DRAINAGE STRATEGY REPORT

RESIDENTIAL DEVELOPMENT OFF

LLON CARDI BACH

CILGERRAN

PEMBROKESHIRE

SA43 2TF

JOB No.: 20772

VERSION 04

Roger Casey Associates

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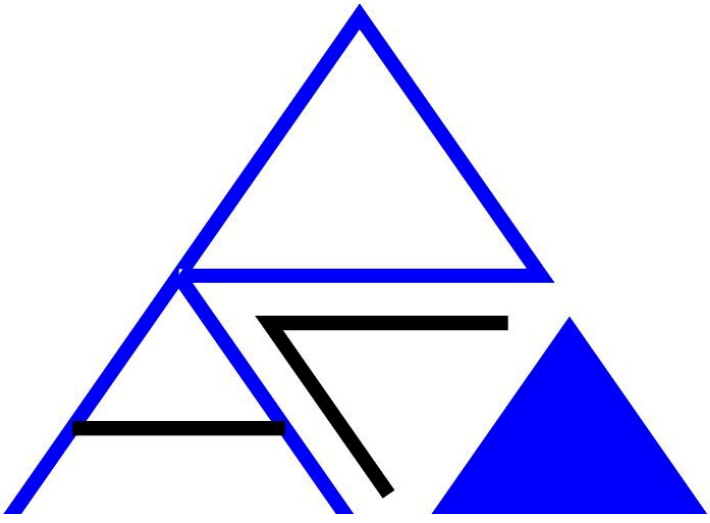

DRAINAGE STRATEGY REPORT

FOR

RESIDENTIAL DEVELOPMENT OFF

LLON CARDI BACH

CILGERRAN

PEMBROKESHIRE

SA43 2TF

Job No.: 20772

Prepared By:	Date: May 2025
Checked By:	Date: May 2025
Approved By:	Date: May 2025

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DOCUMENT REVISION RECORD

Version	Description	Date	Originator	Approver
01	Draft issue.	30/06/2021	PWJL	RC
02	PAC issue.	05/07/2021	PWJL	RC
03	Revised following receipt of further information	17/08/2023	EP	PWJL
04	Revised following DCWW PPA Response, and borehole soakaway investigations	12/05/2025	EP	PWJL

CONTENTS

1.0 INTRODUCTION

Roger Casey Associates have been instructed by Wales and West Housing to prepare a Drainage Strategy Report in respect of the proposed residential development off Llon Cardi Bach, Cilgerran, Pembrokeshire SA43 2TF.

This Drainage Strategy Report is prepared to support the full planning application only and outline the proposals to ensure all foul and surface water drainage design and management is carried out in a sustainable manner and in accordance with current best practice and statutory guidelines and inform the detail drainage design stage.

The National Grid Reference of the approximate centre point of the proposed development site is SN 19627 42704, Easting 219627, Northing 242704.

2.0 SITE CONDITIONS AND TOPOGRAPHY

The site is an irregular shape on plan, located on the southern edge of the village of Cilgerran. Agricultural grassland lies to the east, public highway to the west and a residential dwelling to south. The existing residential development of Llon Cardi Bach is located to the north of the site, from which access is proposed.

A copy of the site location plan is included in Appendix A.

The land rises in a fairly uniform gradient away from a low elevation in the northeast corner to higher elevation in the southwest corner of the land.

A copy of the topographical site survey is included in Appendix B.

3.0 FLOOD RISK

The proposed use of the site, residential, will classify the risk as being a 'Highly Vulnerable Development' (TAN 15, Figure 4). However, in accordance with Natural Resources Wales (NRW) Flood Maps the site is located within an area designated being Flood Zone 1.

A copy of the proposed architectural site plan is included in Appendix C.

In accordance with guidance contained within TAN 15, site specific Flood Consequence Assessments are not required to sites located within Zone 1 however should be informed by Strategic Flood Consequence Assessment. In addition sound drainage design incorporating aspects of Sustainable Urban Drainage Systems (SuDS) is applicable to the development.

National Resources Wales Flood Risk Map and Flood Map for Planning are included in Appendix D.

Planning Policy and Technical Advice Note (TAN) 15 lists six sources of flooding which need to be considered in the assessment of flood risk and the probability of flooding at the Site Location.

Flooding from Rivers or Fluvial

Not applicable due to Site Location and demonstrated on Flood Map in Appendix D.

Flooding from the Sea or Tidal Flooding

Not applicable due to Site Location and demonstrated on Flood Map in Appendix D.

Flooding from Land

Not applicable due to surface water management within the proposed drainage strategy leading to detail design. Proposed external ground formation/levels must form appropriate informal overland flow routes within the landscaping and external area design to safely transfer any flood water away from the proposed buildings and any other existing premises.

Flooding from Groundwater

Groundwater was encountered in Trial Pit TP01 at 2.00 metres below existing ground level which rose to 1.80 m after 40 minutes. If groundwater is struck during further site investigations and/or excavations, suitable measures shall be undertaken to protect proposed and existing premises from this potential flood risk from this source.

3.0 FLOOD RISK (Continued)

Flooding from Sewers

Not applicable due to foul and surface water management within drainage design. Notwithstanding blockage or catastrophic failure of drainage systems upstream of development site resulting in overland flows not being contained within kerb upstand heights, surface gradients, etc.

Where possible, floor levels will be kept above the level of the relevant adjacent roads and drives.

Flooding from Reservoirs, Canals and Other Artificial Sources

Not applicable due to Site Location and demonstrated on Flood Map in Appendix D.

4.0 EXISTING DRAINAGE AND SITE INVESTIGATIONS

Foul Water Drainage

A Pre-Planning Application (PPA) has been made to Dwr Cymru Welsh Water (DCWW) as part of our commission. DCWW PPA response advises that sufficient capacity exists within the public sewer sewerage network to accommodate the new foul water flows from the proposed development.

The PPA goes on to advise that the Cilgerran Wastewater Treatment Works (WwTW) presently does not have capacity for additional flows, however improvement works are proposed to increase treatment capacity with completion by 31th December 2025.

Within further correspondence DCWW have confirmed that upon completion of the improvement works the WwTW will have the required capacity to accommodate the proposed development with a point of connection within located with Lon Cardi Bach to the north.

The PPA and further correspondence is contained within Appendix E.

4.0 EXISTING DRAINAGE AND SITE INVESTIGATIONS (Continued)

Surface Water Drainage

On 7 January 2019, the Welsh Government implemented Schedule 3 of the Flood and Water Management Act (2010). The new mandatory regulations make the incorporation of sustainable drainage systems (SuDS) compulsory in new developments in order to help reduce flood risk and improve water quality. SuDS on new developments must be designed and built in accordance with the Statutory SuDS Standards published by the Welsh Ministers. Schemes must be approved by the Local Authority acting in the role of SuDS Approving Body (SAB) before construction begins.

For the purposes of this Drainage Strategy Report to support a planning application, only the surface water runoff destination will be discussed to provide evidence to the LPA that a sustainable surface water drainage scheme at this site location is achievable.

With reference to Standard S1 of the Statutory Sustainable Drainage Systems Standards, surface water runoff destination is considered in five priority levels:

Priority Level	Flow Destination
1	Surface water run-off is collected for use;
2	Surface water runoff is infiltrated to ground;
3	Surface water runoff is discharged to a surface water body;
4	Surface water runoff is discharged to a surface water sewer, highway drainage, or another drainage system;
5	Surface water runoff is discharged to a combined sewer.

Following investigations and in response to each of the Priority Levels:

1. Rainwater butt(s) will be provided to each dwelling to assist in recycling of rainwater as a valuable resource for irrigation, car washing and other uses external of the dwelling. At this stage it is not envisaged to install underground pumped rainwater harvesting tank(s) due to the initial capital cost and long-term running costs and maintenance regime.

2. Soakaway testing was undertaken by Terra Firma (Wales) Limited as part of their Site Investigation undertaken during August 2020. The trial holes revealed ground strata of clays over gravels over mudstone. Soakaway tests across the site were successful in 5 out of the 7 soakaway test trial holes. A further 3 infiltration testing were undertaken in March 2022 by Quantum Geotech to determine the seasonal effect on permeability, these tests proved unsuccessful.

4.0 EXISTING DRAINAGE AND SITE INVESTIGATIONS (Continued)

In January 2025 borehole soakaways were undertaken by Terra Firma (Wales) Limited as part of further site investigation works. 2 Number boreholes were drilled to a depth of 30m begl to the North of the site with falling head tests undertaken in accordance with BS5930:2015. Both boreholes proved to be successful with infiltration rates of $1.14x10^{-3}$m/s and $6.86x10^{-4}$m/s. Upon completion of the testing the boreholes were installed with slotted standpipes consisting of 165mm internal diameter HDPE slotted tube set in a granular filer zone and sealed with a bentonite plug.

Extracts from the site investigation have been included in Appendix G.

3. Not considered further due to available surface water drainage destination at Priority Level 2.

4. Not considered further due to available surface water drainage destination at Priority Level 2.

5. Not considered further due to available surface water drainage destination at Priority Level 2.

5.0 PROPOSED DRAINAGE STRATEGY

The site will be served by separate foul and surface water drainage systems discharging as follows based on existing drainage and site investigations outlined above (refer to Appendix F for the proposed Concept Engineering Site Plan).

Foul Water Drainage

All foul water drainage flows will be collected from the proposed dwellings via a new gravity, solid wall pipe, system and connected into the existing public sewer system located in the carriageway of Llon Cardi Bach.

To comply with Welsh Ministers Standards, where a foul water drainage system lies outside of the legal curtilage of a dwelling and communicates with the public sewer network. It will need to be adopted by Dwr Cymru Welsh Water under a Water Industry Act Section 104 Adoption Agreement between DCWW and the Developer.

Connection to the public sewer will be subject to a Water Industry Act 1991 Section 106 application and will take the form of a new chamber constructed on the existing sewer pipeline.

Surface Water Drainage

The proposed development's surface water drainage will have to comply with Welsh Government Statutory standards for sustainable drainage systems. These Standards are enforced by Pembrokeshire County Council acting as the Sustainable urban Drainage System Approving Body (SAB).

Predevelopment the development parcel consists of a green field with no impermeable areas, any runoff generated presently will be directed to the lowest elevation on site which is the North Eastern corner, the current proposed impermeable area (subject to detailed design) is considered to be 0.445ha which includes proposed access roads, dwellings, driveways, footpaths and patios.

As part of the detail design the surface water runoff destination, surface water runoff hydraulic control, water quality, amenity, biodiversity and design of drainage for construction, operation and maintenance must be considered. These are referred to as Standards S1 to S6. At this planning application stage, only standards S1 and S2 are being considered (surface water runoff destination and surface water runoff hydraulic control).

5.0 PROPOSED DRAINAGE STRATEGY (Continued)

Following consideration of the available surface water destination, it is envisaged the following SuDS features could be incorporated into the final development site to meet Welsh Government SuDS Standards:

- Adoptable carriageways to be laid in permeable surface to capture surface water, improve water quality, and provide attenuation for the restricted outfall.
- Shallow dry swale adjacent to the proposed carriageway and footpath corridors to capture exceedance flows. Green infrastructure will provide biodiversity and amenity benefits.
- Rainwater butts on plot to allow reuse for gardening or washing of cars.
- Drives and parking areas laid in permeable surfaces to improve water quality prior to conveyance to the downstream network.
- Cellular storage to provide site control in accordance with the naturally occurring rates of the borehole destination. Area will also provide water quality through migration through granular material whilst the ground above will provide biodiversity and amenity benefits through improved landscaping.

Future SuDS maintenance will be required to be undertaken in accordance with the recommendation for the proposed features as outlined within Ciria SuDS Manual. We envisage that the carriageways and footpaths, surface water drainage, along with the street lighting will be Adopted by Pembrokeshire County Council (PCC) under a Highway Act Section 38 Agreement and SuDS Agreement between PCC and the Developer.

Maintenance for the on-plot SuDS features will be the responsibility of the individual residents.

6.0 SUMMARY

This Drainage Strategy Statement concludes that an achievable and sustainable drainage scheme can be designed for both foul and surface water drainage systems:

- All proposed development works are located in a low flood risk location considered by TAN 15.
- Surface water flows drained by gravity to onsite infiltration devices via suitable SuDS measures. Infiltration locations will be dependent upon suitable strata locations in accordance with Terra Firma report dated January 2025.
- Foul water flows drained by gravity to the existing public foul water sewer network

Edward Powell MEng GMICE
Civil Engineer
e.powell@rca-eng.co.uk
for Roger Casey Associates

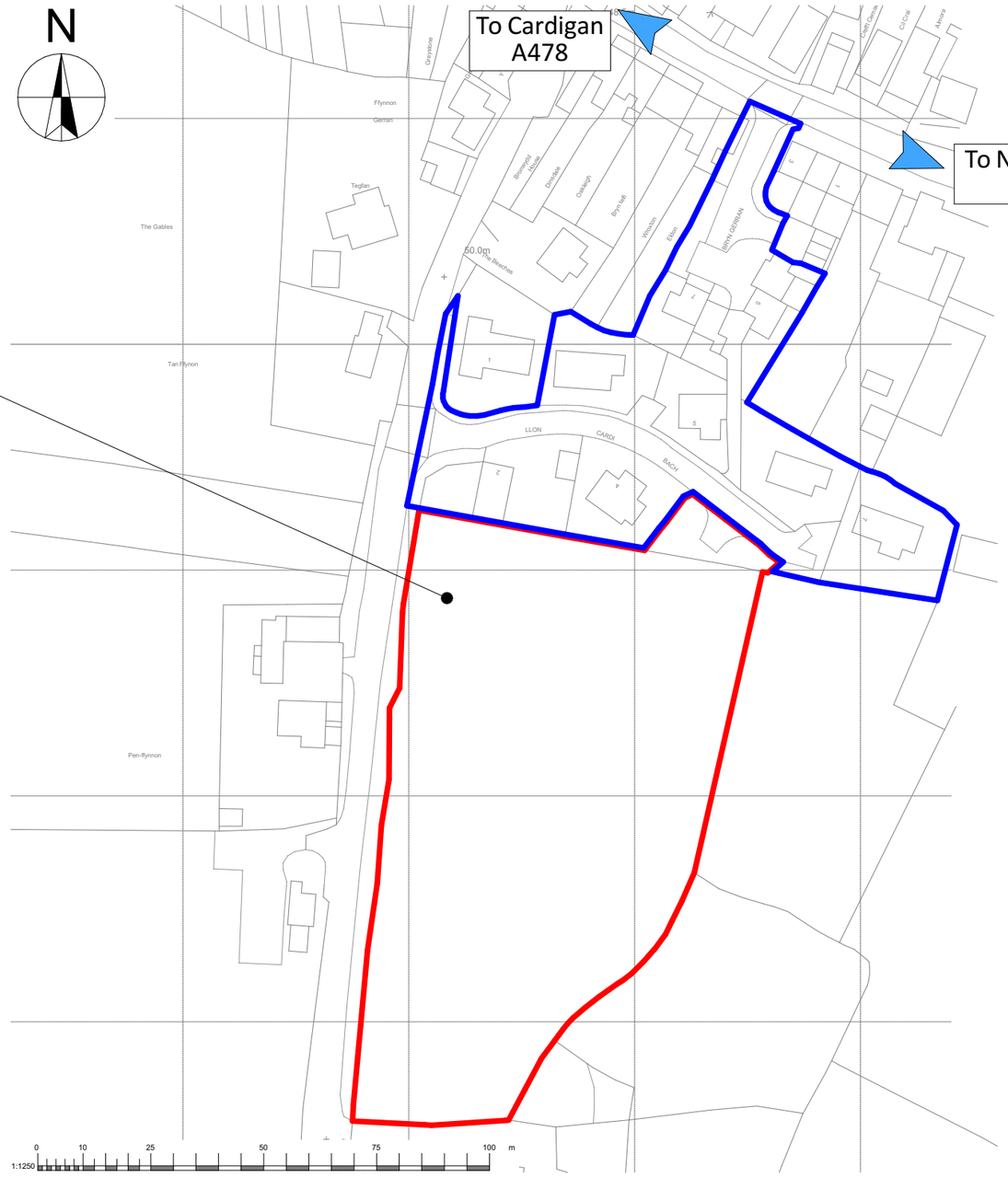
APPENDIX A – SITE LOCATION PLAN

A3 Drawing sheet (420mm x 297mm)

CIAT REGISTERED PRACTICE

Proposed Development, Land South of Llon Cardi Bach, Cilgerran SA43 2TF
"Site Location Plan"

CIAT GROUP MEMBERSHIP SCHEME MEMBER



Site Location Plan 1:1250

Legend:

- Indicates Application Site Boundary
- Indicates Land in applicants ownership

Revision:	Date:	By:

Notes:

R L H architectural
01348 435004
design@rlharchitectural.com
www.rlharchitectural.com

Client:
Tai Wales & West Housing Association

Scale:Noted
Date: Apr '25
Drawn:SE/RH

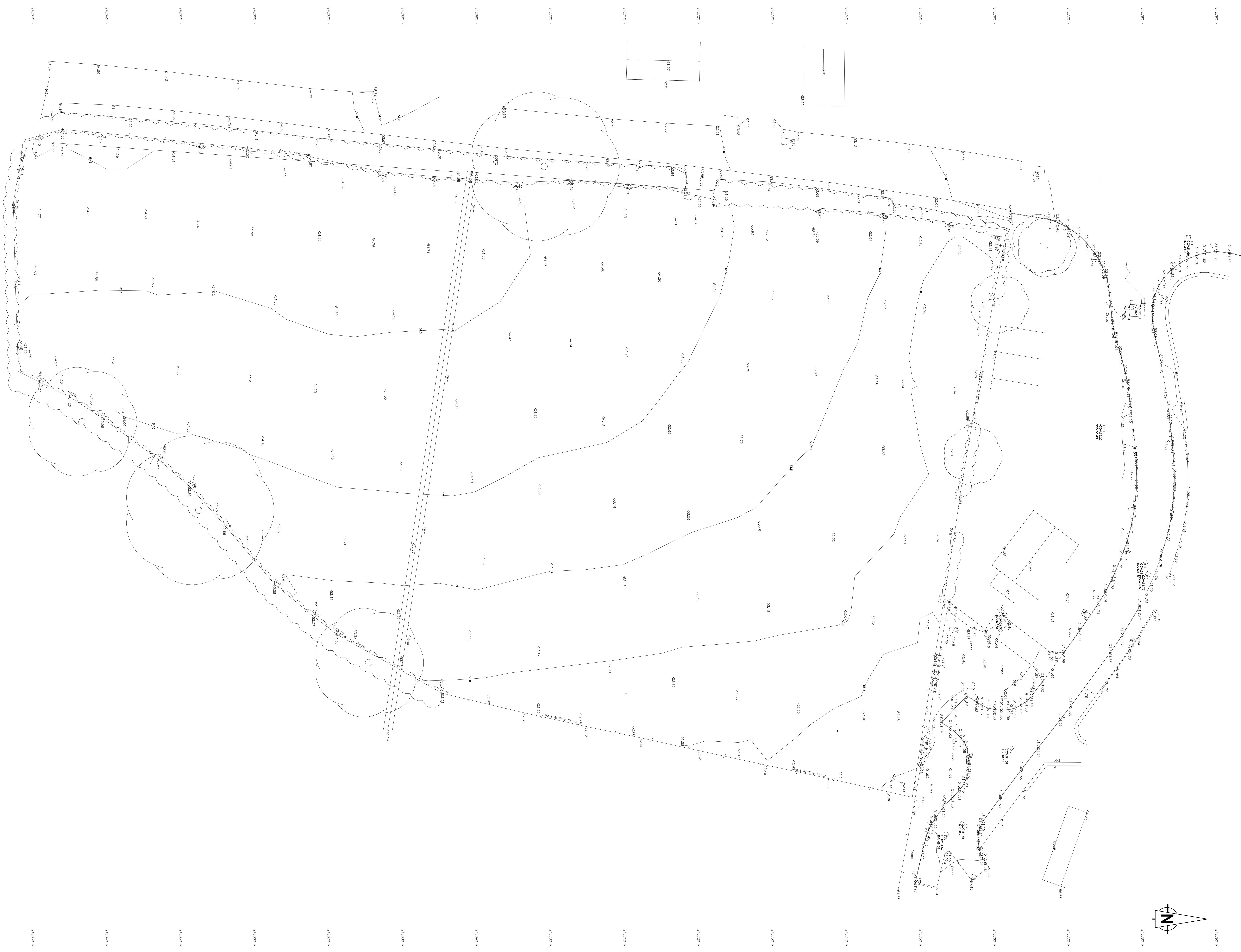
Drawing Title:
PLANNING DRAWINGS - Site Location Plan

Job Title:
Proposed Development, Land South of Llon Cardi Bach, Cilgerran SA43 2TF

R500 - 100

APPENDIX B – TOPOGRAPHICAL SURVEY PLAN

DO NOT SCALE



NOTES:

THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN ROGER CASEY ASSOCIATES AND MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THE WRITTEN CONSENT OF ROGER CASEY ASSOCIATES.

THE CONTRACTOR IS TO CHECK ALL LEVELS AND DIMENSIONS BEFORE WORK COMMENCES, AND ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY TO THE CONSULTANTS.

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALING.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER ROGER CASEY ASSOCIATES DRAWINGS AND SPECIFICATIONS AND ALL OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS RELATING TO THIS PROJECT.

REV.	DESCRIPTION	DRAWN	CHECK	DATE
A	DRAINAGE CHAMBER INVERTS ADDED	PWJL	RSC	15/06/21

DRAWING STATUS:
SURVEY

Roger Casey Associates
Consulting Civil & Structural Engineers

Ty Mansel, 6 Mansel Street, Carmarthen, Carmarthenshire SA31 1PX
T: 01267 222 646

Units 10 & 11, Merlin's Court, Winch Lane, Haverfordwest, Pembrokeshire SA61 1SB
T: 01437 762 795

E: office@rca-eng.co.uk
W: www.rca-eng.co.uk

CLIENT:
WALES & WEST HOUSING

ARCHITECTURAL CONSULTANT:
R L H ARCHITECTURAL FISHGUARD

PROJECT:
RESIDENTIAL DEVELOPMENT OFF LLON CARDI BACH, CILGERRAN, PEMBROKESHIRE SA43 2TF

DRAWING TITLE:
EXISTING SITE SURVEY PLAN

DRAWN BY:	DESIGN BY:	CHECKED BY:	DATE:
PWJL	-	RSC	03/03/2022
SCALES: 1:250	DRAWING No.: 20772/01		REVISION: A

APPENDIX C – PROPOSED ARCHITECTURAL SITE PLAN

A1 Drawing sheet (594mm x 841mm)

CIAT REGISTERED PRACTICE

CIAT GROUP MEMBERSHIP SCHEME MEMBER

Proposed Development, Land South of Llon Cardi Bach, Cilgerran SA43 2TF
"Planning Drawings" - Proposed Site Plan/Block Plan

Note

'Site Area' = **0.86ha / 8,645m²**

Developable 'Site Area' = **0.76ha / 7,689m²**

Legend:

- Indicates Application Site Boundary
- Indicates Land in applicants ownership

Site Legend:

- Indicates Rear Gardens
- Indicates Front Gardens
- Indicates SUDS Infiltration Features. TBC by Engineer.
- Indicates Rain Garden.
- Indicates Permeable Paving.
- 'POS' - Indicates Public Open Space 'POS'
- Indicates Retaining walls. TBC by Engineer.

Note - EV charging infrastructure will be installed to each of the dwellings to ensure they are 'EV Ready'

*	2 Person 1 Bedroom Bungalow	51.0sq.m. x1
*	2 Person 1 Bedroom Walk-up Flats	54.0sq.m. (average) x4
*	4 Person 2 Bedroom Houses	83.0sq.m. x12
*	5 Person 3 Bedroom Houses	93.0sq.m. x 6

Total No of Units = x23

Proposed Site Plan/Block Plan 1:250

Revision:	Date:	By:
Rev A - General Site Updates.	15th May 2025	SE/RH
Rev B - Electric Sub-Station relocated.	23rd May 2025	SE/RH

Notes:
1. To be read in conjunction with 'proposed external house type finishes site plan' dwg. no. R500 - 107 for individual plot finishes.
2. To be read in conjunction with 'proposed house type external finishes drawing' dwg. no. R500 - 108.
3. To be read in conjunction with landscaping plan by RDS Landscaping.
4. To be read in conjunction with Ecology Report by Kite Ecology.
5. For highway, footpaths, shared surfaces & parking bay finishes to be read in conjunction with engineer's drawings.

RLH architectural
01348 435004
design@rlharchitectural.com
www.rlharchitectural.com

Tai Wales & West Housing

Client: Tai Wales & West Housing Association

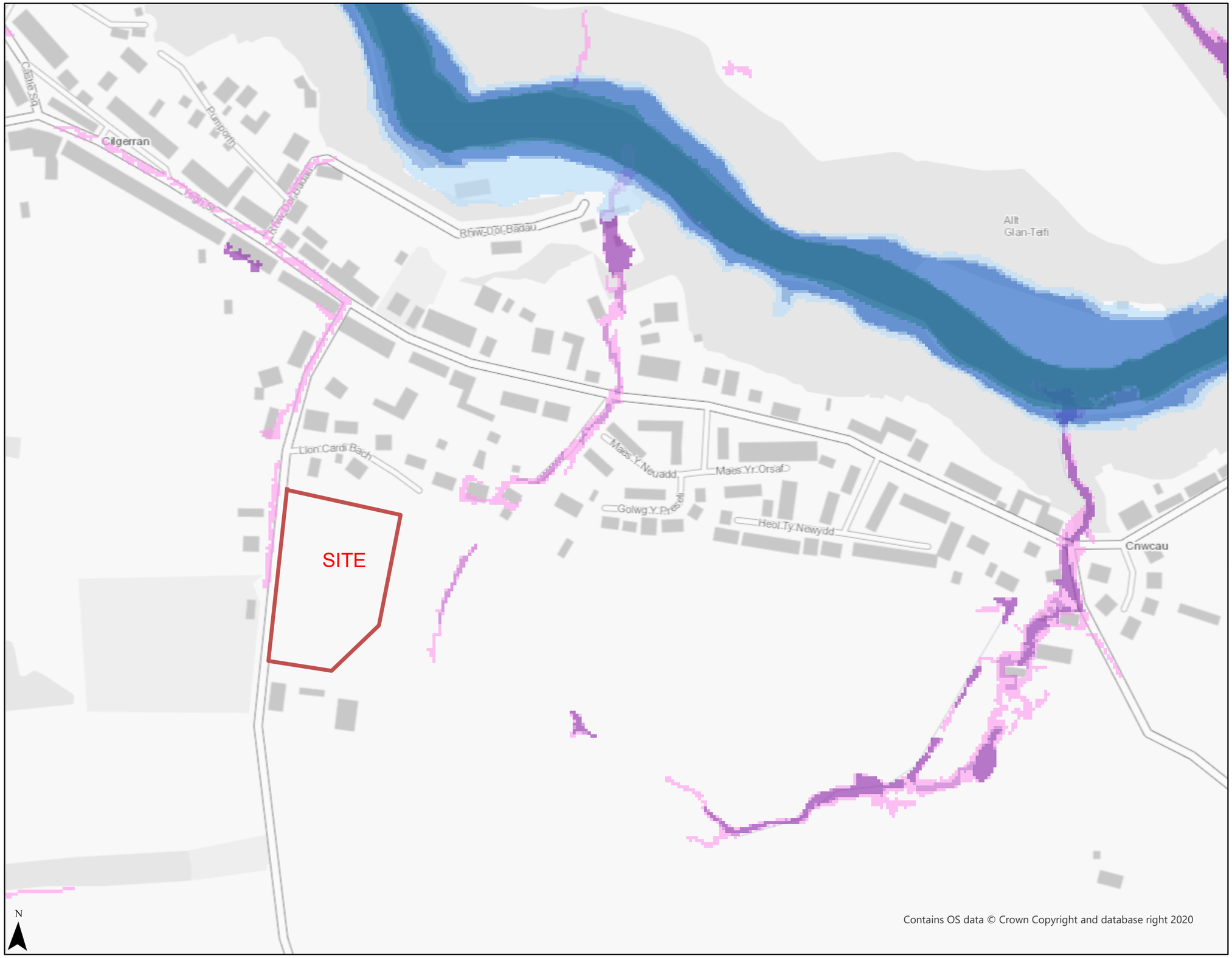
Scale: Noted
Date: Apr '25
Drawn: SE/RH

Drawing Title: PLANNING DRAWINGS - Proposed Site Plan/Block Plan

Job Title: Proposed Development, Land South of Llon Cardi Bach, Cilgerran SA43 2TF

R500 - 103B

APPENDIX D – NATURAL RESOURCES WALES FLOOD RISK MAP AND WELSH GOVERNMENT TAN 15 DEVELOPMENT ADVICE MAP



Cyfoeth Naturiol Cymru
Natural Resources Wales

Flood Risk Maps

Land to South of Lon Cardi bach

Legend

- Flood Defence Locations

Areas Benefitting from Flood Defences

- Rivers
- Sea
- Rivers and Sea

Flood Risk from Rivers

- High
- Medium
- Low

Flood Risk from the Sea

- High
- Medium
- Low

Flood Risk from Surface Water & Small Watercourses

- High
- Medium
- Low
- Risk Level Under Review
- Recorded Flood Extents
- Flood Storage Areas
- Flood Risk from Reservoirs

Scale at A3: 1:2,500

Date: 12/05/2025

0.1 0.05 0 0.1

km

British National Grid

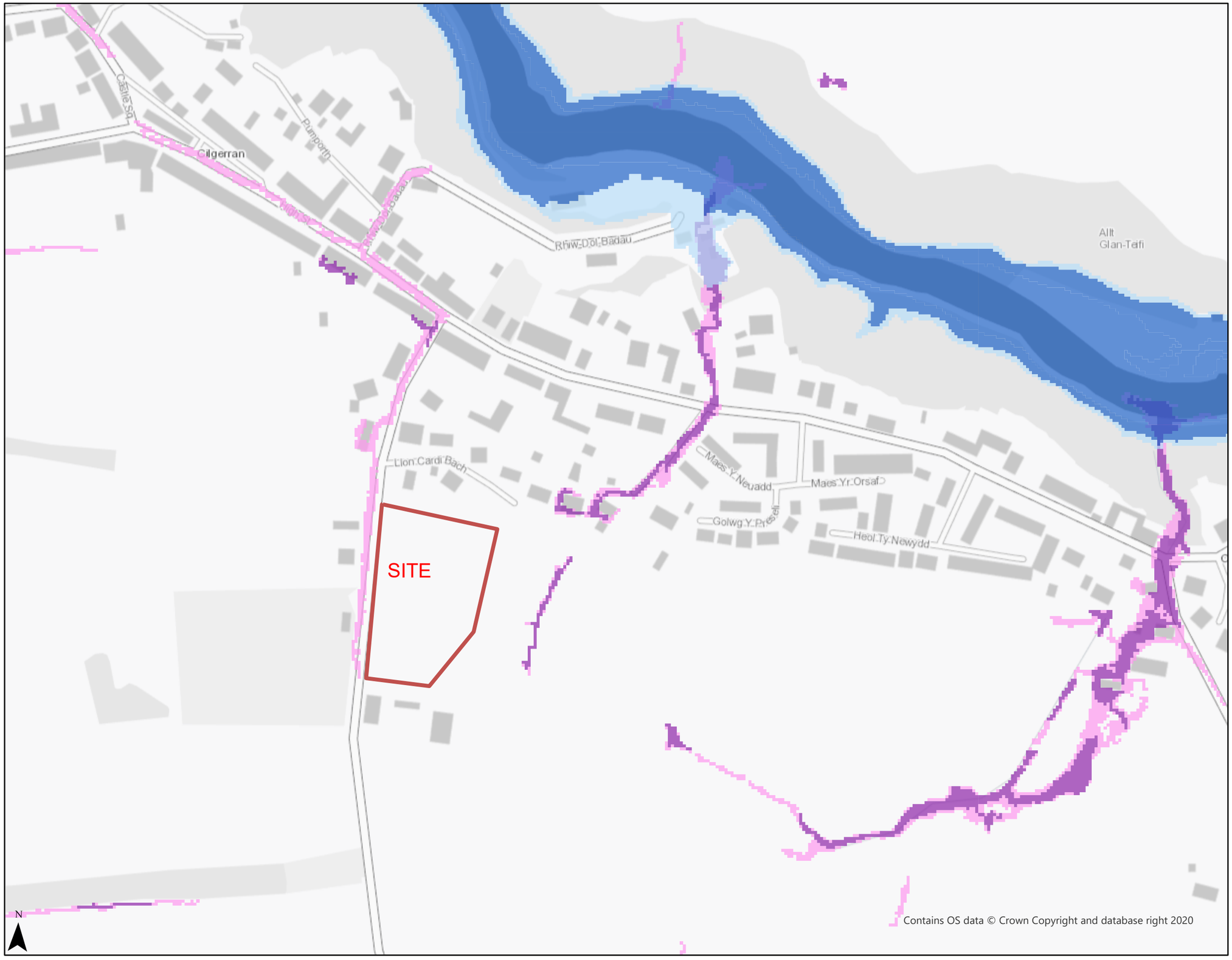
Disclaimer

https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en

Cyfoeth Naturiol Cymru
Natural Resources Wales

Flood Map for Planning - Basic

Land to South of Lon Cardi Bach



Legend

TAN15 Defended Zones

- Rivers
- Sea
- Rivers and Sea

Rivers and Sea

- Flood Zone 3
- Flood Zone 2

Surface Water and Small Watercourses

- Flood Zone 3
- Flood Zone 2
- Recorded Flood Extents

Scale at A3: 1:2,500

Date: 12/05/2025

0.1 0.05 0 0.1

km

British National Grid

Disclaimer

https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en

APPENDIX E – DWR CYMRU WELSH WATER PRE-PLANNING RESPONSE AND DEVELOPER IMPACT ASSESSMENT (EXECUTIVE SUMMARY)

Edward Powell

From: Clare Powell <Clare.Powell@dwrcymru.com>
Sent: 30 April 2025 13:27
To: Edward Powell
Subject: RE: Re.PPA0009363. Notification

Hi Edward

Thank you for the below email, I can confirm we would support a connection to the public sewerage system upon completion of the required upgrade works at the WwTW's.

I can also confirm we would permit a connection upstream of Manhole SN19426701.

Kind Regards
Clare

Clare Powell

Development Planning Officer | Developer Services

Dŵr Cymru Welsh Water

T: 0800 917 2652 | 02922 944175

W: dwrcymru.com

A: PO Box 3146, Cardiff, CF30 0EH

E: developer.services@dwrcymru.com

-----Original Message-----
From: Edward Powell <e.powell@rca-eng.co.uk>
Sent: 29 April 2025 12:36
To: Services Developer <developer.services@dwrcymru.com>
Subject: RE: Re.PPA0009363. Notification

******** External Mail ********

FAO Matthew Lord,

Good afternoon,

Further to the receipt of the attached PPA correspondence I note that presently that there is insufficient headroom within the current phosphate permit, however with the improvements proposed to rectify this to be completed by 31st of December 2025, are you able to confirm if DCWW would support a connection of foul flows from the proposed development upon completion of the upgrade works?

In addition would DCWW support the point of connection to be a new manhole constructed upstream of SN19426701?

Kind Regards, Cofion Gorau,

Edward Powell | Civil Engineer MEng (Hons) GMICE Roger Casey Associates Limited Consulting Civil and Structural Engineers Established 1999 - Celebrating 25 years
E: e.powell@rca-eng.co.uk
W: http://www.rca-eng.co.uk/

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T: 01267 222 646
☐
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T: 01437 762795
☐
First Floor, Unit 19, Mardon Park,
Baglan Energy Park, Port Talbot SA12 7AX
T: 01639 203280

My normal working hours are 08:30 until 17:00 Monday to Thursday and 08:30 until 16:30 to Friday.

-----Original Message-----
From: donotreply@dwrcymru.com <donotreply@dwrcymru.com>
Sent: Tuesday, April 29, 2025 12:18 PM
To: Edward Powell <e.powell@rca-eng.co.uk>
Cc: BPMCopies@dwrcymru.com
Subject: Re.PPA0009363. Notification

Dear Customer,

Please find attached important information relating to your application.

Should you wish to contact us for any reason, you must use the contact information shown on the attachment(s).

Please do not reply directly to this message.

Best regards,

Developer Services
Dwr Cymru Welsh Water

_____
********** This email and any file attached is confidential. If you are not a named recipient or believe you may have received this email in error please delete from your system and promptly inform the sender. Dwr Cymru Cyf (trading as Welsh Water) is a company registered in England and Wales, number 02366777, registered office Linea, Fortran Road, St Mellons, Cardiff CF3 0LT. Mae'r neges e-bost yma ac unrhyw ffeil sydd ynghlwm wrthi'n gyfrinachol. Os nad chi yw'r derbynnydd a enwir, neu os ydych chi'n credu eich bod wedi derbyn y neges yma ar gam, dylech ei dileu o'ch system ar unwaith a hysbysu'r anfonwr. Cwmni sydd wedi ei gofrestru yng Nghymru yw Dŵr Cymru Cyf (yn masnachu fel Dŵr Cymru), ei rif cofrestredig yw 02366777, ,, ac mae ei swyddfa gofrestredig yn Linea, Heol Fortran, Llaneirwg, Caerdydd, CF3 0LT. **********
_____ Dwr Cymru Welsh Water is firmly committed to water conservation and promoting water efficiency. Please log on to our website http://www.dwrcymru.com/waterefficiency to find out how you can become water wise. Mae Dwr Cymru Welsh Water wedi ymrwymo i warchod adnoddau dwr a hyrwyddo defnydd dwr effeithiol. Mae cyngor i' ch helpu i ddefnyddio dwr yn ddoeth yn http://www.dwrcymru.com/waterefficiency

_____
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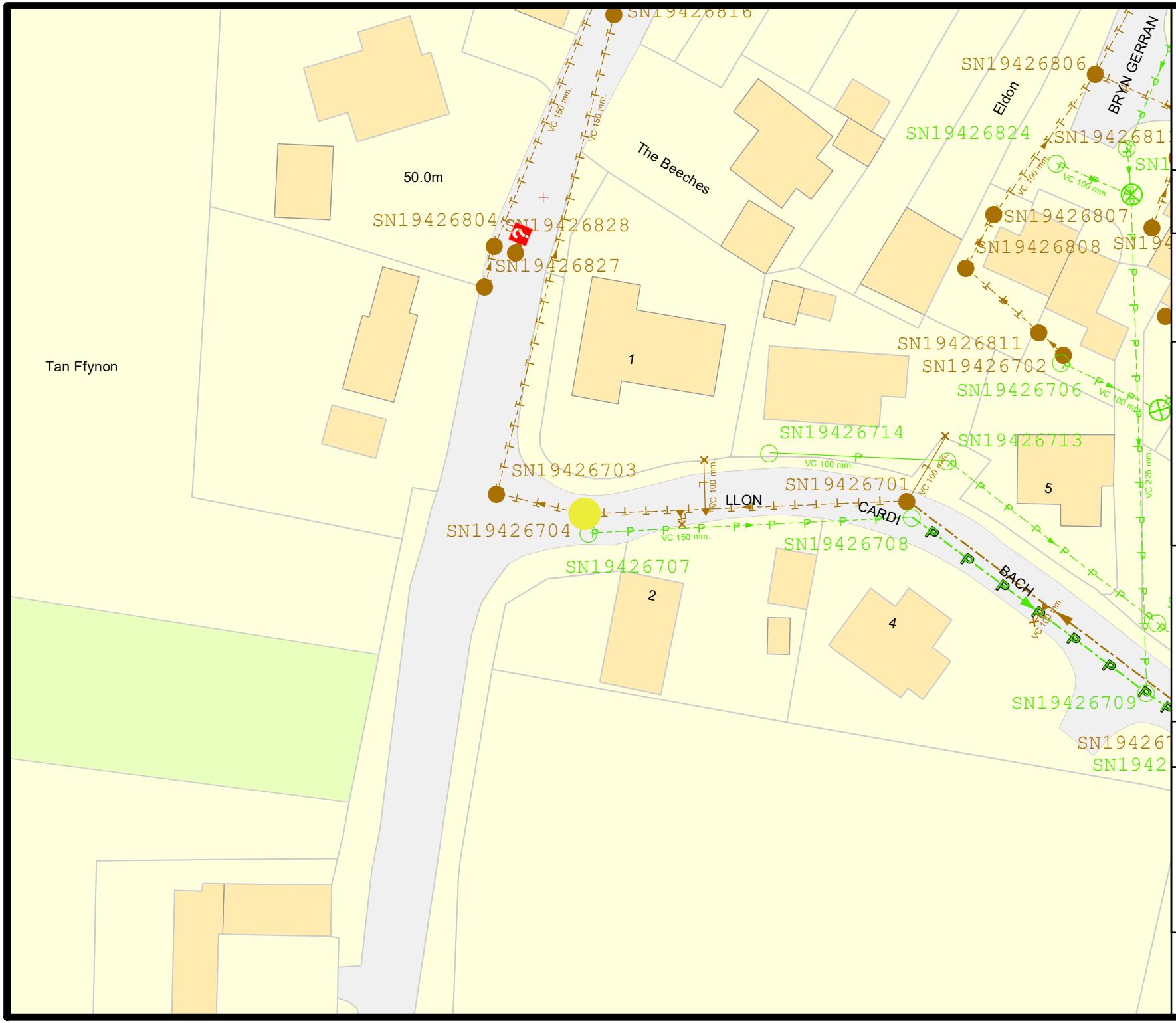

Dŵr Cymru
Welsh Water

SN19426704

N
W E
S

LEGEND(Representative of most common features)

Waste network:

	Foul chamber		Outfall
	Surface water chamber	LH	Lamphole
	Combined chamber		Storm Overflow
C O	Combined sewer overflow		Rising main
SPC	Special purpose chamber		Gravity sewer
	Treatment works		Private sewer
	Pumping station	S 104	Private sewer subject to Sect. 104 adoption agreement
			Private Sewer Transfer
			Lateral Drain
			Inspection Chamber

NB: Sewer symbol colour indicates the type.

RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

Notes:

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

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Map Ref:	219613,242781
Map scale:	1:550
Printed by:	Stacey Harris
Printed on:	28 Apr 2025

Dŵr Cymru
Welsh Water

Developer Services
PO Box 3146
Cardiff
CF30 0EH

Tel: +44 (0)800 917 2652
Fax: +44 (0)2920 740472
E.mail: developer.services@dwrcymru.com

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Caerdydd
CF30 0EH

Ffôn: +44 (0)800 917 2652
Ffacs: +44 (0)2920 740472
E.bost: developer.services@dwrcymru.com

Mr Ryan Parry
West Wales Housing Association
Cwrt Y Llan
Church Lane
Newcastle Emlyn
Ceredigion
SA38 9AB

Date: 28/04/2025
Our Ref: PPA0009363

Dear Mr Parry

Grid Ref: 219629 242700
Site Address: Cilgerran Pembrokeshire
Development: Land to South of Lon Cardi Bach

I refer to your pre-planning enquiry received relating to the above site, seeking our views on the capacity of our network of assets and infrastructure to accommodate your proposed development. Having reviewed the details submitted I can provide the following comments which should be taken into account within any future planning application for the development.

Firstly, we note that the proposal relates to the development of 23 dwellings and acknowledge the site comprises of a potential windfall development with no allocated status in the Local Development Plan (LDP). Accordingly, whilst it does not appear an assessment has been previously undertaken of the public sewerage system, we offer the following comments as part of our appraisal of this development.

Public Sewerage Network

The proposed development site is located in the immediate vicinity of a separate sewerage system, which drains to Cilgerran Wastewater Treatment Works (WwTW).

You are advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal. In order to assist you may contact Dwr Cymru Welsh Water on 0800 085 3968 to establish the location and status of the apparatus in and around your site. Please be mindful that under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

Surface Water Drainage

As of 7th January 2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. As highlighted in these standards, the developer is required to explore and fully exhaust all surface water drainage options in accordance with a hierarchy preferring infiltration (PL2) and, where infiltration is not possible, disposal to a surface water body (PL3), in liaison with the Lead Local Flood Authority and/or Natural Resources Wales, or surface water sewer or highway drain (PL4) in liaison with the riparian owner and/or Local Highways Authority.

Please note, DCWW is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation. Please refer to further detailed advice relating to surface water management included in our attached Advice & Guidance note and our Developer Services website at https://developers.dwrcymru.com/en/help-advice/regulation-to-be-aware-of/sustainable-drainage-systems.

In the absence of an accompanying surface water drainage strategy, it is recommended that the developer engage in consultation with Pembrokeshire County Council as the determining SuDS Approval Body (SAB), in relation to their proposals for SuDS features. In addition, please note, no amount of land drainage run-off is permitted to discharge directly or indirectly into the public sewerage system.

Furthermore, Planning Policy Wales (PPW) acknowledges that discharge of surface water to foul sewers is prohibited and highlights that any additional surface water from new developments should not be discharged to combined systems because of the risk of pollution when combined systems overflow (Para 6.6.3). Moreover, PPW recognises the challenges faced from rainfall intensity causing surface water flooding and diffuse pollution (Para 6.6.14) along with the importance of well-maintained sewerage networks (Para 6.6.15), particularly as a result of run-off from built surfaces and the sewage discharges from overloaded sewers (Para 6.6.16).

Foul Water Drainage – Sewerage Network

We have considered the impact of foul flows generated by the proposed development and concluded that flows can be accommodated within the public foul sewerage system. We advise that the flows can be connected to the foul sewer at manhole SN19426704.

You may need to apply to Dwr Cymru Welsh Water for any connection to the public sewer under Section 106 of the Water industry Act 1991. However, if the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer (i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Foul Sewers and Lateral Drains, and conform with the publication "Sewers for Adoption"- 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com.

Sewerage Treatment

Please note that the Natural Resources Wales have recently released Planning Advice relating to increased phosphate levels in several river Special Areas of Conservation (SAC). Applications for new development in these areas need to consider the requirements set out in the planning advice and should form part of the local planning authority's decision making when determining planning applications.'

In this instance, Cilgerran Wastewater Treatment Works (WwTW) ultimately discharges to a river Special Area of Conservation (SAC). We would advise that this WwTW has a phosphorus consent limit in place and is currently failing to comply with the 95% quartile for its flow passed forward (FPF) performance, at the time of this pre-application consultation. Notwithstanding this, in line with the environmental regulator's National Environment Programme, we are required to deliver a scheme at the WwTW to ensure 95% quartile compliance with our FPF performance by 31st December 2025.

Water Supply

Capacity is currently available in the water supply system to accommodate the development. We reserve the right however to reassess our position as part of the formal application for the provision of new water mains under Section 41 and Section 51 of the Water Industry Act (1991) to ensure there is sufficient capacity available to serve the development without causing detriment to existing customers' supply as demands upon our water systems change continually.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at **developer.services@dwrcymru.com**

Please quote our reference number in all communications and correspondence.

Yours faithfully,

Matthew Lord
Planning Liaison Manager
Developer Services

***Please Note** that demands upon the water and sewerage systems change continually; consequently the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter.*

Dŵr Cymru
Welsh Water

PPA0009363 Sewer plan

N
W E
S

LEGEND(Representative of most common features)

Waste network:

- Foul chamber
- Surface water chamber
- Combined chamber
- Combined sewer overflow
- Special purpose chamber
- Treatment works
- Pumping station
- Outfall
- Lamphole
- Storm Overflow
- Rising main
- Gravity sewer
- Private sewer
- Private sewer subject to Sect. 104 adoption agreement
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

NB: Sewer symbol colour indicates the type.

RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

Notes:

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

Map Ref:	219704,242688
Map scale:	1:1275
Printed by:	Stacey Harris
Printed on:	28 Apr 2025

Dŵr Cymru
Welsh Water

PPA0009363 Water plan

N
W E
S

LEGEND

Clean network:

- Sluice valve
- Pressure reducing valve
- Meter
- Bulk meter
- Hydrant
- Cap end
- Air valve
- Stop tap
- Water Treatment Works
- Water Pumping Station
- Existing main
- Non-operational main
- Raw Water

NB: Water main symbol colour indicates the type.

LIGHT BLUE - Trunk
DARK BLUE - Distribution
YELLOW - Raw Water

Notes:

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

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Map Ref:	219704,242688
Map scale:	1:1275
Printed by:	Stacey Harris
Printed on:	28 Apr 2025

Dŵr Cymru
Welsh Water

Planning and new development

What you should do, and how we can help

dwrcymru.com

WWDEV 0400

Whether you're a homeowner with plans to extend your home, a builder working on a new house or a developer working on a new housing site, you need to involve us in the planning process. Even if you are just thinking about building, getting us involved early can help your project run smoothly and address any water and drainage matters as early as possible in the development process.

How can we help?

As water and waste services are at the forefront of public health and protection of the environment, we play a key part in the town and country planning process.

If you're planning on building new houses, our team of dedicated planning officers can give you advice and guidance at all stages of the process, including pre-application, planning application and discharge of condition.

When it comes to your new development, by getting us involved in the planning stages, we can:

- Assess whether the current local water and sewerage networks have capacity to service your new site (and if they can't, then identify whether the network can be reinforced to support your new site)
- Mitigate any potential negative impact that the new development could have on the performance of our infrastructure, the service we provide to customers, and the wider environment
- Identify where new development and growth is planned so that we can target investment in our existing infrastructure within these areas
- Provide advice on making new water and waste connections to our networks once your development is complete and ready to be occupied
- Identify any existing water or waste pipes in or near to the site, so we can advise on their location and let you know your options for protecting and/or diverting our assets for the lifetime of the development

Step 1: Use our pre-planning service

What is our pre-planning service?

We encourage all developers to engage with us as early as possible to ensure any water and drainage matters that might arise during the planning process are identified and addressed early on. In order to facilitate this, you can engage with us via our dedicated pre-planning service, which will provide:

- An assessment of the impact of your proposed development and whether our local water and waste networks can support it
- Confirmation of whether off-site water mains and/or sewers will need to be provided, and
- Water main and sewer plans indicating the location of our assets crossing the site or located in close proximity. *Please note that these are for general guidance only and all assets need to be accurately located on site before any excavation works begin.*

How can I access it?

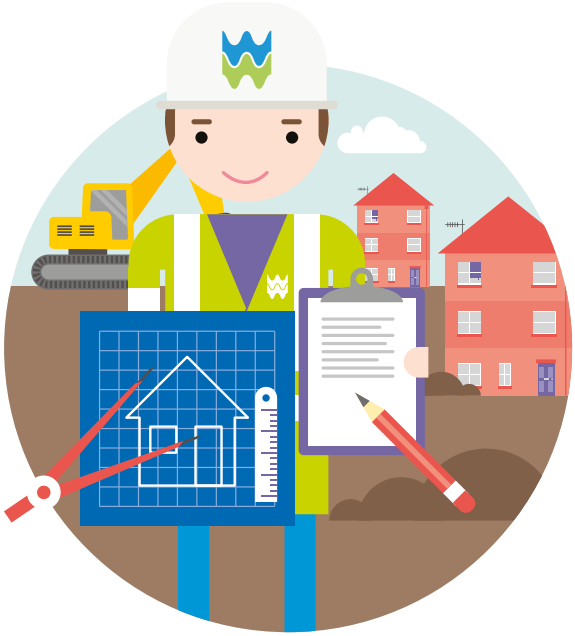
You can submit a 'pre-planning advice' application online via our website. To make sure that we can provide you with the most comprehensive advice, you should include the following information:

- Site location plan
- Details of the proposed development
- Proposed points of communication to our local network of sewers and/or water mains (if known)
- Relevant planning history relating to the site e.g. any previous permissions granted or status within the council's development plan

You can see how much this service will cost on our website, and we'll aim to get back to you with a written **response within 21 days** of your application. The advice provided will be valid for 12 months and help inform our response when consulted on your planning application by the local planning authority (LPA).

For larger developments in Wales:

- You have to undertake pre-application consultation as set out in Schedule 4 of the Town & Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016 for any developments that:
  - Include 10 dwellings or larger
  - Have 1000sqm or larger non-residential floor space or
  - Have a site area that's 1 hectare or larger
- This means you need to consult with us and we will **respond within 28 days**.
- While there's no charge for this service, as it's a statutory requirement, we do recommend that you apply for our pre-planning service in advance of this consultation, as it will help to identify any potential issues that need to be addressed in advance of your planning application.



Step 2: Once you have our pre-planning advice

Locate our assets

Before you build, it's important to identify if any of our pipes, water mains or sewers are underneath the ground in or adjacent to your development site. Under section 159 of the Water Industry Act 1991, we have the rights of access to inspect, maintain, adjust, repair or alter any asset or apparatus at all times.

If your land does contain assets

If your land does indeed contain some of our assets, then this will have an impact on the layout and general arrangement of the new development site. We strongly recommend that you contact us to discuss accurately locating our assets to ensure that they are protected during and after construction. Please contact our Plan and Protect team via **planandprotect@dwrcymru.com** or **08009172652** to discuss further.

If you want to divert or remove the assets contained in your land

If you decide the asset located within or adjacent to your site can't be incorporated within the layout of the new development, or our rights of access to the asset may be hindered by your proposal, you can ask us to alter, divert or remove it in accordance with section 185 of the Water Industry Act 1991. You can find the application forms on our website.

How will you manage surface water?

As with all new development sites, you'll need to think about how to deal with surface water runoff from any new buildings and hard standings. Legislation in both England and Wales now actively encourages the use of sustainable urban drainage systems (SUDS). This approach manages surface water runoff by imitating natural drainage systems and retaining water on or near the site.

There are such a variety of SUDS techniques including green roofs, rainwater harvesting and permeable pavements that any development should be able to include a SUDS scheme. There would need to be good justification not to incorporate a SUDS scheme on your site.

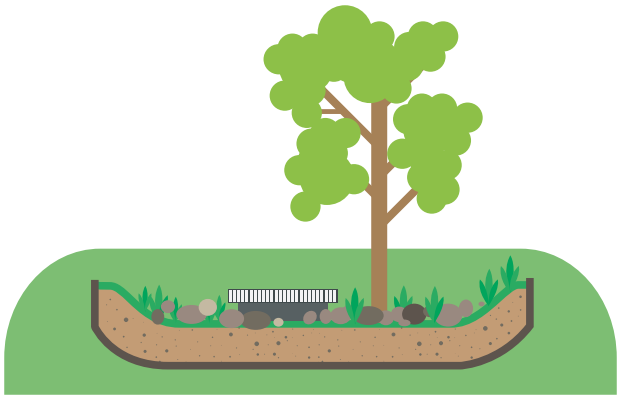
SUDS in Wales

All new development of more than one building or a construction area of 100m2 or more will require consent from the sustainable drainage system (SUDS) approval body (also known as a SAB) for any new SUDS features, as required by Schedule 3 of the Flood and Water Management Act 2010. SABs are delivered by local authorities across Wales.

In accordance with this and the Welsh Government 'Statutory standards for sustainable drainage systems', you need to explore and fully exhaust all surface water drainage options, using discharge to a combined sewer only as a last resort.

SUDS in England

Even if your new development is based in England, it's important to keep Part H of the 'Building Regulations 2000' in mind. On this basis, all new developments in England will also be expected to consider surface water management techniques and demonstrate all technical options have been explored and exhausted, in liaison with the land drainage authority and/or the Environment Agency. You need to consider the management of highway or land drainage runoff as these flows won't be allowed to discharge directly or indirectly into the public sewerage system.



Step 3: The planning application process

Once you've used our pre-planning service and identified any potential issues before building, it's time to incorporate our advice into your proposals to your local planning authority (LPA).

As part of the planning application consultation process we will provide similar advice to that provided in our pre-application **response within 21 days**. It's important to note that while we share our expert opinion during this process, the ultimate decision to grant planning permission is the LPA's.

What are the options if we can't currently support your development?

Network hydraulic modelling/WwTW feasibility studies

As our aim is to support economic development and growth, we do not want to resist new development where possible. However, we must take the capacity of our existing assets, the service we are providing to existing customers and the environment into account. In areas where there are capacity constraints either on our networks or at the wastewater treatment works (WwTW), we may well already have proposals in place to deliver reinforcement works and to create capacity for new developments.

That being said, you may want to develop your site in advance of us undertaking these works. If this is the case, to ensure there's no detriment to our existing customers, you may be required to implement solutions identified by an assessment of either the network or WwTW. It's important to note that you won't be expected to resolve any existing operational issues.

Where further assessments are recommended, you will need to allow sufficient time in your development programme for these studies to be carried out and any reinforcement works to be delivered, as in some circumstances we won't permit a communication to our networks until these works are completed. The delivery of the works will need to align with occupation rather than construction.

Where possible, we will control the delivery of any solutions as part of the planning process. Dependent on the progress of the assessment, we may be in a position to recommend appropriate planning conditions so that the outcomes of the assessment can be delivered as part of any planning permission.

This approach allows us to support the progression of the site through the planning process, however in the absence of a completed assessment and known solutions we may need to work with you and the LPA until the assessment is completed and the outcomes are known.

Step 4: Connecting to our network

If you've had the green light from us and planning permission has been granted for your development, then it's time to start thinking about the different ways you'll need to connect to our network.

On our website you can find detailed guidance around applying for new water connections, new water mains, new public sewers and new sewer connections.

Contact us

If you've still got any questions or queries, then feel free to contact us:

Email: developer.services@dwrcymru.com

Visit: **www.dwrcymru.com**

Tel: 0800 917 2652

Contact Us:

If you've got any questions or queries, then feel free to contact us:

Call
0800 917 2652

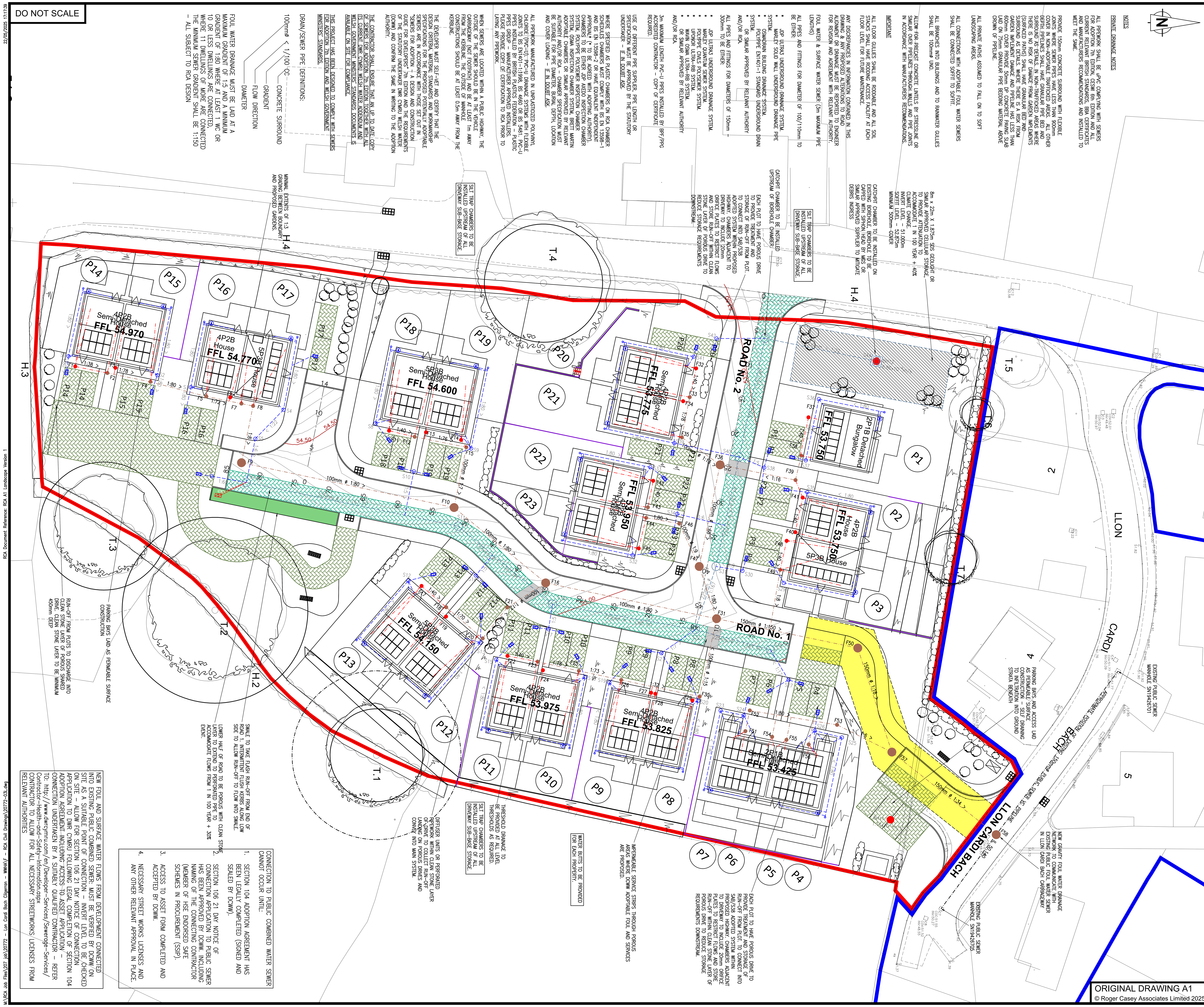
Email
developer.services@dwrcymru.com

Visit
www.dwrcymru.com

@dwrcymru

/dwrcymruwelshwater

APPENDIX F – ENGINEERING SITE PLAN DRAINAGE



NOTES:

THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN ROGER CASEY ASSOCIATES AND MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THE WRITTEN CONSENT OF ROGER CASEY ASSOCIATES.

THE CONTRACTOR IS TO CHECK ALL LEVELS AND DIMENSIONS BEFORE WORK COMMENCES, AND ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY TO THE CONSULTANTS.

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALING.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER ROGER CASEY ASSOCIATES DRAWINGS AND SPECIFICATIONS AND ALL OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS RELATING TO THIS PROJECT.

THIS DRAWING IS PREPARED FOR PLANNING APPLICATION PURPOSES ONLY. ALL LEVELS, DRAINAGE AND ROAD ELEMENTS ARE SUBJECT TO CHANGE TO SECURE TECHNICAL ACCEPTANCE FOR ROAD AND DRAINAGE INFRASTRUCTURE ADOPTION AGREEMENTS PROGRESSED AT POST PLANNING APPLICATION STAGE.

KEY:

- PRIVATE SURFACE WATER DRAINAGE
- ADOPTABLE SURFACE WATER DRAINAGE
- ADOPTABLE PERFORATED PIPE
- PRIVATE FOUL DRAINAGE
- ADOPTABLE FOUL DRAINAGE
- POROUS DRIVE
- IMPERMEABLE SERVICE STRIP
- CELLULAR STORAGE
- SWALE
- POROUS ROAD
- DIFFUSER UNIT
- INDICATIVE WATERBUTT LOCATION, EXACT LOCATION TO BE DETERMINED ON SITE

IMPORTANT – UNTIL TECHNICAL ACCEPTANCE AND/OR APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITY, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS & DETAILS ISSUED ARE PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR COMMENCE SITE WORK PRIOR TO TECHNICAL ACCEPTANCE AND/OR APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK. INFRASTRUCTURE SUBJECT TO A SECTION 104 ADOPTION AGREEMENT SHALL NOT BE CONSTRUCTED UNTIL SUCH TIME THAT THE SECTION 104 ADOPTION AGREEMENT HAS BEEN LEGALLY COMPLETED BETWEEN THE DEVELOPER AND THE STATUTORY UNDERTAKER

REV	DESCRIPTION	DRAWN	CHECK	DATE
E	UPDATED TO LATEST ARCHITECTURAL LAYOUT	EP	PWJL	22.05.25
D	UPDATED TO LATEST TREE SURVEY	EP	PWJL	13.05.25
C	UPDATED TO FOLLOWING DICUSSION WITH HIGHWAYS	EP	PWJL	12.05.25
B	UPDATED TO LATEST ARCHITECTS PLAN	EP	PWJL	16.04.25
A	OUTFALL TO BOREHOLE	EP	PWJL	04.03.25

DRAWING STATUS:
PLANNING

Roger Casey Associates
Consulting Civil & Structural Engineers

Ty Mansel, 6 Mansel Street, Carmarthen, Carmarthenshire SA31 1PX
T: 01267 222 646

Units 10 & 11, Merlin's Court, Winch Lane, Haverfordwest, Pembrokeshire SA61 1SB
T: 01437 762 795

E: office@rca-eng.co.uk
W: www.rca-eng.co.uk

CLIENT:
WALES & WEST HOUSING

ARCHITECTURAL CONSULTANT:
R L H ARCHITECTURAL FISHGUARD

PROJECT:
RESIDENTIAL DEVELOPMENT OFF LLON CARDI BACH, CILGERRAN, PEMBROKESHIRE SA43 2TF

DRAWING TITLE:
ENGINEERING SITE PLAN DRAINAGE

DRAWN BY:	DESIGN BY:	CHECKED BY:	DATE:
EP	EP	PWJL	22/05/2025
SCALES: 1:250	DRAWING No.: 20772/09		REVISION: E

APPENDIX G – EXTRACTS FROM TERRA FIRMA (WALES) LIMITED SITE INVESTIGATION

8.3 Excavations and Formations

Most of the shallow excavations will be possible with normal soil excavating machinery.

Shallow perched water and groundwater flows were not encountered during the investigation. Any water inflows together with rainwater infiltration should be dealt with by conventional pumping techniques. However, it should be noted that during times of heavy rainfall a higher water table will be encountered.

The sides of any excavations deeper than 1.20m, or shallower if unstable, should be supported by planking and strutting or other proprietary means.

The sub-formations/formations are likely to be susceptible to loosening, softening and deterioration by exposure to weather (rain, frost and drying conditions), the action of water (flood water or removal of groundwater) and site traffic.

Formations should never be left unprotected and continuously exposed to rain causing degradation, or left exposed/uncovered overnight, unless permitted by a qualified engineer.

Construction plant and other vehicular traffic should not be operated on unprotected formations.

As a minimum the formation/excavation surfaces must be protected by blinding concrete immediately after exposure.

Allowances should be made for the removal of soft spots/areas and their replacement with well compacted granular materials.

Allowances should also be made for special precautions to prevent formation deterioration in addition to the above.

8.4 Protection of Buried Concrete

When the results are compared with Table C1/C2 of BRE Digest 1:2005, it indicates that buried concrete should generally conform to Class AC-1.

8.5 Access Roads and Car Parking Areas

For car parking and road areas, formations within the in-situ natural soils a CBR value of 5% may be used for design purposes.

Allowances should be made for the removal of any ‘soft spots/areas’ and their replacement with well-compacted granular materials as previously described.

Please note that the Local Council / Highways Authority may require in-situ CBR testing to be undertaken before a road is adopted. In-situ CBR Testing should be performed following earthworks to verify the performance of the engineered fill.

8.6 Storm Water Drainage

During the site investigation seven soakaway test was undertaken in general accordance with BRE DG 365:2016. The soakaway test was carried out in trial pit TP02, TP03, TP04, TP06, TP08, TP09 AND TP11 within natural materials.

The soakaway test within TP04 and TP08 recorded insufficient infiltration and was subsequently terminated early.

TP02
The tests were undertaken in the area of the proposed soakaway at a depth of 1.00m depth. Two fills were achieved at this location and the following infiltration rates have been calculated.

1st Fill: 1.54 x 10^{-5} m/s
2nd Fill: 1.05 x 10^{-5} m/s

TP03
The tests were undertaken in the area of the proposed soakaway at a depth of 1.40m depth. One fill was achieved at this location and the following infiltration rates have been calculated.

1st Fill: 9.02 x 10^{-6} m/s

TP06
The tests were undertaken in the area of the proposed soakaway at a depth of 1.70m depth. One fill was achieved at this location and the following infiltration rates have been calculated.

1st Fill: 8.20 x 10^{-6} m/s

TP09
The tests were undertaken in the area of the proposed soakaway at a depth of 1.40m depth. One fill was achieved at this location and the following infiltration rates have been calculated.

1st Fill: 9.90 x 10^{-5} m/s

TP11
he tests were undertaken in the area of the proposed soakaway at a depth of 0.85m depth. Thee fills were achieved at this location and the following infiltration rates have been calculated.

1st Fill: 3.04 x 10^{-5} m/s
2nd Fill: 2.12 x 10^{-5} m/s
3rd Fill: 2.31 x 10^{-5} m/s

Falling head tests were carried out in BH11 and BH12 in general accordance with BS5930:2015. The tests were carried out by adding water to the borehole and timing the fall of the head of water.

The soakaway tests recorded relatively consistent infiltration across the site of between 1.14x10^{-03} ms^{-01} and 6.86x10^{-04} ms^{-01}. The use of soakaway stormwater drainage is therefore considered viable on site in the locations and depths tested.

Proposed soakaways should be positioned at least 5.0m away from any structure.

SOAKAWAY TEST

terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Lon Cardi Bach, Cilgerran
Project Number: 16166
Date: 13/01/2025
Engineer: Jamie Alderman

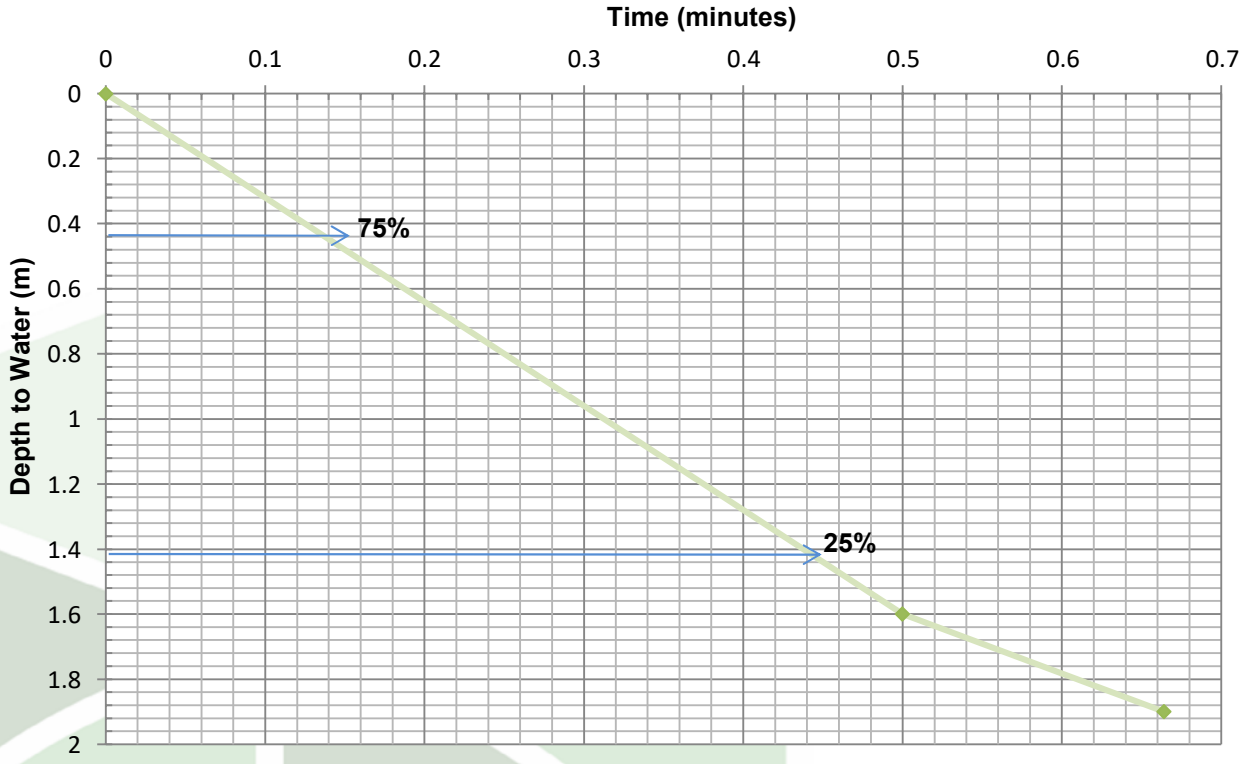
Borehole: **BH11**
Depth: **30.00m**
Water Level: **1.90m**

TEST 1

Borehole Diameter	0.11	m
Depth	1.90	m
Fill Level	0.00	m

V_{p75-25}	0.009	m^3
a_{p50}	0.338	m^2
t_{p75-25}	0.3	minutes

Soil Infiltration Rate, f **1.48E-03** **ms^{-1}**
Provisional Only



REMARKS:
Test carried out in general accordance with BRE DIGEST 365 (2016) but on a small scale

terra firma
Geotechnical & Geoenvironmental Specialists
www.terrafirmawales.co.uk

SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	0
0.5	1.6
0.664	1.9

Effective Depth (m)	1.90
Height to 0.75H	0.475
Height to 0.25H	1.425
tp75	0.125
tp25	0.425

SOAKAWAY TEST

terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Lon Cardi Bach, Cilgerran
Project Number: 16166
Date: 13/01/2025
Engineer: Jamie Alderman

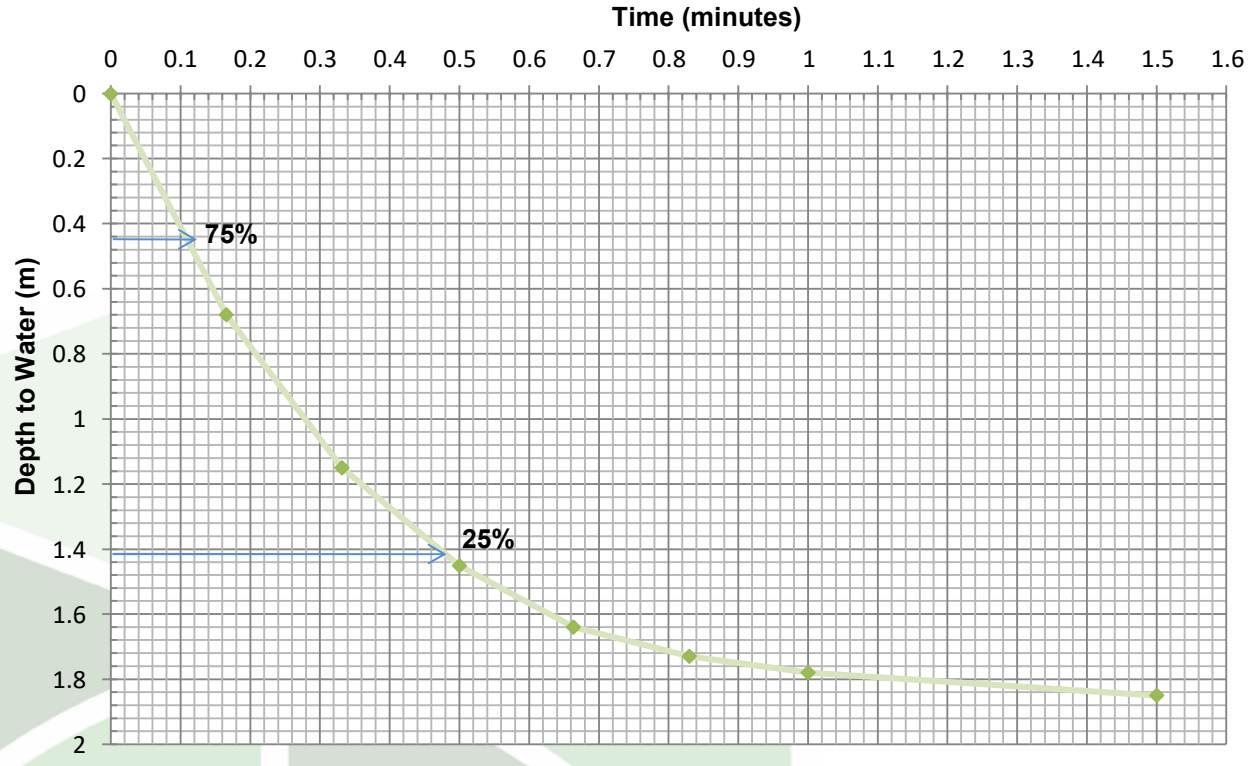
Borehole: **BH11**
Depth: **30.00m**
Water Level: **1.90m**

TEST 2

Borehole Diameter	0.11	m
Depth	1.90	m
Fill Level	0.00	m

V_{p75-25}	0.009	m^3
a_{p50}	0.338	m^2
t_{p75-25}	0.36	minutes

Soil Infiltration Rate, f **1.24E-03** **ms^{-1}**
Provisional Only



REMARKS:
Test carried out in general accordance with BRE DIGEST 365 (2016) but on a small scale

terra firma
Geotechnical & Geoenvironmental Specialists
www.terrafirmawales.co.uk

SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	0
0.166	0.68
0.332	1.15
0.5	1.45
0.664	1.64
0.83	1.73
1	1.78
1.5	1.85

Effective Depth (m)	1.90
Height to 0.75H	0.475
Height to 0.25H	1.425
tp75	0.12
tp25	0.48

SOAKAWAY TEST

terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Lon Cardi Bach, Cilgerran
Project Number: 16166
Date: 13/01/2025
Engineer: Jamie Alderman

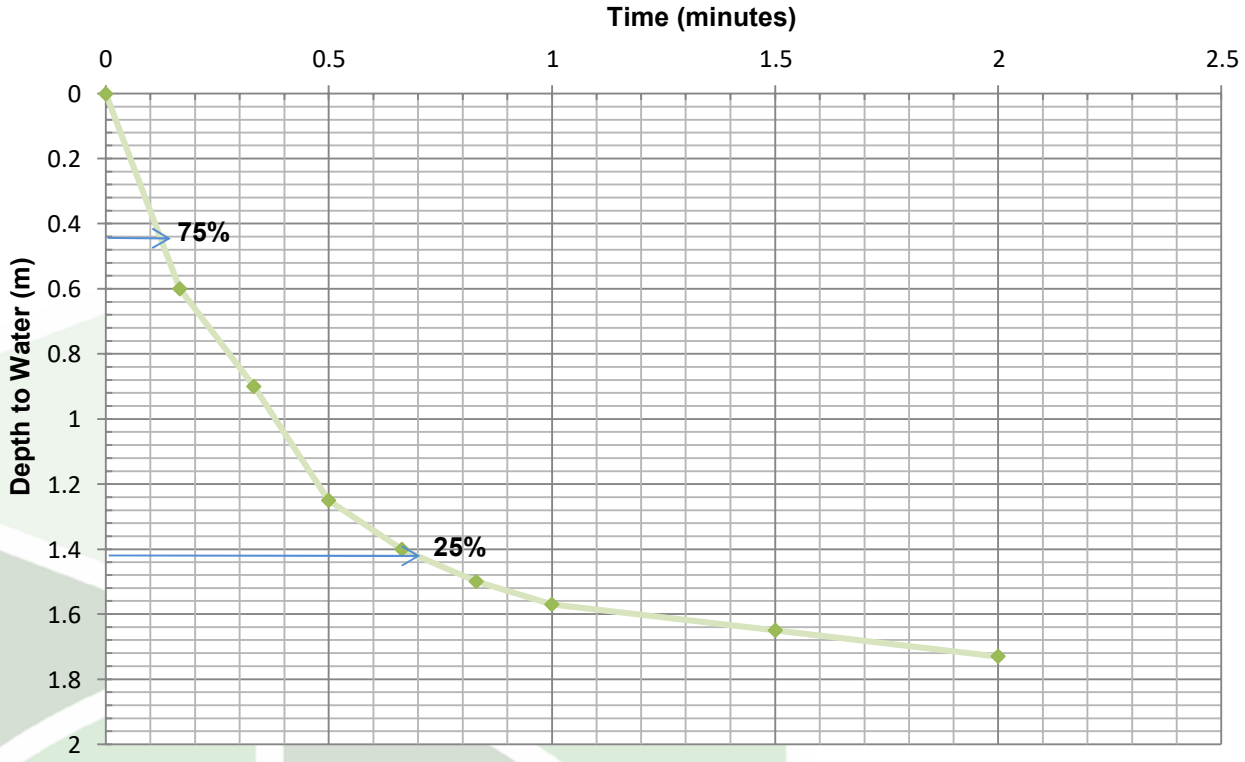
Borehole: **BH11**
Depth: **30.00m**
Water Level: **1.90m**

TEST 3

Borehole Diameter	0.11	m
Depth	1.90	m
Fill Level	0.00	m

V_{p75-25}	0.009	m^3
a_{p50}	0.338	m^2
t_{p75-25}	0.39	minutes

Soil Infiltration Rate, f **1.14E-03** **ms^{-1}**
Provisional Only



REMARKS:
Test carried out in general accordance with BRE DIGEST 365 (2016) but on a small scale

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SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	0
0.166	0.6
0.332	0.9
0.5	1.25
0.664	1.4
0.83	1.5
1	1.57
1.5	1.65
2	1.73

Effective Depth (m)	1.90
Height to 0.75H	0.475
Height to 0.25H	1.425
tp75	0.13
tp25	0.52

SOAKAWAY TEST

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Site Name: Lon Cardi Bach, Cilgerran
Project Number: 16166
Date: 14/01/2025
Engineer: Jamie Alderman

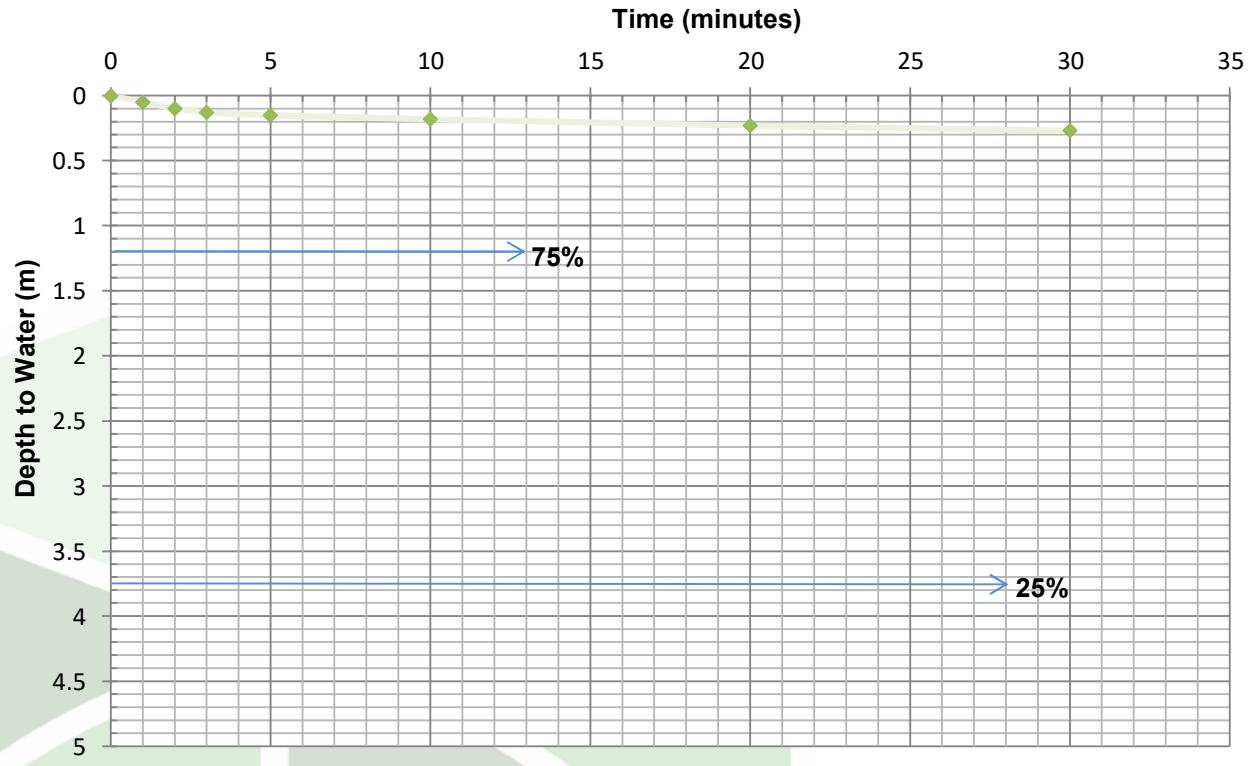
Borehole: **BH12**
Depth: **5.00m**
Water Level: **5.00m**

TEST 1

Borehole Diameter	0.11	m
Depth	5.00	m
Fill Level	0.00	m

V_{p75-25}	0.024	m^3
a_{p50}	0.873	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f **ms^{-1}**
Too little water intake to calculate infiltration rate



REMARKS:
Test carried out in general accordance with BRE DIGEST 365 (2016) but on a small scale

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SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	0
1	0.05
2	0.1
3	0.13
5	0.15
10	0.18
20	0.23
30	0.27

Effective Depth (m)	5.00
Height to 0.75H	1.25
Height to 0.25H	3.75
tp75	
tp25	

SOAKAWAY TEST

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Site Name: Lon Cardi Bach, Cilgerran
Project Number: 16166
Date: 14/01/2025
Engineer: Jamie Alderman

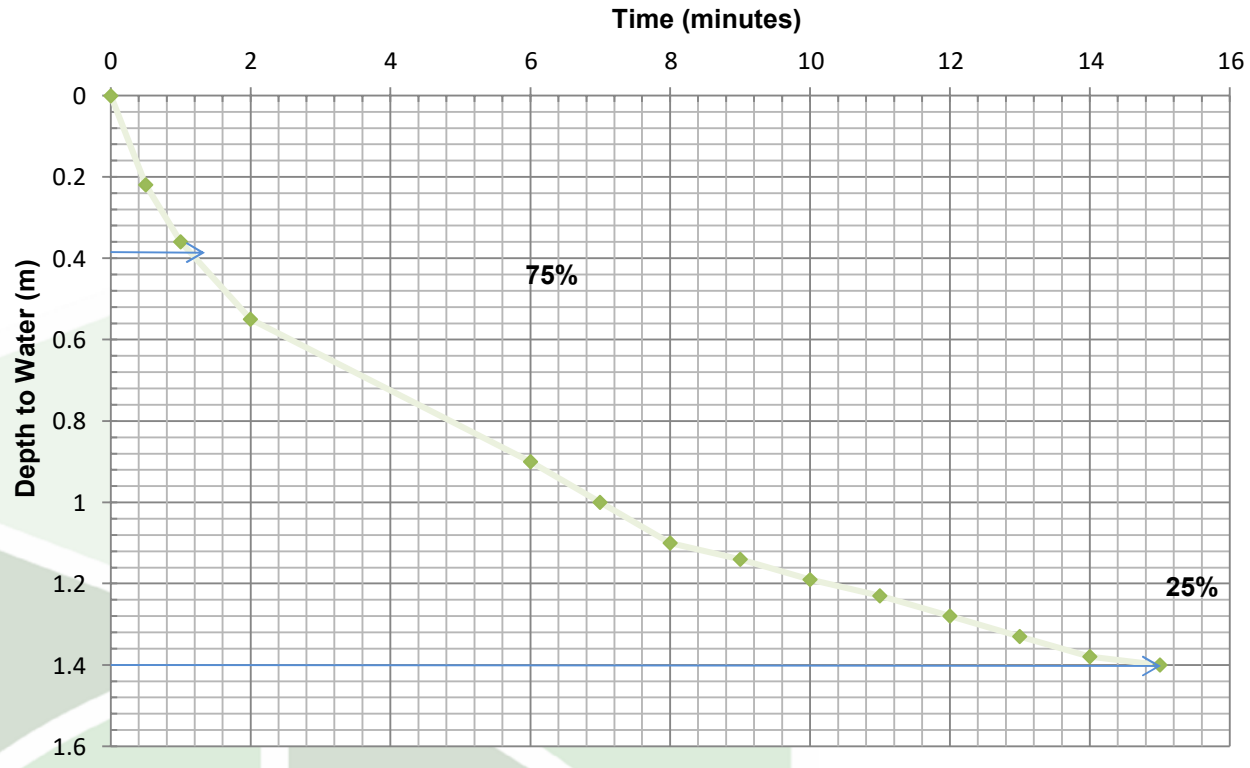
Borehole: **BH12**
Depth: **15.00m**
Water Level: **1.40m**

TEST 1

Borehole Diameter	0.11	m
Depth	1.60	m
Fill Level	0.00	m

V_{p75-25}	0.008	m^3
a_{p50}	0.286	m^2
t_{p75-25}	13.5	minutes

Soil Infiltration Rate, f **3.28E-05** **ms^{-1}**
Provisional Only



REMARKS:
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SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	0
0.5	0.22
1	0.36
2	0.55
6	0.9
7	1
8	1.1
9	1.14
10	1.19
11	1.23
12	1.280
13	1.330
14	1.380
15	1.400

Effective Depth (m)	1.60
Height to 0.75H	0.4
Height to 0.25H	1.2
tp75	1.5
tp25	15

SOAKAWAY TEST

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Site Name: Lon Cardi Bach, Cilgerran
Project Number: 16166
Date: 14/01/2025
Engineer: Jamie Alderman

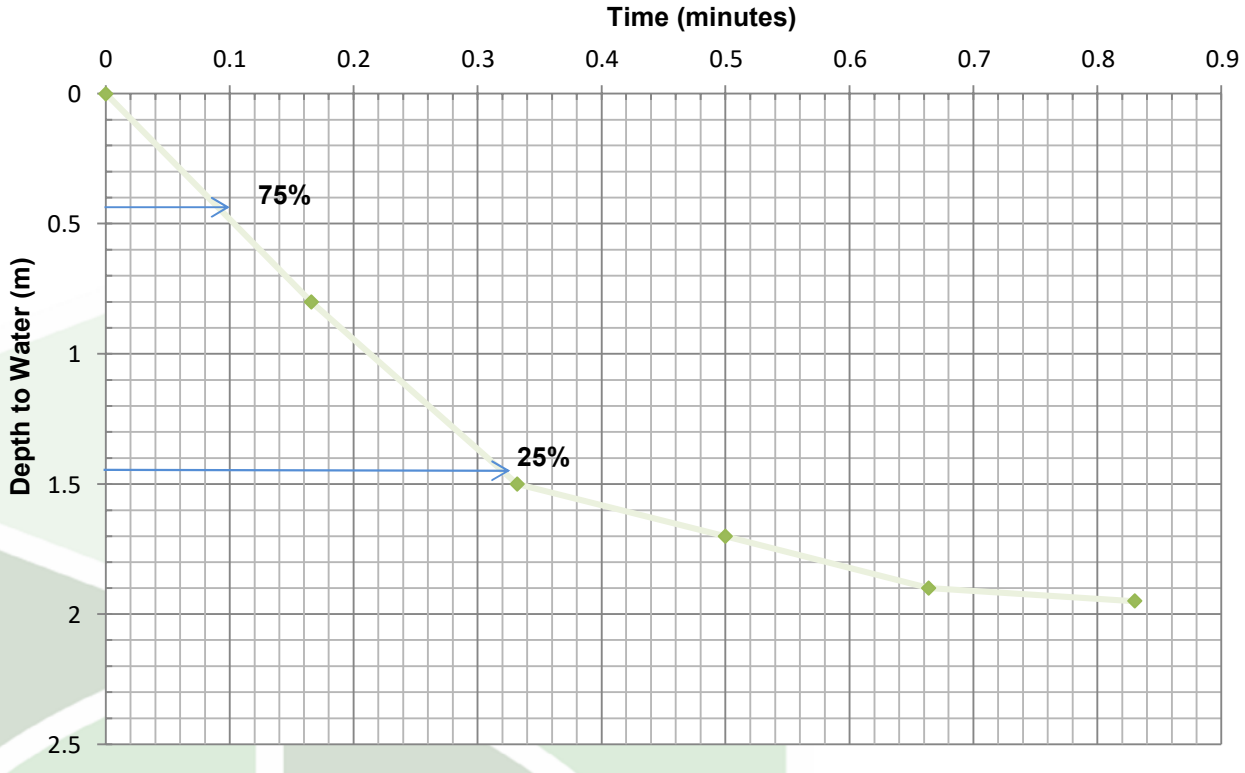
Borehole: **BH12**
Depth: **30.00m**
Water Level: **1.95m**

TEST 1

Borehole Diameter	0.11	m
Depth	1.95	m
Fill Level	0.00	m

V_{p75-25}	0.009	m^3
a_{p50}	0.346	m^2
t_{p75-25}	3.1	minutes

Soil Infiltration Rate, f **1.44E-04** **ms^{-1}**
Provisional Only



REMARKS:
Test carried out in general accordance with BRE DIGEST 365 (2016) but on a small scale

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SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	0
0.166	0.8
0.332	1.5
0.5	1.7
0.664	1.9
0.83	1.95

Effective Depth (m)	1.95
Height to 0.75H	0.4875
Height to 0.25H	1.4625
tp75	0.1
tp25	3.2

SOAKAWAY TEST

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Site Name: Lon Cardi Bach, Cilgerran
Project Number: 16166
Date: 14/01/2025
Engineer: Jamie Alderman

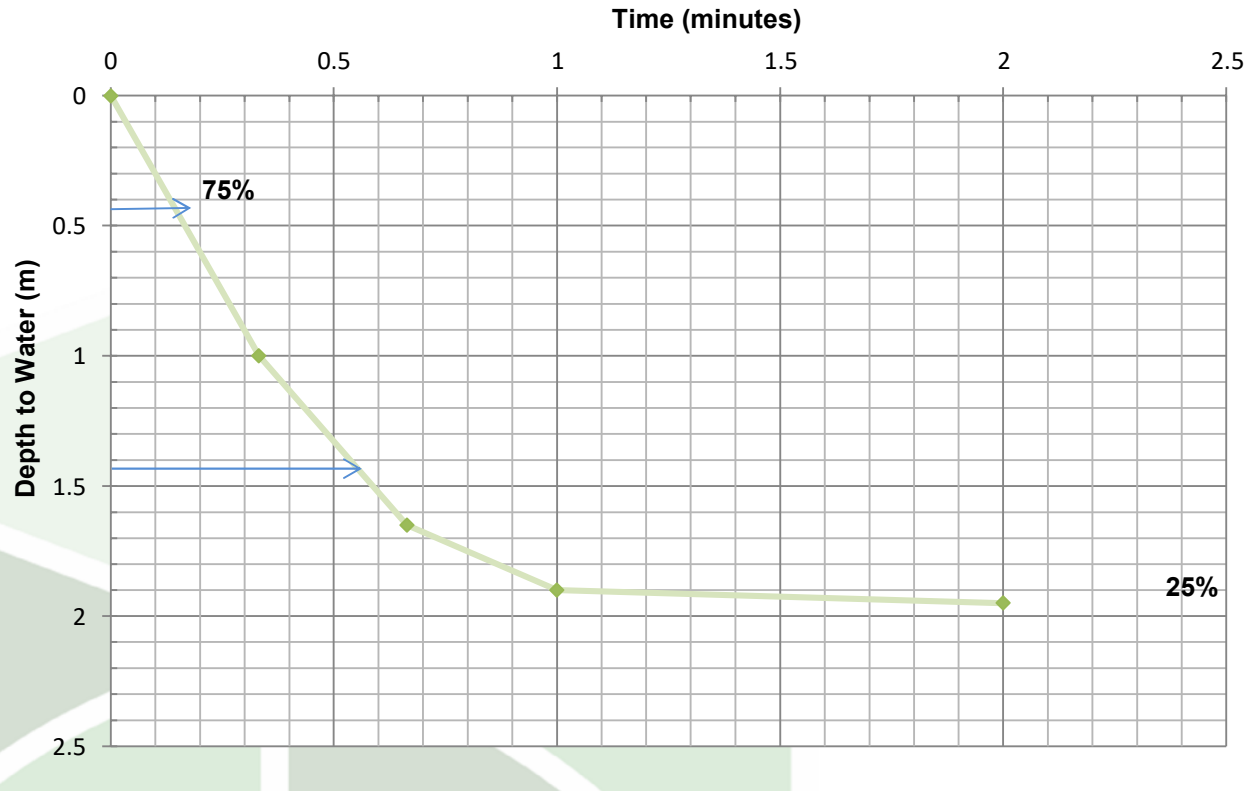
Borehole: **BH12**
Depth: **30.00m**
Water Level: **1.95m**

TEST 2

Borehole Diameter	0.11	m
Depth	1.60	m
Fill Level	0.00	m

V_{p75-25}	0.008	m^3
a_{p50}	0.286	m^2
t_{p75-25}	0.4	minutes

Soil Infiltration Rate, f **1.11E-03** **ms^{-1}**
Provisional Only



REMARKS:
Test carried out in general accordance with BRE DIGEST 365 (2016) but on a small scale

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SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	0
0.332	1
0.664	1.65
1	1.9
2	1.95

Effective Depth (m)	1.60
Height to 0.75H	0.4
Height to 0.25H	1.2
tp75	0.15
tp25	0.55

SOAKAWAY TEST

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Site Name: Lon Cardi Bach, Cilgerran
Project Number: 16166
Date: 14/01/2025
Engineer: Jamie Alderman

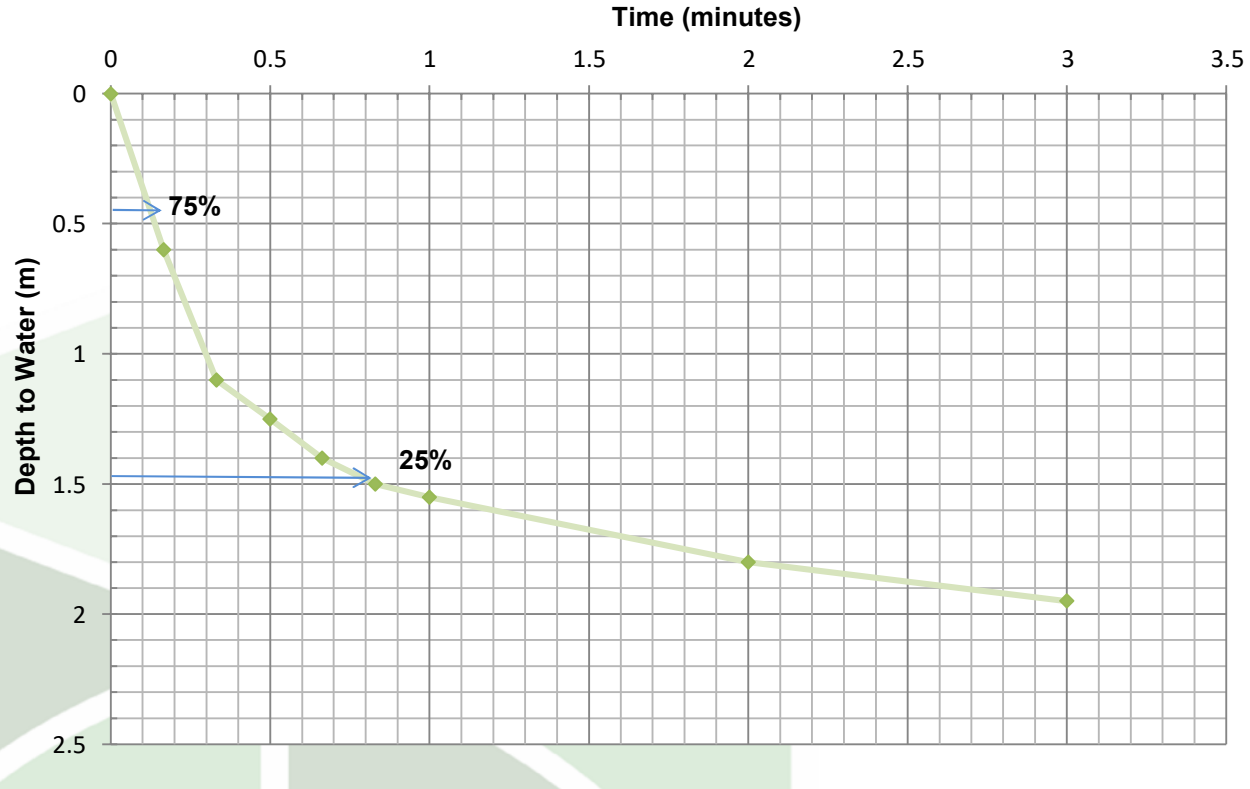
Borehole: **BH12**
Depth: **30.00m**
Water Level: **1.95m**

TEST 3

Borehole Diameter	0.11	m
Depth	1.95	m
Fill Level	0.00	m

V_{p75-25}	0.009	m^3
a_{p50}	0.346	m^2
t_{p75-25}	0.65	minutes

Soil Infiltration Rate, f **6.86E-04** **ms^{-1}**
Provisional Only



REMARKS:
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SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	0
0.166	0.6
0.332	1.1
0.5	1.25
0.664	1.4
0.83	1.5
1	1.55
2	1.8
3	1.95

Effective Depth (m)	1.95
Height to 0.75H	0.4875
Height to 0.25H	1.4625
tp75	0.15
tp25	0.8

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Borehole Log

Borehole No.
BH11
Sheet 1 of 2

Project Name:	Lon Cardi Bach, Cilgerran	Project No: 16166	Co-ords:	Hole Type RO
Location:	Lon Cardi Bach, Cilgerran		Level:	Scale 1:100
Client:	Wales and West Housing Association		Dates: 13/01/2025 - 14/01/2013	Logged By

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				3.20				Soft CLAY, fill (Drillers description)
								Grey SILTSTONE/MUDSTONE (Drillers description)

Remarks: 1. Borehole cased to 1.50m. 2. Groundwater encountered at 2.50m and between 4.00-10.00m. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole soakaway installed on completion.

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Borehole Log

Borehole No.
BH11
Sheet 2 of 2

Project Name:	Lon Cardi Bach, Cilgerran	Project No: 16166	Co-ords:	Hole Type RO
Location:	Lon Cardi Bach, Cilgerran		Level:	Scale 1:100
Client:	Wales and West Housing Association		Dates: 13/01/2025 - 14/01/2013	Logged By

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Grey SILTSTONE/MUDSTONE (Drillers description)
				30.00				End of Borehole at 30.000m

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Remarks: 1. Borehole cased to 1.50m. 2. Groundwater encountered at 2.50m and between 4.00-10.00m. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole soakaway installed on completion.

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Borehole Log

Borehole No.
BH12
Sheet 1 of 2

Project Name:	Lon Cardi Bach, Cilgerran	Project No: 16166	Co-ords:	Hole Type RO
Location:	Lon Cardi Bach, Cilgerran		Level:	Scale 1:100
Client:	Wales and West Housing Association		Dates: 14/01/2025 - 15/01/2025	Logged By

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
				0.80				Soft CLAY, fill (Drillers description)
				2.30				Grey weathered SILTSTONE/MUDSTONE (Drillers description)
								Grey SILTSTONE/MUDSTONE (Drillers description)

Remarks: 1. Borehole cased to 1.50m. 2. Groundwater encountered between 6.00-10.00m. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole soakaway installed on completion.

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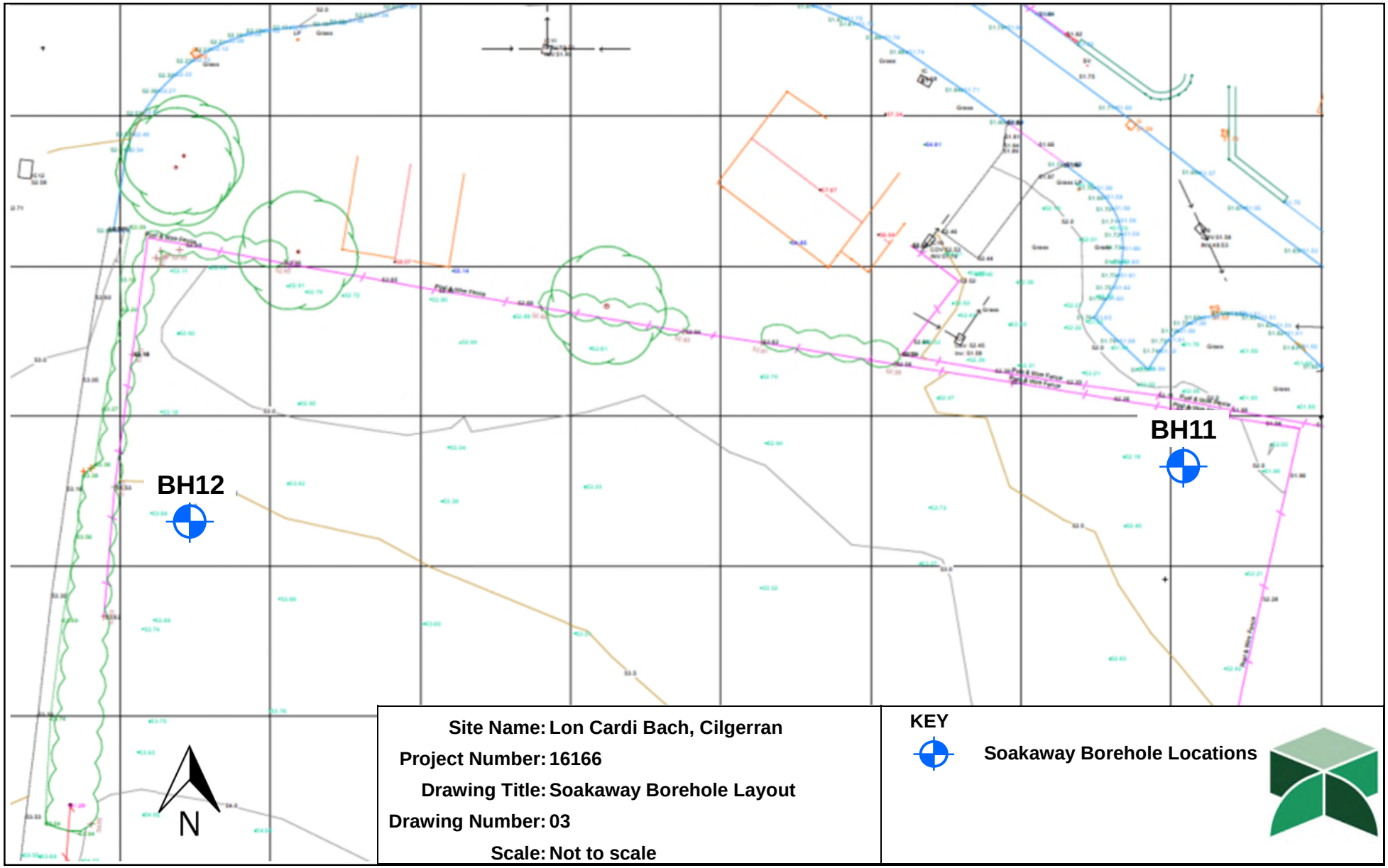
Borehole Log

Borehole No.
BH12
Sheet 2 of 2

Project Name:	Lon Cardi Bach, Cilgerran	Project No: 16166	Co-ords:	Hole Type RO
Location:	Lon Cardi Bach, Cilgerran		Level:	Scale 1:100
Client:	Wales and West Housing Association		Dates: 14/01/2025 - 15/01/2025	Logged By

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
								Grey SILTSTONE/MUDSTONE (Drillers description)
				30.00				End of Borehole at 30.000m

Remarks: 1. Borehole cased to 1.50m. 2. Groundwater encountered between 6.00-10.00m. 3. Description is provided by the drillers based on the arisings at the surface. 4. Borehole terminated at scheduled depth 5. Borehole soakaway installed on completion.



Site Name: Lon Cardi Bach, Cilgerran
Project Number: 16166
Drawing Title: Soakaway Borehole Layout
Drawing Number: 03
Scale: Not to scale

KEY
Soakaway Borehole Locations