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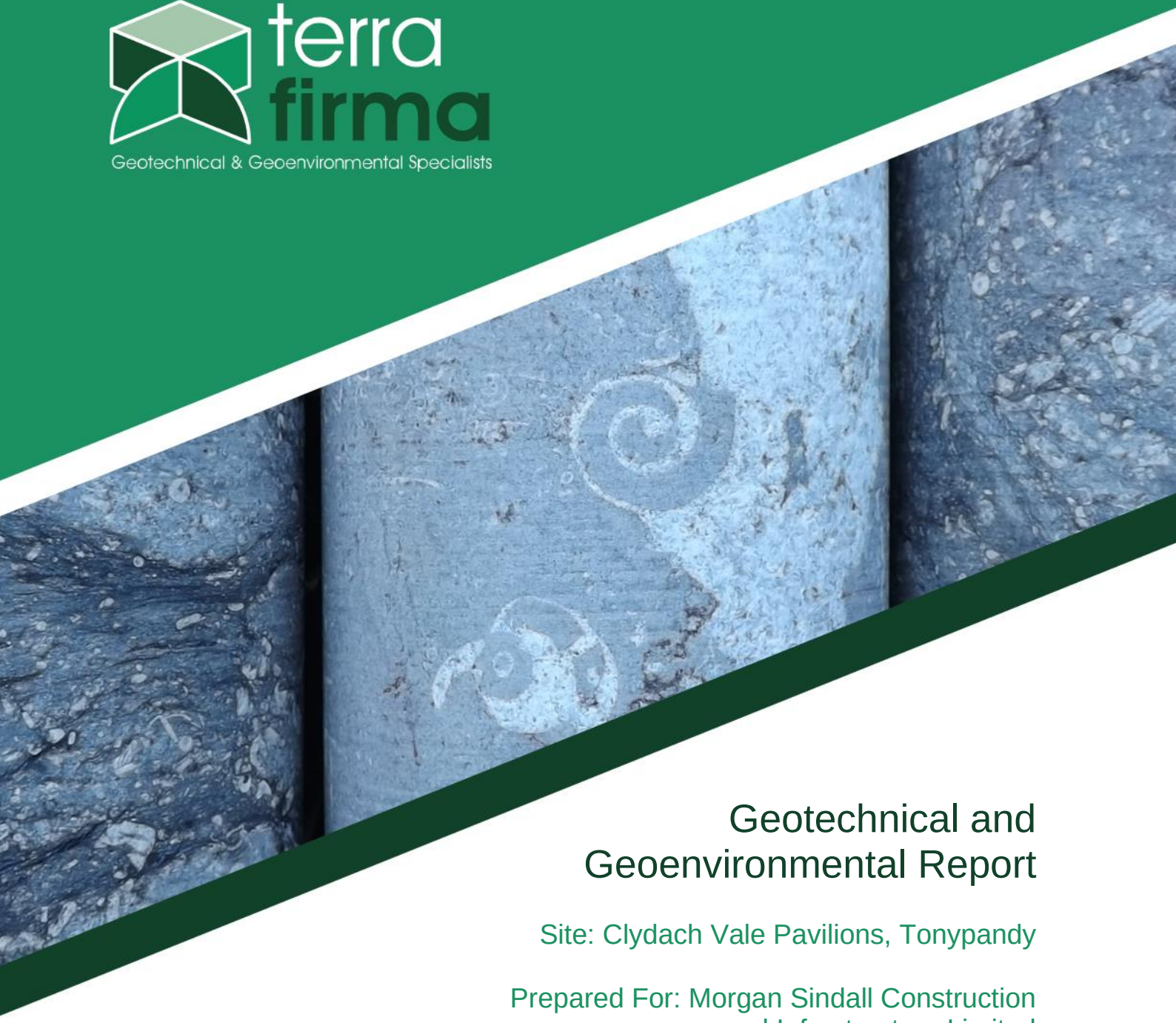
Geotechnical & Geoenvironmental Specialists



Geotechnical and Geoenvironmental Report

Site: Clydach Vale Pavilions, Tonypandy

Prepared For: Morgan Sindall Construction and Infrastructure Limited

Issue Date: July 2024

Job No: 17931

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REPORT TITLE : **Geotechnical and Geoenvironmental Report: Proposed School Development at the Clydach Vale Pavilions, Cambrian Park, Tonypandy**

JOB NUMBER : **17931**

ISSUE DATE : **July 2024**

REPORT REFERENCE : **GGR-310724-17931-02**

Document Revision Record

Issue	Date	Revision Details
01	31.07.2024	Draft Report Publication
02	12.09.2024	Amended for client comments.

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Executive Summary	
Site Location and Proposed Development	*Morgan Sindall Construction and Infrastructure Limited (the Client) on behalf of Rhondda Cynon Taff County Borough Council is proposing a commercial development at the former council offices known as the Clydach Vale Pavilions. The development site locates at Cambrian Park, Tonypandy. The development comprises a large additional learning needs school building with associated car parking, areas of hard and soft landscaping. The development site is roughly rectangular in shape and locates off Cambrian Park, Clydach Vale. The site centres on an approximate National Grid Reference of 298080, 192750, occupying a plan area of approximately 1.61 Hectares.*
Ground Conditions	***Mini Percussive Borehole & Trial Pits*** • **VARIABLE MADE GROUND:** Firm to stiff, dark grey, silty sandy gravelly **CLAY**. / Firm to stiff, dark grey, gravelly **CLAY** with brick fragments. / Stiff, brown, gravelly **CLAY** with glass fragments. ***Rotary Boreholes*** • *Fill / Overburden (Drillers Description)* • *Mudstone and Sandstone with Coal Seams and zones of Soft drill / No Returns / Solid No Returns*
Contamination of Concern	*The chemical analysis has found a single exceedance of the naphthalene S4UL guideline in the made ground encountered in SA06 at a depth of 0.60m. However when this is compared to the C4SL guideline value it is seen to fall below the allowable concentration. All other determinants were below their respective guideline values and it is therefore considered that there are no contaminants of concern on the site.*
Mitigation and Remedial Measures	*As no contaminants of concern have been identified site specific mitigation and remedial measures are not required.*
Ground Gas Risk Assessment	*A detailed mine and ground gas risk assessment is required for the development. Terra Firma have been commissioned to undertake these works and the findings will be reported in due course. The first round of monitoring is indicative of the presence of mine gas and it is therefore likely that protection measures will be required in the proposed development.* *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 211:2015 for further details on required protection elements. Verification of the installed protection measures is highly recommended. Terra Firma Wales Ltd. offer a comprehensive ground gas protection system verification service.* *Naphthalene is a volatile substance and therefore poses a risk to indoor spaces without protection. However the recommendation to excavate and remove the soils will remove the source and protect indoor spaces.*
Legacy Mining Risk Assessment	*It can be seen in Borehole Line A and Borehole Line D that there is a feature that deviates from the expected ground conditions and the boreholes undertaken either side of the feature. These were encountered as voids with a small amount of broken ground and there was an immediate corresponding loss in drilling flush when these features were encountered. This is anticipated to be the roadway extending from adit 298192-001 and is between 3m and 4m in diameter with a height of 2.80m to 3.40m.* *Borehole Line C identified a feature which deviated from the expected ground conditions in BH-C13. This borehole found an open void with a small amount of broken ground and there was an immediate corresponding loss in drilling flush. Due to the location of this borehole in the corner of the site with underground services and the drop in topography it was not possible to drill additional boreholes beyond BH-C13 to confirm the dimensions of the feature. It is anticipated that this is the roadway extending from adit 298192-032 and was seen to be 2.60m in height.*
Legacy Mining Mitigation Measures	*The site investigation boreholes have found roadways with insufficient rock head cover over open voids. The 10:1 ratio for rock head to void has not been achieved and the risk to the proposed development is therefore considered to be high. It is therefore necessary for the roadways to be stabilised by drilling and grouting methods.*

	Ground stabilisation by drilling and grouting must be carried out prior to development commencing. This should be undertaken in accordance with Chapter 6 'Consolidation of Shallow Abandoned Mine Workings' of CIRIA C758D: 2019 'Abandoned Mine Workings Manual'. *Given the proximity of the roadway from adit 298192-032 to the corner of the site it may not be possible to stabilise this feature. The stabilisation process in this area is complicated by the presence of the surface water features. As stabilisation is unlikely to be possible an exclusion zone may be required in which buildings are excluded and the surface is protected with the use of geogrids. The exclusion zone associated with adit 298192-032 would need to extend 5.30m given the thickness of superficial deposits in the area.*
Foundation Solution	*The following recommendations are contingent on completion of the recommended drilling and grouting stabilisation works. A turn and compact exercise is also required to provide a homogenous unit removing any existing soft spots and hard spots associated with the current buildings.* *It is recommended that a reinforced concrete strip foundation be used; founded within the reengineered made ground at an approximate depth of 1.00m below the existing ground level. An allowable bearing pressure of 100kN/m^2 may be used for strips up to 900mm wide.* *Reinforcement should be designed to span a crown hole of 3.0m with a cantilever effect on corners of 1.5m.* *Foundations must sit at least 200mm within the founding horizon.* *For the given foundation solutions and bearing pressure, maximum total settlements of 25mm should result with differential movements of the superstructure not exceeding 1:750.* *Foundations should be taken down to a minimum depth of 750mm below finished levels when founding in low volume change potential soils.* *Floor slabs may be designed as suspended.* *The recommendations should be reviewed by the chosen warranty provider and if necessary, an alternative solution can be explored.*

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SECTION 1 Introduction and Proposed Development

1.1 Introduction

Morgan Sindall Construction and Infrastructure Limited (the Client) on behalf of Rhondda Cynon Taff County Borough Council is proposing a commercial development at the former council offices known as the Clydach Vale Pavilions. The development site locates at Cambrian Park, Tonypandy. The development comprises a large additional learning needs school building with associated car parking, areas of hard and soft landscaping. The proposed layout is presented below in **Figure 1.1**.

Figure 1.1 Proposed Site Layout (Red Boundary)

Terra Firma have been commissioned by Morgan Sindall on behalf of Rhondda Cynon Taff County Borough Council to undertake a geoenvironmental assessment and geotechnical investigation of the site.

Cambria Consulting Limited are the Structural and Civil Engineers for the project.

The main objectives of the geoenvironmental assessment programme are:

- Investigate the potential human health and environmental liabilities at the site associated with any contamination.
- 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:

- Investigated 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.
- 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 including a site walkover, a review of existing data, followed by a field investigation to collect geotechnical and geoenvironmental data from selected locations.

Previous reports produced for the site are detailed below.

- Ove Arup & Partners: Geotechnical Desk Study Report, Proposed W.D.A. Development at Clydach Vale, Rhondda (Reference 86/1175 (Job Number 16049/01) dated 1991).
- TFW Group Limited: Geotechnical and Geoenvironmental Desk Study and CMRA: Proposed Development, Clydach Vale, Rhondda Cynon Taff (Reference 250522-17931-ISSUE01, dated July 2023).
- TFW Group Limited: Soakaway Technical Note (Reference ADB/17931/SoakawayTechnicalNote, dated 21st June 2024).

1.2 Limitations and Exceptions of Investigation

The Client has requested that a Geoenvironmental Site Assessment (GSA) and Geotechnical Investigation (GI) be performed to enable the outlined main objectives.

The GSA and GI were 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 Terra Firma. 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. Terra Firma 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.

The investigation was limited by the presence of underground services, existing buildings on site, surface water features forming the site boundary and immediately beyond and a public access road. The western end of the site is also designated a Site of importance for Nature Conservation (SINC) and access was therefore not possible.

A subsequent post demolition investigation is proposed and to be undertaken in due course once the existing buildings have been removed.

It was beyond the scope of this report to investigate the two adits which cross the western end of the site that are located in the SINC.

1.3 Quality Assurance

The quality and environmental aspects of the assessment comply with Terra Firma Wales Ltd business management system which is UKAS Accredited to ISO 9001:2015 and ISO 14001:2015 standards.

SECTION 2 Review of Existing Data

2.1 Physical Setting and Current Site Use

The development site is roughly rectangular in shape and locates off Cambrian Park, Clydach Vale. The site centres on an approximate National Grid Reference of 298080, 192750, occupying a plan area of approximately 1.61 Hectares.

The site is currently occupied by Rhondda Cynon Taff County Borough Council offices including associated car parking areas. The western end of the site is covered by rough vegetation. The northern boundary is formed by the access road to the site. The eastern boundary is marked by a stream identified at Nant Pwllyrhebog. The southern boundary is marked by a smaller unnamed stream/ditch. The western boundary is marked by a small public footpath.

The site elevation is approximately 200m AOD and slopes gently down to the northeast. The site topography has been modified to provide a level development plateau for the existing buildings.

The site location can be seen in **Figure 2.1**.

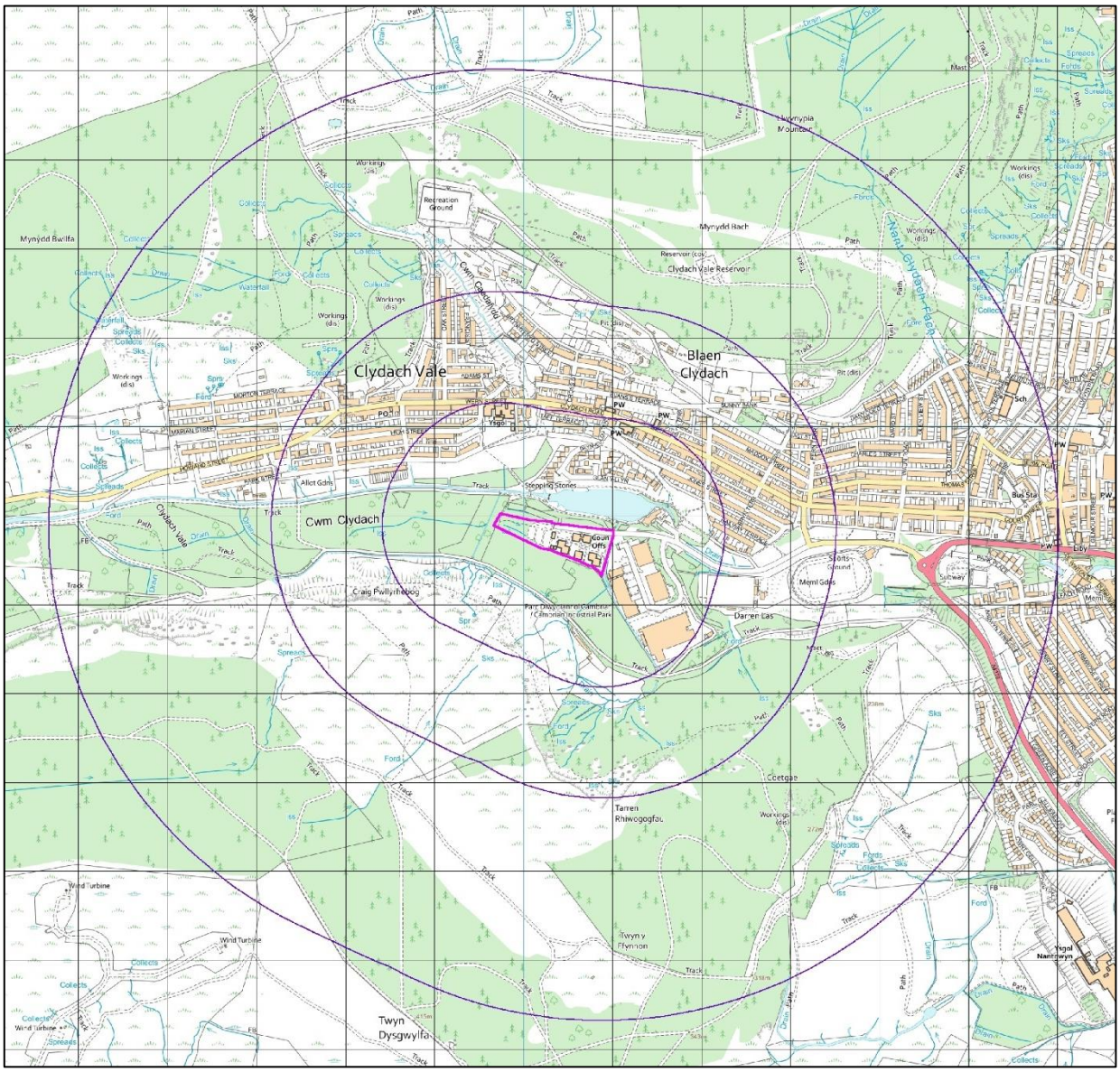

Figure 2.1 Site Location

2.2 Desk Study

As previously outlined Terra Firma have undertaken a desk study for the site. A summary of pertinent/relevant sections have been included below however the full document is available on request and should be read in conjunction with this report.

2.2.1 Site History

Since the earliest map edition available, the site had been semi-occupied by residential houses (Bush Cottages). Several tramways have also been on site, connecting the local collieries to more significant railways. Much of the surrounding area remained as unoccupied land until 1900, with residential development taking place north of the Nant Clydach. Several collieries have been situated within the immediate surrounding area of the site, including the Cwm Clydach Colliery (10-20m northeast) and the Blaen Clydach colliery (250m south).

The 1993 edition shows that the Rhondda Cynon Taff County Borough Council offices have now been established on site. An electricity substation is situated within the northeastern corner of the site. The car parking area in the western end of the site has been extended by the 1996 edition. The site then remains the same until the present edition.

2.2.2 Geology

The British Geological Maps of the area were consulted for geology underlying the site. The site is shown to be underlain by rocks of the Llynfi Member of the Pennant Sandstone Formation. This comprises typically green-grey and blue-grey, feldspathic, micaceous lithic arenites ('Pennant sandstones') with thin mudstone/siltstone and seatearth interbeds and mainly thin coals. Strata in the local area have a dip of 5° north.

Superficial deposits are recorded as Till which comprises clay and silty clay, commonly pebbly and sandy, possibly interbedded with sand and gravel-rich lenses. An unsorted, unstratified deposit generally reflecting the nature of source rock material.

Made ground is anticipated at the site associated with the past uses and formation of a level development plateau.

2.2.3 Radon

No radon protective measures are required for new developments on the investigation site.

2.2.4 Mining

A total of 13 seams have been worked either beneath or within influencing distance of the site. The shallowest of these worked seams is the Abergorki coal seam mined directly beneath the site at a depth of 111m in 1908.

The report records the site is not situated above possible unrecorded shallow workings.

No spine roadways are recorded at shallow depth. However there are 11 mine entries within 100m of the site including one shaft and ten adits. The roadways extending from five of the adits are likely to pass beneath the site.

It was concluded that the recorded mine workings beneath the site are of such an age and depth that they will not affect the surface stability of the site. However, there are a number of adits that cross the site. It is considered that there is a potential risk to the development from any future collapse of these adits. Therefore, the depth and condition of these adits should be investigated by rotary drilling to confirm their depth, condition and amount of sound rock head.

2.2.5 Additional Mining Consideration

As part of the works to determine the required site investigation the abandoned mining plans were obtained from the Coal Authority. Using Geographical Information Systems (GIS) software the Coal Authority plan and abandoned mining plans have been georeferenced and georectified to determine the position and orientation of the adit roadways. The adit mouth locations and anticipated roadway route can be seen in **Figure 2.2**.

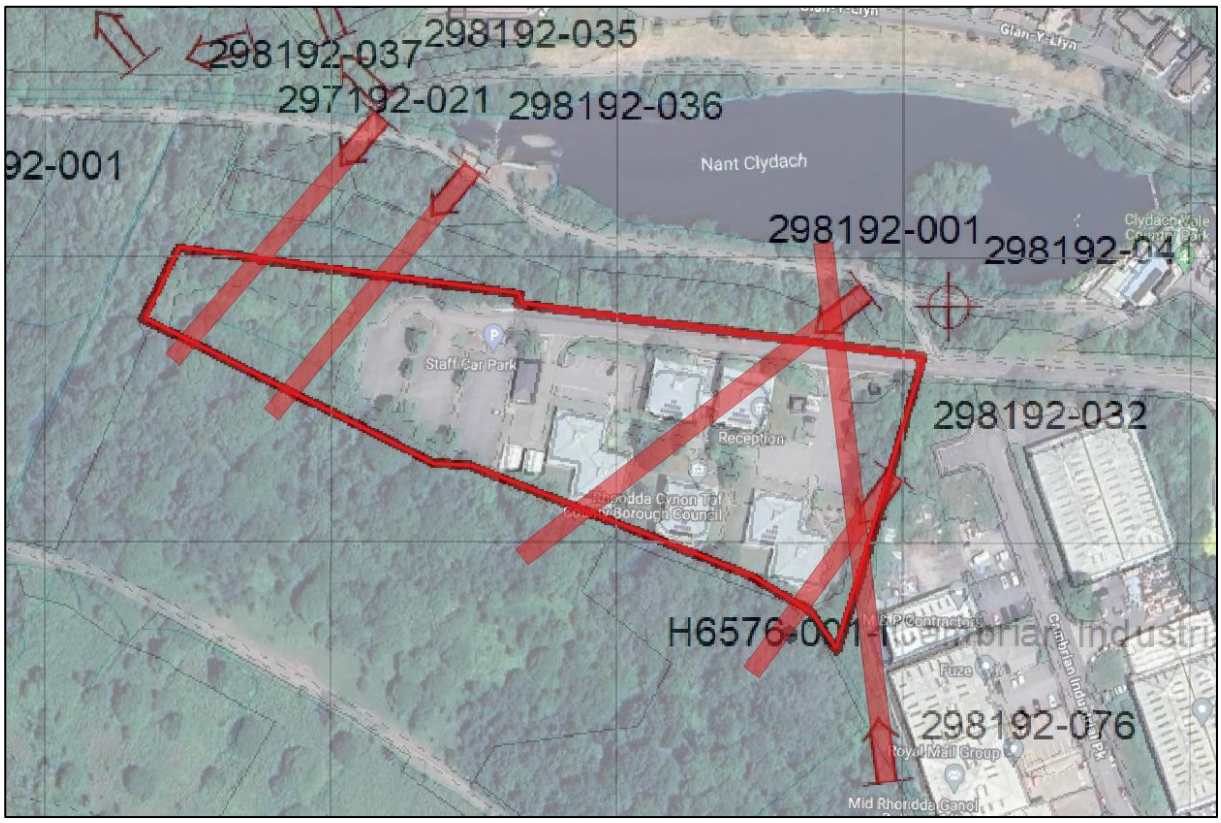

Figure 2.2 Adit Locations and Anticipated Roadway Routes

2.2.6 Natural Hazards

The geology map shows a large landslip to be located in the hillside above and to the south of the site. The South Wales Landslip Survey published by the Institute of Geological Sciences Report No EG80/E records this landslip to be Active, Complex, shallow translational debris slide with slumped sandstone at head, grading to debris flow downslope. Failure has occurred in superficial deposits and Llynfi mudstones below the No.2 Rhondda coal seam, and the overlying Rhondda sandstone. Lower parts of slip over-ride and incorporate boulder clay. Many old levels occur along the No.2 Rhondda seam at the slip head. A clinker and piped drain traverses the slip along an old track immediately downslope of the No.2 Rhondda coal. Seepage below this drain has resulted in active shallow failures in the slip debris and consequent cracking of the ceramic drain pipes, leading to further water flow into slip material. Active shallow failure of the slip debris also occurred in 1976 above the disused railway line at the eastern toe area. Active springs at the No.2 Rhondda seam and near the upper limit of the boulder clay have resulted in movements that drainage installations have so far failed to stabilize.

The location of the slip can be seen in **Figure 2.2**.

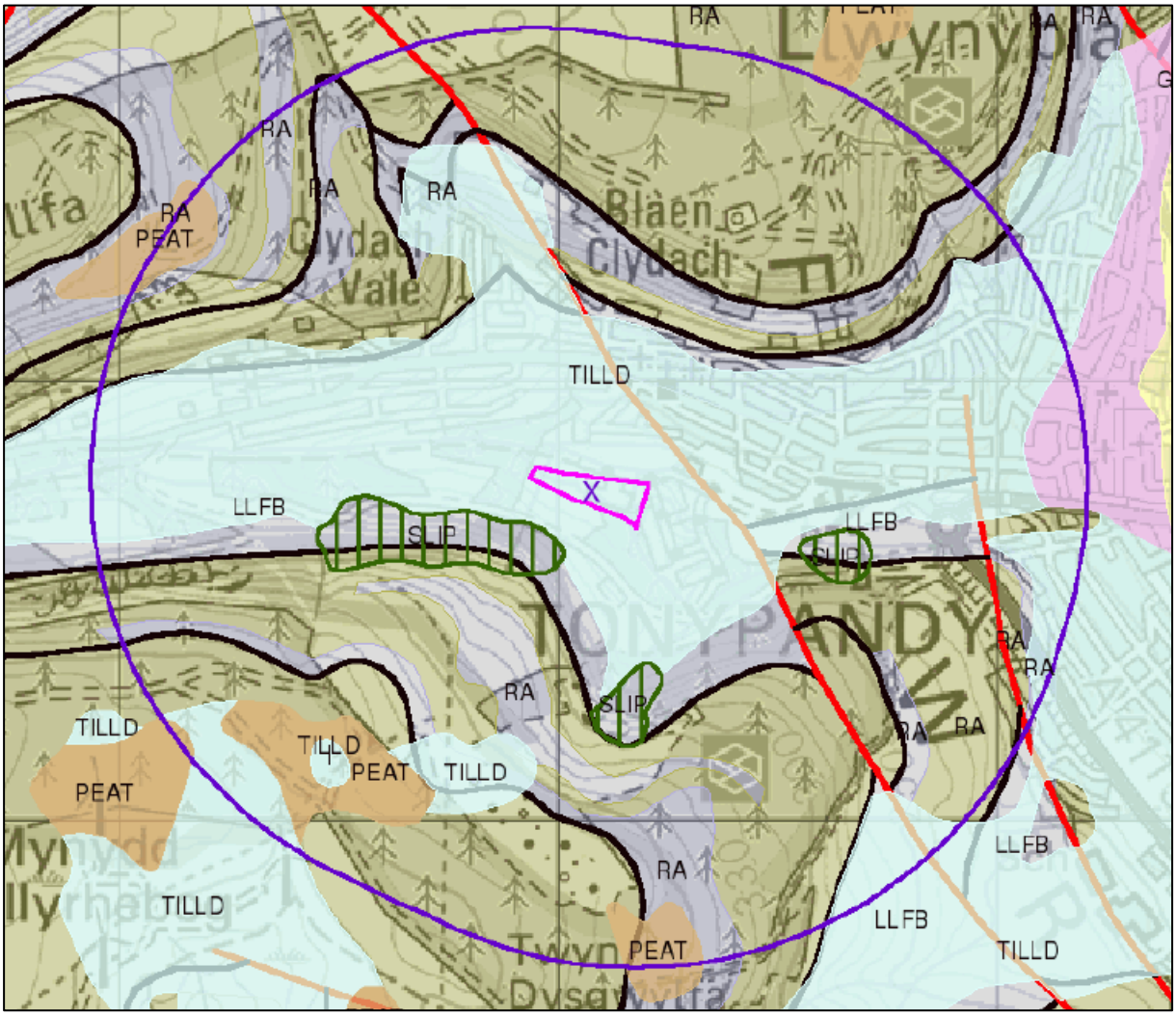

Figure 2.3 Landslip Location

2.3 Human Health and Environmental Risk Assessment

The human health and environmental risk assessment undertaken in the desk study has been summarised and identified the following.

2.3.1 Potential Sources of Contamination

Potential or known sources of contamination associated the sites current and historical land use are summarised in **Table 2.1**.

Table 2.1 Contamination Sources

ID	Source	Contaminant
S1	Made ground soils across the site	Metals, TPH CWG, PAH, Asbestos, Ground gas
S2	Nearby infilled land features	Ground gas
S3	Shallow adit workings	Mine gas

No other significant potential on-site or off-site sources of contamination have been identified during the desk study.

Additionally the site investigation will consider the presence of Polychlorinated Biphenyls (PCBs) associated with the electricity substation in the north eastern corner of the site.

2.3.2 Potential Pollution Pathways

Potential contaminant pathways associated with a school development are as follows.

Table 2.2 Pollution Pathways

ID	Source
P1	Direct soil and dust ingestion.
P2	Consumption of home grown produce (Considered unlikely but possible).
P3	Dermal contact.
P4	Inhalation of dust and vapours.
P5	Vertical migration of leachates (unsaturated zone).
P6	Horizontal and vertical migration of contaminants (saturated zone).
P7	Artificial contaminant pathway (borehole, pile, excavation etc).
P8	Surface run-off.
P9	Plant uptake.
P10	Horizontal and vertical migration of ground gasses and vapours.
P11	Direct contact with construction materials.
P12	Inhalation of asbestos fibres

2.3.3 Potential Receptors

Potential contaminant pathways associated with a school development are as follows.

Table 2.3 Pollution Pathways

ID	Source
R1	Construction and maintenance workers.
R2	Future site users (Staff, Pupils and Visitors).
R3	Passers-by or neighbouring site users.
R4	Groundwater (aquifer).
R5	Surface waters (river/lake).
R6	Area of public open space.
R7	Construction materials (concrete/potable water pipes).

2.3.4 Preliminary Site Conceptual Model

The preliminary site conceptual model has identified that there are credible contamination linkages (source-pathway-receptor) which require investigation. These include risks to site end users from contamination in soils and from ground and mine gases.

SECTION 3 Field Investigation

3.1 Site Works

A geotechnical and geoenvironmental site investigation comprising, 9 trial pit soakaway tests, 14 mini percussive boreholes, 51 rotary boreholes, 6 hand dug trial pits and 6 dynamic cone penetrometer (DCP) tests was undertaken between the 21st March and 28th June 2024.

The fieldwork was supervised by Terra Firma Limited, 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 Ltd in general accordance with BS 10175:2011+A2:2017 in order to assess the findings of the preliminary conceptual site model. The location of six of the trial pit soakaway tests and six rotary boreholes was determined by Cambria Consulting Limited.

Trial Pits

Trial pits referenced TP01 to TP03 and SA01 to SA06, were formed using a mechanical excavator with a 0.60m wide bucket.

Trial pits referenced HDTP01 to HDTP04, were hand excavated to uncover the existing building foundations.

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

The trial pit logs are presented in **Annex A** and foundation sketches are presented in **Section 3.2.2**.

Soakaway Tests

Soakaway tests were carried out in trial pits TP01 to TP03 and SA01 to SA06 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 potable water using a dedicated bowser with a 75mm diameter outlet and the fall in level recorded against time. The results are presented in **Annex B**.

Mini Percussive Boreholes

The boreholes referenced WS01 to WS14, were formed using a Terrier 2000 rig. Dynamic sampling techniques were employed from surface to produce a continuous disturbed sample.

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. 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 borehole logs are presented in **Annex C**.

Rotary Boreholes

Boreholes reference BH101, BH01 (Cambria) to BH06 (Cambria) and borehole lines A, B, C and D were formed using a Casagrande C6xp2 track mounted rotary drilling rig operated by Van Elle. The borehole was advanced from surface using a top hammer with water as the flushing medium.

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

Dynamic Cone Penetrometer Tests

DCP tests, referenced DCP01 to DCP06, were carried out using a CNS Farnell A2465 dynamic cone penetrometer. Probe depths were measured with respect to ground level and the number of blows for the penetration of the probe was recorded. Equivalent CBR values have been calculated and presented with the results in **Annex E**.

Exploratory hole locations are shown on **Drawing 01**, **Drawing 02** and **Drawing 03**.

3.2 Ground Conditions

The ground conditions encountered by the exploratory holes can in general be summarised as shown in **Table 3.1**.

Table 3.1 Summary of Typical Ground Conditions

Depth (m)			Thickness (m)	Stratum
Mini Percussive Boreholes & Trial Pits				
0.00	-	>1.00/>4.00	-	**VARIABLE MADE GROUND:** Firm to stiff, dark grey, silty sandy gravelly **CLAY**. / Firm to stiff, dark grey, gravelly **CLAY** with brick fragments. / Stiff, brown, gravelly **CLAY** with glass fragments.
Rotary Boreholes				
0.00	-	4.00/12.00		Fill / Overburden (Drillers Description)
4.00/12.00	-	>18.00/>50.00		Mudstone and Sandstone with Coal Seams and zones of Soft drill / No Returns / Solid No Returns

3.2.1 Miscellaneous Ground Conditions

In WS09 natural soils were identified under the made ground at a depth of 2.80m. This comprised a firm, grey, mottled orangish brown, silty slightly sandy **CLAY**.

Rotary boreholes have also identified areas of void and broken ground associated with the adits crossing the site. This is discussed further in **Section 7**.

3.2.2 Hand Dug Trial Pits

During the site investigation four hand dug trial pits were undertaken next to the existing buildings to expose the foundations.

Diagrams of the findings can be seen in **Figure 3.1**.

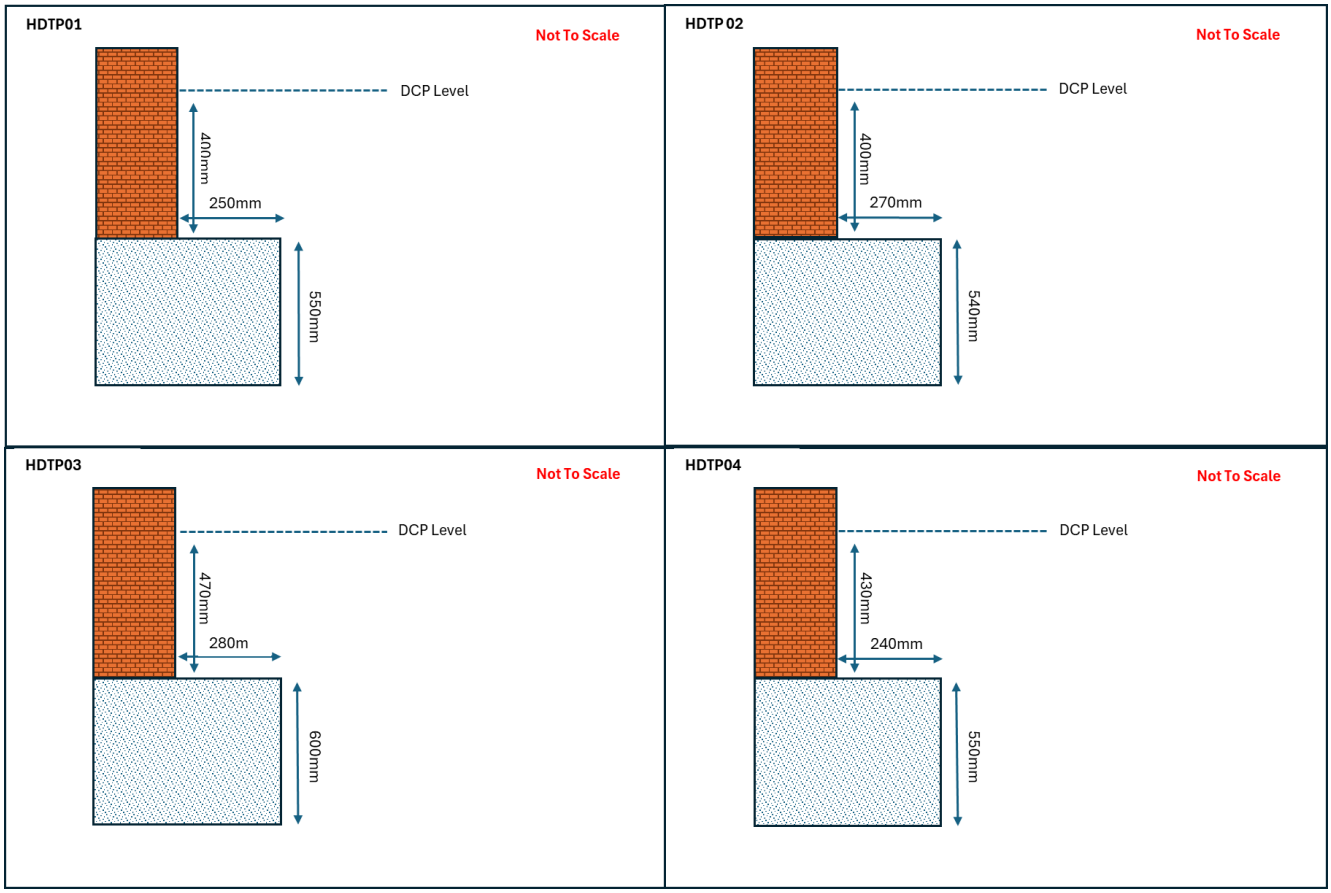

Figure 3.1 Diagrams of Hand Dug Trial Pits

3.3 Groundwater

Groundwater information recorded during the site investigation is summarised in **Table 3.2**.

Table 3.2 Groundwater Summary

Location	Depth (m)	Details
TP01	0.80	Small groundwater inflow which slowly fills trial pit.

3.4 Surface Water

The surface water feature seen running along the southern boundary of the site appears to proceed underground in the area to the south of DCP04. This feature would be termed a ‘sink’. It is unclear why this is occurring however it is in the vicinity of the adit and may therefore be linked to this feature. Annotated photos of this occurrence can be seen on the following page in **Figure 3.2**.

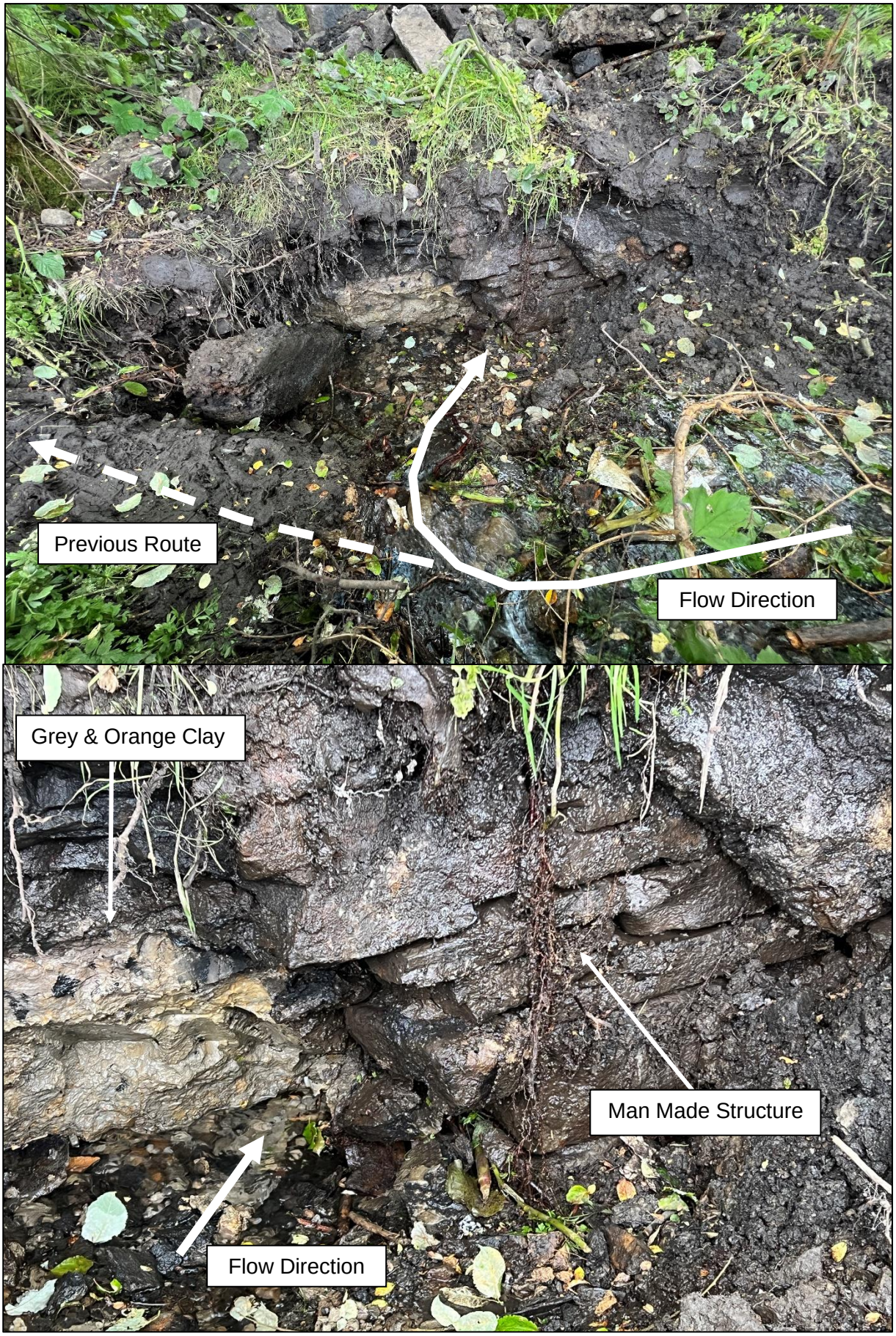

Figure 3.2 Sink on the Site's Southern Boundary

3.5 Stability and Obstructions

Trial pits remained stable and vertical during excavation.

No obstructions were encountered in the exploratory holes.

3.6 Installation Well Construction

Gas well locations were selected on a non-targeted basis to characterise the gas contamination status of the site. A deeper groundwater/gas monitoring well was targeted in the east of the site where the majority of the adits and construction is proposed.

Installation construction details are summarised in **Table 3.3**.

Table 3.3 Installation Well Summary

Location	Response Zone		Stratum
	From (m)	To (m)	
WS09	1.00	3.00	Shallow soils.
WS10	1.00	3.00	Shallow soils.
WS12	1.00	3.00	Shallow soils.
WS14	1.00	3.00	Shallow soils.
BH06 (Cambria)	4.00	20.00	Deeper soils and bedrock.

3.7 Laboratory Chemical Testing

3.7.1 Sampling Strategy

Soil sampling locations were selected on a non-targeted basis to characterise the contamination status of the site. A sample was targeted at the location of the electrical substation.

Sample locations, depths and suspected/known contamination source targets are summarised in **Table 3.4**:

Table 3.4 Sample Locations, Depths and Targets

Location	Depth (m)	Contamination Targets
WS01	1.10	S1
WS03	0.40	S1
WS05	0.80	S1
WS07	2.40	S1
WS08	0.60	S1
WS09	2.90	S1
WS10	0.60	S1
WS12	0.50	S1
RC01	0.60	S1
RC03	0.40	S1
SA01	0.50	S1
SA03	1.10	S1
SA04	0.80	S1
SA05	0.30	S1
SA05 (Sub)	0.60	Electricity Substation
SA06	0.60	S1

3.7.2 Soil Laboratory 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 3.5**.

Table 3.5 Soil Laboratory Analysis

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

The results are discussed in detail in **SECTION 4** and the laboratory test results certificates may be found in **Annex F**.

3.8 Soil Property Testing

3.8.1 In-situ Permeability Testing

During the site investigation nine trial pit soakaway tests were undertaken in TP01 to TP03 and SA01 to SA06 and carried out in general accordance with BRE DG 365:2016.

Soakaway test results are summarised in **Table 3.6**.

Table 3.6 Summary of Soakaway Results

Trial Pit	Depth Range of Test (m)	Infiltration Rate (ms^{-1})
TP01 (TF)	N/A	No test as groundwater seepage at 0.80m slowly fills trial pit.
TP02 (TF)	1.30-2.00	No Infiltration
TP03 (TF)	1.20-2.00	No Infiltration
SA01	1.50-2.00	No Infiltration
SA02	1.50-2.00	No Infiltration
SA03	1.50-2.00	No Infiltration
SA04	1.40-2.00	No Infiltration
SA05	1.20-1.70	No Infiltration
SA06	1.50-2.00	No Infiltration

The test results are discussed in **SECTION 8.6** and the calculation sheets may be found in **Annex B**.

3.8.2 Laboratory Geotechnical Testing

A schedule of laboratory tests was prepared by Terra Firma and samples were despatched to the accredited laboratories of Apex Testing Solutions. A summary of the testing carried out is presented in **Table 3.7**.

Table 3.7 Summary of Geotechnical Testing

Geotechnical Test	Standard (BS1377:1990)	No. Tested
Moisture Content	Part 2, Clause 3.2	4
4 Point Liquid and Plastic Limit	Part 2, Clause 4.3 & 5.3	4

The test results are presented in **Annex G** and discussed in **SECTION 5** of this report.

3.8.3 Asphalt Coal Tar Testing

Six samples of the asphalt present on site were collected and sent to the laboratories of QROS for testing to determine if coal tar was present. The sample locations are listed in **Table 3.8**.

Table 3.8 Road Core Sample Summary

Location	Depth (m)	Testing
WS01 (RC01)	0.10	Coal Tar Tarmac testing.
WS02 (RC02)	0.10	Coal Tar Tarmac testing.
WS03 (RC03)	0.10	Coal Tar Tarmac testing.
WS04 (RC04)	0.10	Coal Tar Tarmac testing.
WS05 (RC05)	0.10	Coal Tar Tarmac testing.
WS10 (RC06)	0.10	Coal Tar Tarmac testing.

The results of the asphalt testing are discussed in **Section 5** and presented in **Annex H**.

SECTION 4 Evaluation of Geoenvironmental Analytical Results

4.1 Assessment Methodology

Comparison of the analytical results has been made with the 2015 Suitable 4 Use Levels (S4UL) provided by Land Quality Management (LQM) Limited and the Chartered Institute of Environmental Health (CIEH) or provisional Category 4 Screening Levels (pC4SL).

4.2 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**.

4.2.1 Inorganics & Miscellaneous

Sixteen samples were tested for a standard suite of inorganics, pH and organic matter. The summarised results are in **Table 4.1**.

Table 4.1 Summary of Soil Chemical Test Results – Inorganics & Miscellaneous

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Arsenic	37	LQM/CIEH	3.7	11	0
Cadmium	11	LQM/CIEH	<0.10	0.35	0
Chromium III	910	LQM/CIEH	5	16	0
Chromium VI	6	LQM/CIEH	<0.50	<0.50	0
Copper	2400	LQM/CIEH	1.5	36	0
Lead	200	pC4SL	6.3	38	0
Mercury (inorganic)	40	LQM/CIEH	<0.05	0.09	0
Nickel	180	LQM/CIEH	2.4	35	0
Selenium	250	LQM/CIEH	0.27	0.96	0
Zinc	3700	LQM/CIEH	9.5	100	0
Cyanide	-	-	<0.50	0.50	-
Boron	290	LQM/CIEH	<0.40	0.57	0
Organic Matter (%)	-	-	1.4	4.2	-
pH	-	-	6.9	9.1	-
Phenols	120	LQM/CIEH	<0.10	<0.10	0

Notes:
- No available guideline

4.2.2 Organics

Sixteen samples were tested for speciated PAH. The summarised results are in **Table 4.2**.

Table 4.2 Summary of Soil Chemical Test Results – Speciated PAH

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Naphthalene	2.3	LQM/CIEH	<0.10	6.6	1*
Acenaphthylene	170	LQM/CIEH	<0.10	<0.10	0
Acenaphthene	210	LQM/CIEH	<0.10	0.80	0

Fluorene	170	LQM/CIEH	<0.10	0.89	0
Phenanthrene	95	LQM/CIEH	<0.10	2.5	0
Anthracene	2400	LQM/CIEH	<0.10	0.44	0
Fluoranthene	280	LQM/CIEH	<0.10	6.6	0
Pyrene	620	LQM/CIEH	<0.10	3.8	0
Benzo(a)anthracene	7.2	LQM/CIEH	<0.10	0.25	0
Chrysene	15	LQM/CIEH	<0.10	0.36	0
Benzo(b)fluoranthene	2.6	LQM/CIEH	<0.10	0.46	0
Benzo(k)fluoranthene	77	LQM/CIEH	<0.10	0.68	0
Benzo(a)pyrene	2.2	LQM/CIEH	<0.10	1.4	0
Indeno(123cd)pyrene	27	LQM/CIEH	<0.10	0.20	0
Dibenzo(ah)anthracene	0.24	LQM/CIEH	<0.10	<0.1	0
Benzo(ghi)perylene	320	LQM/CIEH	<0.10	0.13	0
Total PAH	-	-	<2.0	23	-

Notes:
Thresholds based on 1.0% soil organic matter
- No available guidelines
* - See Section 6.1.

Sixteen samples were tested for petroleum hydrocarbon. The summarised results are shown in **Table 4.3**.

Table 4.3 Summary of Soil Chemical Test Results – Petroleum Hydrocarbons

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Aliphatic					
PH C5 – C6 Ali	42	LQM/CIEH	<0.05	<0.05	0
PH C6 – C8 Ali (Sum)	100	LQM/CIEH	<0.10	<0.10	0
PH C8 – C10 Ali	27	LQM/CIEH	<0.05	<0.05	0
PH C10 – C12 Ali	130	LQM/CIEH	<2.0	10	0
PH C12 – C16 Ali	1100	LQM/CIEH	1.4	18	0
PH C16 – C21 Ali	65000*	LQM/CIEH	<2.0	13	0
PH C21 – C35 Ali	65000*	LQM/CIEH	6.1	92	0
PH C35 – C40 Ali	65000	LQM/CIEH	15	45	0
Aromatic					
PH C5 – C7 Arom	70	LQM/CIEH	<0.05	<0.05	0
PH C7 – C8 Arom	130	LQM/CIEH	<0.05	<0.05	0
PH C8 – C10 Arom	34	LQM/CIEH	<0.05	<0.05	0
PH C10 – C12 Arom	74	LQM/CIEH	<1.0	1.8	0
PH C12 – C16 Arom	140	LQM/CIEH	<1.0	4.8	0
PH C16 – C21 Arom	260	LQM/CIEH	<2.0	8.6	0
PH C21 – C35 Arom	1100	LQM/CIEH	<2.0	12	0
PH C35 – C40 Arom	1100	LQM/CIEH	4.9	21	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

One sample from the electrical substation area was tested for polychlorinated biphenyls (PCBs). The summarised results are in **Table 4.4**.

Table 4.4 Summary of Soil Chemical Test Results – PCB

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)	Number of Exceedances
			SA05	
PCB 81	-	-	<0.010	-
PCB 77	-	-	<0.010	-
PCB 105	-	-	<0.010	-
PCB 114	-	-	<0.010	-
PCB 118	-	-	<0.010	-
PCB 123	-	-	<0.010	-
PCB 126	-	-	<0.010	-
PCB 156	-	-	<0.010	-
PCB 157	-	-	<0.010	-
PCB 167	-	-	<0.010	-
PCB 169	-	-	<0.010	-
PCB 189	-	-	<0.010	-
Total PCBs	0.008	CLEA	<0.12	0

Notes:
- No available guideline

4.2.3 Asbestos Testing

All soil samples were scheduled for asbestos screening.

Asbestos was not detected.

SECTION 5 Geotechnical Testing Results

Geotechnical testing results are summarised in the following sections and presented in **Annex G**.

5.1 Plasticity & Moisture Content Testing

During the investigation four samples of the shallow clay material was taken and submitted for plasticity testing. The test results are summarised in **Table 5.1**.

Table 5.1 Plasticity & Moisture Content Test Results

Location	Depth (m)	Laboratory Principal Soil Type	Moisture Content (%)	Plasticity Index (%)	Passing 425µm Sieve (%)	Modified Plasticity Index (%)	Volume Change Potential
WS05	1.80	Clay	17.4	14	91	12.74	Low
WS09	0.80	Clay	7.9	12	88	10.56	Low
WS12	2.70	Clay	10.4	16	63	10.08	Low
SA04	2.50	Clay	10.8	18	63	11.34	Low

In line with the NHBC (Chapter 4.2), the modified plasticity index for each sample was calculated. For design purposes the soils on site should be assumed to have a low volume change potential.

5.2 BRE SD1 Testing

Five samples were subject to BRE SD1 testing for concrete classification. The results are summarised in **Table 5.2**.

Table 5.2 BRE SD1 Testing Summary

Location	Depth (m)	2:1 Water / Soil Extract	Total Sulphur	Total Potential Sulphate (%)	Acid Soluble Sulphate (%)	Oxidisable Sulphides (%)	pH	Design Sulphate Class for Location	ACEC Class for Location
		SO_4 (mg/l)							
WS01	1.10	19	0.10	0.30	<0.010	0.29	9.0	DS-2	AC-2
WS05	0.80	27	0.14	0.42	<0.010	0.41	8.8	DS-2	AC-2
WS09	2.90	<10	0.020	0.060	<0.010	0.050	6.9	DS-1	AC-1
WS10	0.60	19	0.070	0.210	<0.010	0.200	8.5	DS-1	AC-1
SA05	0.30	46	0.10	0.30	0.011	0.289	8.6	DS-2	AC-2

The following stoichiometric equation was employed in Table 5.2 for the soils to determine the Total Potential Sulphate (TPS).

TPS (% as SO_4) = 3.0 x Total Sulphur (TS % as S)

The amount of Oxidisable Sulphides (OS as %SO_4) has been conservatively calculated by the following equation;

OS = TPS – Acid Soluble Sulphate (AS)

5.3 Tarmac Testing

During the investigation six samples of the asphalt were taken and submitted for testing. The test results are summarised in **Table 5.3**.

Table 5.3 Asphalt Test Result Summary

Location	Depth (m)	Matrix	Coal Tar (%)	Bitumen Degradation Factor
WS01	0.10	Road Binder	None Detected	56
WS02	0.10	Road Binder	None Detected	18
WS03	0.10	Road Binder	None Detected	33
WS04	0.10	Road Binder	None Detected	22
WS05	0.10	Road Binder	None Detected	30
WS10	0.10	Road Binder	None Detected	70

Notes:
Bitumen degradation factor, <100 = undegraded, 100-500 Degraded, >500 Very Degraded.

It can be seen from the above table that the samples of tarmac tested do not contain coal tar.

SECTION 6 Quantitative Risk Assessment

6.1 Contaminants of Concern

The initial screening of the laboratory chemical analysis has utilised S4ULs as the most conservative guideline values to assess the site. This has identified a single exceedance of naphthalene in a sample of the made ground from SA06 at 0.60m depth.

In addition to the 6 substances from Phase 1 of the C4SL Project, phase 2 has produced guidelines for a further 20 substances, including naphthalene. Given that the chemical analysis has identified a single exceedance across the site the risk is considered to be low and it is therefore justifiable and acceptable to use the C4SL guideline as an assessment criteria. While the C4SLs are more pragmatic compared to existing generic screening levels they are still strongly precautionary. The concentrations of naphthalene identified on site have been reassessed using the C4SL, for 1.0% SOM and a residential with consumption of homegrown produce scenario, in Error! Reference source not found..

Table 6.1 C4SL Screening of identified S4UL Exceedances

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Naphthalene	15	C4SL	<0.10	6.6	0

It can be seen from the above table that when the C4SL is used the maximum concentration falls below threshold value. Therefore naphthalene can be excluded as a contaminant of concern.

No other determinants have been found to exceed guideline values and no contaminants of concern are present in the samples collected and analysed.

Gas contamination will be dealt with in the standalone detailed ground and mine gas risk assessment.

6.2 Mitigation and Remedial Measures

As no contaminants of concern have been identified site specific mitigation or remedial measures are not required for the proposed development.

6.2.1 Human Health

6.2.1.1 Contaminated Soils

As good practice, construction workers should 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 should 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 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 (Report 10/WM/03/21)’ should be consulted.

In accordance with EC Regulation 1272/2008 and Environment Agency Guidance WM3 soils destined for off-site disposal should be classified on the basis of their hazard phrases prior to

disposal. Soils are classified as a mirror entry waste and should 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 should be subject to additional sampling and testing and any necessary remedial measures designed and implemented before continuing with the works.

6.2.1.2 Mine Gas / Ground Gas / Radon / Vapours

A detailed mine and ground gas risk assessment is required for the development. Terra Firma have been commissioned to undertake these works and the findings will be reported in due course. The first round of monitoring is indicative of the presence of mine gas and it is therefore likely that protection measures will be required in the proposed development.

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 211:2015 for further details on required protection elements. Verification of the installed protection measures is highly recommended. Terra Firma Wales Ltd. offer a comprehensive ground gas protection system verification service.

6.2.2 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 should 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 7 Assessment of the Risk from Legacy Mining Features

7.1 Coal Seam Stratigraphy

The boreholes confirm both intact and non-intact sequences of coal measures geology to depths of between 18.00m and 50.00m as described below:

- Fill / Overburden / Superficial Deposits
- Measures: Mudstone / Sandstone
- **Coal**
- Measures: Mudstone / Sandstone
- **Coal**
- Measures: Mudstone / Sandstone

7.2 Summary of Boreholes

A summary of the boreholes sunk beneath the site with particular reference to coal seams and old workings is presented in the tables below and on the following page. They have been split into general SI boreholes and the lines targeted at individual adit roadways.

Table 7.1 Borehole Summary Site Investigation Boreholes

Location	Depth (m)	Feature	Thickness (m)
BH01 (Cambria)	15.10-16.10	Coal	1.00
BH02 (Cambria)	13.70-14.50	Coal	0.80
	31.80-33.50	Broken Ground No Returns	1.70
BH03 (Cambria)	16.40-17.10	Soft Drill Poor Returns	0.70
	31.00-33.00	Soft Drill Poor Returns	2.00
BH04 (Cambria)	8.00-8.60	Coal	0.60
	32.80-35.60	Soft / Broken Ground No Returns	2.80
BH05 (Cambria)	15.20-15.90	Soft No Returns	0.70
	32.50-33.20	Soft / Broken Ground No Returns	0.70
BH06 (Cambria)	13.00-13.90	Coal	0.90
	21.00-21.70	Coal	0.70
BH101	14.00-14.50	Coal	0.50
	15.10-16.00	Coal	0.90

Borehole **Line A** and Borehole **Line D** were targeted at the roadway extending from adit 298192-001 which is seen to cross the site in a south westerly direction. Initially Borehole **Line A** was drilled to try and identify the feature as close to the adit mouth as possible. Borehole **Line D** was then drilled to try and identify the orientation of the roadway across the site. The boreholes are listed in their onsite order from west to east.

Table 7.2 Borehole Summary Borehole Line A and Line D

Location	Depth (m)	Feature	Thickness (m)
Borehole Line A			
BH-A10	-	Intact Sequence	-
BH-A09	-	Intact Sequence	-
BH-A08	-	Intact Sequence	-
BH-A01	13.00-15.80	**Void / Broken Ground No Returns**	2.80
BH-A02	13.00-15.80	**Void / Broken Ground No Returns**	2.80
BH-A03	13.00-15.80	**Void / Broken Ground No Returns**	2.80
BH-A04	13.00-15.40	**Void / Broken Ground No Returns**	2.40
BH-A05	-	Intact Sequence	-
BH-A06	-	Intact Sequence	-
BH-A07	-	Intact Sequence	-

Borehole Line D			
BH-D11	15.20-16.00	Coal	0.80
	32.50-36.00	Soft Broken Ground No Returns	3.50
BH-D10	15.20-16.00	Coal	0.80
	32.50-36.00	Soft Broken Ground No Returns	3.50
BH-D01	14.40-15.00	Coal	0.60
	33.00-35.20	Soft Broken Ground No Returns	2.20
BH-D02	13.00-16.40	**Void / Broken Ground No Returns**	3.40
BH-D03	13.00-16.40	**Void / Broken Ground No Returns**	3.40
BH-D04	13.00-16.40	**Void / Broken Ground No Returns**	3.40
BH-D05	13.00-16.40	**Void / Broken Ground No Returns**	3.40
BH-D06	13.00-16.40	**Void / Broken Ground No Returns**	3.40
BH-D07	14.50-15.10	Coal	0.60
	32.90-35.00	Soft Broken Ground No Returns	2.10
BH-D08	15.00-15.60	Coal	0.60
	32.90-35.00	Soft Broken Ground No Returns	2.10
BH-D09	15.00-15.60	Coal	0.60
	32.90-35.00	Soft Broken Ground No Returns	2.10

Borehole **Line B** was targeted at the roadway extending from adit 298192-076 which is seen to cross the eastern most end of the site in a north northeasterly direction.

Table 7.3 Borehole Summary Borehole Line B

Location	Depth (m)	Feature	Thickness (m)
Borehole Line B			
BH-B10	15.50-16.50	Coal	1.00
	21.00-21.80	Coal	0.80
BH-B09	15.50-16.50	Coal	1.00
	21.00-21.80	Coal	0.80
BH-B08	15.50-16.50	Coal	1.00
	21.00-21.80	Coal	0.80
BH-B01	15.50-16.50	Coal	1.00
	21.00-21.80	Coal	0.80
BH-B02	15.20-16.20	Coal	1.00
	20.70-21.40	Coal	0.70
BH-B03	15.00-16.00	Coal	1.00
	20.50-21.20	Coal	0.70
BH-B04	14.40-15.10	Coal	0.70
	20.20-21.00	Coal	0.80
BH-B05	14.40-15.10	Coal	0.70
	20.00-20.80	Coal	0.80
BH-B06	14.20-15.00	Coal	0.80
	19.20-19.90	Coal	0.70
BH-B07	14.00-14.70	Coal	0.70
	19.00-19.60	Coal	0.60

Borehole **Line C** was targeted at the roadway extending from adit 298192-032 which is seen to cross the eastern most end of the site in a south westerly direction.

Table 7.4 Borehole Summary Borehole Line C

Location	Depth (m)	Feature	Thickness (m)
Borehole Line C			
BH-C01	15.20-16.00	Soft Poor Returns	0.80
	18.60-19.50	Soft Poor Returns	0.90
BH-C02	15.00-16.00	Coal	1.00
	18.50-19.50	Coal	1.00

	33.00-34.50	Soft Poor returns	1.50
BH-C03	15.00-16.00	Coal	1.00
	18.50-19.50	Coal	1.00
	33.00-34.50	Soft Poor Returns	1.50
BH-C04	15.00-16.00	Coal	1.00
	18.50-19.50	Coal	1.00
	34.50-36.00	Soft Poor Returns	1.50
BH-C05	14.80-15.80	Coal	1.00
	18.30-19.20	Coal	0.90
	32.50-34.50	Soft Poor Returns	2.00
BH-C06	14.50-15.50	Coal	1.00
	18.00-18.80	Coal	0.80
BH-C07	14.50-15.50	Coal	1.00
	18.00-18.80	Coal	0.80
BH-C08	14.50-15.50	Coal	1.00
	18.00-18.80	Coal	0.80
BH-C09	14.00-15.00	Coal	1.00
	17.60-18.50	Coal	0.90
BH-C10	14.00-15.00	Coal	1.00
	17.60-18.50	Coal	0.90
BH-C11	13.70-14.60	Coal	0.90
	17.00-18.00	Coal	1.00
BH-C12	13.70-14.60	Coal	0.90
	17.00-18.00	Coal	1.00
BH-C13	9.40-12.00	**Void Broken Ground No Returns**	2.60

7.3 Rotary Borehole Interpretation

Several of the boreholes encountered voids / broken ground of varying thickness.

Cross sections of the boreholes have been produced using the Holebase logging software and can be found in **Annex D**. It can be seen in Borehole **Line A** and Borehole **Line D** that there is a feature that deviates from the expected ground conditions and the boreholes undertaken either side of the feature. These were encountered as voids with a small amount of broken ground and there was an immediate corresponding loss in drilling flush when these features were encountered. This is anticipated to be the roadway extending from adit 298192-001 and is between 3m and 4m in diameter with a height of 2.80m to 3.40m.

The drilling shows that the floor of the adit is at an approximate depth of 15.80m in Borehole **Line A** and in Borehole **Line D** it is at 16.40m. This would suggest that roadway is falling in a south westerly direction from the location of the adit mouth.

Borehole **Line B** targeted at the roadway from adit 298192-076 found no features which deviated from the expected ground conditions. This adit roadway runs counter to the majority of the adits in the area and against the topography of the area. It is considered that this adit lies off site or is located at a depth as to not pose a risk to the surface.

Borehole **Line C** identified a feature which deviated from the expected ground conditions in BH-C13. This borehole found an open void with a small amount of broken ground and there was an immediate corresponding loss in drilling flush. Due to the location of this borehole in the corner of the site with underground services and the drop in topography it was not possible to drill additional boreholes beyond BH-C13 to confirm the dimensions of the feature. It is anticipated that this is the roadway extending from adit 298192-032 and was seen to be 2.60m in height.

Due to the presence of shallow roadways, there is risk to the proposed development and this is considered in the following sections.

7.4 Potential Hazards from Shallow Workings

A paper published in 'Land Subsidence (Proceedings of the Fourth International Symposium on Land Subsidence, May 1991 – IAHS Publ. no. 200,1991) by Statham *et al*, titled 'Subsidence Due to Abandoned Mining in the South Wales Coalfield, U.K: Causes, Mechanisms and Environmental Risk Assessment' was consulted.

Statham *et al* have shown that in the South Wales Coalfield the upper limit of crown hole migration through rock is generally 8 to 12 times the void height.

Figure 3 of this paper (reproduced below) presents a histogram of H/T (rock head over void height). From this histogram it can be extrapolated that over 95% of the incidents of crown hole migration occur where the H/T ratio is less than 10 (i.e. 1m void for 10m overlying rockhead cover. Over 75% occur where the H/T ratio is less than 2.

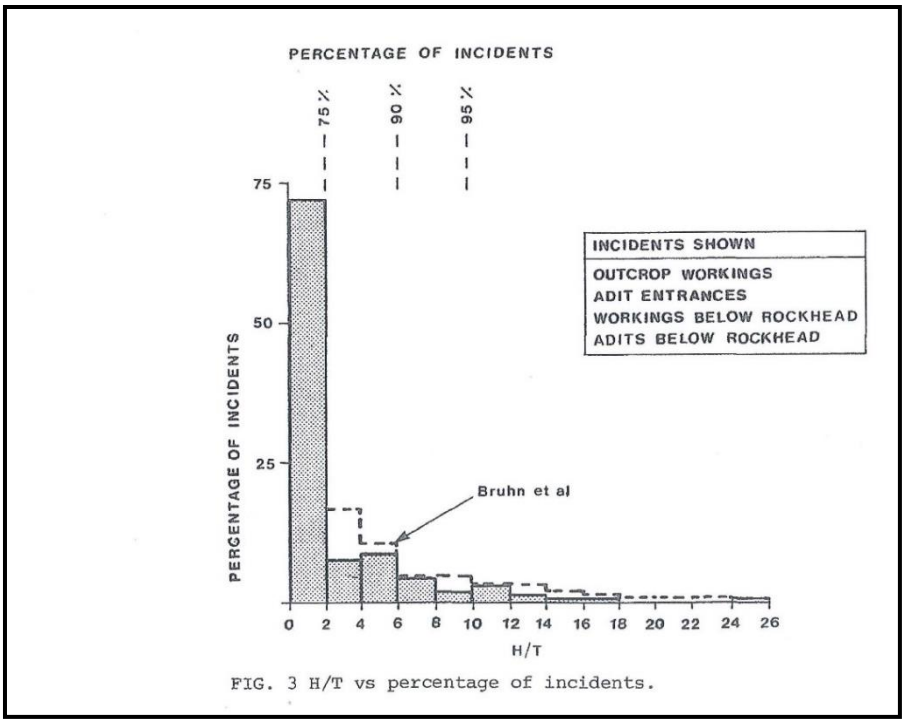

Figure 7.1 Figure 3 Exert from Statham et al

Table 7.5 compares a H/T ratio of ten with actual rock head cover for both normal workings and roadways. Values are shaded red where the 10:1 ratio criterion is not satisfied. Boreholes encountering intact sequences have been excluded.

Table 7.5 Summary of Rock Head Cover

Location	Depth to Rock Head (m below ground level)	Thickness of Mining Feature (m)	Estimated Rock Head Cover Required Based on H/T Ration of ten and feature thickness (m)	Actual Rock Head Cover (m)
BH02 (Cambria)	5.80	1.70 (Broken Ground)	17.00	26.00
BH04 (Cambria)	8.00	2.80 (Broken Ground)	28.00	24.80
BH05 (Cambria)	6.20	0.70 (Broken Ground)	7.00	26.30
BH-A01	13.00	2.80	28.00	None Recorded
BH-A02	13.00	2.80	28.00	None Recorded
BH-A03	13.00	2.80	28.00	None Recorded
BH-A04	13.00	2.40	24.00	None Recorded
BH-C13	9.40	2.60	26.00	None Recorded

BH-D02	13.00	3.40	34.00	None Recorded
BH-D03	13.00	3.40	34.00	None Recorded
BH-D04	13.00	3.40	34.00	None Recorded
BH-D05	13.00	3.40	34.00	None Recorded
BH-D06	13.00	3.40	34.00	None Recorded

Notes:

	Borehole with sufficient rock head cover or where rock sequence was intact
	Borehole with insufficient rock head cover over broken ground
	Borehole with insufficient rock head cover and open voids

The site investigation boreholes have found roadways with insufficient rock head cover over open voids. The 10:1 ratio for rock head to void has not been achieved and the risk to the proposed development is therefore considered to be high. It is therefore necessary for the roadways to be stabilised by drilling and grouting methods.

7.5 Drilling and Grouting

As previously stated, the rotary boreholes have confirmed that there are shallow roadways within the bedrock and there is insufficient rockhead cover to protect from a collapse of these features.

Ground stabilisation by drilling and grouting must be carried out prior to development commencing. This should be undertaken in accordance with Chapter 6 ‘Consolidation of Shallow Abandoned Mine Workings’ of CIRIA C758D: 2019 ‘Abandoned Mine Workings Manual’.

Grout is pumped into the working, acting ‘to replace or maintain the sub-surface support lost by excavation, and to restrict void migration so that any subsequent development does not experience foundation collapse or major subsidence’.

To gain adequate coverage of the area to be treated a series of rotary boreholes are sunk in a grid formation through the workings.

A closely spaced line of grout holes should be established at either end of the feature, as close to the site boundary as possible, using a spacing of 1.00m. For the internal grid between the two end lines, a spacing of 3.00m is utilised. A sacrificial plastic tube is inserted in each hole to ensure it remains open throughout the grouting procedure. Alternatively, a reusable steel casing can be used. The grid should extend beyond the assumed route of the roadway to ensure it is properly stabilised.

Grout typically comprises a 10:1 mixture of pulverised fuel ash (pfa) to Ordinary Portland cement, batch mixed via a paddle mixer.

Given the open nature of the workings grout should be pumped into the borehole under gravity. Where backfill is present it may be necessary to grout under pressure to ensure adequate treatment. Initially the perimeter / end holes are filled until grout is present at the surface. In this way a grout curtain is established to prevent grout migration to areas outside the stabilisation zone. Grouting is also started at the down dip end of the feature which in the case of the roadways is the northern end.

Where particularly high grout intakes are required the grid size may be reduced with additional intersecting boreholes. Once the grout curtain has been established the internal holes are filled.

Drilling and grouting would reduce the potential risks to tolerable levels.

Once the area has successfully been stabilised reinforced concrete strip foundation or a reinforced concrete raft type foundation/floor slab solution can be constructed within competent shallow ground. The foundations should be capable of spanning a residual crown hole of 1.5m with a cantilever effect on corners of 1.0m. These foundation recommendations would need to be confirmed by a suitable site investigation to determine the strength of the in-situ soils and deeper foundations may be required.

Given the proximity of the roadway from adit 298192-032 to the corner of the site it may not be possible to stabilise this feature. The stabilisation process in this area is complicated by the presence of the surface water features. As stabilisation is unlikely to be possible an exclusion zone may be required in which buildings are excluded and the surface is protected with the use of geogrids.

The exclusion zone associated with adit 298192-032 would need to extend 5.30m given the thickness of superficial deposits in the area. This has been marked on **Figure 7.2**.

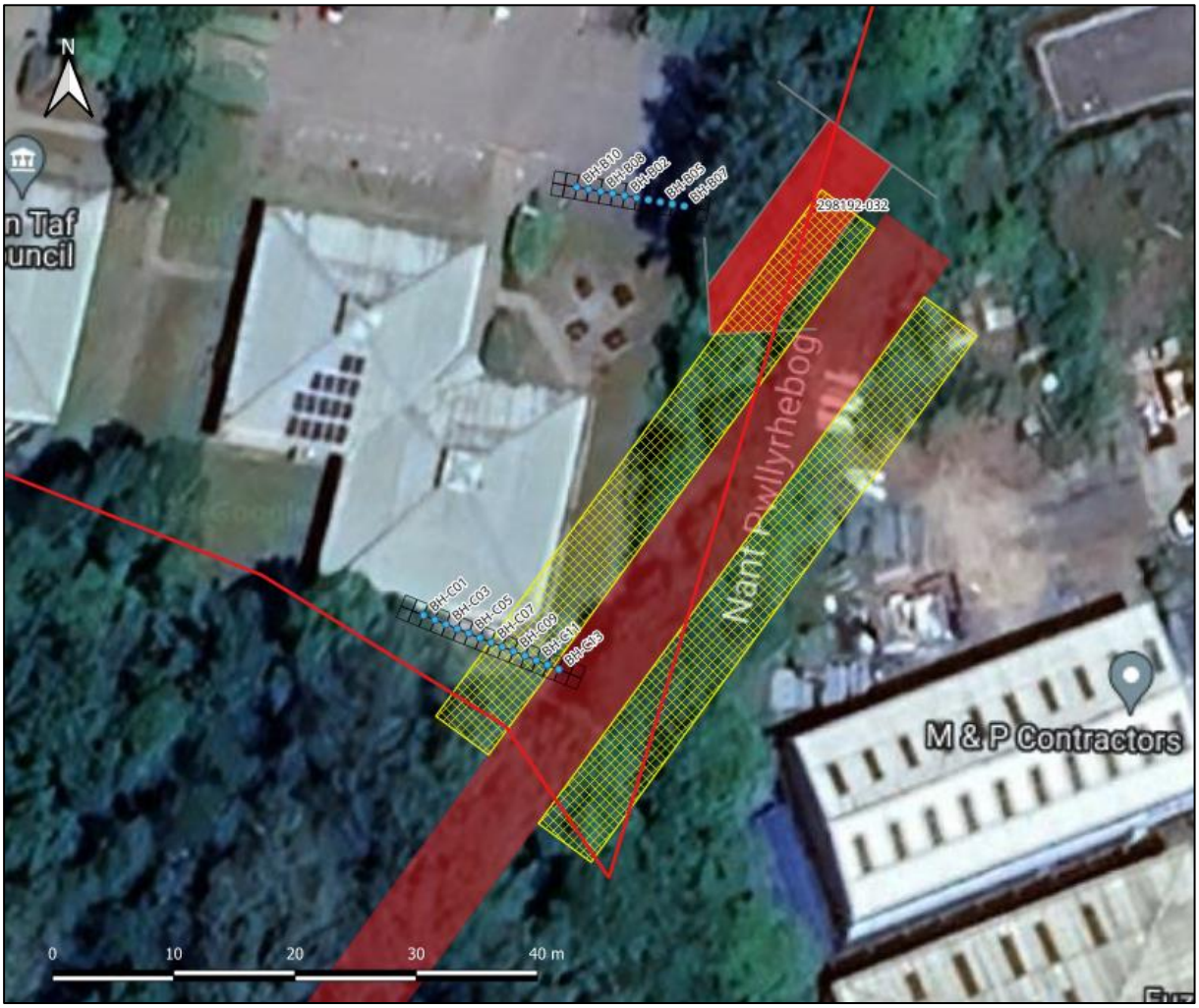

Figure 7.2 Exclusion Zone for Adit 298192-032

It must also be noted that should the roadways be found to be acting as groundwater conduits then the use of cement/pfa grout may not be allowed. If this is the case then consideration should be given to the use of single size stone as an adit filler to allow the free passage of groundwater.

SECTION 8 Engineering Recommendations

8.1 Preparation of Site

The desk study has confirmed that there is an active landslip to the south west of the site. Although remedial works have been undertaken on the landslip, activity has still been detected. It would therefore be prudent (if the landowner agrees) to undertake a current survey of the landslip to confirm or otherwise, movements.

Notwithstanding the above it is recommended that construction in the area of the landslip should be carried out in a sympathetic manner with excavations kept to an absolute minimum.

The location of the slip has been identified in **Figure 2.3**.

Prior to modification or demolition the existing building should be subject to a refurbishment and demolition survey to identify any ACMs. Any deleterious materials should be removed by a suitably qualified person and disposed of at an appropriately licences landfill. Precautions should be in place to prevent any contamination of the soils on site during the removal process.

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

Allowances should be made for any temporary/permanent support works to any existing adjacent structure necessary as a result of the proposed works.

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 should 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 and Environment Agency Guidance WM3 soils and other materials destined for off-site disposal should be classified on the basis of their hazard phrases prior to disposal. Soils are classified as a mirror entry waste and should be classified on the basis of their specific chemical properties. Terra Firma (Wales) Ltd offer this service if required.

8.2 Foundation and Floor Slab Solution

The following recommendations are contingent on completion of the recommended drilling and grouting stabilisation works. A turn and compact exercise is also required to provide a homogenous unit removing any existing soft spots and hard spots associated with the current buildings.

It is recommended that a reinforced concrete strip foundation be used; founded within the reengineered made ground at an approximate depth of 1.00m below the existing ground level. An allowable bearing pressure of 100kN/m^2 may be used for strips up to 900mm wide.

Reinforcement should be designed to span a crown hole of 3.0m with a cantilever effect on corners of 1.5m.

Foundations must sit at least 200mm within the founding horizon.

For the given foundation solutions and bearing pressure, maximum total settlements of 25mm should result with differential movements of the superstructure not exceeding 1:750.

Floor slabs may be designed as suspended.

Foundations will need to be taken deeper within influencing distance of the tree root systems. The National House Building Council (NHBC) Chapter 4.2 gives guidelines as to the appropriate type of floor slab and void based on the type of tree, distance of the foundation from the tree and the plasticity index of the in-situ materials.

During the investigation 4 samples of the in-situ clay were taken and submitted for plasticity testing. In line with the NHBC (Chapter 4.2), the modified plasticity index for each sample was calculated. For design purposes the superficial cohesive deposits should be assumed to have a low volume change potential.

Foundations should be taken down to a minimum depth of 750mm below finished levels when founding in low volume change potential soils.

The recommendations should be reviewed by the chosen warranty provider and if necessary, an alternative solution can be explored.

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 Engineer before being concreted.

8.3 Excavations and Formations

Most of the shallow excavations will be possible with normal soil excavating machinery. Allowances for the use of a breaker attachment should be made when dealing with areas of hard standing or buried obstructions associated with the current buildings.

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.

8.4 Protection of Buried Concrete

The BRE Special Digest 1 testing has been undertaken with 5 samples submitted for analysis. Levels within the in-situ materials measured between <10mg/l and 46mg/l for water soluble sulphate (WS) and the pH varied between 6.9 and 9.0.

When initially compared to Table C2 the concrete on site should conform to Design Sulphate Class DS-2 and to Aggressive Chemical Environment for Concrete (ACEC) Class AC-2.
Acid soluble sulphate was recorded at levels between <0.010% and 0.011%.

The following stoichiometric equations were employed to calculate Total Potential Sulphate (TPS) and Oxidisable Sulphides(OS) to determine if the pyrite is present:

TPS (% as SO_4) = 3.0 x Total Sulphur (TS % as S)

OS (%) = TPS – Acid Soluble Sulphate (AS)

Since OS is above 0.30% in three of the five samples pyrite is probably considered to be present.

With comparison of the highest TPS of 0.14 to Table C2 of BRE Special Digest 1, these soils fall into Design Sulphate Class DS-2 and ACEC Class AC-2.

As the water soluble sulphate concentration is below 3000mg/l an additional consideration for the level of magnesium is not required.

8.5 Access Roads and Car Parking Areas

For car parking and road areas, based on the DCP test results, formations within the in-situ natural soils a CBR value of 5% may be used for design purposes.

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.

8.6 Storm Water Drainage

During the site investigation nine soakaway tests were undertaken in general accordance with BRE DG 365:2016. The soakaway test was carried out in trial pits within the made ground soils.

The soakaway tests recorded insufficient infiltration and was subsequently terminated early.

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

ANNEX A
Trial Pit Logs

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Trial Pit Log

Trial Pit No: TP01-TF
Sheet 1 of 1

Project Name: The Pavilions	Project No: 17931	Co-ords: 298177.39 - 192731.77 Level: 200.05	Date: 21/03/2024
Location: Tonypandy		Dimensions: 2.30 × 0.60, Depth 2.00	Scale: 1:25
Client: Morgan Sindal Construction & Infrastructure Ltd			Logged: JM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over soft dark brown slightly sandy silty CLAY. (MADE GROUND)
				0.30	199.75		Firm very dark brown sandy very gravelly CLAY. Gravels are angular and subangular fine to coarse mudstone and sandstone. (MADE GROUND)
				0.50	199.55		Firm dark brown mottled brown slightly sandy silty gravelly CLAY. Gravels are angular and subangular fine to coarse sandstone, mudstone, glass, coal and brick fragments. (MADE GROUND)
▼							
				2.00	198.05		End of Pit at 2.000m

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Stability:

Remarks: 1. Small groundwater inflow at 0.80m. 2. Density indicator for granular soils in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Trial pit terminated for soakaway test. 4. Trial pit backfilled with arisings.

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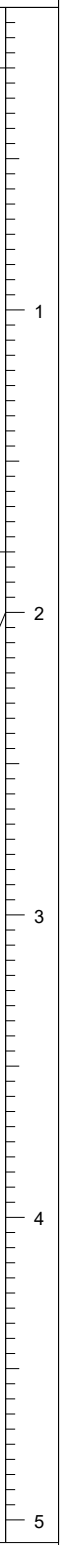
Trial Pit Log

Trial Pit No: TP02-TF
Sheet 1 of 1

Project Name: The Pavilions	Project No: 17931	Co-ords: 298107.29 - 192709.46 Level: 200.85	Date: 21/03/2024
Location: Tonypandy		Dimensions: 2.10 × 0.60, Depth 2.00	Scale: 1:25
Client: Morgan Sindal Construction & Infrastructure Ltd			Logged: JM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	200.65		Grass over soft brown slightly sandy silty CLAY. (MADE GROUND)
				1.80	199.05		Firm dark grey very gravelly silty CLAY. Gravels are angular and subangular fine to coarse sandstone, mudstone and glass fragments. Medium Cobble content. (MADE GROUND)
				2.00	198.85		Firm dark grey mottled brown slightly sandy silty gravelly CLAY. Gravels are angular and subangular fine to coarse sandstone, mudstone, glass, coal and brick fragments. (MADE GROUND) End of Pit at 2.000m



Stability:

Remarks: 1. No groundwater encountered. 2. Density indicator for granular soils in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Trial pit terminated for soakaway test. 4. Trial pit backfilled with arisings.

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Trial Pit Log

Trial Pit No: TP03-TF
Sheet 1 of 1

Project Name: The Pavilions	Project No: 17931	Co-ords: 298010.87 - 192767.17 Level: 202.35	Date: 21/03/2024
Location: Tonypandy		Dimensions: 2.40 × 0.60, Depth 2.00	Scale: 1:25
Client: Morgan Sindal Construction & Infrastructure Ltd			Logged: JM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Grass over soft dark brown slightly sandy silty CLAY. (MADE GROUND)
				0.40	201.95		Firm very dark brown sandy gravelly CLAY. Gravels are angular and subangular fine to coarse mudstone and sandstone. (MADE GROUND)
				0.80	201.55		Firm brown slightly sandy gravelly tending to very gravelly at base silty CLAY. Gravels are angular to subrounded fine to coarse mudstone and sandstone. (MADE GROUND)
				2.00	200.35		End of Pit at 2.000m

Stability:

Remarks: 1. No groundwater encountered. 2. Density indicator for granular soils in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Trial pit terminated for soakaway test. 4. Trial pit backfilled with arisings.

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Trial Pit Log

Trial Pit No: SA01
Sheet 1 of 1

Project Name: The Pavilions	Project No: 17931	Co-ords: 298046.70 - 192771.90 Level: 201.25	Date: 18/06/2024
Location: Tonypandy		Dimensions: 2.30 x 0.60, Depth 2.00	Scale: 1:25
Client: Morgan Sindal Construction & Infrastructure Ltd			Logged: JM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	201.05		Grass over brown slightly sandy slightly gravelly silty CLAY. Gravels are angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)
	0.50	ES					Greyish brown very gravelly sandy CLAY. Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
				0.70	200.55		Dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
				2.00	199.25		End of Pit at 2.000m

Stability:

Remarks: 1. No groundwater encountered. 2. Density indicator for granular soils in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Trial pit terminated for soakaway test. 4. Trial pit backfilled with arisings.

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Trial Pit Log

Trial Pit No: SA02
Sheet 1 of 1

Project Name: The Pavilions	Project No: 17931	Co-ords: 298092.00 - 192765.55 Level: 200.15	Date: 18/06/2024
Location: Tonypandy		Dimensions: Depth 2.00, 0.60 x 2.40	Scale: 1:25
Client: Morgan Sindal Construction & Infrastructure Ltd			Logged: JM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	200.00		Grass over brown slightly sandy slightly gravelly silty CLAY. Gravels are angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)
							Greyish brown very gravelly sandy CLAY. Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
				0.80	199.35		Dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
				2.00	198.15		End of Pit at 2.000m

1 2 3 4 5

Stability:

Remarks: 1. No groundwater encountered. 2. Density indicator for granular soils in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Trial pit terminated for soakaway test. 4. Trial pit backfilled with arisings.

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Trial Pit Log

Trial Pit No: SA03
Sheet 1 of 1

Project Name: The Pavilions	Project No: 17931	Co-ords: 298121.04 - 192727.02 Level: 200.40	Date: 18/06/2024
Location: Tonypandy		Dimensions: Depth 2.00, 0.60 x 2.60	Scale: 1:25
Client: Morgan Sindal Construction & Infrastructure Ltd			Logged: JM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	200.20		Grass over brown slightly sandy slightly gravelly silty CLAY. Gravels are angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)
	1.10	ES					Dark brown slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
				1.50	198.90		Very dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
				2.00	198.40		End of Pit at 2.000m

Stability:

Remarks: 1. No groundwater encountered. 2. Density indicator for granular soils in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Trial pit terminated for soakaway test. 4. Trial pit backfilled with arisings.

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Trial Pit Log

Trial Pit No: SA04
Sheet 1 of 1

Project Name: The Pavilions	Project No: 17931	Co-ords: 298161.90 - 192740.35 Level: 199.50	Date: 18/06/2024
Location: Tonypandy		Dimensions: 2.10 x 0.60 Depth 2.00	Scale: 1:25
Client: Morgan Sindal Construction & Infrastructure Ltd			Logged: JM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	199.30		Grass over brown slightly sandy slightly gravelly silty CLAY. Gravels are angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)
							Greyish brown very gravelly sandy CLAY. Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
				1.40	198.10		Very dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
				2.00	197.50		End of Pit at 2.000m
	2.50	D					

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Stability:

Remarks: 1. No groundwater encountered. 2. Density indicator for granular soils in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Trial pit terminated for soakaway test. 4. Trial pit backfilled with arisings.

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Trial Pit Log

Trial Pit No: SA05
Sheet 1 of 1

Project Name: The Pavilions	Project No: 17931	Co-ords: 298186.54 - 192753.48 Level: 198.45	Date: 18/06/2024
Location: Tonypandy		Dimensions: 2.30 x 0.60 Depth 1.70	Scale: 1:25
Client: Morgan Sindal Construction & Infrastructure Ltd			Logged: JM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES		0.20	198.25		Grass over brown slightly sandy slightly gravelly silty CLAY. Gravels are angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)
	0.60	ES		1.70	196.75		Very dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND) End of Pit at 1.700m

Stability:

Remarks: 1. No groundwater encountered. 2. Density indicator for granular soils in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Trial pit terminated for soakaway test. 4. Trial pit backfilled with arisings.

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Trial Pit Log

Trial Pit No: SA06
Sheet 1 of 1

Project Name: The Pavilions	Project No: 17931	Co-ords: 298133.91 - 192702.55 Level: 200.45	Date: 18/06/2024
Location: Tonypandy		Dimensions: Depth 2.00 (2.40 × 0.60)	Scale: 1:25
Client: Morgan Sindal Construction & Infrastructure Ltd			Logged: JM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	200.15		Grass over brown slightly sandy slightly gravelly silty CLAY. Gravels are angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)
				0.50	199.95		Greyish brown very gravelly sandy CLAY. Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
	0.60	ES					Very dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone with glass, coal and brick fragments. (MADE GROUND)
				2.00	198.45		End of Pit at 2.000m

Stability:

Remarks: 1. No groundwater encountered. 2. Density indicator for granular soils in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Trial pit terminated for soakaway test. 4. Trial pit backfilled with arisings.

ANNEX B
Soakaway Test Results

Trial Pit Soakaway

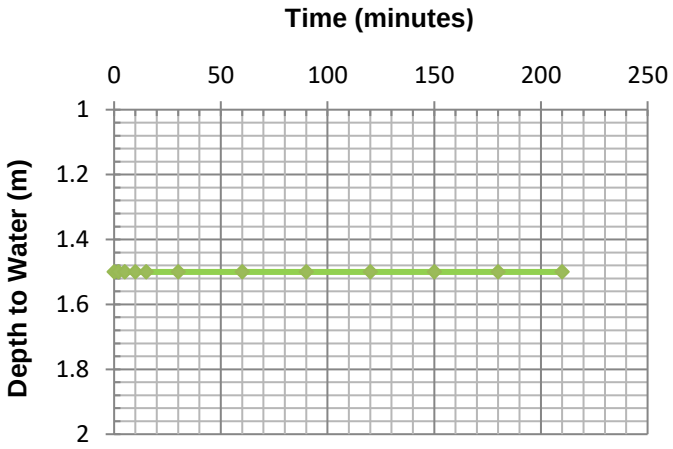
Site Name: The Pavilions, Tonypandy
Project Number: 17931
Date: 18.07.2024
Engineer: JM

Trial Pit: **SA01**

TEST 1

Length	2.30	m
Width	0.60	m
Depth	2.00	m
Fill Level	1.50	m
V_{p75-25}	0.345	m^3
a_{p50}	2.83	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f **No Infiltration**



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

Trial Pit Soakaway

Site Name: The Pavilions, Tonypandy
Project Number: 17931
Date: 18.07.2024
Engineer: JM

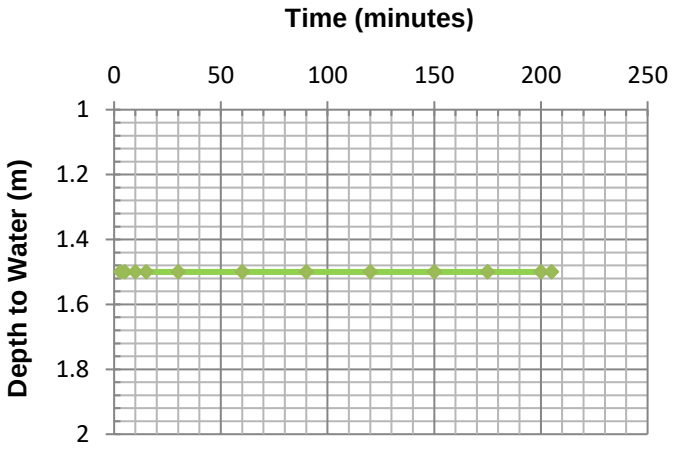
Trial Pit: **SA02**

TEST 1

Length	2.40	m
Width	0.60	m
Depth	2.00	m
Fill Level	1.50	m

V_{p75-25}	0.36	m^3
a_{p50}	2.94	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f **No Infiltration**



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

Trial Pit Soakaway

Site Name: The Pavilions, Tonypandy
Project Number: 17931
Date: 18.07.2024
Engineer: JM

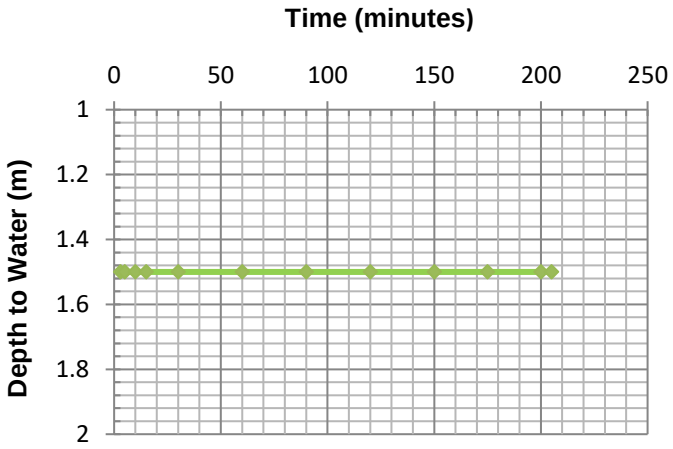
Trial Pit: **SA03**

TEST 1

Length	2.60	m
Width	0.60	m
Depth	2.00	m
Fill Level	1.50	m

V_{p75-25}	0.39	m^3
a_{p50}	3.16	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f **No Infiltration**



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

Trial Pit Soakaway

Site Name: The Pavilions, Tonypandy
Project Number: 17931
Date: 18.07.2024
Engineer: JM

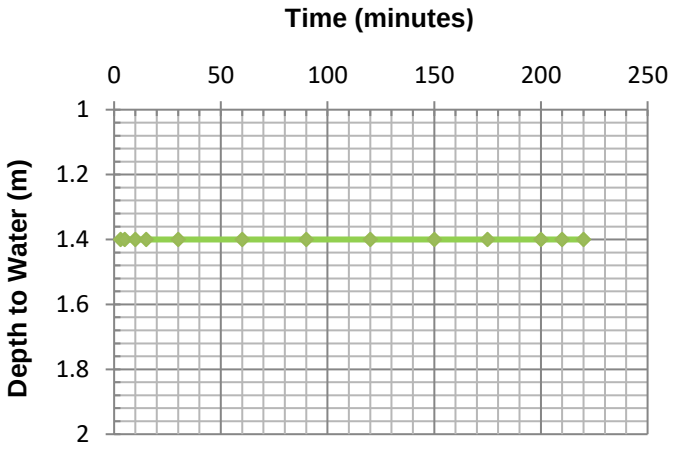
Trial Pit: **SA04**

TEST 1

Length	2.10	m
Width	0.60	m
Depth	2.00	m
Fill Level	1.40	m

V_{p75-25}	0.378	m^3
a_{p50}	2.88	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f **No Infiltration**



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

Trial Pit Soakaway

Site Name: The Pavilions, Tonypandy
Project Number: 17931
Date: 18.07.2024
Engineer: JM

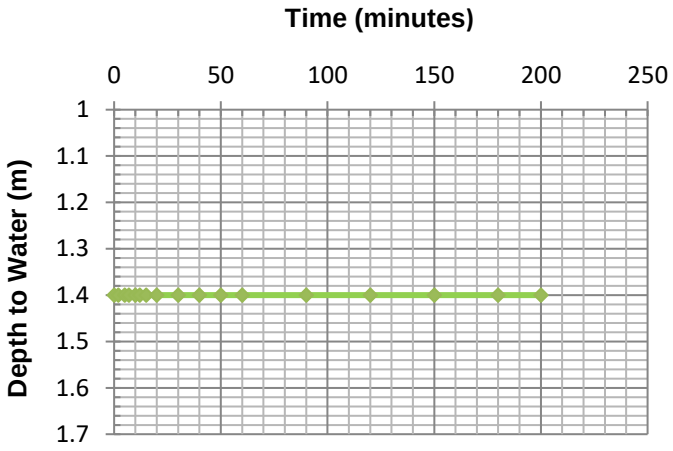
Trial Pit: **SA05**

TEST 1

Length	2.30	m
Width	0.60	m
Depth	1.70	m
Fill Level	1.20	m

V_{p75-25}	0.345	m^3
a_{p50}	2.83	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f **No Infiltration**



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

Trial Pit Soakaway

Site Name: The Pavilions, Tonypandy
Project Number: 17931
Date: 18.07.2024
Engineer: JM

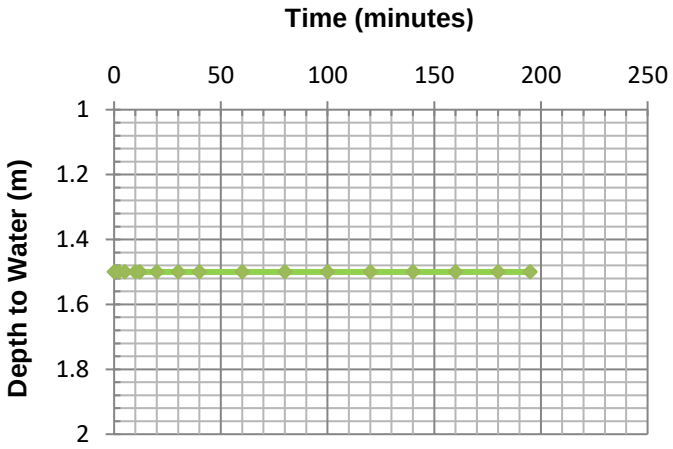
Trial Pit: **SA06**

TEST 1

Length	2.40	m
Width	0.60	m
Depth	2.00	m
Fill Level	1.50	m

V_{p75-25}	0.36	m^3
a_{p50}	2.94	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f **No Infiltration**



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

Trial Pit Soakaway

Site Name: The Pavilions, Tonypandy
Project Number: 17931
Date: 21.03.2024
Engineer: JM

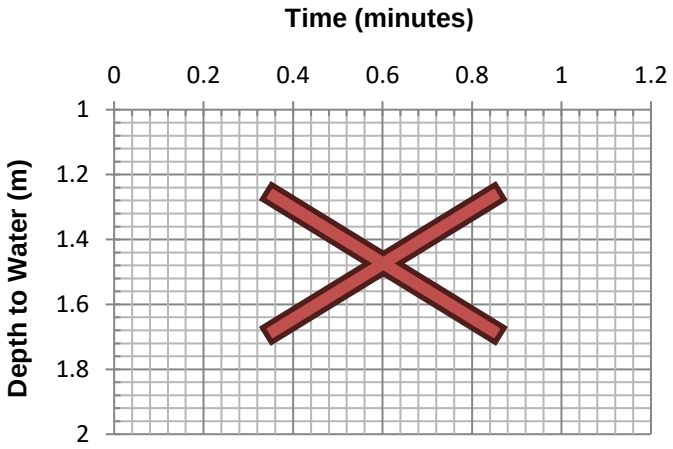
Trial Pit: **TP01 (TF)**

TEST 1

Length	2.30	m
Width	0.60	m
Depth	2.00	m
Fill Level	1.50	m

V_{p75-25}	0.345	m^3
a_{p50}	2.83	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f **No Test**



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016). No test undertaken at this lcoation due to a groundwater seepage filling the trial pit slowly.

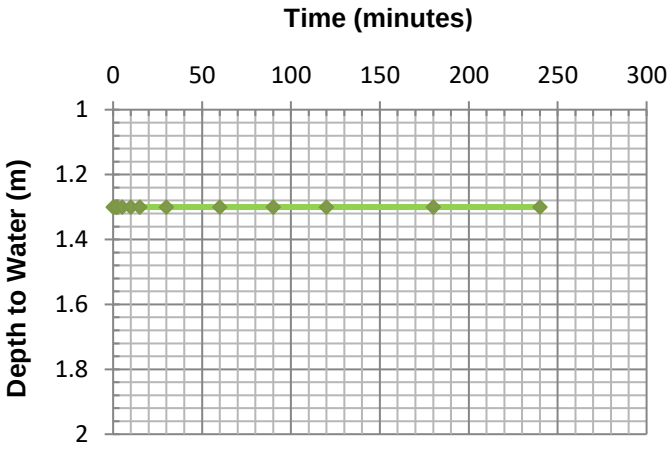
Trial Pit Soakaway

Site Name: The Pavilions, Tonypandy
Project Number: 17931
Date: 21.03.2024
Engineer: JM

Trial Pit: **TP02 (TF)**

TEST 1

Length	2.10	m
Width	0.60	m
Depth	2.00	m
Fill Level	1.30	m
V_{p75-25}	0.441	m^3
a_{p50}	3.15	m^2
t_{p75-25}	0	minutes
Soil Infiltration Rate, f	**No Infiltration**	



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

Trial Pit Soakaway

Site Name: The Pavilions, Tonypandy
Project Number: 17931
Date: 21.03.2024
Engineer: JM

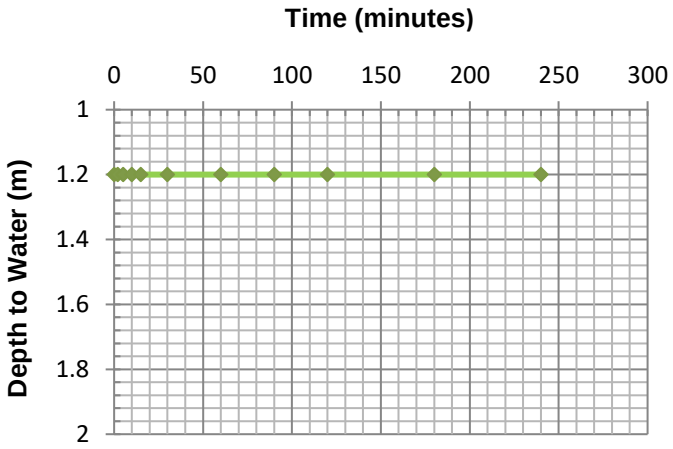
Trial Pit: **TP03 (TF)**

TEST 1

Length	2.40	m
Width	0.60	m
Depth	2.00	m
Fill Level	1.20	m

V_{p75-25}	0.576	m^3
a_{p50}	3.84	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f **No Infiltration**



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

ANNEX C
Mini Percussive Borehole Logs

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Borehole Log

Borehole No.
WS01(RC01)
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298180E - 192758N	Hole Type WS
Location:	Tonypandy		Level:	198.40m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/07/2024 - 19/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
	0.10	D		0.17	198.23			TARMACADAM (MADE GROUND)
				0.30	198.10			Medium dense reddish brown sandy silty angular and subangular fine to coarse aggregate GRAVEL. (MADE GROUND)
	1.00 1.10	SPT ES	N=28 (6,7/6,7,7,8)	1.00	197.40			Firm tending to stiff at base dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND) End of Borehole at 1.000m

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole terminated below road construction. 4. Borehole backfilled with arisings.

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Borehole Log

Borehole No.
WS02(RC02)
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298164E - 192729N	Hole Type WS
Location:	Tonypandy		Level:	199.60m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/07/2024 - 19/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
	0.10	D		0.16	199.44			TARMACADAM (MADE GROUND)
				0.25	199.35			Loose grey sandy angular and subangular medium and coarse sandstone GRAVEL. (MADE GROUND)
				0.45	199.15			Medium dense reddish brown sandy silty angular and subangular fine to coarse aggregate GRAVEL. (MADE GROUND)
	1.00	SPT	N=35 (5,7/8,9,8,10)	1.00	198.60			Firm tending to stiff at base dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
								End of Borehole at 1.000m

1 2 3 4 5 6 7 8 9 10

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole terminated below road construction. 4. Borehole backfilled with arisings.

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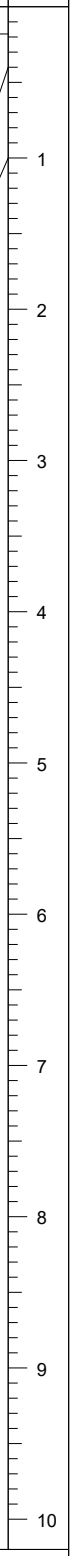
Borehole Log

Borehole No.
WS03(RC03)
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298129E - 192770N	Hole Type WS
Location:	Tonypandy		Level:	199.43m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/07/2024 - 19/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
	0.10	D		0.18	199.25			TARMACADAM (MADE GROUND)
	0.40	ES		0.40	199.03			Medium dense reddish brown saandy silty angular and subangular fine to coarse aggregate GRAVEL. (MADE GROUND)
	1.00	SPT	N=34 (6,9/10,9,7,8)	1.00	198.43			Firm tending to stiff at base dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
								End of Borehole at 1.000m



Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole terminated below road construction. 4. Borehole backfilled with arisings.

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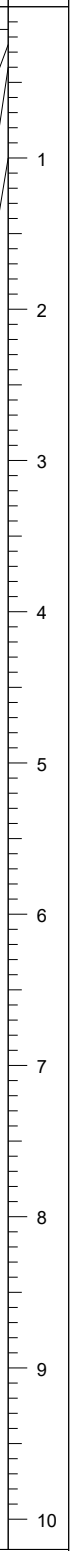
Borehole Log

Borehole No.
WS04(RC04)
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298079E - 192768N	Hole Type WS
Location:	Tonypandy		Level:	200.20m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/07/2024 - 19/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
	0.10	D		0.15	200.05			TARMACADAM (MADE GROUND)
				0.25	199.95			Loose grey sandy angular and subangular medium and coarse sandstone GRAVEL. (MADE GROUND)
				0.40	199.80			Medium dense reddish brown sandy silty angular and subangular fine to coarse aggregate GRAVEL. (MADE GROUND)
	1.00	SPT	N=22 (2,5/5,5,6,6)	1.00	199.20			Firm tending to stiff at base dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
								End of Borehole at 1.000m



Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole terminated below road construction. 4. Borehole backfilled with arisings.

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Borehole Log

Borehole No.
WS05(RC05)
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298037E - 192757N	Hole Type WS
Location:	Tonypandy		Level:	201.74m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/07/2024 - 19/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
	0.10	D		0.16	201.58			TARMACADAM (MADE GROUND)
				0.20	201.54			Medium dense reddish brown sandy silty angular and subangular fine to coarse aggregate GRAVEL. (MADE GROUND)
	0.80	ES						Firm tending to stiff at base dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
	1.00	SPT	N=10 (4,3/2,2,3,3)	1.00	200.74			End of Borehole at 1.000m
	1.80	D						

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole terminated below road construction. 4. Borehole backfilled with arisings.

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Borehole Log

Borehole No. **WS06**

Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298145E - 192731N	Hole Type WS
Location:	Tonypandy		Level:	199.95m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/07/2024 - 19/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.15	199.80			TARMACADAM (MADE GROUND)
				0.30	199.65			Medium dense reddish brown sandy silty angular and subangular fine to coarse aggregate GRAVEL. (MADE GROUND)
	1.00	SPT	N=34 (5,7/7,8,9,10)	1.00	198.95			Firm tending to stiff at base dark grey slightly sandy gravelly silty CLAY . Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
								End of Borehole at 1.000m

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole backfilled with arisings.

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Borehole Log

Borehole No. **WS07**
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298073E - 192743N	Hole Type WS
Location:	Tonypandy		Level:	200.50m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/07/2024 - 20/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.15	200.35			TARMACADAM (MADE GROUND)
								Firm dark grey gravelly CLAY. Gravels are angular and subangular fine to coarse sandstone, mudstone and coal. (MADE GROUND)
				0.80	199.70			
	1.00	SPT	N=21 (2,4/5,5,5,6)					Stiff dark grey gravelly CLAY. Gravels are angular and subangular fine to coarse sandstone, mudstone and coal. (MADE GROUND)
				1.60	198.90			
	2.00	SPT	N=16 (2,5/3,4,4,5)					Stiff locally very stiff brown gravelly CLAY. Gravels are angular and subangular fine to coarse sandstone, mudstone and glass fragments. (MADE GROUND)
	2.40	ES						
	3.00	SPT	N=32 (4,5/7,8,9,8)					
	4.00	SPT	N=22 (4,5/6,6,5,5)	4.00	196.50			End of Borehole at 4.000m

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole backfilled with arisings.

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Borehole Log

Borehole No. **WS08**
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298120E - 192722N	Hole Type WS
Location:	Tonypandy		Level:	200.40m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/07/2024 - 20/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.20	200.20			Loose grey sandy angular and subangular medium and coarse sandstone GRAVEL. (MADE GROUND)
	0.60	ES						Firm dark grey slightly sandy gravelly CLAY. Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
	1.00	SPT	N=13 (3,3/2,4,4,3)					
				1.40	199.00			Firm tending very stiff at base very dark grey gravelly CLAY. Gravels are angular and subangular fine to coarse mudstone, brick fragments and coal (MADE GROUND)
	2.00	SPT	N=29 (4,5/6,6,7,10)					
	3.00	SPT	N=50 (16,9/25,10,11,4)	3.00	197.40			End of Borehole at 3.000m

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole terminated at SPT refusal. 4. Borehole backfilled with arisings.

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Borehole Log

Borehole No. **WS09**
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298057E - 192745N	Hole Type WS
Location:	Tonypandy		Level:	201.37m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/07/2024 - 20/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.18	201.19			TARMACADAM (MADE GROUND)
				0.25	201.12			Loose grey sandy angular and subangular medium and coarse sandstone GRAVEL. (MADE GROUND)
				0.40	200.97			Medium dense reddish brown sandy silty angular and subangular fine to coarse aggregate GRAVEL. (MADE GROUND)
	0.80	D						
	1.00	SPT	N=36 (5,6/7,8,10,11)					Very stiff dark grey gravelly CLAY. Gravels are angular and subangular fine to coarse mustone (MADE GROUND)
	2.00	SPT	N=34 (10,9/8,9,9,8)					
				2.80	198.57			Firm grey mottled orangish brown slightly sandy silty CLAY
	3.00	SPT	N=13 (2,2/2,2,4,5)	3.00	198.37			End of Borehole at 3.000m

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole backfilled with arisings.

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Borehole Log

Borehole No.
WS10(RC06)
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298089E - 192756N	Hole Type WS
Location:	Tonypandy		Level:	200.10m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/07/2024 - 20/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.15	199.95			TARMACADAM (MADE GROUND)
	0.60	ES						Loose grey sandy very clayey angular and subangular medium and coarse sandstone GRAVEL. (MADE GROUND)
				0.80	199.30			
	1.00	SPT	N=47 (5,8/10,10,12,15)					Stiff dark brown sandy gravelly CLAY. Gravels are angular and subangular fine to coarse mudstone, sandstone, brick fragments, glass fragments and timber fragments. (MADE GROUND)
	2.00	SPT	N=19 (2,2/3,4,6,6)	2.10	198.00			Very stiff very dark grey slightly sandy gravelly CLAY. Gravels are angular to subrounded fine to coarse sandstone, brick fragments, mudstone and coal. (MADE GROUND)
	3.00	SPT	N=48 (12,12/12,12,14,10)	3.00	197.10			End of Borehole at 3.000m

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole backfilled with arisings.

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Borehole Log

Borehole No. **WS11**
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298102E - 192749N	Hole Type WS
Location:	Tonypandy		Level:	199.90m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/07/2024 - 21/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.20	199.70			TARMACADAM (MADE GROUND)
				0.50	199.40			Loose grey sandy angular and subangular medium and coarse sandstone GRAVEL. (MADE GROUND)
	1.00	SPT	N=41 (2,5/5,6,6,24)					Very stiff very dark grey slightly sandy gravelly CLAY. Gravels are angular to subrounded fine to coarse sandstone, brick fragments and mudstone. (MADE GROUND)
				1.60	198.30			Very stiff dark grey and brown slightly sandy gravelly CLAY. Gravels are angular to subrounded fine to coarse sandstone, brick fragments and mudstone
	2.00	SPT	N=34 (8,7/8,10,9,7)					
				2.80	197.10			Very stiff greyish brown sandy gravelly CLAY. Gravels are angular to subrounded fine to coarse sandstone, brick fragments and mudstone. (MADE GROUND)
	3.00	SPT	N=43 (10,10/11,10,10,12)					
	4.00	SPT	N=37 (4,6/7,7,11,12)	4.00	195.90			End of Borehole at 4.000m

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole backfilled with arisings.

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Borehole Log

Borehole No. **WS12**
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298121E - 192732N	Hole Type WS
Location:	Tonypandy		Level:	200.38m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/07/2024 - 21/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.15	200.23			Grass over soft brown slightly sandy silty CLAY. (MADE GROUND)
	0.50	ES						Stiff locally very stiff brown gravelly CLAY. Gravels are angular and subangular fine to coarse sandstone, mudstone, brick fragments and rare glass fragments. (MADE GROUND)
	1.00	SPT	N=41 (7,7/8,9,10,14)					
	2.00	SPT	N=17 (3,4/4,3,5,5)	2.00	198.38			Very stiff locally stiff greyish brown sandy gravelly CLAY. Gravels are angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)
	2.70	D						
	3.00	SPT	N=50 (6,13/13,16,21,0)	3.00	197.38			End of Borehole at 3.000m

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole backfilled with arisings.

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Borehole Log

Borehole No. **WS13**
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298160E - 192740N	Hole Type WS
Location:	Tonypandy		Level:	199.60m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/07/2024 - 21/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.20	199.40			Grass over soft brown slightly sandy slightly gravelly silty CLAY. Gravels are angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)
	1.00	SPT	N=25 (5,4/5,6,7,7)					Stiff tending to firm at base dark grey mottled brown slightly sandy gravelly CLAY. Gravels are angular and subangular fine to coarse mudstone and sandstone. (MADE GROUND)
	2.00	SPT	N=9 (4,5/3,2,2,2)					
				2.40	197.20			Firm locally stiff grey mottled brown sandy silty CLAY. (MADE GROUND)
	3.00	SPT	N=11 (1,2/3,4,2,2)					
				3.20	196.40			Very stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravels are angular to subrounded fine to coarse sanstone and mudstone. (MADE GROUND)
	4.00	SPT	N=30 (5,6/8,8,7,7)					
	5.00	SPT	N=42 (5,9/10,11,10,11)	5.00	194.60			End of Borehole at 5.000m

1 2 3 4 5 6 7 8 9 10

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole backfilled with arisings.

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Borehole Log

Borehole No. **WS14**
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298162E - 192719N	Hole Type WS
Location:	Tonypandy		Level:	199.95m	Scale 1:50
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/07/2024 - 21/07/2024	Logged By JM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.20	199.75			Grass over soft brown slightly sandy slightly gravelly silty CLAY. Gravels are angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)
	1.00	SPT	N=7 (2,3/4,1,1,1)					Soft locally stiff grey and brown slightly sandy gravelly CLAY. Gravels are angular and subangular fine to coarse sandstone and mudstone. (MADE GROUND)
	2.00	SPT	N=29 (1,5/5,8,8,8)					
				2.20	197.75			Stiff very dark grey sandy gravelly CLAY. Gravels are angular to subrounded fine to coarse sandstone, mudstone, brick fragments and rare coal. (MADE GROUND)
				2.70	197.25			Very stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravels are angular to subrounded fine to coarse sanstone and mudstone. (MADE GROUND)
	3.00	SPT	N=50 (8,10/11,15,14,10)	3.00	196.95			End of Borehole at 3.000m

Remarks: 1. No groundwater encountered. 2. Density indicator in brackets is based on field judgment and is not in accordance with BS5930:2015 but for guidance only. 3. Borehole backfilled with arisings.

ANNEX D
Rotary Borehole Logs

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Borehole Log

Borehole No.
BH01 (Cambria)
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298061E - 192767N	Hole Type RO
Location:	Tonypandy		Level:	200.82m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	11/06/2024 - 11/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.10	200.72			Tarmac (Drillers Description) Fill (Drillers Description)
				6.90	193.92			Mudstone / Sandstone (Drillers Description)
				15.10	185.72			Coal (Drillers Description)
				16.10	184.72			Fractured Sandstone Poor Returns (Drillers Description)

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No. **BH01 (Cambria)**
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298061E - 192767N	Hole Type RO
Location:	Tonypandy		Level:	200.82m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	11/06/2024 - 11/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Fractured Sandstone Poor Returns (Drillers Description)
				39.00	161.82			End of Borehole at 39.000m

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No. **BH02 (Cambria)**
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298082E - 192753N	Hole Type RO
Location:	Tonypandy		Level:	200.25m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	11/06/2024 - 11/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.10	200.15			Tarmac (Drillers Description) Fill (Drillers Description)
				5.80	194.45			Mudstone (Drillers Description)
				13.70	186.55			Soft Coal (Drillers Description)
				14.50	185.75			Sandstone (Drillers Description)

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No. **BH02 (Cambria)**
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298082E - 192753N	Hole Type RO
Location:	Tonypandy		Level:	200.25m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	11/06/2024 - 11/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				31.80	168.45			Broken Ground No Returns (Drillers Description)
				33.50	166.75			Solid No Returns (Drillers Description)
				36.00	164.25			End of Borehole at 36.000m

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No. **BH03 (Cambria)**
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298107E - 192724N	Hole Type RO
Location:	Tonypandy		Level:	200.65m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	11/06/2024 - 11/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	200.15			Topsoil (Drillers Description)
								Fill (Drillers Description)
				10.90	189.75			Mudstone / Sandstone
				16.40	184.25			Soft Poor Returns (Drillers Description)
				17.10	183.55			Solid Poor Returns (Drillers Description)

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No. **BH03 (Cambria)**
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298107E - 192724N	Hole Type RO
Location:	Tonypandy		Level:	200.65m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	11/06/2024 - 11/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid Poor Returns (Drillers Description)
				31.00	169.65			Soft Poor Returns (Drillers Description)
				33.00	167.65			Solid Poor Returns (Drillers Description)
				39.00	161.65			End of Borehole at 39.000m

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH04 (Cambria)
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298142E - 192728N	Hole Type RO
Location:	Tonypandy		Level:	200.20m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.60	199.60			Topsoil (Drillers Description)
								Fill (Drillers Description)
				8.00	192.20			Coal (Drillers Description)
				8.60	191.60			Mudstone (Drillers Description)

Remarks: 1. Borehole cased to 8.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No. **BH04 (Cambria)**
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298142E - 192728N	Hole Type RO
Location:	Tonypandy		Level:	200.20m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Mudstone (Drillers Description)
				24.60	175.60			Fractured Sandstone (Drillers Description)
				32.80	167.40			Soft / Broken Ground No Returns (Drillers Description)
				35.60	164.60			Solid No Returns (Drillers Description)
				39.00	161.20			End of Borehole at 39.000m

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. Borehole cased to 8.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH05 (Cambria)
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298138E - 192704N	Hole Type RO
Location:	Tonypandy		Level:	200.42m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.60	199.82			Topsoil (Drillers Description)
								Fill (Drillers Description)
				6.20	194.22			Mudstone (Drillers Description)
				15.20	185.22			Soft No Returns (Drillers Description)
				15.90	184.52			Solid No Returns (Drillers Description)

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH05 (Cambria)
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298138E - 192704N	Hole Type RO
Location:	Tonypandy		Level:	200.42m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid No Returns (Drillers Description)
				32.50	167.92			Soft / Broken Ground No Returns (Drillers Description)
				33.20	167.22			Solid No Returns (Drillers Description)
				36.00	164.42			End of Borehole at 36.000m

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No. **BH06 (Cambria)**
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298170E - 192706N	Hole Type RO
Location:	Tonypandy		Level:	200.15m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.20	199.95			Topsoil (Drillers Description) Fill (Drillers Description)
				6.20	193.95			Mudstone (Drillers Description)
				13.00	187.15			Coal (Drillers Description)
				13.90	186.25			Mudstone (Drillers Description)

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No. **BH06 (Cambria)**
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298170E - 192706N	Hole Type RO
Location:	Tonypandy		Level:	200.15m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Mudstone (Drillers Description)
				21.00	179.15			Coal (Drillers Description)
				21.70	178.45			Mudstone (Drillers Description)
				26.30	173.85			Soft and Fractured Sandstone Poor Returns (Drillers Description)
				39.00	161.15			End of Borehole at 39.000m

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH101
Sheet 1 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298014E - 1928N	Hole Type RO
Location:	Tonypandy		Level:	202.10m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	11/06/2024 - 11/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.10	202.00			Tarmac (Drillers Description) Fill (Drillers Description)
				6.30	195.80			Sandstone (Drillers Description)
				9.70	192.40			Mudstone / Sandstone (Drillers Description)
				14.00	188.10			Coal (Drillers Description)
				14.50	187.60			Mudstone (Drillers Description)
				15.10	187.00			Coal (Drillers Description)
				16.00	186.10			Mudstone / Sandstone (Drillers Description)

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH101
Sheet 2 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298014E - 1928N	Hole Type RO
Location:	Tonypandy		Level:	202.10m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	11/06/2024 - 11/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Mudstone / Sandstone (Drillers Description)
				24.50	177.60			Fractured Sandstone Poor Returns (Drillers Description)

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH101
Sheet 3 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298014E - 1928N	Hole Type RO
Location:	Tonypandy		Level:	202.10m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	11/06/2024 - 11/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Fractured Sandstone Poor Returns (Drillers Description)
				50.00	152.10			End of Borehole at 50.000m

Remarks: 1. Borehole cased to 6.00m. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A01
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298015E - 192773N	Hole Type RO
Location:	Tonypandy		Level:	199.82m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.32			Topsoil (Drillers Description)
								Soft to Firm Fill (Drillers Description)
				13.00	186.82			Void / Broken Ground No Returns (Drillers Description)
				15.80	184.02			Solid No Returns (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A01
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298015E - 192773N	Hole Type RO
Location:	Tonypandy		Level:	199.82m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				21.00	178.82			Solid No Returns (Drillers Description) End of Borehole at 21.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A02
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298146E - 192758N	Hole Type RO
Location:	Tonypandy		Level:	199.90m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.40			Topsoil (Drillers Description)
								Soft to Firm Fill (Drillers Description)
				13.00	186.90			Void / Broken Ground No Returns (Drillers Description)
				15.80	184.10			Solid No Returns (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A02
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298146E - 192758N	Hole Type RO
Location:	Tonypandy		Level:	199.90m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				21.00	178.90			Solid No Returns (Drillers Description) End of Borehole at 21.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A03
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298147E - 192757N	Hole Type RO
Location:	Tonypandy		Level:	199.92m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.42			Topsoil (Drillers Description)
								Soft to Firm Fill (Drillers Description)
				13.00	186.92			Void / Broken Ground No Returns (Drillers Description)
				15.80	184.12			Solid No Returns (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A03
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298147E - 192757N	Hole Type RO
Location:	Tonypandy		Level:	199.92m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	12/06/2024 - 12/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				21.00	178.92			Solid No Returns (Drillers Description) End of Borehole at 21.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A04
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298148E - 192757N	Hole Type RO
Location:	Tonypandy		Level:	199.95m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.45			Topsoil (Drillers Description)
								Fill (Drillers Description)
				13.00	186.95			Void / Broken Ground No Returns (Drillers Description)
				15.40	184.55			Solid No Returns (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A04
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298148E - 192757N	Hole Type RO
Location:	Tonypandy		Level:	199.95m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
				21.00	178.95			Solid No Returns (Drillers Description) End of Borehole at 21.000m	21
									22
									23
									24
									25
									26
									27
									28
									29
									30
									31
									32
									33
									34
									35
									36
									37
									38
									39
									40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A05
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298149E - 192757N	Hole Type RO
Location:	Tonypandy		Level:	199.94m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.44			Topsoil (Drillers Description)
								Fill (Drillers Description)
				11.80	188.14			Mudstone / Sandstone (Drillers Description)
				18.00	181.94			End of Borehole at 18.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A06
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298150E - 192757N	Hole Type RO
Location:	Tonypandy		Level:	199.90m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.40			Topsoil (Drillers Description)
								Fill (Drillers Description)
				11.80	188.10			Mudstone / Sandstone (Drillers Description)
				18.00	181.90			End of Borehole at 18.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A07
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298151E - 192757N	Hole Type RO
Location:	Tonypandy		Level:	199.85m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.35			Topsoil (Drillers Description)
								Fill (Drillers Description)
				11.80	188.05			Mudstone / Sandstone (Drillers Description)
				18.00	181.85			End of Borehole at 18.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A08
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298144E - 192758N	Hole Type RO
Location:	Tonypandy		Level:	199.85m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.35			Topsoil (Drillers Description)
								Fill (Drillers Description)
				12.00	187.85			Mudstone / Sandstone (Drillers Description)
				18.00	181.85			End of Borehole at 18.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A09
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298143E - 192758N	Hole Type RO
Location:	Tonypandy		Level:	199.81m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.31			Topsoil (Drillers Description)
								Fill (Drillers Description)
				12.00	187.81			Mudstone / Sandstone (Drillers Description)
				18.00	181.81			End of Borehole at 18.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-A10
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298142E - 192758N	Hole Type RO
Location:	Tonypandy		Level:	199.79m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.29			Overburden (Drillers Description)
								Fill (Drillers Description)
				12.00	187.79			Mudstone / Sandstone (Drillers Description)
				18.00	181.79			End of Borehole at 18.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B01
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298177E - 192719N	Hole Type RO
Location:	Tonypandy		Level:	199.59m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/06/2024 - 20/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				6.50	193.09			Mudstone (Driller Description)
				15.50	184.09			Coal (Drillers Description)
				16.50	183.09			Mudstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B01
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298177E - 192719N	Hole Type RO
Location:	Tonypandy		Level:	199.59m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/06/2024 - 20/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Mudstone (Drillers Description)
				21.00	178.59			Coal (Drillers Description)
				21.80	177.79			Sandstone (Drillers Description)
				39.00	160.59			End of Borehole at 39.000m

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B02
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298178E - 192719N	Hole Type RO
Location:	Tonypandy		Level:	199.58m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/06/2024 - 19/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				6.40	193.18			Mudstone (Drillers Description)
				15.20	184.38			Coal (Drillers Description)
				16.20	183.38			Mudstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B02
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298178E - 192719N	Hole Type RO
Location:	Tonypandy		Level:	199.58m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/06/2024 - 19/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Mudstone (Drillers Description)
				20.70	178.88			Coal (Drillers Description)
				21.40	178.18			Sandstone (Drillers Description)
				39.00	160.58			End of Borehole at 39.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B03
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298179E - 192719N	Hole Type RO
Location:	Tonypandy		Level:	199.56m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/06/2024 - 19/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				6.40	193.16			Mudstone (Drillers Description)
				15.00	184.56			Coal (Drillers Description)
				16.00	183.56			Mudstone / Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B03
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298179E - 192719N	Hole Type RO
Location:	Tonypandy		Level:	199.56m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/06/2024 - 19/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				20.50	179.06			Mudstone / Sandstone (Drillers Description)
				21.20	178.36			Coal (Drillers Description)
								Sandstone (Drillers Description)
				39.00	160.56			End of Borehole at 39.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B04
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298180E - 192719N	Hole Type RO
Location:	Tonypandy		Level:	199.55m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/06/2024 - 19/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				6.20	193.35			Mudstone (Drillers Description)
				14.40	185.15			Coal (Drillers Description)
				15.10	184.45			Mudstone / Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B04
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298180E - 192719N	Hole Type RO
Location:	Tonypandy		Level:	199.55m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/06/2024 - 19/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				20.20	179.35			Mudstone / Sandstone (Drillers Description)
								Coal (Drillers Description)
				21.00	178.55			Sandstone (Drillers Description)
				39.00	160.55			End of Borehole at 39.000m

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B05
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298181E - 192719N	Hole Type RO
Location:	Tonypandy		Level:	199.53m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/06/2024 - 19/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				6.20	193.33			Mudstone (Drillers Description)
				14.40	185.13			Coal (Drillers Description)
				15.10	184.43			Mudstone / Sandstone (Drillers Description)
				20.00	179.53			

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B05
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298181E - 192719N	Hole Type RO
Location:	Tonypandy		Level:	199.53m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/06/2024 - 19/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Coal (Drillers Description)
				20.80	178.73			Sandstone (Drillers Description)
				39.00	160.53			End of Borehole at 39.000m

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B06
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298182E - 192718N	Hole Type RO
Location:	Tonypandy		Level:	199.52m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/06/2024 - 19/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				6.20	193.32			Mudstone (Drillers Description)
				14.20	185.32			Coal (Drillers Description)
				15.00	184.52			Mudstone / Sandstone (Drillers Description)
				19.20	180.32			Coal (Drillers Description)
				19.90	179.62			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B06
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298182E - 192718N	Hole Type RO
Location:	Tonypandy		Level:	199.52m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	19/06/2024 - 19/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				39.00	160.52			End of Borehole at 39.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B07
Sheet 1 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298183E - 192718N	Hole Type RO
Location:	Tonypandy		Level:	199.50m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				6.50	193.00			Mudstone (Drillers Description)
				14.00	185.50			Coal (Drillers Description)
				14.70	184.80			Mudstone / Sandstone (Drillers Description)
				19.00	180.50			Coal (Drillers Description)
				19.60	179.90			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B07
Sheet 2 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298183E - 192718N	Hole Type RO
Location:	Tonypandy		Level:	199.50m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B07
Sheet 3 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298183E - 192718N	Hole Type RO
Location:	Tonypandy		Level:	199.50m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				42.00	157.50			End of Borehole at 42.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B08
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298176E - 192720N	Hole Type RO
Location:	Tonypandy		Level:	199.60m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/06/2024 - 20/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				6.50	193.10			Mudstone (Drillers Description)
				15.50	184.10			Coal (Drillers Description)
				16.50	183.10			Mudstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B08
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298176E - 192720N	Hole Type RO
Location:	Tonypandy		Level:	199.60m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/06/2024 - 20/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Mudstone (Drillers Description)
				21.00	178.60			Coal (Drillers Description)
				21.80	177.80			Sandstone (Drillers Description)
				39.00	160.60			End of Borehole at 39.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B09
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298175E - 192720N	Hole Type RO
Location:	Tonypandy		Level:	199.62m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/06/2024 - 20/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				6.50	193.12			Mudstone (Drillers Description)
				15.50	184.12			Coal (Drillers Description)
				16.50	183.12			Mudstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B09
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298175E - 192720N	Hole Type RO
Location:	Tonypandy		Level:	199.62m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/06/2024 - 20/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Mudstone (Drillers Description)
				21.00	178.62			Coal (Drillers Description)
				21.80	177.82			Sandstone (Drillers Description)
				39.00	160.62			End of Borehole at 39.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B10
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298174E - 192720N	Hole Type RO
Location:	Tonypandy		Level:	199.64m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/06/2024 - 20/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description
				6.50	193.14			Mudstone (Drillers Description)
				15.50	184.14			Coal (Drillers Description)
				16.50	183.14			Mudstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-B10
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298174E - 192720N	Hole Type RO
Location:	Tonypandy		Level:	199.64m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/06/2024 - 20/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Mudstone (Drillers Description)
				21.00	178.64			Coal (Drillers Description)
				21.80	177.84			Sandstone (Drillers Description)
				39.00	160.64			End of Borehole at 39.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C01
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298161E - 192685N	Hole Type RO
Location:	Tonypandy		Level:	200.08m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/06/2024 - 20/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				4.00	196.08			Sandstone / Mudstone (Drillers Description)
				15.20	184.88			Soft Poor Returns (Drillers Description)
				16.00	184.08			Solid Poor Returns (Drillers Description)
				18.60	181.48			Soft Poor Returns (Drillers Description)
				19.50	180.58			Solid Poor Returns (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C01
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298161E - 192685N	Hole Type RO
Location:	Tonypandy		Level:	200.08m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	20/06/2024 - 20/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid Poor Returns (Drillers Description)
				36.00	164.08			End of Borehole at 36.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C02
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298162E - 192684N	Hole Type RO
Location:	Tonypandy		Level:	200.10m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/06/2024 - 21/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				4.00	196.10			Mudstone (Drillers Description)
				15.00	185.10			Coal (Drillers Description)
				16.00	184.10			Mudstone / Sandstone (Drillers Description)
				18.50	181.60			Coal (Drillers Description)
				19.50	180.60			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C02
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298162E - 192684N	Hole Type RO
Location:	Tonypandy		Level:	200.10m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/06/2024 - 21/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				33.00	167.10			Soft Poor Returns (Drillers Description)
				34.50	165.60			Solid Poor Returns (Drillers Description)
				36.00	164.10			End of Borehole at 36.000m

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C03
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298163E - 192684N	Hole Type RO
Location:	Tonypandy		Level:	200.10m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/06/2024 - 21/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				4.00	196.10			Mudstone (Drillers Description)
				15.00	185.10			Coal (Drillers Description)
				16.00	184.10			Mudstone / Sandstone (Drillers Description)
				18.50	181.60			Coal (Drillers Description)
				19.50	180.60			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C03
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298163E - 192684N	Hole Type RO
Location:	Tonypandy		Level:	200.10m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/06/2024 - 21/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				33.00	167.10			Soft Poor Returns (Drillers Description)
				34.50	165.60			Solid Poor Returns (Drillers Description)
				36.00	164.10			End of Borehole at 36.000m

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C04
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298164E - 192683N	Hole Type RO
Location:	Tonypandy		Level:	200.12m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/06/2024 - 21/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				4.00	196.12			Mudstone (Drillers Description)
				15.00	185.12			Coal (Drillers Description)
				16.00	184.12			Mudstone / Sandstone (Drillers Description)
				18.50	181.62			Coal (Drillers Description)
				19.50	180.62			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C04
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298164E - 192683N	Hole Type RO
Location:	Tonypandy		Level:	200.12m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/06/2024 - 21/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				33.00	167.12			Soft Poor Returns (Drillers Description)
				34.50	165.62			Solid Poor Returns (Drillers Description)
				36.00	164.12			End of Borehole at 36.000m

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C05
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298165E - 192683N	Hole Type RO
Location:	Tonypandy		Level:	200.09m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/06/2024 - 21/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				4.20	195.89			Mudstone (Drillers Description)
				14.80	185.29			Coal (Drillers Description)
				15.80	184.29			Mudstone / Sandstone (Drillers Description)
				18.30	181.79			Coal (Drillers Description)
				19.20	180.89			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C05
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298165E - 192683N	Hole Type RO
Location:	Tonypandy		Level:	200.09m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	21/06/2024 - 21/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				32.50	167.59			Soft Poor Returns (Drillers Description)
				34.50	165.59			Solid Poor Returns (Drillers Description)
				36.00	164.09			End of Borehole at 36.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C06
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298166E - 192683N	Hole Type RO
Location:	Tonypandy		Level:	200.09m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	24/06/2024 - 24/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				4.50	195.59			Mudstone (Drillers Description)
				14.50	185.59			Coal (Drillers Description)
				15.50	184.59			Mudstone / Sandstone (Drillers Description)
				18.00	182.09			Coal (Drillers Description)
				18.80	181.29			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C06
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298166E - 192683N	Hole Type RO
Location:	Tonypandy		Level:	200.09m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	24/06/2024 - 24/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				36.00	164.09			End of Borehole at 36.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C07
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298167E - 192682N	Hole Type RO
Location:	Tonypandy		Level:	200.09m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	24/06/2024 - 24/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				4.50	195.59			Mudstone (Drillers Description)
				14.50	185.59			Coal (Drillers Description)
				15.50	184.59			Mudstone / Sandstone (Drillers Description)
				18.00	182.09			Coal (Drillers Description)
				18.80	181.29			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C07
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298167E - 192682N	Hole Type RO
Location:	Tonypandy		Level:	200.09m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	24/06/2024 - 24/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				36.00	164.09			End of Borehole at 36.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C08
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298168E - 192682N	Hole Type RO
Location:	Tonypandy		Level:	200.08m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	24/06/2024 - 24/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				4.50	195.58			Mudstone (Drillers Description)
				14.50	185.58			Coal (Drillers Description)
				15.50	184.58			Mudstone / Sandstone (Drillers Description)
				18.00	182.08			Coal (Drillers Description)
				18.80	181.28			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C08
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298168E - 192682N	Hole Type RO
Location:	Tonypandy		Level:	200.08m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	24/06/2024 - 24/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				36.00	164.08			End of Borehole at 36.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C09
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298169E - 192682N	Hole Type RO
Location:	Tonypandy		Level:	200.13m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	25/06/2024 - 25/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				5.00	195.13			Mudstone (Drillers Description)
				14.00	186.13			Coal (Drillers Description)
				15.00	185.13			Mudstone / Sandstone (Drillers Description)
				17.60	182.53			Coal (Drillers Description)
				18.50	181.63			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C09
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298169E - 192682N	Hole Type RO
Location:	Tonypandy		Level:	200.13m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	25/06/2024 - 25/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				36.00	164.13			End of Borehole at 36.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C10
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298170E - 192681N	Hole Type RO
Location:	Tonypandy		Level:	200.12m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	25/06/2024 - 25/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				5.00	195.12			Mudstone (Drillers Description)
				14.00	186.12			Coal (Drillers Description)
				15.00	185.12			Mudstone / Sandstone (Drillers Description)
				17.60	182.52			Coal (Drillers Description)
				18.50	181.62			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C10
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298170E - 192681N	Hole Type RO
Location:	Tonypandy		Level:	200.12m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	25/06/2024 - 25/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				36.00	164.12			End of Borehole at 36.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C11
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298171E - 192681N	Hole Type RO
Location:	Tonypandy		Level:	200.16m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	25/06/2024 - 25/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				5.30	194.86			Mudstone (Drillers Description)
				13.70	186.46			Coal (Drillers Description)
				14.60	185.56			Mudstone / Sandstone (Drillers Description)
				17.00	183.16			Coal (Drillers Description)
				18.00	182.16			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C11
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298171E - 192681N	Hole Type RO
Location:	Tonypandy		Level:	200.16m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	25/06/2024 - 25/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				36.00	164.16			End of Borehole at 36.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C12
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298172E - 192680N	Hole Type RO
Location:	Tonypandy		Level:	200.11m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	25/06/2024 - 25/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				5.30	194.81			Mudstone (Drillers Description)
				13.70	186.41			Coal (Drillers Description)
				14.60	185.51			Mudstone / Sandstone (Drillers Description)
				17.00	183.11			Coal (Drillers Description)
				18.00	182.11			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C12
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298172E - 192680N	Hole Type RO
Location:	Tonypandy		Level:	200.11m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	25/06/2024 - 25/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				36.00	164.11			End of Borehole at 36.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-C13
Sheet 1 of 1

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298172E - 192680N	Hole Type RO
Location:	Tonypandy		Level:	200.08m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	25/06/2024 - 25/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden FIll (Drillers Description)
				9.40	190.68			Void Broken Ground No Returns (Drillers Description)
				12.00	188.08			Solid No Returns (Drillers Description)
				18.00	182.08			End of Borehole at 18.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D01
Sheet 1 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298107E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.48m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Overburden (Drillers Description)
				12.00	188.48			Mudstone / Sandstone (Drillers Description)
				14.40	186.08			Soft Coal (Drillers Description)
				15.00	185.48			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D01
Sheet 2 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298107E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.48m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				33.00	167.48			Soft Broken Ground No Returns (Drillers Description)
				35.20	165.28			Solid No Returns (Drillers Description)

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D01
Sheet 3 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298107E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.48m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	13/06/2024 - 13/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid No Returns (Drillers Description)
				42.00	158.48			End of Borehole at 42.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D02
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298108E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.45m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	14/06/2024 - 14/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.95			Topsoil (Drillers Description)
								Fill (Drillers Description)
				13.00	187.45			Void / Broken Ground No Return (Drillers Description)
				16.40	184.05			Solid (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D02
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298108E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.45m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	14/06/2024 - 14/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid (Drillers Description)
				24.00	176.45			End of Borehole at 24.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D03
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298109E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.44m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	14/06/2024 - 14/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.94			Topsoil (Drillers Description)
								Fill (Drillers Description)
				13.00	187.44			Void / Broken Ground No Returns (Drillers Description)
				16.40	184.04			Solid No Returns (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D03
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298109E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.44m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	14/06/2024 - 14/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid No Returns (Drillers Description)
				24.00	176.44			End of Borehole at 24.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D04
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298110E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.39m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	14/06/2024 - 14/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.89			Topsoil (Drillers Description)
								Fill (Drillers Description)
				13.00	187.39			Void / Broken Ground No Returns (Drillers Description)
				16.40	183.99			Solid No Returns (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D04
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298110E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.39m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	14/06/2024 - 14/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid No Returns (Drillers Description)
				24.00	176.39			End of Borehole at 24.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D05
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298111E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.40m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	14/06/2024 - 14/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.90			Topsoil (Drillers Description)
								Fill (Drillers Description)
				13.00	187.40			Void / Broken Ground No Returns (drillers Description)
				16.40	184.00			Solid No Returns (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D05
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298111E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.40m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	14/06/2024 - 14/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid No Returns (Drillers Description)
				24.00	176.40			End of Borehole at 24.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D06
Sheet 1 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298112E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.42m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	14/06/2024 - 14/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.92			Topsoil (Drillers Description)
								Fill (Drillers Description)
				13.00	187.42			Void / Broken Ground (Drillers Description)
				16.40	184.02			Solid No Returns (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D06
Sheet 2 of 2

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298112E - 192732N	Hole Type RO
Location:	Tonypandy		Level:	200.42m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	14/06/2024 - 14/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid No Returns (Drillers Description)
				24.00	176.42			End of Borehole at 24.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D07
Sheet 1 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298113E - 192731N	Hole Type RO
Location:	Tonypandy		Level:	200.37m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	17/06/2024 - 17/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.50	199.87			Topsoil (Drillers Description)
								Fill (Drillers Description)
				12.20	188.17			Mudstone / Sandstone (Drillers Description)
				14.50	185.87			Soft Coal (Drillers Description)
				15.10	185.27			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D07
Sheet 2 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298113E - 192731N	Hole Type RO
Location:	Tonypandy		Level:	200.37m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	17/06/2024 - 17/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				32.90	167.47			Soft Broken Ground No Returns (Drillers Description)
				35.00	165.37			Solid No Returns (Drillers Description)

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D07
Sheet 3 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298113E - 192731N	Hole Type RO
Location:	Tonypandy		Level:	200.37m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	17/06/2024 - 17/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid No Returns (Drillers Description)
				42.00	158.37			End of Borehole at 42.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D08
Sheet 1 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298114E - 192731N	Hole Type RO
Location:	Tonypandy		Level:	200.50m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.60	199.90			Topsoil (Drillers Description)
								Fill (Drillers Description)
				12.00	188.50			Mudstone / Sandstone (Drillers Description)
				15.00	185.50			Coal (Drillers Description)
				15.60	184.90			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D08
Sheet 2 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298114E - 192731N	Hole Type RO
Location:	Tonypandy		Level:	200.50m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				32.90	167.60			Soft Poor Returns (Drillers Description)
				35.00	165.50			Solid Poor Returns (Drillers Description)

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D08
Sheet 3 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298114E - 192731N	Hole Type RO
Location:	Tonypandy		Level:	200.50m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid Poor Returns (Drillers Description)
				42.00	158.50			End of Borehole at 42.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D09
Sheet 1 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298115E - 192731N	Hole Type RO
Location:	Tonypandy		Level:	200.47m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.60	199.87			Topsoil (Drillers Description)
								Fill (Drillers Description)
				12.00	188.47			Mudstone / Sandstone (Drillers Description)
				15.00	185.47			Coal (Drillers Description)
				15.60	184.87			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D09
Sheet 2 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298115E - 192731N	Hole Type RO
Location:	Tonypandy		Level:	200.47m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				32.90	167.57			Soft Poor Returns (Drillers Description)
				35.00	165.47			Solid Poor Returns (Drillers Description)

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D09
Sheet 3 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298115E - 192731N	Hole Type RO
Location:	Tonypandy		Level:	200.47m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid Poor Returns (Drillers Description)
				42.00	158.47			End of Borehole at 42.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D10
Sheet 1 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298106E - 192733N	Hole Type RO
Location:	Tonypandy		Level:	200.45m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.60	199.85			Topsoil (Drillers Description)
								Fill (Drillers Description)
				12.30	188.15			Mudstone / Sandstone (Drillers Description)
				15.20	185.25			Coal (Drillers Description)
				16.00	184.45			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D10
Sheet 2 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298106E - 192733N	Hole Type RO
Location:	Tonypandy		Level:	200.45m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				32.50	167.95			Soft Poor Returns (Drillers Description)
				36.00	164.45			Solid Poor Returns (Drillers Description)

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D10
Sheet 3 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298106E - 192733N	Hole Type RO
Location:	Tonypandy		Level:	200.45m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid Poor Returns (Drillers Description)
				42.00	158.45			End of Borehole at 42.000m

41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D11
Sheet 1 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298105E - 192733N	Hole Type RO
Location:	Tonypandy		Level:	200.42m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.60	199.82			Topsoil (Drillers Description)
								Fill (Drillers Description)
				12.30	188.12			Mudstone / Sandstone (Drillers Description)
				15.20	185.22			Coal (Drillers Description)
				16.00	184.42			Sandstone (Drillers Description)

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D11
Sheet 2 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298105E - 192733N	Hole Type RO
Location:	Tonypandy		Level:	200.42m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Sandstone (Drillers Description)
				32.50	167.92			Soft Poor Returns (Drillers Description)
				36.00	164.42			Solid Poor Returns (Drillers Description)

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

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Borehole Log

Borehole No.
BH-D11
Sheet 3 of 3

Project Name:	The Pavilions	Project No: 17931	Co-ords:	298105E - 192733N	Hole Type RO
Location:	Tonypandy		Level:	200.42m	Scale 1:100
Client:	Morgan Sindal Construction & Infrastructure Ltd		Dates:	18/06/2024 - 18/06/2024	Logged By Van Elle

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Solid Poor Returns (Drillers Description)
				42.00	158.42			End of Borehole at 42.000m

Remarks: 1. No casing used. 2. No groundwater recorded. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole backfilled with gravel and OPC. 6. No gas detected during drilling.

Project Id: 17931	Title: Borehole Line A
Project Title: The Pavilions	Vertical Scale: 1:169
Location: Tonypandy	Horizontal Scale: 1:88
Client: Morgan Sindal Construction & Infrastructure Ltd	Engineer: ADB

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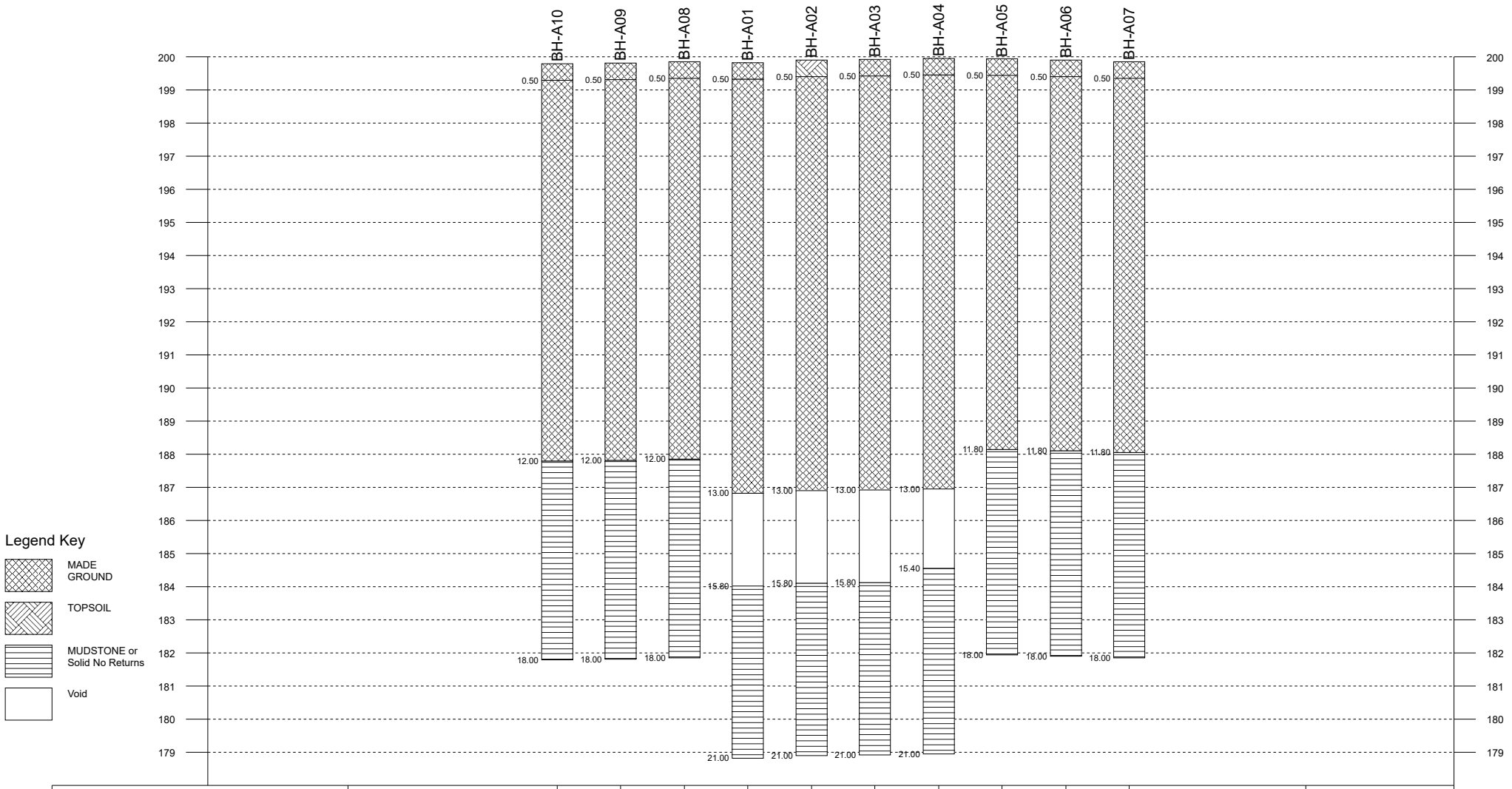

Chainage (m)	0.00	3.29	4.29	5.29	6.29	7.29	8.29	9.29	10.29	11.29	12.29	15.07
Offset (m)	0.04	0.04	0.06	0.07	0.08	0.10	0.11	0.13	0.13	0.15		
Elevation (mAOD)	199.79	199.81	199.85	199.82	199.90	199.92	199.95	199.94	199.90	199.85		

Project Id: 17931	Title: Borehole Line B
Project Title: The Pavilions	Vertical Scale: 1:330
Location: Tonypandy	Horizontal Scale: 1:89
Client: Morgan Sindal Construction & Infrastructure Ltd	Engineer: ADB

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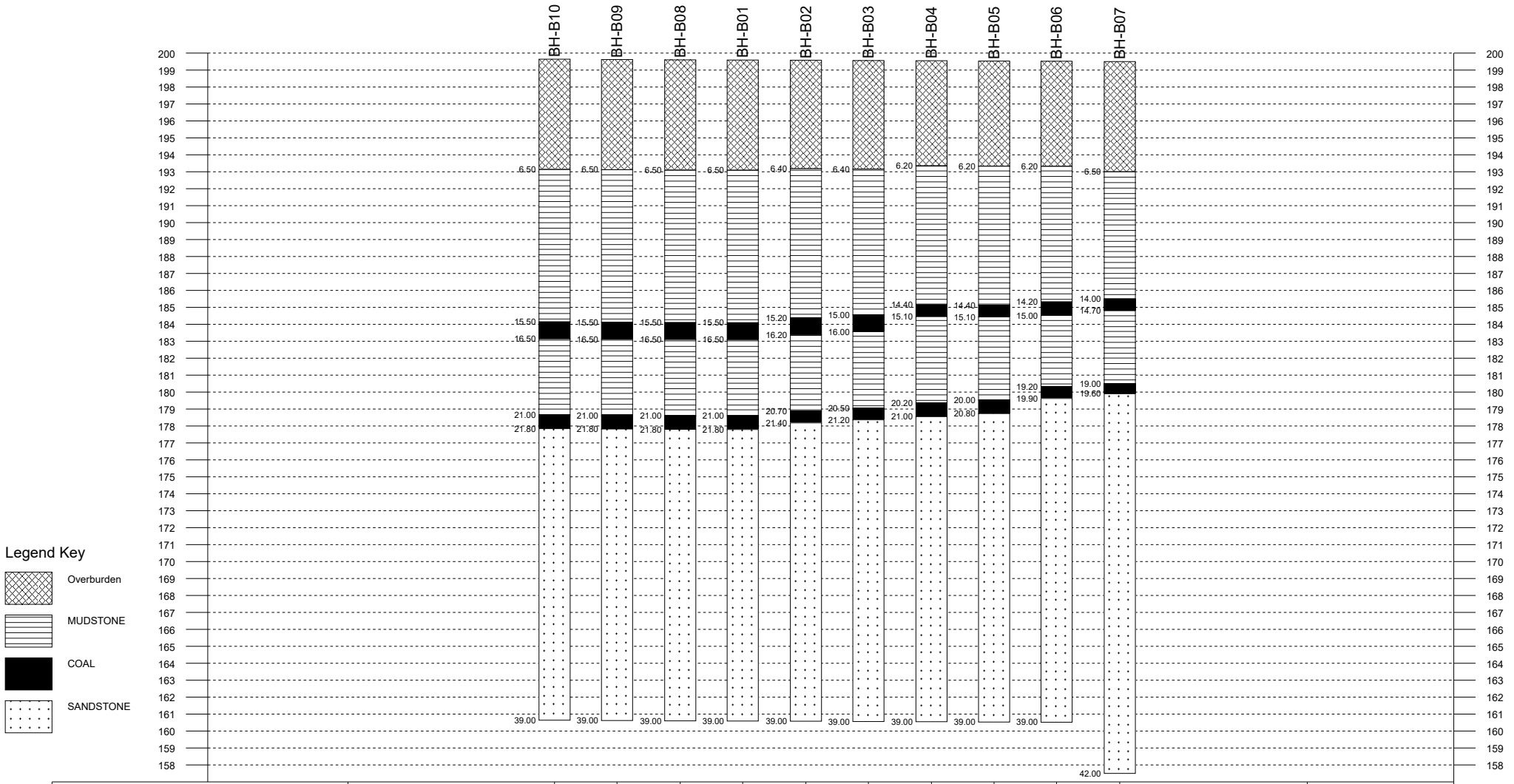

Chainage (m)	0.00	3.29	4.28	5.29	6.28	7.29	8.28	9.29	10.28	11.28	12.28	15.27
Offset (m)		0.34	0.31	0.28	0.25	0.22	0.19	0.15	0.13	0.09	0.07	
Elevation (mAOD)		199.64	199.62	199.60	199.59	199.58	199.56	199.55	199.53	199.52	199.50	

Project Id: 17931	Title: Borehole Line C
Project Title: The Pavilions	Vertical Scale: 1:284
Location: Tonypandy	Horizontal Scale: 1:112
Client: Morgan Sindal Construction & Infrastructure Ltd	Engineer: ADB

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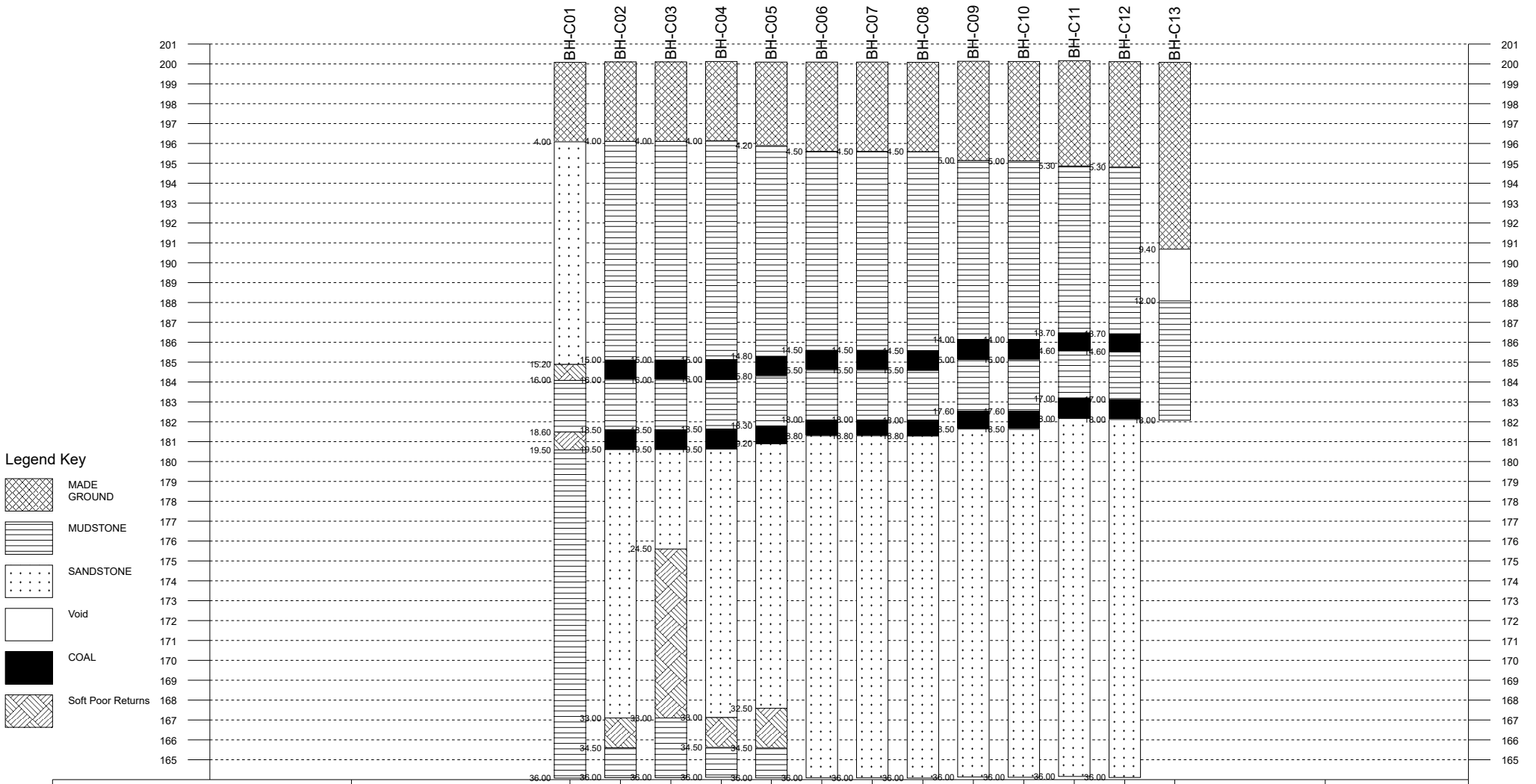

Project Id: 17931	Title: Borehole Line D
Project Title: The Pavilions	Vertical Scale: 1:330
Location: Tonypandy	Horizontal Scale: 1:95
Client: Morgan Sindal Construction & Infrastructure Ltd	Engineer: ADB

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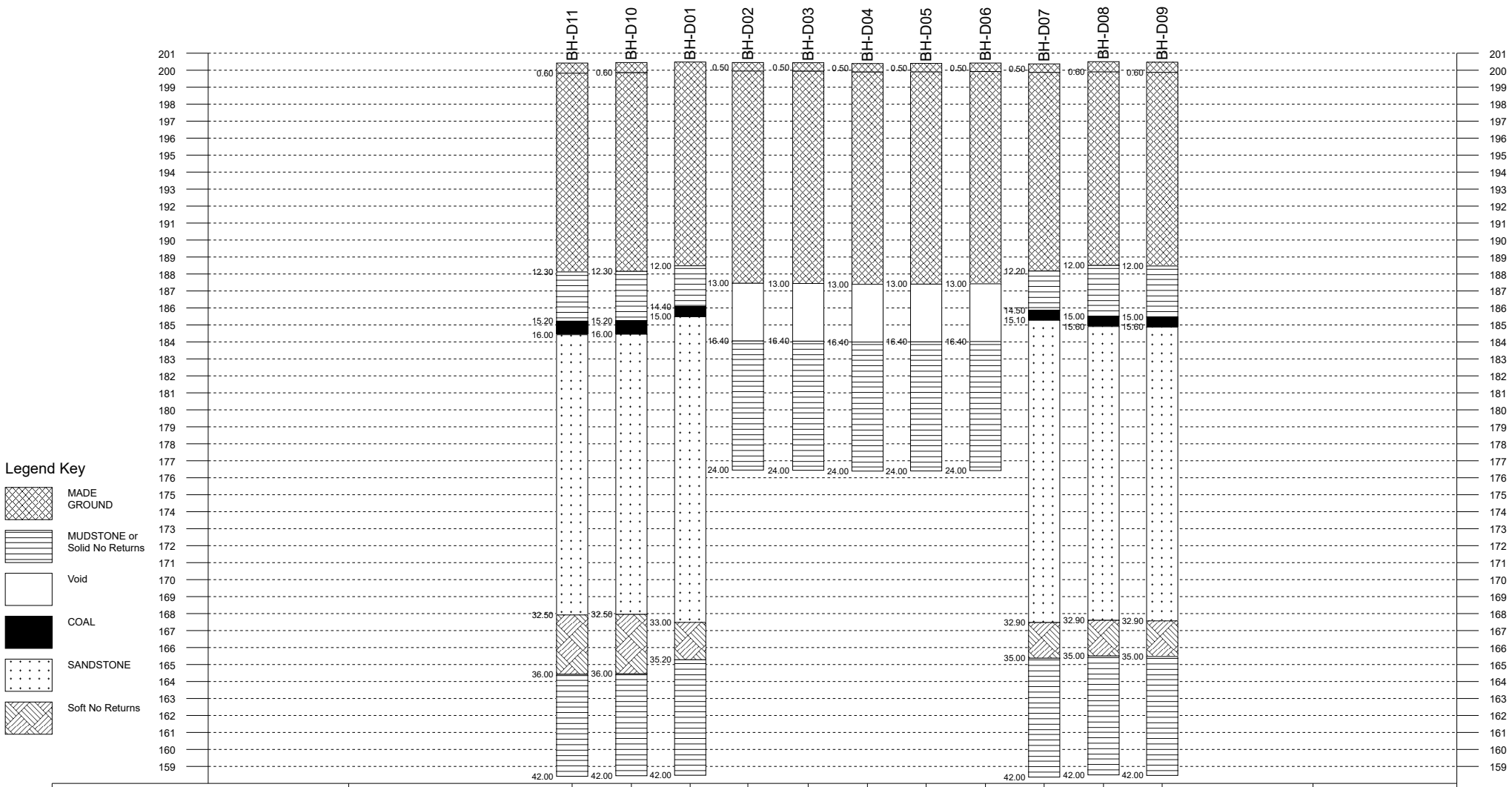


ANNEX E
Dynamic Cone Penetrometer Test Results

BMS QUALITY FORM
Ref: QF-039

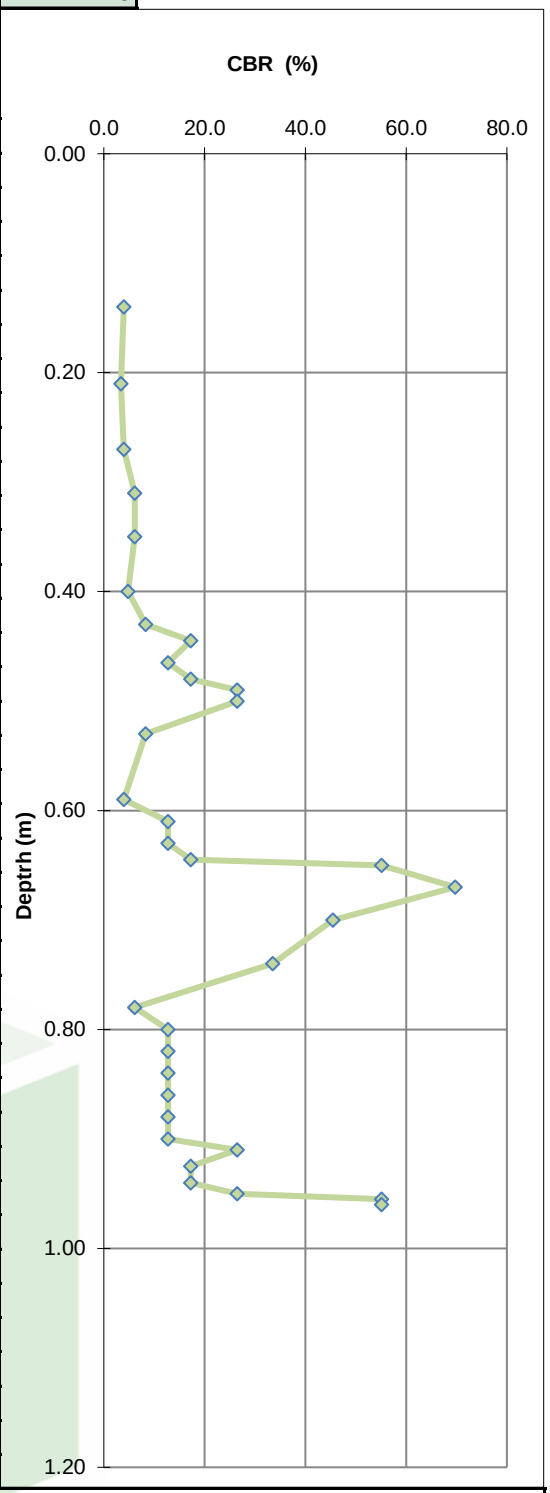
DYNAMIC CONE PENETROMETER TEST

Site Name: Clydach Vale Pavillions
Project Number: 17931
Date: 17.06.2024
Engineer: JM

Test: DCP01

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	140	60	0.14	60	4.0
1	210	70	0.21	70	3.4
1	270	60	0.27	60	4.0
1	310	40	0.31	40	6.1
1	350	40	0.35	40	6.1
1	400	50	0.40	50	4.8
1	430	30	0.43	30	8.3
1	445	15	0.45	15	17.3
1	465	20	0.47	20	12.7
1	480	15	0.48	15	17.3
1	490	10	0.49	10	26.5
1	500	10	0.50	10	26.5
1	530	30	0.53	30	8.3
1	590	60	0.59	60	4.0
1	610	20	0.61	20	12.7
1	630	20	0.63	20	12.7
1	645	15	0.65	15	17.3
1	650	5	0.65	5	55.1
5	670	20	0.67	4	69.8
5	700	30	0.70	6	45.4
5	740	40	0.74	8	33.5
1	780	40	0.78	40	6.1
1	800	20	0.80	20	12.7
1	820	20	0.82	20	12.7
1	840	20	0.84	20	12.7
1	860	20	0.86	20	12.7
1	880	20	0.88	20	12.7
1	900	20	0.90	20	12.7
1	910	10	0.91	10	26.5
1	925	15	0.93	15	17.3
1	940	15	0.94	15	17.3
1	950	10	0.95	10	26.5
1	955	5	0.96	5	55.1
1	960	5	0.96	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 Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

BMS QUALITY FORM
Ref: QF-039

DYNAMIC CONE PENETROMETER TEST

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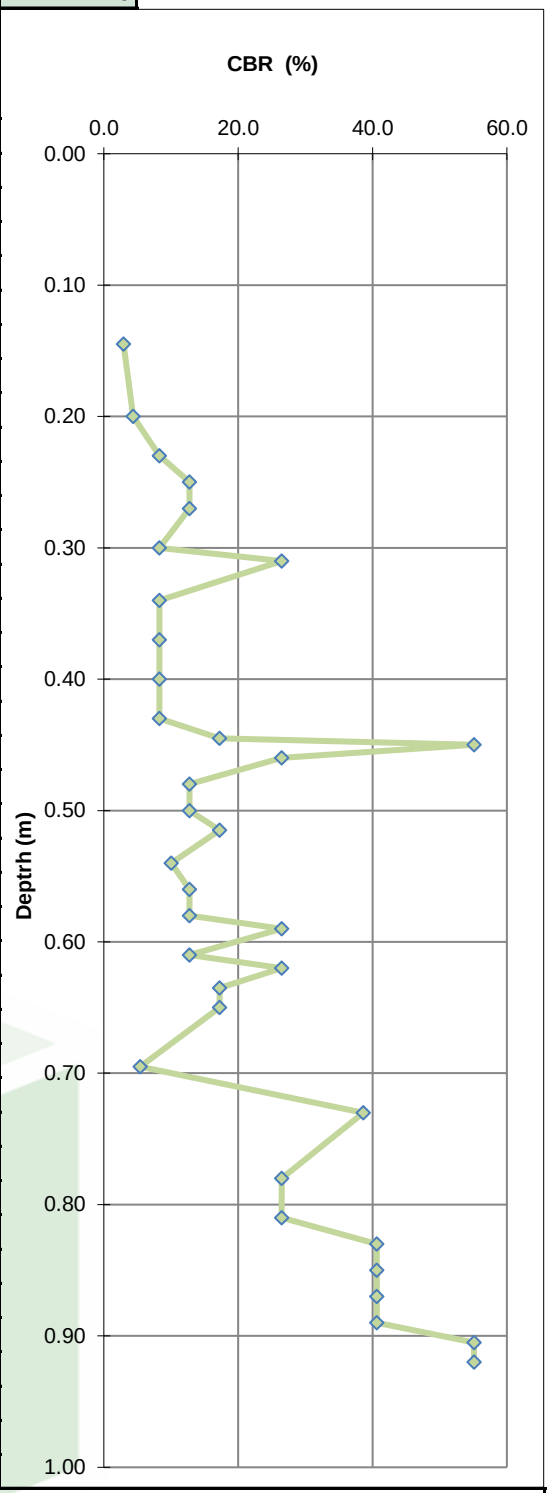
Site Name: Clydach Vale Pavillions
Project Number: 17931
Date: 17.06.2024
Engineer: JM

Test: DCP02

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	145	80	0.15	80	2.9
1	200	55	0.20	55	4.4
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	340	30	0.34	30	8.3
1	370	30	0.37	30	8.3
1	400	30	0.40	30	8.3
1	430	30	0.43	30	8.3
1	445	15	0.45	15	17.3
1	450	5	0.45	5	55.1
1	460	10	0.46	10	26.5
1	480	20	0.48	20	12.7
1	500	20	0.50	20	12.7
1	515	15	0.52	15	17.3
1	540	25	0.54	25	10.1
1	560	20	0.56	20	12.7
1	580	20	0.58	20	12.7
1	590	10	0.59	10	26.5
1	610	20	0.61	20	12.7
1	620	10	0.62	10	26.5
1	635	15	0.64	15	17.3
1	650	15	0.65	15	17.3
1	695	45	0.70	45	5.4
5	730	35	0.73	7	38.6
5	780	50	0.78	10	26.5
3	810	30	0.81	10	26.5
3	830	20	0.83	7	40.7
3	850	20	0.85	7	40.7
3	870	20	0.87	7	40.7
3	890	20	0.89	7	40.7
3	905	15	0.91	5	55.1
3	920	15	0.92	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 Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

BMS QUALITY FORM
Ref: QF-039

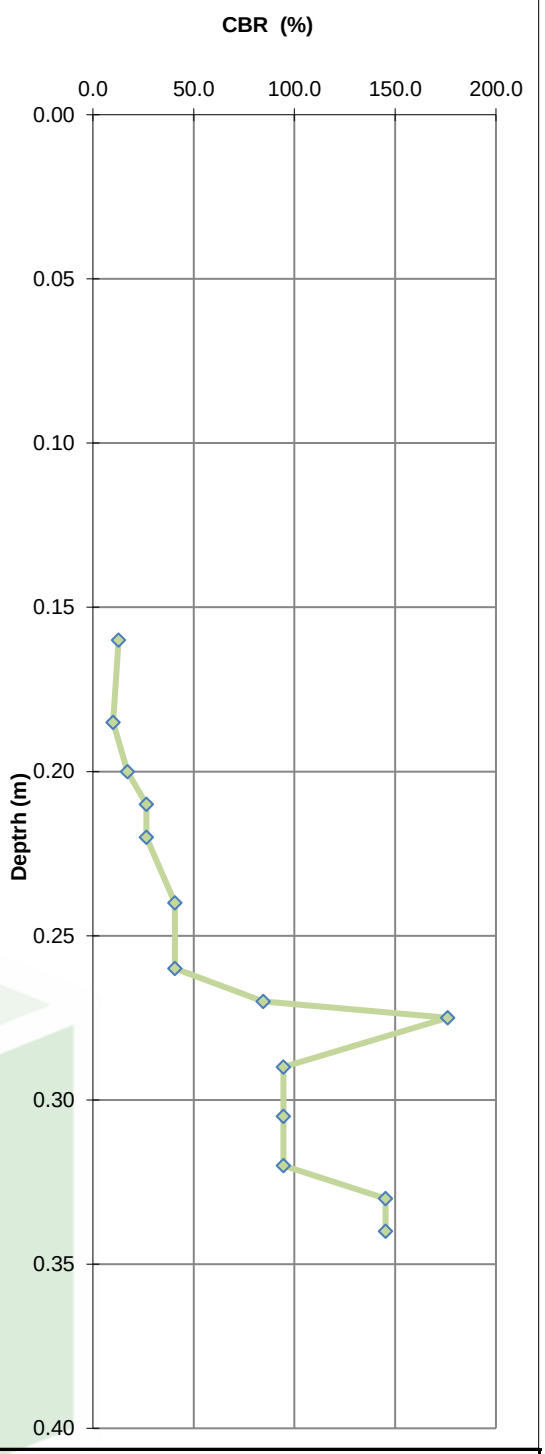
DYNAMIC CONE PENETROMETER TEST

Site Name: Clydach Vale Pavillions
Project Number: 17931
Date: 17.06.2024
Engineer: JM

Test: DCP03

Initial Scale Reading (mm)	140	Datum bgl (mm)	0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	160	20	0.16	20	12.7
1	185	25	0.19	25	10.1
1	200	15	0.20	15	17.3
1	210	10	0.21	10	26.5
1	220	10	0.22	10	26.5
3	240	20	0.24	7	40.7
3	260	20	0.26	7	40.7
3	270	10	0.27	3	84.6
3	275	5	0.28	2	176.0
5	290	15	0.29	3	94.6
5	305	15	0.31	3	94.6
5	320	15	0.32	3	94.6
5	330	10	0.33	2	145.1
5	340	10	0.34	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 Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

BMS QUALITY FORM
Ref: QF-039

DYNAMIC CONE PENETROMETER TEST

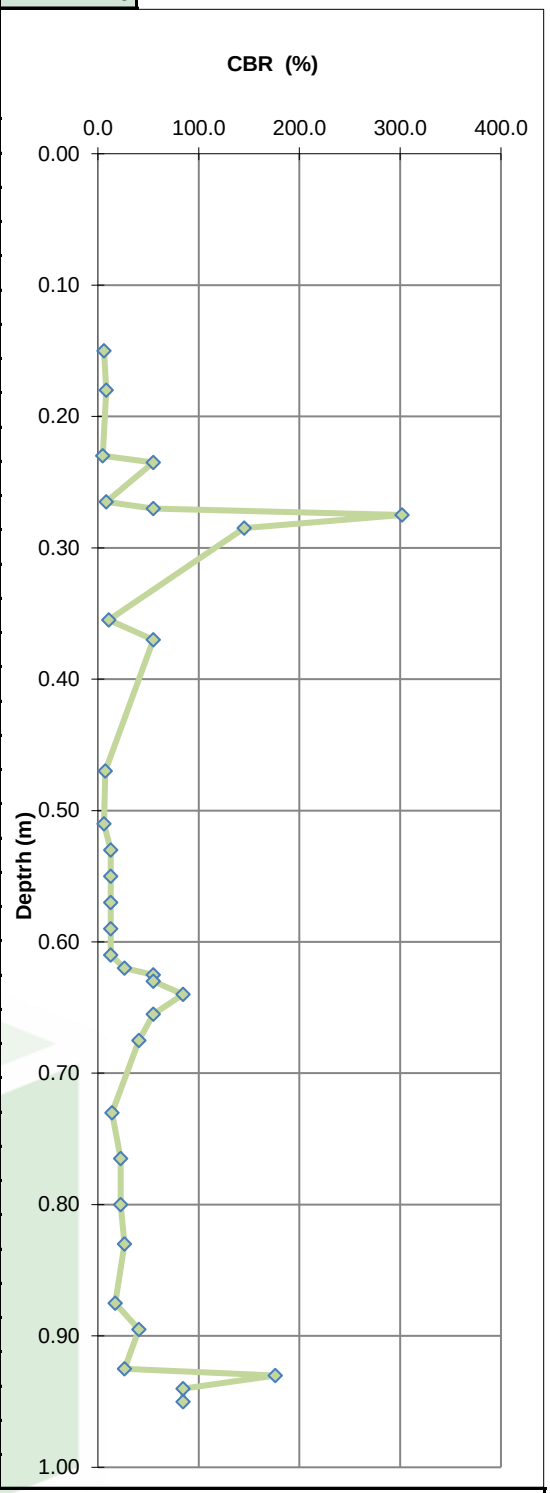
terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Clydach Vale Pavillions
Project Number: 17931
Date: 17.06.2024
Engineer: JM

Test: **DCP04**

Initial Scale Reading (mm)	110	Datum bgl (mm)	0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	150	40	0.15	40	6.1
1	180	30	0.18	30	8.3
1	230	50	0.23	50	4.8
1	235	5	0.24	5	55.1
1	265	30	0.27	30	8.3
1	270	5	0.27	5	55.1
5	275	5	0.28	1	302.0
5	285	10	0.29	2	145.1
3	355	70	0.36	23	10.8
3	370	15	0.37	5	55.1
3	470	100	0.47	33	7.4
1	510	40	0.51	40	6.1
1	530	20	0.53	20	12.7
1	550	20	0.55	20	12.7
1	570	20	0.57	20	12.7
1	590	20	0.59	20	12.7
1	610	20	0.61	20	12.7
1	620	10	0.62	10	26.5
1	625	5	0.63	5	55.1
1	630	5	0.63	5	55.1
3	640	10	0.64	3	84.6
3	655	15	0.66	5	55.1
3	675	20	0.68	7	40.7
3	730	55	0.73	18	14.0
3	765	35	0.77	12	22.5
3	800	35	0.80	12	22.5
3	830	30	0.83	10	26.5
3	875	45	0.88	15	17.3
3	895	20	0.90	7	40.7
3	925	30	0.93	10	26.5
3	930	5	0.93	2	176.0
3	940	10	0.94	3	84.6
3	950	10	0.95	3	84.6



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)

BMS QUALITY FORM
Ref: QF-039

DYNAMIC CONE PENETROMETER TEST

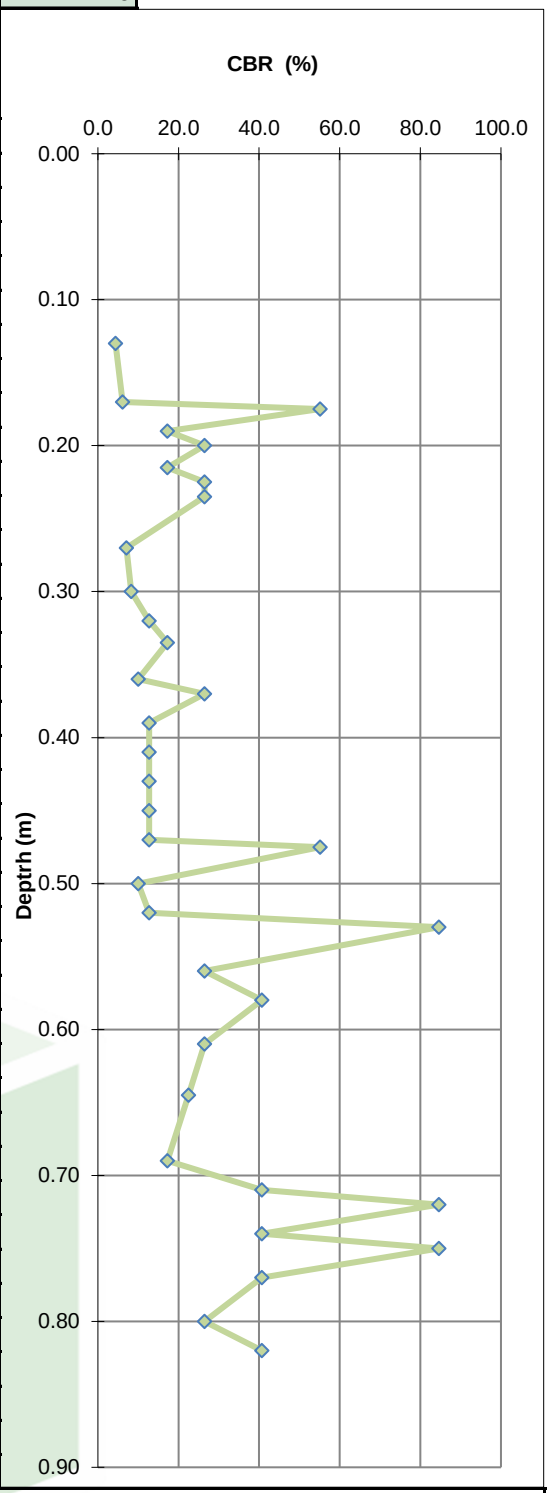
terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Clydach Vale Pavillions
Project Number: 17931
Date: 17.06.2024
Engineer: JM

Test: **DCP05**

Initial Scale Reading (mm)	75	Datum bgl (mm)	0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	130	55	0.13	55	4.4
1	170	40	0.17	40	6.1
1	175	5	0.18	5	55.1
1	190	15	0.19	15	17.3
1	200	10	0.20	10	26.5
1	215	15	0.22	15	17.3
1	225	10	0.23	10	26.5
1	235	10	0.24	10	26.5
1	270	35	0.27	35	7.0
1	300	30	0.30	30	8.3
1	320	20	0.32	20	12.7
1	335	15	0.34	15	17.3
1	360	25	0.36	25	10.1
1	370	10	0.37	10	26.5
1	390	20	0.39	20	12.7
1	410	20	0.41	20	12.7
1	430	20	0.43	20	12.7
1	450	20	0.45	20	12.7
1	470	20	0.47	20	12.7
1	475	5	0.48	5	55.1
1	500	25	0.50	25	10.1
1	520	20	0.52	20	12.7
3	530	10	0.53	3	84.6
3	560	30	0.56	10	26.5
3	580	20	0.58	7	40.7
3	610	30	0.61	10	26.5
3	645	35	0.65	12	22.5
3	690	45	0.69	15	17.3
3	710	20	0.71	7	40.7
3	720	10	0.72	3	84.6
3	740	20	0.74	7	40.7
3	750	10	0.75	3	84.6
3	770	20	0.77	7	40.7
3	800	30	0.80	10	26.5
3	820	20	0.82	7	40.7
3	840	20	0.84	7	40.7
3	850	10	0.85	3	84.6
3	870	20	0.87	7	40.7



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)

BMS QUALITY FORM
Ref: QF-039

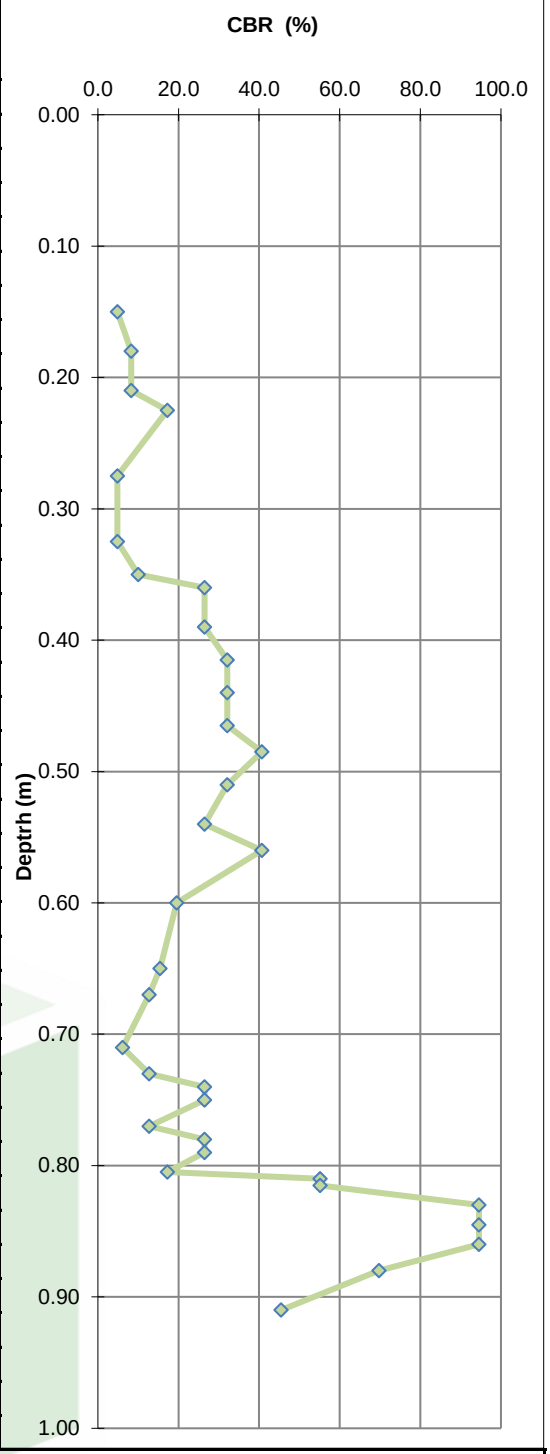
DYNAMIC CONE PENETROMETER TEST

Site Name: Clydach Vale Pavillions
Project Number: 17931
Date: 17.06.2024
Engineer: JM

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	150	50	0.15	50	4.8
1	180	30	0.18	30	8.3
1	210	30	0.21	30	8.3
1	225	15	0.23	15	17.3
1	275	50	0.28	50	4.8
1	325	50	0.33	50	4.8
1	350	25	0.35	25	10.1
1	360	10	0.36	10	26.5
3	390	30	0.39	10	26.5
3	415	25	0.42	8	32.1
3	440	25	0.44	8	32.1
3	465	25	0.47	8	32.1
3	485	20	0.49	7	40.7
3	510	25	0.51	8	32.1
3	540	30	0.54	10	26.5
3	560	20	0.56	7	40.7
3	600	40	0.60	13	19.5
3	650	50	0.65	17	15.4
1	670	20	0.67	20	12.7
1	710	40	0.71	40	6.1
1	730	20	0.73	20	12.7
1	740	10	0.74	10	26.5
1	750	10	0.75	10	26.5
1	770	20	0.77	20	12.7
1	780	10	0.78	10	26.5
1	790	10	0.79	10	26.5
1	805	15	0.81	15	17.3
1	810	5	0.81	5	55.1
1	815	5	0.82	5	55.1
5	830	15	0.83	3	94.6
5	845	15	0.85	3	94.6
5	860	15	0.86	3	94.6
5	880	20	0.88	4	69.8
5	910	30	0.91	6	45.4



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 Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

ANNEX F
Laboratory Soil Chemical Test Results

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

Final Report

Report No.:	24-22072-1
Initial Date of Issue:	19-Jul-2024
Re-Issue Details:	
Client	Terra Firma
Client Address:	5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA
Contact(s):	j.mcananey@tfwgroup.co.uk
Project	058 Clydach Vale Pav
Quotation No.:	**Date Received:** 11-Jul-2024
Order No.:	058 CLYDACH **Date Instructed:** 11-Jul-2024
No. of Samples:	17
Turnaround (Wkdays):	5 **Results Due:** 17-Jul-2024
Date Approved:	19-Jul-2024
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: 058 Clydach Vale Pav

Client: Terra Firma				**Chemtest Job No.:**		24-22072	24-22072	24-22072	24-22072	24-22072	24-22072	24-22072
Quotation No.:				**Chemtest Sample ID.:**		1834030	1834031	1834032	1834033	1834034	1834035	1834036
Order No.: 058 CLYDACH				Client Sample Ref.:		WS01 1.10	WS03 0.40	WS05 0.80	WS07 2.40	WS08 0.60	WS08 1.50	WS09 2.90
				Client Sample ID.:		WS01 1.10	WS03 0.40	WS05 0.80	WS07 2.40	WS08 0.60	WS08 1.50	WS09 2.90
				Sample Location:		WS01 1.10	WS03 0.40	WS05 0.80	WS07 2.40	WS08 0.60	WS08 1.50	WS09 2.90
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		1.10	0.40	0.80.80	2.40	0.60	1.50	2.90
				Date Sampled:		11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024
				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		U	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
Moisture		N	2030	%	0.020	5.6	6.2	7.0	9.8	11	7.8	20
Soil Colour		N	2040		N/A	Black	Black	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones and Roots	Stones and Roots	Stones	Stones	Stones	Stones	Stones
Soil Texture		N	2040		N/A	Loam	Loam	Loam	Clay	Clay	Clay	Clay
pH at 20C		M	2010		4.0	9.0	8.6	8.8	7.7	8.2	8.6	6.9
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.46	0.50	0.43	< 0.40	0.55	< 0.40	0.57
Magnesium (Water Soluble)		N	2120	g/l	0.010	< 0.010		0.010				< 0.010
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.019		0.027				< 0.010
Total Sulphur		U	2175	%	0.010	0.10		0.14				0.020
Chloride (Water Soluble)		M	2220	g/l	0.010	< 0.010		< 0.010				< 0.010
Nitrate (Water Soluble)		N	2220	g/l	0.010	< 0.010		< 0.010				< 0.010
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ammonium (Water Soluble)		M	2220	g/l	0.01	< 0.01		< 0.01				< 0.01
Sulphate (Acid Soluble)		U	2430	%	0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.032	< 0.010	< 0.010
Arsenic		M	2455	mg/kg	0.5	5.2	5.1	4.4	8.1	4.9	4.6	3.7
Beryllium		U	2455	mg/kg	0.5	0.8	0.8	0.7	0.7	< 0.5	0.6	< 0.5
Cadmium		M	2455	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chromium		M	2455	mg/kg	0.5	8.5	7.5	6.2	12	8.0	6.7	6.2
Mercury Low Level		N	2450	mg/kg	0.05	0.07	0.05	< 0.05	0.07	0.06	0.05	< 0.05
Manganese		M	2455	mg/kg	1.0	610	430	330	350	240	450	47
Molybdenum		M	2455	mg/kg	0.5	0.5	0.6	0.6	0.5	0.6	0.6	< 0.5
Antimony		N	2455	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Copper		M	2455	mg/kg	0.50	26	32	26	25	21	26	1.5
Nickel		M	2455	mg/kg	0.50	25	28	23	24	15	34	2.4
Lead		M	2455	mg/kg	0.50	15	16	15	16	20	14	6.3
Selenium		M	2455	mg/kg	0.25	0.78	0.79	0.71	0.60	0.69	0.69	0.27
Zinc		M	2455	mg/kg	0.50	77	65	53	69	68	58	9.5
Chromium (Trivalent)		N	2490	mg/kg	1.0	8.5	7.5	6.2	12	8.0	6.7	6.2
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

Results - Soil

Project: 058 Clydach Vale Pav

Client: Terra Firma						**Chemtest Job No.:**	24-22072	24-22072	24-22072	24-22072	24-22072	24-22072
Quotation No.:						**Chemtest Sample ID.:**	1834030	1834031	1834032	1834033	1834034	1834035	1834036
Order No.: 058 CLYDACH						Client Sample Ref.:	WS01 1.10	WS03 0.40	WS05 0.80	WS07 2.40	WS08 0.60	WS08 1.50	WS09 2.90
						Client Sample ID.:	WS01 1.10	WS03 0.40	WS05 0.80	WS07 2.40	WS08 0.60	WS08 1.50	WS09 2.90
						Sample Location:	WS01 1.10	WS03 0.40	WS05 0.80	WS07 2.40	WS08 0.60	WS08 1.50	WS09 2.90
						Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
						Top Depth (m):	1.10	0.40	0.80.80	2.40	0.60	1.50	2.90
						Date Sampled:	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024
						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**								
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		6.7	6.9	7.1	9.6	7.8	10	9.5
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00		1.7	3.2	2.6	11	5.3	4.3	11
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00		< 2.0	< 2.0	< 2.0	5.1	2.3	4.6	6.7
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00		14	13	15	31	21	30	29
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00		24	22	19	16	27	25	29
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00		23	23	24	57	37	49	55
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00		47	45	43	73	63	74	84
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	3.9	2.4	3.0	2.5
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00		4.9	4.8	4.0	5.2	4.9	5.1	9.2
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00		8.2	6.1	4.9	13	9.1	8.4	18
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00		5.7	6.4	5.2	9.2	7.3	9.4	12
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00		14	13	10	22	16	18	29
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		29	29	30	66	44	58	67
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00		61	57	53	95	80	92	110
Naphthalene		M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	1.5	0.76	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10		< 0.10	< 0.10	0.95	0.35	2.5	0.99	< 0.10
Anthracene		M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	0.44	0.24	< 0.10
Fluoranthene		M	2800	mg/kg	0.10		< 0.10	< 0.10	0.33	0.35	6.6	0.52	< 0.10
Pyrene		M	2800	mg/kg	0.10		< 0.10	< 0.10	0.28	0.34	3.8	0.42	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	1.9	< 0.10	< 0.10
Chrysene		M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	1.7	< 0.10	< 0.10

Results - Soil

Project: 058 Clydach Vale Pav

Client: Terra Firma				**Chemtest Job No.:**		24-22072	24-22072	24-22072	24-22072	24-22072	24-22072	24-22072
Quotation No.:				**Chemtest Sample ID.:**		1834030	1834031	1834032	1834033	1834034	1834035	1834036
Order No.: 058 CLYDACH				Client Sample Ref.:		WS01 1.10	WS03 0.40	WS05 0.80	WS07 2.40	WS08 0.60	WS08 1.50	WS09 2.90
				Client Sample ID.:		WS01 1.10	WS03 0.40	WS05 0.80	WS07 2.40	WS08 0.60	WS08 1.50	WS09 2.90
				Sample Location:		WS01 1.10	WS03 0.40	WS05 0.80	WS07 2.40	WS08 0.60	WS08 1.50	WS09 2.90
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		1.10	0.40	0.80.80	2.40	0.60	1.50	2.90
				Date Sampled:		11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024
				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**							
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.1	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.68	< 0.10	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.4	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	23	2.9	< 2.0
PCB 81		N	2815	mg/kg	0.010							
PCB 77		U	2815	mg/kg	0.010							
PCB 105		N	2815	mg/kg	0.010							
PCB 114		N	2815	mg/kg	0.010							
PCB 118		N	2815	mg/kg	0.010							
PCB 123		N	2815	mg/kg	0.010							
PCB 126		N	2815	mg/kg	0.010							
PCB 156		N	2815	mg/kg	0.010							
PCB 157		N	2815	mg/kg	0.010							
PCB 167		N	2815	mg/kg	0.010							
PCB 169		N	2815	mg/kg	0.010							
PCB 189		N	2815	mg/kg	0.010							
Total PCBs (12 Congeners)		N	2815	mg/kg	0.12							
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	2.2	2.5	3.0	2.5	4.0	3.0	4.2

Results - Soil

Project: 058 Clydach Vale Pav

Client: Terra Firma				**Chemtest Job No.:**		24-22072	24-22072	24-22072	24-22072	24-22072	24-22072	24-22072
Quotation No.:				**Chemtest Sample ID.:**		1834037	1834038	1834039	1834040	1834041	1834042	1834043
Order No.: 058 CLYDACH				Client Sample Ref.:		WS12 0.50	RC 3 0.40	RC1 0.60	SA1 0.50	SA3 1.10	SA4 0.80	SA5 0.30
				Client Sample ID.:		WS12 0.50	RC3 0.40	RC1 0.60	SA1 0.50	SA3 1.10	SA4 0.80	SA5 0.30
				Sample Location:		WS12 0.50	RC3 0.40	RC1 0.60	SA1 0.50	SA3 1.10	SA4 0.80	SA5 0.30
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.50	0.40	0.60	0.50	1.10	0.80	0.30
				Date Sampled:		11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024
				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		U	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
Moisture		N	2030	%	0.020	9.5	5.7	5.8	8.3	8.5	8.3	7.2
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones	Stones	Stones	Stones	Stones	None	Stones and Roots
Soil Texture		N	2040		N/A	Clay	Clay	Clay	Clay	Clay	Sand	Loam
pH at 20C		M	2010		4.0	8.4	8.8	9.1	8.5	8.6	8.8	8.5
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	< 0.40	0.53	0.46	< 0.40	0.49	0.47	0.52
Magnesium (Water Soluble)		N	2120	g/l	0.010							< 0.010
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010							0.019
Total Sulphur		U	2175	%	0.010							0.070
Chloride (Water Soluble)		M	2220	g/l	0.010							< 0.010
Nitrate (Water Soluble)		N	2220	g/l	0.010							< 0.010
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ammonium (Water Soluble)		M	2220	g/l	0.01							< 0.01
Sulphate (Acid Soluble)		U	2430	%	0.010	< 0.010	0.019	0.032	0.027	0.012	< 0.010	< 0.010
Arsenic		M	2455	mg/kg	0.5	5.4	5.8	4.7	7.1	4.6	5.3	6.2
Beryllium		U	2455	mg/kg	0.5	< 0.5	0.9	< 0.5	< 0.5	0.6	0.5	0.8
Cadmium		M	2455	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.35	< 0.10	< 0.10	< 0.10
Chromium		M	2455	mg/kg	0.5	7.0	8.7	5.0	13	6.7	5.2	7.1
Mercury Low Level		N	2450	mg/kg	0.05	< 0.05	0.08	< 0.05	0.06	< 0.05	0.06	0.07
Manganese		M	2455	mg/kg	1.0	390	510	350	740	380	430	380
Molybdenum		M	2455	mg/kg	0.5	< 0.5	0.7	< 0.5	0.7	0.5	0.6	0.7
Antimony		N	2455	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Copper		M	2455	mg/kg	0.50	21	36	20	20	29	26	35
Nickel		M	2455	mg/kg	0.50	19	35	16	18	25	21	29
Lead		M	2455	mg/kg	0.50	14	21	13	30	18	15	25
Selenium		M	2455	mg/kg	0.25	0.60	0.83	0.50	0.92	0.71	0.82	0.96
Zinc		M	2455	mg/kg	0.50	46	76	49	85	61	51	63
Chromium (Trivalent)		N	2490	mg/kg	1.0	7.0	8.7	5.0	13	6.7	5.2	7.1
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

Results - Soil

Project: 058 Clydach Vale Pav

Client: Terra Firma				**Chemtest Job No.:**		24-22072	24-22072	24-22072	24-22072	24-22072	24-22072	24-22072
Quotation No.:				**Chemtest Sample ID.:**		1834037	1834038	1834039	1834040	1834041	1834042	1834043
Order No.: 058 CLYDACH				Client Sample Ref.:		WS12 0.50	RC 3 0.40	RC1 0.60	SA1 0.50	SA3 1.10	SA4 0.80	SA5 0.30
				Client Sample ID.:		WS12 0.50	RC3 0.40	RC1 0.60	SA1 0.50	SA3 1.10	SA4 0.80	SA5 0.30
				Sample Location:		WS12 0.50	RC3 0.40	RC1 0.60	SA1 0.50	SA3 1.10	SA4 0.80	SA5 0.30
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.50	0.40	0.60	0.50	1.10	0.80	0.30
				Date Sampled:		11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024
				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**							
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	6.3	3.3	8.2	3.9	5.0	6.9	6.3
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	2.4	1.9	2.1	4.0	2.5	18	3.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	2.4	< 2.0	13	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	16	17	13	20	18	42	19
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	31	28	19	30	27	27	31
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	25	22	24	31	25	79	29
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	56	50	43	61	53	110	60
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	1.8	< 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	4.8	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	2.2	< 2.0	2.2	2.4	2.8	5.1	5.2
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	5.9	4.9	4.1	6.3	6.2	5.1	5.4
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	8.9	8.7	6.2	9.9	11	9.3	11
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	8.1	7.4	7.1	8.7	9.0	17	12
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	17	16	13	19	21	26	22
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	33	29	31	39	34	96	41
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	73	66	56	79	73	130	82
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.77	< 0.10	0.73
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.80	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.89	< 0.10	0.15
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	0.76	< 0.10	< 0.10	2.0	< 0.10	0.75
Anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.24	< 0.10	< 0.10
Fluoranthene		M	2800	mg/kg	0.10	1.2	0.16	< 0.10	< 0.10	0.85	< 0.10	0.16
Pyrene		M	2800	mg/kg	0.10	1.4	0.16	< 0.10	< 0.10	0.55	< 0.10	0.15
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.23	0.10	0.16
Chrysene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.36	0.14	0.16

Results - Soil

Project: 058 Clydach Vale Pav

Client: Terra Firma				**Chemtest Job No.:**		24-22072	24-22072	24-22072	24-22072	24-22072	24-22072	24-22072
Quotation No.:				**Chemtest Sample ID.:**		1834037	1834038	1834039	1834040	1834041	1834042	1834043
Order No.: 058 CLYDACH				Client Sample Ref.:		WS12 0.50	RC 3 0.40	RC1 0.60	SA1 0.50	SA3 1.10	SA4 0.80	SA5 0.30
				Client Sample ID.:		WS12 0.50	RC3 0.40	RC1 0.60	SA1 0.50	SA3 1.10	SA4 0.80	SA5 0.30
				Sample Location:		WS12 0.50	RC3 0.40	RC1 0.60	SA1 0.50	SA3 1.10	SA4 0.80	SA5 0.30
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.50	0.40	0.60	0.50	1.10	0.80	0.30
				Date Sampled:		11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024	11-Jul-2024
				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**							
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.32	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		M	2800	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	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	2.6	< 2.0	< 2.0	< 2.0	7.0	< 2.0	2.3
PCB 81		N	2815	mg/kg	0.010							
PCB 77		U	2815	mg/kg	0.010							
PCB 105		N	2815	mg/kg	0.010							
PCB 114		N	2815	mg/kg	0.010							
PCB 118		N	2815	mg/kg	0.010							
PCB 123		N	2815	mg/kg	0.010							
PCB 126		N	2815	mg/kg	0.010							
PCB 156		N	2815	mg/kg	0.010							
PCB 157		N	2815	mg/kg	0.010							
PCB 167		N	2815	mg/kg	0.010							
PCB 169		N	2815	mg/kg	0.010							
PCB 189		N	2815	mg/kg	0.010							
Total PCBs (12 Congeners)		N	2815	mg/kg	0.12							
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	2.9	1.4	3.3	2.6	2.9	2.4	2.8

Results - Soil

Project: 058 Clydach Vale Pav

Client: Terra Firma				**Chemtest Job No.:**		24-22072	24-22072	24-22072
Quotation No.:				**Chemtest Sample ID.:**		1834044	1834045	1834046
Order No.: 058 CLYDACH				Client Sample Ref.:		SA6 0.60	WS10 0.60	SUB
				Client Sample ID.:		SA6 0.60	WS10 0.60	SUB
				Sample Location:		SA6 0.60	WS10 0.60	SUB
				Sample Type:		SOIL	SOIL	SOIL
				Top Depth (m):		0.60	0.60	
				Date Sampled:		11-Jul-2024	11-Jul-2024	11-Jul-2024
				Time Sampled:		12:00	12:00	12:00
				Asbestos Lab:		DURHAM	DURHAM	
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type		U	2192		N/A	-	-	
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	
Moisture		N	2030	%	0.020	15	9.9	7.1
Soil Colour		N	2040		N/A	Brown	Brown	
Other Material		N	2040		N/A	Stones	Stones and Roots	
Soil Texture		N	2040		N/A	Clay	Clay	
pH at 20C		M	2010		4.0	6.9	8.6	
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.41	0.45	
Magnesium (Water Soluble)		N	2120	g/l	0.010		< 0.010	
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010		0.046	
Total Sulphur		U	2175	%	0.010		0.10	
Chloride (Water Soluble)		M	2220	g/l	0.010		0.014	
Nitrate (Water Soluble)		N	2220	g/l	0.010		< 0.010	
Cyanide (Complex)		M	2300	mg/kg	0.50	0.50	< 0.50	
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	
Cyanide (Total)		M	2300	mg/kg	0.50	0.50	< 0.50	
Ammonium (Water Soluble)		M	2220	g/l	0.01		< 0.01	
Sulphate (Acid Soluble)		U	2430	%	0.010	0.021	0.011	
Arsenic		M	2455	mg/kg	0.5	11	4.2	
Beryllium		U	2455	mg/kg	0.5	0.7	< 0.5	
Cadmium		M	2455	mg/kg	0.10	0.11	< 0.10	
Chromium		M	2455	mg/kg	0.5	16	7.4	
Mercury Low Level		N	2450	mg/kg	0.05	0.09	< 0.05	
Manganese		M	2455	mg/kg	1.0	410	290	
Molybdenum		M	2455	mg/kg	0.5	0.9	< 0.5	
Antimony		N	2455	mg/kg	2.0	< 2.0	< 2.0	
Copper		M	2455	mg/kg	0.50	28	19	
Nickel		M	2455	mg/kg	0.50	25	17	
Lead		M	2455	mg/kg	0.50	38	19	
Selenium		M	2455	mg/kg	0.25	0.79	0.50	
Zinc		M	2455	mg/kg	0.50	100	65	
Chromium (Trivalent)		N	2490	mg/kg	1.0	16	7.4	
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	

Results - Soil

Project: 058 Clydach Vale Pav

Client: Terra Firma			**Chemtest Job No.:**			24-22072	24-22072	24-22072
Quotation No.:			**Chemtest Sample ID.:**			1834044	1834045	1834046
Order No.: 058 CLYDACH			Client Sample Ref.:			SA6 0.60	WS10 0.60	SUB
			Client Sample ID.:			SA6 0.60	WS10 0.60	SUB
			Sample Location:			SA6 0.60	WS10 0.60	SUB
			Sample Type:			SOIL	SOIL	SOIL
			Top Depth (m):			0.60	0.60	
			Date Sampled:			11-Jul-2024	11-Jul-2024	11-Jul-2024
			Time Sampled:			12:00	12:00	12:00
			Asbestos Lab:			DURHAM	DURHAM	
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	5.4	
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	1.4	2.3	
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	92	6.1	
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	45	15	
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	94	14	
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	140	29	
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	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	
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	8.6	3.2	
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	12	< 2.0	
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	16	21	
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	21	< 5.0	
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	36	21	
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	110	18	
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	180	54	
Naphthalene		M	2800	mg/kg	0.10	6.6	0.57	
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	
Acenaphthene		M	2800	mg/kg	0.10	0.27	0.11	
Fluorene		M	2800	mg/kg	0.10	0.59	0.14	
Phenanthrene		M	2800	mg/kg	0.10	1.5	0.80	
Anthracene		M	2800	mg/kg	0.10	0.30	< 0.10	
Fluoranthene		M	2800	mg/kg	0.10	0.71	0.46	
Pyrene		M	2800	mg/kg	0.10	0.62	0.42	
Benzo[a]anthracene		M	2800	mg/kg	0.10	0.25	0.19	
Chrysene		M	2800	mg/kg	0.10	0.33	0.25	

Results - Soil

Project: 058 Clydach Vale Pav

Client: Terra Firma				**Chemtest Job No.:**		24-22072	24-22072	24-22072
Quotation No.:				**Chemtest Sample ID.:**		1834044	1834045	1834046
Order No.: 058 CLYDACH				Client Sample Ref.:		SA6 0.60	WS10 0.60	SUB
				Client Sample ID.:		SA6 0.60	WS10 0.60	SUB
				Sample Location:		SA6 0.60	WS10 0.60	SUB
				Sample Type:		SOIL	SOIL	SOIL
				Top Depth (m):		0.60	0.60	
				Date Sampled:		11-Jul-2024	11-Jul-2024	11-Jul-2024
				Time Sampled:		12:00	12:00	12:00
				Asbestos Lab:		DURHAM	DURHAM	
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	0.46	0.28	
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	0.42	0.14	
Benzo[a]pyrene		M	2800	mg/kg	0.10	0.21	0.11	
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	0.20	< 0.10	
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	0.13	< 0.10	
Total Of 16 PAH's		N	2800	mg/kg	2.0	13	3.5	
PCB 81		N	2815	mg/kg	0.010			< 0.010
PCB 77		U	2815	mg/kg	0.010			< 0.010
PCB 105		N	2815	mg/kg	0.010			< 0.010
PCB 114		N	2815	mg/kg	0.010			< 0.010
PCB 118		N	2815	mg/kg	0.010			< 0.010
PCB 123		N	2815	mg/kg	0.010			< 0.010
PCB 126		N	2815	mg/kg	0.010			< 0.010
PCB 156		N	2815	mg/kg	0.010			< 0.010
PCB 157		N	2815	mg/kg	0.010			< 0.010
PCB 167		N	2815	mg/kg	0.010			< 0.010
PCB 169		N	2815	mg/kg	0.010			< 0.010
PCB 189		N	2815	mg/kg	0.010			< 0.010
Total PCBs (12 Congeners)		N	2815	mg/kg	0.12			< 0.12
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	
Organic Matter BS1377		N	2930	%	0.10	3.2	3.3	

Results - 2 Stage WAC

Project: 058 Clydach Vale Pav

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-22072								
Chemtest Sample ID:	1834031								
Sample Ref:	WS03 0.40								
Sample ID:	WS03 0.40								
Sample Location:	WS03 0.40								
Top Depth(m):	0.40								
Bottom Depth(m):									
Sampling Date:	11-Jul-2024								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			7.3	3	5	6
Loss On Ignition	2610	M	%			11	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	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				8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.024	--	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	0.0005	0.0003	0.0009	0.0036	0.5	2	25
Barium	1455	U	0.058	0.015	0.12	0.19	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	0.0010	< 0.0005	0.0021	0.0011	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0051	0.0023	0.010	0.026	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	0.0006	< 0.0005	0.0012	0.0006	0.06	0.7	5
Selenium	1455	U	0.0014	< 0.0005	0.0027	0.0015	0.1	0.5	7
Zinc	1455	U	0.005	0.004	0.010	0.044	4	50	200
Chloride	1220	U	4.4	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.29	0.17	< 1.0	1.8	10	150	500
Sulphate	1220	U	35	4.5	70	78	1000	20000	50000
Total Dissolved Solids	1020	N	240	71	470	890	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.6	2.8	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	6.2

Leachate Test Information	
Leachant volume 1st extract/l	0.338
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.188

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: 058 Clydach Vale Pav

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-22072								
Chemtest Sample ID:	1834035								
Sample Ref:	WS08 1.50								
Sample ID:	WS08 1.50								
Sample Location:	WS08 1.50								
Top Depth(m):	1.50								
Bottom Depth(m):									
Sampling Date:	11-Jul-2024								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			18	3	5	6
Loss On Ignition	2610	M	%			11	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	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				8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.020	--	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	0.0012	0.0008	0.0023	0.0087	0.5	2	25
Barium	1455	U	0.046	0.016	0.091	0.19	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	0.0010	0.0009	0.0019	0.0010	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0086	0.0038	0.017	0.043	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	0.0013	< 0.0005	0.0026	0.0014	0.06	0.7	5
Selenium	1455	U	0.0036	0.0016	0.0071	0.018	0.1	0.5	7
Zinc	1455	U	0.006	0.007	0.011	0.070	4	50	200
Chloride	1220	U	6.0	< 1.0	12	< 10	800	15000	25000
Fluoride	1220	U	0.36	0.18	< 1.0	2.0	10	150	500
Sulphate	1220	U	51	5.8	100	110	1000	20000	50000
Total Dissolved Solids	1020	N	200	56	400	720	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.5	3.9	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.8

Leachate Test Information	
Leachant volume 1st extract/l	0.335
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.189

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: 058 Clydach Vale Pav

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-22072								
Chemtest Sample ID:	1834037								
Sample Ref:	WS12 0.50								
Sample ID:	WS12 0.50								
Sample Location:	WS12 0.50								
Top Depth(m):	0.50								
Bottom Depth(m):									
Sampling Date:	11-Jul-2024								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			7.9	3	5	6
Loss On Ignition	2610	M	%			9.6	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			2.7	100	--	--
pH at 20C	2010	M				8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.016	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	0.0005	< 0.0002	0.0042	0.5	2	25
Barium	1455	U	0.020	0.008	0.040	0.094	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	0.0010	0.0011	0.0021	0.0013	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0038	0.0013	0.0076	0.016	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	0.0017	0.0006	0.0033	0.0074	0.1	0.5	7
Zinc	1455	U	0.006	0.009	0.012	0.084	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.26	0.14	< 1.0	1.5	10	150	500
Sulphate	1220	U	13	1.0	26	25	1000	20000	50000
Total Dissolved Solids	1020	N	130	43	260	530	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.3	3.9	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.5

Leachate Test Information	
Leachant volume 1st extract/l	0.332
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.217

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: 058 Clydach Vale Pav

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-22072								
Chemtest Sample ID:	1834041								
Sample Ref:	SA3 1.10								
Sample ID:	SA3 1.10						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	SA3 1.10								
Top Depth(m):	1.10								
Bottom Depth(m):									
Sampling Date:	11-Jul-2024								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			10	3	5	6
Loss On Ignition	2610	M	%			8.4	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			10	100	--	--
pH at 20C	2010	M				8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.024	--	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	0.0003	0.0002	0.0006	0.0022	0.5	2	25
Barium	1455	U	0.034	0.009	0.067	0.11	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	0.0008	0.0006	0.0017	0.0008	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0022	0.0016	0.0043	0.016	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	0.0010	0.0005	0.06	0.7	5
Selenium	1455	U	0.0020	0.0006	0.0041	0.0077	0.1	0.5	7
Zinc	1455	U	0.005	0.005	0.010	0.048	4	50	200
Chloride	1220	U	4.7	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.32	0.19	< 1.0	2.0	10	150	500
Sulphate	1220	U	32	3.2	64	61	1000	20000	50000
Total Dissolved Solids	1020	N	180	53	360	660	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.4	3.8	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.5

Leachate Test Information	
Leachant volume 1st extract/l	0.334
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.178

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: 058 Clydach Vale Pav

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-22072								
Chemtest Sample ID:	1834042								
Sample Ref:	SA4 0.80								
Sample ID:	SA4 0.80								
Sample Location:	SA4 0.80								
Top Depth(m):	0.80								
Bottom Depth(m):									
Sampling Date:	11-Jul-2024								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			23	3	5	6
Loss On Ignition	2610	M	%			15	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			7.2	100	--	--
pH at 20C	2010	M				8.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.028	--	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	0.0004	< 0.0002	0.0032	0.5	2	25
Barium	1455	U	0.038	0.007	0.075	0.10	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	0.0010	0.0009	0.0021	0.0011	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0037	0.0024	0.0074	0.025	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	0.0011	0.0006	0.06	0.7	5
Selenium	1455	U	0.0028	0.0009	0.0056	0.011	0.1	0.5	7
Zinc	1455	U	0.005	0.010	0.011	0.096	4	50	200
Chloride	1220	U	1.7	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.33	0.18	< 1.0	2.0	10	150	500
Sulphate	1220	U	38	3.9	76	75	1000	20000	50000
Total Dissolved Solids	1020	N	200	56	400	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.3	3.9	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.3

Leachate Test Information	
Leachant volume 1st extract/l	0.334
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.185

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: 058 Clydach Vale Pav

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-22072								
Chemtest Sample ID:	1834044								
Sample Ref:	SA6 0.60								
Sample ID:	SA6 0.60								
Sample Location:	SA6 0.60								
Top Depth(m):	0.60								
Bottom Depth(m):									
Sampling Date:	11-Jul-2024								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			4.8	3	5	6
Loss On Ignition	2610	M	%			10	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			3.9	100	--	--
pH at 20C	2010	M				6.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	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	0.0007	0.0015	0.0014	0.014	0.5	2	25
Barium	1455	U	0.014	0.007	0.027	0.076	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	0.0016	0.0024	0.0033	0.0016	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0005	0.0009	0.0010	0.0082	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	0.0012	< 0.0005	0.011	0.5	10	50
Antimony	1455	U	0.0010	0.0006	0.0020	0.0060	0.06	0.7	5
Selenium	1455	U	0.0005	< 0.0005	0.0010	0.0005	0.1	0.5	7
Zinc	1455	U	0.007	0.015	0.013	0.15	4	50	200
Chloride	1220	U	< 1.0	2.6	< 10	23	800	15000	25000
Fluoride	1220	U	0.13	0.15	< 1.0	1.5	10	150	500
Sulphate	1220	U	21	3.6	41	53	1000	20000	50000
Total Dissolved Solids	1020	N	66	21	130	250	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	6.2	7.0	< 50	69	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.319
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.171

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.

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	
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	
2010	pH Value of Soils	pH at 20°C	pH Meter	
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.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	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.	
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	
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	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2810	Polychlorinated Biphenyls (PCB) as Aroclors in Soils by GC-ECD	Polychlorinated Biphenyls expressed as an Aroclor (normally reported as *Aroclor 1242)	Extraction of a soil sample, as received, into hexane/acetone (50:50) followed by gas chromatography (GC) using mass spectrometric (MS) detection for identification of polychlorinated biphenyls and electron capture detection (ECD) for quanitation if present.	
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.	
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	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

Report Information

Key

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

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.

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.
All water samples will be retained for 14 days from the date of receipt.
Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable

Report Information

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

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

ANNEX G
Laboratory Geotechnical Test Results

Results Summary

Apex Testing Solutions Limited
Sturmi Way
Village Farm Industrial Estate
Pyle
Bridgend
CF33 6BZ

Telephone: 01656 746762
E-mail: andrew.grogan@apex-drilling.com
laura.davis@apex-drilling.com

Reporting Details		**Key Information**	
Company Name:	TFW Group Ltd	**Site Name:**	Clydach
Address:	5 Deryn Court		
	Wharfdale Road	**Job Number:**	D24276
	Cardiff	**Date Received:**	22/07/2024
	CF23 7HA	**Job Coordinator:**	A. Grogan
Contact Name:	**Jacob**		
Contact Number:			

Item No.	Tests Undertaken	Number of Tests
1	Water Content - ISO 17892 2014	4
2	Atterburg Limits (4 point) - BS1377-2: 1990	4

Results Issued: 26/07/2024

Comments

Results herein relate only to samples received in the laboratory and where not sampled by Apex Testing Solutions personnel relate to the samples as received.
Where tests are UKAS accredited any Opinion and/or Interpretation expressed herein are outside the scope of the UKAS Accreditation. The reports shall not be reproduced in full without the written approval of the laboratory.

Please contact the job coordinator should any further information be required.

TEST REPORT

Determination Of Water Content

ISO 17892-1: 2014

Project No:	D24276	**Client:**	TFW Group Ltd
Project Name:	Clydach	**Address:**	5 Deryn Court Wharfdale Road Cardiff
ATS Sample No:	37222		CF23 7HA

Site Ref / Hole ID:	WS05	**Depth (m):**	1.80
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Grey sandy gravelly CLAY
Location in Works:	N/a	**Material Source:**	Ex-Site
Date Sampled:	Unknown	**Material Supplier:**	Ex-Site
Sampled By:	Client	**Specification:**	ISO 17892-1
Date Received:	23 July 2024	**Date Tested:**	23 July 2024

Test Results

Water Content (%)	17.4

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
EN ISO 17892-1:2014	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	L Davis	26/07/2024	**MC**
			L Davis, Quality Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

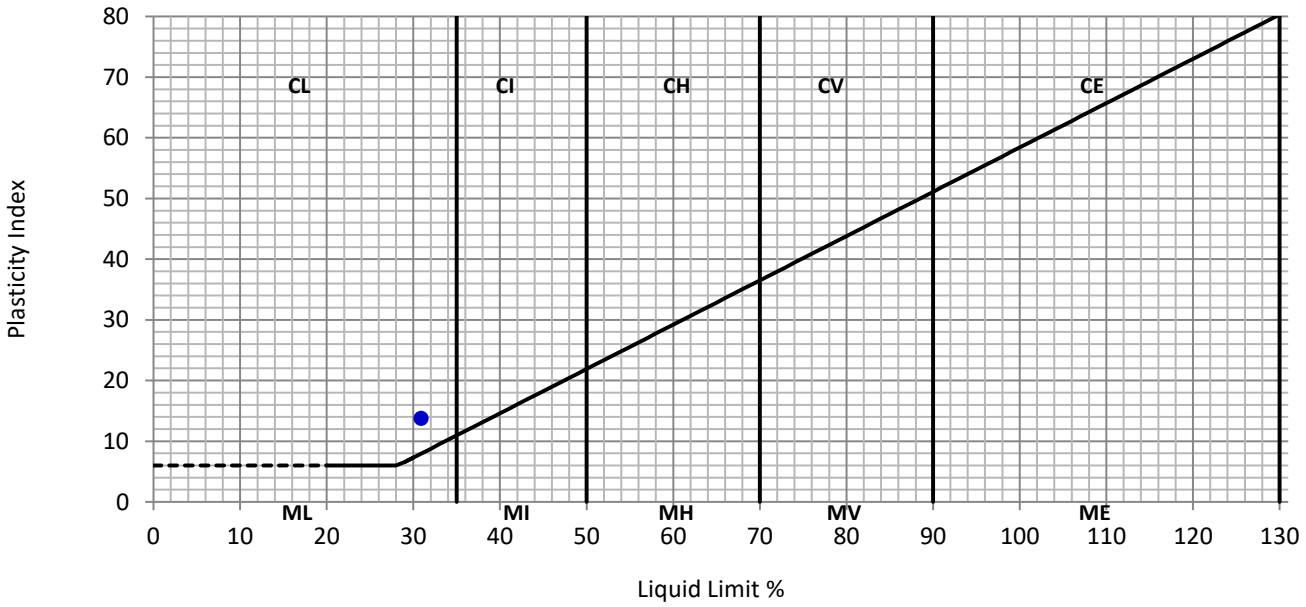
Project No:	D24276	**Client:**	TFW Group Ltd
Project Name:	Clydach	**Address:**	5 Deryn Court Wharfdale Road Cardiff
ATS Sample No:	37222		CF23 7HA

Site Ref / Hole ID:	WS05	**Depth (m):**	1.80
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Grey sandy gravelly CLAY
Location in Works:	N/a	**Material Source:**	Ex-Site
Date Sampled:	Unknown	**Material Supplier:**	Ex-Site
Sampled By:	Client	**Specification:**	BS1377
Date Received:	23 July 2024	**Date Tested:**	25 July 2024

Test Results

Liquid Limit	31	%
Plastic Limit	17	%
Plasticity Index	14	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	9	%



Remarks:

QA Ref. BS1377 - 2 Rev. 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	UKAS TESTING 7771	Approver: L Davis L Davis, Quality Manager	Date: 26/07/2024	Fig. **ATT**

TEST REPORT

Determination Of Water Content

ISO 17892-1: 2014

Project No:	D24276	**Client:**	TFW Group Ltd
Project Name:	Clydach	**Address:**	5 Deryn Court Wharfdale Road Cardiff
ATS Sample No:	37223		CF23 7HA

Site Ref / Hole ID:	WS09	**Depth (m):**	0.80
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Grey slightly sandy slightly gravelly CLAY
Location in Works:	N/a	**Material Source:**	Ex-Site
Date Sampled:	Unknown	**Material Supplier:**	Ex-Site
Sampled By:	Client	**Specification:**	ISO 17892-1
Date Received:	23 July 2024	**Date Tested:**	26 July 2024

Test Results

Water Content (%)	7.9

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
EN ISO 17892-1:2014	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	L Davis	26/07/2024	**MC**
			L Davis, Quality Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

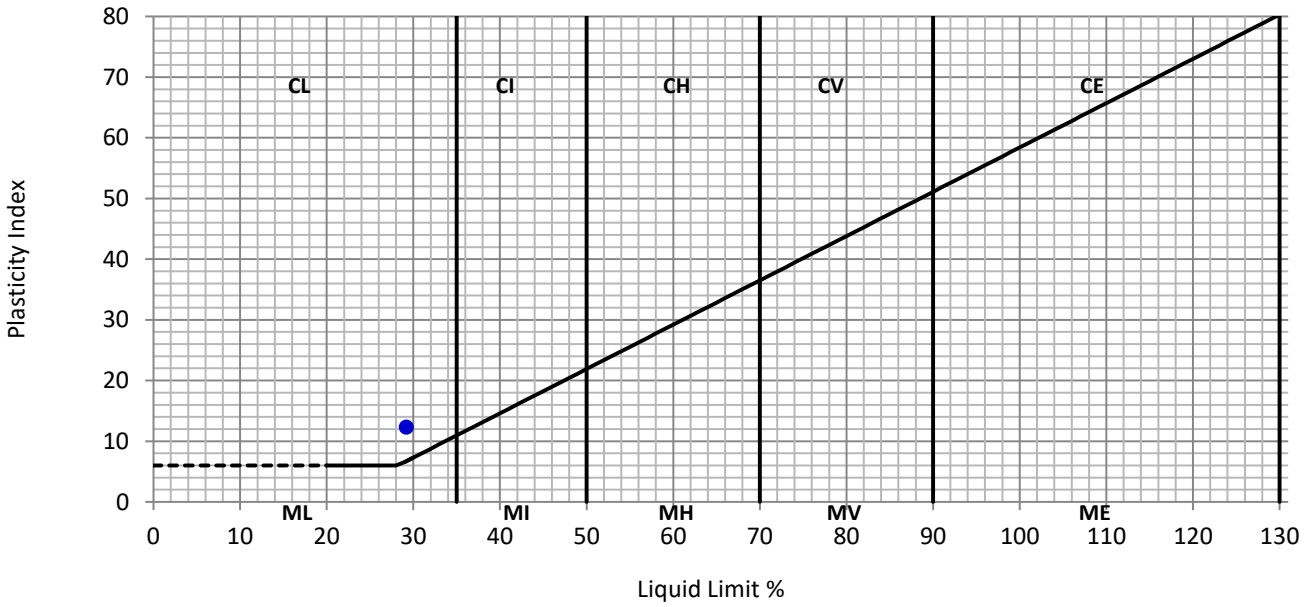
Project No:	D24276	**Client:**	TFW Group Ltd
Project Name:	Clydach	**Address:**	5 Deryn Court Wharfdale Road Cardiff
ATS Sample No:	37223		CF23 7HA

Site Ref / Hole ID:	WS09	**Depth (m):**	0.80
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Grey slightly sandy slightly gravelly CLAY
Location in Works:	N/a	**Material Source:**	Ex-Site
Date Sampled:	Unknown	**Material Supplier:**	Ex-Site
Sampled By:	Client	**Specification:**	BS1377
Date Received:	23 July 2024	**Date Tested:**	25 July 2024

Test Results

Liquid Limit	29	%
Plastic Limit	17	%
Plasticity Index	12	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	12	%



Remarks:

TEST REPORT

Determination Of Water Content

ISO 17892-1: 2014

Project No:	D24276	**Client:**	TFW Group Ltd
Project Name:	Clydach	**Address:**	5 Deryn Court Wharfdale Road Cardiff
ATS Sample No:	37224		CF23 7HA

Site Ref / Hole ID:	WS12	**Depth (m):**	2.70
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Dark grey sandy gravelly CLAY
Location in Works:	N/a	**Material Source:**	Ex-Site
Date Sampled:	Unknown	**Material Supplier:**	Ex-Site
Sampled By:	Client	**Specification:**	ISO 17892-1
Date Received:	23 July 2024	**Date Tested:**	23 July 2024

Test Results

Water Content (%)	10.4

Remarks:

QA Ref.	**Apex Testing Solutions**	Approver	Date	Fig
EN ISO 17892-1:2014	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	L Davis	26/07/2024	**MC**
	7771	L Davis, Quality Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

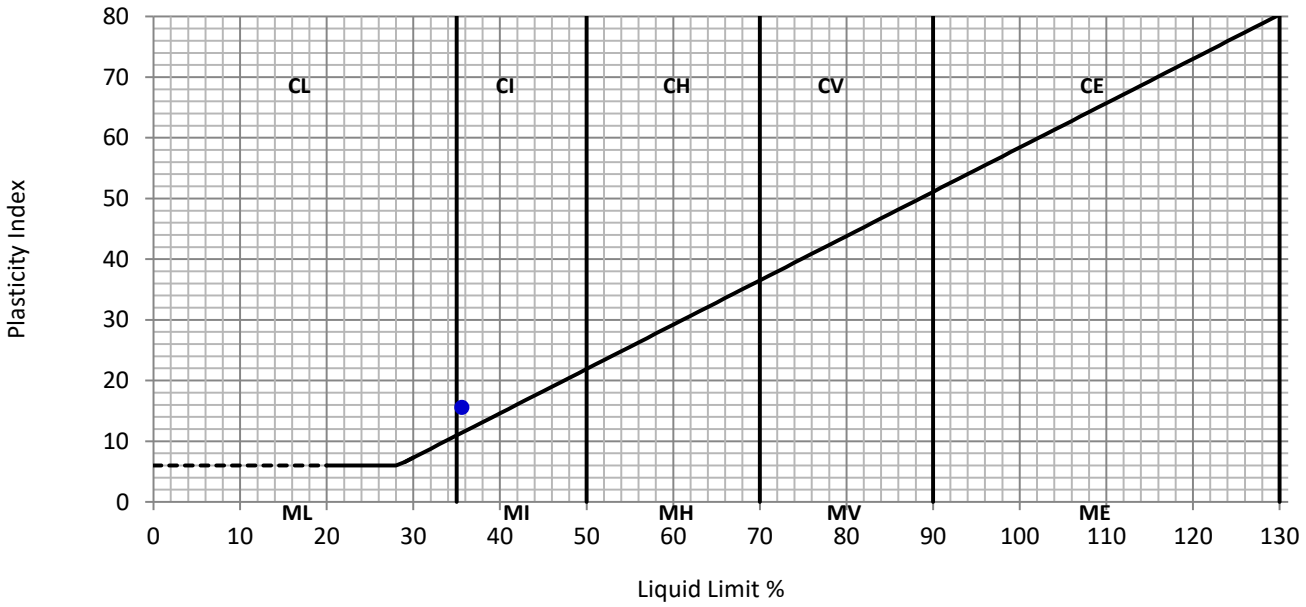
Project No:	D24276	**Client:**	TFW Group Ltd
Project Name:	Clydach	**Address:**	5 Deryn Court Wharfdale Road Cardiff CF23 7HA
ATS Sample No:	37224		

Site Ref / Hole ID:	WS12	**Depth (m):**	2.70
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Dark grey sandy gravelly CLAY
Location in Works:	N/a	**Material Source:**	Ex-Site
Date Sampled:	Unknown	**Material Supplier:**	Ex-Site
Sampled By:	Client	**Specification:**	BS1377
Date Received:	23 July 2024	**Date Tested:**	25 July 2024

Test Results

Liquid Limit	36	%
Plastic Limit	20	%
Plasticity Index	16	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	37	%



Remarks:

TEST REPORT

Determination Of Water Content

ISO 17892-1: 2014

Project No:	D24276	**Client:**	TFW Group Ltd
Project Name:	Clydach	**Address:**	5 Deryn Court Wharfdale Road Cardiff CF23 7HA
ATS Sample No:	37225		

Site Ref / Hole ID:	SA04	**Depth (m):**	2.50
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Dark grey sandy gravelly CLAY
Location in Works:	N/a	**Material Source:**	Ex-Site
Date Sampled:	Unknown	**Material Supplier:**	Ex-Site
Sampled By:	Client	**Specification:**	ISO 17892-1
Date Received:	23 July 2024	**Date Tested:**	24 July 2024

Test Results

Water Content (%)	10.8

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
EN ISO 17892-1:2014	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	L Davis	26/07/2024	**MC**
			L Davis, Quality Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

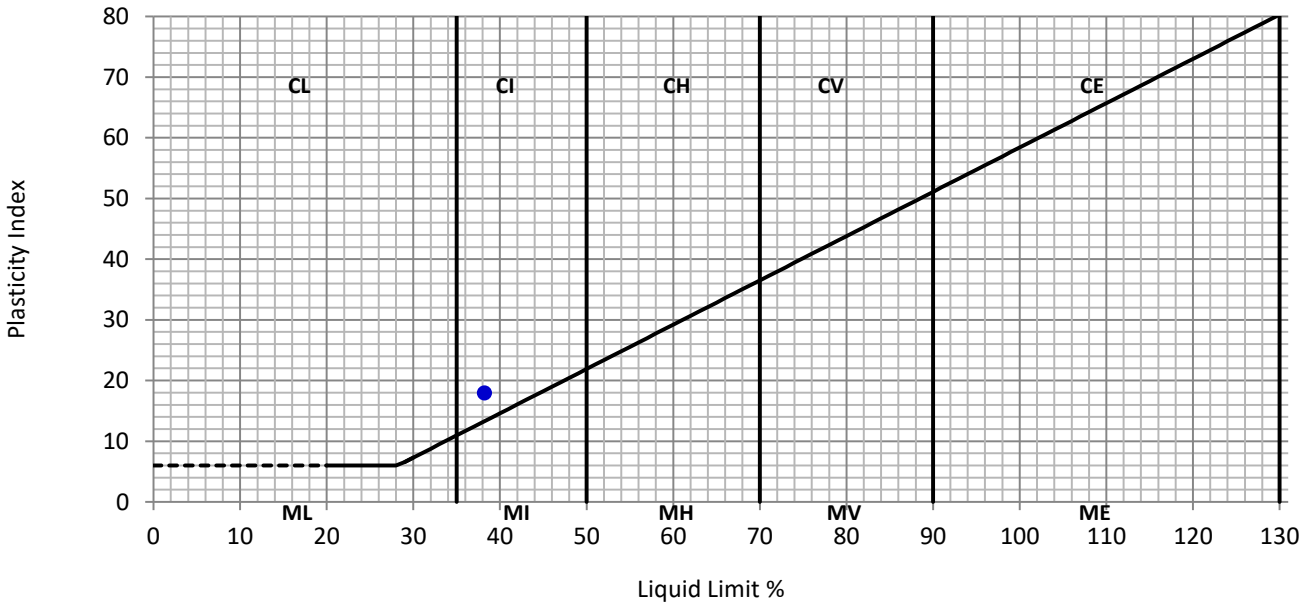
Project No:	D24276	**Client:**	TFW Group Ltd
Project Name:	Clydach	**Address:**	5 Deryn Court Wharfdale Road Cardiff
ATS Sample No:	37225		CF23 7HA

Site Ref / Hole ID:	SA04	**Depth (m):**	2.50
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Dark grey sandy gravelly CLAY
Location in Works:	N/a	**Material Source:**	Ex-Site
Date Sampled:	Unknown	**Material Supplier:**	Ex-Site
Sampled By:	Client	**Specification:**	BS1377
Date Received:	23 July 2024	**Date Tested:**	25 July 2024

Test Results

Liquid Limit	38	%
Plastic Limit	20	%
Plasticity Index	18	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	37	%



Remarks:

ANNEX H
Asphalt Test Results

Road Binder Analysis

Client: TerraFirma
Address:

Samples Taken: unknown
Samples Extracted: 30 July 2024
Samples Analysed: 30 July 2024

Contact:

Analyst: CAG

Project: 17931-Clydach

T03166

Matrix	Sample ID	Phenols Indicator	Coal Tar %	BaP mg/kg	% BaP	BDF	Road Binder Identification
Road Binder	WS01	NA	ND	1.4 - 3.2	NA	56	Bit.Binder 94.2 %
Road Binder	WS02	NA	ND	0.84 - 2	NA	18	Bit.Binder + Traces Pyrogenic Compounds 91.9 %
Road Binder	WS03	NA	ND	1.3 - 3	NA	33	Bit.Binder 96.2 %
Road Binder	WS04	NA	ND	0.81 - 1.9	NA	22	Bit.Binder 95.3 %
Road Binder	WS05	NA	ND	0.62 - 1.5	NA	30	Bit.Binder 100 %
Road Binder	WS10	NA	ND	0.91 - 2.1	NA	70	Bit.Binder 95.4 %

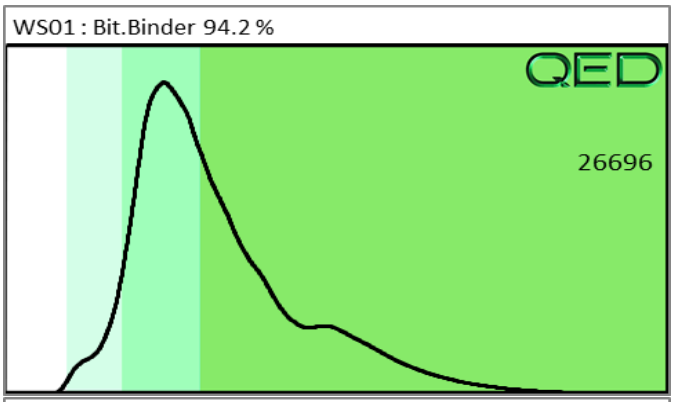
QED QC Check OK
Results generated by QED HC-1 analyser

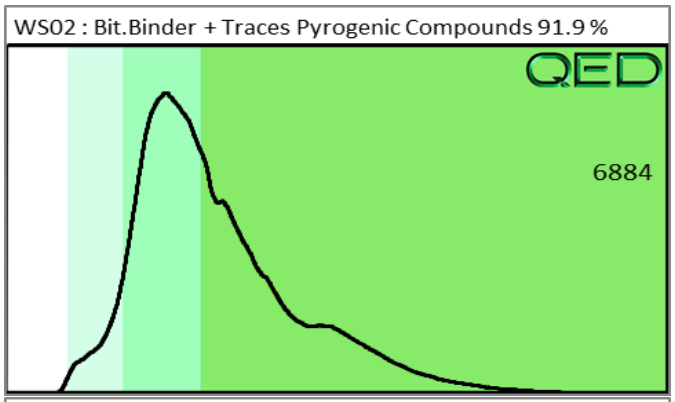
Binder Identification = %match confidence, ND indicates <0.1% coal tar detected, NA = Not Applicable
Concentration range for % Coal Tar and total BaP in as received sample based on a binder content of between 3% and 7%
(% Coal Tar) = Approximate % of Coal Tar in Bitumen Binder (% BaP) = Approximate % of Benzo Pyrene in Coal Tar fraction
Phenol Indicator : NA = not applicable, coal tar not present, ND = not detected, + = detected, ++ detected at high concentration
Bitumen Degradation Factor (BDF) <100 Undegraded, 100 - 500 Degraded, >500 V.Degraded
Red highlight = Hazardous : Yellow highlight = Potentially Hazardous

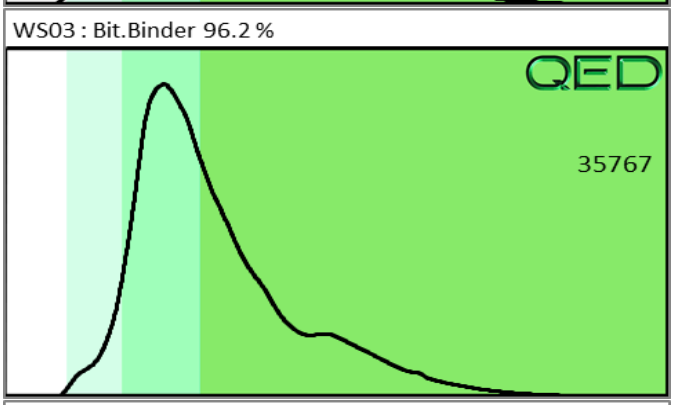
QED Hydrocarbon Fingerprints

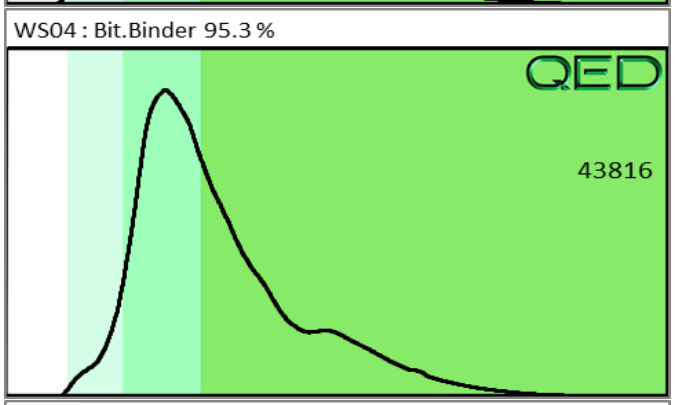
Project: 17931-Clydach

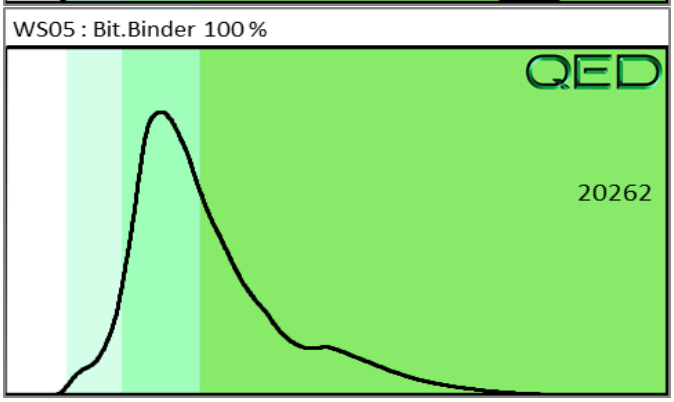
30 July 2024

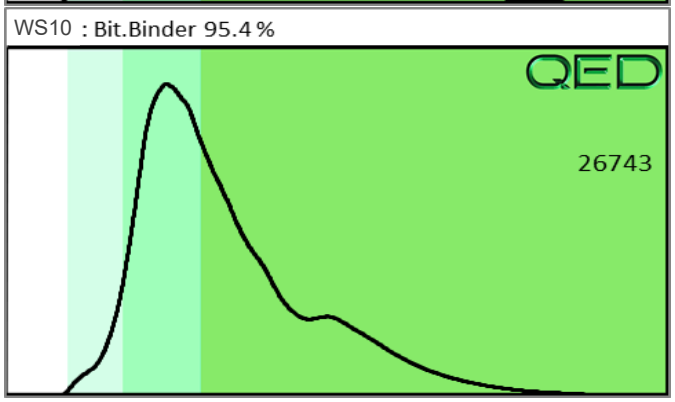




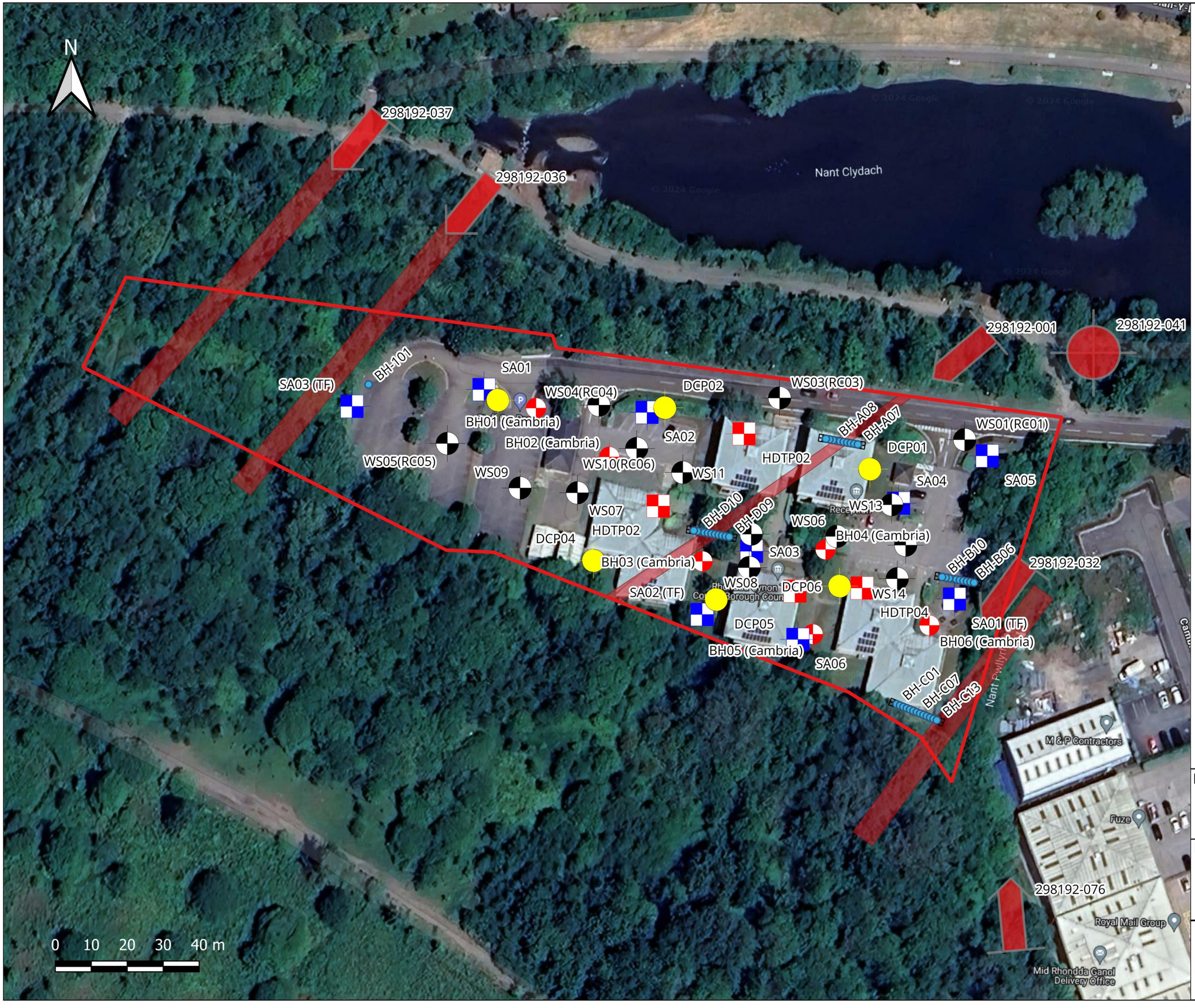








DRAWINGS



terra firma
earth matters

Legend

- Rotary Boreholes
- Cambria Rotary Boreholes
- Mini Percussive Boreholes
- Trial Pit Soakaway
- Hand Dug Trial Pit
- CBR Location
- Adit Roadways

PROJECT:

17931 - Clydach Vale Pavillions

DRAWING 01:

Proposed Site Investigation Locations (Whole Site)

TFW Group Ltd
5 Deryn Court, Wharfedale Road,
Cardiff, CF23 7HA
Tel: 029 2073 5354
Email: info@terrafirmawales.co.uk

terra firma
earth matters

Legend

- Rotary Boreholes
- Cambria Rotary Boreholes
- Mini Percussive Boreholes
- Trial Pit Soakaway
- Hand Dug Trial Pit
- CBR Location
- Adit Roadways

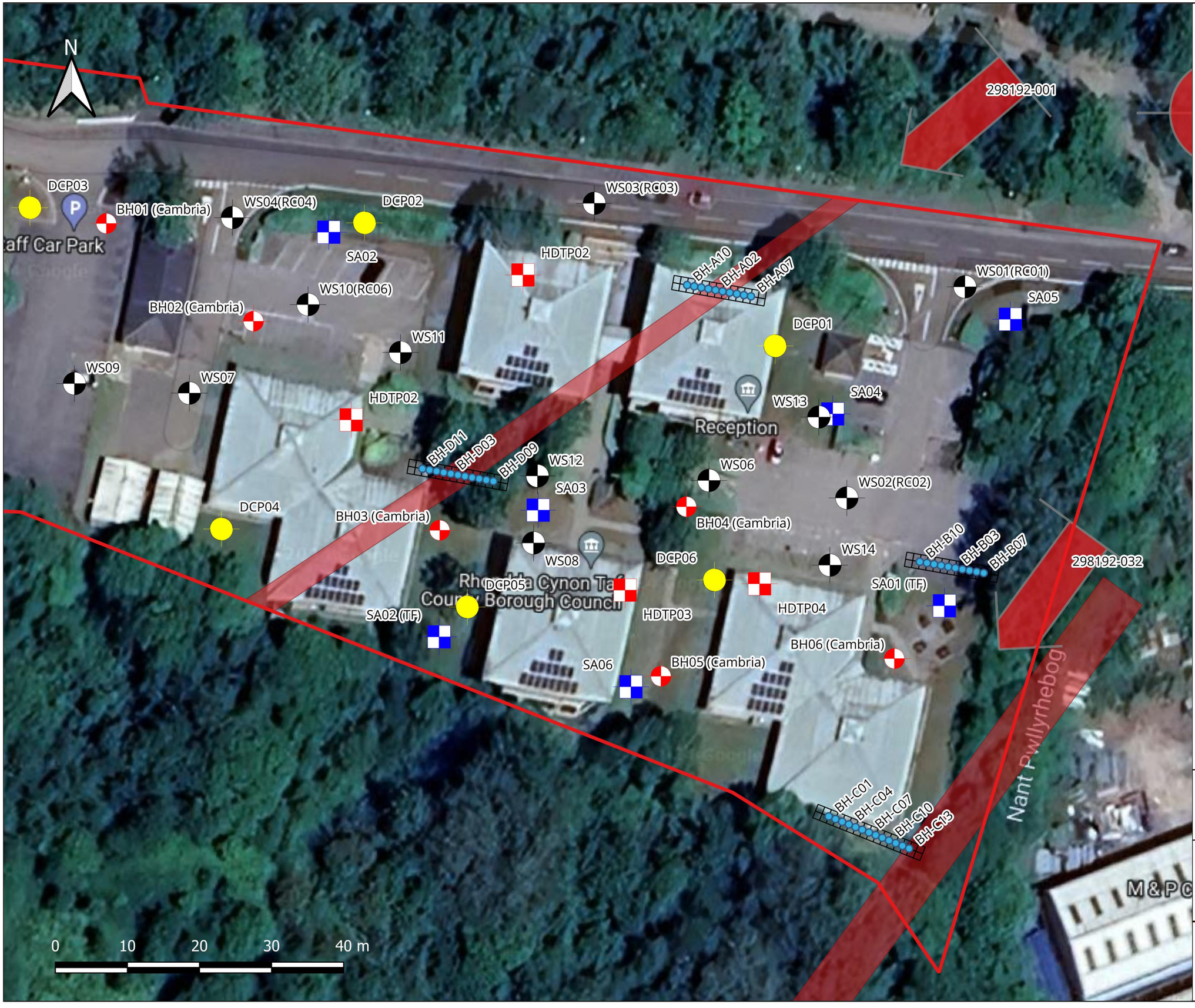
PROJECT:

17931 - Clydach Vale Pavillions

DRAWING 02:

Site Investigation Locations
(Western Site Area)

TFW Group Ltd
5 Deryn Court, Wharfedale Road,
Cardiff, CF23 7HA
Tel: 029 2073 5354
Email: info@terrafirmawales.co.uk



terra firma
earth matters

Legend

- Rotary Boreholes
- Cambria Rotary Boreholes
- Mini Percussive Boreholes
- Trial Pit Soakaway
- Hand Dug Trial Pit
- CBR Location
- Adit Roadways

PROJECT:

17931 - Clydach Vale Pavillions

DRAWING 03:

Site Investigation Locations
(Eastern Site Area)

TFW Group Ltd
5 Deryn Court, Wharfedale Road,
Cardiff, CF23 7HA
Tel: 029 2073 5354
Email: info@terrafirmawales.co.uk

terra firma

Geotechnical & Geoenvironmental Specialists

Terra Firma (Wales) Ltd. 5 Deryn Court, Wharfedale Road, Pentwyn, Cardiff CF23 7HA
Tel: 029 2073 5354 **Fax:** 029 2073 5433 **Email:** info@terrafirmawales.co.uk **www.terrafirmawales.co.uk**