

PROJECT:	Land to the Rear of Cwrt Melin, Bancyfelin
DOCUMENT:	Preliminary Geotechnical Report
DATE:	29th August 2024
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Introduction

Spencer Quantum Limited have been commissioned to provide a geotechnical and geo-environmental investigation on the proposed residential development at Cae Ffynnon, Bancyfelin.

This preliminary technical note presents the early geotechnical information obtained from the trial pitting exercise carried out on 22nd to 23rd August 2024. Formal logs and results will be issued as and when these become available.

A further phase of site sampling and subsequent testing is to be carried out.

Recommendations made and opinions expressed in this preliminary technical note are based on the investigation and observations made to date. The initial conclusions drawn may require revision once full analysis and testing of samples has been carried out.

Site Setting

The site is an enclosed parcel of relatively flat grassed land, bounded to the north by railway embankment and south by existing properties.

The proposed site layout is presented in the plan included in Appendix 1 of this technical note. The positions of the investigation holes to date are also presented on this plan.

The approximate National Grid reference of the site is 232510E 218270N. The ground level is approximately 24mOD.

Geology Review

The British Geological Survey (BGS) on-line Geology Viewer shows the site to be mantled predominantly by River Terrace Deposits - Sand and gravel, with Alluvial clays and silts encroaching on the south-eastern boundary of the site.

The solid geology is indicated to be from the Tetragnostus Beds, typically mudstone from the Ordovician period.

Ground Conditions

A total of eight trial pits have been excavated to date, four of which were utilised to carry out soakaway testing.

The ground conditions encountered are summarised in the following table (over page).

Trial Pit	Depth (m.bgl)		Strata Summary
	From	To	
TP01	GL	0.30	Topsoil
	0.30	0.90	Firm orange mottled grey CLAY, with low cobble content
	0.90	1.30	'Dense' silty slightly clayey gravelly SAND – Highly weathered MUDSTONE <i>Soakaway test carried out at 1.3m</i>
TP02	GL	0.40	Topsoil/Subsoil
	0.40	1.20	Firm orange-brown with grey mottling slightly sandy slightly gravelly CLAY
	1.20	2.00	Firm to stiff brown with grey mottling and black staining to gravel slightly sandy gravelly CLAY with some rounded cobbles <i>Soakaway test carried out at 2.0m</i>
TP03	GL	0.30	Topsoil
	0.30	1.00	Firm brown mottled grey CLAY, with low cobble content <i>Seepage at 1.0m. Soakaway test carried out at 1.0m</i>
TP04	GL	0.30	Topsoil
	0.30	2.00	Firm orange-brown with grey mottling gravelly CLAY. Low cobble content. Gravel becoming more 'shaley' below 1.9m. <i>Soakaway test carried out at 2.0m</i>
TP05	GL	0.30	Topsoil
	0.30	1.00	Firm to stiff orange mottled grey CLAY
	1.00	2.50	'Medium dense' brown clayey slightly sandy GRAVEL, cobble content increasing with depth
	2.50	3.0	'Dense' grey clayey GRAVEL with medium cobble content – Highly weathered MUDSTONE
TP06	GL	0.30	Topsoil
	0.30	1.00	Firm orange-brown CLAY with low cobble content
	1.00	2.40	'Medium dense' brown greyish clayey GRAVEL with medium cobble content
	2.40	2.80	'Dense/Stiff' grey CLAY/GRAVEL with medium cobble content – Completely weathered MUDSTONE
TP07	GL	0.30	Topsoil
	0.30	1.00	Firm orange mottled grey slightly gravelly CLAY, low cobble content
	1.00	2.50	'Medium dense' brown slightly clayey sandy GRAVEL with medium cobble content
	2.50	3.00	'Dense/Stiff' grey CLAY/GRAVEL with medium cobble content – Completely weathered MUDSTONE
TP08	GL	0.30	Topsoil
	0.30	1.50	Firm orange brown CLAY
	1.50	2.50	'Medium dense' brown clayey GRAVEL with low cobble content
	2.50	3.00	'Dense' grey-black clayey GRAVEL – Highly weathered MUDSTONE

Soakaway tests were carried out in TP01 to TP04. The test results summary findings are presented in the table below.

Trial Pit	Pit Depth (m)	Wetted Depth (m)	Water Drop in 60mins
TP01	1.2	0.73	0 mm
TP02	2.0	1.73	80 mm
TP03	1.0	0.63	0 mm
TP04	2.0	1.44	0 mm

A series of in-situ CBR tests were carried out at points along the proposed spine road using the TRL DCP apparatus, as indicated on the site plan in Appendix 1. The resulting CBR values recorded over the test depths are tabulated over page.

Depth Range	Range of CBR %	Suggested Characteristic CBR %
GL – 0.2	< 2.0	< 2
0.2 – 0.65	4 – 7	5
> 0.65	8 – 29	10

Preliminary Geotechnical Appraisal

The trial pits have revealed a similar succession of soils, with a layer of topsoil (up to 0.4m). This is succeeded by a brown and orange, mottled grey, variably gravelly CLAY/ clayey GRAVEL. In the north-western half of the site a completely to highly weathered mudstone bedrock was proved at depths of 0.9m (TP01) to 2.5m (TP05, TP07 & TP08).

For preliminary design purposes the firm, in places stiff, gravelly Clay below the Topsoil will provide an allowable bearing capacity of 100kN/m². Conventional strip foundations should be viable, as well as ground bearing floor slabs. Further site testing and laboratory testing will confirm this along with recommendations as regards shrink-swell potential and chemical concrete attack.

The soakaway testing recorded no drop in water level in three of the four test locations. Soakaways for disposal of site run-off are not considered to be viable based on these test results.

The in-situ CBR tests indicate a preliminary design CBR value of 5% between depths of 0.2m to 0.65m, with a value of 10% in the soils below 0.65m depth, relative to existing ground level.

The technical appraisal of the site will be updated as and when further data and test results become available.

**For and on behalf of
SPENCER QUANTUM LTD**



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APPENDIX 1 – Site Plan






PRELIMINARY




PRELIMINARY

House Type Keys

-  4 No of 2P18 Flat (Walk up)
-  8 No of 4P28 House (Semi-Detached)
-  4 No of 5P38 House (Semi-Detached)

Total = 16 Units

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	EXPLORATORY HOLE LOCATION PLAN		Drawn By: JS Scale: NTS Figure No: 1