

Bryn Morfa, Bodelwyddan

Infiltration Test Report

October 2019

Project Information	
Project:	Bryn Morfa, Bodelwyddan
Report Title:	Infiltration Test Report
Client:	Maxi Developments Ltd
Instruction:	The instruction to undertake this Infiltration Test Report was received from Mr Max Jones of Maxi Developments Ltd.
File Ref:	12188-Infiltration Test Report-01

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Document History		
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01	17/10/2019	First issue

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Introduction

Waterco has been commissioned to undertake infiltration testing in relation to a proposed residential development at Land at Bryn Morfa, Bodelwyddan, Denbighshire, LL18 5TP.

The infiltration testing will establish soil permeability and will be used to inform whether infiltration-based drainage systems are feasible on site.

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Site Overview

The site is located at National Grid Reference (NGR): 299692, 375974. A location plan and an aerial image are included in Appendix A.

The site is currently undeveloped. The site is bordered by agricultural land to the north, Bodelwyddan allotments to the east and residential properties to the south and west. Access to the site is provided from Bryn Morfa (road) to the west. A land drain was recorded along the eastern site boundary flowing north.

Published Ground Conditions

Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the site is underlain by Devensian Till superficial deposits generally comprising diamicton. The superficial deposits are identified as being underlain by the Warwickshire Group consisting of mudstone, siltstone and sandstone (Secondary A Aquifer).

The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a site-specific basis.

The Cranfield University 'Soilscapes' map (accessed September 2019) indicates that the site is underlain by 'slowly permeable, seasonally wet, loamy and clayey soils'.

Development Proposals

The proposed development is for the erection of 31No. dwellings, construction of a new access road and creation of public open space. A proposed development plan is included in Appendix B.

Infiltration Testing

Fieldworks

Waterco Consultants undertook infiltration testing in general accordance with the BRE Digest 365 specification in October 2019. 5No trial pits (excavated by others) were constructed on site; a trial pit construction specification was provided to the client in advance of the works.

The trial pits were dispersed across the site and positioned with respect to health and safety considerations and other on-site constraints. Approximate trial pit (TP) locations are annotated on the trial pit location plan in Appendix C. A photographic record is also included in Appendix C.

The excavated material comprised topsoil to a depth of approximately 0.3 metres below ground level (m.bgl). The topsoil was underlain by sandy, gravelly **clay**. Clay was encountered to a depth of 2m.bgl.

The trial pits were dug prior to Waterco's attendance on site. The client advised that the pits were excavated in accordance with the trial pit specification, to a maximum depth of 2m.bgl, however, partial side collapse of the trial pits caused material to fall to the bottom of the pits, reducing the depth.

The trial pit dimensions are provided in Table 1. The infiltration testing was completed on 1st October 2019. The weather conditions varied with heavy rain the day prior to the site visit with overcast and dry conditions on the day of the infiltration testing.

Table 1 – Trial Pit Dimensions

Trial Pit	Depth (m)	Width (m)	Length (m)
TP1	1.67	1	2.5
TP2	1.48	0.85	2.4
TP3	1.19	1	2.3
TP4	1.06	0.9	2.5
TP5	1.62	0.85	2.3

Water was provided from 1,000-litre intermediate bulk containers (IBC's). 2No. 1000 litre IBC's were provided for each trial pit.

Results

The trial pits were dug up to 3 days prior to Waterco attending site. On the day of testing, shallow depth water was recorded within the trial pits. The water within the trial pits is assumed to be related to the heavy rainfall prior to site attendance, the trial pits being left open and lack of infiltration through the underlying clay.

As water was already recorded within the trial pits prior to undertaking infiltration testing, it can be concluded that infiltration techniques will not be suitable at this site.

Nevertheless, the trial pits were filled with water and the water level recorded over a period of 4 hours. The water level had minimal fall (less than 5cm within all trial pits).

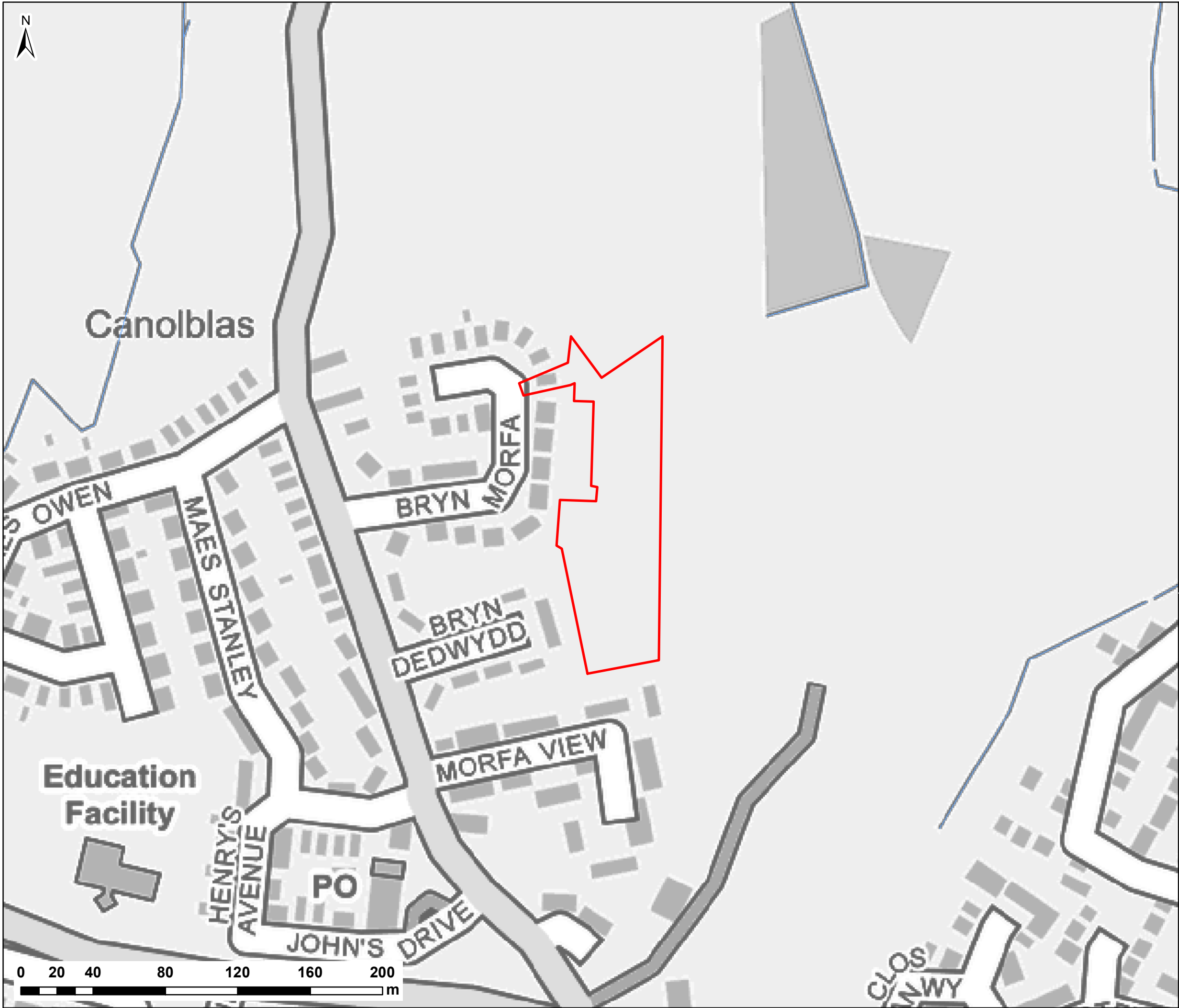
Infiltration tests conclude that the site is not suitable for infiltration drainage techniques.

Conclusions

Infiltration testing has been undertaken in accordance with the BRE Digest 365 specification.



Infiltration tests conclude that the site is not suitable for infiltration techniques due to the impermeable nature of the underlying clay.

Appendix A Location Plan & Aerial Image




NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

-  Site Boundary
-  Watercourses / Water Bodies



CLIENT:			
MAXI DEVELOPMENTS LTD			
 www.waterco.co.uk			
SCHEME:			
BRYN MORFA, BODELWYDDAN			
PLOT TITLE:			
LOCATION PLAN			
PLOT STATUS:			DATE:
FINAL			17/09/2019
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
CM	AW	VG	1:2,000 (UNLESS STATED OTHERWISE)
PLOT NAME:			REV:
12188-Location_Plan			-



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

Site Boundary

CLIENT:

MAXI DEVELOPMENTS LTD

www.waterco.co.uk

SCHEME:

**BRYN MORFA,
BODELWYDDAN**

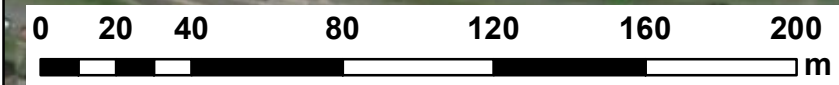
PLOT TITLE:

AERIAL PLAN

PLOT STATUS:			DATE:
FINAL			17/09/2019

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
CM	AW	VG	1:2,000
			(UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
12188-Aerial_Plan	-



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix B Proposed Development Plan

Appendix C Trial Pit Location Plan & Photographic Record



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

-  Site Boundary
-  Trial Pit



CLIENT:

MAXI DEVELOPMENTS LTD



www.waterco.co.uk

SCHEME:

**BRYN MORFA,
BODELWYDDAN**

PLOT TITLE:

**TRIAL PIT
LOCATION PLAN**

PLOT STATUS:

FINAL

DATE:

11/10/2019

DRAWN:

CM

CHECKED:

AW

APPROVED:

VG

PLOT SCALE @ A3:

1:2,000

(UNLESS STATED OTHERWISE)

PLOT NAME:

12188-Trial_Pit_Location_Plan

REV:

-

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Photo No.1	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan
Date: October 2019	
Description: Water infill to trial pit 2	

Photo No. 2	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan
Date: October 2019	
Description: Trial pit 2 arisings	

Photo No.3	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan
Date: October 2019	
Description: Trial pit 2	

Photo No. 4	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan
Date: October 2019	
Description: Trial pit 3 – side collapse (facing west)	

Photo No.5	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan
Date: October 2019	
Description: Trial pit 3 -side collapse (facing east)	

Photo No.6	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan
Date: October 2019	
Description: Trial pit 4 – side collapse	

Photo No.7	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan	
Date: October 2019		
Description: Trial pit 4 arisings		


Photo No.8	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan	
Date: October 2019		
Description: Trial pit 4 arisings – clay in matrix of sands and gravel		


Photo No.9	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan
Date: October 2019	
Description: Trial pit 5, after infill of water	

Photo No.10	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan
Date: October 2019	
Description: Trial pit 2 – after 3 hours.	

Photo No.11	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan
Date: October 2019	
Description: View of site and trial pits, facing north.	

Photo No.12	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan
Date: October 2019	
Description: View of site and trial pits, facing south.	

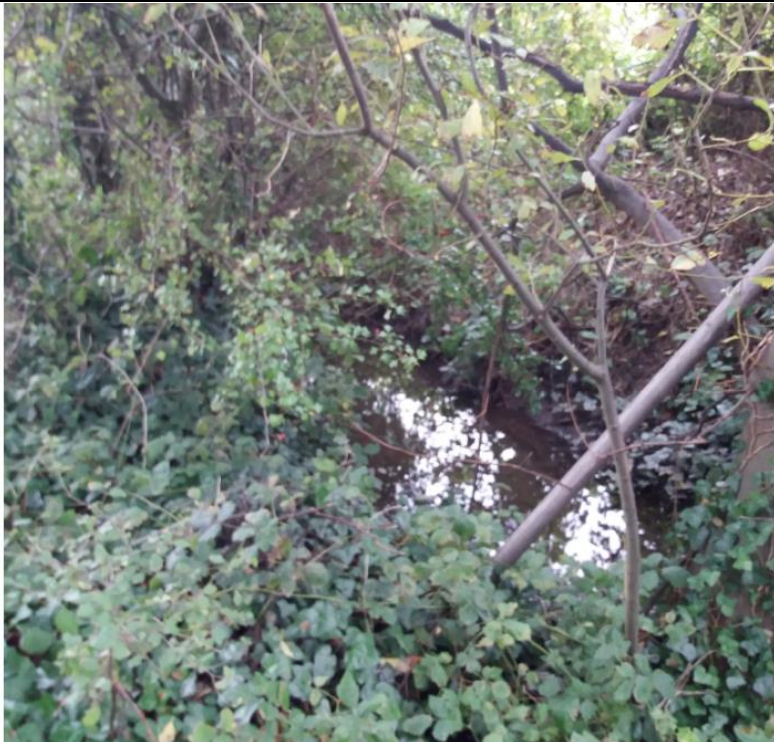
Photo No.13	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan	
Date: October 2019		
Description: Land drain adjacent to eastern site boundary – facing north.		


Photo No.14	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan	
Date: October 2019		
Description: Location of land drain, from the north-eastern corner of the site - facing east		

Photo No.15	Job Reference & Number: 12188 – Bryn Morfa, Bodelwyddan	
Date: October 2019		
Description: Land drain, taken from field north of the site, facing south.		

