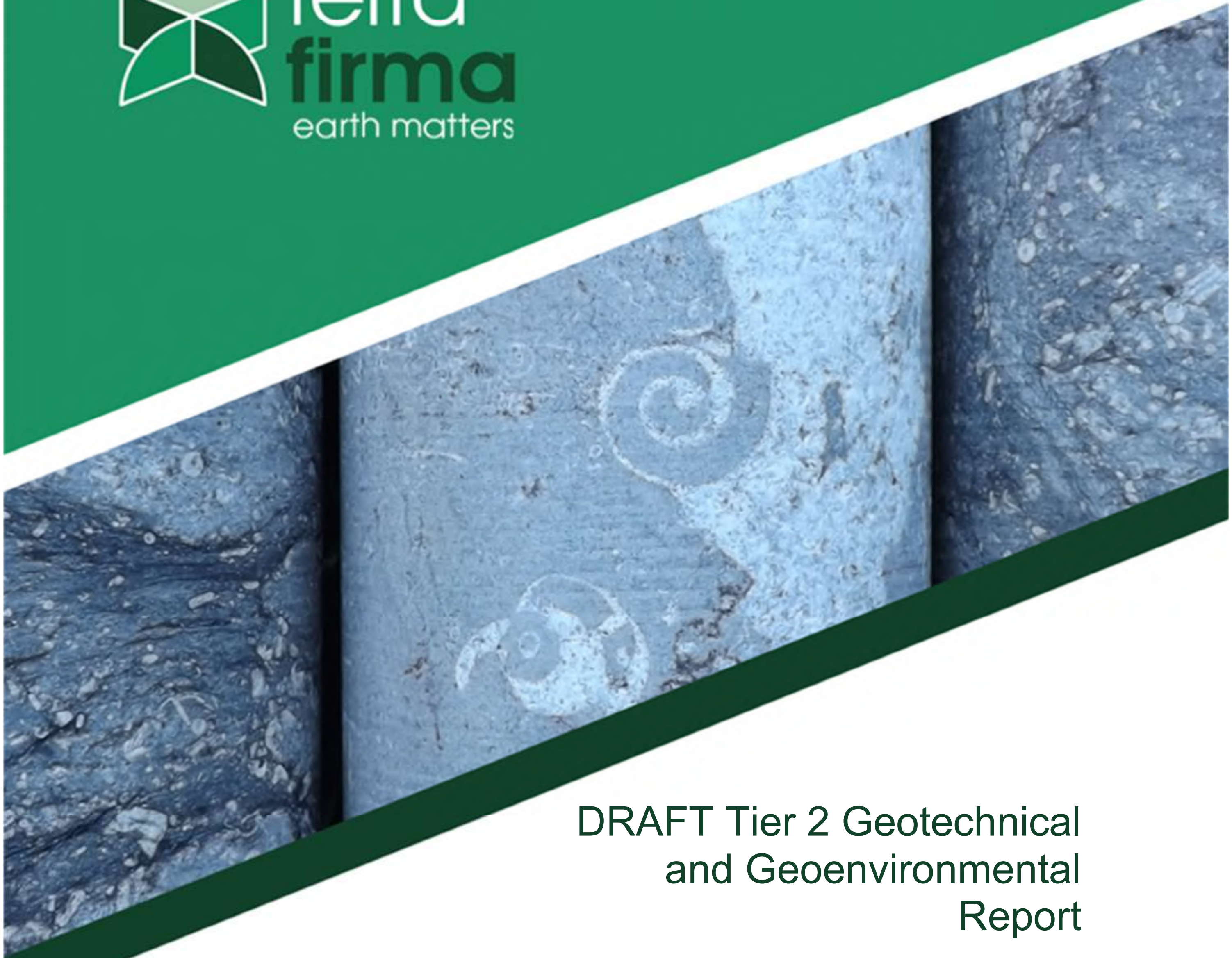

DRAFT Tier 2 Geotechnical and Geoenvironmental Report

Site: Ysgol Iolo Morganwg Primary School

Prepared For: Kier Construction

Issue Date: August 2025

Job No: TF-648-CA-24

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REPORT TITLE	**:**	**DRAFT Geoenvironmental and Geotechnical Report: Proposed Primary School, on land opposite 31 Dunraven Close, Cowbridge, CF717FJ.**
JOB NUMBER	**:**	**TF-648-CA-24**
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Executive Summary

Site Location and Proposed Development

The site is located adjacent to 31 Dunraven Close, Cowbridge, CF71 7FJ with the proposed development consisting of a two-storey primary school and associated playing fields and yards.

Ground Conditions Beneath Proposed School

Depth (m)			***Thickness (m)***	***Stratum***
GL	*-*	*0.1/2.9*	*0.1/2.9*	*Thin veneer of made ground comprising loose brown slightly sandy gravelly **SILT** and soft brown slightly gravelly, slightly sandy **CLAY** with abundant rootlets overlying a firm occasionally soft orange brown slightly gravelly sandy **CLAY**, below approximately 0.4/1.7m becoming very dense orange brown and bluish Dowling slightly sandy sub-angular fine to coarse **GRAVELS** of Limestone*
0.1/2.9	*-*	*>9.0*	*-*	*Medium strong light grey, fine grained moderately weathered **LIMESTONE (BLUE LIAS FORMATION)***

Ground Conditions Beneath Remainder of Site

Depth (m)			***Thickness (m)***	***Stratum***
GL	*-*	*0.1/>5.0*	*0.1/2.9*	*A mixture made ground comprising loose brown slightly sandy gravelly **SILT** and soft brown slightly gravelly, slightly sandy **CLAY** with abundant rootlets overlying a firm occasionally soft orange brown slightly gravelly sandy **CLAY**, in places becoming loose to medium dense orange brown and bluish grey slightly sandy sub-angular fine to coarse **GRAVELS** of Limestone*
0.1/>5.0	*-*	*2.2*	*-*	*Medium strong light grey, fine grained moderately weathered **LIMESTONE (BLUE LIAS FORMATION)***

Contamination of Concern

There are no instances of known contaminants breaching the actionable threshold for the given scenario.

Ground Gas Risk Assessment

Based on the results to date the preliminary gas characterisation of the site is CS-1. The characterisation should be revisited following completion of the gas monitoring programme.

Radon

Full radon protection measures are required for new buildings at the site.

Foundation Solution

Two tentative foundation solutions have been given.

The first is reinforced concrete pad foundations founded within the Blue Lias limestone rocks and the very dense granular deposits (highly weathered bedrock) should be used.

Due to the slight variations in strength a lower bound allowable bearing capacity of 150kN/m^2 may be used for design purposes.

Where rock is encountered at or close to the ground surface the rock should be broken out to at least 0.4m depth so that foundation formation will be deep enough to allow free access of services in and out of the building.

For the above foundation formations and bearing pressure total settlement should be <20mm with angular distortions less than 1:750.

The second and most practical foundation solution would be to use a combination of mass concrete pads founded within the competent Lias bedrock where the depth to the foundation formation does not exceed 1.5m and a piled foundation for greater depths than 1.5m.

For the mass concrete pad foundations an allowable bearing pressure of 400kN/m^2 may be used or design purposes.

For the piled foundations it is suggested that a 125mm diameter steel pile installed using rotary techniques and socketed at least 1.5m into the limestone bedrock should be used.

	Pile lengths should vary between 3 and 5m, although longer piles should be expected as bedrock was not encountered in WS8 (located off the boundary of the proposed school) to 5.0m depth. Variations in pile lengths should therefore be expected. *For the above pile and founding media a safe working load of 125kN may be used for design purposes.* *It should be noted that the pile size, type, safe working load and length are given for guidance only and should be confirmed by the specialist piling contractor appointed to undertake the works.* *Once the column locations have been determined by the structural engineers it is recommended that they are set out on site and additional investigation carried out to determine if the foundations are to be piles or pads. This is likely to take the form of trial pits and boreholes.*

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SECTION 1 Introduction & Proposed Development

1.1 Background

Kier Construction (the Client) is proposing the construction of a new Primary School on land opposite to 31 Dunraven Close, Cowbridge, CF71 7FJ. The proposed development will consist of a two storey primary school and associated infrastructure including access road, car parking, and soft and hard social areas. The proposed layout can be seen in **Figure 1.1**.

Figure 1.1 Proposed Site Layout

Stantec are the Consulting Civil and Structural Engineer for the project.

TFW Group Ltd (Terra Firma) have been commissioned by the Client to undertake a Geotechnical and Geoenvironmental Report.

A Tier 1 (Desk Study) was completed by Hydrock, now Stantec. The findings of the Tier 1 Assessment are summarised in **Section 2** of this report.

This report contains a Tier 2 assessment (Site Investigation) including a Generic Quantitative Geoenvironmental Risk Assessment and Geotechnical Ground Investigation.

1.2 Objectives

Land Contamination Risk Management (LCRM) guidance provided by the Environment Agency advocates using a tiered approach. This comprises Tier 1; the Preliminary Risk Assessment, Tier 2; the Generic Quantitative Risk Assessment and Tier 3; the Detailed Quantitative Risk Assessment. As each tier is completed a decision is made whether it is necessary to advance to the next tier.

In addition to LCRM, geotechnical aspects of the development also need to be considered and are approached in a similar manner, with the risks identified in the preliminary assessment, and then investigated through subsequent phase of investigation.

1.2.1 Tier 2

The main objectives of the Tier 2 Generic Quantitative Geoenvironmental Risk Assessment programme are:

- investigate the potential human health and environmental liabilities at the site associated with any contamination; and
- provide a summary of the human health and environmental conditions at the site, together with any necessary further intrusive works and / or remediation works to render the site fit for its intended use.

The main objectives of the Geotechnical Site Investigation are:

- investigate the type, strength and bearing characteristics of the shallow superficial and underlying solid geology;
- investigate the risk, if any, from historical shallow underground mining features;
- provide engineering foundation and floor slab recommendations for the proposed development;
- provide infiltration rates and stormwater drainage viability; and
- provide recommendations regarding any other geotechnical aspects pertaining to the development.

In order to achieve the above objectives, Terra Firma carried out an assessment programme a review of existing data, followed by a field investigation to collect geotechnical and geoenvironmental data from selected locations.

The scope of the works including the schedule for in-situ and laboratory testing was determined by Terra Firma.

1.3 Geotechnical Category

In accordance with BS EN 1997-1:2004+A1:2013, the proposed development comprises the following geotechnical category:

Geotechnical Category 2: conventional types of structures and foundation with no exceptional risk of difficult soil or loading conditions (e.g., spread, raft & pile foundations; retaining structures; excavations; earthworks and ground anchors).

1.4 Information Sources

The following sources of information have been referenced in support of this assessment:

- Client provided information, plans etc. (**Figure1.1**); and
- Tier 1 Assessment (*Hydrock, Phase 1 Ground Conditions Desk Study. Project Reference: 31793. Dated March 2024*).

1.5 Roles & Responsibilities

Table 1.1 Roles and Responsibilities

Role	Organisation
Client/Developer	Kier Construction

Architect/Engineer	Stantec UK Ltd
Local Authority	Vale of Glamorgan Council

1.6 Limitations & Exceptions of Investigation

The Client has requested that a Tier 2 Geoenvironmental and Geotechnical Report (GGR) be undertaken to enable the outlined main objectives.

The GGR was conducted, and this report has been prepared for the sole internal reliance of the Client and their design and construction team. This report shall not be relied upon or transferred to any other parties without the express written authorisation of TFW Group Ltd. If an unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill. The report represents the findings and opinions of experienced geoenvironmental and geotechnical consultants. TFW Group Ltd does not provide legal advice and the advice of lawyers may be required.

The subsurface geological profiles, any contamination and other plots are generalised by necessity and have been based on the information found at the locations of the exploratory holes and depths sampled and tested.

Human health and environmental risk assessment outcomes may not take into account the potential for the creation of new contaminant linkages as a result of variation to the proposed development and recommended engineering solutions. It is therefore imperative that the Client engages a geoenvironmental consultant to re-visit the conceptual site model and potential risks upon completion of final designs, prior to development.

Whilst this report assesses the suitability of soils in respect to human health and the environment, it is beyond the scope of this report to determine the legal status of imported and re-used soils/aggregates. It is the responsibility of the Client to confirm imported and re-used soils/aggregates have reached ‘Non-Waste’ status.

The investigation was limited by the following site constraints:

- the presence of underground obstructions, structures and/or unexpected ground conditions.

It was beyond the scope of this report to investigate/consider:

- The depth/thickness of the glaciofluvial deposits on the central/eastern portion of the site.

1.7 Quality Assurance

The quality, health, safety and environmental aspects of the assessment comply with Terra Firma business management system which is UKAS accredited and complies with the requirements of BS EN ISO 9001:2015, BS EN ISO 14001:2015 and BS EN ISO 45001:2018 standards.

SECTION 2 Tier 1 Assessment

The site has been the subject of a previous Tier 1 Geoenvironmental Desk Study:

- *Hydrock, Phase 1 Ground Conditions Desk Study. Project Reference: 31793. Dated March 2024*

The salient points of the Tier 1 Assessment are summarised in **Section 2.1**.

2.1 Summary of Tier 1 Assessment

The findings of the Tier 1 Assessment are summarised in **Table 2.1**.

Table 2.1 Summary of Tier 1 Assessment

Site History	*From 1877 to 2023, the site comprised the southern portion of an open field, with tree lines marking the eastern and western boundaries. An aerial photograph taken in 2024 indicates that the southern corner of the site has since been developed into a site compound and car park, served by an east–west orientated access road. The northern half of the site is used for material storage in connection with ongoing housing development located to the west and north of the site.*
Geology	*According to the Envirocheck report received by Hydrock, no superficial deposits are recorded within the site.* *Solid geology is associated with the Blue Lias Formation (MRGF-SHLST) and Porthkerry Member (PO-LSMD).* *The Blue Lias Formation is described as interbedded bioclastic (shelly) limestone, calcareous mudstone and siltstones.* *While the Porthkerry Member is described as interbedded mudstone and limestone.*
Radon	*The Radon Report obtained from the British Geological Survey states that the site is in a Radon Affected Area where radon levels in 10% to 30% of homes are above the action level and full radon protection measures are required for new buildings at this location in line with current guidance.*
Coal Mining Risk Assessment	*The site is not in a coal mining affected area and therefore, a coal mining risk assessment is not required.*
Potential Sources of Contamination	*On site sources of contamination:* • *Made ground- associated with historical construction related activities and imported fill from the construction of a haulage road through the centre of the site.* • *Ground gases* • *Radon* • *Petroleum hydrocarbons and mineral oil associated with vehicle maintenance, fuel storage and possible localised spillages in the contractors compound.*

SECTION 3 Geophysical Investigation

The site locates upon the Blue Lias Formation. Due to the risk of differential weathering/dissolution of this formation a Geophysical Conductivity Survey was undertaken by Terra Dat between the 9th and 10th June prior to the intrusive investigation of the study site. The method is capable of identifying variations in the near surface deposits which could be indicative of anomalies within the superficial deposits and underlying bedrock, allowing investigations to be targeted towards such features.

An integrated survey approach comprising electromagnetic ground conductivity mapping and targeted Electrical Resistivity Tomography was undertaken and has identified and delineated a series of subsurface geophysical features that are characteristic of solution feature development/formation. To assist with ground calibration and validate the current interpretation, a follow-up intrusive investigation is recommended.

Due to the tight time scale preliminary findings were given to Terra Firma to aid with the placement of trial pits and boreholes for the physical investigation.

Variations within the particle size of the superficial deposits can affect the conductivity, with a higher clay content/higher moisture content revealing itself as higher conductivity and likewise, lower conductivity can indicate granular material or thinner superficial cover. Dissolution of bedrock can lead to dilation of the overlying superficial deposits and also localised replacement/filling of depressions leading to conductivity anomalies.

When the geophysical data was processed to correct for anthropogenic effects (fencing, historical earthworks etc) a number of features of interest were identified which were targeted within the broader site investigation.

As detailed below, the intrusive works confirmed that the bedrock depths beneath the site were highly variably.

The full geophysical report is presented in **Annex A**.

SECTION 4 Field Investigation

4.1 Site Works

A geotechnical and geoenvironmental site investigation comprising 3no. rotary boreholes, 8no. dynamic windowless sample boreholes and 26no. trial pits and associated soakaway tests was undertaken between the 17th of June 2025 and 11th of July 2025.

The fieldwork was supervised by Terra Firma, who logged the exploratory holes to the requirements of BS 5930:2015+A1:2020. The proposed locations of the exploratory holes were determined by Terra Firma in general accordance with BS 10175:2011+A2:2017 in order to assess the findings of the preliminary conceptual site model and investigate selected anomalous features encountered beneath the proposed building by the Geophysical Investigation as shown in **Figure 4.1**

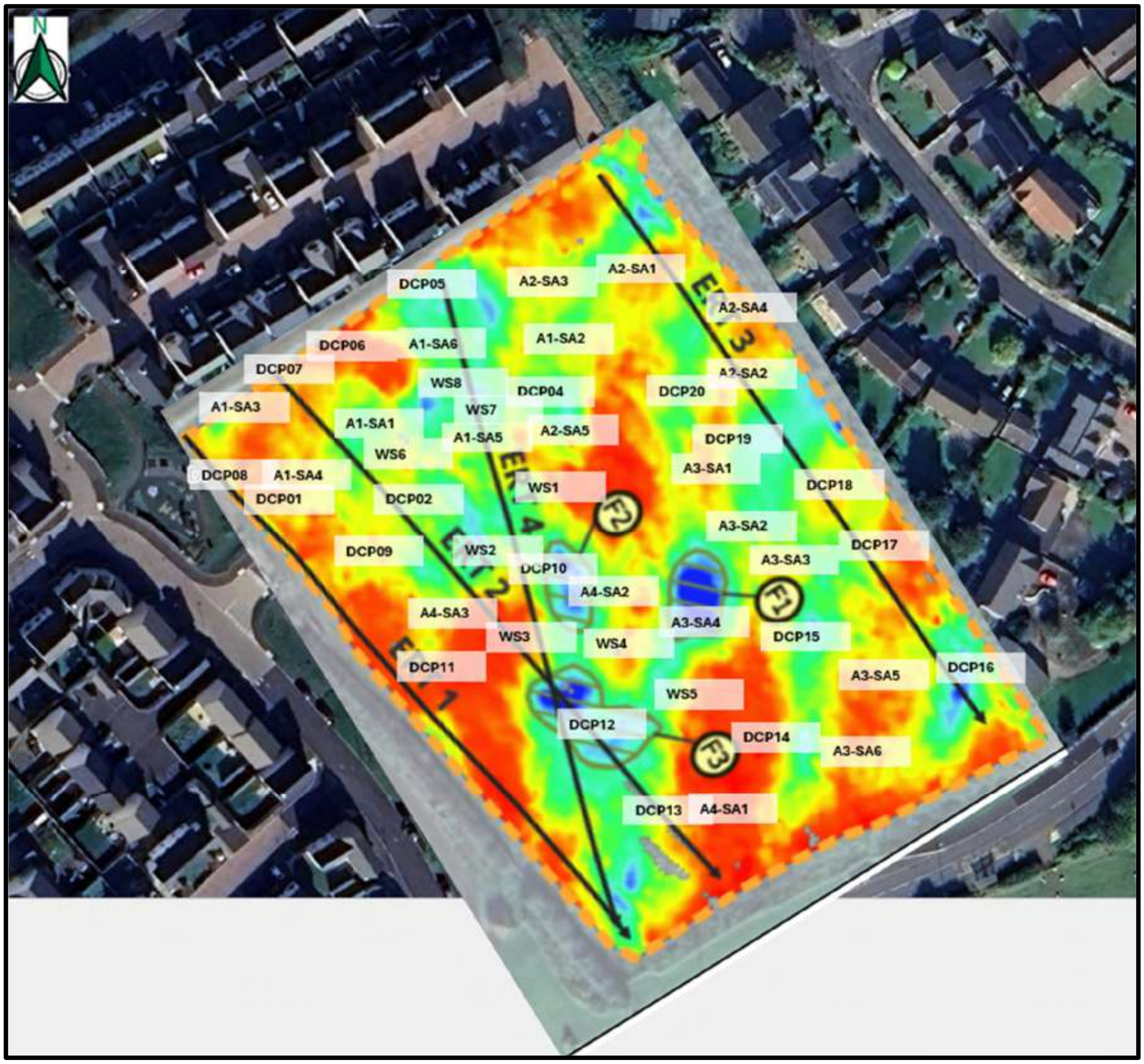

Figure 4.1 Excavation locations overlain with geophysical data, showing correlations between the locations and anomalies.

Trial pits SA1-SA6 were formed using a 13 tonne metal tracked 360 excavator with a 0.60m and 1.20m bucket. Additionally, a breaker/hammer was also used to excavate limestone rock. All other trial pits undertaken, were formed using a JCB 3CX excavator with a 0.60m wide bucket.

Representative disturbed samples were taken and retained in airtight containers for environmental and geotechnical testing.

On completion all trial pits were backfilled with materials arisings compacted in layers using the excavator bucket. The ground surface was reinstated and left proud to accommodate future settlement of backfilled materials.

The trial pit logs are presented in **Annex B.**

Soakaway tests were carried out in eighteen of the trial pits in general accordance with BRE DG 365:2016. The excavation sides were squared using the excavator bucket and dimensions recorded within the test section. The trial pit was partially filled with clean water using a dedicated bowser with a 75mm diameter outlet and the fall in level recorded against time. The results are presented in **Annex C.**

The boreholes referenced WS01 to WS08, were formed using an Archway Dart Windowless Sample Rig. Dynamic sampling techniques were employed from surface to produce a continuous disturbed sample.

Cone penetration tests (CPT) were carried out at regular intervals in general accordance with BS1377: Part 9:1990:3.3. CPT results summarised as N values are presented on the borehole log.

Boreholes were monitored for groundwater ingress as drilling proceeded.

Representative disturbed samples were taken and retained in airtight containers for environmental and geotechnical testing.

The windowless sample borehole logs are presented in **Annex D.**

Boreholes reference BH01 to BH03 were formed using a track mounted rotary drilling rig. Dynamic sampling techniques were employed from surface to produce a continuous disturbed sample. On refusal to dynamic sample the boreholes were continued by rotary core drilling methods utilising an air mist flushing medium.

All core samples were retained in sequence in labelled core boxes.

Standard penetration tests (SPT) were carried out at regular intervals in general accordance with BS1377: Part 9:1990:3.3. SPT results summarised as N values are presented on the borehole logs.

The boreholes were monitored for groundwater ingress as drilling proceeded.

The rotary borehole logs are presented in **Annex E.**

On completion BH01 to BH3 were backfilled with bentonite pellets and the surface reinstated.

Exploratory hole locations are shown on **Drawing 01**.

4.2 Ground Conditions (beneath proposed school)

The ground conditions encountered by the exploratory holes beneath the proposes school can in general be summarised as shown in **Table 4.1**.

Table 4.1 Summary of Typical Ground Conditions (beneath proposed school)

Depth (m)	Thickness (m)	Stratum

GL	-	0.1/2.9	0.1/2.9	Thin veneer of made ground comprising loose brown slightly sandy gravelly **SILT** and soft brown slightly gravelly, slightly sandy **CLAY** with abundant rootlets overlying a firm occasionally soft orange brown slightly gravelly sandy **CLAY**, below approximately 0.4/1.7m becoming very dense orange brown and bluish Dowling slightly sandy sub-angular fine to coarse **GRAVELS** of Limestone
0.1/2.9	-	>9.0	-	Medium strong light grey, fine grained moderately weathered **LIMESTONE (BLUE LIAS FORMATION)**

4.2.1 Miscellaneous Ground Conditions (beneath proposed school)

In trial pit A4-SA2 a soft to firm orangish brown slightly sandy gravelly CLAY was encountered to the base of the pit at 3.9m depth.

In trial pit SA3 Limestone was encountered from 0.2 to 1.2m depth underlain on the eastern face of the trial pit by sot grey slightly sandy gravelly CLAY to the base of the pit at 3.0m depth.

4.2.2 Groundwater (beneath proposed school)

Groundwater was not encountered in the exploratory holes.

4.2.3 Stability & Obstructions (beneath proposed school)

Trial pits remained stable and vertical during excavation.

4.3 Ground Conditions (over remainder of site)

The ground conditions encountered by the exploratory holes beneath the remainder of the site can in general be summarised as shown in **Table 4.2**.

Table 4.2 Summary of Typical Ground Conditions (beneath remainder of site)

Depth (m)			Thickness (m)	Stratum
GL	-	0.1/>5.0	0.1/2.9	A mixture made ground comprising loose brown slightly sandy gravelly **SILT** and soft brown slightly gravelly, slightly sandy **CLAY** with abundant rootlets overlying a firm occasionally soft orange brown slightly gravelly sandy **CLAY**, in places becoming loose to medium dense orange brown and bluish grey slightly sandy sub-angular fine to coarse **GRAVELS** of Limestone
0.1/>5.0	-	2.2	-	Medium strong light grey, fine grained moderately weathered **LIMESTONE (BLUE LIAS FORMATION)**

4.3.1 Miscellaneous Ground Conditions (remainder of site)

Bedrock was not encountered within borehole WS8, trial pit A1-SA5, A3-SA1, A3-SA2 and A3-SA3. In WS8 a soft to firm orangish brown slightly sandy gravelly CLAY was encountered from 0.65m to the base of the hole at 5.0m depth. The trial pits where bedrock was not located encountered similar ground conditions as found in WS8 and terminated between 3.4m in AS-SA4 and 3.9m in A1-SA1.

In trial pit SA3 Limestone was encountered from 0.2 to 1.2m depth underlain on the eastern face of the trial pit by sot grey slightly sandy gravelly CLAY to the base of the pit at 3.0m depth.

4.3.2 Groundwater (reminder of site)

Groundwater was not encountered in the exploratory holes.

4.3.3 Stability & Obstructions (remainder of site)

Trial pits remained stable and vertical during excavation.

4.4 Installation Well Construction

Ground gas well locations were selected on a non-targeted basis to characterise the ground gas contamination status of the site.

Ground gas installation well construction details are summarised in **Table 4.3**.

Table 4.3 Installation Well Summary

Location	Response Zone		Stratum
	From (m)	To (m)	
WS1	1.00	2.00	Weathered Blue Lias Limestone
WS2	0.50	1.00	Residual Soil
WS4	0.60	1.60	Residual Soil
WS8	1.00	5.00	Glaciofluvial Deposit

4.5 Laboratory Chemical Testing

4.5.1 Sampling Strategy

Soil sampling locations were selected on a non-targeted basis to characterise the contamination status of the site.
Sample locations, depths and suspected/known contamination source targets are summarised in **Table 4.4.**

Table 4.4 Sample Locations and Targets

Location	Depth (m)	Type	Contamination Targets
A1-SA2	0.35	ES	Made Ground
A1-SA4	0.10	ES	Superficial- topsoil like material
A1-SA5	0.40	ES	Made Ground
A2-SA2	0.30	ES	Superficial- topsoil like material
A2-SA3	0.20	ES	Made Ground
A2-SA4	0.45	ES	Weathered Limestone

A3-SA1	0.40	ES	Superficial Deposit- Glaciofluvial
A3-SA4	0.50	ES	Weathered Limestone
A3-SA5	0.30	ES	Superficial Deposit- Glaciofluvial
A3-SA6	0.05	ES	Made Ground
A4-SA1	0.05	ES	Made Ground
A4-SA2	0.15	ES	Superficial- topsoil like material
SA3	0.40	ES	Made Ground
SA3	1.60	ES	Organic Clay- suspected Made Ground
WS2	0.25	ES	Made Ground
WS4	0.40	ES	Very Weathered Limestone
WS7	0.20	ES	Weathered Limestone

4.5.2 Sample Analysis

During the site investigation works soil samples were taken and despatched to the accredited laboratories of Eurofins Chemtest for laboratory chemical testing. Soil samples were tested for the determinants listed in **Table 4.5**.

Table 4.5 Laboratory Analysis

Metals & Metalloids	In-Organics	Organics	Others
Arsenic	Cyanide	Phenols	pH (acidity)
Cadmium		PAH	Asbestos
Chromium III		Petroleum Hydrocarbons	
Chromium VI			
Copper			
Lead			
Mercury			
Nickel			
Selenium			
Zinc			
Boron			

The laboratory test results certificates may be found in **Annex F**.

4.6 Soil Property Testing

4.6.1 In-situ Permeability Testing (Soakaways)

Soakaway test results are summarised in **Table 4.6**.

Table 4.6 Summary of Soakaway Results

Trial Pit	Depth Range of Test (m)	Geology Description	Infiltration Rate (ms^{-1})
SA1	2.84-3.40m	Slightly weathered limestone generally recovered as: Bluish grey locally orangish brown slightly clayey subangular to subrounded **COBBLES** of limestone with a moderate subangular limestone boulder content.	Insufficient Infiltration Achieved
SA2	2.45-3.00m		
SA4	2.70-3.40m		

SA5	1.40-2.10m		
SA6	2.23-2.90m		
A1-SA1	0.60-1.10m	Highly weathered limestone recovered as: Soft brown slightly sandy gravelly **CLAY** with a high angular to subangular limestone cobble content.	
A1-SA2	0.90-1.40m	Highly weathered limestone recovered as: Soft to firm orangish brown slightly sandy gravelly **CLAY** with a high subangular to subrounded limestone cobble content.	
A1-SA3	0.84-1.30m	Weathered limestone recovered as: Orangish brown slightly gravelly clayey subangular **COBBLES** of limestone.	
A1-SA4	0.37-0.90m		
A1-SA5	0.97-1.50m	Firm orangish brown slightly gravelly slightly sandy **CLAY**. (GLACIOFLUVIAL DEPOSIT)	
A1-SA6	0.77-1.30m	Weathered limestone recovered as: Orangish brown slightly gravelly clayey subangular to subrounded **COBBLES** of limestone.	
A2-SA1	0.85-1.40m	Highly weathered limestone recovered as: Soft to firm orangish brown slightly sandy gravelly **CLAY** with a high subangular to subrounded limestone cobble content.	
A2-SA2	0.94-1.60m	Weathered limestone recovered as: Orangish brown slightly sandy clayey angular to subangular fine to coarse **GRAVEL** of limestone with a high angular to subangular sandstone cobble content.	$3.05x10^{-05}$
	0.90-1.60m		$3.59x10^{-05}$
	1.02-1.60m		$2.79x10^{-05}$
A2-SA3	0.70-1.30m	Weathered limestone recovered as: Orangish brown slightly gravelly clayey subangular **COBBLES** of limestone.	Insufficient Infiltration Achieved
A2-SA4	1.24-1.80m		
A2-SA5	0.73-1.30m		
A3-SA1	0.80-1.40m	Soft to firm orangish brown slightly gravelly sandy **CLAY** with a low subrounded limestone cobble content. (GLACIOFLUVIAL DEPOSIT)	
A3-SA2	0.75-1.30m		
A3-SA3	0.93-1.50m		
A3-SA4	0.73-1.30m		
A3-SA5	0.82-1.45m		
A3-SA6	0.45-1.00m	Weathered limestone recovered as: Orangish brown slightly gravelly clayey subangular **COBBLES** of limestone.	
A4-SA1	0.43-1.00m		
A4-SA2	1.03-1.65m	Soft to firm orangish brown slightly gravelly sandy **CLAY** with a low subrounded limestone cobble content. (GLACIOFLUVIAL DEPOSIT)	

A4-SA3	0.23-0.63m	Weathered limestone recovered as: Orangish brown slightly gravelly clayey subangular **COBBLES** of limestone.	1.51 $x10^{-05}$
	0.20-0.63m		1.04 $x10^{-05}$
	0.20-0.63m		1.08 $x10^{-05}$

The test results and calculation sheets may be found in **Annex C**.

4.6.2 In-situ Strength Testing

4.6.2.1 Standard Penetration Tests

SPT N Values taken within the made ground and superficial deposit revealed an average uncorrected N value of 35 (Range 4 to 50). **Figure 4.2** shows SPT values with depth.

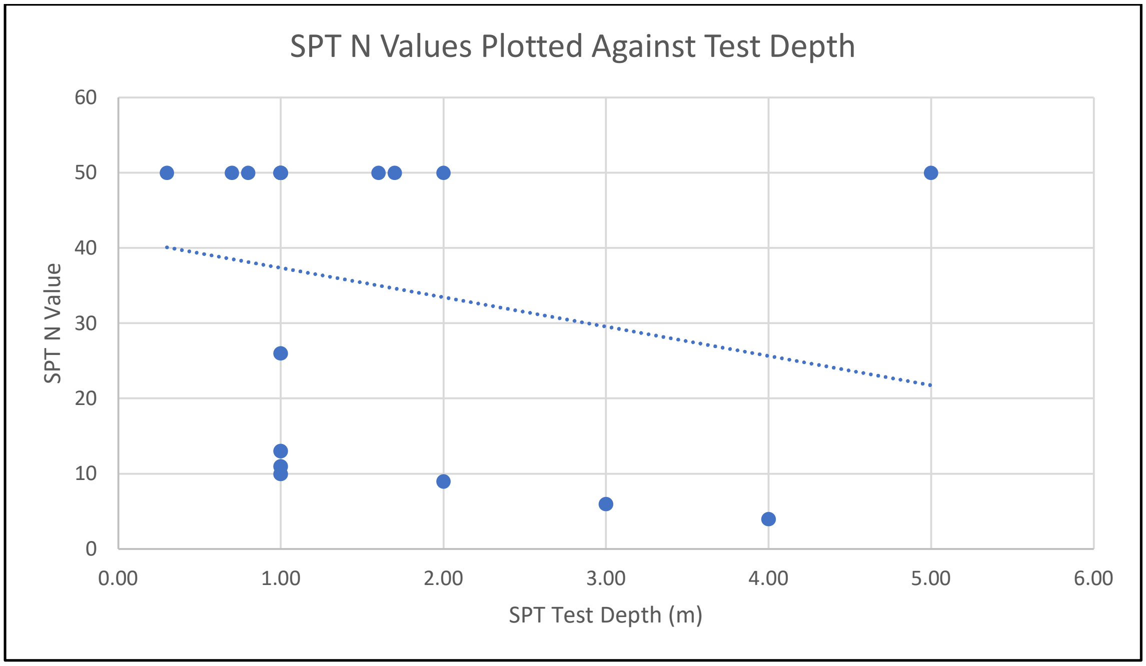

Figure 4.2 SPT vs Depth

4.6.2.2 Plate Load Testing

Plate load testing results are summarised **Table 4.7**.

Table 4.7 Summary of Plate Load Testing Results

Location	Settlement Value Summary (mm)					Comment
	Stage 1 (100k Pa)	Stage 2 (200k Pa)	Stage 3 (300k Pa)	Rebound	Modulus of Subgrade Reaction (k MPa/m)	
PLT01	8.30	14.11	19.35	11.01	12.50	Test Depth: Surface
PLT02	4.49	7.61	10.62	6.42	23.12	Test Depth: 100mmBGL
PLT03	3.08	6.23	9.10	5.57	33.74	Test Depth: 100mmBGL
PLT04	8.50	15.20	20.28	10.33	12.21	Test Depth: 100mmBGL
PLT05	7.53	12.00	17.89	10.26	13.79	Test Depth: 100mmBGL
PLT06	8.16	14.70	20.68	11.31	12.71	Test Depth: 100mmBGL
PLT07	4.02	6.96	9.71	5.53	25.78	Test Depth: 100mmBGL

Plate bearing test results are presented in **Annex G**.

4.6.3 Laboratory Geotechnical Testing

A schedule of laboratory tests was prepared by Terra Firma and samples were despatched to the accredited laboratories of GSTL. A summary of the testing carried out is presented in **Table 4.8**.

Table 4.8 Summary of Geotechnical Testing

Geotechnical Test	No. Samples Tested
Moisture Content	10
4 Point Liquid and Plastic Limit	10
PSD Wet Sieve Method	10
PSD Sedimentation by Pipette	10
Dry Den/MC (2.5kg Rammer Method 1 Litre Mould)	6
UCS	6
BRE SD1 (Concrete classification)	10

The geotechnical test results are presented in **Annex H**.

4.7 Monitoring

Upon completion of site works, installed monitoring wells were visited fortnightly for a period of twelve weeks, to record ground gas levels.

Ground gas monitoring results are presented fully in **Annex I**.

SECTION 5 Evaluation of Geoenvironmental Analytical Results

5.1 Assessment Methodology

5.1.1 Soils

An assessment of the analytical results has been made with comparison with the following generic assessment criteria with preference in most onerous order:

- Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH) Suitable 4 Use Levels (S4UL) (Nathanail, CP *et al.*:2015);
- Category 4 Screening Levels (C4SL) provided by the Department for Environment, Food and Rural Affairs (DEFRA:2014);
- Soil Guideline Values (SGV) by the Environment Agency (2009);
- Generic Assessment Criteria (GAC) provided by EIC/AGS/CL:AIRE (2010); and
- Generic Assessment Criteria (GAC) derived in-house.

In the absence of generic assessment criteria, the laboratory limit of detection has been used for comparison, in order to establish the presence/absence of determinants and for initial screening purposes.

An average soil organic matter (SOM) of 2.7% was determined from laboratory analysis, therefore a conservative value of 1% SOM has been adopted for the site when assessing appropriate threshold values for analysed determinants.

5.2 Soil Test Results

A summary of the chemical test results which include the regulatory soil guideline values used in a **residential setting with plant uptake** are given in the following tables. The complete results can be found in **Annex F**.

5.2.1 Inorganics

Seventeen samples were tested for a standard suite of inorganics, pH and organic matter. The summarised results are in **Table 5.1**.

Table 5.1 Summary of Soil Chemical Test Results – Inorganics

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Arsenic	37	LQM/CIEH	3.3	19	0
Cadmium	11	LQM/CIEH	0.1	0.6	0
Chromium III	910	LQM/CIEH	6.4	54	0
Chromium VI	6	LQM/CIEH	<0.50	<0.50	0
Copper	2400	LQM/CIEH	4.7	32	0
Lead	200	C4SL	16	49	0
Mercury (inorganic)	40	LQM/CIEH	<0.05	0.07	0
Nickel	180	LQM/CIEH	4.6	45	0
Selenium	250	LQM/CIEH	0.3	2.5	0
Zinc	3700	LQM/CIEH	37	140	0
Cyanide	-	-	<0.50	<0.50	-

Boron	290	LQM/CIEH	<0.40	3.5	0
Organic Matter (%)	-	-	0.80	5.1	-
pH	-	-	6.4	10	-
Notes: - No available guideline					

5.2.2 Organics

Seventeen samples were tested for speciated polycyclic aromatic hydrocarbons (PAH). The summarised results are in **Table 5.2**.

Table 5.2 Summary of Soil Chemical Test Results – Speciated PAH

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Naphthalene	2.3	LQM/CIEH	<0.10	<0.10	0
Acenaphthylene	170	LQM/CIEH	<0.10	<0.10	0
Acenaphthene	210	LQM/CIEH	<0.10	0.26	0
Fluorene	170	LQM/CIEH	<0.10	0.18	0
Phenanthrene	95	LQM/CIEH	<0.10	0.95	0
Anthracene	2400	LQM/CIEH	<0.10	0.26	0
Fluoranthene	280	LQM/CIEH	<0.10	1.6	0
Pyrene	620	LQM/CIEH	<0.10	1.4	0
Benzo(a)anthracene	7.2	LQM/CIEH	<0.10	0.92	0
Chrysene	15	LQM/CIEH	<0.10	1.2	0
Benzo(b)fluoranthene	2.6	LQM/CIEH	<0.10	0.6	0
Benzo(k)fluoranthene	77	LQM/CIEH	<0.10	0.52	0
Benzo(a)pyrene	2.2	LQM/CIEH	<0.10	0.82	0
Indeno(123cd)pyrene	27	LQM/CIEH	<0.10	0.4	0
Dibenzo(ah)anthracene	0.24	LQM/CIEH	<0.10	<0.10	0
Benzo(ghi)perylene	320	LQM/CIEH	<0.10	1.4	0
Total PAH	-	-	<2.0	11	-
Notes: Thresholds based on 1.0% soil organic matter - No available guidelines					

Seventeen samples were tested for petroleum hydrocarbon. The summarised results are shown in **Table 5.3**.

Table 5.3 Summary of Soil Chemical Test Results – Petroleum Hydrocarbons

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Aliphatic					
PH C5 – C6 Ali	42	LQM/CIEH	<1.0	<1.0	0
PH C6 – C8 Ali	100	LQM/CIEH	<1.0	<1.0	0
PH C8 – C10 Ali	27	LQM/CIEH	<1.0	<1.0	0
PH C10 – C12 Ali	130	LQM/CIEH	<2.0	3.9	0
PH C12 – C16 Ali	1100	LQM/CIEH	<1.0	14	0

PH C16 – C21 Ali	65000*	LQM/CIEH	<2.0	31	0
PH C21 – C35 Ali	65000*	LQM/CIEH	<1.0	540	0
PH C35 – C40 Ali	65000	LQM/CIEH	<10	190	0
Aromatic					
PH C5 – C7 Arom	70	LQM/CIEH	<1.0	<1.0	0
PH C7 – C8 Arom	130	LQM/CIEH	<1.0	<1.0	0
PH C8 – C10 Arom	34	LQM/CIEH	<1.0	<1.0	0
PH C10 – C12 Arom	74	LQM/CIEH	<1.0	<1.0	0
PH C12 – C16 Arom	140	LQM/CIEH	<1.0	<1.0	0
PH C16 – C21 Arom	260	LQM/CIEH	<2.0	10	0
PH C21 – C35 Arom	1100	LQM/CIEH	<2.0	35	0
PH C35 – C40 Arom	1100	LQM/CIEH	<1.0	9.1	0
Notes: PH – Petroleum Hydrocarbon Ali – Aliphatic Arom – Aromatic Thresholds based on 1.0% soil organic matter * – Ali C16-21 and C21-C35 based on criteria for Ali EC >16-35					

5.2.3 Asbestos Testing

All made ground soil samples were scheduled for asbestos screening. Asbestos was not detected.

SECTION 6 Ground Gas Risk Assessment

The following detailed ground gas risk assessment is prepared with reference to information sources identified during the Tier 1 assessment, as well as encountered ground conditions and quantitative data obtained during subsequent phases of site investigation. Where possible, consideration has also been given to the proposed development and its potential influence on ground gas risk.

6.1 Gas Risk Characterisation

6.1.1 Gas Sources

Potential sources of ground gas that have been identified during this study, along with an interpretation of the gas generation potential and lateral migration potential (Wilson S *et al*.:2009) respectively, are as follows:

- natural soil with low degradable organic content (Alluvium) – very low – negligible;
- made ground soils with low degradable organic content (<5%) – very low – negligible;

6.1.2 Gas Migration Pathways

The potential for gas migration pathways is a factor of the prevailing geology and hydrogeology conditions encountered at the site and surrounding areas. Furthermore, potential gas migration pathways need not be natural, and may comprise artificial conduits such as buried utility pipes, stone columns, piles, boreholes, as well as mining related features.

Potential gas migration pathways identified as part of this study include:

- Ingestion and direct skin contact
- Inhalation of dust
- Asphyxiation/explosive risk from ground gas ingress via permeable soils and/or construction gaps
- Vapour inhalation
- Radon ingress via permeable soils and/or construction gaps
- Surface water via base flow from groundwater
- Vertical and lateral migration of contaminant via leachate migration through the unsaturated zone in the Blue Lias Formation/Porthkerry Member Groundwater Body

6.1.3 Receptors

Potential receptors identified as part of this study include:

- Site end users
- Site operatives
- Neighbouring properties
- Development end use (buildings, utilities and landscaping)
- Groundwater: Principal Aquifer status of the Blue Lias Formation and Secondary A Aquifer status of the Porthkerry Member
- Surface water: River Thaw

6.1.4 Driving Forces

Pressure Driven Flow

Also known as advective flow. Pressure driven gas flow is typically the dominant force in most high-risk scenarios, driven by a differential pressure gradient between the source and receptor. The potential for, and effect of, falling atmospheric pressure, fluctuating groundwater levels, seasonal thermal gradients or confined gas generating sources, should be considered in this context.

Diffusive Flow

Diffusion is dependent on a concentration gradient of gas between two areas, where a high concentration area flows towards a lower concentration area. This scenario only presents a risk when gas migration is sustainable due to there being a constant source of gas able to maintain a constant concentration gradient. In tandem with pressure driven flow, diffusive flow may have a significant influence on overall gas risk, particularly when large void spaces have accumulated hazardous gas diffusively over a long time frame, which is then subsequently expelled suddenly under a pressure driven event.

6.2 Gas Screening Value

Four ground gas monitoring wells were installed in WS01, WS02, WS04 and WS08 Installation details are shown on the relevant log.

One round of gas monitoring have been carried out to date. The installations were tested for carbon dioxide, methane, oxygen, carbon monoxide and hydrogen sulphide using a Gas Analyser GA5000.

Recorded gas concentrations are summarised in **Table 6.3**

Gas	Minimum (% V/V)	Maximum (% V/V)
Methane	0.0	0.0
Carbon Dioxide	2.60	3.20
Oxygen	18.20	20.50

6.3 Measured Gas Concentration Summary

Methane levels peaked at 0.0% V/V. Carbon dioxide levels varied between 2.60% and 3.20% V/V. Oxygen concentrations varied between 18.20% and 20.50% V/V.

The gas flow rate from the boreholes was also assessed, a maximum flow rate of 0.0l/hr was recorded.

Based on a flow rate of 0.0 l/hr and the highest recorded carbon dioxide concentration of 3.2%, a gas screening value of 0.0032 l/hr is calculated, as follows:

(3.20/100) x 0.1 = 0.0032l/hr

When monitoring results are compared with BS8576:2013, the site is classified as 'gas characteristic situation 1' (CS1).

Sites classified as CS1 require no special ground gas protection measures to be incorporated within the construction.

The monitoring results to date along with the gas analyser calibration certificate are presented in **Annex I**.

6.4 Conclusion

Assessing all lines of evidence, it is considered that a potential pollution linkage does not exist.

SECTION 7 Evaluation of Potential Human Health Risks

7.1 Contaminants of Concern

All substances tested for were found to be present at concentrations below their respective human health threshold level.

7.2 Mitigation & Remedial Measures

The site is considered to be uncontaminated, therefore, requiring no mitigation or remedial measure to be undertaken.

7.2.1 Human Health

7.2.1.1 Contaminated Soils

Site specific mitigation and remedial measures are not required with respect to human health.

However, as good practice, construction workers must adhere to good site management, COSHH, good standards of hygiene and appropriate health & safety on site, with personal protection equipment (PPE) and dust suppression where appropriate.

All imported soils must be validated as clean and suitable for use in accordance with ‘Requirements for the Chemical Testing of Imported Soils for Various End Uses and Validation Cover Systems’.

For the specification of proposed new supply water pipes, the UK Water Industry Research publication ‘Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites, must be consulted.

In accordance with EC Regulation 1272/2008 and Environment Agency Guidance WM3 soils destined for off-site disposal must be classified on the basis of their hazard phrases prior to disposal. Soils are classified as a mirror entry waste and must be classified on the basis of their specific chemical properties.

If during earthworks ground conditions are encountered that are markedly different to those found during the investigation, then the ground must be subject to additional sampling and testing and any necessary remedial measures designed and implemented before continuing with the works.

7.2.1.2 Radon

To mitigate against the risk to future site users from radon gas, full protection measures will be required in all structures. Reference should be made to guidance publication BR 211:2023 for further details on required protection elements. Specialist design, specification and verification of the installed protection measures is recommended.

To protect the future site users from identified ground gas, proposed structures will need to incorporate within their construction a suitable ground gas protection system. The ground gas protection system must be designed, specified and verified in accordance with the British Standard 8485:2015+A1:2019 and other relevant guidance, such as CIRIA C735:2014 and NHBC Foundation NF94:2023.

It is important to note that warranty providers may require more or less stringent design, specification and verification to that expected by Local Authority Environmental Health/ Contaminated Land Officers.

It is therefore essential that a specialist consultant, that is competent and suitably indemnified, is retained to prepare a ground gas protection system Design Report and Verification Plan for the proposed development. The Design Report will need to provide justification for the specified ventilation, structural barrier and gas membrane protection elements to be incorporated within the detailed designs. Whereas the Verification Plan is based on the perceived risk associated with the complexity of design, experience of the installer, size of the site and gas risk, and is required to provide a detailed methodology to allow for the successful completion of in-situ verification of the installed protection.

Terra Firma offer a comprehensive in-house ground gas protection system design, specification and verification service. For further details on how we may assist your project needs, please get in touch.

Verification of installed ground gas protection systems by a competent, qualified, accredited, independent third party, will be required upon completion of the protection elements installation. Final verification will only be achieved if evidence gathering processes prescribed in the Verification Plan are fully undertaken.

7.2.2 Aquatic Environment

Site specific mitigation and remedial measures are not required with respect to the aquatic environment.

During the construction period, there is a risk to the environment/adjacent sites from de-watering, digging foundations, moving contaminated soil, drainage misconnections, discharges to local surface waters or the ground, runoff from construction materials and/or exposed ground, wheel washings and oil or chemical spills.

The risk is considered to be negligible as any adverse effects will be easily preventable by due diligence to good construction practise and housekeeping in preventing surface runoff and the spillage of materials.

The basic measures that must be taken are as follows:

- Prepare a drainage plan and mark the manholes to prevent pollutants accidently reaching the surface water sewers;
- Carry out any activities that could cause pollution in a designated, bunded area, away from rivers or boreholes. Where possible it should drain to the foul sewer;
- Use settlement ponds to remove silty water;
- Store all oils and chemicals in a fully bunded area to prevent leaks or spills;
- Get advice on whether you need an environmental permit and apply in good time

SECTION 8 Evaluation of Geotechnical Results

Laboratory geotechnical testing results are summarised in the following sections and presented in their entirety in **Annex H,** unless otherwise stated.

8.1 Soil Testing

8.1.1 Plasticity & Moisture Content Testing

During the investigation ten samples of the shallow cohesive material was obtained and submitted for plasticity and moisture content testing while another 10 were scheduled for just moisture content testing. The test results are summarised in **Table 8.1.**

Table 8.1 Plasticity & Moisture Content Test Results

Location	Depth (m)	Moisture Content (%)	Plasticity Index (%)	Passing 425µm Sieve (%)	Modified Plasticity Index (%)	Volume Change Potential
A1-SA1	1.00	27.5	-	-	-	-
A1-SA2	0.75	33.8	-	-	-	-
A1-SA5	0.80	22.7	-	-	-	-
A2-SA2	0.90	32.6	-	-	-	-
A3-SA1	0.50	29.8	-	-	-	-
A3-SA4	0.80	28	-	-	-	-
A3-SA6	0.05	9.8	-	-	-	-
A4-SA1	0.60	24	-	-	-	-
WS4	0.50	20.5	-	-	-	-
WS2	0.15	9	-	-	-	-
A1-SA4	0.15	37.5	40	82	40	Medium-high
A1-SA5	0.50	20.3	27	85	27	Medium
A1-SA6	0.40	28.4	44	95	44	High
A2-SA4	0.40	24.4	48	89	48	High
A3-SA1	1.60	32.9	33	97	33	Medium
A3-SA3	0.90	31.6	36	87	36	Medium
A4-SA2	0.65	32.6	37	98	37	Medium
A4-SA3	0.45	26.1	41	89	41	High
WS4	0.2	10.1	21	73	21	Medium
A3-SA3	0.1	28.5	42	93	42	High

In line with the NHBC:2024 (Chapter 4.2), the modified plasticity index for each sample was calculated.

For design purposes the shallow soils on site must be considered to have a medium to high volume change potential. The clay found, both within the fractures of the weathered limestone and that of the thicker superficial covering located to the centre and east- southeast of the site are considered to be medium to high plasticity. A high volume change potential should therefore be used for design purposes.

8.2 Particle Size Distribution Analysis

Ten samples were subject to particle size distribution (PSD) testing. The results are summarised in **Table 8.2.**

Table 8.2 Summary of Particle Size Distribution Testing

Location	Depth (m)	Geological Description	Clay & Silt (%)	Sand (%)	Gravel (%)	Cobbles/ Boulders (%)	SHW Series 600 Class
A1-SA5	0.00-0.55	Greyish brown slightly clayey silty subangular to subrounded fine to coarse **GRAVEL** of limestone with occasional plastic and a moderate subangular limestone cobble content.	8	7	40	45	6F1
A1-SA6	0.80	Orangish brown slightly clayey gravelly subangular to subrounded **COBBLES** of limestone.	15	1	24	60	6F1
A1-SA1	0.80	Orangish brown slightly clayey gravelly subangular **COBBLES** of limestone.	2	0	33	65	6F1
A1-SA2	0.60		24	3	38	35	6F1
A2-SA1	1.10		5	0	19	76	6F1
A3-SA6	0.30		7	1	51	41	6F1
A4-SA3	0.20		30	4	66	0	6N
A3-SA1	0.20	Soft to firm orangish brown slightly gravelly sandy **CLAY** with a low subrounded limestone cobble content.	78	5	17	0	Class 7
A3-SA5	0.00-0.20	Greyish brown slightly clayey sandy subangular to subrounded fine to medium **GRAVEL** of limestone and concrete with abundant rootlets and a moderate subangular limestone cobble content.	12	5	46	37	6F2
WS4	0.20-1.60	Firm orangish brown gravelly slightly sandy **CLAY.**	70	2	28	0	Class 7

The National Highways *et al*: 2017 Specification for Highway Works Series 600 has been referenced to obtain a suitable classification.

Due to the size of the recovered material, the particle size distribution data will not be a true representation of the strata. Much of the material was too coarse to sample effectively.

8.3 Compaction Testing

Six remoulded samples were subject to compaction testing using a 2.5kg rammer. Where oversized materials were contained within samples, the coarse fraction has been removed to facilitate testing. The results are summarised in **Table 8.3**.

Table 8.3 Compaction Testing Summary

Location	Depth (m)	Geological Description	Initial Moisture Content (%)	Maximum Dry Density (Mg/m³)	Optimum Moisture Content (%)
A1-SA1	0.3	Brown silty sandy gravelly clay	28	1.7	17
A1-SA2	0.2	Brown silty sandy gravelly clay	32	1.72	17
A2-SA2	0.7	Brown silty sandy gravelly clay	35	1.75	17
A3-SA4	0.5	Brown silty sandy gravelly clay	19	1.86	12
A3-SA5	0.45	Brown silty sandy gravelly clay	26	1.72	17
A4-SA2	0.45	Brown silty sandy gravelly clay	38	1.68	10

The results indicate the majority of soils tested to have natural moisture contents above than optimum moisture content by between 9% and 28%. Therefore, to re-compact the gravelly clay to at least 95% of Optimum Moisture Content and hence Maximum Dry Density, the soil will need to be died wither by air drying or the inclusion of a lime based product.

Failure to achieve 95% compaction will result in settlement of the newly placed made ground and failure to achieve the required performance specification.

Unless there is scope to dry/treat the in-situ clay materials the use of these materials as fill is not recommended as structural fill.

8.4 Concrete Classification Testing

Nine samples were subject to testing for concrete classification in accordance with BRE SD1:2015. The results are summarised in **Table 8.4**.

Table 8.4 BRE SD1 Testing Summary

Location	Depth (m)	2:1 Water/Soil Extract		Total Sulphur (%)	pH	Total Potential Sulphate (%)	Acid Soluble Sulphate (%)	Oxidisable Sulphides (%)
		SO_4 (mg/l)	Mg (mg/l)					
SA01	0.9	10.00	230	0.010	7.9	0.03	0.022	0.008
SA02	0.1	10.00	260	0.050	7.3	0.15	0.078	0.072
SA03	0.2	15.00	63	0.080	7.0	0.24	0.030	0.21
WS02	0.5	10.00	170	0.060	8.0	0.18	0.096	0.084
WS03	1.5	10.00	250	0.010	7.7	0.03	0.020	0.01
WS05	0.2	10.00	350	0.010	7.3	0.03	0.039	-0.009
WS06	0.8	10.00	340	0.11	7.6	0.33	0.074	0.256
WS07	0.2	10.00	490	0.060	7.5	0.18	0.048	0.132
WS08	0.1	10.00	390	0.060	6.7	0.18	0.067	0.113

Notes:
The following stoichiometric equation was employed to determine the Total Potential Sulphate (TPS). TPS (% as SO4) = 3.0 x Total Sulphur (TS % as S).
The Oxidisable Sulphide (OS as %SO4) concentration has been conservatively calculated by the following equation. OS = TPS – Acid Soluble Sulphate (AS).

Based on results obtained, the characteristic values are provided below.

The initial classification for the site based on sulphate (2:1 Water Soluble) as SO4 is Design Sulphate (DS) Class DS-1. The Aggressive Chemical Environment for Concrete (ACEC) Class for the site based on sulphate (2:1 Water Soluble) as SO4, mobile water and pH is AC-1s.

The DS class for the site base on the TPS is DS-1.

The ACEC Class for the site based on TPS, mobile water and pH is AC-1d.

Based on the above assessment the DS Class for the site is determined as DS-1, and the ACEC Class is AC-1s.

The test results can be found in **Annex F**.

8.5 Rock Testing

8.5.1 Uniaxial Compressive Strength Testing

Selected sections of rock cores were submitted for uniaxial compressive strength (UCS) testing. Testing results are summarised in **Table 8.5.**

Table 8.1 Summary of UCS Test Results

Borehole	Depth (m)	Geological Description	Water Content (%)	Bulk Density (Mg/m^3)	Uniaxial Compressive Strength (MPa)	Type of Failure
BH1	7.01-7.25		0.8	2.66	29	Axial Splitting
BH1	8.63-8.86		1.2	2.65	29.9	Single Shear
BH2	7.73-7.96		1.0	2.66	32.7	Single Shear
BH2	8.89-9.12		0.7	2.65	36.3	Axial Splitting
BH3	2.40-2.63		0.8	2.63	55.8	Axial Splitting
BH3	7.13-7.39		0.8	2.65	33.3	Axial Splitting

8.6.1 Point Load Index Testing

Suitable samples of rock cores were submitted for point-load index testing.

The Uniaxial Compressive Strength (UCS) is related to the Point Load Index (Is_{50}) by a conversion factor, K, as follows;

UCS = (K) Is_{50}

Published K values for sedimentary rock typically range from 16 to 24 (Rusnak, J. & Mark, C.:2000*)*. Terra Firma have typically found the value of K to sit in the region of K=20 locally. This value has subsequently been employed to estimate UCS values where point load testing was undertaken. UCS values derived from point load testing results are summarised in **Table 8.6**.

Table 8.6 Summary of Point Load Index Test Results

Borehole	Depth (m)	Geological Description	Point Load Index (Is_{50})	Uniaxial Compressive Strength (MPa)
BH1	3.40-3.50	Medium strong to strong very thinly to thickly bedded light bluish grey **BLUE LIAS LIMESTONE.**	2.24	44.8
BH1	4.76-4.95		3.15	63
BH1	6.44-6.56		2.68	53.6
BH1	8.88-9.00		1.90	38
BH2	2.62-2.73	Medium to strong, very thinly to very thickly bedded light bluish-grey locally dark bluish grey **BLUE LIAS LIMESTONE**	2.18	43.6
BH2	4.53-4.70		3.09	61.8
BH2	5.70-5.90		0.86	17.2
BH2	7.59-7.72		0.42	8.4
BH3	2.05-2.20	Medium strong, thinly to very thickly bedded light bluish-grey **BLUE LIAS LIMESTONE**	1.03	20.6
BH3	4.50-4.62	Medium to strong, very thinly to thickly bedded light bluish-grey **BLUE LIAS LIMESTONE**	0.51	10.2
BH3	7.58-7.71		1.30	26
BH3	8.00-8.13		2.33	46.6

Notes:
Point Load Index Tests (UCS derived from Is50 and K=20)
d - Diametral loading
a - Axial loading
i - Irregular lump

SECTION 9 Engineering Recommendations

9.1 Preparation of Site

Areas of vegetation including all roots must be stripped and removed from beneath the proposed development site.

Contingencies should be made for the protection/diversion of any underground/overhead services present beneath/above the site brought about as a result of the proposed works.

Any reduced levels should be brought up to the required levels with suitable inert mainly granular materials. Department for Transport (DfT) type 2 sub-base or similar should be used and compacted in layers to the requirements of the Specification for Highway Works.

Allowances must also be made for the excavation of any soft spots/areas and their replacement with well compacted imported granular materials.

In accordance with EC Regulation 1272/2008 (Ref) and Environment Agency Guidance WM3 soils and other materials destined for off-site disposal must be classified on the basis of their hazard phrases prior to disposal. Soils are classified as a mirror entry waste and must be classified on the basis of their specific chemical properties. Terra Firma offer this service if required.

9.2 Foundation & Floor Slab Solution

Due to the variable depth to rock head and the corresponding strength difference between the rock and the generally firm to stiff but occasionally soft clay overburden the following foundation solution is proposed.

The first would be to use reinforced concrete pad foundations founded within the Blue Lias limestone rocks and the very dense granular deposits (highly weathered bedrock) present at depth above the competent Lias rocks.

Due to the slight variations in strength a lower bound allowable bearing capacity of 150kN/m^2 may be used for design purposes.

Based upon the site investigation the depth to the suitable founding horizon will vary between 0.1m and 2.0m below the existing ground level.

Where rock is encountered at or close to the ground surface the rock should be broken out to at least 0.4m depth so that foundation formation will be deep enough to allow free access of services in and out of the building.

For the above foundation formations and bearing pressure total settlement should be <20mm with angular distortions less than 1:750.

Provided all soft spots/areas are removed and replaced with well compacted inert granular materials as previously described a reinforced concrete ground bearing floor may be used for foundation design. Due to the presence of softer areas the slab should be designed to span a soft spot of 3.5m.

Plate tests carried out during the investigations have given modulus of sub grade reaction (k) values varying between 12.21 and 33.74

Due the plasticity of the clay materials heave precautions should be incorporated in the ground bearing floor slab.

Allowances should be made for the removal of any ‘soft spots’ and their replacement with well-compacted granular materials. Department for Transport (DfT) Type 2 materials or similar could be used and should be compacted in layers to the specification for Highway Works.

All foundation formations should be inspected by a suitably qualified Geotechnical Engineer before being concreted.

The second and most practical foundation solution would be to use a combination of mass concrete pads founded within the competent Lias bedrock where the depth to the foundation formation does not exceed 1.5m and a piled foundation for greater depths than 1.5m.

For the mass concrete pad foundations an allowable bearing pressure of 400kN/m^2 may be used or design purposes.

For the piled foundations it is suggested that a 125mm diameter steel pile installed using rotary techniques and socketed at least 1.5m into the limestone bedrock should be used.

Pile lengths should vary between 3 and 5m, although longer piles should be expected as bedrock was not encountered in WS8 (located off the boundary of the proposed school) to 5.0m depth. Variations in pile lengths should therefore be expected.

For the above pile and founding media a safe working load of 125kN may be used for design purposes.

It should be noted that the pile size, type, safe working load and length are given for guidance only and should be confirmed by the specialist piling contractor appointed to undertake the works.

For the given foundation solution maximum settlements should not exceed 15mm with angular distortions < 1:750.

Once the column locations have been determined by the structural engineers it is recommended that they are set out on site and additional investigation carried out to determine if the foundations are to be piles or pads. This is likely to take the form of trial pits and boreholes.

Provided all soft spots/areas are removed and replaced with well compacted inert granular materials as previously described a reinforced concrete ground bearing floor may again be used for foundation design. Due to the presence of softer areas the slab should be designed to span a soft spot of 3.5m.

Plate tests carried out during the investigations have given modulus of sub grade reaction (k) values varying between 12.21 and 33.74

Due the plasticity of the clay materials heave precautions should be incorporated in the ground bearing floor slab.

9.3 Excavations & Formations

Most of the shallow excavations will be possible with normal soil excavating machinery. However allowances for a breaker attachment will be required when dealing with areas of shallow bedrock.

Shallow perched water and groundwater flows were not encountered during the investigation. Any water inflows together with rainwater infiltration should be dealt with by conventional pumping techniques. However, it should be noted that during times of heavy rainfall a higher water table will be encountered.

The sides of any excavations deeper than 1.20m, or shallower if unstable, should be supported by planking and strutting or other proprietary means.

The sub-formations/formations are likely to be susceptible to loosening, softening and deterioration by exposure to weather (rain, frost and drying conditions), the action of water (flood water or removal of groundwater) and site traffic.

Formations should never be left unprotected and continuously exposed to rain causing degradation, or left exposed/uncovered overnight, unless permitted by a qualified engineer.

Construction plant and other vehicular traffic should not be operated on unprotected formations.

As a minimum the formation/excavation surfaces must be protected by blinding concrete immediately after exposure.

Allowances should be made for the removal of soft spots/areas and their replacement with well compacted granular materials.

Allowances should also be made for special precautions to prevent formation deterioration in addition to the above.

9.3 Protection of Buried Concrete

When the results are compared with Table C1/C2 of BRE Digest 1:2005 (Ref), it indicates that buried concrete should generally conform to Class AC-1s.

9.4 Access Roads & Car Parking Areas

A selection of TRL probe tests were conducted throughout the site, full TRL logs may be found in **Annex J.**

For car parking and road areas, formations within the in-situ natural soils a California Bearing Ration (CBR) value of 5% may be used for design purposes in areas corresponding to DCP01-DCP18. Areas corresponding to DCP18 to DCP21 should use CBR values of 3%.

Allowances should be made for the removal of any ‘soft spots/areas’ and their replacement with well-compacted granular materials as previously described.

Please note that the Local Council / Highways Authority may require in-situ CBR testing to be undertaken before a road is adopted. In-situ CBR testing should be performed following earthworks to verify the performance of the engineered fill.

9.5 Storm Water Drainage

During the site investigation soakaway tests were undertaken in general accordance with BRE DG 365:2016 (Ref). The soakaway tests were carried out within natural materials.

All but two soakaway infiltration tests failed to achieve sufficient infiltration rates necessary for completion. The two soakaway pits that did achieve a passing rate were A2-SA2 and A4-SA3 achieving $3.05x10^{-05}$ and $1.51x10^{-05}$ respectively.

It is therefore considered that soakaway storm water draining is unsuitable at the site.

For a further detailed description, please see the previously issued report: **Soakaway Testing: Land and Dunraven Close and Llantwit Major Road Cowbridge.**

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ANNEX A
Geophysical Report

GEOPHYSICAL SURVEY REPORT

Project

Geophysical survey to map potential karst features

Location

Cowbridge, Vale of Glamorgan

Client

Terrafirma

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Unit 1
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Job reference: 9232
Date: July 2025
Version: 1

GEOPHYSICAL SURVEY REPORT

Project

Geophysical survey to map potential karst features

Location

Cowbridge, Vale of Glamorgan

Client

Terrafirma

Project Geophysicist:	Toby Child MESci FSG
Reviewer:	Dr Jonathan Thomas BSc FGS
Job Reference:	9232
Date:	July 2025

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1 EXECUTIVE SUMMARY

A geophysical survey was carried out at the site of the proposed new primary school in Cowbridge, Vale of Glamorgan. The survey was commissioned by Terrafirma (the client) and took place between the 9th and 10th of June 2025. The survey aimed to provide information on the potential presence of karst features within the proposed development area.

An integrated survey approach comprising electromagnetic ground conductivity mapping and targeted Electrical Resistivity Tomography has identified and delineated a series of subsurface geophysical features that are characteristic of solution feature development/formation. To assist with ground calibration and validate the current interpretation, a follow-up intrusive investigation is recommended.

The electromagnetic ground conductivity survey revealed a distinctive NNE-SSW oriented banded pattern interpreted as variations in the semicontinuous and lithologically varied marginal facies units. Within this regional pattern, three isolated conductive anomalies were identified that may indicate fine material accumulation within areas of subsidence. However, given historical information and corresponding in-phase response, some of these features may relate to the construction/remediation of the former compound area.

The resulting ERT sections show a good correlation with the EM survey and are characterised by three distinct geo-electrical units comprising two upper conductive units that overlie a deeper resistive unit. There appears to be a marked east-west transition across the site, and the most notable attribute is the marked change in the apparent depth to the lower resistive unit. This may indicate either a dipping boundary, some form of fault displacement or an erosional channel feature.

Multiple anomalous features potentially indicative of dissolution processes were observed, including significant lateral discontinuities and bowl-shaped depressions within the resistive bedrock unit. The most significant feature comprises a broad sub-vertical conductive zone that extends beyond the base of the sections and lies beneath the planned primary school building footprint.

2 INTRODUCTION

This report describes a geophysical survey completed at the site of the proposed new primary school in Cowbridge, Vale of Glamorgan. The survey was commissioned by Terrafirma (the client) and took place between the 9th and 10th of June 2025. The survey aimed to provide information on the potential presence of karst features within the proposed development area.

2.1 Site description

The site is located at the western edge of Cowbridge and centred on National Grid coordinates 298359, 174664. The survey area (Plate 1) comprises an open field that measures approximately 1.9 ha and is situated at the southern margin of a new housing development. At the time of the survey, the field was covered by overgrown vegetation and was enclosed by Heras fencing on all sides. Previously, the site had been utilised as a compound and material store (Plate 2) during the construction of the adjacent housing estate. It is understood that no utilities cross the survey area.

***Plate 1**: Geophysical survey area (orange outline) south of the A48, Cowbridge (Google Satellite Image, 2025).*

***Plate 2**: Former compound layout (Google Satellite Image, 2021).*

The primary school development (Plate 3) plan includes a carpark in the north east corner of the site, a tarmacked play area to the north, playing fields in the eastern corner, and a small central area for plant and bin storage. The main primary school building is planned along the western portion of the site, and this is the main area of investigation.

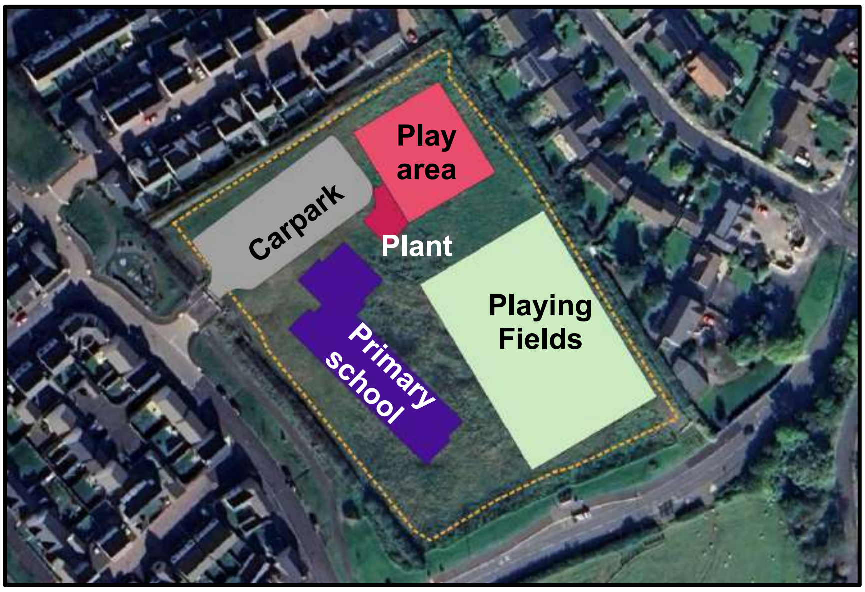


***Plate 3**: The approximate location of the planned primary school setup (Taken from documents supplied by the client).*

2.2 Geological setting

British Geological Survey (BGS) 50K geological maps (BGS, 1:50000 series, Sheet 262, Bridgend, solid and drift geology, NERC, 1989) indicates the site is located in an area with complex local geology (Plate 4) and underlain by the Lower Lias Formation which includes the marginal facies units. There is no superficial material reported on site, and little borehole information is available.

The marginal units are described around Cowbridge by Wilson et al. (reference #1) as made up of interbedded transitional offshore to marginal facies units. The rocks represent a large range of depositional environments with poorly-sorted breccias and scree, interpreted as subaerial zones, to well-sorted conglomerates representing alluvial fans and ephemeral streams formed during periodic rainstorms in a semi-arid environment. These units have been reworked and are often controlled by the structural nature of the underlying limestone, which these streams incise into. Erosional benches and replacement evaporites also suggest fluctuating lake-level/coastal environments. These units are mapped as horizontally laid.

The Jurassic sequences unconformably overlie various Carboniferous sequences, the most likely at the site being the Friars Points Limestone or the Gully Oolite. Both these units would be at risk of dissolution, particularly along fracture and fault zones.

Just to the south of the survey area, the marginal facies are overlain by the Porthkerry Member with a west-northwest-east-southeast trending contact/transition. The Porthkerry Member consists of interbedded limestones and mudstones. Both the marginal facies and Porthkerry Member sequences may be liable to dissolution.

Bounding the site to the east and the west are two approximately northeast-southwest trending faults. The regional faulting is a complex mixture of Caledonian faults with a northeast-southwest trend and, more commonly, Variscan east-west trending faulting.

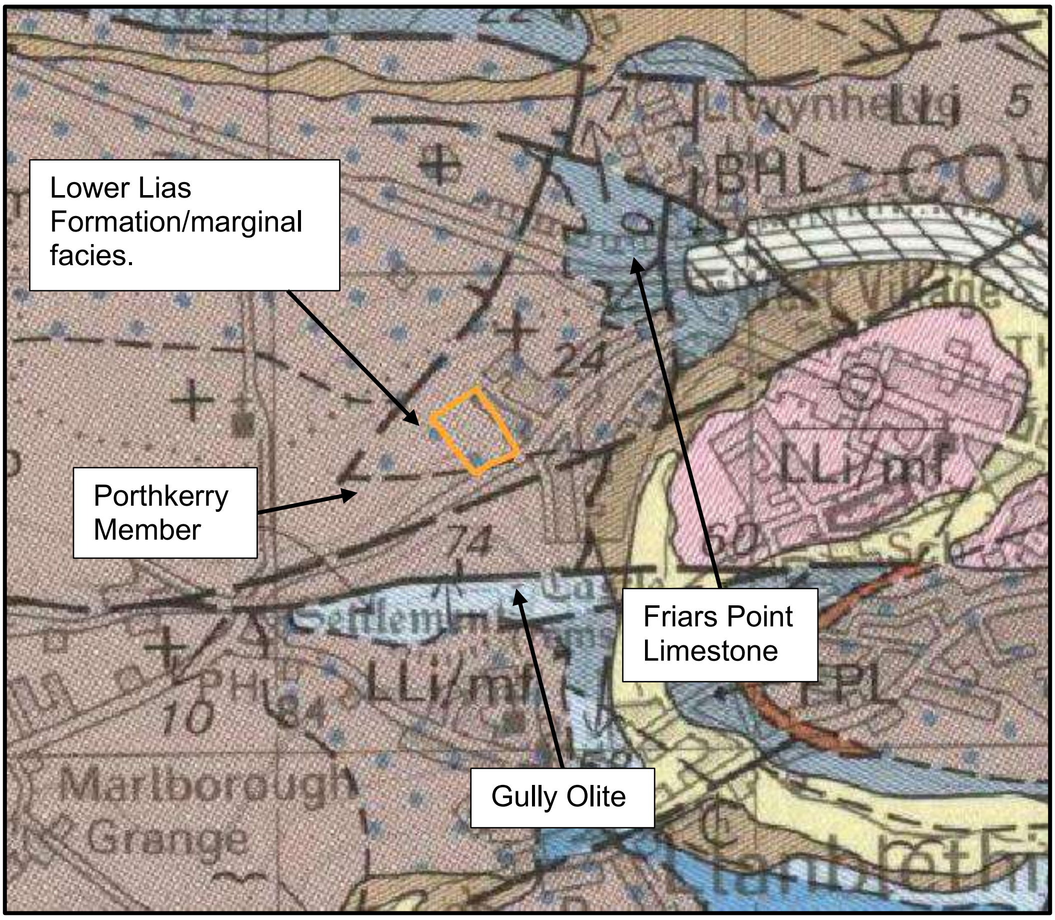


***Plate 4**: A portion of the 50K geological map with the site boundary indicated in orange (BGS, 1:50000 series, Sheet 262, Bridgend, solid and drift geology, NERC, 1989).*

2.3 Survey objectives

The primary objective of the survey was to locate any possible karst features within the underlying bedrock.

2.4 Survey design

Given the nature of the targets under investigation, it was decided to adopt an integrated survey approach comprising the following techniques:

- **Ground conductivity survey (*Geophex GEM-2*)** – to map variations in ground conductivity that may be associated with changes in the ground character and/or features potentially related to limestone dissolution.

- **Electrical Resistivity Tomography (ERT, *IRIS Syscal Pro*)** – to provide cross-sections of the ground for identification of localised resistivity anomalies that may be related to limestone dissolution.

2.5 Quality control

The geophysical data are collected in line with normal operating procedures as outlined by the instrument manufacturer and TerraDat company policy. On completion of the survey, the data are downloaded from the survey instrument onto a computer and backed up appropriately. The acquired dataset is initially checked for errors that may be caused by instrument noise, low batteries, positional discrepancies, etc., and any field notes are either written up or incorporated in the initial data processing stage. The dataset is processed using the standard processing routines, and once completed, the resulting plots are subject to peer review to ensure the integrity of the interpretation. Our quality control standards are BS EN ISO 9001: 2015 certified.

3 SURVEY DESCRIPTION

The survey was carried out using the following geophysical methods:

- Ground conductivity survey (EM, *Geophex GEM-2*)
- Electrical Resistivity Tomography (ERT, *IRIS Syscal Pro*)

Background information on these survey methods is provided in the Appendices, and a summary of the techniques with a brief description of the onsite activity is provided below.

3.1 Survey layout and topographic survey

A high-precision *Topcon Hiper SR* dGPS system was used to set out control points, record the position of each electrode, and gather general points for a simple topographical base plan. The *Hiper* system utilises a real-time mobile phone network correction (*Topnet*) that is rated to an accuracy of +/- 25 mm. All measurements were referenced to National Grid (OSTN15) using the *Topnet* network correction.

ID		Easting	Northing	Elevation	Electrode spacing	Length
ERT 1	START	298341.4	174687.4	57.975	2 m	142 m
	END	298432.0	174578.1	60.963		
ERT 2	START	298361.4	174699.3	57.485	2 m	142 m
	END	298451.6	174590.1	60.000		
ERT 3	START	298430.8	174739.6	56.739	2 m	142 m
	END	298508.6	174621.1	56.630		
ERT 4	START	298396.9	174717.9	56.977	2 m	142 m
	END	298429.4	174580.5	60.989		

Table 1: *ERT profile start/end coordinates and profile information.*

3.2 Ground conductivity survey (*EM*)

An electromagnetic survey involves transmitting an electromagnetic field into the subsurface and picking up the returning signal via a receiver in the same instrument. Data are acquired on a grid covering the area of interest, and a contoured plan of the variation in ground conductivity and in-phase response (sensitive to disturbed ground and metal) across the site is produced. The presence of conductive materials in the subsurface, such as metal, ash, clay, water, mudstone, some contaminants, leachate, etc., can be evident as regions of high values on the ground conductivity plan. Materials such as coarse-grained sediments and well-drained made-ground, dry zones and many bedrock types will appear as regions of low values.

3.2.1 Ground conductivity - field activity

The conductivity data were acquired using a multifrequency *Geophex GEM-2* instrument along a series of 3 m-spaced survey lines (Plate 5). The data were positioned using a dGPS system, and the instrument was pulled behind a quadbike across the survey area. For this survey, the instrument was primarily configured to investigate depths down to 3 to 5 m below ground level.

To optimise data collection, the orientation of the EM survey lines was recorded parallel to the main fence lines.

Item	Description
System	*GEOPHEX GEM-2*
Frequency	Multifrequency 47 KHz, 13 KHz, and 4 KHz
Line Spacing	3 m
Reading interval	20 cm
Acquisition method	Towed behind a quad bike
Depth of investigation	Up to 3 - 5 m

Table 2: *GEM-2 equipment list and data acquisition parameters.*

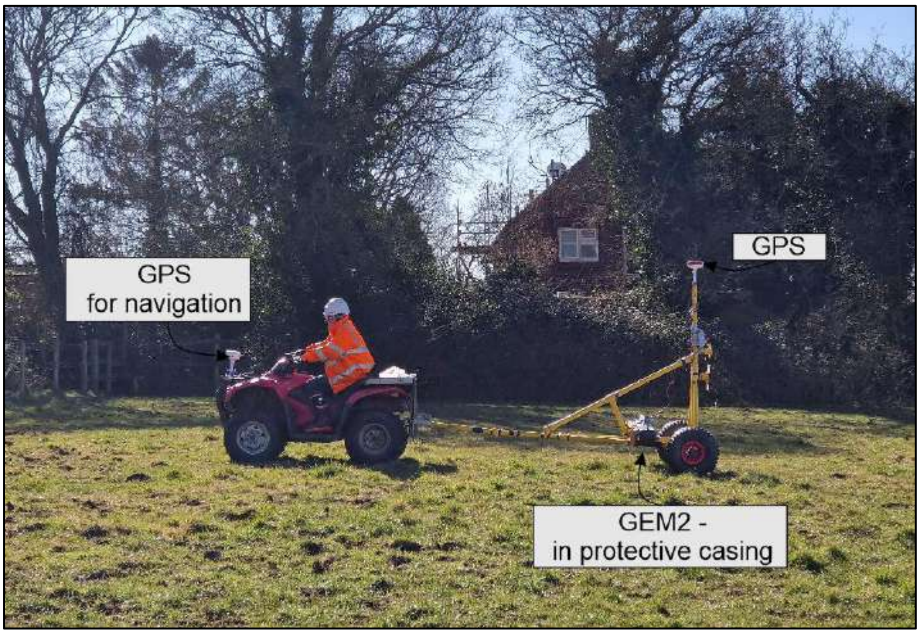


Plate 5*: The GEM-2 ground conductivity instrument with a dGPS (photo from archive)*

3.2.2 Ground conductivity - data processing

The dataset was downloaded from the data logger and compiled using the dedicated software *WINGEM-3*. Initial editing was carried out to remove positional errors and rogue values. The data were then exported as a 'XY' file and translated into the OSGB36 Coordinate system using the OSTN02 transformation. The next step was to bring the data into *Oasis montaj*, where it was edited and gridded to enhance any features of interest. The resultant colour contour plots were then integrated with the base plan information, and the resulting plans were exported to *CorelDRAW* for final annotation.

3.3 Electrical Resistivity Tomography (ERT) survey

An ERT survey involves the injection of DC electrical current into the ground at various electrode locations along a profile line. An electrical cross-section of the subsurface is then derived from the recorded data. A diverse range of features such as clay-rich sediments, the water table, gravel lenses, fracture zones, infilled solution features, bedrock structure and leachate can be imaged in cross-section using a resistivity survey. A feature may be targeted using resistivity tomography, given sufficient electrical contrast with its surroundings. A description of the field activity is provided below, and some background information on the survey method is found in the Appendix.

3.3.1 ERT survey - field activity

A 72-electrode *IRIS Syscal Pro* resistivity system (Plate 6) was used to acquire four resistivity profiles using a minimum electrode spacing of 2 m and the Wenner-Schlumberger array.

The positioning of the ERT profiles was based on targeting features within the EM survey, particularly concentrating on the planned extent of the primary school building, whilst also providing a generalised site overview. The depth of investigation of the ERT survey was limited (~20 m) by the lateral extents of the survey area.

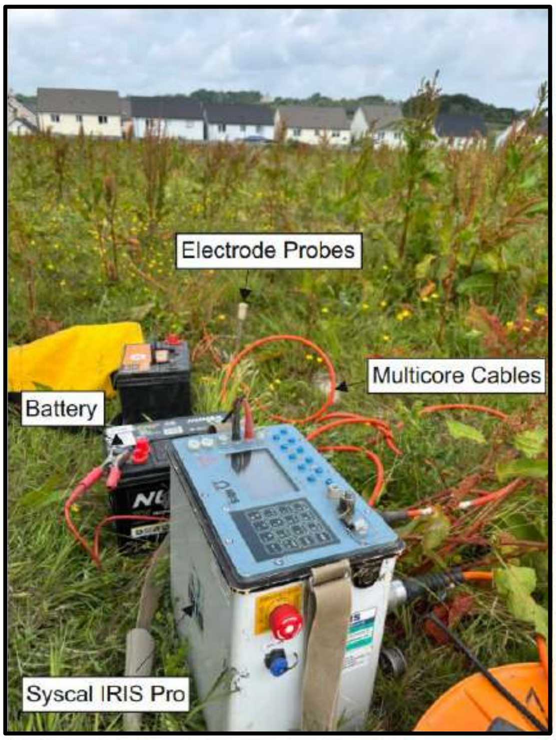


Plate 6: *An Iris Syscal instrument with associated cables and power supply on site.*

Item	Description
System	1x *IRIS SYSCAL Pro*
Cables	4x 18-channel cables
Electrodes	72x stainless steel electrodes
Minimum Electrode Spacing	2 m
Array Type	Wenner-Schlumberger
Cycles/time	Min 3 stack / 500 ms
Depth of investigation	Up to ~20 m

Table 3: *ERT equipment list and data acquisition parameters.*

3.3.2 ERT survey - data processing

The data were downloaded from the instrument using the *PROSYS III* software at the end of each field day to ensure data quality and consistency across all ERT sections. The profiles were processed using *GEOTOMO RES2DINVx64* software to derive modelled geo-electrical cross-sections of the subsurface. Elevation data (accuracy +/- 25mm) were incorporated within the respective data sets before the inversion process.

The 2D datasets were processed using ‘L2 norm’ smoothness-constrained least-squares optimisation (Standard Gauss-Newton least-squares method). To improve the inversion model's fit to the observed data, the process was refined, where applicable, by removing outliers based on the RMS error. The RMS values for all five acquired datasets were typically less than 5%, indicating an excellent fit between the measured and modelled data.

The data was exported into Surfer to enable comparative analysis of ERT models after each field day, where it was gridded (kriging with a cell size of half the electrode spacing) to produce 2D cross-sections. These cross-sections were then exported to *CorelDRAW* for final annotation.

4 RESULTS AND INTERPRETATION

The results of the geophysical survey are shown as a series of plots and sections in Figures 2 to 6. A description of the interpretation process and a broad discussion of the results for each technique are given below.

4.1 Electromagnetic survey – Interpretation rationale

The results of the electromagnetic survey are presented as colour-contoured plots of the ground conductivity in Figure 2 and the In-Phase response in Figure 3.

Following a review of the electromagnetic data, it was decided only to consider the response of the 47,000 Hz frequency channel. A relative increase in conductivity values usually indicates a localised increase in the clay/water content, which, for example, could signify either a lateral change in lithology or a change in bedrock depth. However, it can also represent interference from adjacent metallic features (both above and below ground). Extreme fluctuations in conductivity values are usually indicative of instrument 'overload' due to high metal content and usually correlate with anomalous readings in the in-phase response.

The interpretation of the conductivity data is based on both published electrical properties of typical sedimentary materials (Plate 7) and, when available, correlation with onsite information.

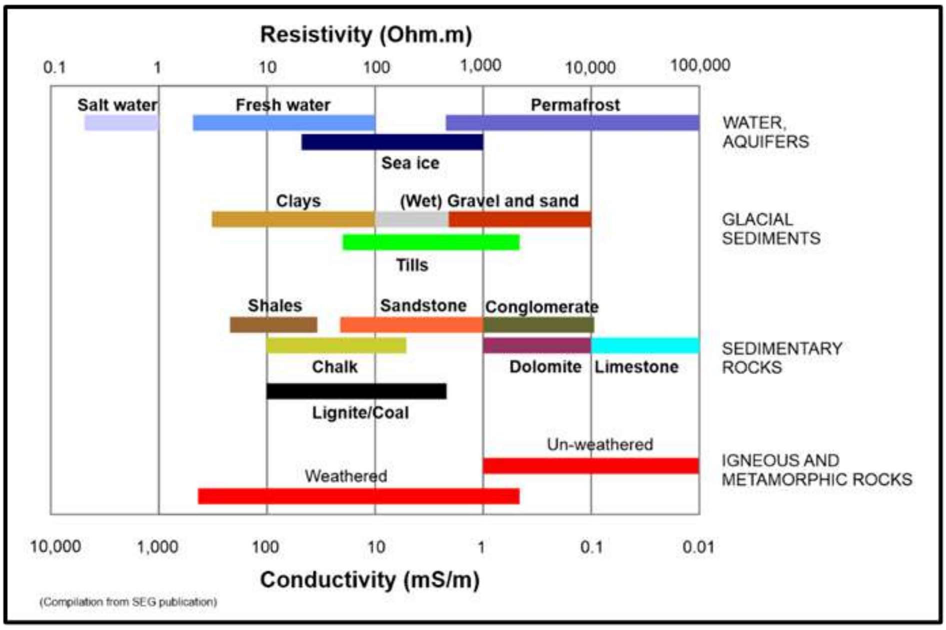


Plate 7: *Resistivity/conductivity of typical sedimentary materials.*

Ground conductivity mapping can aid the identification of a dissolution feature by either detecting an anomaly directly associated with differential fill material within the solution feature compared to the host lithology or by identifying secondary effects such as preferential water drainage. The technique can also aid in the identification of solution features by revealing the context of the regional geology in which they may have formed.

The direct identification of features associated with the dissolution of underlying limestone can vary based on the local geology. Typically, potential solution features are identified by localised 'bull's eye' or 'circular' anomalies that are formed by the crowning of material towards the surface caused by the migration/wash-out of material associated with voiding in the limestone. These can either represent clay-filled (i.e. more conductive) pockets or wash-out/granular-filled zones (i.e. more resistive). Often these are controlled by structural features in the geology (i.e. unit contacts, faults, fractures, etc) and may be offset from a deeper underlying void.

While the in-phase response can assist in categorising highlighted features by helping to differentiate between anomalies caused by disturbed ground or metal, and those relating to soil composition, potentially linked to subsurface voiding or subsidence.

4.2 EM ground conductivity survey – results

The quality of the acquired ground conductivity data was good, but due to the site conditions (overgrown vegetation, obstructions, uneven ground, etc), there are some small gaps in the overall data coverage. The bulk ground conductivity values range from ~37 to ~60 mS/m, which is typical for this type of environment and is likely to represent discernible changes in the near-surface geology.

To illustrate the overall trend, the results of the ground conductivity element are presented as both a conventional rainbow colour scheme and a simplified version. Both plots clearly show a banded pattern of response with a NNE-SSW orientation. The orange/red zones indicate relatively less conductive ground conditions, i.e. drier, more granular/clay-deficient material. This banding pattern seems to be consistent with the underlying marginal facies geology, which usually exhibits variable and intermittent lithological units and has the potential for incised erosional and reworked features.

This banding correlates well with the ERT sections and appears to relate to local variation in lithology type rather than recognisable changes in bedrock depth. As some of the bands suggest a possible lateral offset, the potential for some form of structural feature (i.e. faulting) is a possibility.

Within the banding, there are some isolated anomalous conductive zones (***F1 to F3***) that potentially may be associated with underlying solution features. At this stage, it is uncertain if Features ***F1*** and ***F2*** reflect changes in the natural geology or relate to the construction/remediation of the access track that passed through the former compound. Given that ***F1*** also exhibits an elevated in-phase response, it is more than likely related to the former compound activities.

According to ERT profiles 2 and 4, although feature **F3** does not seem to extend to any considerable depth, it is located immediately adjacent to a much broader sub-vertical conductive zone within the deeper resistive bedrock unit.

The corresponding in-phase results (Figure 3) reveal a scattering of features which are consistent with disturbed/reworked ground. Many of the observed responses correlate with the features shown on the historical compound layout (Plate 2) and accompanying Lidar plan (Figure 1). The most significant are the increased response around the eastern entrance (***F4***) and linear zone (***F7***) in the north that follows the former track.

The main features of interest have been highlighted in the figures and are summarised in Table 4 below.

Feature ID	Associated responses		Description/interpretation
	EM - Ground Conductivity	EM – Inphase Response	
F1	☒	☒**(F6)**	An isolated conductive and inphase zone approximately 18x11m within a band of intermediate conductivity values. This response indicates increased clay/moisture in the top approximately 5 m, which may be related to fine material collecting within an area of subsidence. However, given the corresponding in-phase response, it may relate construction/remediation of the former compound.
F2	☒	☐	An isolated elongated conductive zone approximately 19x9m within a band of intermediate conductivity values. This response indicates increased clay/moisture in the top approximately 5 m, which may be related to fine material collecting within an area of subsidence. However, it may also relate to the construction/remediation of the former compound. Although ERT 4 does not pass directly over the **F2** (~9m offset), there is a significant conductivity feature (**R2**) below ERT 4 that seems to line up.
F3	☒	☒**(F8)**	An isolated conductive and inphase zone formed of two adjacent features, totalling approximately 25x15m within a band of intermediate conductivity values. This response indicates increased clay/moisture in the top approximately 5 m, which may be related to fine material collecting within an area of subsidence. It has partial correlation with an inphase anomaly, which may indicate the response relates to worked ground and material infill. Although not extending to depth, it lies adjacent to a significant conductivity feature (**R2**) below ERT 4.
F4	☐	☐	A very broad irregular area in the eastern corner of the site shows an elevated in-phase response. The response has one linear margin and is typical of the type of in-phase data that is observed in areas of worked ground.
F5	☐	☒	A localised zone of high response (~11x7m) which may relate to a zone of worked ground. This feature lies in an area observed to be raised in the 2015 LiDAR imagery (**L1**).

***Table 4:** EM Survey - features of interest*

F7	☐	☒	A broad linear (approximately 45x9 m) area of high response with some indication of occasional dipole anomalies, indicating buried or surface metal. Onsite, this ground appeared more gravelly and may be a trackway, an area of hardstanding or worked ground
F9	☐	☒	A small (7x4 m) isolated zone of high response near the margin of the survey area. This may relate to work ground in the near surface.
F10	☐	☒	A small (11x2 m) linear response which is found at the western end of **L2**. This most likely relates to the work ground relating to the **L2** feature.

Table 4 (continued): *EM Survey - features of interest*

4.3 ERT survey – Interpretation rationale

The resistivity survey results are presented as standard contoured scaled 2D sections of the subsurface showing changes in apparent resistivity (Figure 4). The vertical and horizontal axes display elevation and chainage along the profile line. In addition, the ERT profiles are presented as 3D fence plots to show the spatial relationship between the profiles (Figure 5). The interpretation of the modelled resistivity sections is based on both published electrical properties of typical sub-surface materials (Plate 7) and, when available, correlation with onsite information.

In principle, an increase in resistivity values usually indicates a relative decrease in the clay content or groundwater saturation. However, due to the non-uniqueness of the electrical properties (i.e., different materials exhibiting the same resistivity values), the final interpretation may be limited and may require additional calibration (i.e., drilling or other supplementary geophysical techniques). Table 5 shows a simple relationship between resistivity and geological setting.

RESISTIVITY	TYPICAL GEOLOGICAL SETTING
High	Dry, granular clay-deficient material,
Intermediate	Mixed sediments/fill material.
Low	Clay-rich, water-saturated sediments.

Table 5: *A simplified relationship between resistivity and geological setting*

The resolution of the ERT survey is subjective as it is based on a combination of electrode spacing, electrode array type and resistivity contrast. The main underlying principle is that the resolution decreases non-linearly with depth. If the target geological boundaries are relatively abrupt with good electrical contrasts, then this should result in sharp resistivity boundaries. However, these resistivity boundaries become indistinct with variable geology and more transitional boundaries.

4.4 ERT survey – results

The four resistivity profiles were laid out to characterise the geology of the site, targeting features detected in the EM survey whilst paying particular attention to the area around the main primary school building footprint. The overall range of the modelled resistivity values is relatively broad (~15 - 401 Ohm.m) and is consistent with a varied environment of salicaceous and carbonate material. Each profile exhibits several features of interest, which are tabulated and discussed in more detail below. Due to the combination of the non-uniqueness of the resistivity data (i.e., overlapping range of resistivity values) and no borehole control, the interpretation is subjective and may be revised following the inclusion of any additional calibration data.

The overall data quality of the ERT was very good, and the resulting resistivity models for ERT profiles 2 and 4 exhibited root mean square (RMS) error values of around 2.5. For ERT 1 and ERT 3, the final modelled fit error was slightly higher, reflecting either more variable geology or some distortions in the geo-electrical field (i.e. disturbed ground/metallic interference)

The correlation of the resulting modelled ERT sections EM results is very good, and based on the range of resistivity values and the general distribution, it was possible to identify three distinct geo-electrical units within the model sections. These are described below:

- **Unit U1** – This generally represents the upper conductive layer that is laterally variable with localised conductive/resistive zones that correlate well with the banding observed in the EM data. This layer varies in thickness between 4 to 8 m and is interpreted as near-surface marginal facies deposits, the variability of which is most likely influenced by the complex erosional process and depositional environments.

- **Unit U2** – This represents a more established conductive layer that is only observed below the easternmost line (ERT 3) and lies between approximately 4 to 13 m BGL. It is uncertain at this stage if this signifies a clay-rich band within the upper conductive unit U1 or a different lithological unit.

- **Unit U3** – This is consistently present at the base of all the ERT sections and is characterised by more resistive values, ranging between 180 to 401 Ohm·m. This is likely to represent either a more competent or clay-deficient bedrock unit. The upper boundary of this unit varies from being relatively planar in the east to becoming more irregular further west with pronounced discontinuities. The other key observation is the significant change in the depth of this unit. On ERT 3 (eastern margin), this boundary lies at around 53 m AOD (~15 m BGL), while for the remaining ERT profiles in the west, it lies at approximately 46 m AOD (~8 m BGL). This apparent change in depth may indicate either a dipping boundary, some form of fault displacement or an erosional channel feature.

In addition to the three main geoelectrical units, there are several notable features that suggest some form of lateral/vertical discontinuity or localised heterogeneities that may represent either a change in lithology, differential weathering, groundwater or structural features. These features are noted as a break from the geo-electrical model outlined above and are tabulated in Table 6 below.

Feature ID	Associated responses	Description/interpretation
	ERT	
R1	☒	Observed as a lateral discontinuity in the upper boundary of the resistive Unit **U3,** the northern end of ERT 4. As the feature is on the margin of the survey profile, it is not fully constrained and so inferences are difficult to make; however, it indicates a localised increase in the clay/moisture content to depth that potentially could relate to dissolution, faulting or a change in bedrock lithology.
R2	☒	A substantial (~25m wide) sub-vertical conductive feature that extends beyond the base of the section. This is present in both ERT 2/4 and may indicate a fault or infilled channel/solution feature. This feature is typical of a potentially large dissolution feature and should be considered a priority anomaly. EM ground conductivity features **F2** and **F3** are located approximately 10 m on either side of this.
R3	☒	This forms a 'bow' like response at the top of resistive unit U3 that results in a localised thickening of the upper conducive layer U1. As this also seems to coincide with a subtle decrease in resistivity within U3, it may be related to dissolution or preferential erosion due to lithology or faulting.
R4	☒	This forms a narrow 'bow' like response at the top of resistive unit U3 that results in a localised thickening of the upper conducive layer U1. As this also seems to coincide with a subtle decrease in resistivity within U3, it may be related to dissolution or preferential erosion due to lithology or faulting.
R5	☒	This forms a broad "bow" like response at the top of resistive unit U3 that results in a localised thickening of the upper conducive layer U1. As this also seems to coincide with a subtle decrease in resistivity within U3, then potentially it may be related to dissolution or preferential erosion due to lithology or faulting
R6	☒	A localised near-surface restive unit (~22m wide) that extends from the surface to approximately 4 m BGL. This feature approximately correlates with an area of in-phase response ***F9*** and may relate to shallow interference or worked ground.

Table 6: *Table of features of interest in the ERT dataset (continued).*

The 3D visualisation (Figure 5) demonstrates the spatial relationships between the geo-electrical layers across the profiles and highlights the extent of the identified features, illustrating how the resistivity anomalies relate to the broader geological structure.

4.5 Summary discussion

The geophysical survey completed at the site mapped broad ground characteristics and defined numerous localised variations. The EM survey provided a good overview of the site, whilst the ERT survey targeted specific features in depth. Although the surveys have identified local variations that may be associated with underlying dissolution, a more definitive interpretation will require some form of intrusive ground truthing or more geophysics.

In terms of understanding the broader geological sequence for the site, identifying the cause (i.e. lithology, bedding or fault) of the depth discrepancy for the deeper resistive unit U3 is key. This will also help them to resolve or differentiate between the upper conductive units U1 and U2.

The main features of interest have been arranged in Table 7 and Plate 8 below as points for investigation in the follow-up intrusive work.

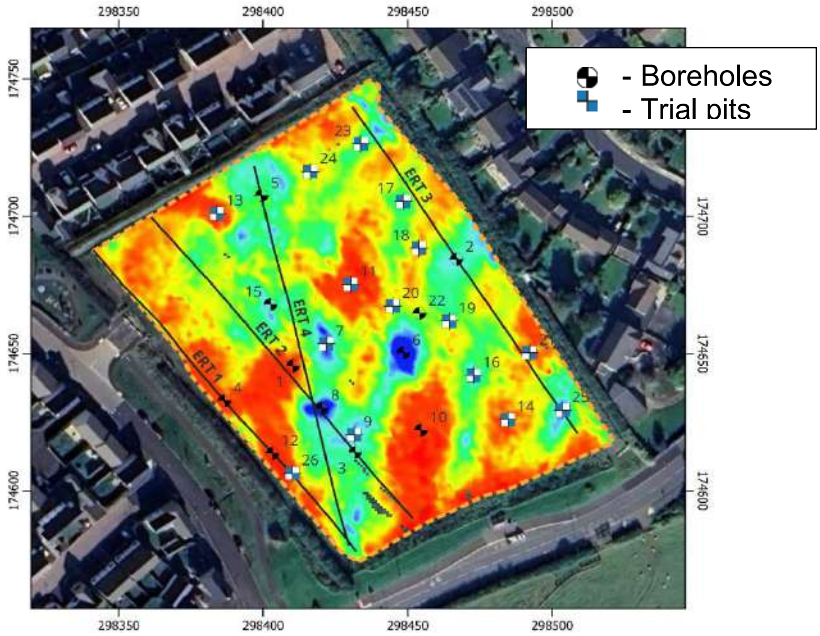


Plate 8: *Map showing recommended targets.*

Priority/ ID	Type	Data	Feature Target	X	Y
1	BH	ERT	R2	298407.1336	174644.6899
2	BH	ERT	R2	298466.8744	174684.3257
3	BH	ERT	R3	298431.7818	174613.9844
4	BH	ERT	R4	298386.6033	174632.7484
5	BH	ERT	R1	298399.4745	174707.4944
6	BH	EM	F1/F6/Ground conductivity data	298448.4926	174650.2428
7	TP	EM	F2	298421.8534	174653.5218
8	BH	EM	F3/F8/Ground conductivity data	298420.3455	174630.1377
9	TP	EM	F3	298431.4512	174620.3724
10	BH	EM	Ground conductivity data	298454.6199	174622.0957
11	TP	EM	Ground conductivity data	298430.3023	174675.1348
12	BH	ERT	R5/R6	298403.2265	174613.6066
13	TP	EM	Ground conductivity data	298383.9649	174700.9842
14	TP	EM	Ground conductivity data	298484.6818	174625.9252
15	BH	EM	Ground conductivity data	298402.5382	174667.8587
16	TP	EM	F5/Ground conductivity	298472.8102	174642.0093
17	TP	EM	Ground conductivity data	298448.4926	174705.3882
18	TP	EM	Ground conductivity data	298453.854	174688.3467
19	TP	EM	Ground conductivity data	298464.3852	174661.7314
20	TP	EM	Ground conductivity data	298444.8546	174667.2842
21	TP	EM	Ground conductivity data	298492.1494	174650.2428
22	BH	EM	Ground conductivity data (offset in the NNE-SSW banding)	298454.0455	174664.6036
23	TP	EM	Ground conductivity data	298433.7489	174726.3549
24	TP	EM	F7/Ground conductivity data	298416.3245	174716.2066
25	TP	EM	F4/Ground conductivity data	298503.638	174629.276
26	TP	EM	F9	298410.0673	174606.3078

Table 7: *Table of suggested targets.*

5 CONCLUSIONS

- Given site constraints, the geophysical investigation has successfully met the primary objective and has provided detailed information on the prevailing ground conditions beneath the survey area. The geophysical data were of good quality with excellent correlation between the EM and ERT surveys. It has identified and delineated a series of subsurface geophysical features that are characteristic of solution feature development/formation.

- The electromagnetic ground conductivity survey revealed a distinctive NNE-SSW oriented banded pattern, interpreted as variations in the semicontinuous and lithologically varied marginal facies units. The discontinuous and locally offset banding pattern reflects localised changes in material composition and/or material thickness, with potential unknown structural controls such as faulting or lateral lithological changes within the underlying geology.

- Within the regional banded ground conductivity response, localised features have been observed, and these may be considered significant targets for potential dissolution feature identification. However, given historical information and corresponding in-phase response, some of these features may relate to the construction/remediation of the former compound area.

- The resulting ERT sections are characterised by three distinct geo-electrical units comprising two upper conductive units that overlie a deeper resistive unit. There appears to be a marked east-west transition across the site, and the most notable response is the marked change in the apparent depth to the lower resistive unit. This may indicate either a dipping boundary, some form of fault displacement or an erosional channel feature.

- The ERT sections also reveal several inconsistencies in the general geo-electrical unit arrangement, and these features may potentially be associated with dissolution processes. The most significant feature comprises a broad sub-vertical conductive zone that extends beyond the base of the section and is observed on two ERT profiles.

As this feature lies beneath the planned primary school building footprint, this represents a priority investigation target due to its likely association with substantial changes in the underlying geology and potential dissolution activity.

- As dissolution features occur more readily at geological boundaries and structural features, the incorporation of intrusive information with the geophysical data will be vital to obtain a better understanding of the site. TerraDat recommends conducting targeted intrusive investigations to calibrate and validate the current interpretation. Following that process, it may be possible to further extend or refine the interpretation and inform more detailed recommendations.

References:

1. Wilson et al. (By D Wilson, J R Davies, C J N Fletcher and M Smith, Geology of the South Wales Coalfield, Part VI, the country around Bridgend. Memoir for 1:50 000 geological sheet 261 and 262 (England and Wales))

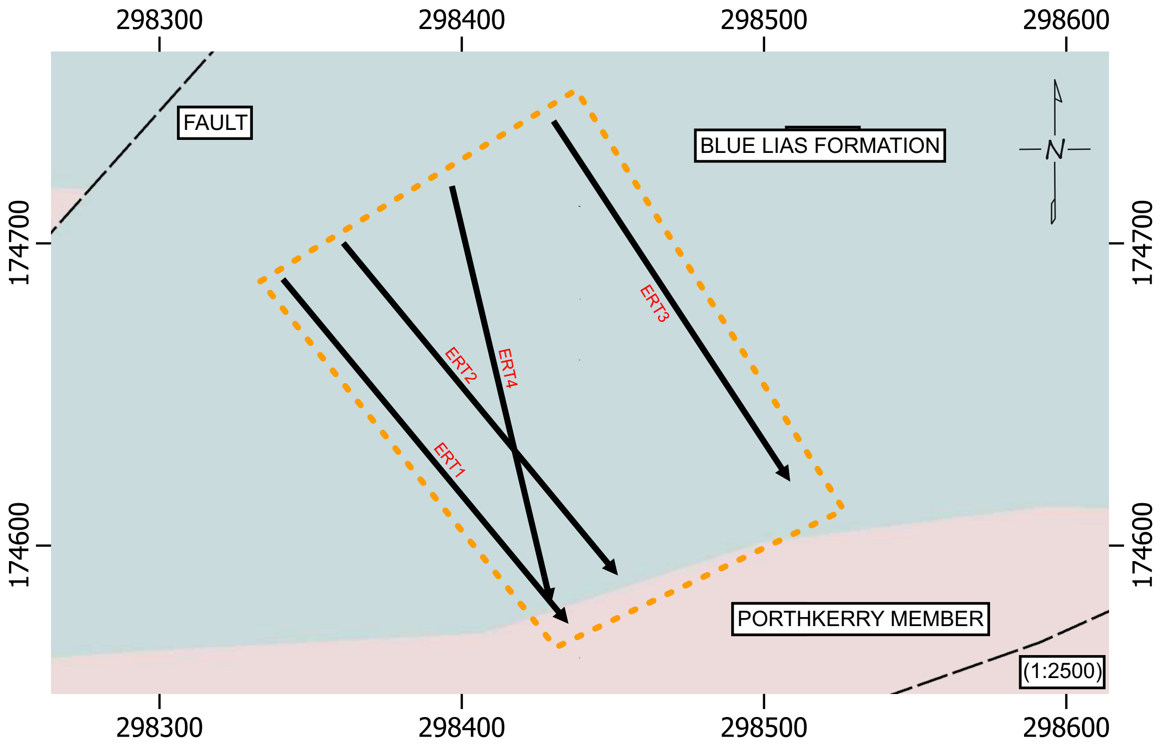
Disclaimer

This report represents an opinionated interpretation of the geophysical data. It is intended to guide a follow-up invasive investigation. Features that do not produce measurable geophysical anomalies or are hidden by other features may remain undetected. Geophysical surveys complement invasive/destructive methods and provide a tool for investigating the subsurface; they do not produce data that can be taken to represent all the ground conditions found within the surveyed area. Areas that have not been surveyed due to obstructed access or any other reason are excluded from the interpretation.

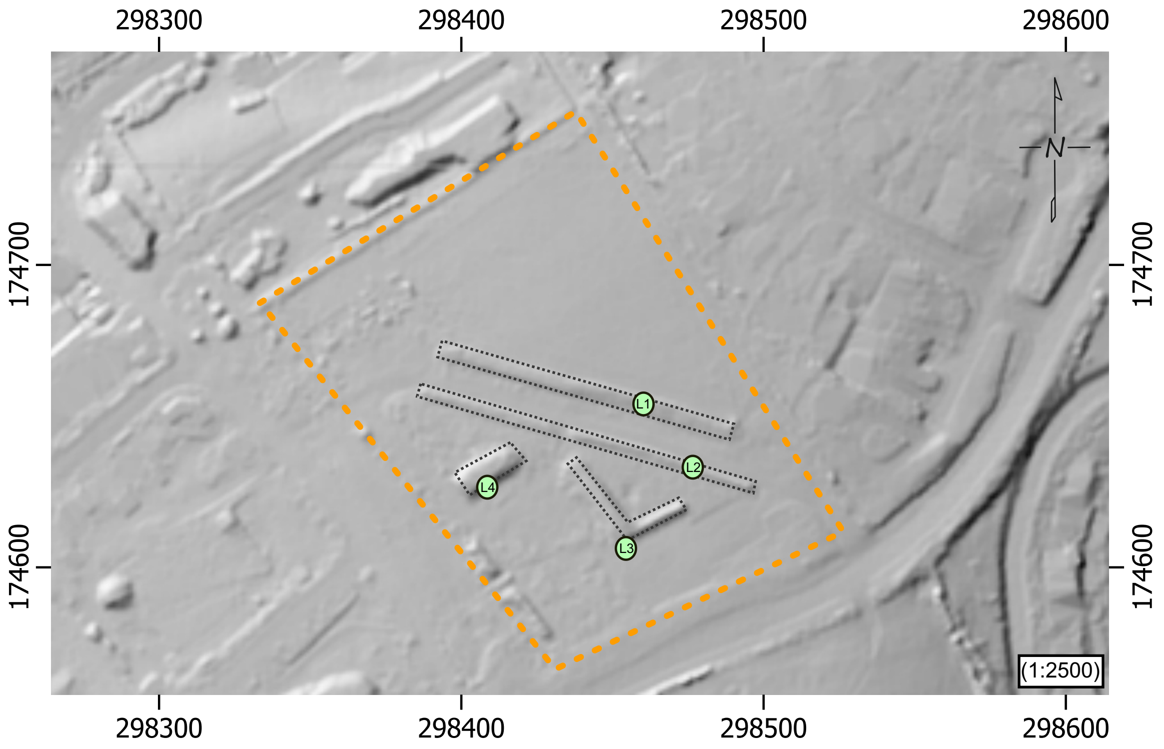
Figures

A) SITE OVERVIEW (Overlaid on Google Satellite Imagery, 2025)

B) BEDROCK GEOLOGY (BGS, 2025)



C) LiDAR IMAGERY (Defra, 1 m resolution, 2015, with ERT survey profile locations)



KEY

- ⋯ Geophysical survey area.
- → ERT survey profile locations (arrow shows line direction in Figure 4).
- ● LiDAR features (2015)

GEOLOGY KEY

- 🟦 Blue Lias Formation - shell limestone
- 🟥 Porthkerry Member - limestone and mudstone
- ⋰ Fault

NOTES

- All maps produced in QGIS, 2025.

- Satellite Imagery © 2020 Google, Map data © [2025] Google; not geo-referenced by Terradat.

- Geology from British Geological Survey, materials © NERC [2025].

SITE NOTES

The survey was designed to characterise the ground and to locate potential karst features within the limestone bedrock in preparation for a potential primary school development at a site on the western outskirts of Cowbridge.

The area is underlain by the Blue Lias Limestone Formation with no overlying superficial deposits. A small section of the southern edge of the site is underlain by Porthkerry Member limestone and mudstone.

The survey area comprised an overgrown field surrounded by a newly built housing development. The field was enclosed by metal fencing but there were no other known services on te site.

An electromagnetic survey was completed across the whole accessible area and an Electrical Resistivity Tomography (ERT) survey was completed comprising four ERT profiles.

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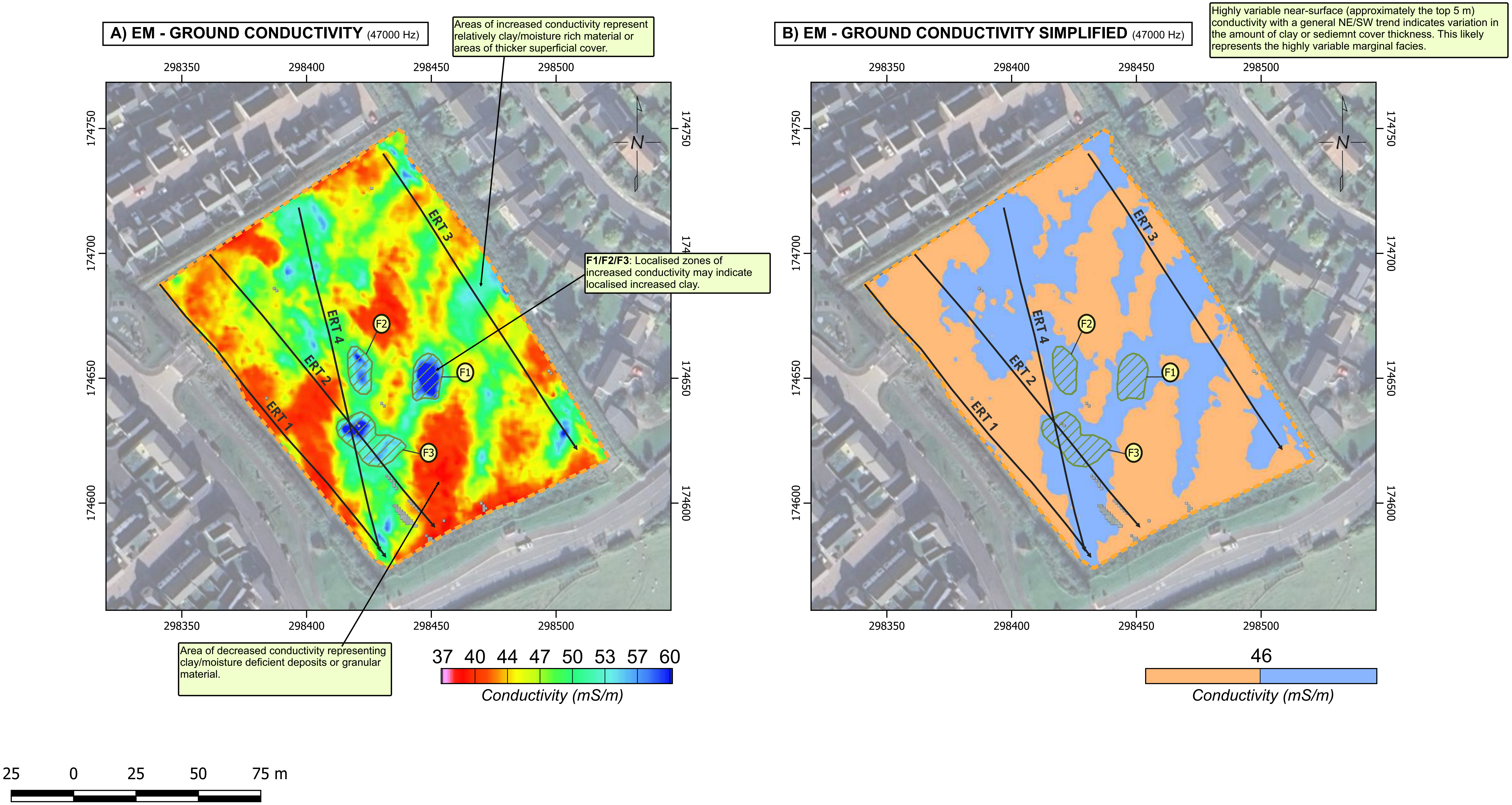
Title:
SITE OVERVIEW

Project:
COWBRIDGE,
VALE OF GLAMORGAN

Scale: See individual plots
Drawn by/Ref: GP/9232/1
Date: June 2025

FIGURE 1



A) EM - GROUND CONDUCTIVITY (47000 Hz)

Areas of increased conductivity represent relatively clay/moisture rich material or areas of thicker superficial cover.

F1/F2/F3: Localised zones of increased conductivity may indicate localised increased clay.

Area of decreased conductivity representing clay/moisture deficient deposits or granular material.

B) EM - GROUND CONDUCTIVITY SIMPLIFIED (47000 Hz)

Highly variable near-surface (approximately the top 5 m) conductivity with a general NE/SW trend indicates variation in the amount of clay or sediemnt cover thickness. This likely represents the highly variable marginal facies.

KEY

- 🟧 Geophysical survey area
- → ERT survey profile locations (arrow shows line direction in Figure 4)
- F3 Features of interest
- ▨ Anomalously low conductivity response.

NOTES

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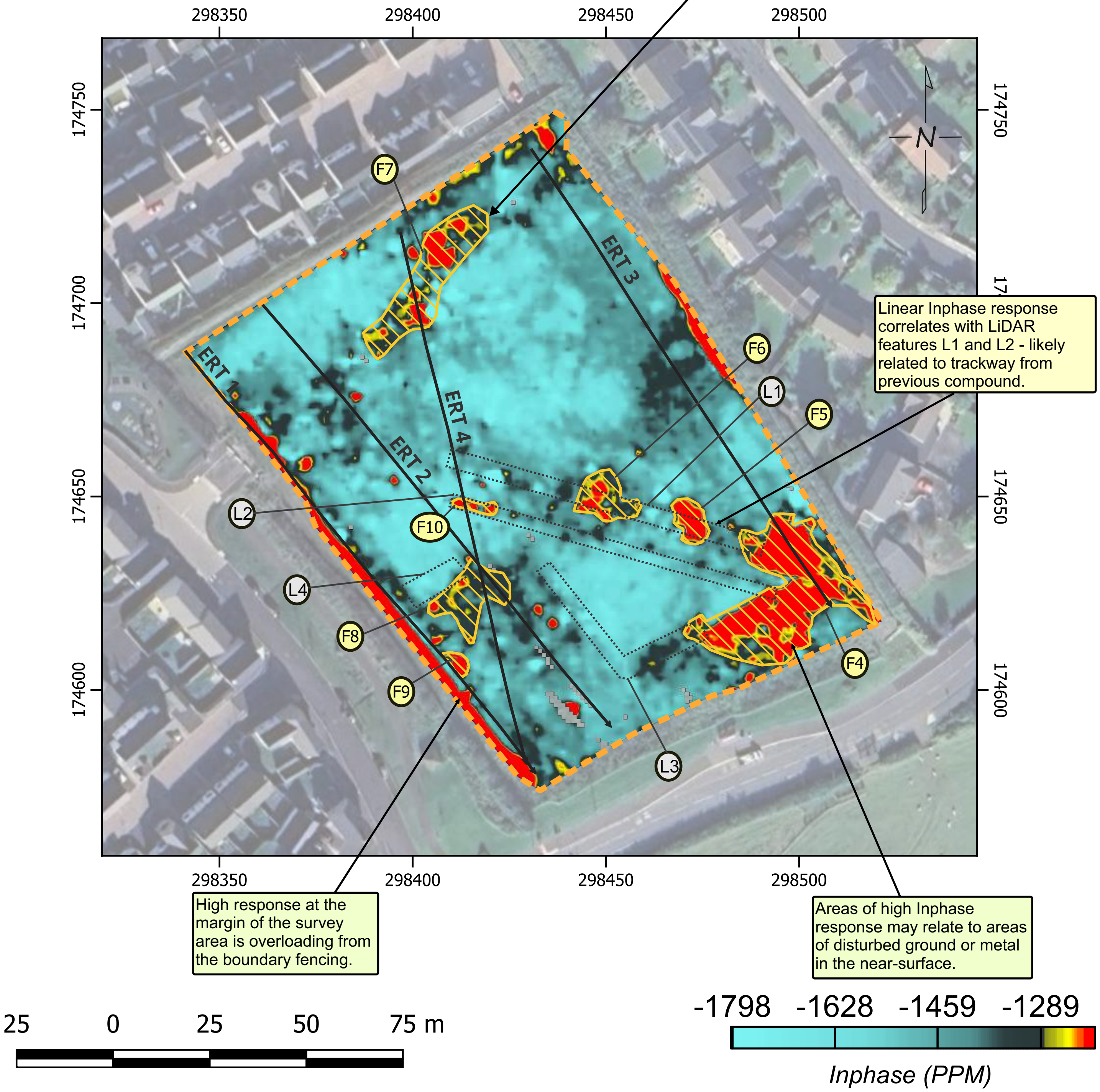
Title:
EM - GROUND CONDUCTIVITY

Project:
COWBRIDGE, VALE OF GLAMORGAN

Scale: 1:1500 at A3
Drawn by/Ref: TC/9232/2
Date: June 2025

FIGURE 2

EM - INPHASE RESPONSE (47000 Hz)



Linear (**F7**) Inphase response correlates with trackway from previous sitework. This response may relate to disturbed ground or scattered metal.

Linear Inphase response correlates with LiDAR features L1 and L2 - likely related to trackway from previous compound.

High response at the margin of the survey area is overloading from the boundary fencing.

Areas of high Inphase response may relate to areas of disturbed ground or metal in the near-surface.

KEY

- Geophysical survey area.
- ERT survey profile locations (arrow shows line direction in Figure 4).
- F3 Features of interest.
- Anomalous inphase response.
- L3 LiDAR features (2015)

NOTES

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Title: **EM - INPHASE RESPONSE**

Project: **COWBRIDGE, VALE OF GLAMORGAN**

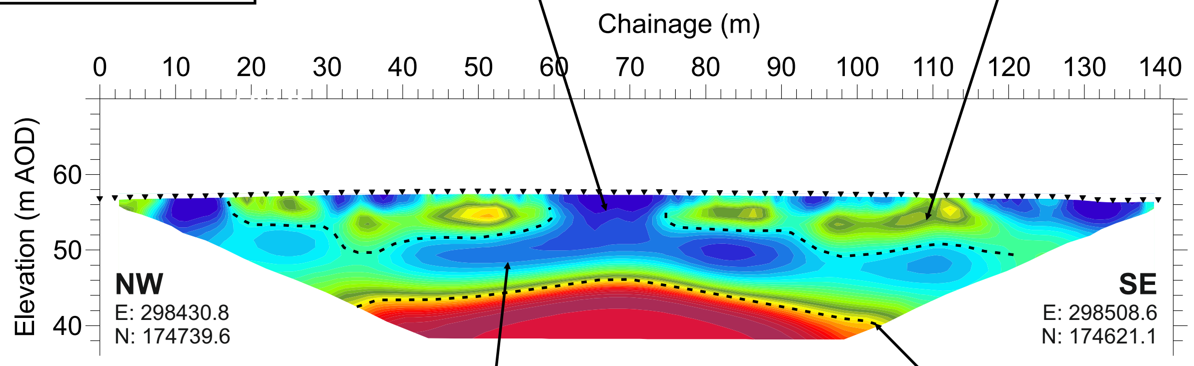
Scale:	1:1500 at A3
Drawn by/Ref:	TC/9232/3
Date:	June 2025

FIGURE 3

R2: A central area of more conductive ground (i.e. increased clay/moisture). This is similar to near-surface conductive features in ERT 2 and ERT 4.

Unit U1: The top approximately 6 m of the profile appears to show a high degree of lateral variability potentially relating to marginal facies material and/or rock head topography. This shows a good correlation with the banding in the conductivity plot.

A) ERT 3 (RMS - 4.7)

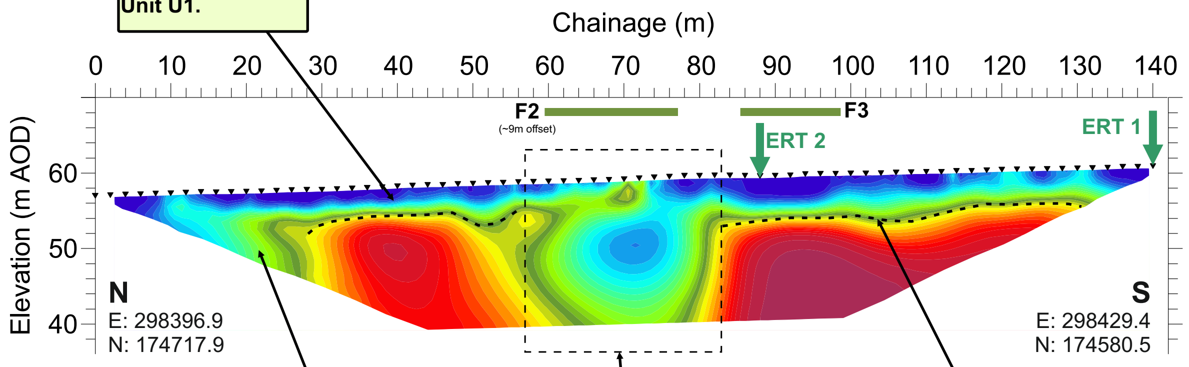


A more conductive (**Unit U2**) layer may relate to a siliceous unit within the bedrock group imaged along strike, or a thickening of the marginal facies.

Resistive boundary at the top of **Unit U3** at approximately 45 mAOD, deeper than in the west of site, may relate to limestone.

B) ERT 4 (RMS - 2.2)

Upper conductive **Unit U1.**



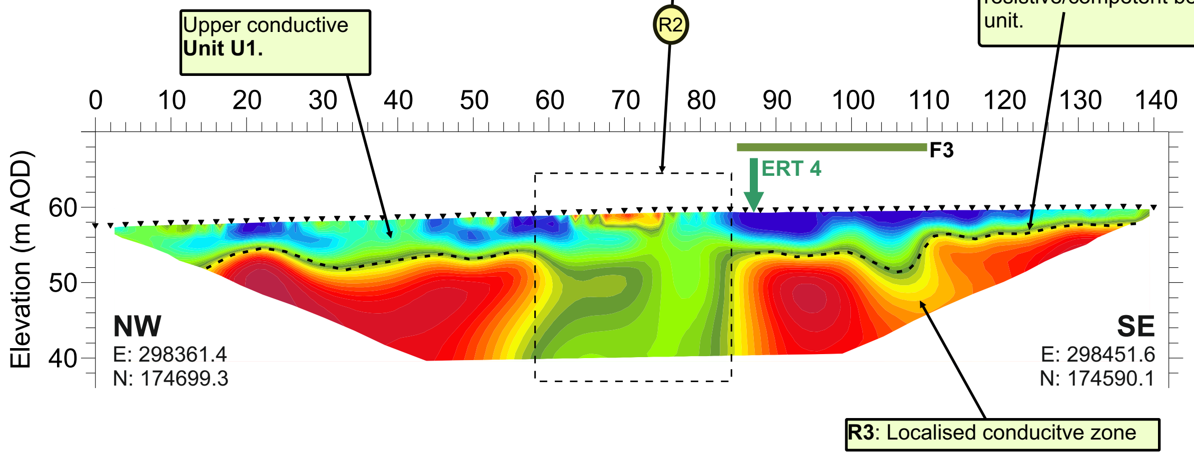
R1: Localised conducitve zone

R2: A distinct broad area of decreased and variable resistivity values, within **Units U1** and **U3** which continues to the base of the section. This may relate to change in material or potentially an area of dissolution. This should be targeted intrusively.

Resistive boundary at the top of **Unit U3** at approximately 53 mAOD, shallower than in the east of site, may relate to more resistive/competent bedrock unit.

C) ERT 2 (RMS - 2.5)

Upper conductive **Unit U1.**

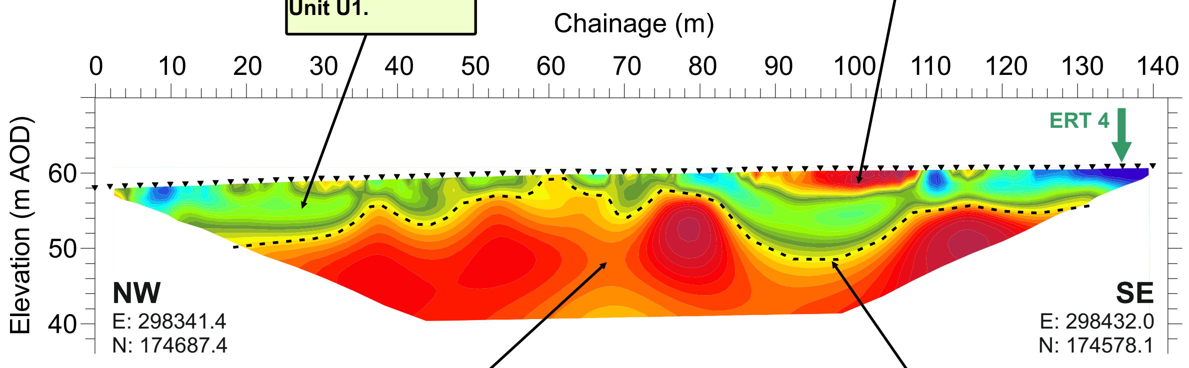


R3: Localised conducitve zone

R6: Localised zone at the surface of higher values, which approximately correlate with some high values in the inphase response (Figure 3), may represent interference.

D) ERT 1 (RMS - 4.7)

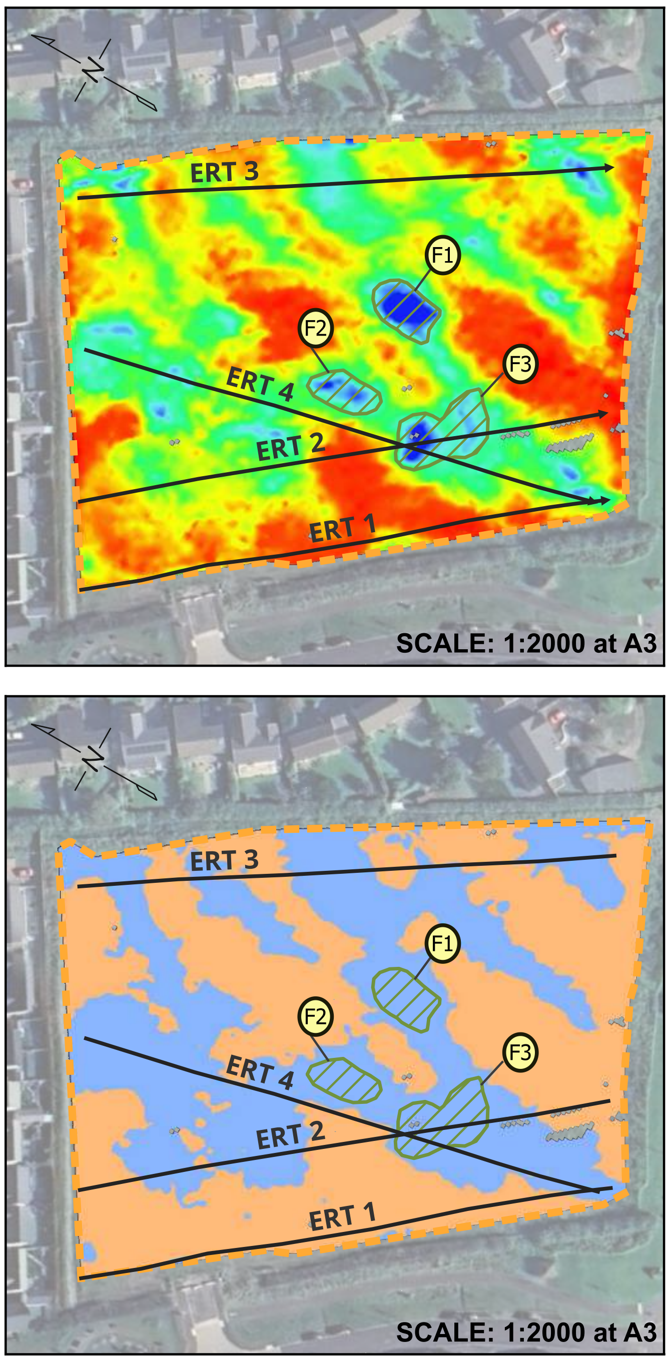
Upper conductive **Unit U1.**



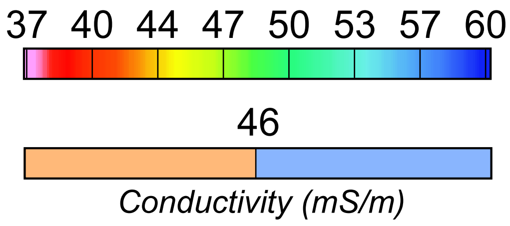
R4: Localised conducitve zone

R5: Localised conducitve zone

E) ERT PROFILE LOCATIONS



CONDUCTIVITY COLOURSCALES



KEY

Geophysical survey area.

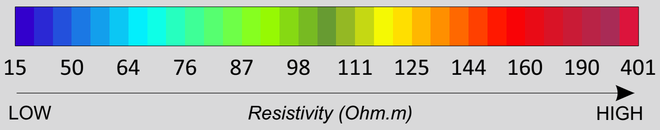
ERT survey profile locations (arrow shows line direction in Figure 4).

R3 Features of interest (ERT survey).

ERT profile intersection point.

F3 Extent of conductivity features (See Figure 2)

ERT COLOURSCALE



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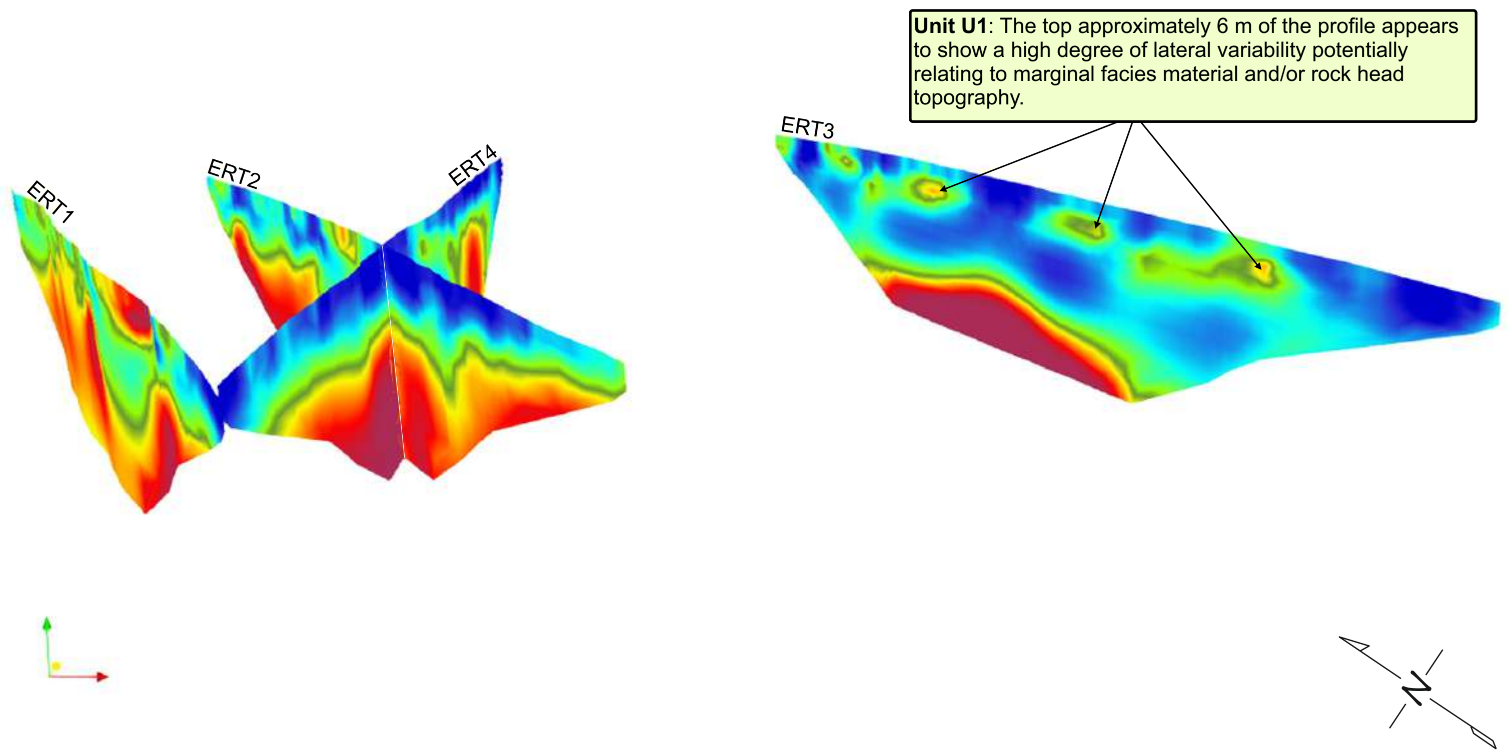
Title:
ELECTRICAL RESISTIVITY
TOMOGRAPHY (ERT) PROFILES

Project:
COWBRIDGE,
VALE OF GLAMORGAN

Scale:	SEE NOTES
Drawn by/Ref:	TC/9232/4
Date:	June 2025

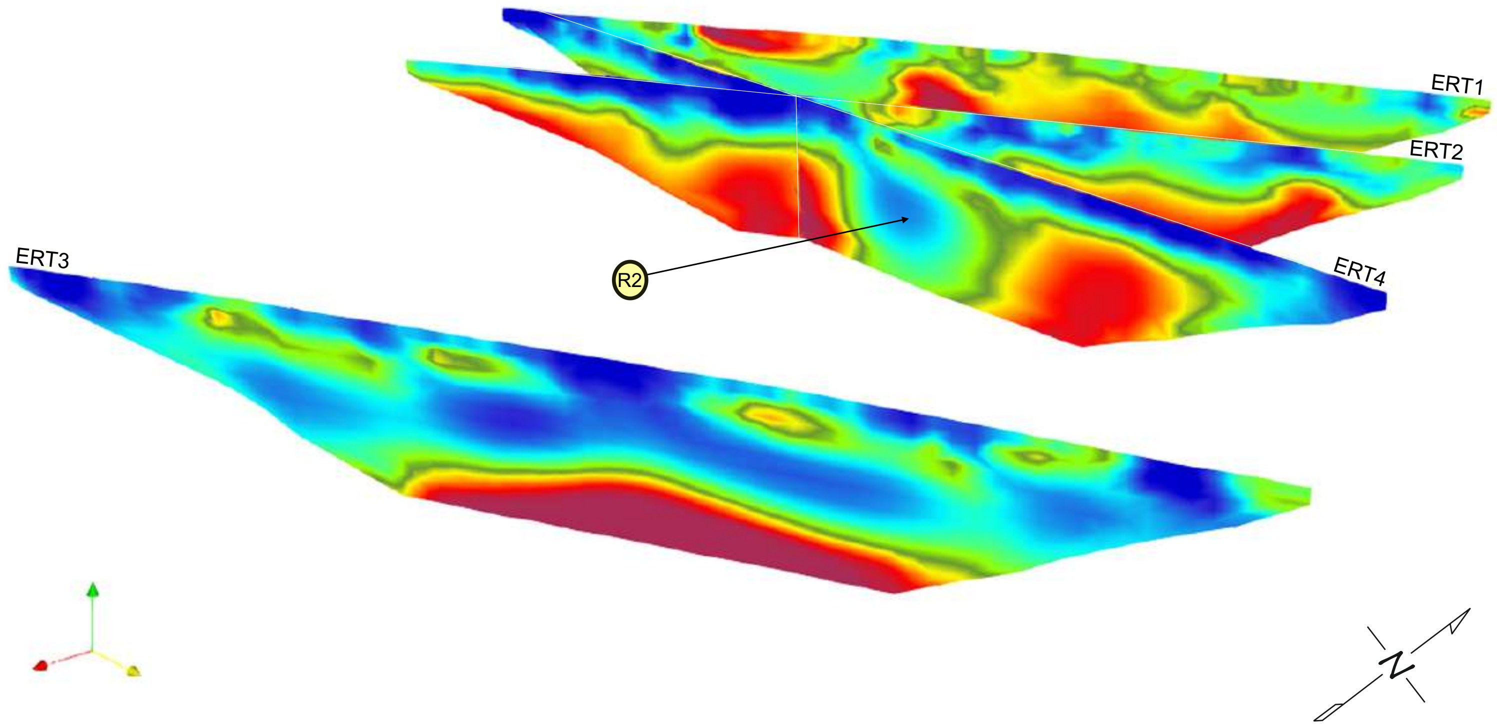
FIGURE 4

A) 3D ERT RENDER (Looking north)

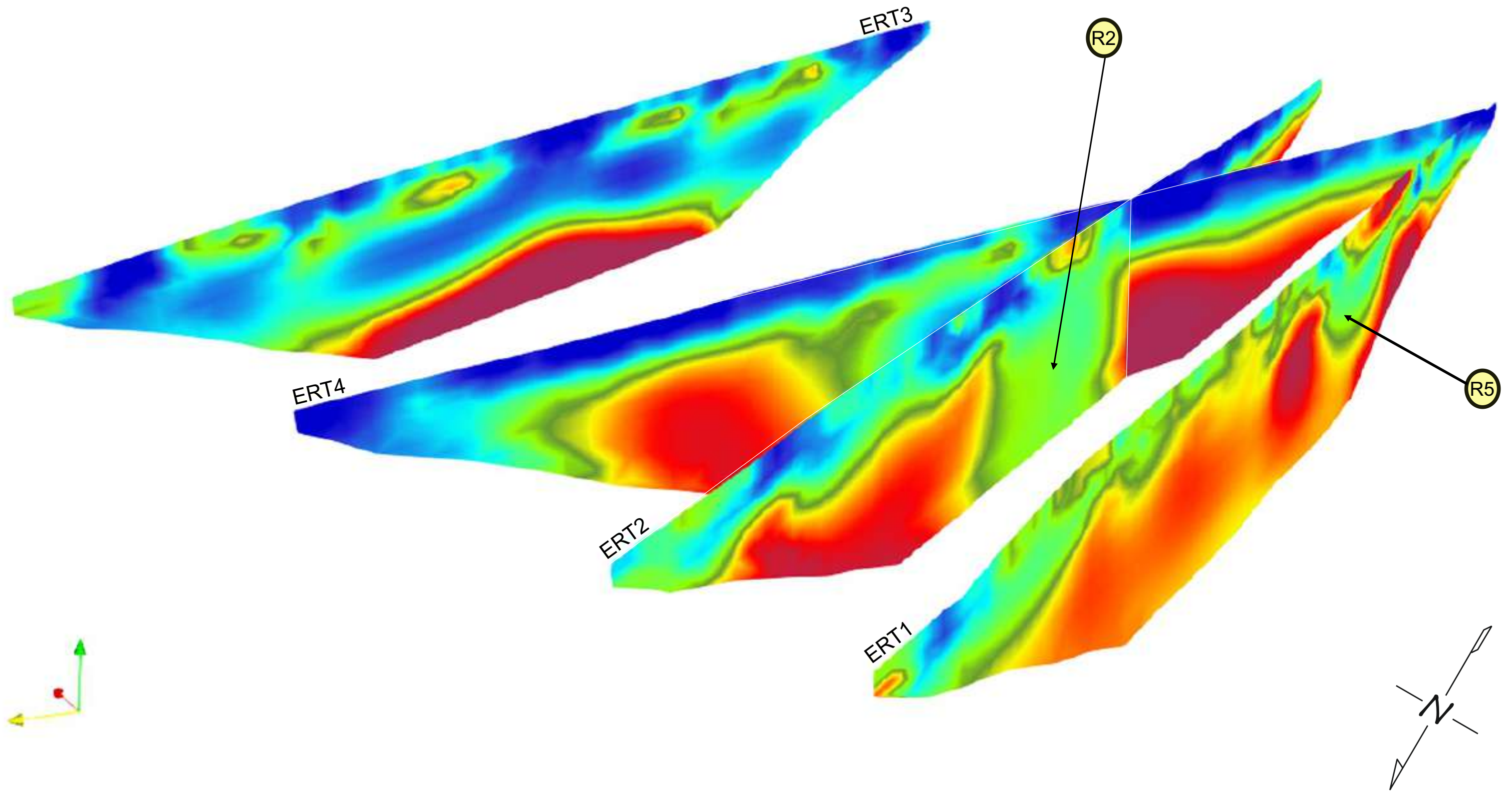


Unit U1: The top approximately 6 m of the profile appears to show a high degree of lateral variability potentially relating to marginal facies material and/or rock head topography.

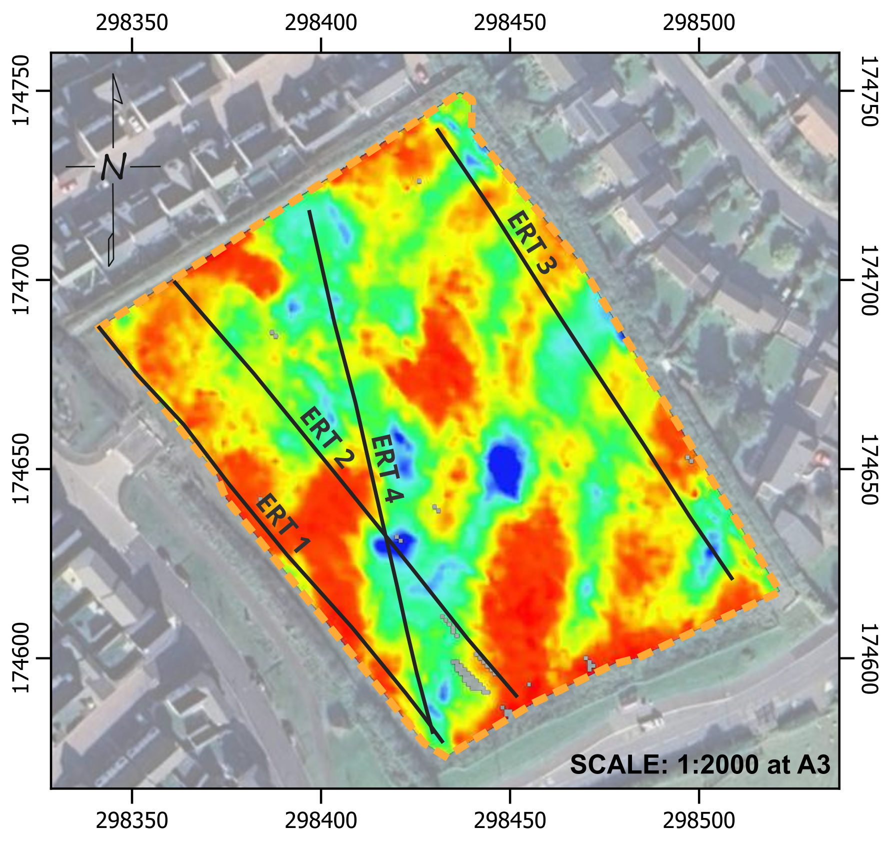
B) 3D ERT RENDER (Looking southwest)



C) 3D ERT RENDER (Looking southeast)



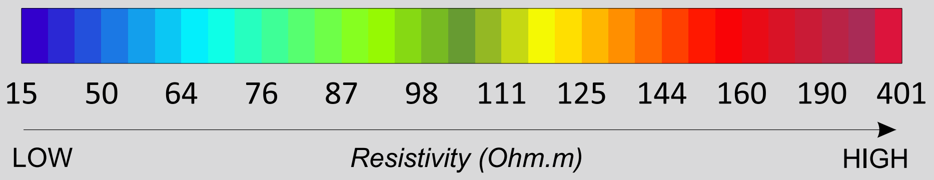
D) ERT LOCATIONS OVERLAIN ON GROUND CONDUCTIVITY



SCALE: 1:2000 at A3

KEY

- Geophysical survey area
- ERT survey profile locations
- Feature of interest



NOTES

- All maps produced in QGIS, 2025.

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The 3D visualisations created in Paraview and offer a perspective of the ERT data, illustrating the spatial relationships between the geo-electrical layers across the profiles, and highlighting the extent of the features.

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Title:
3D ERT PROFILES

Project:
COWBRIDGE, VALE OF GLAMORGAN

Scale: SEE PLOTS
Drawn by/Ref: GP.TC/9232/5
Date: June 2025

FIGURE 5

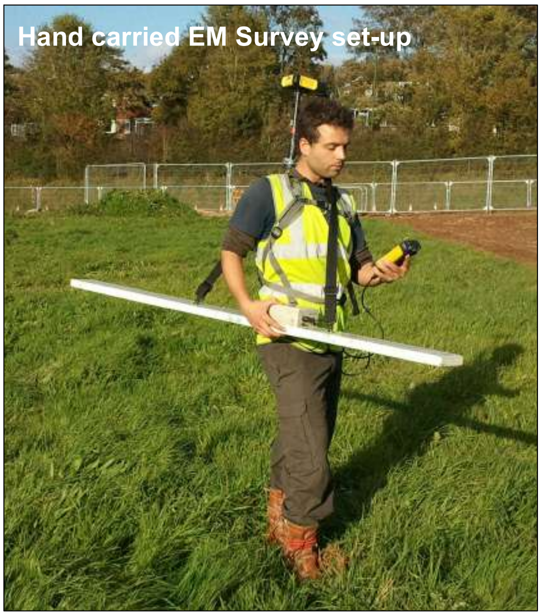
Appendices

Electromagnetic Survey

The electromagnetic (EM) technique involves the generation of an EM field at the surface and measuring the response of the ground as it propagates into the subsurface. The main components of an EM survey instrument are a transmitter (for the generation of the primary field) and a receiver (for measuring the induced secondary field). The instrument functions by inducing current into the ground via a transmitter coil which causes the generation of secondary electromagnetic fields in any ground conductors present within the depth range of the particular instrument. These secondary fields are measured at a receiver coil, and the instrument can record ground conductivity and in-phase component (metal indicator) at each survey station.

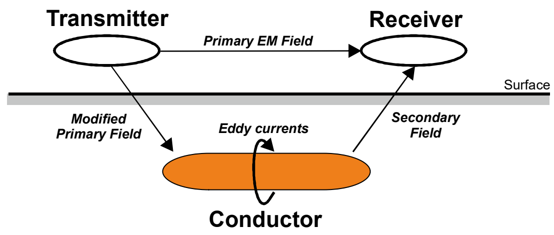
Electromagnetic (EM) surveys are carried out using man-portable instruments with readings taken on a regular grid or along selected traverse lines. If site conditions permit, the EM instrument may be mounted/towed behind a quad bike and positional control is provided by dGPS. The selection of the particular EM instrument (GEM2/EM-38/EM-31/EM-34) is based on the required penetration depth of the survey.

The results from the EM survey can be presented as colour contoured plots of conductivity and inphase (metal response) data. In general terms, a relative increase in conductivity values usually indicates a local increase in clay content or water saturation. However, if there is a corresponding increase in the inphase response, the influence of some artificial source is likely (i.e. metal).

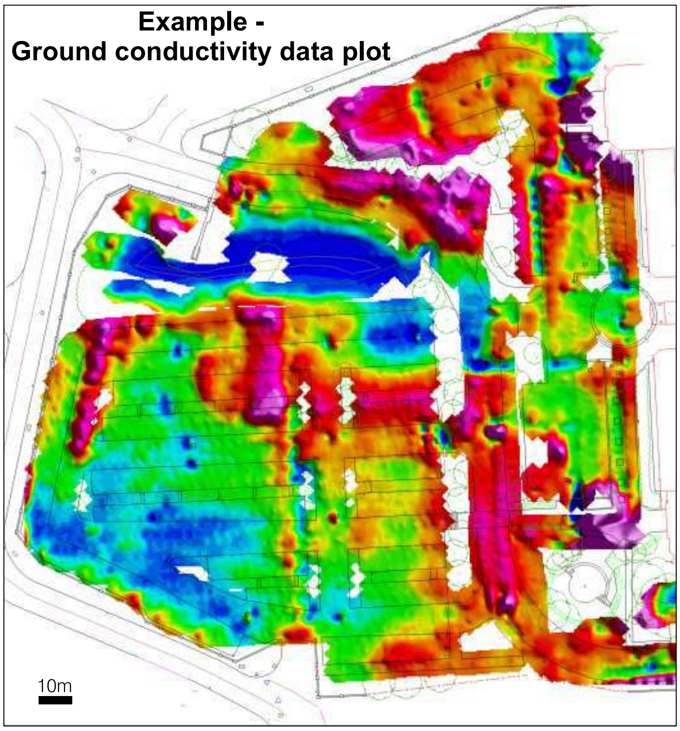

Hand carried EM Survey set-up


EM Survey set-up on a quad bike

General principle of EM surveying



Example -
Ground conductivity data plot



At the end of the survey, the data are downloaded to a field computer and corrected for instrument, diurnal and positional shifts. Additional editing may be carried out to remove non-essential or 'noisy' data values/positions. The dataset is then processed to enhance any identifiable anomalies.

Constraints

Power lines, buildings, metal structures (fences, rebar, vehicles, debris etc.) and buried services can interfere with the electromagnetic measurements.

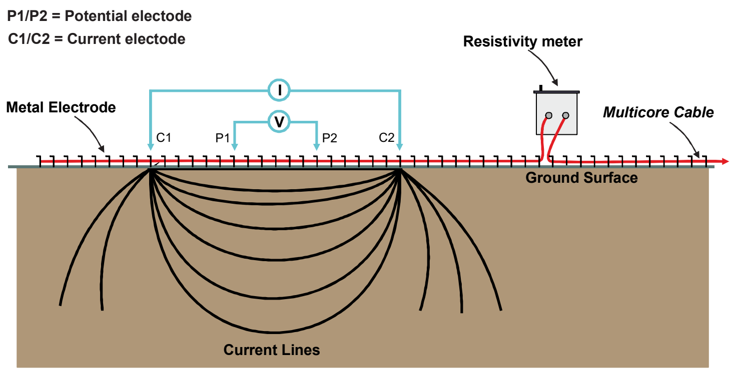
Electrical Resistivity Tomography

The resistivity technique is a useful method for characterising the sub-surface materials in terms of their electrical properties. Variations in electrical resistivity (or conductivity) typically correlate with variations in lithology, water saturation, fluid conductivity, porosity and permeability, which may be used to map stratigraphic units, geological structures, sinkholes, fractures and groundwater.

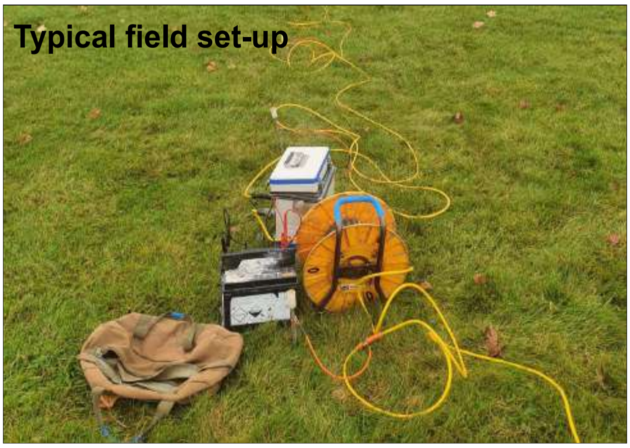
The acquisition of resistivity data involves the injection of current into the ground via a pair of electrodes and then the resulting potential field is measured by a corresponding pair of potential electrodes. The field set-up requires the deployment of an array of regularly spaced electrodes, which are connected to a central control unit via multi-core cables. Resistivity data are then recorded via complex combinations of current and potential electrode pairs to build up a pseudo cross-section of apparent resistivity beneath the survey line. The depth of investigation depends on the electrode separation and geometry, with greater electrode separations yielding bulk resistivity measurements from greater depths.

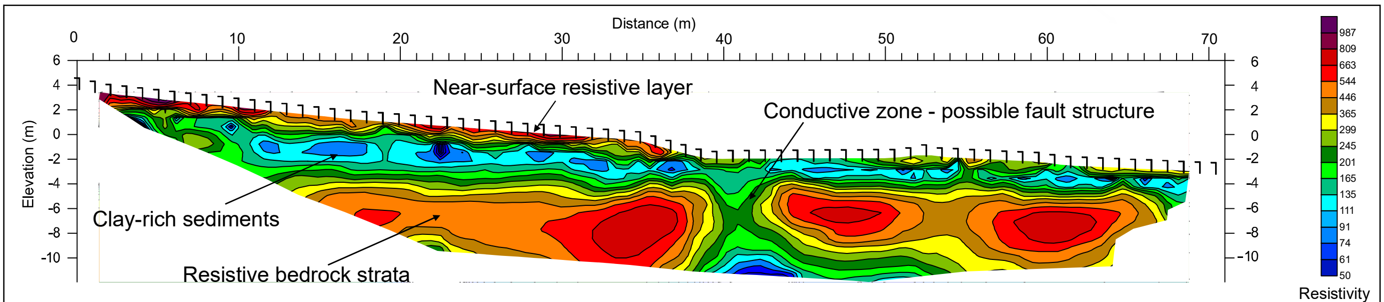
The recorded data are transferred for processing. To derive a cross-sectional model of true ground resistivity, the measured data are subject to a finite-difference inversion process via RES2DINV software.

General ERT principle

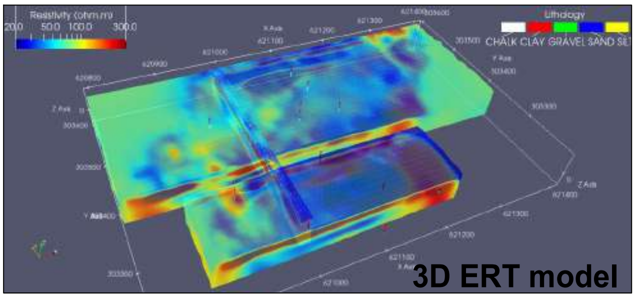


Typical field set-up





Modelled 2D resistivity section



3D ERT model

The true resistivity models are presented as colour contour sections revealing spatial variation in subsurface resistivity. The 2D method of presenting resistivity data is limited where highly irregular or complex geological features are present, and a 3D survey may be required. Geological materials have characteristic resistivity values that enable identification of boundaries between distinct lithologies on resistivity cross-sections. At some sites, however, there are overlaps between the ranges of possible resistivity values for the targeted materials which therefore necessitates use of other geophysical surveys and/or drilling to confirm the nature of identified features.

Constraints:

Readings can be affected by poor electrical contact at the surface. An increased electrode array length is required to locate increased depths of interest therefore, the site layout must permit long arrays. Resolution of target features decreases with increased depth of burial.

ANNEX B
Trial Pit Logs

Borehole No.
A1-SA1
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 17/06/2025 to 17/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298365.00 N: 174685.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor Arthur Winnett & Sons **Plant Used** JCB 3CX			**Approved By** Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
			(0.25) 0.25		Loose brown slightly sandy gravelly SILT with abundant rootlets. Gravel is subangular fine to coarse of limestone. Sand is fine to coarse. **(Made Ground)**	
	B	0.30				
	D	0.50				
			(0.85) 1.10		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: orangish brown slightly clayey gravelly subangular COBBLES of limestone. Gravel is angular to subangular fine to coarse of limestone. **(Blue Lias Formation)**	
	B	0.80				
	D	1.00				
					End of Trial Pit at 1.10m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

2.10m
0.70m
Final Depth 1.10m

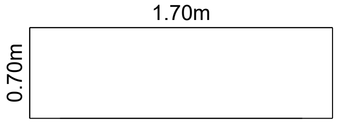
Borehole No.
A1-SA2
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 17/06/2025 to 17/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298408.00 N: 174705.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor Arthur Winnett & Sons **Plant Used** JCB 3CX			**Approved By** Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B	0.20	(0.20) 0.20		Loose brown slightly sandy gravelly SILT with abundant rootlets. Gravel is subangular fine to coarse of limestone. Sand is fine to coarse. **()**	
	ES	0.35	(0.30) 0.50		Soft bown slightly gravelly sandy CLAY with frequent plastic and anthropogenic waste. Gravel is subangular fine to coarse of limestone. Sand is fine to coarse. **()**	
	B D B D	0.60 0.75 1.00 1.30	(0.90) 1.40		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly clayey gravelly subangular COBBLES of limestone. Gravel is angular to subangular fine to coarse of limestone. **(Blue Lias Formation)**	
					End of Trial Pit at 1.40m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 1.40m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.
A1-SA3
Sheet 1 of 1

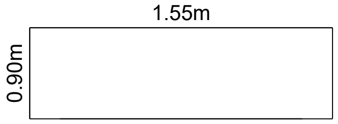
Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 18/06/2025 to 18/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298353.00 N: 174688.00 L:	**Water Strike Details**	**Logged By** CB
Contractor Arthur Winnett & Sons	**Plant Used** JCB 3CX	Depth Strike / Remarks	**Approved By**
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B	0.00			Loose brown slightly sandy gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
	D	0.20	(0.30) 0.30			
	B	0.40			Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly gravelly clayey subangular COBBLES of limestone. Gravel is subangular fine to coarse of limestone. **()**	
	D	0.70	(1.00) 1.30			
					End of Trial Pit at 1.30m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



Final Depth 1.30m

Borehole No.

A1-SA4

Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 18/06/2025 to 18/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298368.00 N: 174673.00 L:	**Water Strike Details**	**Logged By** CB
Contractor Arthur Winnett & Sons	**Plant Used** JCB 3CX	Depth Strike / Remarks	**Approved By**
			Scale 1:50

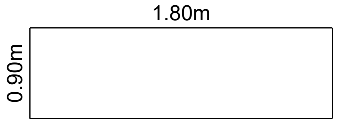
Results	Type	Depth	Depth, (Thickness)	Level	Stratum Description	Legend
	B ES D	0.00 0.10 0.15	(0.20) 0.20		Loose brown slightly sandy gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **(Made Ground)**	▨
	B D	0.50 0.60	(0.70) 0.90		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly gravelly clayey subangular COBBLES of limestone. Gravel is subangular fine to coarse of limestone. **(Blue Lias Formation)** *0.20 to 0.00m - 1 no concrete block*	▦
					End of Trial Pit at 0.90m	

Remarks

Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



Final Depth 0.90m

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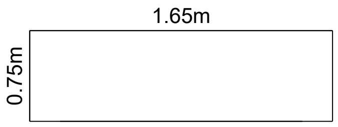
Borehole No.
A1-SA5
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 18/06/2025 to 18/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298389.00 N: 174691.00 L:	**Water Strike Details**	**Logged By** CB
Contractor Arthur Winnett & Sons	**Plant Used** JCB 3CX	Depth Strike | Remarks	**Approved By**
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B	0.00	(0.55)		Medium dense greyish brown slightly clayey silty subangular to subrounded fine to coarse GRAVEL of limestone with occasional plastic and a moderate subangular limestone cobble content. **(Made Ground)**	
	ES	0.40				
	D	0.50				
			0.55			
	B	0.60	(1.55)		Firm orangish brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
	D	0.80				
	B	1.60				
	D	1.80				
			2.10			
			(1.80)		Soft to firm slightly gravelly sandy CLAY with a moderate subangular to subrounded limestone cobble content. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine. **()**	
	B	2.50				
	D	2.70				
	B	3.50				
	D	3.70				
			3.90		End of Trial Pit at 3.90m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated at extent of excavator's reach. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 3.90m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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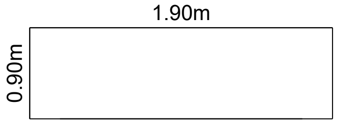
Borehole No.
A1-SA6
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School		**Project No.** 648-CA-24	**Date** 18/06/2025 to 18/06/2025	**Hole Type** TP
Client Kier Construction		**Co-ords** E: 298378.00 N: 174703.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor Arthur Winnett & Sons	**Plant Used** JCB 3CX			**Approved By** Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B	0.00	(0.25)		Loose brown slightly sandy gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	▨
	D	0.15				
	B	0.25	0.25		Firm orangish brown slightly gravelly slightly sandy CLAY with a low subangular to subrounded limestone cobble content. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	▨
	D	0.40	(0.40)			
			0.65		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly clayey gravelly subangular to subrounded COBBLES of limestone. Gravel is subangular to subrounded fine to coarse of limestone. **(Blue Lias Formation)**	▨
	B	0.80	(0.65)			
	D	1.10				
			1.30		End of Trial Pit at 1.30m	

Remarks

Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.



Final Depth 1.30m

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

A2-SA1

Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 17/06/2025 to 17/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298426.00 N: 174720.00 L:	**Water Strike Details**	**Logged By** CB
Contractor Arthur Winnett & Sons **Plant Used** JCB 3CX		Depth Strike / Remarks	**Approved By**
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B	0.20	(0.20) 0.20		Loose brown slightly sandy gravelly SILT with abundant rootlets and frequent plastic and anthropogenic waste. Gravel is subangular fine to coarse of limestone. Sand is fine to coarse. **(Made Ground)**	▩
			(0.30) 0.50		Soft bown slightly gravelly sandy CLAY with frequent plastic and anthropogenic waste. Gravel is subangular fine to coarse of limestone. Sand is fine to coarse. **(Made Ground)**	▩
	D	0.60			Soft to firm orangish brown slightly clayey gravelly subangular to subrounded COBBLES of limestone. Gravel is subangular to subrounded fine to coarse of limestone. **()**	
	B	1.10	(1.00)			
	D	1.30				
			1.50		End of Trial Pit at 1.40m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

1.70m × 0.70m

Final Depth 1.40m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.
A2-SA2
Sheet 1 of 1

Project Name	Ysgol Iolo Morganwg Primary School
Project No.	648-CA-24
Date	17/06/2025 to 17/06/2025
Hole Type	TP
Client	Kier Construction
Co-ords	E: 298450.00 N: 174696.00 L:
Logged By	CB
Contractor	Arthur Winnett & Sons
Plant Used	JCB 3CX
Approved By	
	Scale 1:50

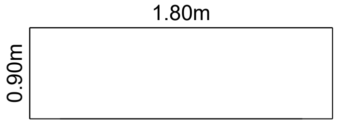
Water Strike Details

Depth Strike	Remarks

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B	0.00			Loose brown slightly sandy gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
	D	0.20	(0.35)			
	ES	0.30	0.35			
	B	0.70			Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly sandy clayey angular to subangular fine to coarse GRAVEL of limestone with a high angular to subangular sandstone cobble content. Sand is fine to coarse. **(Blue Lias Formation)**	
	D	0.90	(1.25)			
			1.60		End of Trial Pit at 1.60m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 1.60m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.
A2-SA3
Sheet 1 of 1

Project Name
Ysgol Iolo Morganwg Primary School

Project No.
648-CA-24

Date
18/06/2025 to 18/06/2025

Hole Type
TP

Client
Kier Construction

Co-ords
E: 298405.00
N: 174717.00
L:

Water Strike Details

Depth Strike	Remarks

Logged By
CB

Approved By

Contractor
Arthur Winnett & Sons

Plant Used
JCB 3CX

Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B	0.00			Loose greyish brown slightly silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of limestone, brick fragments, concrete, glass and concrete blocks. **(Made Ground)**	▩
	ES	0.20	(0.40)			
	D	0.30				
	B	0.40	0.40			
	D	0.55	(0.30)		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly gravelly clayey subangular to subrounded COBBLES of limestone. Gravel is subangular to subrounded fine to coarse of limestone. **(Blue Lias Formation)**	▦
			0.70			
	B	0.80			Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly gravelly clayey subangular COBBLES of limestone. Gravel is subangular fine to coarse of limestone. **(Blue Lias Formation)**	▦
	D	1.00	(0.60)			
			1.30		End of Trial Pit at 1.30m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

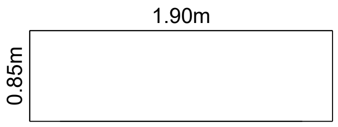
1.80m
0.90m
Final Depth 1.30m

Borehole No.
A2-SA4
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 19/06/2025 to 19/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298450.00 N: 174711.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor Arthur Winnett & Sons **Plant Used** JCB 3CX			**Approved By** Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B D B	0.00 0.15 0.25	(0.25) 0.25		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
	D ES	0.40 0.45	(0.35) 0.60		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly gravelly clayey subangular to subrounded COBBLES of limestone. Gravel is subangular to subrounded fine to coarse of limestone. **(Blue Lias Formation)**	
	B D	1.40 1.60	(1.20) 1.80		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly gravelly clayey subangular COBBLES of limestone. Gravel is subangular fine to coarse of limestone. **(Blue Lias Formation)**	
					End of Trial Pit at 1.80m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.



Final Depth 1.80m

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

A2-SA5

Sheet 1 of 1

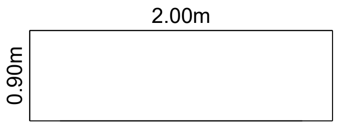
Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 19/06/2025 to 19/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298432.00 N: 174693.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor Arthur Winnett & Sons	**Plant Used** JCB 3CX		**Approved By**
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B	0.00	(0.25)		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
	D	0.20	0.25			
	B	0.40			Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly gravelly clayey subangular COBBLES of limestone. Gravel is subangular fine to coarse of limestone. **(Blue Lias Formation)**	
	D	0.60				
	B	0.80	(1.05)			
	D	1.00				
			1.30		End of Trial Pit at 1.30m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



Final Depth 1.30m

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Borehole No.
A3-SA1
Sheet 1 of 1

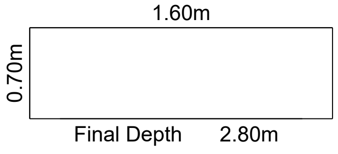
Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 19/06/2025 to 19/06/2025		**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298464.00 N: 174674.00 L:	**Water Strike Details**		**Logged By** CB
Contractor Arthur Winnett & Sons **Plant Used** JCB 3CX		Depth Strike	Remarks	**Approved By**
				Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B	0.20	(0.20) 0.20		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
	ES	0.40	(1.60)		Soft to firm orangish brown slightly gravelly sandy CLAY with a low subrounded limestone cobble content. Gravel is subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
	D	0.50				
	B	1.40				
	D	1.60	1.80			
	B	2.00	(1.00)		Soft light orangish brown slightly gravelly slightly sandy CLAY with a high subangular to subrounded limestone cobble content. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
	D	2.35	2.80			
					End of Trial Pit at 2.80m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit paused at 1.40m to undertake infiltration test, pit commenced and terminated at 2.80m on dense cobbly material. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



Final Depth 2.80m

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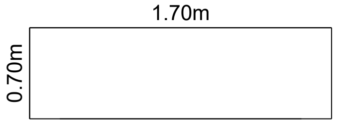
Borehole No.
A3-SA2
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 19/06/2025 to 19/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298449.00 N: 174660.00 L:	**Water Strike Details**	**Logged By** CB
Contractor Arthur Winnett & Sons	**Plant Used** JCB 3CX	Depth Strike / Remarks	**Approved By**
			Scale 1:50

Results	Type	Depth	Depth, (Thickness)	Level	Stratum Description	Legend
			(0.20) 0.20		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
			(2.20) 2.40		Soft to firm orangish brown slightly gravelly sandy CLAY with a low subrounded limestone cobble content. Gravel is subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
					End of Trial Pit at 2.40m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit paused at 1.30m to undertake infiltration test, pit commenced and terminated at 2.40m on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 2.40m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.
A3-SA3
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 20/06/2025 to 20/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298482.00 N: 174653.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor Arthur Winnett & Sons **Plant Used** JCB 3CX			**Approved By** Scale 1:50

Results	Type	Depth	Depth, (Thickness)	Level	Stratum Description
	B D	0.00 0.10	(0.20) 0.20		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**
	B D	0.70 0.90	(1.40) 1.60		Soft to firm orangish brown slightly gravelly sandy CLAY with a low subrounded limestone cobble content. Gravel is subrounded fine to coarse of limestone. Sand is fine to coarse. **()**
	B D	3.00 3.20	(1.80) 3.40		Soft light orangish brown slightly gravelly slightly sandy CLAY with a high subangular to subrounded limestone cobble content. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**
					End of Trial Pit at 3.40m

Remarks

Consistency, strength and density indicators are based upon field judgement. Trial pit paused at 1.50m to undertake infiltration test, pit commenced and terminated at 3.40m on dense cobbly material. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

1.70m
0.70m

Final Depth 3.40m

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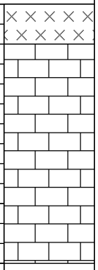
Borehole No.

A3-SA4

Sheet 1 of 1

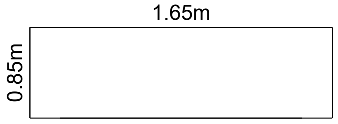
Project Name Ysgol Iolo Morganwg Primary School		**Project No.** 648-CA-24	**Date** 20/06/2025 to 20/06/2025	**Hole Type** TP
Client Kier Construction		**Co-ords** E: 298461.00 N: 174638.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor Arthur Winnett & Sons	**Plant Used** JCB 3CX			**Approved By**
				Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B D	0.00 0.15	(0.20) 0.20		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	✕
	B ES D	0.50 0.50 0.80	(1.10) 1.30		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly gravelly clayey subangular COBBLES of limestone. Gravel is subangular fine to coarse of limestone. **(Blue Lias Formation)**	▦
					End of Trial Pit at 1.30m	



Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 1.30m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

Borehole No.

A3-SA5

Sheet 1 of 1

Project Name
Ysgol Iolo Morganwg Primary School

Project No.
648-CA-24

Date
20/06/2025 to 20/06/2025

Hole Type
TP

Client
Kier Construction

Co-ords
E: 298503.00
N: 174626.00
L:

Water Strike Details

Depth Strike	Remarks

Logged By
CB

Approved By

Scale 1:50

Contractor
Arthur Winnett & Sons

Plant Used
JCB 3CX

Samples and Results

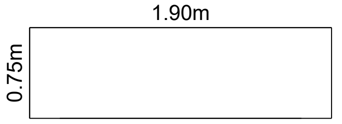
Results	Type	Depth
	B	0.00
	D	0.10
	ES	0.30
	B	0.45
	D	0.65
	B	1.70

Depth, (Thickness)	Level	Stratum Description	Legend
(0.20) 0.20		Loose greyish brown slightly clayey sandy subangular to subrounded fine to medium GRAVEL of limestone and concrete with abundant rootlets and a moderate subangular limestone cobble content. **()**	
(1.40) 1.60		Soft to firm orangish brown slightly gravelly sandy CLAY with a low subrounded limestone cobble content. Gravel is subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
(0.60) 2.20		Soft light orangish brown slightly gravelly slightly sandy CLAY with a high subangular to subrounded limestone cobble content. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
(0.30) 2.50		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly gravelly clayey subangular COBBLES of limestone. Gravel is subangular fine to coarse of limestone. **(Blue Lias Formation)**	

End of Trial Pit at 2.50m

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit paused at 1.45m to undertake infiltration test, pit commenced and terminated at 2.50m on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 2.50m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

Borehole No.

A3-SA6

Sheet 1 of 1

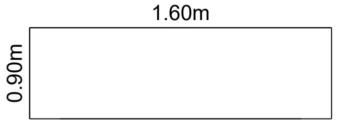
Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 20/06/2025 to 20/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298478.00 N: 174608.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor Arthur Winnett & Sons **Plant Used** JCB 3CX			**Approved By** Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B D ES	0.00 0.05 0.05	(0.10) 0.10		Loose greyish brown slightly silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to medium of limestone and brick fragments. **(Made Ground)**	▨
	B D	0.30 0.50	(0.90) 1.00		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly clayey gravelly subangular COBBLES of limestone. Gravel is subangular fine to coarse of limestone. **(Blue Lias Formation)**	▦
					End of Trial Pit at 1.00m	

Remarks

Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 1.00m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

Borehole No.
A4-SA1
Sheet 1 of 1

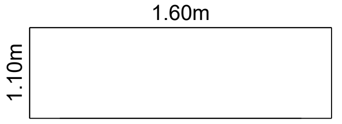
Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 20/06/2025 to 20/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298448.00 N: 174594.00 L:	**Water Strike Details**	**Logged By** CB
Contractor Arthur Winnett & Sons	**Plant Used** JCB 3CX	Depth Strike / Remarks	**Approved By**
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	D ES	0.05 0.05	(0.10) 0.10		Loose greyish brown slightly silty gravelly fine to coarse SAND with abundant rootlets. Gravel is subangular to subrounded fine to medium of limestone. **(Made Ground)**	
	B D	0.40 0.60	(0.90) 1.00		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly gravelly clayey subangular COBBLES of limestone. Gravel is subangular fine to coarse of limestone. **(Blue Lias Formation)**	
					End of Trial Pit at 1.00m	

Remarks

Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 1.00m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

A4-SA2

Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 23/06/2025 to 23/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298419.00 N: 174645.00 L:	**Water Strike Details**	**Logged By** CB
Contractor Arthur Winnett & Sons	**Plant Used** JCB 3CX		**Approved By**
			Scale 1:50

Depth Strike	Remarks

Samples and Results

Results	Type	Depth
	B	0.00
	D	0.15
	ES	0.15
	B	0.45
	D	0.65
	B	1.80
	D	2.00
	B	3.00
	D	3.25

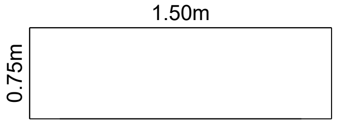
Depth, (Thickness)	Level	Stratum Description	Legend
(0.20) 0.20		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
(3.30) 3.50		Soft to firm orangish brown slightly gravelly sandy CLAY with a low subrounded limestone cobble content. Gravel is subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	
		End of Trial Pit at 3.50m	

Remarks

Consistency, strength and density indicators are based upon field judgement. Trial pit paused at 1.65m to undertake infiltration test, pit commenced and terminated at 3.50m on dense cobbly material. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



Final Depth 3.50m

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Borehole No.
A4-SA3
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 23/06/2025 to 23/06/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298380.00 N: 174649.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor Arthur Winnett & Sons **Plant Used** JCB 3CX			**Approved By** Scale 1:50

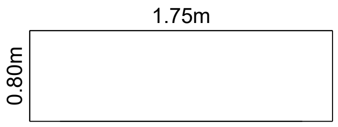
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	B D B	0.00 0.10 0.20	(0.20) 0.20		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	××××
	D	0.45	(0.43) 0.63		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Orangish brown slightly clayey gravelly subangular COBBLES of limestone. Gravel is subangular fine to coarse of limestone. **(Blue Lias Formation)**	▦
					End of Trial Pit at 0.63m	

Remarks

Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



Final Depth 0.63m

Borehole No.

SA1

Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 09/07/2025 to 09/07/2025		**Hole Type** TP
Client Kier Construction	**Co-ords**	**Water Strike Details**		**Logged By** CB
		Depth Strike	Remarks	
Contractor M&J Plant **Plant Used** 13 Tonne Tracked Excavator	E: 298384.00 N: 174700.00 L:			**Approved By**
				Scale 1:50

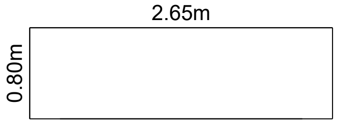
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
			(0.30) 0.30		Loose brown slightly gravelly clayey fine to medium SAND with abundant rootlets and occasional pieces of plastic. Gravel is subangular to subrounded fine to coarse of limestone and brick fragments. **(Made Ground)**	▩
			(1.10) 1.40		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Organish brown slightly gravelly clayey subangular to subrounded COBBLES of limestone. Gravel is subangular to subrounded fine to coarse of limestone. **(Blue Lias Formation)**	▦
			(2.00) 3.40		Strong, light bluish grey, fine grained, slightly weathered (Grade II), Blue Lias LIMESTONE recovered as: Bluish grey locally orangish brown slightly clayey subangular to subrounded COBBLES of limestone with a moderate subangular limestone boulder content. **(Blue Lias Formation)**	▦
					End of Trial Pit at 3.40m	

Remarks

Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



Final Depth 3.40m

Borehole No.

SA2

Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School		**Project No.** 648-CA-24	**Date** 09/07/2025 to 09/07/2025	**Hole Type** TP
Client Kier Construction		**Co-ords** E: 298431.00 N: 174675.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor M&J Plant	**Plant Used** 13 Tonne Tracked Excavator			**Approved By**
				Scale 1:50

Results	Type	Depth	Depth, (Thickness)	Level	Stratum Description
			(0.20) 0.20		Loose brown slightly gravelly clayey fine to medium SAND with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. **()**
			(1.25) 1.45		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Organish brown slightly gravelly clayey subangular to subrounded COBBLES of limestone. Gravel is subangular to subrounded fine to coarse of limestone. **(Blue Lias Formation)**
			(1.55) 3.00		Strong, light bluish grey, fine grained, slightly weathered (Grade II), Blue Lias LIMESTONE recovered as: Bluish grey locally orangish brown slightly clayey subangular to subrounded COBBLES of limestone with a moderate subangular limestone boulder content. **(Blue Lias Formation)**
					End of Trial Pit at 3.00m

Remarks

Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

3.80m

1.40m

Final Depth 3.00m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

Borehole No.

SA3

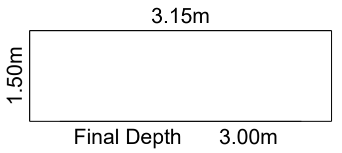
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 09/07/2025 to 09/07/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298454.00 N: 174624.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor M&J Plant	**Plant Used** 13 Tonne Tracked Excavator		**Approved By**
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
			(0.20) 0.20		Western face: Loose brown slightly gravelly clayey fine to medium SAND with abundant rootlets and occasional pieces of plastic. Gravel is subangular to subrounded fine to coarse of limestone and brick fragments. **(Made Ground)**	
	ES	0.40			Eastern face: Loose becoming moderately dense brown slightly clayey gravelly fine to coarse SAND with occasional metal, rebar and plastic. Gravel is subangular to subrounded fine to coarse of limestone, brick and brick fragments, concrete, and concrete blocks. **(Made Ground)**	
			(1.20) 1.20		Western face: Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Organish brown slightly gravelly clayey subangular to subrounded COBBLES of limestone. Gravel is subangular to subrounded fine to coarse of limestone. **(Blue Lias Formation)**	
	ES	1.60	(2.80) (1.80) 3.00 3.00		Eastern Face: Soft grey slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of limestone. **()**	
					End of Trial Pit at 3.00m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 3.00m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

Borehole No.

SA4

Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 09/07/2025 to	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298484.00 N: 174626.00 L:	**Water Strike Details**	**Logged By** CB
Contractor M&J Plant	**Plant Used** 13 Tonne Tracked Excavator	Depth Strike / Remarks	**Approved By**
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
			(0.20) 0.20		Loose brown slightly gravelly clayey fine to medium SAND with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. **()**	▨
			(2.05) 2.25		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Organish brown slightly gravelly clayey subangular to subrounded COBBLES of limestone. Gravel is subangular to subrounded fine to coarse of limestone. **(Blue Lias Formation)**	▦
			(1.15) 3.40		Strong, light bluish grey, fine grained, slightly weathered (Grade II), Blue Lias LIMESTONE recovered as: Bluish grey locally orangish brown slightly clayey subangular to subrounded COBBLES of limestone with a moderate subangular limestone boulder content. **(Blue Lias Formation)**	▦
					End of Trial Pit at 3.40m	

Remarks

Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable

3.00m

1.70m

Final Depth 3.40m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

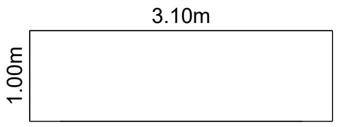
Borehole No.
SA5
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 09/07/2025 to 09/07/2025	**Hole Type** TP
Client Kier Construction	**Co-ords** E: 298359.00 N: 174682.00 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** CB
Contractor M&J Plant	**Plant Used** 13 Tonne Tracked Excavator		**Approved By**
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
			(0.15) 0.15		Loose brown slightly gravelly clayey fine to medium SAND with abundant rootlets and occasional pieces of plastic. Gravel is subangular to subrounded fine to coarse of limestone and brick fragments. **(Made Ground)**	▨
			(1.00) 1.15		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Organish brown slightly gravelly clayey subangular to subrounded COBBLES of limestone. Gravel is subangular to subrounded fine to coarse of limestone. **(Blue Lias Formation)**	▦
			(0.95) 2.10		Strong, light bluish grey, fine grained, slightly weathered (Grade II), Blue Lias LIMESTONE recovered as: Bluish grey locally orangish brown slightly clayey subangular to subrounded COBBLES of limestone with a moderate subangular limestone boulder content. **(Blue Lias Formation)**	▦
					End of Trial Pit at 2.10m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 2.10m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

Borehole No.
SA6
Sheet 1 of 1

Project Name	**Project No.**	**Date**	**Hole Type**
Ysgol Iolo Morganwg Primary School	648-CA-24	11/07/2025 to 11/07/2025	TP

Client
Kier Construction

Contractor
M&J Plant

Plant Used
13 Tonne Tracked Excavator

Co-ords
E: 298423.00
N: 174732.00
L:

Water Strike Details

Depth Strike	Remarks

Logged By
CB

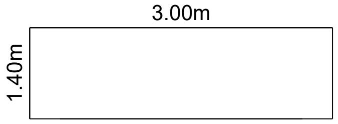
Approved By

Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
			(0.20) 0.20		Loose brown slightly gravelly clayey fine to medium SAND with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. **()**	⁘
			(0.90) 1.10		Medium strong, light grey, fine grained, moderately weathered (Grade III), Blue Lias LIMESTONE recovered as: Organish brown slightly gravelly clayey subangular to subrounded COBBLES of limestone. Gravel is subangular to subrounded fine to coarse of limestone. **(Blue Lias Formation)**	▦
			(1.80) 2.90		Strong, light bluish grey, fine grained, slightly weathered (Grade II), Blue Lias LIMESTONE recovered as: Bluish grey locally orangish brown slightly clayey subangular to subrounded COBBLES of limestone with a moderate subangular limestone boulder content. **(Blue Lias Formation)**	▦
					End of Trial Pit at 2.90m	

Remarks
Consistency, strength and density indicators are based upon field judgement. Trial pit terminated on hard stratum. No groundwater encountered. Trial pit backfilled with arisings.

Pit Stability: Stable



Final Depth 2.90m

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

ANNEX C
Soakaway Test Results

BMS QUALITY FORM
Ref: QF-041

V1 Issued: Nov 2020
Reviewed: Nov 2020

SOAKAWAY TEST

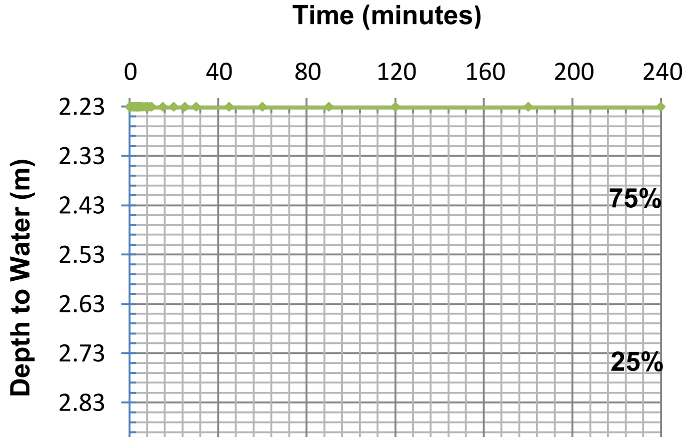
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 11/07/2025
Engineer: CB

Trial Pit: **SA6**

TEST 1

Length	3.00	m
Width	1.40	m
Depth	2.90	m
Fill Level	2.23	m
V_{p75-25}	1.407	m^3
a_{p50}	7.148	m^2

Soil Infiltration Rate, f
Insufficient infiltration



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

75%

25%

75%

25%

11:28

Standard		Test 1		
Time (mins)	Depth to Water (m)	Time (mins)	Depth to Water (m)	Time (mins)
0		0	2.23	0
0.5		0.5	2.23	0.5
1		1	2.23	1
1.5		1.5	2.23	1.5
2		2	2.23	2
2.5		2.5	2.23	2.5
3		3	2.23	3
3.5		3.5	2.23	3.5
4		4	2.23	4
4.5		4.5	2.23	4.5
5		5	2.23	5
6		6	2.23	6
7		7	2.23	7
8		8	2.23	8
9		9	2.23	9
10		10	2.23	10
15		15	2.23	15
20		20	2.23	20
25		25	2.23	25
30		30	2.23	30
45		45	2.23	45
60		60	2.23	60
90		90	2.23	75
120		120	2.23	90
180		180	2.23	105
240		240	2.23	135

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	115	
	130	

SOAKAWAY TEST

terra firma
Geotechnical & Geoenvironmental Specialists

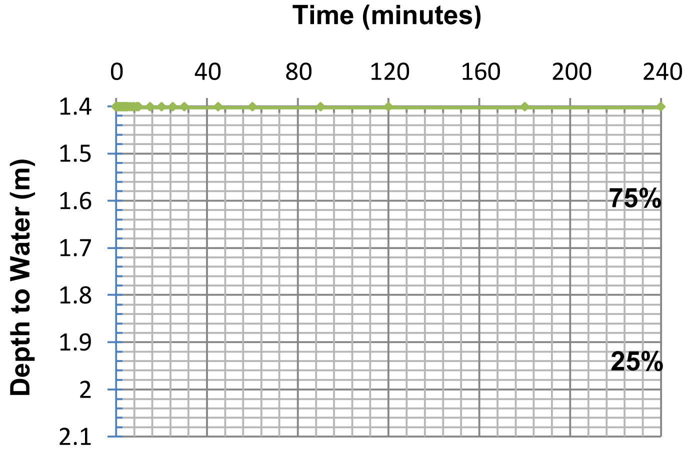
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 09/07/2025
Engineer: CB

Trial Pit: **SA5**

TEST 1

Length	3.10	m
Width	1.00	m
Depth	2.10	m
Fill Level	1.40	m
V_{p75-25}	1.085	m^3
a_{p50}	5.97	m^2

Soil Infiltration Rate, f
Insufficient infiltration



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	1.4	0
0.5		0.5	1.4	0.5
1		1	1.4	1
1.5		1.5	1.4	1.5
2		2	1.4	2
2.5		2.5	1.4	2.5
3		3	1.4	3
3.5		3.5	1.4	3.5
4		4	1.4	4
4.5		4.5	1.4	4.5
5		5	1.4	5
6		6	1.4	6
7		7	1.4	7
8		8	1.4	8
9		9	1.4	9
10		10	1.4	10
15		15	1.4	15
20		20	1.4	20
25		25	1.4	25
30		30	1.4	30
45		45	1.4	45
60		60	1.4	60
90		90	1.4	75
120		120	1.4	90
180		180	1.4	105
240		240	1.4	135

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	115	
	130	

SOAKAWAY TEST

Geotechnical & Geoenvironmental Specialists

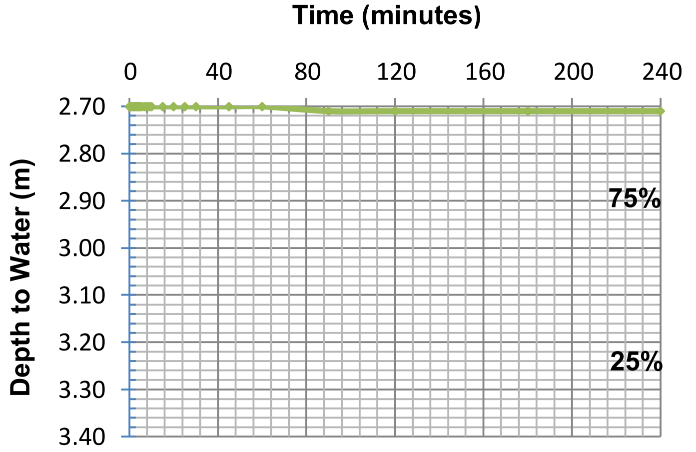
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 11/07/2025
Engineer: CB

Trial Pit: **SA4**

TEST 1

Length	3.00	m
Width	1.70	m
Depth	3.40	m
Fill Level	2.70	m
V_{p75-25}	1.785	m^3
a_{p50}	8.39	m^2

Soil Infiltration Rate, f
Insufficient infiltration



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	2.70	0
0.5		0.5	2.70	0.5
1		1	2.70	1
1.5		1.5	2.70	1.5
2		2	2.70	2
2.5		2.5	2.70	2.5
3		3	2.70	3
3.5		3.5	2.70	3.5
4		4	2.70	4
4.5		4.5	2.70	4.5
5		5	2.70	5
6		6	2.70	6
7		7	2.70	7
8		8	2.70	8
9		9	2.70	9
10		10	2.70	10
15		15	2.70	15
20		20	2.70	20
25		25	2.70	25
30		30	2.70	30
45		45	2.70	45
60		60	2.70	60
90		90	2.71	75
120		120	2.71	90
180		180	2.71	105
240		240	2.71	135

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	115	
	130	

SOAKAWAY TEST

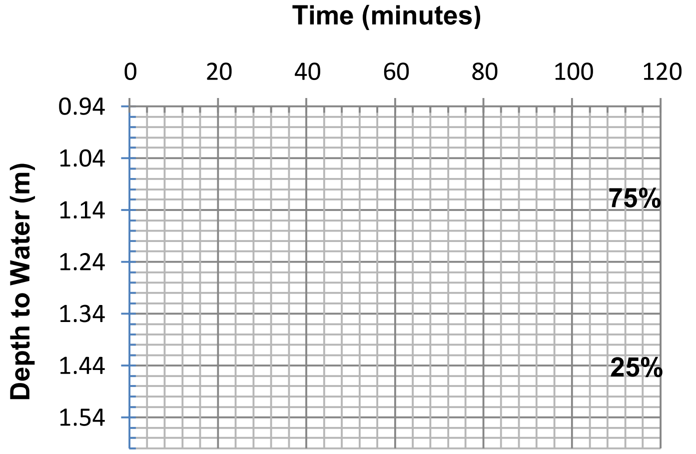
terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date:
Engineer: CB

Trial Pit: SA3

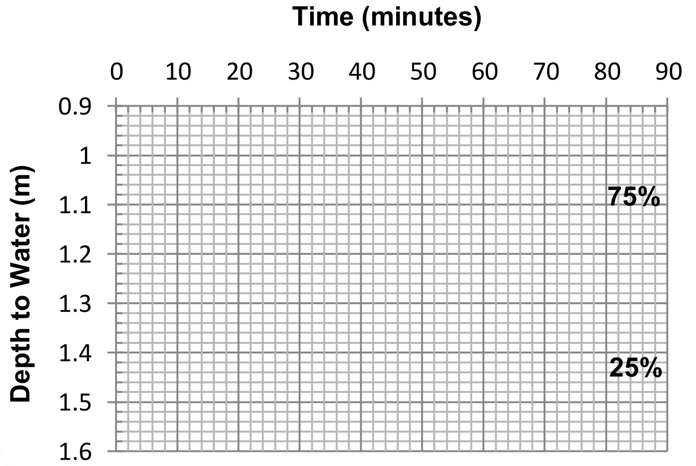
TEST 1

Length		m
Width		m
Depth		m
Fill Level		m
V_{p75-25}	0	m^3
a_{p50}	0	m^2
t_{p75-25}	0	minutes
Soil Infiltration Rate, f	**#DIV/0!**	**ms^{-1}**



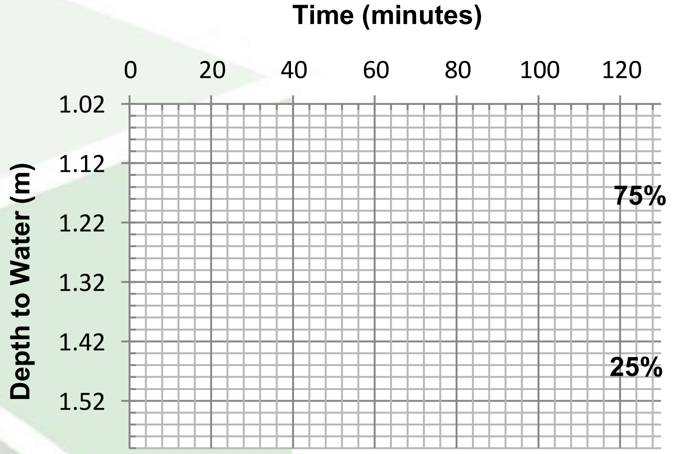
TEST 2

Length		m
Width		m
Depth		m
Fill Level		m
V_{p75-25}	0	m^3
a_{p50}	0	m^2
t_{p75-25}	0	minutes
Soil Infiltration Rate, f	**#DIV/0!**	**ms^{-1}**



TEST 3

Length		m
Width		m
Depth		m
Fill Level		m
V_{p75-25}	0	m^3
a_{p50}	0	m^2
t_{p75-25}	0	minutes
Soil Infiltration Rate, f	**#DIV/0!**	**ms^{-1}**



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0		0
0.5		0.5		0.5
1		1		1
1.5		1.5		1.5
2		2		2
2.5		2.5		2.5
3		3		3
3.5		3.5		3.5
4		4		4
4.5		4.5		4.5
5		5		5
6		6		6
7		7		7
8		8		8
9		9		9
10		10		10
15		15		15
20		20		20
25		25		25
30		30		30
45		45		45
60		60		60
90		70		75
120		80		90
180		90		105
240		100		135
		120		

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	115	
	130	

SOAKAWAY TEST

Geotechnical & Geoenvironmental Specialists

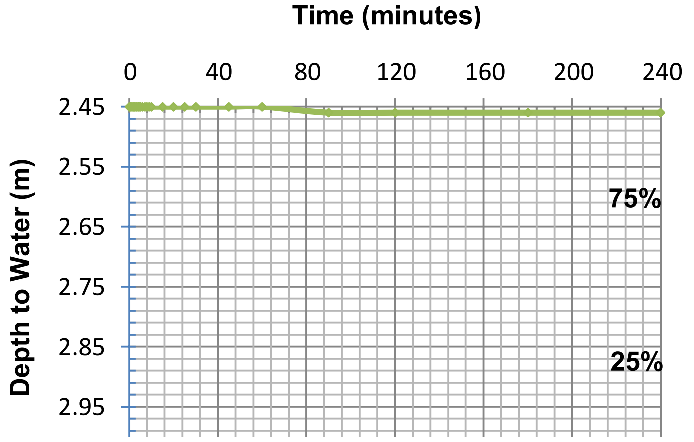
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 10/07/2025
Engineer: CB

Trial Pit: **SA2**

TEST 1

Length	3.80	m
Width	1.40	m
Depth	3.00	m
Fill Level	2.45	m
V_{p75-25}	1.463	m^3
a_{p50}	8.18	m^2

Soil Infiltration Rate, f
Insufficient infiltration



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	2.45	0
0.5		0.5	2.45	0.5
1		1	2.45	1
1.5		1.5	2.45	1.5
2		2	2.45	2
2.5		2.5	2.45	2.5
3		3	2.45	3
3.5		3.5	2.45	3.5
4		4	2.45	4
4.5		4.5	2.45	4.5
5		5	2.45	5
6		6	2.45	6
7		7	2.45	7
8		8	2.45	8
9		9	2.45	9
10		10	2.45	10
15		15	2.45	15
20		20	2.45	20
25		25	2.45	25
30		30	2.45	30
45		45	2.45	45
60		60	2.45	60
90		90	2.46	75
120		120	2.46	90
180		180	2.46	105
240		240	2.46	135

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	115	
	130	

SOAKAWAY TEST

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 10/07/2025
Engineer: CB

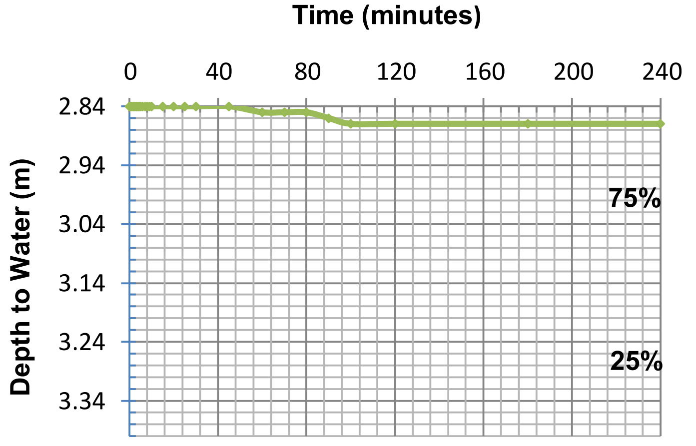
Trial Pit: **SA1**

TEST 1

Length	2.65	m
Width	0.80	m
Depth	3.40	m
Fill Level	2.84	m

V_{p75-25}	0.594	m^3
a_{p50}	4.052	m^2

Soil Infiltration Rate, f
Insufficient infiltration



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

10:10

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	2.84	0
0.5		0.5	2.84	0.5
1		1	2.84	1
1.5		1.5	2.84	1.5
2		2	2.84	2
2.5		2.5	2.84	2.5
3		3	2.84	3
3.5		3.5	2.84	3.5
4		4	2.84	4
4.5		4.5	2.84	4.5
5		5	2.84	5
6		6	2.84	6
7		7	2.84	7
8		8	2.84	8
9		9	2.84	9
10		10	2.84	10
15		15	2.84	15
20		20	2.84	20
25		25	2.84	25
30		30	2.84	30
45		45	2.84	45
60		60	2.85	60
90		70	2.85	75
120		80	2.85	90
180		90	2.86	105
240		100	2.87	135
		120	2.87	
		180	2.87	
		240	2.87	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	115	
	130	

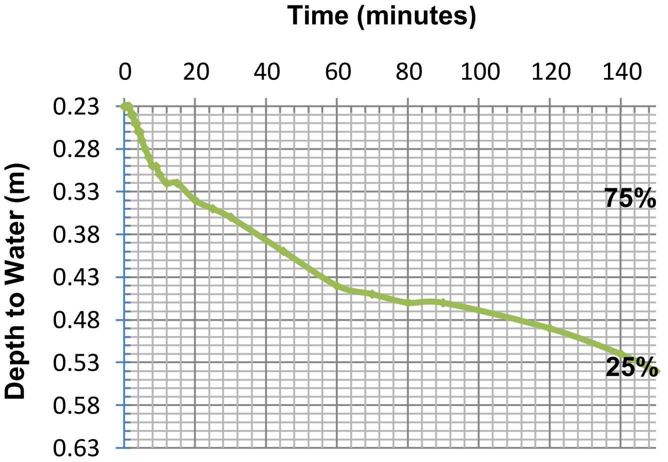
SOAKAWAY TEST

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 23/06/2025
Engineer: CB

Trial Pit: **A4-SA3**

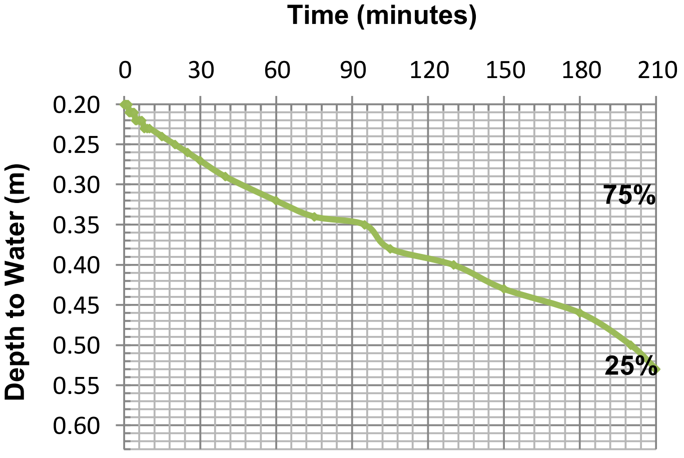
TEST 1

Length	1.75	m
Width	0.80	m
Depth	0.63	m
Fill Level	0.23	m
V_{p75-25}	0.28	m^3
a_{p50}	2.42	m^2
t_{p75-25}	128	minutes
Soil Infiltration Rate, f	**1.51E-05**	**ms^{-1}**



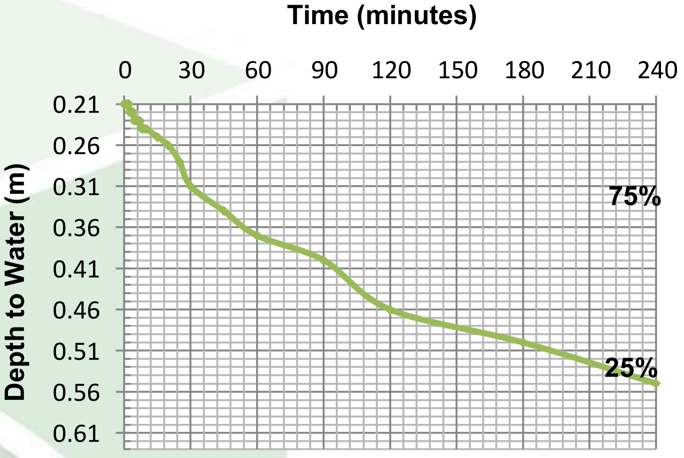
TEST 2

Length	1.75	m
Width	0.80	m
Depth	0.63	m
Fill Level	0.20	m
V_{p75-25}	0.301	m^3
a_{p50}	2.497	m^2
t_{p75-25}	193	minutes
Soil Infiltration Rate, f	**1.04E-05**	**ms^{-1}**



TEST 3

Length	1.75	m
Width	0.80	m
Depth	0.63	m
Fill Level	0.21	m
V_{p75-25}	0.294	m^3
a_{p50}	2.471	m^2
t_{p75-25}	183	minutes
Soil Infiltration Rate, f	**1.08E-05**	**ms^{-1}**



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.23	0
0.5		0.5	0.23	0.5
1		1	0.23	1
1.5		1.5	0.23	1.5
2		2	0.24	2
2.5		2.5	0.24	2.5
3		3	0.25	3
3.5		3.5	0.25	3.5
4		4	0.26	4
4.5		4.5	0.26	4.5
5		5	0.27	5
6		6	0.28	6
7		7	0.29	7
8		8	0.30	8
9		9	0.30	9
10		10	0.31	10
15		12	0.32	15
20		15	0.32	20
25		20	0.34	25
30		25	0.35	30
45		30	0.36	40
60		45	0.40	60
90		60	0.44	75
120		70	0.45	95
180		80	0.46	105
240		90	0.46	130
		120	0.49	150
		140	0.52	180
		150	0.54	200
				210

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
0.20	0	0.21
0.20	0.5	0.21
0.20	1	0.21
0.20	1.5	0.21
0.21	2	0.21
0.21	2.5	0.22
0.21	3	0.22
0.21	3.5	0.22
0.21	4	0.22
0.22	4.5	0.23
0.22	5	0.23
0.22	6	0.23
0.22	7	0.23
0.23	8	0.24
0.23	9	0.24
0.23	10	0.24
0.24	15	0.25
0.25	20	0.26
0.26	25	0.28
0.27	30	0.31
0.29	45	0.34
0.32	60	0.37
0.34	90	0.40
0.35	120	0.46
0.38	180	0.50
0.40	240	0.55
0.43		
0.46		
0.50		
0.53		

SOAKAWAY TEST

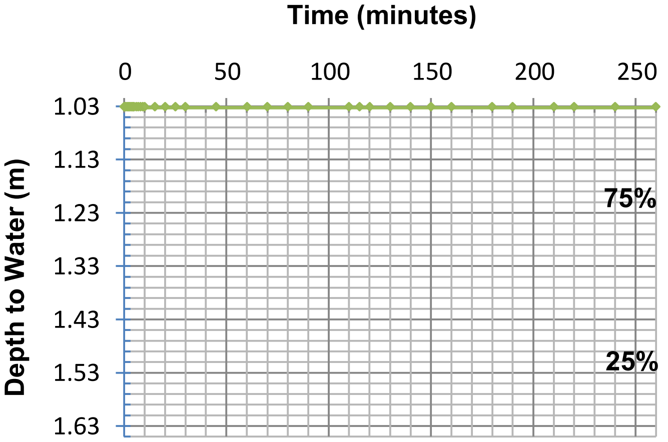
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 23/06/2025
Engineer: CB

Trial Pit: **A4-SA2**

TEST 1

Length	1.50	m
Width	0.75	m
Depth	1.65	m
Fill Level	1.03	m
V_{p75-25}	0.349	m^3
a_{p50}	2.52	m^2

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	1.03	0
0.5		0.5	1.03	0.5
1		1	1.03	1
1.5		1.5	1.03	1.5
2		2	1.03	2
2.5		2.5	1.03	2.5
3		3	1.03	3
3.5		3.5	1.03	3.5
4		4	1.03	4
4.5		4.5	1.03	4.5
5		5	1.03	5
6		6	1.03	6
7		7	1.03	7
8		8	1.03	8
9		9	1.03	9
10		10	1.03	10
15		15	1.03	15
20		20	1.03	20
25		25	1.03	25
30		30	1.03	30
45		45	1.03	45
60		60	1.03	60
70		70	1.03	70
80		80	1.03	80
90		90	1.03	90
110		110	1.03	110
115		115	1.03	115
120		120	1.03	120
130		130	1.03	130
140		140	1.03	140
150		150	1.03	150
160		160	1.03	160
180		180	1.03	180
190		190	1.03	190
210		210	1.03	210
220		220	1.03	220
240		240	1.03	240
260		260	1.03	260

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	70	
	80	
	90	
	110	
	115	
	120	
	130	
	140	
	150	
	160	
	180	
	190	
	210	
	220	
	240	
	260	

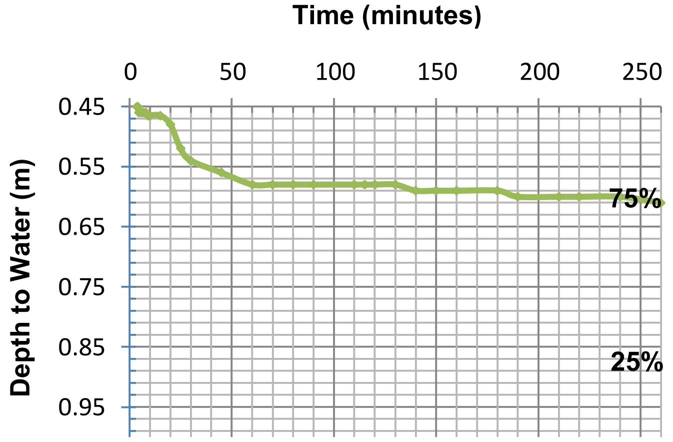
SOAKAWAY TEST

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 20/06/2025
Engineer: CB

Trial Pit: **A4-SA1**

TEST 1

Length	1.60	m
Width	1.10	m
Depth	1.00	m
Fill Level	0.43	m
V_{p75-25}	0.502	m^3
a_{p50}	3.299	m^2



Soil Infiltration Rate, f
Insufficient infiltration achieved.

REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.43	0
0.5		0.5	0.43	0.5
1		1	0.43	1
1.5		1.5	0.44	1.5
2		2	0.44	2
2.5		2.5	0.44	2.5
3		3	0.44	3
3.5		3.5	0.45	3.5
4		4	0.45	4
4.5		4.5	0.46	4.5
5		5	0.46	5
6		6	0.46	6
7		7	0.46	7
8		8	0.46	8
9		9	0.47	9
10		10	0.47	10
15		15	0.47	15
20		20	0.48	20
25		25	0.52	25
30		30	0.54	30
45		45	0.56	45
60		60	0.58	60
70		70	0.58	70
80		80	0.58	80
90		90	0.58	90
110		110	0.58	110
115		115	0.58	115
120		120	0.58	120
130		130	0.58	130
140		140	0.59	140
150		150	0.59	150
160		160	0.59	160
180		180	0.59	180
190		190	0.60	190
210		210	0.60	210
220		220	0.60	220
240		240	0.60	240
260		260	0.61	260

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	70	
	80	
	90	
	110	
	115	
	120	
	130	
	140	
	150	
	160	
	180	
	190	
	210	
	220	
	240	
	260	

SOAKAWAY TEST

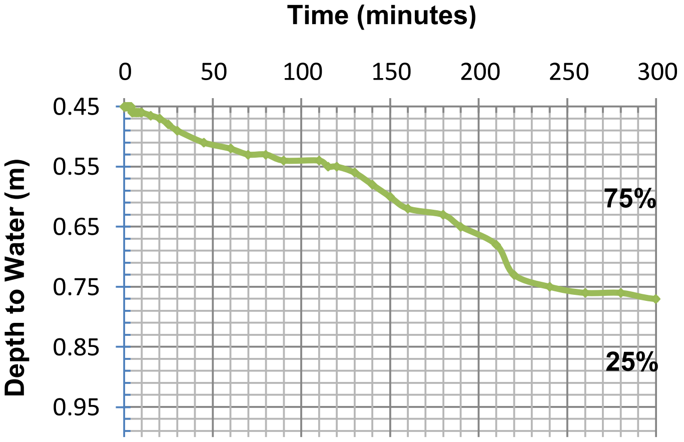
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 20/06/2025
Engineer: CB

Trial Pit: **A3-SA6**

TEST 1

Length	1.60	m
Width	0.90	m
Depth	1.00	m
Fill Level	0.45	m
V_{p75-25}	0.396	m^3
a_{p50}	2.815	m^2

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.45	0
0.5		0.5	0.45	0.5
1		1	0.45	1
1.5		1.5	0.45	1.5
2		2	0.45	2
2.5		2.5	0.45	2.5
3		3	0.45	3
3.5		3.5	0.45	3.5
4		4	0.45	4
4.5		4.5	0.46	4.5
5		5	0.46	5
6		6	0.46	6
7		7	0.46	7
8		8	0.46	8
9		9	0.46	9
10		10	0.46	10
15		15	0.47	15
20		20	0.47	20
25		25	0.48	25
30		30	0.49	30
45		45	0.51	45
60		60	0.52	60
		70	0.53	
		80	0.53	
90		90	0.54	75
		110	0.54	
		115	0.55	
120		120	0.55	.
		130	0.56	
		140	0.58	
		150	0.60	
		160	0.62	
180		180	0.63	105
		190	0.65	
		210	0.68	
		220	0.73	
		240	0.75	
240		260	0.76	135
		280	0.76	
		300	0.77	
		330	0.77	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

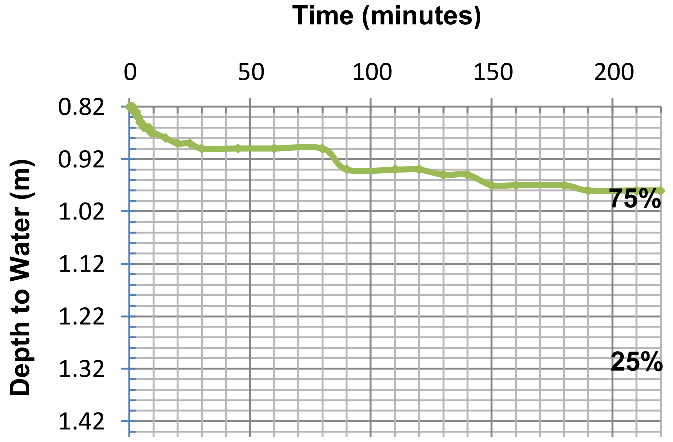
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 20/06/2025
Engineer: CB

Trial Pit: **A3-SA5**

TEST 1

Length	1.90	m
Width	0.75	m
Depth	1.45	m
Fill Level	0.82	m
V_{p75-25}	0.449	m^3
a_{p50}	3.095	m^2

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.82	0
0.5		0.5	0.82	0.5
1		1	0.82	1
1.5		1.5	0.82	1.5
2		2	0.83	2
2.5		2.5	0.83	2.5
3		3	0.83	3
3.5		3.5	0.84	3.5
4		4	0.84	4
4.5		4.5	0.85	4.5
5		5	0.85	5
6		6	0.86	6
7		7	0.86	7
8		8	0.86	8
9		9	0.87	9
10		10	0.87	10
15		15	0.88	15
20		20	0.89	20
25		25	0.89	25
30		30	0.90	30
45		45	0.90	45
60		60	0.90	60
		80	0.90	
90		90	0.94	75
		110	0.94	
120		120	0.94	90
		130	0.95	
		140	0.95	
		150	0.97	
		160	0.97	
180		180	0.97	105
		190	0.98	
		210	0.98	
		220	0.98	
240				135

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

terra firma
Geotechnical & Geoenvironmental Specialists

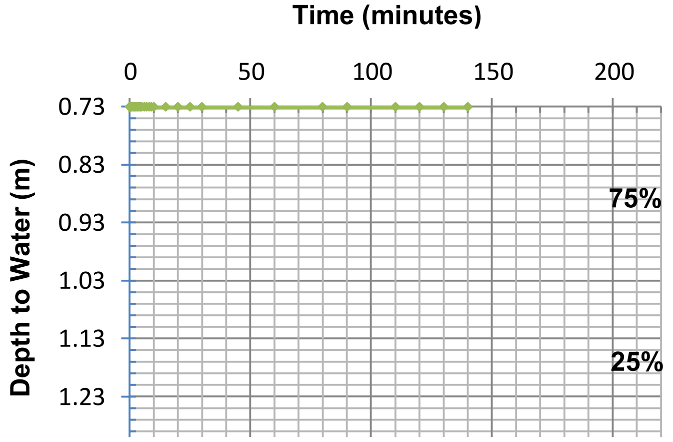
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 20/06/2025
Engineer: CB

Trial Pit: **A3-SA4**

TEST 1

Length	1.65	m
Width	0.85	m
Depth	1.30	m
Fill Level	0.73	m
V_{p75-25}	0.4	m^3
a_{p50}	2.828	m^2

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.73	0
0.5		0.5	0.73	0.5
1		1	0.73	1
1.5		1.5	0.73	1.5
2		2	0.73	2
2.5		2.5	0.73	2.5
3		3	0.73	3
3.5		3.5	0.73	3.5
4		4	0.73	4
4.5		4.5	0.73	4.5
5		5	0.73	5
6		6	0.73	6
7		7	0.73	7
8		8	0.73	8
9		9	0.73	9
10		10	0.73	10
15		15	0.73	15
20		20	0.73	20
25		25	0.73	25
30		30	0.73	30
45		45	0.73	45
60		60	0.73	60
		80	0.73	
90		90	0.73	75
		110	0.73	
120		120	0.73	90
		130	0.73	
		140	0.73	
180				105
240				135

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

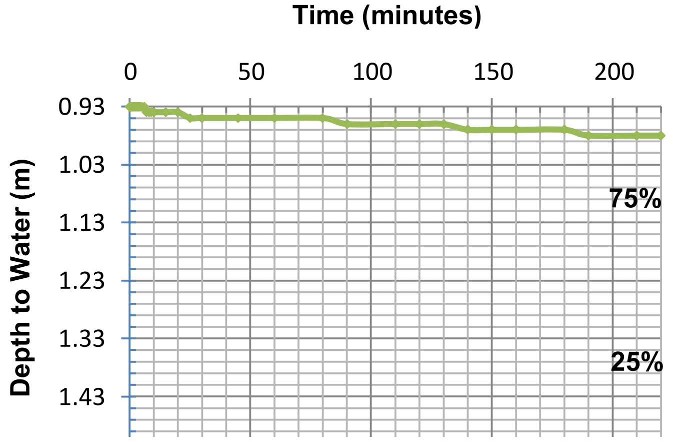
terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 20/06/2025
Engineer: CB

Trial Pit: **A3-SA3**

TEST 1

Length	1.70	m
Width	0.70	m
Depth	1.50	m
Fill Level	0.93	m
V_{p75-25}	0.339	m^3
a_{p50}	2.558	m^2



Soil Infiltration Rate, f
Insufficient infiltration achieved.

REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	Depth to Water (m)	Time (mins)	Depth to Water (m)	Time (mins)
0		0	0.93	0
0.5		0.5	0.93	0.5
1		1	0.93	1
1.5		1.5	0.93	1.5
2		2	0.93	2
2.5		2.5	0.93	2.5
3		3	0.93	3
3.5		3.5	0.93	3.5
4		4	0.93	4
4.5		4.5	0.93	4.5
5		5	0.93	5
6		6	0.93	6
7		7	0.94	7
8		8	0.94	8
9		9	0.94	9
10		10	0.94	10
15		15	0.94	15
20		20	0.94	20
25		25	0.95	25
30		30	0.95	30
45		45	0.95	45
60		60	0.95	60
		80	0.95	
90		90	0.96	75
		110	0.96	
120		120	0.96	90
		130	0.96	
		140	0.97	
		150	0.97	
		160	0.97	
180		180	0.97	105
		190	0.98	
		210	0.98	
		220	0.98	
240				135

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

terra firma
Geotechnical & Geoenvironmental Specialists

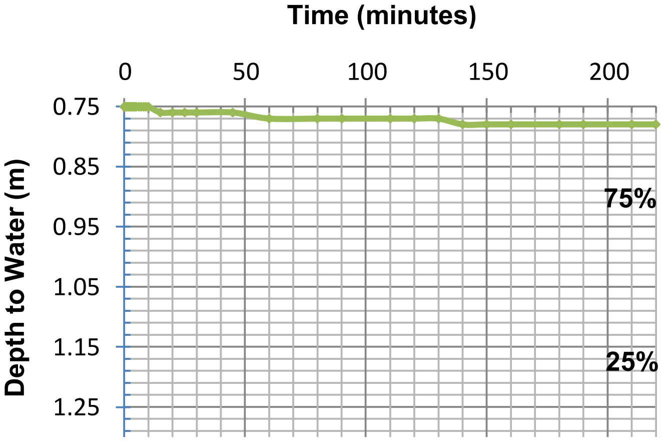
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 19/06/2025
Engineer: CB

Trial Pit: **A3-SA2**

TEST 1

Length	1.70	m
Width	0.70	m
Depth	1.30	m
Fill Level	0.75	m
V_{p75-25}	0.327	m^3
a_{p50}	2.51	m^2

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.75	0
0.5		0.5	0.75	0.5
1		1	0.75	1
1.5		1.5	0.75	1.5
2		2	0.75	2
2.5		2.5	0.75	2.5
3		3	0.75	3
3.5		3.5	0.75	3.5
4		4	0.75	4
4.5		4.5	0.75	4.5
5		5	0.75	5
6		6	0.75	6
7		7	0.75	7
8		8	0.75	8
9		9	0.75	9
10		10	0.75	10
15		15	0.76	15
20		20	0.76	20
25		25	0.76	25
30		30	0.76	30
45		45	0.76	45
60		60	0.77	60
		80	0.77	
90		90	0.77	75
		110	0.77	
120		120	0.77	90
		130	0.77	
		140	0.78	
		150	0.78	
		160	0.78	
180		180	0.78	105
		190	0.78	
		210	0.78	
		220	0.78	
240				135

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

Geotechnical & Geoenvironmental Specialists

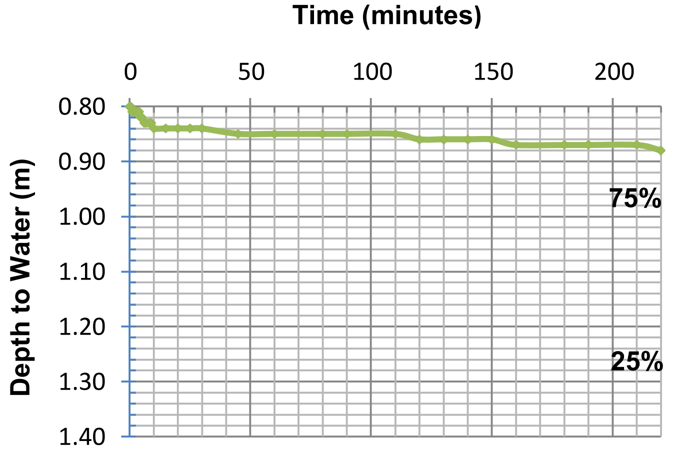
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 19/06/2025
Engineer: CB

Trial Pit: **A3-SA1**

TEST 1

Length	1.60	m
Width	0.70	m
Depth	1.40	m
Fill Level	0.80	m
V_{p75-25}	0.336	m^3
a_{p50}	2.5	m^2

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.80	0
0.5		0.5	0.8	0.5
1		1	0.81	1
1.5		1.5	0.81	1.5
2		2	0.81	2
2.5		2.5	0.81	2.5
3		3	0.81	3
3.5		3.5	0.81	3.5
4		4	0.81	4
4.5		4.5	0.82	4.5
5		5	0.82	5
6		6	0.83	6
7		7	0.83	7
8		8	0.83	8
9		9	0.83	9
10		10	0.84	10
15		15	0.84	15
20		20	0.84	20
25		25	0.84	25
30		30	0.84	30
45		45	0.85	45
60		60	0.85	60
		80	0.85	
90		90	0.85	75
		110	0.85	
120		120	0.86	90
		130	0.86	
		140	0.86	
		150	0.86	
		160	0.87	
180		180	0.87	105
		190	0.87	
		210	0.87	
		220	0.88	
240				135

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

Geotechnical & Geoenvironmental Specialists

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 19/06/2025
Engineer: CB

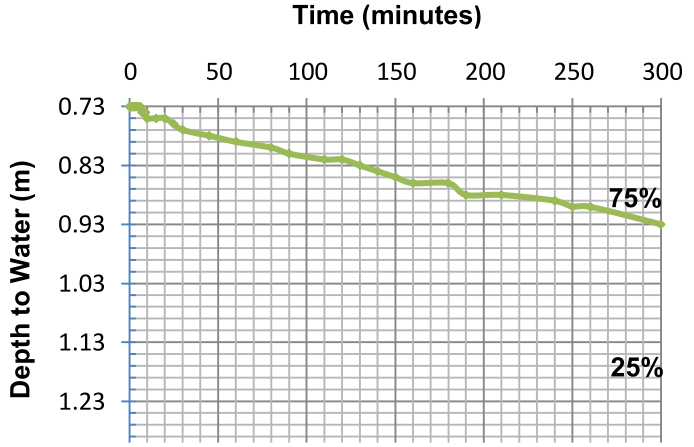
Trial Pit: **A2-SA5**

TEST 1

Length	2.00	m
Width	0.90	m
Depth	1.30	m
Fill Level	0.73	m

V_{p75-25}	0.513	m^3
a_{p50}	3.453	m^2
t_{p75-25}		

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.73	0
0.5		0.5	0.73	0.5
1		1	0.73	1
1.5		1.5	0.73	1.5
2		2	0.73	2
2.5		2.5	0.73	2.5
3		3	0.73	3
3.5		3.5	0.73	3.5
4		4	0.73	4
4.5		4.5	0.73	4.5
5		5	0.73	5
6		6	0.73	6
7		7	0.74	7
8		8	0.74	8
9		9	0.74	9
10		10	0.75	10
15		15	0.75	15
20		20	0.75	20
25		25	0.76	25
30		30	0.77	30
45		45	0.78	45
60		60	0.79	60
		80	0.80	
90		90	0.81	75
		110	0.82	
120		120	0.82	90
		130	0.83	
		140	0.84	
		150	0.85	
		160	0.86	
180		180	0.86	105
		190	0.88	
		210	0.88	
240		240	0.89	135
		250	0.90	
		260	0.90	
		300	0.93	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

Geotechnical & Geoenvironmental Specialists

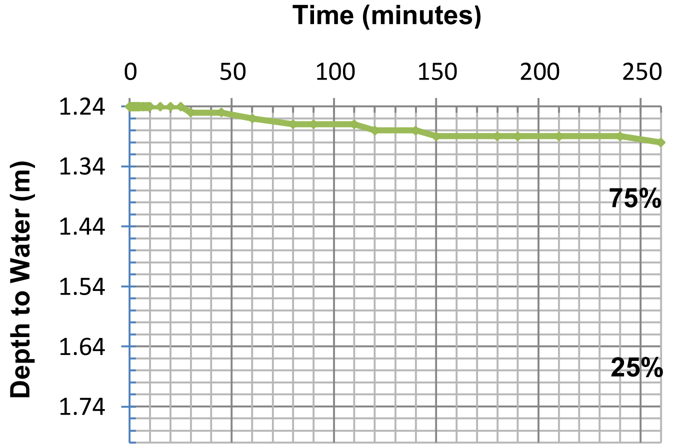
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 19/06/2025
Engineer: CB

Trial Pit: **A2-SA4**

TEST 1

Length	1.90	m
Width	0.85	m
Depth	1.80	m
Fill Level	1.24	m
V_{p75-25}	0.452	m^3
a_{p50}	3.155	m^2
t_{p75-25}		

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	1.24	0
0.5		0.5	1.24	0.5
1		1	1.24	1
1.5		1.5	1.24	1.5
2		2	1.24	2
2.5		2.5	1.24	2.5
3		3	1.24	3
3.5		3.5	1.24	3.5
4		4	1.24	4
4.5		4.5	1.24	4.5
5		5	1.24	5
6		6	1.24	6
7		7	1.24	7
8		8	1.24	8
9		9	1.24	9
10		10	1.24	10
15		15	1.24	15
20		20	1.24	20
25		25	1.24	25
30		30	1.25	30
45		45	1.25	45
60		60	1.26	60
		80	1.27	
90		90	1.27	75
		110	1.27	
120		120	1.28	90
		140	1.28	
		150	1.29	
180		180	1.29	105
		190	1.29	
		210	1.29	
240		240	1.29	135
		260	1.30	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

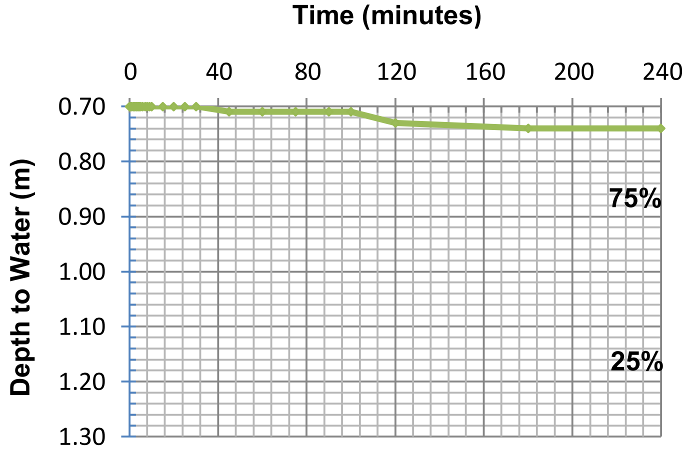
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 18/06/2025
Engineer: CB

Trial Pit: **A2-SA3**

TEST 1

Length	1.80	m
Width	0.90	m
Depth	1.30	m
Fill Level	0.70	m
V_{p75-25}	0.486	m^3
a_{p50}	3.24	m^2

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.70	0
0.5		0.5	0.70	0.5
1		1	0.70	1
1.5		1.5	0.70	1.5
2		2	0.70	2
2.5		2.5	0.70	2.5
3		3	0.70	3
3.5		3.5	0.70	3.5
4		4	0.70	4
4.5		4.5	0.70	4.5
5		5	0.70	5
6		6	0.70	6
7		7	0.70	7
8		8	0.70	8
9		9	0.70	9
10		10	0.70	10
15		15	0.70	15
20		20	0.70	20
25		25	0.70	25
30		30	0.70	30
45		45	0.71	45
60		60	0.71	60
90		75	0.71	75
120		90	0.71	90
180		100	0.71	105
240		120	0.73	135
		180	0.74	
		240	0.74	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

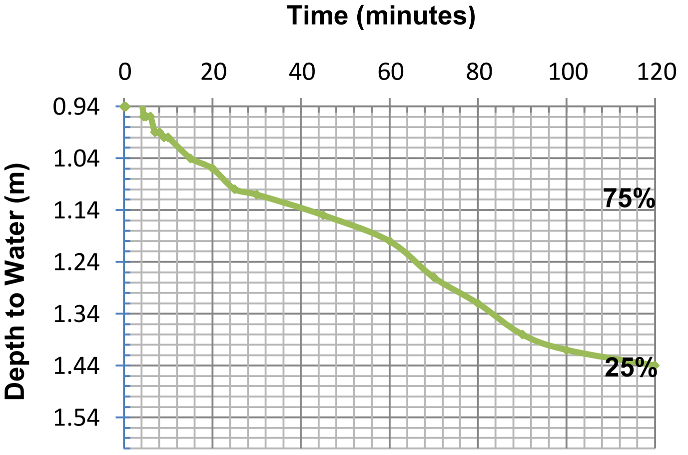
SOAKAWAY TEST

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 17/06/2025
Engineer: CB

Trial Pit: **A2-SA2**

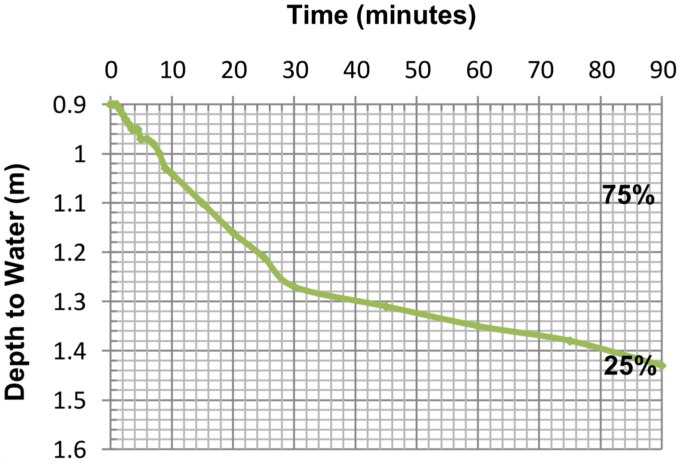
TEST 1

Length	1.80	m
Width	0.90	m
Depth	1.60	m
Fill Level	0.94	m
V_{p75-25}	0.535	m^3
a_{p50}	3.402	m^2
t_{p75-25}	86	minutes
Soil Infiltration Rate, f	**3.05E-05**	**ms^{-1}**



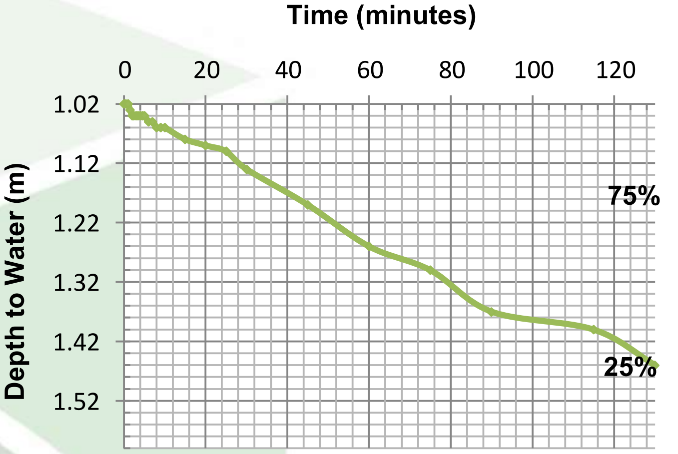
TEST 2

Length	1.80	m
Width	0.90	m
Depth	1.60	m
Fill Level	0.90	m
V_{p75-25}	0.567	m^3
a_{p50}	3.51	m^2
t_{p75-25}	75	minutes
Soil Infiltration Rate, f	**3.59E-05**	**ms^{-1}**



TEST 3

Length	1.80	m
Width	0.90	m
Depth	1.60	m
Fill Level	1.02	m
V_{p75-25}	0.47	m^3
a_{p50}	3.186	m^2
t_{p75-25}	88	minutes
Soil Infiltration Rate, f	**2.79E-05**	**ms^{-1}**



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.94	0
0.5		0.5	0.94	0.5
1		1	0.93	1
1.5		1.5	0.93	1.5
2		2	0.93	2
2.5		2.5	0.93	2.5
3		3	0.93	3
3.5		3.5	0.93	3.5
4		4	0.93	4
4.5		4.5	0.96	4.5
5		5	0.96	5
6		6	0.96	6
7		7	0.99	7
8		8	0.99	8
9		9	1.00	9
10		10	1.00	10
15		15	1.04	15
20		20	1.06	20
25		25	1.10	25
30		30	1.11	30
45		45	1.15	45
60		60	1.20	60
90		70	1.27	75
120		80	1.32	90
180		90	1.38	105
240		100	1.41	135
		120	1.44	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
0.9	0	1.02
0.9	0.5	1.02
0.9	1	1.02
0.91	1.5	1.03
0.92	2	1.04
0.93	2.5	1.04
0.94	3	1.04
0.95	3.5	1.04
0.95	4	1.04
0.95	4.5	1.04
0.97	5	1.04
0.97	6	1.05
0.98	7	1.05
1.00	8	1.06
1.03	9	1.06
1.04	10	1.06
1.10	15	1.08
1.16	20	1.09
1.21	25	1.10
1.27	30	1.13
1.31	45	1.19
1.35	60	1.26
1.38	75	1.3
1.43	90	1.37
	115	1.40
	130	1.46

SOAKAWAY TEST

Geotechnical & Geoenvironmental Specialists

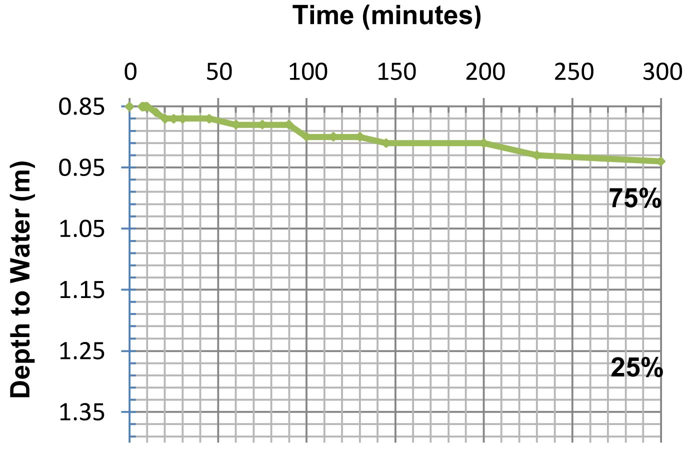
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 17/06/2025
Engineer: CB

Trial Pit: **A2-SA1**

TEST 1

Length	1.70	m
Width	0.70	m
Depth	1.40	m
Fill Level	0.85	m
V_{p75-25}	0.327	m^3
a_{p50}	2.51	m^2
t_{p75-25}		

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.85	0
0.5		0.5	0.83	0.5
1		1	0.83	1
1.5		1.5	0.83	1.5
2		2	0.83	2
2.5		2.5	0.83	2.5
3		3	0.83	3
3.5		3.5	0.83	3.5
4		4	0.84	4
4.5		4.5	0.84	4.5
5		5	0.84	5
6		6	0.84	6
7		7	0.85	7
8		8	0.85	8
9		9	0.85	9
10		10	0.85	10
15		15	0.86	15
20		20	0.87	20
25		25	0.87	25
30		30	0.87	30
45		45	0.87	45
60		60	0.88	60
90		75	0.88	75
120		90	0.88	90
180		100	0.90	105
240		115	0.90	135
		130	0.90	
		145	0.91	
		200	0.91	
		230	0.93	
		300	0.94	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

BMS QUALITY FORM
Ref: QF-041

V1 Issued: Nov 2020
Reviewed: Nov 2020

SOAKAWAY TEST

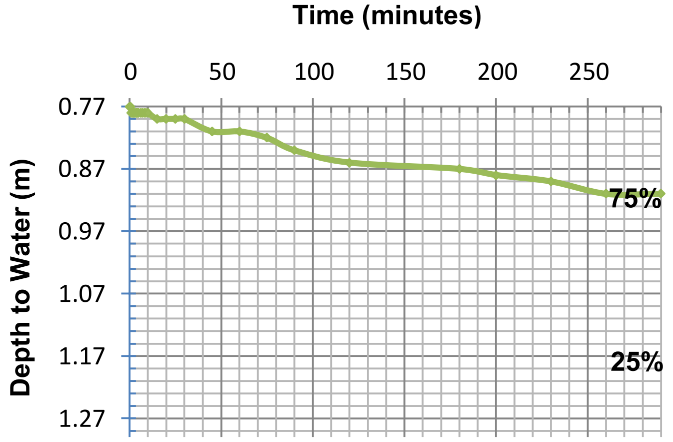
terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 18/06/2025
Engineer: CB

Trial Pit: **A1-SA6**

TEST 1

Length	1.90	m
Width	0.90	m
Depth	1.30	m
Fill Level	0.77	m
V_{p75-25}	0.453	m^3
a_{p50}	3.194	m^2



Soil Infiltration Rate, f
Insufficient infiltration achieved.

REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.77	0
0.5		0.5	0.77	0.5
1		1	0.78	1
1.5		1.5	0.78	1.5
2		2	0.78	2
2.5		2.5	0.78	2.5
3		3	0.78	3
3.5		3.5	0.78	3.5
4		4	0.78	4
4.5		4.5	0.78	4.5
5		5	0.78	5
6		6	0.78	6
7		7	0.78	7
8		8	0.78	8
9		9	0.78	9
10		10	0.78	10
15		15	0.79	15
20		20	0.79	20
25		25	0.79	25
30		30	0.79	30
45		45	0.81	45
60		60	0.81	60
90		75	0.82	75
120		90	0.84	90
180		120	0.86	105
240		180	0.87	135
		200.00	0.88	
		230.00	0.89	
		260.00	0.91	
		290.00	0.91	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

Geotechnical & Geoenvironmental Specialists

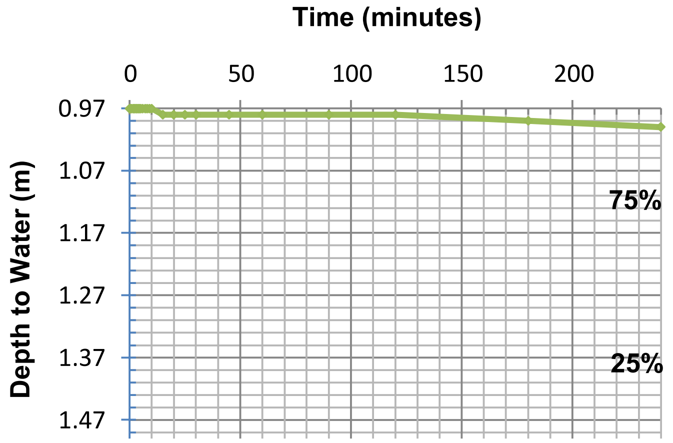
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 18/06/2025
Engineer: CB

Trial Pit: **A1-SA5**

TEST 1

Length	1.65	m
Width	0.75	m
Depth	1.50	m
Fill Level	0.97	m
V_{p75-25}	0.328	m^3
a_{p50}	2.51	m^2

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.97	0
0.5		0.5	0.97	0.5
1		1	0.97	1
1.5		1.5	0.97	1.5
2		2	0.97	2
2.5		2.5	0.97	2.5
3		3	0.97	3
3.5		3.5	0.97	3.5
4		4	0.97	4
4.5		4.5	0.97	4.5
5		5	0.97	5
6		6	0.97	6
7		7	0.97	7
8		8	0.97	8
9		9	0.97	9
10		10	0.97	10
15		15	0.98	15
20		20	0.98	20
25		25	0.98	25
30		30	0.98	30
45		45	0.98	45
60		60	0.98	60
90		90	0.98	75
120		120	0.98	90
180		180	0.99	105
240		240	1.00	135

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

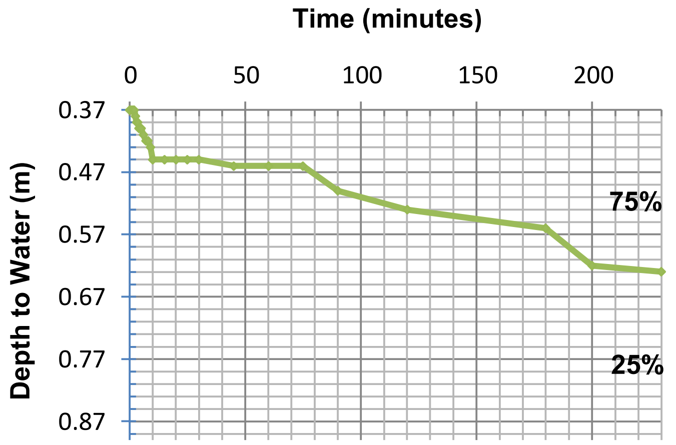
SOAKAWAY TEST

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 18/06/2025
Engineer: CB

Trial Pit: **A1-SA4**

TEST 1

Length	1.80	m
Width	0.90	m
Depth	0.90	m
Fill Level	0.37	m
V_{p75-25}	0.429	m^3
a_{p50}	3.051	m^2



Soil Infiltration Rate, f
Insufficient infiltration achieved.

REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.37	0
0.5		0.5	0.37	0.5
1		1	0.37	1
1.5		1.5	0.37	1.5
2		2	0.37	2
2.5		2.5	0.38	2.5
3		3	0.39	3
3.5		3.5	0.39	3.5
4		4	0.40	4
4.5		4.5	0.40	4.5
5		5	0.40	5
6		6	0.41	6
7		7	0.42	7
8		8	0.42	8
9		9	0.43	9
10		10	0.45	10
15		15	0.45	15
20		20	0.45	20
25		25	0.45	25
30		30	0.45	30
45		45	0.46	45
60		60	0.46	60
90		75	0.46	75
120		90	0.50	90
180		120	0.53	105
240		180	0.56	135
		200	0.62	
		230	0.63	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

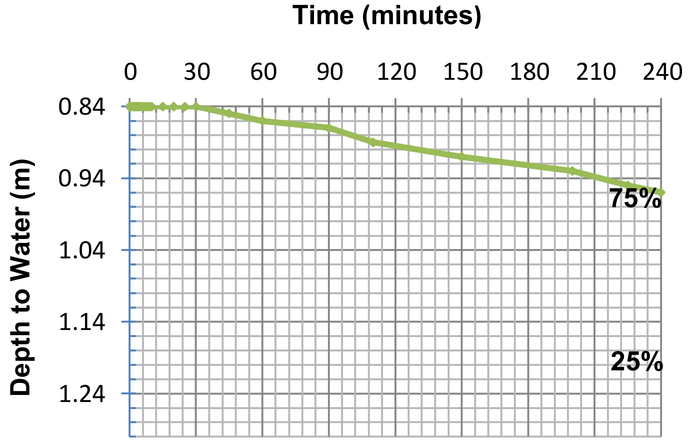
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 18/06/2025
Engineer: CB

Trial Pit: **A1-SA3**

TEST 1

Length	1.55	m
Width	0.90	m
Depth	1.30	m
Fill Level	0.84	m

V_{p75-25} 0.321 m^3
a_{p50} 2.522 m^2



Soil Infiltration Rate, f
Insufficient infiltration achieved.

REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.84	0
0.5		0.5	0.84	0.5
1		1	0.84	1
1.5		1.5	0.84	1.5
2		2	0.84	2
2.5		2.5	0.84	2.5
3		3	0.84	3
3.5		3.5	0.84	3.5
4		4	0.84	4
4.5		4.5	0.84	4.5
5		5	0.84	5
6		6	0.84	6
7		7	0.84	7
8		8	0.84	8
9		9	0.84	9
10		10	0.84	10
15		15	0.84	15
20		20	0.84	20
25		25	0.84	25
30		30	0.84	30
45		45	0.85	45
60		60	0.86	60
90		90	0.87	75
120		110	0.89	90
180		150	0.91	105
240		200	0.93	135
		225	0.95	
		240	0.96	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

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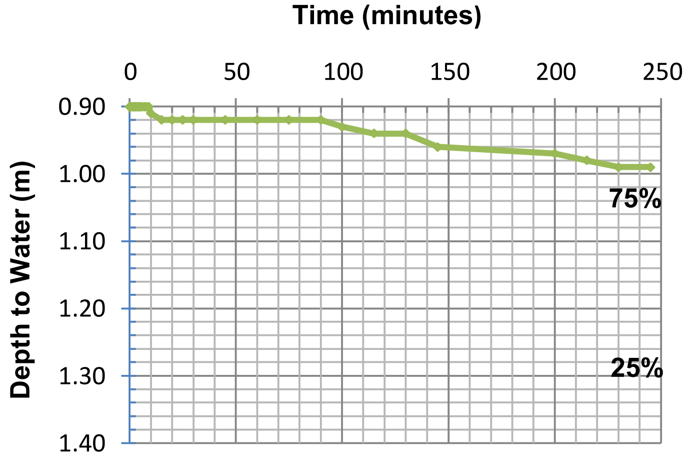
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 17/06/2025
Engineer: CB

Trial Pit: **A1-SA2**

TEST 1

Length	1.70	m
Width	0.70	m
Depth	1.40	m
Fill Level	0.90	m
V_{p75-25}	0.298	m^3
a_{p50}	2.39	m^2
t_{p75-25}		

Soil Infiltration Rate, f
Insufficient infiltration achieved.



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Standard		Test 1		
Time (mins)	**Depth to Water (m)**	**Time (mins)**	**Depth to Water (m)**	**Time (mins)**
0		0	0.90	0
0.5		0.5	0.90	0.5
1		1	0.90	1
1.5		1.5	0.90	1.5
2		2	0.90	2
2.5		2.5	0.90	2.5
3		3	0.90	3
3.5		3.5	0.90	3.5
4		4	0.90	4
4.5		4.5	0.90	4.5
5		5	0.90	5
6		6	0.90	6
7		7	0.90	7
8		8	0.90	8
9		9	0.90	9
10		10	0.91	10
15		15	0.92	15
20		20	0.92	20
25		25	0.92	25
30		30	0.92	30
45		45	0.92	45
60		60	0.92	60
90		75	0.92	75
120		90	0.92	90
180		100	0.93	105
240		115	0.94	135
		130	0.94	
		145	0.96	
		200	0.97	
		215	0.98	
		230	0.99	
		245	0.99	

Test 2	Test 3	
Depth to Water (m)	**Time (mins)**	**Depth to Water (m)**
	0	
	0.5	
	1	
	1.5	
	2	
	2.5	
	3	
	3.5	
	4	
	4.5	
	5	
	6	
	7	
	8	
	9	
	10	
	15	
	20	
	25	
	30	
	45	
	60	
	75	
	90	
	120	
	150	

SOAKAWAY TEST

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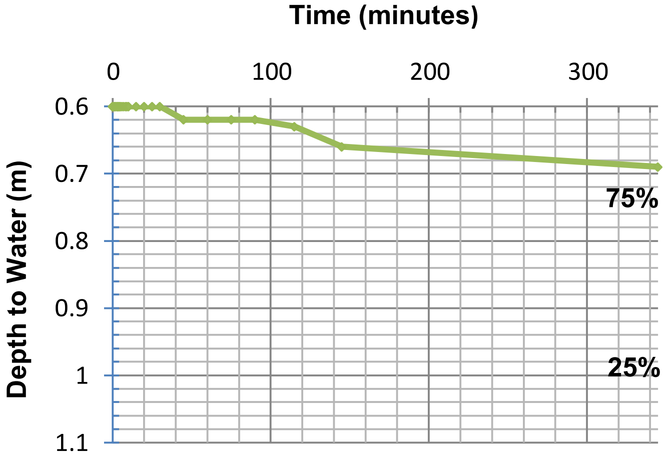
Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 648
Date: 17/06/2025
Engineer: CB

Trial Pit: **A1-SA1**

TEST 1

Length	2.10	m
Width	0.70	m
Depth	1.10	m
Fill Level	0.60	m

V_{p75-25}	0.368	m^3
a_{p50}	2.87	m^2
t_{p75-25}		



Soil Infiltration Rate, f
Insufficient infiltration achieved.

REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

Test 1	
Time (mins)	**Depth to Water (m)**
0	0.6
0.5	0.6
1	0.6
1.5	0.6
2	0.6
2.5	0.6
3	0.6
3.5	0.6
4	0.6
4.5	0.60
5	0.60
6	0.60
7	0.60
8	0.60
9	0.60
10	0.60
15	0.60
20	0.60
25	0.60
30	0.60
45	0.62
60	0.62
75	0.62
90	0.62
115	0.63
145	0.66
345	0.69

ANNEX D
Windowless Sample Borehole Logs

Borehole No.

WS1

Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 18/06/2025 to 18/06/2025	**Hole Type** WS
Client Kier Construction	**Co-ords** E: 298407.00 N: 174669.00 L:	**Water Strike Details**	**Logged By** CB
Contractor Southern Ground Testing	**Plant Used** Archway Dart		**Approved By**
			Scale 1:50

Depth Strike	After 20 mins	Remarks

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth					
	B D B	0.00 0.10 0.20	(0.20) 0.20		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**		
	D B	0.70 0.90	(0.70) 0.90		Firm orangish brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**		
N=11 (2,2/2,2,2,5) 50 (8,12/50 for 190mm)	SPT(C) SPT(C)	1.00 2.00	(1.10) 2.00		Medium dense becoming very dense greyish brown slightly sandy slightly clayey subangular fine to coarse GRAVEL of limestone. Sand is fine to coarse. **()**		
					End of Borehole at 2.00m		

Remarks

Borehole terminated on refusal. On completion a 50mm standpipe (50mm) was installed to 2.00m depth. Slotted pipe with granular response zone from 1.00m-2.00m, solid standpipe with bentonite seal GL-1.00m, and a raised cover. No groundwater recorded.

Borehole Diameter	
Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

WS2

Sheet 1 of 1

Project Name
Ysgol Iolo Morganwg Primary School

Project No.
648-CA-24

Date
18/06/2025 to 18/06/2025

Hole Type
WS

Client
Kier Construction

Co-ords
E: 298392.00
N: 174655.00
L:

Water Strike Details

Depth Strike	After 20 mins	Remarks

Logged By
CB

Approved By

Contractor
Southern Ground Testing

Plant Used
Archway Dart

Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description
Results	Type	Depth			
	B D ES B	0.00 0.15 0.25 0.30	(0.30) 0.30		Loose to moderately dense greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of limestone, brick fragments and concrete. **(Made Ground)**
	D	0.55	(0.70)		Firm orangish brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**
50 (25 for 85mm/50 for 10mm)	SPT(C)	1.00	1.00		End of Borehole at 1.00m

Remarks

Borehole terminated on refusal. On completion a 50mm standpipe (50mm) was installed to 1.00m depth. Slotted pipe with granular response zone from 0.50m-1.00m, solid standpipe with bentonite seal GL-0.50m, and a raised cover. No groundwater recorded.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.
WS3
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School

Project No. 648-CA-24

Date 18/06/2025 to 18/06/2025

Hole Type WS

Client Kier Construction

Co-ords
E: 298400.00
N: 174634.00
L:

Water Strike Details

Depth Strike	After 20 mins	Remarks

Logged By CB

Approved By

Scale 1:50

Contractor Southern Ground Testing

Plant Used Archway Dart

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth					
	D	0.00	(0.15)		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**	× × × × ×	
	D	0.15	0.15				
50 (25 for 10mm/50 for 10mm)	SPT(C)	0.30	(0.25)		Very dense grey slightly sandy subangular fine to coarse GRAVEL of limestone. Sand is fine to coarse. **()**	⁘	
			0.40		End of Borehole at 0.30m		
			1				
			2				
			3				
			4				
			5				
			6				

Remarks

Borehole terminated on refusal. On completion borehole backfilled with arisings. No groundwater recorded.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.
WS4
Sheet 1 of 1

Project Name	**Project No.**	**Date**	**Hole Type**
Ysgol Iolo Morganwg Primary School	648-CA-24	18/06/2025 to 18/06/2025	WS

Client
Kier Construction

Contractor
Southern Ground Testing

Plant Used
Archway Dart

Co-ords
E: 298424.00
N: 174633.00
L:

Water Strike Details

Depth Strike	After 20 mins	Remarks

Logged By
CB

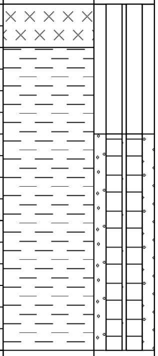
Approved By

Scale 1:50

Results	Type	Depth
	D	0.00
	B	0.20
	ES	0.40
	D	0.50
N=13 (2,3/3,3,3,4)	SPT(C)	1.00
	D	1.50
50 (25 for 10mm/50 for 10mm)	SPT(C)	1.60

Depth, (Thickness)	Level	Stratum Description
(0.20) 0.20		Loose rown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**
(1.40) 1.60		Firm orangish brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**

End of Borehole at 1.60m



Remarks

Borehole terminated on refusal. On completion a 50mm standpipe (50mm) was installed to 1.60m depth. Slotted pipe with granular response zone from 0.60m-1.60m, solid standpipe with bentonite seal GL-0.60m, and a raised cover. No groundwater recorded.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.
WS5
Sheet 1 of 1

Project Name
Ysgol Iolo Morganwg Primary School

Project No.
648-CA-24

Date
18/06/2025 to 18/06/2025

Hole Type
WS

Client
Kier Construction

Co-ords
E: 298439.00
N: 174621.00
L:

Water Strike Details

Depth Strike	After 20 mins	Remarks

Logged By
CB

Approved By

Contractor
Southern Ground Testing

Plant Used
Archway Dart

Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth					
	B D	0.00 0.00	(0.30) 0.30		Loose brown slightly sandy clayey subangular to subrounded fine to coarse GRAVEL of limestone. Sand is fine to coarse. **()**	⁘	
			(0.40)		Very dense grey slightly sandy subangular fine to coarse GRAVEL of limestone. Sand is fine to coarse. **()**	⁘	
50 (25 for 85mm/50 for 85mm)	SPT(C)	0.70	0.70		End of Borehole at 0.70m		

Remarks

Borehole terminated on refusal. On completion borehole backfilled with arisings. No groundwater recorded.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.
WS6
Sheet 1 of 1

Project Name
Ysgol Iolo Morganwg Primary School

Project No.
648-CA-24

Date
18/06/2025 to 18/06/2025

Hole Type
WS

Client
Kier Construction

Co-ords
E: 298386.00
N: 174688.00
L:

Water Strike Details

Depth Strike	After 20 mins	Remarks

Logged By
CB

Approved By

Contractor
Southern Ground Testing

Plant Used
Archway Dart

Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth					
	B	0.00			Loose becoming moderately dense to dense greyish brown slightly clayey sandy subangular fine to coarse GRAVEL of limestone with occasional pieces of timber. **(Made Ground)**	▩	
	D	0.50	(0.90)				
	D	0.90	0.90		Very dense orangish brown clayey subangular coarse GRAVEL of limestone. **()**	⁘	
50 (12,12/50 for 180mm)	SPT(C)	1.00	(0.10) 1.00		End of Borehole at 1.00m		

Remarks

Borehole terminated on refusal. On completion borehole backfilled with arisings. No groundwater recorded.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.
WS7
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 18/06/2025 to 18/06/2025	**Hole Type** WS
Client Kier Construction	**Co-ords** E: 298392.00 N: 174688.00 L:	**Water Strike Details**	**Logged By** CB
Contractor Southern Ground Testing	**Plant Used** Archway Dart		**Approved By**
			Scale 1:50

Water Strike Details

Depth Strike	After 20 mins	Remarks

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth					
	D	0.00	(0.10) 0.10		Loose brown slightly sandy slightly gravelly SILT with abundant rootlets. Gravel is subangular to subrounded fine to coarse of limestone. Sand is fine to coarse. **()**		
	ES B	0.20 0.30	(0.20) 0.30		Loose greyish brown slightly sandy clayey fine to coarse SAND. Gravel is subangular fine to medium of limestone. **()**		
			(0.40) 0.70		Moderately dense grey slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone. Sand is fine to coarse. **()**		
					End of Borehole at 0.70m		
50 (25 for 115mm/50 for 10mm)	SPT(C)	1.00					

Remarks

Borehole terminated on refusal. On completion borehole backfilled with arisings. No groundwater recorded.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

Borehole No.
WS8
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 18/06/2025 to 18/06/2025	**Hole Type** WS
Client Kier Construction	**Co-ords** E: 298392.00 N: 174694.00 L:	**Water Strike Details**	**Logged By** CB
Contractor Southern Ground Testing	**Plant Used** Archway Dart		**Approved By**
			Scale 1:50

Depth Strike	After 20 mins	Remarks

Samples and Results			Depth, (Thickness)	Level	Stratum Description
Results	Type	Depth			
	B	0.00			Loose becoming moderately dense greyish brown slightly clayey gravelly fine to coarse SAND with occasional plastic. Gravel is subangular to subrounded fine to coarse of limestone. **(Made Ground)**
	D	0.35	(0.65)		
	B	0.65	0.65		Soft to firm orangish brown slightly gravelly slightly sandy CLAY. **()**
N=10 (2,1/2,2,3,3)	D SPT(C)	1.00 1.00			
N=9 (2,2/2,2,2,3)	SPT(C)	2.00			
	D	2.20			
			(4.35)		
N=6 (1,2/1,2,1,2)	SPT(C)	3.00			
N=4 (1,0/1,1,1,1)	SPT(C) D	4.00 4.10			
50 (1,1/50 for 160mm)	SPT(C)	5.00	5.00		End of Borehole at 5.00m

Remarks

Borehole terminated on refusal. On completion a 50mm standpipe (50mm) was installed to 5.00m depth. Slotted pipe with granular response zone from 1.00m-5.00m, solid standpipe with bentonite seal GL-1.00m, and a raised cover. No groundwater recorded.

Borehole Diameter	
Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

ANNEX E
Rotary Borehole Logs

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Borehole No.

BH1

Sheet 1 of 1

Project Name
Ysgol Iolo Morganwg Primary School

Project No.
648-CA-24

Date
02/07/2025 to 02/07/2025

Hole Type
RC

Client
Kier Construction

Co-ords
E: 298401.00
N: 174661.00
L:

Logged By
CB

Approved By

Contractor
GK Drilling

Plant Used
Massenza M15

Scale 1:50

Water Strike Details		
Depth Strike	After 20 mins	Remarks

Samples and Results			TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth							
					(0.30) 0.30		Soft brown slightly gravelly, slightly sandy CLAY with abundant rootlets. Gravelis sub angular to sub rounded, fine to medium of limestone. Sand is fine to coarse. **()**		
N=26 (6,7/6,8,8,4)	SPT (C)	1.00			(1.40) 1.70		Firm orangish brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of limestone. **()**		
50 (25 for 35mm/50 for 60mm)	SPT (C)	1.70			(0.75) 2.45		No recovery **()**		
		1.70 - 3.00	77 0 0		(0.45) 2.90		Bluish grey and orangish brown slightly sandy cleyey subangular fine to coarse GRAVEL of limestone with occasional subangular limestone cobbles. **()**		
					(0.30) 3.20		NI: Bluish grey slightly cleyey, slightly sandy subangular fine to coarse GRAVEL of limestone with frequent subangular limestone cobbles. **()** *3.00 to 3.25m - NI: recovered as bluish grey subangular to subrounded fine to coarse GRAVEL of limestone.*		
		3.00 - 4.50	100 64 29				Medium to strong, thickly to very thickly bedded light bluish-grey Blue Lias Limestone with occasional to frequent calcite veins (<2mm). Weathering: The rock is generally fresh to slightly weathered, with moderate to highly weathered zones localized along sub-horizontal to horizontal bedding fractures. Discolouration and weakening, ranging from weak to moderately weak, penetrate up to 2 cm along fracture surfaces creating areas of softening or friability. Fracture Set 1: Sub-horizontal to horizontal bedding fractures (0-15 degrees) are closely to moderately spaced (60-600mm), generally planar and smooth, but may locally exhibit undulating surfaces. The fractures are open to tight and show orangish-brown surface staining. Fracture Set 2: Sub vertical to vertical fractures (75-90 degrees) are moderately to widely spaced (200-2000mm), planar smooth, locally undulating smooth, tight to very tight. Fracture surfaces are clean. **(Blue Lias Formation)** *3.00 to 3.25m - NI: recovered as bluish grey subangular to subrounded fine to coarse GRAVEL of limestone.* *3.50 to 3.75m - NI: recovered as bluish grey subangular to subrounded fine to coarse GRAVEL of limestone.* *4.95 to 5.30m - NI: recovered as bluish grey sub angular to sub rounded fine to coarse GRAVEL of limestone with occassional subangular limestone cobbles.*		
		4.50 - 6.00	100 67 47						
					(6.10) (5.80)		*6.10 to 6.25m - NI: recovered as bluish grey sub angular to sub rounded fine to coarse GRAVEL of limestone.*		
		6.00 - 7.50	89 77 65				Medium strong to strong very thinly to thickly bedded light bluish grey BLUE LIAS LIMESTONE. Weathering: weathering localised to sub horizontal and horizontal fractures. Discolouration and weakening penetrating up to 2cm on fracture surfaces. **(Blue Lias Formation)** *3.50 to 3.75m - NI: recovered as bluish grey subangular to subrounded fine to coarse GRAVEL of limestone.* *4.95 to 5.30m - NI: recovered as bluish grey sub angular to sub rounded fine to coarse GRAVEL of limestone with occassional subangular limestone cobbles.* *6.10 to 6.25m - NI: recovered as bluish grey sub angular to sub rounded fine to coarse GRAVEL of limestone.*		
		7.50 - 9.00	91 87 74		9.00 9.00		End of Borehole at 9.00m		

Remarks
Borehole terminated at scheduled depth. On completion borehole backfilled with bentonite. No groundwater recorded.

Borehole Diameter	
Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

terra
firma
earth matters

Consulting Geotechnical, Geo-Environmental Engineers
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Borehole No.
BH3
Sheet 1 of 1

Project Name	**Project No.**	**Date**	**Hole Type**
Ysgol Iolo Morganwg Primary School	648-CA-24	04/07/2025 to 04/07/2025	RC

Client	**Co-ords**	**Logged By**
Kier Construction	E: 298430.00 N: 174607.00 L:	CB

Contractor	**Plant Used**	**Approved By**
GK Drilling	Massenza M15	

Scale 1:50

Water Strike Details

Depth Strike	After 20 mins	Remarks

Results	Type	Depth	TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
					(0.50) 0.50		Grey slightly silty sandy sub angular to sub rounded fine to coarse GRAVEL of limestone and concrete with frequent subangular cobbles of limestone and concrete. Sand is fine to coarse. **()**	▨	■
50 (25 for 120mm/50 for 50mm)	SPT (C)	1.00			(0.70) 1.20		Firm orangish brown slightly gravelly CLAY with occassional to frequent subangular to subrounded limestone cobbles. Gravel is subangular to subrounded fine to coarse of limestone. **()**	░	■
					(0.15) 1.35		No recovery **()**		■
					(0.65) 2.00		Firm orangish brown slightly gravelly CLAY with occassional to frequent subangular to subrounded limestone cobbles. Gravel is subangular to subrounded fine to coarse of limestone. **()**	░	■
		2.00 - 3.50	100 55 36		(1.60) 3.60		Medium strong, thickly to very thickly bedded light bluish-grey Blue Lias Limestone with occasional to frequent calcite veins (<2mm). Weathering: The rock is slightly weathered, with moderate to highly weathered zones localized along sub-horizontal to horizontal bedding fractures. Discolouration and weakening, ranging from weak to moderately weak, penetrate up to 3cm along fracture surfaces creating areas of softening or friability. Fracture Set 1: Sub-horizontal to horizontal bedding fractures (0-15 degrees) are very closely to moderately spaced (20-600mm), generally planar and smooth, but may locally exhibit undulating smooth surfaces. The fractures range from open to wide and show orangish-brown surface staining and clay infilling. Fracture Set 2: Sub vertical to vertical fractures (75-90 degrees) are medium to widely spaced (200-2000mm), planar smooth, locally undulating smooth, tight to very tight. Fracture surfaces are clean. **(Blue Lias Formation)**	▦	■
		3.50 - 5.00	93 85 79		(5.40) 9.00		Medium to strong, thickly to very thickly bedded light bluish-grey Blue Lias Limestone with occassional to frequent calcite veins (<2mm).Weathering: The rock is generally fresh to slightly weathered, with moderate to highly weathered zones localized along sub-horizontal to horizontal bedding fractures. Discolouration and weakening, ranging from weak to moderately weak, penetrate up to 2 cm along fracture surfaces creating areas of softening or friability.Fracture Set 1: Sub-horizontal to horizontal bedding fractures (0-15 degrees) are closely to moderately spaced (60-600 mm), generally planar and smooth, but may locally exhibit undulating surfaces. The fractures are open to tight and show orangish-brown surface staining.Fracture Set 2: Sub vertical to vertical fractures (75-90 degrees) are moderately to widely spaced (200-2000mm), planar smooth, locally undulating smooth, tight to very tight. Fracture surfaces are clean. **(Blue Lias Formation)**	▦	■
		5.00 - 6.50	89 80 67					▦	■
		6.50 - 8.00	95 77 59					▦	■
		8.00 - 9.00	100 100 100					▦	■
							End of Borehole at 9.00m		

Remarks

Borehole terminated at scheduled depth. On completion borehole backfilled with bentonite. No groundwater recorded.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors

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Borehole No.
BH2
Sheet 1 of 1

Project Name Ysgol Iolo Morganwg Primary School	**Project No.** 648-CA-24	**Date** 03/07/2025 to 03/07/2025	**Hole Type** RC
Client Kier Construction	**Co-ords** E: 298410.00 N: 174642.00 L:	**Water Strike Details**	**Logged By** CB
Contractor GK Drilling	**Plant Used** Massenza M15	Depth Strike / After 20 mins / Remarks	**Approved By**
			Scale 1:50

Samples and Results: Results	Type	Depth	TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
					(0.25) 0.25		Soft brown slightly gravelly, slightly sandy CLAY with abundant rootlets. Gravel is subangular to subrounded, fine to medium of limestone. Sand is fine to coarse. ()		
					(0.10) 0.35		Frim greyish brown slightly gravelly, slightly sandy CLAY with abundant rootlets. Gravel is subangular to subrounded, fine to medium of limestone. Sand is fine to coarse. **()**		
50 (25 for 40mm/50 for 45mm)	SPT (C)	0.80			(0.45) 0.80		Orongish brown and grey slightly sandy clayey subangular fine to coarse GRAVEL of limestone. Sand is fine to coarse. **()**		
					(0.90) 1.70		No recovery **()**		
					(0.30) 2.00		NI: Light greyish brown sub angular to sub rounded fine to coarse GRAVEL and COBBLES of limestone. **()**		
					(0.30) 2.30		Bluish grey and orangish brown slightly sandy cleyey subangular fine to coarse GRAVEL of limestone with occasional subangular limestone cobbles. **()**		
		2.00 - 3.50	93 41 36		(6.90) 9.20		Medium to strong, thickly to very thickly bedded light bluish-grey locally dark bluish grey Blue Lias Limestone with occasional to frequent calcite veins (<2mm diameter). Weathering: The rock is generally fresh to slightly weathered, with moderate to highly weathered zones localized along sub-horizontal to horizontal bedding fractures. Discolouration and weakening, ranging from weak to moderately weak, penetrate up to 2 cm along fracture surfaces creating areas of softening or friability. Fracture Set 1: Sub-horizontal to horizontal bedding fractures (0-15 degrees) are closely to moderately spaced (60-600mm), generally planar and smooth, but may locally exhibit undulating surfaces. The fractures are open to tight and show orangish-brown surface staining. Fracture Set 2: Sub vertical to vertical fractures (75-90 degrees) are moderately to widely spaced (200-2000mm), planar smooth, locally undulating smooth, tight to very tight. Fracture surfaces are clean. **(Blue Lias Formation)** *3.20 to 3.40m - NI: recovered as bluish grey and brown slightly sandy clayey sub angular fine to coarse GRAVEL of limestone. Sand is fine to coarse.*		
		3.50 - 5.00	100 91 79						
		5.00 - 6.50	100 82 65						
		6.50 - 8.00	93 89 75						
		8.00 - 9.20	100 91 75						
							End of Borehole at 9.20m		

Depth scale: 1 2 3 4 5 6 7 8 9

Remarks
Borehole terminated at scheduled depth. On completion borehole backfilled with bentonite. No groundwater recorded.

Borehole Diameter	
Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

ANNEX F
Laboratory Soil Chemical Test Results

Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	25-21495-1		
Initial Date of Issue:	14-Jul-2025		
Re-Issue Details:			
Client	*Terra Firma*		
Client Address:	*5 Deryn Court* *Wharfedale Road* *Pentwyn* *Cardiff* *CF23 7HA*		
Contact(s):	*c.blackman@tfwgroup.co.uk*		
Project	*Ysgol Iolo*		
Quotation No.:	*Q25-37254*	**Date Received:**	26-Jun-2025
Order No.:		**Date Instructed:**	30-Jun-2025
No. of Samples:	*6*		
Turnaround (Wkdays):	7	**Results Due:**	08-Jul-2025
Date Approved:	14-Jul-2025		
Approved By:			
Details:	David Smith, Technical Director		

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

Results - 2 Stage WAC

Project: Ysgol Iolo

Chemtest Job No:	25-21495						**Landfilll Waste Acceptance Criteria Limits**		
Chemtest Sample ID:	1992908								
Sample Ref:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	*ES3*								
Client Reference:	*WS2*								
Top Depth(m):	*0.25*								
Bottom Depth(m):									
Sampling Date:	*24-Jun-2025*								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			2.4	3	5	6
Loss On Ignition	2610	M	%			4.9	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.05	1	--	--
TPH Total WAC	2670	M	mg/kg			90	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH at 20C	2010	M				8.5	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0070	--	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	0.0024	0.0059	0.0048	0.055	0.5	2	25
Barium	1455	U	0.026	0.031	0.051	0.30	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0028	0.011	0.0055	0.097	0.5	10	70
Copper	1455	U	0.0051	0.0027	0.010	0.0062	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0028	0.0047	0.0056	0.044	0.5	10	30
Nickel	1455	U	0.0013	0.0012	0.0026	0.012	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0006	0.0017	0.0012	0.016	0.06	0.7	5
Selenium	1455	U	0.0017	0.0045	0.0034	0.042	0.1	0.5	7
Zinc	1455	U	0.004	< 0.003	0.008	0.005	4	50	200
Chloride	1220	U	5.9	12	12	110	800	15000	25000
Fluoride	1220	U	0.31	0.51	< 1.0	4.9	10	150	500
Sulphate	1220	U	42	53	84	520	1000	20000	50000
Total Dissolved Solids	1020	N	140	140	280	1400	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	9.1	9.8	< 50	97	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.8
WAC Sample Weight	301.6

Leachate Test Information	
Leachant volume 1st extract/l	0.333
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.214

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: Ysgol Iolo

							Landfilll Waste Acceptance Criteria Limits		
Chemtest Job No:	25-21495								
Chemtest Sample ID:	1992909								
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:	*ES2*								
Client Reference:	*A1-SA4*								
Top Depth(m):	*0.10*								
Bottom Depth(m):									
Sampling Date:	*24-Jun-2025*								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			2.7	3	5	6
Loss On Ignition	2610	M	%			4.0	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.05	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH at 20C	2010	M				7.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0030	--	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	0.0019	0.0028	0.0037	0.027	0.5	2	25
Barium	1455	U	0.020	0.026	0.039	0.25	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0005	< 0.0005	0.0011	0.0007	0.5	10	70
Copper	1455	U	0.0034	0.0030	0.0068	0.0045	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0014	0.0024	0.0027	0.023	0.5	10	30
Nickel	1455	U	0.0008	0.0007	0.0016	0.0070	0.4	10	40
Lead	1455	U	0.0009	0.0009	0.0018	0.0093	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0006	0.0008	0.0013	0.0080	0.1	0.5	7
Zinc	1455	U	0.005	0.005	0.010	0.050	4	50	200
Chloride	1220	U	1.2	1.2	< 10	12	800	15000	25000
Fluoride	1220	U	0.45	0.53	< 1.0	5.2	10	150	500
Sulphate	1220	U	3.3	4.7	< 10	45	1000	20000	50000
Total Dissolved Solids	1020	N	73	86	150	840	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	6.1	9.8	< 50	93	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	11
WAC Sample Weight	342.2

Leachate Test Information	
Leachant volume 1st extract/l	0.328
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.231

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: Ysgol Iolo

Chemtest Job No:	25-21495						**Landflll Waste Acceptance Criteria Limits**		
Chemtest Sample ID:	1992910								
Sample Ref:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	*ES3*								
Client Reference:	*WS4*								
Top Depth(m):	*0.40*								
Bottom Depth(m):									
Sampling Date:	*24-Jun-2025*								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			0.66	3	5	6
Loss On Ignition	2610	M	%			4.6	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.05	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH at 20C	2010	M				7.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0030	--	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	0.0004	0.0018	0.0009	0.016	0.5	2	25
Barium	1455	U	0.014	0.013	0.028	0.13	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	0.0012	< 0.0005	0.010	0.5	10	70
Copper	1455	U	0.0010	0.0032	0.0020	0.0012	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0010	0.0007	0.0090	0.5	10	30
Nickel	1455	U	0.0007	0.0036	0.0013	0.033	0.4	10	40
Lead	1455	U	< 0.0005	0.0009	< 0.0005	0.0081	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	0.0011	< 0.0005	0.0096	0.1	0.5	7
Zinc	1455	U	< 0.003	0.006	< 0.003	0.050	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.17	0.28	< 1.0	2.7	10	150	500
Sulphate	1220	U	13	3.7	26	48	1000	20000	50000
Total Dissolved Solids	1020	N	80	64	160	660	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.9	5.9	< 50	57	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13
WAC Sample Weight	374.8

Leachate Test Information	
Leachant volume 1st extract/l	0.325
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.211

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: Ysgol Iolo

Chemtest Job No: 25-21495
Chemtest Sample ID: 1992911
Sample Ref:
Sample ID: *ES2*
Client Reference: *A3-SA6*
Top Depth(m): *0.05*
Bottom Depth(m):
Sampling Date: *24-Jun-2025*

Determinand	**SOP**	**Accred.**	**Units**				**Landfilll Waste Acceptance Criteria Limits**		
							Inert Waste Landfill	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			2.1	3	5	6
Loss On Ignition	2610	M	%			5.2	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.05	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH at 20C	2010	M				7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0040	--	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	0.0014	0.0026	0.0027	0.025	0.5	2	25
Barium	1455	U	0.020	0.025	0.039	0.24	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0006	0.0007	0.0011	0.0072	0.5	10	70
Copper	1455	U	0.0043	0.0047	0.0085	0.0054	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0010	0.0023	0.0020	0.021	0.5	10	30
Nickel	1455	U	0.0013	0.0016	0.0026	0.015	0.4	10	40
Lead	1455	U	< 0.0005	0.0008	< 0.0005	0.0068	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0013	0.0031	0.0026	0.029	0.1	0.5	7
Zinc	1455	U	0.005	0.007	0.011	0.069	4	50	200
Chloride	1220	U	< 1.0	3.0	< 10	26	800	15000	25000
Fluoride	1220	U	0.45	0.64	< 1.0	6.2	10	150	500
Sulphate	1220	U	18	14	36	150	1000	20000	50000
Total Dissolved Solids	1020	N	79	86	160	850	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	7.2	11	< 50	110	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	10
WAC Sample Weight	186.8

Leachate Test Information	
Leachant volume 1st extract/l	0.330
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.220

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: Ysgol Iolo

Chemtest Job No:	25-21495							**Landfilll Waste Acceptance Criteria Limits**		
Chemtest Sample ID:	1992912									
Sample Ref:								**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	*ES5*									
Client Reference:	*A3-SA4*									
Top Depth(m):	*0.50*									
Bottom Depth(m):										
Sampling Date:	*24-Jun-2025*									
Determinand	**SOP**	**Accred.**	**Units**							
Total Organic Carbon	2625	M	%				1.0	3	5	6
Loss On Ignition	2610	M	%				2.4	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.05	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH at 20C	2010	M					7.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.0040	--	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	0.0006	0.0007	0.0012	0.0072	0.5	2	25	
Barium	1455	U	0.010	0.013	0.021	0.13	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	0.0005	< 0.0005	0.0049	0.5	10	70	
Copper	1455	U	0.0022	0.0022	0.0043	0.0023	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0007	0.0019	0.0014	0.018	0.5	10	30	
Nickel	1455	U	0.0007	0.0008	0.0014	0.0079	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	0.010	0.005	0.019	0.056	4	50	200	
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.30	0.54	< 1.0	5.1	10	150	500	
Sulphate	1220	U	2.4	1.4	< 10	15	1000	20000	50000	
Total Dissolved Solids	1020	N	68	83	140	810	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	5.6	5.3	< 50	53	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13
WAC Sample Weight	372.4

Leachate Test Information	
Leachant volume 1st extract/l	0.323
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.181

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: Ysgol Iolo

Chemtest Job No:	25-21495						**Landfilll Waste Acceptance Criteria Limits**		
Chemtest Sample ID:	1992913								
Sample Ref:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	*ES7*								
Client Reference:	*A2-SA4*								
Top Depth(m):	*0.45*								
Bottom Depth(m):									
Sampling Date:	*24-Jun-2025*								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			0.24	3	5	6
Loss On Ignition	2610	M	%			1.3	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.05	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH at 20C	2010	M				7.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.0070	--	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	0.0002	< 0.0002	0.0022	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	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0006	0.0006	0.0011	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0004	0.0007	0.0039	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	< 0.003	0.003	< 0.003	0.024	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.14	0.17	< 1.0	1.7	10	150	500
Sulphate	1220	U	2.1	< 1.0	< 10	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	78	36	150	390	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	3.9	3.5	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	11
WAC Sample Weight	429.0

Leachate Test Information	
Leachant volume 1st extract/l	0.328
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.140

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.

Chemtest Sample ID	***Clients Sample Ref:***	***Clients Sample ID:***	***Clients Reference:***	***Sampled Date:***	**Deviation Code(s):**	**Containers Received:**
1992908		*ES3*	*WS2*	*24-Jun-2025*	E	Amber Glass 250ml
1992908		*ES3*	*WS2*	*24-Jun-2025*	E	Amber Glass 60ml
1992908		*ES3*	*WS2*	*24-Jun-2025*	E	Plastic Tub 1000g
1992908		*ES3*	*WS2*	*24-Jun-2025*	E	Plastic Tub 500g
1992909		*ES2*	*A1-SA4*	*24-Jun-2025*	E	Amber Glass 250ml
1992909		*ES2*	*A1-SA4*	*24-Jun-2025*	E	Plastic Tub 500g
1992910		*ES3*	*WS4*	*24-Jun-2025*	E	Amber Glass 250ml
1992910		*ES3*	*WS4*	*24-Jun-2025*	E	Plastic Tub 500g
1992911		*ES2*	*A3-SA6*	*24-Jun-2025*	E	Amber Glass 250ml
1992911		*ES2*	*A3-SA6*	*24-Jun-2025*	E	Plastic Tub 500g
1992912		*ES5*	*A3-SA4*	*24-Jun-2025*	E	Amber Glass 250ml
1992912		*ES5*	*A3-SA4*	*24-Jun-2025*	E	Plastic Tub 500g
1992913		*ES7*	*A2-SA4*	*24-Jun-2025*	E	Amber Glass 250ml
1992913		*ES7*	*A2-SA4*	*24-Jun-2025*	E	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter	TE LE SW GW
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.	RE PW PL LE DW GW
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).	RE PW PL SW DW GW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW GW
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	
2015	Acid Neutralisation Capacity	Acid Reserve	Titration	
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 <30°C.	
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.	
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. Reported PCB 101 results may contain contributions from PCB 90 due to inseparable chromatography.	
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 C2,C8,C10,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
Text example	All items indicated in italic font represent customer-supplied information that may not be independently verified by the laboratory

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

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 EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at ≤ 30°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.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

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 - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

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.

Report Information

Water Sample Category Key for Accreditation

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

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

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

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.: 25-21048-1

Initial Date of Issue: 03-Jul-2025

Re-Issue Details:

Client *Terra Firma*

Client Address:
5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): *c.blackman@tfwgroup.co.uk*

Project *Ysgol Iolo*

Quotation No.: *Q25-37254* **Date Received:** 26-Jun-2025

Order No.: 648 **Date Instructed:** 26-Jun-2025

No. of Samples: *15*

Turnaround (Wkdays): 5 **Results Due:** 02-Jul-2025

Date Approved: 03-Jul-2025

Approved By:

Details: David Smith, Technical Director

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

Results - Soil

Project: Ysgol Iolo

Client: Terra Firma		**Chemtest Job No.:**				25-21048	25-21048	25-21048	25-21048	25-21048	25-21048	25-21048
Quotation No.: Q25-37254		**Chemtest Sample ID.:**				1991483	1991484	1991485	1991486	1991487	1991488	1991489
		Client Sample ID.:				*ES3*	*ES2*	*ES2*	*ES1*	*ES2*	*ES3*	*ES3*
		Client Reference:				*WS2*	*A1-SA4*	*A1-SA5*	*A4-SA1*	*A1-SA2*	*WS4*	*A3-SA5*
		Sample Type:				*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
		Top Depth (m):				*0.25*	*0.10*	*0.40*	*0.05*	*0.35*	*0.40*	*0.30*
		Date Sampled:				*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*
		Time Sampled:				*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
		Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
ACM Type		N	2192		N/A	-	-	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage		U	2192		N/A	-	-	-	-	-	-	-
Moisture		N	2030	%	0.020	10	18	11	12	17	23	16
Soil Colour		N	2030		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2030		N/A	Stones and Roots	Stones and Roots	Stones and Roots	Stones and Roots	Stones and Roots	Roots	Stones
Soil Texture		N	2030		N/A	Loam	Loam	Loam	Loam	Loam	Clay	Clay
pH at 20C		M	2010		4.0	10.0	8.3	8.5	8.1	8.2	8.2	7.4
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	1.1	0.51	1.6	1.3	1.5	0.48	< 0.40
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)		U	2430	%	0.010	0.10	0.025	0.053	0.042	0.064	0.043	0.016
Arsenic		M	2455	mg/kg	0.5	5.4	10	3.3	9.4	7.5	19	11
Cadmium		M	2455	mg/kg	0.10	0.25	0.42	0.10	0.38	0.17	0.56	0.21
Chromium		M	2455	mg/kg	0.5	22	13	6.9	24	7.7	25	12
Mercury Low Level		N	2450	mg/kg	0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05	0.07	< 0.05
Copper		M	2455	mg/kg	0.50	6.5	13	4.7	14	8.4	32	14
Nickel		M	2455	mg/kg	0.50	5.2	11	4.6	13	8.3	45	17
Lead		M	2455	mg/kg	0.50	25	49	16	47	28	31	23
Selenium		M	2455	mg/kg	0.25	0.45	0.75	0.42	0.88	0.70	2.5	0.45
Zinc		M	2455	mg/kg	0.50	42	77	37	61	48	56	93
Chromium (Trivalent)		N	2490	mg/kg	1.0	22	13	6.9	24	7.7	25	12
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
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	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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	10	14	11	< 3.0	8.6	< 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	10	14	11	< 5.0	8.6	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	10	14	11	< 10	< 10	< 10	< 10

Results - Soil

Project: Ysgol Iolo

Client: Terra Firma		**Chemtest Job No.:**				25-21048	25-21048	25-21048	25-21048	25-21048	25-21048	25-21048
Quotation No.: Q25-37254		**Chemtest Sample ID.:**				1991483	1991484	1991485	1991486	1991487	1991488	1991489
		Client Sample ID.:				*ES3*	*ES2*	*ES2*	*ES1*	*ES2*	*ES3*	*ES3*
		Client Reference:				*WS2*	*A1-SA4*	*A1-SA5*	*A4-SA1*	*A1-SA2*	*WS4*	*A3-SA5*
		Sample Type:				*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
		Top Depth (m):				*0.25*	*0.10*	*0.40*	*0.05*	*0.35*	*0.40*	*0.30*
		Date Sampled:				*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*
		Time Sampled:				*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
		Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
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	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	16	25	9.7	6.4	19	< 2.0	< 2.0
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	4.7	2.0	< 1.0	< 1.0	9.1	< 1.0	< 1.0
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	18	27	12	7.6	20	< 5.0	< 5.0
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	23	29	12	< 10	29	< 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	28	41	23	< 10	28	< 10	< 10
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	33	43	23	< 10	37	< 10	< 10
Naphthalene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.12	< 0.10	< 0.10	< 0.10
Acenaphthylene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.26	< 0.10	< 0.10	< 0.10
Fluorene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.18	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.95	< 0.10	< 0.10	< 0.10
Anthracene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.26	< 0.10	< 0.10	< 0.10
Fluoranthene		M	2700	mg/kg	0.10	0.33	< 0.10	< 0.10	1.6	< 0.10	< 0.10	< 0.10
Pyrene		M	2700	mg/kg	0.10	0.34	< 0.10	< 0.10	1.4	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.92	< 0.10	< 0.10	< 0.10
Chrysene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.2	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.60	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.52	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.82	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.40	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.4	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		M	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	11	< 2.0	< 2.0	< 2.0
Total Phenols		M	2920	mg/kg	0.10	0.20	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	2.7	5.1	2.2	4.6	3.8	1.6	1.3

Results - Soil

Project: Ysgol Iolo

Client: Terra Firma		**Chemtest Job No.:**				25-21048	25-21048	25-21048	25-21048	25-21048	25-21048	25-21048
Quotation No.: Q25-37254		**Chemtest Sample ID.:**				1991490	1991491	1991492	1991493	1991494	1991495	1991496
		Client Sample ID.:				*ES5*	*ES2*	*ES2*	*ES5*	*ES7*	*ES5*	*ES7*
		Client Reference:				*A4-SA2*	*A3-SA6*	*A2-SA3*	*A2-SA2*	*A3-SA1*	*A3-SA4*	*A2-SA4*
		Sample Type:				*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
		Top Depth (m):				*0.15*	*0.05*	*0.20*	*0.30*	*0.40*	*0.50*	*0.45*
		Date Sampled:				*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*
		Time Sampled:				*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
		Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
ACM Type		N	2192		N/A	-	-	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage		U	2192		N/A	-	-	-	-	-	-	-
Moisture		N	2030	%	0.020	20	6.8	11	23	21	9.0	17
Soil Colour		N	2030		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2030		N/A	Stones and Roots	Stones and Roots	Stones and brick	Stones and Roots	Stones and Roots	Stones and Roots	Stones
Soil Texture		N	2030		N/A	Loam	Loam	Sand	Loam	Loam	Clay	Clay
pH at 20C		M	2010		4.0	7.0	9.1	9.7	6.4	6.4	8.6	7.6
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	< 0.40	3.5	1.1	< 0.40	< 0.40	< 0.40	< 0.40
Cyanide (Total)		M	2300	mg/kg	0.50	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)		U	2430	%	0.010	0.059	0.055	0.16	0.039	0.011	0.015	< 0.010
Arsenic		M	2455	mg/kg	0.5	8.2	6.6	6.9	9.6	11	8.9	19
Cadmium		M	2455	mg/kg	0.10	0.23	0.25	0.18	0.44	0.11	0.24	0.22
Chromium		M	2455	mg/kg	0.5	12	54	13	6.4	9.1	9.2	16
Mercury Low Level		N	2450	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Copper		M	2455	mg/kg	0.50	11	13	13	9.9	14	12	20
Nickel		M	2455	mg/kg	0.50	7.8	7.7	9.1	9.9	14	13	23
Lead		M	2455	mg/kg	0.50	44	40	26	43	28	22	42
Selenium		M	2455	mg/kg	0.25	0.39	1.0	0.30	0.52	0.34	0.51	0.73
Zinc		M	2455	mg/kg	0.50	54	88	71	93	140	86	120
Chromium (Trivalent)		N	2490	mg/kg	1.0	12	54	13	6.4	9.1	9.2	16
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
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	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0	< 1.0	4.5	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	31	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	10	< 3.0	540	5.5	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	190	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	10	< 5.0	570	8.8	< 5.0	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	10	< 10	760	< 10	< 10	< 10	< 10

Results - Soil

Project: Ysgol Iolo

Client: Terra Firma		**Chemtest Job No.:**				25-21048	25-21048	25-21048	25-21048	25-21048	25-21048	25-21048
Quotation No.: Q25-37254		**Chemtest Sample ID.:**				1991490	1991491	1991492	1991493	1991494	1991495	1991496
		Client Sample ID.:				*ES5*	*ES2*	*ES2*	*ES5*	*ES7*	*ES5*	*ES7*
		Client Reference:				*A4-SA2*	*A3-SA6*	*A2-SA3*	*A2-SA2*	*A3-SA1*	*A3-SA4*	*A2-SA4*
		Sample Type:				*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
		Top Depth (m):				*0.15*	*0.05*	*0.20*	*0.30*	*0.40*	*0.50*	*0.45*
		Date Sampled:				*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*	*24-Jun-2025*
		Time Sampled:				*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
		Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
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	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0	< 2.0	10	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	16	4.4	35	8.1	2.8	< 2.0	< 2.0
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	< 1.0	< 1.0	7.7	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	17	5.7	46	9.6	< 5.0	< 5.0	< 5.0
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	17	< 10	53	< 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	27	< 10	620	18	< 10	< 10	< 10
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	27	< 10	810	18	< 10	< 10	< 10
Naphthalene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene		M	2700	mg/kg	0.10	< 0.10	0.34	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene		M	2700	mg/kg	0.10	< 0.10	0.52	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene		M	2700	mg/kg	0.10	< 0.10	0.31	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene		M	2700	mg/kg	0.10	< 0.10	0.34	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		M	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 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	< 0.10
Organic Matter BS1377		N	2930	%	0.10	4.9	2.6	1.9	4.1	0.80	1.4	0.80

Results - Soil

Project: Ysgol Iolo

Client: Terra Firma		**Chemtest Job No.:**				25-21048
Quotation No.: Q25-37254		**Chemtest Sample ID.:**				1991497
		Client Sample ID.:				*ES4*
		Client Reference:				*WS7*
		Sample Type:				*SOIL*
		Top Depth (m):				*0.20*
		Date Sampled:				*24-Jun-2025*
		Time Sampled:				*12:00*
		Asbestos Lab:				DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type		N	2192		N/A	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected
ACM Detection Stage		U	2192		N/A	-
Moisture		N	2030	%	0.020	2.3
Soil Colour		N	2030		N/A	Brown
Other Material		N	2030		N/A	Stones
Soil Texture		N	2030		N/A	Sand
pH at 20C		M	2010		4.0	9.0
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	1.8
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50
Sulphate (Acid Soluble)		U	2430	%	0.010	0.056
Arsenic		M	2455	mg/kg	0.5	6.6
Cadmium		M	2455	mg/kg	0.10	0.20
Chromium		M	2455	mg/kg	0.5	13
Mercury Low Level		N	2450	mg/kg	0.05	< 0.05
Copper		M	2455	mg/kg	0.50	11
Nickel		M	2455	mg/kg	0.50	7.4
Lead		M	2455	mg/kg	0.50	32
Selenium		M	2455	mg/kg	0.25	0.48
Zinc		M	2455	mg/kg	0.50	68
Chromium (Trivalent)		N	2490	mg/kg	1.0	13
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	4.8
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	< 5.0
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10

Results - Soil

Project: Ysgol Iolo

Client: Terra Firma		**Chemtest Job No.:**				25-21048
Quotation No.: Q25-37254		**Chemtest Sample ID.:**				1991497
		Client Sample ID.:				*ES4*
		Client Reference:				*WS7*
		Sample Type:				*SOIL*
		Top Depth (m):				*0.20*
		Date Sampled:				*24-Jun-2025*
		Time Sampled:				*12:00*
		Asbestos Lab:				DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	< 1.0
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	< 5.0
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	< 10
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	< 10
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	< 10
Naphthalene		M	2700	mg/kg	0.10	< 0.10
Acenaphthylene		M	2700	mg/kg	0.10	< 0.10
Acenaphthene		M	2700	mg/kg	0.10	< 0.10
Fluorene		M	2700	mg/kg	0.10	< 0.10
Phenanthrene		M	2700	mg/kg	0.10	< 0.10
Anthracene		M	2700	mg/kg	0.10	< 0.10
Fluoranthene		M	2700	mg/kg	0.10	< 0.10
Pyrene		M	2700	mg/kg	0.10	< 0.10
Benzo[a]anthracene		M	2700	mg/kg	0.10	< 0.10
Chrysene		M	2700	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	< 0.10
Benzo[a]pyrene		M	2700	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	< 0.10
Total Of 16 PAH's		M	2700	mg/kg	2.0	< 2.0
Total Phenols		M	2920	mg/kg	0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	2.3

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
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 <30°C.	
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	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2450	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.	
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-diphenylcarbazide.	
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)	
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	
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.	
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration	

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
Text example	All items indicated in italic font represent customer-supplied information that may not be independently verified by the laboratory
	This report shall not be reproduced except in full, and only with the prior approval of the laboratory.
	Any comments or interpretations are outside the scope of UKAS accreditation.
	The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.
	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 EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.
	For all other tests the samples were dried at ≤ 30°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.
NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

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 - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

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.

Report Information

Water Sample Category Key for Accreditation

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

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

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

ANNEX G
Plate Bearing Test Results

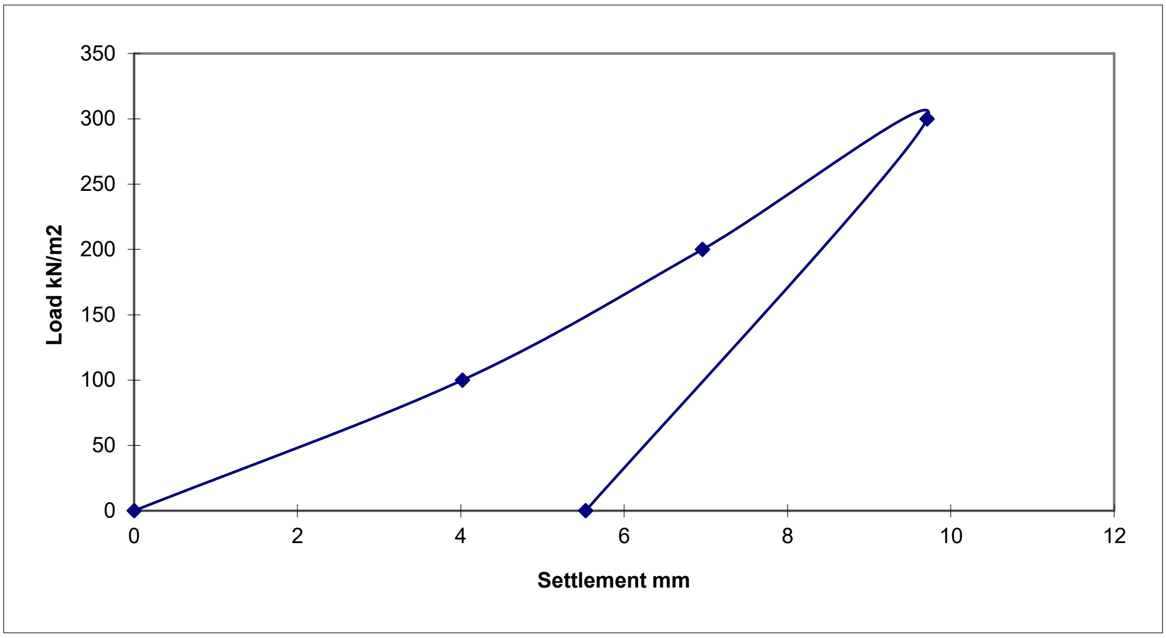
SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 7	Test Depth: 100mm BGL	Plate Diameter: 600mm	Soil Description: MADEGROUND - Stiff brown gravelly clay with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
4.02	100	5
6.96	200	10
9.71	300	15
5.53	0	20

Modulus of subgrade reaction (k762) 25.78 MPa/m



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.01mm per minute.
5: Plate settlement measured by three travel gauges fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.
k752 for 600mm circular plate = pressure requied to achieve 1.25mm penetraion x 0.83

CONTRACT:
Bristol

Date: 08.07.24
Sheet 1 of 1

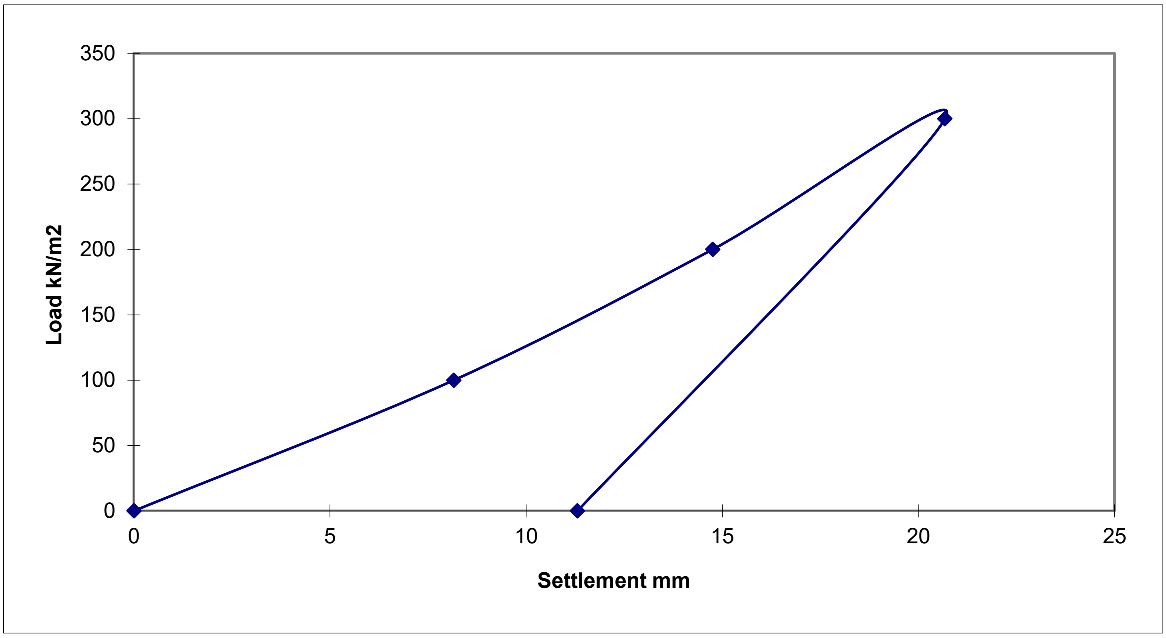
SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 6	Test Depth: 100mm BGL	Plate Diameter: 600mm	Soil Description: MADEGROUND - Stiff brown gravelly clay with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
8.16	100	5
14.76	200	10
20.68	300	15
11.31	0	20

Modulus of subgrade reaction (k762) 12.71 MPa/m



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.01mm per minute.
5: Plate settlement measured by three travel gauges fixed to datum beams.
6: Load measured using electric load cell.

SOUTHERN GROUND TESTING

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.
k752 for 600mm circular plate = pressure requied to achieve 1.25mm penetraion x 0.83

CONTRACT:
Bristol

Date: 08.07.24
Sheet 1 of 1

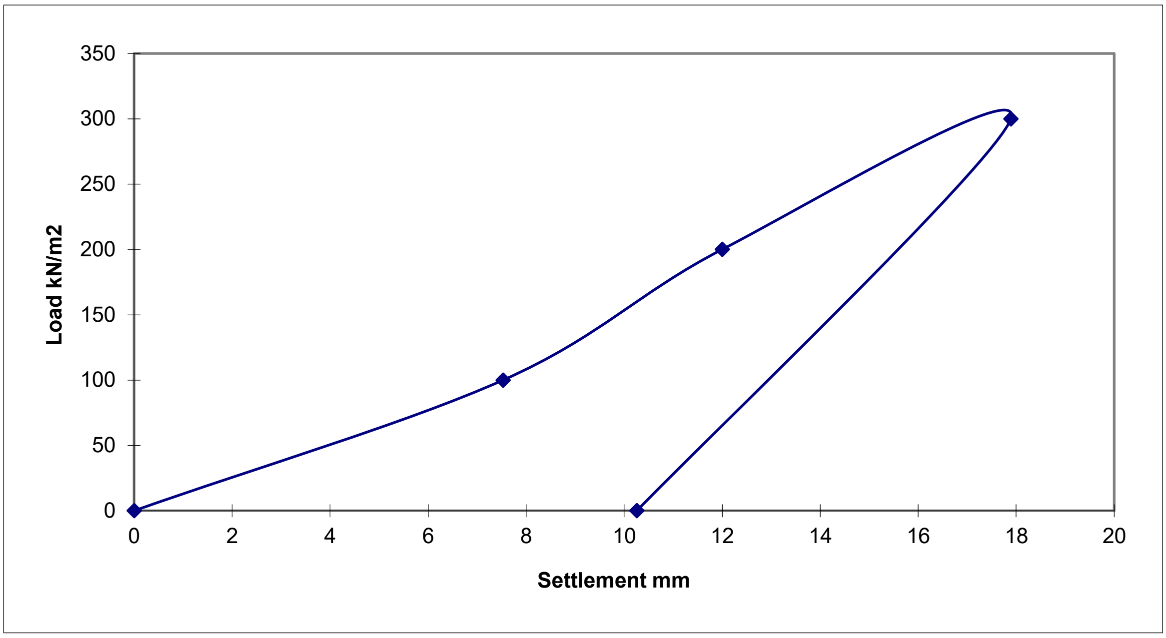
SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 5	Test Depth: 100mm BGL	Plate Diameter: 600mm	Soil Description: MADEGROUND - Stiff brown gravelly clay with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
7.53	100	5
12.00	200	10
17.89	300	15
10.26	0	20

Modulus of subgrade reaction (k762) 13.79 MPa/m



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.01mm per minute.
5: Plate settlement measured by three travel gauges fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.
k752 for 600mm circular plate = pressure requied to achieve 1.25mm penetraion x 0.83

CONTRACT:
Bristol

Date: 08.07.24
Sheet 1 of 1

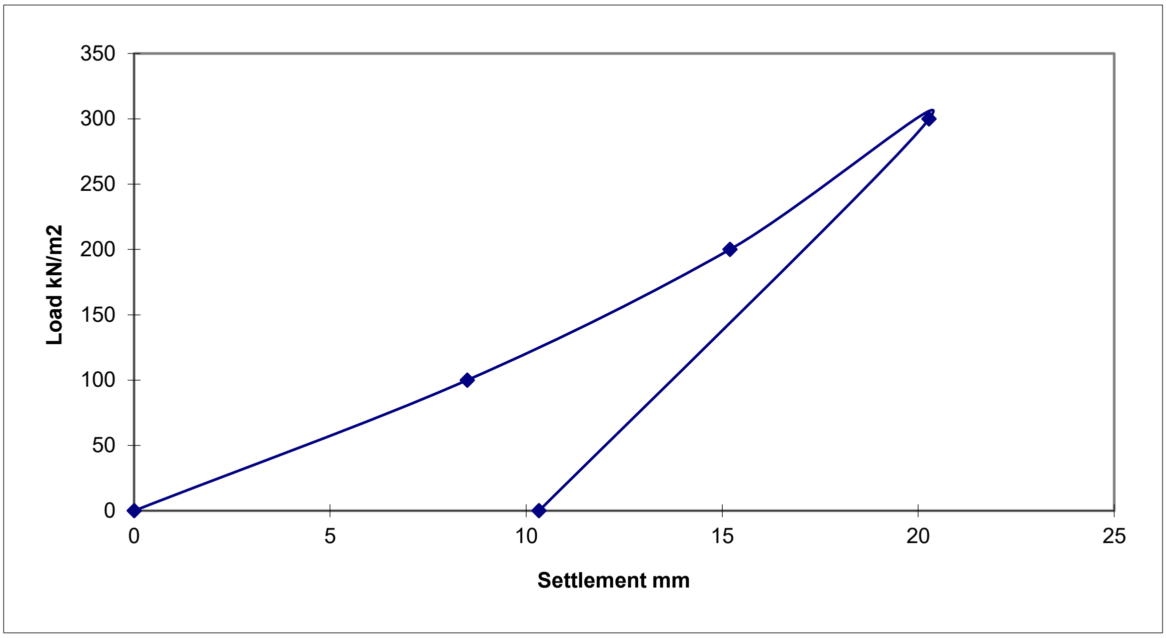
SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 4	Test Depth: 100mm BGL	Plate Diameter: 600mm	Soil Description: MADEGROUND - Stiff brown gravelly clay with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
8.50	100	5
15.20	200	10
20.28	300	15
10.33	0	20

Modulus of subgrade reaction (k762) 12.21 MPa/m



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.01mm per minute.
5: Plate settlement measured by three travel gauges fixed to datum beams.
6: Load measured using electric load cell.

SOUTHERN GROUND TESTING

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.
k752 for 600mm circular plate = pressure requied to achieve 1.25mm penetraion x 0.83

CONTRACT:
Bristol

Date: 08.07.24
Sheet 1 of 1

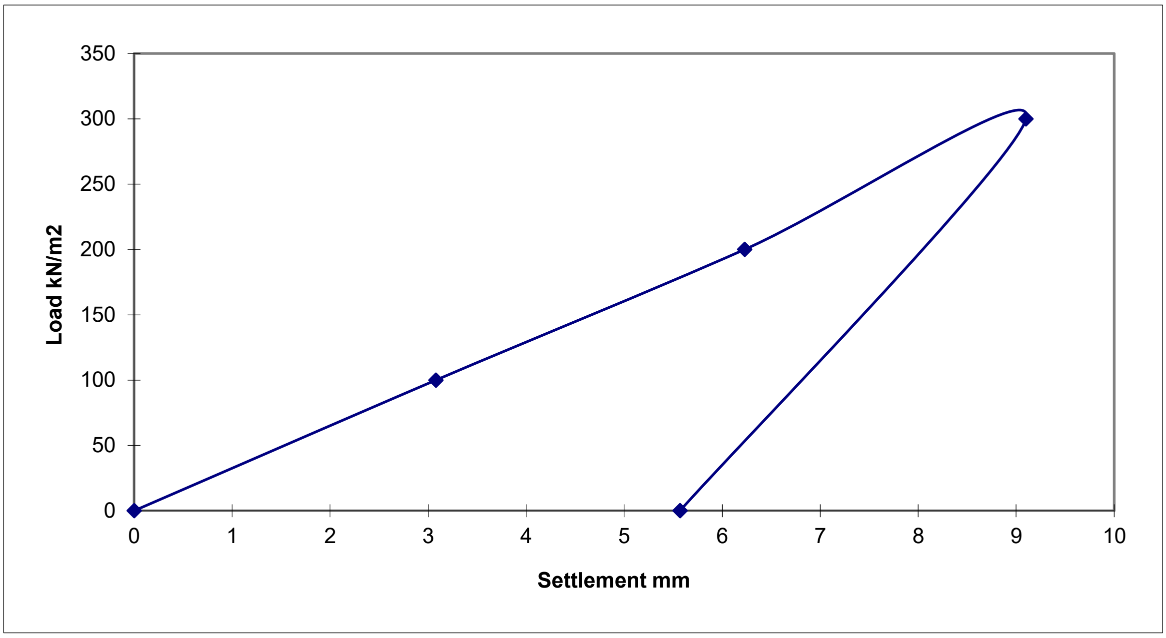
SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 3	Test Depth: 100mm BGL	Plate Diameter: 600mm	Soil Description: MADEGROUND - Stiff brown gravelly clay with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
3.08	100	5
6.23	200	10
9.10	300	15
5.57	0	20

Modulus of subgrade reaction (k762) 33.74 MPa/m



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.01mm per minute.
5: Plate settlement measured by three travel gauges fixed to datum beams.
6: Load measured using electric load cell.

SOUTHERN GROUND TESTING

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.
k752 for 600mm circular plate = pressure requied to achieve 1.25mm penetraion x 0.83

CONTRACT: Bristol	Date: 08.07.24 Sheet 1 of 1

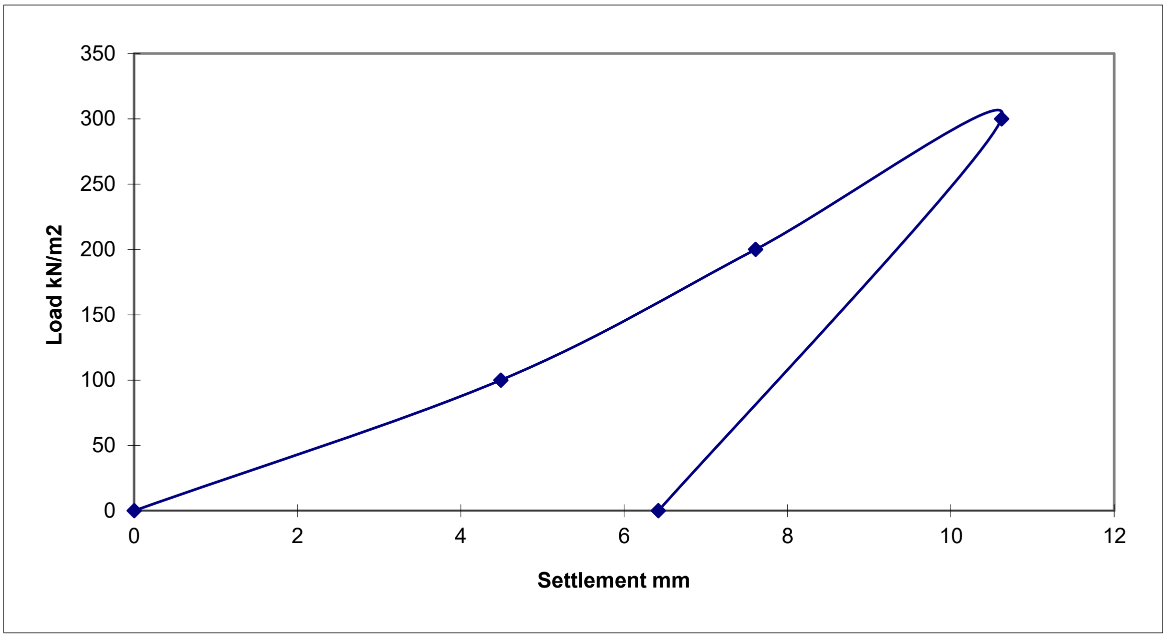
SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 2	Test Depth: 100mm BGL	Plate Diameter: 600mm	Soil Description: MADEGROUND - Stiff brown gravelly clay with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
4.49	100	5
7.61	200	10
10.62	300	15
6.42	0	20

Modulus of subgrade reaction (k762) 23.12 MPa/m



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.01mm per minute.
5: Plate settlement measured by three travel gauges fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.
k752 for 600mm circular plate = pressure requied to achieve 1.25mm penetraion x 0.83

CONTRACT:
Bristol

Date: 08.07.24
Sheet 1 of 1

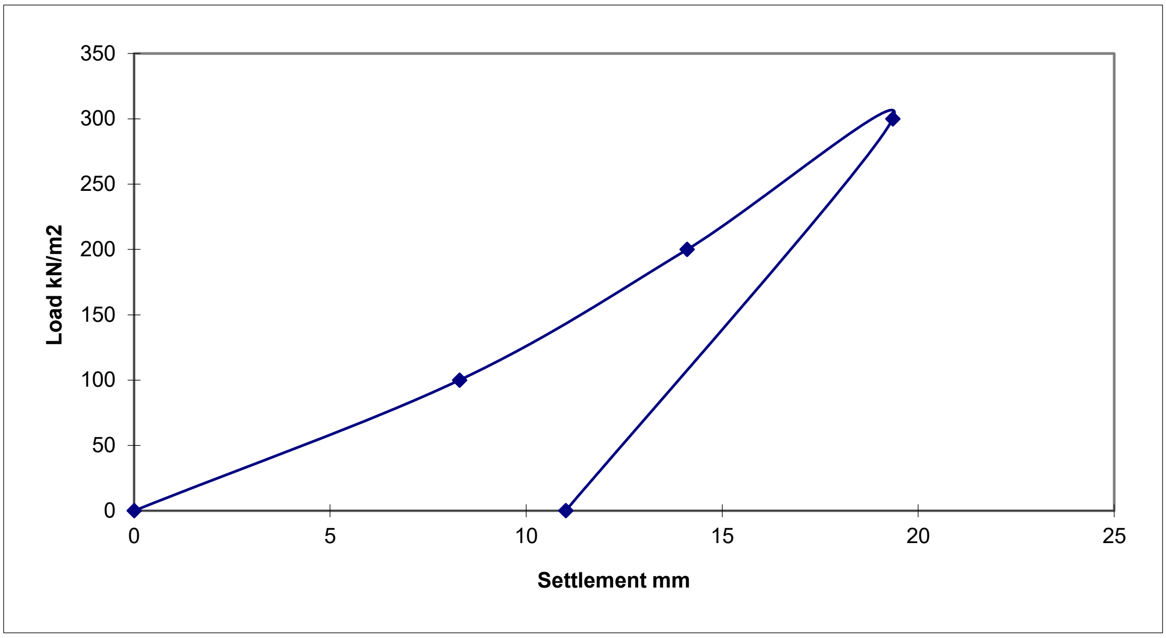
SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 1	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: MADEGROUND - Top Soil

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
8.30	100	5
14.11	200	10
19.35	300	15
11.01	0	20

Modulus of subgrade reaction (k762) 12.50 MPa/m



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.01mm per minute.
5: Plate settlement measured by three travel gauges fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.
k752 for 600mm circular plate = pressure requied to achieve 1.25mm penetraion x 0.83

CONTRACT:
Bristol

Date: 08.07.24
Sheet 1 of 1

ANNEX H
Laboratory Geotechnical Test Results

UKAS TESTING 2788

Laboratory Report

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

Contract Number: 79904

Client Ref: **648**
Client PO: **648**

Client: **Terrafirma Wales Ltd**

Contract Title: **Ysgol Iolo Morganwg, Cowbridge**
For the attention of: **Calum Blackman**

Date Received: **23-07-2025**
Date Completed: **24-07-2025**
Report Date: **24-07-2025**

This report has been checked and approved by:

Shaun Jones
Laboratory manager

Description	Qty
Uniaxial Compressive Strength of Rock inc sample prep 54-165mm diameter cores ISRM Suggested Method for determining uniaxial compressive strength - @ Non Accredited Test	6
Determination of Point Load Value Axial or Diametrical including WC ***Please note GSTL is not accredited for the water content of rock*** ISRM Suggested Method for Point Load Strength - * UKAS	12

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 (Senior Office Administrator) - Brendan Evans (Business Support Co-ordinator) - 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)

Point Load Test

The complete ISRM suggested methods for rock characterization, testing and monitoring 1974-2006 Determining Point Load Strength

Contract Number	79904
Project Name	Ysgol Iolo Morganwg, Cowbridge
Sample Type	Core
Date Tested	23/07/2025

*Please note that GSTL is not accredited for the water content of rock

Hole Reference	Depth (m)			Sample No	Test Type		Width	Platen Seperation	Failure Load	Equivalent Diameter	Point Load	Size Factor	Point Load Index	Moisture Content	Description	Angle Between Plane of Anisotropy & Core Axis	Type of Anisotropy (Bedding or Cleavage)
					d / a / b / i	I //											
BH1	3.40	-	3.50	1	d	I		89	13.71		1.73	1.30	2.24	1.6	SILTSTONE		
BH1	4.76	-	4.95	2	d	I		89	19.25		2.43	1.30	3.15	1.0	SILTSTONE		
BH1	6.44	-	6.56	3	d	I		89	16.38		2.07	1.30	2.68	0.7	SILTSTONE		
BH1	8.88	-	9.00	4	d	I		89	11.61		1.47	1.30	1.90	2.1	SILTSTONE		
BH2	2.62	-	2.73	1	d	I		89	13.31		1.68	1.30	2.18	0.7	SILTSTONE		
BH2	4.53	-	4.70	2	d	I		89	18.87		2.38	1.30	3.09	1.3	SILTSTONE		
BH2	5.70	-	5.90	3	d	I		89	5.25		0.66	1.30	0.86	0.9	SILTSTONE		
BH2	7.59	-	7.72	4	d	I		89	2.56		0.32	1.30	0.42	3.7	SILTSTONE		
BH3	2.05	-	2.20	1	d	I		101	7.63		0.75	1.37	1.03	1.6	SILTSTONE		
BH3	4.50	-	4.62	2	d	I		101	3.78		0.37	1.37	0.51	1.3	SILTSTONE		
BH3	7.58	-	7.71	3	d	I		101	9.69		0.95	1.37	1.30	1.2	SILTSTONE		
BH3	8.00	-	8.13	4	d	I		101	17.30		1.70	1.37	2.33	0.6	SILTSTONE		
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Key	Reported As
Width	(W) mm
Platen Separation	(D) mm
Failure Load	(P) kN
Equivalent Diameter	(De) mm
Point Load	(Is) MPa
Size Factor	(F)
Point Load Index	(Is(50)) MPa
Moisture Content	%
Description	SC
Perpendicluar	I
Parallel to planes of weakness	//

Operator
Julian Jones

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Determination of Unconfined Compressive Strength
ISRM Suggested Methods Vol 16, No. 2, pp. 135-140 1979

Contract Number	79904
Project Name	Ysgol Iolo Morganwg, Cowbridge
Sample Preperation	Sawing and Grinding
Date Tested	23/07/2025

Hole Reference	Depth (m)			Diameter	Length	Initial Mass	Moisture Content	Bulk Density	Dry Density	Load Failure	Maximum Strength	Type of Failure
BH1	7.01		7.25	89.7	235.5	3955.1	0.8	2.66	2.64	183.5	29.0	Axial Splitting
BH1	8.63		8.86	89.8	230.3	3867.3	1.2	2.65	2.62	189.6	29.9	Single Shear
BH2	7.73		7.96	89.7	229.1	3849.7	1.0	2.66	2.63	206.7	32.7	Single Shear
BH2	8.89		9.12	89.8	226.6	3805.0	0.7	2.65	2.63	229.9	36.3	Axial Splitting
BH3	2.40		2.63	101.9	234.1	5016.1	0.8	2.63	2.61	455.2	55.8	Axial Splitting
BH3	7.13		7.39	101.9	258.2	5571.6	0.8	2.65	2.62	271.2	33.3	Axial Splitting

Key	Reported As
Diameter	mm
Length	mm
Initial Mass	g
Moisture Content	%
Bulk Density	Mg/m^3
Dry Density	Mg/m^3
Load Failure	kN
Maximum Strength	MPa

Operator
Julian. J

Laboratory Report

UKAS TESTING 2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

Contract Number: 79564

Client Ref: **648**
Client PO: **648**

Date Received: **04-07-2025**
Date Completed: **29-07-2025**
Report Date: **29-07-2025**

Client: **Terrafirma Wales Ltd**

Contract Title: **Ysgol Iolo Morganwg, Cowbridge**
For the attention of: **Calum Blackman**

This report has been checked and approved by:

Shaun Jones
Laboratory manager

Description	Qty
Determination of water content BS EN ISO 17892-1:2014 - @ Non Accredited Test	20
1 point Liquid & Plastic Limit.. BS EN ISO 17892-12 - * UKAS	10
Particle Size Distribution BS EN ISO 17892-4 : 5.1 - * UKAS	10
Sedimentation by Pipette Method BS EN ISO 17892-4 : 5.4 - @ Non Accredited Test	6
BRE Reduced Suite **includes pH, water & acid soluble sulphate and total sulphur** Sub-contracted Test#	10
Dry Den/MC (2.5kg Rammer Method 1 litre mould/CBR Mould) BS 1377:1990 - Part 4 : 3.4 - * UKAS	6

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 (Senior Office Administrator) - Brendan Evans (Business Support Co-ordinator) - 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)

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX** **BS EN ISO 17892-12:2018+A2:2022 1 Point Liquid Limit** **BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content**	
Contract Number	79564	
Project Name	Ysgol Iolo Morganwg, Cowbridge	
Date Tested	11/07/2025	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
A1-SA1	4	D	1.00	-		Brown fine gravelly silty CLAY
SA1-SA2	4	D	0.75	-		Brown fine gravelly silty CLAY
A1-SA5	5	D	0.80	-		Brown fine gravelly silty CLAY
A2-SA2	4	D	0.90	-		Brown fine to medium gravelly silty CLAY
A3-SA1	2	D	0.50	-		Brown fine gravelly silty CLAY
A3-SA4	4	D	0.80	-		Brown fine to medium gravelly silty CLAY
A3-SA6	3	D	0.05	-		Brown fine to medium gravelly silty CLAY
A4-SA1	4	D	0.60	-		Brown fine gravelly silty CLAY
WS4	4	D	0.50	-		Brown silty CLAY
WS2	2	D	0.15	-		Brown fine to medium gravelly silty CLAY
A1-SA4	3	D	0.15	-		Brown fine to coarse gravelly silty CLAY
A1-SA5	3	D	0.50	-		Brown fine to coarse gravelly silty CLAY
A1-SA6	4	D	0.40	-		Brown fine gravelly silty CLAY
A2-SA4	4	D	0.40	-		Brown fine gravelly silty CLAY
A3-SA1	4	D	1.60	-		Brown fine gravelly silty CLAY
A3-SA3	4	D	0.90	-		Brown fine to medium gravelly silty CLAY
A4-SA2	4	D	0.65	-		Brown fine gravelly silty CLAY
A4-SA3	4	D	0.45	-		Brown fine to medium gravelly silty CLAY
WS4	1	D	0.00	-	0.20	Brown fine to coarse gravelly silty CLAY
A3-SA3	2	D	0.10	-		Brown fine gravelly silty CLAY
				-		
				-		
				-		
				-		

Operator
Aaron. H

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

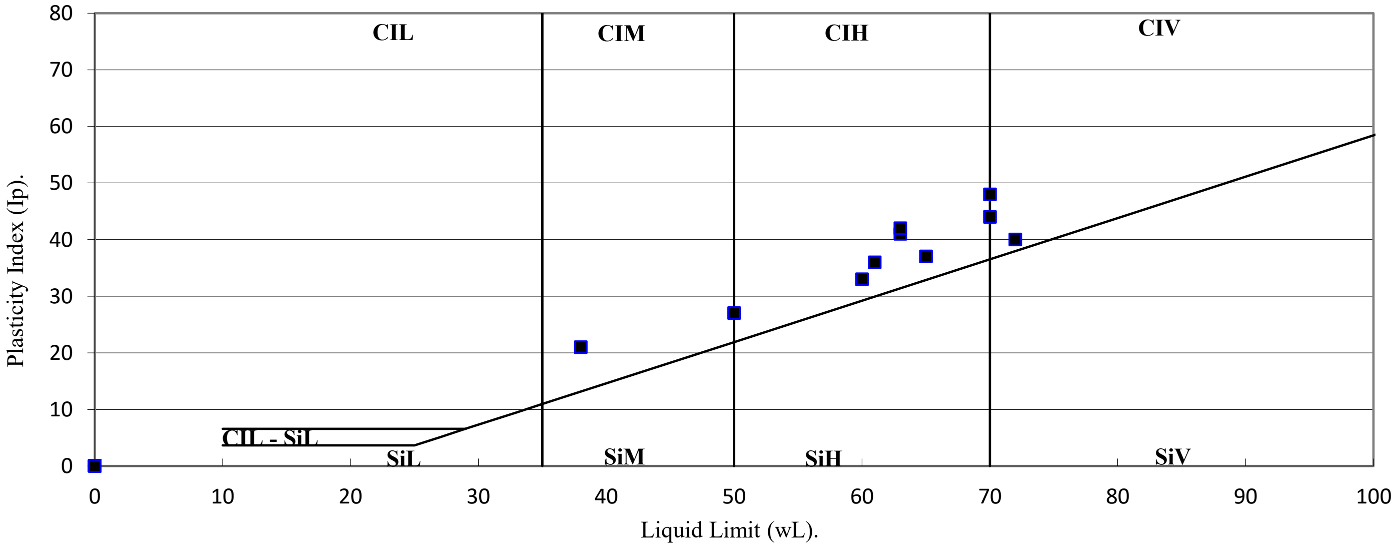
WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
BS EN ISO 17892-12:2018+A2:2022 1 Point Liquid Limit
BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content

Contract Number	79564	
Project Name	Ysgol Iolo Morganwg, Cowbridge	
Date Tested	11/07/2025	
Test Comments	80g/30° Fall cone used	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Water Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Factor Applied	Remarks
A1-SA1	4	D	1.00	-		27.5						
SA1-SA2	4	D	0.75	-		33.8						
A1-SA5	5	D	0.80	-		22.7						
A2-SA2	4	D	0.90	-		32.6						
A3-SA1	2	D	0.50	-		29.8						
A3-SA4	4	D	0.80	-		28.0						
A3-SA6	3	D	0.05	-		9.8						
A4-SA1	4	D	0.60	-		24.0						
WS4	4	D	0.50	-		20.5						
WS2	2	D	0.15	-		9.0						
A1-SA4	3	D	0.15	-		37.5	72	32	40	82	0.987	CV Very High Plasticity
A1-SA5	3	D	0.50	-		20.3	50	23	27	85	0.987	CI/H Inter/High Plasticity
A1-SA6	4	D	0.40	-		28.4	70	26	44	95	1.020	CH/V High/HighPlasticity
A2-SA4	4	D	0.40	-		24.4	70	22	48	89	1.016	CH/V High/HighPlasticity
A3-SA1	4	D	1.60	-		32.9	60	27	33	97	0.989	CH High Plasticity
A3-SA3	4	D	0.90	-		31.6	61	25	36	87	0.998	CH High Plasticity
A4-SA2	4	D	0.65	-		32.6	65	28	37	98	0.989	CH High Plasticity
A4-SA3	4	D	0.45	-		26.1	63	22	41	89	1.002	CH High Plasticity
WS4	1	D	0.00	-	0.20	10.1	38	17	21	73	0.982	CI Intermediate Plasticity
A3-SA3	2	D	0.10	-		28.5	63	21	42	93	1.018	CH High Plasticity
				-								
				-								
				-								
				-								

SYMBOLS : NP = Non Plastic

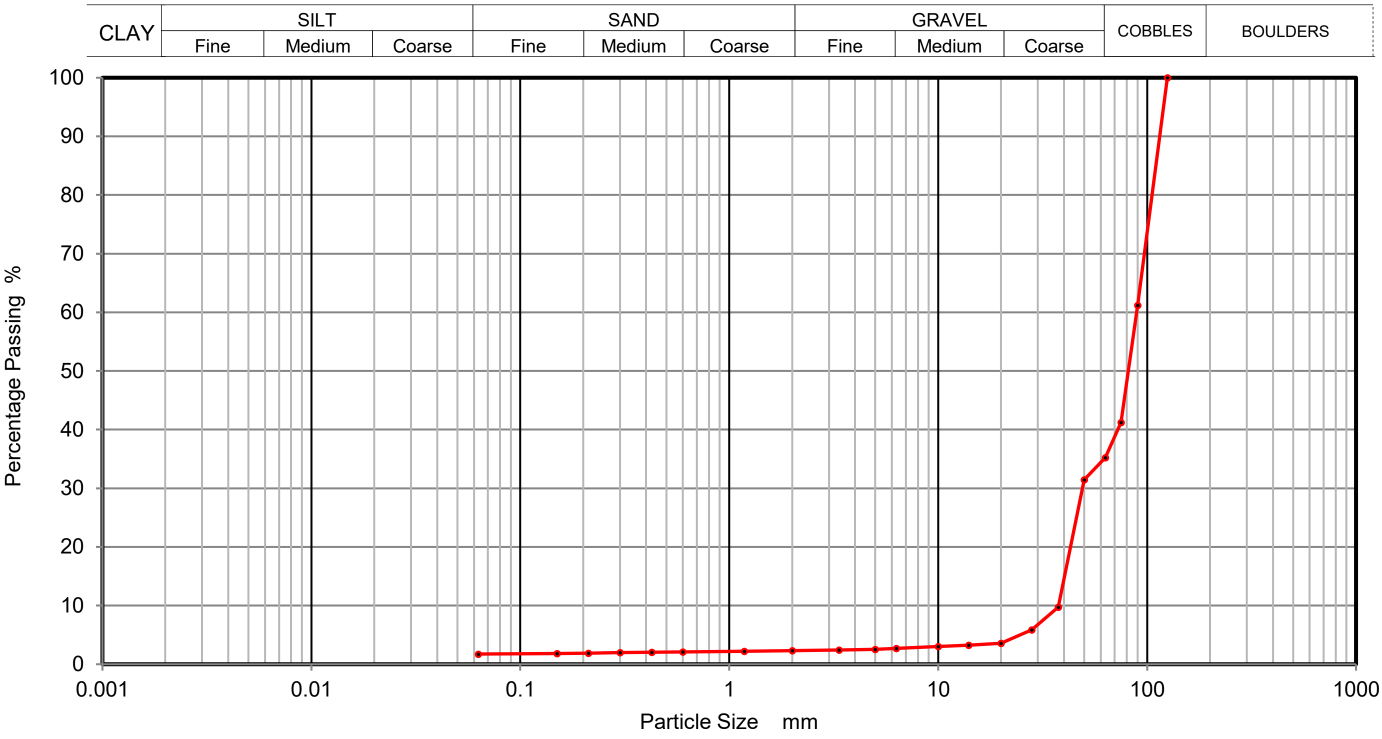
PLASTICITY CHART
BS EN ISO 14688-2:2018 Clause 4.4



***For sample descriptions please see sample descriptions sheet**

Operator	
Aaron. H	

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS EN ISO 17892-4:2016** **Wet Sieve, Clause 5.2**	Contract Number	**79564**
		Borehole/Pit No.	**A1-SA1**
Project Name	**Ysgol Iolo Morganwg, Cowbridge**	Sample No.	**3**
Sample Description	Brown slightly silty/ clayey fine to coarse GRAVEL with cobbles	Depth Top	**0.80**
		Depth Base	
Date Tested	15/07/2025	Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	61		
75	41		
63	35		
50	31		
37.5	10		
28	6		
20	4		
14	3		
10	3		
6.3	3		
5	3		
3.35	2		
2	2		
1.18	2		
0.63	2		
0.425	2		
0.30	2		
0.20	2		
0.15	2		
0.063	2		

Sample Proportions	% dry mass
Cobbles	65
Gravel	33
Sand	0
Silt and Clay	2

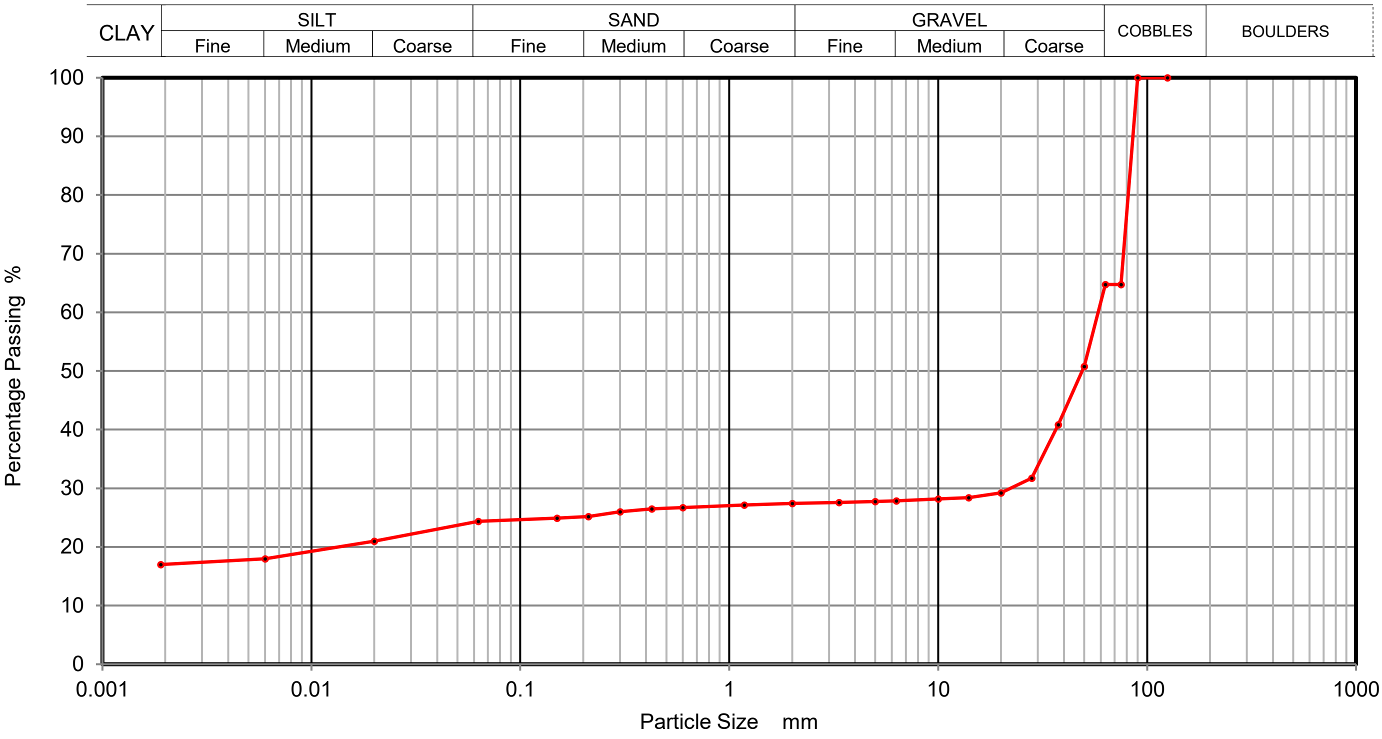
Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Ben. J

PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

		Contract Number	**79564**
		Borehole/Pit No.	**A1-SA2**
Project Name	**Ysgol Iolo Morganwg, Cowbridge**	Sample No.	**3**
Sample Description	Brown slightly sandy slightly silty clayey fine to coarse GRAVEL with cobbles	Depth Top	**0.60**
		Depth Base	
Date Tested	15/07/2025	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	21
90	100	0.0060	18
75	65	0.0020	17
63	65		
50	51		
37.5	41		
28	32		
20	29		
14	28		
10	28		
6.3	28		
5	28		
3.35	28		
2	27		
1.18	27		
0.63	27		
0.425	27		
0.30	26		
0.20	25		
0.15	25		
0.063	24		

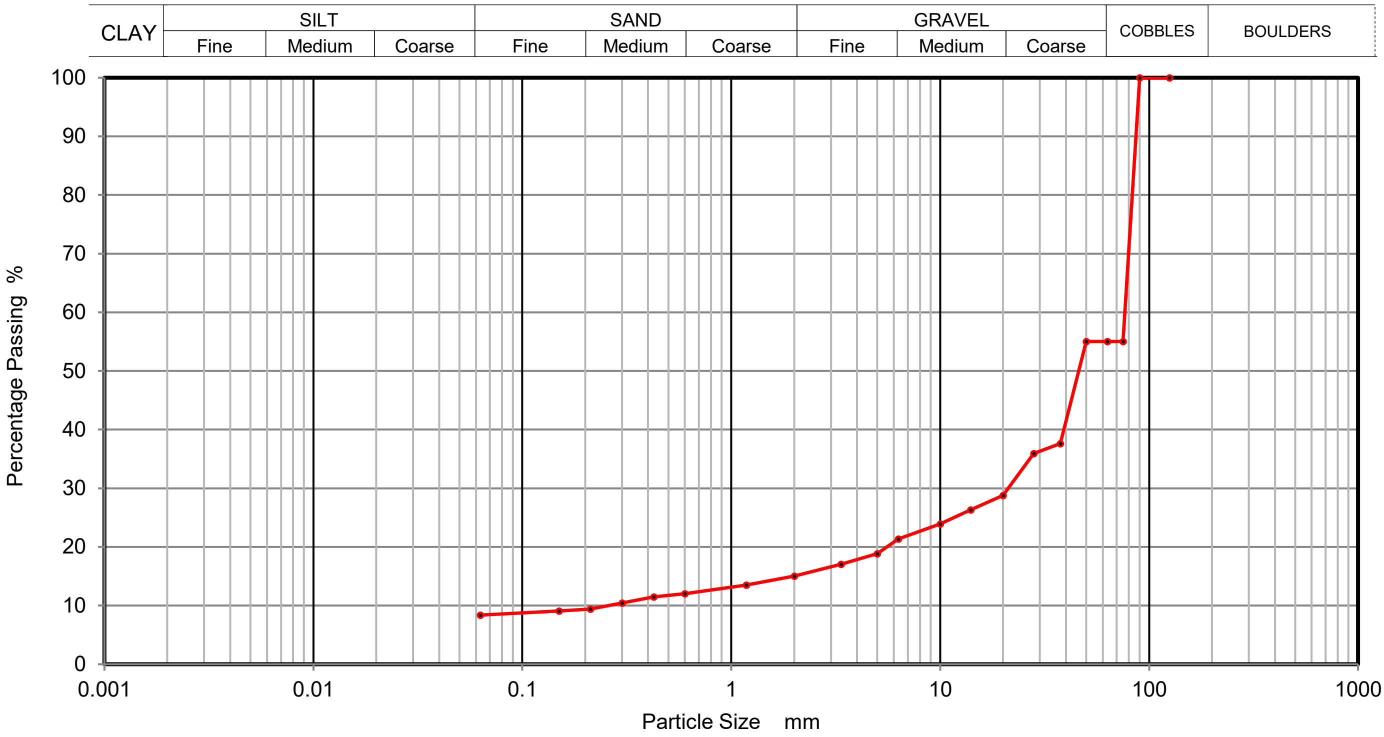
Sample Proportions	% dry mass
Cobbles	35
Gravel	38
Sand	3
Silt	7
Clay	17

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Ben. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS EN ISO 17892-4:2016** **Wet Sieve, Clause 5.2**	Contract Number	**79564**
		Borehole/Pit No.	**A1-SA5**
Project Name	**Ysgol Iolo Morganwg, Cowbridge**	Sample No.	**1**
Sample Description	Brown slightly sandy slightly silty/ clayey fine to coarse GRAVEL with cobbles	Depth Top	**0.00**
		Depth Base	**0.55**
Date Tested	15/07/2025	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	55		
63	55		
50	55		
37.5	38		
28	36		
20	29		
14	26		
10	24		
6.3	21		
5	19		
3.35	17		
2	15		
1.18	13		
0.63	12		
0.425	11		
0.30	10		
0.20	9		
0.15	9		
0.063	8		

Sample Proportions	% dry mass
Cobbles	45
Gravel	40
Sand	7
Silt and Clay	8

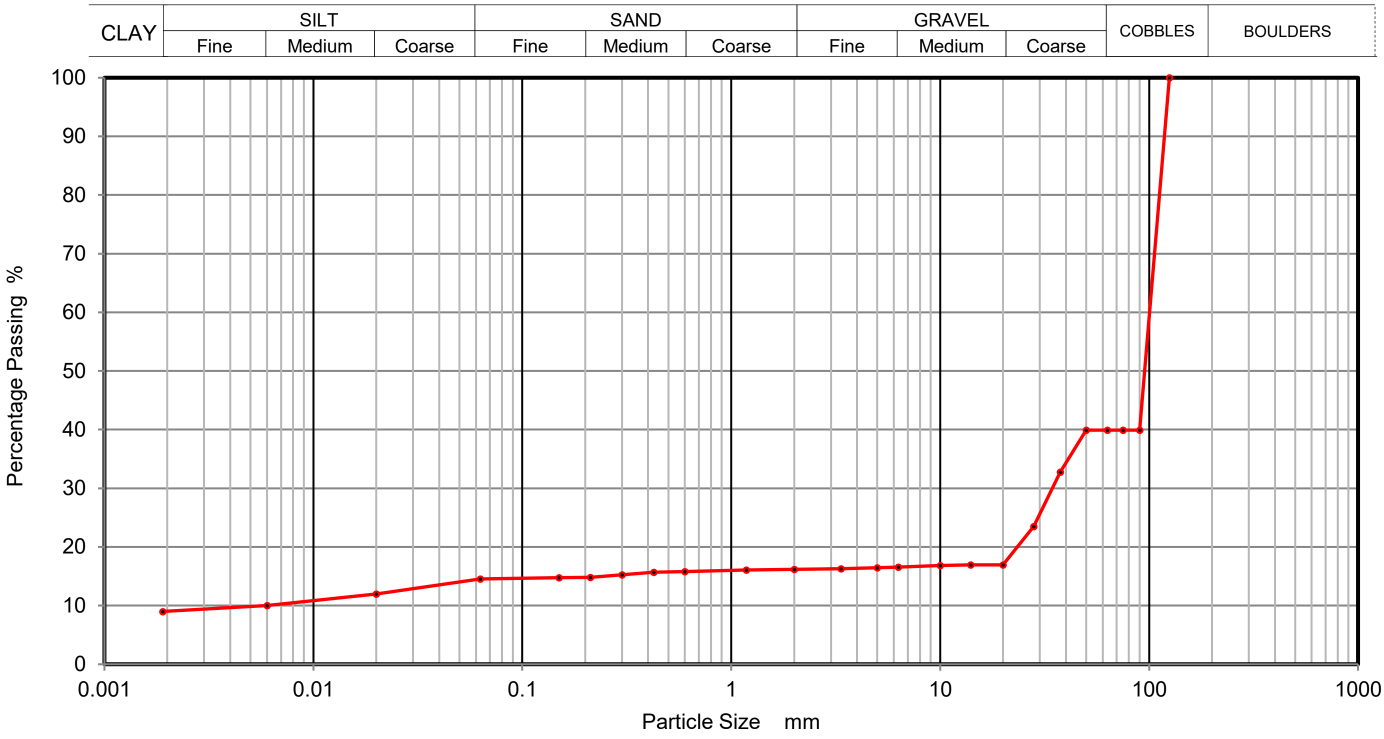
Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Ben. J

PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4	Contract Number	**79564**
		Borehole/Pit No.	**A1-SA6**
Project Name	**Ysgol Iolo Morganwg, Cowbridge**	Sample No.	**5**
Sample Description	Brown slightly sandy slightly silty slightly clayey fine to coarse GRAVEL with cobbles	Depth Top	**0.80**
		Depth Base	
Date Tested	15/07/2025	Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	12
90	40	0.0060	10
75	40	0.0020	9
63	40		
50	40		
37.5	33		
28	24		
20	17		
14	17		
10	17		
6.3	17		
5	16		
3.35	16		
2	16		
1.18	16		
0.63	16		
0.425	16		
0.30	15		
0.20	15		
0.15	15		
0.063	15		

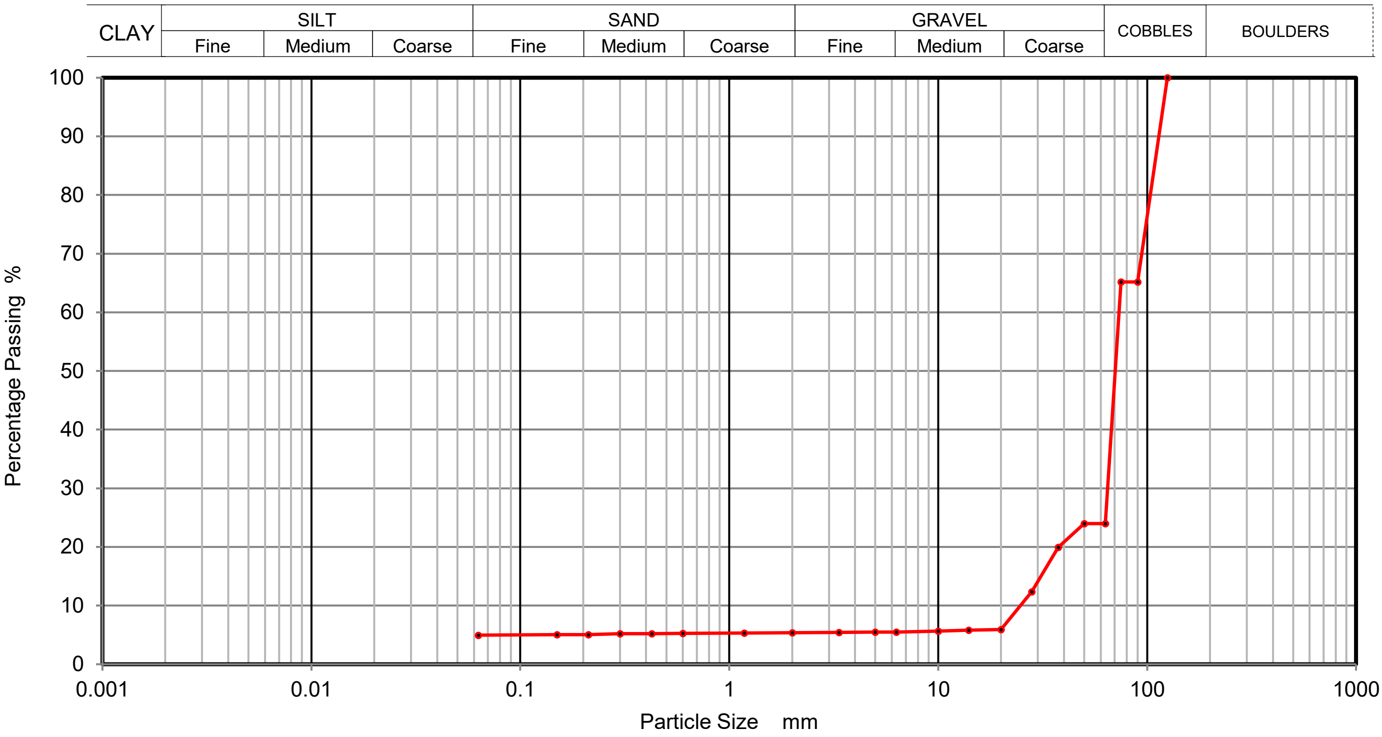
Sample Proportions	% dry mass
Cobbles	60
Gravel	24
Sand	1
Silt	6
Clay	9

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Ben. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS EN ISO 17892-4:2016** **Wet Sieve, Clause 5.2**	Contract Number	**79564**
		Borehole/Pit No.	**A2-SA1**
Project Name	**Ysgol Iolo Morganwg, Cowbridge**	Sample No.	**4**
Sample Description	Brown slightly silty/ clayey fine to coarse GRAVEL with cobbles	Depth Top	**1.10**
		Depth Base	
Date Tested	15/07/2025	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	65		
75	65		
63	24		
50	24		
37.5	20		
28	12		
20	6		
14	6		
10	6		
6.3	6		
5	5		
3.35	5		
2	5		
1.18	5		
0.63	5		
0.425	5		
0.30	5		
0.20	5		
0.15	5		
0.063	5		

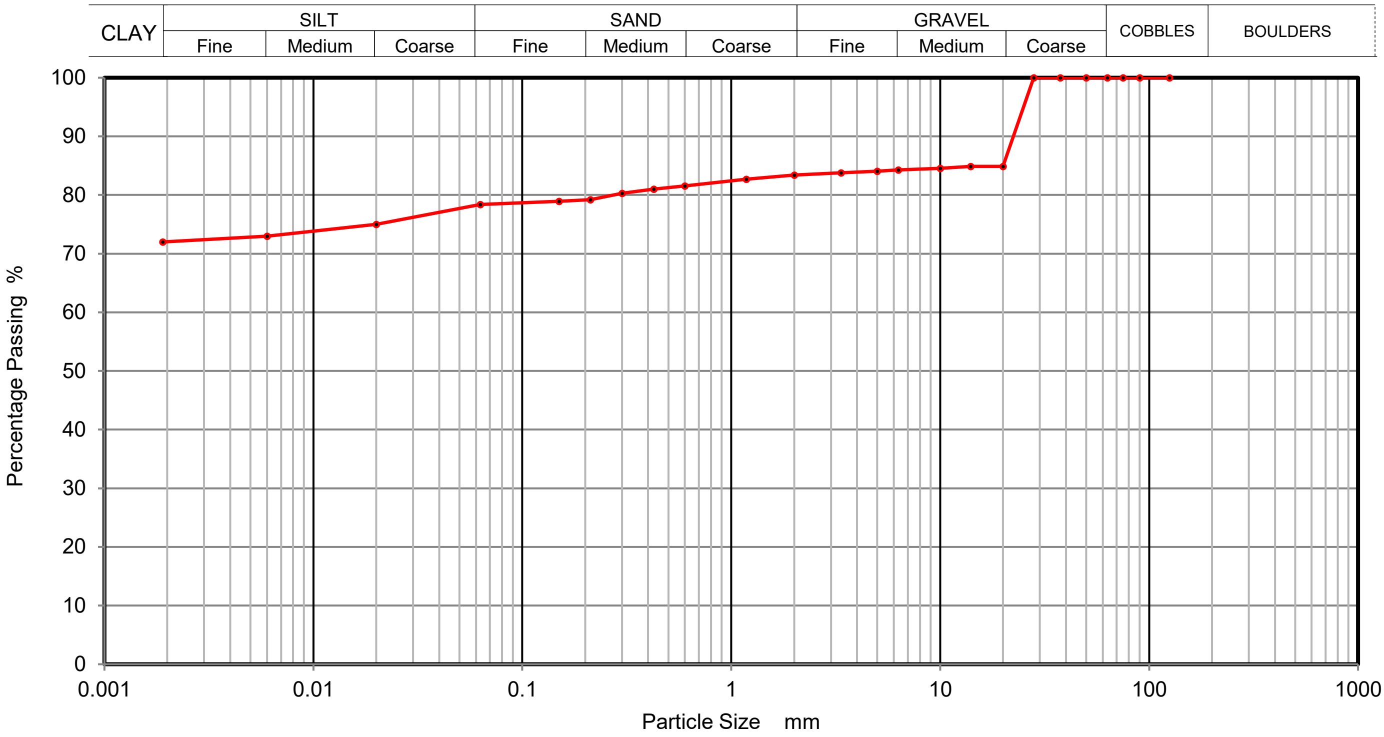
Sample Proportions	% dry mass
Cobbles	76
Gravel	19
Sand	0
Silt and Clay	5

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Ben. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4**	Contract Number	**79564**
		Borehole/Pit No.	**A3-SA1**
Project Name	**Ysgol Iolo Morganwg, Cowbridge**	Sample No.	**1**
Sample Description	Brown slightly sandy fine to coarse gravelly silty CLAY	Depth Top	**0.20**
		Depth Base	
Date Tested	15/07/2025	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	75
90	100	0.0060	73
75	100	0.0020	72
63	100		
50	100		
37.5	100		
28	100		
20	85		
14	85		
10	85		
6.3	84		
5	84		
3.35	84		
2	83		
1.18	83		
0.63	82		
0.425	81		
0.30	80		
0.20	79		
0.15	79		
0.063	78		

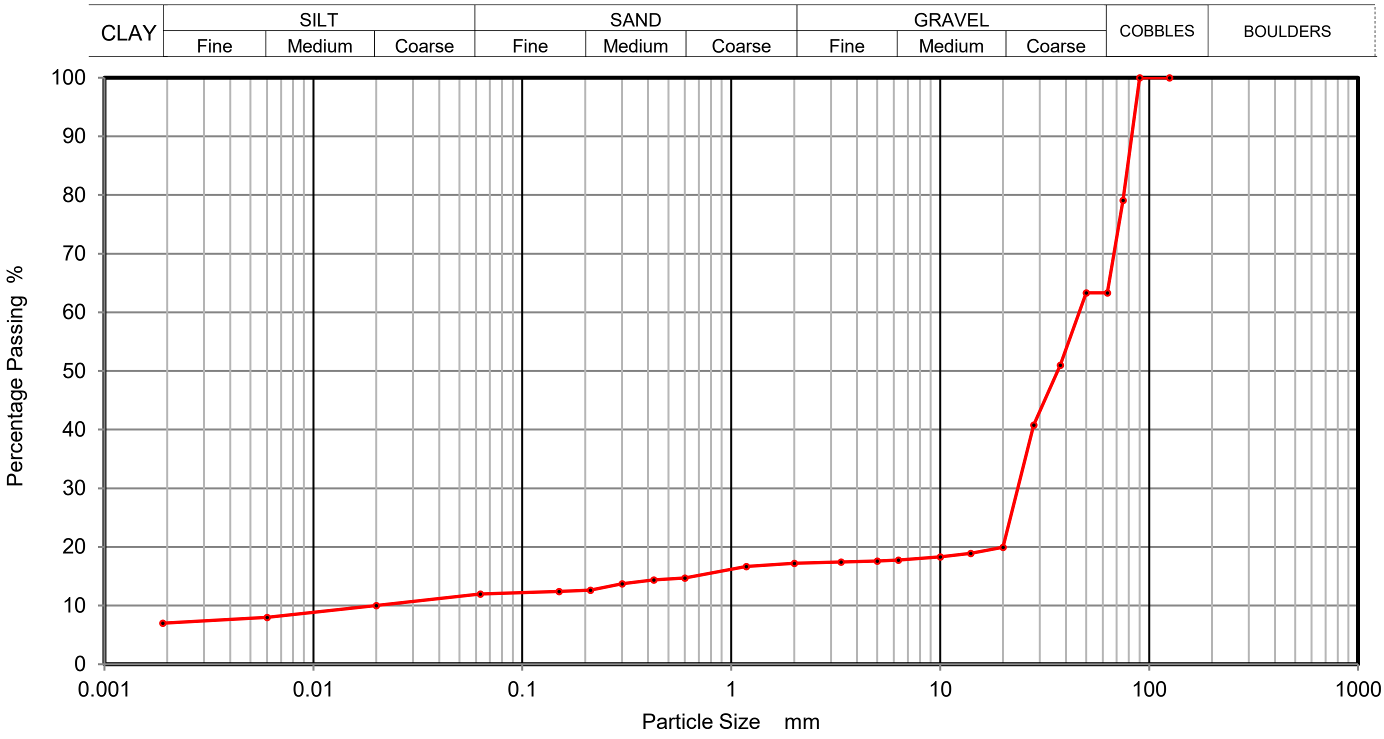
Sample Proportions	% dry mass
Cobbles	0
Gravel	17
Sand	5
Silt	6
Clay	72

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Ben. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS EN ISO 17892-4:2016** **Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4**	Contract Number Borehole/Pit No.	**79564** **A3-SA5**
Project Name	**Ysgol Iolo Morganwg, Cowbridge**	Sample No.	**1**
Sample Description	Brown slightly silty slightly sandy slightly clayey fine to coarse GRAVEL with cobbles	Depth Top Depth Base	**0.00** **0.20**
Date Tested	15/07/2025	Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	10
90	100	0.0060	8
75	79	0.0020	7
63	63		
50	63		
37.5	51		
28	41		
20	20		
14	19		
10	18		
6.3	18		
5	18		
3.35	17		
2	17		
1.18	17		
0.63	15		
0.425	14		
0.30	14		
0.20	13		
0.15	12		
0.063	12		

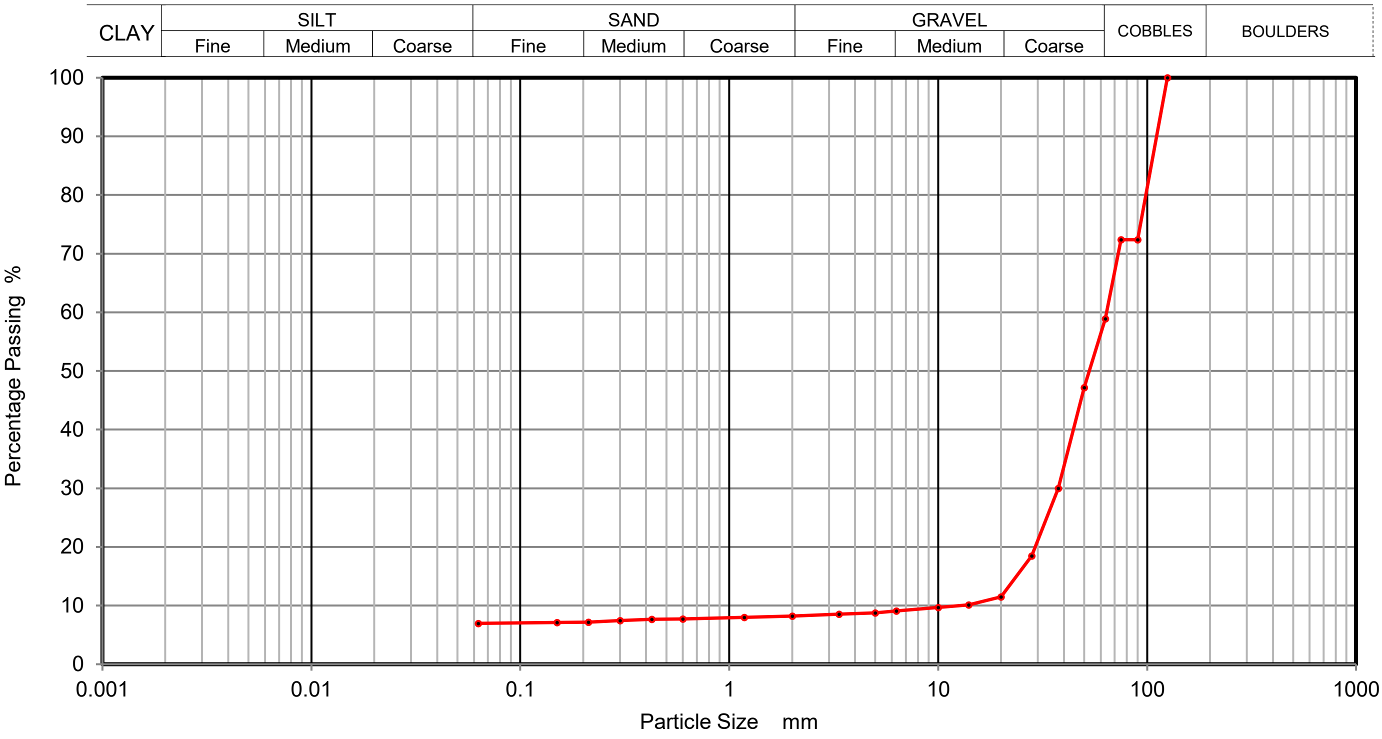
Sample Proportions	% dry mass
Cobbles	37
Gravel	46
Sand	5
Silt	5
Clay	7

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Ben. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**79564**
		Borehole/Pit No.	**A3-SA6**
Project Name	**Ysgol Iolo Morganwg, Cowbridge**	Sample No.	**4**
Sample Description	Brown slightly sandy slightly silty/ clayey fine to coarse GRAVEL with cobbles	Depth Top	**0.30**
		Depth Base	
Date Tested	15/07/2025	Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	72		
75	72		
63	59		
50	47		
37.5	30		
28	18		
20	11		
14	10		
10	10		
6.3	9		
5	9		
3.35	9		
2	8		
1.18	8		
0.63	8		
0.425	8		
0.30	7		
0.20	7		
0.15	7		
0.063	7		

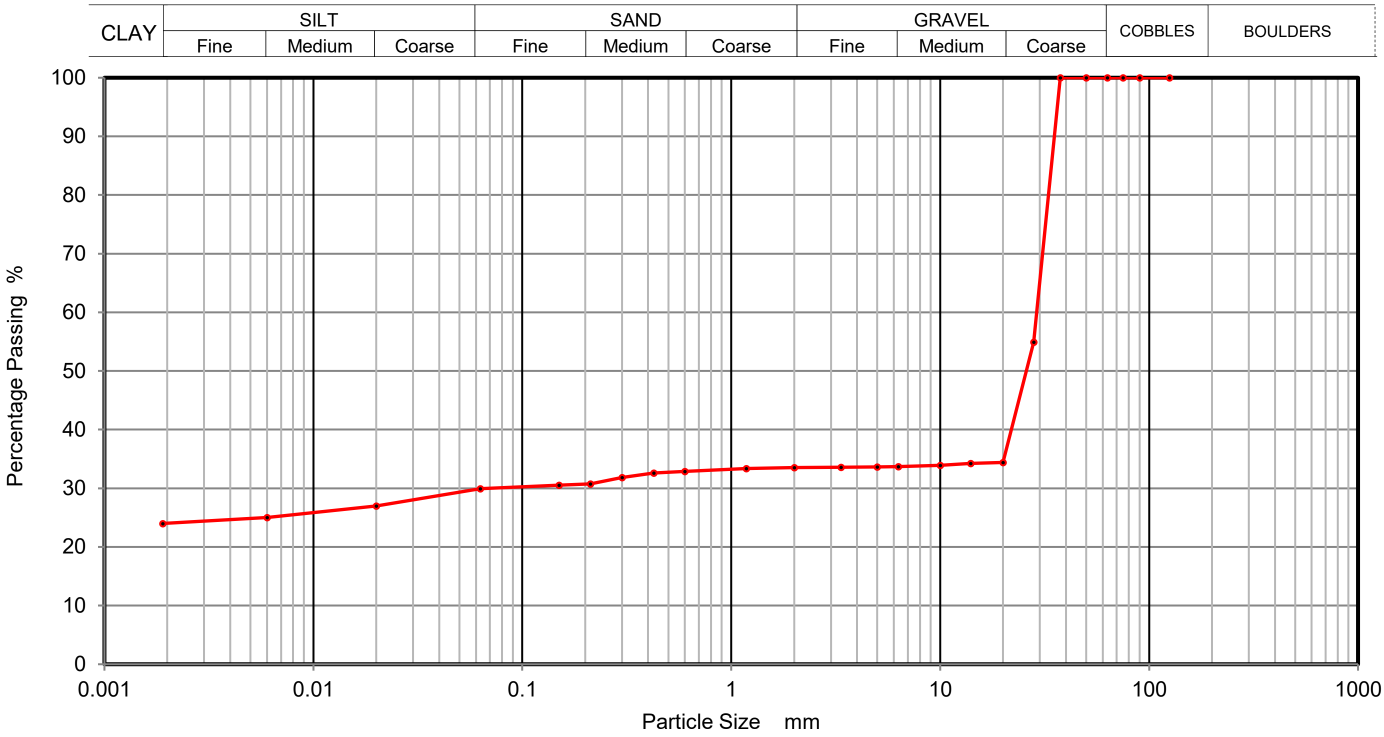
Sample Proportions	% dry mass
Cobbles	41
Gravel	51
Sand	1
Silt and Clay	7

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Ben. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4**	Contract Number	**79564**
		Borehole/Pit No.	**A4-SA3**
Project Name	**Ysgol Iolo Morganwg, Cowbridge**	Sample No.	**3**
Sample Description	Brown slightly sandy slightly silty clayey fine to coarse GRAVEL	Depth Top	**0.20**
		Depth Base	
Date Tested	15/07/2025	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	27
90	100	0.0060	25
75	100	0.0020	24
63	100		
50	100		
37.5	100		
28	55		
20	34		
14	34		
10	34		
6.3	34		
5	34		
3.35	34		
2	34		
1.18	33		
0.63	33		
0.425	33		
0.30	32		
0.20	31		
0.15	31		
0.063	30		

Sample Proportions	% dry mass
Cobbles	0
Gravel	66
Sand	4
Silt	6
Clay	24

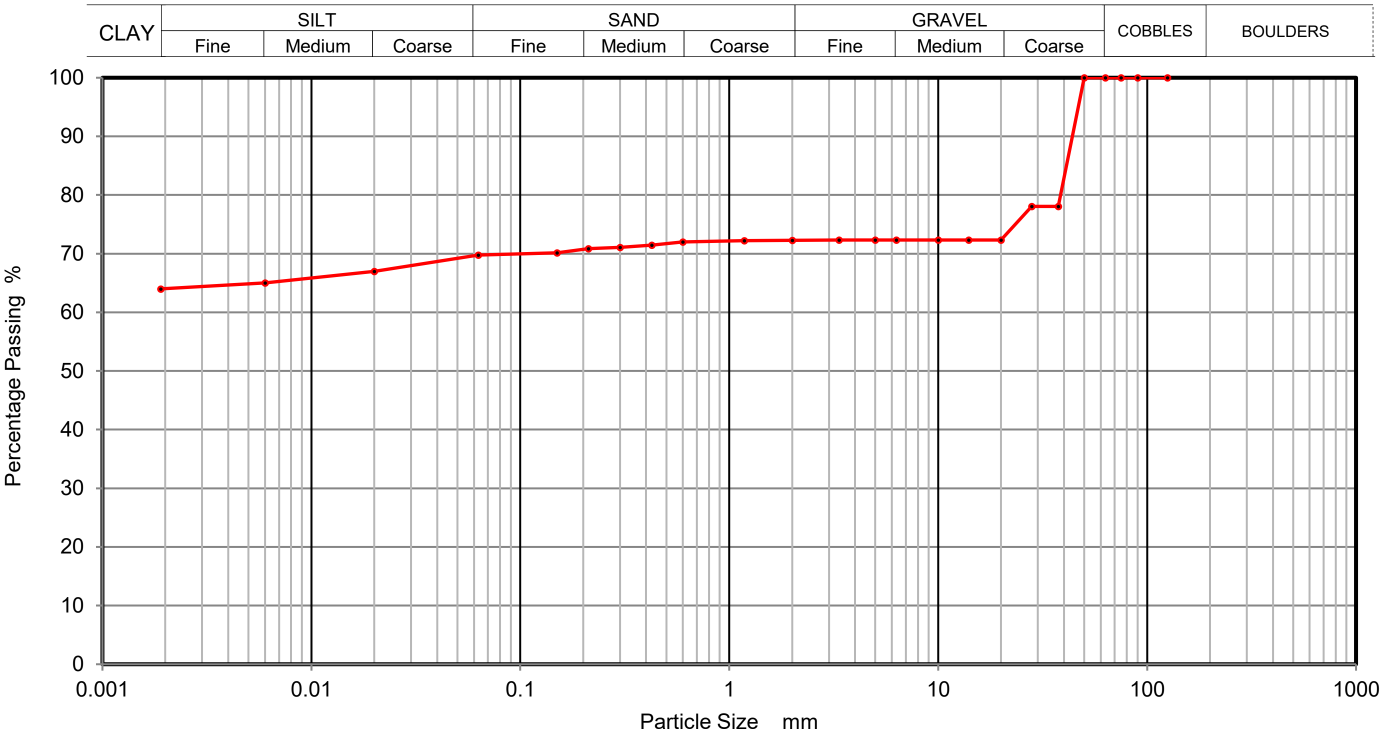
Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Ben. J

PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES		Contract Number	**79564**
		Borehole/Pit No.	**WS4**
Project Name	**Ysgol Iolo Morganwg, Cowbridge**	Sample No.	**2**
Sample Description	Brown slightly sandy fine to coarse gravelly silty CLAY	Depth Top	**0.20**
		Depth Base	**1.60**
Date Tested	15/07/2025	Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	67
90	100	0.0060	65
75	100	0.0020	64
63	100		
50	100		
37.5	78		
28	78		
20	72		
14	72		
10	72		
6.3	72		
5	72		
3.35	72		
2	72		
1.18	72		
0.63	72		
0.425	71		
0.30	71		
0.20	71		
0.15	70		
0.063	70		

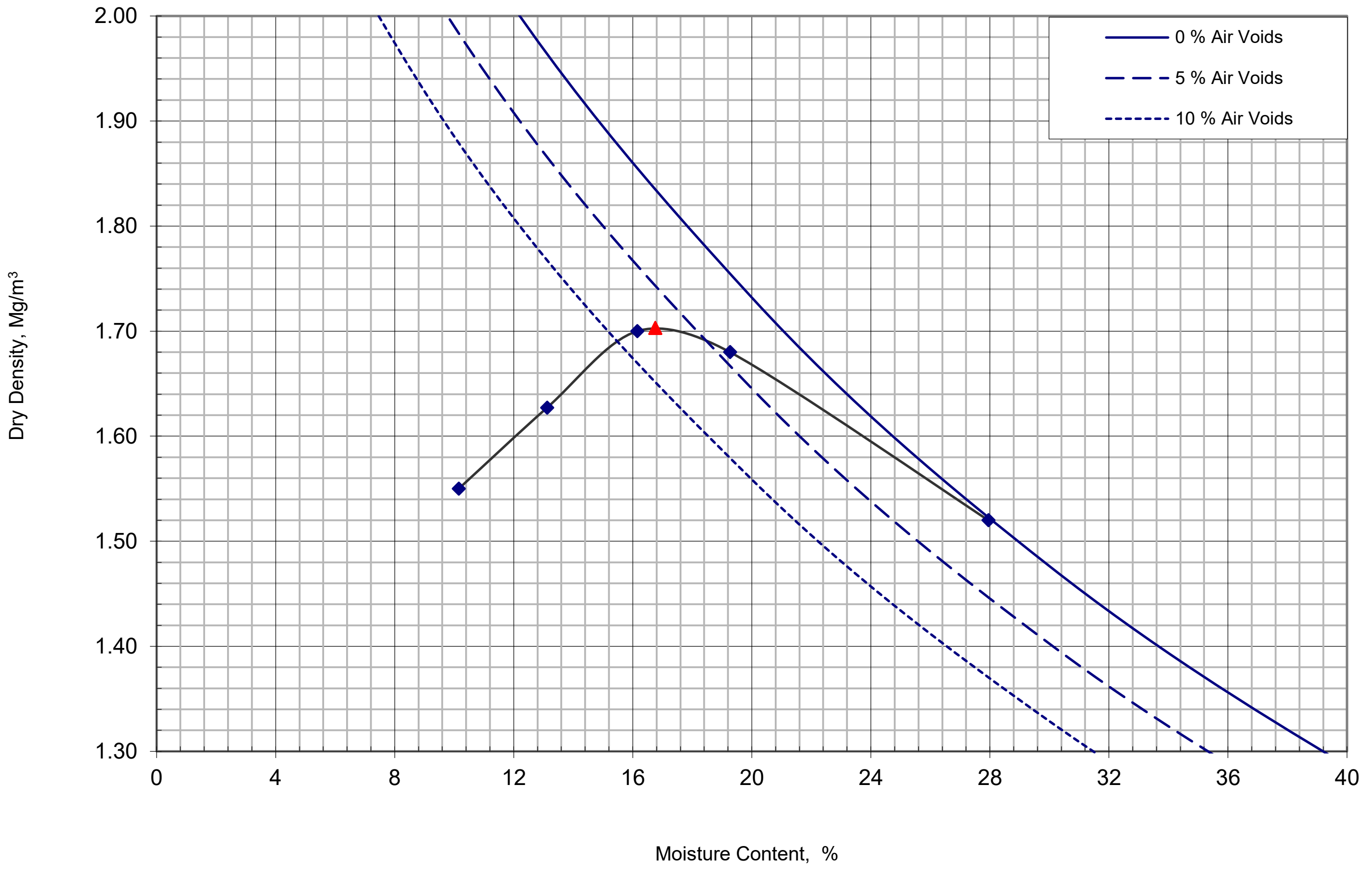
Sample Proportions	% dry mass
Cobbles	0
Gravel	28
Sand	2
Silt	6
Clay	64

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Ben. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Dry Density / Moisture Content Relationship** **BS 1377:Part 4:1990**	Contract Number	79564
		Borehole / Pit No	A1-SA1
Project Name	Ysgol Iolo Morganwg, Cowbridge	Sample No	1
Date Tested	23/07/2025	Depth Top	0.30
Compaction Method	2.5 Kg Rammer	Depth Base	
Compaction Clause	BS1377:Part 4:1990, Clause 3.4	Sample Type	B
Sample Description	Brown fine to coarse gravelly silty CLAY	Single or Separate Sample Used	Single



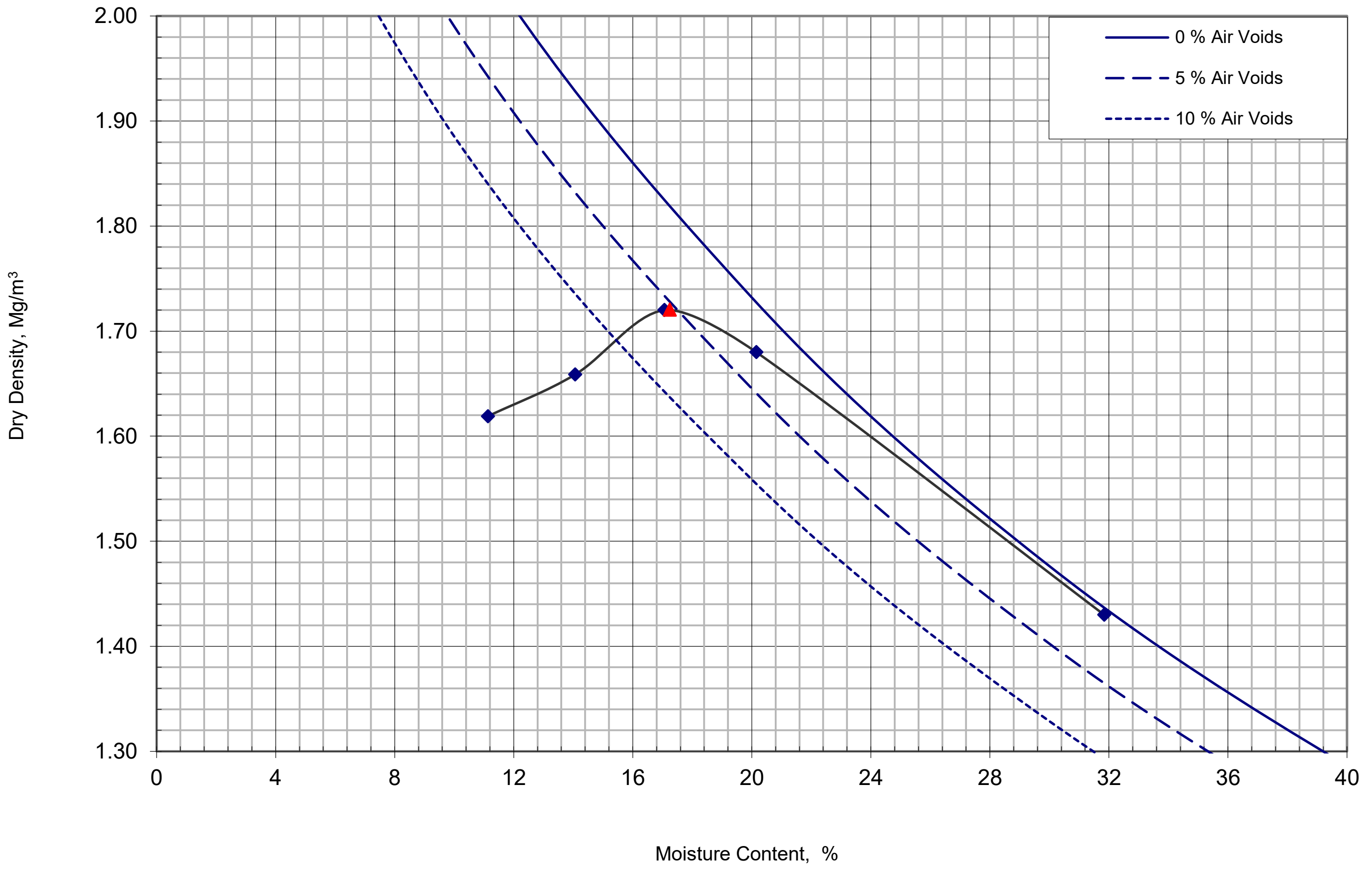
Compaction Point	1	2	3	4	5							
Moisture Content	10	13	16	19	28							
Bulk Density	1.71	1.84	1.97	2.00	1.94							
Dry Density	1.55	1.63	1.70	1.68	1.52							

Initial Moisture Content	28	%
Maximum Dry Density	1.70	Mg/m3
Optimum Moisture Content	17	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	52	%
Material Retained 20mm	6	%

Operator
Cameron. E

Dry Density / Moisture Content Relationship
BS 1377:Part 4:1990

		Contract Number	79564
		Borehole / Pit No	A1-SA2
Project Name	Ysgol Iolo Morganwg, Cowbridge	Sample No	1
Date Tested	23/07/2025	Depth Top	0.20
Compaction Method	2.5 Kg Rammer	Depth Base	
Compaction Clause	BS1377:Part 4:1990, Clause 3.4	Sample Type	B
Sample Description	Brown silty fine to coarse gravelly CLAY	Single or Separate Sample Used	Single

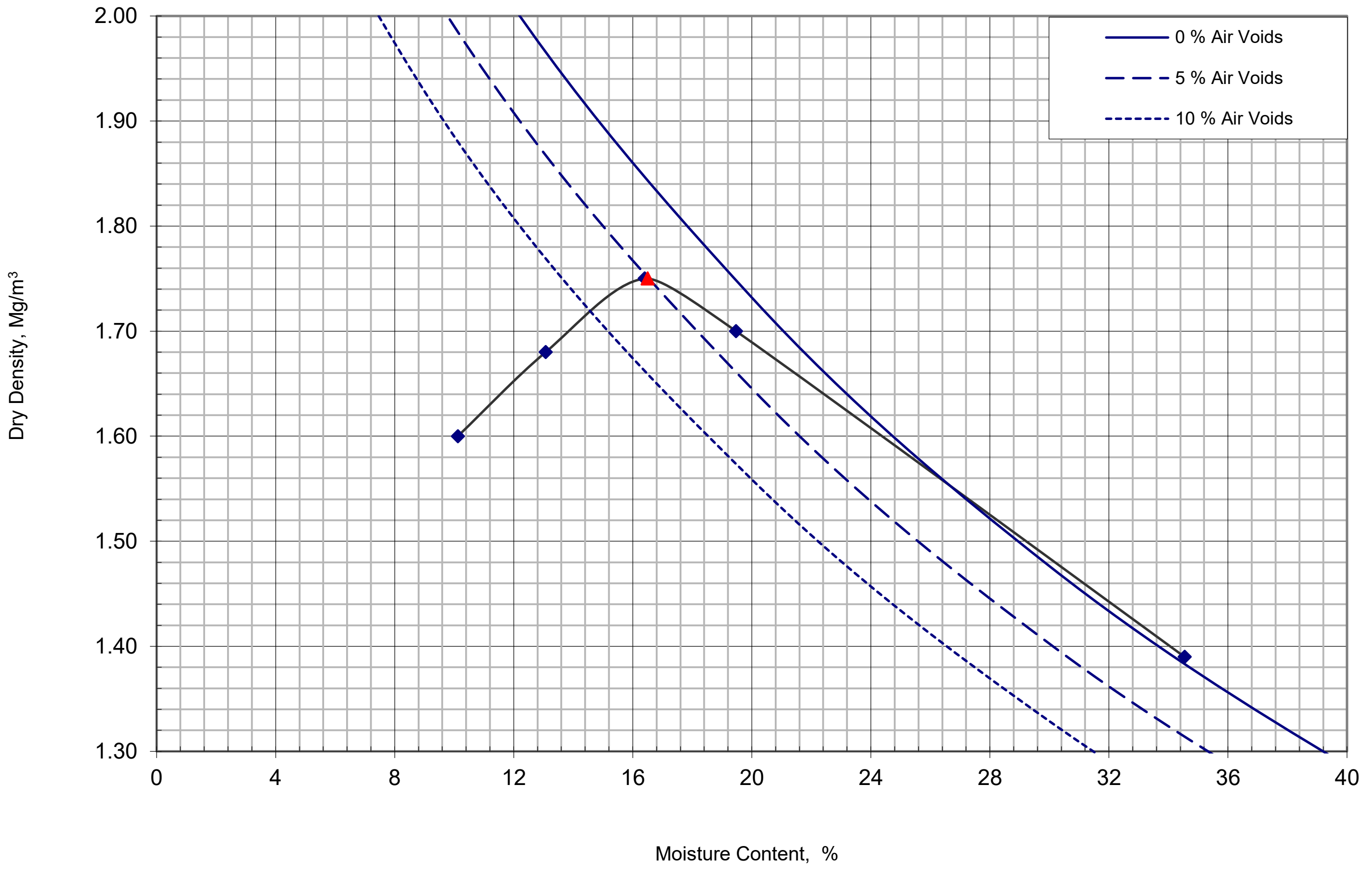


Compaction Point	1	2	3	4	5							
Moisture Content	11	14	17	20	32							
Bulk Density	1.80	1.89	2.01	2.02	1.89							
Dry Density	1.62	1.66	1.72	1.68	1.43							

Initial Moisture Content	32	%
Maximum Dry Density	1.72	Mg/m3
Optimum Moisture Content	17	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	42	%
Material Retained 20mm	5	%

Operator
Cameron. E

	Dry Density / Moisture Content Relationship **BS 1377:Part 4:1990**	Contract Number	79564
		Borehole / Pit No	A2-SA2
Project Name	Ysgol Iolo Morganwg, Cowbridge	Sample No	3
Date Tested	23/07/2025	Depth Top	0.70
Compaction Method	2.5 Kg Rammer	Depth Base	
Compaction Clause	BS1377:Part 4:1990, Clause 3.4	Sample Type	B
Sample Description	Brown silty fine to coarse gravelly CLAY	Single or Separate Sample Used	Single

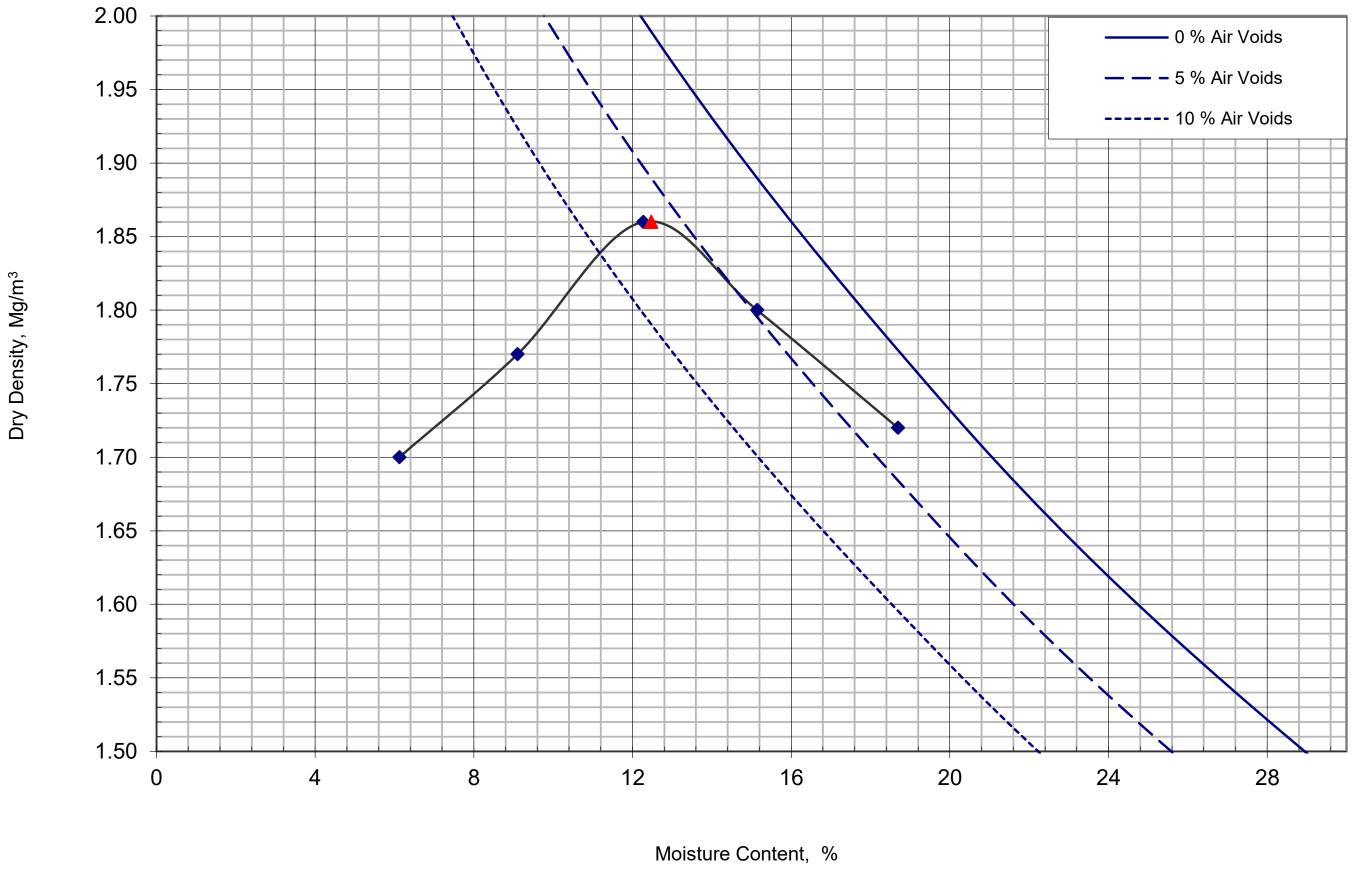


Compaction Point	1	2	3	4	5							
Moisture Content	10	13	16	19	35							
Bulk Density	1.76	1.90	2.04	2.03	1.87							
Dry Density	1.60	1.68	1.75	1.70	1.39							

Initial Moisture Content	35	%
Maximum Dry Density	1.75	Mg/m3
Optimum Moisture Content	17	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	44	%
Material Retained 20mm	12	%

Operator
Cameron. E

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Dry Density / Moisture Content Relationship** **BS 1377:Part 4:1990**	Contract Number	79564
		Borehole / Pit No	A3-SA4
Project Name	Ysgol Iolo Morganwg, Cowbridge	Sample No	3
Date Tested	23/07/2025	Depth Top	0.50
Compaction Method	2.5 Kg Rammer	Depth Base	
Compaction Clause	BS1377:Part 4:1990, Clause 3.4	Sample Type	B
Sample Description	Brown sandy silty fine to coarse gravelly CLAY	Single or Separate Sample Used	Single

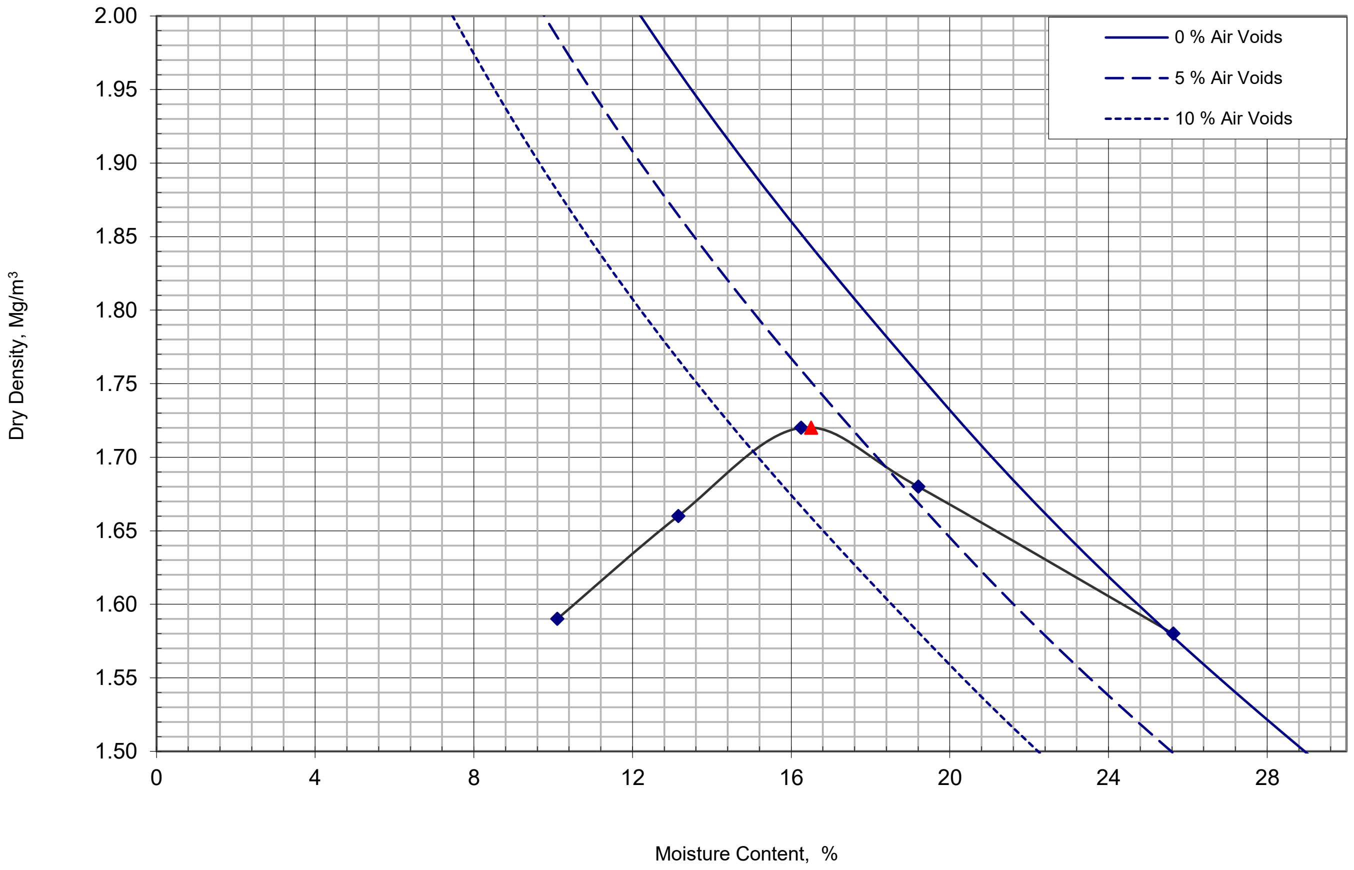


Compaction Point	1	2	3	4	5							
Moisture Content	6.1	9.1	12	15	19							
Bulk Density	1.80	1.93	2.09	2.07	2.04							
Dry Density	1.70	1.77	1.86	1.80	1.72							

Initial Moisture Content	19	%
Maximum Dry Density	1.86	Mg/m3
Optimum Moisture Content	12	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	38	%
Material Retained 20mm	12	%

Operator
Cameron. E

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Dry Density / Moisture Content Relationship** **BS 1377:Part 4:1990**	Contract Number	79564
		Borehole / Pit No	A3-SA5
Project Name	Ysgol Iolo Morganwg, Cowbridge	Sample No	4
Date Tested	23/07/2025	Depth Top	0.45
Compaction Method	2.5 Kg Rammer	Depth Base	
Compaction Clause	BS1377:Part 4:1990, Clause 3.4	Sample Type	B
Sample Description	Brown fine to coarse gravelly silty CLAY	Single or Separate Sample Used	Single

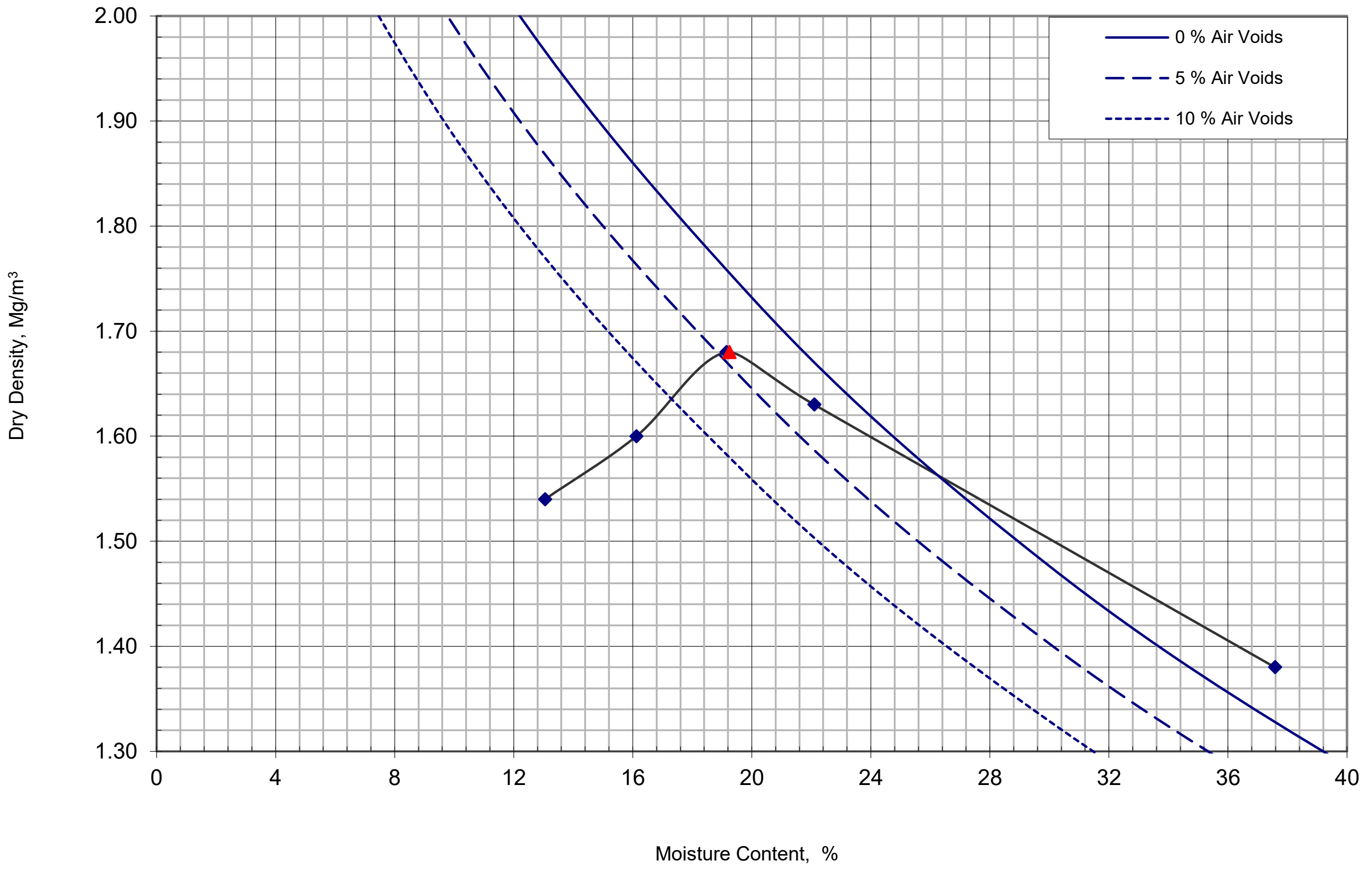


Compaction Point	1	2	3	4	5							
Moisture Content	10	13	16	19	26							
Bulk Density	1.75	1.88	2.00	2.00	1.98							
Dry Density	1.59	1.66	1.72	1.68	1.58							

Initial Moisture Content	26	%
Maximum Dry Density	1.72	Mg/m3
Optimum Moisture Content	17	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	40	%
Material Retained 20mm	13	%

Operator
Cameron. E

	Dry Density / Moisture Content Relationship **BS 1377:Part 4:1990**	Contract Number	79564
		Borehole / Pit No	A4-SA2
Project Name	Ysgol Iolo Morganwg, Cowbridge	Sample No	3
Date Tested	23/07/2025	Depth Top	0.45
Compaction Method	2.5 Kg Rammer	Depth Base	
Compaction Clause	BS1377:Part 4:1990, Clause 3.4	Sample Type	B
Sample Description	Brown slightly fine to coarse gravelly silty CLAY	Single or Separate Sample Used	Single



Compaction Point	1	2	3	4	5							
Moisture Content	13	16	19	22	38							
Bulk Density	1.74	1.86	2.00	1.99	1.90							
Dry Density	1.54	1.60	1.68	1.63	1.38							

Initial Moisture Content	38	%
Maximum Dry Density	1.68	Mg/m3
Optimum Moisture Content	19	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	10	%
Material Retained 20mm	0	%

Operator
Cameron. E

7 - 11 Harding Street
Leicester
LE1 4DH

GSTL
Unit 3-4 Heol Aur
Dafen Ind Estate
Dafen
SA14 8QN

Analytical Test Report: L25/07244/GSL - 25-74046

Your Project Reference:	**648 Ysgol Iolo Morganwg, Cowbridge**		
Your Order Number:	79564	Samples Received / Instructed:	18/07/2025 / 18/07/2025
Report Issue Number:	1	Sample Tested:	18/07 to 28/07/2025
Samples Analysed:	10 sample(s)	Report issued:	28/07/2025

Signed

James Gane
Analytical Services Manager
CTS

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

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

This report shall not be reproduce except in full

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

UKAS accreditation on waters only covers the Ground water and Surface water matrices

Date of Issue: 21.05.25
Issued by: J. Gane
Issue No: 4
Rev No: 27

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LE1 4DH

L25/07244/GSL - 25-74046

Project Reference - 648 Ysgol Iolo Morganwg, Cowbridge

Analytical Test Results - Chemical Analysis

Lab Reference			**550641**	**550642**	**550643**	**550644**	**550645**	**550646**
Client Sample ID			-	-	-	-	-	-
Client Sample Location			WS01	WS02	WS03	WS04	WS05	A4-SA3
Client Sample Type			D	D	D	D	D	D
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			0.70	0.55	0.15	1.50	0.00	0.10
Depth - Bottom (m)			0.70	0.55	0.40	1.50	0.30	0.10
Date of Sampling			-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Clay	Clay	Other	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**						
Water soluble sulphate (as SO_4)	(mg/l)	u	35	190	76	72	340	< 10
Acid Soluble Sulphate	(%)	u	< 0.01	0.04	0.02	< 0.01	0.10	0.04
Total Sulphur	(%)	UKAS	< 0.01	0.02	0.04	< 0.01	0.06	0.04
pH Value	pH Units	MCERTS	7.4	6.8	7.1	7.1	7.0	7.4

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L25/07244/GSL - 25-74046

Project Reference - 648 Ysgol Iolo Morganwg, Cowbridge

Analytical Test Results - Chemical Analysis

Lab Reference			**550647**	**550648**	**550649**	**550650**
Client Sample ID			-	-	-	-
Client Sample Location			A3-SA6	A1-SA1	A2-SA1	A3-SA5
Client Sample Type			D	D	D	D
Client Sample Number			-	-	-	-
Depth - Top (m)			0.50	0.50	0.60	0.10
Depth - Bottom (m)			0.50	0.50	0.60	0.10
Date of Sampling			-	-	-	-
Time of Sampling			-	-	-	-
Sample Matrix			Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**				
Water soluble sulphate (as SO_4)	(mg/l)	u	53	< 10	81	100
Acid Soluble Sulphate	(%)	u	< 0.01	0.04	0.09	0.21
Total Sulphur	(%)	UKAS	0.02	0.02	0.05	0.12
pH Value	pH Units	MCERTS	7.0	7.2	7.2	7.3

L25/07244/GSL - 25-74046

Project Reference - 648 Ysgol Iolo Morganwg, Cowbridge

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 (%)
550641	-	WS01	D	-	Brown slightly gravelly slightly sandy silty clay with rare organic matter	-	-	97
550642	-	WS02	D	-	Brown slightly sandy silty clay	-	-	100
550643	-	WS03	D	-	Light grey crushed rock	-	-	100
550644	-	WS04	D	-	Light brown slightly sandy silty clay with rare organic matter	-	-	100
550645	-	WS05	D	-	Brown slightly gravelly slightly sandy silty clay with rare organic matter	-	-	92
550646	-	A4-SA3	D	-	Brown silty sandy clay with rare organic matter brick fragments	-	-	100
550647	-	A3-SA6	D	-	Light brown slightly gravelly slightly sandy silty clay	-	-	97
550648	-	A1-SA1	D	-	Brown slightly gravelly slightly sandy silty clay with rare organic matter	-	-	92
550649	-	A2-SA1	D	-	Brown slightly gravelly slightly sandy silty clay	-	-	95
550650	-	A3-SA5	D	-	Brown slightly gravelly silty sandy clay with frequent organic matter	-	-	59

L25/07244/GSL - 25-74046

Project Reference - 648 Ysgol Iolo Morganwg, Cowbridge

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
550641	-	WS01	D	-	
550642	-	WS02	D	-	
550643	-	WS03	D	-	
550644	-	WS04	D	-	
550645	-	WS05	D	-	
550646	-	A4-SA3	D	-	
550647	-	A3-SA6	D	-	
550648	-	A1-SA1	D	-	
550649	-	A2-SA1	D	-	
550650	-	A3-SA5	D	-	

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L25/07244/GSL - 25-74046

Project Reference - 648 Ysgol Iolo Morganwg, Cowbridge

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
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)

L25/07244/GSL - 25-74046

Project Reference - 648 Ysgol Iolo Morganwg, Cowbridge

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
W - No time of sampling provided for water sample
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
550641	-	WS01	D	-		A
550642	-	WS02	D	-		A
550643	-	WS03	D	-		A
550644	-	WS04	D	-		A
550645	-	WS05	D	-		A
550646	-	A4-SA3	D	-		A
550647	-	A3-SA6	D	-		A
550648	-	A1-SA1	D	-		A
550649	-	A2-SA1	D	-		A
550650	-	A3-SA5	D	-		A

ANNEX I
Ground Gas Monitoring Results

GROUND GAS & GROUNDWATER MONITORING RESULTS

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 24-648-CA
Date: 03/07/2025
Engineer: Calum Blackman
Weather: Cloudy
Visit: 1 of 6

Baro Pressure

Equipment/Serial: GA5000/G506329

https://www.weatheronline.co.uk/weather/maps/forecastmaps?LANG=en&CONT=ukuk&R=150
(insert pressure graph here for previous month)

ID	TIME	CH4	CO2	O2	BAL	BARO	TECH	FLOW	CO	H2S	Res N	VOC	GROUNDWATER (m)			BASE	REMARKS
		%	%	%	%	mb	ID	l/h	ppm	ppm	%	ppm	LNAPL	DNAPL	LEVEL	m	
WS01	16:11:00	0.00	3.60	15.90	80.50	1022	RH	0.00	0.00	0.00	20.40						
WS02	16:30:00	0.00	3.80	19.00	77.20	1022	RH	-0.20	0.00	0.00	5.38						
WS04	16:21:00	0.00	2.20	18.70	79.10	1022	RH	0.00	0.00	0.00	8.41						
WS08	16:02:00	0.00	2.80	18.10	79.10	1022	RH	0.00	0.00	0.00	10.68						

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GROUND GAS & GROUNDWATER MONITORING RESULTS

Site Name: Ysgol Iolo Morganwg Primary School
Project Number: 24-648-CA
Date: 16/07/2025
Engineer: Calum Blackman
Weather: Cloudy
Visit: 2 of 6

Baro Pressure

Equipment/Serial: GA5000/G508273

https://www.weatheronline.co.uk/weather/maps/forecastmaps?LANG=en&CONT=ukuk&R=150
(insert pressure graph here for previous month)

ID	TIME	CH4	CO2	O2	BAL	BARO	TECH	FLOW	CO	H2S	Res N	VOC	GROUNDWATER (m)			BASE	REMARKS
		%	%	%	%	mb	ID	l/h	ppm	ppm	%	ppm	LNAPL	DNAPL	LEVEL	m	
WS01	12:49:00	0.00	2.90	19.30	77.80	1011	RH	0.00	0.00	0.00	4.85						
WS02	13:21:00	0.00	2.70	20.50	76.80	1011	RH	0.00	0.00	0.00	0.00						
WS04	13:07:00	0.00	2.60	19.90	77.50	1011	RH	0.00	0.00	0.00	2.28						
WS08	12:36:00	0.00	3.20	18.20	78.60	1010	RH	0.00	0.00	0.00	9.80						

ANNEX J
CBR Correlations

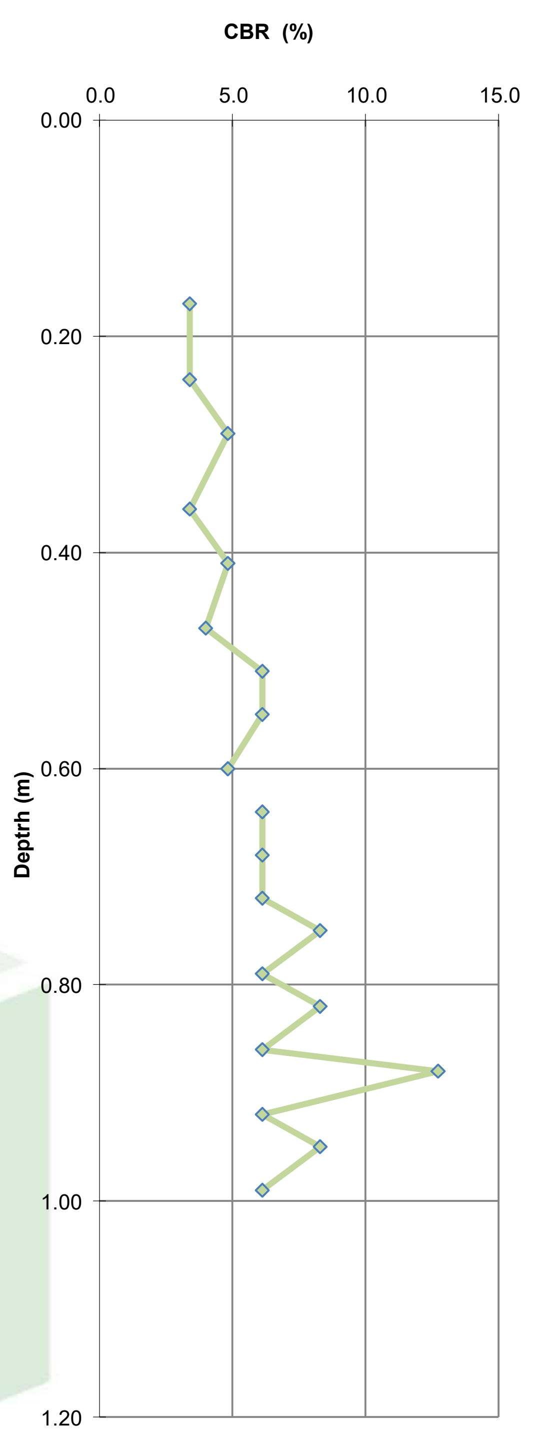
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP20**

Initial Scale Reading (mm) 100 Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	170	70	0.17	70	3.4
1	240	70	0.24	70	3.4
1	290	50	0.29	50	4.8
1	360	70	0.36	70	3.4
1	410	50	0.41	50	4.8
1	470	60	0.47	60	4.0
1	510	40	0.51	40	6.1
1	550	40	0.55	40	6.1
1	600	50	0.60	50	4.8
1	640	40	0.64	40	6.1
1	680	40	0.68	40	6.1
1	720	40	0.72	40	6.1
1	750	30	0.75	30	8.3
1	790	40	0.79	40	6.1
1	820	30	0.82	30	8.3
1	860	40	0.86	40	6.1
1	880	20	0.88	20	12.7
1	920	40	0.92	40	6.1
1	950	30	0.95	30	8.3
1	990	40	0.99	40	6.1



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

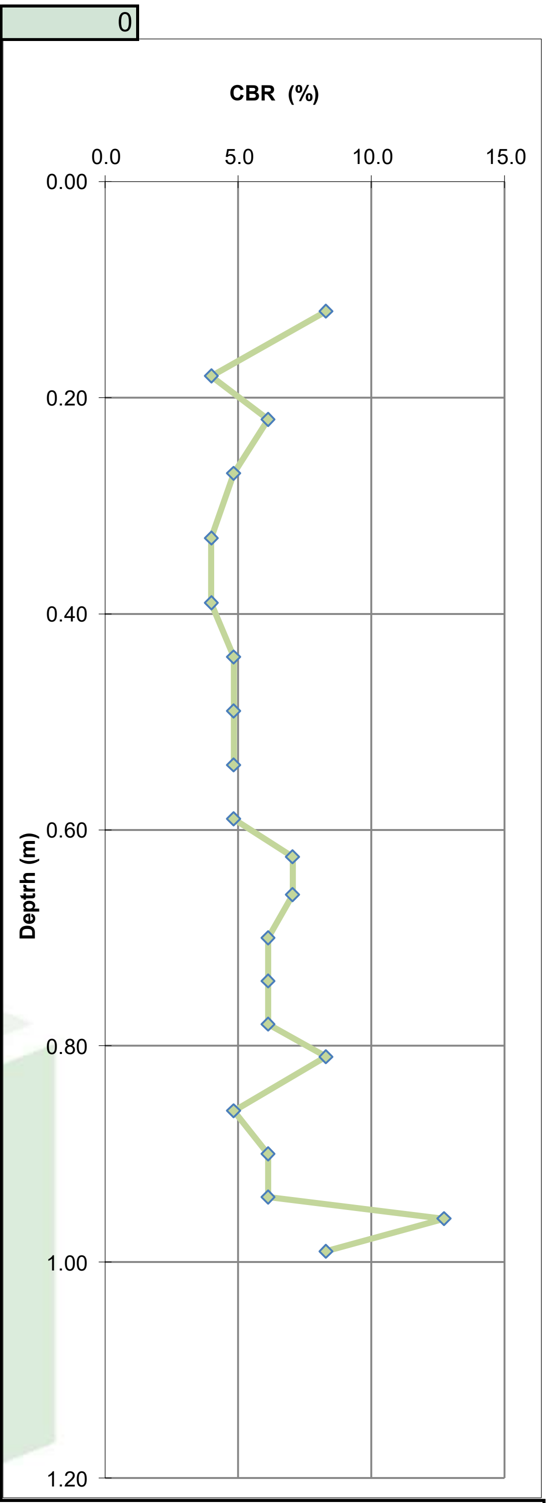
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: DCP19

Initial Scale Reading (mm) 90
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	120	30	0.12	30	8.3
1	180	60	0.18	60	4.0
1	220	40	0.22	40	6.1
1	270	50	0.27	50	4.8
1	330	60	0.33	60	4.0
1	390	60	0.39	60	4.0
1	440	50	0.44	50	4.8
1	490	50	0.49	50	4.8
1	540	50	0.54	50	4.8
1	590	50	0.59	50	4.8
1	625	35	0.63	35	7.0
1	660	35	0.66	35	7.0
1	700	40	0.70	40	6.1
1	740	40	0.74	40	6.1
1	780	40	0.78	40	6.1
1	810	30	0.81	30	8.3
1	860	50	0.86	50	4.8
1	900	40	0.90	40	6.1
1	940	40	0.94	40	6.1
1	960	20	0.96	20	12.7
1	990	30	0.99	30	8.3



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

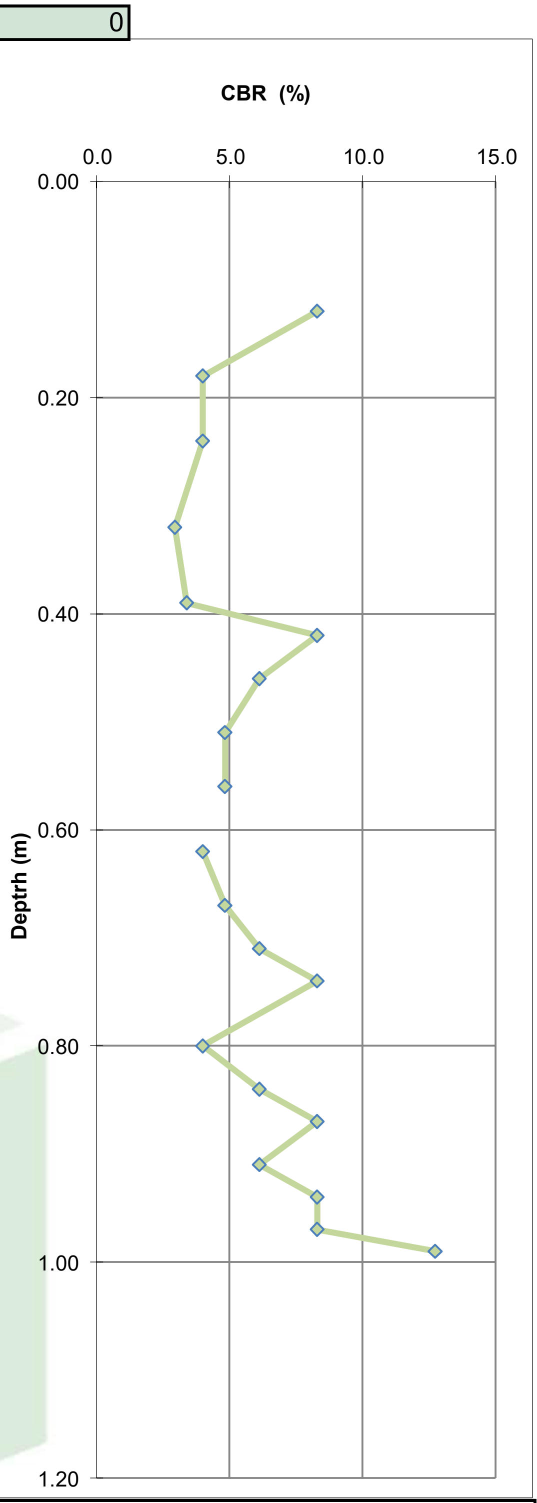
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP18**

Initial Scale Reading (mm): 90
Datum bgl (mm): 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	120	30	0.12	30	8.3
1	180	60	0.18	60	4.0
1	240	60	0.24	60	4.0
1	320	80	0.32	80	2.9
1	390	70	0.39	70	3.4
1	420	30	0.42	30	8.3
1	460	40	0.46	40	6.1
1	510	50	0.51	50	4.8
1	560	50	0.56	50	4.8
1	620	60	0.62	60	4.0
1	670	50	0.67	50	4.8
1	710	40	0.71	40	6.1
1	740	30	0.74	30	8.3
1	800	60	0.80	60	4.0
1	840	40	0.84	40	6.1
1	870	30	0.87	30	8.3
1	910	40	0.91	40	6.1
1	940	30	0.94	30	8.3
1	970	30	0.97	30	8.3
1	990	20	0.99	20	12.7



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST

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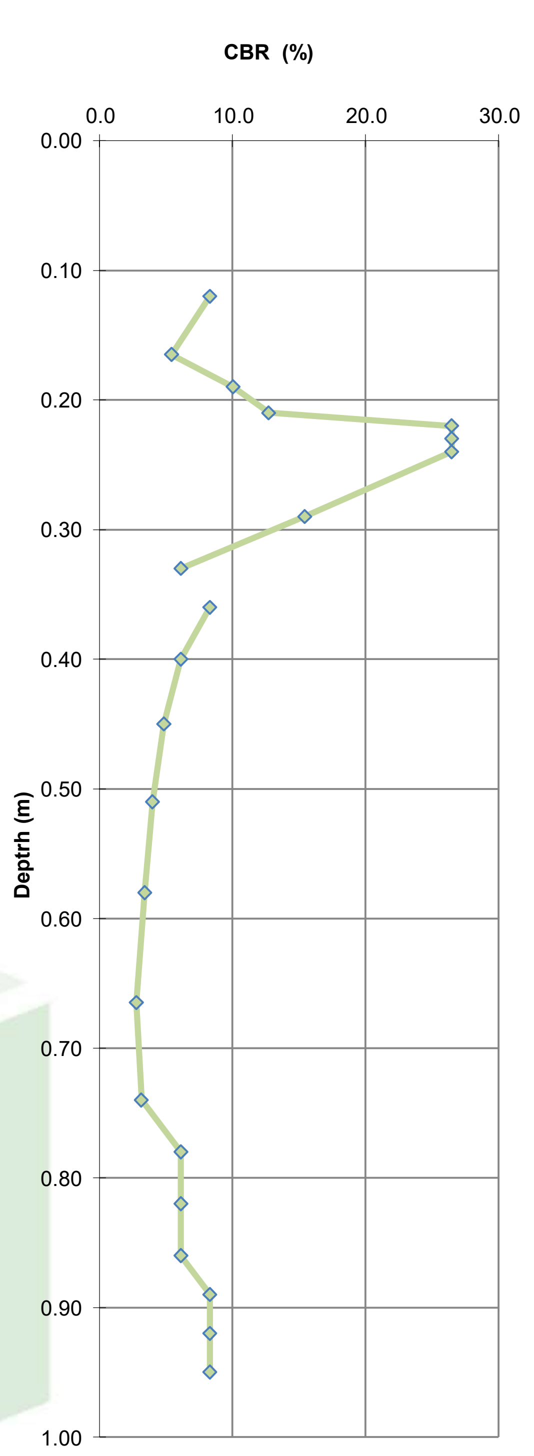
Site Name: Ysgol Iolo Morganwg Primary Schoc
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: DCP17

Initial Scale Reading (mm) 90
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	120	30	0.12	30	8.3
1	165	45	0.17	45	5.4
1	190	25	0.19	25	10.1
1	210	20	0.21	20	12.7
1	220	10	0.22	10	26.5
1	230	10	0.23	10	26.5
1	240	10	0.24	10	26.5
3	290	50	0.29	17	15.4
1	330	40	0.33	40	6.1
1	360	30	0.36	30	8.3
1	400	40	0.40	40	6.1
1	450	50	0.45	50	4.8
1	510	60	0.51	60	4.0
1	580	70	0.58	70	3.4
1	665	85	0.67	85	2.8
1	740	75	0.74	75	3.1
1	780	40	0.78	40	6.1
1	820	40	0.82	40	6.1
1	860	40	0.86	40	6.1
1	890	30	0.89	30	8.3
1	920	30	0.92	30	8.3
1	950	30	0.95	30	8.3



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

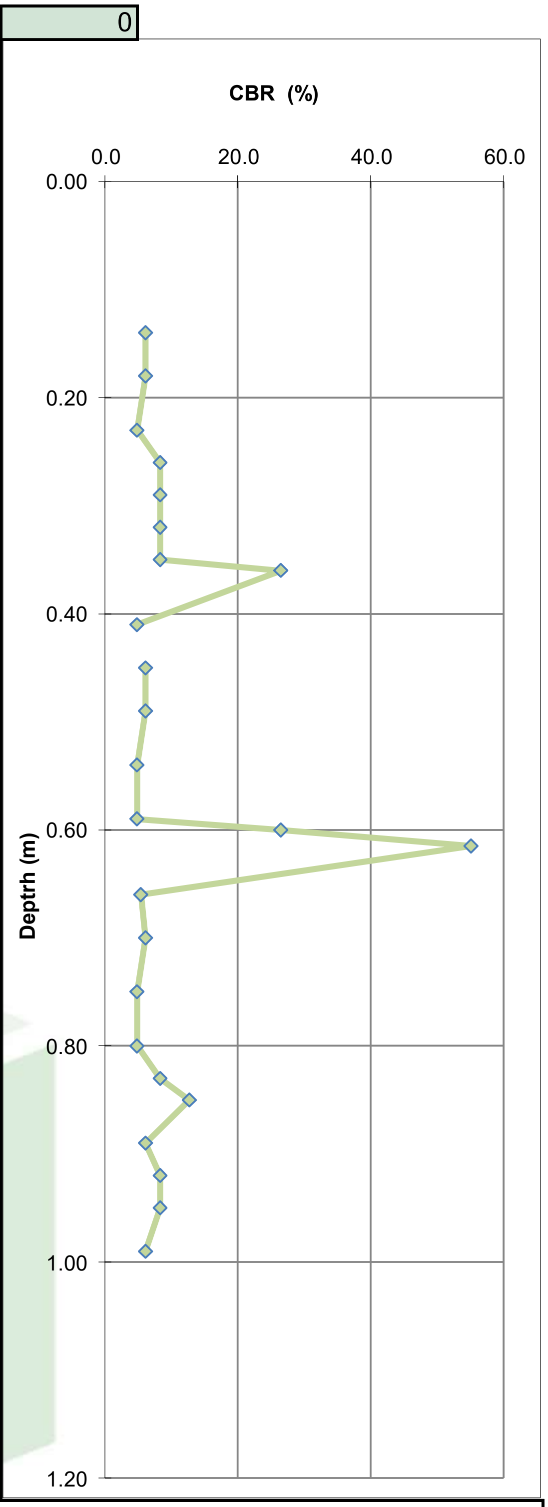
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP16**

Initial Scale Reading (mm) 100   Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	140	40	0.14	40	6.1
1	180	40	0.18	40	6.1
1	230	50	0.23	50	4.8
1	260	30	0.26	30	8.3
1	290	30	0.29	30	8.3
1	320	30	0.32	30	8.3
1	350	30	0.35	30	8.3
1	360	10	0.36	10	26.5
1	410	50	0.41	50	4.8
1	450	40	0.45	40	6.1
1	490	40	0.49	40	6.1
1	540	50	0.54	50	4.8
1	590	50	0.59	50	4.8
1	600	10	0.60	10	26.5
3	615	15	0.62	5	55.1
1	660	45	0.66	45	5.4
1	700	40	0.70	40	6.1
1	750	50	0.75	50	4.8
1	800	50	0.80	50	4.8
1	830	30	0.83	30	8.3
1	850	20	0.85	20	12.7
1	890	40	0.89	40	6.1
1	920	30	0.92	30	8.3
1	950	30	0.95	30	8.3
1	990	40	0.99	40	6.1



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

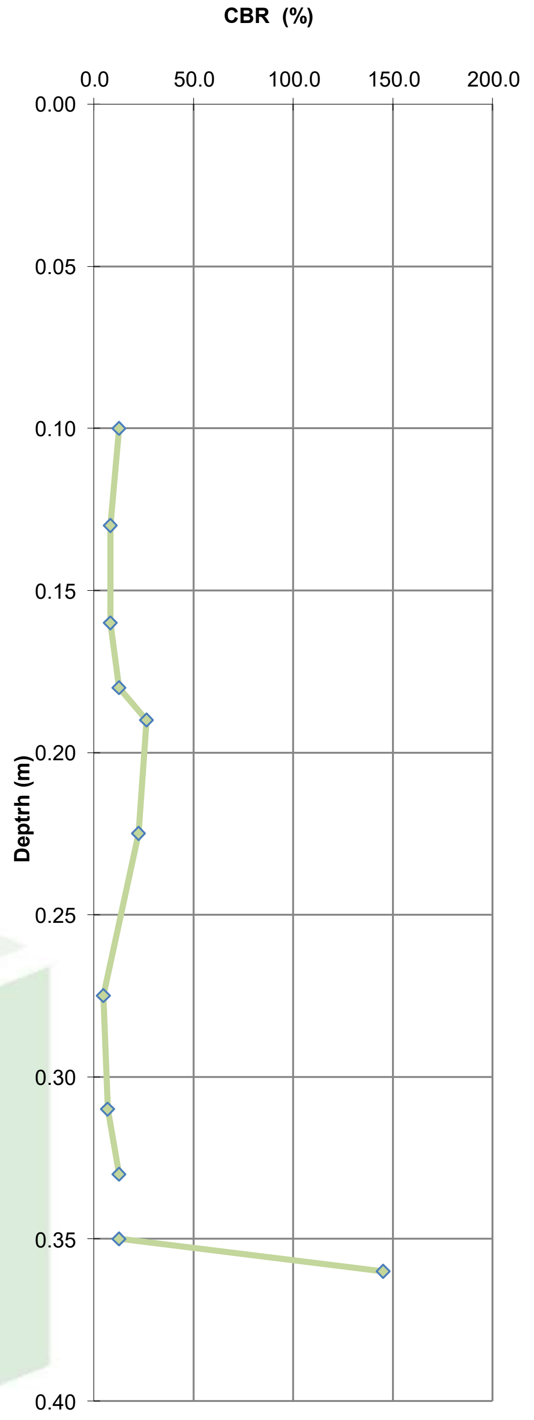
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP15**

Initial Scale Reading (mm) 80
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	100	20	0.10	20	12.7
1	130	30	0.13	30	8.3
1	160	30	0.16	30	8.3
1	180	20	0.18	20	12.7
1	190	10	0.19	10	26.5
3	225	35	0.23	12	22.5
1	275	50	0.28	50	4.8
1	310	35	0.31	35	7.0
1	330	20	0.33	20	12.7
1	350	20	0.35	20	12.7
5	360	10	0.36	2	145.1



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

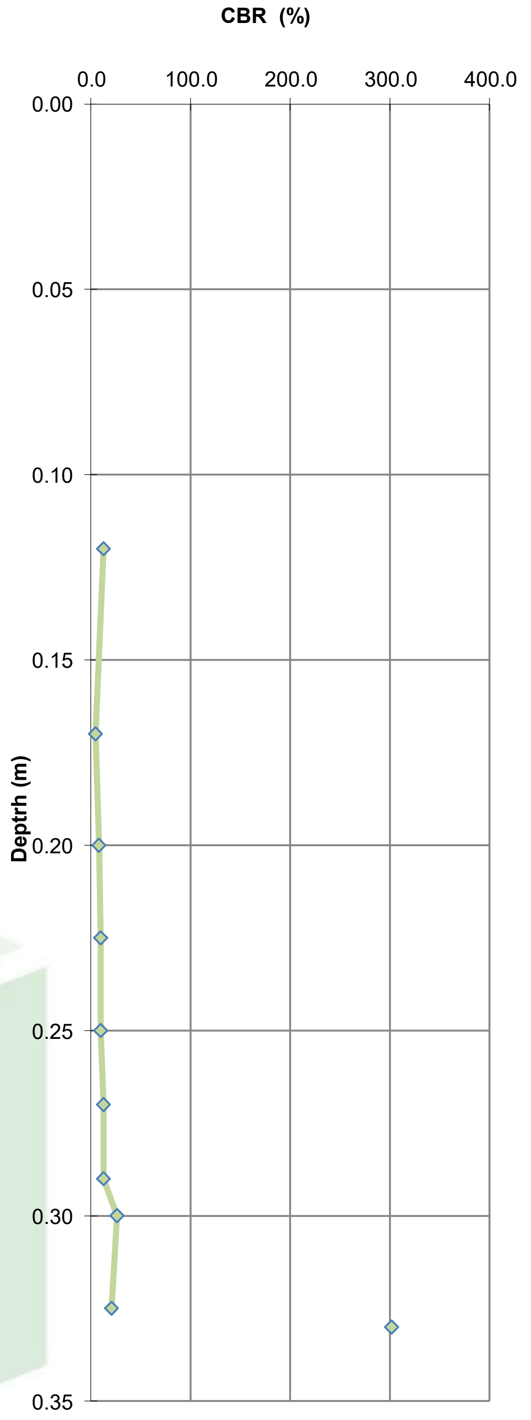
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: DCP14

Initial Scale Reading (mm) 100 Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	120	20	0.12	20	12.7
1	170	50	0.17	50	4.8
1	200	30	0.20	30	8.3
1	225	25	0.23	25	10.1
1	250	25	0.25	25	10.1
1	270	20	0.27	20	12.7
1	290	20	0.29	20	12.7
1	300	10	0.30	10	26.5
2	325	25	0.33	13	20.9
5	330	5	0.33	1	302.0



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

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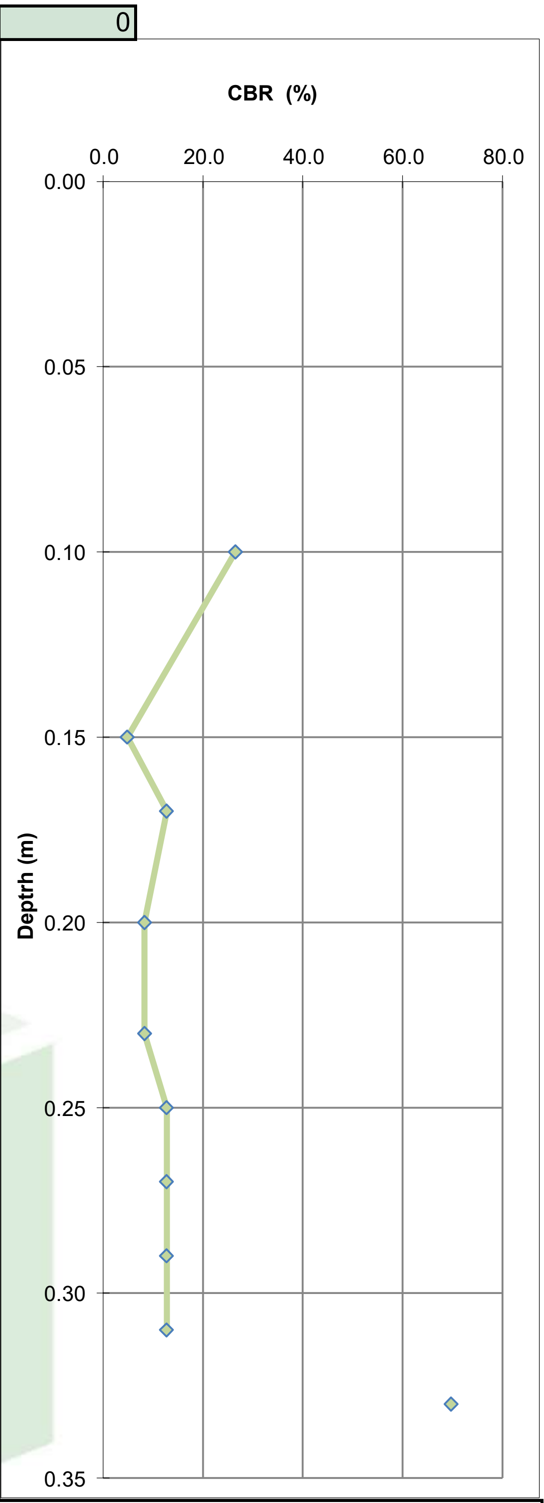
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP13**

Initial Scale Reading (mm) 90 Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	100	10	0.10	10	26.5
1	150	50	0.15	50	4.8
1	170	20	0.17	20	12.7
1	200	30	0.20	30	8.3
1	230	30	0.23	30	8.3
1	250	20	0.25	20	12.7
1	270	20	0.27	20	12.7
1	290	20	0.29	20	12.7
1	310	20	0.31	20	12.7
5	330	20	0.33	4	69.8



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

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Ref: QF-039

V1 Issued: Nov 2020
Reviewed: Nov 2020

DYNAMIC CONE PENETROMETER TEST

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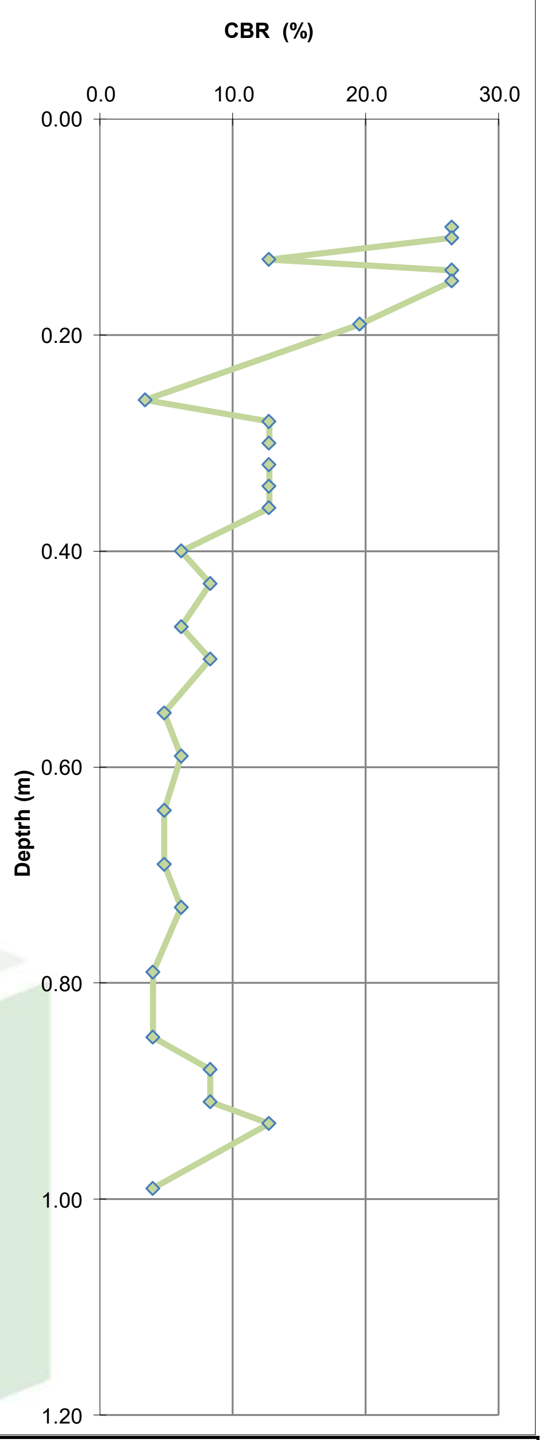
Site Name: Ysgol Iolo Morganwg Primary Schoc
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP12**

Initial Scale Reading (mm) 90
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	100	10	0.10	10	26.5
1	110	10	0.11	10	26.5
1	130	20	0.13	20	12.7
1	140	10	0.14	10	26.5
1	150	10	0.15	10	26.5
3	190	40	0.19	13	19.5
1	260	70	0.26	70	3.4
1	280	20	0.28	20	12.7
1	300	20	0.30	20	12.7
1	320	20	0.32	20	12.7
1	340	20	0.34	20	12.7
1	360	20	0.36	20	12.7
1	400	40	0.40	40	6.1
1	430	30	0.43	30	8.3
1	470	40	0.47	40	6.1
1	500	30	0.50	30	8.3
1	550	50	0.55	50	4.8
1	590	40	0.59	40	6.1
1	640	50	0.64	50	4.8
1	690	50	0.69	50	4.8
1	730	40	0.73	40	6.1
1	790	60	0.79	60	4.0
1	850	60	0.85	60	4.0
1	880	30	0.88	30	8.3
1	910	30	0.91	30	8.3
1	930	20	0.93	20	12.7
1	990	60	0.99	60	4.0



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

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DYNAMIC CONE PENETROMETER TEST

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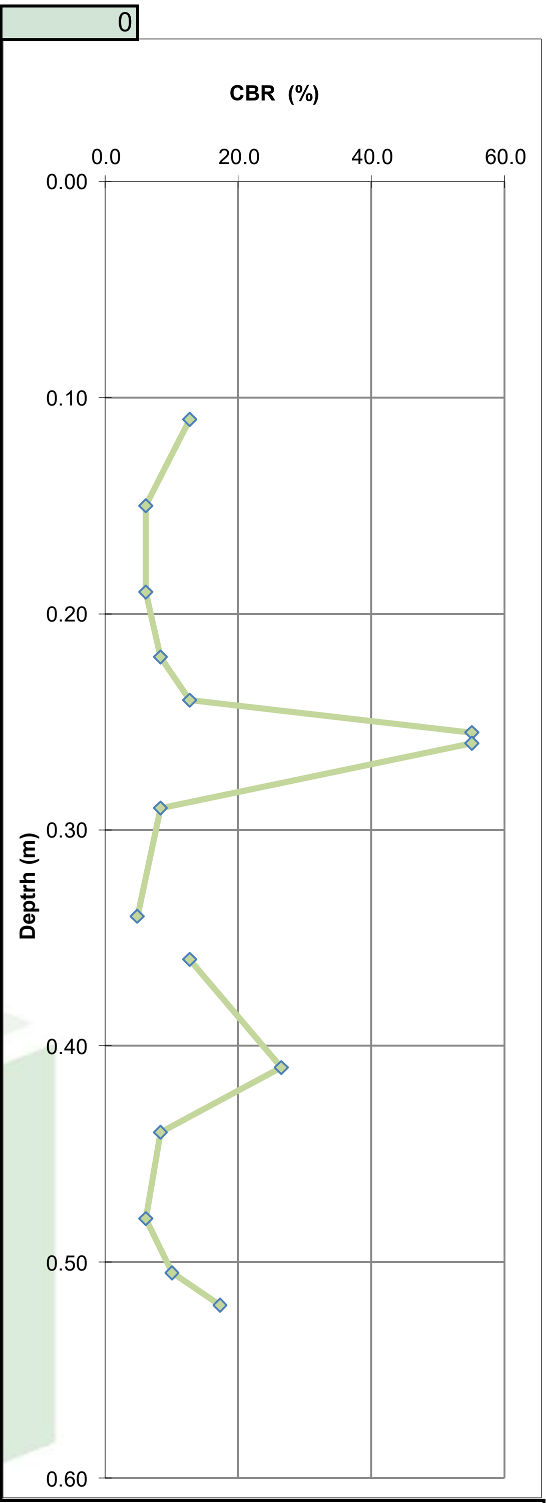
Site Name: Ysgol Iolo Morganwg Primary Schoc
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP11**

Initial Scale Reading (mm) 90 Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	110	20	0.11	20	12.7
1	150	40	0.15	40	6.1
1	190	40	0.19	40	6.1
1	220	30	0.22	30	8.3
1	240	20	0.24	20	12.7
3	255	15	0.26	5	55.1
1	260	5	0.26	5	55.1
1	290	30	0.29	30	8.3
1	340	50	0.34	50	4.8
1	360	20	0.36	20	12.7
5	410	50	0.41	10	26.5
1	440	30	0.44	30	8.3
1	480	40	0.48	40	6.1
1	505	25	0.51	25	10.1
1	520	15	0.52	15	17.3



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

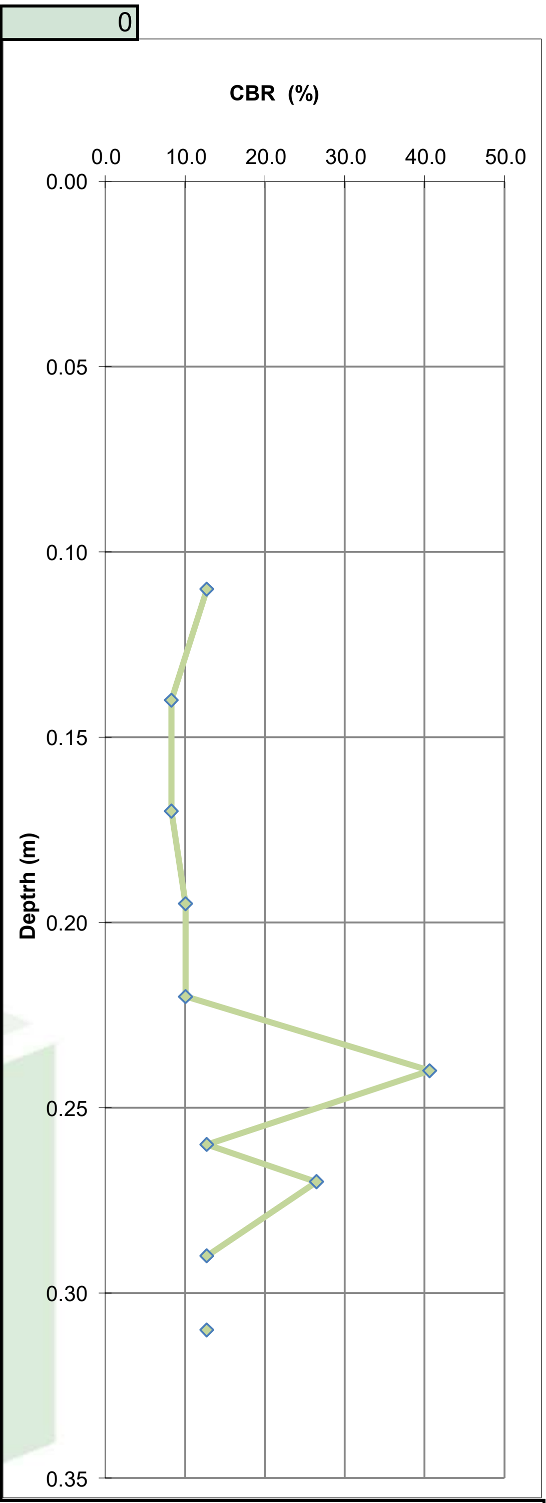
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP10**

Initial Scale Reading (mm) 90 | Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	110	20	0.11	20	12.7
1	140	30	0.14	30	8.3
1	170	30	0.17	30	8.3
1	195	25	0.20	25	10.1
1	220	25	0.22	25	10.1
3	240	20	0.24	7	40.7
1	260	20	0.26	20	12.7
1	270	10	0.27	10	26.5
1	290	20	0.29	20	12.7
1	310	20	0.31	20	12.7



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST

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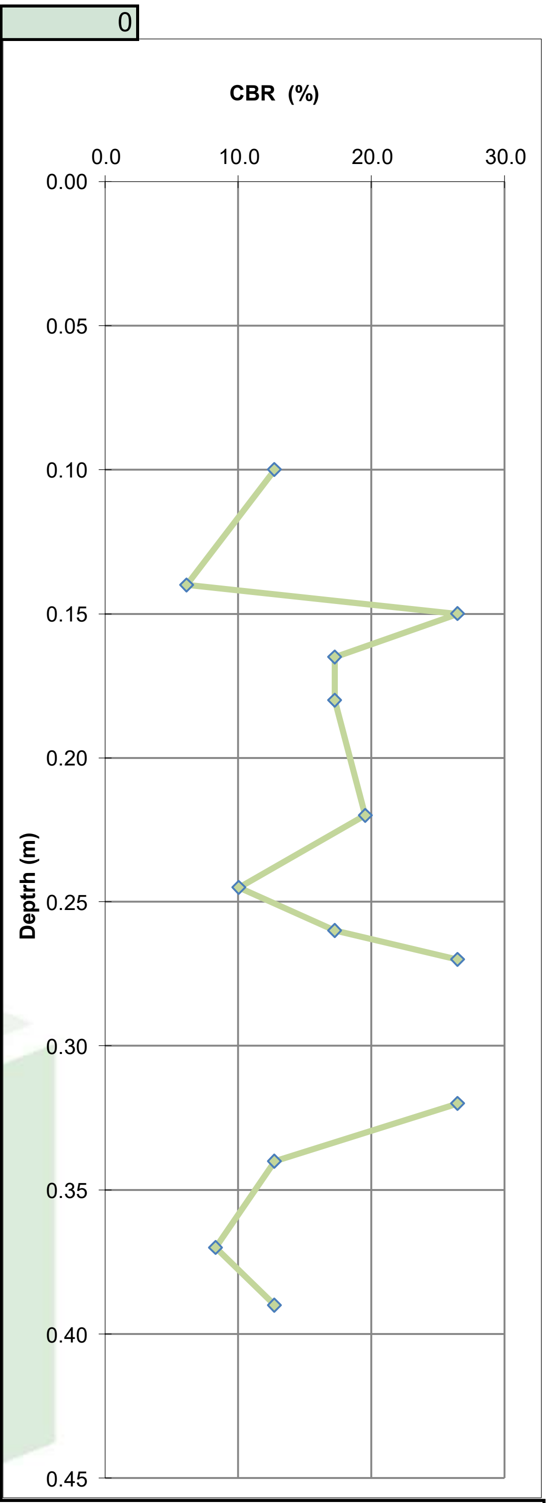
Site Name: Ysgol Iolo Morganwg Primary Schoc
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP09**

Initial Scale Reading (mm) 80 Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	100	20	0.10	20	12.7
1	140	40	0.14	40	6.1
1	150	10	0.15	10	26.5
1	165	15	0.17	15	17.3
1	180	15	0.18	15	17.3
3	220	40	0.22	13	19.5
1	245	25	0.25	25	10.1
1	260	15	0.26	15	17.3
1	270	10	0.27	10	26.5
5	320	50	0.32	10	26.5
1	340	20	0.34	20	12.7
1	370	30	0.37	30	8.3
1	390	20	0.39	20	12.7



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

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V1 Issued: Nov 2020
Reviewed: Nov 2020

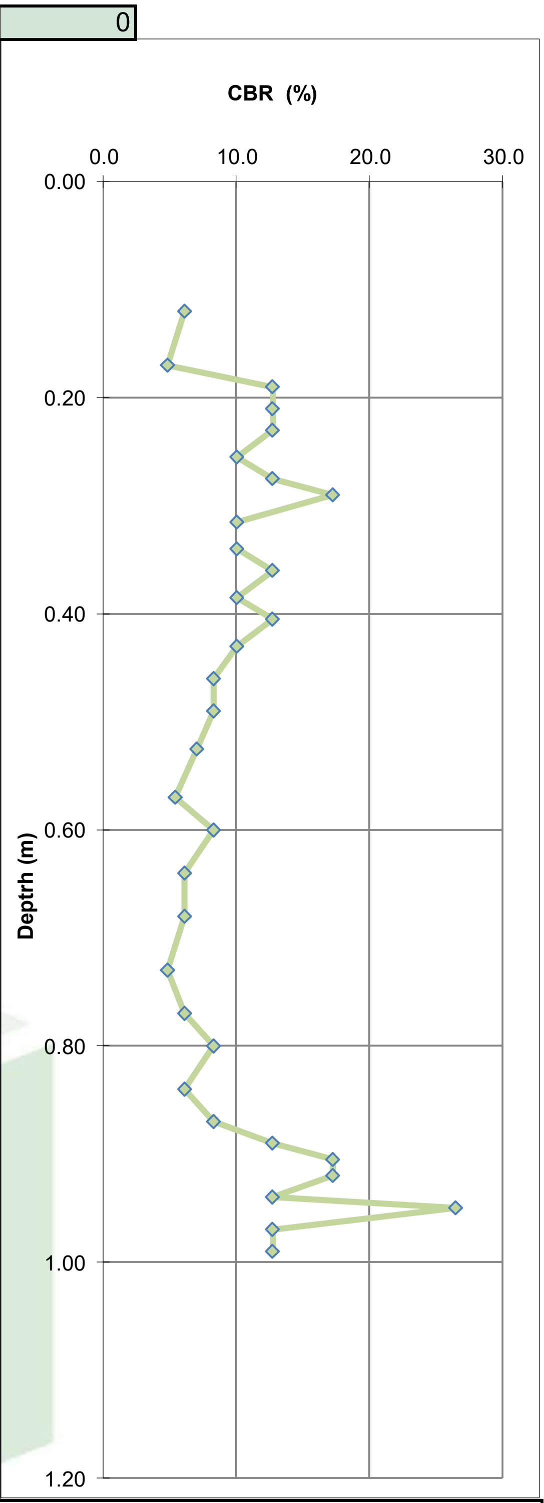
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP08**

Initial Scale Reading (mm) 80
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	120	40	0.12	40	6.1
1	170	50	0.17	50	4.8
1	190	20	0.19	20	12.7
1	210	20	0.21	20	12.7
1	230	20	0.23	20	12.7
1	255	25	0.26	25	10.1
1	275	20	0.28	20	12.7
1	290	15	0.29	15	17.3
1	315	25	0.32	25	10.1
1	340	25	0.34	25	10.1
1	360	20	0.36	20	12.7
1	385	25	0.39	25	10.1
1	405	20	0.41	20	12.7
1	430	25	0.43	25	10.1
1	460	30	0.46	30	8.3
1	490	30	0.49	30	8.3
1	525	35	0.53	35	7.0
1	570	45	0.57	45	5.4
1	600	30	0.60	30	8.3
1	640	40	0.64	40	6.1
1	680	40	0.68	40	6.1
1	730	50	0.73	50	4.8
1	770	40	0.77	40	6.1
1	800	30	0.80	30	8.3
1	840	40	0.84	40	6.1
1	870	30	0.87	30	8.3
1	890	20	0.89	20	12.7
1	905	15	0.91	15	17.3
1	920	15	0.92	15	17.3
1	940	20	0.94	20	12.7
1	950	10	0.95	10	26.5
1	970	20	0.97	20	12.7
1	990	20	0.99	20	12.7



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

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Reviewed: Nov 2020

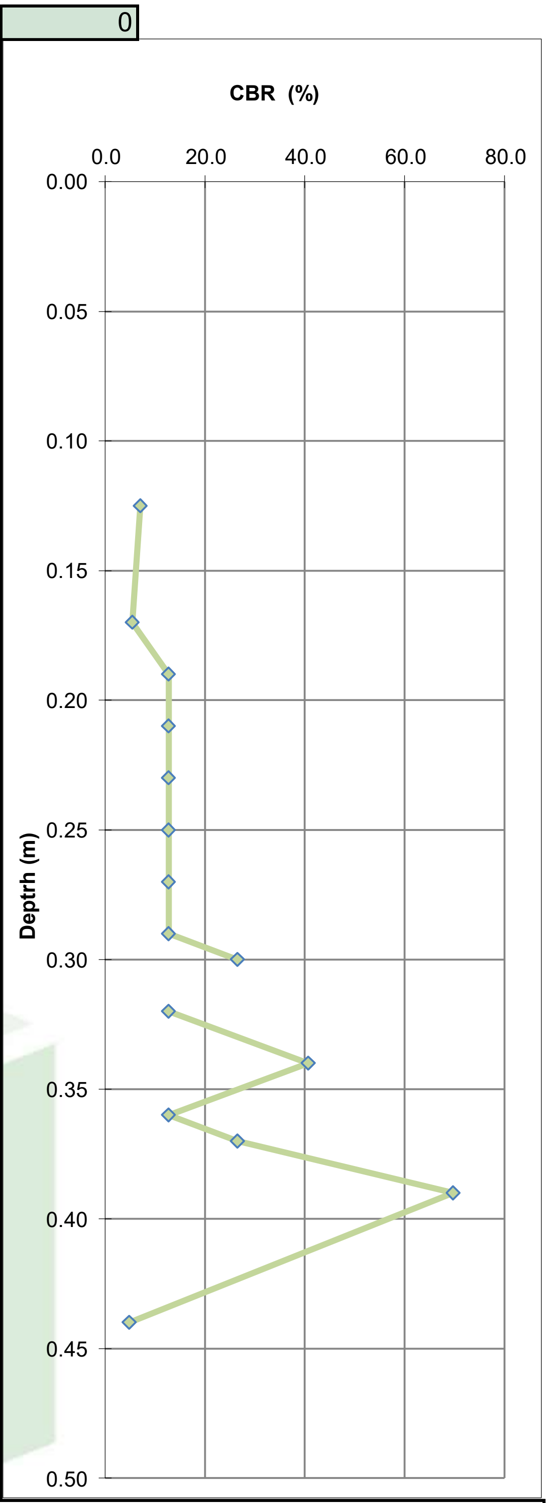
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP07**

Initial Scale Reading (mm) 90
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	125	35	0.13	35	7.0
1	170	45	0.17	45	5.4
1	190	20	0.19	20	12.7
1	210	20	0.21	20	12.7
1	230	20	0.23	20	12.7
1	250	20	0.25	20	12.7
1	270	20	0.27	20	12.7
1	290	20	0.29	20	12.7
1	300	10	0.30	10	26.5
1	320	20	0.32	20	12.7
3	340	20	0.34	7	40.7
1	360	20	0.36	20	12.7
1	370	10	0.37	10	26.5
5	390	20	0.39	4	69.8
1	440	50	0.44	50	4.8



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

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DYNAMIC CONE PENETROMETER TEST

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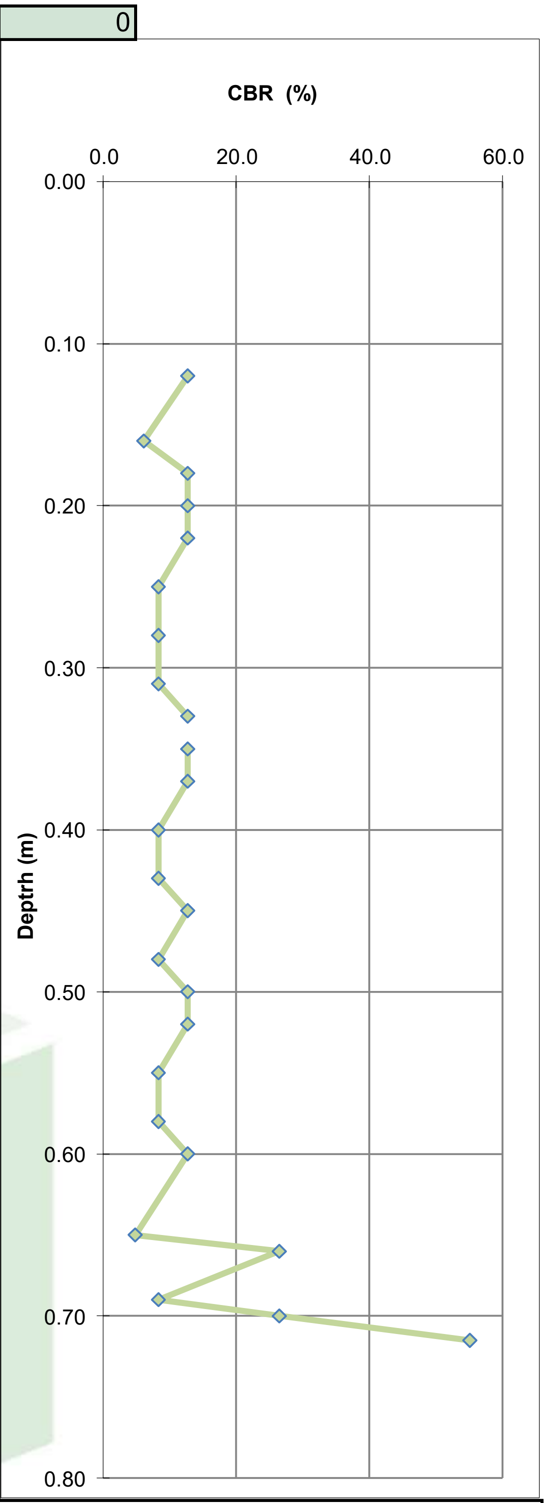
Site Name: Ysgol Iolo Morganwg Primary Schoc
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP06**

Initial Scale Reading (mm) 100
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	120	20	0.12	20	12.7
1	160	40	0.16	40	6.1
1	180	20	0.18	20	12.7
1	200	20	0.20	20	12.7
1	220	20	0.22	20	12.7
1	250	30	0.25	30	8.3
1	280	30	0.28	30	8.3
1	310	30	0.31	30	8.3
1	330	20	0.33	20	12.7
1	350	20	0.35	20	12.7
1	370	20	0.37	20	12.7
1	400	30	0.40	30	8.3
1	430	30	0.43	30	8.3
1	450	20	0.45	20	12.7
1	480	30	0.48	30	8.3
1	500	20	0.50	20	12.7
1	520	20	0.52	20	12.7
1	550	30	0.55	30	8.3
1	580	30	0.58	30	8.3
1	600	20	0.60	20	12.7
1	650	50	0.65	50	4.8
1	660	10	0.66	10	26.5
1	690	30	0.69	30	8.3
1	700	10	0.70	10	26.5
3	715	15	0.72	5	55.1



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

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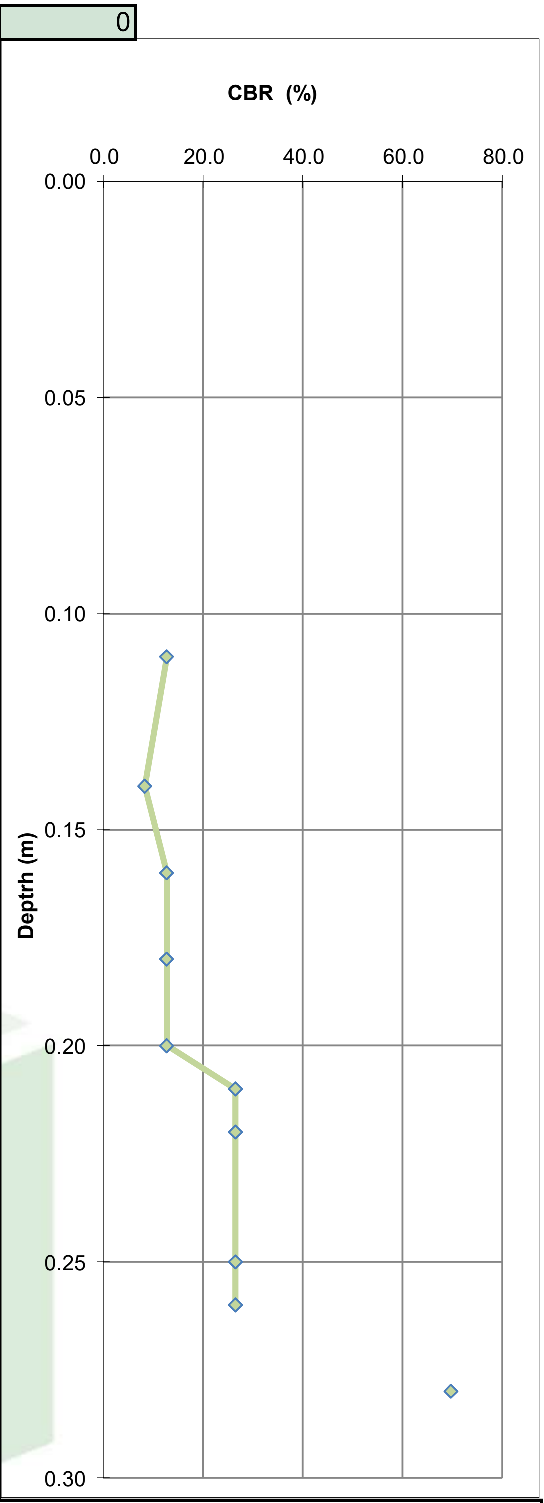
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP05**

Initial Scale Reading (mm) 90
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	110	20	0.11	20	12.7
1	140	30	0.14	30	8.3
1	160	20	0.16	20	12.7
1	180	20	0.18	20	12.7
1	200	20	0.20	20	12.7
1	210	10	0.21	10	26.5
1	220	10	0.22	10	26.5
3	250	30	0.25	10	26.5
1	260	10	0.26	10	26.5
5	280	20	0.28	4	69.8



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

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DYNAMIC CONE PENETROMETER TEST

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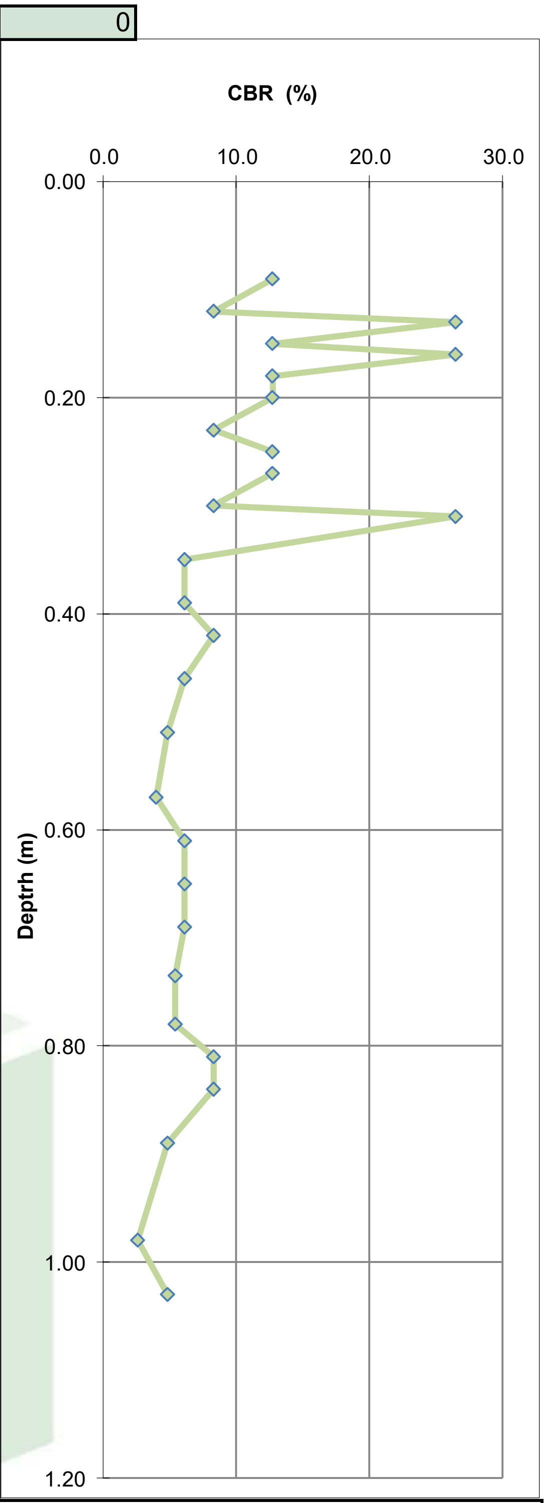
Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP04**

Initial Scale Reading (mm) 70
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	90	20	0.09	20	12.7
1	120	30	0.12	30	8.3
1	130	10	0.13	10	26.5
1	150	20	0.15	20	12.7
1	160	10	0.16	10	26.5
1	180	20	0.18	20	12.7
1	200	20	0.20	20	12.7
1	230	30	0.23	30	8.3
1	250	20	0.25	20	12.7
1	270	20	0.27	20	12.7
1	300	30	0.30	30	8.3
1	310	10	0.31	10	26.5
1	350	40	0.35	40	6.1
1	390	40	0.39	40	6.1
1	420	30	0.42	30	8.3
1	460	40	0.46	40	6.1
1	510	50	0.51	50	4.8
1	570	60	0.57	60	4.0
1	610	40	0.61	40	6.1
1	650	40	0.65	40	6.1
1	690	40	0.69	40	6.1
1	735	45	0.74	45	5.4
1	780	45	0.78	45	5.4
1	810	30	0.81	30	8.3
1	840	30	0.84	30	8.3
1	890	50	0.89	50	4.8
1	980	90	0.98	90	2.6
1	1030	50	1.03	50	4.8



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

DYNAMIC CONE PENETROMETER TEST

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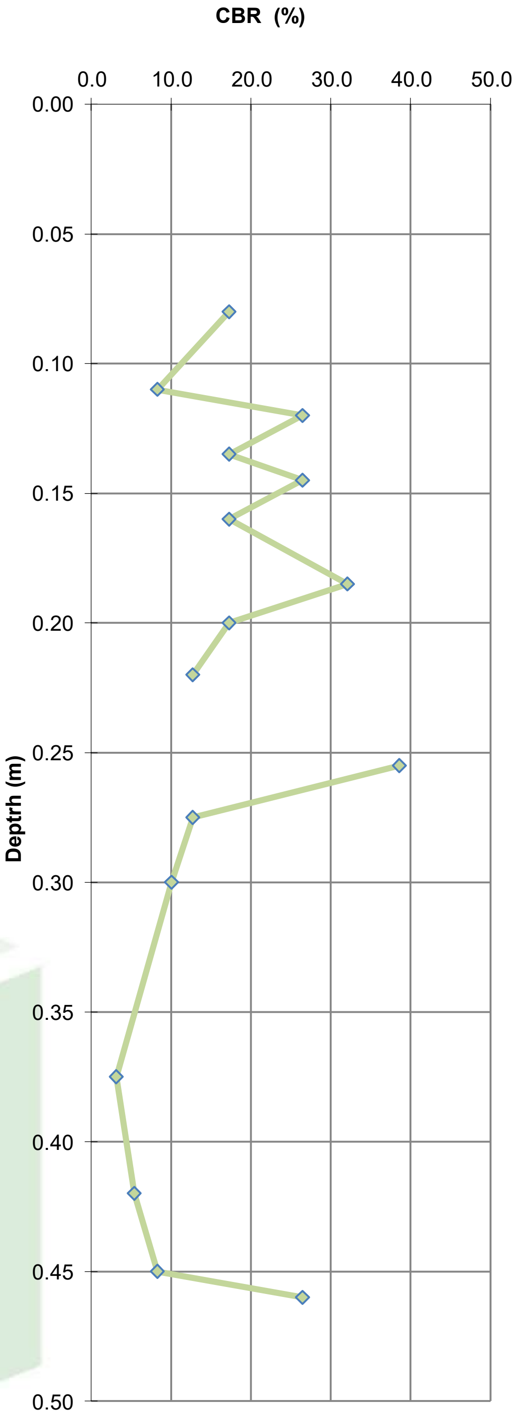
Site Name: Ysgol Iolo Morganwg Primary Schoc
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP03**

Initial Scale Reading (mm) 65
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	80	15	0.08	15	17.3
1	110	30	0.11	30	8.3
1	120	10	0.12	10	26.5
1	135	15	0.14	15	17.3
1	145	10	0.15	10	26.5
1	160	15	0.16	15	17.3
3	185	25	0.19	8	32.1
1	200	15	0.20	15	17.3
1	220	20	0.22	20	12.7
5	255	35	0.26	7	38.6
1	275	20	0.28	20	12.7
1	300	25	0.30	25	10.1
1	375	75	0.38	75	3.1
1	420	45	0.42	45	5.4
1	450	30	0.45	30	8.3
1	460	10	0.46	10	26.5



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

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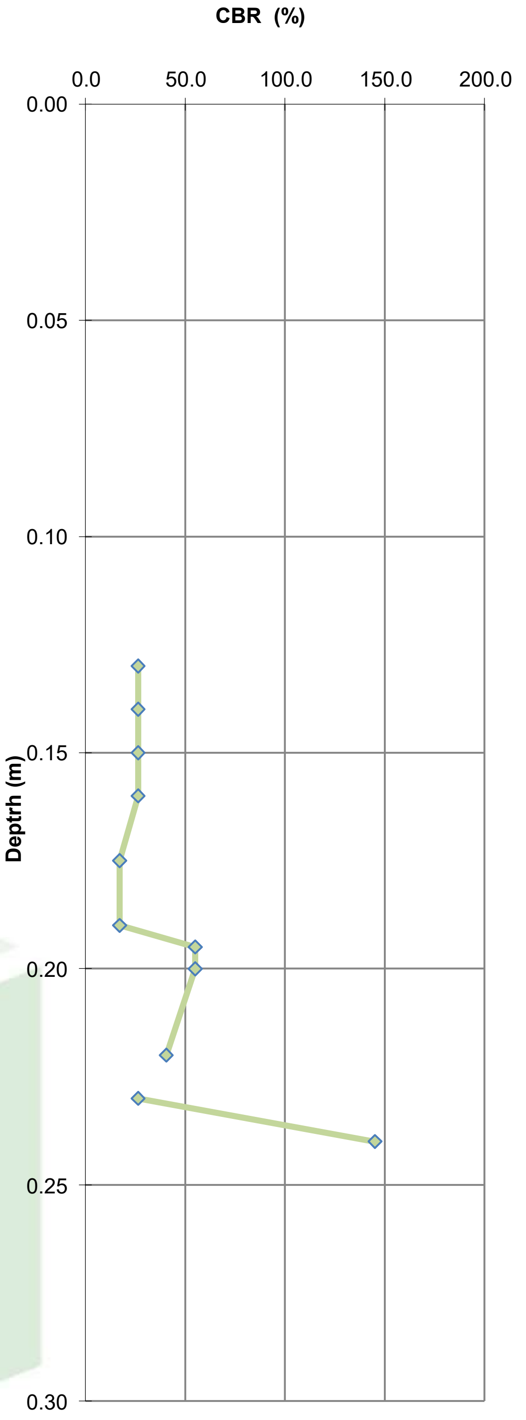
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoc
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP02**

Initial Scale Reading (mm) 120 Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	130	10	0.13	10	26.5
1	140	10	0.14	10	26.5
1	150	10	0.15	10	26.5
1	160	10	0.16	10	26.5
1	175	15	0.18	15	17.3
1	190	15	0.19	15	17.3
1	195	5	0.20	5	55.1
1	200	5	0.20	5	55.1
3	220	20	0.22	7	40.7
1	230	10	0.23	10	26.5
5	240	10	0.24	2	145.1



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

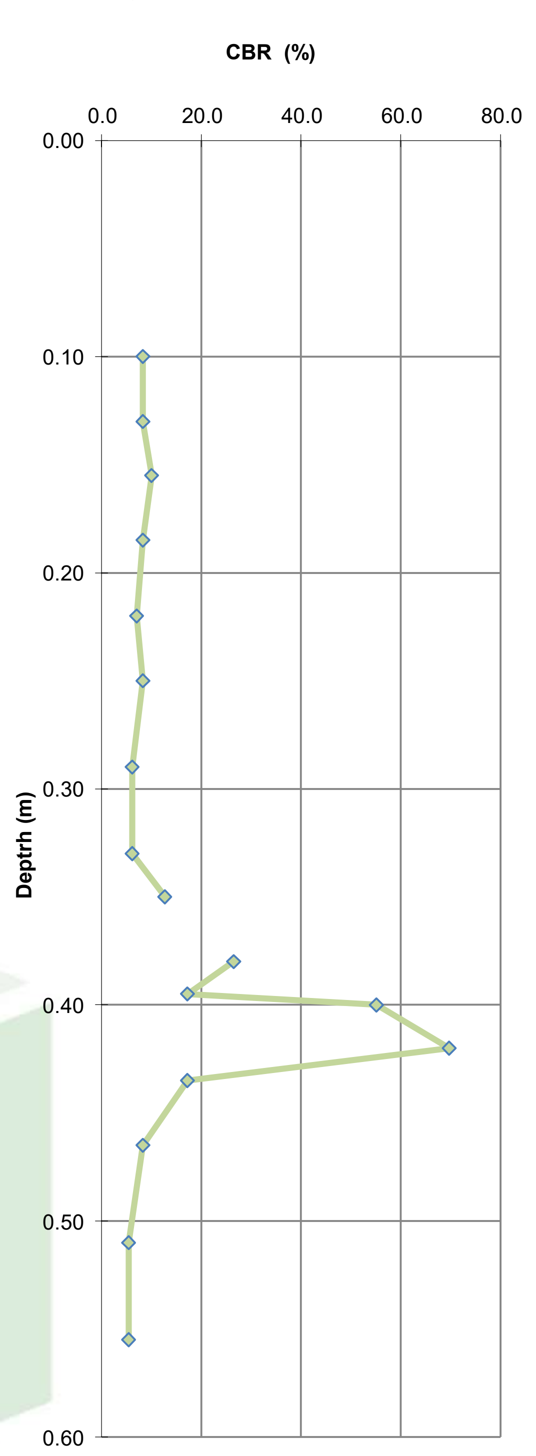
DYNAMIC CONE PENETROMETER TEST

Site Name: Ysgol Iolo Morganwg Primary Schoo
Project Number: 648
Date: 23/06/2025
Engineer: CB

Test: **DCP01**

Initial Scale Reading (mm) 70
Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	100	30	0.10	30	8.3
1	130	30	0.13	30	8.3
1	155	25	0.16	25	10.1
1	185	30	0.19	30	8.3
1	220	35	0.22	35	7.0
1	250	30	0.25	30	8.3
1	290	40	0.29	40	6.1
1	330	40	0.33	40	6.1
1	350	20	0.35	20	12.7
3	380	30	0.38	10	26.5
1	395	15	0.40	15	17.3
1	400	5	0.40	5	55.1
5	420	20	0.42	4	69.8
1	435	15	0.44	15	17.3
1	465	30	0.47	30	8.3
1	510	45	0.51	45	5.4
1	555	45	0.56	45	5.4

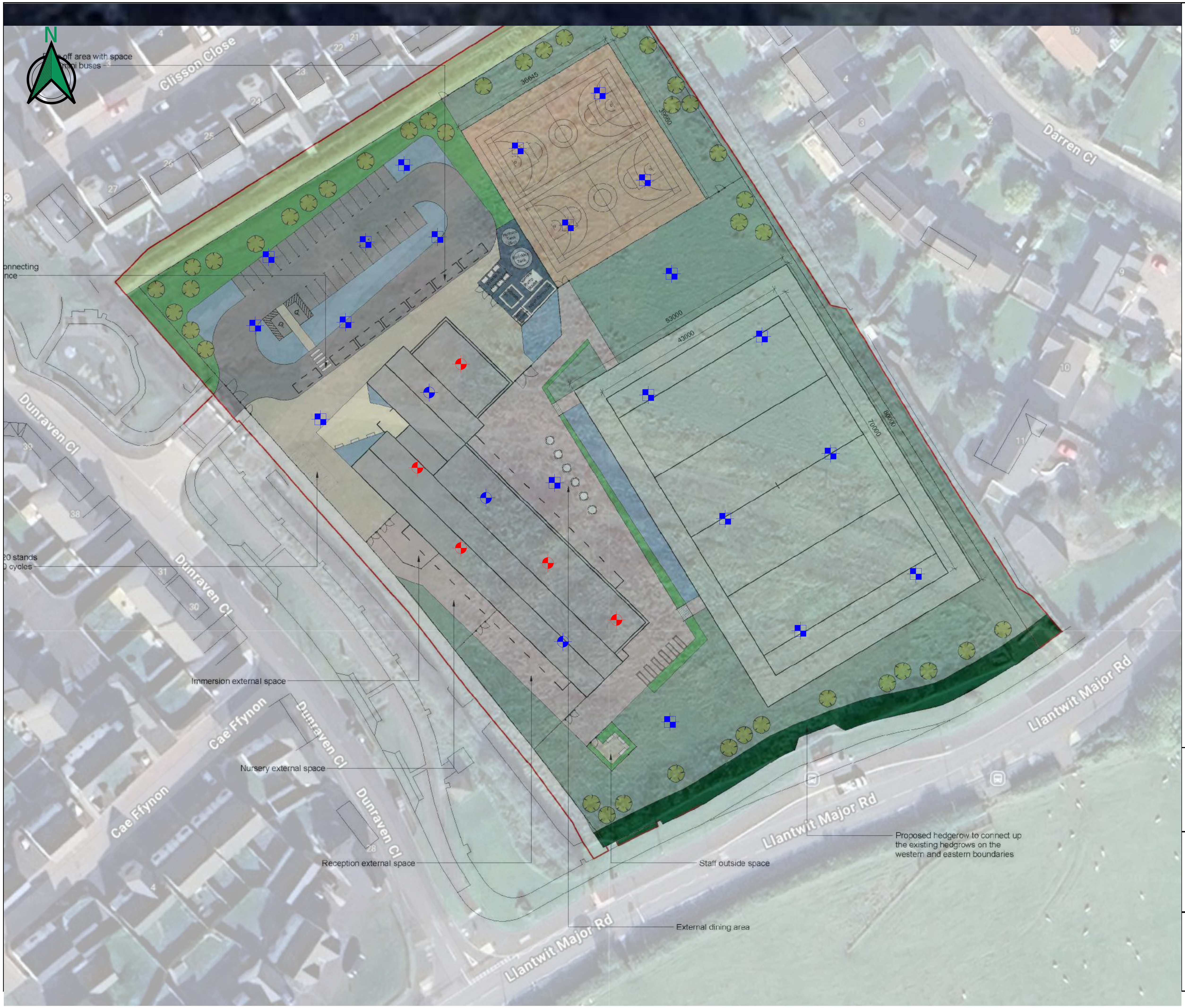


REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The

DRAWINGS



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earth matters

Legend

⊕	RBH
⊕	WS Loc
▚	TP Loc

PROJECT:

Ysgol Iolo Morganwg Primary School, Cowbridge

DRAWING 01:

Proposed Exploratory Hole Locations

TFW Group Ltd
5 Deryn Court, Wharfedale Road, Cardiff,
CF23 7HA
Tel: 029 2073 5354
Email: Hello@tfwgroup.co.uk

terra firma
earth matters

Legend

- 🟥 Site Boundary
- ⊕ Rotary Borehole Locations
- ▨ Deep Soakaway Locations
- ▨ Soakaway Locations
- ⊕ Window Sample Locations

Google Satellite

PROJECT:

TF-24-648-CA Ysgol Iolo Morganwg Primary School

DRAWING 01:

Exploratory Hole Location Plan

TFW Group Ltd
5 Deryn Court, Wharfedale Road,
Cardiff, CF23 7HA
Tel: 029 2073 5354
Email: Hello@tfwgroup.co.uk

terra firma

Geotechnical & Geoenvironmental Specialists

TFW Group Ltd, 5 Deryn Court, Wharfedale Road, Pentwyn, Cardiff. CF23 7HA
Tel: 033 022 36380 **Email**: hello@tfwgroup.co.uk **www.tfwgroup.co.uk**