Drive
South Ordnance Way
Enfield
EN3 6JJ

t: 02075379233

e: GL@harrisongroupuk.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 20-14505

Project / Site name:	Northern Arc, Burgess Hill	**Samples received on:**	16/06/2020
Your job number:	GL23484	**Sample instructed/ Analysis started on:**	17/06/2020
Your order number:		**Analysis completed by:**	24/06/2020
Report Issue Number:	1	**Report issued on:**	24/06/2020
Samples Analysed:	1 soil sample		

Signed: [redacted]

Will Fardon

Technical Reviewer (CS Team)
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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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.

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Analytical Report Number: 20-14505

Project / Site name: Northern Arc, Burgess Hill

Lab Sample Number	1535682				
Sample Reference	IT7-01				
Sample Number	1				
Depth (m)	0.10-0.10				
Date Sampled	15/06/2020				
Time Taken	None Supplied				

Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	12				
Total mass of sample received	kg	0.001	NONE	0.82				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.0				
Total Cyanide	mg/kg	1	MCERTS	< 1				
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				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1				
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.8				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	44				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	82				
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	< 10				
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1				
TPH C6 - C40	mg/kg	10	NONE	< 10				

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Analytical Report Number : 20-14505

Project / Site name: Northern Arc, Burgess Hill

* 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 *
1535682	IT7-01	1	0.10-0.10	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 20-14505

Project / Site name: Northern Arc, Burgess Hill

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
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
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
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
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
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 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
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
TPH C6 - C40 (soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method.	L076-PL	W	NONE
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	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.

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GL
Harrison Group
Water Ways Business Centre
Navigation Drive
South Ordnance Way
Enfield
EN3 6JJ

t: 02075379233

e: GL@harrisongroupuk.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 20-17805

Project / Site name:	Northern Arc, Burgess Hill	**Samples received on:**	03/07/2020
Your job number:	GL23484	**Samples instructed on:**	06/07/2020
Your order number:		**Analysis completed by:**	20/07/2020
Report Issue Number:	1	**Report issued on:**	20/07/2020
Samples Analysed:	3 water samples		

Signed: [redacted]

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
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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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 20-17805

Project / Site name: Northern Arc, Burgess Hill

Lab Sample Number	1553285	1553286	1553287		
Sample Reference	CP7-01	WS7-01	WS7-02		
Sample Number	EW1-SP1	EW1-SP1	EW1-SP1		
Depth (m)	1.90-1.90	1.75-1.75	1.60-1.60		
Date Sampled	01/07/2020	02/07/2020	01/07/2020		
Time Taken	None Supplied	None Supplied	None Supplied		

Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
General Inorganics								
pH	pH Units	N/A	ISO 17025	6.4	6.4	7.0		
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	1.0		
Free Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1	< 1	< 1		
Thiocyanate as SCN	µg/l	200	ISO 17025	< 200	< 200	< 200		
Sulphate as SO_4	mg/l	0.045	ISO 17025	27.1	55.7	114		
Total Sulphur	µg/l	15	NONE	9000	19000	38000		
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0		
Phenols by HPLC								
Catechol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5		
Resorcinol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5		
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5		
Cresols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5		
Naphthols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5		
Isopropylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5		
Phenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5		
Trimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5		
Total Phenols								
Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5	< 3.5	< 3.5		
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16		

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 20-17805

Project / Site name: Northern Arc, Burgess Hill

Lab Sample Number				1553285	1553286	1553287		
Sample Reference				CP7-01	WS7-01	WS7-02		
Sample Number				EW1-SP1	EW1-SP1	EW1-SP1		
Depth (m)				1.90-1.90	1.75-1.75	1.60-1.60		
Date Sampled				01/07/2020	02/07/2020	01/07/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.43	6.70	0.97		
Boron (dissolved)	µg/l	10	ISO 17025	120	190	240		
Cadmium (dissolved)	µg/l	0.02	ISO 17025	1.6	< 0.02	0.19		
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0		
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2		
Copper (dissolved)	µg/l	0.5	ISO 17025	3.2	2.3	5.4		
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	0.3		
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05		
Nickel (dissolved)	µg/l	0.5	ISO 17025	100	31	22		
Selenium (dissolved)	µg/l	0.6	ISO 17025	1.6	1.8	1.1		
Zinc (dissolved)	µg/l	0.5	ISO 17025	22	17	18		
Petroleum Hydrocarbons								
TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10		

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 20-17805

Project / Site name: Northern Arc, Burgess Hill

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Free cyanide (low level) in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Phenols, speciated, in water, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Thiocyanate in water	Determination of thiocyanate in water by discreet analyser (colorimetry). Accredited matrices SW, GW, PW.	In house method based on SMWW 4500-CN-M. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Total Sulphur in water	Determination of total sulphur in water by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	NONE
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE

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.

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The results included within the report are representative of the samples submitted for analysis.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
CP7-01	1-SP1	W	20-17805	1553285	c	pH at 20oC in water (automated)	L099-PL	c
WS7-01	1-SP1	W	20-17805	1553286	c	pH at 20oC in water (automated)	L099-PL	c
WS7-02	1-SP1	W	20-17805	1553287	c	pH at 20oC in water (automated)	L099-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

APPENDIX F

RIG CERTIFICATES

Southern Testing
Environmental & Geotechnical

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Southern Testing
Keeble House
Stuart Way
East Grinstead
West Sussex
RH19 4QA

SPT Hammer Ref:	DART1229
Test Date:	11/06/2019
Report Date:	18/07/2019
File Name:	DART.spt
Test Operator:	NPB

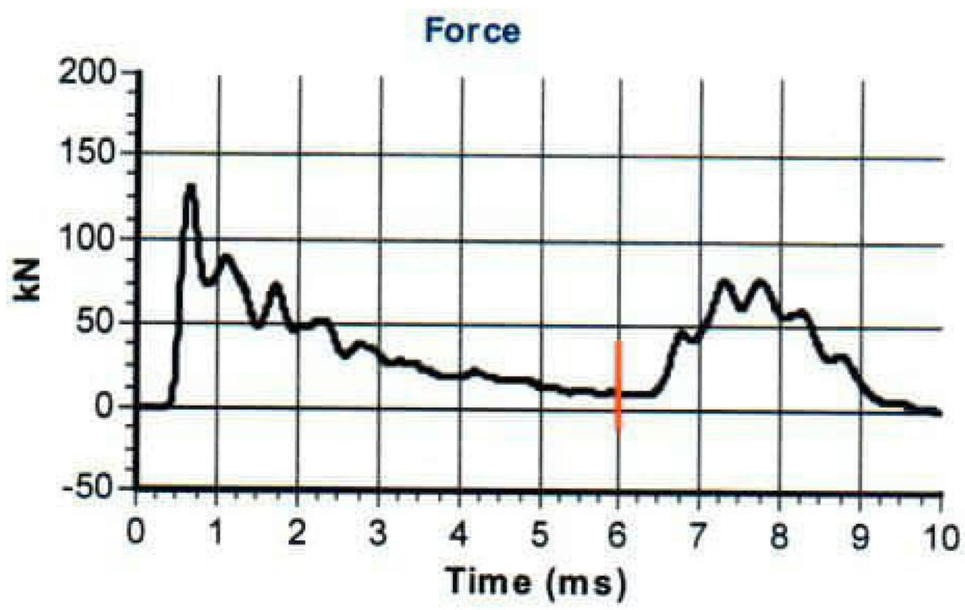
Instrumented Rod Data

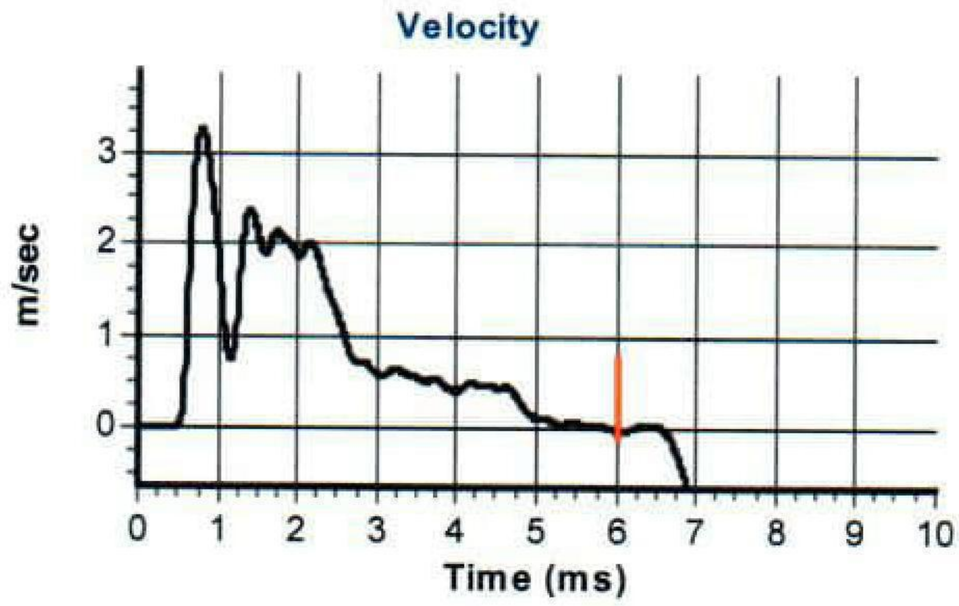
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	200
Accelerometer No.1:	6458
Accelerometer No.2:	9607

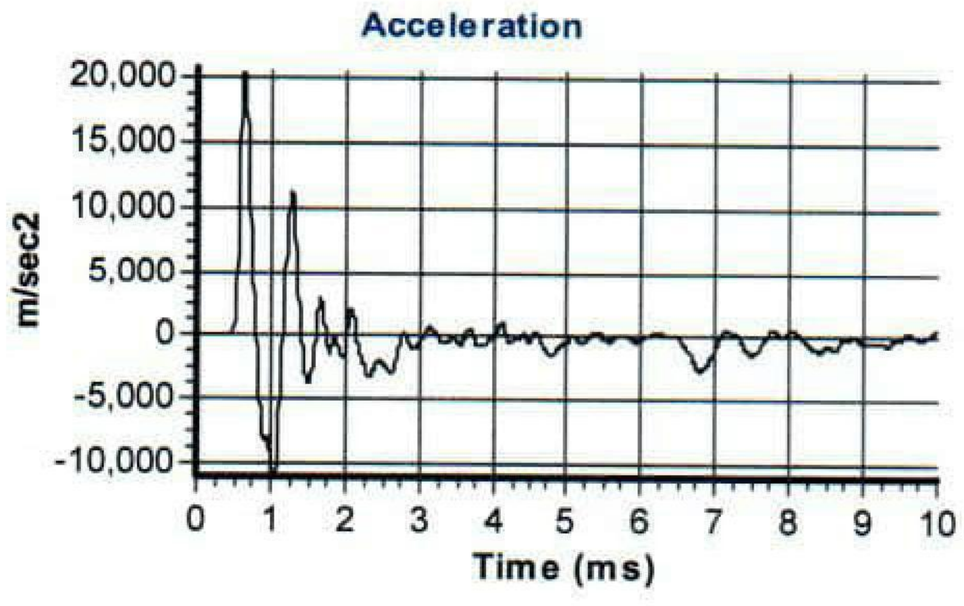
SPT Hammer Information

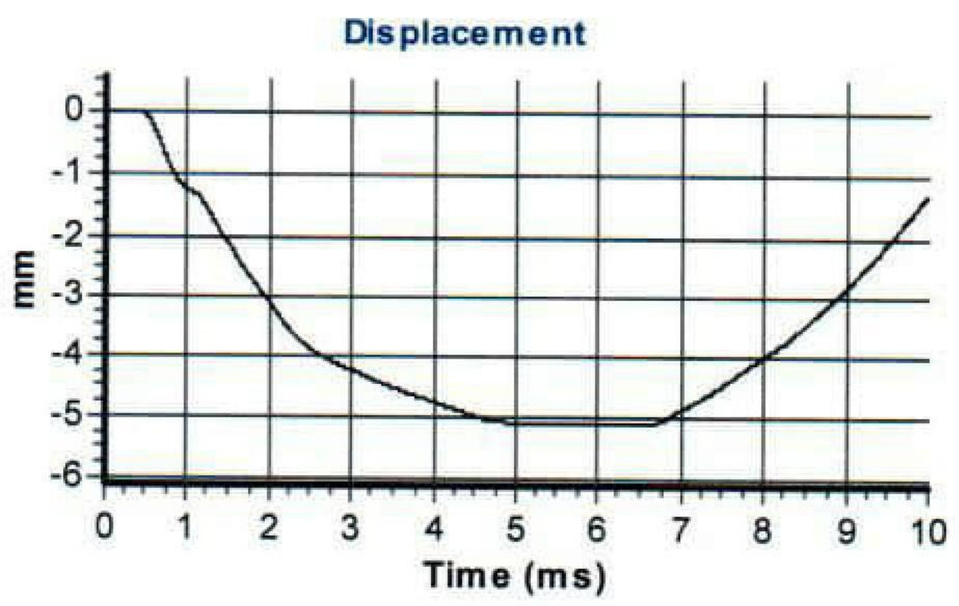
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	14.5

Comments / Location
CHARLWOODS









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	286

Energy Ratio E_r (%): 60

Signed: S M Simmonds
Title: Field Operations Technician

The recommended calibration interval is 12 months

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SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Unit 8
Orton Enterprise Centre
Orton Southgate
Peterborough
PE2 6XU

SPT Hammer Ref:	EQU061
Test Date:	05/10/2019
Report Date:	05/10/2019
File Name:	EQU061.spt
Test Operator:	CR

Instrumented Rod Data

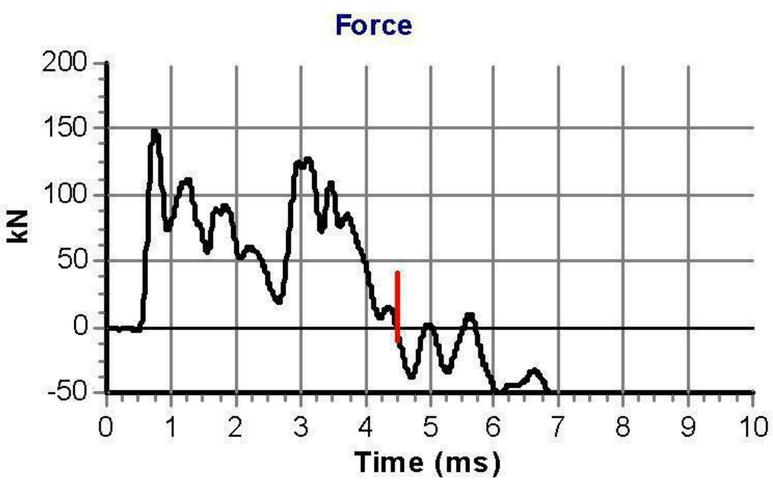
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.3
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	11941
Accelerometer No.2:	11942

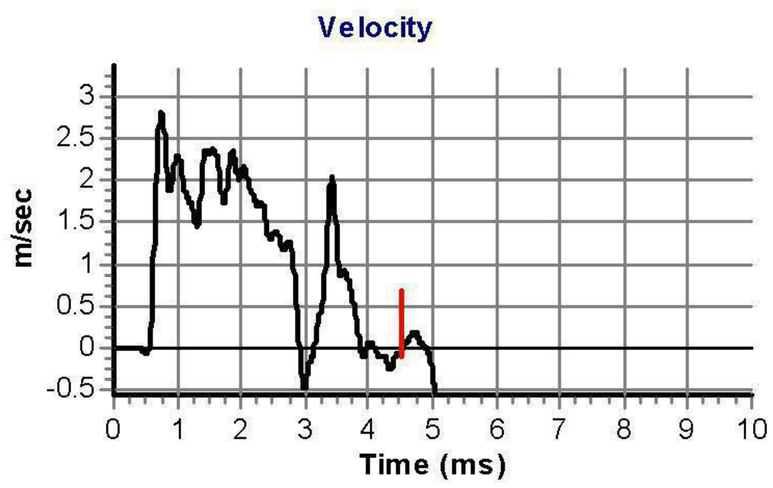
SPT Hammer Information

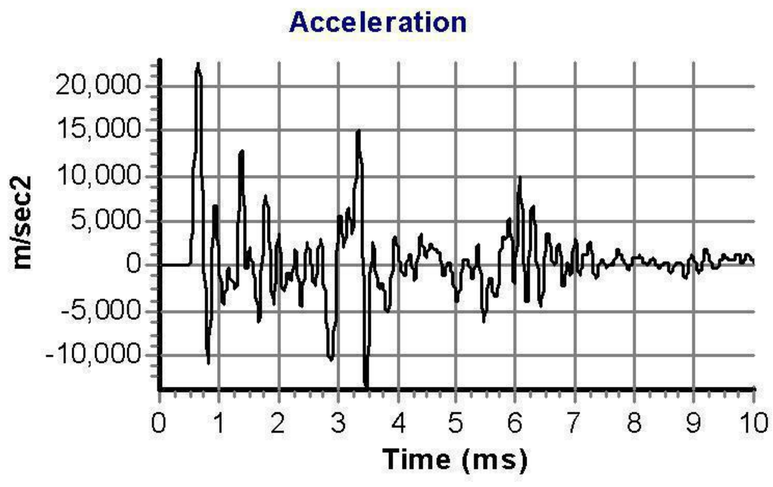
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	15.0

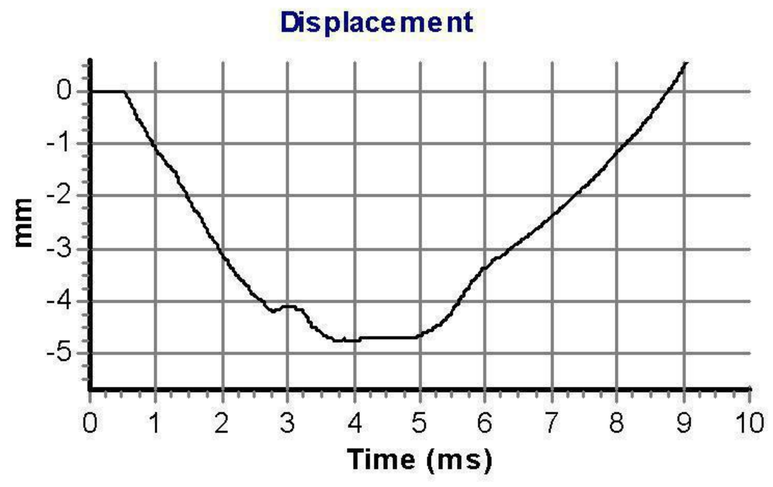
Comments / Location

Recommended calibration interval is 6 months









Calculations

Area of Rod A (mm2):	944
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	349

Energy Ratio E_r (%): **74**

CR

Signed: CR

Title: Operator

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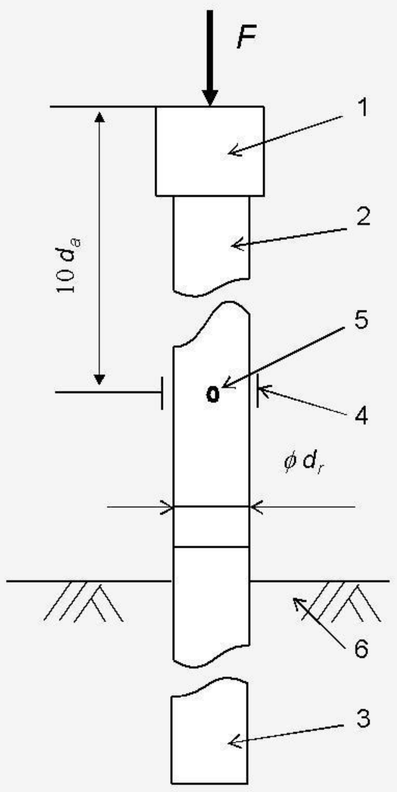
SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer		PREMIER
Test No		EQU2533
Client		GEOTECHNICAL SERVICES
Test Depth (m)		8.20
Mass of hammer	m =	63.5kg
Falling height	h =	0.76m
E_{theor} =	$m \times g \times h$ =	473J

Characteristics of the instrumented rod

Diameter	d_r =	0.052 m
Length of instrumented rod		0.558 m
Area	A =	11.61 cm²
Modulus	E_a =	206843 MPa



Key

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

F Force
d_r Diameter of rod

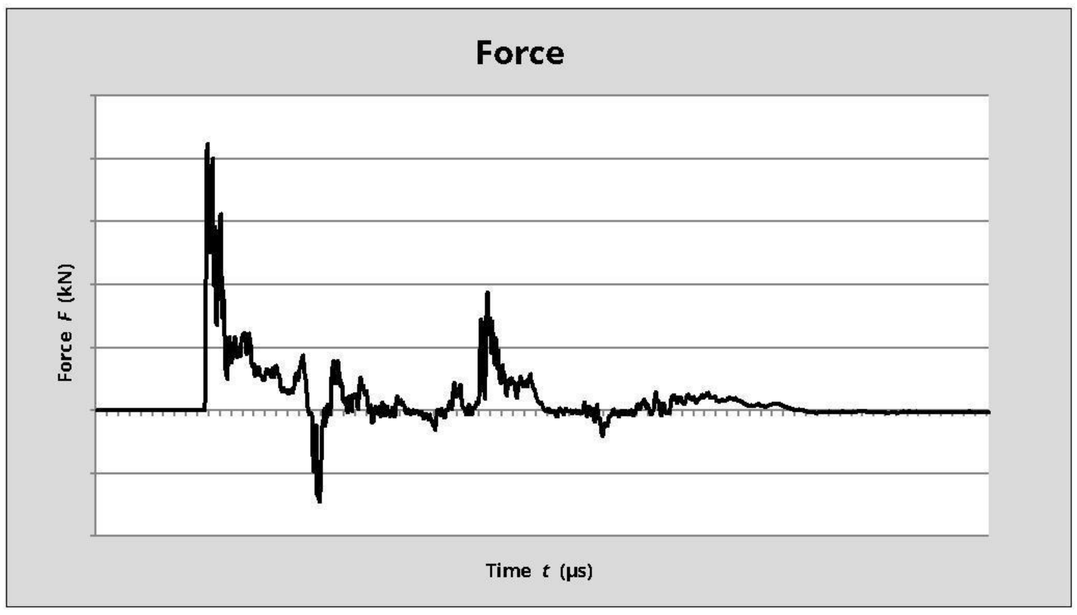
Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

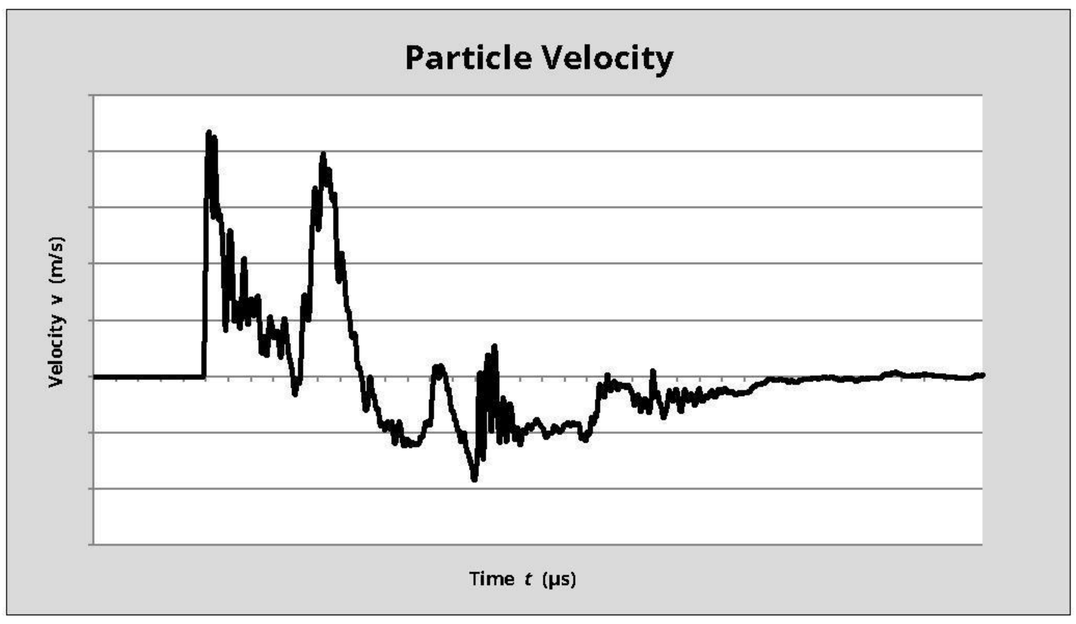
DATE OF TEST	VALID UNTIL	HAMMER ID
13/02/2020	12/02/2021	RED RIG

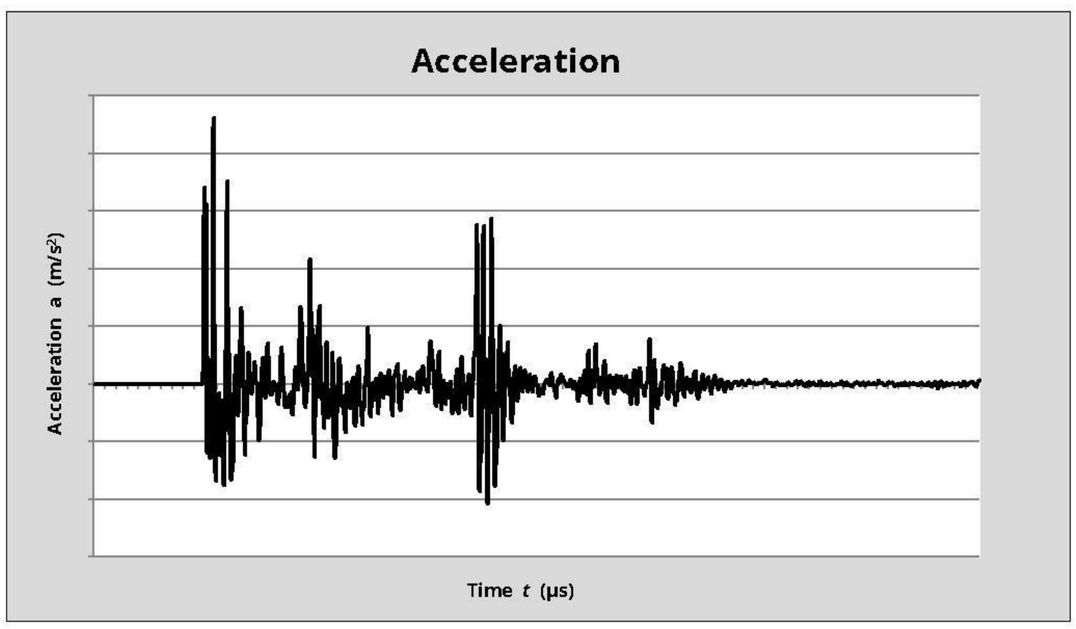
E_{meas} = **0.441** kN-m

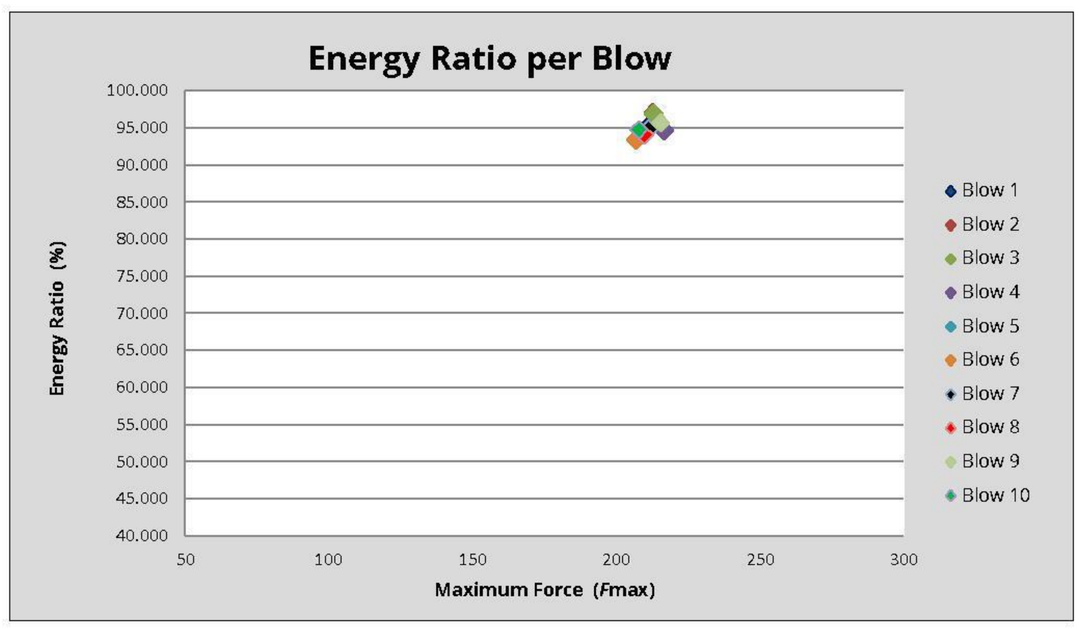
E_{theor} = **0.473** kN-m

Comments









Energy Ratio (Er) = $\frac{E_{meas}}{E_{theor}}$ **93.19%**

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Equipe SPT Analyzer Operator	Certificate prepared by	Certificate checked by	Certificate date
[redacted]	[redacted]	[redacted]	19/02/2020

© Copyright 2020 **Equipe Group**, The Paddocks, Home Farm Offices, The Upton Estate, Banbury, Oxfordshire, OX15 6HU
Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

Norwich (Registered Office)

Kimberley Street
Norwich
Norfolk
NR2 2RJ

Tel: 01603 613111

London

12 Waterways Business Centre
Navigation Drive
South Ordnance Road
Enfield, EN3 6JJ

Tel: 020 7537 9233

Cambridge

1 Francis Court
High Ditch Road
Fen Ditton, Cambridge
CB5 8TE

Tel: 01223 781585

Colchester

Colchester Business Centre
1 George Williams Way
Colchester
CO1 2JS

Tel: 01206 986675

CampbellReith
consulting engineers

Appendix 4

CLEA Land Use Parameter Summary

Appendices

Summary of CLEA settings for schools end use	**School**	**Justification**
Direct ingestion of soil (outdoors) and dust derived from soil (indoors)	x	-
Ingestion of soil attached to fruit/vegetables	x	-
Ingestion of fruit/vegetables	x	assumes school has garden
Dermal contact with dust derived from soil (indoors)	x	-
Dermal contact with soil (outdoors)	x	-
Inhalation of dust derived from soil (indoors)	x	-
Inhalation of dust derived from soil (outdoors)	x	-
Inhalation of vapours (indoors)	x	-
Inhalation of vapours (outdoors)	x	-
Critical receptor	Female child	female is more sensitive than male to contamination in soil - after senstivity analysis with schoolboy, secondary school pupil, female janitor and female teacher, primary age school girl found to be more conservative.
Age range	4 to <12 years	age range of primary school pupil
CLEA Age Classes (AC)	5 to 12	-
Default building	schools (single storey school)	dimensions of building taken from Government guidelines on new school developments. https://www.gov.uk/government/collections/school-building-design-and-maintenance - senstivity analysis carried out to compare with other dimensions and single storey chosen as was more conservative.
Default soil	sandy loam	default CLEA value
Default gardener	average	homegrown fraction for an average gardner. This is already conservative considering this assumes that produce grown at school ranges from 2 - 9% of all fruit and veg consumed by pupils.

London

15 Bermondsey Square
London
SE1 3UN

T: +44 (0)20 7340 1700
E: london@campbellreith.com

Birmingham

Chantry House
High Street, Coleshill
Birmingham B46 3BP

T: +44 (0)1675 467 484
E: birmingham@campbellreith.com

Bristol

Unit 5.03
HERE
470 Bath Road
Bristol BS4 3AP

T: +44 (0)117 916 1066
E: bristol@campbellreith.com

Manchester

10 Chapel Walks
Manchester
M2 1HL

T: +44 (0)161 819 3060
E: manchester@campbellreith.com

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A list of Members is available at our Registered Office at: 15 Bermondsey Square, London, SE1 3UN
VAT No 974 8892 43