

Analytical Report Number : 21-57017
Project / Site name: Merthyr Tydfil

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically, (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



Laboratory Report



GEO Site & Testing Services Ltd

Contract Number: 52491

Client Ref:

Report Date: **04-02-2021**

Client PO:

Client **IDOM Merebrook**

**Mill Lane,
Cromford,
Matlock,
Derbyshire,
DE4 3RQ**

Contract Title: **Former St Tydfil Hospital**

For the attention of: **Tim Crowe**

Date Received: **04-02-2021**

Date Completed: **04-02-2021**

Test Description	Qty
Determination of the in-situ California Bearing Ratio Rate includes mobilisation of technician and 4 x 4 and provision of equipment.	1
BS 1377:1990 - Part 9 Cl 4.3 - * UKAS	

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 certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Office Manager/Director) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)

Shaun Jones (Laboratory manager) - 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



**Determination of the Vertical Deformation Tests
BS 1377: Part 9: 1990 & IAN73/06 Guidance**

Contract Number

52491

Client Reference

0

Client

IDOM Merebrook

Test Date

04/02/2021

Site Location

Former St Tydfil Hospital

Test Location

CBR 1

Soil Description

Brown silty clayey fine to coarse GRAVEL

Test Depth (m)

0.50

Kentledge Type

Tracked Excavator

Settlement (mm)	Load (kPa)
0.00	2
0.25	34
0.50	51
0.75	68
1.00	74
1.25	101
1.50	108
1.75	142
2.00	162
2.25	169
2.50	176

CBR Value %

13.7

Remarks

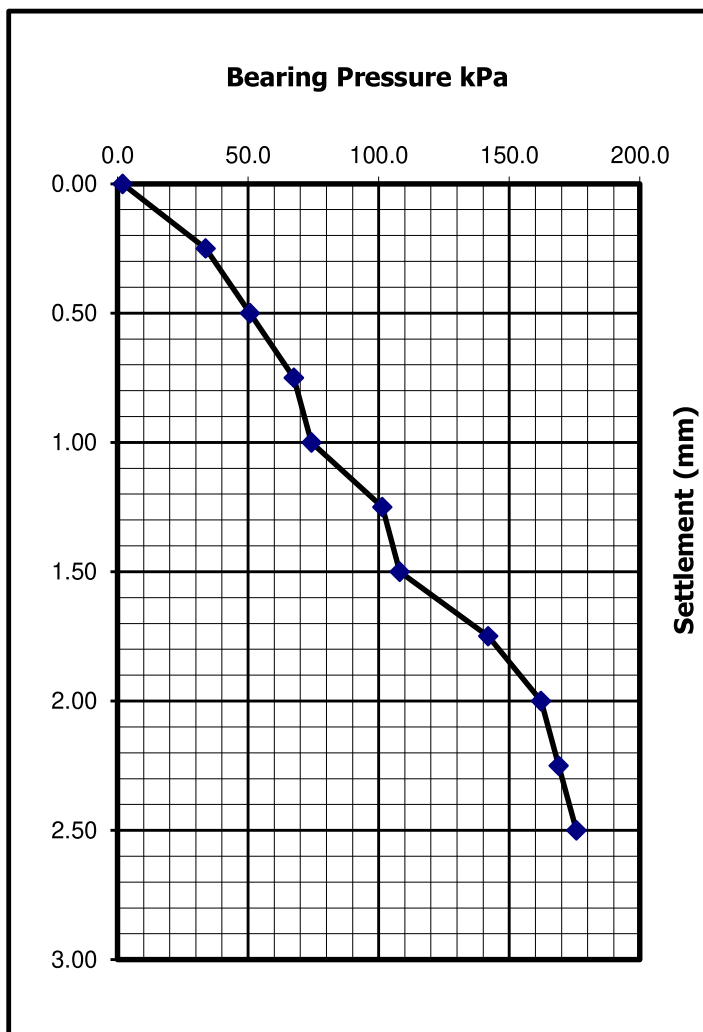
**CBR Values calculated at the pressure at
1.25mm settlement**

Plate Area (m2):

0.2884

**Applied Pressure@ 1.25mm (kPa):
Modulus of Subgrade Reaction (k):**

**101.371
65.8**



Test Operator	Checked and Authorised by		Shaun Thomas	
Dean Smith	Date	09/02/2021		





**Determination of the Vertical Deformation Tests
BS 1377: Part 9: 1990 & IAN73/06 Guidance**

Contract Number

52491

Client Reference

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Client

IDOM Merebrook

Test Date

04/02/2021

Site Location

Former St Tydfil Hospital

Test Location

CBR 2

Soil Description

Brown silty clayey fine to coarse GRAVEL

Test Depth (m)

0.50

Kentledge Type

Tracked Excavator

Settlement (mm)	Load (kPa)
0.00	2
0.25	51
0.50	68
0.75	84
1.00	118
1.25	135
1.50	152
1.75	169
2.00	203
2.25	220
2.50	237

CBR Value %

22.5

Remarks

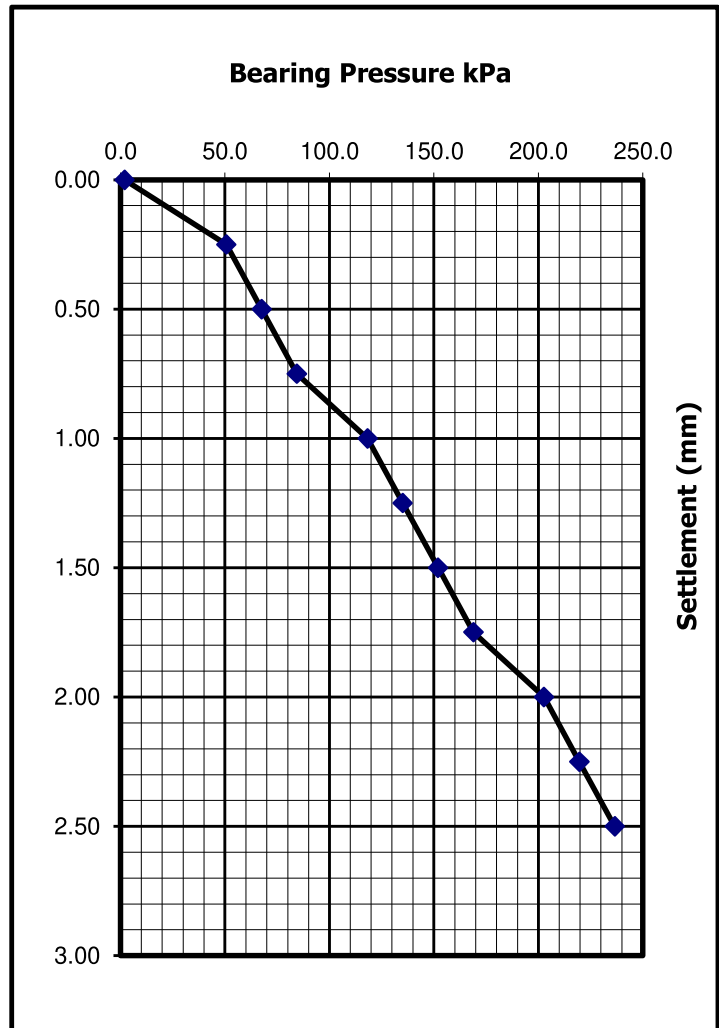
**CBR Values calculated at the pressure at
1.25mm settlement**

Plate Area (m2):

0.2884

**Applied Pressure@ 1.25mm (kPa):
Modulus of Subgrade Reaction (k):**

**135.162
87.8**



Test Operator	Checked and Authorised by		Shaun Thomas	
Dean Smith	Date	09/02/2021		





**Determination of the Vertical Deformation Tests
BS 1377: Part 9: 1990 & IAN73/06 Guidance**

Contract Number

52491

Client Reference

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Client

IDOM Merebrook

Test Date

04/02/2021

Site Location

Former St Tydfil Hospital

Test Location

CBR 4

Soil Description

Brown silty clayey fine to coarse GRAVEL

Test Depth (m)

0.80

Kentledge Type

Tracked Excavator

Settlement (mm)	Load (kPa)
0.00	2
0.25	34
0.50	41
0.75	61
1.00	74
1.25	81
1.50	95
1.75	101
2.00	115
2.25	135
2.50	169

CBR Value %

9.3

Remarks

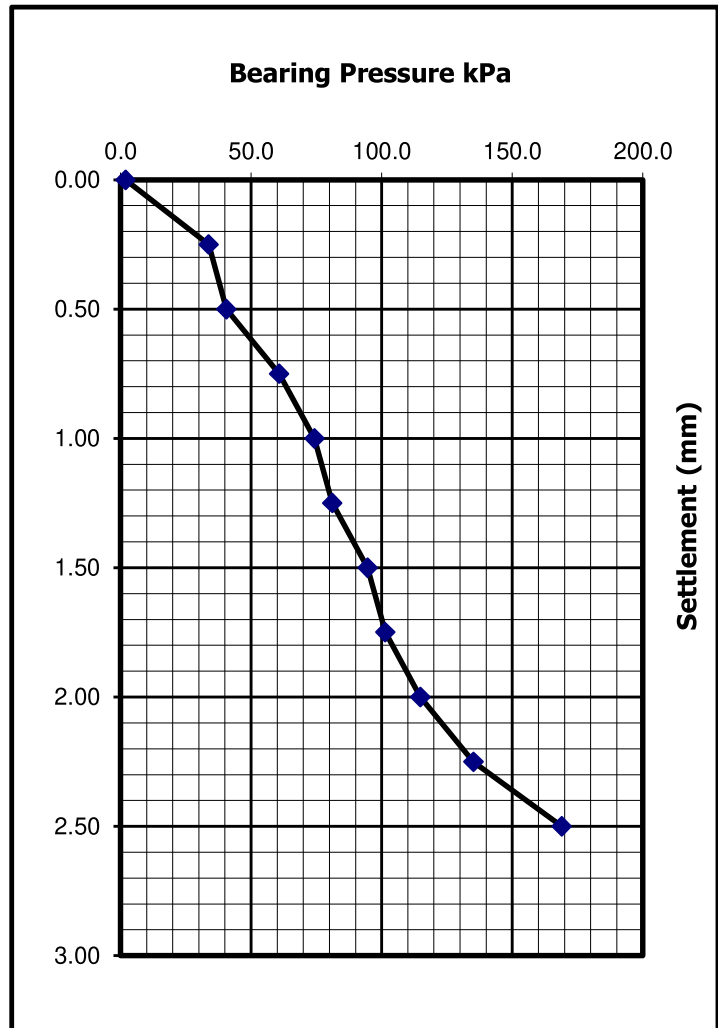
**CBR Values calculated at the pressure at
1.25mm settlement**

Plate Area (m2):

0.2884

Applied Pressure@ 1.25mm (kPa):
Modulus of Subgrade Reaction (k):

81.097
52.7



Test Operator	Checked and Authorised by		Shaun Thomas	
Dean Smith	Date	09/02/2021		





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Client Reference

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Client

IDOM Merebrook

Test Date

04/02/2021

Site Location

Former St Tydfil Hospital

Test Location

CBR 5

Soil Description

Brown silty clayey fine to coarse GRAVEL

Test Depth (m)

0.50

Kentledge Type

Tracked Excavator

Settlement (mm)	Load (kPa)
0.00	2
0.25	34
0.50	51
0.75	68
1.00	68
1.25	84
1.50	95
1.75	101
2.00	115
2.25	128
2.50	142

CBR Value %

10.0

Remarks

**CBR Values calculated at the pressure at
1.25mm settlement**

Plate Area (m2):

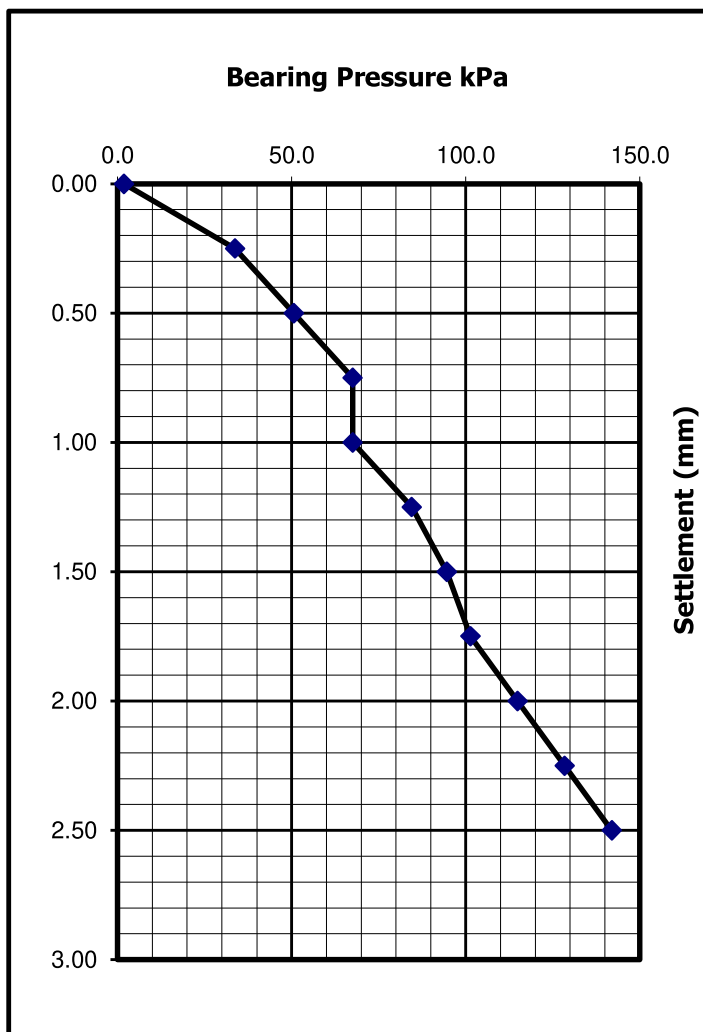
0.2884

Applied Pressure@ 1.25mm (kPa):

84.476

Modulus of Subgrade Reaction (k):

54.9



Test Operator	Checked and Authorised by		Shaun Thomas	
Dean Smith	Date	09/02/2021		





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52491

Client Reference

0

Client

IDOM Merebrook

Test Date

04/02/2021

Site Location

Former St Tydfil Hospital

Test Location

CBR 6

Soil Description

Brown silty clayey fine to coarse GRAVEL

Test Depth (m)

0.45

Kentledge Type

Tracked Excavator

Settlement (mm)	Load (kPa)
0.00	2
0.25	51
0.50	68
0.75	81
1.00	101
1.25	118
1.50	135
1.75	149
2.00	162
2.25	176
2.50	186

CBR Value %

17.8

Remarks

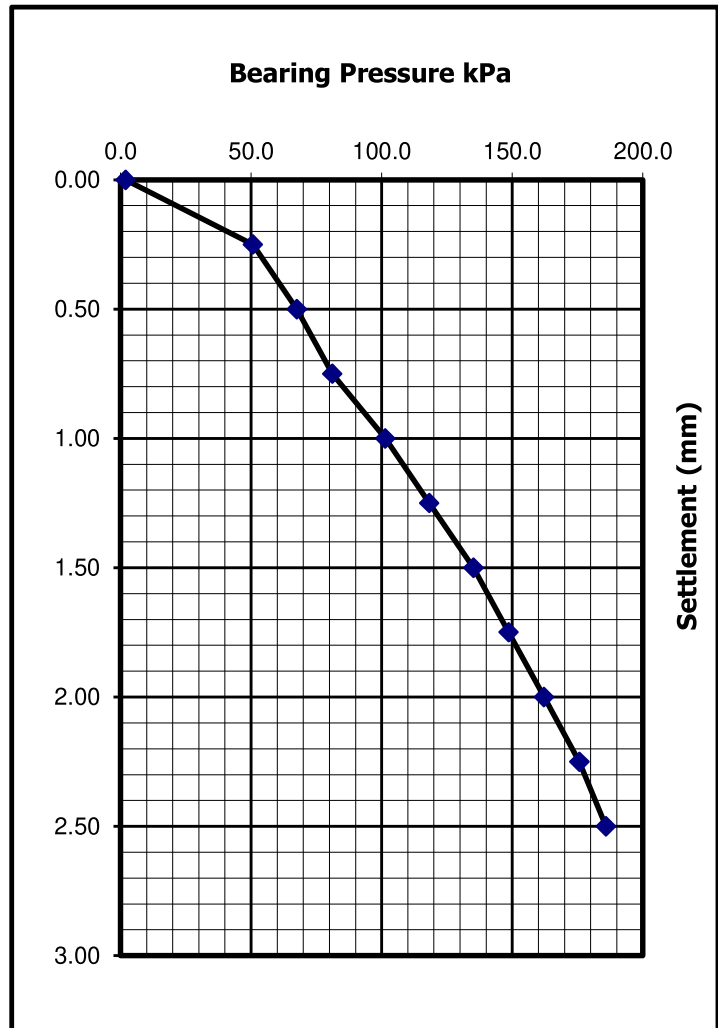
**CBR Values calculated at the pressure at
1.25mm settlement**

Plate Area (m2):

0.2884

Applied Pressure@ 1.25mm (kPa):
Modulus of Subgrade Reaction (k):

118.267
76.8



Test Operator	Checked and Authorised by		Shaun Thomas	
Dean Smith	Date	09/02/2021		





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Contract Number

52491

Client Reference

0

Client

IDOM Merebrook

Test Date

04/02/2021

Site Location

Former St Tydfil Hospital

Test Location

CBR 7

Soil Description

Brown silty clayey fine to coarse GRAVEL

Test Depth (m)

0.50

Kentledge Type

Tracked Excavator

Settlement (mm)	Load (kPa)
0.00	2
0.25	34
0.50	51
0.75	68
1.00	81
1.25	95
1.50	101
1.75	115
2.00	128
2.25	135
2.50	149

CBR Value %

12.1

Remarks

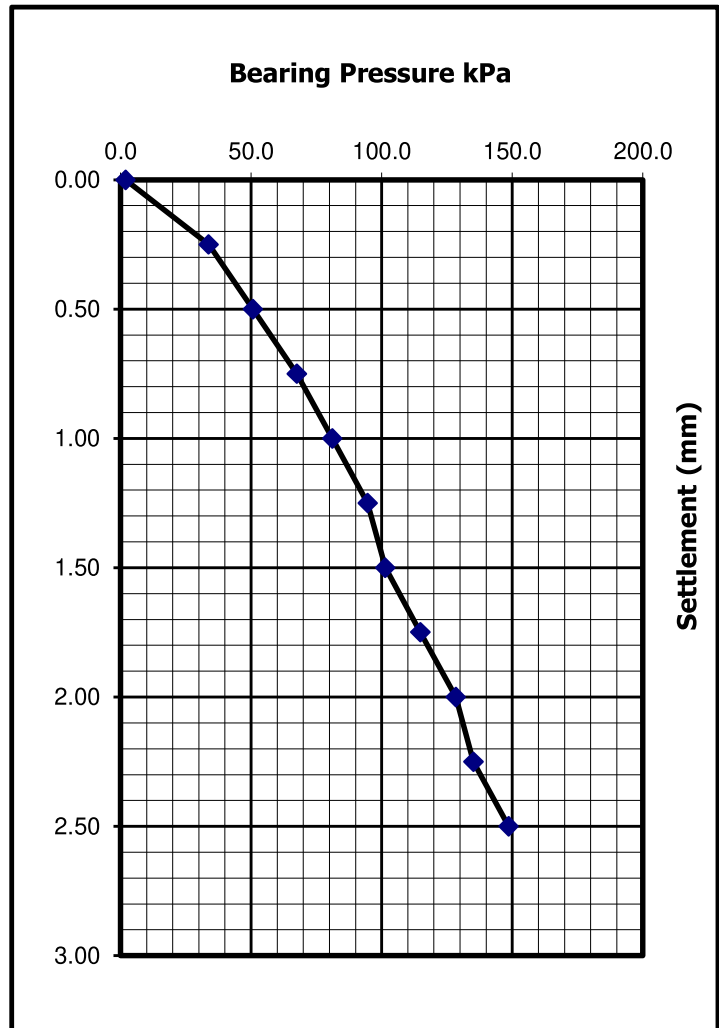
**CBR Values calculated at the pressure at
1.25mm settlement**

Plate Area (m2):

0.2884

**Applied Pressure@ 1.25mm (kPa):
Modulus of Subgrade Reaction (k):**

**94.613
61.4**



Test Operator	Checked and Authorised by		Shaun Thomas	
Dean Smith	Date	09/02/2021		





**Determination of the Vertical Deformation Tests
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Contract Number

52491

Client Reference

0

Client

IDOM Merebrook

Test Date

04/02/2021

Site Location

Former St Tydfil Hospital

Test Location

CBR 8

Soil Description

Brown silty clayey fine to coarse GRAVEL

Test Depth (m)

0.40

Kentledge Type

Tracked Excavator

Settlement (mm)	Load (kPa)
0.00	2
0.25	34
0.50	41
0.75	68
1.00	81
1.25	101
1.50	115
1.75	135
2.00	135
2.25	142
2.50	149

CBR Value %

13.7

Remarks

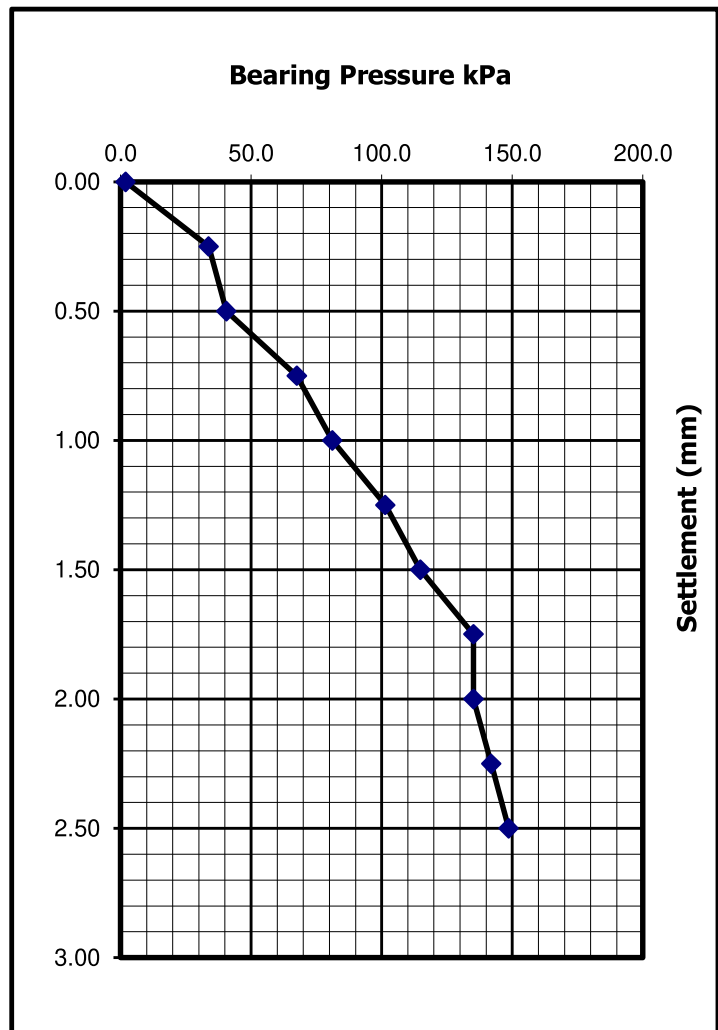
**CBR Values calculated at the pressure at
1.25mm settlement**

Plate Area (m2):

0.2884

**Applied Pressure@ 1.25mm (kPa):
Modulus of Subgrade Reaction (k):**

**101.371
65.8**



Test Operator	Checked and Authorised by		Shaun Thomas	
Dean Smith	Date	09/02/2021		





**Determination of the Vertical Deformation Tests
BS 1377: Part 9: 1990 & IAN73/06 Guidance**

Contract Number

52491

Client Reference

0

Client

IDOM Merebrook

Test Date

04/02/2021

Site Location

Former St Tydfil Hospital

Test Location

CBR 9

Soil Description

Brown silty clayey fine to coarse GRAVEL

Test Depth (m)

0.50

Kentledge Type

Tracked Excavator

Settlement (mm)	Load (kPa)
0.00	2
0.25	34
0.50	47
0.75	68
1.00	81
1.25	101
1.50	118
1.75	135
2.00	152
2.25	169
2.50	182

CBR Value %

13.7

Remarks

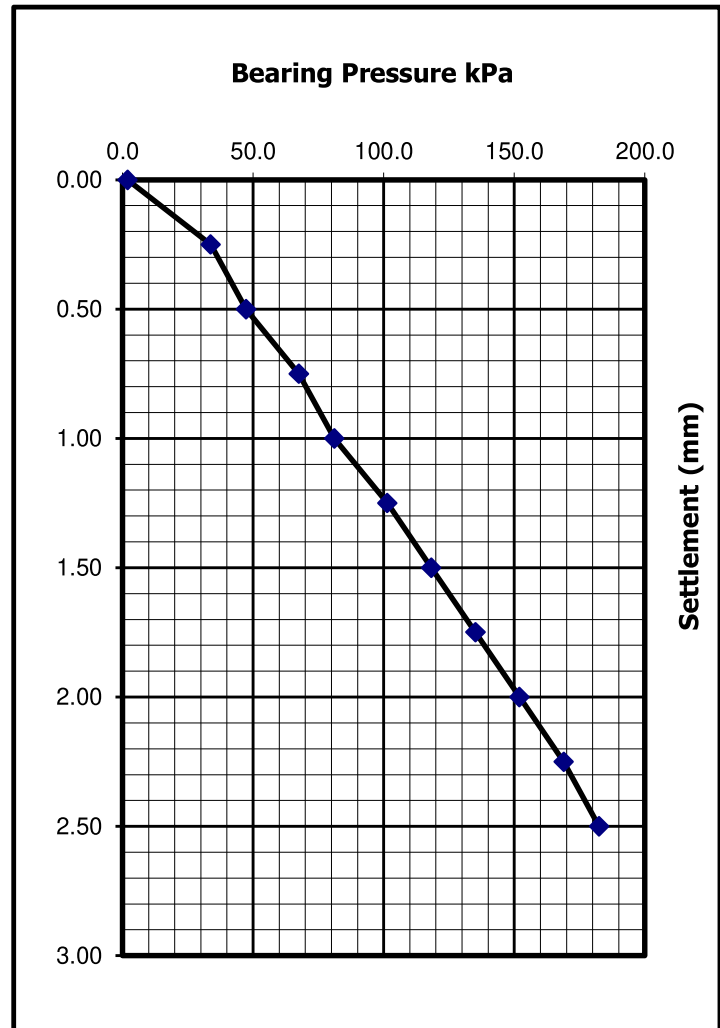
**CBR Values calculated at the pressure at
1.25mm settlement**

Plate Area (m2):

0.2884

**Applied Pressure@ 1.25mm (kPa):
Modulus of Subgrade Reaction (k):**

**101.371
65.8**



Test Operator	Checked and Authorised by		Shaun Thomas	
Dean Smith	Date	09/02/2021		





**Determination of the Vertical Deformation Tests
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Contract Number

52491

Client Reference

0

Client

IDOM Merebrook

Test Date

04/02/2021

Site Location

Former St Tydfil Hospital

Test Location

CBR 10

Soil Description

Brown silty clayey fine to coarse GRAVEL

Test Depth (m)

0.40

Kentledge Type

Tracked Excavator

Settlement (mm)	Load (kPa)
0.00	2
0.25	27
0.50	41
0.75	61
1.00	81
1.25	101
1.50	115
1.75	128
2.00	142
2.25	149
2.50	155

CBR Value %

13.7

Remarks

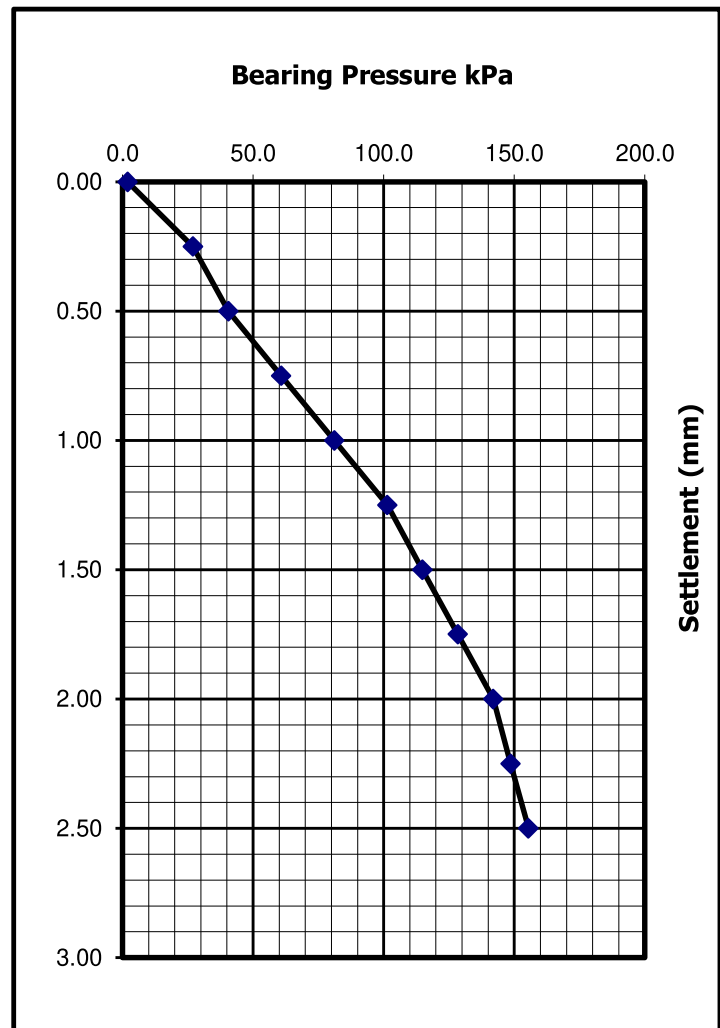
**CBR Values calculated at the pressure at
1.25mm settlement**

Plate Area (m2):

0.2884

**Applied Pressure@ 1.25mm (kPa):
Modulus of Subgrade Reaction (k):**

**101.371
65.8**



Test Operator	Checked and Authorised by		Shaun Thomas	
Dean Smith	Date	09/02/2021		



APPENDIX 6 ▪ Groundwater Laboratory Certificates

**C Oliveira**

Merebrook
First Floor
1 Leonard Place
Westerham Road
Keston
BR2 6HQ

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f: 01689 889981
e: coliveira@idom.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 21-59338

Project / Site name:	St Tydfil Merthyr Tydfil	Samples received on:	26/02/2021
Your job number:	21968	Samples instructed on/ Analysis started on:	26/02/2021
Your order number:	21 2 FDO LABS	Analysis completed by:	05/03/2021
Report Issue Number:	1	Report issued on:	05/03/2021
Samples Analysed:	6 water samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 21-59338
Project / Site name: St Tydfil Merthyr Tydfil

Your Order No: 21 2 FDO LABS

Lab Sample Number	1785251	1785252	1785253	1785254	1785255
Sample Reference	MWS02	MWS03	MWS06	MBH01	MBH02
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	25/02/2021	25/02/2021	25/02/2021	25/02/2021	25/02/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	7.5	8.1	7.8	7.3	7.9
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO ₄	µg/l	45	ISO 17025	219000	82000	39600	52300	30300
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	U/S*	1.25	2.87	1.44	0.57

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	0.33	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	0.68	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	0.66	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	10.6	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	2.89	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	28	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	21.4	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	18.2	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	15.4	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	18.6	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	7.17	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	12.9	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	7.43	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	2.84	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	8.06	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	155	< 0.16	< 0.16	< 0.16	< 0.16
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Heavy Metals / Metalloids

Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Arsenic (dissolved)	µg/l	0.15	ISO 17025	3.94	1.42	0.88	0.34	< 0.15
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.03	< 0.02	< 0.02	0.08	0.04
Chromium (dissolved)	µg/l	0.2	ISO 17025	1.4	2.1	1.5	2.1	2.5
Copper (dissolved)	µg/l	0.5	ISO 17025	2.9	2.2	1.2	1.6	< 0.5
Lead (dissolved)	µg/l	0.2	ISO 17025	2.3	< 0.2	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	6.1	0.9	2.2	4.6	1.5
Selenium (dissolved)	µg/l	0.6	ISO 17025	2.4	1.6	2.1	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	3.2	3.2	2.1	3.4	2.6



Analytical Report Number: 21-59338
Project / Site name: St Tydfil Merthyr Tydfil

Your Order No: 21 2 FDO LABS

Lab Sample Number				1785251	1785252	1785253	1785254	1785255
Sample Reference				MWS02	MWS03	MWS06	MBH01	MBH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				25/02/2021	25/02/2021	25/02/2021	25/02/2021	25/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	85	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	1000	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	1100	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

*Some analysis could not be completed due to sample matrix.



Analytical Report Number: 21-59338
Project / Site name: St Tydfil Merthyr Tydfil

Your Order No: 21 2 FDO LABS

Lab Sample Number				1785256
Sample Reference				MBH3
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				25/02/2021
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

General Inorganics

pH	pH Units	N/A	ISO 17025	7.6
Total Cyanide	µg/l	10	ISO 17025	< 10
Sulphate as SO4	µg/l	45	ISO 17025	67400
Sulphide	µg/l	5	NONE	< 5.0
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	1.19

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16
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Heavy Metals / Metalloids

Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
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Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.19
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.17
Chromium (dissolved)	µg/l	0.2	ISO 17025	1.8
Copper (dissolved)	µg/l	0.5	ISO 17025	0.5
Lead (dissolved)	µg/l	0.2	ISO 17025	0.5
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.7
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	5.2



Analytical Report Number: 21-59338
Project / Site name: St Tydfil Merthyr Tydfil

Your Order No: 21 2 FDO LABS

Lab Sample Number				1785256
Sample Reference				MBH3
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				25/02/2021
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

*Some analysis could not be completed due to sample matrix.



Analytical Report Number : 21-59338
Project / Site name: St Tydfil Merthyr Tydfil

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report



Analytical Report Number : 21-59338

Project / Site name: St Tydfil Merthyr Tydfil

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
MBH01	None Supplied	W	1785254	c	pH at 20oC in water (automated)	L099-PL	c
MBH02	None Supplied	W	1785255	c	pH at 20oC in water (automated)	L099-PL	c
MBH3	None Supplied	W	1785256	c	pH at 20oC in water (automated)	L099-PL	c
MWS02	None Supplied	W	1785251	c	pH at 20oC in water (automated)	L099-PL	c
MWS03	None Supplied	W	1785252	c	pH at 20oC in water (automated)	L099-PL	c
MWS06	None Supplied	W	1785253	c	pH at 20oC in water (automated)	L099-PL	c

APPENDIX 7

- Field Monitoring Records
- Groundwater Level Data
- Hazardous Soil Gas Data and Gas Risk Regime Calculation

GAS MONITORING RECORD ROUND 2

Location Reference	Time	Flow and Pressure Measurements			Gas Measurements				VOC Measurements			Dip Measurements		Comments		
		Flow		Atmospheric Pressure	Differential Pressure	Methane	Methane LEL	Carbon Dioxide	Oxygen	Carbon Monoxide	Hydrogen Sulphide	Hexane	PID		Depth to Water	Depth to Base
		max	steady													
		l hr ⁻¹	mb	Pa	%	%	%	%	ppm	ppm	ppm	%	ppm	m	m	
MBH01	09:30	13.3	0.6	1003	4	0	0	3.9	12.9	0	0	0.000	0	3.46	6.56	sludgy bottom
MBH02	10:30	22.5	0	1002	1	0	0	0.8	16.5	220	50	0.000	0	3.15	6.06	-
MBH03	13:30	0.4	0	1003	1	0	0	1.2	16	10	0	0.000	0	1.28	5.97	-
MWS02	14:15	0	0	1003	0	0	0	0	20	0	0	0.000	0	2.27	3.74	-
MWS03	11:30	0	0	1003	0	0	0	0.9	18	0	0	0.000	0	1.40	4.04	-
MWS06	12:30	0	0	1003	0	0	0	0	20.1	0	0	0.000	0	1.17	2.52	bung loose
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Weather:		cloudy sunny spells, cold				nr = not recorded		Gas Analyser		PID		Site:		Former St Tydfill Hospital		
								Model:		MiniRae Lite		Project Number:				
								Serial Number:		12226		Monitored By:				
								Date of Last Calibration:		21/10/2020		Date:				

[illegible]

GAS MONITORING RECORD ROUND 5

Location Reference	Time	Flow and Pressure Measurements			Gas Measurements						VOC Measurements			Dip Measurements		Comments	
		Flow		Atmospheric Pressure	Differential Pressure	Methane	Methane LEL	Carbon Dioxide	Oxygen	Carbon Monoxide	Hydrogen Sulphide	Hexane	PID	Depth to Water	Depth to Base		
		max	steady														
		l hr ⁻¹	mb	Pa	%	%	%	ppm	ppm	%	ppm	ppm	m	m			
MBH01	11:45	0	0	998	0	0	5.1	6.2	0	0	0	0.034	0	4.90	6.50	-	
MBH02	11:55	0	0	997	0	0	0.8	6.5	0	0	0	0.034	1	3.42	6.14	-	
MBH03	11:00	-7.5	0	998	-52	0	2.2	3.2	0	0	0	0.034	0	1.74	6.06	-	
MWS02	11:10	0	0	998	0	0	2.4	11.9	0	0	0	0.034	0	3.20	3.83	-	
MWS03	11:40	0	0	998	0	0	0.6	20.2	0	0	0	0.034	0	1.98	4.09	-	
MWS06	11:20	-26.2	0	998	-200	0	1.9	17.3	0	0	0	0.034	0	2.19	2.64	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Weather:		Sunny intervals.															Former St Tydfill Hospital
																	Project Number:
																	Monitored By:
																	Date:

GAS MONITORING RECORD ROUND 6

Location Reference	Time	Flow and Pressure Measurements			Gas Measurements					VOC Measurements			Dip Measurements		Comments	
		Flow		Atmospheric Pressure	Differential Pressure	Methane	Methane LEL	Carbon Dioxide	Oxygen	Carbon Monoxide	Hydrocen Sulphide	Hexane	PID	Depth to Water		Depth to Base
		max	steady													
		l hr ⁻¹	mb													
MBH01	11:55	0	0	1010	0	0	4.9	6.6	0	0	0.035	0	3.92	6.56	Sludge at base	
MBH02	12:10	-10	0	1009	0	0	0.8	6.3	0	0	0.058	0	3.41	6.18	Sludge at base	
MBH03	12:30	0	0	1010	0	0	2.3	3.0	0	0	0.036	0	1.77	6.07	Sludge at base	
MWS02	12:40	0	0	1010	0	0	1.5	15.7	0	0	0.033	0	3.20	3.85	Sludge at base	
MWS03	11:45	0	0	1010	0	0	0.5	20.4	0	0	0.038	0	1.82	4.10	Sludge at base	
MWS06	12:20	0	0	1009	0	0	0	20.9	0	0	0.03	0	2.22	2.66	Bung missing - replaced	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Weather:		Clear, sunny. 8C. Light breeze from NW				nr = not recorded		Gas Analyser		PID		Site:				
								GFMA35		MiniRae Lite		Project Number:				
								11839		590-904749		Monitored By:				
								26/06/2020		07/07/2020		Date:				

MODIFIED WILSON AND CARD GAS CHARACTERISTIC SITUATION

SITE: Former St Tydri Hospital

JOB NUMBER: 21988

01/06/2021

Carbon Dioxide		Methane	
Maximum Gas Concentration	5,10 %	Maximum Gas Concentration	0,10 %
Maximum Measured Steady Flow	3,30 L hr ⁻¹	Maximum Measured Peak Flow	49,90 L hr ⁻¹
Gas Screening Value	0,17 L hr ⁻¹	Gas Screening Value	0,05 L hr ⁻¹
Characteristic Situation	2	Characteristic Situation	1

if measured values are zero then resolution limit of instrument is used for calculation of GSV
worst case carbon dioxide or methane characteristic situation value defines overall characteristic situation for the site

Modified Wilson and Card Classification

					BS 8485:2015+A1:2019 Gas Protection Scores - refer to standard for full guidance			
					Minimum Gas Protection Score Required			
Characteristic Situation	Risk Classification	Gas Screening Value Threshold (L hr ⁻¹)	Additional Factors	Typical Source of Generation	Type A Building	Type B Building	Type C Building	Type D Building
1	very low risk	<0,07	typically methane not to exceed 1% and/or carbon dioxide 5% otherwise consider increase to situation 2	natural soils with low organic content; typical made ground	0	0	0	0
2	low risk	0,07 to <0,7	borehole air flow rate not to exceed 70 L hr ⁻¹ otherwise consider increase to situation 3	natural soils with high peat/organic content; typical made ground	3,5	3,5	2,5	1,5
3	moderate risk	0,7 to <3,5		old landfill; inert waste; mineworking flooded	4,5	4	3	2,5
4	moderate to high risk	3,5 to <15	quantitative risk assessment required to evaluate scope of protective measures	mineworking susceptible to flooding; completed landfill	6,5 ^{A)}	5,5 ^{A)}	4,5	3,5
5	high risk	15 to <70		mineworking unroofed; inactive with shallow workings near surface		6 ^{A)}	5,5	4,5
6	very high risk	>70		recent landfill site	hazard too high for this method to define protection measures	hazard too high for this method to define protection measures	hazard too high for this method to define protection measures	6

BS 8485:2015+A1:2019 Gas Protection Measures - refer to standard for full guidance					
Select two or more elements from the following three types of protection to achieve score (only one element per type permitted)					
Structural Barrier	Score ^{A)}	Ventilation Measures		Score	Gas Resistant Membrane
Precast suspended segmental subfloor (i.e. beam and block)	0	Pressure relief pathway (usually formed of low fines gravel or with a thin geocomposite blanket or strips terminating in a gravel trench external to the building)		0,5	1, sufficiently impervious, both in the sheet material and in the sealing of sheets and sealing around sheet penetrations, to prevent any significant passage of methane and/or carbon dioxide through the membrane, A membrane with a methane gas transmission rate <40,0 ml/day/m ² /atm (average) for sheets and joints (tested in accordance with BS ISO 15105-1:2007 manometric method) is regarded as sufficiently impervious. 2, sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions 3, sufficiently strong* to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc) and to withstand in-service stresses (e.g. settlement if placed below a floor slab) 4, capable, after installation, of providing a complete barrier to the entry of the relevant gas 5, verified in accordance with CIRIA C735 * For example, reinforced LDPE (virgin polymer) membranes having a minimum mass per unit area of 370 g/m ² and not significantly less than 0,4 mm thickness between the reinforcement scrim (tested in accordance with Procedure D (2 mm diameter tip) of BS EN ISO 9963-1:2016) installed above floor slabs are considered sufficiently strong to meet the performance criteria (see also C.5). Thicker and more robust membranes or an additional membrane protection layer should be installed directly beneath cast-in-situ floor slabs.
Cast in situ ground-bearing floor slab (with only nominal mesh reinforcement)	0,5	Passive sub floor dispersal layer	Very good performance ^{B)}	2,5	
			Good performance ^{B)}	1,5	
Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations	1 or 1,5 ^{B)}	Active dispersal layer, usually comprising fans with active abstraction (suction) from a subfloor dilution layer, with roof level vents. The dilution layer may comprise a clear void or be formed of geocomposite or polystyrene void formers ^{C)}		1,5 to 2,5	
Basement floor and walls conforming to BS 8102:2009, Grade 2 waterproofing ^{C)}	2	Active positive pressurization by the creation of a blanket of external fresh air beneath the building floor slab by pumps supplying air to points across the central footprint of the building into a permeable layer, usually formed of a thin geocomposite blanket ^{C)}		1,5 to 2,5	
Basement floor and walls conforming to BS 8102:2009, Grade 3 waterproofing ^{C)}	2,5	Ventilated car park (floor slab of occupied part of the building under consideration is underlain by a basement or undercroft car park) ^{F)}		4	

Notes

A) The scores are conditional on breaches of floor slabs, etc., being effectively sealed

C) The score is conditional on the waterproofing being provided by a suitable structural barrier with the design and detailing of the walls and floor meeting the requirements for Type B protection. The score cannot be assigned for Type A (waterproof membrane) or Type C (drained cavity wall).

E) Refer to BS 8485:2015 Annex B to determine performance and assign score

Building Types

Type A

Private ownership with no building management controls on alterations to the internal structure, the use of rooms, the ventilation of rooms or the structural fabric of the building. Some small rooms present. Probably conventional building construction (rather than civil engineering). Examples include private housing and some retail premises.

FOR TYPE A BUILDINGS ACTIVE VENTILATION MEASURES ARE INAPPROPRIATE

Type B

Private or commercial property with central building management control of any alterations to the building or its uses but limited or no central building management control of the maintenance of the building, including the gas protection measures. Multiple occupancy. Small to medium size rooms with passive ventilation of rooms and other internal spaces throughout ground floor and basement areas. May be conventional building or civil engineering construction. Examples include managed apartments, multiple occupancy offices, some retail premises and parts of some public buildings (such as schools, hospitals, leisure centres) and parts of hotels.

B) To achieve a score of 1,5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in

D) If a membrane is installed beneath and around the basement to provide Type A waterproofing (BS 8102:2009), it can be assigned a gas protection score in accordance with Table 7, if it meets all the criteria for a gas resistant membrane in that table

F) Assumes that the car park is vented to deal with car exhaust fumes, designed to Buildings Regulations 2000, Approved Document F

Type C

Commercial building with central building management control of any alterations to the building or its uses and central building management control of the maintenance of the building, including the gas protection measures. Single occupancy of ground floor and basement areas. Small to large size rooms with active ventilation or good passive ventilation of all rooms and other internal spaces throughout ground floor and basement areas. Probably civil engineering construction. Examples include offices, some retail premises, and parts of some public buildings (such as schools, hospitals, leisure centres and parts of hotels).

Type D

Industrial style building having large volume internal space(s) that are well ventilated. Corporate ownership with building management controls on alterations to the ground floor and basement areas of the building and on maintenance of ground gas protective measures. Probably civil engineering construction. Examples are retail park sales buildings, factory shop floor areas, warehouses. (Small rooms within these style buildings should be separately categorized as Type B or Type C).

NHBC TRAFFIC LIGHT GAS CHARACTERISTIC SITUATION

SITE: Former St Tydfil Hospital

JOB NUMBER: 21988

01/06/2021

Carbon Dioxide		Methane	
Maximum Gas Concentration	5.10 %	Maximum Gas Concentration	0.10 %
Maximum Measured Steady Flow	3.30 L hr ⁻¹	Maximum Measured Peak Flow	49.90 L hr ⁻¹
Gas Screening Value	0.17 L hr ⁻¹	Gas Screening Value	0.05 L hr ⁻¹
Characteristic Situation	Green	Characteristic Situation	Green
if measured values are zero then resolution limit of instrument is used for calculation of GSV			
worst case carbon dioxide or methane characteristic situation value defines overall characteristic situation for the site			

NHBC Classification		Carbon Dioxide			Methane		Identified Gas Regime	Protection Measures Required
Characteristic Situation		Typical Maximum Concentration (%v/v)	Gas Screening Value (L hr ⁻¹)	Typical Maximum Concentration (%v/v)	Gas Screening Value (L hr ⁻¹)			
Green							negligible	Ground gas protection measures are not required
Amber 1		5	0.78	1	0.16		low to intermediate	Low-level ground gas protection measures are required, using a membrane and ventilated sub-floor void that creates a permeability contrast to limit the ingress of gas into buildings. Gas protection measures are to be installed as prescribed in BRE 414. Ventilation of the sub-floor void should be designed to provide a minimum of one complete volume change per 24 hours
Amber 2		10	1.56	5	0.63		intermediate to high	High-level ground gas protection measures are required, creating a permeability contrast to prevent ingress of gas into buildings. Gas protection measures are to be installed as prescribed in BRE 414. Membranes used should always be fitted by a specialist contractor and should be fully certified (see Appendix E). As with Amber 1, ventilation of the sub-floor void should be designed to provide a minimum of one complete volume change per 24 hours.
Red		30	3.10	20	1.56		high	Standard residential housing is not normally acceptable without further Ground Gas Risk Assessment and/or possible remedial mitigation measures to reduce/remove the source of the ground gases. In certain circumstances, active protection methods could be applied, but only when there is a legal agreement assuring the management and maintenance of the system for the life of the property.

APPENDIX 8 ▪ Soakage Test Calculations

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION					
Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	Tim Crowe	Date:	08/02/2021	Weather:	Overcast, Cold, light snow

TEST PIT DETAILS							
Trial Pit Number:		MSP01		Test 1 of 3			
Length (m):		2.3	Width (m):		0.4	Depth (m): 2.3	
Depth to Groundwater (m):		N/A					
Time Filling Commenced:		08:52		Time Filling Completed:		09:39	
Depth to Water at Start of Test:		0.77					
Effective Depths:		75%:		1.15	50%:	1.54	25%: 1.92

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

[illegible]

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION					
Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	Tim Crowe	Date:	08/02/2021	Weather:	Overcast, Cold, light snow

TEST PIT DETAILS							
Trial Pit Number:		MSP01		Test 1 of 3			
Length (m):		2.3	Width (m):		0.4	Depth (m): 2.3	
Depth to Groundwater (m):		N/A					
Time Filling Commenced:		11:31		Time Filling Completed:		11:31	
Depth to Water at Start of Test:		0.65					
Effective Depths:		75%:	1.06	50%:	1.48	25%:	1.89

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

TEST DATA			
Time	t (mins)	t (secs)	Depth to Water (m)
11:33	0	0	0.650
11:34:00	0.5	30	0.690
11:34	1	60	0.720
11:35:00	1.5	90	0.760
11:36	2	120	0.820
11:37	3	180	0.880
11:38	4	240	0.940
11:39	5	300	1.010
11:40	6	360	1.060
11:41	7	420	1.100
11:42	8	480	1.140
11:43	9	540	1.170
11:44	10	600	1.190
11:46	12	720	1.270
11:48	14	840	1.300
11:50	16	960	1.340
11:52	18	1080	1.370
11:54	20	1200	1.390
11:59	25	1500	1.450
12:04	30	1800	1.510
12:14	40	2400	1.590
12:24	50	3000	1.650
12:34	60	3600	1.670
13:04	90	5400	1.750
13:34	120	7200	1.780
	150	9000	
	180	10800	
	210	12600	
	240	14400	

The graph plots Depth (m) on the y-axis (ranging from 0 to 2.0) against Time (secs) on the x-axis (ranging from 0 to 16000). The data points are connected by a smooth curve, showing a rapid initial rise in depth followed by a gradual approach to equilibrium.

MSP01	
t at 75% Effective Depth:	395 secs
t at 25% Effective Depth:	15000 secs
Infiltration Rate f = Vp75-25 / ap50 x tp75-25	
Vp75-25:	0.76 m3
ap50:	5.375 m2
tp75-25	14605 secs
f = 9.67E-06 m/s	

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION					
Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	Tim Crowe	Date:	08/02/2021	Weather:	Overcast, Cold, light snow

TEST PIT DETAILS							
Trial Pit Number:	MSP01		Test	1	of	3	
Length (m):	2.3	Width (m):	0.4		Depth (m):	2.1	
Depth to Groundwater (m):	N/A						
Time Filling Commenced:	13:56		Time Filling Completed:			11:58	
Depth to Water at Start of Test:	0.6						
Effective Depths:	75%:		0.98	50%:	1.35	25%:	1.73

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

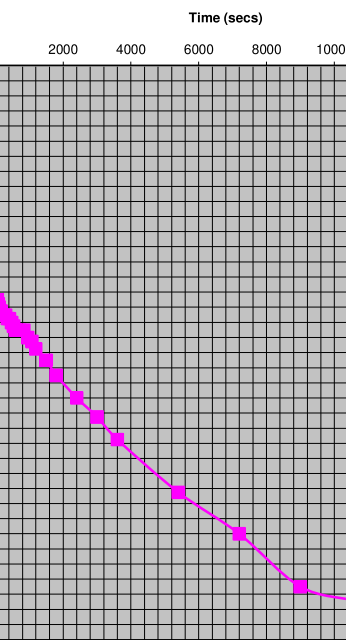
[illegible]

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION					
Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	Tim Crowe	Date:	08/02/2021	Weather:	Overcast, Cold, light snow

TEST PIT DETAILS							
Trial Pit Number:		MSP02		Test 1 of 3			
Length (m):		2.0	Width (m):		0.4	Depth (m): 2.3	
Depth to Groundwater (m):		N/A					
Time Filling Commenced:		09:56		Time Filling Completed:		09:58	
Depth to Water at Start of Test:		0.62					
Effective Depths:		75%:	1.04	50%:	1.46	25%:	1.88

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

TEST DATA				MSP02
Time	t (mins)	t (secs)	Depth to Water (m)	
09:58	0	0	0.620	
	0.5	30	0.620	
09:59	1	60	0.620	
	1.5	90	0.630	
10:00	2	120	0.640	
10:01	3	180	0.650	
10:02	4	240	0.660	
10:03	5	300	0.660	
10:04	6	360	0.670	
10:05	7	420	0.670	
10:06	8	480	0.680	
10:07	9	540	0.690	
10:08	10	600	0.700	
10:10	12	720	0.700	
10:12	14	840	0.700	
10:14	16	960	0.720	
10:16	18	1080	0.730	
10:18	20	1200	0.750	
10:23	25	1500	0.780	
10:28	30	1800	0.820	
10:38	40	2400	0.880	
10:48	50	3000	0.930	
10:58	60	3600	0.990	
11:28	90	5400	1.130	
11:58	120	7200	1.240	
12:28	150	9000	1.380	
12:58	180	10800	1.420	
13:28	210	12600	1.460	

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION

Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	Tim Crowe	Date:	08/02/2021	Weather:	Overcast, Cold, light snow

TEST PIT DETAILS

Trial Pit Number:	MSP03		Test 1 of 3				
Length (m):	1.5	Width (m):	0.4		Depth (m):	2.1	
Depth to Groundwater (m):	N/A						
Time Filling Commenced:	10:35		Time Filling Completed:			10:36	
Depth to Water at Start of Test:	0.89						
Effective Depths:	75%:		1.19	50%:	1.50	25%:	1.80

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

TEST PIT RESULTS

[illegible]

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION					
Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	Tim Crowe	Date:	08/02/2021	Weather:	Overcast, Cold, light snow

TEST PIT DETAILS							
Trial Pit Number:		MSP03		Test 2 of 3			
Length (m):		1.5	Width (m):		0.4	Depth (m): 2.1	
Depth to Groundwater (m):		N/A					
Time Filling Commenced:		11:08		Time Filling Completed:			11:09
Depth to Water at Start of Test:		0.9					
Effective Depths:		75%:	1.20	50%:	1.50	25%:	1.80

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

[illegible]

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION					
Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	Tim Crowe	Date:	08/02/2021	Weather:	Overcast, Cold, light snow

TEST PIT DETAILS							
Trial Pit Number:		MSP03		Test 3 of 3			
Length (m):		1.5	Width (m):		0.4	Depth (m): 2.1	
Depth to Groundwater (m):		N/A					
Time Filling Commenced:		11:45		Time Filling Completed:		11:47	
Depth to Water at Start of Test:		0.95					
Effective Depths:		75%:	1.24	50%:	1.53	25%:	1.81

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

[illegible]

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION

Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	Tim Crowe	Date:	08/02/2021	Weather:	Overcast, Cold, light snow

TEST PIT DETAILS

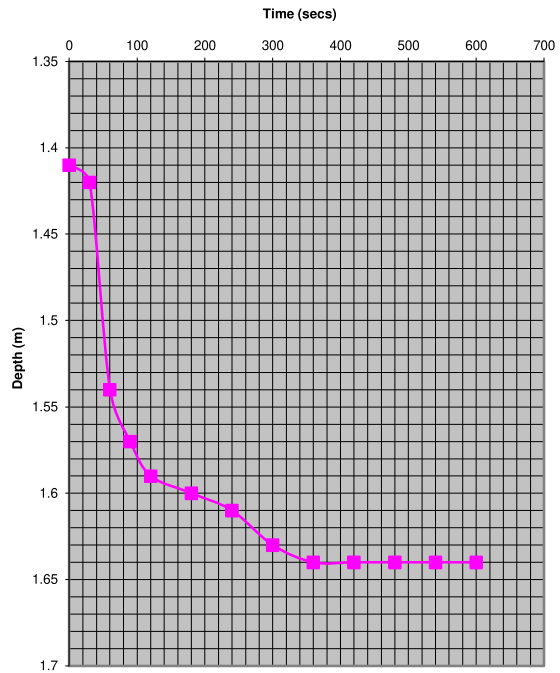
Trial Pit Number:	MSP04		Test 1 of 2				
Length (m):	2.0	Width (m):	0.4	Depth (m):	2.3		
Depth to Groundwater (m):	N/A						
Time Filling Commenced:	12:20		Time Filling Completed:		12:21		
Depth to Water at Start of Test:	1.41						
Effective Depths:	75%:		1.63	50%:	1.86	25%:	2.08

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

TEST PIT RESULTS

[illegible]

MSP04



t at 75% Effective Depth: **300** secs

t at 25% Effective Depth: secs

$$\text{Infiltration Rate } f = V_{p75-25} / a_{p50} \times t_{p75-25}$$

Vp75-25: **0.36** m3

ap50: **2.936** m2tp75-25 **-300** secs

$$f = -0.0004 \text{ m/s}$$

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION

Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	Tim Crowe	Date:	08/02/2021	Weather:	Overcast, Cold, light snow

TEST PIT DETAILS

Trial Pit Number:	MSP04		Test 2 of 2				
Length (m):	2.0	Width (m):	0.4		Depth (m):	2.3	
Depth to Groundwater (m):	N/A						
Time Filling Commenced:	12:35		Time Filling Completed:			12:36	
Depth to Water at Start of Test:	1.4						
Effective Depths:	75%:		1.63	50%:	1.85	25%:	2.08

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

TEST PIT RESULTS

[illegible]

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION

Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	AH	Date:	09/02/2021	Weather:	cold, dry, 2/8 cloud

TEST PIT DETAILS

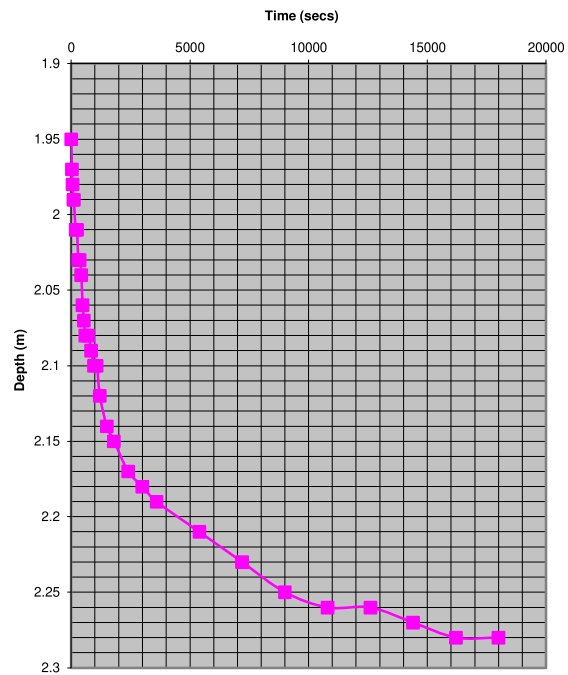
Trial Pit Number:	MSP05		Test 1 of 3				
Length (m):	1.5	Width (m):	0.6		Depth (m):	2.6	
Depth to Groundwater (m):	N/A						
Time Filling Commenced:	09:20		Time Filling Completed:			09:21	
Depth to Water at Start of Test:	1.86						
Effective Depths:	75%:	2.05	50%:	2.23	25%:	2.42	

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

TEST PIT RESULTS

TEST DATA			
Time	t (mins)	t (secs)	Depth to Water (m)
09:21	0	0	1.950
09:21:30	0.5	30	1.970
09:22	1	60	1.980
09:22:30	1.5	90	1.990
09:23	2	120	1.990
09:24	3	180	2.010
09:25	4	240	2.010
09:26	5	300	2.030
09:27	6	360	2.030
09:28	7	420	2.040
09:29	8	480	2.060
09:30	9	540	2.070
09:31	10	600	2.080
09:33	12	720	2.080
09:35	14	840	2.090
09:37	16	960	2.100
09:39	18	1080	2.100
09:41	20	1200	2.120
09:46	25	1500	2.140
09:51	30	1800	2.150
10:01	40	2400	2.170
10:11	50	3000	2.180
10:21	60	3600	2.190
10:51	90	5400	2.210
11:21	120	7200	2.230
11:51	150	9000	2.250
12:21	180	10800	2.260
12:51	210	12600	2.260
13:21	240	14400	2.270
13:51	270	16200	2.280
14:21	300	18000	2.280

MSP05

t at 75% Effective Depth: **450** secs

t at 25% Effective Depth: **n/a** secs

$$\text{Infiltration Rate } f = V_{p75-25} / a_{p50} \times t_{p75-25}$$

Vp75-25: **0.33** m3

ap50: **2.454** m2

tp75-25 **#VALUE!** secs

f = #VALUE! m/s

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION					
Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	AH	Date:	09/02/2021	Weather:	cold, dry, 2/8 cloud

TEST PIT DETAILS							
Trial Pit Number:	MSP06		Test 1 of 3				
Length (m):	2.0	Width (m):	0.4	Depth (m):	2.0		
Depth to Groundwater (m):	N/A						
Time Filling Commenced:	09:34		Time Filling Completed:		09:35		
Depth to Water at Start of Test:	0.56						
Effective Depths:	75%:	0.91	50%:	1.26	25%:	1.61	

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

TEST PIT RESULTS			
TEST DATA			MSP06
Time	t (mins)	t (secs)	Depth to Water (m)
09:35	0	0	0.560
09:35:30	0.5	30	0.580
09:36	1	60	0.590
09:36:30	1.5	90	0.590
09:37	2	120	0.590
09:38	3	180	0.590
09:39	4	240	0.590
09:40	5	300	0.590
09:41	6	360	0.600
09:42	7	420	0.600
09:43	8	480	0.600
09:44	9	540	0.600
09:45	10	600	0.600
09:47	12	720	0.600
09:49	14	840	0.600
09:51	16	960	0.600
09:53	18	1080	0.600
09:55	20	1200	0.600
10:00	25	1500	0.600
10:05	30	1800	0.610
10:15	40	2400	0.620
10:25	50	3000	0.630
10:35	60	3600	0.630
11:05	90	5400	0.640
11:35	120	7200	0.640
12:05	150	9000	0.640
12:35	180	10800	0.650
13:05	210	12600	0.650
13:35	240	14400	0.650
14:05	270	16200	0.650
14:35	300	18000	0.650

t at 75% Effective Depth: n/a secs
 t at 25% Effective Depth: n/a secs

Infiltration Rate $f = V_{p75-25} / a_{p50} \times t_{p75-25}$

Vp75-25: **0.56** m3
 ap50: **4.16** m2
 tp75-25 **#VALUE!** secs

f = #VALUE! m/s

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION					
Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	AH	Date:	09/02/2021	Weather:	cold, dry, 2/8 cloud

TEST PIT DETAILS							
Trial Pit Number:	MSP07		Test	1 of 3			
Length (m):	2.0	Width (m):	0.4	Depth (m):	1.6		
Depth to Groundwater (m):	N/A						
Time Filling Commenced:	11:06		Time Filling Completed:		11:08		
Depth to Water at Start of Test:	0.5						
Effective Depths:	75%:	0.78	50%:	1.05	25%:	1.33	

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

[illegible]

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION					
Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	AH	Date:	09/02/2021	Weather:	cold, dry, 2/8 cloud

TEST PIT DETAILS							
Trial Pit Number:	MSP08		Test	1 of 3			
Length (m):	2.0	Width (m):	0.4	Depth (m):	2.6		
Depth to Groundwater (m):	N/A						
Time Filling Commenced:	12:06		Time Filling Completed:			12:10	
Depth to Water at Start of Test:	0.65						
Effective Depths:	75%:		1.14	50%:	1.63	25%:	2.11

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

TEST PIT RESULTS			
TEST DATA			MSP08
Time	t (mins)	t (secs)	Depth to Water (m)
12:10	0	0	0.650
12:10:30	0.5	30	0.650
12:11	1	60	0.670
12:11:30	1.5	90	0.690
12:12	2	120	0.710
12:13	3	180	0.710
12:14	4	240	0.740
12:15	5	300	0.780
12:16	6	360	0.790
12:17	7	420	0.790
12:18	8	480	0.790
12:19	9	540	0.790
12:20	10	600	0.790
12:22	12	720	0.800
12:24	14	840	0.800
12:26	16	960	0.800
12:28	18	1080	0.800
12:30	20	1200	0.810
12:35	25	1500	0.820
12:40	30	1800	0.820
12:50	40	2400	0.830
13:00	50	3000	0.830
13:10	60	3600	0.840
13:40	90	5400	0.840
14:10	120	7200	0.840
14:40	150	9000	0.840
15:10	180	10800	0.820
15:40	210	12600	0.830

The graph plots Depth (m) on the y-axis against Time (secs) on the x-axis. The y-axis ranges from 0 to 0.9 m, and the x-axis ranges from 0 to 14000 secs. A series of blue dots connected by a red line shows the water level rising from about 0.65 m at t=0 to approximately 0.84 m at t=12600 secs.

t at 75% Effective Depth: **n/a** secs
t at 25% Effective Depth: **n/a** secs

$$\text{Infiltration Rate } f = V_{p75-25} / ap_{50} \times tp_{75-25}$$

Vp75-25: **0.78** m3
ap50: **5.48** m2
tp75-25 **#VALUE!** secs

f = #VALUE! m/s

**DETERMINATION OF SOIL INFILTRATION RATE IN
ACCORDANCE WITH BRE DIGEST 365**

GENERAL INFORMATION					
Site Name:	Former St Tydfil Hospital, Merthyr Tydfil			Job No:	21988
Engineer:	Lucy Blain	Date:	09/02/2021	Weather:	Cold, dry, clear.

TEST PIT DETAILS							
Trial Pit Number:	MSP09		Test	1	of	3	
Length (m):	2.0	Width (m):	0.4		Depth (m):	2.6	
Depth to Groundwater (m):	N/A						
Time Filling Commenced:	13:47		Time Filling Completed:			13:49	
Depth to Water at Start of Test:	0.86						
Effective Depths:	75%:		1.30	50%:	1.74	25%:	2.18

NOTE: Soakage to at least 25% effective depth is required in order to calculate infiltration rate. If infiltration rates are slow extrapolation maybe required to determine time at which 25% effective depth would be achieved.

[illegible]

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