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CADARN
CONSULTING ENGINEERS

POROSITY REPORT

PROPOSED DEVELOPMENT AT FORDD GLANFFYNNON LLANRUG

July 2024
Suitability S2
Revision P01

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S2	P01	23.07.2024	First Issue.		Tomos Jones	Ian Gunn

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APPENDICES

1.0 Introduction

1.1 Project Background

1.1.1 Cadarn Consulting Engineers Ltd have been appointed to provide a drainage strategy for surface water discharge of the proposed development at the site adjacent to Ffordd Glanffynnon at Llanrug, Gwynedd, LL55 4PP. (National Grid Reference **SH SH 53618 63026**). The site location plan is contained within **APPENDIX A.**

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 infiltration is the second priority level following re-use of water. 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 This porosity report aims to provide knowledge and understanding of the soil infiltration characteristics encountered on site.

1.2.2 The purpose of the calculations and accompanying details provided are to determine the infiltration value for the soil to produce a drainage layout that complies with the relevant legislation of TAN 15 and the SuDS hierarchy.

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, to determine if the underlying strata is suitable for utilising infiltration systems for the disposal of surface water run-off generated from the proposal.

2.1.2 On the 26th of June 2024, an intrusive site investigation was carried out to undertake porosity testing on the site of the proposal, which consisted of 5 No. trial holes, 2 of which were porosity tested. TP-2 was taken to a depth of 1.060m and TP-4 was taken to a depth of 2.100. Infiltration testing was conducted within the trial holes in order to assess the infiltration characteristics of the ground.

2.1.3 The trial pit was located as per the attached trial pit location plan drawing contained within **APPENDIX C.**

3.0 Design Criteria

3.1 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 D** for further information.

Table 1 – *Test Results*

Ref	Test N°	Depth	Ground Water Depth	Soil Infiltration Rate
TP-2	01	1.060m	N/A	ABANDONED
TP-4	05	2.100	2.100m	N/A

3.2 Result Discussion

3.2.1 **TP-2** was excavated to a depth of 1060mm and filled to within 310mm of the existing surface level. One test was carried out at this depth

1) Water level filled to within 310mm of the existing surface level. Water level dropped by 240mm over 95 minutes. Following this, water failed to infiltrate further. As a result, porosity testing within this trial pit was abandoned.

3.2.2 **TP-4** was excavated to a depth of 2.100, where groundwater was encountered during the excavation of the hole at this depth. As a result, porosity testing was not undertaken within this trial pit.

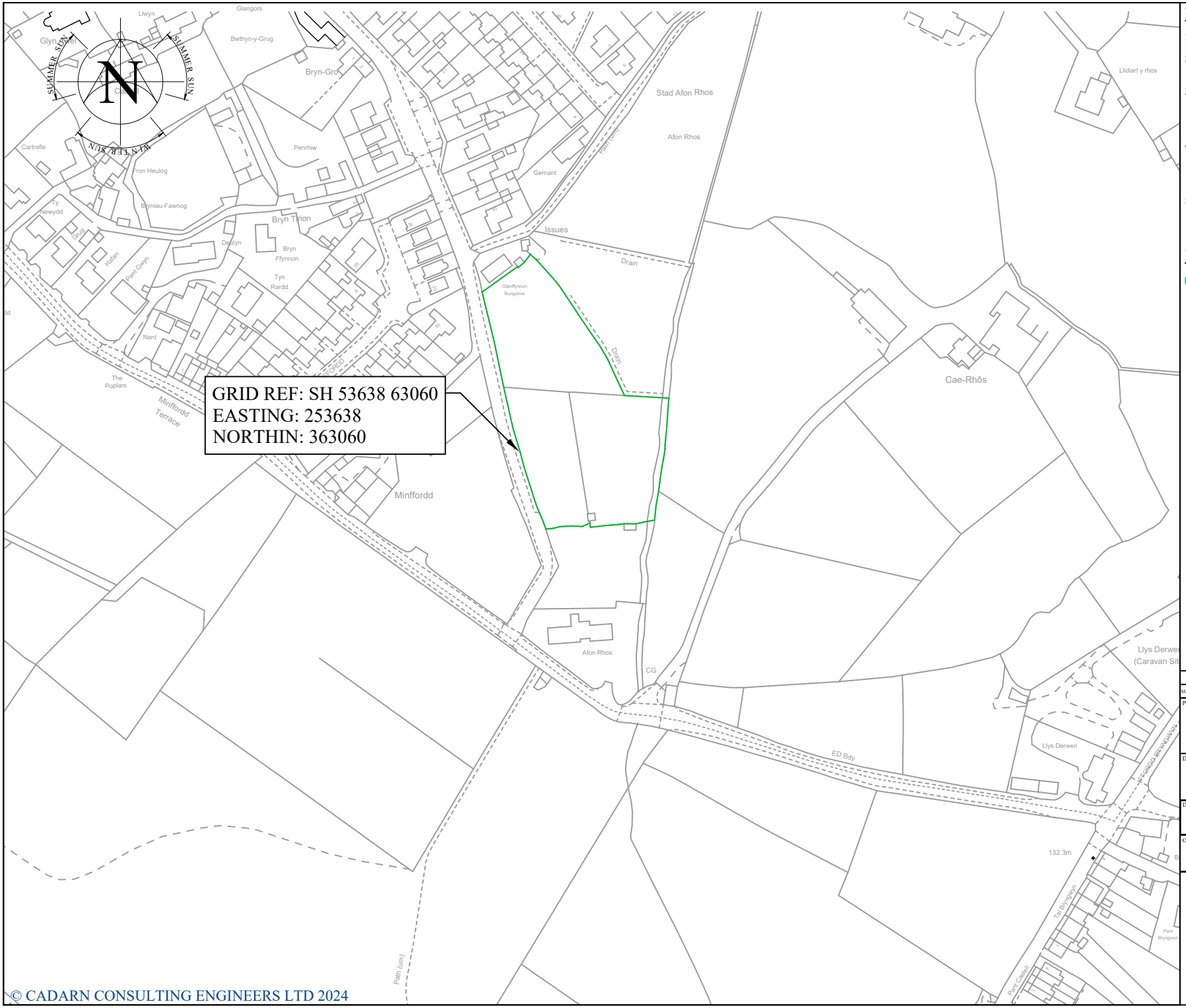
Figure 1 – Trail pit 2

4.0 Conclusion

4.1.1 The results of the testing undertaken on the 26th of June 2024 indicate that the use of soakaways as a method of surface water disposal is not considered to be a suitable method of discharge, and an alternative method of discharge should be investigated.

APPENDICES

APPENDIX A - Site Location Plan



NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL LEVELS IN METRES UNLESS NOTED OTHERWISE ON DRAWING.
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KEY

DENOTES PROPOSED SITE BOUNDARY.

NOT FOR CONSTRUCTION

SUITABILITY	REV	DATE	DESCRIPTION	Orig.	Chk'd	App'd	Auth.
S2	P01	24.06.24	FIRST ISSUE				

PROJECT TITLE:

FFORDD GLANFFYNNON, LLANRUG

DRAWING TITLE:

SITE LOCATION PLAN

DRAWING No:

15824L-CCE-XX-XX-DR-C-0001

ORIGINATOR:	DATE:	SCALE @ A4:	SUITABILITY:	REVISION:
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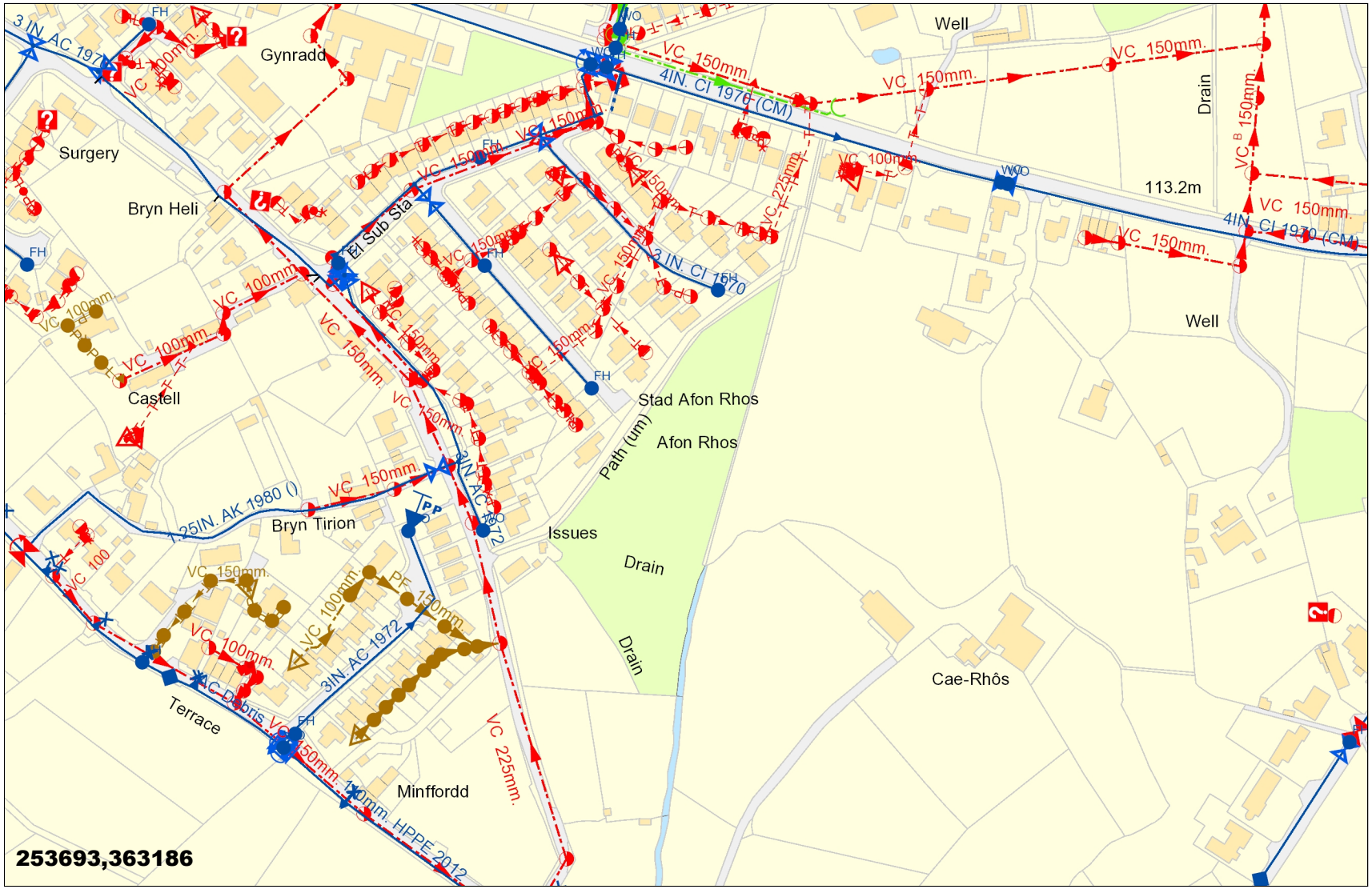
APPENDIX B - DCWW Apparatus Map

Dŵr Cymru
Welsh Water

22/05/2024

N
W E
S

Scale: 1: 3000



LEGEND

Clean Water

- Sluice Val
- Air Val, SINGLE
- Tap
- Pressure Reducing Valve
- Meter
- BULK Meter
- FH
- Cap
- Existing Main
- NON COMPANY

Sewerage External

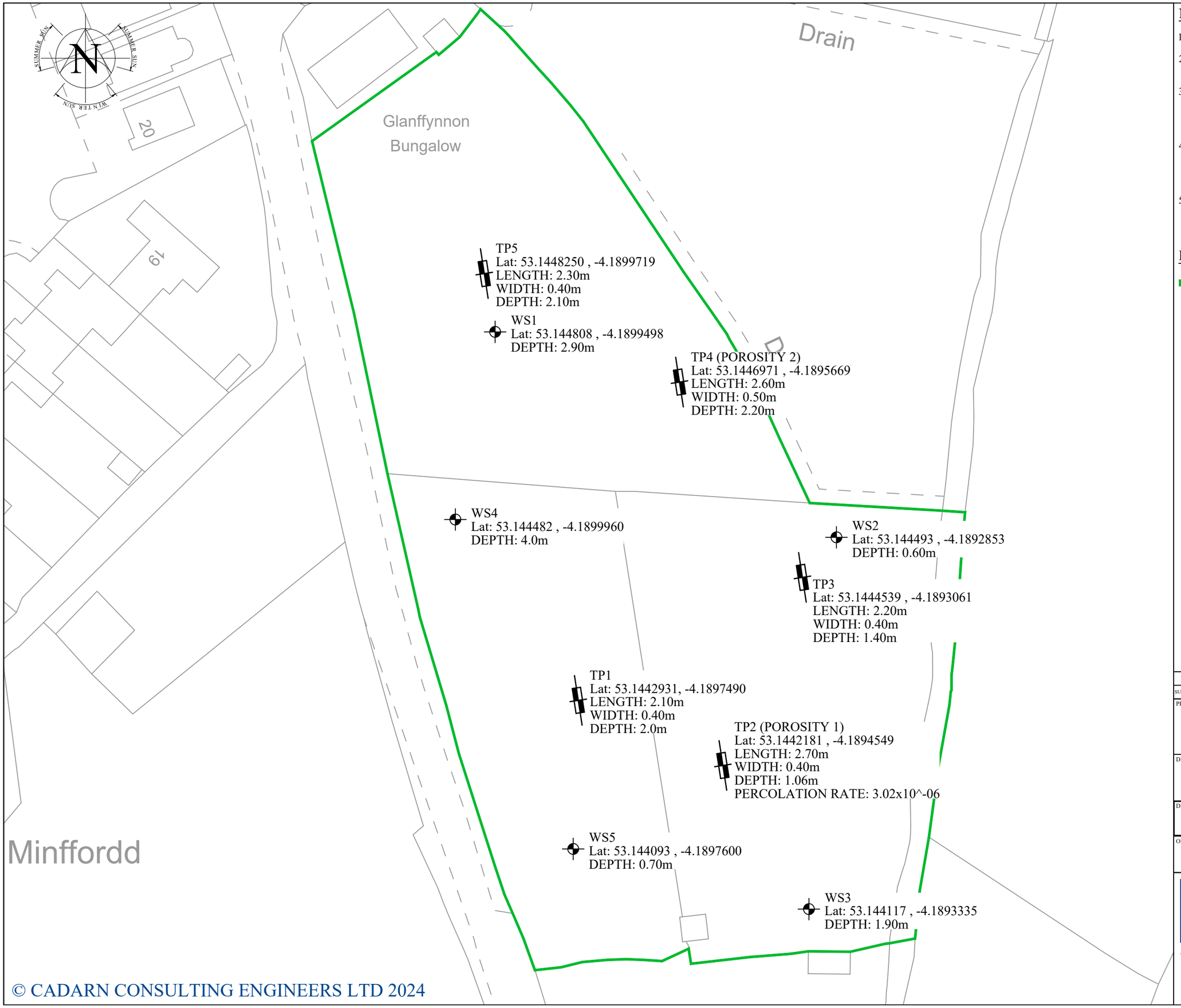
- Foul
- Surface Water
- Combined
- Rising Main
- Private
- Treatment Works
- Pumping Station
- Special Purpose
- Unknown End
- Change, Combined Overflow
- Outfall, FOUL
- Lamp Hole, Foul
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

Dwr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon In the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby the company, is done so in accordance with statutory requirements of sections 198 and 199 f the water industry Act 1991 based upon the best Information available and in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclosure the existence of a drain sewer or disposal main laid before 1 September 1989, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information us entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the company's right to be compensated for any damage to its apparatus.

EXACT LOCATION OF ALL APPARATUS TO BE DETERMINED ON SITE

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

APPENDIX C - Trail Pit Location Plan



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KEY

DENOTES PROPOSED SITE BOUNDARY.

TP0 — DENOTES LOCATION OF TRAIL PIT.

WS0 — DENOTES LOCATION OF WINDOW SAMPLE

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SUITABILITY	REV	DATE	DESCRIPTION	Org.	Chk'd	App'd	Auth.
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PROJECT TITLE:

FFORDD GLANFFYNNON, LLANRUG

DRAWING TITLE:

TRIAL PIT LOCATION PLAN

DRAWING REF:

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APPENDIX D - Trail Porosity Test Calculations

CADARN CONSULTING ENGINEERS

TP1 - INFILTRATION CALCUALTIONS

Site:	Ffordd Glanffynnon, Llanrug
Doc Ref:	15824L TP2 - Test 1

Trial Pit Dimensions:	Length (m) 2.700	Width (m) 0.400	Depth (m) 1.060

Depth of Groundwater from GL (m):	N/A	**Thus Effective depth (m) =**	0.750

Time (mins)	Depth of water from (m)	Rate of change (m/min)
0	0.310	
10	0.370	0.0060
15	0.400	0.0060
20	0.415	0.0030
25	0.430	0.0030
30	0.450	0.0040
35	0.465	0.0030
40	0.470	0.0010
45	0.480	0.0020
50	0.490	0.0020
55	0.510	0.0040
60	0.515	0.0010
65	0.515	0.0000
70	0.520	0.0010
75	0.530	0.0020
80	0.540	0.0020
85	0.550	0.0020
90	0.550	0.0000
95	0.550	0.0000

TEST ABANDONED

Volume Outflow, Vp75-25	0.130	m^3
Surface Area, ap50	3.033	m^2
Time Taken, tp75-25	40.00	min

Soil Infiltration Rate, f	N/A	
Over Effective depth of	0.750	m
Part H Vp	20.00	s/mm

depth (%Full)	depth (m)	time (min)
0	0.550	0
	0.550	95.00
25	0.490	0.00
	0.490	50.00
50	0.430	0
	0.430	25.00
75	0.370	0
	0.370	10.00
100	0.310	0
	0.310	0.00