



Quantum Geotechnic Ltd
Plas Newydd
Pontardulais
Swansea
SA4 0FQ

T: 01554 744880
E: enquiries@quantumgeotech.co.uk
W: <http://www.quantumgeotech.co.uk>

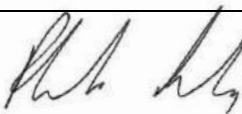
GRANDISON BROOK FLOOD ALEVIATION SCHEME – PHASE III GROUND INVESTIGATION GROUND INVESTIGATION FACTUAL REPORT

Report No. Q1114/FR.01

September 2023

DOCUMENT CONTROL

Contract Name:	Grandison Brook Flood Alleviation Scheme – Phase III Ground Investigation
Contract Reference:	Q1114
Report Type:	Ground Investigation Factual Report
Report Reference:	Q1114/FR.01
Date of Report Production:	September 2023
Client:	Atkins

Version:	Date:	Prepared by:	Checked by:	Approved by:
1	08/09/23	A Jones	P. Darby	J. Stark
				
		Project Manager	Senior Engineering Geologist B.Sc.(Hons).,M.Sc., C.Geol., F.G.S.	Technical Manager B.Sc.(Hons.),M.Sc., C.Geol., F.G.S.

Disclaimer: Quantum Geotechnic Limited has prepared this report in accordance with the instructions of the above named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

Quantum Geotechnic Ltd, Plas Newydd, Llanedi, Swansea, SA4 0FQ. T: 01554 744880 E: enquiries@quantumgeotech.co.uk
Website: <http://www.quantumgeotech.co.uk/>

CONTENTS

0.0	FOREWORD	4
1.0	INTRODUCTION	5
1.1	General	5
1.2	Purpose of Ground Investigation.....	5
1.3	Initial Scope of Work	5
2.0	SITE DETAIL	7
2.1	Site Description.....	7
2.2	Statutory Service Information.....	7
2.3	Published Geology.....	7
3.0	FIELDWORK	9
3.1	General	9
3.2	Exploratory Hole Locations	9
3.3	Boreholes.....	11
3.4	Hand Excavated Service Trial Trench.....	11
3.5	Machine Excavated Trial Pits.....	12
3.6	Land gas and Groundwater Standpipe Installations.....	13
3.7	In-Situ Testing.....	13
3.8	Soil, Groundwater and Surface Water Sampling.....	14
3.9	Post-Fieldwork Monitoring	14
4.0	LABORATORY TESTING.....	16
4.1	General	16
4.2	Geotechnical Testing	16
4.3	Geo-Environmental Testing	16
5.0	REFERENCES	17

APPENDICES

APPENDIX I – SITE PLANS AND FIGURES I

APPENDIX II – BOREHOLE LOGS.....II

APPENDIX III – HAND EXCAVATED SERVICE TRIAL PIT LOGS III

APPENDIX IV – MACHINE EXCAVATED TRIAL PIT LOGS IV

APPENDIX VI – GEOTECHNICAL LABORATORY TEST RESULTS V

APPENDIX VII – CHEMICAL LABORATORY TEST RESULTS VI

APPENDIX VIII – GAS AND GROUNDWATER MONITORING RECORDS VII

0.0 FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

0.1 General

Recommendations made and opinions expressed in the report are based on the strata observed in the excavations, together with the results of site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the Exploratory Holes or which occur between Exploratory Holes. Whilst the report may suggest the likely configuration of strata, both between Exploratory Holes and below the maximum depth of investigation, this is only indicative and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

0.2 Investigation Procedures

Windowless Sample Boreholes, Hand and Machine excavated pitting techniques for ground investigation have been employed within the project. All Exploratory Hole operations, sampling and logging of soils, rocks and in-situ testing complies with the recommendations of the British Code of Practice BS 5930: 2015 'Site Investigations', British Code of Practice BS 10175: A2:2017 'Investigation of Potentially Contaminated Sites' and BS 1377: 1990, 'Methods of Test for Soils for Engineering Purposes'.

0.3 Routine Sampling

Representative bulk disturbed and environmental samples of the different strata are taken following completion of logging. These samples are sealed and labelled in clear plastic bags and 2kg plastic tubs. Soil samples obtained for environmental testing are sampled and sealed in borosilicate amber jars or in specialist vessels where required. Ground Water samples were sampled and sealed in borosilicate amber bottles or in specialist vessels where required. All samples are returned from site to QGL's laboratory for controlled storage within 24 hours of sampling to await test scheduling/requirements.

0.4 In-Situ Testing, Surveying & Instrumentation

In-situ testing comprised:

- Standard Penetration Testing within Boreholes (SPT)
- All exploratory hole locations to be surveyed for location and elevation.
- PID testing

0.5 Groundwater

Where possible, the depth of entry of any influx of groundwater is recorded during the course of excavation or boring operations. The rate of inflow into the excavation or borehole is monitored during the course of the excavation or during boring procedures. Upon encountering any water strikes, work is temporarily halted and the water levels monitored for a standard twenty-minute period recording the change in water level at the end of the twenty minutes.

Groundwater conditions observed in the excavations are those appertaining to the period of investigation. It should be noted, however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions or other causes.

0.6 Retention of Samples

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded. Further to notifying the Engineer/ Client with one week's notice all soil and/or rock samples not tested will be discarded 28 days after submission of the approved final report.

1.0 INTRODUCTION

1.1 General

Upon the instructions of Atkins, the scheme Engineer / Investigation Supervisor / Client, Quantum Geotechnic Limited (QGL) was commissioned to undertake a third phase of ground investigation works for the proposed flood alleviation scheme for Grandison Brook, Briton Ferry.

The siteworks were carried out between 15th and 17th May 2023.

This report presents a factual account of the fieldwork carried out, includes descriptions of the strata encountered, available groundwater observations, details of in-situ testing undertaken, location of services encountered and provides results of subsequent laboratory testing of samples obtained from the investigation.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out site investigation work.

1.2 Purpose of Ground Investigation

The purpose of the ground investigation is to determine the existing ground conditions on the site, together with details and location of services along the proposed culvert route to allow the design of the proposed Grandison Brook Flood Alleviation Scheme culvert improvement works.

The proposed culvert improvement works will involve the installation of a new culvert in the highway and through green spaces, also enclosing the current open channel within a culvert in some sections. The new culvert will rejoin the existing watercourse further downstream before it discharges into the River Neath. The Grandison Brook Flood Alleviation Scheme is required to mitigate flooding to properties within the vicinity of the Brook.

1.3 Initial Scope of Work

The aim of the ground investigation is to:

- Determine the nature and thickness of any Made Ground;
- Determine the nature and thickness of the Superficial Deposits;
- Determine the depth to Bedrock and thickness of any weathered horizon;
- Recover suitable samples for geotechnical and geo-environmental laboratory testing;
- Locate presence, size and depth of services on site.

The initial scope of works entails the following:

- 3 no. Windowless Sample / Dynamic Sampled Boreholes
- 4 no. Hand Excavated Pits
- 1 no. Hand Excavated Trench to locate 2 x 300mm water main buried services
- 4 no. Machine Excavated Trial Pits
- In-Situ Testing
- 2 No. Surface water samples from nearby watercourse
- Post fieldwork groundwater and ground gas monitoring

General

- Geotechnical and Geo-environmental Laboratory Testing.
- Factual reporting detailing the investigation.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out ground investigation work.

2.0 SITE DETAIL

2.1 Site Description

The site is located in the Pantyrheol area of Briton Ferry, Neath and passes through residential areas, sports fields, Ysgol Carreg Hir, along Ynysymaerdy Road, through Jersey Park, across the A474 and through railway land towards the River Neath. This Phase III investigation was focused within the Railway Land, Jersey Park, land adjacent to the Briton Ferry Football Ground and rough ground behind the properties at Collins Street.

The site is located at Ordnance Survey National Grid reference 274680E and 195180N.

QGL were the appointed Contractor for the works, under order number 5192793-002 issued on 18th April 2023.

The general extent of the site is shown in Figure 1 in Appendix I.

2.2 Statutory Service Information

All service information was held by the Client with the relevant plans and information made available to QGL prior to commencement of the intrusive works.

A permit to excavate was issued by QGL for all exploratory holes. Standard QGL procedures for breaking ground were followed and all areas were scanned using a cable avoidance tool. A hand dug trial pit was excavated to 1.2m prior to commencement of drilling where services may be at risk. All hand excavation was undertaken using insulated digging tools.

2.3 Published Geology

Details of the published and inferred geology of the site are summarised as followed:

The British Geological Survey (BGS) sheet 1:50,000 247 (Swansea) indicates

Superficial Deposits

The site is predominantly underlain by Glacial Till deposits. Tidal Flat deposits are mapped along the northern boundary of the site.

Bedrock Geology

The site is mapped to be underlain by interbedded sandstone, siltstone and mudstone with coal seams of

the Hughes Member and Brithdir Member.

Client Supplied Information

“Ground Investigation information for Cwrt Sart Comprehensive School, located approximately 200m north west of the site has been made available by Neath Port Talbot County Borough Council. The ground investigation found Made Ground between 0.7m and 1.45m thick comprising sandy gravel with low to medium cobble content, soft clay and peat between 0.3m and 2.15m thick overlying firm to stiff sandy gravelly clay and medium dense sandy gravel with low to medium cobble content with thin lenses of sand..... Groundwater was recorded in two boreholes at 1.5m and 2.3m”.

3.0 FIELDWORK

3.1 General

A summary of the works completed and covered by this report are given below:

- 2 No. Windowless Sample / Dynamic Sampled boreholes. (GB-BH07 & GB-BH09)
- 1 No. Hand Excavated Trial Trench (GB-HP06)
- 1 No. Machine Excavated Trial Pit (GB-TP11)
- Surface water sampling at 2 No. locations
- In-situ testing and sampling.
- Post fieldwork groundwater and ground gas monitoring.

Full time site supervision and attendance from QGL was undertaken on all aspects of the site works and subsequent reinstatement works of all exploratory hole locations. All service plans were held onsite, with all site personnel inducted by QGL and briefed of the pertinent Risk Assessments and Method Statements relating to the tasks to be undertaken.

The borehole locations were subject to a 1.2m deep service / utility inspection pit prior to any drilling. Also, each area of investigation was fully eCAT4+ ('Cable Avoidance Tool') scanned prior to breaking ground.

Access to GB-BH07 is via Network Rail owned land and assets which required Network rail supervision. Due to the presence of dense vegetation within the Railway Land, access was not available to GB-HP07, GB-HP08, GB-HP09 and GB-HP10.

Exploratory holes GB-TP12, GB-TP13, GB-TP14 and GB-BH08 were postponed due to the for CADW permission to work within the area of an old railway line (scheduled monument) within Jersey Park.

3.2 Exploratory Hole Locations

The exploratory hole locations were specified by Atkins and set out on site by QGL using the co-ordinates provided.

Exploratory Hole Location Plans are presented as Figure 2 in Appendix I and the Exploratory Hole co-ordinates and levels are detailed within Table 1.

Table 1: Exploratory Hole Co-Ordinates & Levels

Exploratory Hole	Easting	Northing	Height (mAOD)
GB-BH07	274053.91	195634.53	4.9
GB-BH09	274578.133	194913.036	14.818
GB-HP06	274528.147	195242.791	12.683
GB-TP11	274201.821	195620.017	4.92

3.3 Boreholes

Windowless Sample Boreholes

Windowless Sample Boreholes were undertaken during the site works. Windowless Sampling techniques involve a sampler dynamically driven down to depth using sampling tubes, nominally 116mm in diameter and reducing as depth increases. This technique allows a relatively undisturbed sample of soil to be taken in a plastic liner, or alternatively sub sampled as a disturbed jar sample. Within competent granular-cohesive soils the portable equipment used for Windowless Sampling is limited by the nature of the ground and robustness of the driving tool. The recovered sample liners were subsequently split and logged on site in accordance with BS5930: 2015; BS EN ISO 14688-1:2017 and BS EN ISO 14688-2:2017, by a Quantum Engineering Geologist. Each Windowless Sample location was reinstated with Bentonite and surface replaced as per pre-existing construction.

In-situ testing was carried out in specified boreholes.

A summary of the boreholes are provided in Table 2.

Table 2: Borehole details

Exploratory Hole ID	Drilling method	SPT Hammer Reference	Termination Depth (mbgl)	Notes/Reason for Termination
GB-BH07	Windowless Sampling / Dynamic Sampling	TERRIER	8.2	Approximately Scheduled Depth
GB-BH09	Windowless Sampling / Dynamic Sampling	TERRIER	4.65	Refusal on Dense Gravel and / or Cobbles

The Engineering Geologist's borehole logs are presented within Appendix II.

A 50mm dual gas and groundwater monitoring standpipe was installed in boreholes GB-BH04 & GB-BH05, records of the post fieldwork monitoring are presented in Appendix VIII.

3.4 Hand Excavated Service Trial Trench

1 No. Hand Excavated Trial Trench was formed using insulated Hand Digging Tools and the assistance of a two tonne excavator to determine the locations of the underground services present together with shallow ground conditions. The position is shown on the exploratory hole location plan in Appendix I.

This method of investigation allows a safe method of excavation around services together with direct sampling of the near surface deposits for identification purposes, as well as assessment of any salient features and Made Ground or disturbed ground. The trial trench was logged in accordance with BS5930:2015; BS EN ISO 14688-1:2017 and BS EN ISO 14688-2:2017 and supervised at all times by an

Engineering Geologist from QGL. The trial trench was backfilled with compacted layers of arisings upon completion with suitable surface reinstatement where required.

Details of the Trial Trench, including final depth in metres below ground level (mbgl) are provided below in Table 3.

Table 3: Hand Pit details

Exploratory Hole ID	Exploratory Hole Type	Termination Depth (mbgl)	Notes/Reason for Termination
GB-HP06	Hand Excavated Trial Trench	1.4	Terminated upon identifying targeted buried services

A complete set of Engineering Geologist Trial Trench log is presented within Appendix III.

3.5 Machine Excavated Trial Pits

1 No. Trial Pit was excavated using an 8 tonne excavator owned and operated by Spencer ECA as an approved plant supplier to QGL. The exploratory hole positions are shown on the exploratory hole location plan in Figure 2 in Appendix I.

This method of investigation allows direct sampling of the near surface deposits for identification purposes, locating of buried services, as well as assessment of any salient features and Made Ground or disturbed ground. The trial pits were logged in accordance with BS5930:2015; BS EN ISO 14688-1:2017 and BS EN ISO 14688-2:2017, and supervised at all times by an Engineering Geologist from QGL.

The trial pit was backfilled with compacted layers of arisings upon completion.

Geotechnical and Environmental samples were taken within the superficial deposits for laboratory testing purposes.

Details of the Trial Pit including final depths in metres below ground level (mbgl) are provided in Table 4.

Table 4: Trial Pit Detail

Exploratory Hole ID	Exploratory Hole Type	Final Length (mbgl)	Reason for termination
GB-TP11	Machine Excavated Trial Pit	3.5	Maximum reach of excavator

A complete set of Engineering Geologist's Machine Excavated Trial Pit logs are presented within Appendix IV.

3.6 Land gas and Groundwater Standpipe Installations

50mm internal diameter standpipes were installed in selected boreholes for the purposes of land gas and groundwater monitoring and sampling.

Monitoring standpipes consist of plastic pipework set in filter aggregate (pea gravel) forming a well. The filter is sealed at one or both ends by use of bentonite pellets which 'go off' and become watertight. Parts of the pipe itself are slotted, allowing the infiltration of groundwater which can then be accessed through the pipe from ground level. Slotted sections are covered by 'geo-sock' to reduce the intrusion of silt into the standpipes and the range of depths at which the groundwater is intercepted is known as the 'response zone'.

Standpipes were installed using a combination of 1m and 3m lengths of pipework (threaded at either end) fitted together and lowered into the borehole. The boreholes were then filled with either pea gravel or bentonite pellets (depending on which zone or level) and cemented in place at ground level with a steel flush cover.

Each standpipe installation was designed by the Investigation Supervisor and instructed on site, after the completion of each borehole. All standpipe installations were sealed above the response zone by a minimum of 0.50m of bentonite pellets.

A summary of the pipe installation details is presented in Table 5

Table 5: Borehole Installation Details

Exploratory Hole ID	Installation Pipe ID	Standpipe Diameter (Internal mm)	Response Zone (mbgl)		Total Standpipe Length (m)
			Top	Bottom	
GB-BH07	A	50	1.00	2.50	2.50
GB-BH09	A	50	1.00	4.65	4.65

3.7 In-Situ Testing

3.7.1 Standard Penetration Testing

Standard penetration tests (SPTs) were undertaken within all boreholes, at intervals specified by Redstart.

This is a dynamic test as described in BS EN ISO 22476-3:2005 + A1:2011. Within fine grained or cohesive soils, the test incorporates a small diameter tube (650mm length, 50mm external diameter and 35mm internal diameter) with a cutting shoe known as the 'split barrel sampler'. The sampler is forced into the soil dynamically using blows from a 63.5kg hammer dropped through 760mm. The sampler is initially advanced 150mm into the soil with seating blows, then the number of blows required to advance the sampler each 75mm increment up to a depth of 300mm is recorded. This cumulative total number of blows over the

300mm test is referred to as the "N" value. For coarse gravels and bedrock the split barrel is replaced by a 60° cone (SPT(C) - Standard Penetration Test (Cone)). SPT/SPT(C) results are detailed within the relevant borehole Logs. The SPT calibration certificate for the SPT hammer used during this investigation is presented in Appendix II.

3.7.2 Headspace Testing

All environmental soil samples collected were screened using a calibrated Photoionisation Detector onsite to measure isobutylene, prior to being sent to the laboratory.

Soil is placed in a sealed plastic bag, half-filled to allow airspace above the soil and left a period of no less than one hour prior to screening.

Measurements are detailed within the exploratory hole logs included within Appendix II and Appendix III.

3.8 Soil, Groundwater and Surface Water Sampling

Disturbed samples of soil were taken in clear sealed plastic bags and white plastic tubs. Environmental samples were taken at various depths as noted on the relevant logs.

Environmental soil samples were taken in amber glass jars, vials and plastic tubs provided by the laboratory to suit the anticipated testing.

Groundwater samples were collected during post fieldwork monitoring rounds. Surface water samples were collected from Grandison Brook at specified locations, detailed within Figure 2, Appendix I. All water samples were collected in the required vials, plastic and gas bottles.

The environmental samples were dispatched to Chemtest, Coventry using a daily courier service for storage awaiting testing instructions from the Engineer.

Geotechnical samples were returned from site to QGL's laboratory for controlled storage to await test scheduling/requirements. For specific details of laboratory testing see Section 4.0.

3.9 Post-Fieldwork Monitoring

Following completion of the siteworks, QGL shall undertake 3 No. monitoring visits to record land gas and groundwater within the installed borehole standpipes..

Monitoring comprised groundwater and ground gas monitoring. Gas monitoring was undertaken using a GA2000 gas analyser to measure the following:

- Atmospheric pressure

- Flow rates (L/hr)
- Methane
- Carbon Dioxide
- Oxygen
- Carbon Monoxide
- Hydrogen Sulphide

Results are presented within Appendix VIII.

4.0 LABORATORY TESTING

4.1 General

The laboratory testing was scheduled by Atkins and comprised a number of geotechnical classification and performance tests as well as chemical testing on selected soil samples and ground water samples recovered from the investigation.

4.2 Geotechnical Testing

Geotechnical classification and performance testing was undertaken at QGL's approved UKAS accredited laboratory at GSTL, Llanelli.

Geotechnical tests undertaken on selected soil samples are listed below. All the geotechnical soil testing work was carried out in accordance with the procedures stipulated in the various sections of BS 1377:1990 "Methods of test for soils for civil engineering purposes" and to UKAS accreditation where applicable and chemical testing carried out in accordance with BRE Special Digest 1:2005 "Concrete in aggressive ground".

Geotechnical soil testing undertaken:

- 10 No. Moisture content
- 8 No. Liquid limit, plastic limit and plasticity index
- 10 No. Particle size distribution by wet sieving
- 6 No. Sedimentation by Pipette
- 4 No. Organic Matter

Geotechnical Laboratory Test results are presented in Appendix VI.

4.3 Geo-Environmental Testing

Geo-Environmental chemical testing was undertaken at Eurofins Chemtest Ltd, Coventry. All testing was scheduled by Atkins. The following suites of testing were scheduled:

- 6 No Suite E (Soil)
- 4 No. Suite F (Leachate)
- 1 No. Suite G – Goundwater Sample
- 2 No. Sute G – Surface Water Sample

Chemical Laboratory Test results are presented in Appendix VII.

5.0 REFERENCES

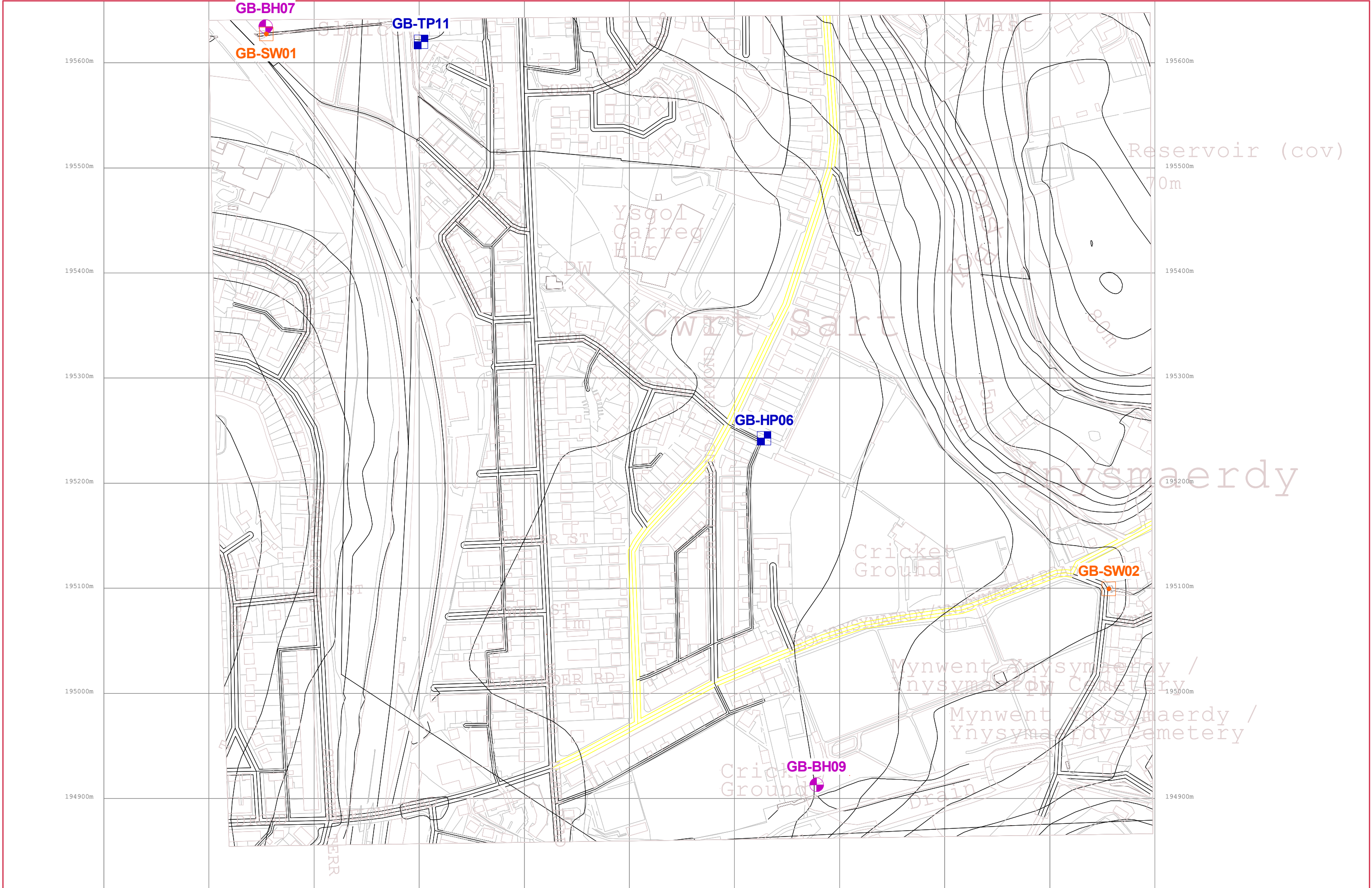
British Geological Survey:

- The British Geological Survey (BGS) sheet 1:50,000 247 (Swansea)
- BGS Geology of Britain Viewer (www.bgs.ac.uk)

Specialist Publications:-

- British Code of Practice BS 5930:2015 '*Code of Practice for Site Investigations*'
- British Code of Practice BS 1377:1990 '*Methods of test for soils for civil engineering purposes*'.
- British Code of Practice BS EN ISO 14688-1:2002+A2:2013 investigation and testing. Identification and classification of soil. Identification and description
- British Code of Practice BS EN ISO 14688-2:2004+A2:2013 Geotechnical investigation and testing. Identification and classification of soil. Principles for a classification.
- British Code of Practice BS EN ISO 14689-1:2003 Ground Investigation and Testing – Identification and classification of rock
- Health and Safety Executive Guidance Note EH40/90
- *CIRIA Report 143* 'The Standard Penetration Test (SPT): Methods and Use', 1995.
- BRE (2005) Special Digest 1:2005, 3rd Edition, Concrete in aggressive ground. BRE, Garston.
- BS 6031: 2009 Code of Practice for Earthworks.
- Workmanship for excavation shall comply with BS 8000: 1989 Part 1, Sections 3.1, 3.2 and 3.3.
- Specification for Highway Works (MCHW 1), Volume 1, Series 600 & Series 800, 2006 with Amendment 2016
- ICE UK Specification for Ground Investigation Second Edition.
- Design Manual for Roads and Bridges: Volume 7 Pavement Design and Maintenance
- Specification for Highways Works Series 600 Earthworks
- Highways Agency Interim Advice Note 73/06, Rev 1 2009, Clause 7.7

APPENDIX I – SITE PLANS AND FIGURES



APPENDIX II – BOREHOLE LOGS

Contract : Grandison Brook Client : Atkins										Window Sample No. GB-BH07																																																																																																																																									
Dates : 17/5/23 - 17/5/23 Location : Railway Land					Job Number : Q1114 Engineer : Atkins			Ground Level : 4.90 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 274053.91 E 195634.53 N <i>Co-ordinates to National Grid</i>																																																																																																																																											
<table border="1"> <thead> <tr> <th colspan="2">Samples</th> <th colspan="2">Sample Run</th> <th colspan="2">Tests</th> <th colspan="4">STRATA</th> <th rowspan="2">Water</th> <th rowspan="2">Install/Backfill</th> </tr> <tr> <th>Depth</th> <th>Type No.</th> <th>Diam. (mm)</th> <th>Recovery (%)</th> <th>Depth</th> <th>SPT & Hand Vane Results</th> <th>Depth (Thickness)</th> <th>DESCRIPTION</th> <th>Legend</th> <th>Red. Level . A.O.D.</th> </tr> </thead> <tbody> <tr> <td rowspan="2">1</td> <td>0.30 - 0.80 0.30</td> <td>B 1 ES 1</td> <td></td> <td></td> <td rowspan="2">1.20</td> <td rowspan="2">SPT (S) 14 (1-1-6-5-2-1)</td> <td>(0.10) 0.10</td> <td rowspan="2"> Turf over TOPSOIL: Brown sandy slightly gravelly CLAY. MADE GROUND: Black silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone, ash, brick, concrete, glass and tile. Sand is fine to coarse. PID = 0.0ppm PID = 0.0ppm PID = 0.0ppm </td> <td rowspan="2"></td> <td rowspan="2">4.80</td> <td rowspan="2"></td> </tr> <tr> <td>0.80</td> <td>ES 2</td> <td></td> <td></td> <td>(2.60)</td> </tr> <tr> <td rowspan="2">2</td> <td>1.20 1.20 - 2.00 1.20</td> <td>SPTLS 1 B 2 ES 3</td> <td>101</td> <td>60</td> <td rowspan="2">2.20</td> <td rowspan="2">SPT (S) 4 (1-1-1-1-1-1)</td> <td></td> <td rowspan="2">PID = 0.0ppm</td> <td rowspan="2"></td> <td rowspan="2"></td> <td rowspan="2"></td> </tr> <tr> <td>2.20 2.20 - 2.60 2.20</td> <td>SPTLS 2 B 3 ES 4</td> <td>101</td> <td>80</td> <td></td> </tr> <tr> <td rowspan="2">3</td> <td>3.20 3.20 - 3.80 3.20</td> <td>SPTLS 3 B 4 ES 5</td> <td>101</td> <td>100</td> <td rowspan="2">3.20</td> <td rowspan="2">SPT (S) 4 (1-1-1-1-1-1)</td> <td>2.70 (1.20)</td> <td rowspan="2"> Firm Mottled brown grey slightly silty slightly sandy CLAY. PID = 0.0ppm </td> <td rowspan="2"></td> <td rowspan="2">2.20</td> <td rowspan="2"></td> </tr> <tr> <td>4.00 - 4.20 4.20 4.20 - 5.00</td> <td>B 5 SPTLS 4 B 6</td> <td>101</td> <td>100</td> <td>3.90</td> </tr> <tr> <td rowspan="2">4</td> <td>4.20 4.20 - 5.00</td> <td>SPTLS 4 B 6</td> <td>101</td> <td>100</td> <td rowspan="2">4.20</td> <td rowspan="2">SPT (S) 0 (1-0-0-0-0-0)</td> <td></td> <td rowspan="2"> Soft blue grey silty slightly sandy organic CLAY with lenses of fibrous material. </td> <td rowspan="2"></td> <td rowspan="2">1.00</td> <td rowspan="2"></td> </tr> <tr> <td>5.20 5.20 - 6.00</td> <td>SPTLS 5 B 7</td> <td>87</td> <td>100</td> <td>(3.10)</td> </tr> <tr> <td rowspan="2">5</td> <td>6.20 6.20 - 6.80</td> <td>SPTLS 6 B 8</td> <td>67</td> <td>80</td> <td rowspan="2">6.20</td> <td rowspan="2">SPT (S) 0 (1-0-0-0-0-0)</td> <td></td> <td rowspan="2"></td> <td rowspan="2"></td> <td rowspan="2"></td> <td rowspan="2"></td> </tr> <tr> <td>7.20 7.20 - 8.00</td> <td>SPTLS 7 B 9</td> <td>57</td> <td>100</td> <td>7.00 (1.20)</td> </tr> <tr> <td rowspan="2">6</td> <td>7.20 7.20 - 8.00</td> <td>SPTLS 7 B 9</td> <td>57</td> <td>100</td> <td rowspan="2">7.20</td> <td rowspan="2"></td> <td></td> <td rowspan="2"> Brown clayey pseudo-fibrous PEAT. </td> <td rowspan="2"></td> <td rowspan="2">-2.10</td> <td rowspan="2"></td> </tr> <tr> <td>8.20</td> <td>SPTLS 8</td> <td></td> <td></td> <td>8.20</td> </tr> <tr> <td colspan="7"></td> <td>8.20</td> <td> Hole terminated at 8.2mbgl. Approximate scheduled depth </td> <td></td> <td>-3.30</td> <td></td> </tr> </tbody> </table>												Samples		Sample Run		Tests		STRATA				Water	Install/Backfill	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth	SPT & Hand Vane Results	Depth (Thickness)	DESCRIPTION	Legend	Red. Level . A.O.D.	1	0.30 - 0.80 0.30	B 1 ES 1			1.20	SPT (S) 14 (1-1-6-5-2-1)	(0.10) 0.10	Turf over TOPSOIL: Brown sandy slightly gravelly CLAY. MADE GROUND: Black silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone, ash, brick, concrete, glass and tile. Sand is fine to coarse. PID = 0.0ppm PID = 0.0ppm PID = 0.0ppm		4.80		0.80	ES 2			(2.60)	2	1.20 1.20 - 2.00 1.20	SPTLS 1 B 2 ES 3	101	60	2.20	SPT (S) 4 (1-1-1-1-1-1)		PID = 0.0ppm				2.20 2.20 - 2.60 2.20	SPTLS 2 B 3 ES 4	101	80		3	3.20 3.20 - 3.80 3.20	SPTLS 3 B 4 ES 5	101	100	3.20	SPT (S) 4 (1-1-1-1-1-1)	2.70 (1.20)	Firm Mottled brown grey slightly silty slightly sandy CLAY. PID = 0.0ppm		2.20		4.00 - 4.20 4.20 4.20 - 5.00	B 5 SPTLS 4 B 6	101	100	3.90	4	4.20 4.20 - 5.00	SPTLS 4 B 6	101	100	4.20	SPT (S) 0 (1-0-0-0-0-0)		Soft blue grey silty slightly sandy organic CLAY with lenses of fibrous material.		1.00		5.20 5.20 - 6.00	SPTLS 5 B 7	87	100	(3.10)	5	6.20 6.20 - 6.80	SPTLS 6 B 8	67	80	6.20	SPT (S) 0 (1-0-0-0-0-0)						7.20 7.20 - 8.00	SPTLS 7 B 9	57	100	7.00 (1.20)	6	7.20 7.20 - 8.00	SPTLS 7 B 9	57	100	7.20			Brown clayey pseudo-fibrous PEAT.		-2.10		8.20	SPTLS 8			8.20								8.20	Hole terminated at 8.2mbgl. Approximate scheduled depth		-3.30	
Samples		Sample Run		Tests		STRATA				Water	Install/Backfill																																																																																																																																								
Depth	Type No.	Diam. (mm)	Recovery (%)	Depth	SPT & Hand Vane Results	Depth (Thickness)	DESCRIPTION	Legend	Red. Level . A.O.D.																																																																																																																																										
1	0.30 - 0.80 0.30	B 1 ES 1			1.20	SPT (S) 14 (1-1-6-5-2-1)	(0.10) 0.10	Turf over TOPSOIL: Brown sandy slightly gravelly CLAY. MADE GROUND: Black silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone, ash, brick, concrete, glass and tile. Sand is fine to coarse. PID = 0.0ppm PID = 0.0ppm PID = 0.0ppm		4.80																																																																																																																																									
	0.80	ES 2					(2.60)																																																																																																																																												
2	1.20 1.20 - 2.00 1.20	SPTLS 1 B 2 ES 3	101	60	2.20	SPT (S) 4 (1-1-1-1-1-1)		PID = 0.0ppm																																																																																																																																											
	2.20 2.20 - 2.60 2.20	SPTLS 2 B 3 ES 4	101	80																																																																																																																																															
3	3.20 3.20 - 3.80 3.20	SPTLS 3 B 4 ES 5	101	100	3.20	SPT (S) 4 (1-1-1-1-1-1)	2.70 (1.20)	Firm Mottled brown grey slightly silty slightly sandy CLAY. PID = 0.0ppm		2.20																																																																																																																																									
	4.00 - 4.20 4.20 4.20 - 5.00	B 5 SPTLS 4 B 6	101	100			3.90																																																																																																																																												
4	4.20 4.20 - 5.00	SPTLS 4 B 6	101	100	4.20	SPT (S) 0 (1-0-0-0-0-0)		Soft blue grey silty slightly sandy organic CLAY with lenses of fibrous material.		1.00																																																																																																																																									
	5.20 5.20 - 6.00	SPTLS 5 B 7	87	100			(3.10)																																																																																																																																												
5	6.20 6.20 - 6.80	SPTLS 6 B 8	67	80	6.20	SPT (S) 0 (1-0-0-0-0-0)																																																																																																																																													
	7.20 7.20 - 8.00	SPTLS 7 B 9	57	100			7.00 (1.20)																																																																																																																																												
6	7.20 7.20 - 8.00	SPTLS 7 B 9	57	100	7.20			Brown clayey pseudo-fibrous PEAT.		-2.10																																																																																																																																									
	8.20	SPTLS 8					8.20																																																																																																																																												
							8.20	Hole terminated at 8.2mbgl. Approximate scheduled depth		-3.30																																																																																																																																									
Equipment used: Dando Terrier Remarks: Seepage at 5.2mbgl																																																																																																																																																			
Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk					Operator: PK		Logged By: A Jones		Sheet No. 1 Of 1		m Per Page 10		All measurements in metres unless otherwise stated																																																																																																																																						

Contract : Grandison Brook

Client : Atkins

Borehole No.
GB-BH07

Dates : 17/5/23 - 17/5/23

Job Number : Q1114

Ground Level : 4.90 m A.O.D.
Level to Ordnance Datum

Location : Railway Land

Engineer : Atkins

Coordinates: 274053.91 E
195634.53 N
Co-ordinates to National Grid



Contract : Grandison Brook Client : Atkins										Window Sample No. GB-BH09						
Dates : 17/5/23 - 17/5/23 Location : Adj to Jersey Park					Job Number : Q1114 Engineer : Atkins			Ground Level : 14.82 m A.O.D. <i>Level to Ordinance Datum</i> Coordinates: 274578.13 E 194913.04 N <i>Co-ordinates to National Grid</i>								
Samples		Sample Run		Tests		STRATA										
Depth	Type No.	Diam. (mm)	Recovery (%)	Depth	SPT & Hand Vane Results	Depth (Thickness)	DESCRIPTION	Legend	Red. Level A.O.D.	Water	Install/ Backfill					
1	0.20 - 0.30 0.30	B 1 ES 1	101	80	SPT (S) 0 (1-0-0-0-0-0)	(0.10)	Turf over TOPSOIL: Brown sandy slightly gravelly CLAY. Gravel is sub angular to sub rounded fine to coarse sandstone. MADE GROUND: Brown clayey slightly sandy GRAVEL with low cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone, angular brick and concrete with plastic. Sand is fine to coarse. PID = 0.0ppm		14.72							
	0.50 - 0.70 0.70	B 2 ES 2				(0.25)			14.47							
	1.00 - 1.30 1.20 1.20 1.50 - 1.80	B 3 SPTLS 1 ES 3 B 4				(0.45) (0.80) (0.60)			14.02							
	2.20 2.30 - 2.50	SPTLS 2 B 5				(1.40) (0.80)			13.42							
2	2.20 2.30 - 2.50	SPTLS 2 B 5	101	100	SPT (S) 2 (1-0-0-0-0-2)	(0.80)	MADE GROUND: Black silty sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone and ash. Sand is fine to coarse. PID = 0.0ppm		12.62							
	2.80 - 3.00 3.20 3.20 - 4.00	B 6 SPTLS 3 B 7				(0.50) (2.70) (0.40)			12.12							
3	2.80 - 3.00 3.20 3.20 - 4.00	B 6 SPTLS 3 B 7	101	80	SPT (S) 18 (2-2-4-4-4-6)	(3.10)	Brown sandy slightly gravelly organic CLAY. Gravel is sub rounded fine to coarse sandstone. Sand is fine to coarse. Mottled pale brown grey sandy slightly organic CLAY. Sand is fine to coarse. Grey slightly silty gravelly SAND. Gravel is sub angular to sub rounded fine to coarse sandstone.		11.72							
	4.00 - 4.60 4.20	B 8 SPTLS 4				(1.55)			10.17							
4	4.00 - 4.60 4.20	B 8 SPTLS 4	101	80	SPT (S) 22 (2-2-4-4-6-8)	(4.65)	Grey slightly silty sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone. Sand is fine to coarse. Hole terminated at 4.65mbgl upon refusal. (Possible cobble / dense gravel)		10.17							
Equipment used: Dando Terrier Remarks: Fast groundwater ingress at 1.2mbgl																
Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk					Operator: PK		Logged By: A Jones		Sheet No. 1 Of 1		m Per Page 10		All measurements in metres unless otherwise stated			

Contract : Grandison Brook

Client : Atkins

Borehole No.

GB-BH09

Dates : 17/5/23 - 17/5/23

Job Number : Q1114

Ground Level : 14.82 m A.O.D.
Level to Ordnance Datum

Location : Adj to Jersey Park

Engineer : Atkins

Coordinates: 274578.13 E
194913.04 N
Co-ordinates to National Grid



Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
PK

Logged By:
A Jones

Sheet No.
1 Of 1

m Per
Page
2

All measurements in
metres unless
otherwise stated



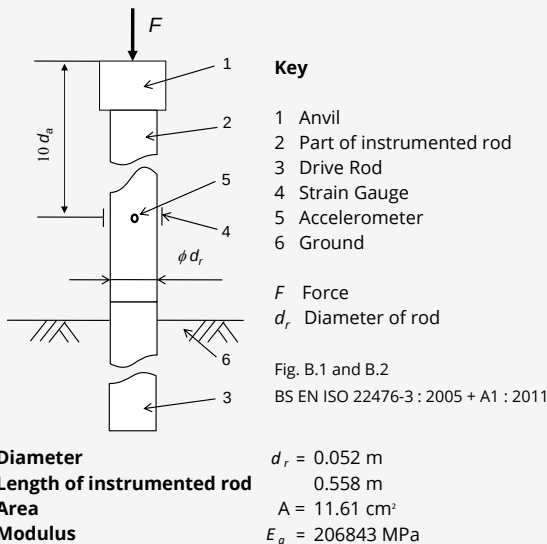
SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer: TERRIER
Test No: EQU2023_108
Client: QUANTUM GEOTECH

Test Depth (m): 11.70
Mass of hammer: $m = 63.5\text{kg}$
Falling height: $h = 0.76\text{m}$
 $E_{\text{theor}} = m \times g \times h = 473\text{J}$

Characteristics of the instrumented rod

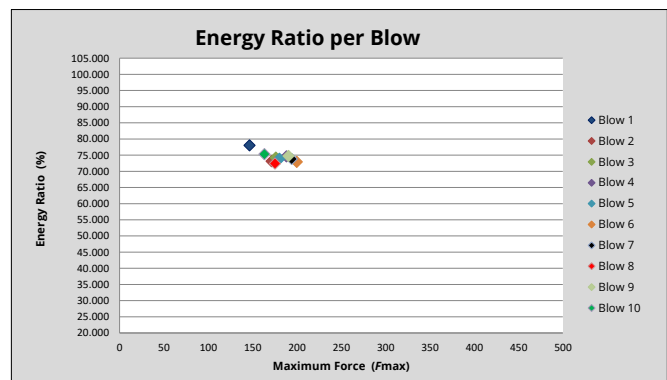
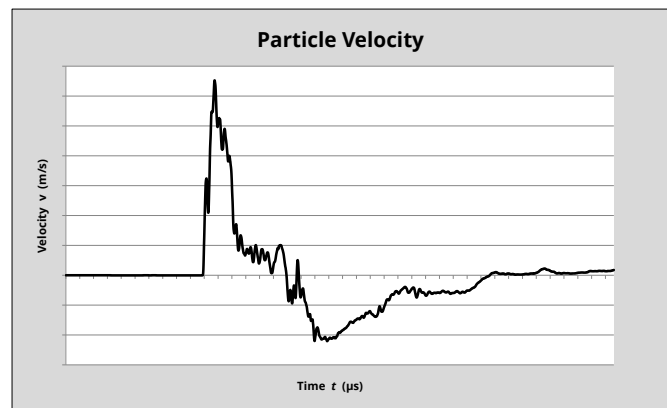
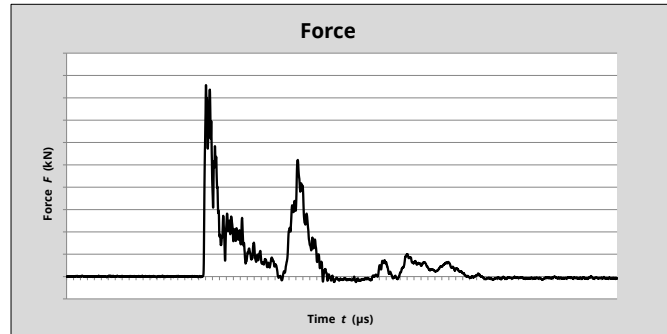
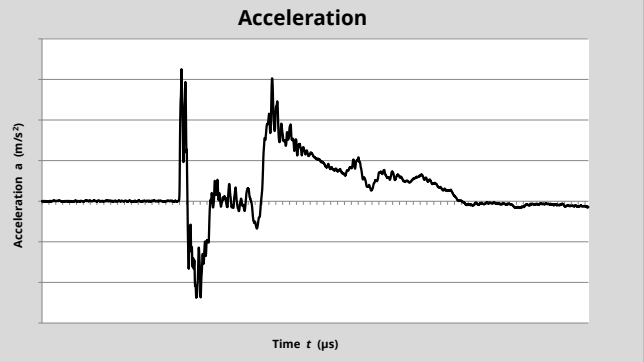


DATE OF TEST	VALID UNTIL	HAMMER ID
16/06/2023	15/06/2024	DT13137

$E_{\text{meas}} = 0.352\text{ kN-m}$

$E_{\text{theor}} = 0.473\text{ kN-m}$

Comments



$$\text{Energy Ratio (Er)} = \frac{E_{\text{meas}}}{E_{\text{theor}}}$$

74.36%

© COPYRIGHT 2023

Equipe SPT Analyzer Operator

JL

Certificate prepared by

[Signature]

Certificate checked by

[Signature]

Certificate date

19/06/2023

KEY TO BOREHOLE AND TRIAL PIT LOGS

MATERIAL LEGENDS

	Made Ground		Topsoil		Clay
	Gravel		Sand		Silt
	Peat		Boulders		Cobbles
	Chalk		Conglomerate		Volcaniclastic
	Asphalt		Void		Mudstone
	Siltstone		Sandstone		Limestone
	Ironstone		Mudstone / Siltstone		Breccia
	Coal		Coral		Bedrock
	Shale		Gypsum		Igneous (Coarse Grained)
	Igneous (Fine Grained)		Igneous (Medium Grained)		Metamorphic (Coarse Grained)
	Metamorphic (Fine Grained)		Metamorphic (Medium Grained)		

INSTALLATION / BACKFILL DETAILS

	Arisings		Concrete		Bentonite cement grout
	Bentonite seal		Filter		Pea Gravel
	Plain pipe		Slotted pipe		Piezometer / Standpipe tip

NOTE:
Legend symbols in accordance with BS 5930 (2015)

KEY TO BOREHOLE AND TRIAL PIT LOGS

m.A.O.D. metres Above Ordnance Datum.

SAMPLE AND TEST TYPES

U	Undisturbed driven tube sample - 102mm diameter, 450mm long.
P	Undisturbed pushed piston sample - 102mm diameter, 1000mm long.
TW	Undisturbed thin walled push in sample - 100mm diameter, 750mm long.
B	Bulk disturbed sample.
BLK	Block Sample
CBR	Heavy duty undisturbed sample - 154 mm diameter (CBR mould).
D	Small disturbed sample.
LB	Large Bulk disturbed sample (for earthworks testing)
C	Core sample
W	Water sample
G	Gas sample
ES	Environmental sample (soil)
j	Jar sample
t	Tub sample
p	Pot sample
s	Small sample
v	Vial sample
S	Standard Penetration Test using split spoon sampler. (See Note).
C	Standard Penetration Test using a solid 60 degree cone. (See Note).

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm.

Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total penetration is quoted eg. +50/75 mm.

HV	Hand Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
V	Borehole Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
FHT/RHT	Falling / Rising Head Permeability Test.

CORE RUN DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
FI	Fracture Index. NI - Non intact where > 25 No. per metre length.

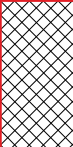
WATER COLUMN SYMBOLS

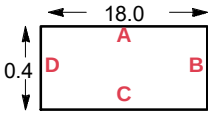
	First water strike, second water strike etc.
	Standing water level after first strike, second strike etc.
	Seepage.

NOTE:
Legend symbols in accordance with BS 5930 (2015)

APPENDIX III – HAND EXCAVATED SERVICE TRIAL PIT LOGS

Contract : Grandison Brook Client : Atkins							Trial Pit No. GB-HP06	
Dates : 15/5/23 - 15/5/23 Location : Adj to Football Ground			Job Number : Q1114 Engineer : Atkins		Ground Level : 12.68 m A.O.D. <i>Level to Ordinance Datum</i> Coordinates: 274528.15 E 195242.79 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 - 0.40	B1			0.45	MADE GROUND: Dark brown clayey sandy GRAVEL with low cobble content of sandstone, concrete and tarmac. Gravel is angular to sub angular fine to coarse sandstone, siltstone, slate, concrete, brick, tarmac, tile and rare glass with plastic and many roots. PID = 0.0ppm			
	0.30 -	ES1							
	0.50 - 1.00	B2			0.45	Orange brown slightly silty sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone, with many roots. PID = 0.0ppm		12.23	
	0.60 -	ES2							
	1.00 -	ES3			0.95	PID = 0.0ppm			
					1.40	Trial pit terminated upon locating water mains.		11.28	

PLAN 	Groundwater: No groundwater encountered Stability: Stable Shoring: None	Remarks: 12inch water main located at 1.3mbgl, 4.8m from back Football ground stand wall; 8inch cast water main located at 1.3mbgl, 2.85m from back of Football ground stand wall. Pit excavated from 274528.147(E) 195242.791(N) to 274546.547(E) 195236.171(N) and 274528.147(E) 195242.791(N) to 274531.448(E) 195244.744(N)
--	---	---

Equipment Used: 1.6tonne tracked excavator and Insulated hand tools

 Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: JW, RM & PK	Logged By: A Jones	Sheet No. 1 Of 3	m Per Page 4	All measurements in metres unless otherwise stated	
---	--------------------------	-----------------------	---------------------	-----------------	--	---

Form Name: TP LOG. Version 2.11.100, 27/11/20 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Grandison Brook		Trial Pit No.
Client : Atkins		GB-HP06
Dates : 15/5/23 - 15/5/23	Job Number : Q1114	Ground Level : 12.68 m A.O.D. <i>Level to Ordnance Datum</i>
Location : Adj to Football Ground	Engineer : Atkins	Coordinates: 274528.15 E 195242.79 N <i>Co-ordinates to National Grid</i>



	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		JW, RM & PK	A Jones	2 Of 3			

Contract : Grandison Brook		Trial Pit No.
Client : Atkins		GB-HP06
Dates : 15/5/23 - 15/5/23	Job Number : Q1114	Ground Level : 12.68 m A.O.D. <i>Level to Ordnance Datum</i>
Location : Adj to Football Ground	Engineer : Atkins	Coordinates: 274528.15 E 195242.79 N <i>Co-ordinates to National Grid</i>



	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		JW, RM & PK	A Jones	3 Of 3			

KEY TO BOREHOLE AND TRIAL PIT LOGS

MATERIAL LEGENDS

	Made Ground		Topsoil		Clay
	Gravel		Sand		Silt
	Peat		Boulders		Cobbles
	Chalk		Conglomerate		Volcaniclastic
	Asphalt		Void		Mudstone
	Siltstone		Sandstone		Limestone
	Ironstone		Mudstone / Siltstone		Breccia
	Coal		Coral		Bedrock
	Shale		Gypsum		Igneous (Coarse Grained)
	Igneous (Fine Grained)		Igneous (Medium Grained)		Metamorphic (Coarse Grained)
	Metamorphic (Fine Grained)		Metamorphic (Medium Grained)		

INSTALLATION / BACKFILL DETAILS

	Arisings		Concrete		Bentonite cement grout
	Bentonite seal		Filter		Pea Gravel
	Plain pipe		Slotted pipe		Piezometer / Standpipe tip

NOTE:
Legend symbols in accordance with BS 5930 (2015)

KEY TO BOREHOLE AND TRIAL PIT LOGS

m.A.O.D. metres Above Ordnance Datum.

SAMPLE AND TEST TYPES

U	Undisturbed driven tube sample - 102mm diameter, 450mm long.
P	Undisturbed pushed piston sample - 102mm diameter, 1000mm long.
TW	Undisturbed thin walled push in sample - 100mm diameter, 750mm long.
B	Bulk disturbed sample.
BLK	Block Sample
CBR	Heavy duty undisturbed sample - 154 mm diameter (CBR mould).
D	Small disturbed sample.
LB	Large Bulk disturbed sample (for earthworks testing)
C	Core sample
W	Water sample
G	Gas sample
ES	Environmental sample (soil)
j	Jar sample
t	Tub sample
p	Pot sample
s	Small sample
v	Vial sample
S	Standard Penetration Test using split spoon sampler. (See Note).
C	Standard Penetration Test using a solid 60 degree cone. (See Note).

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm.

Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total penetration is quoted eg. +50/75 mm.

HV	Hand Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
V	Borehole Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
FHT/RHT	Falling / Rising Head Permeability Test.

CORE RUN DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
FI	Fracture Index. NI - Non intact where > 25 No. per metre length.

WATER COLUMN SYMBOLS

	First water strike, second water strike etc.
	Standing water level after first strike, second strike etc.
	Seepage.

NOTE:
Legend symbols in accordance with BS 5930 (2015)

APPENDIX IV – MACHINE EXCAVATED TRIAL PIT LOGS

Contract : Grandison Brook Client : Atkins							Trial Pit No. GB-TP11	
Dates : 16/5/23 - 16/5/23 Location : Rear of Collins Street			Job Number : Q1114 Engineer : Atkins		Ground Level : 4.92 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 274201.82 E 195620.02 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.10 - 0.20	B1			0.35	Grass over MADE GROUND: Dark brown slightly silty sandy GRAVEL. Gravel is angular to sub angular fine to coarse sandstone with plastic. PID = 0.0ppm			
	0.20 -	ES1			0.35	MADE GROUND: Black silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone, sandstone, ash, glass, tile, and clay pipe fragments. PID = 0.0ppm		4.57	
	0.40 - 0.50	B2			0.25				
	0.50 -	ES2			0.60	Firm to stiff, mottled brown grey slightly silty slightly sandy slightly gravelly CLAY. PID = 0.0ppm		4.32	
	0.70 - 0.80	B3			0.30				
	0.80 -	D1			0.90	Soft blue grey slightly silty slightly sandy slightly organic CLAY.		4.02	
		ES3							
	1.60 -	D2				with fine fibrous organic material from 1.6mbgl			
2	2.00 - 2.20	B4			2.60				
3	3.00 - 3.50	B5							
					3.50	Trial Pit terminated at 3.5mbgl		1.42	

PLAN 		Groundwater: Seepage at 0.9mbgl, Many seepages from 1.6 - 3.5mbgl Stability: Stable Shoring: None	Remarks:
-----------------	--	--	-----------------

Equipment Used: 6.5tonne tracked 360

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: JW	Logged By: A Jones	Sheet No. 1 Of 2	m Per Page 4	All measurements in metres unless otherwise stated	
--	--	------------------------	------------------------------	----------------------------	------------------------	--	--

Contract : Grandison Brook

Client : Atkins

Trial Pit No.

GB-TP11

Dates : 16/5/23 - 16/5/23

Job Number : Q1114

Ground Level : 4.92 m A.O.D.
Level to Ordnance Datum

Location : Rear of Collins Street

Engineer : Atkins

Coordinates: 274201.82 E
195620.02 N
Co-ordinates to National Grid



Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
JW

Logged By:
A Jones

Sheet No.
2 Of 2

**m Per
Page**

All measurements in
metres unless
otherwise stated



KEY TO BOREHOLE AND TRIAL PIT LOGS

MATERIAL LEGENDS

	Made Ground		Topsoil		Clay
	Gravel		Sand		Silt
	Peat		Boulders		Cobbles
	Chalk		Conglomerate		Volcaniclastic
	Asphalt		Void		Mudstone
	Siltstone		Sandstone		Limestone
	Ironstone		Mudstone / Siltstone		Breccia
	Coal		Coral		Bedrock
	Shale		Gypsum		Igneous (Coarse Grained)
	Igneous (Fine Grained)		Igneous (Medium Grained)		Metamorphic (Coarse Grained)
	Metamorphic (Fine Grained)		Metamorphic (Medium Grained)		

INSTALLATION / BACKFILL DETAILS

	Arisings		Concrete		Bentonite cement grout
	Bentonite seal		Filter		Pea Gravel
	Plain pipe		Slotted pipe		Piezometer / Standpipe tip

NOTE:
Legend symbols in accordance with BS 5930 (2015)

KEY TO BOREHOLE AND TRIAL PIT LOGS

m.A.O.D. metres Above Ordnance Datum.

SAMPLE AND TEST TYPES

U	Undisturbed driven tube sample - 102mm diameter, 450mm long.
P	Undisturbed pushed piston sample - 102mm diameter, 1000mm long.
TW	Undisturbed thin walled push in sample - 100mm diameter, 750mm long.
B	Bulk disturbed sample.
BLK	Block Sample
CBR	Heavy duty undisturbed sample - 154 mm diameter (CBR mould).
D	Small disturbed sample.
LB	Large Bulk disturbed sample (for earthworks testing)
C	Core sample
W	Water sample
G	Gas sample
ES	Environmental sample (soil)
j	Jar sample
t	Tub sample
p	Pot sample
s	Small sample
v	Vial sample
S	Standard Penetration Test using split spoon sampler. (See Note).
C	Standard Penetration Test using a solid 60 degree cone. (See Note).

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm.

Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total penetration is quoted eg. +50/75 mm.

HV	Hand Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
V	Borehole Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
FHT/RHT	Falling / Rising Head Permeability Test.

CORE RUN DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
FI	Fracture Index. NI - Non intact where > 25 No. per metre length.

WATER COLUMN SYMBOLS

	First water strike, second water strike etc.
	Standing water level after first strike, second strike etc.
	Seepage.

NOTE:
Legend symbols in accordance with BS 5930 (2015)

APPENDIX VI – GEOTECHNICAL LABORATORY TEST RESULTS



Laboratory Report



Contract Number: 67452

Client Ref: **Q1114**

Client PO: **Q1114**

Date Received: **03-07-2023**

Date Completed: **12-07-2023**

Report Date: **12-07-2023**

Client: **Quantum Geotechnic Ltd**

Plas Newydd

Llanedi

Pontarddulais

Swansea

SA4 0FQ

This report has been checked and approved by:

Brendan Evans

Office Administrator

Contract Title: **Grandison Brook**

For the attention of: **Arwel Jones**

Test Description	Qty
Moisture Content of Soil BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS	10
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	8
PSD Wet & Dry Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	10
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	6
Organic Matter Content Sub-contracted Test	4
Disposal of samples for job	1

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

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

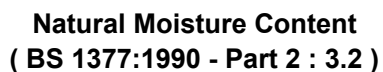
Approved Signatories:

Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)

Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)

Wayne Honey (Human Resources/ Health and Safety Manager)





Contract Number	67452	
Project Name	Grandison Brook	
Date Tested	07/07/2023	

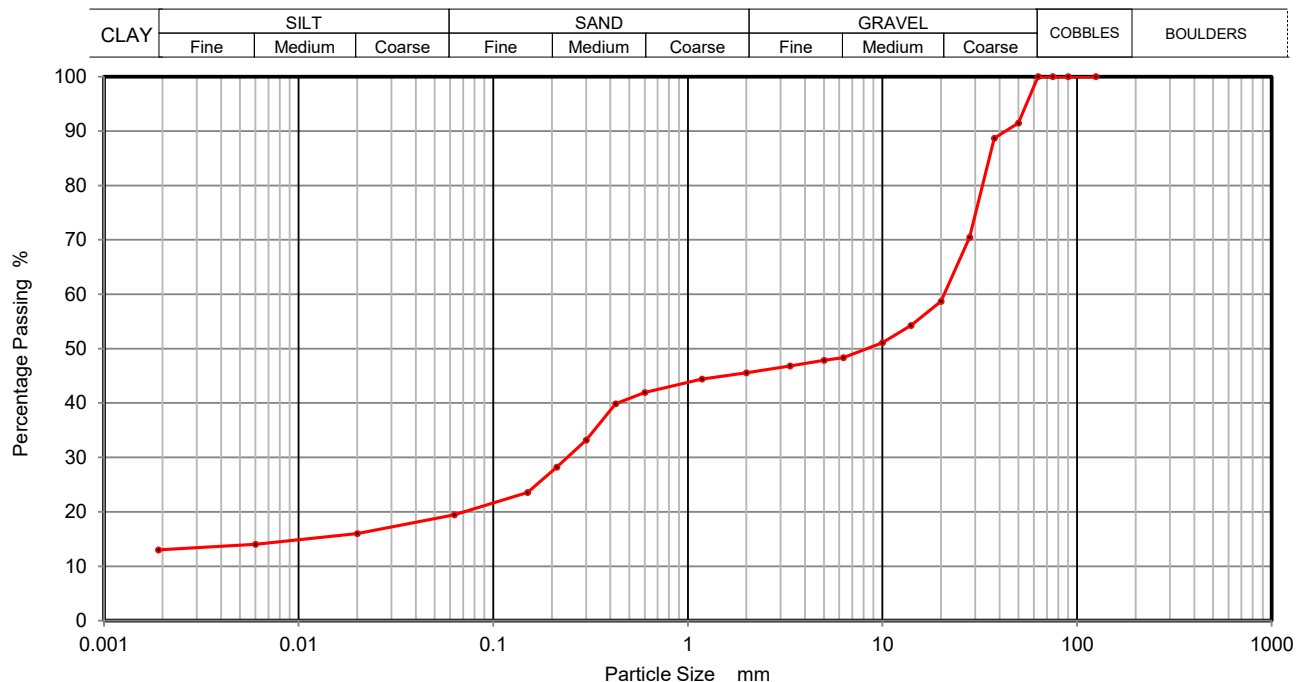
[illegible]

Operator
Clayton Jenkins



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	67452
	Borehole/Pit No. GB-HP06
Project Name	Grandison Brook
Soil Description	*See sample description sheet
Date Tested	07/07/2023
Sample No.	2
Depth Top	0.50
Depth Base	1.00
Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	16
90	100	0.0060	14
75	100	0.0020	13
63	100		
50	92		
37.5	89		
28	70		
20	59		
14	54		
10	51		
6.3	48		
5	48		
3.35	47		
2	46		
1.18	44		
0.6	42		
0.425	40		
0.3	33		
0.212	28		
0.15	24		
0.063	19		

Sample Proportions	% dry mass
Cobbles	0
Gravel	54
Sand	27
Silt	6
Clay	13

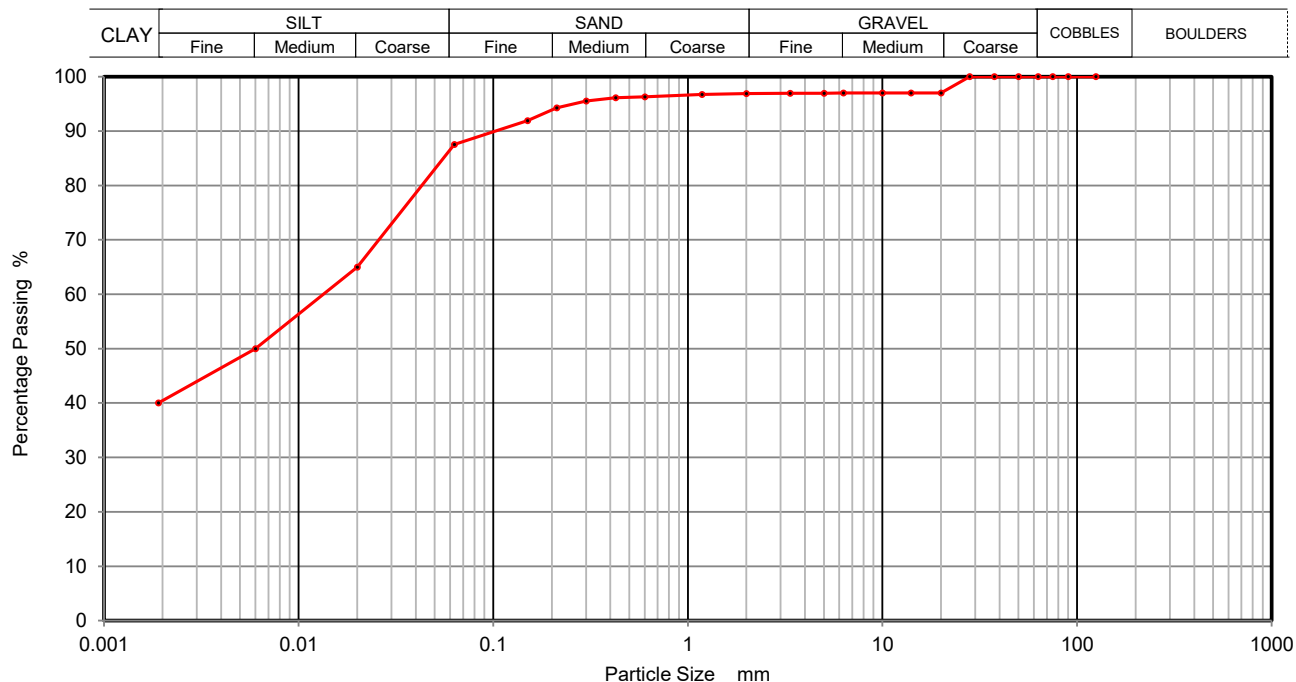
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	67452
	Borehole/Pit No. GB-TP11
Project Name	Grandison Brook
Soil Description	*See sample description sheet
Date Tested	07/07/2023
Sample No.	4
Depth Top	2.00
Depth Base	2.20
Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	65
90	100	0.0060	50
75	100	0.0020	40
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	97		
10	97		
6.3	97		
5	97		
3.35	97		
2	97		
1.18	97		
0.6	96		
0.425	96		
0.3	96		
0.212	94		
0.15	92		
0.063	88		

Sample Proportions	% dry mass
Cobbles	0
Gravel	3
Sand	9
Silt	48
Clay	40

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 67452

Borehole/Pit No. GB-BH07

Project Name Grandison Brook

Sample No. 2

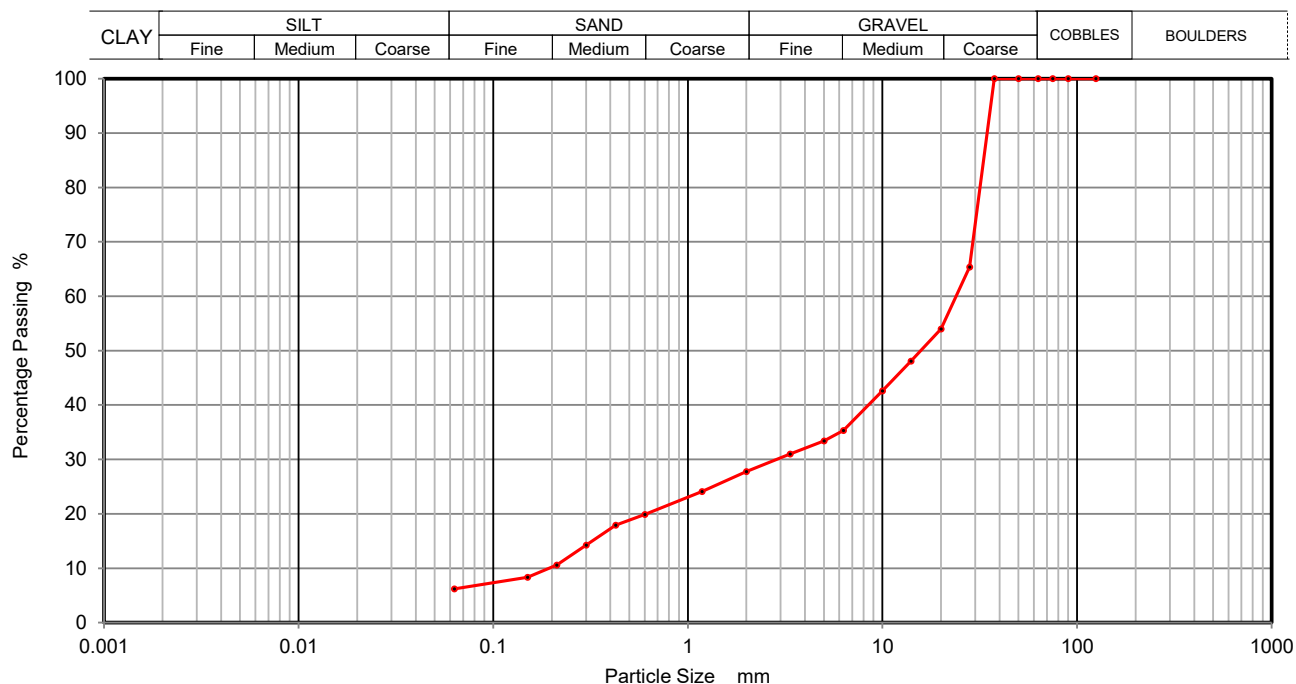
Soil Description *See sample description sheet

Depth Top 1.20

Depth Base 2.00

Date Tested 07/07/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	65		
20	54		
14	48		
10	43		
6.3	35		
5	33		
3.35	31		
2	28		
1.18	24		
0.6	20		
0.425	18		
0.3	14		
0.212	11		
0.15	8		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	72
Sand	22
Silt and Clay	6

Remarks

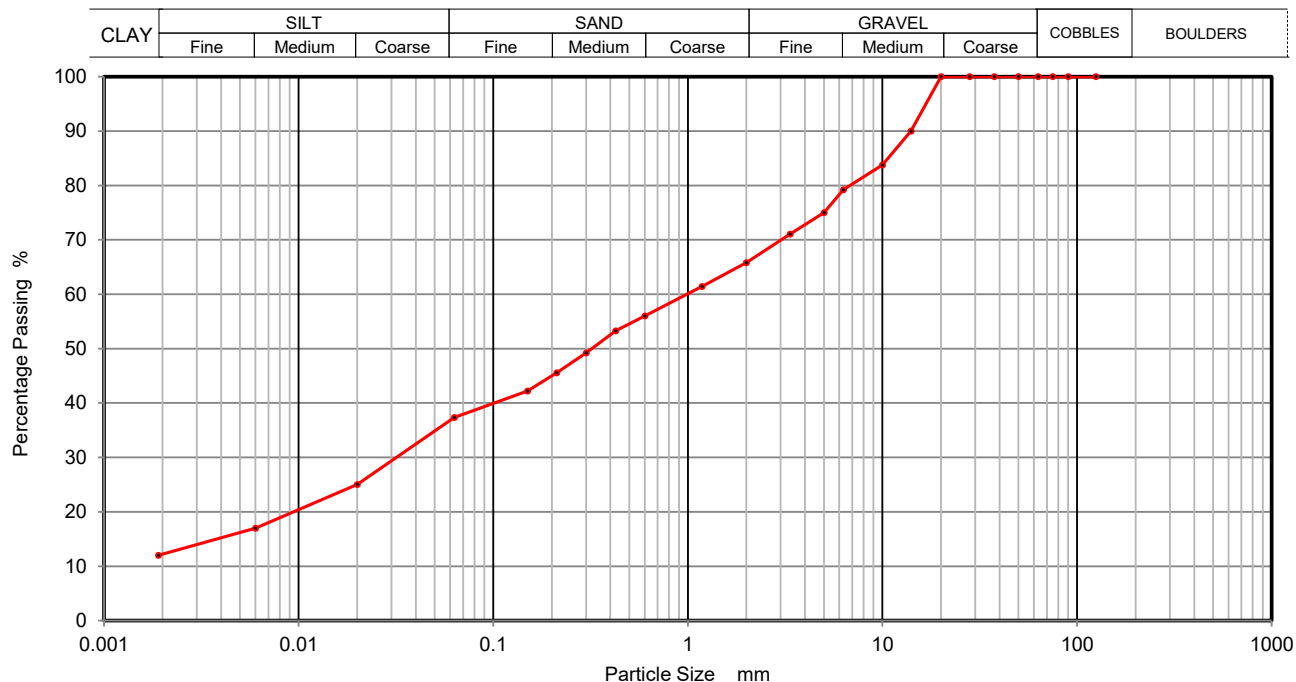
Preparation and testing in accordance with BS1377 unless noted below

Operator

David Edwards

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	67452
	Borehole/Pit No. GB-BH07
Project Name	Grandison Brook
Soil Description	*See sample description sheet
Date Tested	07/07/2023
Sample No.	3
Depth Top	2.20
Depth Base	2.60
Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	25
90	100	0.0060	17
75	100	0.0020	12
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	90		
10	84		
6.3	79		
5	75		
3.35	71		
2	66		
1.18	61		
0.6	56		
0.425	53		
0.3	49		
0.212	46		
0.15	42		
0.063	37		

Sample Proportions	% dry mass
Cobbles	0
Gravel	34
Sand	29
Silt	25
Clay	12

Remarks

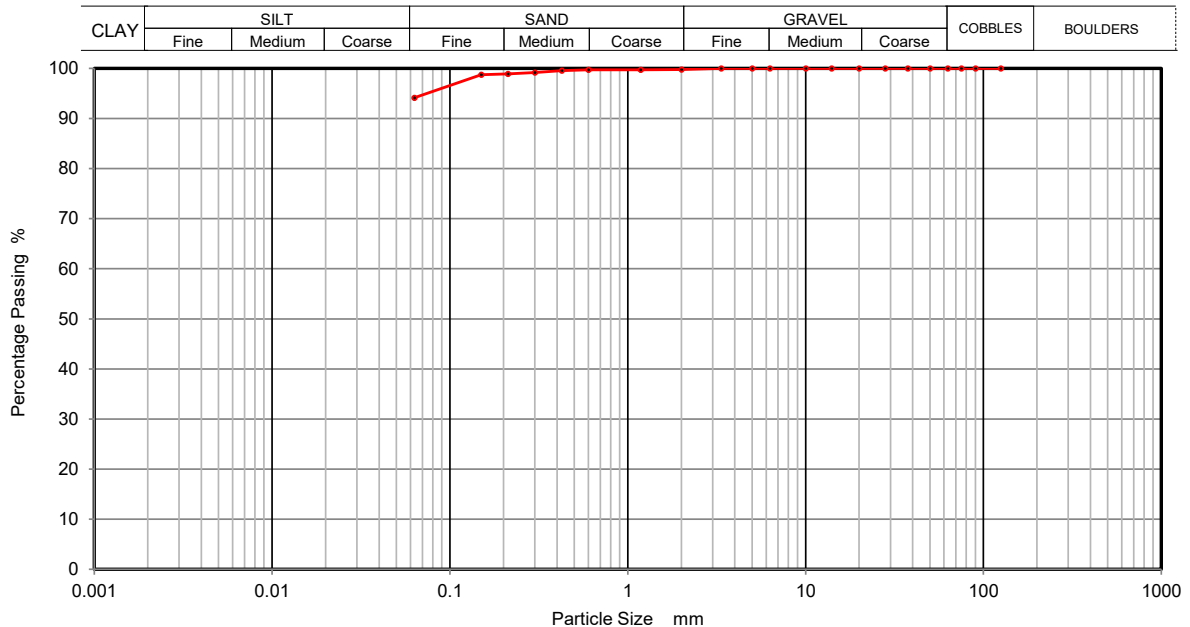
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

		Contract Number	67452
		Borehole/Pit No.	GB-BH07
Project Name	Grandison Brook	Sample No.	5
Soil Description	*See sample description sheet	Depth Top	4.00
		Depth Base	4.20
Date Tested	07/07/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	99		
0.15	99		
0.063	94		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	6
Silt and Clay	94

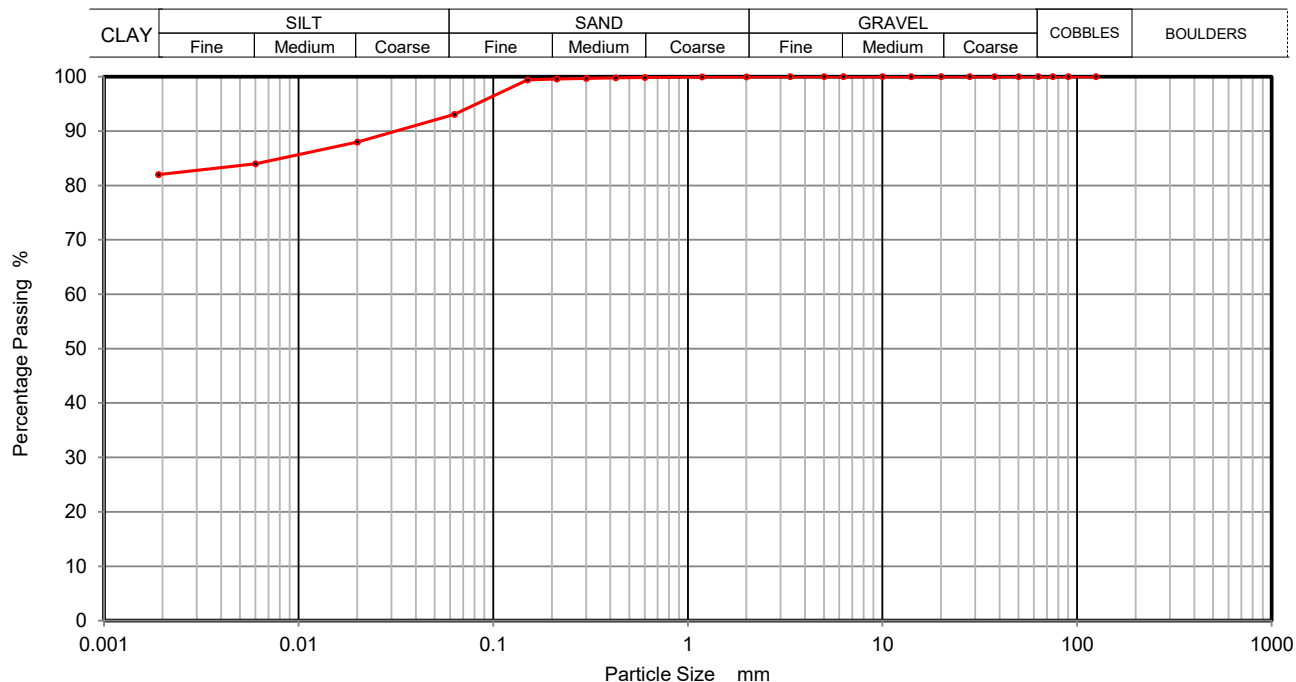
Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	67452
	Borehole/Pit No. GB-BH07
Project Name	Grandison Brook
Soil Description	*See sample description sheet
Date Tested	07/07/2023
Sample No.	6
Depth Top	4.20
Depth Base	5.00
Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	88
90	100	0.0060	84
75	100	0.0020	82
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		
0.425	100		
0.3	100		
0.212	100		
0.15	99		
0.063	93		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	7
Silt	11
Clay	82

Remarks

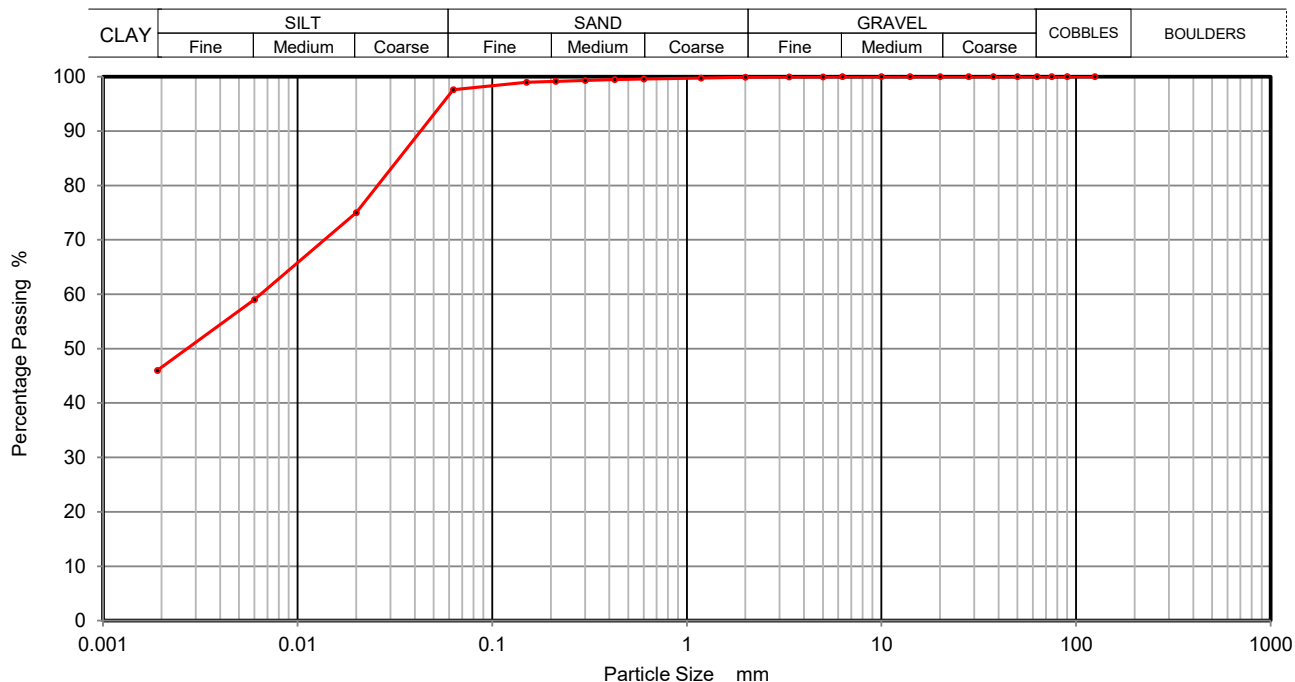
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	67452
Borehole/Pit No.	GB-BH07
Sample No.	9
Depth Top	7.20
Depth Base	8.00
Sample Type	B

Project Name	Grandison Brook
Soil Description	*See sample description sheet
Date Tested	07/07/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	75
90	100	0.0060	59
75	100	0.0020	46
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		
0.425	99		
0.3	99		
0.212	99		
0.15	99		
0.063	98		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	2
Silt	52
Clay	46

Remarks
Preparation and testing in accordance with BS1377 unless noted below

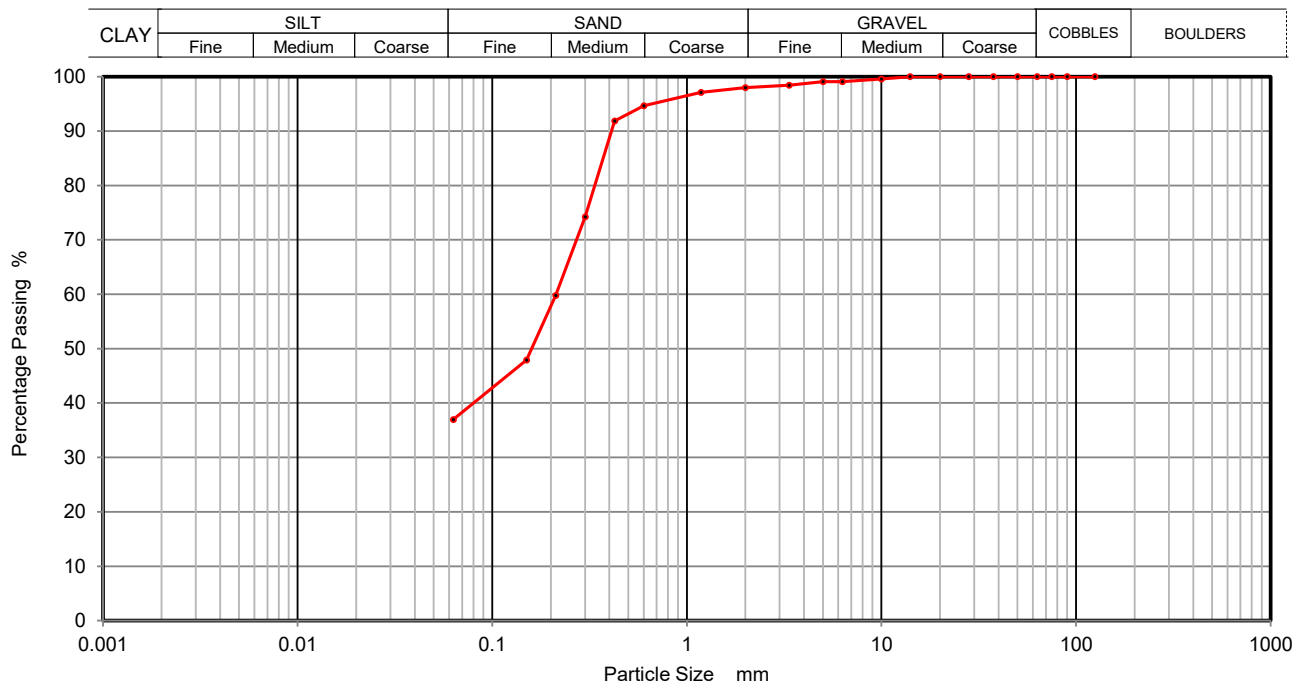
Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	67452
Borehole/Pit No.	GB-BH09
Sample No.	4
Depth Top	1.50
Depth Base	1.80
Sample Type	B

Project Name	Grandison Brook
Soil Description	*See sample description sheet
Date Tested	07/07/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98		
2	98		
1.18	97		
0.6	95		
0.425	92		
0.3	74		
0.212	60		
0.15	48		
0.063	37		

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	61
Silt and Clay	37

Remarks
Preparation and testing in accordance with BS1377 unless noted below

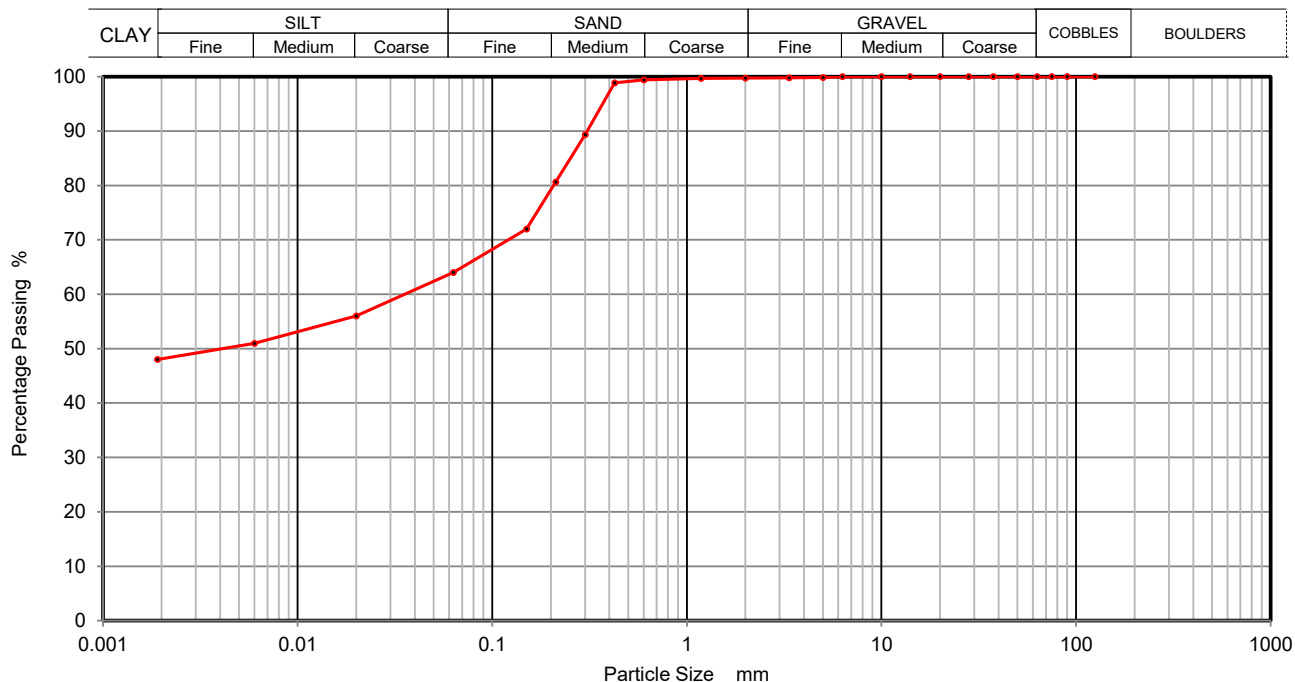
Operator
David Edwards



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	67452
Borehole/Pit No.	GB-BH09
Sample No.	5
Depth Top	2.30
Depth Base	2.50
Sample Type	B

Project Name	Grandison Brook
Soil Description	*See sample description sheet
Date Tested	07/07/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	56
90	100	0.0060	51
75	100	0.0020	48
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	99		
0.425	99		
0.3	89		
0.212	81		
0.15	72		
0.063	64		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	36
Silt	16
Clay	48

Remarks
Preparation and testing in accordance with BS1377 unless noted below

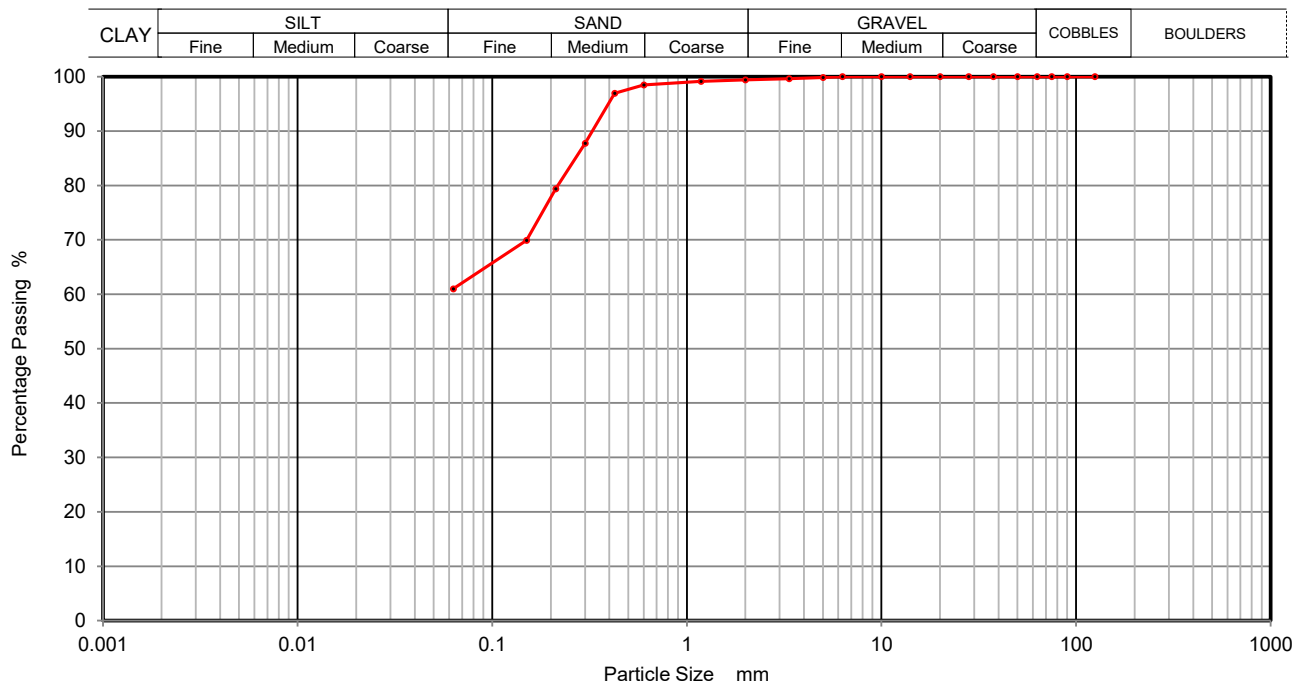
Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	67452
Borehole/Pit No.	GB-BH09
Sample No.	7
Depth Top	3.20
Depth Base	4.00
Sample Type	B

Project Name	Grandison Brook
Soil Description	*See sample description sheet
Date Tested	07/07/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	98		
0.425	97		
0.3	88		
0.212	79		
0.15	70		
0.063	61		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	38
Silt and Clay	61

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards





ANALYTICAL TEST REPORT

Contract no: 124438

Contract name: Grandison Brook

Client reference: 67452

Clients name: Geo Site and Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 05 July 2023

Analysis started: 05 July 2023

Analysis completed: 11 July 2023

Report issued: 11 July 2023

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
\$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:

E. McCulloch

Ellis McCulloch
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			124438-1	124438-2	124438-3	124438-4
Sample id			GB-TP11	GB-BH07	GB-BH07	GB-BH09
Depth (m)			2.00-2.20	4.20-5.00	7.20-8.00	2.30-2.50
Sample Type			B4	B6	B9	B5
Date sampled			-	-	-	-
Test	Method	Units				
Total Organic Carbon (TOC)	CE197	% w/w C	1.4	0.5	1.6	1.1
Estimate of OMC (calculated from TOC)	CE197	% w/w	2.5	0.9	2.7	1.9

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
124438-1	GB-TP11	2.00-2.20	Y	All (NSD)
124438-2	GB-BH07	4.20-5.00	Y	All (NSD)
124438-3	GB-BH07	7.20-8.00	Y	All (NSD)
124438-4	GB-BH09	2.30-2.50	Y	All (NSD)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.

APPENDIX VII – CHEMICAL LABORATORY TEST RESULTS

Final Report

Report No.: 23-16281-1

Initial Date of Issue: 24-May-2023

Re-Issue Details:

Client Quantum Geotechnic Ltd

Client Address: Plas Newydd
Llanedi
Pontarddulais
Swansea
SA4 0FQ

Contact(s): Arwel Jones

Project Q1114 Grandison Brook

Quotation No.: Q23-30210

Date Received: 17-May-2023

Order No.:

Date Instructed: 18-May-2023

No. of Samples: 1

Turnaround (Wkdays): 5

Results Due: 24-May-2023

Date Approved: 24-May-2023

Approved By:



Details: Stuart Henderson, Technical
Manager

Results - Leachate

Project: Q1114 Grandison Brook

Client: Quantum Geotechnic Ltd	Chemtest Job No.:		23-16281			
Quotation No.: Q23-30210	Chemtest Sample ID.:		1640426			
Order No.:	Client Sample Ref.:		1			
	Sample Location:		GBHP 06			
	Sample Type:		SOIL			
	Top Depth (m):		0.30			
	Date Sampled:		15-May-2023			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	8.1
Sulphate	U	1220	10:1	mg/l	1.0	43
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.42
Boron (Dissolved)	U	1455	10:1	µg/l	10.0	18
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	1.8
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Total)	N	1455	10:1	µg/l	0.50	0.76
Total TPH >C6-C40	U	1670	10:1	µg/l	10	< 10
Naphthalene	U	1800	10:1	µg/l	0.10	< 0.10
Acenaphthylene	U	1800	10:1	µg/l	0.10	< 0.10
Acenaphthene	U	1800	10:1	µg/l	0.10	< 0.10
Fluorene	U	1800	10:1	µg/l	0.10	< 0.10
Phenanthrene	U	1800	10:1	µg/l	0.10	< 0.10
Anthracene	U	1800	10:1	µg/l	0.10	< 0.10
Fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10
Pyrene	U	1800	10:1	µg/l	0.10	< 0.10
Benzo[a]anthracene	U	1800	10:1	µg/l	0.10	< 0.10
Chrysene	U	1800	10:1	µg/l	0.10	< 0.10
Benzo[b]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10
Benzo[k]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10
Benzo[a]pyrene	U	1800	10:1	µg/l	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	10:1	µg/l	0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	10:1	µg/l	0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	10:1	µg/l	0.10	< 0.10
Total Of 16 PAH's	U	1800	10:1	µg/l	2.0	< 2.0
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: Q1114 Grandison Brook

Client: Quantum Geotechnic Ltd	Chemtest Job No.:		23-16281		
Quotation No.: Q23-30210	Chemtest Sample ID.:		1640426		
Order No.:	Client Sample Ref.:		1		
	Sample Location:		GBHP 06		
	Sample Type:		SOIL		
	Top Depth (m):		0.30		
	Date Sampled:		15-May-2023		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	15
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	Stones
Soil Texture	N	2040		N/A	Sand
pH	U	2010		4.0	7.4
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.93
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.035
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	33
Cadmium	U	2455	mg/kg	0.10	0.68
Chromium	U	2455	mg/kg	0.5	16
Copper	U	2455	mg/kg	0.50	86
Mercury	U	2455	mg/kg	0.05	0.13
Nickel	U	2455	mg/kg	0.50	22
Lead	U	2455	mg/kg	0.50	120
Zinc	U	2455	mg/kg	0.50	200
Organic Matter	U	2625	%	0.40	6.6
Total TPH >C6-C40	U	2670	mg/kg	10	37
Naphthalene	U	2800	mg/kg	0.10	0.27
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	0.12
Phenanthrene	U	2800	mg/kg	0.10	0.99
Anthracene	U	2800	mg/kg	0.10	0.25
Fluoranthene	U	2800	mg/kg	0.10	1.8
Pyrene	U	2800	mg/kg	0.10	1.3
Benzo[a]anthracene	U	2800	mg/kg	0.10	1.2
Chrysene	U	2800	mg/kg	0.10	1.5
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	1.9
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	0.59
Benzo[a]pyrene	U	2800	mg/kg	0.10	1.0
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	0.83
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.25
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	0.61
Total Of 16 PAH's	N	2800	mg/kg	2.0	13

Results - Soil

Project: Q1114 Grandison Brook

Client: Quantum Geotechnic Ltd	Chemtest Job No.:		23-16281	
Quotation No.: Q23-30210	Chemtest Sample ID.:		1640426	
Order No.:	Client Sample Ref.:		1	
	Sample Location:		GBHP 06	
	Sample Type:		SOIL	
	Top Depth (m):		0.30	
	Date Sampled:		15-May-2023	
	Asbestos Lab:		DURHAM	
Determinand	Accred.	SOP	Units	LOD
Total Phenols	U	2920	mg/kg	0.10
				< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Final Report

Report No.: 23-16559-1

Initial Date of Issue: 02-Jun-2023

Re-Issue Details:

Client Quantum Geotechnic Ltd

Client Address: Plas Newydd Farm
Llanedi
Pontarddulais
Swansea
SA4 0FQ

Contact(s): Arwel Jones

Project Q1114 Grandison Brook

Quotation No.: Q23-30210

Date Received: 19-May-2023

Order No.:

Date Instructed: 24-May-2023

No. of Samples: 3

Turnaround (Wkdays): 5

Results Due: 31-May-2023

Date Approved: 02-Jun-2023

Approved By:



Details: Stuart Henderson, Technical
Manager

Results - Leachate

Project: Q1114 Grandison Brook

Client: Quantum Geotechnic Ltd	Chemtest Job No.:					23-16559	23-16559
Quotation No.: Q23-30210	Chemtest Sample ID.:					1641736	1641738
Order No.:	Client Sample Ref.:					2	1
	Client Sample ID.:					GB-BH09	GB-BH07
	Sample Type:					SOIL	SOIL
	Top Depth (m):					0.7	0.3
Determinand	Accred.	SOP	Type	Units	LOD		
pH	U	1010	10:1		N/A	7.3	6.8
Sulphate	U	1220	10:1	mg/l	1.0	10	13
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	5.2	1.1
Boron (Dissolved)	U	1455	10:1	µg/l	10.0	48	46
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11	0.36
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	6.3	12
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	0.62	14
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	12	27
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	38	300
Chromium (Total)	N	1455	10:1	µg/l	0.50	< 0.50	0.78
Total TPH >C6-C40	U	1670	10:1	µg/l	10	< 10	< 10
Naphthalene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Acenaphthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Fluorene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Phenanthrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Chrysene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	1800	10:1	µg/l	2.0	< 2.0	< 2.0
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030

Results - Soil

Project: Q1114 Grandison Brook

Client: Quantum Geotechnic Ltd	Chemtest Job No.:				23-16559	23-16559	23-16559
Quotation No.: Q23-30210	Chemtest Sample ID.:				1641736	1641738	1641740
Order No.:	Client Sample Ref.:				2	1	3
	Client Sample ID.:				GB-BH09	GB-BH07	GB-BH07
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0.7	0.3	1.2
	Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	19	13	16
Soil Colour	N	2040		N/A	Brown	Brown	Black
Other Material	N	2040		N/A	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand
pH	U	2010		4.0	6.8	6.8	8.1
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010	0.047	< 0.010
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	1.7
Arsenic	U	2455	mg/kg	0.5	32	16	42
Cadmium	U	2455	mg/kg	0.10	0.65	1.4	3.6
Chromium	U	2455	mg/kg	0.5	11	14	40
Copper	U	2455	mg/kg	0.50	74	200	620
Mercury	U	2455	mg/kg	0.05	0.11	0.19	0.59
Nickel	U	2455	mg/kg	0.50	16	48	120
Lead	U	2455	mg/kg	0.50	190	430	1300
Zinc	U	2455	mg/kg	0.50	350	660	1400
Organic Matter	U	2625	%	0.40	40	48	48
Total TPH >C6-C40	U	2670	mg/kg	10	< 10	540	370
Naphthalene	U	2800	mg/kg	0.10	0.95	1.1	0.85
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	0.23	0.16
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	0.54	0.24
Fluorene	U	2800	mg/kg	0.10	0.28	0.53	0.30
Phenanthrene	U	2800	mg/kg	0.10	1.4	6.7	3.7
Anthracene	U	2800	mg/kg	0.10	0.16	1.5	0.89
Fluoranthene	U	2800	mg/kg	0.10	0.48	11	6.3
Pyrene	U	2800	mg/kg	0.10	0.35	8.8	5.2
Benzo[a]anthracene	U	2800	mg/kg	0.10	0.28	5.5	3.3
Chrysene	U	2800	mg/kg	0.10	0.62	6.8	4.1
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	0.59	8.2	4.6
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	0.15	2.9	1.5
Benzo[a]pyrene	U	2800	mg/kg	0.10	0.19	5.4	3.2
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	3.9	2.4
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	0.86	0.54
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	3.5	2.1
Total Of 16 PAH's	N	2800	mg/kg	2.0	5.5	68	39
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 23-18767-1

Initial Date of Issue: 09-Jun-2023

Re-Issue Details:

Client Quantum Geotechnic Ltd

Client Address: Plas Newydd Farm
Llanedi
Pontarddulais
Swansea
SA4 0FQ

Contact(s): Arwel Jones

Project Q1114 Grandson Brook, Briton Ferry

Quotation No.: Q23-30210

Date Received: 02-Jun-2023

Order No.:

Date Instructed: 05-Jun-2023

No. of Samples: 3

Turnaround (Wkdays): 5

Results Due: 09-Jun-2023

Date Approved: 09-Jun-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Water

Project: Q1114 Grandson Brook, Briton Ferry

Client: Quantum Geotechnic Ltd	Chemtest Job No.:				23-18767	23-18767	23-18767
Quotation No.: Q23-30210	Chemtest Sample ID.:				1650675	1650676	1650677
Order No.:	Client Sample Ref.:				EW1	EW1	EW1
	Sample Location:				GB BH 07	GB SW 01	GB SW 02
	Sample Type:				WATER	WATER	WATER
	Top Depth (m):				1.93		
	Bottom Depth (m):				4.46		
	Date Sampled:				31-May-2023	31-May-2023	31-May-2023
	Time Sampled:				9:30	9:50	10:20
Determinand	Accred.	SOP	Units	LOD			
pH	U	1010		N/A	6.8	7.5	7.8
Biochemical Oxygen Demand	N	1090	mg O2/l	4.0	[B] < 4.0	[B] < 4.0	[B] < 4.0
Chloride	U	1220	mg/l	1.0	21	21	28
Ammonia (Free)	N	1220	mg/l	0.050	< 0.050	< 0.050	< 0.050
Ammonium	U	1220	mg/l	0.050	2.0	0.080	< 0.050
Ammoniacal Nitrogen	U	1220	mg/l	0.050	1.6	0.063	< 0.050
Nitrate as NO3	U	1220	mg/l	0.50	< 0.50	4.6	6.7
Sulphate	U	1220	mg/l	1.0	2.9	22	42
Cyanide (Total) Low-Level	N	1300	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050
Cyanide (Free) Low-Level	N	1300	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050
Sulphide	U	1325	mg/l	0.050	[B] < 0.050	[B] < 0.050	[B] < 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00		24	47
Total Hardness as CaCO3	U	1270	mg/l	15		76	160
Aluminium (Dissolved)	N	1455	µg/l	5.0	17	7.8	< 5.0
Arsenic (Dissolved)	U	1455	µg/l	0.20	0.58	1.0	1.4
Boron (Dissolved)	U	1455	µg/l	10.0	36	24	40
Barium (Dissolved)	U	1455	µg/l	5.00	58	21	39
Beryllium (Dissolved)	U	1455	µg/l	1.00	< 1.0	< 1.0	< 1.0
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11
Copper (Dissolved)	U	1455	µg/l	0.50	1.3	1.9	1.7
Iron (Dissolved)	N	1455	µg/l	5.0	100	120	< 5.0
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05
Molybdenum (Dissolved)	U	1455	µg/l	0.20	3.4	0.94	1.2
Nickel (Dissolved)	U	1455	µg/l	0.50	0.70	0.94	0.59
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Antimony (Dissolved)	U	1455	µg/l	0.50	< 0.50	0.55	0.90
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50	0.68	1.7
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	0.62	0.66
Zinc (Dissolved)	U	1455	µg/l	2.5	23	13	17
Chromium (Total)	N	1455	µg/l	0.50	36	2.5	1.6
Low-Level Chromium (Hexavalent)	U	1495	µg/l	0.10	[B] 0.35	[B] 0.15	[B] 0.28
Dissolved Organic Carbon	U	1610	mg/l	2.0		2.9	2.4
Total Organic Carbon	U	1610	mg/l	2.0	15	2.7	2.2
Aliphatic TPH >C5-C6	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: Q1114 Grandson Brook, Briton Ferry

Client: Quantum Geotechnic Ltd	Chemtest Job No.:				23-18767	23-18767	23-18767
Quotation No.: Q23-30210	Chemtest Sample ID.:				1650675	1650676	1650677
Order No.:	Client Sample Ref.:				EW1	EW1	EW1
	Sample Location:				GB BH 07	GB SW 01	GB SW 02
	Sample Type:				WATER	WATER	WATER
	Top Depth (m):				1.93		
	Bottom Depth (m):				4.46		
	Date Sampled:				31-May-2023	31-May-2023	31-May-2023
	Time Sampled:				9:30	9:50	10:20
Determinand	Accred.	SOP	Units	LOD			
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	µg/l	10	< 10	< 10	< 10
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0	< 2.0	< 2.0

Results - Water

Project: Q1114 Grandson Brook, Briton Ferry

Client: Quantum Geotechnic Ltd	Chemtest Job No.:				23-18767	23-18767	23-18767
Quotation No.: Q23-30210	Chemtest Sample ID.:				1650675	1650676	1650677
Order No.:	Client Sample Ref.:				EW1	EW1	EW1
	Sample Location:				GB BH 07	GB SW 01	GB SW 02
	Sample Type:				WATER	WATER	WATER
	Top Depth (m):				1.93		
	Bottom Depth (m):				4.46		
	Date Sampled:				31-May-2023	31-May-2023	31-May-2023
	Time Sampled:				9:30	9:50	10:20
Determinand	Accred.	SOP	Units	LOD			
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1650675	EW1		GB BH 07	31-May-2023	B	Coloured Winchester 1000ml
1650675	EW1		GB BH 07	31-May-2023	B	EPA Vial 40ml
1650675	EW1		GB BH 07	31-May-2023	B	Plastic Bottle 1000ml
1650676	EW1		GB SW 01	31-May-2023	B	Coloured Winchester 1000ml
1650676	EW1		GB SW 01	31-May-2023	B	EPA Vial 40ml
1650676	EW1		GB SW 01	31-May-2023	B	Plastic Bottle 1000ml
1650677	EW1		GB SW 02	31-May-2023	B	Coloured Winchester 1000ml
1650677	EW1		GB SW 02	31-May-2023	B	EPA Vial 40ml
1650677	EW1		GB SW 02	31-May-2023	B	Plastic Bottle 1000ml

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1090	Biochemical Oxygen Demand	Biochemical Oxygen demand (BOD)	Colorimetric determination of dissolved oxygen in seeded sample after 5 days incubation at 20°C.
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l ⁻¹ CaCO ₃ equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easily liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1325	Sulphide in Waters	Sulphides	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N-dimethyl-p-phenylenediamine.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1495	Low Level Hexavalent Chromium in Waters	Chromium [VI]	Colorimetric determination of hexavalent chromium expressed as Cr (VI) µg/l in water, using Ion Chromatography and UV-visible spectrophotometry.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44 Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[a,h]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

APPENDIX VIII – GAS AND GROUNDWATER MONITORING RECORDS

Page 1 of 1

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
4.9	A	50mm	2.50	1.0-2.5

[illegible]

Page 1 of 1

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
14.82	A	50mm	4.65	1.0-4.65

[illegible]



Quantum Geotechnic Ltd
Plas Newydd
Pontardulais
Swansea
SA4 0FQ

T: 01554 744880
E: enquiries@quantumgeotech.co.uk
W: <http://www.quantumgeotech.co.uk>



**GRANDISON BROOK
PHASE 4
GROUND INVESTIGATION
FACTUAL LETTER REPORT**

Report No. Q1432GI/LR01

PREPARED BY:	Quantum Geotechnic Ltd	DATE:	13/02/2024
CLIENT:	Atkins	AUTHOR:	Arwel Jones
PROJECT TITLE:	Grandison Brook Phase 4	OUR REF:	Q1432GI/LR01
RE:	Ground Investigation Factual Letter Report		

1.0 Introduction

Upon the instructions of the Client, Atkins, Quantum Geotechnic Limited (QGL) was commissioned to undertake additional ground investigation work the proposed flood alleviation scheme for Grandison Brook, Briton Ferry.

QGL were requested to attend site and undertake investigative work to determine the ground conditions and locate an underground sewage pipe, together with establishing the thickness of concrete over the existing culvert.

The general location of the site is set out in Figure 1 below.

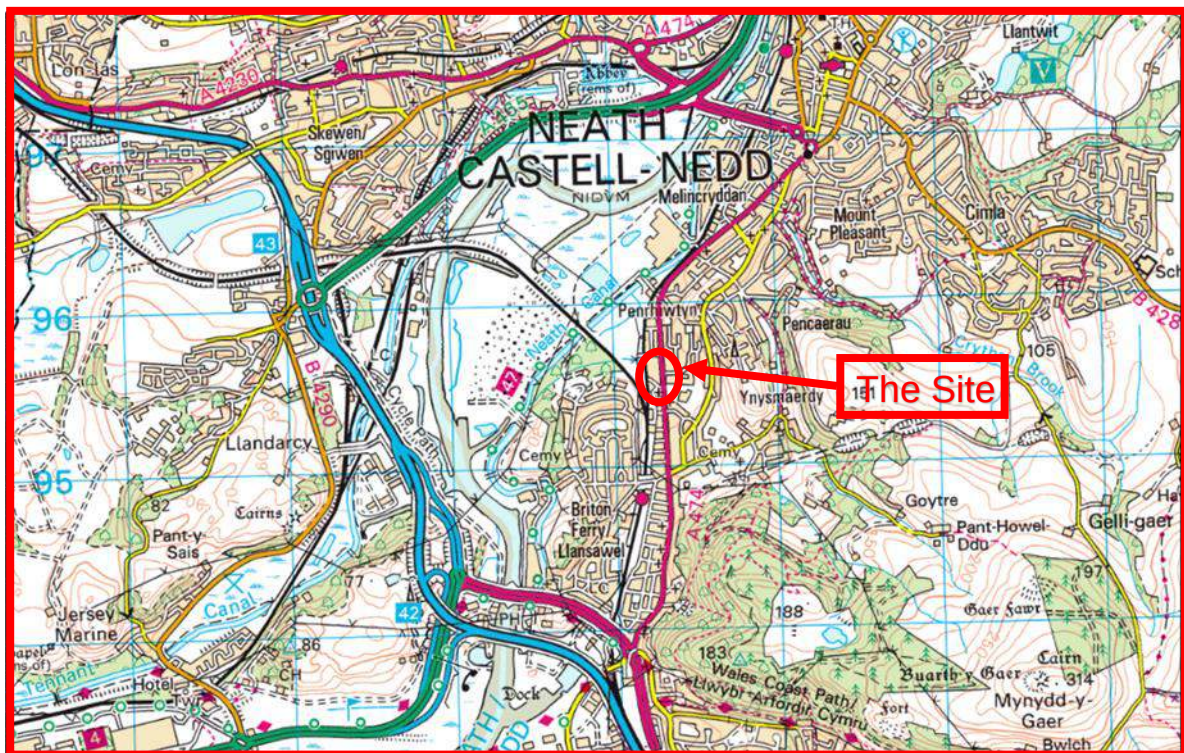


Figure 1: Site location. Not to Scale © Ordnance Survey

This report sets out the existing conditions on site and the findings of the intrusive ground investigation.

1.1 Site Setting

The site is located in the Pant Yr Heol area of Briton Ferry, Neath and passes through residential areas, sports fields, Ysgol Carreg Hir, along Ynysmaerdy Road, through Jersey Park, across the A474

and through railway land towards the River Neath. This additional investigation was focused within the land to the rear of properties along Farm Road and adjacent culvert off A474 Pant Yr Heol.

The site is located at Ordnance Survey National Grid reference SS74264 95514.

1.2 Published Geology Review

Details of the published and inferred geology of the site are summarised as followed:

The British Geological Survey (BGS) sheet 1:50,000 247 (Swansea) indicates:-

Superficial Deposits

The site is predominantly underlain by Glacial Till deposits. Tidal Flat deposits are mapped along the northern boundary of the site.

Bedrock Geology

The site is mapped to be underlain by interbedded sandstone, siltstone and mudstone with coal seams of the Hughes Member and Brithdir Member.

1.3 Exploratory Hole Locations

The exploratory hole locations were specified by the Client and set out on site by QGL. All exploratory positions were surveyed accurately using a Leica GS08 GPS on completion. Table 1 below summarises the exploratory hole locations.

Exploratory Hole ID	Easting	Northing	Ground Level (m.A.O.D)
GBTP05A	274255.40	195514.55	5.10
GBTP05B	274225.08	195543.03	5.29
GBCC01	274288.71	195516.06	5.65

Table 1: Exploratory Hole Locations

An Exploratory Hole Location Plan is presented as Figure 1 in Appendix I.

2.0 Ground Investigation Works Undertaken

The fieldworks were undertaken on 23rd and 24th October 2023 and comprised the following:

- 2 No. Hand & Machine excavated shallow trial pits to locate sewage pipe;
- 1 No. Concrete Core;
- 2 No Stream Silt samples for Laboratory testing.

No incidents or near misses were recorded during the fieldworks. No deviations from Standards and Procedures adopted for the works were recorded. Each area of investigation was fully CAT ('Cable Avoidance Tool') scanned prior to breaking ground. Site supervision and attendance by an Engineering Geologist from QGL was provided on all aspects of the site works.

2.1 Intrusive Investigation Methods

Trial Pits

Hand and Machine Excavated Trial Pitting techniques were used throughout the ground investigation using a 3tonne tracked excavator and insulated hand digging tools to expose services. Two trial pits (GBTP05A and GBTP06A) were excavated. The purpose of these pits was to locate the existing sewage pipe and assess the shallow ground conditions around the services. This method of investigation allows direct sampling of the near surface deposits for identification purposes, as well as assessment of any salient features and Made Ground or disturbed ground. The Trial Pits were logged in accordance with BS5930:2015+A1:2020; BS EN ISO 14688-1:2018 and BS EN ISO 14688-2:2018, and supervised at all times by an Engineering Geologist from QGL. Each Trial Pit location was reinstated with compacted arisings.

Table 2 below details the depths achieved and location of services within each trial pit.

Trial Pit I.D.	Sewage Pipe		Termination Depth (mbgl)
	Depth to crown of pipe (mbgl)	Distance from Garden Wall	
GBTP05A	1.1	1.6	1.3
GBTP06A	1.1	1.2	1.2

Table 2: Termination depth of Trial Pits

A complete set of Engineer's Trial Pit logs are presented within Appendix II.

Concrete Core

One vertical Masonry core was undertaken to determine the thickness of concrete pad covering the existing Culvert at the Pant Yr Heol crossing.

The core was undertaken using a hydraulic Xcalibre Magnum diamond coring drill with a 100mm core barrel. On completion the core hole was backfilled with concrete.

A summary of the concrete core is presented in Table 3, with Engineer's Concrete Core log presented in Appendix III.

Trial Pit I.D.	Angle	Length of Core (m)	Reinforcement
GBCC01	Vertical	0.57	Yes - 10mm

Table 3: Concrete Core Summary

3.0 Laboratory Testing

Environmental soil samples were taken in amber glass jars, vials and plastic tubs provided by the laboratory to suit the anticipated testing of two silt samples obtained from the stream passing through the adjacent land.

Geo-Environmental chemical testing was undertaken at Eurofins Chemtest Ltd, Newmarket. All testing was scheduled by Atkins. The following suites of testing were scheduled:

- 2 No Suite E - Soil
- 2 No Suite H - WAC testing

Laboratory test certificates are presented within Appendix IV.

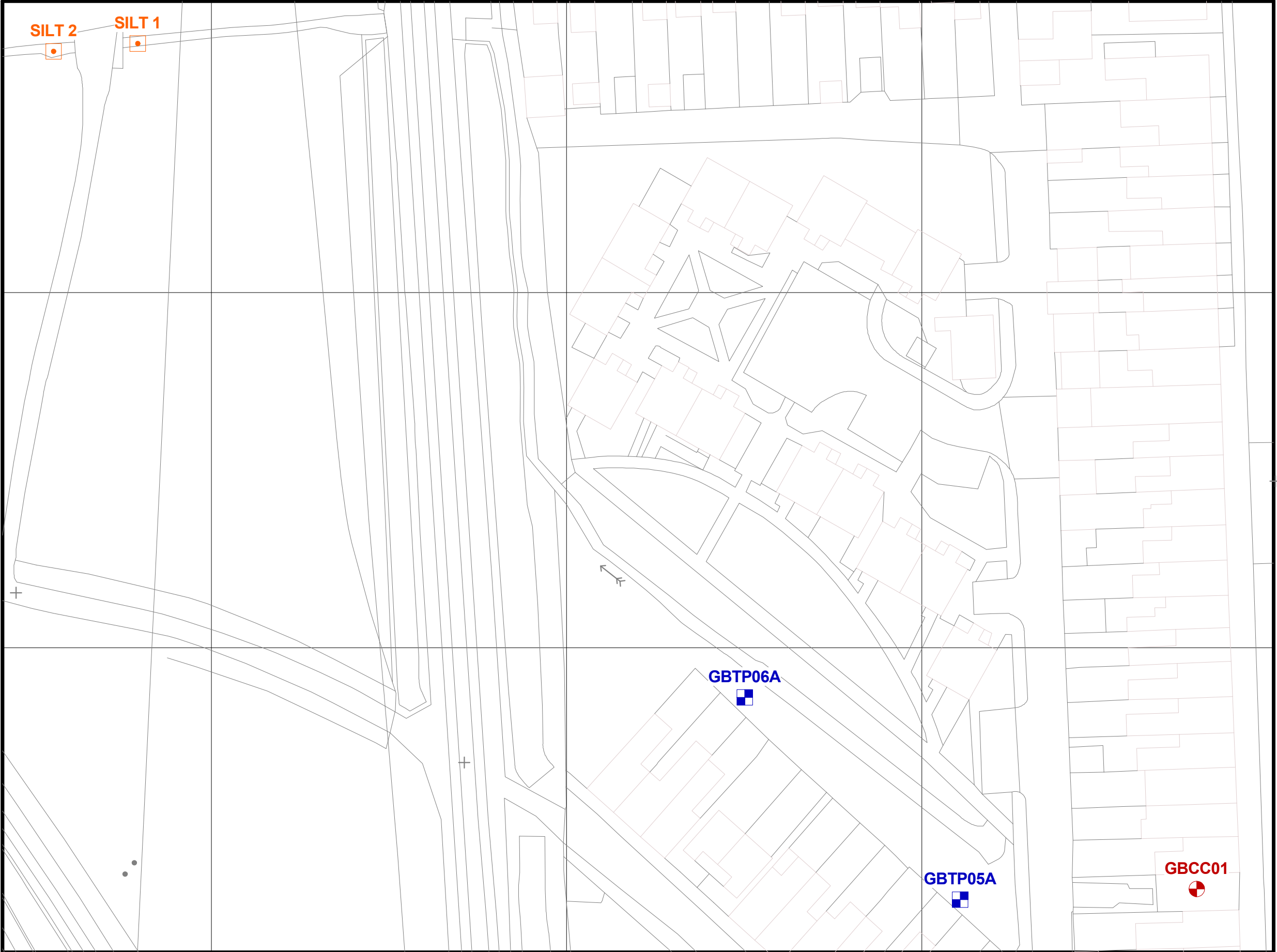
We trust that the above is of assistance; however, if you need any further clarification or have any queries, please do not hesitate to contact us.

Best Regards



Arwel Jones
Project Manager
Quantum Geotech

APPENDIX I – EXPLORATORY HOLE LOCATION PLAN



Quantum

Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
Fax:
Email: enquiries@quantumgeotech.co.uk

KEY

- | | | | |
|---|--|---|--|
|  Borehole |  Trial Pit |  Dynamic Probe |  In-situ Test |
|  Window Sample |  Sampling Point |  Historical Borehole | |

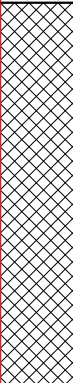
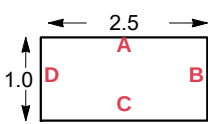
PROJECT
GRANDISON BROOK PHASE 4

DRAWING TITLE:
EXPLORATORY HOLE
LOCATION PLAN

JOB NO.
Q1432
DATE
14/02/24

FIGURE NO.
2
SCALE
1:550

APPENDIX II – ENGINEERING GEOLOGIST TRIAL PIT LOGS

Contract : Grandison Brook Phase 4 Client : Atkins							Trial Pit No. GBTP05A			
Dates : 23/11/23 - 23/11/23 Location : Brook Court			Job Number : Q1432 Engineer : Atkins		Ground Level : 5.10 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 274255.40 E 195514.55 N <i>Co-ordinates to National Grid</i>					
m B.G.L.	Samples		Tests		Strata				WATER	
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
1					0.45	Turf over TOPSOIL: Brown slightly gravelly clayey Sand with many rootlets.				
					0.45	MADE GROUND: Black silty slightly sandy Gravel with low cobble content of siltstone, brick and slag. Gravel is angular to sub angular fine to coarse siltstone, sandstone, ash, slag, brick and concrete, angular fine to medium coal with glass bottles and plastic.		4.65		
					0.85					
						1.30	250mm Clay foul sewer pipe at 1.1mbgl, 1.6m from back of rear garden wall.			
						Trial Pit terminated at 1.3mbgl		3.80		
PLAN 			Groundwater: Slow water ingress at 1.3mbgl, Seepage at 1.1mbgl. Stability: Sides collapsing Shoring: None			Remarks: Trial Pit to establish depth and location of foul sewer. Pit marked out using plan provided by client. Area CAT and Genny scanned with permit to excavate issued by QGL. Clay Foul sewer pipe located at 1.1mbgl, 1.6m from back of rear garden wall. Trial Pit backfilled with arrisings, with Turf replaced at surface.				
Equipment Used: 2.7tonne tracked excavator										
 Plas Newydd, Llanedi, Pontarddulais, Swansea SA4 0FQ Tel: 01554 744880 email: enquiries@quantumgeotech.co.uk			Operator: JJ		Logged By: A Jones		Sheet No. 1 Of 2		m Per Page 3	
							All measurements in metres unless otherwise stated			

Contract : Grandison Brook Phase 4

Client : Atkins

Trial Pit No.

GBTP05A

Dates : 23/11/23 - 23/11/23

Job Number : Q1432

Ground Level : 5.10 m A.O.D.
Level to Ordnance Datum

Location : Brook Court

Engineer : Atkins

Coordinates: 274255.40 E
195514.55 N
Co-ordinates to National Grid



Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

Operator:
JJ

Logged By:
A Jones

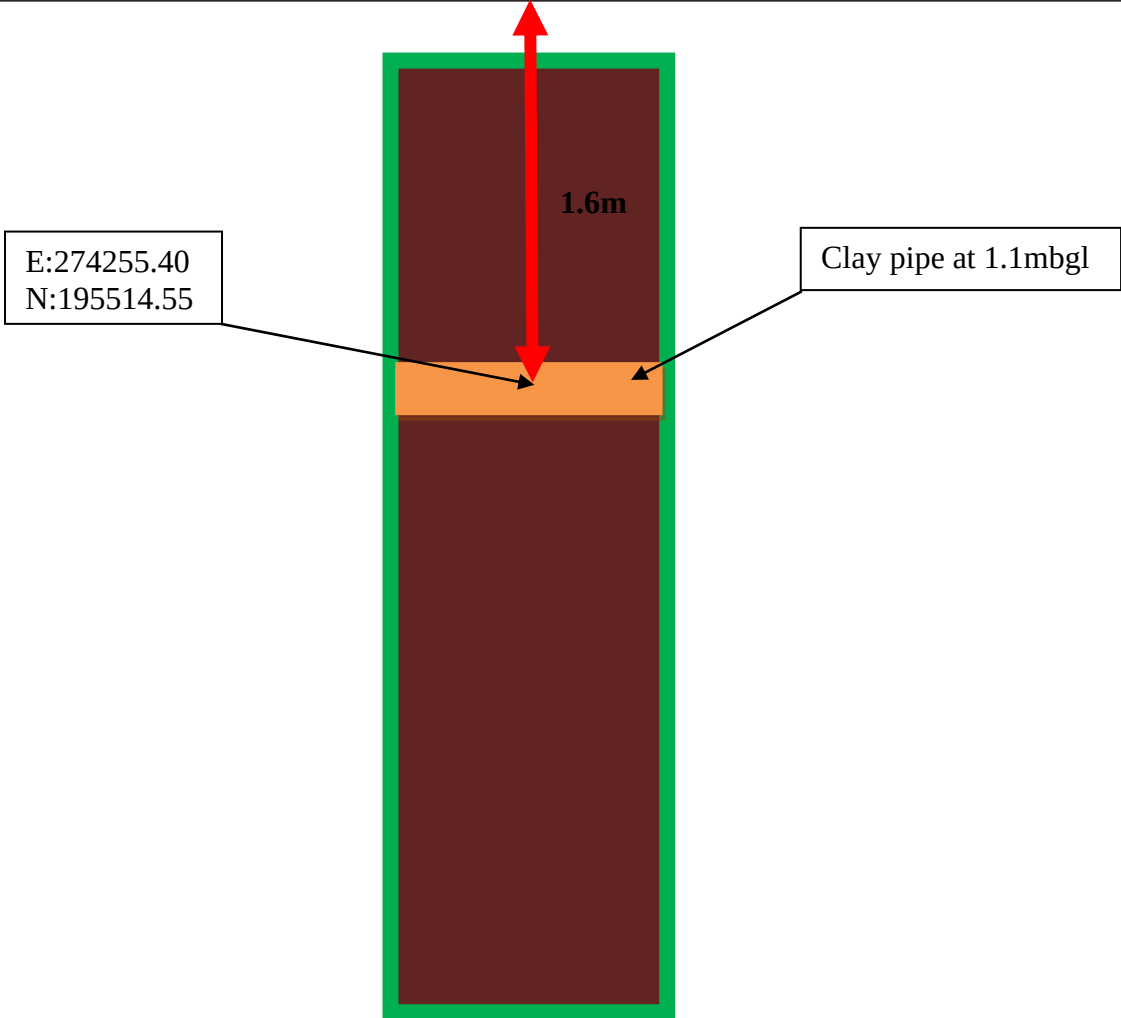
Sheet No.
2 Of 2

m Per
Page

All measurements in
metres unless
otherwise stated



Rear Garden Wall



 Quantum Geotech Quantum Geotechnic Ltd, Plas Newydd Farm, Llanedi, Pontardulais, SA4 0FQ T: 01554 744880 E-mail: enquiries@quantumgeotech.co.uk	Grandison Brook Phase 4	Scale: Not to Scale
	GBTP05A	Job No. Q1432

Contract : Grandison Brook Phase 4 Client : Atkins							Trial Pit No. GBTP06A	
Dates : 23/11/23 - 23/11/23 Location : Brook Court			Job Number : Q1432 Engineer : Atkins		Ground Level : 5.29 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 274225.08 E 195543.03 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Samples		Tests		Strata			WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	
1					0.10	Turf over TOPSOIL: Brown slightly gravelly clayey Sand with many rootlets.		
					0.10	MADE GROUND: Black silty slightly sandy Gravel with low cobble content of sandstone, brick and concrete. Gravel is angular to sub angular fine to coarse siltstone, sandstone, ash, brick and concrete, angular fine to medium coal with glass bottles and plastic.		5.19
					0.50			
					0.60			
					0.60	MADE GROUND: Black sandy slightly gravelly SILT with low cobble content of brick. Gravel is angular to sub angular fine to coarse siltstone, sandstone and fine coal.		4.69
					1.20	Trial Pit terminated at 1.2mbgl		4.09

PLAN

Groundwater: Seepage at 1.15mbgl, becoming very wet.

 Stability: Sides collapsing

 Shoring: None

Remarks: Trial Pit to establish depth and location of foul sewer.
 Pit marked out using plan provided by client.
 Area CAT and Genny scanned with permit to excavate issued by QGL.
 Clay Foul sewer pipe located at 1.1mbgl, 1.2m from back of rear garden wall.
 Trial Pit backfilled with arrisings, with Turf replaced at surface.

Equipment Used: 2.7tonne tracked excavator

 Plas Newydd, Llanedi, Pontarddulais, Swansea SA4 0FQ Tel: 01554 744880 email: enquiries@quantumgeotech.co.uk	Operator: JJ	Logged By: A Jones	Sheet No. 1 Of 2	m Per Page 3	All measurements in metres unless otherwise stated	
---	-----------------	-----------------------	---------------------	-----------------	--	--

Contract : Grandison Brook Phase 4

Client : Atkins

Trial Pit No.

GBTP06A

Dates : 23/11/23 - 23/11/23

Job Number : Q1432

Ground Level : 5.29 m A.O.D.
Level to Ordnance Datum

Location : Brook Court

Engineer : Atkins

Coordinates: 274225.08 E
195543.03 N
Co-ordinates to National Grid



Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

Operator:
JJ

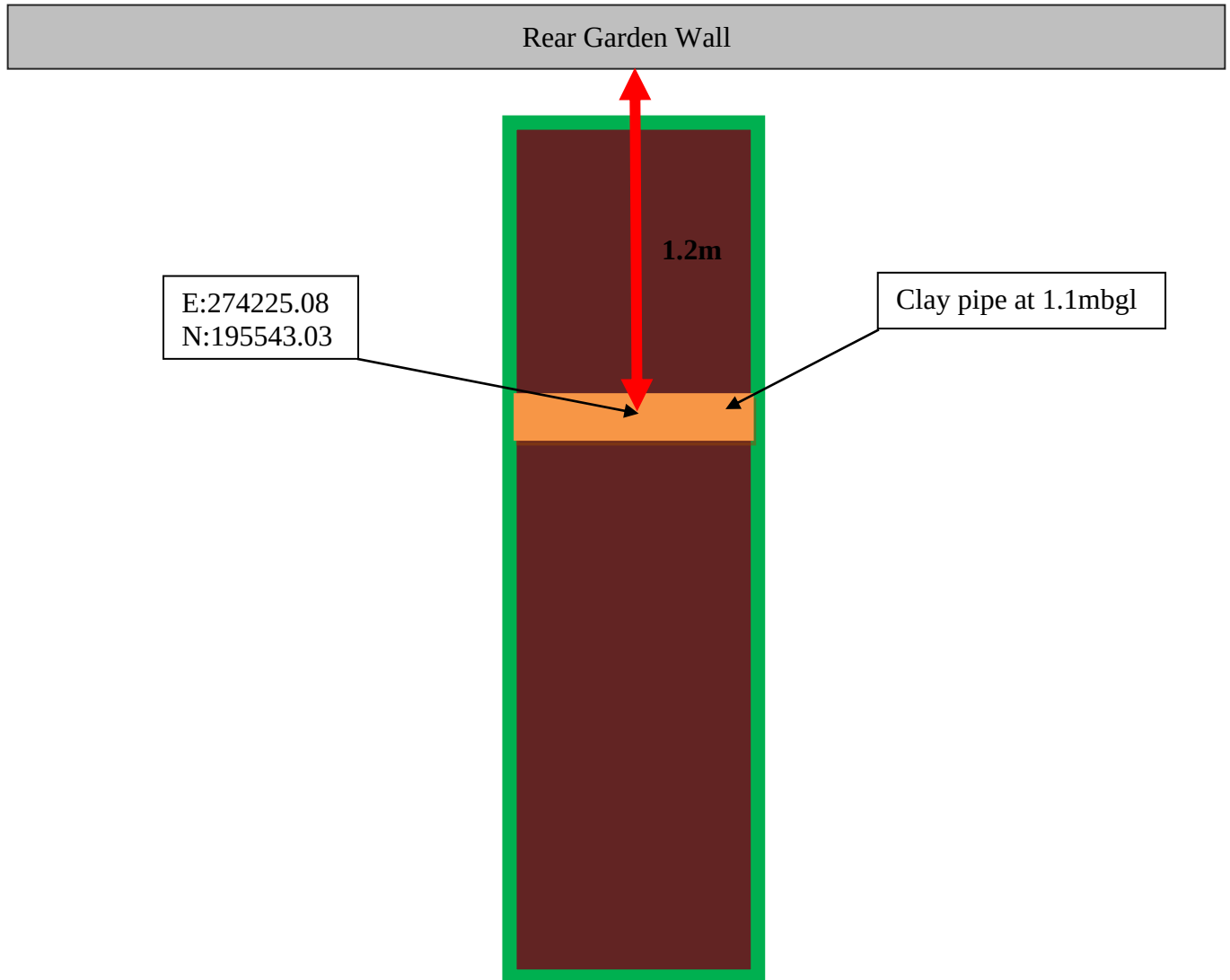
Logged By:
A Jones

Sheet No.
2 Of 2

m Per
Page

All measurements in
metres unless
otherwise stated

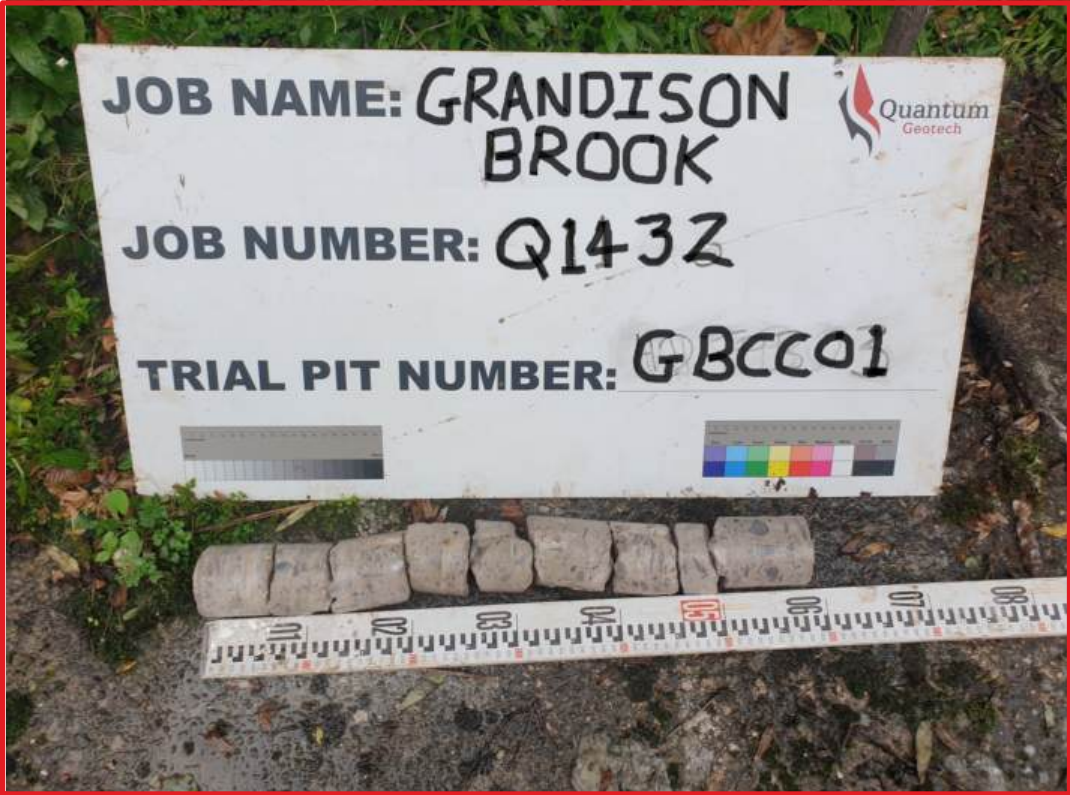




APPENDIX III – ENGINEERING GEOLOGIST CONCRETE CORE LOGS

Contract : Grandison Brook Phase 4 Client : Atkins				Core No. GBCC01	
Dates : 24/11/23 - 24/11/23 Location : Pant yr Rheol Rd		Job Number : Q1432 Engineer : Atkins		Ground Level : 5.65 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 274288.71 E 195516.06 N <i>Co-ordinates to National Grid</i>	
Core Diameter: 100mm Core Length: 0.57m					
m Along Core Axis		Description		m Along Core Axis Angle Of Fracture	
		Strong, grey, CONCRETE (non-reinforced), 75-80% aggregate of fine to coarse, angular limestone and sandstone. 10mm steel reinforcement at 0.08, 0.19 and 0.54mbgl. Drilling Induced fractures at 0.08, 0.12, 0.19, 0.25, 0.31, 0.39, 0.46 and 0.50mbgl			
Core terminated at 0.57mbgl, on Base of core at 0.57m length					
Equipment used: Xcalibre Hydraulic Hand drill Remarks: Core to establish the construction thickness over the culvert.					
Plas Newydd, Llanedi, Pontarddulais, Swansea SA4 0FQ Tel: 01554 744880 email: enquiries@quantumgeotech.co.uk		Operator: JJ	Logged By: A Jones	Sheet No. 1 Of 2	m Per Page 1
All measurements in metres unless otherwise stated					

Contract : Grandison Brook Phase 4		Core No. GBCC01	
Client : Atkins			
Dates : 24/11/23 - 24/11/23	Job Number : Q1432	Ground Level :	5.65 m A.O.D. <i>Level to Ordnance Datum</i>
Location : Pant yr Rheol Rd	Engineer : Atkins	Coordinates:	274288.71 E 195516.06 N <i>Co-ordinates to National Grid</i>
Core Diameter: 100mm Core Length:0.57 m			



	Plas Newydd, Llanedi, Pontarddulais, Swansea SA4 0FQ Tel: 01554 744880 email: enquiries@quantumgeotech.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		JJ	A Jones	2 Of 2	1		

APPENDIX IV – LABORATORY TEST RESULTS



Final Report

Report No.: 23-42377-1

Initial Date of Issue: 08-Jan-2024

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Arwel Jones

Project Q1142 Grandison Brook Phase 4

Quotation No.: **Date Received:** 21-Dec-2023

Order No.: **Date Instructed:** 21-Dec-2023

No. of Samples: 2

Turnaround (Wkdays): 7 **Results Due:** 08-Jan-2024

Date Approved: 08-Jan-2024

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: Q1142 Grandison Brook Phase 4

Chemtest Job No: 23-42377 Chemtest Sample ID: 1749190 Sample Ref: Sample ID: Sample Location: Silt 1 Top Depth(m): Bottom Depth(m): Sampling Date: 24-Nov-2023							Landfill Waste Acceptance Criteria				
			Limits								
			Inert Waste Landfill				Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill			
Determinand									SOP	Accred.	Units
Total Organic Carbon									2625	M	%
Loss on Ignition											
Total BTEX									2760	M	mg/kg
Total PCBs (7 Congeners)									2815	M	mg/kg
TPH Total WAC									2670	M	mg/kg
Total (Of 17) PAH's			2700	N	mg/kg						
pH at 20C			2010	M							
Acid Neutralisation Capacity											
Eluate Analysis					2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic			1455	U	< 0.0002	0.0010	< 0.0002	0.0082	0.5	2	25
Barium			1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300
Cadmium			1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium			1455	U	< 0.0005	0.0016	< 0.0005	0.014	0.5	10	70
Copper			1455	U	< 0.0005	0.0014	< 0.0005	< 0.0005	2	50	100
Mercury			1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum			1455	U	0.0005	0.0004	0.0009	0.0043	0.5	10	30
Nickel			1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead			1455	U	< 0.0005	0.0010	< 0.0005	0.0082	0.5	10	50
Antimony			1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5
Selenium			1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7
Zinc			1455	U	0.014	0.033	0.028	0.30	4	50	200
Chloride			1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride			1220	U	0.14	0.16	< 1.0	1.6	10	150	500
Sulphate			1220	U	1.3	< 1.0	< 10	< 10	1000	20000	50000
Total Dissolved Solids			1020	N	19	12	38	130	4000	60000	100000
Phenol Index			1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon			1610	U	2.8	2.7	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	18

Leachate Test Information	
Leachant volume 1st extract/l	0.312
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.304

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: Q1142 Grandison Brook Phase 4

Chemtest Job No: 23-42377							Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1749191							Limits		
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:									
Sample Location: Silt 2									
Top Depth(m):									
Bottom Depth(m):									
Sampling Date: 24-Nov-2023									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	M	%				3		
Loss on Ignition							--		
Total BTEX	2760	M	mg/kg				[B] < 0.010		
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10		
TPH Total WAC	2670	M	mg/kg				[B] 220		
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0		
pH at 20C	2010	M					7.8		
Acid Neutralisation Capacity							--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1455	U	0.0002	0.0005	0.0004	0.0047	0.5	2	25
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	0.0006	< 0.0005	0.0050	0.5	10	70
Copper	1455	U	0.0006	0.0009	0.0011	0.0010	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0006	0.0004	0.0012	0.0046	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	0.013	0.027	0.025	0.24	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.14	0.13	< 1.0	1.3	10	150	500
Sulphate	1220	U	1.3	< 1.0	< 10	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	18	11	36	120	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	2.8	< 2.5	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	16

Leachate Test Information	
Leachant volume 1st extract/l	0.316
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.291

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1749190			Silt 1	24-Nov-2023	B	Amber Glass 250ml
1749190			Silt 1	24-Nov-2023	B	Amber Glass 60ml
1749190			Silt 1	24-Nov-2023	B	Plastic Tub 1000g
1749191			Silt 2	24-Nov-2023	B	Amber Glass 250ml
1749191			Silt 2	24-Nov-2023	B	Amber Glass 60ml
1749191			Silt 2	24-Nov-2023	B	Plastic Tub 1000g

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 23-42059-1

Initial Date of Issue: 05-Jan-2024

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Arwel Jones

Project Q1142, GRANDISON BROOK PHASE
4

Quotation No.: Q23-33408

Date Received: 20-Dec-2023

Order No.:

Date Instructed: 21-Dec-2023

No. of Samples: 2

Turnaround (Wkdays): 5

Results Due: 04-Jan-2024

Date Approved: 05-Jan-2024

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: Q1142, GRANDISON BROOK PHASE 4

Client: Spencer Quantum Ltd		Chemtest Job No.:				23-42059	23-42059
Quotation No.: Q23-33408		Chemtest Sample ID.:				1748080	1748081
Order No.:		Client Sample Ref.:				1	2
		Sample Location:				SILT 1	SILT 2
		Sample Type:				SOIL	SOIL
		Date Sampled:				24-Nov-2023	24-Nov-2023
		Asbestos Lab:				NEW-ASB	NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
ACM Type		U	2192		N/A	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	18	16
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones and Roots	Stones and Roots
Soil Texture		N	2040		N/A	Clay	Clay
pH at 20C		M	2010		4.0	8.3	7.8
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	2.5	< 0.40
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.026	< 0.010
Cyanide (Total)		M	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50
Arsenic		M	2455	mg/kg	0.5	23	24
Cadmium		M	2455	mg/kg	0.10	0.13	0.18
Chromium		M	2455	mg/kg	0.5	45	50
Copper		M	2455	mg/kg	0.50	33	47
Mercury		M	2455	mg/kg	0.05	0.08	0.10
Nickel		M	2455	mg/kg	0.50	49	59
Lead		M	2455	mg/kg	0.50	36	55
Zinc		M	2455	mg/kg	0.50	130	150
Organic Matter		M	2625	%	0.40	9.4	3.3
Total TPH >C6-C40		M	2670	mg/kg	10	[B] < 10	[B] 290
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	< 2.0

Results - Soil

Project: Q1142, GRANDISON BROOK PHASE 4

Client: Spencer Quantum Ltd		Chemtest Job No.:		23-42059	23-42059
Quotation No.: Q23-33408		Chemtest Sample ID.:		1748080	1748081
Order No.:		Client Sample Ref.:		1	2
		Sample Location:		SILT 1	SILT 2
		Sample Type:		SOIL	SOIL
		Date Sampled:		24-Nov-2023	24-Nov-2023
		Asbestos Lab:		NEW-ASB	NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD
Total Phenols		M	2920	mg/kg	0.10
				< 0.10	< 0.10

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1748080	1		SILT 1	24-Nov-2023	B	Amber Glass 250ml
1748080	1		SILT 1	24-Nov-2023	B	Amber Glass 60ml
1748080	1		SILT 1	24-Nov-2023	B	Plastic Tub 1000g
1748081	2		SILT 2	24-Nov-2023	B	Amber Glass 250ml
1748081	2		SILT 2	24-Nov-2023	B	Amber Glass 60ml
1748081	2		SILT 2	24-Nov-2023	B	Plastic Tub 1000g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

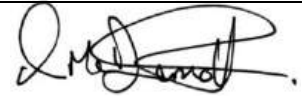
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

DOCUMENT CONTROL

Contract Name: Grandison Brook Phase 4
Contract Reference: Q1432
Report Type: Ground Investigation Factual Letter Report
Report Reference: Q1432GI/LR01
Date of Report Production: February 2024
Client: Atkins

Version:	Date:	Prepared by:	Checked by:	Approved by:
01	13/02/24	A. Jones	P. Darby	R. McDermott
				
		Project Manager	Senior Engineering Geologist B.Sc.(Hons.),M.Sc., C.Geol., F.G.S.	Company Manager B.Sc.(Hons.),M.Sc., C.Geol., F.G.S.
<i>Disclaimer: Quantum Geotech Limited has prepared this report in accordance with the instructions of the above named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.</i> Quantum Geotechnic Ltd, Plas Newydd, Llanedi, Pontarddulais, Swansea. SA4 0FQ T: 01554 744880 E: enquiries@quantumgeotech.co.uk				



Quantum Geotechnic Ltd
Plas Newydd
Pontardulais
Swansea
SA4 0FQ

T: 01554 744880
E: enquiries@quantumgeotech.co.uk
W: <http://www.quantumgeotech.co.uk>

**GRANDISON BROOK FLOOD ALEVATION SCHEME
– JERSEY PARK BOREHOLES
GROUND INVESTIGATION
FACTUAL REPORT**

Report No. Q1484/FR.01



GRANDISON BROOK FLOOD ALEVIATION SCHEME – JERSEY PARK BOREHOLES GROUND INVESTIGATION

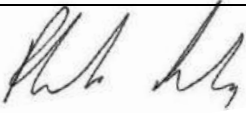
GROUND INVESTIGATION FACTUAL REPORT

Report No. Q1484/FR.01

June 2024

DOCUMENT CONTROL

Contract Name:	Grandison Brook Flood Alleviation Scheme – Jersey Park Boreholes Ground Investigation
Contract Reference:	Q1484
Report Type:	Ground Investigation Factual Report
Report Reference:	Q1484/FR.01
Date of Report Production:	June 2024
Client:	Atkins

Version:	Date:	Prepared by:	Checked by:	Approved by:
0.0	24/06/24	A Jones	P. Darby	J. Stark
				
		Project Manager	Senior Engineering Geologist B.Sc.(Hons.), M.Sc., C.Geol., F.G.S.	Technical Manager B.Sc.(Hons.), M.Sc., C.Geol., F.G.S.

Disclaimer: Quantum Geotechnic Limited has prepared this report in accordance with the instructions of the above named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

Quantum Geotechnic Ltd, Plas Newydd, Llanedi, Swansea, SA4 0FQ. T: 01554 744880 E: enquiries@quantumgeotech.co.uk
Website: <http://www.quantumgeotech.co.uk/>

CONTENTS

0.0	FOREWORD	4
1.0	INTRODUCTION	5
1.1	General	5
1.2	Purpose of Ground Investigation.....	5
1.3	Initial Scope of Work	5
2.0	SITE DETAIL	7
2.1	Site Description.....	7
2.2	Statutory Service Information.....	7
2.3	Published Geology.....	7
3.0	FIELDWORK	8
3.1	General	8
3.2	Exploratory Hole Locations	8
3.3	Boreholes.....	8
3.4	Land gas and Groundwater Standpipe Installations.....	9
3.5	In-Situ Testing.....	10
3.6	Soil, Groundwater and Surface Water Sampling.....	11
3.7	Post-Fieldwork Monitoring	11
4.0	LABORATORY TESTING.....	12
4.1	General	12
4.2	Geotechnical Testing	12
4.3	Geo-Environmental Testing	12
5.0	REFERENCES	13

APPENDICES

APPENDIX I – SITE PLANS AND FIGURES I

APPENDIX II – BOREHOLE LOGS.....II

APPENDIX III – GAS AND GROUNDWATER MONITORING RECORDS.....III

APPENDIX IV – GEOTECHNICAL LABORATORY TEST RESULTS IV

APPENDIX V – CHEMICAL LABORATORY TEST RESULTS V

0.0 FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

0.1 General

Recommendations made and opinions expressed in the report are based on the strata observed in the excavations, together with the results of site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the Exploratory Holes or which occur between Exploratory Holes. Whilst the report may suggest the likely configuration of strata, both between Exploratory Holes and below the maximum depth of investigation, this is only indicative and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

0.2 Investigation Procedures

Dynamic Sample Borehole techniques for ground investigation have been employed within the project. All Exploratory Hole operations, sampling and logging of soils, rocks and in-situ testing complies with the recommendations of the British Code of Practice BS 5930: 2015 'Site Investigations', British Code of Practice BS 10175: A2:2017 'Investigation of Potentially Contaminated Sites' and BS 1377: 1990, 'Methods of Test for Soils for Engineering Purposes'.

0.3 Routine Sampling

Representative bulk disturbed and environmental samples of the different strata are taken following completion of logging. These samples are sealed and labelled in clear plastic bags and 2kg plastic tubs. Soil samples obtained for environmental testing are sampled and sealed in borosilicate amber jars or in specialist vessels where required. Ground Water samples were sampled and sealed in borosilicate amber bottles or in specialist vessels where required. All samples are returned from site to QGL's laboratory for controlled storage within 24 hours of sampling to await test scheduling/requirements.

0.4 In-Situ Testing, Surveying & Instrumentation

In-situ testing comprised:

- Standard Penetration Testing within Boreholes (SPT)
- All exploratory hole locations to be surveyed for location and elevation.
- PID testing

0.5 Groundwater

Where possible, the depth of entry of any influx of groundwater is recorded during the course of excavation or boring operations. The rate of inflow into the excavation or borehole is monitored during the course of the excavation or during boring procedures. Upon encountering any water strikes, work is temporarily halted and the water levels monitored for a standard twenty-minute period recording the change in water level at the end of the twenty minutes.

Groundwater conditions observed in the excavations are those appertaining to the period of investigation. It should be noted, however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions or other causes.

0.6 Retention of Samples

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded. Further to notifying the Engineer/ Client with one week's notice all soil and/or rock samples not tested will be discarded 28 days after submission of the approved final report.

1.0 INTRODUCTION

1.1 General

Upon the instructions of Atkins, the scheme Engineer / Investigation Supervisor / Client, Quantum Geotechnic Limited (QGL) was commissioned to undertake a ground investigation works for the proposed flood alleviation scheme for Grandison Brook, Briton Ferry at Jersey Park.

The siteworks were carried out between 6th and 8th March 2024.

This report presents a factual account of the fieldwork carried out, includes descriptions of the strata encountered, available groundwater observations, details of in-situ testing undertaken, location of services encountered and provides results of subsequent laboratory testing of samples obtained from the investigation.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out site investigation work.

1.2 Purpose of Ground Investigation

The purpose of the ground investigation is to determine the existing ground conditions on the site, to allow the design of the proposed attenuation tank as part of the Grandison Brook Flood Alleviation Scheme culvert improvement works. This is the fifth phase of Ground Investigation carried out on the scheme by QGL.

The proposed culvert improvement works will involve the installation of a new culvert in the highway and through green spaces, also enclosing the current open channel within a culvert in some sections. The new culvert will rejoin the existing watercourse further downstream before it discharges into the River Neath. The Grandison Brook Flood Alleviation Scheme is required to mitigate flooding to properties within the vicinity of the Brook. This phase of investigation was undertaken in Jersey Park, Britton Ferry.

1.3 Initial Scope of Work

The aim of the ground investigation is to:

- Determine the nature and thickness of any Made Ground;
- Determine the nature and thickness of the Superficial Deposits;
- Recover suitable samples for geotechnical and geo-environmental laboratory testing;

The initial scope of works entails the following:

- 3 no. Dynamic Sampled Boreholes to maximum 8m depth

- In-Situ Testing
- Post fieldwork groundwater and ground gas monitoring

General

- Geotechnical and Geo-environmental Laboratory Testing.
- Factual reporting detailing the investigation.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out ground investigation work.

2.0 SITE DETAIL

2.1 Site Description

The site is located within the recreational grounds of Jersey Park in the Ynysmaerdy area of Briton Ferry, Neath. The site is accessed through the park gates leading off Ynysmaerdy Road. The site is an asphalt surface comprising children's play area and open-air sport facilities.

The site is located at Ordnance Survey National Grid reference SS745949

QGL were the appointed Contractor for the works, under order number 5192793-003 issued on 13th February 2024.

The general extent of the site is shown in Figure 1 in Appendix I.

2.2 Statutory Service Information

All service information was held by the Client with the relevant plans and information made available to QGL prior to commencement of the intrusive works.

A permit to excavate was issued by QGL for all exploratory holes. Standard QGL procedures for breaking ground were followed and all areas were scanned using a cable avoidance tool. A hand dug trial pit was excavated to 1.2m prior to commencement of drilling where services may be at risk. All hand excavation was undertaken using insulated digging tools.

2.3 Published Geology

Details of the published and inferred geology of the site are summarised as followed:

The British Geological Survey (BGS) sheet 247(Swansea) 1:50,000 indicates,

Superficial Deposits

The site is predominantly underlain by Glacial Till deposits. Tidal Flat deposits are mapped along the northern boundary of the site.

Bedrock Geology

The site is mapped to be underlain by interbedded sandstone, siltstone and mudstone with coal seams of the Hughes Member and Brithdir Member.

3.0 FIELDWORK

3.1 General

A summary of the works completed and covered by this report are given below:

- 3 No. Dynamic Sampled boreholes. (GB-BH10 - GB-BH12)
- In-situ testing and sampling.
- Post fieldwork groundwater and ground gas monitoring.

Full time site supervision and attendance from QGL was undertaken on all aspects of the site works and subsequent reinstatement works of all exploratory hole locations. All service plans were held onsite, with all site personnel inducted by QGL and briefed of the pertinent Risk Assessments and Method Statements relating to the tasks to be undertaken.

The borehole locations were subject to a 1.2m deep service / utility inspection pit prior to any drilling. Also, each area of investigation was fully eCAT4+ ('Cable Avoidance Tool') scanned prior to breaking ground.

3.2 Exploratory Hole Locations

The exploratory hole locations were specified by Atkins and set out on site by QGL using the co-ordinates provided.

Exploratory Hole Location Plans are presented as Figure 2 in Appendix I and the Exploratory Hole co-ordinates and levels are detailed within Table 1 below.

Table 1: Exploratory Hole Co-Ordinates & Levels

Exploratory Hole	Easting	Northing	Height (mAOD)
GB-BH10	274578.96	194916.75	14.75
GB-BH11	274569.43	194934.25	14.42
GB-BH12	274565.07	194970.34	14.30

3.3 Boreholes

Percussive Rotary (Dynamic Sampling) Boreholes

A Commachio MC205 rubber track-mounted rotary drilling rig was used to progress the boreholes to depths of 8.0mbgl (below ground level)..

Each Borehole was drilled using dynamic sampling methods through the superficial deposits with an ODEX casing system. Dynamic Sampling is a technique whereby a hydraulically driven percussive hammer

attached to the head of the drill rig mast is used to drive a 1.00m length, 101mm diameter, steel sampling tube through the soils to obtain undisturbed samples within 87mm core liner.

On encountering an obstruction or refusal of the Dynamic sample barrel, all boreholes were continued and kept open using an ODEX casing system of 115mm diameter. A combined air/mist flush was used to clear the hole of returns and debris.

In-situ testing was carried out in all boreholes (see section 3.4.1.).

Details of the exploratory holes, including final depths in metres below ground level (mbgl) and SPT Hammer used are provided below in Table 2.

Table 2: Borehole details

Exploratory Hole ID	Drilling method	SPT Hammer Reference	Termination Depth (mbgl)	Notes/Reason for Termination
GB-BH10	Dynamic Sampling	AR830	8.0	Scheduled Depth
GB-BH11	Dynamic Sampling	AR830	8.0	Scheduled Depth
GB-BH12	Dynamic Sampling	AR830	8.0	Scheduled Depth

The Engineering Geologist's borehole logs are presented within Appendix II.

A 50mm dual gas and groundwater monitoring standpipe was installed in all boreholes, records of the post fieldwork monitoring are presented in Appendix III.

3.4 Land gas and Groundwater Standpipe Installations

50mm internal diameter standpipes were installed in all boreholes for the purposes of land gas and groundwater monitoring and sampling.

Monitoring standpipes consist of plastic pipework set in filter aggregate (pea gravel) forming a well. The filter is sealed at one or both ends by use of bentonite pellets which 'go off' and become watertight. Parts of the pipe itself are slotted, allowing the infiltration of groundwater which can then be accessed through the pipe from ground level. Slotted sections are covered by 'geo-sock' to reduce the intrusion of silt into the standpipes and the range of depths at which the groundwater is intercepted is known as the 'response zone'.

Standpipes were installed using a combination of 1m and 3m lengths of pipework (threaded at either end) fitted together and lowered into the borehole. The boreholes were then filled with either pea gravel or bentonite pellets (depending on which zone or level) and cemented in place at ground level with a steel

flush cover.

Each standpipe installation was designed by the Investigation Supervisor and instructed on site, after the completion of each borehole. All standpipe installations were sealed above the response zone by a minimum of 0.50m of bentonite pellets.

A summary of the pipe installation details is presented in Table 3

Table 3: Borehole Installation Details

Exploratory Hole ID	Installation Pipe ID	Standpipe Diameter (Internal mm)	Response Zone (mbgl)		Total Standpipe Length (m)
			Top	Bottom	
GB-BH10	A	50	2.00	8.00	8.00
GB-BH11	A	50	2.00	8.00	8.00
GB-BH12	A	50	1.00	8.00	8.00

3.5 In-Situ Testing

3.5.1 Standard Penetration Testing

Standard penetration tests (SPTs) were undertaken within all boreholes, at intervals specified by Redstart.

This is a dynamic test as described in BS EN ISO 22476-3:2005 + A1:2011. Within fine grained or cohesive soils, the test incorporates a small diameter tube (650mm length, 50mm external diameter and 35mm internal diameter) with a cutting shoe known as the 'split barrel sampler'. The sampler is forced into the soil dynamically using blows from a 63.5kg hammer dropped through 760mm. The sampler is initially advanced 150mm into the soil with seating blows, then the number of blows required to advance the sampler each 75mm increment up to a depth of 300mm is recorded. This cumulative total number of blows over the 300mm test is referred to as the "N" value. For coarse gravels and bedrock the split barrel is replaced by a 60° cone (SPT(C) - Standard Penetration Test (Cone)). SPT/SPT(C) results are detailed within the relevant borehole Logs. The SPT calibration certificate for the SPT hammer used during this investigation is presented in Appendix II.

3.5.2 Headspace Testing

All environmental soil samples collected were screened using a calibrated Photoionisation Detector onsite to measure isobutylene, prior to being sent to the laboratory.

Soil is placed in a sealed plastic bag, half-filled to allow airspace above the soil and left a period of no less than one hour prior to screening.

Measurements are detailed within the exploratory hole logs included within Appendix II.

3.6 Soil, Groundwater and Surface Water Sampling

Disturbed samples of soil were taken in clear sealed plastic bags and white plastic tubs. Environmental samples were taken at various depths as noted on the relevant logs.

Environmental soil samples were taken in amber glass jars, vials and plastic tubs provided by the laboratory to suit the anticipated testing.

Groundwater samples were collected during post fieldwork monitoring rounds. All water samples were collected in the required vials, plastic and glass bottles.

The environmental soil and water samples were dispatched to Chemtest, Newmarket using a daily courier service for storage awaiting testing instructions from the Engineer.

Geotechnical samples were returned from site to QGL's laboratory for controlled storage to await test scheduling/requirements. For specific details of laboratory testing see Section 4.0.

3.7 Post-Fieldwork Monitoring

Following completion of the siteworks, QGL have undertake 3 No. monitoring visits to record land gas and groundwater within the installed borehole standpipes.

Monitoring comprised groundwater and ground gas monitoring. Gas monitoring was undertaken using a GA2000 gas analyser to measure the following:

- Atmospheric pressure
- Flow rates (L/hr)
- Methane
- Carbon Dioxide
- Oxygen
- Carbon Monoxide
- Hydrogen Sulphide

Results are presented within Appendix III.

4.0 LABORATORY TESTING

4.1 General

The laboratory testing was scheduled by Atkins and comprised a number of geotechnical classification and performance tests as well as chemical testing on selected soil samples and ground water samples recovered from the investigation.

4.2 Geotechnical Testing

Geotechnical classification and performance testing was undertaken at QGL's approved UKAS accredited laboratory at GSTL, Llanelli.

Geotechnical tests undertaken on selected soil samples are listed below. All the geotechnical soil testing work was carried out in accordance with the procedures stipulated in the various sections of BS 1377:1990 "Methods of test for soils for civil engineering purposes" and to UKAS accreditation where applicable and chemical testing carried out in accordance with BRE Special Digest 1:2005 "Concrete in aggressive ground".

Geotechnical soil testing undertaken:

- 16 No. Moisture content
- 9 No. Liquid limit, plastic limit and plasticity index
- 9 No. Particle size distribution by wet sieving
- 8 No. Sedimentation by Pipette
- 2 No. Organic Matter
- 2 No. BRE Reduced Suite

Geotechnical Laboratory Test results are presented in Appendix IV.

4.3 Geo-Environmental Testing

Geo-Environmental chemical testing was undertaken at Eurofins Chemtest Ltd, Newmarket. All testing was scheduled by Atkins. The following suites of testing were scheduled:

- 6 No Suite E (Soil)
- 2 No. Suite F (Leachate)

Chemical Laboratory Test results are presented in Appendix V.

5.0 REFERENCES

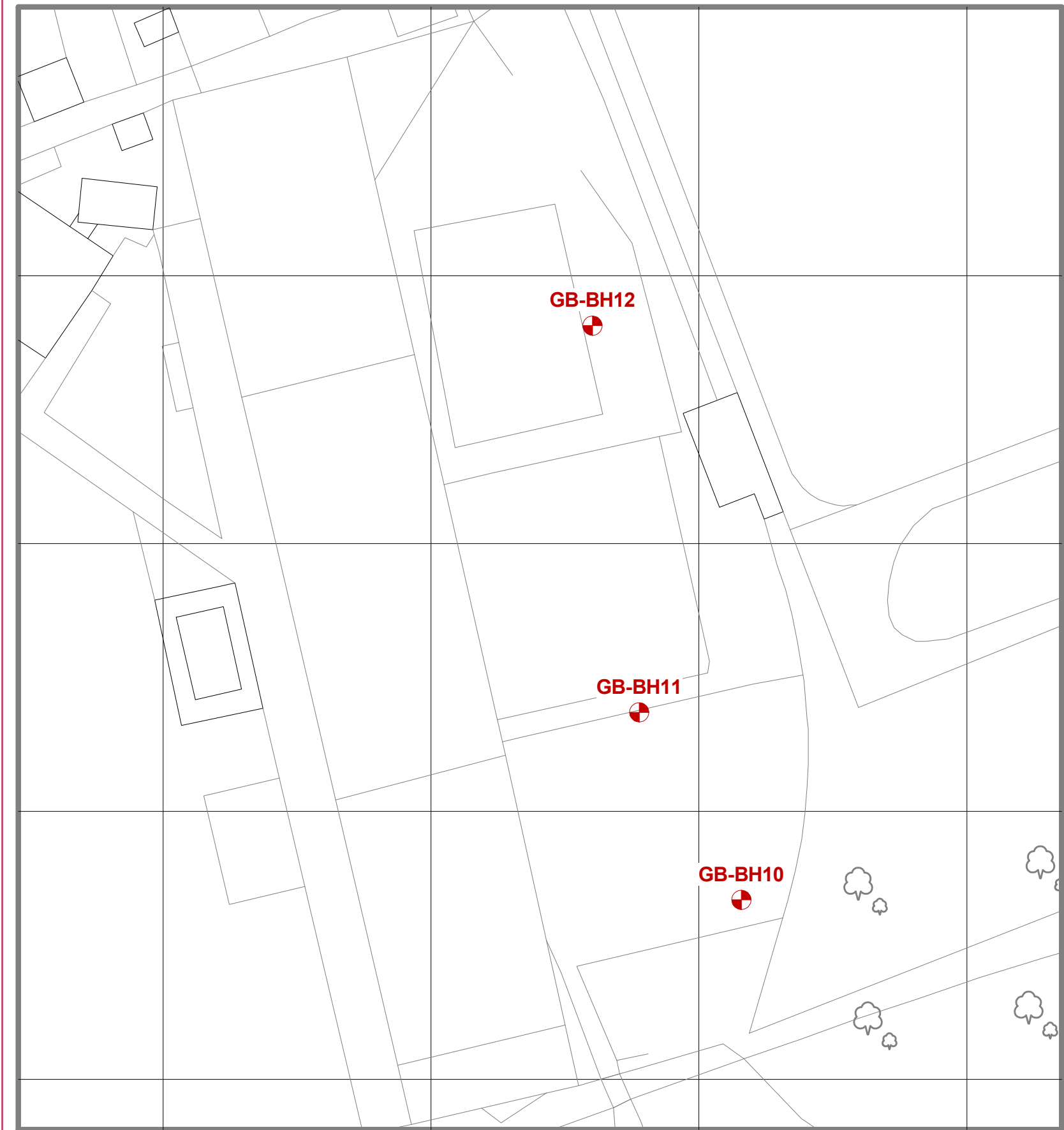
British Geological Survey:

- The British Geological Survey (BGS) sheet 1:50,000 247 (Swansea)
- BGS Geology of Britain Viewer (www.bgs.ac.uk)

Specialist Publications:-

- British Code of Practice BS 5930:2015 '*Code of Practice for Site Investigations*'
- British Code of Practice BS 1377:1990 '*Methods of test for soils for civil engineering purposes*'.
- British Code of Practice BS EN ISO 14688-1:2002+A2:2013 investigation and testing. Identification and classification of soil. Identification and description
- British Code of Practice BS EN ISO 14688-2:2004+A2:2013 Geotechnical investigation and testing. Identification and classification of soil. Principles for a classification.
- British Code of Practice BS EN ISO 14689-1:2003 Ground Investigation and Testing – Identification and classification of rock
- Health and Safety Executive Guidance Note EH40/90
- *CIRIA Report 143* 'The Standard Penetration Test (SPT): Methods and Use', 1995.
- BRE (2005) Special Digest 1:2005, 3rd Edition, Concrete in aggressive ground. BRE, Garston.
- BS 6031: 2009 Code of Practice for Earthworks.
- Workmanship for excavation shall comply with BS 8000: 1989 Part 1, Sections 3.1, 3.2 and 3.3.
- Specification for Highway Works (MCHW 1), Volume 1, Series 600 & Series 800, 2006 with Amendment 2016
- ICE UK Specification for Ground Investigation Second Edition.
- Design Manual for Roads and Bridges: Volume 7 Pavement Design and Maintenance
- Specification for Highways Works Series 600 Earthworks
- Highways Agency Interim Advice Note 73/06, Rev 1 2009, Clause 7.7

APPENDIX I – SITE PLANS AND FIGURES



APPENDIX II – BOREHOLE LOGS

Contract : Grandison Brook FAS - Jersey Park Boreholes												Borehole No. GB-BH10																			
Client : Atkins																															
Dates : 7/3/24 - 8/3/24						Job Number : Q1484				Ground Level : 14.75 m A.O.D. Level to Ordnance Datum																					
Location :						Engineer : Atkins				Coordinates: 274578.96 E 194916.75 N Co-ordinates to National Grid																					
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill															
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.																	
0	1.20	0					SPT (S) 50/5mm (2-23/0mm-50/5mm--)		0.10 - 0.20	B1	(0.08)	TARMAC		14.67																	
									0.20	ES1	(0.22)	MADE GROUND: Dark grey slightly silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse sandstone with plastic.		14.45																	
									0.50 - 1.00	B2	(0.15)	Very strong CONCRETE		14.30																	
									0.50	ES2	0.45	MADE GROUND: Dark grey slightly silty slightly sandy GRAVEL with high cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone and siltstone with rare pottery.																			
									1.00	ES3																					
									1.50 - 2.00	D1																					
									1.50	ES4																					
									2.20 - 2.70	D2																					
									2.80	ES5																					
									2.90	D3																					
1	2.70						SPT (S) 22 (2-6-6-6-5-5)		2.20 - 2.70	D2	2.10	Brown slightly silty slightly gravelly clayey SAND. Sand is fine to coarse.		12.65																	
									2.80	ES5																					
									2.90	D3																					
									3.00 - 4.00	B3																					
2																															
3																															
4																															
Hole Progress / Water Obs														Casing		Groundwater				Flush											
Date / Time		H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour		Sealed	Depth	Type	Returns																	
07/03/2024 16:30		1.20		DRY			1.50	1.50	Medium groundwater ingress at 1.5mbgl		2.90	0.00 - 8.00	Air																		
08/03/2024 07:30		1.20		DRY																											
Plant: Comacchio 205																															
Remarks: Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer.																															
STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL.																															
On completion borehole installed following clients instructions with lockable steel flush cover at surface.																															
Quantum Geotech Plas Newydd, Llanedi, Pontarddulais, Swansea SA4 0FQ Tel: 01554 744880 email: enquiries@quantumgeotech.co.uk						Operator: GB & DF		Logged By: A Jones		Sheet No. 1 Of 2		m Per Page 4.1		All measurements in metres unless otherwise stated																	
														AGS																	

Contract : Grandison Brook FAS - Jersey Park Boreholes												Borehole No. GB-BH10				
Client : Atkins																
Dates : 7/3/24 - 8/3/24						Job Number : Q1484				Ground Level : 14.75 m A.O.D. Level to Ordnance Datum						
Location :						Engineer : Atkins				Coordinates: 274578.96 E 194916.75 N Co-ordinates to National Grid						
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thick- ness)	Description	Legend	Red. Level A.O.D.		
5	4.20	100					4.2	SPT (S) 41 (8-9-10-10-10-11)	4.10	D4		Dark brown clayey sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone. Sand is fine to coarse. *DRILLERS DESCRIPTION* Dark brown / grey sandy GRAVEL with cobbles. Arisings logged as Dark brownish grey silty slightly clayey slightly sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone and siltstone.				
		100							4.30 - 4.50	B4	4.30 (0.20)					10.45
							4.50 - 5.00	D5	4.50	10.25						
6	5.70	0					7.2	SPT (S) 50 (6-6-8-13-18-11)	5.50 - 6.00	D6	(3.50)					
7	7.20 7.3	0					7.2		6.50 - 7.00	D7						
8									7.50 - 8.00	D8						
											8.00	Borehole terminated at scheduled depth of 8.0mbgl.		6.75		
Hole Progress / Water Obs						Casing			Groundwater				Flush			
Date / Time		H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour		Sealed	Depth	Type	Returns		
08/03/2024 13:00		8.00	8.00	DRY	8.00	115.00										
Plant: Comacchio 205																
Remarks: Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer.																
STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL.																
On completion borehole installed following clients instructions with lockable steel flush cover at surface.																
						Operator: GB & DF		Logged By: A Jones		Sheet No. 2 Of 2		m Per Page 4.1		All measurements in metres unless otherwise stated		

Contract : Grandison Brook FAS - Jersey Park Boreholes

Client : Atkins

Borehole No.

GB-BH10

Dates : 7/3/24 - 8/3/24

Job Number : Q1484

Ground Level : 14.75 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Atkins

Coordinates: 274578.96 E
194916.75 N
Co-ordinates to National Grid



Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

Operator:
GB & DF

Logged By:
A Jones

Sheet No.
1 Of 1

m Per
Page
2

All measurements in
metres unless
otherwise stated



Contract : Grandison Brook FAS - Jersey Park Boreholes												Borehole No. GB-BH11					
Client : Atkins																	
Dates : 7/3/24 - 7/3/24						Job Number : Q1484				Ground Level : 14.42 m A.O.D. Level to Ordnance Datum							
Location :						Engineer : Atkins				Coordinates: 274569.43 E 194934.25 N Co-ordinates to National Grid							
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill	
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.			
5	4.20	80					4.2	SPT (S) 15 (2-3-3-3-6-3)	4.50 - 4.80	B5		Soft brown sandy slightly gravelly CLAY with high cobble content of sandstone.					
		100									4.40 (0.40)	Dark brown clayey sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone. Sand is fine to coarse.		10.02			
							5.00 - 5.50	D3	4.80	*DRILLERS DESCRIPTION* Dark brown / grey sandy GRAVEL with cobbles. Arisings logged as Dark brownish grey silty slightly clayey slightly sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone and siltstone.		9.62					
	5.70	0				5.7	SPT (S) 50/100mm (5-17-16-34/25mm--)	6.00 - 6.50	D4	(3.20)							
							7.00 - 7.50	D5									
7	7.20 7.3	0					7.2	SPT (S) 50/90mm (10-15/65mm-27-23/15mm--)			8.00	Borehole terminated at scheduled depth of 8.0mbgl		6.42			
Hole Progress / Water Obs				Casing		Groundwater				Flush							
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns					
07/03/2024 14:30	8.00	8.00	DRY	8.00	115.00												
Plant: Comacchio 205																	
Remarks: Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer. STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL. On completion borehole installed following clients instructions with lockable steel flush cover at surface.																	
						Operator: GB & DF		Logged By: A Jones		Sheet No. 2 Of 2		m Per Page 4.1		All measurements in metres unless otherwise stated			

Contract : Grandison Brook FAS - Jersey Park Boreholes

Client : Atkins

Borehole No.

GB-BH11

Dates : 7/3/24 - 7/3/24

Job Number : Q1484

Ground Level : 14.42 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Atkins

Coordinates: 274569.43 E
194934.25 N
Co-ordinates to National Grid



Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

Operator:
GB & DF

Logged By:
A Jones

Sheet No.
1 Of 1

m Per
Page
2

All measurements in
metres unless
otherwise stated



Contract : Grandison Brook FAS - Jersey Park Boreholes												Borehole No. GB-BH12	
Client : Atkins													
Dates : 6/3/14 - 6/3/24						Job Number : Q1484				Ground Level : 14.30 m A.O.D. Level to Ordnance Datum			
Location :						Engineer : Atkins				Coordinates: 274565.07 E 194970.34 N Co-ordinates to National Grid			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill	
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.			
5	4.20	100					4.2	SPT (S) 50/230mm (12-10-10-12-18-10/5mm)	4.20 - 4.55	B5	(0.30)	Dark grey slightly clayey slightly silty sandy GRAVEL. Sand is fine to coarse. Gravel is sub angular to sub rounded fine to coarse siltstone and sandstone.		10.10			
		100									4.20					(0.35)	
	5.70	0					5.7	SPT (S) 50/120mm (15-10/30mm-27-23/45mm-)	5.70 - 6.50	D4	4.55			Brownish grey clayey slightly sandy GRAVEL with low cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse siltstone and sandstone.			9.75
											(3.25)						
6	7.20 7.3	0					7.2	SPT (S) 50/160mm (7-17/60mm-17-23-10/10mm-)	7.20 - 7.80	D6		*DRILLERS DESCRIPTION* Clayey sandy GRAVEL with cobbles. Arisings logged as Brownish grey silty slightly clayey sandy GRAVEL. Sand is fine to coarse. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone.					
8							8	SPT (C) 50/11mm (25/5mm-50/11mm-)			7.80	*DRILLERS DESCRIPTION* Grey SANDSTONE. Arisings logged as Grey angular Gravel of sandstone. Borehole terminated at		6.50			
											8.00			6.30			

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
06/03/2024 15:00	8.00	8.00	6.30	8.00	115.00							

Plant: Comacchio 205

Remarks: Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer. STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL. On completion borehole installed following clients instructions with lockable steel flush cover at surface.

Quantum Geotech Plas Newydd, Llanedi, Pontarddulais, Swansea SA4 0FQ Tel: 01554 744880 email: enquiries@quantumgeotech.co.uk	Operator: GB & RH	Logged By: A Jones	Sheet No. 2 Of 3	m Per Page 4.1	All measurements in metres unless otherwise stated

Contract : Grandison Brook FAS - Jersey Park Boreholes Client : Atkins												Borehole No. GB-BH12					
Dates : 6/3/14 - 6/3/24 Location :						Job Number : Q1484 Engineer : Atkins				Ground Level : 14.30 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 274565.07 E 194970.34 N <i>Co-ordinates to National Grid</i>							
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill	
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.			
9												scheduled depth of 8.0mbgl					
10																	
11																	
12																	
Hole Progress / Water Obs						Casing			Groundwater				Flush				
Date / Time		H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour		Sealed	Depth	Type	Returns			
Plant: Comacchio 205 Remarks: Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer. STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL. On completion borehole installed following clients instructions with lockable steel flush cover at surface.																	
 Quantum Geotech Plas Newydd, Llanedi, Pontarddulais, Swansea SA4 0FQ Tel: 01554 744880 email: enquiries@quantumgeotech.co.uk						Operator: GB & RH		Logged By: A Jones		Sheet No. 3 Of 3		m Per Page 4.1		All measurements in metres unless otherwise stated			

Contract : Grandison Brook FAS - Jersey Park Boreholes

Client : Atkins

**Borehole No.
GB-BH12**

Dates : 6/3/14 - 6/3/24

Job Number : Q1484

Ground Level : 14.30 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Atkins

Coordinates: 274565.07 E
194970.34 N
Co-ordinates to National Grid



Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

Operator:
GB & RH

Logged By:
A Jones

Sheet No.
1 Of 1

m Per
Page
2

All measurements in
metres unless
otherwise stated



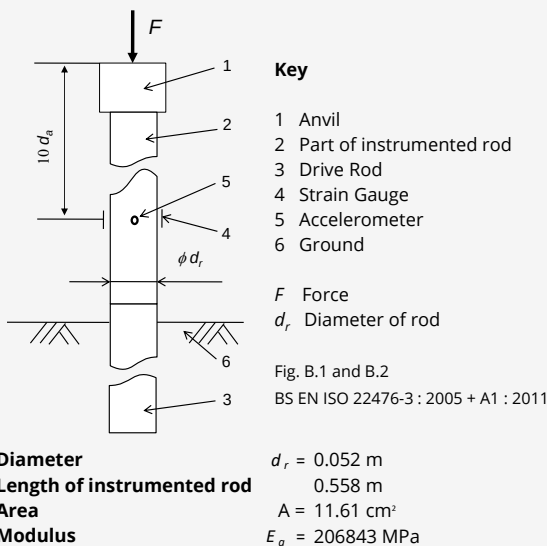
SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer SPT HAMMER
Test No EQU2023_110
Client QUANTUM GEOTECH

Test Depth (m) 11.70
Mass of hammer $m = 63.5\text{kg}$
Falling height $h = 0.76\text{m}$
 $E_{\text{theor}} = m \times g \times h = 473\text{J}$

Characteristics of the instrumented rod

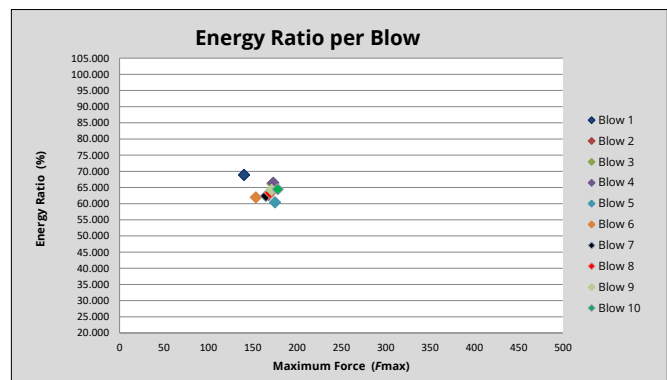
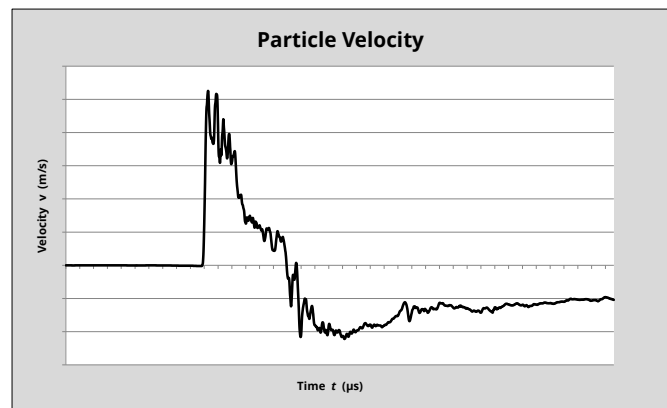
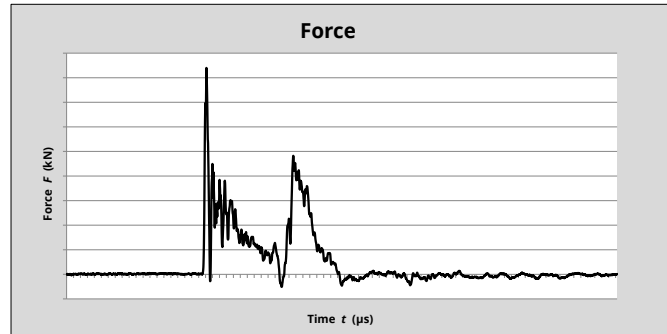
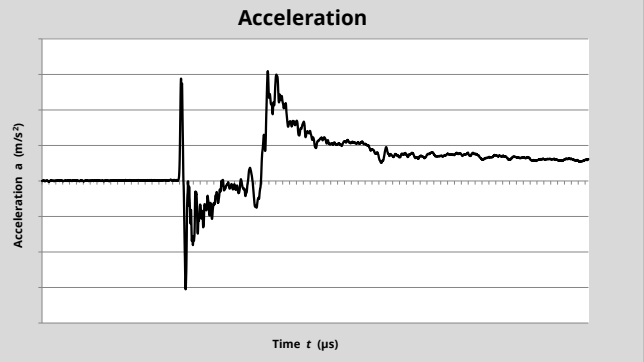


DATE OF TEST	VALID UNTIL	HAMMER ID
16/06/2023	15/06/2024	AR830

$E_{\text{meas}} = 0.303\text{ kN-m}$

$E_{\text{theor}} = 0.473\text{ kN-m}$

Comments



$$\text{Energy Ratio (Er)} = \frac{E_{\text{meas}}}{E_{\text{theor}}}$$

64.13%
© COPYRIGHT 2023

Equipe SPT Analyzer Operator

JL

Certificate prepared by

Equipe

Certificate checked by

Equipe

Certificate date

19/06/2023

APPENDIX III – GAS AND GROUNDWATER MONITORING RECORDS

LANDGAS & GROUNDWATER MONITORING RECORD SHEET

Page 1 of 1

Project Name:	Grandison Brook
Project No.:	Q1484
BH/TP No.:	BH10
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Analyser

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
14.75	A	50mm	8.00	2.0 - 8.0

[illegible]

LANDGAS & GROUNDWATER MONITORING RECORD SHEET

Page 1 of 1

Project Name:	Grandison Brook
Project No.:	Q1484
BH/TP No.:	BH11
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Analyser

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
14.42	A	50mm	8.00	2.0 - 8.0

[illegible]

LANDGAS & GROUNDWATER MONITORING RECORD SHEET

Page 1 of 1

Project Name:	Grandison Brook
Project No.:	Q1484
BH/TP No.:	BH12
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Analyser

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
14.3	A	50mm	8.00	1.0 - 8.0

[illegible]

APPENDIX IV – GEOTECHNICAL LABORATORY TEST RESULTS



Laboratory Report



Contract Number: 72058

Client Ref: **Q1484**

Client PO: **Q1484**

Date Received: **28-03-2024**

Date Completed: **18-04-2024**

Report Date: **18-04-2024**

Client: **Spencer Quantum Ltd**

This report has been checked and approved by:

Contract Title: **Grandison Brook - Jersey Park Boreholes**

For the attention of: **Arwel Jones**

Brendan Evans
Office Administrator

Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	16
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	9
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	9
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	4
PSD: Sedimentation by pipette carried out separately BS 1377:1990 - Part 2 : 9.4 - * UKAS	4
BRE Reduced Suite includes pH, water & acid soluble sulphate and total sulphur Sub-contracted Test	2
Organic Matter Content Sub-contracted Test	2
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

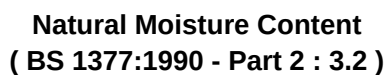
This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:

Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)

Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)

Wayne Honey (HR & HSE Manager)



Contract Number

72058

Project Name

Grandison Brook - Jersey Park Boreholes

Date Tested

12/04/2024

Operator

Clayton Jenkins



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 72058

Borehole/Pit No. GBBH10

Project Name Grandison Brook - Jersey Park Boreholes

Sample No. 2

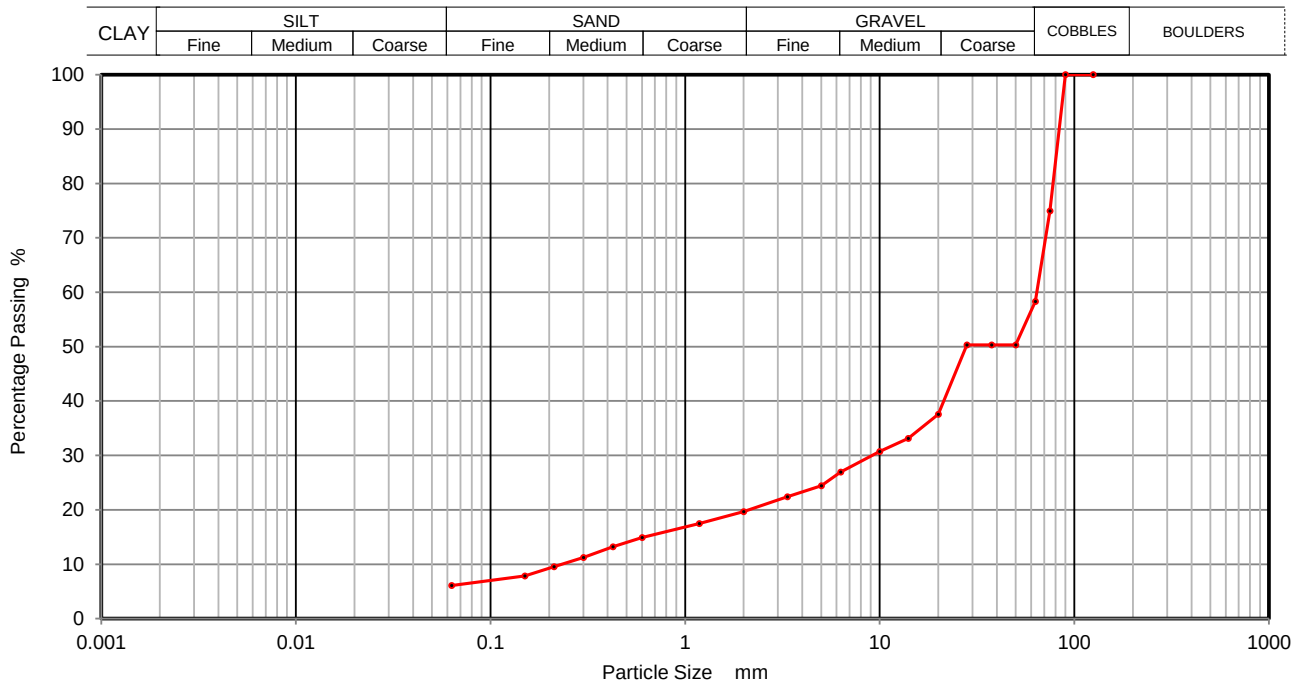
Soil Description Grey slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL with cobbles

Depth Top 0.50

Depth Base 1.00

Date Tested 11/04/2024

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	75		
63	58		
50	50		
37.5	50		
28	50		
20	38		
14	33		
10	31		
6.3	27		
5	24		
3.35	22		
2	20		
1.18	17		
0.6	15		
0.425	13		
0.3	11		
0.212	10		
0.15	8		
0.063	6		

Sample Proportions	% dry mass
Cobbles	42
Gravel	38
Sand	14
Silt and Clay	6

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator

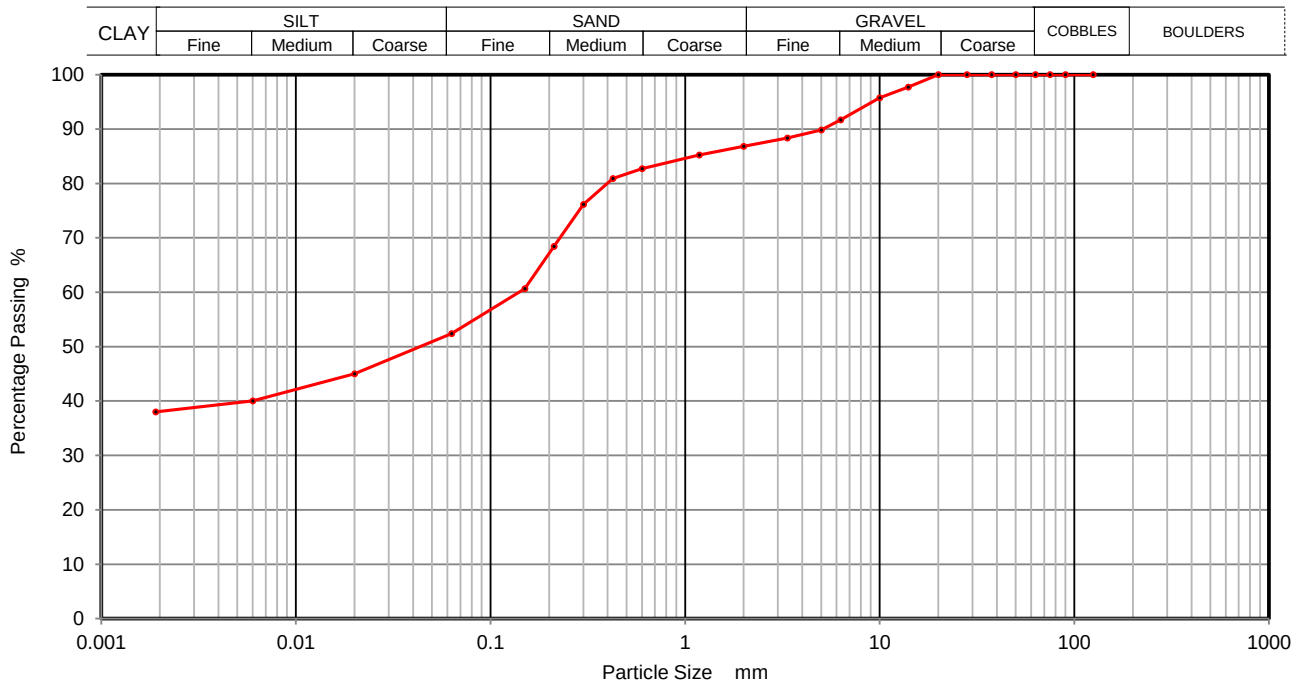
Cameron Thomas



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	72058
Borehole/Pit No.	GBBH10
Sample No.	3
Depth Top	3.00
Depth Base	4.00
Sample Type	B

Project Name	Grandison Brook - Jersey Park Boreholes
Soil Description	Brown fine to medium gravelly fine to coarse sandy silty CLAY
Date Tested	11/04/2024



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	45
90	100	0.0060	40
75	100	0.0020	38
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	96		
6.3	92		
5	90		
3.35	88		
2	87		
1.18	85		
0.6	83		
0.425	81		
0.3	76		
0.212	68		
0.15	61		
0.063	52		

Sample Proportions	% dry mass
Cobbles	0
Gravel	13
Sand	35
Silt	14
Clay	38

Remarks
Preparation and testing in accordance with BS1377 unless noted below

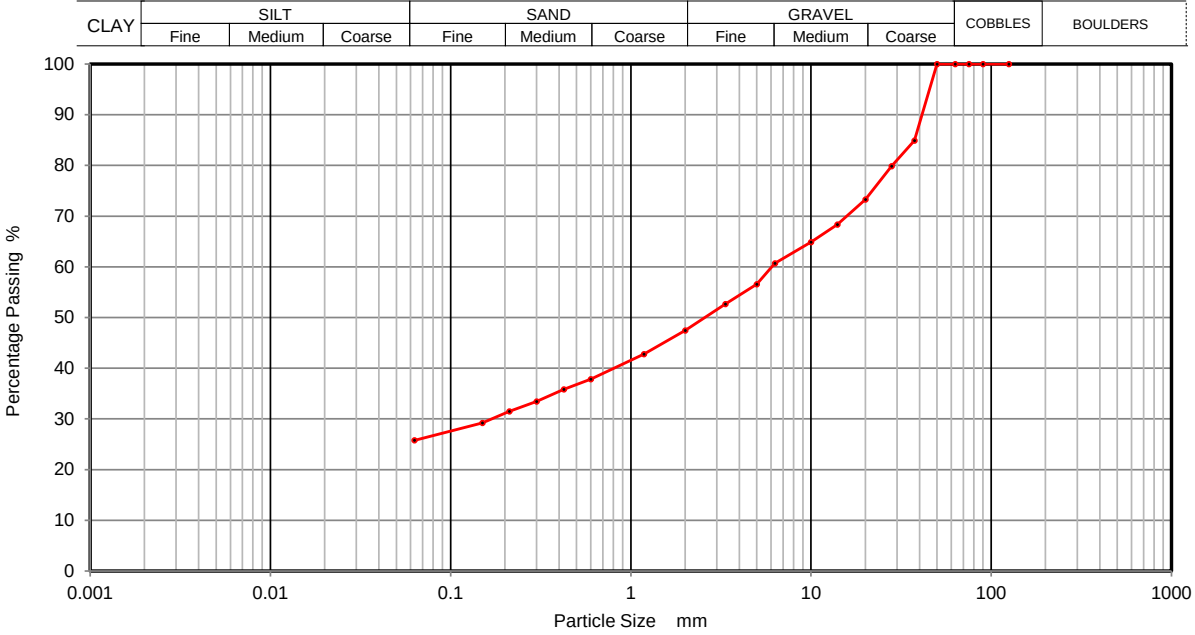
Operator
Cameron Thomas



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number	72058
Borehole/Pit No.	GBBH10

Project Name	Grandison Brook - Jersey Park Boreholes	Sample No.	5
Soil Description	Brown fine to coarse sandy silty/ clayey fine to coarse GRAVEL	Depth Top	4.50
		Depth Base	8.00
Date Tested	11/04/2024	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	85		
28	80		
20	73		
14	68		
10	65		
6.3	61		
5	57		
3.35	53		
2	47		
1.18	43		
0.6	38		
0.425	36		
0.3	33		
0.212	31		
0.15	29		
0.063	26		

Sample Proportions	% dry mass
Cobbles	0
Gravel	53
Sand	21
Silt and Clay	26

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
Cameron Thomas





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 72058

Borehole/Pit No. GBBH11

Project Name Grandison Brook - Jersey Park Boreholes

Sample No. 3

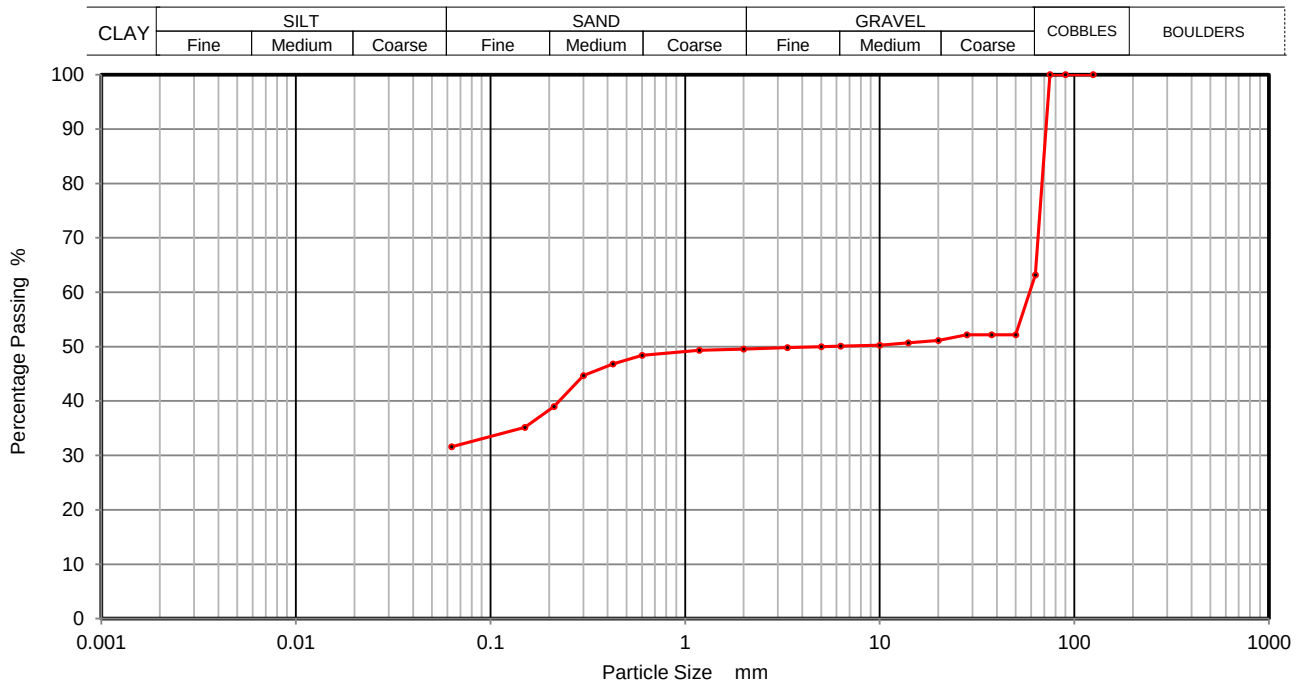
Soil Description Brown fine to coarse gravelly fine to coarse sandy SILT/ CLAY with cobbles

Depth Top 1.50

Depth Base 2.50

Date Tested 11/04/2024

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	63		
50	52		
37.5	52		
28	52		
20	51		
14	51		
10	50		
6.3	50		
5	50		
3.35	50		
2	50		
1.18	49		
0.6	48		
0.425	47		
0.3	45		
0.212	39		
0.15	35		
0.063	32		

Sample Proportions	% dry mass
Cobbles	37
Gravel	13
Sand	18
Silt and Clay	32

Remarks

Preparation and testing in accordance with BS1377 unless noted below

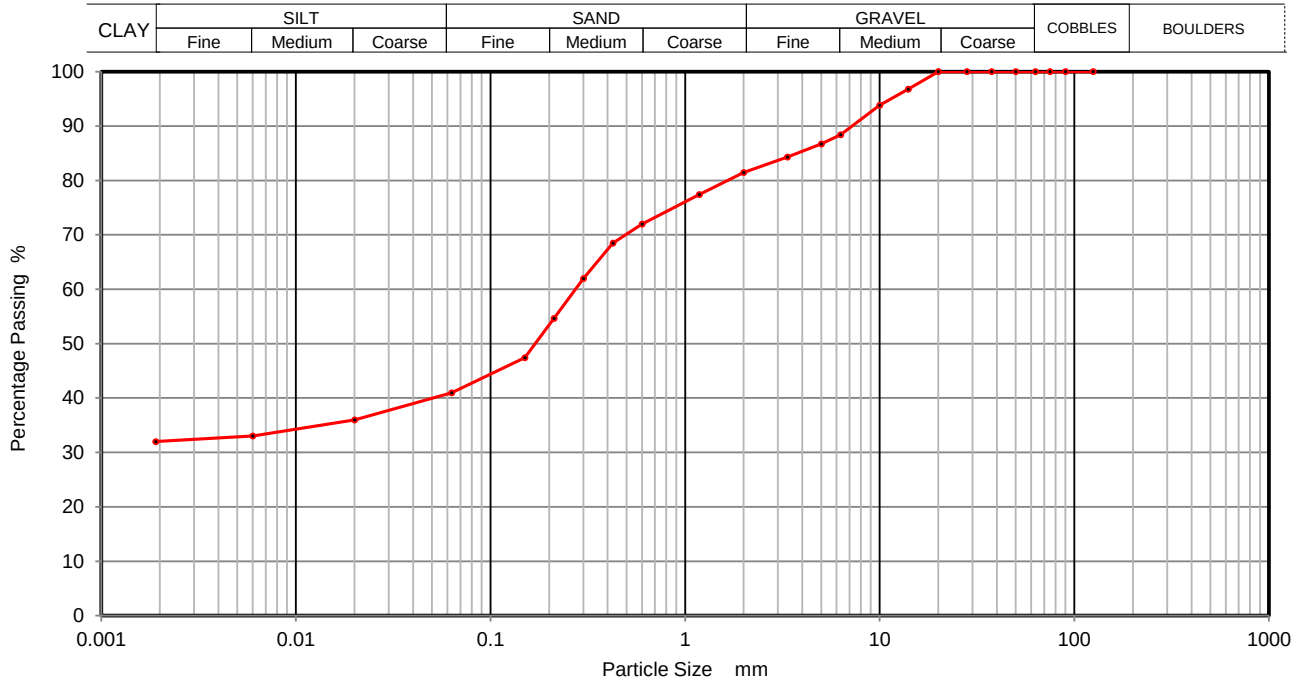
Operator

Cameron Thomas



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**

 GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Contract Number	72058
		Borehole/Pit No.	GBBH11
Project Name	Grandison Brook - Jersey Park Boreholes	Sample No.	4
Soil Description	Brown fine to medium gravelly fine to coarse sandy silty CLAY	Depth Top	3.00
		Depth Base	4.00
Date Tested	11/04/2024	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	36
90	100	0.0060	33
75	100	0.0020	32
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	97		
10	94		
6.3	88		
5	87		
3.35	84		
2	81		
1.18	77		
0.6	72		
0.425	69		
0.3	62		
0.212	55		
0.15	47		
0.063	41		

Sample Proportions	% dry mass
Cobbles	0
Gravel	19
Sand	40
Silt	9
Clay	32

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
Cameron Thomas



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number 72058

Borehole/Pit No. GBBH11

Project Name Grandison Brook - Jersey Park Boreholes

Sample No. 5

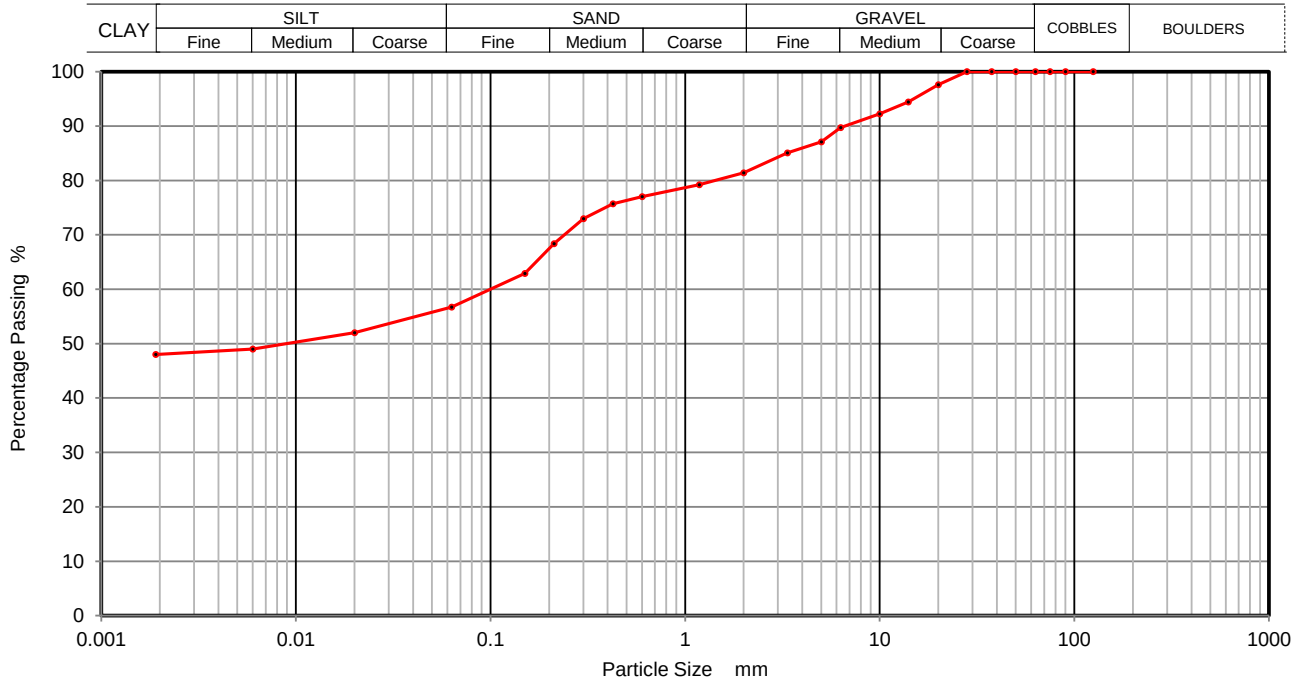
Soil Description Brown fine to coarse gravelly fine to coarse sandy silty CLAY

Depth Top 4.50

Depth Base 4.80

Date Tested 11/04/2024

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	52
90	100	0.0060	49
75	100	0.0020	48
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	94		
10	92		
6.3	90		
5	87		
3.35	85		
2	81		
1.18	79		
0.6	77		
0.425	76		
0.3	73		
0.212	68		
0.15	63		
0.063	57		

Sample Proportions	% dry mass
Cobbles	0
Gravel	19
Sand	24
Silt	9
Clay	48

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator

Cameron Thomas





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 72058

Borehole/Pit No. GBBH12

Project Name Grandison Brook - Jersey Park Boreholes

Sample No. 2

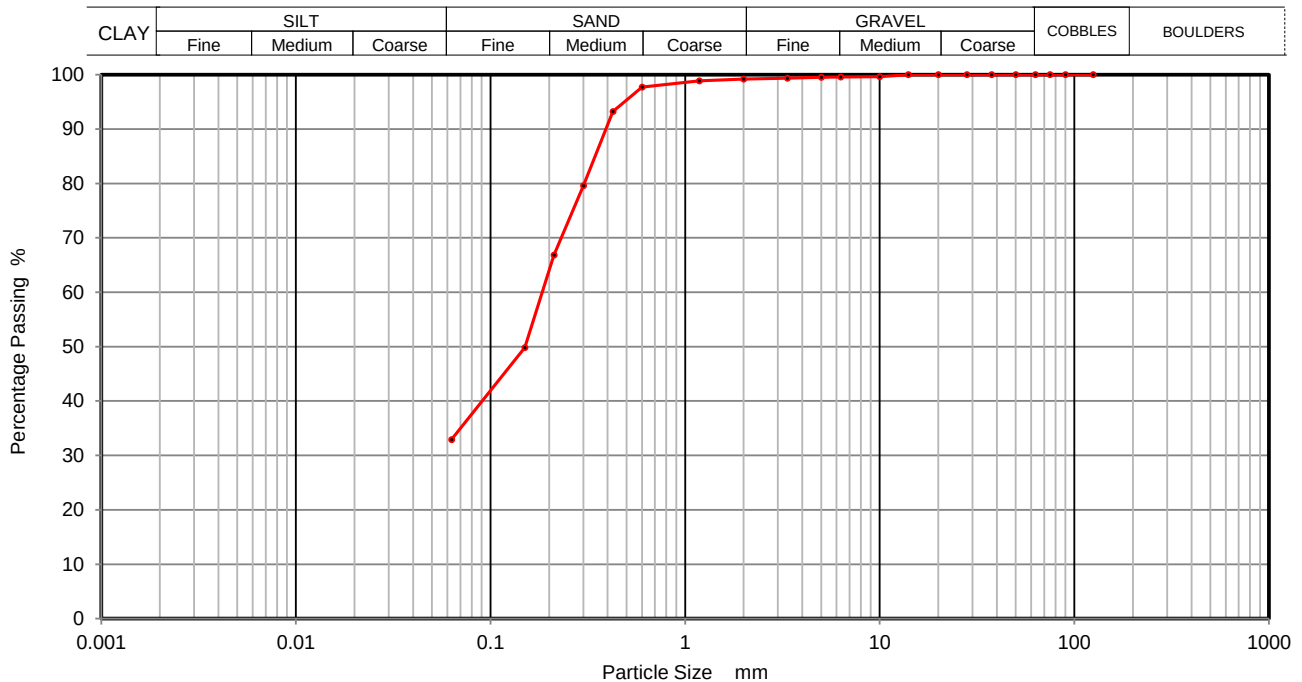
Soil Description Brown slightly gravelly silty/ clayey fine to coarse SAND

Depth Top 1.20

Depth Base 2.70

Date Tested 11/04/2024

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	99		
1.18	99		
0.6	98		
0.425	93		
0.3	80		
0.212	67		
0.15	50		
0.063	33		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	66
Silt and Clay	33

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator

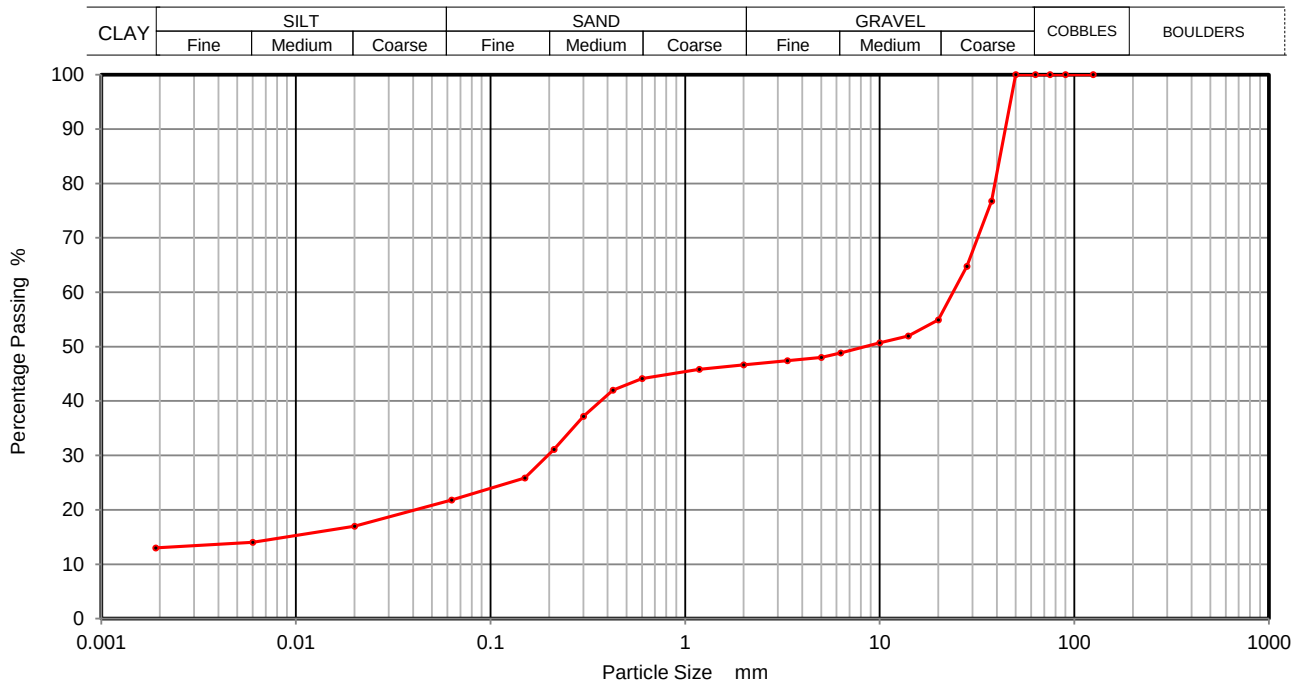
Cameron Thomas



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	72058
Borehole/Pit No.	GBBH12
Sample No.	3
Depth Top	3.00
Depth Base	3.70
Sample Type	B

Project Name	Grandison Brook - Jersey Park Boreholes
Soil Description	Brown slightly silty clayey fine to coarse sandy fine to coarse GRAVEL
Date Tested	11/04/2024



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	17
90	100	0.0060	14
75	100	0.0020	13
63	100		
50	100		
37.5	77		
28	65		
20	55		
14	52		
10	51		
6.3	49		
5	48		
3.35	47		
2	47		
1.18	46		
0.6	44		
0.425	42		
0.3	37		
0.212	31		
0.15	26		
0.063	22		

Sample Proportions	% dry mass
Cobbles	0
Gravel	53
Sand	25
Silt	9
Clay	13

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
Cameron Thomas



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 72058

Borehole/Pit No. GBBH12

Project Name Grandison Brook - Jersey Park Boreholes

Sample No. 5

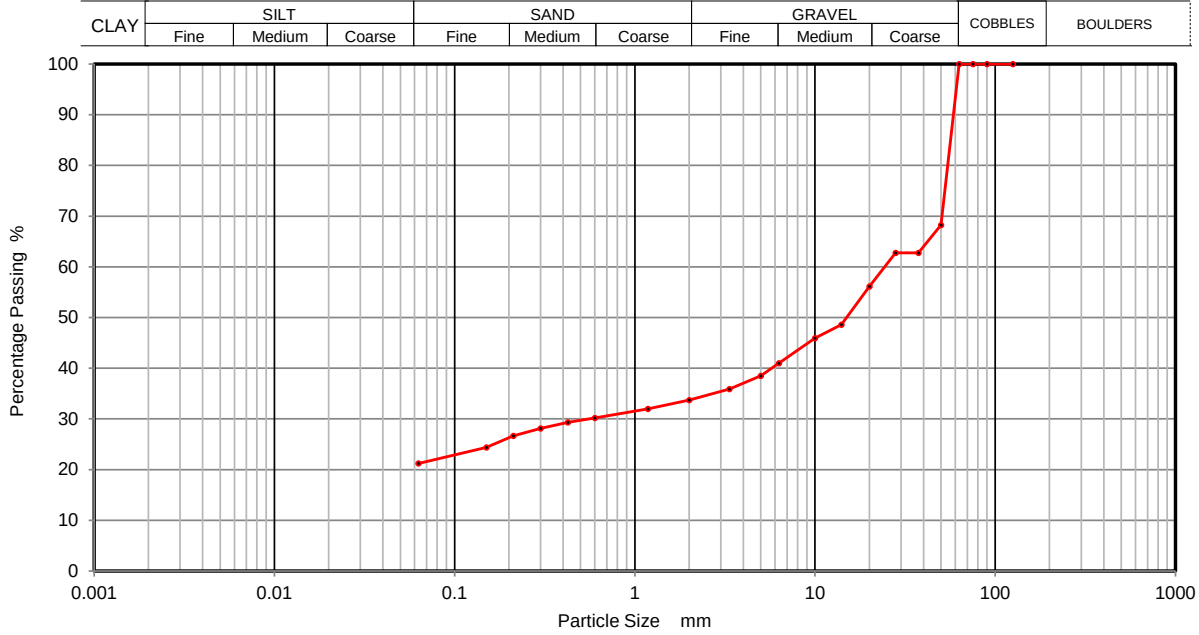
Soil Description Brown fine to coarse sandy silty/clayey fine to coarse GRAVEL

Depth Top 4.20

Depth Base 4.55

Date Tested 11/04/2024

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	68		
37.5	63		
28	63		
20	56		
14	49		
10	46		
6.3	41		
5	38		
3.35	36		
2	34		
1.18	32		
0.6	30		
0.425	29		
0.3	28		
0.212	27		
0.15	24		
0.063	21		

Sample Proportions	% dry mass
Cobbles	0
Gravel	66
Sand	13
Silt and Clay	21

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
Cameron Thomas





Sedimentation By Pipette Analysis
BS 1377 Part 2:1990
Clause 9.4

Contract Number 72058

Borehole/Pit No. GBBH10

Project Name Grandison Brook - Jersey Park Boreholes

Sample No. 7

Soil Description Brown Gravelly Clayey Silty SAND

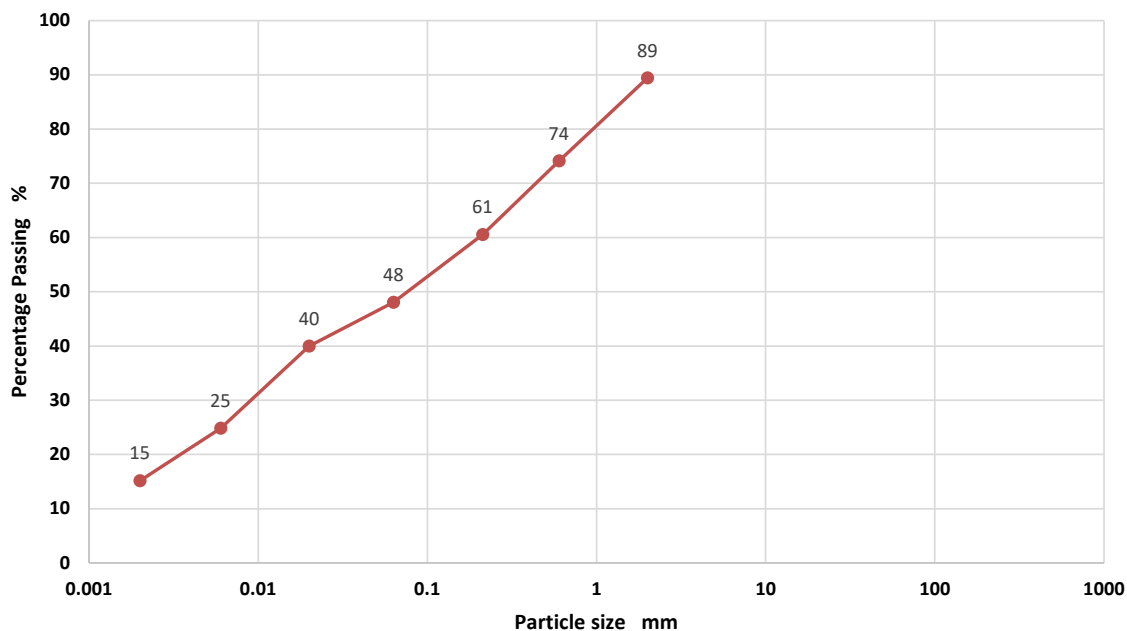
Depth Top 6.50

Depth Base 7.00

Date Tested 11/04/2024

Sample Type D

Sedimentation By Pipette



Top Sieve Analysis

BS Test Sieve	Percentage Passing
2.00	89
0.60	74
0.212	61
0.063	48

Sedimentation Analysis

Particle Diameter	Percentage Passing
0.02	40
0.006	25
0.002	15

Soil Fraction	Total Percentage
Gravel	11
Sand	41
Silt	33
Clay	15

Operator

Rhydian Williams





Sedimentation By Pipette Analysis
BS 1377 Part 2:1990
Clause 9.4

Contract Number 72058

Borehole/Pit No. GBBH11

Project Name Grandison Brook - Jersey Park Boreholes

Sample No. 3

Soil Description Brown Gravelly Clayey Sandy SILT

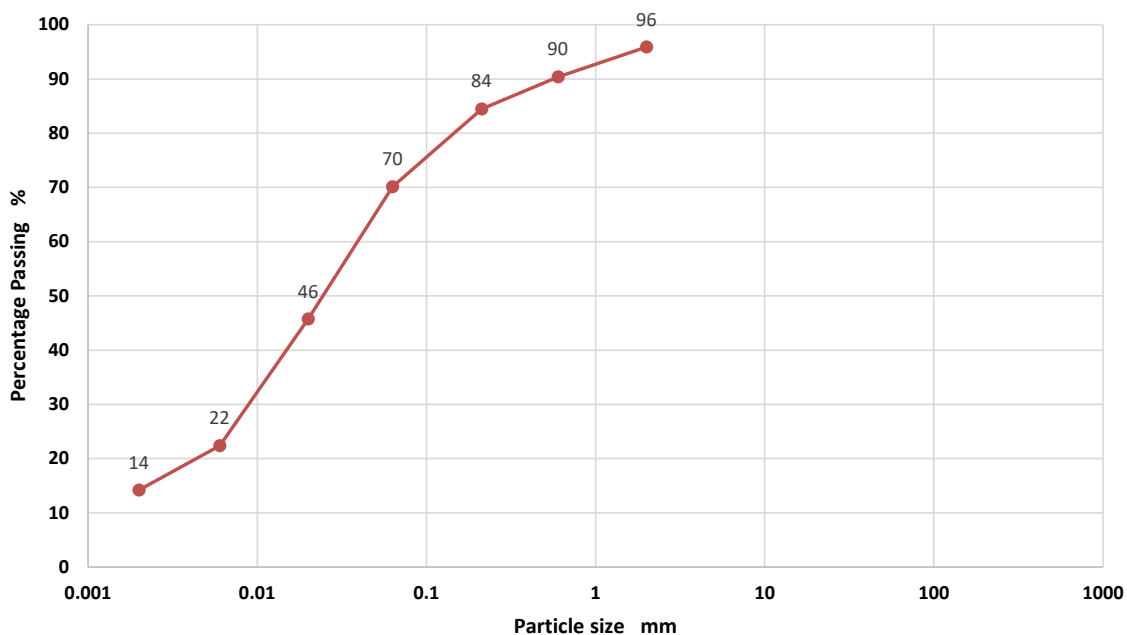
Depth Top 5.00

Depth Base 5.50

Date Tested 11/04/2024

Sample Type D

Sedimentation By Pipette



Top Sieve Analysis

BS Test Sieve	Percentage Passing
2.00	96
0.60	90
0.212	84
0.063	70

Sedimentation Analysis

Particle Diameter	Percentage Passing
0.02	46
0.006	22
0.002	14

Soil Fraction	Total Percentage
Gravel	4
Sand	26
Silt	56
Clay	14

Operator

Rhydian Williams



2788



Sedimentation By Pipette Analysisis
BS 1377 Part 2:1990
Clause 9.4

Contract Number 72058

Borehole/Pit No. GBBH12

Project Name Grandison Brook - Jersey Park Boreholes

Sample No. 2

Soil Description Brown Clayey Silty SAND

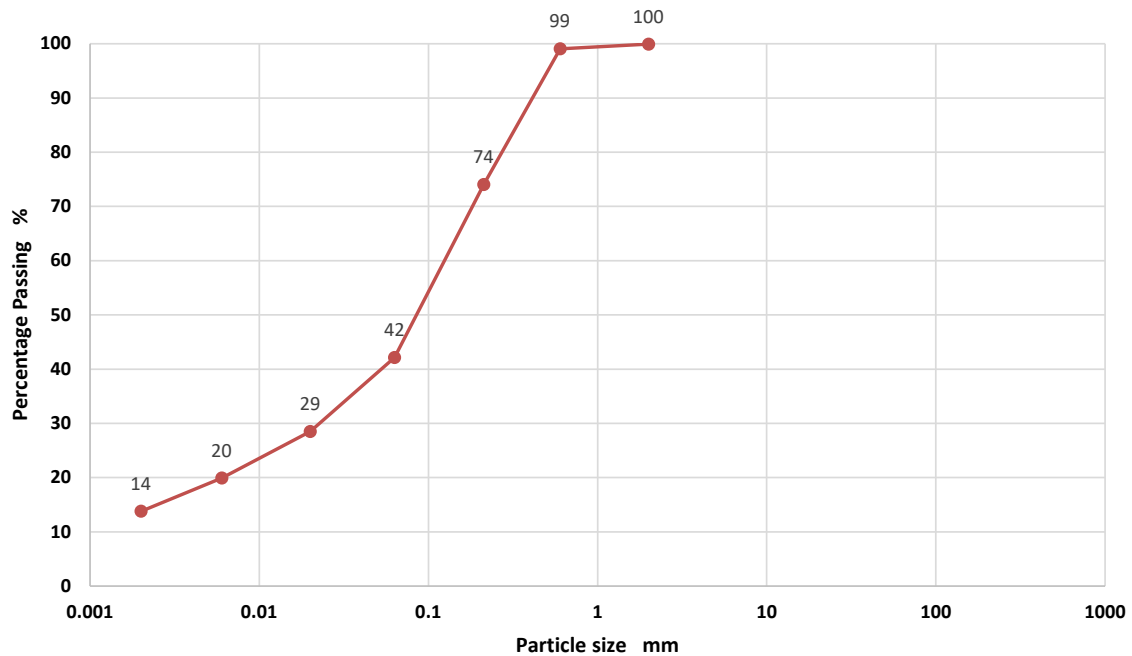
Depth Top 2.00

Depth Base

Date Tested 11/04/2024

Sample Type D

Sedimentation By Pipette



Top Sieve Analysis

BS Test Sieve	Percentage Passing
2.00	100
0.60	99
0.212	74
0.063	42

Sedimentation Analysis

Particle Diameter	Percentage Passing
0.02	29
0.006	20
0.002	14

Soil Fraction	Total Percentage
Gravel	0
Sand	58
Silt	28
Clay	14

Operator

Rhydian Williams



2788



Sedimentation By Pipette Analysis
BS 1377 Part 2:1990
Clause 9.4

Contract Number 72058

Borehole/Pit No. GBBH12

Project Name Grandison Brook - Jersey Park Boreholes

Sample No. 4

Soil Description Brown Gravelly Clayey Silty SAND

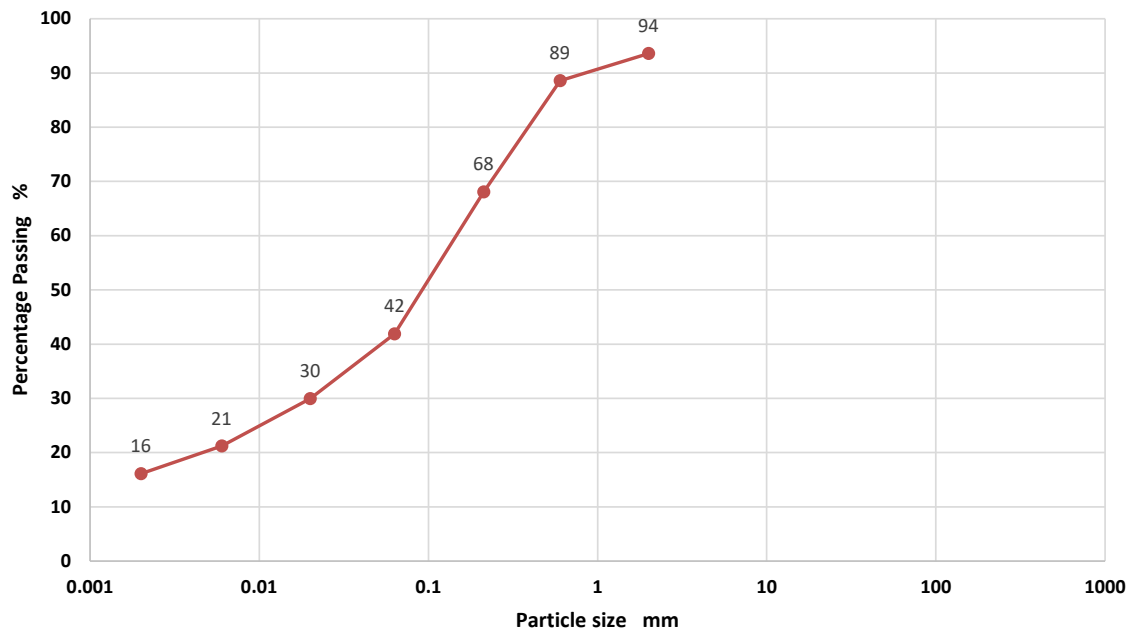
Depth Top 5.70

Depth Base 6.50

Date Tested 11/04/2024

Sample Type D

Sedimentation By Pipette



Top Sieve Analysis

BS Test Sieve	Percentage Passing
2.00	94
0.60	89
0.212	68
0.063	42

Sedimentation Analysis

Particle Diameter	Percentage Passing
0.02	30
0.006	21
0.002	16

Soil Fraction	Total Percentage
Gravel	6
Sand	52
Silt	26
Clay	16

Operator

Rhydian Williams



2788



4161



7 - 11 Harding Street
Leicester
LE1 4DH

GSTL

Unit 3-4 Heol Aur

Dafen Ind Estate

Dafen

SA14 8QN

Analytical Test Report: L24/03010/GSL - 24-43718

Your Project Reference: **Q1484 Grandison Brook- Jersey Park Boreholes**

Your Order Number: 72058 Samples Received / Instructed: 09/04/2024 / 09/04/2024

Report Issue Number: 1 Sample Tested: 09/04 to 16/04/2024

Samples Analysed: 4 soil samples Report issued: 16/04/2024

Signed

James Gane
Analytical Services Manager
CTS Group

Notes:**General**

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.**Uncertainty of measurement values are available on request.**

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited, subUKAS - Subcontracted to a laboratory UKAS accredited for this test, subMCERTS - Subcontracted to a laboratory MCERTS accredited for this test

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 08.04.2024

Issued by: J. Gane

Issue No: 4

Rev No: 6



L24/03010/GSL - 24-43718

Project Reference - Q1484 Grandison Brook- Jersey Park

Boreholes

Analytical Test Results - Solid

Lab Reference			351972	351974
Client Sample ID			3	1
Client Sample Location			GBBH11	GBBH12
Client Sample Type			B	D
Client Sample Number			-	-
Depth - Top (m)			1.50	1.00
Depth - Bottom (m)			2.50	1.10
Date of Sampling			-	-
Time of Sampling			-	-
Sample Matrix			Clay	Clay
Determinant	Units	Accreditation		
SOM (via TOC)	(%)	UKAS	2.3	3.3



7 - 11 Harding Street
Leicester
LE1 4DH

L24/03010/GSL - 24-43718

Project Reference - Q1484 Grandison Brook- Jersey Park

Boreholes

Analytical Test Results - Chemical Analysis

Lab Reference			351973	351975
Client Sample ID			4	4
Client Sample Location			GBBH11	GBBH11
Client Sample Type			B	B
Client Sample Number			-	-
Depth - Top (m)			3.00	3.90
Depth - Bottom (m)			4.00	4.20
Date of Sampling			-	-
Time of Sampling			-	-
Sample Matrix			Clay	Clay
Determinant	Units	Accreditation		
Water soluble sulphate (as SO ₄)	(mg/l)	u	12	< 10
Acid Soluble Sulphate	(%)	u	< 0.01	< 0.01
Total Sulphur	(%)	UKAS	0.01	0.06
pH Value	pH Units	MCERTS	7.1	6.2



4161



7 - 11 Harding Street
Leicester
LE1 4DH

L24/03010/GSL - 24-43718

Project Reference - Q1484 Grandison Brook- Jersey Park Boreholes

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
351972	3	GBBH11	B	-	Brown silty clay	26	< 0.1	-
351973	4	GBBH11	B	-	Brown silty sandy clay	-	-	100
351974	1	GBBH12	D	-	Dark brown silty sandy clay	24	< 0.1	-
351975	4	GBBH11	B	-	Dark grey very gravelly sandy silty clay	-	-	85



7 - 11 Harding Street
Leicester
LE1 4DH

L24/03010/GSL - 24-43718

Project Reference - Q1484 Grandison Brook- Jersey Park Boreholes

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
351972	3	GBBH11	B	-	
351973	4	GBBH11	B	-	
351974	1	GBBH12	D	-	
351975	4	GBBH11	B	-	



7 - 11 Harding Street
Leicester
LE1 4DH

L24/03010/GSL - 24-43718

Project Reference - Q1484 Grandison Brook- Jersey Park Boreholes

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)



7 - 11 Harding Street
Leicester
LE1 4DH

L24/03010/GSL - 24-43718

Project Reference - Q1484 Grandison Brook- Jersey Park Boreholes

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
351972	3	GBBH11	B	-		A
351973	4	GBBH11	B	-		A
351974	1	GBBH12	D	-		A
351975	4	GBBH11	B	-		A

APPENDIX V – CHEMICAL LABORATORY TEST RESULTS



Amended Report

Report No.: 24-08078-2

Initial Date of Issue: 26-Mar-2024 **Date of Re-Issue:** 04-Apr-2024

Re-Issue Details: This report has been revised and directly supersedes 24-08078-1 in its entirety

Client: Spencer Quantum Ltd

Client Address: 13A Bishops Court Gardens
Clyst St Mary
Exeter
EX5 1DH

Contact(s): Arwel Jones

Project: Grandison Brook FAS - Jersey Park Boreholes

Quotation No.: Q24-34208 **Date Received:** 15-Mar-2024

Order No.: Q1484 **Date Instructed:** 15-Mar-2024

No. of Samples: 6

Turnaround (Wkdays): 5 **Results Due:** 21-Mar-2024

Date Approved: 26-Mar-2024

Approved By:

Details: Stuart Henderson, Technical Manager

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Leachate

Project: Grandison Brook FAS - Jersey Park Boreholes

Client: Spencer Quantum Ltd	Chemtest Job No.:					24-08078	24-08078
Quotation No.: Q24-34208	Chemtest Sample ID.:					1780458	1780463
Order No.: Q1484	Client Sample Ref.:					2	2
	Sample Location:					GBBH10	GBBH12
	Sample Type:					SOIL	SOIL
	Top Depth (m):					0.5	0.8
	Date Sampled:					07-Mar-2024	06-Mar-2024
Determinand	Accred.	SOP	Type	Units	LOD		
pH at 20C	U	1010	10:1		4.0	7.6	7.3
Chemical Oxygen Demand	U	1100	10:1	mg O2/l	10	< 10	20
Ammoniacal Nitrogen	U	1220	10:1	mg/l	0.050	< 0.050	1.3
Nitrite	U	1220	10:1	mg/l	0.020	< 0.020	< 0.020
Nitrate	U	1220	10:1	mg/l	0.50	6.7	1.7
Sulphate	U	1220	10:1	mg/l	1.0	54	< 1.0
Cyanide (Total) Low-Level	N	1300	10:1	mg/l	0.0050	< 0.0050	< 0.0050
Cyanide (Free) Low-Level	N	1300	10:1	mg/l	0.0050	< 0.0050	< 0.0050
Cyanide (Complex) Low-Level	N	1300	10:1	mg/l	0.0050	< 0.0050	< 0.0050
Sulphide	U	1325	10:1	mg/l	0.050	< 0.050	< 0.050
Magnesium	U	1455	10:1	mg/l	0.20	2.0	0.50
Aluminium (Dissolved)	N	1455	10:1	µg/l	5.0	71	690
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	15	17
Boron (Dissolved)	U	1455	10:1	µg/l	10.0	20	13
Barium (Dissolved)	U	1455	10:1	µg/l	5.00	72	7.2
Beryllium (Dissolved)	U	1455	10:1	µg/l	1.00	< 1.0	< 1.0
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	0.21	< 0.11
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	3.2	12
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	10:1	µg/l	0.50	36	90
Molybdenum (Dissolved)	U	1455	10:1	µg/l	0.20	5.8	2.9
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	0.84	1.6
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	21	4.2
Antimony (Dissolved)	U	1455	10:1	µg/l	0.50	3.7	1.5
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	4.9	4.3
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	1.4	2.8
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	22	11
Chromium (Total)	N	1455	10:1	µg/l	0.50	0.58	1.2
Iron (Dissolved)	N	1455	10:1	µg/l	5.0	48	1800
Low-Level Chromium (Hexavalent)	N	1495	10:1	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C5-C6	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	10:1	µg/l	5.0	< 5.0	< 5.0

Results - Leachate

Project: Grandison Brook FAS - Jersey Park Boreholes

Client: Spencer Quantum Ltd	Chemtest Job No.:					24-08078	24-08078
Quotation No.: Q24-34208	Chemtest Sample ID.:					1780458	1780463
Order No.: Q1484	Client Sample Ref.:					2	2
	Sample Location:					GBBH10	GBBH12
	Sample Type:					SOIL	SOIL
	Top Depth (m):					0.5	0.8
	Date Sampled:					07-Mar-2024	06-Mar-2024
Determinand	Accred.	SOP	Type	Units	LOD		
Aromatic TPH >C5-C7	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	10:1	µg/l	0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	10:1	µg/l	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	10:1	µg/l	10	< 10	< 10
Benzene	U	1760	10:1	µg/l	1.0	< 1.0	< 1.0
Toluene	U	1760	10:1	µg/l	1.0	< 1.0	< 1.0
Ethylbenzene	U	1760	10:1	µg/l	1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	10:1	µg/l	1.0	< 1.0	< 1.0
o-Xylene	U	1760	10:1	µg/l	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	N	1760	10:1	µg/l	1.0	< 1.0	< 1.0
Naphthalene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Acenaphthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Fluorene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Phenanthrene	U	1800	10:1	µg/l	0.10	3.3	< 0.10
Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Fluoranthene	U	1800	10:1	µg/l	0.10	6.4	< 0.10
Pyrene	U	1800	10:1	µg/l	0.10	4.4	< 0.10
Benzo[a]anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Chrysene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Coronene	N	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Total Of 17 PAH's	N	1800	10:1	µg/l	2.0	14	< 2.0
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030

Results - Soil

Project: Grandison Brook FAS - Jersey Park Boreholes

Client: Spencer Quantum Ltd		Chemtest Job No.:		24-08078	24-08078	24-08078	24-08078	24-08078	24-08078
Quotation No.: Q24-34208		Chemtest Sample ID.:		1780458	1780459	1780460	1780461	1780462	1780463
Order No.: Q1484		Client Sample Ref.:		2	3	1	3	1	2
		Sample Location:		GBBH10	GBBH10	GBBH11	GBBH11	GBBH12	GBBH12
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		0.5	1.0	0.5	1.5	0.25	0.8
		Date Sampled:		07-Mar-2024	07-Mar-2024	07-Mar-2024	07-Mar-2024	06-Mar-2024	06-Mar-2024
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD				
ACM Type		U	2192		N/A	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	16	17	19	27
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones	Stones	Stones	Stones
Soil Texture		N	2040		N/A	Loam	Loam	Loam	Loam
pH at 20C		M	2010		4.0	8.3	10.2	8.5	7.4
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.12	0.076	0.15	< 0.010
Total Sulphur		U	2175	%	0.010	0.27	0.17	0.16	0.098
Nitrite (Extractable)		N	2220	mg/kg	0.10	0.12	0.52	< 0.10	< 0.10
Nitrate (Water Soluble)		N	2220	g/l	0.010	< 0.010	0.019	0.015	< 0.010
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Thiocyanate		M	2300	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	13	29	11	5.1
Ammoniacal Nitrogen		M	2425	mg/kg	0.50	6.1	0.77	19	37
Aluminium (Total)		N	2430	mg/kg	100	4900	2500	3900	3500
Iron (Total)		N	2430	mg/kg	100	9500	4400	7200	5400
Sulphate (Total)		U	2430	mg/kg	100	2400	1000	1600	1400
Sulphate (Acid Soluble)		U	2430	%	0.010	0.031	0.013	0.088	0.14
Arsenic		M	2455	mg/kg	0.5	1400	67	810	28
Barium		M	2455	mg/kg	0.5	550	1200	420	91
Beryllium		U	2455	mg/kg	0.5	1.3	0.8	1.7	0.5
Cadmium		M	2455	mg/kg	0.10	27	1.4	11	0.45
Chromium		M	2455	mg/kg	0.5	510	2900	45	22
Manganese		M	2455	mg/kg	1.0	7600	31000	4200	260
Molybdenum		M	2455	mg/kg	0.5	15	33	4.9	0.6
Antimony		N	2455	mg/kg	2.0	55	3.3	28	2.5
Copper		M	2455	mg/kg	0.50	1000	180	660	26
Mercury		M	2455	mg/kg	0.05	0.20	0.34	0.14	0.09
Nickel		M	2455	mg/kg	0.50	79	110	49	29
Lead		M	2455	mg/kg	0.50	8300	210	3500	320
Selenium		M	2455	mg/kg	0.25	5.2	1.4	1.8	0.73
Vanadium		U	2455	mg/kg	0.5	190	680	57	38
Zinc		M	2455	mg/kg	0.50	14000	450	6300	710
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Soil

Project: Grandison Brook FAS - Jersey Park Boreholes

Client: Spencer Quantum Ltd		Chemtest Job No.:					24-08078	24-08078	24-08078	24-08078	24-08078	24-08078
Quotation No.: Q24-34208		Chemtest Sample ID.:					1780458	1780459	1780460	1780461	1780462	1780463
Order No.: Q1484		Client Sample Ref.:					2	3	1	3	1	2
		Sample Location:					GBBH10	GBBH10	GBBH11	GBBH11	GBBH12	GBBH12
		Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):					0.5	1.0	0.5	1.5	0.25	0.8
		Date Sampled:					07-Mar-2024	07-Mar-2024	07-Mar-2024	07-Mar-2024	06-Mar-2024	06-Mar-2024
		Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL #1	M	2690	mg/kg	2.00	2.8	2.5	2.7	3.2	2.7	3.0	3.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL #1	M	2690	mg/kg	1.00	1.7	1.7	1.3	1.7	1.4	1.7	1.7
Aliphatic EPH >C16-C21 MC	EH_2D_AL #1	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL #1	M	2690	mg/kg	3.00	3.8	< 3.0	5.5	< 3.0	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40 MC	EH_2D_AL #1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL #1	M	2690	mg/kg	5.00	8.4	5.6	11	6.0	< 5.0	7.4	7.4
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL #1	N	2690	mg/kg	10.00	< 10	< 10	11	< 10	< 10	< 10	< 10
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR #1	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR #1	U	2690	mg/kg	1.00	< 1.0	< 1.0	1.5	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR #1	U	2690	mg/kg	2.00	8.6	< 2.0	20	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C21-C35 MC	EH_2D_AR #1	U	2690	mg/kg	2.00	17	2.2	56	< 2.0	< 2.0	3.9	3.9
Aromatic EPH >C35-C40 MC	EH_2D_AR #1	N	2690	mg/kg	1.00	44	1.5	3.3	< 1.0	< 1.0	1.1	1.1
Total Aromatic EPH >C10-C35 MC	EH_2D_AR #1	U	2690	mg/kg	5.00	26	< 5.0	78	< 5.0	< 5.0	5.0	5.0
Total Aromatic EPH >C10-C40 MC	EH_2D_AR #1	N	2690	mg/kg	10.00	70	< 10	81	< 10	< 10	< 10	< 10
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total #1	U	2690	mg/kg	10.00	34	< 10	88	< 10	< 10	12	12
Total EPH >C10-C40 MC	EH_2D_Total #1	N	2690	mg/kg	10.00	78	< 10	92	< 10	< 10	14	14
Organic Matter		M	2625	%	0.40	30	3.3	7.6	2.1	8.8	1.8	1.8
Total TPH >C6-C40	EH_1D_Total	M	2670	mg/kg	10	160	< 10	300	< 10	130	< 10	< 10
Naphthalene		M	2700	mg/kg	0.10	0.52	< 0.10	0.77	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene		M	2700	mg/kg	0.10	0.51	< 0.10	0.43	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2700	mg/kg	0.10	0.64	< 0.10	0.59	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene		M	2700	mg/kg	0.10	0.71	< 0.10	0.65	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2700	mg/kg	0.10	2.5	< 0.10	2.1	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene		M	2700	mg/kg	0.10	1.4	< 0.10	1.1	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene		M	2700	mg/kg	0.10	7.0	0.50	6.1	< 0.10	0.24	< 0.10	< 0.10
Pyrene		M	2700	mg/kg	0.10	6.3	0.59	5.4	< 0.10	0.35	< 0.10	< 0.10
Benzo[a]anthracene		M	2700	mg/kg	0.10	4.2	0.21	3.8	< 0.10	0.63	< 0.10	< 0.10

Results - Soil

Project: Grandison Brook FAS - Jersey Park Boreholes

Client: Spencer Quantum Ltd		Chemtest Job No.:						24-08078	24-08078	24-08078	24-08078	24-08078	24-08078
Quotation No.: Q24-34208		Chemtest Sample ID.:						1780458	1780459	1780460	1780461	1780462	1780463
Order No.: Q1484		Client Sample Ref.:						2	3	1	3	1	2
		Sample Location:						GBBH10	GBBH10	GBBH11	GBBH11	GBBH12	GBBH12
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):						0.5	1.0	0.5	1.5	0.25	0.8
		Date Sampled:						07-Mar-2024	07-Mar-2024	07-Mar-2024	07-Mar-2024	06-Mar-2024	06-Mar-2024
		Asbestos Lab:						DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
Chrysene		M	2700	mg/kg	0.10	5.7	0.40	5.0	< 0.10	0.44	< 0.10		
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	7.4	< 0.10	5.5	< 0.10	< 0.10	< 0.10		
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	2.7	< 0.10	1.9	< 0.10	< 0.10	< 0.10		
Benzo[a]pyrene		M	2700	mg/kg	0.10	5.0	< 0.10	3.5	< 0.10	< 0.10	< 0.10		
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	4.0	< 0.10	2.6	< 0.10	< 0.10	< 0.10		
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	1.4	< 0.10	0.96	< 0.10	< 0.10	< 0.10		
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	3.7	< 0.10	2.6	< 0.10	< 0.10	< 0.10		
Total Of 16 PAH's		M	2700	mg/kg	2.0	54	< 2.0	43	< 2.0	< 2.0	< 2.0		
Benzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Toluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
o-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Naphthalene		M	2800	mg/kg	0.10	0.17	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Acenaphthylene		N	2800	mg/kg	0.10	0.82	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Acenaphthene		M	2800	mg/kg	0.10	0.19	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Fluorene		M	2800	mg/kg	0.10	0.52	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Phenanthrene		M	2800	mg/kg	0.10	3.9	< 0.10	0.81	< 0.10	< 0.10	< 0.10		
Anthracene		M	2800	mg/kg	0.10	2.1	< 0.10	0.36	< 0.10	< 0.10	< 0.10		
Fluoranthene		M	2800	mg/kg	0.10	12	< 0.10	2.3	< 0.10	< 0.10	< 0.10		
Pyrene		M	2800	mg/kg	0.10	7.9	< 0.10	1.9	< 0.10	< 0.10	< 0.10		
Benzo[a]anthracene		M	2800	mg/kg	0.10	8.8	< 0.10	1.3	< 0.10	< 0.10	< 0.10		
Chrysene		M	2800	mg/kg	0.10	9.6	< 0.10	1.2	< 0.10	< 0.10	< 0.10		
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	12	< 0.10	2.0	< 0.10	< 0.10	< 0.10		
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	4.5	< 0.10	0.61	< 0.10	< 0.10	< 0.10		
Benzo[a]pyrene		M	2800	mg/kg	0.10	7.4	< 0.10	1.4	< 0.10	< 0.10	< 0.10		
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	5.2	< 0.10	0.94	< 0.10	< 0.10	< 0.10		
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	1.7	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	4.0	< 0.10	1.0	< 0.10	< 0.10	< 0.10		
Coronene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Total Of 17 PAH's		N	2800	mg/kg	2.0	81	< 2.0	14	< 2.0	< 2.0	< 2.0		
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1010	pH Value of Waters	pH at 20°C	pH Meter	
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].	
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.	
1325	Sulphide in Waters	Sulphides	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N-dimethyl-p-phenylenediamine.	
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	
1495	Low Level Hexavalent Chromium in Waters	Chromium [VI]	Colorimetric determination of hexavalent chromium expressed as Cr (VI) µg/l in water, using Ion Chromatography and UV-visible spectrophotometry.	
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44 Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection	
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.	
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection	
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2425	Extractable Ammonium in soils	Ammonium	Extraction with potassium chloride solution / analysis by 'Aquakem 600' Discrete Analyser using sodium salicylate and sodium dichloroisocyanurate.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

Water Sample Category Key for Accreditation

- DW - Drinking Water
- GW - Ground Water
- LE - Land Leachate
- NA - Not Applicable
- PL - Prepared Leachate
- PW - Processed Water

Report Information

RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

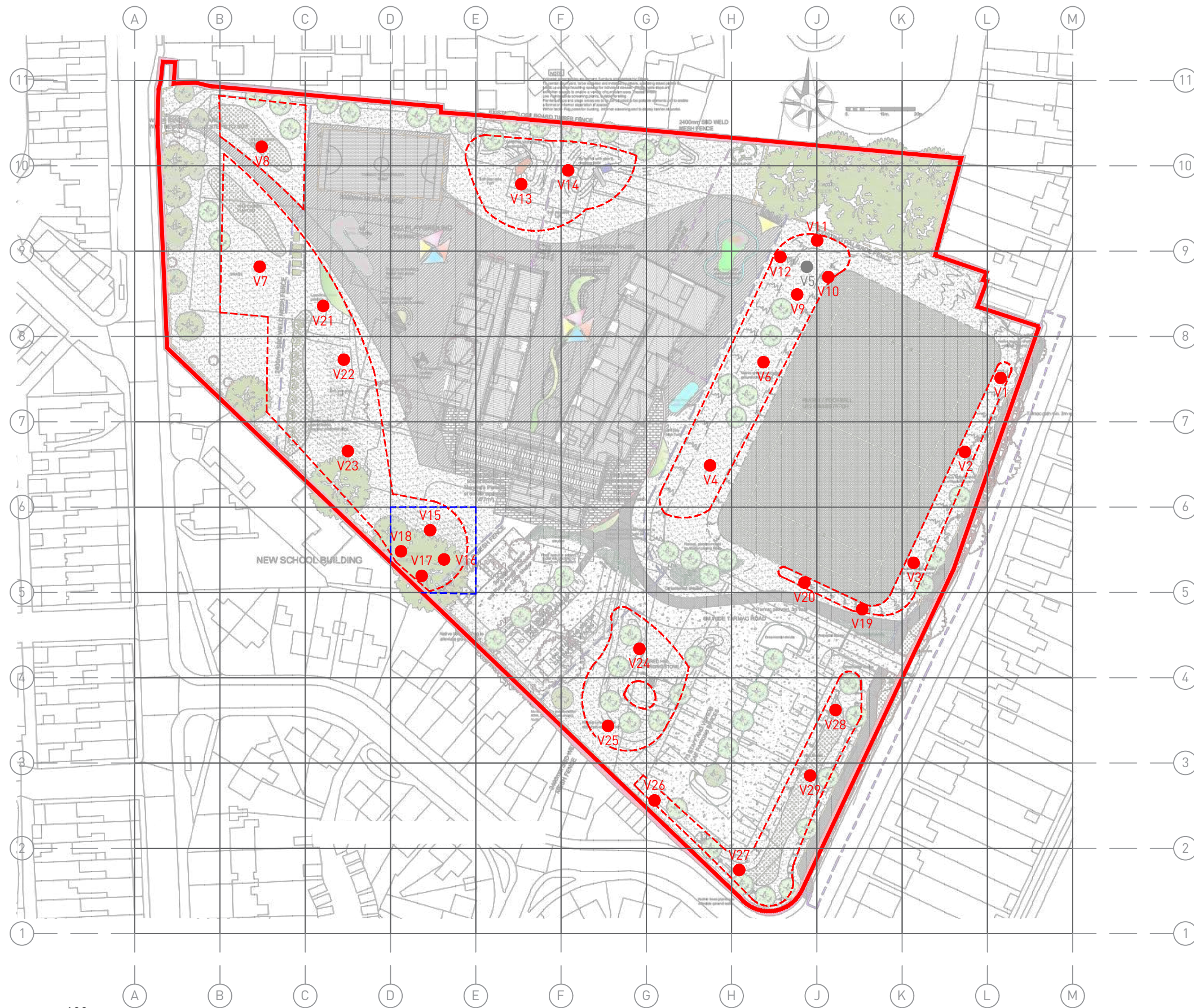
If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Quantum Geotechnic Ltd
Plas Newydd
Pontardulais
Swansea
SA4 0FQ

T: 01554 744880
E: enquiries@quantumgeotech.co.uk
W: <http://www.quantumgeotech.co.uk>

Appendix H. Ysgol Carreg Hir remediation drawings



Legend:

- Site Boundary
- Area of Arsenic Investigation
- Soil Validation Sample Location (Passed Bund & Landscape Criteria)
- Soil Validation Sample Location (Failed Bund & Landscape Criteria)
- Area of Validated Capping

Drawing Notes:
Based on Powell Dobsons DWG - Proposed Site Layout.
All locations are approximate.

Site Address:
Ysgol Newydd Briton Ferry
Old Rd
Briton Ferry
Neath
SA11 2ET

Rev.	Description	Date
A	First Issue	13/08/2018
B	Locations Added	03/09/2018
C	Locations Updated	09/10/2018

Project Name: Ysgol Newydd, Briton Ferry		
Client: Kier Construction		
Drawing Title: Validation Soil Sample Location Plan		
Contract No: S2333	Drawing No: D2333/021	Scale @ A3: 1:1250
Drawn By: JH	QC Check By: AKS	Approved By: LH



Sanctus House, The Waterfront, Stonehouse Park,
Stonehouse, Glos, GL10 3UT
T: 01453 828222
E: info@sanctusltd.co.uk www.sanctusltd.com



Sanctus House, The Waterfront, Stonehouse Park,
Stonehouse, Glos, GL10 3UT
T: 01453 828222
E: info@sanctustld.co.uk www.sanctustld.com

Legend:

- Proposed Site Investigation Locations
- Previous Site Investigation Locations
- Stockpile Sample Location (No Asbestos Detected)
- Site Boundary
- Proposed Building Footprint

Stockpile Location

Drawing Notes:
Based on Powell Dobsons DWG -
Proposed Site Layout.

All locations are approximate.

Site Address:
Ysgol Newydd Briton Ferry
Old Rd
Briton Ferry
Neath
SA11 2ET

Rev.	Description	Date
A	First Issue	21/07/2017

Project Name: Ysgol Newydd, Briton Ferry		
Client: Kier Construction		
Drawing Title: Previous and Proposed Site Investigation Location Plan		
Contract No: S2333	Drawing No: D2333/005	Scale @ A3: 1:1250
Drawn By: JH	QC Check By: LH	Approved By: JR

Appendix I. Geoenvironmental screening sheets



Assessment Criteria :		Drinking Water Standard England and Wales/WHO											
CaCO (mg/l):		0.00		pH		0.00							
Calcium (mg/l):		0.00		DOC (mg/l)		0.00		Catchment area:		Drinking Water Standard			
Constituents	Unit	Limit of Detection	Generic Assessment Criteria	Number of Samples	Minimum Value	Maximum Value	Number of Exceedences	Locations of Exceedences	Location		GBBH05	GBBH07	
									Sample ID		GBBH05	GBBH07	
									Depth		-m	-m	
									Date		25/07/2021	31/05/2023	
									Strata		-	-	
								Zone		-	-		
pH	-	N/A	6.5-9.5	2	6.8	8.3	0				8.3	6.8	
Biochemical Oxygen Demand Low Level	mg O2/l	1.0	No WSV	2	<1	<4	0				<1	<4	
Alkalinity (Total)	mg/l	10	No WSV	1	61	61	0				61		
Chloride	mg/l	1.0	250	2	19	21	0				19	21	
Ammonia (Free)	mg/l	0.050	No WSV	2	<0.05	<0.05	0				<0.05	<0.05	
Ammonium	mg/l	0.050	0.5	2	0.3	2	1	GBBH07			0.3	2	
Ammoniacal Nitrogen	mg/l	0.050	0.39	2	0.26	1.6	1	GBBH07			0.26	1.6	
Nitrate	mg/l	0.50	50	2	<0.5	7.8	0				7.8	<0.5	
Phosphorus (Dissolved)	mg/l	0.020	No WSV	1	0.023	0.023	0				0.023		
Sulphate	mg/l	1.0	250	2	2.9	20	0				20	2.9	
Cyanide (Total)	mg/l	0.050	0.05	1	<0.05	<0.05	0				<0.05		
Cyanide (Free)	mg/l	0.050	See Cyanide (total)	1	<0.05	<0.05	0				<0.05		
Cyanide (Total) Low-Level	mg/l	0.0050	No WSV	1	<0.005	<0.005	0					<0.005	
Cyanide (Free) Low-Level	mg/l	0.0050	No WSV	1	<0.005	<0.005	0					<0.005	
Sulphide	mg/l	0.050	No WSV	2	<0.05	<0.05	0				<0.05	<0.05	
Calcium	mg/l	2.00	N/A	1	21	21	0				21		
Total Hardness as CaCO3	mg/l	15	No WSV	1	67	67	0				67		
Aluminium	mg/l	0.005	0.2	2	<0.005	0.017	0				<0.005	0.017	
Arsenic	mg/l	0.0002	0.01	2	0.00058	0.00095	0				0.00095	0.00058	
Boron	mg/l	0.01	1	2	0.023	0.036	0				0.023	0.036	
Barium	mg/l	0.005	1.3	2	0.02	0.058	0				0.02	0.058	
Beryllium	mg/l	0.001	0.012	2	<0.001	<0.001	0				<0.001	<0.001	
Cadmium	mg/l	0.00011	0.005	2	<0.00011	<0.00011	0				<0.00011	<0.00011	
Copper	mg/l	0.0005	2	2	0.0013	0.0025	0				0.0025	0.0013	
Iron	mg/l	0.005	0.2	2	0.1	0.15	0				0.15	0.1	
Mercury	mg/l	0.00005	0.001	2	<0.00005	<0.00005	0				<0.00005	<0.00005	
Molybdenum	mg/l	0.0002	0.07	2	0.00064	0.0034	0				0.00064	0.0034	
Nickel	mg/l	0.0005	0.02	2	0.0007	0.0011	0				0.0011	0.0007	
Lead	mg/l	0.0005	0.01	2	<0.0005	<0.0005	0				<0.0005	<0.0005	
Antimony	mg/l	0.0005	0.005	2	<0.0005	<0.0005	0				<0.0005	<0.0005	
Selenium	mg/l	0.0005	0.01	2	<0.0005	0.00056	0				0.00056	<0.0005	
Vanadium	mg/l	0.0005	N/A	2	<0.0005	0.00052	0				0.00052	<0.0005	
Zinc	mg/l	0.0025	3	2	0.0039	0.023	0				0.0039	0.023	
Chromium (Total)	mg/l	0.0005	0.05	2	0.0057	0.036	0				0.0057	0.036	
Low-Level Chromium (Hexavalent)	mg/l	0.0001	No WSV	2	0.00035	0.003	0				0.003	0.00035	
Dissolved Organic Carbon	mg/l	2.0	No WSV	1	3.4	3.4	0				3.4		
Total Organic Carbon	mg/l	2.0	No WSV	2	3.3	15	0				3.3	15	
Aliphatic TPH >C5-C6	mg/l	0.0001	15	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aliphatic TPH >C6-C8	mg/l	0.0001	15	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aliphatic TPH >C8-C10	mg/l	0.0001	0.3	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aliphatic TPH >C10-C12	mg/l	0.0001	0.3	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aliphatic TPH >C12-C16	mg/l	0.0001	0.3	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aliphatic TPH >C16-C21	mg/l	0.0001	N/A	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aliphatic TPH >C21-C35	mg/l	0.0001	N/A	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aliphatic TPH >C35-C44	mg/l	0.0001	N/A	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Total Aliphatic Hydrocarbons	mg/l	0.005	No WSV	2	<0.005	<0.005	0				<0.005	<0.005	
Aromatic TPH >C5-C7	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aromatic TPH >C7-C8	mg/l	0.0001	0.7	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aromatic TPH >C8-C10	mg/l	0.0001	0.3	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aromatic TPH >C10-C12	mg/l	0.0001	0.09	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aromatic TPH >C12-C16	mg/l	0.0001	0.09	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aromatic TPH >C16-C21	mg/l	0.0001	0.09	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aromatic TPH >C21-C35	mg/l	0.0001	0.09	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Aromatic TPH >C35-C44	mg/l	0.0001	N/A	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Total Aromatic Hydrocarbons	mg/l	0.005	No WSV	2	<0.005	<0.005	0				<0.005	<0.005	
Total Petroleum Hydrocarbons	mg/l	0.01	No WSV	2	<0.01	<0.01	0				<0.01	<0.01	
Benzene	mg/l	0.001	0.001	2	<0.001	<0.001	0				<0.001	<0.001	
Toluene	mg/l	0.001	0.7	2	<0.001	<0.001	0				<0.001	<0.001	
Ethylbenzene	mg/l	0.001	0.3	2	<0.001	<0.001	0				<0.001	<0.001	
m & p-Xylene	mg/l	0.001	See Xylenes (total)	2	<0.001	<0.001	0				<0.001	<0.001	
o-Xylene	mg/l	0.001	See Xylenes (total)	2	<0.001	<0.001	0				<0.001	<0.001	
Naphthalene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Acenaphthylene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Acenaphthene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Fluorene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Phenanthrene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Anthracene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Fluoranthene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Pyrene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Benzo[a]anthracene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Chrysene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Benzo[b]fluoranthene	mg/l	0.0001	See PAH Sum of 4	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Benzo[k]fluoranthene	mg/l	0.0001	See PAH Sum of 4	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Benzo[a]pyrene	mg/l	0.0001	0.00001	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Indeno(1,2,3-c,d)Pyrene	mg/l	0.0001	See PAH Sum of 4	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Dibenz(a,h)Anthracene	mg/l	0.0001	See BaP	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Benzo[g,h,i]perylene	mg/l	0.0001	See PAH Sum of 4	2	<0.0001	<0.0001	0				<0.0001	<0.0001	
Coronene	mg/l	0.0001	No WSV	1	<0.0001	<0.0001	0				<0.0001		
Total Of 17 PAH's	mg/l	0.002	No WSV	2	<0.002	<0.002	0				<0.002	<0.002	
Total Phenols	mg/l	0.030	No WSV	2	<0.03	<0.03	0				<0.03	<0.03	



Assessment Criteria :		Manual SSAC										
CaCO (mg/l):		116.00	pH		8.07							
Calcium (mg/l):		34.50	DOC (mg/l)		2.75		Catchment area:		Freshwater not listed			
Constituents	Unit	Limit of Detection	Generic Assessment Criteria	Number of Samples	Minimum Value	Maximum Value	Number of Exceedences				Location	
											Sample ID	
											Depth	
											Date	
											Strata	
Locations of Exceedences										Zone		
pH	-	N/A	6-9	2	6.8	8.3	0				8.3	6.8
Biochemical Oxygen Demand Low Level	mg O2/l	1.0	No WSV	2	<1	<4	0				<1	<4
Alkalinity (Total)	mg/l	10	No WSV	1	61	61	0				61	
Chloride	mg/l	1.0	250	2	19	21	0				19	21
Ammonia (Free)	mg/l	0.050	No WSV	2	<0.05	<0.05	0				<0.05	<0.05
Ammonium	mg/l	0.050	0.26	2	0.3	2	2	GBBH05; GBBH07			0.3	2
Ammoniacal Nitrogen	mg/l	0.050	0.2	2	0.26	1.6	2	GBBH05; GBBH07			0.26	1.6
Nitrate	mg/l	0.50	N/A	2	<0.5	7.8	0				7.8	<0.5
Phosphorus (Dissolved)	mg/l	0.020	No WSV	1	0.023	0.023	0				0.023	
Sulphate	mg/l	1.0	400	2	2.9	20	0				20	2.9
Cyanide (Total)	mg/l	0.050	N/A	1	<0.05	<0.05	0				<0.05	
Cyanide (Free)	mg/l	0.050	0.001	1	<0.05	<0.05	0				<0.05	
Cyanide (Total) Low-Level	mg/l	0.0050	No WSV	1	<0.005	<0.005	0					<0.005
Cyanide (Free) Low-Level	mg/l	0.0050	No WSV	1	<0.005	<0.005	0					<0.005
Sulphide	mg/l	0.050	No WSV	2	<0.05	<0.05	0				<0.05	<0.05
Calcium	mg/l	2.00	N/A	1	21	21	0				21	
Total Hardness as CaCO3	mg/l	15	No WSV	1	67	67	0				67	
Aluminium	mg/l	0.005	N/A	2	<0.005	0.017	0				<0.005	0.017
Arsenic	mg/l	0.0002	0.05	2	0.00058	0.00095	0				0.00095	0.00058
Boron	mg/l	0.01	2	2	0.023	0.036	0				0.023	0.036
Barium	mg/l	0.005	N/A	2	0.02	0.058	0				0.02	0.058
Beryllium	mg/l	0.001	N/A	2	<0.001	<0.001	0				<0.001	<0.001
Cadmium	mg/l	0.00011	0.00008 -> CaCO3 0-50mg/l 0.00009 -> CaCO3 50-100mg/l 0.00015 -> CaCO3 100-200mg/l 0.00025 -> CaCO3 200+mg/l	2	<0.00011	<0.00011	0				<0.00011	<0.00011
Copper	mg/l	0.0005	0.007	2	0.0013	0.0025	0				0.0025	0.0013
Iron	mg/l	0.005	1	2	0.1	0.15	0				0.15	0.1
Mercury	mg/l	0.00005	0.00007	2	<0.00005	<0.00005	0				<0.00005	<0.00005
Molybdenum	mg/l	0.0002	N/A	2	0.00064	0.0034	0				0.00064	0.0034
Nickel	mg/l	0.0005	0.006	2	0.0007	0.0011	0				0.0011	0.0007
Lead	mg/l	0.0005	0.003	2	<0.0005	<0.0005	0				<0.0005	<0.0005
Antimony	mg/l	0.0005	N/A	2	<0.0005	<0.0005	0				<0.0005	<0.0005
Selenium	mg/l	0.0005	N/A	2	<0.0005	0.00056	0				0.00056	<0.0005
Vanadium	mg/l	0.0005	0.02 -> CaCO3 0-200mg/l 0.06 -> CaCO3 200+mg/l	2	<0.0005	0.00052	0				0.00052	<0.0005
Zinc	mg/l	0.0025	0.019	2	0.0039	0.023	1	GBBH07			0.0039	0.023
Chromium (Total)	mg/l	0.0005	See Cr VI as first pass	2	0.0057	0.036	0				0.0057	0.036
Low-Level Chromium (Hexavalent)	mg/l	0.0001	No WSV	2	0.00035	0.003	0				0.003	0.00035
Dissolved Organic Carbon	mg/l	2.0	No WSV	1	3.4	3.4	0				3.4	
Total Organic Carbon	mg/l	2.0	No WSV	2	3.3	15	0				3.3	15
Aliphatic TPH >C5-C6	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aliphatic TPH >C6-C8	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aliphatic TPH >C8-C10	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aliphatic TPH >C10-C12	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aliphatic TPH >C12-C16	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aliphatic TPH >C16-C21	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aliphatic TPH >C21-C35	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aliphatic TPH >C35-C44	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Total Aliphatic Hydrocarbons	mg/l	0.005	No WSV	2	<0.005	<0.005	0				<0.005	<0.005
Aromatic TPH >C5-C7	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aromatic TPH >C7-C8	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aromatic TPH >C8-C10	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aromatic TPH >C10-C12	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aromatic TPH >C12-C16	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aromatic TPH >C16-C21	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aromatic TPH >C21-C35	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Aromatic TPH >C35-C44	mg/l	0.0001	0.01	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Total Aromatic Hydrocarbons	mg/l	0.005	No WSV	2	<0.005	<0.005	0				<0.005	<0.005
Total Petroleum Hydrocarbons	mg/l	0.01	No WSV	2	<0.01	<0.01	0				<0.01	<0.01
Benzene	mg/l	0.001	0.01	2	<0.001	<0.001	0				<0.001	<0.001
Toluene	mg/l	0.001	0.074	2	<0.001	<0.001	0				<0.001	<0.001
Ethylbenzene	mg/l	0.001	0.02	2	<0.001	<0.001	0				<0.001	<0.001
m & p-Xylene	mg/l	0.001	See Xylenes (total)	2	<0.001	<0.001	0				<0.001	<0.001
o-Xylene	mg/l	0.001	See Xylenes (total)	2	<0.001	<0.001	0				<0.001	<0.001
Naphthalene	mg/l	0.0001	0.002	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Acenaphthylene	mg/l	0.0001	Screen BaP only	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Acenaphthene	mg/l	0.0001	Screen BaP only	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Fluorene	mg/l	0.0001	N/A	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Phenanthrene	mg/l	0.0001	Screen BaP only	2	<0.0001	<0.0001	0				<0.0001	<0.0001
Anthracene	mg/l	0.0001	0.0001	2	<0.0001	<0.0001	0				<0.0001	<0.0001



Assessment Criteria :		Manual SSAC									
CaCO (mg/l):		116.00	pH		8.07						
Calcium (mg/l):		34.50	DOC (mg/l)		2.75	Catchment area:		Freshwater not listed			
Constituents	Unit	Limit of Detection	Generic Assessment Criteria	Number of Samples	Minimum Value	Maximum Value	Number of Exceedences	Locations of Exceedences	Location	GBBH05	GBBH07
									Sample ID	GBBH05	GBBH07
									Depth	-m	-m
									Date	25/07/2021	31/05/2023
									Strata	-	-
									Zone	-	-
Fluoranthene	mg/l	0.0001	0.0000063	2	<0.0001	<0.0001	0			<0.0001	<0.0001
Pyrene	mg/l	0.0001	N/A	2	<0.0001	<0.0001	0			<0.0001	<0.0001
Benzo[a]anthracene	mg/l	0.0001	Screen BaP only	2	<0.0001	<0.0001	0			<0.0001	<0.0001
Chrysene	mg/l	0.0001	Screen BaP only	2	<0.0001	<0.0001	0			<0.0001	<0.0001
Benzo[b]fluoranthene	mg/l	0.0001	Screen BaP only	2	<0.0001	<0.0001	0			<0.0001	<0.0001
Benzo[k]fluoranthene	mg/l	0.0001	Screen BaP only	2	<0.0001	<0.0001	0			<0.0001	<0.0001
Benzo[a]pyrene	mg/l	0.0001	0.00000017	2	<0.0001	<0.0001	0			<0.0001	<0.0001
Indeno(1,2,3-c,d)Pyrene	mg/l	0.0001	Screen BaP only	2	<0.0001	<0.0001	0			<0.0001	<0.0001
Dibenz(a,h)Anthracene	mg/l	0.0001	N/A	2	<0.0001	<0.0001	0			<0.0001	<0.0001
Benzo[g,h,i]perylene	mg/l	0.0001	Screen BaP only	2	<0.0001	<0.0001	0			<0.0001	<0.0001
Coronene	mg/l	0.0001	No WSV	1	<0.0001	<0.0001	0			<0.0001	
Total Of 17 PAH's	mg/l	0.002	No WSV	2	<0.002	<0.002	0			<0.002	<0.002
Total Phenols	mg/l	0.030	No WSV	2	<0.03	<0.03	0			<0.03	<0.03

Assessment Criteria :		Drinking Water Standard England and Wales/WHO																																			
CaCO (mg/l):		0.00	pH		0.00																																
Calcium (mg/l):		0.00	DOC (mg/l)		0.00	Catchment area:										Drinking Water Standard																					
Constituents	Unit	Limit of Detection	Generic Assessment Criteria	Number of Samples	Minimum Value	Maximum Value	Number of Exceedences	Locations of Exceedences																													
Location		Sample ID		Depth		Date		Strata		Zone																											
		GBH01		GBH02		GBH03		GBH04		GBH05		GBTP04		GBTP05		GBTP06		HP02		HP02		HP03		HP05		GBHP 06		GB-BH09		GB-BH07		GBBH10		GBBH12			
		GBH01		GBH02		GBH03		GBH04		GBH05		GBTP04		GBTP05		GBTP06		HP02		HP02		HP03		HP05		GBHP 06		GB-BH09		GB-BH07		GBBH10		GBBH12			
		0.5m		0.50m		0.5m		0.5m		1.00m		0.5m		1.20m		1.20m		0.50m		1.00m		0.40m		0.3m		0.30m		0.7m		0.3m		0.5m		0.8m			
		05/07/2021				15/11/2021		06/07/2021		15/11/2021		06/07/2021				18/08/2021		18/08/2021		19/08/2021		19/08/2021		19/08/2021		15/05/2023				07/03/2024		06/03/2024					
pH	-	N/A	6.5-9.5	17	6.8	8.8	0											8.7	8.4	8.5	8.5	8.3	8.8	8.3	8.3	8.3	8		8.1	8.6		8.1	7.3	6.8	7.6	7.3	
Chemical Oxygen Demand	mg O2/l	10	No WSV	14	10	31	0											11	10	13	15	<10	<10	11	14	31	25	<10	31						<10	20	
Ammoniacal Nitrogen	mg/l	0.050	0.39	14	<0.05	1.3	2	GBBH02, 0.50m; GBBH12, 0.8m										0.093	0.086	0.093	0.051	0.17	<0.05	0.093	0.12	0.068	0.061	0.078	0.093				<0.05	1.3			
Nitrite	mg/l	0.020	0.5	14	0.02	0.038	0											0.020	0.020	0.038	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		
Nitrate	mg/l	0.50	50	14	<0.5	15	0											1.2	2.3	<0.5	1.5	5.3	2	2.7	1.4	<0.5	1.2	1.3	1.5				6.7	1.7			
Sulphate	mg/l	1.0	250	17	<1	54	0											7	23	32	14	13	15	22	33	35	12	11	8.8	43	10	13	54	<1			
Cyanide (Total)	mg/l	0.050	0.05	15	<0.05	0.25	1	GBTP04, 0.5m										<0.05	<0.05	<0.05	<0.05	<0.05	0.25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
Cyanide (Free)	mg/l	0.050	See Cyanide (total)	12	<0.05	<0.05	0											<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Cyanide (Complex)	mg/l	0.050	0.05	12	<0.05	0.25	1	GBTP04, 0.5m										<0.05	<0.05	<0.05	<0.05	<0.05	0.25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
Cyanide (Total) Low-Level	mg/l	0.0050	No WSV	2	<0.005	<0.005	0											<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Cyanide (Free) Low-Level	mg/l	0.0050	No WSV	2	<0.005	<0.005	0											<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Cyanide (Complex) Low-Level	mg/l	0.0050	No WSV	2	<0.005	<0.005	0											<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Sulphide	mg/l	0.050	No WSV	14	<0.05	0.074	0											<0.05	<0.05	<0.05	0.054	<0.05	0.074	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Magnesium	mg/l	0.20	N/A	14	0.5	3.4	0											0.75	0.56	1.4	1.4	1.4	1.5	2.9	2.1	2.8	3.4	2.5	2.8				2	0.5			
Aluminium	mg/l	0.005	0.2	14	0.0087	7.9	5	GBH01, 0.5m; GBBH02, 0.50m; GBBH04, 0.5m; GBTP04, 0.5m; GBBH12, 0.8m										0.21	0.23	0.018	7.9	0.044	7.5	0.038	0.04	0.037	0.0087	0.039	0.019				0.071	0.69			
Arsenic	mg/l	0.0002	0.01	17	0.00042	0.036	5	GBH03, 0.5m; GBTP04, 0.5m; HP02, 0.50m; GBBH10, 0.5m; GBBH12, 0.8m										0.001	0.0012	0.016	0.0086	0.0031	0.036	0.0016	0.0038	0.011	0.001	0.0026	0.0011	0.00042	0.0052	0.0011	0.015	0.017			
Boron	mg/l	0.01	1	17	0.013	0.066	0											0.016	0.026	0.066	0.023	0.023	0.025	0.038	0.039	0.061	0.026	0.02	0.02	0.018	0.048	0.046	0.02	0.013			
Barium	mg/l	0.005	1.3	14	<0.005	0.099	0											<0.005	0.0074	0.014	0.025	0.037	0.055	0.076	0.099	0.037	0.01	0.044	0.034				0.072	0.0072			
Beryllium	mg/l	0.001	0.012	14	<0.001	<0.001	0											<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Cadmium	mg/l	0.00011	0.005	17	<0.00011	0.00036	0											<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	0.00013	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	0.00036	0.00021	<0.00011		
Copper	mg/l	0.0005	2	17	0.0016	0.11	0											0.00018	0.00018	0.0024	0.02	0.0078	0.11	0.0034	0.0039	0.0038	0.002	0.0016	0.005	0.0018	0.0063	0.012	0.0032	0.012			
Mercury	mg/l	0.00005	0.001	17	<0.00005	0.00042	0											<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00042	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		
Manganese	mg/l	0.0005	0.05	14	0.00096	0.31	3	GBBH02, 0.50m; GBTP04, 0.5m; GBBH12, 0.8m										0.02	0.31	0.0019	0.018	0.0022	0.096	0.036	0.0071	0.016	0.017	0.00096	0.0016				0.0036	0.09			
Molybdenum	mg/l	0.0002	0.07	14	0.00081	0.05	0											0.0011	0.0081	0.046	0.0025	0.0078	0.0073	0.027	0.05	0.02	0.0086	0.01	0.0013				0.0058	0.029			
Nickel	mg/l	0.0005	0.02	17	<0.0005	0.014	0											0.00078	0.00068	<0.0005	0.0045	0.0021	0.013	0.0009	0.00058	0.00067	<0.0005	<0.0005	0.00075	<0.0005	0.00062	0.014	0.00084	0.0016			
Lead	mg/l	0.0005	0.01	17	<0.0005	0.093	5	GBBH04, 0.5m; GBTP04, 0.5m; GB-BH09, 0.7m; GB-BH07, 0.3m; GBBH10, 0.5m										0.00052	0.001	<0.0005	0.011	0.0078	0.093	0.00082	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.012	0.027	0.021	0.0042			
Antimony	mg/l	0.0005	0.005	14	<0.0005	0.013	4	GBBH05, 1.00m; GBTP04, 0.5m; GBTP05, 1.20m; GBTP06, 1.20m										<0.0005	<0.0005	<0.0005	0.0013	0.0015	0.013	0.0083	0.0059	0.013	0.0014	<0.0005	0.0044	0.0014				0.0037	0.0015		
Selenium	mg/l	0.0005	0.01	14	<0.0005	0.0066	0											0.0024	0.00073	0.0066	<0.0005	0.00068	0.0018	0.0028	0.0047	0.0053	0.00012	0.00059	<0.0005				0.0049	0.0043			
Vanadium	mg/l	0.0005	N/A	14	<0.0005	0.024	0											0.00093	0.00091	0.0019	0.02	0.0011	0.024	<0.0005	0.0031	0.0093	0.00015	0.00079	<0.0005				0.0014	0.0028			
Zinc	mg/l	0.0025	3	17	<0.0025	0.3	0											0.0065	<0.0025	<0.0025	0.029	0.012	0.082	0.011	0.011	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	0.038	0.3	0.022	0.011		
Chromium (Total)	mg/l	0.0005	0.05	17	<0.0005	0.025	0											0.00076	0.00051	0.0048	0.013	<0.0005	0.025	0.0016	<0.0005	0.00058	<0.0005	0.00015	<0.0005	0.00076	<0.0005	0.00078			0.0058	0.0012	
Iron (Dissolved)	mg/l	0.005	0.2	14	<0.005	12	5	GBH01, 0.5m; GBBH02, 0.50m; GBBH04, 0.5m; GBTP04, 0.5m; GBBH12, 0.8m										1.7	1.6	0.0079	6.3	0.074	12	0.02	0.023	0.018	0.0087	<0.005	0.053				0.048	1.8			
Chromium (Hexavalent)	mg/l	0.02	See Total Chromium	12	<0.02	0.022	0											<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.022	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		
Low-Level Chromium (Hexavalent)	mg/l	0.0001	No WSV	2	<0.0001	<0.0001	0																													<0.0001	<0.0001
Aliphatic TPH >C5-C6	mg/l	0.0001	15	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Aliphatic TPH >C6-C8	mg/l	0.0001	15	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Aliphatic TPH >C9-C10	mg/l	0.0001	0.3	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Aliphatic TPH >C10-C12	mg/l	0.0001	0.3	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Aliphatic TPH >C12-C16	mg/l	0.0001	0.3	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Aliphatic TPH >C16-C21	mg/l	0.0001	N/A	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001						

Assessment Criteria :		Manual SSAC																																				
CaCO (mg/l):		116.00	pH		8.07																																	
Calcium (mg/l):		34.50	DOC (mg/l)		2.75	Catchment area:										Freshwater not listed																						
Constituents	Unit	Limit of Detection	Generic Assessment Criteria	Number of Samples	Minimum Value	Maximum Value	Number of Exceedences	Locations of Exceedences										Location																				
																		Sample ID																				
																		Depth																				
																		Date																				
Strata		Zone																																				
pH	-	N/A	6-9	17	6.8	8.8	0											GBH01	GBBH02	GBBH03	GBBH04	GBBH05	GBTP04	GBTP05	GBTP06	HP02	HP02	HP03	HP03	HP05	GBHP 06	GB-BH09	GB-BH07	GBBH10	GBBH12			
Chemical Oxygen Demand	mg O2/l	10	No WSV	14	10	31	0											8.7	8.4	8.5	8.5	8.3	8.8	8.3	8.3	8.3	8	8.1	8.6	8.1	7.3	6.8	7.6	7.3				
Ammoniacal Nitrogen	mg/l	0.050	0.2	14	<0.05	1.3	2	GBBH02, 0.50m; GBBH12, 0.8m										11	10	13	15	<10	<10	11	14	31	25	<10	31			<10	20					
Nitrite	mg/l	0.020	0.01	14	0.02	0.038	3	GBH01, 0.5m; GBBH02, 0.50m; GBH03, 0.5m										0.093	0.86	0.093	0.051	0.17	<0.05	0.093	0.12	0.068	0.061	0.078	0.093			<0.05	1.3					
Nitrate	mg/l	0.50	N/A	14	<0.5	15	0											0.038	0.023	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				
Sulphate	mg/l	1.0	400	17	<1	54	0											2	1.2	<0.5	1.5	5.3	2	2.7	1.4	<0.5	1.2	1.3	15			6.7	1.7					
Cyanide (Total)	mg/l	0.050	N/A	15	<0.05	0.25	0											7	23	32	14	13	15	22	33	35	12	11	8.8	43	10	13	54	<1				
Cyanide (Free)	mg/l	0.050	0.001	12	<0.05	<0.05	0											<0.05	<0.05	<0.05	<0.05	<0.05	0.25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
Cyanide (Complex)	mg/l	0.050	N/A	12	<0.05	0.25	0											<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
Cyanide (Total) Low-Level	mg/l	0.0050	No WSV	2	<0.005	<0.005	0											<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
Cyanide (Free) Low-Level	mg/l	0.0050	No WSV	2	<0.005	<0.005	0											<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
Cyanide (Complex) Low-Level	mg/l	0.0050	No WSV	2	<0.005	<0.005	0											<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
Sulphide	mg/l	0.050	No WSV	14	<0.05	0.074	0											<0.05	<0.05	<0.05	0.054	<0.05	0.074	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
Magnesium	mg/l	0.20	N/A	14	0.5	3.4	0											0.75	0.56	1.4	1.4	1.4	1.5	2.9	2.1	2.8	3.4	2.5	2.8			2	0.5					
Aluminium	mg/l	0.005	N/A	14	0.0087	7.9	0											0.21	0.23	0.018	7.9	0.044	7.5	0.038	0.04	0.037	0.0087	0.039	0.019			0.071	0.69					
Arsenic	mg/l	0.0002	0.05	17	0.00042	0.036	0											0.001	0.0012	0.016	0.0088	0.0031	0.036	0.0016	0.0038	0.011	0.001	0.0026	0.0011	0.00042	0.0052	0.0011	0.015	0.017				
Boron	mg/l	0.01	2	17	0.013	0.066	0											0.018	0.026	0.066	0.023	0.023	0.025	0.038	0.039	0.061	0.026	0.02	0.02	0.018	0.048	0.048	0.002	0.013				
Barium	mg/l	0.005	N/A	14	<0.005	0.099	0											<0.005	0.0007	0.006	0.004	0.005	0.007	0.009	0.037	0.001	0.044	0.004			0.076	0.0072						
Beryllium	mg/l	0.001	N/A	14	<0.001	<0.001	0											<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Cadmium	mg/l	0.00011	0.00008 -> CaCO3 0-50mg/l 0.00009 -> CaCO3 50-100mg/l 0.00015 -> CaCO3 100-200mg/l 0.00025 -> CaCO3 200+mg/l	17	<0.00011	0.00036	0											<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	0.00013	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011				
Copper	mg/l	0.0005	0.007	17	0.0016	0.11	5	GBBH04, 0.5m; GBBH05, 1.00m; GBTP04, 0.5m; GB-BH07, 0.3m; GBBH12, 0.8m										0.0018	0.0018	0.0024	0.02	0.0078	0.11	0.0034	0.0039	0.0038	0.002	0.0016	0.005	0.0018	0.0063	0.012	0.0032	0.012				
Mercury	mg/l	0.00005	0.00007	17	<0.00005	0.00042	2	GBBH03, 0.5m; GBTP04, 0.5m										<0.00005	<0.00005	0.00008	<0.00005	<0.00005	0.00042	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005			
Manganese	mg/l	0.0005	0.18	14	0.00096	0.31	1	GBBH02, 0.50m										0.00026	0.00031	0.0019	0.018	0.0022	0.026	0.0036	0.0071	0.016	0.017	0.00096			0.016							
Molybdenum	mg/l	0.0002	N/A	14	0.00081	0.05	0											0.00011	0.00081	0.046	0.0025	0.0078	0.0073	0.027	0.05	0.02	0.0066	0.01	0.0013			0.0058	0.0029					
Nickel	mg/l	0.0005	0.006	17	<0.0005	0.014	2	GBTP04, 0.5m; GB-BH07, 0.3m										0.00078	0.00068	<0.0005	0.0045	0.0021	0.013	0.00058	0.00067	<0.0005	<0.0005	0.00075	<0.0005	0.00062	0.014	0.00084	0.0016					
Lead	mg/l	0.0005	0.003	17	<0.0005	0.093	7	GBBH04, 0.5m; GBBH05, 1.00m; GBTP04, 0.5m; GB-BH09, 0.7m; GB-BH07, 0.3m; GBBH10, 0.5m; GBBH12, 0.8m										0.00052	0.001	<0.0005	0.011	0.0078	0.093	0.00082	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.012	0.027	0.021	0.0042			
Antimony	mg/l	0.0005	N/A	14	<0.0005	0.013	0											<0.0005	<0.0005	0.0013	0.0015	0.013	0.0083	0.0059	0.013	0.0014	<0.0005	0.0044	0.0014			0.0037	0.0015					
Selenium	mg/l	0.0005	N/A	14	<0.0005	0.0066	0											0.0024	0.00073	0.0066	<0.0005	0.00068	0.0018	0.0028	0.0047	0.0053	0.001	0.00059	<0.0005			0.0049	0.0043					
Vanadium	mg/l	0.0005	0.02 -> CaCO3 0-200mg/l 0.06 -> CaCO3 200+mg/l	14	<0.0005	0.024	0											0.00093	0.00091	0.019	0.02	0.0011	0.024	<0.0005	0.0031	0.0093	<0.0005	0.00079	<0.0005			0.0014	0.0028					
Zinc	mg/l	0.0025	0.019	17	<0.0025	0.3	5	GBBH04, 0.5m; GBTP04, 0.5m; GB-BH09, 0.7m; GB-BH07, 0.3m; GBBH10, 0.5m										0.00065	<0.0025	<0.0025	0.029	0.012	0.082	0.011	0.011	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	0.038	0.3	0.022	0.011				
Chromium (Total)	mg/l	0.0005	See Cr VI as first pass	17	<0.0005	0.025	0											0.00076	0.00051	0.0048	0.013	<0.0005	0.025	0.0018	<0.0005	0.00058	0.0005	0.0015	0.00076	<0.0005	0.00078	0.00058	0.0012					
Iron (Dissolved)	mg/l	0.005	1	14	<0.005	12	5	GBH01, 0.5m; GBBH02, 0.50m; GBBH04, 0.5m; GBTP04, 0.5m; GBBH12, 0.8m										1.7	1.6	0.0079	6.3	0.074	12	0.02	0.023	0.018	0.0067	<0.005	0.053			0.048	1.8					
Chromium (Hexavalent)	mg/l	0.02	0.0034	12	<0.02	0.022	1	GBTP04, 0.5m										<0.02	<0.02	<0.02	<0.02	<0.02	0.022	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				
Low-Level Chromium (Hexavalent)	mg/l	0.0001	No WSV	2	<0.0001	<0.0001	0																															
Aliphatic TPH >C5-C8	mg/l	0.0001	0.01	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Aliphatic TPH >C8-C8	mg/l	0.0001	0.01	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Aliphatic TPH >C8-C10	mg/l	0.0001	0.01	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Aliphatic TPH >C10-C12	mg/l	0.0001	0.01	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Aliphatic TPH >C12-C16	mg/l	0.0001	0.01	14	<0.0001	<0.0001	0											<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<												

Assessment Criteria :		Manual SSAC											
CaCO (mg/l):		116.00	pH		8.07								
Calcium (mg/l):		34.50	DOC (mg/l)		2.75		Catchment area:					Freshwater not listed	
Constituents	Unit	Limit of Detection	Generic Assessment Criteria	Number of Samples	Minimum Value	Maximum Value	Number of Exceedences	Locations of Exceedences	Location	Upstream	Downstream	GB SW 02 (Upstream)	GB SW 01 (Downstream)
									Sample ID	Upstream	Downstream	GB SW 02 (Upstream)	GB SW 01 (Downstream)
									Depth	-m	-m	-m	-m
									Date	25-Aug-201	25-Aug-201	31-May-23	31-May-23
									Strata	-	-	-	-
		Zone		-	-	-	-	-	-	-	-	-	-
pH		N/A	6-9	4	7.5	8.5	0			8.5	8.5	7.8	7.5
Biochemical Oxygen Demand Low Level	mg O2/l	1.0	No WSV	4	<1	<4	0			<1	<1	<4	<4
Alkalinity (Total)	mg/l	10	No WSV	2	61	150	0			150	61		
Chloride	mg/l	1.0	250	4	20	32	0			32	20	28	21
Ammonia (Free)	mg/l	0.050	No WSV	4	<0.05	0.19	0			0.19	<0.05	<0.05	<0.05
Ammonium	mg/l	0.050	0.26	4	<0.05	1.4	2	Upstream, 25-Aug-201; Downstream, 25-Aug-201		1.4	0.33	<0.05	0.08
Ammoniacal Nitrogen	mg/l	0.050	0.2	4	<0.05	1.2	2	Upstream, 25-Aug-201; Downstream, 25-Aug-201		1.2	0.3	<0.05	0.063
Nitrate	mg/l	0.50	N/A	4	4.4	11	0			11	4.4	6.7	4.6
Phosphorus (Dissolved)	mg/l	0.020	No WSV	2	0.024	0.065	0			0.065	0.024		
Sulphate	mg/l	1.0	400	4	19	42	0			35	19	42	22
Cyanide (Total)	mg/l	0.050	N/A	2	<0.05	<0.05	0			<0.05	<0.05		
Cyanide (Free)	mg/l	0.050	0.001	2	<0.05	<0.05	0			<0.05	<0.05		
Cyanide (Total) Low-Level	mg/l	0.0050	No WSV	2	<0.005	<0.005	0					<0.005	<0.005
Cyanide (Free) Low-Level	mg/l	0.0050	No WSV	2	<0.005	<0.005	0					<0.005	<0.005
Sulphide	mg/l	0.050	No WSV	4	<0.05	<0.05	0			<0.05	<0.05	<0.05	<0.05
Calcium	mg/l	2.00	N/A	4	21	47	0			46	21	47	24
Total Hardness as CaCO3	mg/l	15	No WSV	4	69	160	0			160	69	160	76
Aluminium	mg/l	0.005	N/A	4	<0.005	0.0078	0			<0.005	<0.005	<0.005	0.0078
Arsenic	mg/l	0.0002	0.05	4	0.00081	0.0014	0			0.0012	0.00081	0.0014	0.001
Boron	mg/l	0.01	2	4	0.024	0.051	0			0.051	0.024	0.04	0.024
Barium	mg/l	0.005	N/A	4	0.02	0.041	0			0.041	0.02	0.039	0.021
Beryllium	mg/l	0.001	N/A	4	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001
Cadmium	mg/l	0.00011	0.00008 -> CaCO3 0-50mg/l 0.00009 -> CaCO3 50-100mg/l 0.00015 -> CaCO3 100-200mg/l 0.00025 -> CaCO3 200+mg/l	4	<0.00011	<0.00011	0			<0.00011	<0.00011	<0.00011	<0.00011
Copper	mg/l	0.0005	0.007	4	0.0017	0.0028	0			0.0026	0.0028	0.0017	0.0019
Iron	mg/l	0.005	1	4	<0.005	0.12	0			<0.005	0.11	<0.005	0.12
Mercury	mg/l	0.00005	0.00007	4	<0.00005	<0.00005	0			<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum	mg/l	0.0002	N/A	4	0.00083	0.0013	0			0.0013	0.00083	0.0012	0.00094
Nickel	mg/l	0.0005	0.006	4	0.00059	0.0011	0			0.00066	0.0011	0.00059	0.00094
Lead	mg/l	0.0005	0.003	4	<0.0005	<0.0005	0			<0.0005	<0.0005	<0.0005	<0.0005
Antimony	mg/l	0.0005	N/A	4	<0.0005	0.0009	0			0.00056	<0.0005	0.0009	0.00055
Selenium	mg/l	0.0005	N/A	4	<0.0005	0.002	0			0.002	<0.0005	0.0017	0.00068
Vanadium	mg/l	0.0005	0.02 -> CaCO3 0-200mg/l 0.06 -> CaCO3 200+mg/l	4	0.00051	0.00066	0			0.00058	0.00051	0.00066	0.00062
Zinc	mg/l	0.0025	0.019	4	0.0036	0.017	0			0.0088	0.0036	0.017	0.013
Chromium (Total)	mg/l	0.0005	See Cr VI as first pass	4	0.0016	0.0066	0			0.0066	0.0058	0.0016	0.0025
Low-Level Chromium (Hexavalent)	mg/l	0.0001	No WSV	4	0.00015	0.0037	0			0.0037	0.0033	0.00028	0.00015
Dissolved Organic Carbon	mg/l	2.0	No WSV	4	2.2	3.5	0			2.2	3.5	2.4	2.9
Total Organic Carbon	mg/l	2.0	No WSV	4	2	3.2	0			2	3.2	2.2	2.7
Aliphatic TPH >C5-C6	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aliphatic TPH >C6-C8	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aliphatic TPH >C8-C10	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aliphatic TPH >C10-C12	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aliphatic TPH >C12-C16	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aliphatic TPH >C16-C21	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aliphatic TPH >C21-C35	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aliphatic TPH >C35-C44	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Total Aliphatic Hydrocarbons	mg/l	0.005	No WSV	4	<0.005	<0.005	0			<0.005	<0.005	<0.005	<0.005
Aromatic TPH >C5-C7	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aromatic TPH >C7-C8	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aromatic TPH >C8-C10	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aromatic TPH >C10-C12	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aromatic TPH >C12-C16	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aromatic TPH >C16-C21	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aromatic TPH >C21-C35	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Aromatic TPH >C35-C44	mg/l	0.0001	0.01	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Total Aromatic Hydrocarbons	mg/l	0.005	No WSV	4	<0.005	<0.005	0			<0.005	<0.005	<0.005	<0.005
Total Petroleum Hydrocarbons	mg/l	0.01	No WSV	4	<0.01	<0.01	0			<0.01	<0.01	<0.01	<0.01
Benzene	mg/l	0.001	0.01	4	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001
Toluene	mg/l	0.001	0.074	4	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/l	0.001	0.02	4	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001
m & p-Xylene	mg/l	0.001	See Xylenes (total)	4	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001
o-Xylene	mg/l	0.001	See Xylenes (total)	4	<0.001	<0.001	0			<0.001	<0.001	<0.001	<0.001
Naphthalene	mg/l	0.0001	0.002	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Acenaphthylene	mg/l	0.0001	Screen BaP only	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Acenaphthene	mg/l	0.0001	Screen BaP only	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Fluorene	mg/l	0.0001	N/A	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Phenanthrene	mg/l	0.0001	Screen BaP only	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Anthracene	mg/l	0.0001	0.0001	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Fluoranthene	mg/l	0.0001	0.0000063	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Pyrene	mg/l	0.0001	N/A	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Benzo[a]anthracene	mg/l	0.0001	Screen BaP only	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Chrysene	mg/l	0.0001	Screen BaP only	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Benzo[b]fluoranthene	mg/l	0.0001	Screen BaP only	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Benzo[k]fluoranthene	mg/l	0.0001	Screen BaP only	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001
Benzo[a]pyrene	mg/l	0.0001	0.00000017	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001



Assessment Criteria :		Manual SSAC														
CaCO (mg/l):		116.00	pH		8.07											
Calcium (mg/l):		34.50	DOC (mg/l)		2.75	Catchment area:					Freshwater not listed					
Constituents	Unit	Limit of Detection	Generic Assessment Criteria	Number of Samples	Minimum Value	Maximum Value	Number of Exceedences	Locations of Exceedences	Location							
									Sample ID							
									Upstream	Downstream	GB SW 02 (Upstream)	GB SW 01 (Downstream)				
									Depth	-m	-m	-m	-m			
									Date	25-Aug-201	25-Aug-201	31-May-23	31-May-23			
									Strata	-	-	-	-			
									Zone	-	-	-	-			
Indeno(1,2,3-c,d)Pyrene	mg/l	0.0001	Screen BaP only	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001			
Dibenz(a,h)Anthracene	mg/l	0.0001	N/A	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001			
Benzo(g,h,i)perylene	mg/l	0.0001	Screen BaP only	4	<0.0001	<0.0001	0			<0.0001	<0.0001	<0.0001	<0.0001			
Coronene	mg/l	0.0001	No WSV	2	<0.0001	<0.0001	0			<0.0001	<0.0001					
Total Of 17 PAH's	mg/l	0.002	No WSV	4	<0.002	<0.002	0			<0.002	<0.002	<0.002	<0.002			
Total Phenols	mg/l	0.030	No WSV	4	<0.03	<0.03	0			<0.03	<0.03	<0.03	<0.03			

Assessment Criteria		Public Open Space (Residential) - 6% SOD Sandy Loam		Use MR Values?		Location		Sample ID		Depth		Date		Strata		Zone		Locations of Exceedances		GBH01		GBH02		GBH03		GBH04		GBH05		GBH06		GBH07		GBH08		GBH09		GBH10		GBH11		GBH12		GBH13		GBH14		GBH15		GBH16		GBH17		GBH18		GBH19		GBH20		GBH21		GBH22		GBH23		GBH24		GBH25		GBH26		GBH27		GBH28		GBH29		GBH30		GBH31		GBH32		GBH33		GBH34		GBH35		GBH36		GBH37		GBH38		GBH39		GBH40		GBH41		GBH42		GBH43		GBH44		GBH45		GBH46		GBH47		GBH48		GBH49		GBH50		GBH51		GBH52		GBH53		GBH54		GBH55		GBH56		GBH57		GBH58		GBH59		GBH60		GBH61		GBH62		GBH63		GBH64		GBH65		GBH66		GBH67		GBH68		GBH69		GBH70		GBH71		GBH72		GBH73		GBH74		GBH75		GBH76		GBH77		GBH78		GBH79		GBH80		GBH81		GBH82		GBH83		GBH84		GBH85		GBH86		GBH87		GBH88		GBH89		GBH90		GBH91		GBH92		GBH93		GBH94		GBH95		GBH96		GBH97		GBH98		GBH99		GBH100		GBH101		GBH102		GBH103		GBH104		GBH105		GBH106		GBH107		GBH108		GBH109		GBH110		GBH111		GBH112		GBH113		GBH114		GBH115		GBH116		GBH117		GBH118		GBH119		GBH120		GBH121		GBH122		GBH123		GBH124		GBH125		GBH126		GBH127		GBH128		GBH129		GBH130		GBH131		GBH132		GBH133		GBH134		GBH135		GBH136		GBH137		GBH138		GBH139	
---------------------	--	---	--	----------------	--	----------	--	-----------	--	-------	--	------	--	--------	--	------	--	--------------------------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	-------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--	--------	--

Appendix J. The Coal Authority report



The Coal
Authority

CON29M

coal mining report

SITE AT 274590, 195200, NEATH PORT TALBOT



Known or potential coal mining risks

Past underground coal mining	Page 4
Future underground coal mining	Page 4



Further action

No further reports from the Coal Authority are required. Further information on any next steps can be found in our Professional opinion.

For more information on our reports please visit
www.groundstability.com



Professional opinion

According to the official mining information records held by the Coal Authority at the time of this search, evidence of, or the potential for, coal mining related features have been identified. In view of the coal mining circumstances we would recommend that any planned or future development should follow detailed technical advice before beginning work on site. Please see **page 3** for further details on **Future development**.

Your reference: **222284714_2|5192793**

Our reference: **51002185942001**

Date: **22 October 2019**

Client name:

**LANDMARK INFORMATION
GROUP LIMITED**

If you require any further assistance please
contact our experts on:

0345 762 6848

groundstability@coal.gov.uk

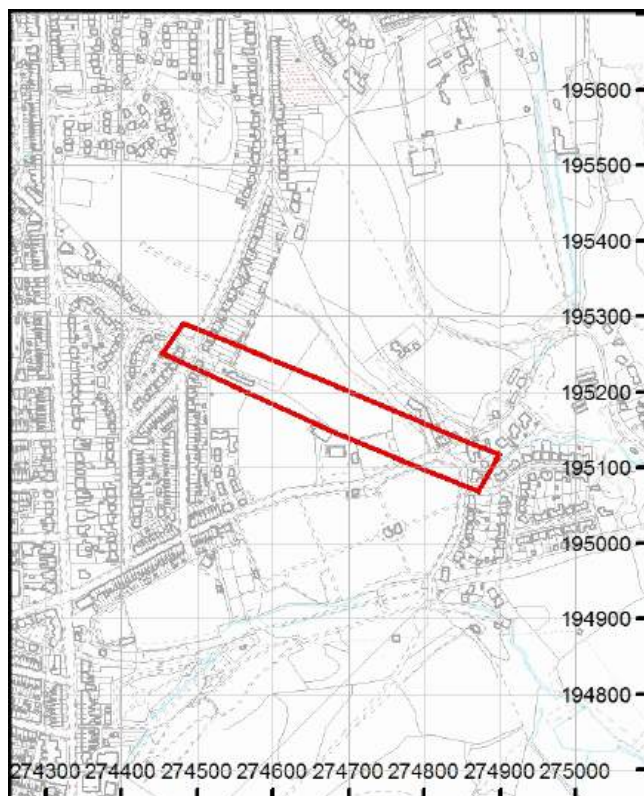


The Law
Society

Enquiry boundary

Key

Approximate position of enquiry boundary shown



We can confirm that the location is
on the coalfield



Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2018. All rights reserved.
Ordnance Survey Licence number: 100020315.

This report is prepared in accordance with the latest Law Society's Guidance Notes 2018, the User Guide 2018 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.



Accessibility

If you would like this information in an alternative format, please contact our communications team on 0345 762 6848 or email communications@coal.gov.uk.

Your reference: **222284714_2|5192793**

Our reference: **51002185942001**

Date: **22 October 2019**

Client name:

**LANDMARK INFORMATION
GROUP LIMITED**

If you require any further assistance please
contact our experts on:

0345 762 6848

groundstability@coal.gov.uk

Professional opinion



Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed.

If you are looking to develop, or undertake works, within a coal mining development high risk area your Local Authority planning department may require a Coal Mining Risk Assessment to be undertaken by a qualified mining geologist or engineer. Should you require any additional information then please contact the Coal Authority on **0345 762 6848** or email **cmra@coal.gov.uk**.

Detailed findings

Information provided by the Coal Authority in this report is compiled in response to the Law Society's CON29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL.

The Coal Authority owns the copyright in this report and the information used to produce this report is protected by our database rights. All rights are reserved and unauthorised use is prohibited. If we provide a report for you, this does not mean that copyright and any other rights will pass to you. However, you can use the report for your own purposes.

1 Past underground coal mining

The property is not within a surface area that could be affected by any past recorded underground coal mining.

However the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk. Your attention is drawn to the Professional opinion sections of the report.

2 Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3 Future underground coal mining

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4 Mine entries

There are no recorded coal mine entries known to the Coal Authority within, or within 20 metres, of the boundary of the property.

5 Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6 Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7 Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8 Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9 Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10 Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11 Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

12 Withdrawal of support

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

13 Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14 Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Statutory cover



Coal mining subsidence

In the unlikely event of any coal mining related subsidence damage, the Coal Authority or the mine operator has a duty to take remedial action in respect of subsidence caused by the withdrawal of support from land or property in connection with lawful coal mining operations.

When the works are the responsibility of the Coal Authority, our dedicated public safety and subsidence team will manage the claim. The house or land owner ("the owner") is covered for these works under the terms of the Coal Mining Subsidence Act 1991 (as amended by the Coal Industry Act 1994). Please note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

If you believe your land or property is suffering from coal mining subsidence damage and you need more information on what to do next, please use the following link to our website which sets out what your rights are and what you need to consider before making a claim.

www.gov.uk/government/publications/coal-mining-subsidence-damage-notice-form



Coal mining hazards

Our public safety and subsidence team provide a 24 hour a day, 7 days a week hazard reporting service, to help protect the public from hazards caused by past coal workings, such as a mine shaft or shallow working collapse. To report any hazards please call **01623 646 333**. Further information can be found on our website: www.gov.uk/coalauthority.

Glossary



Key terms

adit - horizontal or sloped entrance to a mine

coal mining subsidence - ground movement caused by the removal of coal by underground mining

Coal Mining Subsidence Act 1991 - the Act setting out the duties of the Coal Authority to repair damage caused by coal mining subsidence

coal mining subsidence damage - damage to land, buildings or structures caused by the removal of coal by underground mining

coal seams - bed of coal of varying thickness

future opencast coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal from the surface

future underground coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal underground. Although it is unlikely, remaining coal reserves could create a possibility for future mining, which would be licensed by the Coal Authority

mine entries - collective name for shafts and adits

payments to owners of former copyhold land - historically, copyhold land gave rights to coal to the copyholder. Legislation was set up to allow others to work this coal, but they had to issue a notice and pay compensation if a copyholder came forward

shaft - vertical entry into a mine

site investigation - investigations of coal mining risks carried out with the Coal Authority's permission

stop notice - a delay to repairs because further coal mining subsidence damage may occur and it would be unwise to carry out permanent repairs

subsidence claim - a formal notice of subsidence damage to the Coal Authority since it was established on 31 October 1994

withdrawal of support - a historic notice informing landowners that the coal beneath their property was going to be worked

working facilities orders - a court order which gave permission, restricted or prevented coal mine workings

AtkinsRéalis



Ryan Edwards
AtkinsRéalis
2 Capital Quarter
Tyndall St
Cardiff
CF10 4BZ

Tel: 029 2048 5159

© AtkinsRéalis except where stated otherwise

AtkinsRéalis - Sensitive / Sensible

20191395 Grandison Brook GIR
update 2024
November 2024