

# Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

## **Waterfalls Country Centre, Pontneddfechan Commercial Development Supplementary Factual Exploratory Investigation**

Report Reference: ESP.8715.02.4352

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Consulting Engineers | Geologists | Environmental Scientists

33 Cardiff Road, Taff's Well, CARDIFF, CF15 7RB ☎ 029 2081 3385  
✉ [enquiries@earthsciencepartnership.com](mailto:enquiries@earthsciencepartnership.com) [www.earthsciencepartnership.com](http://www.earthsciencepartnership.com)

## Waterfalls Country Centre, Pontneddfechan Proposed Commercial Development Supplementary Factual Exploratory Investigation

Prepared for:  
Andrew Scott Ltd  
Scott House  
Enterprise Park  
Charter Ct  
Llansamlet  
Swansea  
SA7 9DH



Report Reference: **ESP.8715.02.4352**

| Revision   | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Date     | Written by                   | Checked by                                            | Approved by                                                              |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------|
| 0          | Draft                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | May 2025 | Tomos McCann<br>BSc Hons FGS | Hywel Davies<br>MESci CGeol FGS<br>RoGEP Professional | Matthew Eynon<br>BSc (Hons) MSc CGeol<br>EurGeol FGS RoGEP<br>Specialist |
| Signature: |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |                              |                                                       |                                                                          |
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**Figure 1 – Investigation Point Plan**

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# 1 Introduction

## 1.1 Background

Andrew Scott Ltd (hereafter known as the Client) have been appointed Principal Contractor to redevelop the subject site for commercial and leisure purposes. We understand the development will comprise 'a new single storey community/visitor hub, a new single storey bunkhouse, and areas car parking and soft landscaping.'

The Earth Science Partnership Ltd (ESP), Consulting Engineers, Geologists and Environmental Scientists, were instructed by the Client to undertake a supplementary factual exploratory investigation to inform development design.

JUBB Consulting Engineers Ltd (hereafter known as the Designer) originally specified the scope of works for the investigation, as detailed in the Ground Investigation Tender document provided (ref: Waterfalls Country Centre, Glynneath – Ground Investigation Scope - Additional GI, 30th September 2024). The scope was subsequently amended by the Client.

## 1.2 Objective and Scope of Works

The objective and scope of works of the investigation was developed by the designer to obtain further factual information on the geotechnical character and properties of the ground beneath the site and levels of contamination.

The works were tendered for by ESP, based on the specification provided by the Designer and Client which comprised the supervision and direction of machine excavated trial pits, rotary boreholes, soakaway testing, gas and groundwater monitoring, geotechnical and geo-environmental laboratory testing, and factual reporting. This report is the factual presentation of the ground investigation only and no interpretive assessment has been undertaken by ESP.

The contract was awarded on the basis of a competitive tender quotation. The terms of reference for the assessment are as laid down in the Earth Science Partnership costing (ref.ESP.8715.02.Rev3 – Waterfalls Country Centre). The investigation, factual reporting and gas and groundwater monitoring were undertaken between April and May 2025.

## 1.3 Report Format

This report is factual only, presenting the findings of the investigation undertaken in line with the scope of works provided by the Designer/Client. No other aspects have been considered in this report.

This factual ground investigation Report includes details of the ground investigation undertaken of BS5930:2020 (Section 3), followed by a summary of the ground conditions identified (Section 4).

This factual report is issued as a digital version only.

## 1.4 Limitations of Report

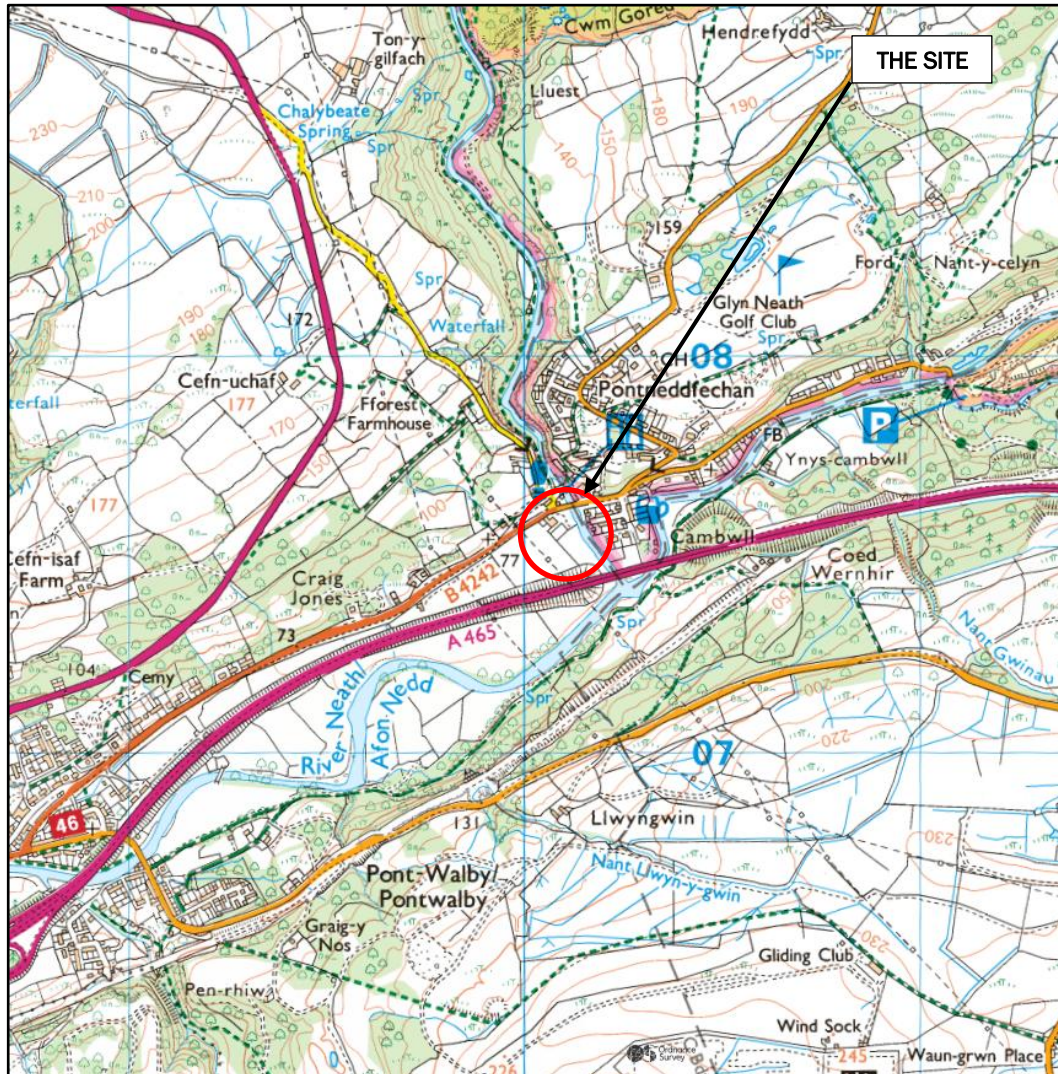
This report represents the factual findings of the scope of works provided by the designer, relating to the proposed end use. The scope of works did not require any interpretation or assessment of the data, and we understand that this is being undertaken by the designer (Jubb).

## 2 Site Description & Background

The site description is largely based on a field reconnaissance and site inspection visit made during the fieldworks (April and May 2025) during generally dry weather.

### 2.1 Site Location and Description

The site is located within the village of Pontneddfechan within Neath Port Talbot County Borough. The National Grid Reference of the approximate centre of the site is (SN) 290111, 207537 and the nearest postcode is SA11 5NR. A Site Location Plan is presented as Insert 1 below.



Insert 1 - Site Location Plan from Ordnance Survey 1:25,000 scale map.  
Reproduced with permission (OS License No.: AL100015788).

The site comprises an irregular shaped parcel of land and currently comprises existing restaurant in the north (to remain), with adjacent farm buildings. The remainder of the site comprises fields to the southeast, as well as additional parcel within the field to the west. The site is largely grass surfaced with an area of grass/gravel noted in the northeast, which appears to be a possible area of filling to create a level platform. Vehicular access to the site is currently gained via a gate in the northeast.

The general topography in the area slopes to the south to the Afon Nedd. The site itself slopes north to south from approximately 79.5m AOD in the northeast to approximately 73/74m AOD in the southeast.

The designer provided ESP with a series of plans/surveys showing the locations of recorded underground services at the site and in the vicinity. These were utilised by ESP to safely locate all investigation points and where required, adjust any proposed positions provided by the designer so as not to damage any existing services.

A Dwr Cymru Welsh Water (DCWW) water main is located beneath the site, trending northeast to southwest. The designer provided a plan showing the surveyed location of the main (after Landmark Surveys Wales, dwg ref: 6765) and marked out the location at the surface in advance of the investigation. The easement on this main is 6.5m either side of the pipe, therefore all investigation were located outside of this zone.

## 2.2 Previous Assessments

Earth Science Partnership (ESP) undertook an exploratory investigation at the site in December 2023 (ESP, 2023) for the current proposed development.

The investigation included windowless sample boreholes, trial pits, dynamic cone penetrometer testing, soakaway tests, laboratory testing and gas and groundwater level monitoring.

For further details on previous findings the report should be referenced (Ref: ESP8715.4014, January 2024).

## 2.3 Geological Setting

The published 1:50,000 scale geological map for the area of the site (Sheet 231, available on the website of the British Geological Survey, 2023) indicates the site to be underlain by River Terrace Deposits (sand and gravel) overlying bedrock of the South Wales Lower Coal measures.

Made Ground may also be present in the north/northeast given the historical development in this area.

This geological succession is confirmed in the designer's specification, which also indicates that alluvial deposits may be present in the southeast (Jubb, 2023).

## 2.4 Unexploded Ordnance

A Preliminary (Pre-Desk Study) UXO Desk Study assessment of risk had been completed prior to the previous ESP investigation (ESP, 2023) by a specialist Ordnance consultant in accordance with CIRIA guidelines (Stone et al, 2009).

The assessment concludes that '*a detailed desk study, whilst always prudent, is not considered essential in this instance*'.

## 3 Exploratory Investigation

### 3.1 Investigation Points

#### 3.1.1 Introduction

The intrusive investigation was undertaken between 23<sup>rd</sup> and 24<sup>th</sup> of April 2025 in accordance with BS5930:2020 and BS10175:2017. It comprised trial pitting, soakaway infiltration testing, and rotary drilling (including dynamic sampling and rotary coring) with hand excavated inspection pits.

The exploratory holes were supervised and logged by an engineering geologist in general accordance with BS5930:2020, BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2018, and BS EN ISO 14689:2018.

A representative from the Designer (Jubb) was also present throughout much of the intrusive works and all works were cleared of services prior to ESP attendance.

The ground levels and coordinates of the investigation points were surveyed by ESP after the completion of the works. The details of the investigation point locations are presented on the individual borehole records.

#### 3.1.2 Investigation Strategy

The investigation strategy was indicated in the designer's scope (Jubb, 2024) and the positions of the investigation points were marked out by the Client prior to the works, as per the drawing presented in Figure 1.

All exploratory holes were terminated in line with the specification or where no further progression was possible.

#### 3.1.3 Trial Pits

3 no. trial pits (TP201 to TP203) were excavated across the site on the 23<sup>rd</sup> of April, 2025, using a tracked hydraulic excavator. The trial pits were excavated to depths of between 1.1m and 2.3m bgl. The trial pit records are presented as Appendix A and their Positions shown on Figure 1.

Environmental, Disturbed and bulk samples were collected from the trial pits for laboratory testing as shown on the trial pit records. In situ measurements of the undrained shear strength of fine-grained soils at shallow depth were taken using a calibrated hand vane (with a 1m extension where required). No man entry into the pits was undertaken. The results of hand vane measurements are presented on the trial pit records.

On completion of scheduled soakaway testing, the trial pits were backfilled with arisings in layers compacted with the excavator bucket.

#### 3.1.4 Soakaway Infiltration Testing

Soakaway infiltration tests were undertaken in general accordance with BRE Digest 365 (2016) in Trial Pits TP201 and TP202. The results of the infiltration testing, and the calculated infiltration rates, are presented in Appendix C. Further details are provided on the trial pit logs.

At each position, the test pit was excavated to around 1.0 depth. Clean water was added from a large capacity bowser and the water level monitored as it percolated into the soil.

The infiltration rate was calculated from the time taken for the water to fall between the 75% and 25% full level. Where insufficient time was available for the water level to fall to the 25% full level, but a significant drop in water level was recorded, the infiltration rate can be estimated by extrapolating the test results.

Due to time restraints, soakaway SA202 was unable to complete three full fills in the available test. The refilling of the pit prior to completion was agreed with the Designer.

On completion of the testing in each pit, any remaining water was removed from the test pit and backfilled with arisings once the trial pit was completed. The test results and permeability calculations are presented in Appendix C.

### 3.1.5 Rotary Drill Boreholes

One rotary drillhole was constructed (BH201) on the 24<sup>th</sup> of April 2025. The borehole records are presented as Appendix B, and their positions are shown on Figure 1.

To clearly identify the interface between the upper fine grained deposits and the underlying coarse grained soils (which was difficult to determine from the trial pits due to poor temporary stability), the borehole was sampled from the surface.

The recovery of the soils were initially attempted using windowless sampling techniques, whereby the soil would be collected within plastic lined sampling tubes, which were to be split to allow sampling and logging. However, due to the density of the soils, the windowless sampling refused.

Standard Penetration Tests (SPT) were carried out using a split spoon/solid cone in the borehole in accordance with BS EN ISO 22476-3 (2005) and BS5930 (2020) to assess the relative density of the superficial soils and to provide a correlated assessment of the likely undrained shear strength of fine-grained soils using relationships published by Stroud (1975). As required in BS5930:2020, the SPT N-values shown on the borehole records are the direct, uncorrected results obtained in the field. Depending on the nature of the test undertaken and the soils subjected to testing, field SPT N-values may require correction before using in design.

On refusal from windowless sampling, rotary open hole was used to progress the borehole to the target depth. Where openholing was undertaken, the ground conditions are based on the drillers description only.

On completion, a monitoring well was installed in the borehole, and was backfilled with pea gravel and a bentonite seal.

## 3.2 Instrumentation

### 3.2.1 Gas and Groundwater Well Installations

A 50mm diameter monitoring well was installed within BH201 (as specified by the designer).

The well, comprising slotted plastic pipe, with a gravel surround (the response zone), bentonite seals above the response zone, and a lockable vandal proof cover, was installed to a base depth of 5.3m, with a response zone between 1.0 and 5.3m.

### 3.2.2 Gas and Groundwater Monitoring

The installed well has been monitored on 3no. occasions between the 1<sup>st</sup> and 29<sup>th</sup> May 2025. The results are presented in Appendix D.

## 3.3 Sampling Strategy

### 3.3.1 Soil Sampling

Soil samples were collected from the exploratory holes as discussed in the previous sections.

Environmental samples (denoted as ES on the exploratory holes records) were collected for possible geo-environmental laboratory testing and generally comprised a plastic tub, an amber glass jar and an amber glass vial. The sample containers provided clean by the testing laboratory appropriate for the proposed testing to be scheduled. Immediately after collection the samples were placed in sealed cool boxes where they remained during storage and transport to the laboratory.

Samples for logging and geotechnical laboratory testing purposes were collected at regular intervals within the exploratory holes.

### 3.3.2 Geotechnical Laboratory Testing

Geotechnical laboratory testing was specified by Jubb and undertaken on samples from the suitable quality classes recovered from the exploratory holes in order to obtain information on the geotechnical properties on the soils beneath the site.

The following tests were undertaken by a UKAS accredited laboratory on samples selected by ESP.

- Natural moisture content.
- Atterberg limits.
- Particle size analysis (wet sieve).
- 2.5kg rammer compaction
- Vibrating hammer compaction.

The results are presented in Appendix E.

## 3.4 Geo-environmental Laboratory Testing

The laboratory testing suites were specified by Jubb.

The geo-environmental analyses were carried out by a UKAS accredited testing laboratory with detection limits being generally compatible with the relevant guideline values adopted in the assessment.

### 3.4.1 Soil Samples

The suits of soil geo-environmental laboratory testing undertaken comprised:

- Antimony
- Arsenic
- Asbestos Screen
- Boron
- Cadmium
- Chromium (Total)
- Copper
- Cyanide
- Fraction of Organic Carbon
- Lead
- Inorganic Mercury
- Nickel
- pH
- Phenols
- Polyaromatic Hydrocarbons (USEPA 16 speciated)
- Sulphate (Water soluble)
- Sulphate (Total)
- Selenium
- Total Petroleum Hydrocarbons (TPH CWG)
- Vanadium
- Zinc

The results are presented in Appendix F.

## 4 Summary of Conditions Encountered

### 4.1 Ground Conditions

The strata encountered in the exploratory holes are summarised below.

**Made Ground – Reworked Topsoil:** encountered in BH01 and TP201 and TP202 from ground level to between 0.2 and 0.25m as a dark brown clayey gravelly sand with rare coal and ceramic fragments.

**Made Ground:** encountered in TP203 from ground level to 0.6m (depth variable across the length of the pit) as black sandy gravel followed by a gravelly sandy clay both with low to medium cobble content and rare to low boulder content.

Anthropogenic material including rare wire, concrete and metal sheeting was noted.



Insert 2 - View of ground conditions and arisings from TP203. Note Made Ground in upper portion.

**Possible River Alluvium Deposits:** encountered in BH201, TP201 and TO202, from between 0.2 to 0.85m generally as a light brown soft to firm sandy silt/clay which became a silty sand with depth.



Insert 3 – View of windowless sample core recovery from GL to 1m in BH01.  
Note fine grained possible Alluvium beneath the Topsoil and above the coarse-grained River Terrace Deposits.

**River Terrace Deposits:** encountered in all positions, from between depths of 0.7 to 2.3m and generally consisting of dense to very dense brown sandy, slightly clayey to very clayey gravel with generally a medium to high cobble and boulder content. The fines and cobble and boulder content varied locally.



*Insert 4 - View of ground conditions and arisings from TP201*



*Insert 5 - View of ground conditions and arisings from TP202*

## 4.2 Groundwater

A groundwater strike was recorded by the driller during the construction of BH01 at 3.5m.

The water level was monitored at depths of between 4.9 and 5.18m bgl.

No groundwater was encountered to the base of the trial pits.

## 4.3 Evidence of Site Contamination Found During Site Works

No obvious evidence of contamination identified.

## 5 References

BRITISH STANDARDS INSTITUTION (BSI). 1990. Methods of Test for Soils for Civil Engineering Purposes. BS1377, Parts 1 to 9, HMSO, London.

BRITISH STANDARDS INSTITUTION (BSI). 2002. Geotechnical Investigation and Testing: Identification and Classification of Soil, Part 1. Identification and Description. BS EN ISO 14688-1. HMSO, London.

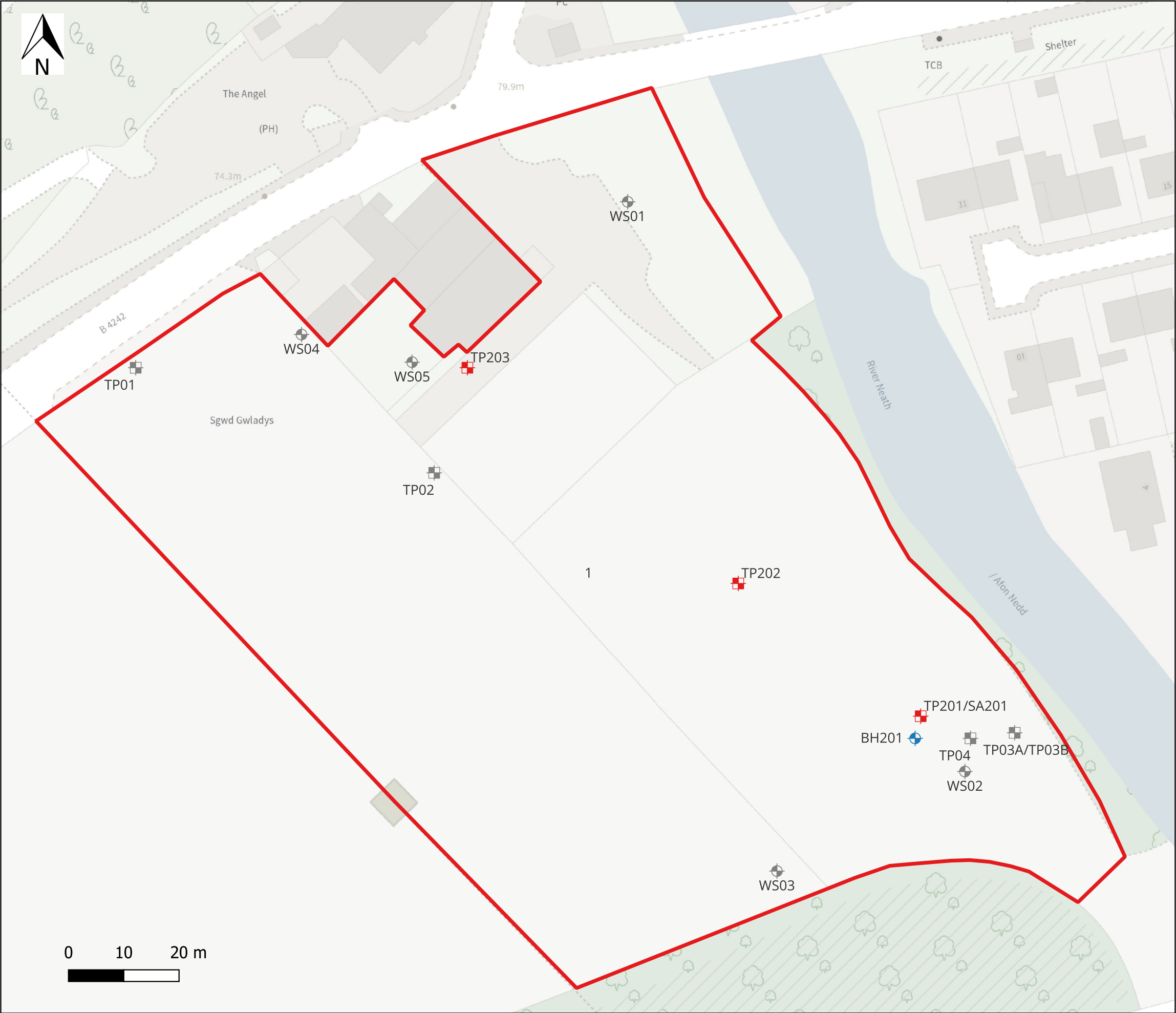
BRITISH STANDARDS INSTITUTION (BSI). 2018. Geotechnical Investigation and Testing: Identification and Classification of Soil, Part 2. Principles for Classification. BS EN ISO 14688-2:2018. HMSO, London.

BRITISH STANDARDS INSTITUTION (BSI). 2018. Geotechnical Investigation and Testing: Identification, Description and Classification of Rock. BS EN ISO 1468:2018. HMSO, London.

BRITISH STANDARDS INSTITUTION (BSI). 2005. Geotechnical Investigation and Testing – Field Testing, Part 3, Standard Penetration Test. BS EN ISO 22476-3:2005. HMSO, London.

BRITISH STANDARDS INSTITUTION (BSI). 2017. Investigation of Potentially Contaminated Sites – Code of Practice. BS10175, HMSO, London.

BRITISH STANDARDS INSTITUTION (BSI). 2015+A1:2020. Code of Practice for Ground Investigation. BS5930:2015+A1:2020. HMSO, London.



LEGEND:

- Site Boundary
- Rotary Boreholes (ESP, 2025)
- Trial Pits (ESP, 2025)

Phase One Investigation Points (ESP 2023)

- Trial Pits (ESP 2023)
- Windowless Sample Boreholes (ESP 2023)

NOTES:

1. Do not scale from drawing. This drawing should be read in conjunction with all other associated project information.

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|               |                           |                |
|---------------|---------------------------|----------------|
| PROJECT NAME: | Waterfalls Country Centre |                |
| REPORT REF:   | 8715.02                   |                |
| CLIENT:       | Andrew Scott Ltd          |                |
| FIGURE TITLE: | Investigation Point Plan  |                |
| FIGURE NO:    | 00                        | REV.: 00       |
| DATE:         | 01/05/2025                | SCALE: 1: 700  |
| DRAWN BY:     | TM                        | CHECKED BY: HD |

## Appendix A Trial Pit Records (2025)

| <div>Earth Science Partnership</div> <div>Consulting Engineers   Geologists   Environmental Scientists</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |        |      | <div>Excavation method/plant:</div> 8T Tracked Excavator.                                                             |                                                                                                                                                                                                                                                                                                                                                       | <div>Shoring/support:</div> None.                                     |     | <div>TP201</div> |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
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| <div>Project Name:</div> Waterfalls Country Park                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |      | <div>Excavation date:</div> 23/04/2025                                                                                |                                                                                                                                                                                                                                                                                                                                                       | <div>Groundwater observations:</div> No groundwater observed to base. |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Site Location:</div> Pontneddfechan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |        |      | <div>Backfill date:</div> 23/04/2025                                                                                  |                                                                                                                                                                                                                                                                                                                                                       |                                                                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Client:</div> Andrew Scott Ltd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |        |      | <div>Logged by:</div> HD                                                                                              |                                                                                                                                                                                                                                                                                                                                                       |                                                                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Project No:</div> 8715.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                       |                                                                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Survey details:</div> <div>Ground Level:</div> <div>Easting:</div> <div>Northing:</div> <div>Bearing:</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |      | <div>Plan details:</div> <div><div>0.30</div><div>Face B</div><div>Face A</div><div>Face C</div><div>1.50</div></div> |                                                                                                                                                                                                                                                                                                                                                       | <div>Face Stability:</div> Spalling throughout.                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <table><tr><th colspan="2">Depth</th><th colspan="2">Sample</th><th colspan="2">Test Details</th><th colspan="4">Strata Details</th></tr><tr><th>m</th><th>Type</th><th>Class</th><th>Type</th><th>Result</th><th>Description</th><th>Depth (thickness)</th><th>mOD</th><th colspan="2">Legend</th></tr><tr><td>0.15</td><td>ES</td><td></td><td></td><td></td><td>Grass followed by: dark brown clayey gravelly SAND. Rare coal and ceramic fragments. Rootlets. Re-worked soil. (MADE GROUND - RE-WORKED TOPSOIL).</td><td>(0.25)</td><td></td><td colspan="2"></td></tr><tr><td>0.40</td><td>D</td><td></td><td></td><td></td><td>Light brown slightly gravelly very sandy SILT becoming a silty gravelly fine to coarse SAND. Fines content is variable and the depth of the boundary with the underlying strata is also variable. Gravel is fine to coarse and subangular to rounded. Cobbles and boulders noted near the base. Rootlets in upper portion. (Probable RIVER ALLUVIUM).</td><td>0.25<br/>(0.45)</td><td></td><td colspan="2"></td></tr><tr><td>0.70</td><td>B<br/>D</td><td></td><td></td><td></td><td>Brown slightly sandy locally clayey fine to coarse rounded to subrounded GRAVEL with high rounded to subangular cobble and boulder (up to 0.5m) content. (Probable RIVER TERRACE DEPOSITS).</td><td>0.70<br/>(0.40)</td><td></td><td colspan="2"></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>End of Trialpit at 1.100m</td><td>1.10</td><td></td><td colspan="2"></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>2.0</td><td></td><td colspan="2"></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>3.0</td><td></td><td colspan="2"></td></tr></table> |        |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                       |                                                                       |     |                  |  | Depth |  | Sample |  | Test Details |  | Strata Details |  |  |  | m | Type | Class | Type | Result | Description | Depth (thickness) | mOD | Legend |  | 0.15 | ES |  |  |  | Grass followed by: dark brown clayey gravelly SAND. Rare coal and ceramic fragments. Rootlets. Re-worked soil. (MADE GROUND - RE-WORKED TOPSOIL). | (0.25) |  |  |  | 0.40 | D |  |  |  | Light brown slightly gravelly very sandy SILT becoming a silty gravelly fine to coarse SAND. Fines content is variable and the depth of the boundary with the underlying strata is also variable. Gravel is fine to coarse and subangular to rounded. Cobbles and boulders noted near the base. Rootlets in upper portion. (Probable RIVER ALLUVIUM). | 0.25<br>(0.45) |  |  |  | 0.70 | B<br>D |  |  |  | Brown slightly sandy locally clayey fine to coarse rounded to subrounded GRAVEL with high rounded to subangular cobble and boulder (up to 0.5m) content. (Probable RIVER TERRACE DEPOSITS). | 0.70<br>(0.40) |  |  |  |  |  |  |  |  | End of Trialpit at 1.100m | 1.10 |  |  |  |  |  |  |  |  |  | 2.0 |  |  |  |  |  |  |  |  |  | 3.0 |  |  |  |
| Depth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        | Sample |      | Test Details                                                                                                          |                                                                                                                                                                                                                                                                                                                                                       | Strata Details                                                        |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Type   | Class  | Type | Result                                                                                                                | Description                                                                                                                                                                                                                                                                                                                                           | Depth (thickness)                                                     | mOD | Legend           |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 0.15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ES     |        |      |                                                                                                                       | Grass followed by: dark brown clayey gravelly SAND. Rare coal and ceramic fragments. Rootlets. Re-worked soil. (MADE GROUND - RE-WORKED TOPSOIL).                                                                                                                                                                                                     | (0.25)                                                                |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 0.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | D      |        |      |                                                                                                                       | Light brown slightly gravelly very sandy SILT becoming a silty gravelly fine to coarse SAND. Fines content is variable and the depth of the boundary with the underlying strata is also variable. Gravel is fine to coarse and subangular to rounded. Cobbles and boulders noted near the base. Rootlets in upper portion. (Probable RIVER ALLUVIUM). | 0.25<br>(0.45)                                                        |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 0.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | B<br>D |        |      |                                                                                                                       | Brown slightly sandy locally clayey fine to coarse rounded to subrounded GRAVEL with high rounded to subangular cobble and boulder (up to 0.5m) content. (Probable RIVER TERRACE DEPOSITS).                                                                                                                                                           | 0.70<br>(0.40)                                                        |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |        |      |                                                                                                                       | End of Trialpit at 1.100m                                                                                                                                                                                                                                                                                                                             | 1.10                                                                  |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                       | 2.0                                                                   |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                       | 3.0                                                                   |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Weather and environmental conditions:</div> <div>1. Sunny and Dry</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                       |                                                                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Other comments:</div> <div>1. Grid reference and ground level surveyed by ESP following completion of works using GEODE GPS (+/- 0.3m AOD).</div> <div>2. Trial pit positioned as agreed with Client and landowner.</div> <div>3. Trial pit terminated at 1.1m as instructed by Jubb to undertake soakaway test (SA201).</div> <div>4. Trial pit backfilled with arisings on completion of soakaway test.</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                       |                                                                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                   |        |  |  |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |      |        |  |  |  |                                                                                                                                                                                             |                |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |     |  |  |  |

Excavation method/plant:

### 8T Tracked Excavator.

**Shoring/support:**

None.

TP202

**Project Name:** Waterfalls Country Park

**Site Location:** Pontneddfechan

**Client:** Andrew Scott Ltd.

**Project No:** 8715.02

**Excavation date:** 23/04/2025

23/04/2025

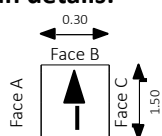
**Backfill date:** 23/04/2025

23/04/2025

Logged by: HD

HD

### Plan details:



**Face Stability:**

Spalling throughout.

**Groundwater observations:**

No groundwater observed to base.

### Survey details:

Ground Level:

Easting:

Northing:

Bearing:

[illegible]

## Weather and environmental conditions:

1. Sunny and Dry

## Other comments:

1. Grid reference and ground level surveyed by ESP following completion of works using GEODE GPS (+/- 0.3m AOD).
2. Trial pit positioned as agreed with Client and landowner.
3. Trial pit terminated at 1.1m as instructed by Jubb to undertake soakaway test (SA202).
4. Trial pit backfilled with arisings on completion of soakaway test.

| <div>Earth Science Partnership</div> <div>Consulting Engineers   Geologists   Environmental Scientists</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |        |      | <div>Excavation method/plant:</div> 8T Tracked Excavator.                                                             |                                                                                                                                                                                                                                                                                     | <div>Shoring/support:</div> None.                                     |     | <div>TP203</div> |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------|------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----|------------------|--|-------|--|--------|--|--------------|--|----------------|--|--|--|---|------|-------|------|--------|-------------|-------------------|-----|--------|--|------|----|--|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--|--|--|------|----|--|--|--|----------------------------------------------------------------------------------------------------------------------------------|-------------|--|------|---|--|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--|------|---|--|--|--|--|--------|--|------|---|--|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--|------|---|--|--|--|--|--------|--|--|--|------|---|--|--|--|--|-----|--|--|--|--|--|--|--|--|---------------------------|------|--|--|--|--|--|--|--|--|--|-----|--|--|--|
| <div>Project Name:</div> Waterfalls Country Park                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |        |      | <div>Excavation date:</div> 23/04/2025                                                                                |                                                                                                                                                                                                                                                                                     | <div>Groundwater observations:</div> No groundwater observed to base. |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Site Location:</div> Pontneddfechan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |        |      | <div>Backfill date:</div> 23/04/2025                                                                                  |                                                                                                                                                                                                                                                                                     |                                                                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Client:</div> Andrew Scott Ltd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |        |      | <div>Logged by:</div> HD                                                                                              |                                                                                                                                                                                                                                                                                     |                                                                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Project No:</div> 8715.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                     |                                                                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Survey details:</div> <div>Ground Level:</div> <div>Easting:</div> <div>Northing:</div> <div>Bearing:</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |        |      | <div>Plan details:</div> <div><div>0.30</div><div>Face B</div><div>Face A</div><div>Face C</div><div>1.50</div></div> |                                                                                                                                                                                                                                                                                     | <div>Face Stability:</div> Spalling throughout.                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <table><tr><th colspan="2">Depth</th><th colspan="2">Sample</th><th colspan="2">Test Details</th><th colspan="4">Strata Details</th></tr><tr><th>m</th><th>Type</th><th>Class</th><th>Type</th><th>Result</th><th>Description</th><th>Depth (thickness)</th><th>mOD</th><th colspan="2">Legend</th></tr><tr><td>0.10</td><td>ES</td><td></td><td></td><td></td><td>Black sandy fine to coarse angular GRAVEL with low to medium cobble and boulder content. Rare wire, concrete blocks and metal sheeting. Gravel mainly consists of aggregate. (MADE GROUND).</td><td>(0.50)</td><td></td><td colspan="2" rowspan="5"></td></tr><tr><td>0.50</td><td>ES</td><td></td><td></td><td></td><td>Firm dark brown gravelly sandy CLAY with low cobble content and rare boulders. Possibly re-worked soils. (Probable MADE GROUND).</td><td>0.50 (0.10)</td><td></td></tr><tr><td>0.80</td><td>D</td><td></td><td></td><td></td><td>Firm brown mottled orange sandy gravelly CLAY with low to medium cobble and boulder content. Clay content reducing near base. (PROBABLE RIVER TERRACE DEPOSITS)</td><td>0.60</td><td></td></tr><tr><td>0.85</td><td>B</td><td></td><td></td><td></td><td></td><td>(0.50)</td><td></td></tr><tr><td>1.20</td><td>D</td><td></td><td></td><td></td><td>Dense to very dense brown sandy slightly clayey to very clayey fine to coarse rounded to subrounded GRAVEL with a medium to high rounded to subrounded cobble and boulder content. Clay content is variable. Boulders up to 0.7m x 0.5m x 0.25m. (Probable RIVER TERRACE DEPOSITS).</td><td>1.10</td><td></td></tr><tr><td>1.50</td><td>B</td><td></td><td></td><td></td><td></td><td>(1.20)</td><td></td><td colspan="2"></td></tr><tr><td>2.00</td><td>D</td><td></td><td></td><td></td><td></td><td>2.0</td><td></td><td colspan="2"></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>End of Trialpit at 2.300m</td><td>2.30</td><td></td><td colspan="2"></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>3.0</td><td></td><td colspan="2"></td></tr></table> |      |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                     |                                                                       |     |                  |  | Depth |  | Sample |  | Test Details |  | Strata Details |  |  |  | m | Type | Class | Type | Result | Description | Depth (thickness) | mOD | Legend |  | 0.10 | ES |  |  |  | Black sandy fine to coarse angular GRAVEL with low to medium cobble and boulder content. Rare wire, concrete blocks and metal sheeting. Gravel mainly consists of aggregate. (MADE GROUND). | (0.50) |  |  |  | 0.50 | ES |  |  |  | Firm dark brown gravelly sandy CLAY with low cobble content and rare boulders. Possibly re-worked soils. (Probable MADE GROUND). | 0.50 (0.10) |  | 0.80 | D |  |  |  | Firm brown mottled orange sandy gravelly CLAY with low to medium cobble and boulder content. Clay content reducing near base. (PROBABLE RIVER TERRACE DEPOSITS) | 0.60 |  | 0.85 | B |  |  |  |  | (0.50) |  | 1.20 | D |  |  |  | Dense to very dense brown sandy slightly clayey to very clayey fine to coarse rounded to subrounded GRAVEL with a medium to high rounded to subrounded cobble and boulder content. Clay content is variable. Boulders up to 0.7m x 0.5m x 0.25m. (Probable RIVER TERRACE DEPOSITS). | 1.10 |  | 1.50 | B |  |  |  |  | (1.20) |  |  |  | 2.00 | D |  |  |  |  | 2.0 |  |  |  |  |  |  |  |  | End of Trialpit at 2.300m | 2.30 |  |  |  |  |  |  |  |  |  | 3.0 |  |  |  |
| Depth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | Sample |      | Test Details                                                                                                          |                                                                                                                                                                                                                                                                                     | Strata Details                                                        |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Type | Class  | Type | Result                                                                                                                | Description                                                                                                                                                                                                                                                                         | Depth (thickness)                                                     | mOD | Legend           |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 0.10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ES   |        |      |                                                                                                                       | Black sandy fine to coarse angular GRAVEL with low to medium cobble and boulder content. Rare wire, concrete blocks and metal sheeting. Gravel mainly consists of aggregate. (MADE GROUND).                                                                                         | (0.50)                                                                |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 0.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ES   |        |      |                                                                                                                       | Firm dark brown gravelly sandy CLAY with low cobble content and rare boulders. Possibly re-worked soils. (Probable MADE GROUND).                                                                                                                                                    | 0.50 (0.10)                                                           |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 0.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D    |        |      |                                                                                                                       | Firm brown mottled orange sandy gravelly CLAY with low to medium cobble and boulder content. Clay content reducing near base. (PROBABLE RIVER TERRACE DEPOSITS)                                                                                                                     | 0.60                                                                  |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 0.85                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | B    |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                     | (0.50)                                                                |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 1.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D    |        |      |                                                                                                                       | Dense to very dense brown sandy slightly clayey to very clayey fine to coarse rounded to subrounded GRAVEL with a medium to high rounded to subrounded cobble and boulder content. Clay content is variable. Boulders up to 0.7m x 0.5m x 0.25m. (Probable RIVER TERRACE DEPOSITS). | 1.10                                                                  |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 1.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | B    |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                     | (1.20)                                                                |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 2.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D    |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                     | 2.0                                                                   |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |        |      |                                                                                                                       | End of Trialpit at 2.300m                                                                                                                                                                                                                                                           | 2.30                                                                  |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                     | 3.0                                                                   |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Weather and environmental conditions:</div> <div>1. Sunny and Dry</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                     |                                                                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |
| <div>Other comments:</div> <div>1. Grid reference and ground level surveyed by ESP following completion of works using GEODE GPS (+/- 0.3m AOD).</div> <div>2. Trial pit positioned as agreed with Client and landowner.</div> <div>3. Trial pit terminated at 2.3m as agreed with Jubb due to very dense ground conditions.</div> <div>4. Trial pit backfilled with arisings on completion.</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |        |      |                                                                                                                       |                                                                                                                                                                                                                                                                                     |                                                                       |     |                  |  |       |  |        |  |              |  |                |  |  |  |   |      |       |      |        |             |                   |     |        |  |      |    |  |  |  |                                                                                                                                                                                             |        |  |  |  |      |    |  |  |  |                                                                                                                                  |             |  |      |   |  |  |  |                                                                                                                                                                 |      |  |      |   |  |  |  |  |        |  |      |   |  |  |  |                                                                                                                                                                                                                                                                                     |      |  |      |   |  |  |  |  |        |  |  |  |      |   |  |  |  |  |     |  |  |  |  |  |  |  |  |                           |      |  |  |  |  |  |  |  |  |  |     |  |  |  |

## Appendix B Rotary Drillhole Records (2025)

Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

Project Name:

Waterfalls Country Park

Site Location:

Pontneddfechan

Client:

Andrew Scott Ltd.

Project No:

8715.02

Drilling method

Rotary open hole

Equipment

PL-G

Ground Level:

Easting:

Northing:

Start date:

24/04/2025

Driller:

APEX

End date:

24/04/2025

Logged by:

HD

Backfill date:

24/04/2025

Date logged:

24/04/2025

BH01

| Core Details and SPT Data |         |         |         |    |               |                        | Strata Details |                                                                                                                                                                     |        | Water            | Depth             |     | Backfill/Installations |
|---------------------------|---------|---------|---------|----|---------------|------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------|-------------------|-----|------------------------|
| Depth (Length)            | TCR (%) | SCR (%) | RQD (%) | FI | Sample        | SPT-N                  | Depth          | Description                                                                                                                                                         | Legend | Strikes/Standing | Depth (Thickness) | mOD |                        |
|                           |         |         |         |    | 0.10/ES       |                        |                | Grass followed by: dark brown clayey gravelly SAND. Rare coal fragments.                                                                                            |        |                  | (0.25)            |     |                        |
|                           |         |         |         |    | 0.50/ES       |                        | 0.5            | Rootlets (MADE GROUND - RE-WORKED TOPSOIL).                                                                                                                         |        |                  | 0.25              |     |                        |
|                           |         |         |         |    | 0.70/D        |                        |                |                                                                                                                                                                     |        |                  | (0.60)            |     |                        |
|                           |         |         |         |    | 1.00/D        |                        | 1.0            | Firm light brown very sandy SILT becoming a silty fine to coarse SAND.                                                                                              |        |                  | 0.85              |     |                        |
|                           |         |         |         |    |               | 50 (6,11/50 for 230mm) | 1.5            | Rare fine to medium subrounded to rounded gravel clasts. Rootlets in upper portion. (Probable RIVER ALLUVIUM).                                                      |        |                  | (0.35)            |     |                        |
|                           |         |         |         |    |               |                        | 2.0            |                                                                                                                                                                     |        |                  | 1.20              |     |                        |
|                           |         |         |         |    |               |                        | 2.5            | Dense to very dense brown sandy locally clayey fine to coarse rounded to subrounded GRAVEL with a low to medium rounded to subrounded cobble and boulder content.   |        |                  | (2.30)            |     |                        |
|                           |         |         |         |    |               | 50 (5,10/50 for 226mm) | 3.0            | (Probable RIVER TERRACE DEPOSITS). Gravel and Boulders. Driller's description only. (PROBABLE RIVER TERRACE DEPOSITS)                                               |        |                  |                   |     |                        |
|                           |         |         |         |    |               |                        | 3.5            | Clay and Gravel. Driller's description only. (PROBABLE RIVER TERRACE DEPOSITS)                                                                                      |        | →                | 3.50              |     |                        |
|                           |         |         |         |    |               | 17 (2,2/3,5,4,5)       | 4.0            |                                                                                                                                                                     |        |                  | (0.70)            |     |                        |
|                           |         |         |         |    |               |                        | 4.5            | Medium dense to dense brown sandy locally clayey fine to coarse rounded to subrounded GRAVEL with a low to medium rounded to subrounded cobble and boulder content. |        |                  | 4.20              |     |                        |
| 4.20 - 5.30 (1.10)        | 65      |         |         |    | 4.20 - 5.30/B | 32 (3,4/6,10,7,9)      | 5.0            | Recovered soils were wet. (Probable RIVER TERRACE DEPOSITS).                                                                                                        |        |                  | (1.10)            |     |                        |
|                           |         |         |         |    |               |                        | 5.5            |                                                                                                                                                                     |        |                  | 5.30              |     |                        |
|                           |         |         |         |    |               |                        | 6.0            |                                                                                                                                                                     |        |                  |                   |     |                        |
|                           |         |         |         |    |               |                        | 6.5            |                                                                                                                                                                     |        |                  |                   |     |                        |
|                           |         |         |         |    |               |                        | 7.0            |                                                                                                                                                                     |        |                  |                   |     |                        |
|                           |         |         |         |    |               |                        | 7.5            |                                                                                                                                                                     |        |                  |                   |     |                        |
|                           |         |         |         |    |               |                        | 8.0            |                                                                                                                                                                     |        |                  |                   |     |                        |
|                           |         |         |         |    |               |                        | 8.5            |                                                                                                                                                                     |        |                  |                   |     |                        |
|                           |         |         |         |    |               |                        | 9.0            |                                                                                                                                                                     |        |                  |                   |     |                        |
|                           |         |         |         |    |               |                        | 9.5            |                                                                                                                                                                     |        |                  |                   |     |                        |
|                           |         |         |         |    |               |                        | 10.0           |                                                                                                                                                                     |        |                  |                   |     |                        |
|                           |         |         |         |    |               |                        | 10.5           |                                                                                                                                                                     |        |                  |                   |     |                        |

| Progress & Standing Water Levels |      |            |              |             | Water Strikes |       |              |              |                 |                |              | Hole Diameter |               | Casing Diameter |              |
|----------------------------------|------|------------|--------------|-------------|---------------|-------|--------------|--------------|-----------------|----------------|--------------|---------------|---------------|-----------------|--------------|
| Date                             | Time | Hole Depth | Casing Depth | Water Depth | Date          | Time  | Strike Depth | Casing Depth | Elapsed Minutes | Depth to Water | Depth Sealed | Hole Depth    | Hole Diameter | Casing Diameter | Casing Depth |
|                                  |      |            |              |             | 24/04/2025    | 12:00 | 3.50         |              | 0.00            | 0.00           |              |               |               |                 |              |

General Remarks

1. Grid reference and ground level surveyed by ESP following completion of works using GEODE GPS (+/- 0.3m AOD).

2. Borehole terminated at 5.3m depth as per specification.

3. Borehole installed with monitoring well (response zone 1.3m - 5.3m) as agreed with Jubb.

## Appendix C   Results of Soakaway Infiltration Testing

# SOAKAWAY INFILTRATION TEST RESULTS

BRE 365 method

|               |                                    |
|---------------|------------------------------------|
| Project Name: | PROPOSED WATERFALLS COUNTRY CENTRE |
|---------------|------------------------------------|

|              |         |                  |          |
|--------------|---------|------------------|----------|
| Project Ref: | 8715.02 | Date of Testing: | 23.04.25 |
|--------------|---------|------------------|----------|

|                |             |                        |                |
|----------------|-------------|------------------------|----------------|
| Test Location: | SA1 (TP201) | Soil Infiltration Rate | 1.92E-04 m/sec |
|----------------|-------------|------------------------|----------------|

|              |   |
|--------------|---|
| Fill Number: | 1 |
|--------------|---|

## Test results:

| Time (mins) | Water Level (m bgl) |
|-------------|---------------------|
| 0           | 0.18                |
| 1           | 0.25                |
| 2           | 0.33                |
| 3           | 0.40                |
| 4           | 0.45                |
| 5           | 0.50                |
| 7           | 0.57                |
| 8           | 0.65                |
| 11          | 0.70                |
| 13          | 0.76                |
| 15          | 0.80                |
| 17          | 0.86                |
| 18          | 0.89                |
|             |                     |
|             |                     |
|             |                     |
|             |                     |
|             |                     |
|             |                     |
|             |                     |
|             |                     |

## Pit Dimensions (m)

|        |      |
|--------|------|
| Length | 1.90 |
| Width  | 0.60 |
| Depth  | 1.00 |

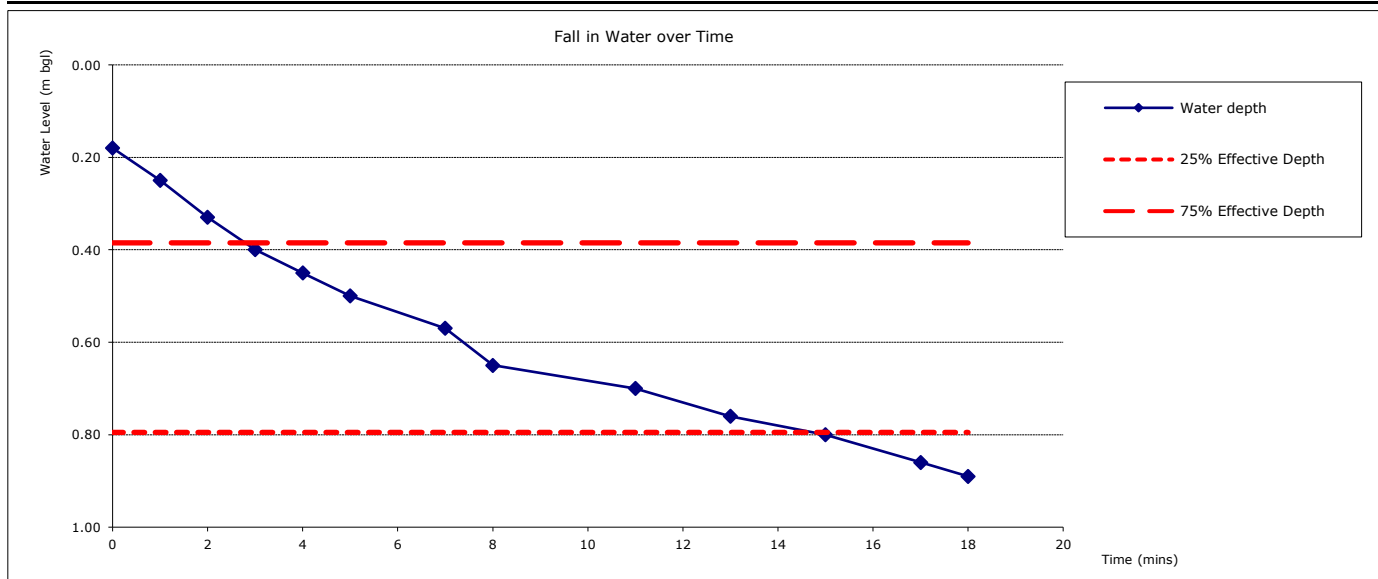
|                              |      |
|------------------------------|------|
| Assumed Invert Level (m bgl) | 0.18 |
|------------------------------|------|

## Ground Conditions:

|             |                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| GL - 0.25m  | Grass followed by: dark brown clayey gravelly SAND. Rare coal and ceramic fragments. Rootlets. Re-worked soil. (MADE GROUND - RE-WORKED TOPSOIL).  |
| 0.25 - 0.7m | Light brown slightly gravelly very sandy SILT becoming a silty gravelly fine to coarse SAND. (Probable RIVER ALLUVIUM).                            |
| 0.7 - 1.1m  | Brown sandy locally clayey fine to coarse rounded to subrounded GRAVEL with medium rounded to subangular cobble content. (PROBABLE RIVER ALLUVIUM) |

## Remarks:

1. Testing undertaken in general accordance with BRE Digest 365:2007
2. Trial pit was not filled with aggregate for test.
3. Stability of pit sides was poor, minor spalling during test
4. No groundwater encountered.



Soil Infiltration Rate (m/sec)

$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

|                |                                                                                                  |      |
|----------------|--------------------------------------------------------------------------------------------------|------|
| $V_{p75-25}$   | Effective depth storage volume of water in the trial pit between 75% and 25% effective depth     | 0.47 |
| $\alpha_{p50}$ | The internal surface area of the trial pit up to 50% effective depth and including the base area | 3.19 |
| $t_{p75-25}$   | The time for the water level to fall from 75% to 25% effective depth                             | 13   |

Soil Infiltration Rate (m/sec)

$$f = \frac{0.467}{2440.35}$$

$$f \text{ 1.92E-04}$$

# SOAKAWAY INFILTRATION TEST RESULTS

BRE 365 method

|                |                                    |                        |                |
|----------------|------------------------------------|------------------------|----------------|
| Project Name:  | PROPOSED WATERFALLS COUNTRY CENTRE |                        |                |
| Project Ref:   | 8715.02                            | Date of Testing:       | 23.04.25       |
| Test Location: | SA1 (TP201)                        | Soil Infiltration Rate | 1.34E-04 m/sec |
| Fill Number:   | 2                                  |                        |                |

## Test results:

| Time (mins) | Water Level (m bgl) |
|-------------|---------------------|
| 0           | 0.16                |
| 1           | 0.19                |
| 2           | 0.24                |
| 3           | 0.28                |
| 4           | 0.33                |
| 5           | 0.38                |
| 6           | 0.41                |
| 8           | 0.47                |
| 9           | 0.50                |
| 12          | 0.57                |
| 14          | 0.62                |
| 16          | 0.67                |
| 18          | 0.70                |
| 20          | 0.73                |
| 22          | 0.77                |
| 25          | 0.83                |
| 27          | 0.86                |
| 30          | 0.92                |
| 33          | 0.98                |

## Pit Dimensions (m)

|        |      |
|--------|------|
| Length | 1.90 |
| Width  | 0.60 |
| Depth  | 0.98 |

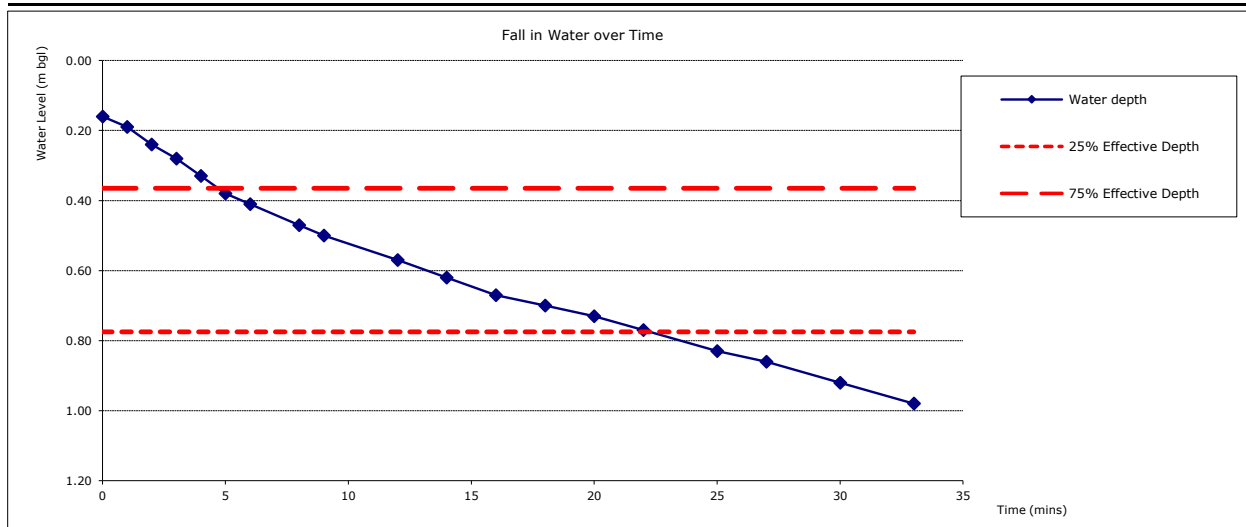
|                              |      |
|------------------------------|------|
| Assumed Invert Level (m bgl) | 0.16 |
|------------------------------|------|

## Ground Conditions:

|             |                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| GL - 0.25m  | Grass followed by: dark brown clayey gravelly SAND. Rare coal and ceramic fragments. Rootlets. Re-worked soil. (MADE GROUND - RE-WORKED TOPSOIL).  |
| 0.25 - 0.7m | Light brown slightly gravelly very sandy SILT becoming a silty gravelly fine to coarse SAND. (Probable RIVER ALLUVIUM).                            |
| 0.7 - 1.1m  | Brown sandy locally clayey fine to coarse rounded to subrounded GRAVEL with medium rounded to subangular cobble content. (PROBABLE RIVER ALLUVIUM) |

## Remarks:

1. Testing undertaken in general accordance with BRE Digest 365:2007
2. Trial pit was not filled with aggregate for test.
3. Stability of pit sides was poor, base raised to 0.98m.
4. No groundwater encountered.



Soil Infiltration Rate (m/sec)

$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

|                |                                                                                                  |      |
|----------------|--------------------------------------------------------------------------------------------------|------|
| $V_{p75-25}$   | Effective depth storage volume of water in the trial pit between 75% and 25% effective depth     | 0.47 |
| $\alpha_{p50}$ | The internal surface area of the trial pit up to 50% effective depth and including the base area | 3.19 |
| $t_{p75-25}$   | The time for the water level to fall from 75% to 25% effective depth                             | 18   |

Soil Infiltration Rate (m/sec)

$$f = \frac{0.467}{3493.05}$$

$$f = 1.34E-04$$

# SOAKAWAY INFILTRATION TEST RESULTS

BRE 365 method

|                |                                    |                        |                |
|----------------|------------------------------------|------------------------|----------------|
| Project Name:  | PROPOSED WATERFALLS COUNTRY CENTRE |                        |                |
| Project Ref:   | 8715.02                            | Date of Testing:       | 23.04.25       |
| Test Location: | SA1 (TP201)                        | Soil Infiltration Rate | 1.11E-04 m/sec |
| Fill Number:   | 3                                  |                        |                |

## Test results:

| Time (mins) | Water Level (m bgl) |
|-------------|---------------------|
| 0           | 0.14                |
| 1           | 0.16                |
| 2           | 0.21                |
| 3           | 0.25                |
| 4           | 0.29                |
| 5           | 0.33                |
| 6           | 0.37                |
| 7           | 0.40                |
| 8           | 0.43                |
| 9           | 0.45                |
| 10          | 0.47                |
| 12          | 0.52                |
| 14          | 0.57                |
| 16          | 0.61                |
| 18          | 0.65                |
| 20          | 0.68                |
| 25          | 0.74                |
| 30          | 0.81                |
| 35          | 0.87                |
| 40          | 0.98                |

## Pit Dimensions (m)

|        |      |
|--------|------|
| Length | 1.90 |
| Width  | 0.60 |
| Depth  | 0.98 |

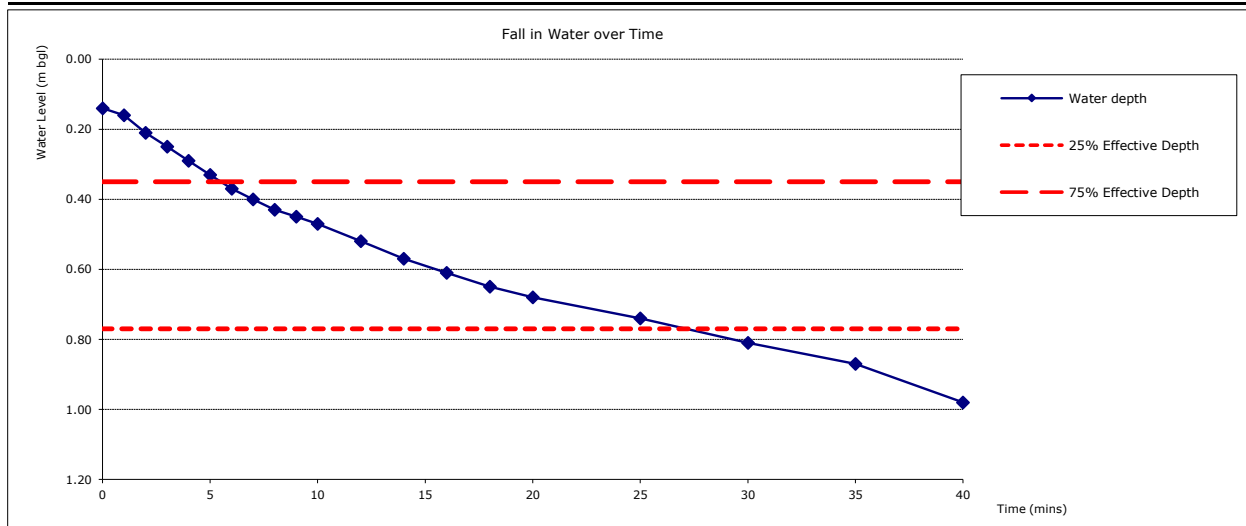
|                              |      |
|------------------------------|------|
| Assumed Invert Level (m bgl) | 0.14 |
|------------------------------|------|

## Ground Conditions:

|             |                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| GL - 0.25m  | Grass followed by: dark brown clayey gravelly SAND. Rare coal and ceramic fragments. Rootlets. Re-worked soil. (MADE GROUND - RE-WORKED TOPSOIL).  |
| 0.25 - 0.7m | Light brown slightly gravelly very sandy SILT becoming a silty gravelly fine to coarse SAND. (Probable RIVER ALLUVIUM).                            |
| 0.7 - 1.1m  | Brown sandy locally clayey fine to coarse rounded to subrounded GRAVEL with medium rounded to subangular cobble content. (PROBABLE RIVER ALLUVIUM) |

## Remarks:

1. Testing undertaken in general accordance with BRE Digest 365:2007
2. Trial pit was not filled with aggregate for test.
3. Stability of pit sides was poor, base raised to 0.98m.
4. No groundwater encountered.



Soil Infiltration Rate (m/sec)

$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

|                |                                                                                                  |      |
|----------------|--------------------------------------------------------------------------------------------------|------|
| $V_{p75-25}$   | Effective depth storage volume of water in the trial pit between 75% and 25% effective depth     | 0.48 |
| $\alpha_{p50}$ | The internal surface area of the trial pit up to 50% effective depth and including the base area | 3.24 |
| $t_{p75-25}$   | The time for the water level to fall from 75% to 25% effective depth                             | 22   |

Soil Infiltration Rate (m/sec)

$$f = \frac{0.479}{4304.571429}$$

$$f = 1.11E-04$$

# SOAKAWAY INFILTRATION TEST RESULTS

BRE 365 method



|               |                                    |
|---------------|------------------------------------|
| Project Name: | PROPOSED WATERFALLS COUNTRY CENTRE |
|---------------|------------------------------------|

|              |         |                  |          |
|--------------|---------|------------------|----------|
| Project Ref: | 8715.02 | Date of Testing: | 23.04.25 |
|--------------|---------|------------------|----------|

|                |             |                        |                |
|----------------|-------------|------------------------|----------------|
| Test Location: | SA2 (TP202) | Soil Infiltration Rate | 8.97E-05 m/sec |
| Fill Number:   | 1           |                        |                |

## Test results:

| Time (mins) | Water Level (m bgl) |
|-------------|---------------------|
| 0           | 0.10                |
| 1           | 0.15                |
| 2           | 0.19                |
| 3           | 0.23                |
| 4           | 0.27                |
| 5           | 0.32                |
| 10          | 0.47                |
| 12          | 0.53                |
| 15          | 0.59                |
| 17          | 0.64                |
| 20          | 0.69                |
| 23          | 0.67                |
| 25          | 0.69                |
| 30          | 0.76                |
| 33          | 0.81                |
| 36          | 0.85                |
|             |                     |
|             |                     |
|             |                     |
|             |                     |

## Pit Dimensions (m)

|        |      |
|--------|------|
| Length | 2.10 |
| Width  | 0.50 |
| Depth  | 1.00 |

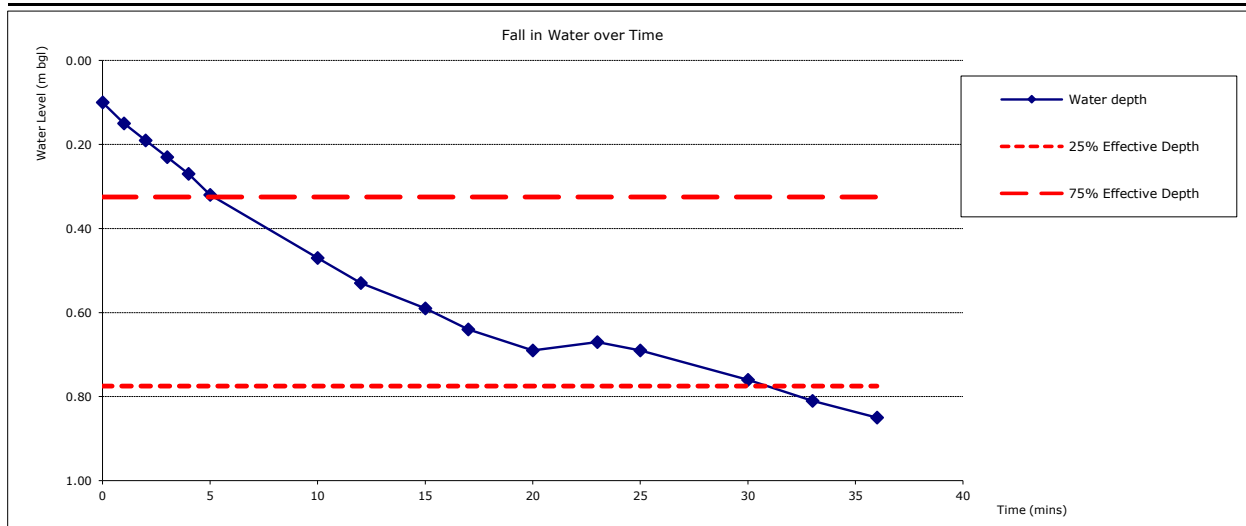
|                              |      |
|------------------------------|------|
| Assumed Invert Level (m bgl) | 0.10 |
|------------------------------|------|

## Ground Conditions:

|            |                                                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GL - 0.2m  | Grass followed by: dark brown clayey gravelly SAND. Rare coal fragments. Rootlets (MADE GROUND - RE-WORKED TOPSOIL).                                                |
| 0.2 - 0.7m | Firm light brown very sandy SILT becoming a silty fine to coarse SAND. Rare fine to medium subrounded to rounded gravel clasts. (Probable RIVER ALLUVIUM).          |
| 0.7 - 1.1m | Dense to very dense brown sandy very clayey fine to coarse rounded to subrounded GRAVEL with a mediumcobble and boulder content. (Probable RIVER TERRACE DEPOSITS). |

## Remarks:

1. Testing undertaken in general accordance with BRE Digest 365:2007
2. Trial pit was not filled with aggregate for test.
3. Stability of pit sides was poor, spalling and sidewall collapse occurred at around 20mins.
4. No groundwater encountered.



## Soil Infiltration Rate (m/sec)

$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

|                |                                                                                                  |      |
|----------------|--------------------------------------------------------------------------------------------------|------|
| $V_{p75-25}$   | Effective depth storage volume of water in the trial pit between 75% and 25% effective depth     | 0.47 |
| $\alpha_{p50}$ | The internal surface area of the trial pit up to 50% effective depth and including the base area | 3.39 |
| $t_{p75-25}$   | The time for the water level to fall from 75% to 25% effective depth                             | 26   |

## Soil Infiltration Rate (m/sec)

$$f = \frac{0.473}{5268.06}$$

$$f = 8.97E-05$$

# SOAKAWAY INFILTRATION TEST RESULTS

BRE 365 method

|                |                                    |                        |                   |
|----------------|------------------------------------|------------------------|-------------------|
| Project Name:  | PROPOSED WATERFALLS COUNTRY CENTRE |                        |                   |
| Project Ref:   | 8715.02                            | Date of Testing:       | 23.04.25          |
| Test Location: | SA2 (TP202)                        | Soil Infiltration Rate | test failed m/sec |
| Fill Number:   | 2                                  |                        |                   |

## Test results:

| Time (mins) | Water Level (m bgl) |
|-------------|---------------------|
| 0           | 0.08                |
| 1           | 0.10                |
| 2           | 0.11                |
| 3           | 0.12                |
| 4           | 0.13                |
| 5           | 0.14                |
| 7           | 0.16                |
| 9           | 0.18                |
| 12          | 0.21                |
| 17          | 0.25                |
| 24          | 0.30                |
| 33          | 0.35                |
| 40          | 0.39                |
| 58          | 0.48                |
|             |                     |
|             |                     |
|             |                     |
|             |                     |
|             |                     |
|             |                     |
|             |                     |

## Pit Dimensions (m)

|        |      |
|--------|------|
| Length | 2.10 |
| Width  | 0.50 |
| Depth  | 1.00 |

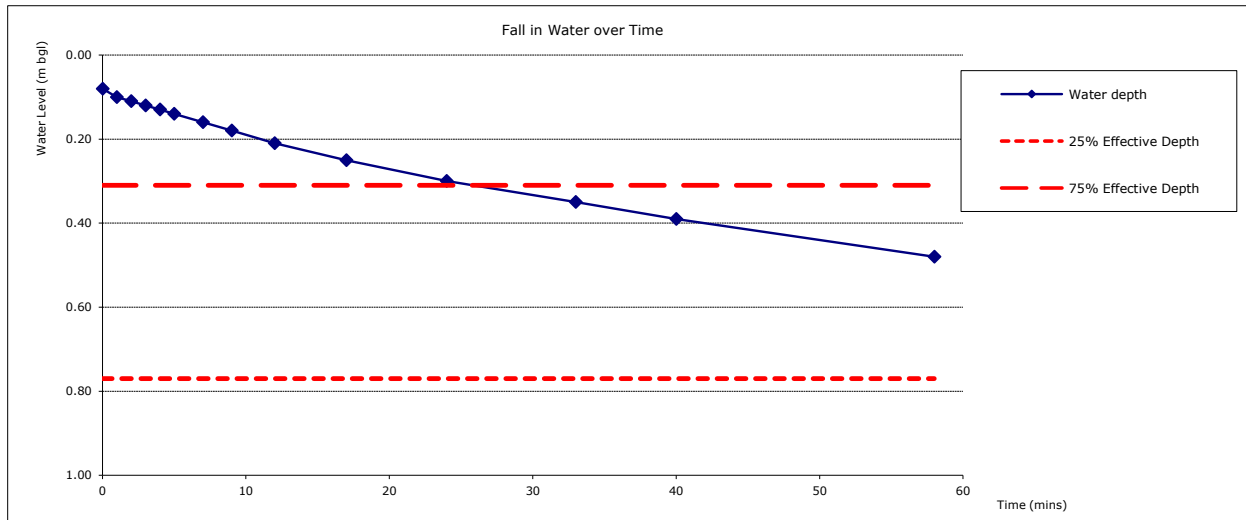
|                              |      |
|------------------------------|------|
| Assumed Invert Level (m bgl) | 0.08 |
|------------------------------|------|

## Ground Conditions:

|            |                                                                                                                                                                      |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GL - 0.2m  | Grass followed by: dark brown clayey gravelly SAND. Rare coal fragments. Rootlets (MADE GROUND - RE-WORKED TOPSOIL).                                                 |
| 0.2 - 0.7m | Firm light brown very sandy SILT becoming a silty fine to coarse SAND. Rare fine to medium subrounded to rounded gravel clasts. (Probable RIVER ALLUVIUM).           |
| 0.7 - 1.1m | Dense to very dense brown sandy very clayey fine to coarse rounded to subrounded GRAVEL with a medium cobble and boulder content. (Probable RIVER TERRACE DEPOSITS). |

## Remarks:

1. Testing undertaken in general accordance with BRE Digest 365:2007
2. Trial pit was not filled with aggregate for test.
3. Pit side stability was poor, spalling and side wall collapse occurred during first fill. The pit was re-excavated.
4. No groundwater encountered.
5. Test failed to empty 75% of its original fill depth after around 1hr. Instructed by investigation designer to re-fill the pit. Projected rate provided on next page.



## Soil Infiltration Rate (m/sec)

$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

|                |                                                                                                  |       |
|----------------|--------------------------------------------------------------------------------------------------|-------|
| $V_{p75-25}$   | Effective depth storage volume of water in the trial pit between 75% and 25% effective depth     | 0.48  |
| $\alpha_{p50}$ | The internal surface area of the trial pit up to 50% effective depth and including the base area | 3.442 |
| $t_{p75-25}$   | The time for the water level to fall from 75% to 25% effective depth                             | n/a   |

## Soil Infiltration Rate (m/sec)

$$f = \frac{0.483}{\text{no value}}$$

$f$  test failed

# SOAKAWAY INFILTRATION TEST RESULTS

BRE 365 method



|                |                                    |                                  |                |
|----------------|------------------------------------|----------------------------------|----------------|
| Project Name:  | PROPOSED WATERFALLS COUNTRY CENTRE |                                  |                |
| Project Ref:   | 8715.02                            | Date of Testing:                 | 23.04.25       |
| Test Location: | SA2 (TP202)                        | Projected Soil Infiltration Rate | 1.94E-05 m/sec |
| Fill Number:   | 2 - PROJ                           |                                  |                |

## Test results:

| Time (mins) | Water Level (m bgl) |
|-------------|---------------------|
| 0           | 0.08                |
| 1           | 0.10                |
| 2           | 0.11                |
| 3           | 0.12                |
| 4           | 0.13                |
| 5           | 0.14                |
| 7           | 0.16                |
| 9           | 0.18                |
| 12          | 0.21                |
| 17          | 0.25                |
| 24          | 0.30                |
| 33          | 0.35                |
| 40          | 0.39                |
| 58          | 0.48                |
| 120         | 0.70                |
| 190         | 0.90                |
|             |                     |
|             |                     |
|             |                     |
|             |                     |

## Pit Dimensions (m)

|        |      |
|--------|------|
| Length | 2.10 |
| Width  | 0.50 |
| Depth  | 1.00 |

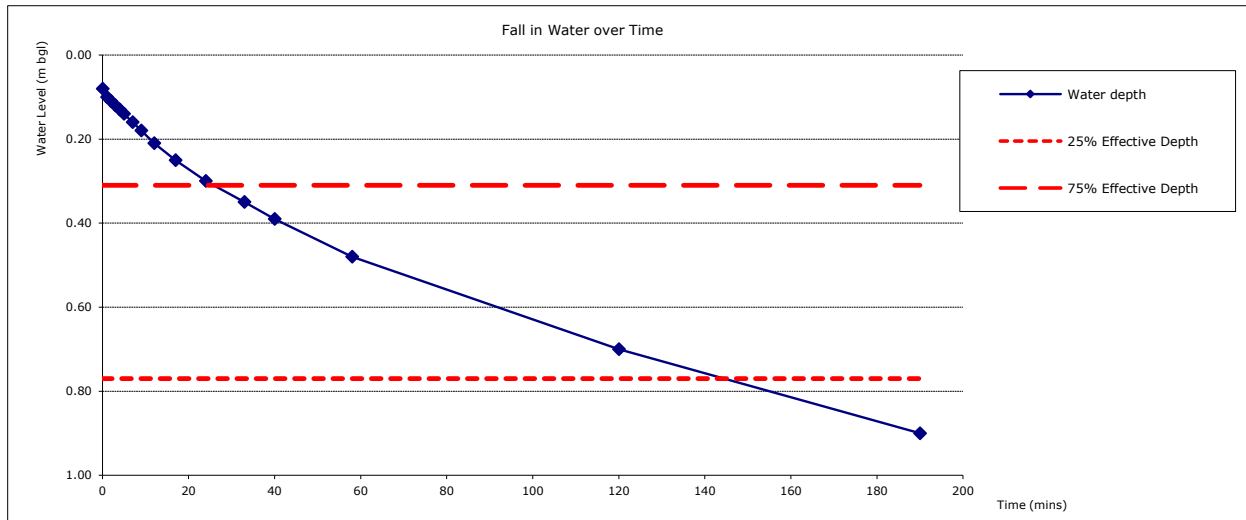
|                              |      |
|------------------------------|------|
| Assumed Invert Level (m bgl) | 0.08 |
|------------------------------|------|

## Ground Conditions:

|            |                                                                                                                                                                      |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GL - 0.2m  | Grass followed by: dark brown clayey gravelly SAND. Rare coal fragments. Rootlets (MADE GROUND - RE-WORKED TOPSOIL).                                                 |
| 0.2 - 0.7m | Firm light brown very sandy SILT becoming a silty fine to coarse SAND. Rare fine to medium subrounded to rounded gravel clasts. (Probable RIVER ALLUVIUM).           |
| 0.7 - 1.1m | Dense to very dense brown sandy very clayey fine to coarse rounded to subrounded GRAVEL with a medium cobble and boulder content. (Probable RIVER TERRACE DEPOSITS). |

## Remarks:

1. Testing undertaken in general accordance with BRE Digest 365:2007
2. Trial pit was not filled with aggregate for test.
3. Pit side stability was poor, spalling and side wall collapse occurred during first fill. The pit was re-excavated.
4. No groundwater encountered.
5. The infiltration rate has been projected based on the data recorded after a test duration of 1hr. The projected infiltration rate should be used with caution.



## Soil Infiltration Rate (m/sec)

$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

|                |                                                                                                  |       |
|----------------|--------------------------------------------------------------------------------------------------|-------|
| $V_{p75-25}$   | Effective depth storage volume of water in the trial pit between 75% and 25% effective depth     | 0.48  |
| $\alpha_{p50}$ | The internal surface area of the trial pit up to 50% effective depth and including the base area | 3.442 |
| $t_{p75-25}$   | The time for the water level to fall from 75% to 25% effective depth                             | 121   |

## Projected Soil Infiltration Rate (m/sec)

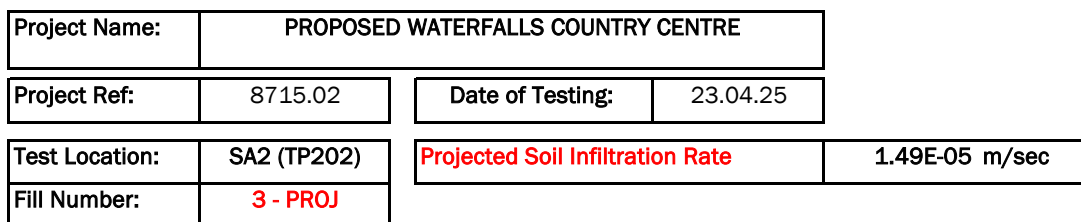
$$f = \frac{0.483}{24885.66}$$

$$f = 1.94E-05$$

## BRE 365 method



### BRE 365 method



### Pit Dimensions (m)

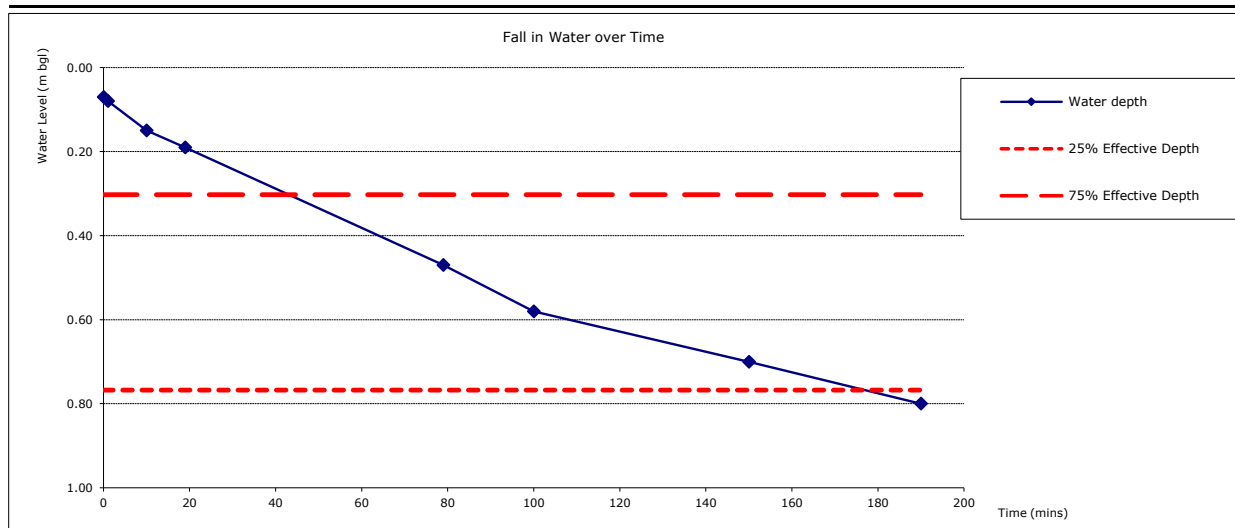
[illegible]

|        |      |
|--------|------|
| Length | 2.10 |
| Width  | 0.50 |
| Depth  | 1.00 |

|                              |      |
|------------------------------|------|
| Assumed Invert Level (m bgl) | 0.07 |
|------------------------------|------|

| Ground Conditions: |                                                                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GL - 0.2m          | Grass followed by: dark brown clayey gravelly SAND. Rare coal fragments. Rootlets (MADE GROUND - RE-WORKED TOPSOIL).                                                 |
| 0.2 - 0.7m         | Firm light brown very sandy SILT becoming a silty fine to coarse SAND. Rare fine to medium subrounded to rounded gravel clasts. (Probable RIVER ALLUVIUM).           |
| 0.7 - 1.1m         | Dense to very dense brown sandy very clayey fine to coarse rounded to subrounded GRAVEL with a medium cobble and boulder content. (Probable RIVER TERRACE DEPOSITS). |

1. Testing undertaken in general accordance with BRE Digest 365:2007
2. Trial pit was not filled with aggregate for test.
3. Stability of pit sides was poor, spalling and side wall collapse.
4. No groundwater encountered.
5. The infiltration rate has been projected based on the data recorded after a test duration of 1hr. The projected infiltration rate should be used with caution.



$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

|                |                                                                                                  |      |
|----------------|--------------------------------------------------------------------------------------------------|------|
| $V_{p75-25}$   | Effective depth storage volume of water in the trial pit between 75% and 25% effective depth     | 0.46 |
| $\alpha_{p50}$ | The internal surface area of the trial pit up to 50% effective depth and including the base area | 3.46 |
| $t_{p75-25}$   | The time for the water level to fall from 75% to 25% effective depth                             | 15   |

$$\frac{f}{0.488} = 32876.64$$

$f$  1.49E-05

## Appendix D   Results of Spot Gas and Groundwater Monitoring

**PROPOSED LEISURE AND COMMERCIAL DEVELOPMENT  
WATERFALLS COUNTRY CENTRE, PONTNEDDFECHAN**  
**Results of Hazardous Gas and Groundwater Monitoring  
(Spot Monitoring)**  
Project Ref. 8715.02



**Monitoring Event 1**

|             |                             |                               |            |        |        |
|-------------|-----------------------------|-------------------------------|------------|--------|--------|
| Date:       | 01/05/2025                  | Atmospheric Pressure (start): | 1,011 mb   | Trend: | steady |
| Time:       | 08:30                       | Atmospheric Pressure (end):   | 1,011 mb   |        |        |
| Engineer:   | TM                          | Site Status:                  | Open field |        |        |
| Weather:    | Dry, Mild                   | Ground Conditions:            | Damp       |        |        |
| Instrument: | Gas Data LMSxi G3,18e meter | Next Calibration Due Date:    | 16/8/2025  |        |        |
| Instrument: | Phocheck 2000+ PID          | Next Calibration Due Date:    | 09/11/2025 |        |        |

|                                                                           |       |                 |         |                    |                     |                        |                        |                        |           |
|---------------------------------------------------------------------------|-------|-----------------|---------|--------------------|---------------------|------------------------|------------------------|------------------------|-----------|
| Well ID:                                                                  | BH201 | Well dia.(mm):  | 50      | Date installed:    | 24/04/2025          | Response stratum:      | River terrace deposits |                        |           |
|                                                                           |       | Well depth (m): | 5.30    |                    |                     | Groundwater depth (m): | 5.18                   |                        |           |
| Monitored Variables                                                       |       | dP (Pa)         | LEL (%) | N <sub>2</sub> (%) | CO <sub>2</sub> (%) | CH <sub>4</sub> (%)    | O <sub>2</sub> (%)     | H <sub>2</sub> S (ppm) | PID (ppm) |
| Immediate Reading                                                         |       | 0.0             | 0.0     | 78.0               | 0.0                 | 0.0                    | 22.0                   | 0.0                    | 0.4       |
| After 30 Seconds                                                          |       | 0.0             | 0.0     | 76.5               | 4.0                 | 0.0                    | 19.5                   | 0.0                    | 0.1       |
| After 1 Minute                                                            |       | 0.0             | 0.0     | 76.6               | 4.1                 | 0.0                    | 19.3                   | 0.0                    | 0.0       |
| After 2 Minutes                                                           |       | 0.0             | 0.0     | 76.7               | 4.1                 | 0.0                    | 19.2                   | 0.0                    | 0.0       |
| Steady State                                                              |       | 0.0             | 0.0     | 76.7               | 4.1                 | 0.0                    | 19.2                   | 0.0                    | 0.0       |
| min                                                                       |       | 0.0             | 0.0     | 76.5               | 0.0                 | 0.0                    | 19.2                   | 0.0                    | 0.0       |
| max                                                                       |       | 0.0             | 0.0     | 78.0               | 4.1                 | 0.0                    | 22.0                   | 0.0                    | 0.4       |
| Borehole Hazardous Gas Flow Rates Q <sub>h0</sub> (max gas conc)          |       |                 |         |                    | Methane:            | 0 L/hr                 | Carbon Dioxide         | 0.00 L/hr              |           |
| Borehole Hazardous Gas Flow Rates Q <sub>h0</sub> (steady state gas conc) |       |                 |         |                    | Methane:            | 0.00 L/hr              | Carbon Dioxide         | 0 L/hr                 |           |
| Comments:                                                                 |       |                 |         |                    |                     |                        |                        |                        |           |

**Key:**

dP - differential pressure (well-atmosphere)

LEL - Lower Explosive Limit (methane)

N<sub>2</sub> - nitrogen

CO<sub>2</sub> - carbon dioxide

CH<sub>4</sub> - methane

O<sub>2</sub> - oxygen

H<sub>2</sub>S - Hydrogen sulphide

PID - measure of volatile organic compounds

**PROPOSED LEISURE AND COMMERCIAL DEVELOPMENT  
WATERFALLS COUNTRY CENTRE, PONTNEDDFECHAN**  
**Results of Hazardous Gas and Groundwater Monitoring**  
**(Spot Monitoring)**  
Project Ref. 8715.02



**Monitoring Event 2**

|             |                             |                               |            |        |        |
|-------------|-----------------------------|-------------------------------|------------|--------|--------|
| Date:       | 13/05/2025                  | Atmospheric Pressure (start): | 1.008 mb   | Trend: | Steady |
| Time:       | 11:30                       | Atmospheric Pressure (end):   | 1.008 mb   |        |        |
| Engineer:   | JA                          | Site Status:                  | Open field |        |        |
| Weather:    | Dry, warm                   | Ground Conditions:            | Dry        |        |        |
| Instrument: | Gas Data LMSxi G3,18e meter | Next Calibration Due Date:    | 16/8/2025  |        |        |
| Instrument: | Phocheck 2000+ PID          | Next Calibration Due Date:    | 09/11/2025 |        |        |

|                                                                           |       |                 |         |                    |                     |                        |                        |                        |           |
|---------------------------------------------------------------------------|-------|-----------------|---------|--------------------|---------------------|------------------------|------------------------|------------------------|-----------|
| Well ID:                                                                  | BH201 | Well dia.(mm):  | 50      | Date installed:    | 24/04/2025          | Response stratum:      | River terrace deposits |                        |           |
|                                                                           |       | Well depth (m): | 5.25    |                    |                     | Groundwater depth (m): | 5.1                    |                        |           |
| Monitored Variables                                                       |       | dP (Pa)         | LEL (%) | N <sub>2</sub> (%) | CO <sub>2</sub> (%) | CH <sub>4</sub> (%)    | O <sub>2</sub> (%)     | H <sub>2</sub> S (ppm) | PID (ppm) |
| Immediate Reading                                                         |       | 0.0             | 0.0     | 75.0               | 0.0                 | 0.0                    | 25.0                   | 0.0                    | 0.2       |
| After 30 Seconds                                                          |       | 0.0             | 0.0     | 76.0               | 4.9                 | 0.0                    | 19.1                   | 0.0                    | 1.2       |
| After 1 Minute                                                            |       | 0.0             | 0.0     | 76.0               | 5.0                 | 0.0                    | 19.0                   | 0.0                    | 1.2       |
| After 2 Minutes                                                           |       | 0.0             | 0.0     | 75.9               | 5.1                 | 0.0                    | 19.0                   | 0.0                    | 0.8       |
| After 3 Minutes                                                           |       | 0.0             | 0.0     | 75.9               | 5.1                 | 0.0                    | 19.0                   | 0.0                    | 0.8       |
| After 4 Minutes                                                           |       | 0.0             | 0.0     | 75.8               | 5.2                 | 0.0                    | 19.0                   | 0.0                    | 0.7       |
| After 5 minutes                                                           |       | 0.0             | 0.0     | 75.8               | 5.2                 | 0.0                    | 19.0                   | 0.0                    | 0.7       |
| Steady State                                                              |       | 0.0             | 0.0     | 75.8               | 5.2                 | 0.0                    | 19.0                   | 0.0                    | 0.7       |
| min                                                                       |       | 0.0             | 0.0     | 75.0               | 0.0                 | 0.0                    | 19.0                   | 0.0                    | 0.2       |
| max                                                                       |       | 0.0             | 0.0     | 76.0               | 5.2                 | 0.0                    | 25.0                   | 0.0                    | 1.2       |
| Borehole Hazardous Gas Flow Rates Q <sub>hg</sub> (max gas conc)          |       |                 |         |                    | Methane:            | 0 L/hr                 | Carbon Dioxide         | 0.00 L/hr              |           |
| Borehole Hazardous Gas Flow Rates Q <sub>hg</sub> (steady state gas conc) |       |                 |         |                    | Methane:            | 0.00 L/hr              | Carbon Dioxide         | 0 L/hr                 |           |
| Comments:                                                                 |       |                 |         |                    |                     |                        |                        |                        |           |

**Key:**  
dP - differential pressure (well-atmosphere)  
LEL - Lower Explosive Limit (methane)  
N<sub>2</sub> - nitrogen  
CO<sub>2</sub> - carbon dioxide  
CH<sub>4</sub> - methane  
O<sub>2</sub> - oxygen  
H<sub>2</sub>S - Hydrogen sulphide  
PID - measure of volatile organic compounds

**PROPOSED LEISURE AND COMMERCIAL DEVELOPMENT  
WATERFALLS COUNTRY CENTRE, PONTNEDDFECHAN**  
**Results of Hazardous Gas and Groundwater Monitoring**  
**(Spot Monitoring)**  
Project Ref. 8715.02



**Monitoring Event 3**

|             |                             |                               |            |        |        |
|-------------|-----------------------------|-------------------------------|------------|--------|--------|
| Date:       | 29.05.2025                  | Atmospheric Pressure (start): | 1.010 mb   | Trend: | Steady |
| Time:       | 14:30                       | Atmospheric Pressure (end):   | 1.010 mb   |        |        |
| Engineer:   | JA                          | Site Status:                  | Open field |        |        |
| Weather:    | Light rain, overcast        | Ground Conditions:            | Damp       |        |        |
| Instrument: | Gas Data LMSxi G3,18e meter | Next Calibration Due Date:    | 16/8/2025  |        |        |
| Instrument: | Phocheck 2000+ PID          | Next Calibration Due Date:    | 09/11/2025 |        |        |

|                                                                           |       |                 |         |                    |                     |                        |                    |                        |             |           |
|---------------------------------------------------------------------------|-------|-----------------|---------|--------------------|---------------------|------------------------|--------------------|------------------------|-------------|-----------|
| Well ID:                                                                  | BH201 | Well dia.(mm):  | 50      | Date installed:    | 24/04/2025          | Response stratum:      |                    | River terrace deposits |             |           |
|                                                                           |       | Well depth (m): | 5.27    |                    |                     | Groundwater depth (m): |                    | 4.9                    |             |           |
| Monitored Variables                                                       |       | dP (Pa)         | LEL (%) | N <sub>2</sub> (%) | CO <sub>2</sub> (%) | CH <sub>4</sub> (%)    | O <sub>2</sub> (%) | H <sub>2</sub> S (ppm) | Flow (L/hr) | PID (ppm) |
| Immediate Reading                                                         |       | 0.0             | 0.0     | 79.2               | 0.0                 | 0.0                    | 20.8               | 0.0                    | 0.0         | 0.2       |
| After 30 Seconds                                                          |       | 0.0             | 0.0     | 77.9               | 3.0                 | 0.0                    | 19.1               | 0.0                    | 0.0         | 0.4       |
| After 1 Minute                                                            |       | 0.0             | 0.0     | 77.9               | 3.1                 | 0.0                    | 19.0               | 0.0                    | 0.0         | 0.4       |
| After 2 Minutes                                                           |       | 0.0             | 0.0     | 77.7               | 3.3                 | 0.0                    | 19.0               | 0.0                    | 0.0         | 0.4       |
| After 3 Minutes                                                           |       | 0.0             | 0.0     | 77.7               | 3.3                 | 0.0                    | 19.0               | 0.0                    | 0.0         | 0.4       |
| Steady State                                                              |       | 0.0             | 0.0     | 77.7               | 3.3                 | 0.0                    | 19.0               | 0.0                    | 0.0         | 0.4       |
| min                                                                       |       | 0.0             | 0.0     | 77.7               | 0.0                 | 0.0                    | 19.0               | 0.0                    | 0.0         | 0.2       |
| max                                                                       |       | 0.0             | 0.0     | 79.2               | 3.3                 | 0.0                    | 20.8               | 0.0                    | 0.0         | 0.4       |
| Borehole Hazardous Gas Flow Rates Q <sub>hg</sub> (max gas conc)          |       |                 |         |                    | Methane:            | 0 L/hr                 |                    | Carbon Dioxide         | 0.00 L/hr   |           |
| Borehole Hazardous Gas Flow Rates Q <sub>hh</sub> (steady state gas conc) |       |                 |         |                    | Methane:            | 0.00 L/hr              |                    | Carbon Dioxide         | 0 L/hr      |           |
| Comments:                                                                 |       |                 |         |                    |                     |                        |                    |                        |             |           |

**Key:**

dP - differential pressure (well-atmosphere)

LEL - Lower Explosive Limit (methane)

N<sub>2</sub> - nitrogen

CO<sub>2</sub> - carbon dioxide

CH<sub>4</sub> - methane

O<sub>2</sub> - oxygen

H<sub>2</sub>S - Hydrogen sulphide

PID - measure of volatile organic compounds

## Appendix E Geotechnical Laboratory Test Results

## Contract Number: 78455

Client Ref: **8715.02**

Client PO: **13428**

Date Received: **12-05-2025**

Date Completed: **28-05-2025**

Report Date: **28-05-2025**

Client: **Earth Science Partnership**

This report has been checked and approved by:

Contract Title: **Waterfalls Centre, Glynneath**  
 For the attention of: **Hywel Davies**

**Brendan Evans**  
 Senior Office Administrator

| Description                                                                                                   | Qty |
|---------------------------------------------------------------------------------------------------------------|-----|
| <b>Determination of water content</b><br>BS EN ISO 17892-1:2014 - @ Non Accredited Test                       | 3   |
| <b>4 Point Liquid &amp; Plastic Limit..</b><br>BS EN ISO 17892-12 - * UKAS                                    | 3   |
| <b>Particle Size Distribution</b><br>BS EN ISO 17892-4 : 5.1 - * UKAS                                         | 2   |
| <b>Water Soluble Sulphate 2:1 extract</b><br>Sub-contracted Test In-house method                              | 2   |
| <b>Dry Den/MC (2.5kg Rammer Method 1 litre mould/CBR Mould)</b><br>BS 1377-2:2022 Clause 11.3 & 11.4 - * UKAS | 1   |
| <b>Dry Den/MC (Vibrating Hammer Method)</b><br>BS 1377-2:2022 Clause 11.7 - * UKAS                            | 1   |

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

\* - denotes test included in laboratory scope of accreditation

# - denotes test carried out by approved contractor

@ - denotes non accredited tests

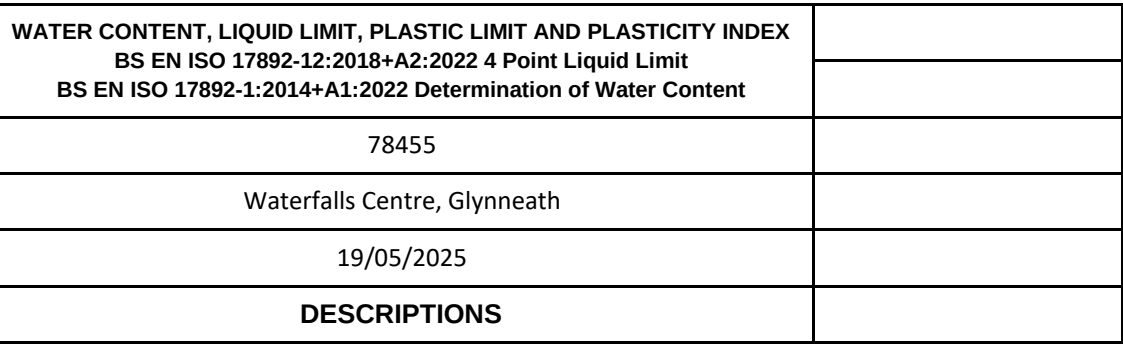
This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO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

**Approved Signatories:**

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

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

Wayne Honey (HR & HSE Manager)

[illegible]

|          |
|----------|
| Operator |
| Jason    |

[illegible]

The chart is a plasticity chart with Liquid Limit (wL) on the x-axis (0 to 100) and Plasticity Index (Ip) on the y-axis (0 to 80). The chart is divided into regions: CIL, CIM, CIH, CIV, SiL, SiM, SiH, and SiV. A solid line represents the A-line, and a dashed line represents the U-line. Data points are plotted as blue squares.

| Point | Liquid Limit (wL) | Plasticity Index (Ip) | Region |
|-------|-------------------|-----------------------|--------|
| 1     | 0                 | 0                     | SiL    |
| 2     | 28                | 12                    | SiL    |
| 3     | 30                | 13                    | SiL    |
| 4     | 39                | 20                    | SiM    |

|          |
|----------|
| Operator |
| Jason    |

**PARTICLE SIZE DISTRIBUTION**  
**BS EN ISO 17892-4:2016**  
**Wet Sieve, Clause 5.2**

Contract Number

**78455**

Borehole/Pit No.

**TP201**

Project Name

**Waterfalls Centre, Glynneath**

Sample No.

Sample Description

Brown slightly clayey/silty slightly sandy fine to coarse GRAVEL (with cobbles)

Depth Top

**0.70**

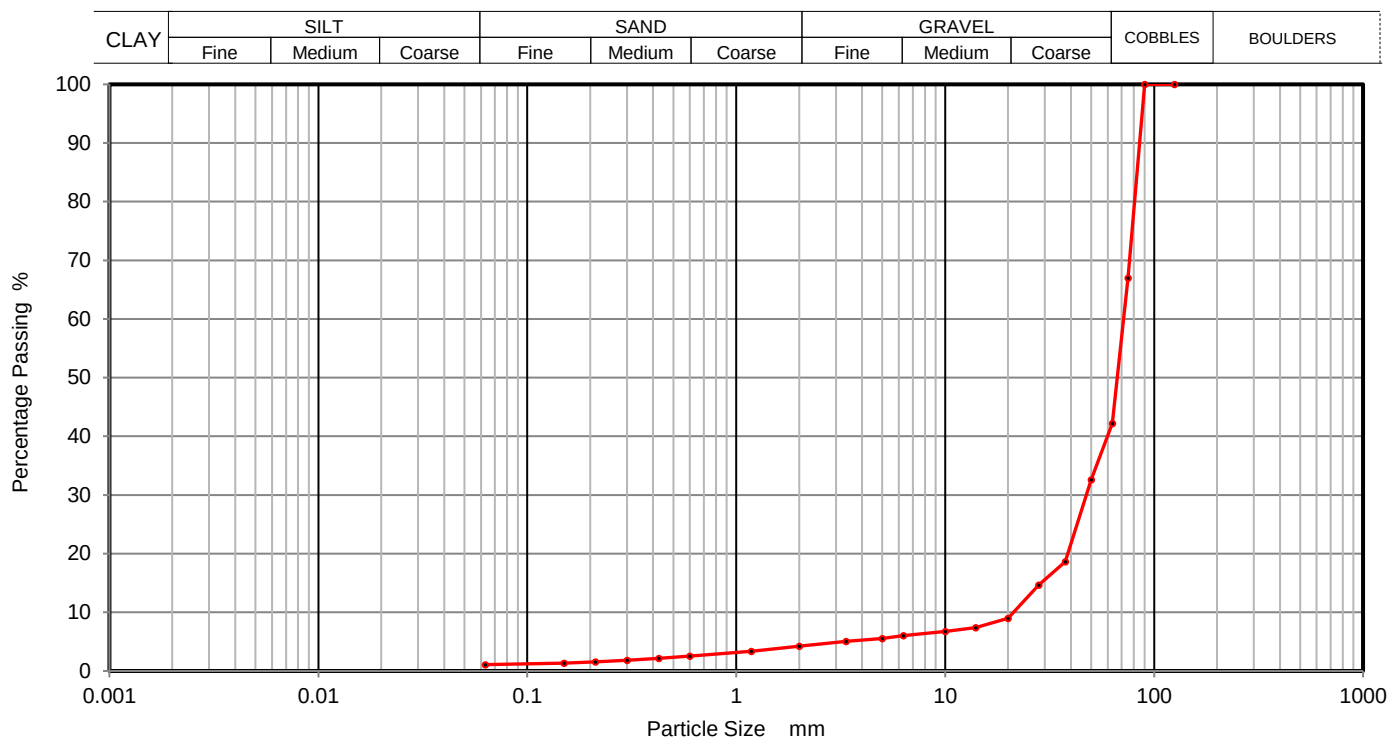
Depth Base

Date Tested

15/05/2025

Sample Type

**B**



| Sieving          |           | Sedimentation    |           |
|------------------|-----------|------------------|-----------|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125              | 100       |                  |           |
| 90               | 100       |                  |           |
| 75               | 67        |                  |           |
| 63               | 42        |                  |           |
| 50               | 33        |                  |           |
| 37.5             | 19        |                  |           |
| 28               | 15        |                  |           |
| 20               | 9         |                  |           |
| 14               | 7         |                  |           |
| 10               | 7         |                  |           |
| 6.3              | 6         |                  |           |
| 5                | 6         |                  |           |
| 3.35             | 5         |                  |           |
| 2                | 4         |                  |           |
| 1.18             | 3         |                  |           |
| 0.63             | 3         |                  |           |
| 0.425            | 2         |                  |           |
| 0.30             | 2         |                  |           |
| 0.20             | 2         |                  |           |
| 0.15             | 1         |                  |           |
| 0.063            | 1         |                  |           |

| Sample Proportions | % dry mass |
|--------------------|------------|
| Cobbles            | 58         |
| Gravel             | 38         |
| Sand               | 3          |
| Silt and Clay      | 1          |
|                    |            |
|                    |            |

**Remarks**

Preparation and testing in accordance with BS17892 unless noted below

Operator

Cameron Thomas

**PARTICLE SIZE DISTRIBUTION**  
**BS EN ISO 17892-4:2016**  
**Wet Sieve, Clause 5.2**

Contract Number

**78455**

Borehole/Pit No.

**TP202**

Project Name

**Waterfalls Centre, Glynneath**

Sample No.

Sample Description

Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)

Depth Top

**0.90**

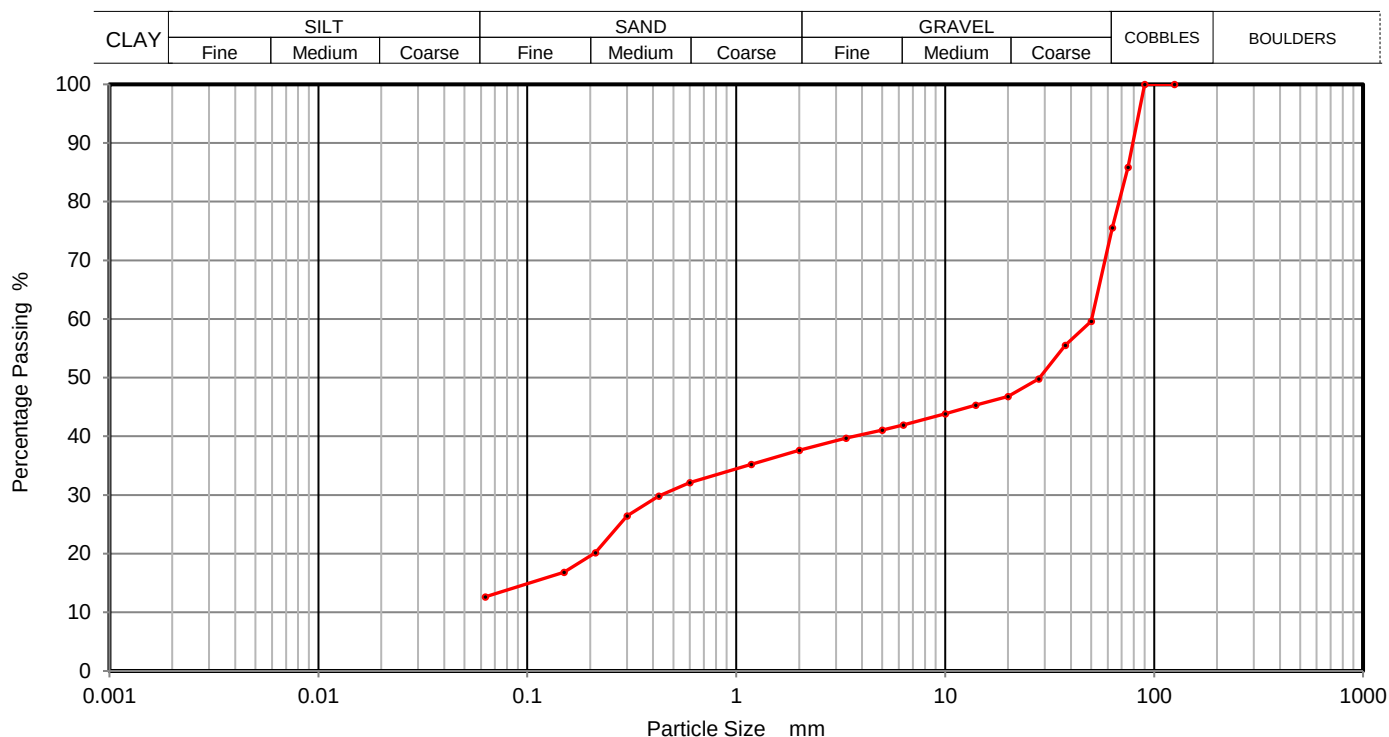
Depth Base

Date Tested

15/05/2025

Sample Type

**B**



| Sieving          |           | Sedimentation    |           |
|------------------|-----------|------------------|-----------|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125              | 100       |                  |           |
| 90               | 100       |                  |           |
| 75               | 86        |                  |           |
| 63               | 76        |                  |           |
| 50               | 60        |                  |           |
| 37.5             | 56        |                  |           |
| 28               | 50        |                  |           |
| 20               | 47        |                  |           |
| 14               | 45        |                  |           |
| 10               | 44        |                  |           |
| 6.3              | 42        |                  |           |
| 5                | 41        |                  |           |
| 3.35             | 40        |                  |           |
| 2                | 38        |                  |           |
| 1.18             | 35        |                  |           |
| 0.63             | 32        |                  |           |
| 0.425            | 30        |                  |           |
| 0.30             | 26        |                  |           |
| 0.20             | 20        |                  |           |
| 0.15             | 17        |                  |           |
| 0.063            | 13        |                  |           |

| Sample Proportions | % dry mass |
|--------------------|------------|
| Cobbles            | 24         |
| Gravel             | 38         |
| Sand               | 25         |
| Silt and Clay      | 13         |
|                    |            |
|                    |            |

**Remarks**

Preparation and testing in accordance with BS17892 unless noted below

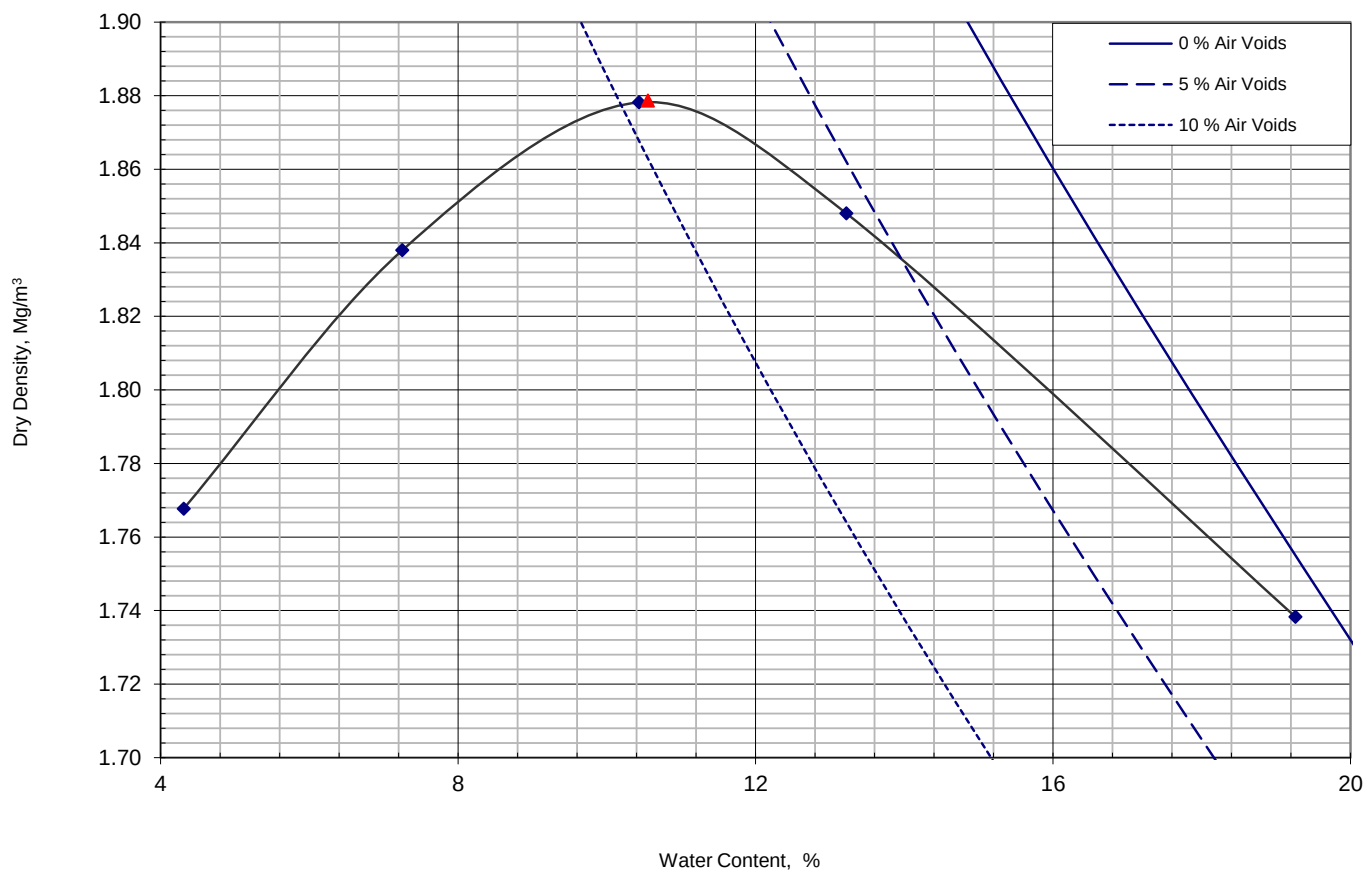
Operator

Cameron Thomas

## Determination of The Dry Density / Water Content Relationship BS 1377-2:2022

|                   |       |
|-------------------|-------|
| Contract Number   | 78455 |
| Borehole / Pit No | TP202 |

|                    |                                              |                                |        |
|--------------------|----------------------------------------------|--------------------------------|--------|
| Project Name       | Waterfalls Centre, Glynneath                 | Sample No                      |        |
| Date Tested        | 15/05/2025                                   | Depth Top                      | 0.40   |
| Compaction Method  | 2.5 Kg Rammer                                | Depth Base                     |        |
| Compaction Clause  | BS1377-2:2022, Clause 11.3                   | Sample Type                    | B      |
| Sample Description | Brown silty sandy CLAY                       | Single or Separate Sample Used | Single |
| Grading Zone       | Grading Zone 1 - Not Susceptible to Crushing |                                |        |



| Compaction Point | 1    | 2    | 3    | 4    | 5    |  |  |  |  |  |  |
|------------------|------|------|------|------|------|--|--|--|--|--|--|
| Water Content    | 4.3  | 7.3  | 10.4 | 13.2 | 19.3 |  |  |  |  |  |  |
| Bulk Density     | 1.84 | 1.97 | 2.07 | 2.09 | 2.07 |  |  |  |  |  |  |
| Dry Density      | 1.77 | 1.84 | 1.88 | 1.85 | 1.74 |  |  |  |  |  |  |

|                          |              |       |
|--------------------------|--------------|-------|
| Initial Water Content    | 19.3         | %     |
| Maximum Dry Density      | 1.88         | Mg/m3 |
| Optimum Water Content    | 10.6         | %     |
| Particle Density         | 2.65 Assumed | Mg/m3 |
| Material Retained 37.5mm | 0            | %     |
| Material Retained 20mm   | 0            | %     |

Operator

Conal

**Determination of The Dry Density / Water Content Relationship**  
**BS 1377-2:2022 Clause 11.7**

Contract Number

78455

BH / TP No

TP201

Project Name

Waterfalls Centre, Glynneath

Sample No

Sample Description

Brown slightly clayey sandy fine to coarse GRAVEL

Depth Top

0.70

Compaction Method

Vibrating Rammer

Depth Bottom

Date Tested

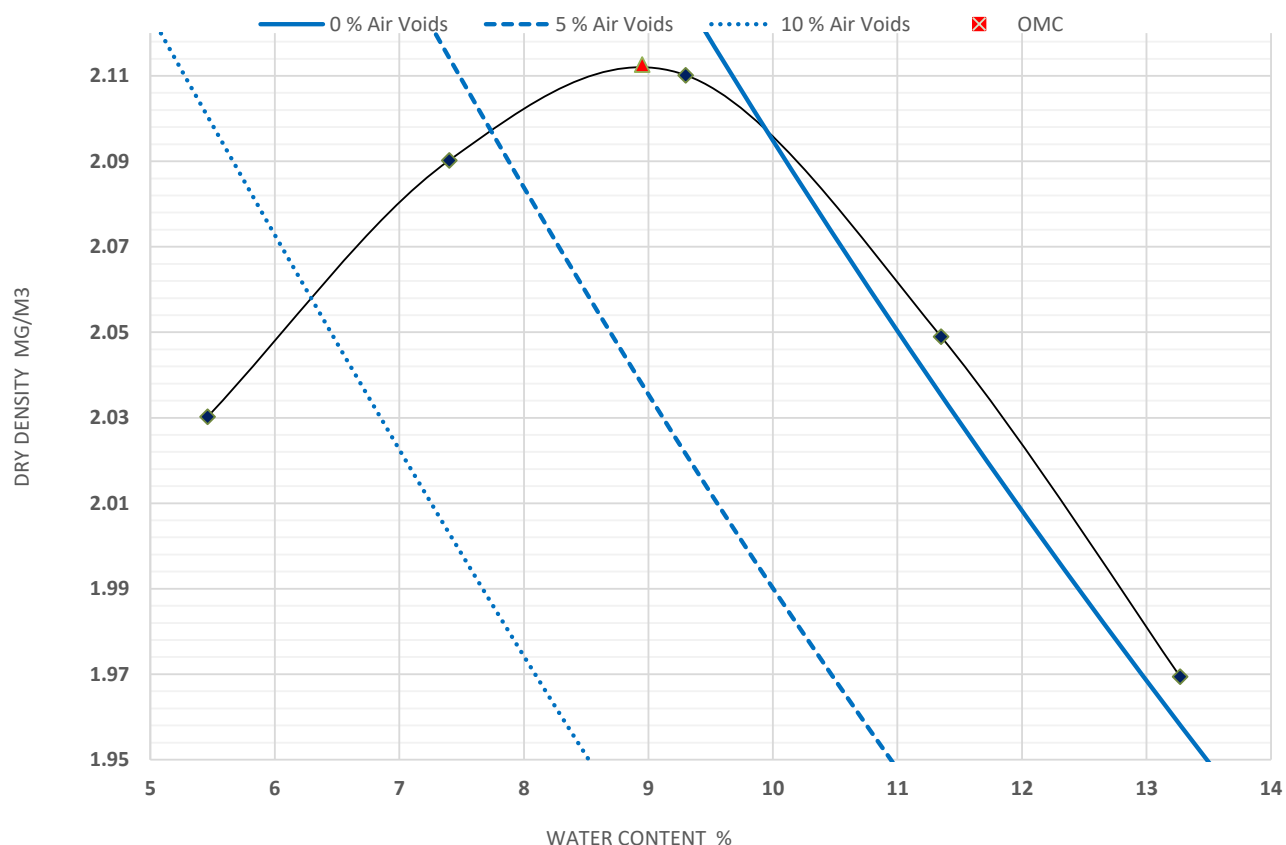
15/05/2025

Sample Type

B

Grading Zone

Grading Zone 5 - Not Susceptible to Crushing



|                  |      |      |      |      |      |  |  |  |  |  |  |  |
|------------------|------|------|------|------|------|--|--|--|--|--|--|--|
| Compaction Point | 1    | 2    | 3    | 4    | 5    |  |  |  |  |  |  |  |
| Water Content    | 5.5  | 7.4  | 9.3  | 11.4 | 13.3 |  |  |  |  |  |  |  |
| Bulk Density     | 2.14 | 2.24 | 2.31 | 2.28 | 2.23 |  |  |  |  |  |  |  |
| Dry Density      | 2.03 | 2.09 | 2.11 | 2.05 | 1.97 |  |  |  |  |  |  |  |

|                          |      |                   |                                |        |
|--------------------------|------|-------------------|--------------------------------|--------|
| Initial Water Content    | 9.3  | %                 | Single or Separate Sample Used | Single |
| Maximum Dry Density      | 2.11 | Mg/m <sup>3</sup> |                                |        |
| Optimum Water Content    | 9.0  | %                 |                                |        |
| Particle Density         | 2.65 | Mg/m <sup>3</sup> | Assumed                        |        |
| Material Retained 37.5mm | 6    | %                 |                                |        |
| Material Retained 20mm   | 15   | %                 |                                |        |

Operator

Conal

**GSTL**

Unit 3-4 Heol Aur  
Dafen Ind Estate  
Dafen  
SA14 8QN

**Analytical Test Report: L25/05002/GSL - 25-66203**

|                         |                                               |                                |                         |
|-------------------------|-----------------------------------------------|--------------------------------|-------------------------|
| Your Project Reference: | <b>Waterfalls Centre, Glynneath - 8715.02</b> |                                |                         |
| Your Order Number:      | 78455                                         | Samples Received / Instructed: | 16/05/2025 / 16/05/2025 |
| Report Issue Number:    | 1                                             | Sample Tested:                 | 16/05 to 28/05/2025     |
| Samples Analysed:       | 2 sample(s)                                   | Report issued:                 | 28/05/2025              |

Signed



**James Gane**  
Analytical Services Manager  
CTS

**Notes:**

**General**

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

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

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

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

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

**Uncertainty of measurement values are available on request.**

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

**Deviating Samples**

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

**Accreditation Key**

This report shall not be reproduce except in full

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

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

UKAS accreditation on waters only covers the Ground water and Surface water matrices

Date of Issue: 21.05.25

Issued by: J. Gane

Issue No: 4

Rev No: 27

**L25/05002/GSL - 25-66203**

**Project Reference - Waterfalls Centre,  
Glynneath - 8715.02**

**Analytical Test Results - Solid**

| Lab Reference                                |        |               | 509351    | 509352    |
|----------------------------------------------|--------|---------------|-----------|-----------|
| Client Sample ID                             |        |               | -         | -         |
| Client Sample Location                       |        |               | TP202     | TP203     |
| Client Sample Type                           |        |               | B         | D         |
| Client Sample Number                         |        |               | -         | -         |
| Depth - Top (m)                              |        |               | 0.40      | 1.50      |
| Depth - Bottom (m)                           |        |               | 0.40      | 1.50      |
| Date of Sampling                             |        |               | -         | -         |
| Time of Sampling                             |        |               | -         | -         |
| Sample Matrix                                |        |               | Not Found | Not Found |
| Determinant                                  | Units  | Accreditation |           |           |
| Sulphate (Water soluble as SO <sub>4</sub> ) | (mg/l) | u             | < 10      | 19        |

**L25/05002/GSL - 25-66203**

**Project Reference - Waterfalls Centre, Glynneath - 8715.02**

**Sample Descriptions**

| Lab Reference | Client Sample ID | Client Sample Location | Client Sample Type | Client Sample Number | Description                     | Moisture Content (%) | Stone Content (%) | Passing 2mm test sieve (%) |
|---------------|------------------|------------------------|--------------------|----------------------|---------------------------------|----------------------|-------------------|----------------------------|
| 509351        | -                | TP202                  | B                  | -                    | Brown silty gravelly sandy clay | -                    | -                 | 80                         |
| 509352        | -                | TP203                  | D                  | -                    | Brown silty gravelly sandy clay | -                    | -                 | 71                         |

**L25/05002/GSL - 25-66203**

**Project Reference - Waterfalls Centre, Glynneath - 8715.02**

**Sample Comments**

| Lab Reference | Client Sample ID | Client Sample Location | Client Sample Type | Client Sample Number | Comments |
|---------------|------------------|------------------------|--------------------|----------------------|----------|
| 509351        | -                | TP202                  | B                  | -                    |          |
| 509352        | -                | TP203                  | D                  | -                    |          |

**L25/05002/GSL - 25-66203**

**Project Reference - Waterfalls Centre, Glynneath - 8715.02**

**Analysis Methodologies**

| Test Code  | Test Name / Reference                    | Sample condition for analysis | Sample Preparation     | Test Details                                                                                                                         |
|------------|------------------------------------------|-------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| ANIONSS    | MS - CL - Anions by Aquakem (2:1Extract) | Oven dried                    | Passing 2mm test sieve | Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio |
| SAMPLEPREP | MS - CL - Sample Preparation             | -                             | -                      | Preparation of samples (including determination of moisture content) to allow for subsequent analysis                                |

## Appendix F Geo-environmental Laboratory Test results

# Certificate of Analysis

*Certificate Number* 25-09739

*Issued:* 19-May-25

*Client* Earth Science Partnership  
33 Cardiff Road  
Taffs Well  
Cardiff  
CF15 7RB

*Our Reference* 25-09739

*Client Reference* ~ 8715.02

*Order No* ~ 13429

*Contract Title* ~ Waterfalls Centre, Glynneath

*Description* 3 Soil samples.

*Date Received* 02-May-25

*Date Started* 02-May-25

*Date Completed* 19-May-25

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

*Approved By*

Louise Cook  
Contracts Manager



# Summary of Chemical Analysis

## Soil Samples

Our Ref 25-09739

Client Ref ~ 8715.02

Contract Title ~ Waterfalls Centre, Glynneath

|                 | Deviating  | Deviating  | Deviating  |
|-----------------|------------|------------|------------|
| Lab No          | 2502711    | 2502712    | 2502713    |
| Sample ID ~     | TP201      | TP203      | TP203      |
| Depth ~         | 0.15       | 0.10       | 0.50       |
| Other ID ~      |            |            |            |
| Sample Type ~   | SOIL       | SOIL       | SOIL       |
| Sampling Date ~ | 23/04/2025 | 23/04/2025 | 23/04/2025 |
| Sampling Time ~ | n/s        | n/s        | n/s        |

| Test                                        | Method      | LOD  | Units |         |         |         |
|---------------------------------------------|-------------|------|-------|---------|---------|---------|
| <b>Metals</b>                               |             |      |       |         |         |         |
| Arsenic                                     | DETSC 2301# | 0.2  | mg/kg | 32      | 2.5     | 18      |
| Beryllium                                   | DETSC 2301# | 0.2  | mg/kg | 0.4     | < 0.2   | 0.5     |
| Boron, Water Soluble (2.5:1)                | DETSC 2311# | 0.2  | mg/kg | 0.4     | 0.7     | 0.4     |
| Cadmium                                     | DETSC 2301# | 0.1  | mg/kg | 0.7     | < 0.1   | 0.2     |
| Chromium                                    | DETSC 2301# | 0.15 | mg/kg | 7.1     | 15      | 14      |
| Chromium, Hexavalent                        | DETSC 2204* | 1    | mg/kg | < 1.0   | < 1.0   | < 1.0   |
| Copper                                      | DETSC 2301# | 0.2  | mg/kg | 54      | 7.6     | 27      |
| Lead                                        | DETSC 2301# | 0.3  | mg/kg | 60      | 7.8     | 89      |
| Mercury                                     | DETSC 2325# | 0.05 | mg/kg | 0.06    | < 0.05  | < 0.05  |
| Nickel                                      | DETSC 2301# | 1    | mg/kg | 12      | 6.0     | 24      |
| Selenium                                    | DETSC 2301# | 0.5  | mg/kg | 0.7     | < 0.5   | 0.8     |
| Vanadium                                    | DETSC 2301# | 0.8  | mg/kg | 19      | 9.2     | 19      |
| Zinc                                        | DETSC 2301# | 1    | mg/kg | 66      | 21      | 84      |
| <b>Inorganics</b>                           |             |      |       |         |         |         |
| pH                                          | DETSC 2008# |      | pH    | 5.9     | 10.6    | 7.2     |
| Cyanide, Total                              | DETSC 2130# | 0.1  | mg/kg | 0.3     | < 0.1   | 0.1     |
| Organic matter                              | DETSC 2002# | 0.1  | %     | 6.0     | 4.9     | 2.1     |
| Sulphate Aqueous Extract as SO4 (2:1)       | DETSC 2076# | 10   | mg/l  |         |         | 21      |
| Sulphur as S, Total                         | DETSC 2320  | 0.01 | %     |         |         | 0.02    |
| Sulphate as SO4, Total                      | DETSC 2321# | 0.01 | %     |         |         | 0.04    |
| <b>Petroleum Hydrocarbons</b>               |             |      |       |         |         |         |
| Aliphatic C5-C6: HS_1D_AL                   | DETSC 3321* | 0.01 | mg/kg | < 0.01  | < 0.01  | < 0.01  |
| Aliphatic C6-C8: HS_1D_AL                   | DETSC 3321* | 0.01 | mg/kg | < 0.01  | < 0.01  | < 0.01  |
| Aliphatic C8-C10: HS_1D_AL                  | DETSC 3321* | 0.01 | mg/kg | < 0.01  | < 0.01  | < 0.01  |
| Aliphatic >EC10-EC12: EH_2D_AL              | DETSC 3521# | 1.5  | mg/kg | < 1.50  | 37.23   | 1.91    |
| Aliphatic >EC12-EC16: EH_2D_AL              | DETSC 3521# | 1.2  | mg/kg | < 1.20  | 27.02   | < 1.20  |
| Aliphatic >EC16-EC21: EH_2D_AL              | DETSC 3521# | 1.5  | mg/kg | < 1.50  | < 30.00 | < 1.50  |
| Aliphatic >EC21-EC35: EH_2D_AL              | DETSC 3521# | 3.4  | mg/kg | < 3.40  | < 3.40  | < 3.40  |
| Aliphatic C5-C35: EH_2D+HS_1D_AL            | DETSC 3521* | 10   | mg/kg | < 10.00 | 95.44   | < 10.00 |
| Aromatic C5-C7: HS_1D_AR                    | DETSC 3321* | 0.01 | mg/kg | < 0.01  | < 0.01  | < 0.01  |
| Aromatic C7-C8: HS_1D_AR                    | DETSC 3321* | 0.01 | mg/kg | < 0.01  | < 0.01  | < 0.01  |
| Aromatic C8-C10: HS_1D_AR                   | DETSC 3321* | 0.01 | mg/kg | < 0.01  | < 0.01  | < 0.01  |
| Aromatic >EC10-EC12: EH_2D_AR               | DETSC 3521# | 0.9  | mg/kg | < 0.90  | < 18.00 | < 0.90  |
| Aromatic >EC12-EC16: EH_2D_AR               | DETSC 3521# | 0.5  | mg/kg | < 0.50  | < 10.00 | < 0.50  |
| Aromatic >EC16-EC21: EH_2D_AR               | DETSC 3521# | 0.6  | mg/kg | 1.66    | 73.36   | 1.83    |
| Aromatic >EC21-EC35: EH_2D_AR               | DETSC 3521# | 1.4  | mg/kg | < 1.40  | 312.9   | < 1.40  |
| Aromatic C5-C35: EH_2D+HS_1D_AR             | DETSC 3521* | 10   | mg/kg | < 10.00 | 415.3   | < 10.00 |
| TPH Ali/Aro Total C5-C35: EH_2D+HS_1D_Total | DETSC 3521* | 10   | mg/kg | < 10.00 | 510.8   | < 10.00 |
| Benzene                                     | DETSC 3321# | 0.01 | mg/kg | < 0.01  | < 0.01  | < 0.01  |
| Ethylbenzene                                | DETSC 3321# | 0.01 | mg/kg | < 0.01  | < 0.01  | < 0.01  |

# Summary of Chemical Analysis

## Soil Samples

Our Ref 25-09739

Client Ref ~ 8715.02

Contract Title ~ Waterfalls Centre, Glynneath

|                 | Deviating  | Deviating  | Deviating  |
|-----------------|------------|------------|------------|
| Lab No          | 2502711    | 2502712    | 2502713    |
| Sample ID ~     | TP201      | TP203      | TP203      |
| Depth ~         | 0.15       | 0.10       | 0.50       |
| Other ID ~      |            |            |            |
| Sample Type ~   | SOIL       | SOIL       | SOIL       |
| Sampling Date ~ | 23/04/2025 | 23/04/2025 | 23/04/2025 |
| Sampling Time ~ | n/s        | n/s        | n/s        |

| Test                    | Method      | LOD  | Units |        |        |        |
|-------------------------|-------------|------|-------|--------|--------|--------|
| Toluene                 | DETSC 3321# | 0.01 | mg/kg | < 0.01 | < 0.01 | < 0.01 |
| Xylene                  | DETSC 3321# | 0.01 | mg/kg | < 0.01 | < 0.01 | < 0.01 |
| <b>PAHs</b>             |             |      |       |        |        |        |
| Acenaphthene            | DETSC 3303# | 0.03 | mg/kg | < 0.03 | < 2.00 | < 0.03 |
| Acenaphthylene          | DETSC 3303# | 0.03 | mg/kg | < 0.03 | < 2.00 | < 0.03 |
| Anthracene              | DETSC 3303  | 0.03 | mg/kg | < 0.03 | 2.5    | < 0.03 |
| Benzo(a)anthracene      | DETSC 3303# | 0.03 | mg/kg | < 0.03 | 14     | 0.04   |
| Benzo(a)pyrene          | DETSC 3303# | 0.03 | mg/kg | < 0.03 | 21     | 0.11   |
| Benzo(b)fluoranthene    | DETSC 3303# | 0.03 | mg/kg | < 0.03 | 27     | 0.19   |
| Benzo(g,h,i)perylene    | DETSC 3303# | 0.03 | mg/kg | < 0.03 | 15     | 0.21   |
| Benzo(k)fluoranthene    | DETSC 3303# | 0.03 | mg/kg | < 0.03 | 9.4    | 0.05   |
| Chrysene                | DETSC 3303  | 0.03 | mg/kg | < 0.03 | 14     | 0.06   |
| Dibenzo(a,h)anthracene  | DETSC 3303# | 0.03 | mg/kg | < 0.03 | 4.1    | 0.04   |
| Fluoranthene            | DETSC 3303# | 0.03 | mg/kg | < 0.03 | 23     | 0.05   |
| Fluorene                | DETSC 3303  | 0.03 | mg/kg | < 0.03 | < 2.00 | < 0.03 |
| Indeno(1,2,3-c,d)pyrene | DETSC 3303# | 0.03 | mg/kg | < 0.03 | 12     | 0.16   |
| Naphthalene             | DETSC 3303# | 0.03 | mg/kg | < 0.03 | < 2.00 | < 0.03 |
| Phenanthrene            | DETSC 3303# | 0.03 | mg/kg | < 0.03 | 8.5    | < 0.03 |
| Pyrene                  | DETSC 3303# | 0.03 | mg/kg | < 0.03 | 18     | 0.04   |
| PAH - USEPA 16, Total   | DETSC 3303  | 0.1  | mg/kg | < 0.10 | 170    | 0.95   |
| <b>Phenols</b>          |             |      |       |        |        |        |
| Phenol - Monohydric     | DETSC 2130# | 0.3  | mg/kg | 0.4    | < 0.3  | < 0.3  |

## Summary of Asbestos Analysis Soil Samples

Our Ref 25-09739

Client Ref ~ 8715.02

Contract Title ~ Waterfalls Centre, Glynneath

| Lab No  | Sample ID  | Material Type | Result | Comment* | Analyst      |
|---------|------------|---------------|--------|----------|--------------|
| 2502711 | TP201 0.15 | SOIL          | NAD    | none     | Keith Wilson |
| 2502712 | TP203 0.10 | SOIL          | NAD    | none     | Keith Wilson |
| 2502713 | TP203 0.50 | SOIL          | NAD    | none     | Keith Wilson |

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* -not included in laboratory scope of accreditation.

## Information in Support of the Analytical Results

Our Ref 25-09739

Client Ref ~ 8715.02

Contract ~ Waterfalls Centre, Glynneath

### Containers Received & Deviating Samples

| Lab No  | Sample ID ~        | Date<br>Sampled ~ | Containers Received                   | Holding time exceeded for tests                        | Incorrect<br>container<br>for tests | Headspace in<br>container for tests |
|---------|--------------------|-------------------|---------------------------------------|--------------------------------------------------------|-------------------------------------|-------------------------------------|
| 2502711 | TP201 0.15<br>SOIL | 23/04/25          | GJ 250ml, GJ 60ml, PT 1L              | pH + Conductivity (7 days)                             |                                     |                                     |
| 2502712 | TP203 0.10<br>SOIL | 23/04/25          | GJ 250ml, GJ 60ml (Headspace)), PT 1L | pH + Conductivity (7 days)                             |                                     | BTEX /C5-10                         |
| 2502713 | TP203 0.50<br>SOIL | 23/04/25          | GJ 250ml, GJ 60ml (Headspace)), PT 1L | Total Sulphur ICP (7 days), pH + Conductivity (7 days) |                                     | BTEX /C5-10                         |

Key: G-Glass P-Plastic J-Jar T-Tub

Normec DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 250µm sieve

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

## Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

| Acronym | Description                                                         |
|---------|---------------------------------------------------------------------|
| 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                                 |
| 2D      | GC-GC - Double coil gas chromatography                              |
| Total   | Aliphatics & Aromatics                                              |
| AL      | Aliphatics only                                                     |
| AR      | Aromatics only                                                      |
| #1      | EH_2D_Total but with humics mathematically subtracted               |
| #2      | EH_2D_Total but with fatty acids mathematically subtracted          |
| _       | Operator - underscore to separate acronyms (exception for +)        |
| +       | Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total   |

| Det                      | Acronym           |
|--------------------------|-------------------|
| Aliphatic C5-C6          | HS_1D_AL          |
| Aliphatic C6-C8          | HS_1D_AL          |
| Aliphatic C8-C10         | HS_1D_AL          |
| Aliphatic >EC10-EC12     | EH_2D_AL          |
| Aliphatic >EC12-EC16     | EH_2D_AL          |
| Aliphatic >EC16-EC21     | EH_2D_AL          |
| Aliphatic >EC21-EC35     | EH_2D_AL          |
| Aliphatic C5-C35         | EH_2D+HS_1D_AL    |
| Aromatic C5-C7           | HS_1D_AR          |
| Aromatic C7-C8           | HS_1D_AR          |
| Aromatic C8-C10          | HS_1D_AR          |
| Aromatic >EC10-EC12      | EH_2D_AR          |
| Aromatic >EC12-EC16      | EH_2D_AR          |
| Aromatic >EC16-EC21      | EH_2D_AR          |
| Aromatic >EC21-EC35      | EH_2D_AR          |
| Aromatic C5-C35          | EH_2D+HS_1D_AR    |
| TPH Ali/Aro Total C5-C35 | EH_2D+HS_1D_Total |

### Key:

~ Sample details are provided by the client and can affect the validity of the results

\* -not accredited.

# -MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

**End of Report**

## General Notes

## GENERAL NOTES

1. Earth Science Partnership (ESP) believes that providing information about limitations is essential to help clients identify and therefore manage their risks. These risks can be mitigated through further investigation or research, but they cannot be eliminated. This report may not be used for any purpose other than that for which it was commissioned.
2. This report includes available factual data for the site as obtained only from the sources described in the text. The data are related to the site on the basis of the site location and boundary information provided by the client. The findings and opinions conveyed in this assessment are based on the information obtained from a variety of sources as detailed in the report, which ESP believe are reliable. Nevertheless, ESP cannot and does not guarantee the authenticity or reliability of the information it has relied on. It is possible that the assessment failed to indicate the existence of further sources of information on the site. Assuming such sources do exist, their information could not have been considered in the formulation of the opinions and findings in this report. It should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.
3. In preparing this report it has been assumed that all past and present occupants of the site have provided all relevant and other information, especially relating to known or potential hazards. This report is not required to identify insufficiencies or mistakes in the information provided by the user/owner or from any other source, but has sought to compensate for these where obvious in the light of other information.
4. Reports are normally prepared and written in the context of a stated purpose, and should not, therefore be used in a different context. Furthermore, new information, improved practices and legislation may necessitate an alteration to the report in whole or in part after its submission.
5. The opinions presented in this report are based on the findings derived from a site inspection, investigations and a review of historical and other records. The report details any indicators that may suggest that hazardous substances exist at the site at levels likely to warrant mitigation. Not finding such indicators does not mean that hazardous substances do not exist at the site. The most recent site inspection was undertaken as detailed within the report. Circumstances on sites are subject to change and certain indicators of the presence of hazardous substances that may have been latent at the time of this inspection may subsequently have become observable.
6. The work carried out for the assessment can only investigate a small portion of the subsurface conditions. Certain indicators or evidence of hazardous substances may have been outside the limited portion of the subsurface investigated, latent at the time of the work or only partially intercepted by the works, and thus their full significance could not be appreciated. In this regard, groundwater levels are particularly susceptible to variation and it should be noted that groundwater levels are subject to diurnal, seasonal, and climatic changes and are solely dependent on the time the ground investigation was carried out and the weather before and during the investigation.
7. Accordingly, it is possible that the assessment failed to indicate the presence or significance of hazardous substances. Assuming such substances exist, their presence could not have been considered in the formulation of the report's findings and opinions. The conclusions resulting from this study and contained in this report are not necessarily indicative of future conditions or operating practices at or adjacent to the site. Where differing ground conditions or suspect materials are encountered during future site works, additional specialist advice should be sought to assess whether the new information will materially affect the recommendations currently provided herein and whether further consideration is required. Any limiting factors should be assessed by an appropriately qualified specialist.
8. The assessment was prepared for the sole internal use and reliance of the Client. The report shall not be relied upon by or transferred to other parties without the express written authorisation of the Earth Science Partnership. If an unauthorised party comes into possession of the report, they rely on it at their peril and the authors owe them no duty of care and skill.
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