



**PROPOSED DEVELOPMENT AT
LAND ADJACENT TO CROWN STREET
GWALCHMAI**

POROSITY REPORT

June 2022
Suitability S1
Revision P01

Prepared on Behalf of:

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- A Trial Pit Location Plan**
- B Trial Pit Log**
- C Porosity Test Calculations**

1.0 Introduction

1.1 Project Background

1.1.1 Cadarn Consulting Engineers Ltd have been appointed by AMP Construction and Groundwork Ltd to undertake a surface water drainage design on the site of a proposed development in Gwalchmai.

1.1.2 As part of the surface water drainage design the method of surface water disposal should be undertaken in line with the SuDS Hierarchy outlined within CIRIA C753 'The SuDS Manual 2015' and the Statutory standards for sustainable drainage systems in Wales 2018. This hierarchy indicates that disposal into the ground via a soakaway structure must be the first method of surface water disposal considered. In order to determine whether this is a viable means of surface water disposal infiltration testing on site is required. This report contains the results and findings of the testing undertaken on site.

1.2 Scope of Porosity Report

1.2.1 The main purpose of the investigation was to undertake soil infiltration tests, in accordance with BRE Digest 365 and Approved Document H of the Building Regulations 2010, to determine if the underlying strata is suitable for utilising infiltration systems for the disposal of surface water run-off generated by the proposal.

1.2.2 This porosity report aims to provide knowledge and understanding of the soil infiltration characteristics encountered on site.

1.2.3 The purpose of the calculations and accompanying details provided are to determine the infiltration value for the soil in order to produce a drainage layout that complies with the relevant legislation of TAN 15, SuDS hierarchy and Approved Document H of the Building Regulations.

2.0 General Overview

- 2.1.1 The main purpose of the investigation was to undertake soil infiltration tests, in accordance with BRE Digest 365 and Approved Document H of the Building Regulations 2010, to determine if the underlying strata is suitable for utilising infiltration systems for the disposal of surface water run-off generated by the proposal. Due to time constraints, unfortunately it was not possible to comply with BRE 365 as the trial hole was only filled once.
- 2.1.2 On the 17th of June 2022, a site investigation was carried out which consisted of 7 trial holes, taken to a maximum depth of 3.1m. After further inspection of TP-1, ground water had begun to ingress. No ground water was found in TP-2 but not that the strata was very firm during excavation. The remaining trial holes, bedrock was found at form 1.1-1.4m. Infiltration testing was conducted on TP-1 and TP2 in order to assess the infiltration characteristics of the ground.
- 2.1.3 The trial pit located as per the attached trial pit location plan drawing contained within **Appendix A**.

3.0 Test Results

3.1.1 The soil infiltration calculations are summarised within **Table 1** below. Refer to the porosity test calculation sheet contained within **Appendix C** for further information.

3.1.2 The soil infiltration calculations are summarised within **Table 1** below. Refer to the porosity test calculation sheet contained within **Appendix C** for further information.

Table 1 – Test Results

<u>Ref</u>	Test N ^o	Depth	Ground Water Depth	Soil Infiltration Rate
TP-1	01	1.10m	N/A	3.91×10^{-06}
TP-2	02	1.10m	N/A	3.10×10^{-06}

3.1.3 Trial pit logs containing information on the depths of strata encountered on site for TP-1 to TP-7 is contained within **Appendix B**.

3.1.4 The results of the test undertaken on the 17th of June 2022 indicate that the use of soakaways as an infiltration method is considered to be a unsuitable method for surface water disposal for this site. Other methods of surface water disposal will need to be explored.

4.0 Conclusion

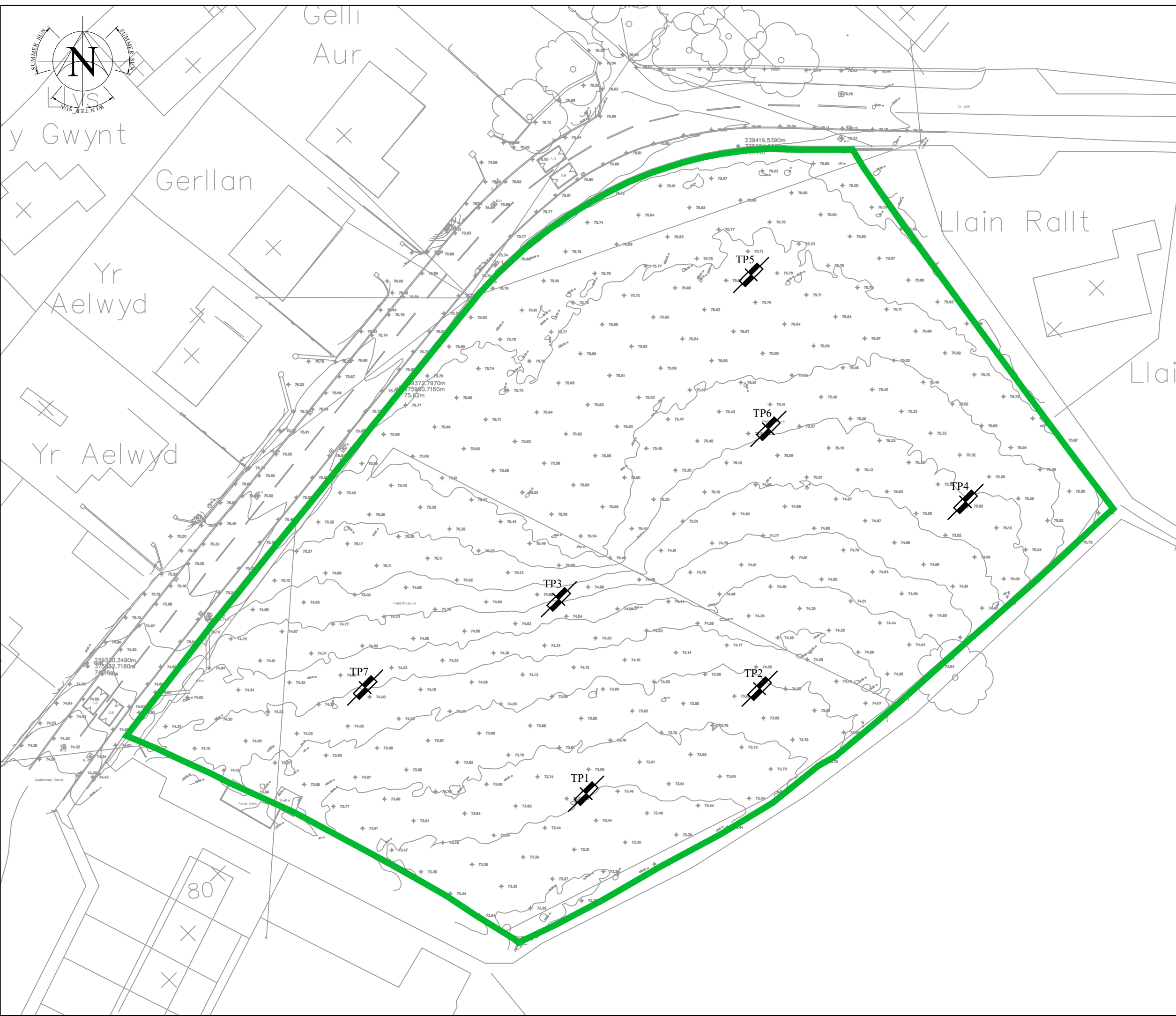
- 4.1.1 The results of the test undertaken on the 17th of June 2022 indicate that the use of soakaways as an infiltration method is not suitable for surface water discharge.

- 4.1.2 Groundwater was encountered during excavations of TP1 when reached 3.1m. Bedrock was also identified at 5 of the Trial pits on site ranging from 1.1m - 1.4m.

APPENDICES

APPENDIX A

Trial Pit Location Plan



- NOTES**
- DO NOT SCALE FROM THIS DRAWING.
 - ALL LEVELS IN METRES UNLESS NOTED OTHERWISE ON DRAWING.
 - ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO UNDERTAKING ANY WORKS, ORDERING MATERIALS OR FABRICATING ANY COMPONENTS
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.

- KEY**
- DENOTES PROPOSED SITE BOUNDARY.
 - TPO DENOTES LOCATION OF TRAIL PIT.

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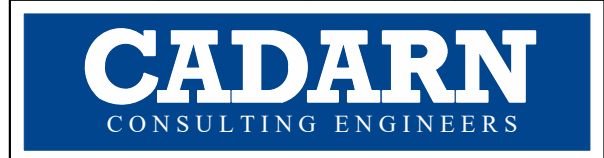
PROJECT TITLE:
**LAND ADJ TO CROWN STREET,
 GWALCHMAI**

DRAWING TITLE:
TRAIL PIT LOCATION PLAN

DRAWING No.:

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009422	CCE	V1	XX	40:40:01	C
	50:30	0009	S1	P01	
CLASSIFICATION		No.	SUITABILITY	REVISION	

ORIGINATOR:	DATE:	SCALE:	ORIGINAL SIZE:
B.Thorne	13.06.2022	1:500	A3



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APPENDIX B

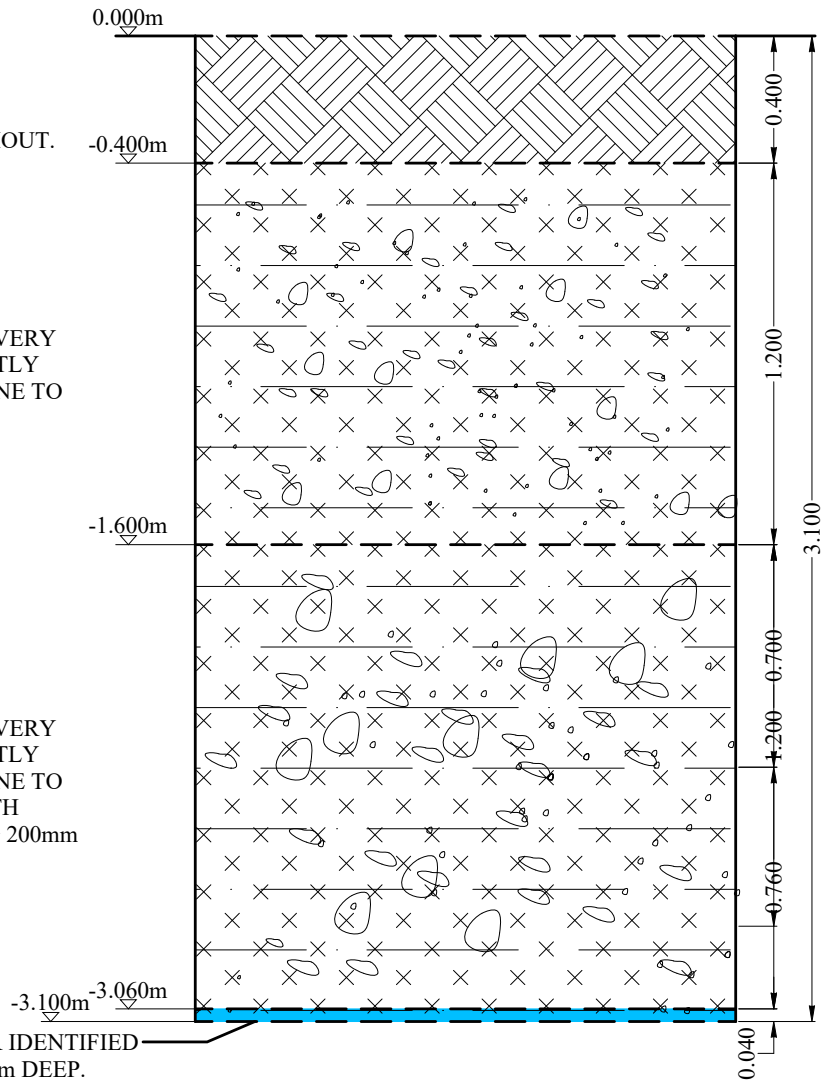
Trial Pit Log

DARK BROWN SILTY TOPSOIL
CONTAINING OCCASIONAL MEDIUM
SIZED ROUNDED AND ANGULAR
GRAVELS WITH ROOTLETS THROUGHOUT.

VERY FIRM, LIGHT BROWN/ORANGE VERY
GRAVELY, SLIGHTLY CLAYEY SLIGHTLY
SANDY, SILT. GRAVELS ARE VERY FINE TO
MEDIUM SIZED ANGULAR GRAVEL.

VERY FIRM, LIGHT BROWN/ORANGE VERY
GRAVELY, SLIGHTLY CLAYEY SLIGHTLY
SANDY, SILT. GRAVELS ARE VERY FINE TO
LARGE SIZED ANGULAR GRAVEL WITH
OCCASIONAL BOULDERS EXCEEDING 200mm
DIAMETER.

SLIGHT SEEPAGE OF GROUND WATER IDENTIFIED
AT BOTTOM OF TRAIL HOLE, AT 3.060m DEEP.



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0013		40:40:01		SUITABILITY		REVISION					

PROJECT TITLE:		DRAWING TITLE:	
LAND ADJ TO CROWN STREET, Gwalchmai		TP1 TRAIL PIT LOG	

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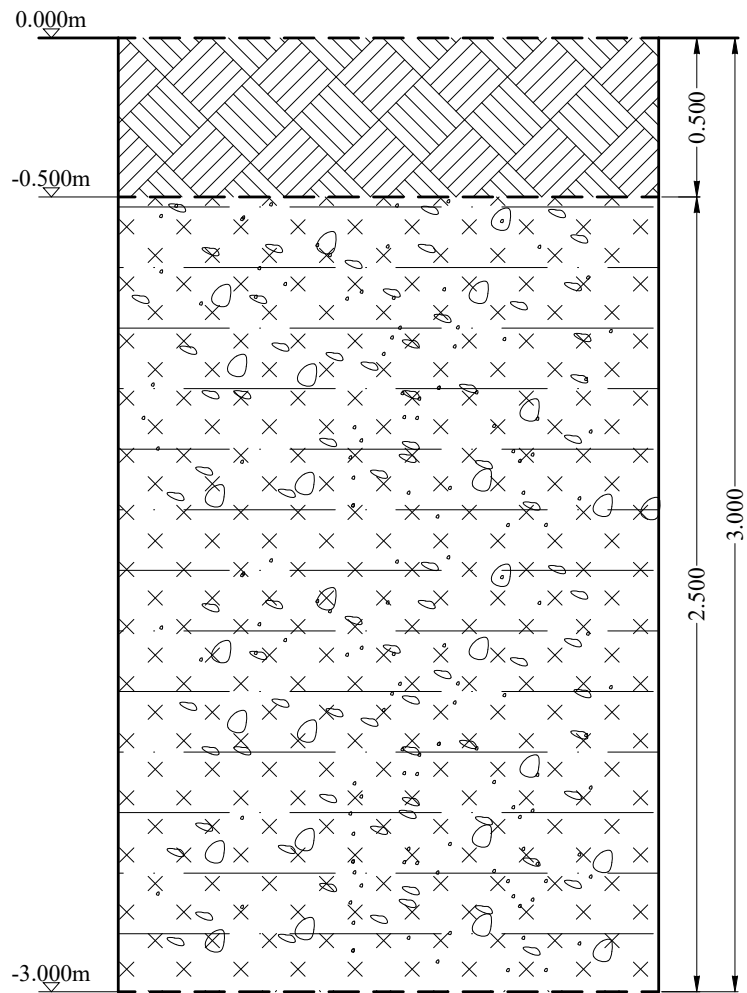
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DARK BROWN SILTY TOPSOIL
CONTAINING OCCASIONAL MEDIUM
SIZED ROUNDED AND ANGULAR
GRAVELS WITH ROOTLETS THROUGHOUT.

VERY FIRM, LIGHT BROWN/ORANGE VERY
GRAVELLY, SLIGHTLY CLAYEY SLIGHTLY
SANDY, **SILT**. GRAVELS ARE VERY FINE TO
MEDIUM SIZED ANGULAR GRAVEL.



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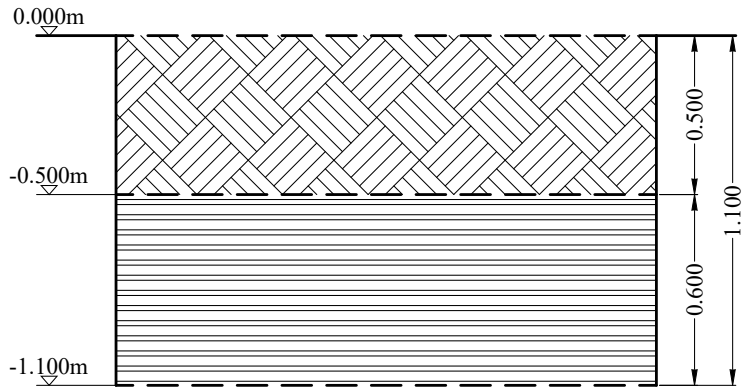
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DARK BROWN SILTY TOPSOIL
CONTAINING OCCASIONAL MEDIUM
SIZED ROUNDED AND ANGULAR
GRAVELS WITH ROOTLETS THROUGHOUT.

FRACTURED SHALE BEDROCK,
BECOMING MORE FIRM WITH DEPTH.



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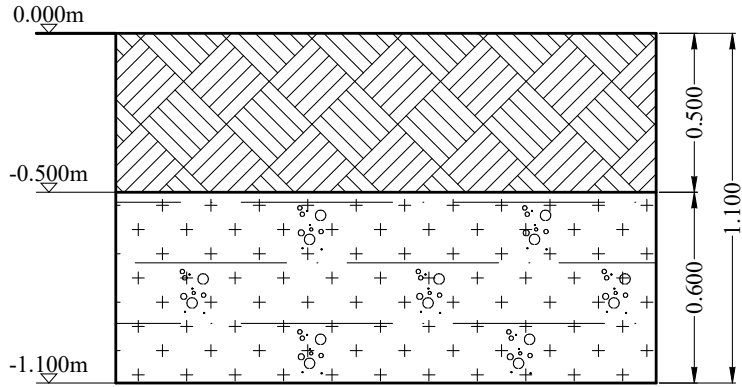
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DARK BROWN SILTY TOPSOIL
CONTAINING OCCASIONAL MEDIUM
SIZED ROUNDED AND ANGULAR
GRAVELS WITH ROOTLETS THROUGHOUT.

FIRM LIGHT BROWN VERY
GRAVELLY SLIGHTLY SANDY
SILT. FINE TO MEDIUM SIZED
ANGULAR GRAVELS



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T.JONES		21.06.2022		1:25		A4		TP5 TRAIL PIT LOG							

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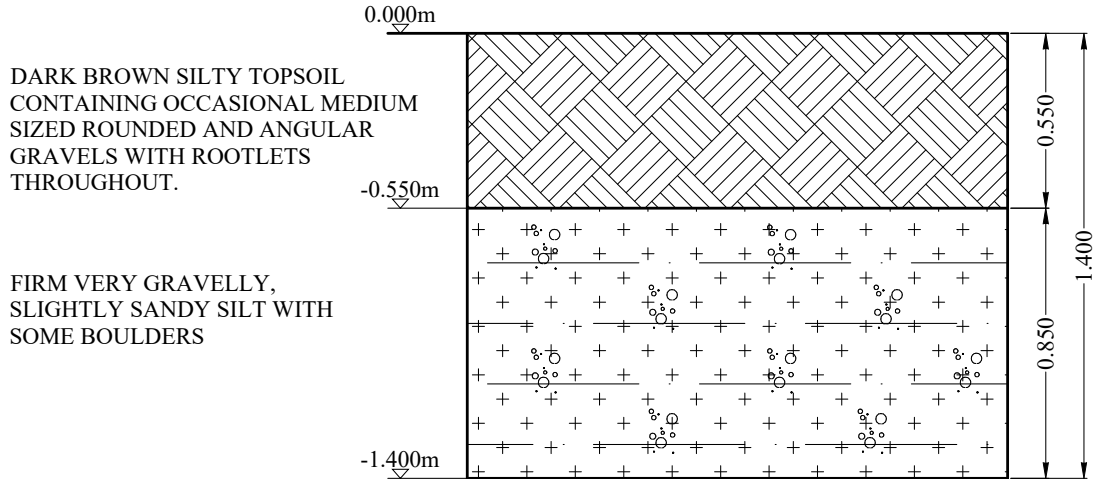
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DRAWING No.:		PROJECT		ORIGINATOR	VOL.	LOC.	TYPE	ROLE	PROJECT TITLE: LAND ADJ TO CROWN STREET, Gwalchmai
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T.JONES	21.06.2022	1:20	A4	TP7 TRAIL PIT LOG					

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APPENDIX C

Porosity Test Calculations

TP1 - INFILTRATION CALCUALTIONS

Site: LAND ADJ TO CROWN STREET, GWALCHMAI
 Doc Ref: Job Ref - 09422 - TP1

Trial Pit Dimensions: Length (m) 2.300 Width (m) 0.800 Depth (m) 3.100

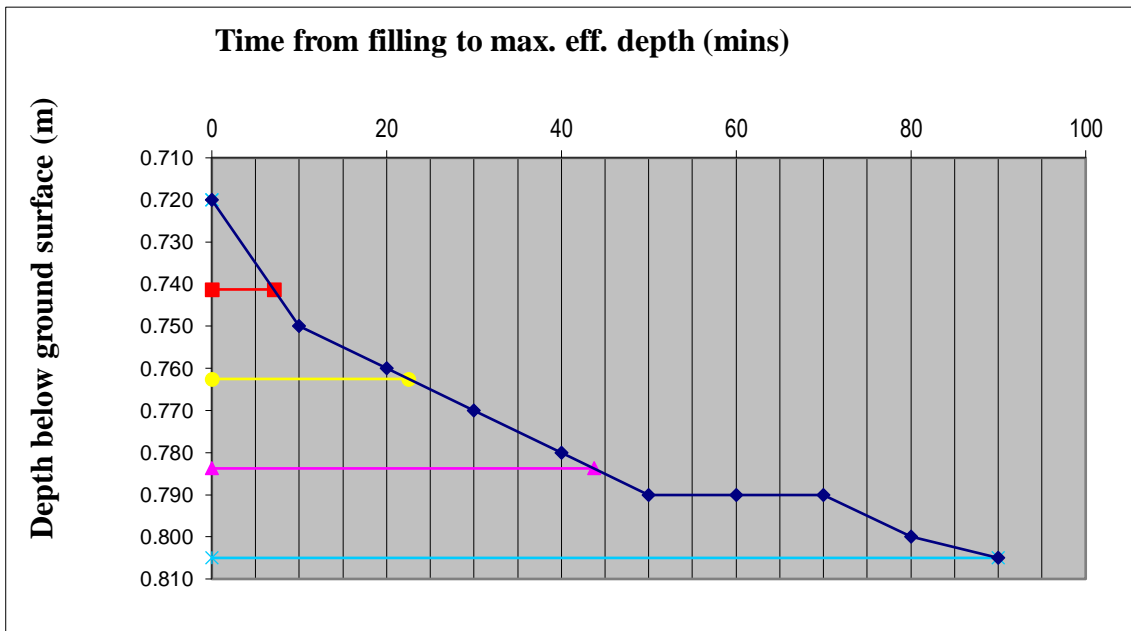
Depth of Groundwater from GL (m): N/A **Thus Effective depth (m) =** 2.380

Time (mins)	Depth of water from (m)	Rate of change (m/min)
0	0.720	
10	0.750	0.0030
20	0.760	0.0010
30	0.770	0.0010
40	0.780	0.0010
50	0.790	0.0010
60	0.790	0.0000
70	0.790	0.0000
80	0.800	0.0010
90	0.805	0.0005

Volume Outflow, Vp75-25	0.078 m ³
Surface Area, ap50	9.100 m ²
Time Taken, tp75-25	36.67 min

Soil Infiltration Rate, f	3.91E-06 m/s
Over Effective depth of	2.380 m
Part H Vp	51.76 s/mm

depth (%Full)	depth (m)	time (min)
0	0.805	0
	0.805	90.00
25	0.784	0.00
	0.784	43.75
50	0.763	0
	0.763	22.50
75	0.741	0
	0.741	7.08
100	0.720	0
	0.720	0.00



TP1 - INFILTRATION CALCUALTIONS

Site: LAND ADJ TO CROWN STREET, GWALCHMAI
 Doc Ref: Job Ref - 09422 - TP2

Trial Pit Dimensions: Length (m) 1.800 Width (m) 0.300 Depth (m) 3.000

Depth of Groundwater from GL (m): N/A **Thus Effective depth (m) =** 2.520

Time (mins)	Depth of water from (m)	Rate of change (m/min)
0	0.480	
10	0.500	0.0020
20	0.500	0.0000
30	0.500	0.0000
40	0.500	0.0000
50	0.505	0.0005
60	0.505	0.0000
TEST ABANDONED		

Volume Outflow, Vp75-25	0.007 m ³
Surface Area, ap50	5.806 m ²
Time Taken, tp75-25	6.25 min

Soil Infiltration Rate, f	3.10E-06 m/s
Over Effective depth of	2.520 m
Part H Vp	30.00 s/mm

depth (%Full)	depth (m)	time (min)
0	0.505	0
	0.505	60.00
25	0.499	0.00
	0.499	9.38
50	0.493	0
	0.493	6.25
75	0.486	0
	0.486	3.12
100	0.480	0
	0.480	0.00

