Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

96 Cyfyng Road, Pantteg Landslip

Ground Investigation Report

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Earth Science Partnership
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96 Cyfyng Road, Pantteg Landslip
Ground Investigation Report

Prepared for:
Neath Port Talbot County Borough Council , Environment, The Quays, Baglan Energy Park, Brunel Way, Briton Ferry, SA11 2GG

Document Reference: **ESP.5859e.07.2937**

Revision	Status	Date	Written by	Checked by	Approved by
01	Draft	January 2018	A Wilding BSc (Hons) MSc FGS	M T Elcock BEng (Hons) FGS	M Eynon BSc MSc CGeol EurGeol FGS Registered Ground Engineering Specialist
		Signature:	A. Wilding		M Eynon
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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.*

2) *This report may not be used for any purpose other than that for which it was commissioned.*

3) *We have taken reasonable efforts to ensure the accuracy and reliability of the information presented herein. Some of this information has been obtained from third party sources and they are referenced as appropriate. Nevertheless, no guarantee is provide on the authenticity or reliability of this information.*

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1 Introduction

1.1 Background

The Earth Science Partnership Ltd (ESP), were instructed by Neath Port Talbot County Borough Council, to undertake a Ground Investigation at 96 Cyfyng Road, Pantteg in general accordance with the ESP's email proposal dated 26th October 2017.

This report presents the findings of exploratory works agreed between ESP and Neath Port Talbot County Borough Council.

1.2 Objective and Scope of Works

The objective of the investigation was to provide information on the ground conditions beneath the site, in particular the depth to rock head, and to install monitoring equipment to allow future monitoring. This was to be achieved by drilling a single borehole to a depth of 12m.

The findings of this investigation will be incorporated into the wider hazard and risk assessment currently being undertaken by the ESP.

2 Site Description

2.1 The Site

The site is the land directly south of the now derelict 96 Cyfyng Road. The grid reference for the borehole location is approximately 276270 208270. The borehole location plan is shown as Figure 1.

The site consists of a concrete surface and is predominantly surrounded by residential dwellings. The location of the borehole and Cyfyng Road gently rise toward the are relatively flat, with the surrounding area sloping steeply to the southeast.

2.2 Site Geology

The published 1:10560 scale geological map for the area (SN70NE) indicates the site to be underlain bedrock of the Middle Coal Measures Formation, with the 'Red Vein' coal seam inferred to crop out downslope of the site. The bedrock in the area generally dips at 10° to the south. The geological maps indicated landslip materials directly to the southwest of the borehole position.

3 Fieldwork

3.1 Boreholes

One rotary cored drillhole was constructed (BH401) to a depth of 12m on the 9th and 10th November 2017. The drillhole records are presented as Appendix A and photographs of the recovered core are presented in Appendix B.

At the commencement of the borehole, a hydraulic breaker was used to break the concrete surface, and a service inspection pit was excavated by hand to a depth of 1.2m.

Dynamic sampling was then carried out from 1.2m, with cores of the material recovered in plastic liners. Dynamic sampling proceeded to maximum depth of 9.0m, rotary coring was then adopted to a maximum depth of 12m.

Dynamic sampling was chosen in the weathered rock horizon due to the likelihood of lower recovery from rotary coring in this material.

Cores of nominal 73mm diameter were recovered in plastic liners using a triple tube barrel system, over runs of 1.5m length. Due to the nature of the material recovered from the dynamic sampling, the first two core runs were 0.5m and 1.0m respectively to ensure proficient recovery. The recovered cores were sealed in the plastic liners and placed in solid core boxes to prevent disturbance and swelling before logging. The plastic liners were only cut immediately prior to logging and sampling. In addition to the nature of the rock material, the identified fractures within the rock mass were also logged in accordance with BS5930:2015. The Rock Quality Designation (RQD) recorded was for rock core 100mm or greater in length. The fracture state, and fracture index, of the recovered cores is presented on the borehole records.

The borehole was constructed under license to the Coal Authority (ref.15090). In accordance with Coal Authority requirements, given the proximity to occupied properties, water was used as a flushing medium to keep the drill bits cool and return chippings to the surface, and the levels of ground gas were recorded at the drillhole during the drilling works.

Standard Penetration Tests (SPT) were carried out between each dynamic sampling and rotary coring run using a split spoon or solid cone in the borehole in accordance with BS EN ISO 22476-3 (2005) and BS5930 (2015) to assess the relative density of the superficial deposits and the bedrock. As required in BS5930:2015, the SPT N-values shown on the borehole records are the direct, uncorrected results obtained in the field.

3.2 Installations

Upon completion of the borehole, 12m of inclinometer casing was installed, with a vibrating wire piezometer at a depth of 10m. To date, a baseline reading has been undertaken for the inclinometer, with repeat readings to be carried out in due course.

3.3 Geotechnical Testing

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

The following tests were undertaken by a UKAS accredited laboratory on samples selected by ESP in accordance with the methodologies presented in BS1377:1990. The results are presented in Appendix C.

- Natural moisture content.
- Atterberg limits.
- Particle size analysis.
- Uniaxial Compressive Strength
- Point Load Test

4 Ground Conditions

4.1 Geology

The borehole constructed has identified the site to be underlain by Made Ground, over weathered bedrock which gradually grades to fresh, unweathered bedrock at the base of the borehole. A summary of the ground conditions encountered is outlined below.

4.1.1 Made Ground

Encountered to a depth of 4.2m as either; sandy gravel and cobbles of sandstone, with some coal; brown mottled orange gravelly clay, with gravel of fine to coarse mudstone, siltstone and coal; grey silty sandy gravelly clay with wood and slag fragments.

A SPT N-values of 0 were measured in the Made Ground at depths of 1.2m and 2.7m indicating a void or voided ground. Voids are however not anticipated as seating blows in each test were recorded and it is more likely the zeros represent very soft or very loose ground conditions.

4.1.2 South Wales Middle Coal Measures Formation Bedrock

Encountered to the base of the borehole. The weathered expression of this unit was encountered between 4.2m and 9.4m, grading from Grade E to Grade B.

Grade E material encountered is firm brown, orange-brown and grey gravelly sandy clay, with a gravel of fine to coarse, angular, tabular siltstone.

Grade D material is encountered as very dense occasionally clayey, sandy gravel of fine to coarse angular siltstone or mudstone. Orange-brown surface discolouration is present on the surface of the gravel.

Grade B material is encountered as very weak black partially weathered mudstone with orange discoloration on fracture surfaces.

Unweathered bedrock is encountered from 9.45m to the base of the borehole, as a weak to very strong dark grey sandy siltstone, with a high content of fossilised plant material.

4.2 Hydrogeology

The groundwater encountered during the investigation are summarised in the Table 1:

Table 1 - Summary of groundwater encountered during the investigation.

Hole ID	Stratum	Comment on groundwater encountered
BH401	Made Ground	Slow inflow at 4.2m.
BH401	Middle Coal Measures	Water strike at 11m[1], rising to 9.7m after around 40 minutes.

Notes:
1. Strike tentatively identified by driller – inflow potentially masked due to water flush drilling method.

5 References

BS 5930:2015. Code of practice for ground investigations. British Standards Institution.

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

Eurocode 7. BS EN 1997-1:2004+A1:2013 Eurocode 7. Geotechnical design. General rules. British Standards Institution.

Eurocode 7. BS EN 1997-2:2007 Eurocode 7. Geotechnical design. Ground investigation and testing.

Figure 1 Investigation Point Plan

esp
ENGINEERS
GEOLOGISTS
SCIENTISTS

Notes:

⊗ Borehole Location

Base map from OS mapping of the area, provided by the client.

PROJECT:
96 CYFYNG ROAD, PANTTEG LANDSLIP

Scale: 1:400 (approx.) at A3

FIGURE 1:
EXPLORATORY HOLE LOCATION PLAN

EARTH SCIENCE PARTNERSHIP
33 Cardiff Road, Taffs Well,
Cardiff CF15 7RB Tel: 029 2081 3385
enquiries@earthsciencepartnership.com

5859e.07.2937

Appendix A Borehole Log

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Start date:	09-11-2017	Driller:	APEX	Project Name: 96 Cyfyng Road, Pantteg	Drilling method: Rotary cored
End date:	10-11-2017	Logged by:	ESP-AW	Site Location: Pantteg, Ystalyfera	Equipment: Beretta T44
Backfill date:	10-11-2017	Date logged:	10-11-2017	Client: NPTCBC	Ground Level: 106.80 mOD
				Project No: 5859e.07	Easting: 276267 m
					Northing: 208268 m

BH401

Core Details and SPT Data

Depth (Length)	TCR (%)	SCR (%)	RQD (%)	FI	SPT-N
					0 (2,1/0,0,0,0)
1.20 - 2.70 (1.50)	67				0 (1,0/0,0,0,0)
2.70 - 4.20 (1.50)	67				10 (2,2/3,2,2,3)
4.20 - 5.70 (1.50)	90	0	0		50 (5,8/50 for 270mm)
5.70 - 6.50 (0.80)	100	0	0		50 (12,13/50 for 190mm)
6.50 - 8.00 (1.50)	100	0	0	NI	50 (16,9/50 for 160mm)
8.00 - 9.00 (1.00)	100	0	0		50 (25 for 75mm/50 for 75mm)
9.00 - 9.50 (0.50)	100	0	0		

Strata Details

Depth	Description	Legend	Water: Strikes/ Standing	Depth: Depth (Thickness)	Depth: mOD
0.0	CONCRETE			(0.15)	106.65
0.15	Probably medium dense black sandy fine to coarse GRAVEL and COBBLES of subangular sandstone. (MADE GROUND)			0.15	
1.20	Very loose dark brown sandy GRAVEL of fine to coarse angular to subangular sandstone with some coal. Occasional pieces of polystyrene. (MADE GROUND)			(1.05)	
2.30	Very soft brown mottled orange-brown clayey silty very sandy GRAVEL with occasional partially decomposed wood. Gravel is fine to coarse angular mudstone, siltstone and coal. (MADE GROUND)			1.20	105.60
3.50	Soft grey silty sandy slightly gravelly CLAY with occasional partially decomposed wood and fragments of possible slag. Gravel is subangular to angular fine to coarse mudstone. (MADE GROUND)			(1.10)	
4.00	Stiff brown, orange and grey gravelly very sandy CLAY. Gravel is angular, tabular siltstone with orange surface discolouration. (GRADE E SOUTH WALES MIDDLE COAL MEASURES FORMATION)			2.30	104.50
5.80	Becoming sandy very clayey silty GRAVEL			(1.20)	
6.50	Very dense slightly clayey sandy GRAVEL of fine to coarse angular siltstone with orange surface discolouration. (GRADE D SOUTH WALES MIDDLE COAL MEASURES)			3.50	103.30
9.00	Very dense grey and orange sandy GRAVEL of angular, tabular mudstone with orange surface discoloration and thin to thick relic laminae. (GRADE D SOUTH WALES MIDDLE COAL MEASURES FORMATION)			(0.50)	
9.45	Very weak black partially weathered thinly to thickly laminated MUDSTONE. Orange discolouration on fracture surfaces, and occasionally on the surface of laminae. (Recovered as a slightly clayey fine to coarse angular gravel).			4.00	102.80
				(1.80)	
				5.80	101.00
				(0.70)	
				6.50	100.30
				(2.50)	
				9.00	97.80
				(0.45)	
				9.45	97.35

Backfill/ Install-ations

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
09-11-2017	04:30	8.00	5.70	Dry
10-11-2017	08:00	8.00	5.70	Dry
10-11-2017	12:00	12.00	5.70	9.7

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
09-11-2017	12:00	4.20	4.20	0.00	4.20	
10-11-2017	12:00	11.00	5.70	40.00	9.70	

Hole Diameter

Hole Depth	Hole Diameter
12.00	73

Casing Diameter

Casing Diameter	Casing Depth
140	5.70

General Remarks

1. Coordinates and elevation interpolated from recent LiDAR data (ESP, 2017) from the area.
2. Hand-dug pit excavated to 1.2m to check location for the presence of services.
3. Borehole excavated utilising dynamic sampling to a depth of 9.0m followed by rotary coring to a maximum depth of 12m.

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Project Name:	96 Cyfyng Road, Pantteg
Site Location:	Pantteg, Ystalyfera
Client:	NPTCBC
Project No:	5859e.07
Drilling method	Rotary cored
Equipment	Beretta T44

BH401

Start date:	09-11-2017	Driller:	APEX
End date:	10-11-2017	Logged by:	ESP-AW
Backfill date:	10-11-2017	Date logged:	10-11-2017
Ground Level:	106.80 mOD		
Easting:	276267 m		
Northing:	208268 m		

Core Details and SPT Data

Depth (Length)	TCR (%)	SCR (%)	RQD (%)	FI	SPT-N
9.50 - 10.50 (1.00)	100	67	27	12	50 (25 for 85mm/50 for 20mm)
10.50 - 12.00 (1.50)	100	68	42	7 13	50 (25 for 50mm/50 for 15mm)

Strata Details

Depth	Description	Legend	Water Strikes/ Standing	Depth (Thickness)	Depth mOD	Backfill/ Install-ations
10.5	(GRADE B SOUTH WALES MIDDLE COAL MEASURES FORMATION) Weak becoming very strong dark grey fresh sandy SILTSTONE with a high content of fossilised plant debris to 10.4m. (SOUTH WALES MIDDLE COAL MEASURES)			(2.55)		
12.0	End of Borehole at 12.000m			12.00	94.80	

Progress & Standing Water Levels

Date	Time	Hole Depth	Casing Depth	Water Depth
09-11-2017	04:30	8.00	5.70	Dry
10-11-2017	08:00	8.00	5.70	Dry
10-11-2017	12:00	12.00	5.70	9.7

Water Strikes

Date	Time	Strike Depth	Casing Depth	Elapsed Minutes	Depth to Water	Depth Sealed
09-11-2017	12:00	4.20	4.20	0.00	4.20	
10-11-2017	12:00	11.00	5.70	40.00	9.70	

Hole Diameter

Hole Depth	Hole Diameter
12.00	73

Casing Diameter

Casing Diameter	Casing Depth
140	5.70

General Remarks

1. Coordinates and elevation interpolated from recent LiDAR data (ESP, 2017) from the area.
2. Hand-dug pit excavated to 1.2m to check location for the presence of services.
3. Borehole excavated utilising dynamic sampling to a depth of 9.0m followed by rotary coring to a maximum depth of 12m.

Appendix B Core Photographs

APPENDIX B – CORE PHOTOGRAPHS

Borehole:	BH401		
Depth range:	1.2 – 4.2m	Date of coring:	9th November 2017

Full core box overview

Left hand side of box

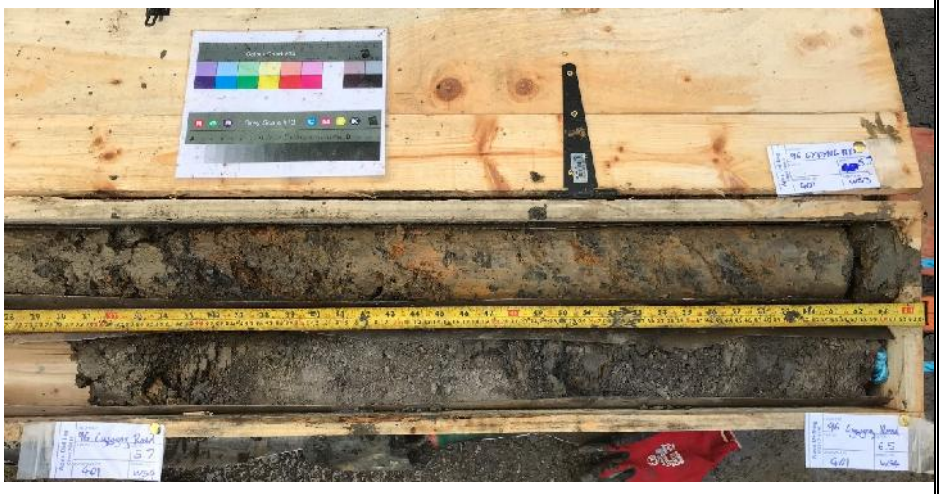
Right hand side of box

Borehole:	BH401		
Depth range:	4.2 – 6.5m	Date of coring:	9th November 2017

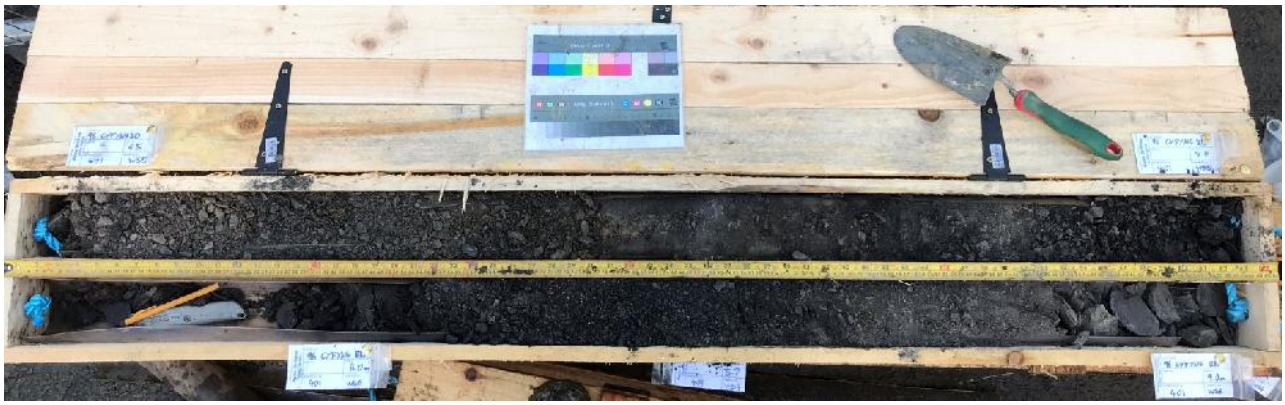
Full core box overview

Left hand side of box

Right hand side of box



Borehole:	BH401		
Depth range:	6.5 – 9.0m	Date of coring:	9th November 2017



Full core box overview

Left hand side of box

Right hand side of box

Borehole:	BH401		
Depth range:	9.0 – 10.5m	Date of coring:	10th November 2017

Full core box overview

Left hand side of box

Right hand side of box

Borehole:	BH401		
Depth range:	10.5 – 12.0m	Date of coring:	10th November 2017

Full core box overview

Left hand side of box

Right hand side of box

Appendix C Geotechnical Laboratory Testing

Laboratory Report

2788

GEO Site & Testing Services Ltd

Contract Number: 37339

Client Ref: **5859e.07**
Client PO: **6561**

Report Date: **28-11-2017**

Client **Earth Science Partnership**
33 Cardiff Road
Taff's Well
Cardiff
CF15 7RB

Contract Title: **Pantteg, Ystalyfera**
For the attention of: **Mat Elcock**

Date Received: **20-11-2017**
Date Commenced: **20-11-2017**
Date Completed: **28-11-2017**

Test Description	Qty
Moisture Content 1377 : 1990 Part 2 : 3.2 - * UKAS	3
4 Point Liquid & Plastic Limit (LL/PL) 1377 : 1990 Part 2 : 4.3 & 5.3 - * UKAS	3
Uniaxial Compressive Strength of Rock incl sample prep 54-165mm diameter cores ISRM Part 1 Methods For Rock Characterisation 1974-2006 - @ Non Accredited Test	1
Determination of Point Load Value Axial or Diametrical including WC ISRM Suggested Method for Point Load Strength 1974-2006 - * UKAS	5
PSD Wet Sieve method 1377 : 1990 Part 2 : 9.2 - * UKAS	3
Disposal of Samples on Project	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

Approved Signatories:
Alex Wynn (Associate Director) - Ben Sharp (Contracts Manager) - Emma Sharp (Office Manager)
Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) - Sean Penn (Administrative Assistant)
Vaughan Edwards (Managing Director) - Wayne Honey (Administrative/Quality Assistant)

GEO Site & Testing Services Ltd
Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GSTL	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377 : Part 2 : 1990 Method 5)	
Contract Number	**37339**	
Site Name	**Pantteg, Ystalyfera**	

Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing .425mm %	Remarks
BH401	2		0.50	-		20	38	16	22	41	CI Intermediate Plasticity
BH401	1		3.80	-		27	40	24	16	62	CI Intermediate Plasticity
BH401	2		5.10	-		19	38	25	13	34	MI Intermediate Plasticity
				-							
				-							
				-							
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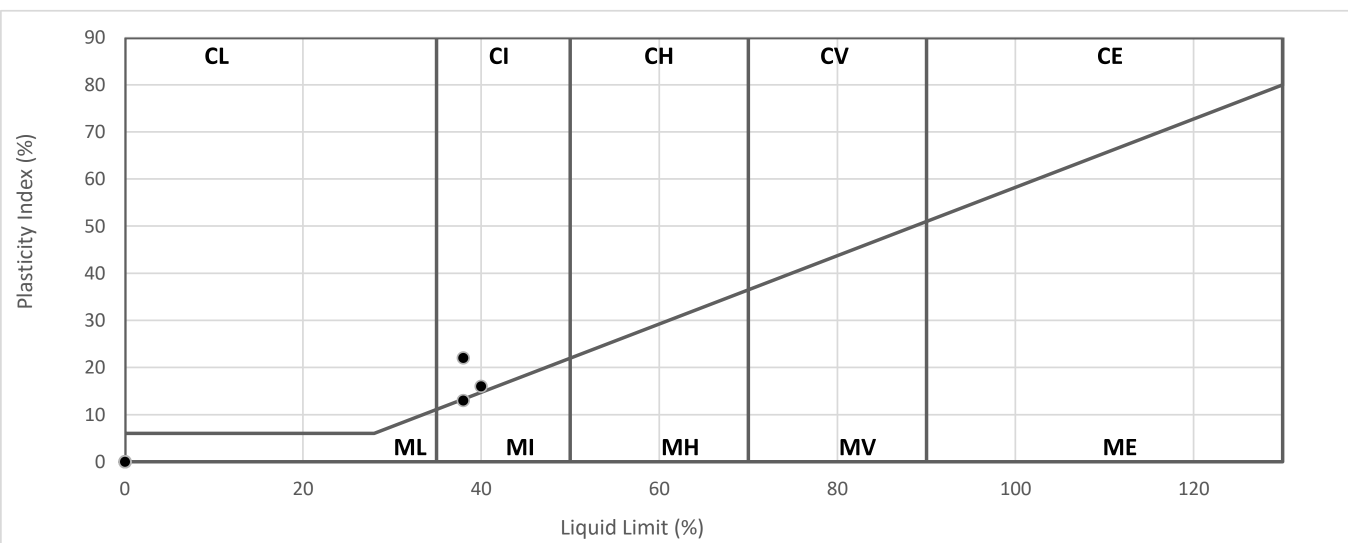
				-							

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

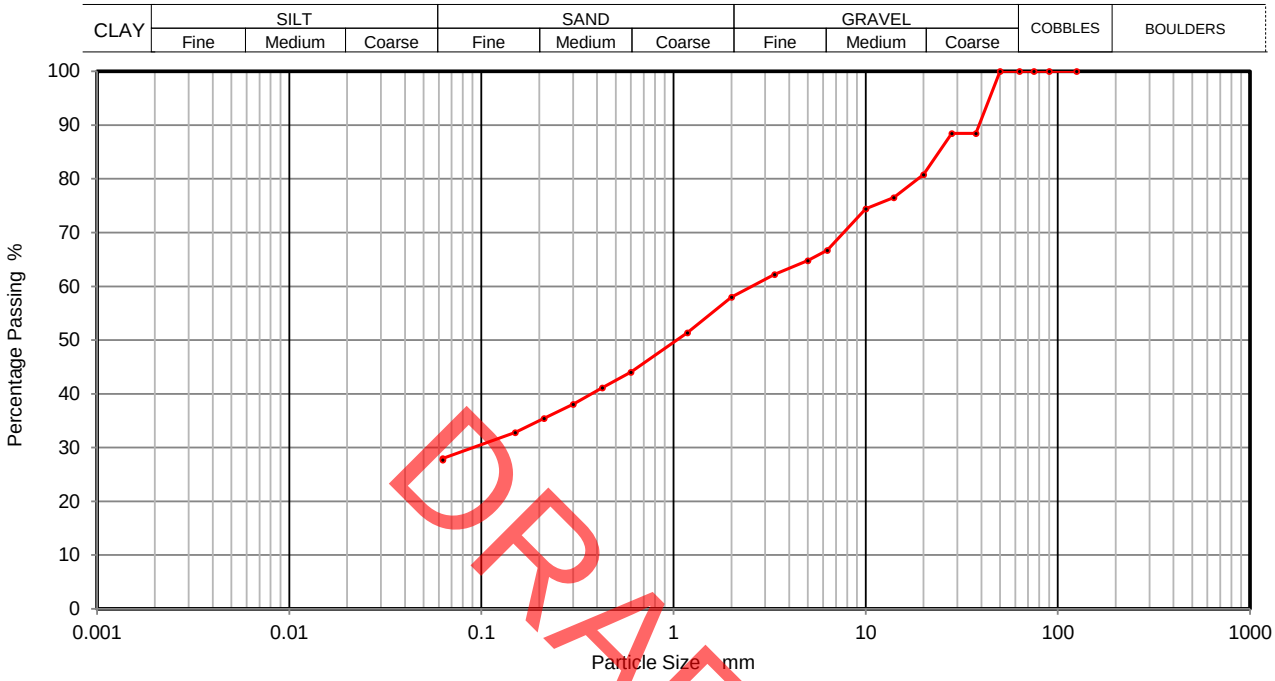
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010



Operators	Checked	27-11-17	Emma Sharp	[signature]
DB	Approved	28-11-17	Paul Evans	[signature]

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	37339
		Borehole/Pit No.	BH401
Site Name	**Pantteg, Ystalyfera**	Sample No.	2
Soil Description	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL.	Depth Top	2.50
		Depth Base	
		Sample Type	T



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	88		
28	88		
20	81		
14	77		
10	74		
6.3	67		
5	65		
3.35	62		
2	58		
1.18	51		
0.6	44		
0.425	41		
0.3	38		
0.212	35		
0.15	33		
0.063	28		

Sample Proportions	% dry mass
Cobbles	0
Gravel	42
Sand	30
Silt and Clay	28

Grading Analysis	
Uniformity Coefficient	

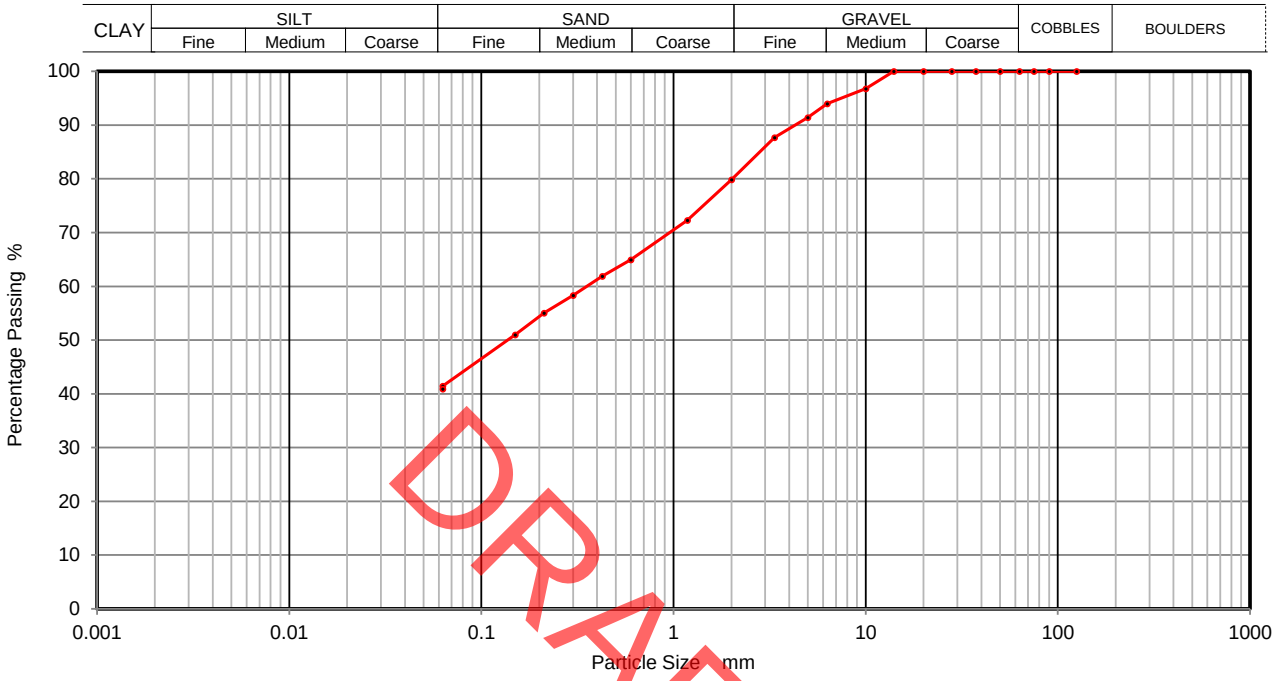
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	27-11-17	Emma Sharp	
RO/MH	Approved	28-11-17	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	37339
		Borehole/Pit No.	BH401
Site Name	Pantteg, Ystalyfera	Sample No.	1
Soil Description	Grey fine to coarse gravelly fine to coarse sandy silty CLAY.	Depth Top	3.80
		Depth Base	
		Sample Type	T



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	97		
6.3	94		
5	91		
3.35	88		
2	80		
1.18	72		
0.6	65		
0.425	62		
0.3	58		
0.212	55		
0.15	51		
0.063	41		

Sample Proportions	% dry mass
Cobbles	0
Gravel	20
Sand	39
Silt and Clay	41

Grading Analysis	
Uniformity Coefficient	

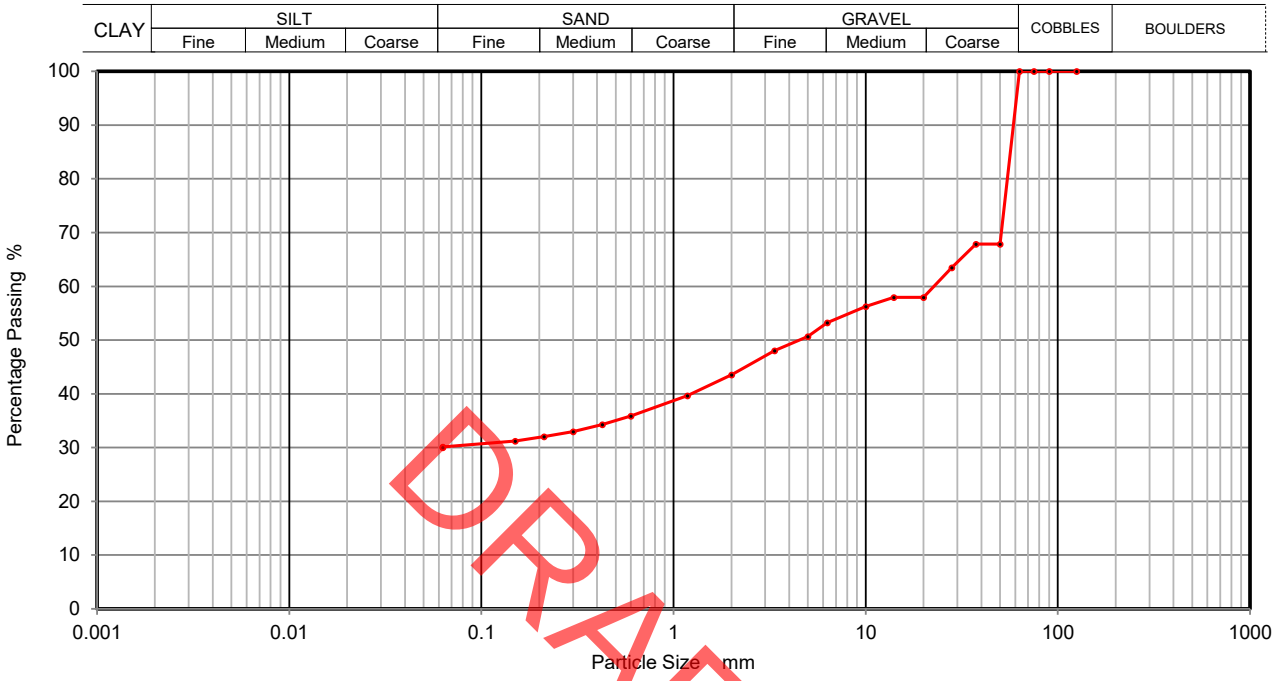
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	27-11-17	Emma Sharp	
RO/MH	Approved	28-11-17	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	37339
		Borehole/Pit No.	BH401
Site Name	Pantteg, Ystalyfera	Sample No.	2
Soil Description	Brown fine to coarse sandy silty fine to coarse GRAVEL.	Depth Top	5.10
		Depth Base	
		Sample Type	T



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	68		
37.5	68		
28	63		
20	58		
14	58		
10	56		
6.3	53		
5	51		
3.35	48		
2	44		
1.18	40		
0.6	36		
0.425	34		
0.3	33		
0.212	32		
0.15	31		
0.063	30		

Sample Proportions	% dry mass
Cobbles	0
Gravel	56
Sand	14
Silt and Clay	30

Grading Analysis	
Uniformity Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	27-11-17	Emma Sharp	
RO/MH	Approved	28-11-17	Paul Evans	

UKAS TESTING 2788

GSTL	Point Load Test Int. J. Rock Mech. Sci. & Geomech. Abstr. Vol. 22, No. 2, pp. 51 - 60, 1985.	
Contract Number	37339	
Site Name	Pantteg, Ystalyfera	
Sample Type	Core	
Date Tested	27-11-17	

Hole Reference	Depth (m)		Test Type		Width	Platen Seperation	Failure Load	Equivalent Diameter	Point Load	Size Factor	Point Load Index	Moisture Content	Description	Angle Between Plane of Anisotropy & Core Axis	Type of Anisotropy (Bedding or Cleavage)
			d / a / b / i	l //											
BH401	9.25	-	a		75	37	0.73	59.44	0.21	1.08	0.22	5.0	SILTSTONE		
	10.20	-	a		74	64	4.99	77.65	0.83	1.22	1.01	2.3	SILTSTONE		
	10.60	-	a		73	42	4.38	62.48	1.12	1.11	1.24	2.1	SILTSTONE		
	11.50	-	a		73	50	3.23	68.17	0.70	1.15	0.80	2.3	SILTSTONE		
	12.00	-	i		73	67	28.21	78.91	4.53	1.23	5.56	0.5	SILTSTONE		

Key	Reported As
Width	(W) mm
Platen Separation	(D) mm
Failure Load	(P) kN
Equivalent Diameter	(De) mm
Point Load	(Is) MPa
Size Factor	(F)
Point Load Index	(Is(50)) MPa
Moisture Content	%
Description	SC

Operators	Checked	27-11-17	Ben Sharp	
JD	Approved	28-11-17	Paul Evans	

UKAS TESTING 2788

GSTL	Determination of Unconfined Compressive Strength ISRM Suggested Methods Vol 16, No. 2, pp. 135-140 1979	
Contract Number	37339	
Site Name	Pantteg, Ystalyfera	
Sample Preperation	Sawing and Grinding	
Date Tested	28-11-17	

Hole Reference	Depth (m)			Diameter	Length	Initial Mass	Moisture Content	Bulk Density	Dry Density	Load Failure	Maximum Strength	Type of Failure
BH401	10.00			73.3	139.2	1512.6	2.20	2.57	2.52	63.5	15.0	Axial Splitting

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

Operators	Checked	27-11-17	Ben Sharp	
JD	Approved	28-11-17	Paul Evans	