



RHONDDA
GEOTECHNICAL
SERVICES

GEOTECHNICAL REPORT
ON GROUND CONDITIONS
PROPOSED INDUSTRIAL UNIT AT
R-TECH MATERIALS
TESTING HOUSE
KENFIG INDUSTRIAL ESTATE
MARGAM
PORT TALBOT
SA13 2PE
18/03/2026

This document, including any enclosures and attachments has been prepared for the exclusive use and benefit of the Client as an assessment of ground conditions at the location on the front cover. Options for foundation design are discussed. The recommendations for precise foundation design will be made by others. This report can be supplied to third persons with a legitimate interest such as Planning Officers, Structural Engineers, Construction Firms or Finance Lenders. This report is based solely on observations made during the site investigation and is limited to the remit requested by the client. Rhondda Geotechnical Services do not accept any duty, liability or responsibility for any other use of the report or use by unauthorised third parties. This report remains the intellectual property of the author. Unauthorised use will result in legal action.

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INTRODUCTION

Rhondda Geotechnical Services were initially approached by Richard Andrews Architects on behalf of a client R-Tech Materials, to investigate ground conditions at a site at Kenfig Industrial Estate, Margam. Plans have been drawn up for a new steel frame portal building at the site on land already owned by R-Tech Materials. Following initial consultations, Rhondda Geotechnical Services were formally commissioned to arrange a site investigation by Dr Dave Mumford, the Managing Director.

The R.G.S. remit was to scope suitable methods for the site investigation work via a preliminary desk study. Following this, R.G.S. were arrange and supervise contractors to carry the works out and collate the results. These were then to be presented in a factual report with foundation recommendations based on ground conditions as found. The data in the report is anticipated to be submitted to a Structural Engineer for foundation design.

The site is centred on grid reference 279510, 183690 and is at an altitude of approximately 10m A.O.D. The R-Tech site is trapezoidal and covers approximately 0.46 Ha. The proposed building footprint measures 28m x 27m on the drawing and is located in the northern corner of the site. The site of the proposed building is currently a flat featureless yard laid with aggregate. The site location is shown in Figure 1 overleaf. Figure 2 shows the site boundary as a red line with the position of the proposed building shown.

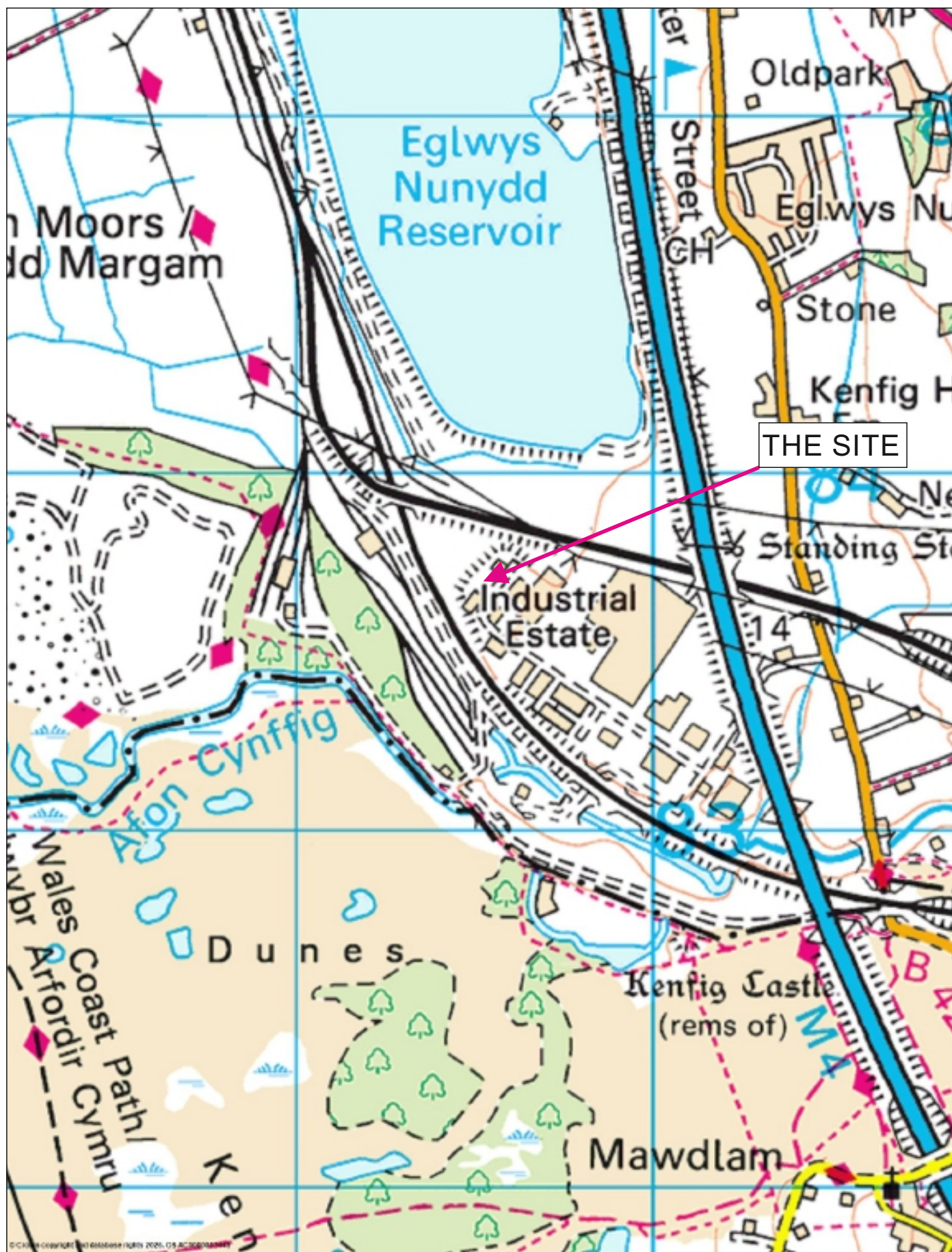


FIGURE 1
SITE LOCATION

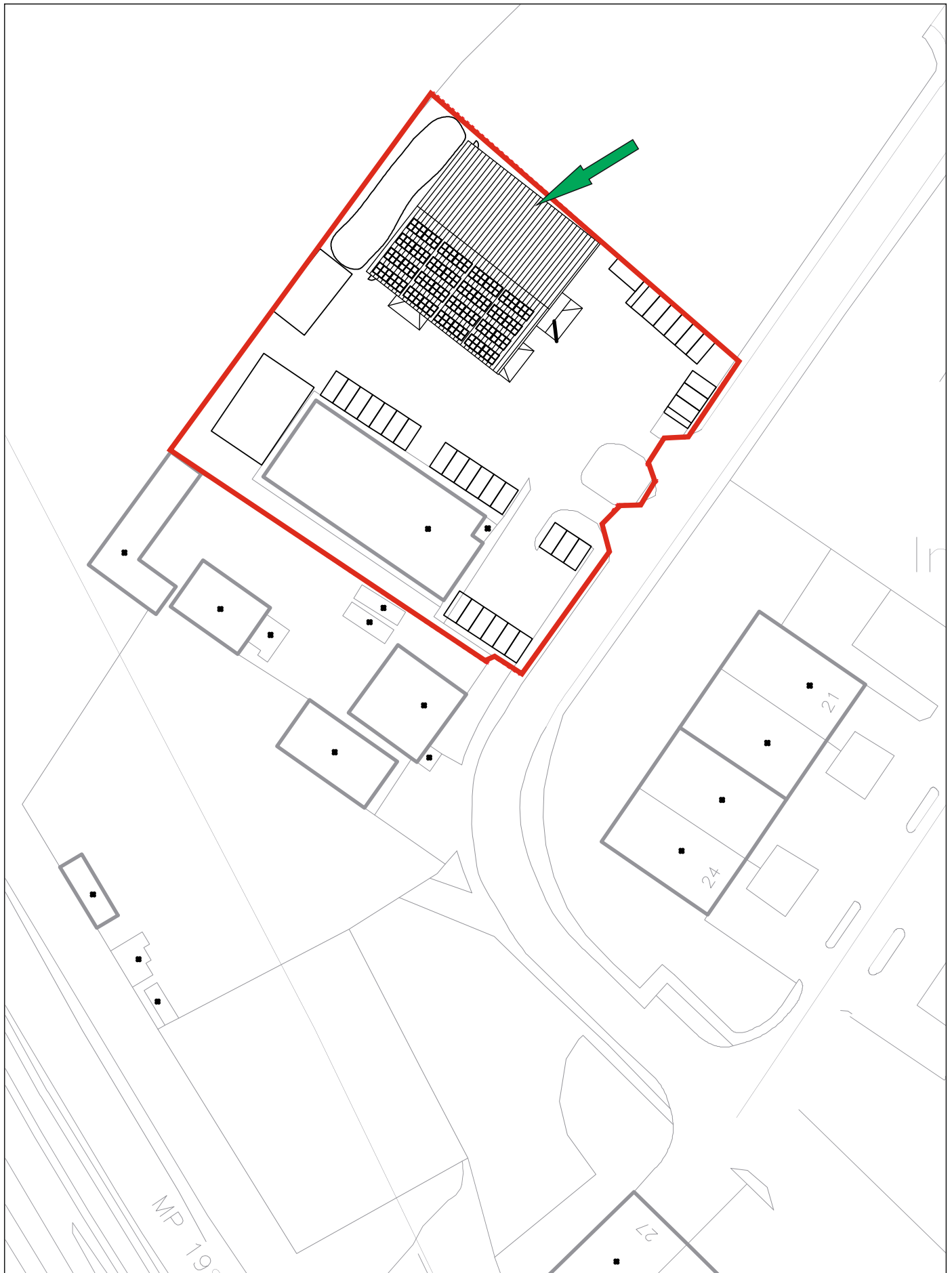


FIGURE 2
LOCATION OF PROPOSED NEW BUILDING (ARROWED).

1. SOLID GEOLOGY

Figure 3 is taken from the B.G.S. Geoindex 1:50,000 bedrock map. The site is underlain by bedrock of the Lower Coal Measures, close to their boundary with the Middle Coal Measures. To the south of the site the Coal Measures are overlain unconformably by Mercia Mudstone (formerly Keuper Marl). The Lower Coal Measures are predominantly argillaceous with subordinate Sandstones and Siltstones. The Lower Coal Measures contain multiple coal seams of economic thickness and have been heavily exploited in the past. The former Newlands Colliery was situated 1400m the east of the site. Workings from the colliery underlie part of the former Borg Warner plant on the Industrial Estate, now occupied by Amazon. The workings do not extend as far as the site. The site lies within a Coal Mining Reporting Area (C.M.R.A.) as defined by the Mining Remediation Authority. As part of any desk study within such an area, it is a requirement to look at the mining situation. Figure 4 is taken from the M.R.A. Interactive Viewer. All land within the C.M.R.A. is divided into Development High Risk and Development Low Risk areas. The hatched areas in Figure 4 are Development High Risk. The blue areas indicate recorded shallow mining. These are not connected to Newlands Colliery and are shallow outcrop workings. They are of limited extent, with the closest being 600m from the site. The purple colour indicates these linear areas are buffer zones above seam outcrops. Although orientated toward the site, these are all truncated well short of the site. This reflects the fact that the precise position of the seams is unknown because of the deep superficial deposits (see below). The Coal Measures are known to extend out to sea and across Swansea Bay. Water bearing superfcials made conditions too difficult for mining beneath the site prior to 1874 and the compulsory keeping of mine plans. There is no possibility of unrecorded mining beneath the site.

2. SUPERFICIAL DEPOSITS

Figure 5 is taken from the B.G.S. Geoindex 1:50,000 superficial deposits map. The site sits within a large area of Tidal Flat deposits. These consist of a considerable thickness of soft clays and silts. To the west these deposits are covered by blown sand. The Tidal Flats deposits are problematic for conventional foundation design because of the low bearing capacity of these soils. To the north in Figure 3, the pink colour represents Fluvioglacial deposits. These were laid down by meltwater at the end of the last Ice Age and are known to extend beneath the tidal flat deposits at the site and well past the present-day shoreline. The history and appearance of the site indicate Made Ground of unknown thickness or composition forms the present ground level.

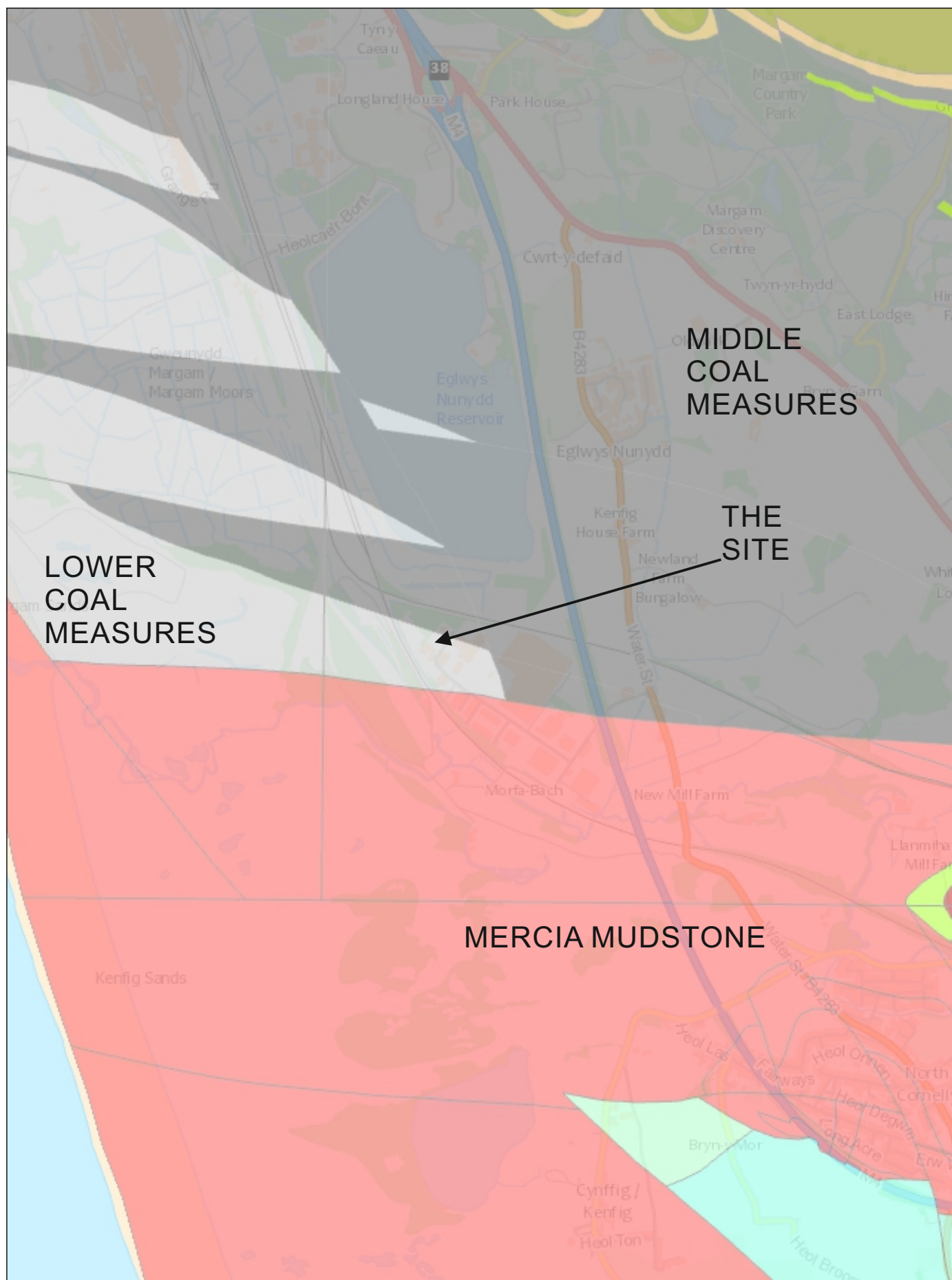


FIGURE 3
B.G.S. GEOINDEX 1:50,000 BEDROCK MAP.

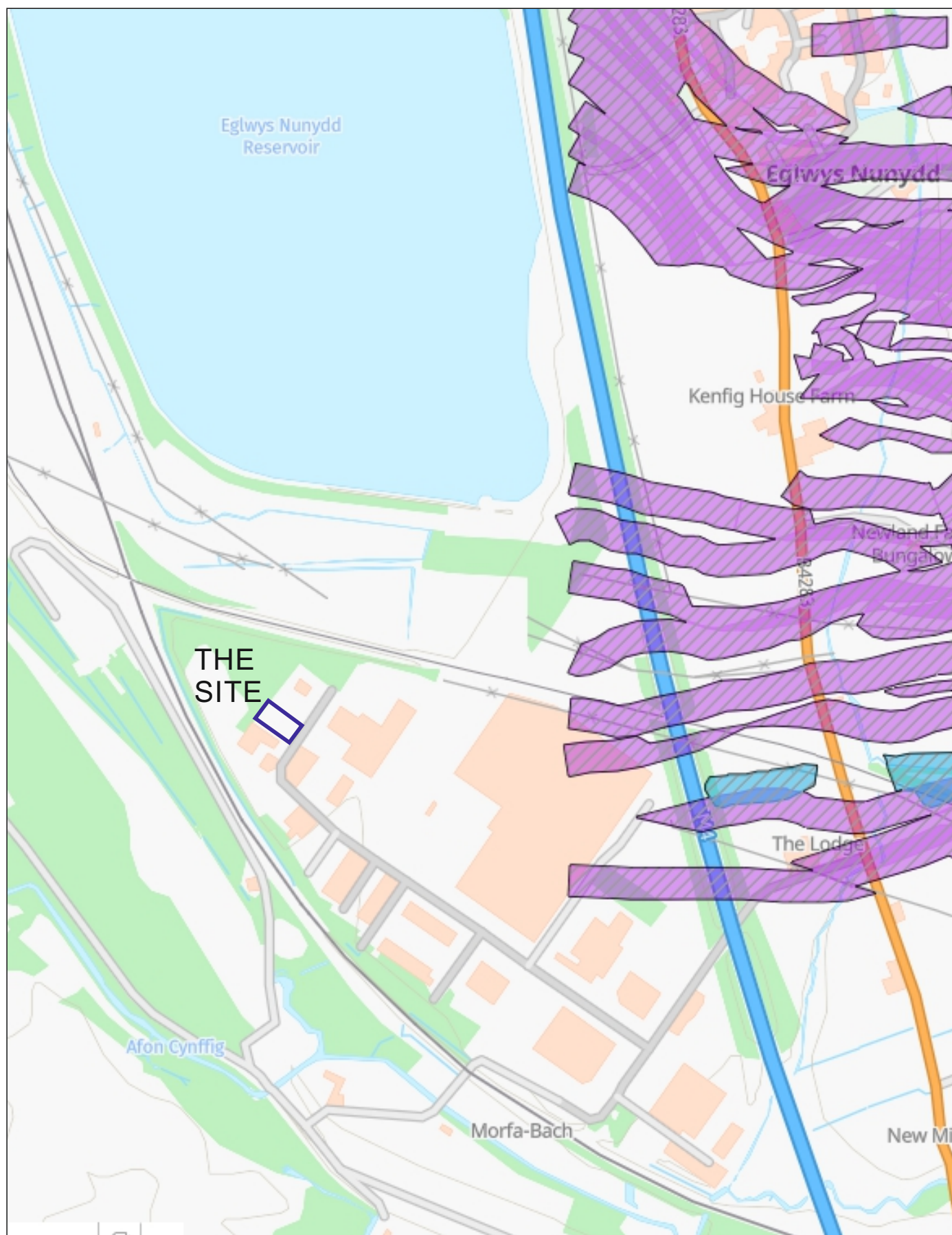


FIGURE 4
COAL AUTHORITY INTERACTIVE VIEWER.
HATCHED AREAS ARE CLASSSED AS DEVELOPMENT HIGH RISK.

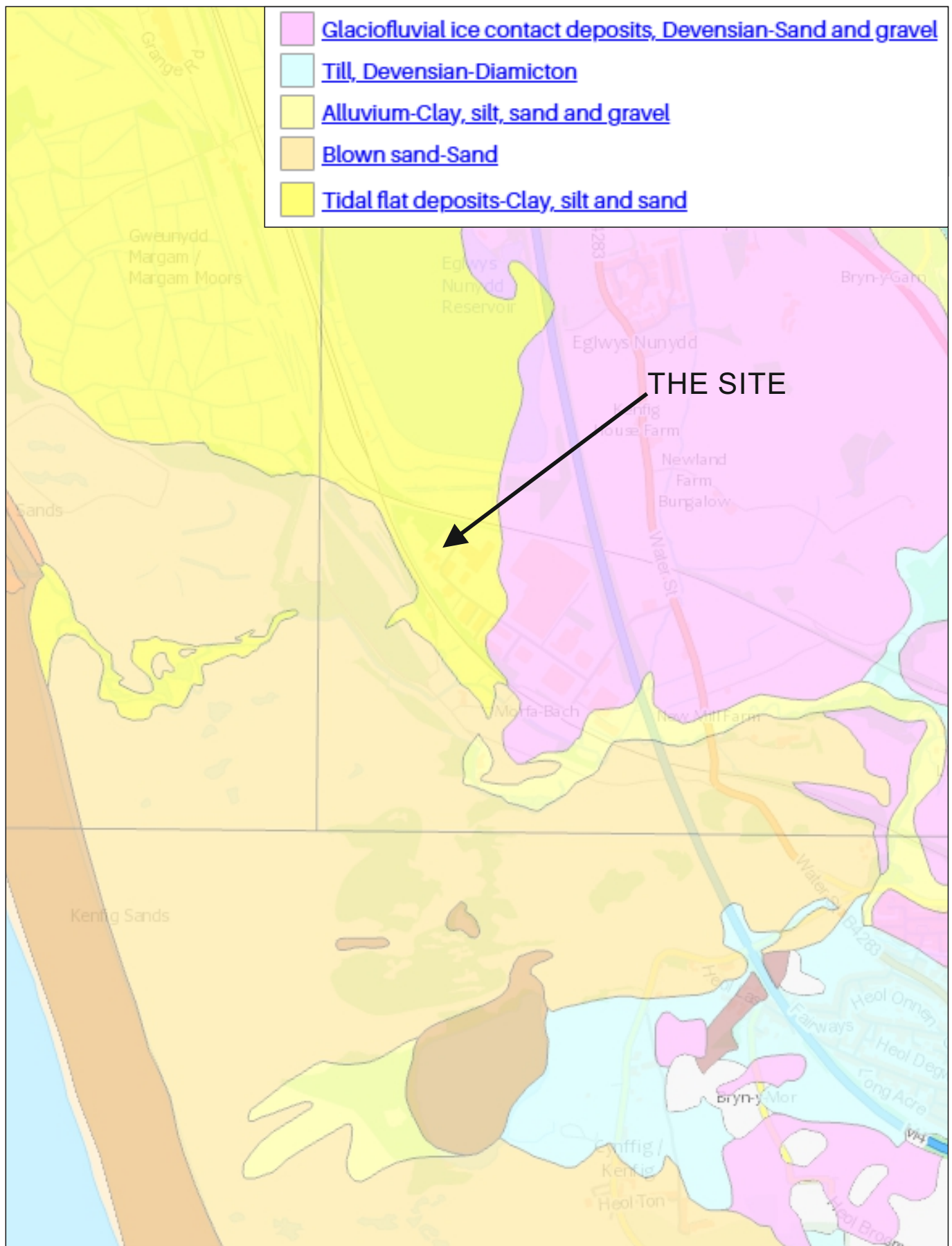


FIGURE 5
B.G.S. GEOINDEX 1:50,000 MAP OF SUPERFICIAL DEPOSITS.

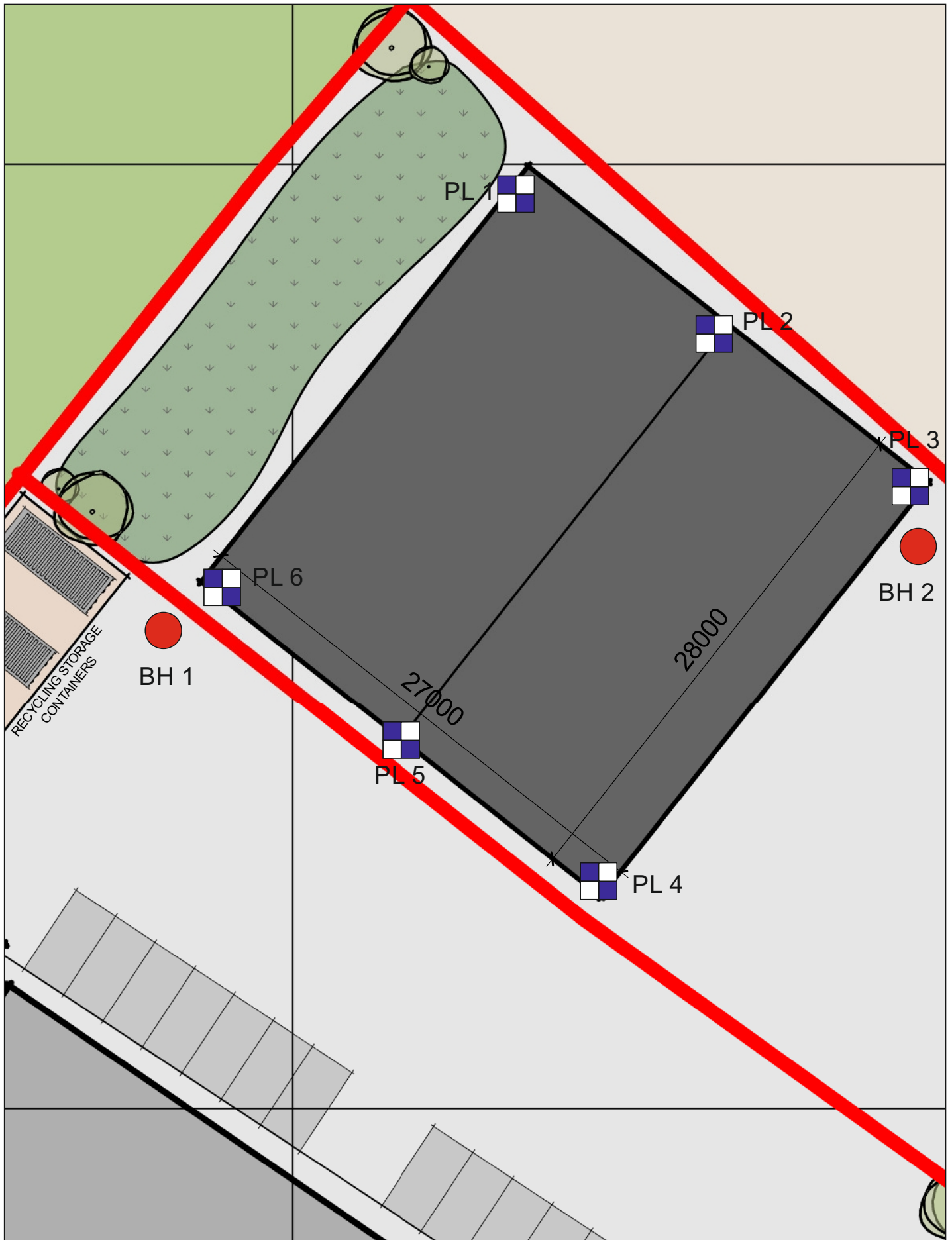


FIGURE 6
SITE INVESTIGATION LOCATIONS.
BH=BOREHOLE, PL=PLATE LOAD TEST.

3. CHOICE OF SITE INVESTIGATION METHODS

Based on the desk study material and extensive previous site investigation work in the area it was decided to initially drill two cable percussive (shell and auger) boreholes with the option of a further two, depending on findings. The purpose was to establish the extent and nature of the superficial deposits beneath the site. From previous work it was known that the Fluvioglacial deposits shown in Figure 5 would extend under the site. These have a high bearing capacity and are ideally suited for conventional foundations. The artificial nature of the surrounding landscape made it impossible to form a reliable estimate of their depth. The drilling rig and crew were supplied by Forester Drilling on the recommendation of R.G.S. to the client. The cable percussive rig was brought to site on Tuesday 24th February 2026. The borehole positions were set out by R.G.S. to be just outside the proposed building footprint at diagonally opposite corners. The positions are shown in Figure 6 on the preceding page. The drilling took four days in total and was supervised part time by Richard Davies who also logged all the samples taken.

4. SUMMARY OF SOIL CONDITIONS

Full borehole logs to BS5930:2015 have not been produced as they would be an unnecessary expense given the results. The drillers logs are attached as Appendix A. The drilling commenced at 200mm diameter. This was specified by R.G.S. at the outset to enable the borehole to be taken to the maximum depth possible. In summary, beneath approximately 200mm of aggregate laid on Terram was 3.9m (BH2)- 5.2m (BH1) of Made Ground. This was very heterogenous, consisting of demolition waste, limestone aggregate, steelworks slag and a variable proportion of firm Clay. The expected soft silty and sandy clay extended from the base of the Made Ground to 14.2m in BH1. S.P.T. tests were scheduled at 1m intervals. n values ranged from 5-8. At 14.2 the top of the fluvioglacial gravel was encountered. C.P.T. n values at 14.0m and 15.0m were 45 and 50 respectively. The density of the gravels indicated they would be suitable for end bearing driven pile design. In BH2 gravel was encountered at 10.5m. The gravel was initially clayey and medium dense with n values from 21-25. An n value of 41 was recorded at both 14m and 15m. The borehole was then terminated on the instruction of R.G.S. who believed there was already sufficient information obtained for the design of piled foundations for a relatively light building.

5. PLATE LOAD TESTING.

Piling was not the preferred option for the clients. The boreholes indicated driven piles of 15m+ would be required to reach strata suitable for end bearing. Apart from

the large former Borg Warner plant it is unlikely the smaller units on the Kenfig Industrial Estate are piled. As an alternative solution for a light portal building, founding on the Made ground could be considered. To assess this possibility, the bearing capacity of the Made Ground needed to be quantified. C.P.T. n-values from the drilling were low but the interpretation of n values in Made Ground with large particle size is difficult and unreliable with the cone tending to find the easiest way down. A more reliable method of assessing bearing capacity in these circumstances is plate loading. In this method a direct load is applied to the ground and settlement monitored. R.G.S. brought in South Wales Ground Testing to carry out the work. The testing was undertaken on Wednesday 11th March 2026. The ground was excavated to 0.2m with the aggregate and Terram removed. A JCB3CX excavator was used for the work as a counterweight for the tests. The six test locations are shown in Figure 6.

6. RESULTS

The full results are attached as Appendix B. In summary, in each location loadings were increased in 50kN/m² increments to 150kN/m². Settlements ranged from 0.50mm-1.49mm at 50kN/m², 1.03mm-4.21mm at 100kN/m² and 2.28mm-7.59mm at 150kN/m².

7. CONCLUSIONS AND RECOMMENDATIONS

It would be advisable to use the highest settlement values above to assess the bearing capacity of the Made Ground because of the presence of suspected large objects at shallow depth. Several were encountered during the cable percussive drilling. Taking the results above, the maximum settlement at a loading of 100kN/m² was 4.21mm. Settlements of this order should not be a problem for a portal building. In conclusion, the Made Ground at the site has a sufficient bearing capacity for pad foundations supporting the main columns. The loading on these columns is not known by the author at the time of writing. It is anticipated the design of the pad sizes will be carried out by a qualified Structural Engineer to incorporate a sufficient Factor of Safety and acceptable settlement based on the building loads and the bearing capacity indicated by the settlement results obtained during the testing.

Richard Davies BSc. (Hons.), MSc., F.G.S.

18.03.2026

APPENDIX A
CABLE PERCUSSIVE BOREHOLE LOGS
R-TECH MATERIALS
KENFIG INDUSTRIAL ESTATE

Tel: 07795 967491
Email: r.forester@sky.com

FORESTER DRILLING

26 Pyle Inn Way, Pyle, Bridgend CF33 6LP

DRILLERS DAILY LOG

[illegible]

Tel: 07795 967491
Email: r.forester@sky.com

FORESTER DRILLING

26 Pyle Inn Way, Pyle, Bridgend CF33 6LP

DRILLERS DAILY LOG

[illegible]

Tel: 07795 967491
Email: r.forester@sky.com

FORESTER DRILLING

26 Pyle Inn Way, Pyle, Bridgend CF33 6LP

DRILLERS DAILY LOG

[illegible]

Tel: 07795 967491
Email: r.forester@sky.com

FORESTER DRILLING

26 Pyle Inn Way, Pyle, Bridgend CF33 6LP

DRILLERS DAILY LOG

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APPENDIX B

PLATE LOADING TEST RESULTS

R-TECH MATERIALS

KENFIG INDUSTRIAL ESTATE

Plate Load Test Settlement v Time Data

11.03.26

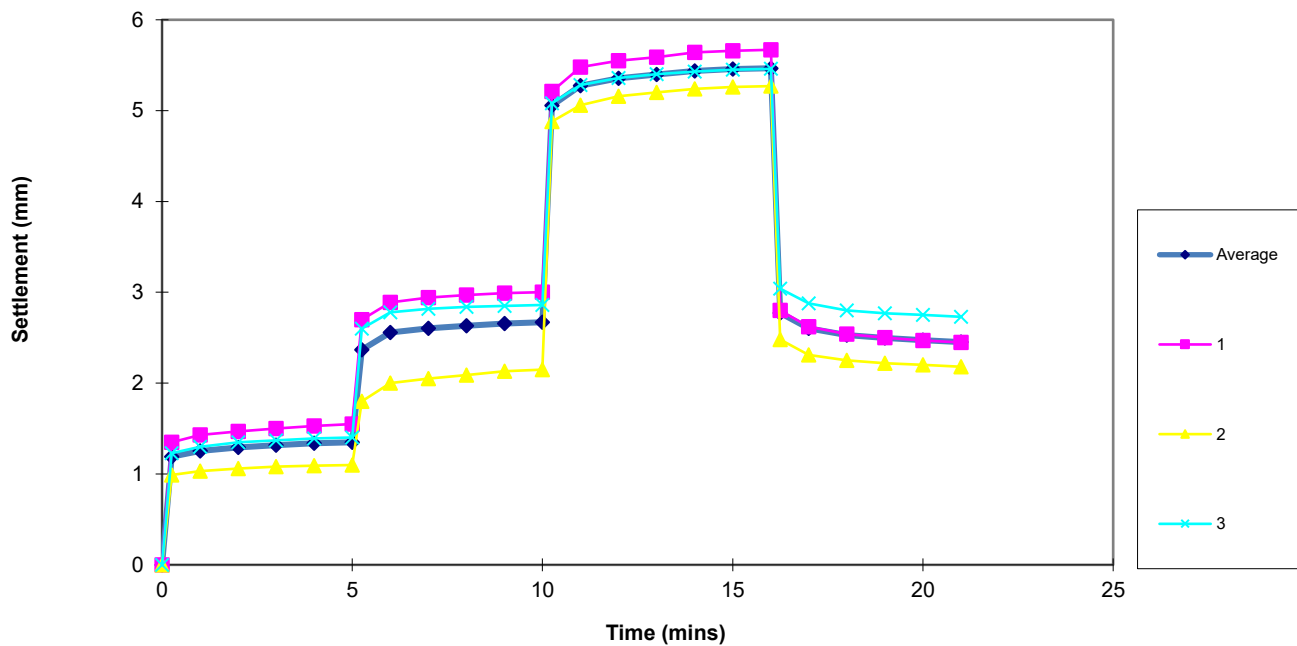
Seating Load: 5kN/m^2 

**SOUTH WALES
GROUND TESTING**

SOUTH WALES GROUND TESTING

Plate Load Test Settlement v Time Plot

Test Reference: Plate Test 1



Contract: R Tech Materials Kenfig Industrial Estate

Date: 11.03.26

South Wales Ground Testing, Unit 25, South Cornelly
Trading Estate, Bridgend, CF33 4RE



**SOUTH WALES
GROUND TESTING**

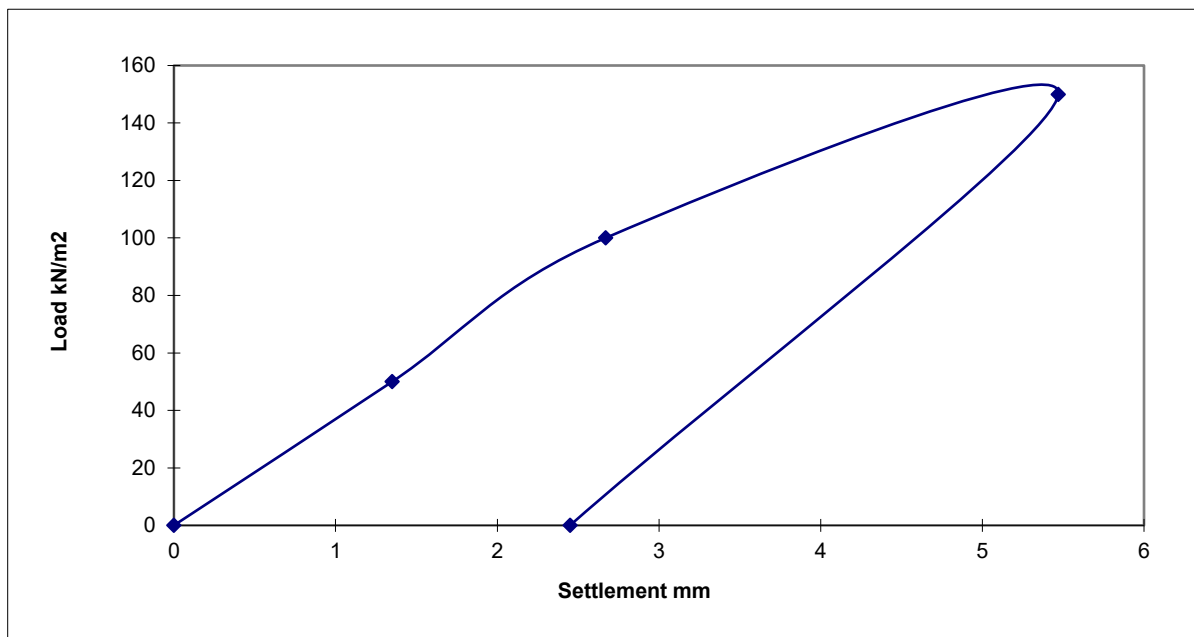
Page 2 of 3

SOUTH WALES GROUND TESTING **PLATE LOAD TEST REPORT**

Test Reference: Plate Test 1 0	Test Depth: 0.20m bgl	Plate Diameter: 600mm	Soil Description: Light brown very gravelly clay
		Counterweight:	
		Tracked excavator	Weather Conditions: Sunny

[illegible]

Deformation Modulus (E)	11.8	MN/m ²
Degree of Rebound (%)	55.2	%
Load req'd to achieve 1.25mm settlement	34.3	kN/m ²
Modulus of subgrade reaction (K762)	24954	kPa/m
Derived CBR Value	4.3	%
σ_{max}	150	kN/m ²
s at σ_{max}	5.47	mm



Notes:

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

Approved by : 
David McArthur BSc MSc ARSM

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

k762 for 600mm circular plate = pressure required to achieve 1.25mm penetration x 0.91 (HD 25/94)

Size factor correction after Croney 1991. CBR derivation from CBR USA FAA (Tuleubek and Brill)

CONTRACT:

R Tech Materials Kenfig Industrial Estate



SOUTH WALES GROUND TESTING

Date:	11.03.26
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SOUTH WALES GROUND TESTING

Plate Load Test Settlement v Time Data

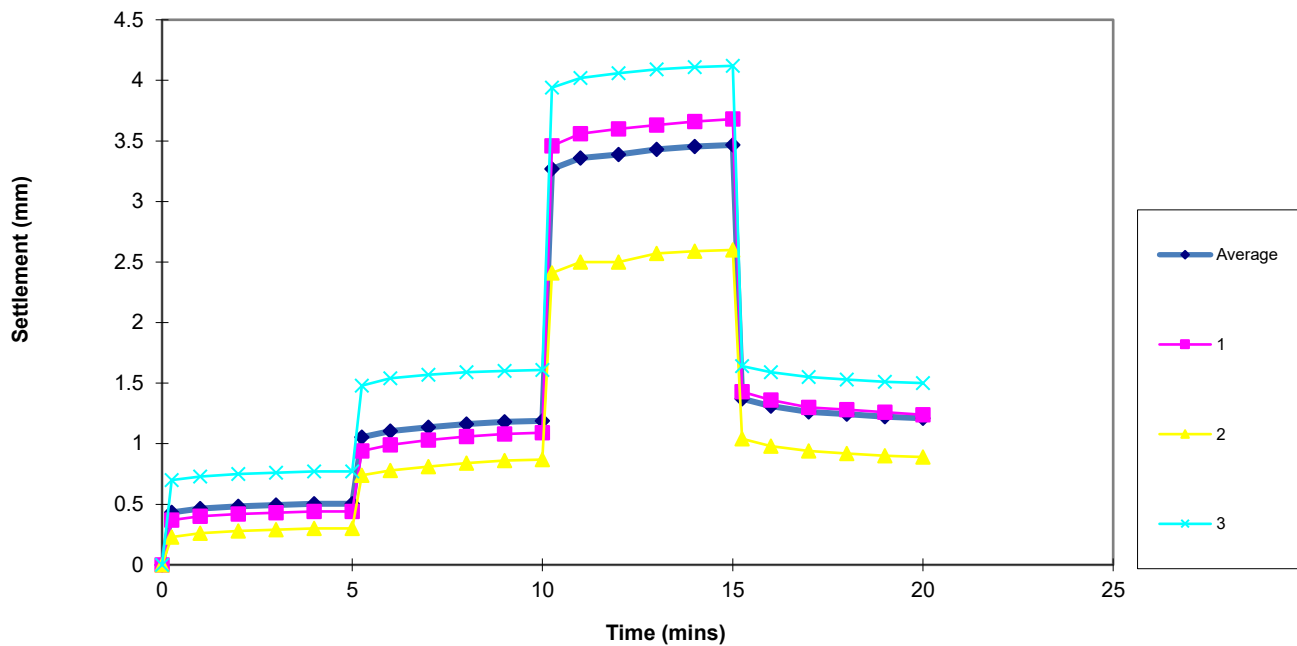
Contract: R Tech Materials Kenfig Industrial Estate			Date:	11.03.26
Test Reference: Plate Test 2		Test Depth: 0.20m bgl	Plate Diameter: 600mm	
			Seating Load: 5kN/m ²	

	Time (mins)	Travel Gauges set on plate			Average Plate Settlement mm
		Gauge 1	Gauge 2	Gauge 3	
50kN/m ² Load	0	0	0	0	0
	0.25	0.37	0.23	0.70	0.43
	1	0.40	0.26	0.73	0.46
	2	0.42	0.28	0.75	0.48
	3	0.43	0.29	0.76	0.49
	4	0.44	0.30	0.77	0.50
	5	0.44	0.30	0.77	0.50
100kN/m ² Load	5.25	0.94	0.74	1.48	1.05
	6	0.99	0.78	1.54	1.10
	7	1.03	0.81	1.57	1.14
	8	1.06	0.84	1.59	1.16
	9	1.08	0.86	1.60	1.18
	10	1.09	0.87	1.61	1.19
150kN/m ² Load	10.25	3.46	2.41	3.94	3.27
	11	3.56	2.50	4.02	3.36
	12	3.60	2.50	4.06	3.39
	13	3.63	2.57	4.09	3.43
	14	3.66	2.59	4.11	3.45
	15	3.68	2.60	4.12	3.47
0kN/m ² Unload	15.25	1.43	1.04	1.64	1.37
	16	1.36	0.98	1.59	1.31
	17	1.30	0.94	1.55	1.26
	18	1.28	0.92	1.53	1.24
	19	1.26	0.90	1.51	1.22
	20	1.24	0.89	1.50	1.21

SOUTH WALES GROUND TESTING

Plate Load Test Settlement v Time Plot

Test Reference: Plate Test 2



Contract: R Tech Materials Kenfig Industrial Estate

Date: 11.03.26

South Wales Ground Testing, Unit 25, South Cornelly
Trading Estate, Bridgend, CF33 4RE



**SOUTH WALES
GROUND TESTING**

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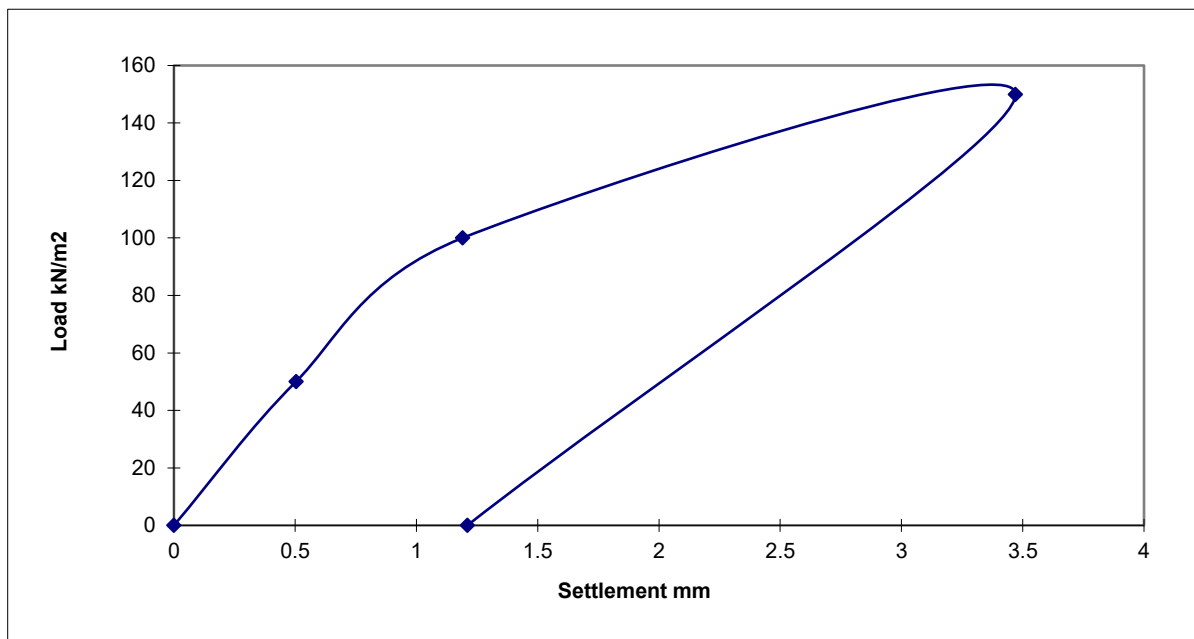
SOUTH WALES GROUND TESTING

PLATE LOAD TEST REPORT

Test Reference: Plate Test 2 0	Test Depth: 0.20m bgl	Plate Diameter: 600mm Counterweight: Tracked excavator	Soil Description: Light brown very gravelly clay Weather Conditions: Sunny
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Average Plate Settlement (mm)	Load (kN/m ²)	Time (mins)
0	0	0
0.50	50	5
1.19	100	10
3.47	150	15
1.21	0	20

Deformation Modulus (E)	18.6	MN/m ²
Degree of Rebound (%)	65.1	%
Load req'd to achieve 1.25mm settlement	54.0	kN/m ²
Modulus of subgrade reaction (K762)	39337	kPa/m
Derived CBR Value	7.8	%
σ _{max}	150	kN/m ²
s at σ _{max}	3.47	mm



Notes:

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

Approved by : *D. McArthur*
David McArthur BSc MSc ARSM

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

k762 for 600mm circular plate = pressure required to achieve 1.25mm penetration x 0.91 (HD 25/94)

Size factor correction after Croney 1991. CBR derivation from CBR USA FAA (Tulebek and Brill)

CONTRACT:
R Tech Materials Kenfig Industrial Estate



Date: 11.03.26

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Plate Load Test Settlement v Time Data

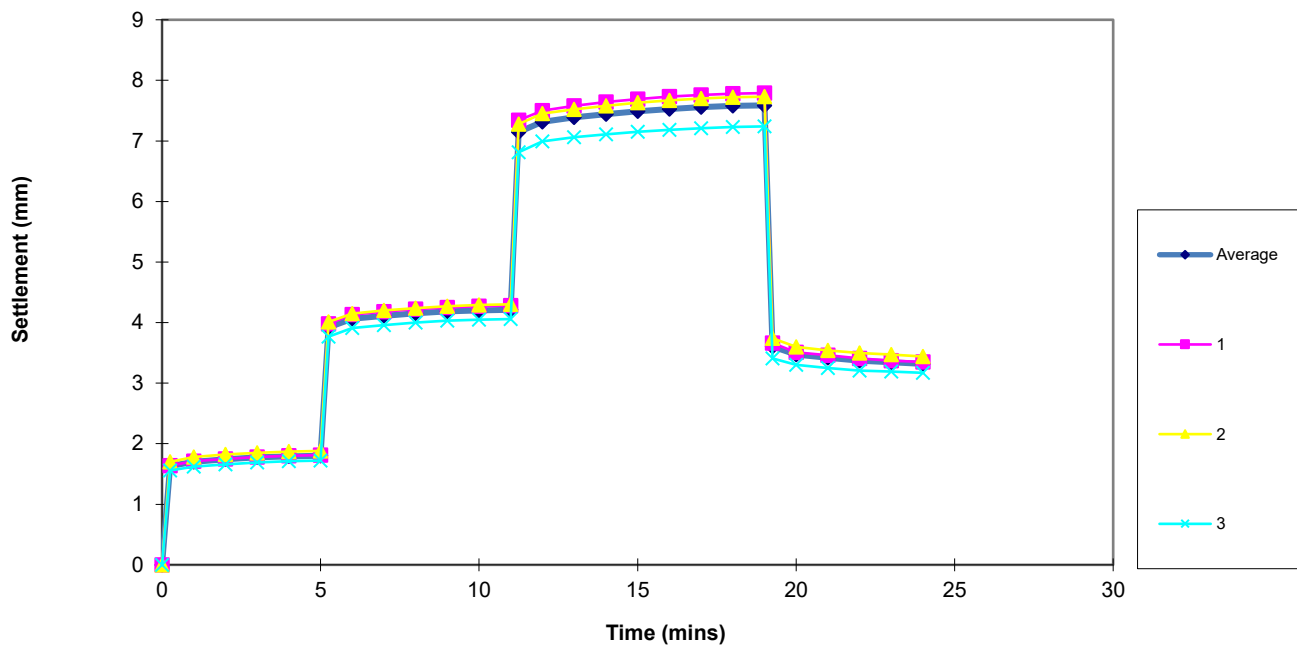
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Seating Load: 5kN/m^2 Page 1 of 3

SOUTH WALES GROUND TESTING

Plate Load Test Settlement v Time Plot

Test Reference: Plate Test 3



Contract: R Tech Materials Kenfig Industrial Estate

Date: 11.03.26

South Wales Ground Testing, Unit 25, South Cornelly
Trading Estate, Bridgend, CF33 4RE



**SOUTH WALES
GROUND TESTING**

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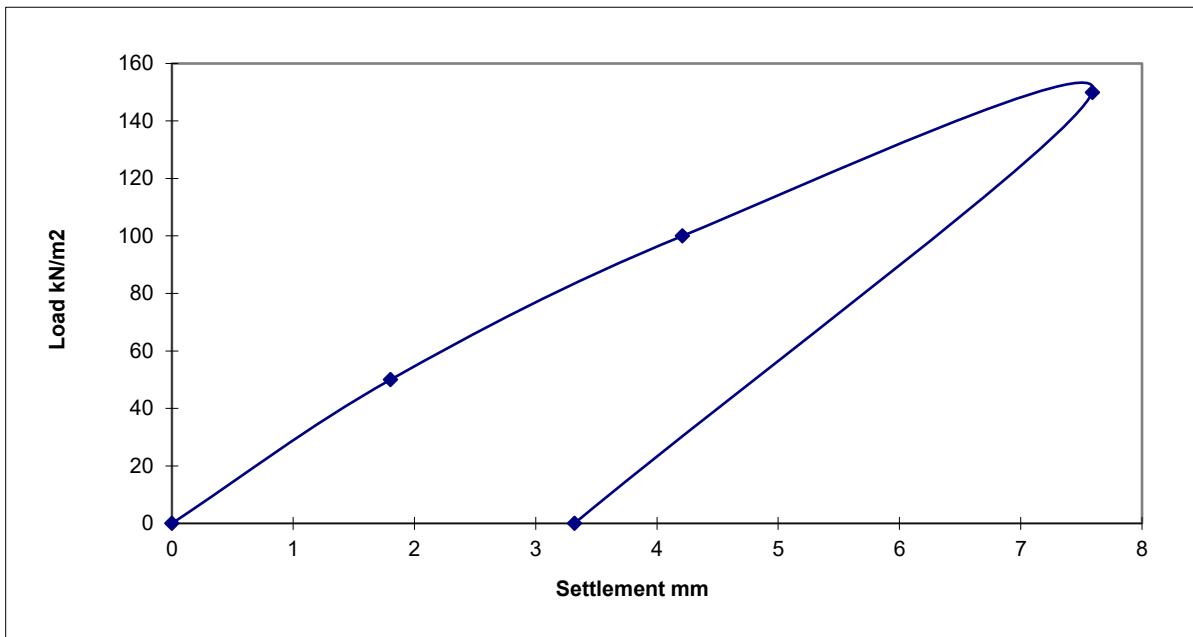
SOUTH WALES GROUND TESTING

PLATE LOAD TEST REPORT

Test Reference: Plate Test 3 0	Test Depth: 0.20m bgl	Plate Diameter: 600mm	Soil Description: Light brown very gravelly clay
		Counterweight:	
		Tracked excavator	Weather Conditions: Sunny

[illegible]

Deformation Modulus (E)	8.5	MN/m ²
Degree of Rebound (%)	56.3	%
Load req'd to achieve 1.25mm settlement	24.7	kN/m ²
Modulus of subgrade reaction (K762)	17984	kPa/m
Derived CBR Value	2.8	%
σ_{max}	150	kN/m²
s at σ_{max}	7.59	mm



Notes:

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

Approved by :

David McArthur BSc MSc ARSM

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

k762 for 600mm circular plate = pressure required to achieve 1.25mm penetration x 0.91 (HD 25/94)

Size factor correction after Croney 1991. CBR derivation from CBR USA FAA (Tuleubek and Brill)

CONTRACT:

R Tech Materials Kenfig Industrial Estate



SOUTH WALES GROUND TESTING

Date:	11.03.26
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Plate Load Test Settlement v Time Data

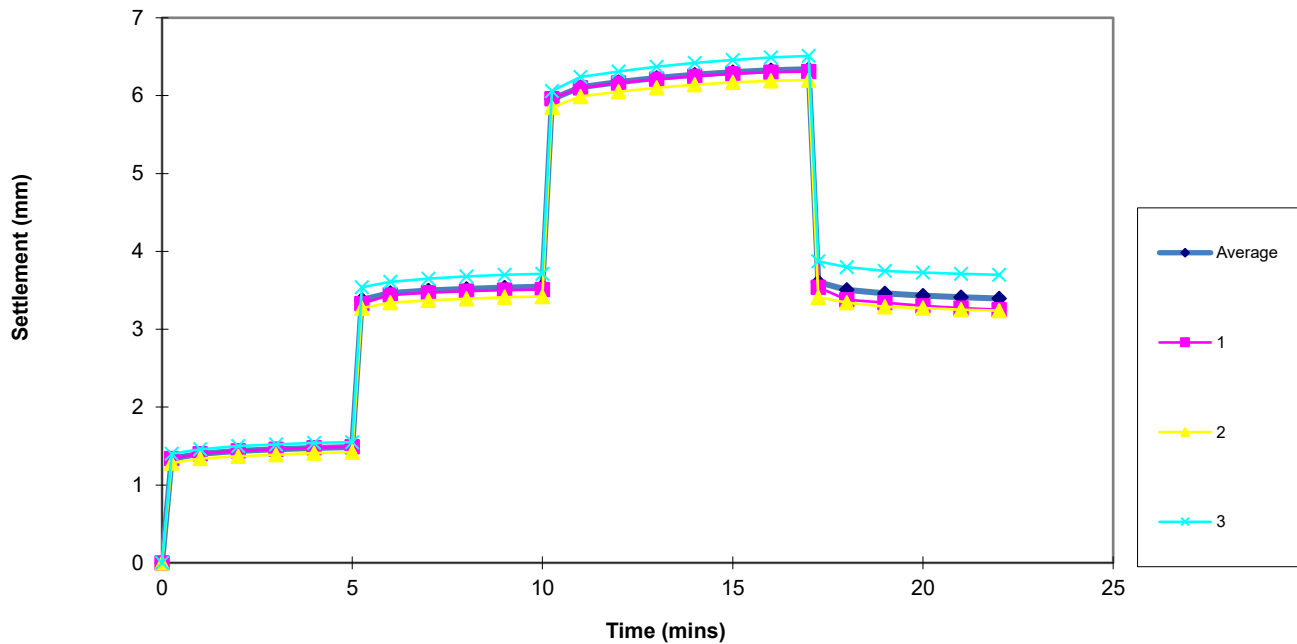
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Seating Load: 5kN/m^2 Page 1 of 3

SOUTH WALES GROUND TESTING

Plate Load Test Settlement v Time Plot

Test Reference: Plate Test 4



Contract: R Tech Materials Kenfig Industrial Estate

Date: 11.03.26

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**SOUTH WALES
GROUND TESTING**

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Plate Load Test Settlement v Time Data

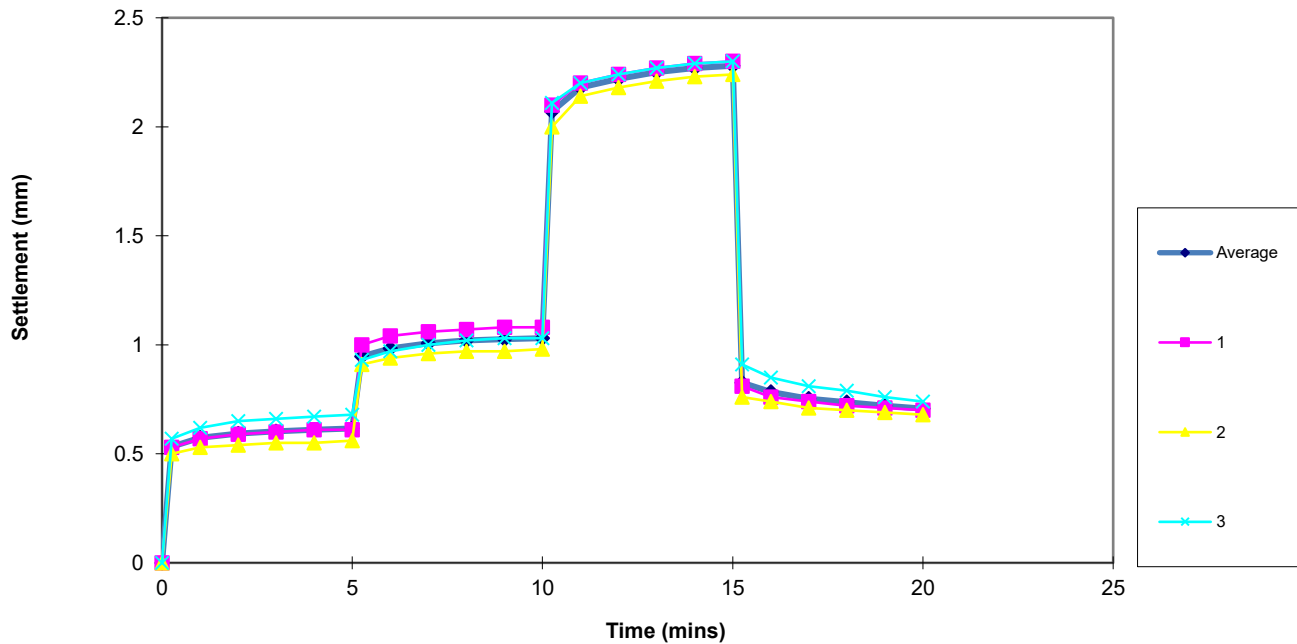
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Seating Load: 5kN/m^2 Page 1 of 3

SOUTH WALES GROUND TESTING

Plate Load Test Settlement v Time Plot

Test Reference: Plate Test 5



Contract: R Tech Materials Kenfig Industrial Estate

Date: 11.03.26

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Trading Estate, Bridgend, CF33 4RE



**SOUTH WALES
GROUND TESTING**

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SOUTH WALES GROUND TESTING

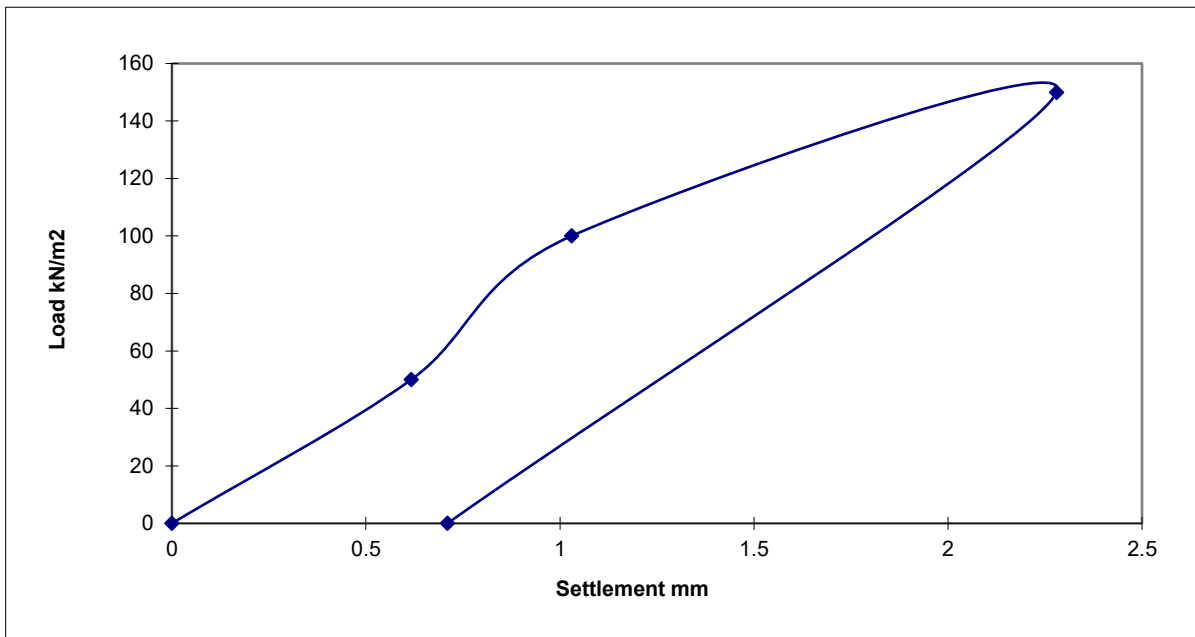
PLATE LOAD TEST REPORT

Test Reference: Plate Test 5 0	Test Depth: 0.20m bgl	Plate Diameter: 600mm	Soil Description: Light brown very gravelly clay
		Counterweight: Tracked excavator	

[illegible]

Deformation Modulus (E)	28.3	MN/m ²
Degree of Rebound (%)	68.9	%
Load req'd to achieve 1.25mm settlement	82.2	kN/m ²
Modulus of subgrade reaction (K762)	59868	kPa/m
Derived CBR Value	13.3	%

$\sigma_{\max}$	150	kN/m^2
s at $\sigma_{\max}$	2.28	mm



Notes:

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

Approved by :

David McArthur BSc MSc ARSM

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

k762 for 600mm circular plate = pressure required to achieve 1.25mm penetration x 0.91 (HD 25/94)

Size factor correction after Croney 1991. CBR derivation from CBR USA FAA (Tuleubek and Brill)

CONTRACT:

R Tech Materials Kenfig Industial Estate



SOUTH WALES GROUND TESTING

Date:	11.03.26
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SOUTH WALES GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: R Tech Materials Kenfig Industrial Estate

Date:

11.03.26

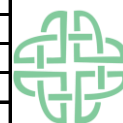
Test Reference: Plate Test 6

Test Depth: 0.20m bgl

Plate Diameter: 600mm

Seating Load: 5kN/m²

	Time (mins)	Travel Gauges set on plate			Average Plate Settlement mm
		Gauge 1	Gauge 2	Gauge 3	
50kN/m ² Load	0	0	0	0	0
	0.25	0.93	0.94	0.74	0.87
	1	1.03	1.01	0.80	0.95
	2	1.07	1.04	0.83	0.98
	3	1.10	1.06	0.85	1.00
	4	1.12	1.07	0.86	1.02
	5	1.13	1.07	0.87	1.02
100kN/m ² Load	5.25	1.60	1.57	1.50	1.56
	6	1.73	1.69	1.60	1.67
	7	1.77	1.73	1.63	1.71
	8	1.80	1.75	1.66	1.74
	9	1.82	1.77	1.69	1.76
	10	1.83	1.78	1.70	1.77
150kN/m ² Load	10.25	4.08	4.00	3.91	4.00
	11	4.27	4.21	4.10	4.19
	12	4.32	4.26	4.14	4.24
	13	4.35	4.29	4.17	4.27
	14	4.37	4.31	4.19	4.29
	15	4.38	4.32	4.20	4.30
0kN/m ² Unload	15.25	1.74	1.61	1.55	1.63
	16	1.65	1.54	1.50	1.56
	17	1.60	1.50	1.47	1.52
	18	1.57	1.47	1.45	1.50
	19	1.55	1.45	1.42	1.47
	20	1.53	1.44	1.41	1.46

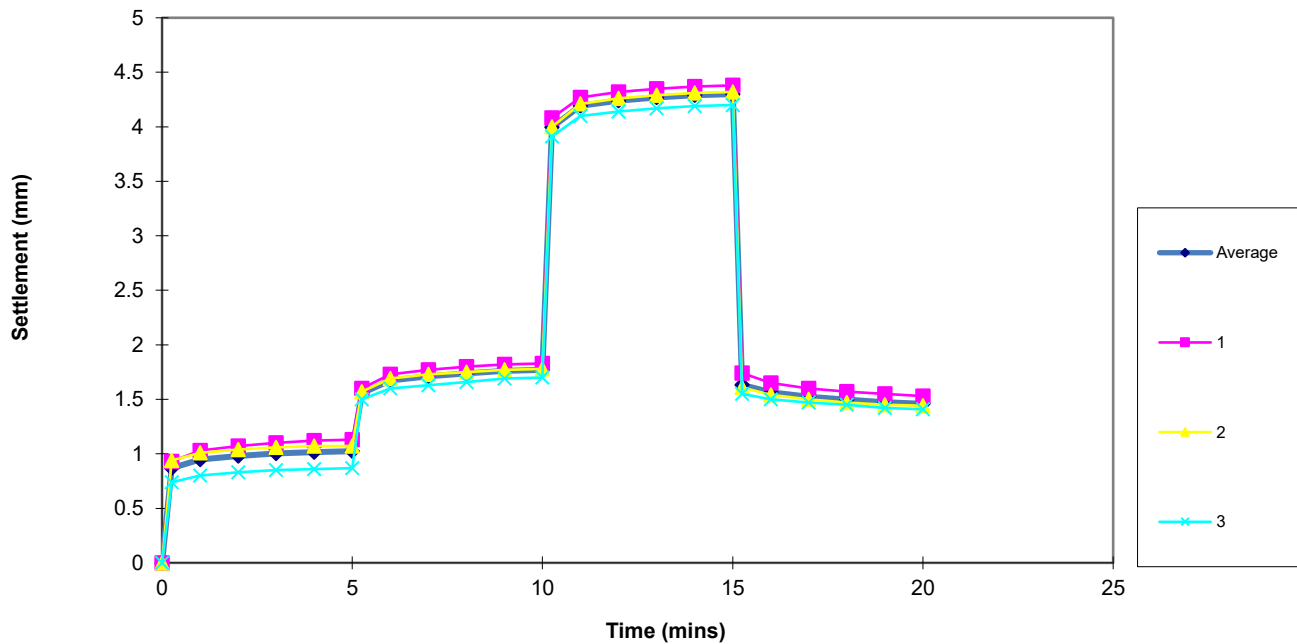


SOUTH WALES
GROUND TESTING

SOUTH WALES GROUND TESTING

Plate Load Test Settlement v Time Plot

Test Reference: Plate Test 6



Contract: R Tech Materials Kenfig Industrial Estate

Date: 11.03.26

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SOUTH WALES
GROUND TESTING

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