Cwmtawe Ganol Farm, Godrergraig

Flood Consequences Assessment & Drainage Strategy

March 2026



Waterco

Assessment | Modelling | Design

Project Information	
Project:	Cwmtawe Ganol Farm, Godrergraig
Report Title:	Flood Consequences Assessment & Drainage Strategy
Client:	Conway Morgan
Instruction:	The instruction to undertake this Flood Consequences Assessment & Drainage Strategy was received from Laura Evans of Rural Advisor
File Ref:	17239-FCA & Drainage Strategy-01

Approval Record	
Author:	Louis Hunt BSc (Hons) GradCIWEM
Checker:	Adam McCulloch BSc (Hons)
Approver:	Nigel Jones BEng (Hons) CEng MICE

Document History		
Revision	**Date**	**Comment**
01	02/03/2026	First issue

The copyright in this document (including its electronic form) shall remain vested in Waterco Limited (Waterco) but the Client shall have a licence to copy and use the document for the purpose for which it was provided. Waterco shall not be liable for the use by any person of the document for any purpose other than that for which the same was provided by Waterco. This document shall not be reproduced in whole or in part or relied upon by third parties for any use whatsoever without the express written authority of Waterco.

Contents

Introduction 1
Existing Conditions 1
Development Proposals 2
Flood Zone Category and Policy Context 2
Sources of Flooding and Probability 3
Safe Access / Egress 12
Compliance with TAN15 12
Surface Water Management 12
Construction, Operation and Maintenance 16
Conclusions 17
Recommendations 18

Appendices

Appendix A Location & Aerial Plan
Appendix B Topographical Information
Appendix C DCWW Sewer Records
Appendix D Development Plans
Appendix E NRW Maps
Appendix F Modelled Outputs – Cwm Twrch 2018 & 2022
Appendix G ReFH2 Greenfield Runoff Rates
Appendix H MicroDrainage Outputs
Appendix I Concept Drainage Sketch
Appendix J SuDS Maintenance Schedules
Appendix K CDRA

Tables

Table 1 - Pollution Hazard Indices 15
Table 2 - SuDS Mitigation Indices 15

Figures

Figure 1 - 1% AEP + CC (Central Estimate - 30%) - Defended Fluvial Event....4
Figure 2 - 0.1% AEP - Defended Fluvial Event....5
Figure 3 - 10% AEP - Undefended Fluvial Event....5
Figure 4 - 2% AEP - Undefended Fluvial Event....6
Figure 5 - 1% AEP + CC (Central Estimate - 30%) - Undefended Fluvial Event....6
Figure 6 - 0.1% AEP - Undefended Fluvial Event....7
Figure 7 - NRW Surface Water - Flood Depths - 3.3% AEP Present Day Scenario....8
Figure 8 - NRW Surface Water - Flood Depths - 1% AEP Present Day Scenario....9
Figure 9 - NRW Surface Water - Flood Depths - 0.1% AEP Present Day Scenario....9
Figure 10 - NRW Surface Water - Flood Depths - 3.3% AEP Climate Change Scenario....10
Figure 11 - NRW Surface Water - Flood Depths - 1% AEP Climate Change Scenario....10
Figure 12 - NRW Surface Water - Flood Depths - 0.1% AEP Climate Change Scenario....11

Introduction

Waterco has been instructed to prepare a Flood Consequences Assessment (FCA) and Drainage Strategy in respect of a proposed new stable and menage at Cwmtawe Ganol Farm, Godrergraig, SA9 2DG.

The purpose of this report is to outline the potential flood risk to the site, the impact of the proposed development on flood risk elsewhere, and the proposed measures which could be incorporated to mitigate the identified flood risk. The report has been prepared in accordance with the guidance contained in Planning Policy Wales (PPW) and Technical Advice Note 15 (TAN15): Development and Flooding and Coastal Erosion.

Neath Port Talbot County Borough Council as a Lead Local Flood Authority (LLFA) and Sustainable Drainage Approval Body (SAB) is a statutory consultee for major planning applications in relation to surface water drainage, requiring that all planning applications are accompanied by a Sustainable Drainage Strategy. The aim of the Sustainable Drainage Strategy is to identify water management measures, including Sustainable Drainage Systems (SuDS), to provide surface water runoff reduction and treatment.

This report has been prepared in accordance with the Welsh Government 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems' (2018) – herein referred to as 'the Statutory Standards for SuDS'.

Existing Conditions

The site covers an area of approximately 2,425m² and is located at National Grid Reference (NGR) 275550, 207066. A location plan and an aerial image are included in Appendix A.

Online mapping (including Google Maps / Google Streetview imagery accessed February 2026) shows that the site comprises undeveloped land. The site is bordered by woodland to the north, the A4067 to the east, an existing barn to the south, and woodland with Graig Road to the west. Access to the site is provided from the A4067.

Local Topography

A topographical survey was carried out by The Survey House in November 2024. The topographical survey shows that the site slopes from 63.37 metres Above Ordnance Datum (m AOD) in the northwest, to 48.97m AOD in the south-east.

Topographic levels to metres Above Ordnance Datum (m AOD) have also been derived from a 1m resolution NRW composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). The LiDAR data generally corroborates with the topographical survey carried out by The Survey House.

Topographical information is provided in Appendix B.

Ground Conditions

Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the majority of the site is underlain by superficial deposits of Devensian glaciofluvial deposits comprising sand and gravel. The eastern extent of the site (including the access road) is underlain by superficial deposits of alluvium

comprising clay, silt, sand and gravel. The western extent of the site is underlain by bedrock deposits of Llynfi member, consisting of sandstone. The central extent of the site is underlain by bedrock deposits of South Wales Upper Coal Measures Formation consisting of mudstone, siltstone and sandstone. The south-eastern extent of the site is underlain by bedrock deposits of South Wales Middle Coal Measures Formation consisting of mudstone, siltstone and sandstone.

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

There are no historical BGS borehole records within the immediate vicinity of the site.

According to NRW's Aquifer Designation data, obtained from BGS GeoIndex's online mapping (accessed February 2026) the Devensian glaciofluvial deposits and Alluvium-Clay is classified as a Secondary A Aquifer. Secondary A aquifers comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers

The underlying South Wales Upper Coal Measures Formation and the South Wales Middle Coal Measures Formation is also classified as a Secondary A Aquifer.

Local Drainage

Public sewer records have been obtained from Dŵr Cymru Welsh Water (DCWW) and are included in Appendix C. The DCWW sewer records show that there is a 525mm public combined sewer, approximately 15m east of the access road, beneath the A4067 flowing south-west. There is also a 225mm public foul sewer, approximately 55m west of the site, beneath Graig Road flowing south-west.

Development Proposals

The proposed development is for the erection of a new stable, concrete yard and a horse riding menage. Proposed development plans are included in Appendix D.

The proposed development will introduce hardstanding areas in the form of the proposed stable, concrete yard and menage. The access track is existing and does not need to be formally drained. Hardstanding will comprise 1,890m^2 or 78% of the total site area. Hardstanding areas have been measured from a PDF copy of the 'Block Plan' and are approximate only.

Flood Zone Category and Policy Context

Flood Zone Category

The NRW 'Flood Map for Planning' (Appendix E), shows that majority of the site is located within an area outside of the extreme flood extent (Flood Zone 1), meaning it has a less than 0.1% annual probability of fluvial flooding, including the effect of climate change. The eastern extent of the access road is located within

Flood Zone 2, defined as an area considered to be at flood risk with between a 1% (1 in 100) and 0.1% annual probability of fluvial flooding, including the effect of climate change.

Development Vulnerability Classification

The proposed is considered to be 'less vulnerable' development in accordance with Figure 4 of the Welsh Government's TAN15.

TAN15 states that Applications for all types of development, change of use or conversion are acceptable in principle within Flood Zone 1.

TAN15 states that planning applications in Flood Zone 2 require careful consideration and must be consistent with the acceptability considerations set out in Section 11.

Local Policy

Local guidance documents including the South West Wales - Stage 1 Strategic Flood Consequences Assessment (SFCA) (November 2022) and the Neath Port Talbot Council Preliminary Flood Risk Assessment (PFRA) (March 2011) have been reviewed for site specific information.

Sources of Flooding and Probability

Fluvial

The nearest watercourse is an unnamed watercourse which is culverted beneath the access road on site. The unnamed watercourse is part of a wider network of land drains which flow south-east into an unnamed watercourse that runs parallel with the A4067. The unnamed watercourse flows south-west, following the A4067 until discharging into the River Tawe approximately 700m south-west of the site. Other watercourses in the area include the River Tawe which is located approximately 290m south-east of the site.

The NRW 'Flood Map for Planning' shows that majority of the site (including all development) is located within Flood Zone 1, defined as an area outside of the extreme flood extent, meaning it has a less than 0.1% annual probability of fluvial flooding, including the effect of climate change.

Fluvial flooding could occur within the site's access road and adjacent A4067 if the River Tawe overtopped its banks during or following an extreme rainfall event.

The NRW 'Recorded Flood Extents' map (Appendix E) indicates that NRW hold no record of fluvial flooding at or near to the site.

NRW River Tawe Model Outputs

Modelled outputs for the River Tawe have been obtained from NRW. The modelled outputs have been taken from the 2018 and 2022 Cwm Twrch fluvial model which includes data for the River Tawe. The model outputs have been processed to create depth, height, velocity and hazard mapping, included in Appendix F.

Defended Scenario

As shown in the modelled outputs (Appendix F) Figure 1, the site remains flood free during all considered defended events up to and including the 1% annual exceedance probability (AEP) defended flood event plus climate change (CC) (central allowance – 30%).

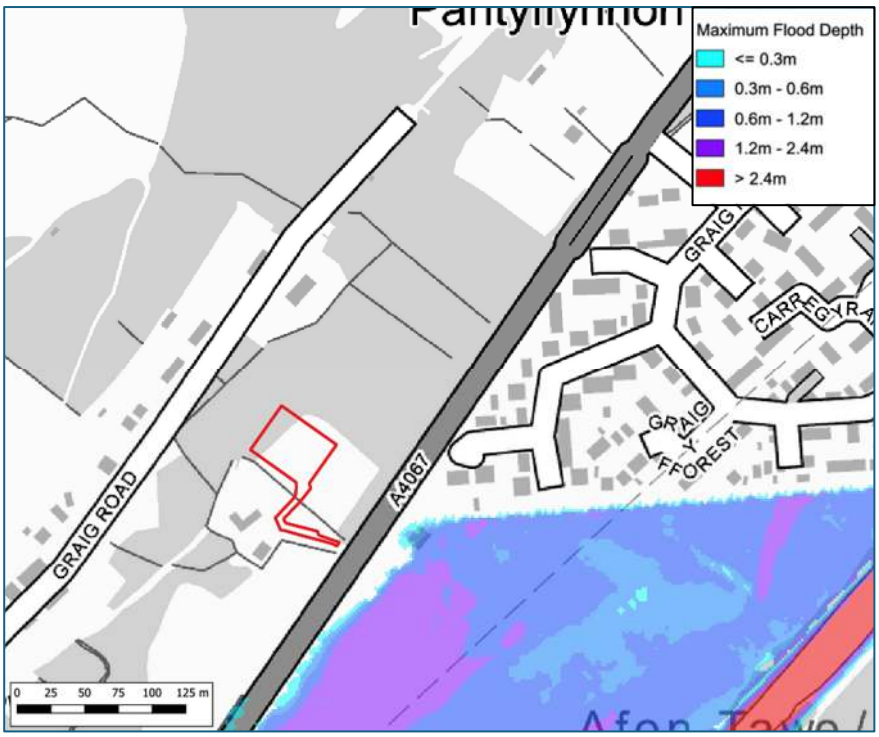


Figure 1 - 1% AEP + CC (Central Estimate - 30%) - Defended Fluvial Event

As shown in Figure 2, during the 0.1% AEP defended flood event, the site remains flood free, however the adjacent A4067 (associated with access from the site) is estimated to flood up to a maximum depth of 600mm, with flood depths typically less than 300mm.

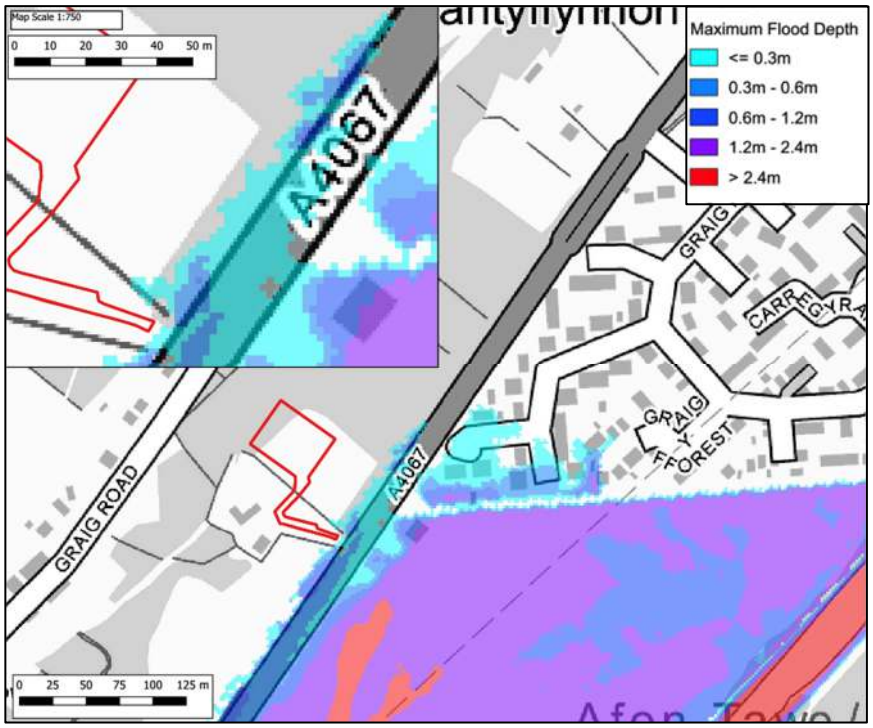


Figure 2 - 0.1% AEP - Defended Fluvial Event

Undefended Scenario

As shown in Figure 3, during the 10% AEP undefended flood event, the site remains flood free.

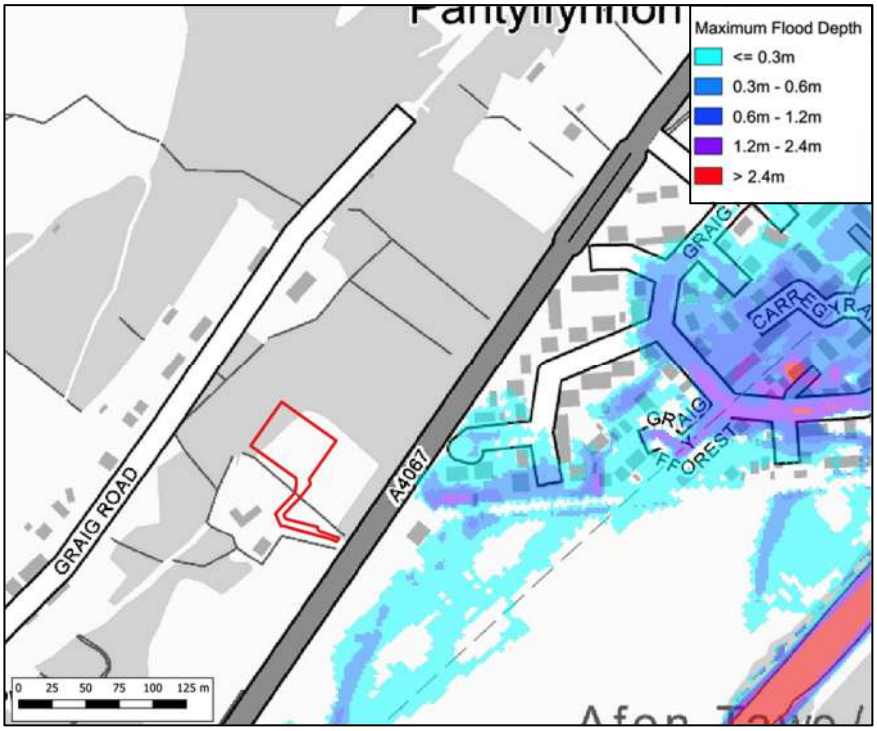


Figure 3 - 10% AEP - Undefended Fluvial Event

As shown in Figure 4 during the 2% AEP undefended flood event, the site remains flood free, however the

adjacent A4067 (associated with access from the site) is estimated to flood up to a maximum depth of 600mm.

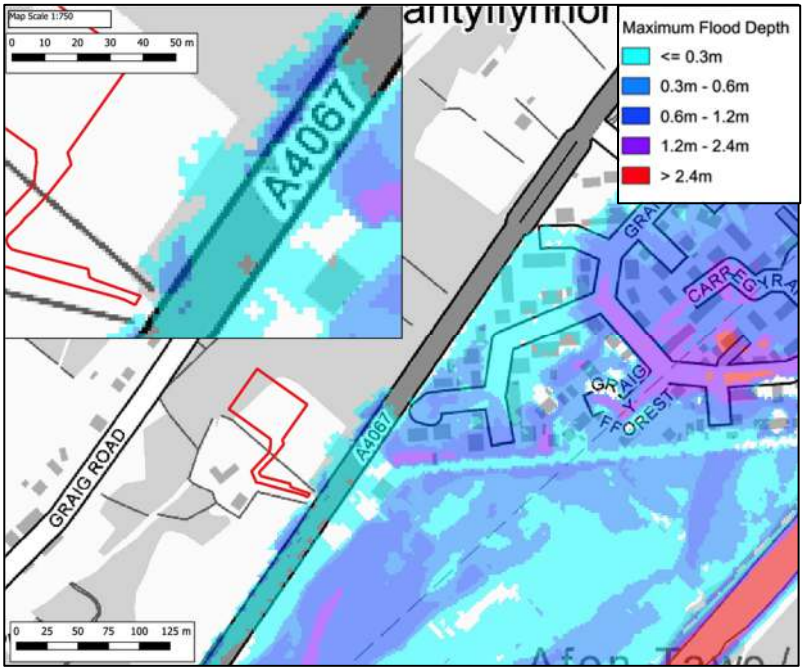


Figure 4 - 2% AEP - Undefended Fluvial Event

As shown in Figure 5, during the 1% AEP plus CC (30%) undefended flood event, the site remains flood free, however the adjacent A4067 is estimated to flood up to a maximum depth of 600mm.

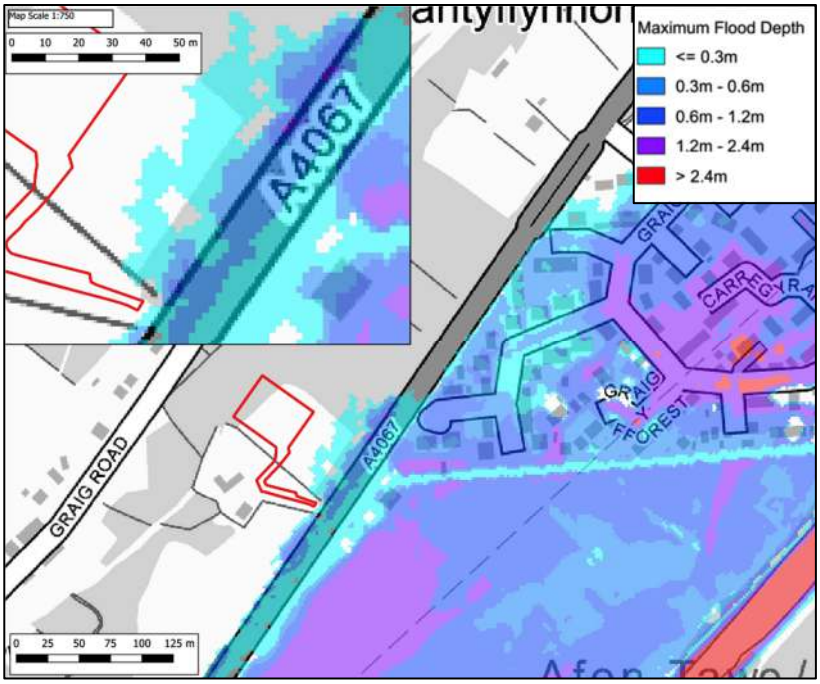


Figure 5 - 1% AEP + CC (Central Estimate - 30%) - Undefended Fluvial Event

As seen in Figure 6, during the 0.1% AEP undefended flood event, the site remains flood free, however the

adjacent A4067 is estimated to flood up to a depth of 600mm.

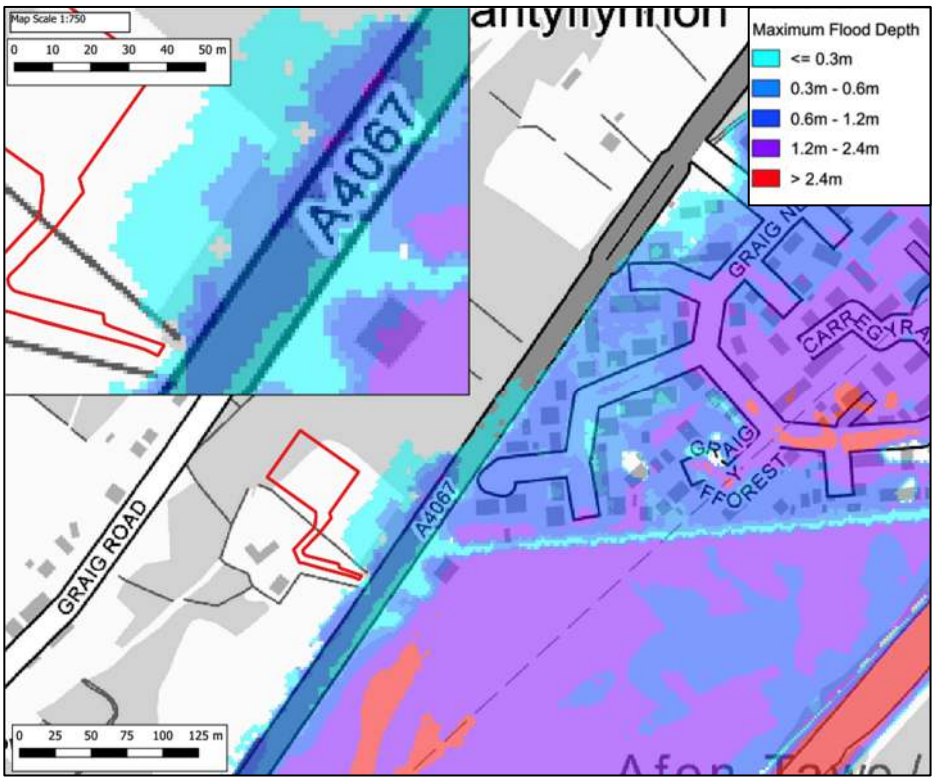


Figure 6 - 0.1% AEP - Undefended Fluvial Event

The site (including all development) is therefore considered to be at very low risk of fluvial flooding. When considering defended scenarios, the A4067, associated with the site's access is estimated to remain flood free during the defended 1% AEP plus CC (30%). Flooding is estimated during the defended 0.1% AEP up to a depth of 600mm. When considering undefended scenarios, the A4067, is estimated to remain flood free during the 10% AEP event. Flooding is estimated during all other considered undefended events, with depths reaching a maximum of 600mm.

Tidal

The site is situated at a minimum of approximately 48.97m AOD and is significantly above sea level. The site is therefore at very low risk of tidal flooding.

Surface Water

Surface water flooding occurs when rainwater does not drain away through the normal drainage system or soak into the ground. It is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or melting snow where the ground is saturated, frozen or developed, resulting in overland flow and ponding in depressions in topography. Surface water flooding can occur anywhere without warning. However, flow paths can be determined by consideration of contours and relative levels.

The NRW 'Flood Zones – Surface Water & Small Watercourses' map (Appendix E) shows that the site is located within Flood Zone 1, meaning it has a less than 0.1% annual probability of flooding, including the

effects of climate change. A section of the A4067, associated with the site's access is located within Flood Zones 2 and 3 on the NRW surface water flood mapping. Flood Zone 2 is defined as having between a 1% and 0.1% chance of surface water flooding in any given year, including the effects of climate change. Flood Zone 3 is defined as having a greater than 1% chance of surface water flooding in any given year, including the effects of climate change.

The surface water flood risk identified by the NRW mapping is associated with out of channel flooding from the unnamed watercourse located south-west of the site. NRW surface water flood depth mapping has been produced and is included in Appendix E. As shown in Figure 7, during the present-day high risk (3.3% AEP) event, the majority of the A4067 associated with the site's access is flood free, with depths reaching up to 200mm.

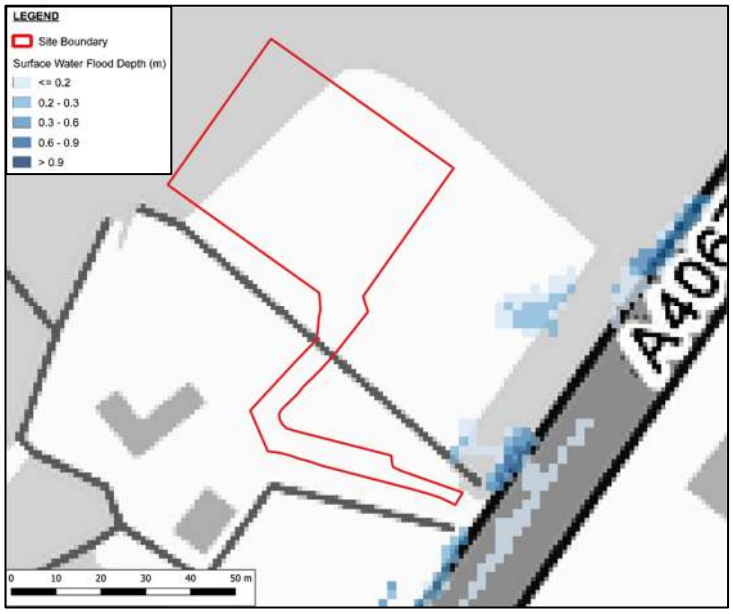


Figure 7 - NRW Surface Water - Flood Depths - 3.3% AEP Present Day Scenario

As shown in Figure 8, during the present-day medium risk (1% AEP) event, the A4067 associated with the site's access is estimated to flood to a maximum depth of 200mm.

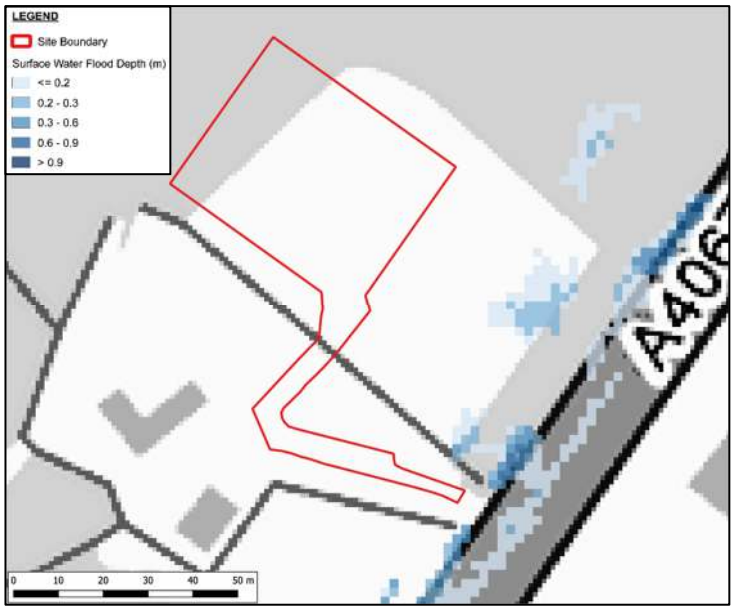


Figure 8 - NRW Surface Water - Flood Depths - 1% AEP Present Day Scenario

As shown in Figure 9, during the present-day low risk (0.1% AEP) event, the A4067 associated with the site's access is estimated to flood. Flood depths are typically less than 200mm. Flood depths reach up to 300mm in places.

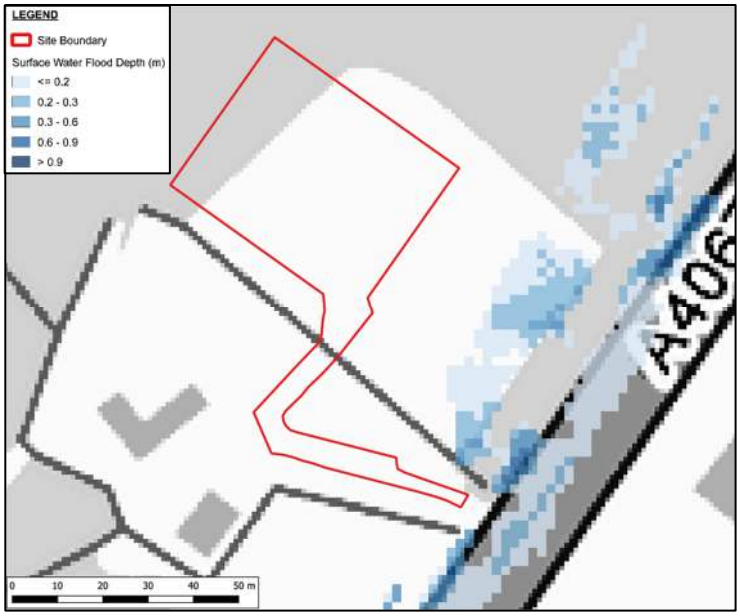


Figure 9 - NRW Surface Water - Flood Depths - 0.1% AEP Present Day Scenario

As shown in Figure 10, during the climate change high risk (3.3% AEP) event, the A4067 associated with the site's access is estimated to flood up to a depth of 200mm.

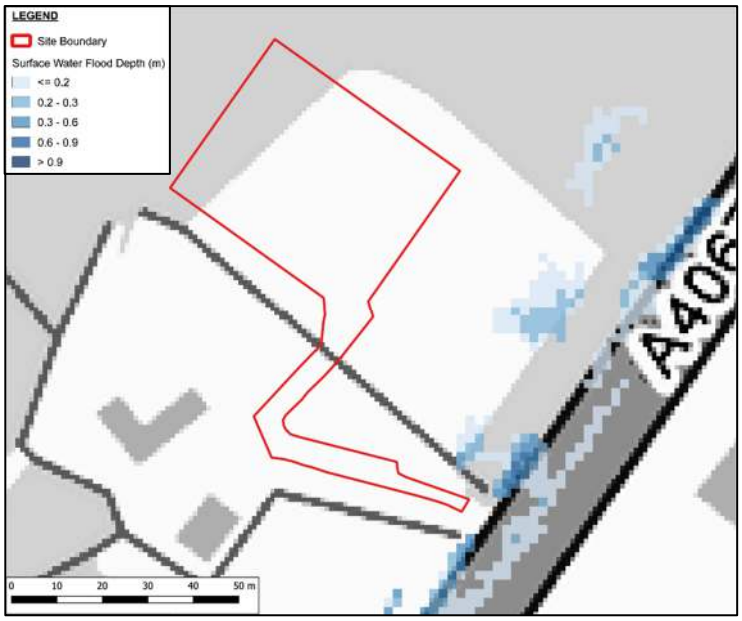


Figure 10 - NRW Surface Water - Flood Depths - 3.3% AEP Climate Change Scenario

As shown in Figure 11, during the climate change medium risk (1% AEP) event, the A4067 is estimated to flood, with flood depths typically less than 200mm.

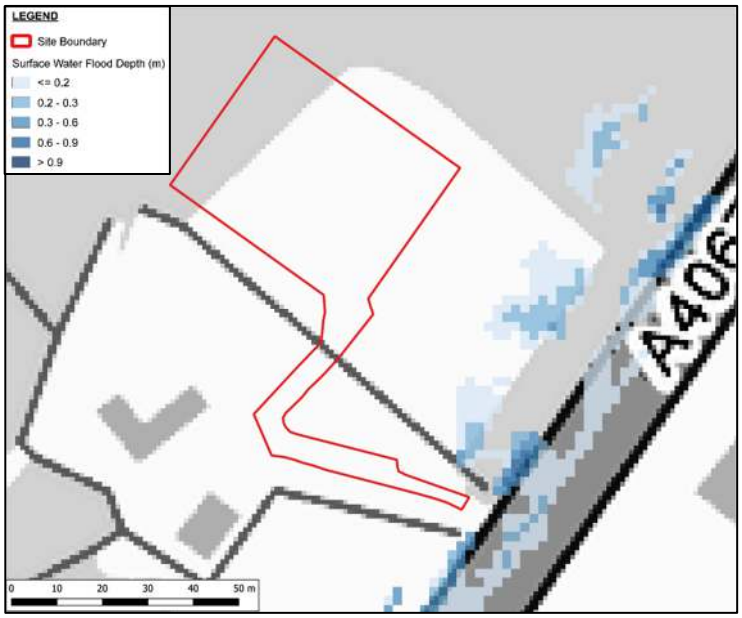


Figure 11 - NRW Surface Water - Flood Depths - 1% AEP Climate Change Scenario

As shown in Figure 12, during the climate change low risk (0.1% AEP) event, the A4067 associated with the site's access is estimated to flood with a maximum depth of 300mm. Flood depths are typically less than 200mm.

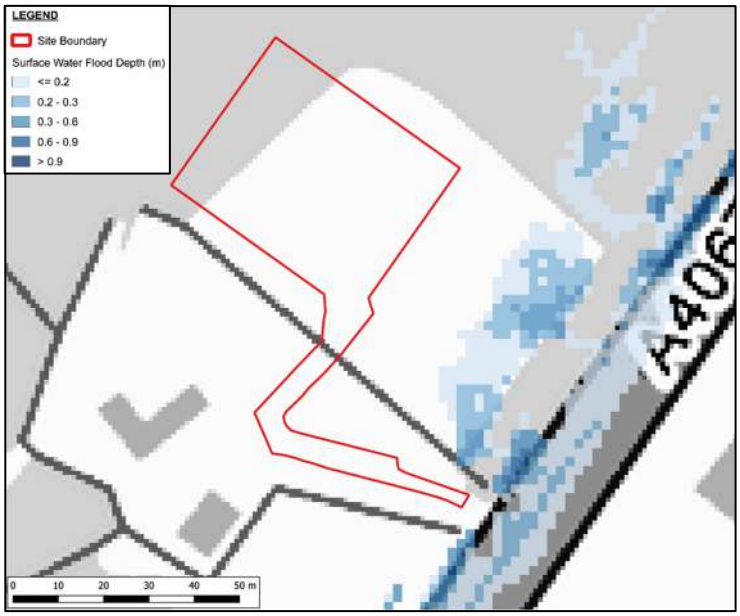


Figure 12 - NRW Surface Water - Flood Depths - 0.1% AEP Climate Change Scenario

It can be concluded that the site is at very low risk of surface water flooding. The NRW mapping identifies that the A4067 associated with the site's access is at risk of fluvial flooding. Flood depths on the A4067 reach a maximum of 300mm during the low risk (0.1% AEP) plus climate change, however flood depths are typically less than 200mm.

Sewer

Flooding from sewers can occur when a sewer is overwhelmed by heavy rainfall, becomes blocked, is damaged, or is of inadequate capacity. Flooding is mostly applicable to combined and surface water sewers.

The DCWW sewer records show that there is a 525mm public combined sewer beneath the A4067 flowing south-west. There is also a 225mm public foul sewer beneath Graig Road approximately 55m west of the site, flowing south-west.

Any flooding arising from the 525mm public combined sewer within the A4067 would be directed south-west, away from the site, following the local topography. There are no distinct flow routes in the area which would direct any potential flooding arising from the 225mm public foul sewer within Graig Road towards the site.

The SFCA identifies a total of 5no. sewer flooding incidents within the Godre'r Graig electoral ward, which is relatively low compared to other nearby wards.

It can be concluded that the risk of sewer flooding is very low.

Groundwater

Groundwater flooding occurs when water levels underneath the ground rise above normal levels. Prolonged heavy rainfall soaks into the ground and can cause the ground to become saturated. This results in rising groundwater levels which leads to flooding above ground.

The PFRA states that *'groundwater is not believed to be a major source of flooding in the county'* and *'there are however no specific areas of historical groundwater flooding recorded in the NPT area'* (Neath Port Talbot area).

Furthermore, there are no basement levels identified on the development plans. It can therefore be concluded that the risk of groundwater flooding is very low.

Artificial Sources

There are no canals in the vicinity of the site and there is no associated flood risk. The NRW 'Risk of Flooding from Reservoirs' online map shows that the site is not at risk of flooding from reservoirs. Therefore, it can be concluded that there is no risk of flooding from artificial sources.

Summary of Potential Flooding

It can be concluded that the site itself is at very low risk of flooding from all sources. The A4067, associated with the site's access is at risk of fluvial and surface water flooding. During fluvial flood events, the A4067 is estimated to remain flood free during the 1% AEP plus CC (30%) defended event. Flooding during all considered fluvial events reaches a maximum of 600mm. Surface water flooding affecting the A4067 reaches a maximum depth of 300mm, including during the climate change low risk (0.1% AEP) event.

Safe Access / Egress

The A4067 which provides access to the site is shown to be at risk of surface water flooding. Flood depths reach up to 600mm during the 0.1% AEP event. As the proposed development is not at risk of flooding, the site users would not require evacuation during the event of a flood and are advised to remain on site.

Compliance with TAN15

The A4067, associated with the site's access is identified to be at risk of fluvial and surface water flooding. During all considered events, including the 1% AEP plus CC and 0.1% AEP events, flood depths reach a maximum of 600mm. Therefore, estimated flood depths are within the tolerances set out in Section 11 of TAN15.

Surface Water Management

The site area associated with the proposed stable, concrete yard and menage is not formally drained and is therefore considered to be 100% permeable.

The proposed development will introduce hardstanding areas in the form of the proposed stable, concrete yard and menage. Hardstanding will comprise 1,890m^2 or 78% of the total site area. The access road is existing and does not need to be formally drained. A 90m^2 manure store, adjacent to the concrete yard will have its

own surface water drainage system to avoid contaminated runoff entering the nearby watercourse.

In accordance with TAN15, new development should not create additional runoff when compared with the undeveloped situation.

The increase in hardstanding area will result in an increase in surface water runoff rates and volumes. In order to ensure the proposed development will not increase flood risk elsewhere, surface water discharge from the site will be controlled.

Discharge Method

Standard S1 of the Statutory Standards for SuDS sets out the following hierarchy of drainage options:

> *Priority Level 1: Surface water runoff is collected for use;*
>
> *Priority Level 2: Surface water runoff is infiltrated to ground;*
>
> *Priority Level 3: Surface water runoff is discharged to a surface water body;*
>
> *Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system;*
>
> *Priority Level 5: Surface water runoff is discharged to a combined sewer.*

Priority Level 1: Surface water runoff collected for use

In line with section G1.4 of the Statutory Standards for SuDS, rainwater harvesting is not proposed for this site as:

1. There is no foreseeable demand for non-potable water on the site throughout its design life;
2. There is no foreseeable need to harvest water at the site as DCWW water resources and drought management plans do not identify potential stresses on mains water supplies;
3. The use of rainwater harvesting is not a viable/ cost-effective part of the solution for managing surface water runoff on the site, taking account of the potential water supply benefits of such a system.

With regards to point 3 above, section G1.6 of the Statutory Standards for SuDS states that; in most cases, rainwater harvesting alone will not be adequate to deal with the site drainage and provision will be required for an overflow to a Level 2 or lower priority runoff destination. As downstream provision of attenuation storage will be required to accommodate for rainwater harvesting system overflows, rainwater harvesting is not considered a cost-effective solution for managing surface water runoff.

Priority Level 2: Surface water runoff is infiltrated to ground

As described above the majority of the site is underlain by superficial deposits of Devensian glaciofluvial deposits comprising sand and gravel. As such, infiltration techniques may be feasible.

Infiltration tests should be undertaken in accordance with the BRE365 specification to determine the suitability of soakaways.

Priority Level 3: Surface water runoff is discharged to a surface water body

Where infiltration techniques are not suitable, a connection to watercourse is the next consideration.

The nearest watercourse is an unnamed watercourse which runs parallel with the A4067. Discharge to the unnamed watercourse, with an invert level of 47.33m AOD at a limited discharge rate appears to be feasible.

Discharge Rates

In order to establish the proposed limited discharge rate, the existing greenfield runoff rates have been estimated using the Revitalised Flood Hydrograph Model (ReFH2) method. A summary of the greenfield runoff rates for a range of events is provided as Appendix G. The existing 1 in 1 year greenfield rate for the 1,890m^2 development area is 1 l/s.

In order to minimise the risk of blockage and to ensure the drainage system is self-cleansing, a discharge rate of 2 l/s is proposed. While a discharge rate of 1 l/s was tested in MicroDrainage, it proved unfeasible and identified that the design was unsatisfactory due to half drain times not being achievable.

Attenuation Storage

In order to achieve a discharge rate of 2 l/s, attenuation storage will be required. Storage estimates have been provided using MicroDrainage and are included in Appendix H. An estimated storage volume of 145m³ will be required for the 1 in 100 year plus 30% Climate Change (CC) event. The storage estimates are based on a flow rate of 2 l/s, storage within a tank or pond structure, an impermeable drainage area of 1800m^2 (90m^2 has been discounted for manure store), a design head of 1m and hydro brake flow control.

Manure Store

Surface water runoff from the manure store will be captured via a sealed drainage system and directed to a storage tank. No contaminated runoff will discharge to the surface water attenuation system. The manure store's runoff storage tank has been sized to accommodate the 6 hour 1 in 100 year plus 30% CC event, a storage estimate of 8.5m^3 is estimated. The storage estimate is based on a 90m^2 manure store, and 72.55mm of rainfall over 6 hours (1% AEP plus CC).

Sustainable Drainage Systems

Attenuation storage will be provided in the form of an attenuation pond located within the area of green open space to the south-east of the proposed menage. A 1m deep attenuation pond with a base (invert) area of 83m^2, 1 in 3 side slopes and a surface area of 208m^2 will provide 145m^3 of storage, sufficient to accommodate the 1 in 100 year plus 30% CC event.

Concept Surface Water Drainage Scheme

Where infiltration techniques are not feasible, surface water runoff will be discharged to the unnamed watercourse located south-east of the site at a rate of 2 l/s. Surface water runoff up to the 1 in 100 year plus 30% climate change allowance event will be attenuated on site. A total attenuation volume of 145m³ will be

required to achieve the discharge rate and will be provided in the form of an attenuation pond located to the south-east of the proposed menage. The proposed surface water drainage scheme will ensure no increase in runoff over the lifetime of the development.

A Concept Drainage Sketch is included in Appendix I.

Exceedance Event

Storage will be provided for the 1 in 100 year plus 30% CC event. Storm events in excess of the 1 in 100 year plus 30% CC event should be permitted to produce temporary shallow depth flooding within the green areas.

Surface Water Treatment

The Statutory Standards for SuDS sets out the following guidance for surface water treatment;

S3 - Surface water quality management

Treatment for surface water runoff should be provided to prevent negative impacts on the receiving water quality and/or protect downstream drainage systems, including sewers.

In accordance with the CIRIA C753 publication 'The SuDS Manual' (2015), other roofs (typically commercial / industrial roofs) have a 'low' pollution hazard level, with low traffic roads also classified as having a 'low' pollution hazard level. Table 1 below shows the pollution hazard indices for each land use.

Table 1 - Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other Roofs (typically commercial / industrial)	Low	0.3	0.2	0.05
Low Traffic Roads	Low	0.5	0.4	0.4

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.2

* Indices values range from 0-1.

Runoff from roofs and roads will be directed to an attenuation pond, prior to discharge to the unnamed watercourse. Table 2 below demonstrates that an attenuation pond provides sufficient treatment.

Table 2 - SuDS Mitigation Indices

	Mitigation Indices		
Type of SuDS	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Pond	0.7	0.7	0.5

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.3

Amenity

The Statutory Standards for SuDS provide the following guidance in relation to Standard S4 – Amenity:

'The design of the surface water management system should maximise amenity benefits.'

The proposed development will include an attenuation pond which will maximise the amenity value of the proposed drainage system.

Biodiversity

The Statutory Standards for SuDS provide the following guidance in relation to Standard S5 – Biodiversity:

'The design of the surface water management system should maximise biodiversity benefits.'

The proposed attenuation pond will maximise the biodiversity value of the proposed drainage system.

Construction, Operation and Maintenance

Standard S6 of the Statutory Standards for SuDS states;

S6 – Design of drainage for Construction, Operation and Maintenance

1) All elements of the surface water drainage system should be designed so that they can be constructed easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).

2) All elements of the surface water drainage system should be designed to ensure maintenance and operation can be undertaken (by the relevant responsible body) easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).

3) The surface water drainage system should be designed to ensure structural integrity of all elements under anticipated loading conditions over the design life of the development site, taking into account the requirement for reasonable levels of maintenance.

All drainage systems will be readily accessible for maintenance access.

The proposal is considered a private development and as such the drainage system will not be adopted by the SAB. Maintenance of the drainage system will be the responsibility of the site owner. Maintenance can be arranged through appointment of a site management company.

Maintenance schedules for an attenuation pond, piped drainage systems and a flow control chamber are included in Appendix J.

Conclusions

The proposed development is for the erection of a new stable, concrete yard and a horse riding menage.

Flood Risk

The NRW 'Flood Map for Planning', shows that majority of the site is located within an area outside of the extreme flood extent (Flood Zone 1), meaning it has a less than 0.1% annual probability of fluvial flooding, including the effect of climate change. The eastern extent of the access road is located within Flood Zone 2, defined as an area considered to be at flood risk with between a 1% (1 in 100) and 0.1% annual probability of fluvial flooding, including the effect of climate change.

The site (including all development) is considered to be at very low risk of flooding from all sources.

When considering defended scenarios, the A4067, associated with the site's access is estimated to remain flood free during the defended 1% AEP plus CC (30%). Flooding is estimated during the defended 0.1% AEP up to a depth of 600mm. When considering undefended scenarios, the A4067, associated with the site's access is estimated to remain flood free during the 10% AEP event. Flooding is estimated during all undefended events from the 2% AEP to the 0.1% AEP event, with depths reaching a maximum of 600mm.

The A4067 associated with the site's access is also at risk of surface water flooding. Flood depths on the A4067 reach a maximum of 300mm during the low risk (0.1% AEP) plus climate change, however flood depths are typically less than 200mm.

During all considered events, including the 1% AEP plus CC and 0.1% AEP events, flood depths on the A4067 reach a maximum of 600mm. Therefore, estimated flood depths are within the tolerances set out in Section 11 of TAN15.

Drainage

The proposed development will introduce hardstanding areas in the form of the proposed stable, concrete yard and menage. Hardstanding will comprise 1,890m^2 or 78% of the total site area. A 90m^2 manure store, adjacent to the concrete yard will have its own surface water drainage system to avoid contaminated runoff entering the nearby watercourse. In order to ensure the increase in surface water runoff will not increase flood risk elsewhere, flow control will be used and attenuation provided on site to accommodate storm events up to and including the 1 in 100 year plus 30% climate change event.

All methods of surface water discharge have been assessed. Where infiltration techniques are not possible, discharge of surface water to the unnamed watercourse at a rate of 2 l/s appears to be the most practical option. A gravity connection is achievable.

Surface water runoff up to the 1 in 100 year plus 30% climate change event will be attenuated on site. Attenuation will be provided in the form of an attenuation pond located to the south-east of the proposed menage.

Treatment of surface water will be provided by the attenuation pond. The site owner will be responsible for

the maintenance of the drainage system.

A Concept Designer's Risk Assessment (cDRA) has been prepared to inform future designers of any identified hazards associated with the scheme. The cDRA has been included in Appendix K.

Recommendations

1. Submit this Flood Consequences Assessment and Drainage Strategy to the Planning Authority in support of the Planning Application.
2. Undertake BRE 365 infiltration testing to determine the suitability of infiltration techniques.
3. Verify the attenuation volumes included in this report when undertaking detailed drainage design.

Appendix A Location & Aerial Plan

N

GRAIG ROAD

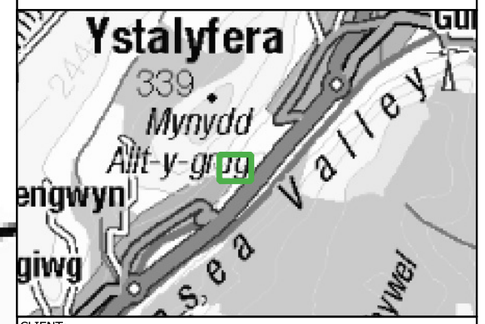
A4067

0 20 40 60 80 100 m

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Watercourses
- Waterbodies



CLIENT:
Conway Morgan

Waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
Location Plan

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:1200

PLOT NAME:	REVISION:
17239_Location_Plan	-

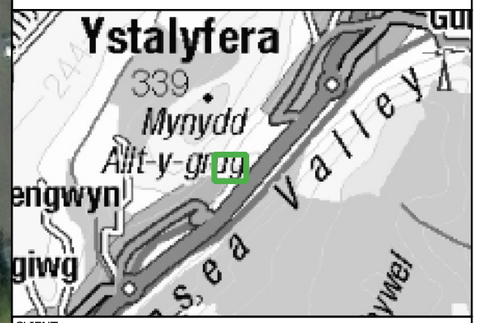
CONTAINS OS DATA © CROWN COPYRIGHT (2026)



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site Boundary



CLIENT:
Conway Morgan

Waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
Aerial Plan

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:1200

PLOT NAME:	REVISION:
17239_Aerial_Plan	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
BASEMAP: WORLD IMAGERY. SOURCES: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, GIS USER COMMUNITY

Appendix B Topographical Information

Cwm-tawe-ganol

Drain

Drain

Drain

Iron Railing Fence

Vegetation

Grass

Tippings

Fence

Water Level 50.08

IL 50.42

IL 50.10

ToRL 56.58

Eaves 54.01

ST01 50.149

ST02 48.976

TP

A4067

Station	Easting	Northing	Level
A1	275614.362	207049.338	48.992
A2	275558.347	207068.440	50.135
A3	275531.820	207060.739	50.969

Key to Abbreviations

Asp.	Asphalt
B	Bollard
BB	Belisha Beacon
BH	Bush
BU	Buried uplighter
BT	British Telecom Cover
B/W	Barbed Wire
CB	Telephone Control Cabinet
C/B	Close Boarded
CCTV	Closed Circuit Television
CDP	Cable Draw Pit
CL	Cover Level
C/L	Chain Link
C/P	Chestnut Paling
Conc.	Concrete
Elec.	Electricity Inspection Cover
El Sub Sta	Electricity Sub Station
EP	Electricity Pole
ER	Earth Rod
FH	Fire Hydrant
FW	Foul Water
G	Gully
Gab.	Gabion Wall
GV	Gas Valve
IC	Inspection Chamber
IL	Invert Level
I/R	Iron Railings
LB	Litter Bin
L/L	Larch Lap
LP	Lamp Post
MH	Manhole
Mkr	Marker
P/R	Post and Rail
RE	Rodding Eye
RS	Road Sign
RWP	Rain Water Pipe
SC	Stop Cock
Sen	Sensor
SL	Sump Level
SV	Stop Valve
SW	Surface Water
TL	Traffic Light
TOW	Top of Wall
TP	Telegraph Pole
TV	Cable Television Cover
UTL	Unable to Lift
VP	Vent Pipe
W/L	Washing Line
WL	Water Level
WM	Water Meter

LINE TYPES

- Building
- Canopy
- Edge of Surfaces
- Embankments and ditches
- Fences
- Overhead cables
- Vegetation
- Walls, Kerbs etc.
- Hedges

Kerb levels are channel levels unless otherwise stated.

Notes

Survey updated from revisit July 2025

Sheet Layout

North Point

All levels related to:-
Ordnance Survey Datum derived by GPS.

Title

CWMTAWE GANOL FARM,
GODRERGRAIG, YSTALYFERA.

Client

Scale:- 1:100 @ A0	Date:- November 2024
Surveyed by:-D Jones / P Baff	Checked by:- D Jones / P Baff
Drawing Number:- 3268 Sheet 1	Rev A

THE SURVEY HOUSE

The Survey House Ltd
3 Well house Barns,
Chester Road,
Chester,
CH4 0DH.

Telephone: 01244 955 599

Email: office@thesurveyhouse.co.uk
Website: www.thesurveyhouse.co.uk

Cwm-tawe-ganol

Path (um)

Drain

Drain

Fence Post & Wire

Vegetation

Grass

Tippings

Area of Japanese Knotweed

Long grass

Pool

Key to Abbreviations

Asp.	Asphalt
B	Bollard
BB	Belisha Beacon
BH	Bush
BU	Buried uplighter
BT	British Telecom Cover
B/W	Barbed Wire
CB	Telephone Control Cabinet
C/B	Close Boarded
CCTV	Closed Circuit Television
CDP	Cable Draw Pit
CL	Cover Level
C/L	Chain Link
C/P	Chestnut Paling
Conc.	Concrete
Elec.	Electricity Inspection Cover
El Sub Sta	Electricity Sub Station
EP	Electricity Pole
ER	Earth Rod
FH	Fire Hydrant
FW	Foul Water
G	Gully
Gab.	Gabion Wall
GV	Gas Valve
IC	Inspection Chamber
IL	Invert Level
I/R	Iron Railings
LB	Litter Bin
L/L	Larch Lap
LP	Lamp Post
MH	Manhole
Mkr	Marker
P/R	Post and Rail
RE	Rodding Eye
RS	Road Sign
RWP	Rain Water Pipe
SC	Stop Cock
Sen	Sensor
SL	Sump Level
SV	Stop Valve
SW	Surface Water
TL	Traffic Light
TOW	Top of Wall
TP	Telegraph Pole
TV	Cable Television Cover
UTL	Unable to Lift
VP	Vent Pipe
W/L	Washing Line
WL	Water Level
WM	Water Meter

LINE TYPES

- Building
- Canopy
- Edge of Surfaces
- Embankments and ditches
- Fences
- Overhead cables
- Vegetation
- Walls, Kerbs etc.
- Hedges

Kerb levels are channel levels unless otherwise stated.

Notes

Sheet Layout
Survey updated from revisit July 2025

North Point

All levels related to:-
Ordnance Survey Datum derived by GPS.

Title
CWMTAWE GANOL FARM,
GODRERGRAIG, YSTALYFERA.

Client

Scale:- 1:100 @ A0	Date:- November 2024
Surveyed by:-D Jones / P Baff	Checked by:- D Jones / P Baff
Drawing Number:- 3268-Sheet 2	Rev. A

THE SURVEY HOUSE

The Survey House Ltd
3 Well house Barns,
Chester Road,
Chester,
CH4 0DH.

Telephone: 01244 955 599

Email: office@thesurveyhouse.co.uk
Website: www.thesurveyhouse.co.uk

207150N

207100N

Drain

Drain

anol

Grass

Vegetation

Tippings

Water Level

Fence

Iron Railing Fence

Area of Japanese Knotweed

Long grass

Shredded rubber / grass

Overgrown

Pond

TP

Key to Abbreviations

Asp.	Asphalt
B	Bollard
BB	Bellisha Beacon
BH	Bush
BU	Buried uplighter
BT	British Telecom Cover
B/W	Barbed Wire
CB	Telephone Control Cabinet
C/B	Close Boarded
CCTV	Closed Circuit Television
CDP	Cable Draw Pit
CL	Cover Level
C/L	Chain Link
C/P	Chestnut Paling
Conc.	Concrete
Elec.	Electricity Inspection Cover
El Sub Sta	Electricity Sub Station
EP	Electricity Pole
ER	Earth Rod
FH	Fire Hydrant
FW	Foul Water
G	Gully
Gab.	Gabion Wall
GV	Gas Valve
IC	Inspection Chamber
IL	Invert Level
I/R	Iron Railings
LB	Litter Bin
L/L	Larch Lap
LP	Lamp Post
MH	Manhole
Mkr	Marker
P/R	Post and Rail
RE	Rodding Eye
RS	Road Sign
RWP	Rain Water Pipe
SC	Stop Cock
Sen	Sensor
SL	Sump Level
SV	Stop Valve
SW	Surface Water
TL	Traffic Light
TOW	Top of Wall
TP	Telegraph Pole
TV	Cable Television Cover
UTL	Unable to Lift
VP	Vent Pipe
W/L	Washing Line
WL	Water Level
WM	Water Meter

LINE TYPES

- Building
- Canopy
- Edge of Surfaces
- Embankments and ditches
- Fences
- Overhead cables
- Vegetation
- Walls, Kerbs etc.
- Hedges

Kerb levels are channel levels unless otherwise stated.

Notes

Survey updated from revisit July 2025

Sheet Layout

North Point

All levels related to:-
Ordnance Survey Datum derived by GPS.

Title

CWMTAWE GANOL FARM,
GODRERGRAIG, YSTALYFERA.

Client

Scale:- 1:100 @ A0	Date:- November 2024
Surveyed by:-D Jones / P Baff	Checked by:- D Jones / P Baff
Drawing Number:- 3268-Sheet 3	Rev: A

THE SURVEY HOUSE

The Survey House Ltd
3 Well house Barns,
Chester Road,
Chester,
CH4 0DH.

Telephone: 01244 955 599

Email: office@thesurveyhouse.co.uk
Website: www.thesurveyhouse.co.uk

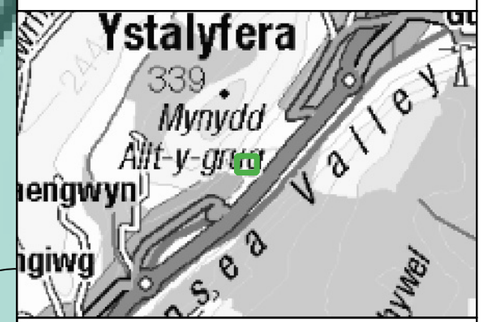
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- 1m contour
- Site Levels (m AOD)

Ground Elevation (m AOD)

- <= 54
- 54 - 60
- 60 - 66
- 66 - 72
- > 72



CLIENT:
Conway Morgan

Waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
LiDAR Plan
1m Resolution
Data from Natural Resources Wales (February 2026)

PLOT STATUS:	DATE:
FINAL	19-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:750

PLOT NAME:	REVISION:
17239_LiDAR_Plan	-

0 10 20 30 40 50 m

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED.

Appendix C DCWW Sewer Records

Dŵr Cymru
Welsh Water

Godrergraig , Swansea, SA9 2NX

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

Dŵr 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. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is 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 disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus 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 is 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.

Service pipes are not generally shown but their presence should be anticipated.

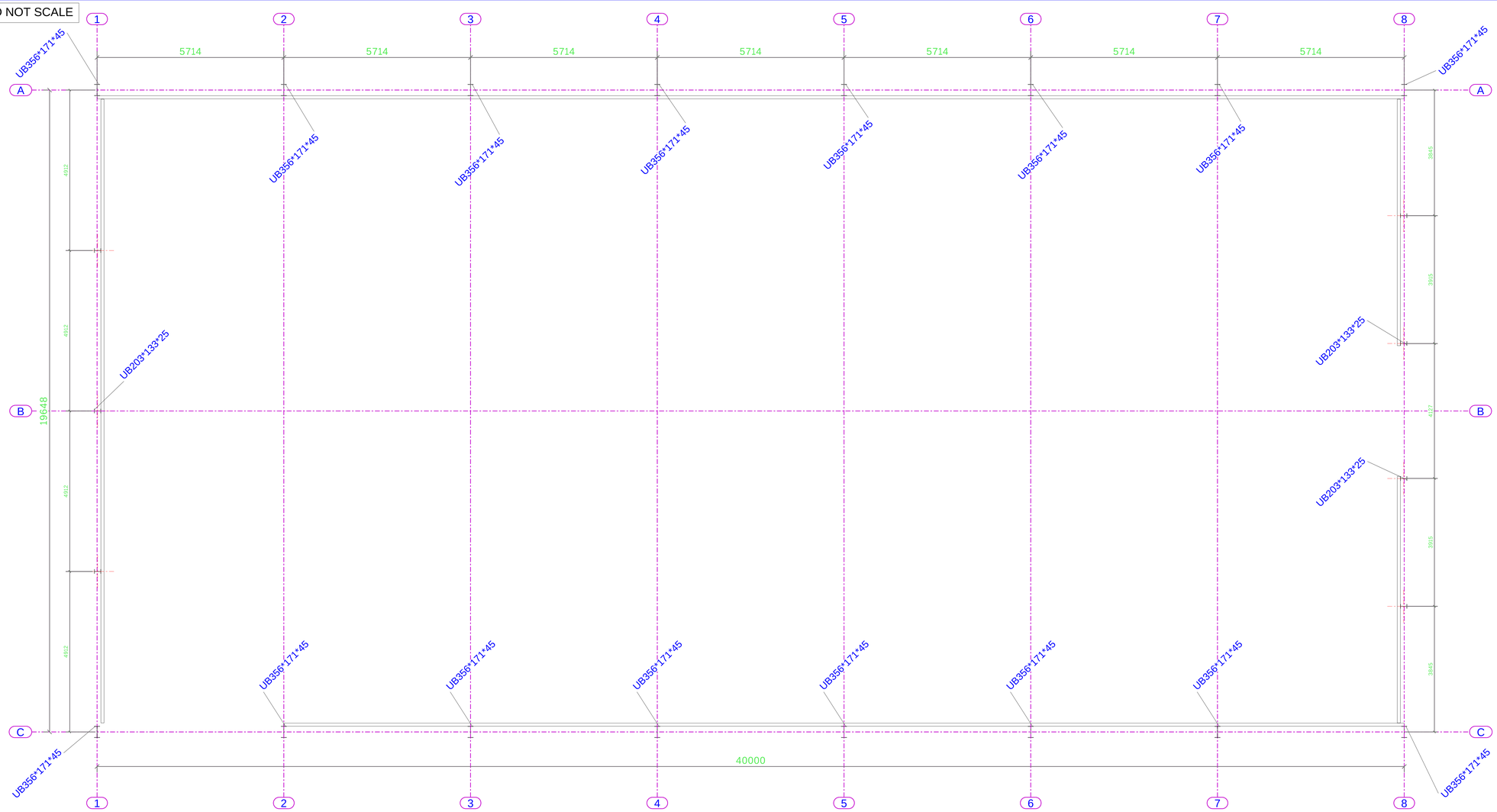
EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Reproduced by permission of the Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2017.
All rights reserved .
Ordnance Survey Licence number 100019534

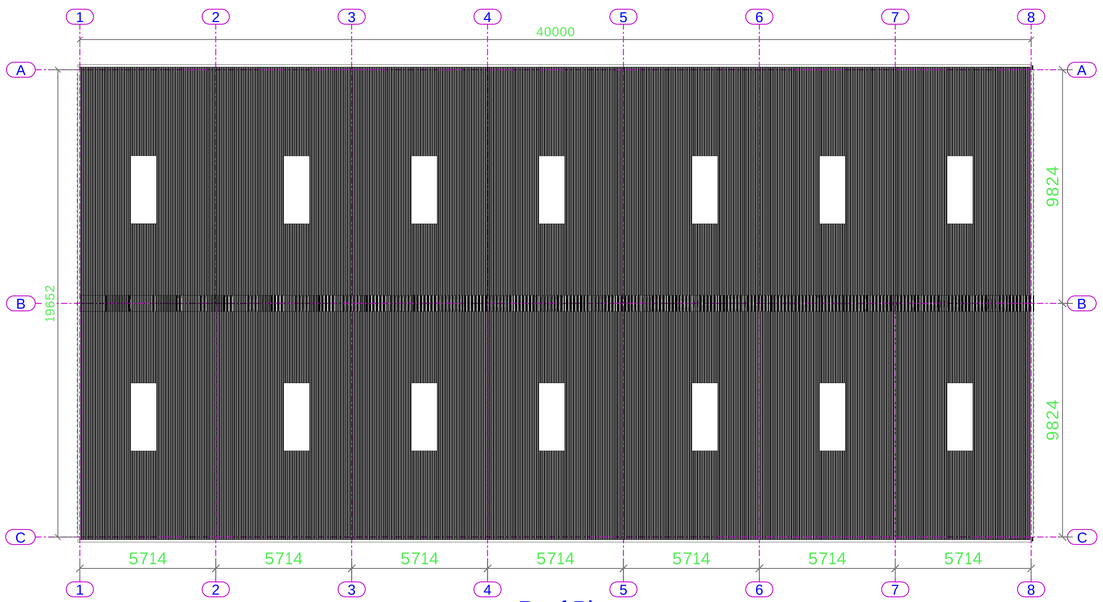
Map Ref:	275559,207114
Map scale:	1:2000
Printed by:	Jay Kobeissi
Printed on:	11 Dec 2025

Appendix D Development Plans

DO NOT SCALE



Column Layout
Scale 1 : 50 @ A0



Roof Plan
N.T.S

Plan Views:
Natural Grey P6R Fibre Cement with either Vented, Alternated Vented or Closed Ridge.
With 14 No. 9f 6ins Roof Lights.

Cold Rolled Purlins & Timber Eaves Beam.

All rainwater goods, i.e. Grey PVC Gutters and Grey PVC Downpipes.

95*1500mm Concrete Panels with Drip flashing below cladding.
(In standard positions)



Scale Bar
Scale 1 : 50 @ A0

NOTES:

Foundation design allows for a safe ground bearing capacity of 150kN/sqm.

Steelwork shotblast to BS SA 2.5

The entire footprint of the building and a further 3.5m clear working area must be provided to the building for the duration of the erecting works. The ground must be suitably prepared with stone to provide a firm, level and smooth operating surface. It is advisable to lay a geotextile membrane below the stone to prevent sinkage. This must be done to prevent un-safe plant operations.

All concrete and plant supplied and installed by customer.

Prior to commencement of erection, holding down bolts must have the cones used while installing the holding down bolts completely removed. Shufflebottom Ltd. will not remove the cones.

Holding down bolts must be grouted by others after hand-over/completion of steel erection.

Shufflebottom Ltd. will not work within 2m of any materials containing asbestos or other site hazards. If you are unsure of the materials within a 2m distance of any point of work of the new build you should undertake a survey. In the event Shufflebottom Ltd. suspect material containing asbestos is present or other site hazards are present, we will undertake our works in so far as possible up to the 2m radius and others must complete at no expense to Shufflebottom Ltd.

The supply of materials and the construction will be undertaken in accordance with BS5502/ BS5950/ EN1090:2 (whichever applies on the confirmation/ order). All tolerances, permitted deviations, manufacturers manuals and specifications of all products and services as stated and referred to within the applicable documentation will prevail.

All dimensions are from centre to centre of steelwork on foundation plan unless noted otherwise. Except in the case of angles and channels where dimensions are taken from the outside face of the angle and channel.

This is how we have interpreted your requirements. If this is incorrect can you please notify us verbally or in writing within 7 days of receiving your drawing.

I CONFIRM THAT (IF APPLICABLE) THE FINISHED FLOOR LEVEL AS SHOWN ON THIS PLAN IS POSITIONED CORRECTLY.

SIGNED..... DATE.....

REV MARK	REVISION DESCRIPTION	REVISION DATE
A	Change Door POS + Open Bay GL C	

Shufflebottom Ltd
Cross Hands Business Park
Cross Hands
Llanelli, Carmarthenshire
SA14 6RE - Tel: 01269 831831

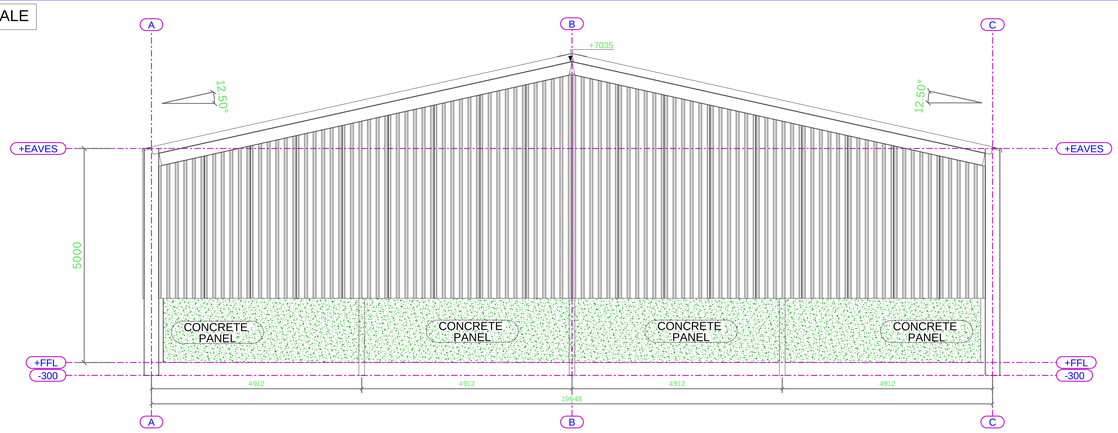
SHUFFLEBOTTOM

DRAWING TITLE	Column Layout		
CONTRACT	MORGAN		
MODELLED BY	EPMO	ISSUE DATE	07.04.2025
CONTRACT NO	D15133	SCALE	1:50 1:90
DRAWING No		REVISION No.	A

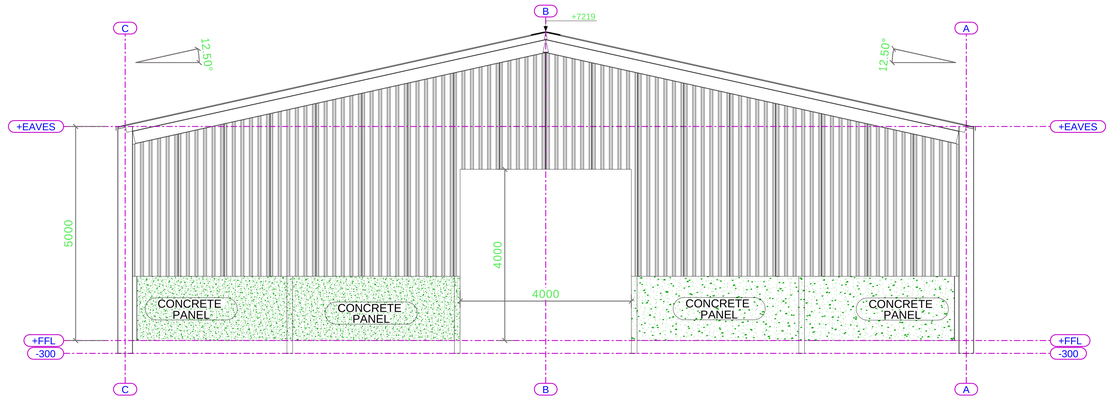
FOR APPROVAL

Atlas Structures

DO NOT SCALE



Elevation on Line 1
Scale 1 : 50 @ A0

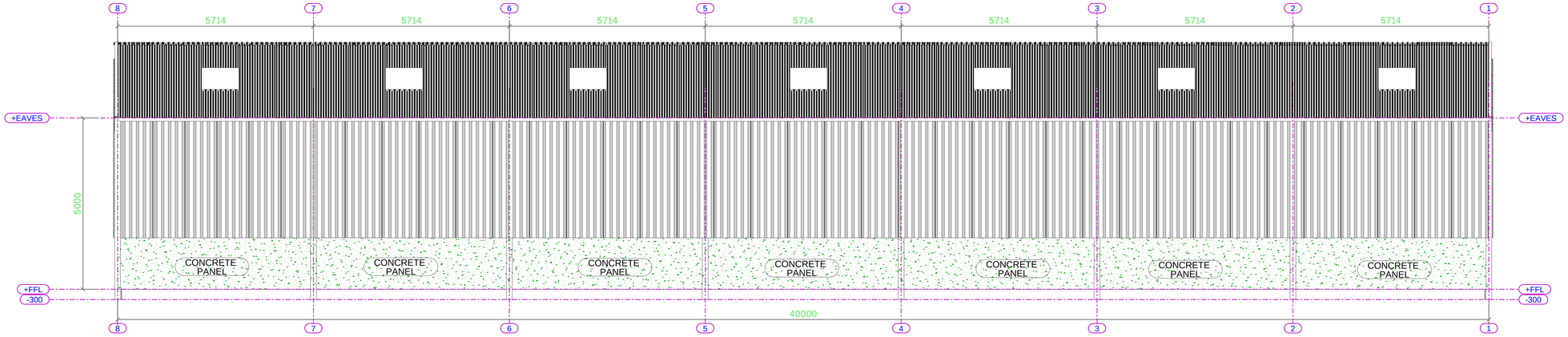


Elevation on Line 8
Scale 1 : 50 @ A0

Gable Views:
Down 3.7m below eaves level in Vertical Treated Timber Yorkshire Boarding with Treated Timber side rails.

95*1500mm Concrete Panels with Drip flashing below cladding.

Incorporating 3 No. Gable Columns UB203*133*25kg along GL/1
Incorporating 4 No. Gable Columns UB203*133*25kg along GL/8 &
Allowing for 1 No. Openings 4m wide by 4m high - Position T.B.C
(Door type TBC)



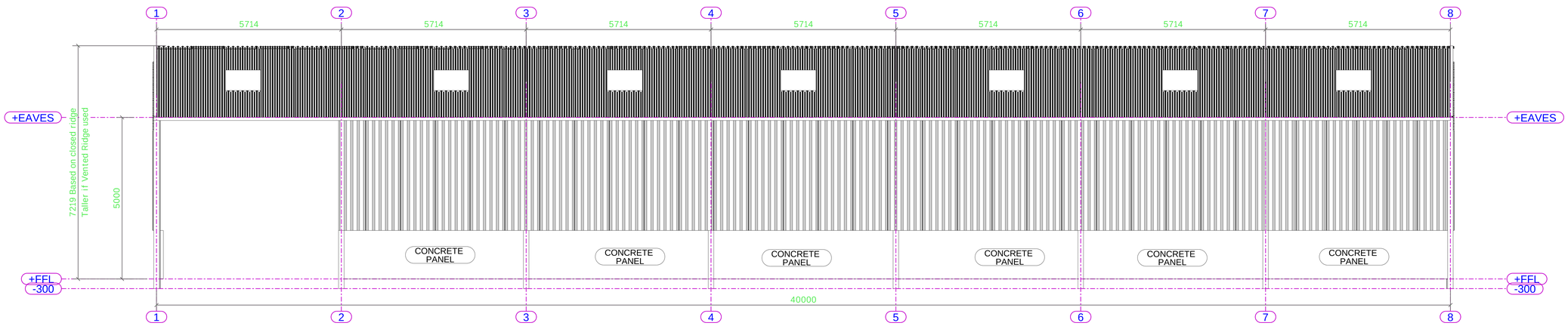
Elevation on Line A
Scale 1 : 50 @ A0

Elevations GL A & C:
Down 3.7m below eaves level in Vertical 0.5mm Plastic Coated Box Profile with Cold Rolled side rails.

Allowing for opening along GL/C Bay 1 - 2

All rainwater goods, i.e. Grey PVC Gutters and Grey PVC Downpipes.

95*1500mm Concrete Panels with Drip flashing below cladding.



Elevation on Line C
Scale 1 : 50 @ A0



Scale Bar
Scale 1 : 50 @ A0

FOR APPROVAL

REV MARK	REVISION DESCRIPTION	REVISION DATE
A	Change Door POS + Open Bay GL C	

Shufflebottom Ltd
Cross Hands Business Park
Cross Hands
Llanelli, Carmarthenshire
SA14 6RE - Tel: 01269 831831

SHUFFLEBOTTOM

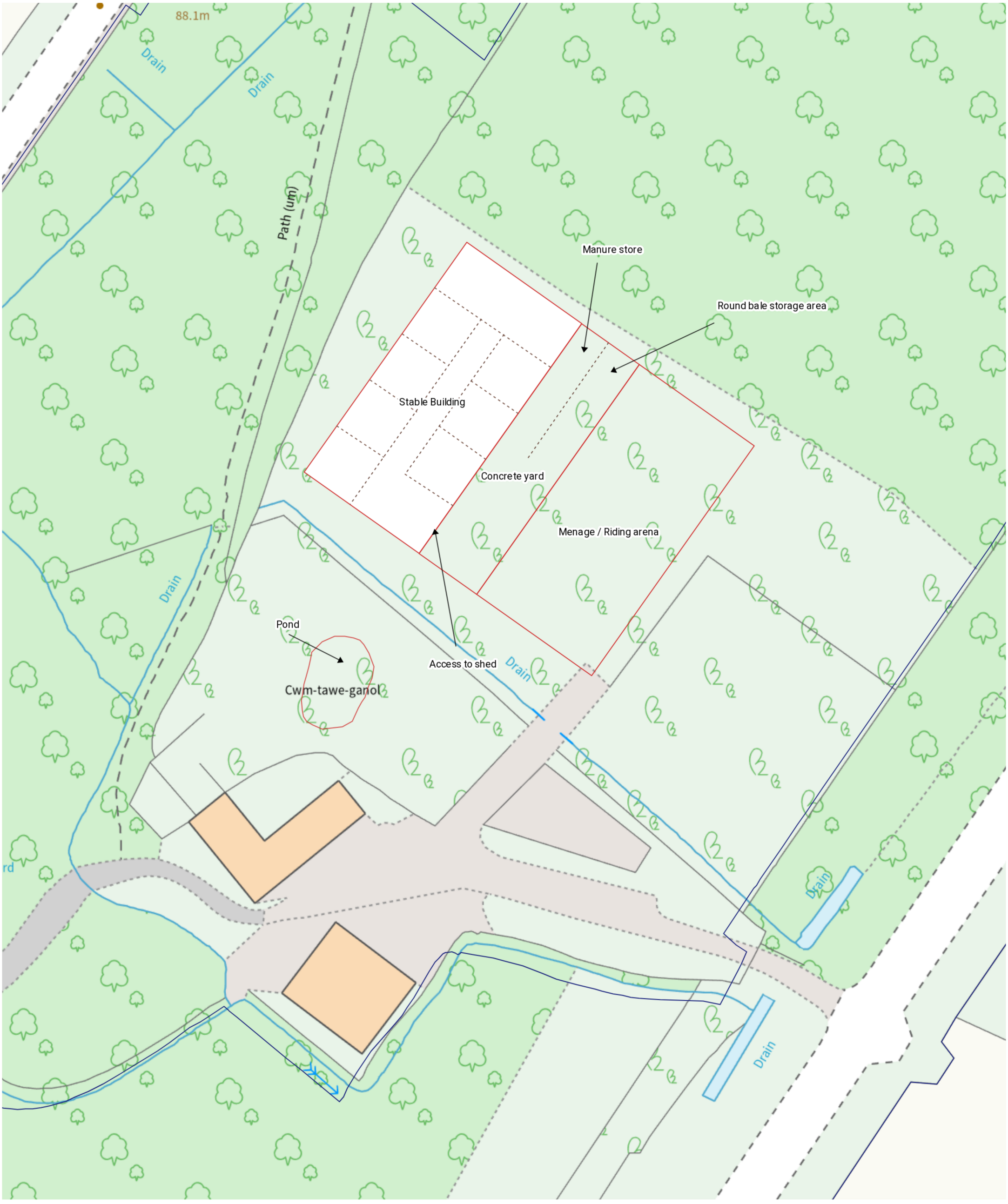
DRAWING TITLE	Side and Gable Elevations		
CONTRACT	MORGAN		
MODELLED BY	EPMO	ISSUE DATE	07.04.2025
CONTRACT NO	D15133	SCALE	1:50
DRAWING No	G [2]	REVISION No.	A

Arch Services

Rural ADVISOR

Block Plan / Site Plan

Land App



Cwmtawe Ganol Farm
Godrergraig
Swansea Valley
SA9 2NX

Produced on Land App, Jul 21, 2025.
© Crown copyright and database rights 2025 (licence number 100059532)

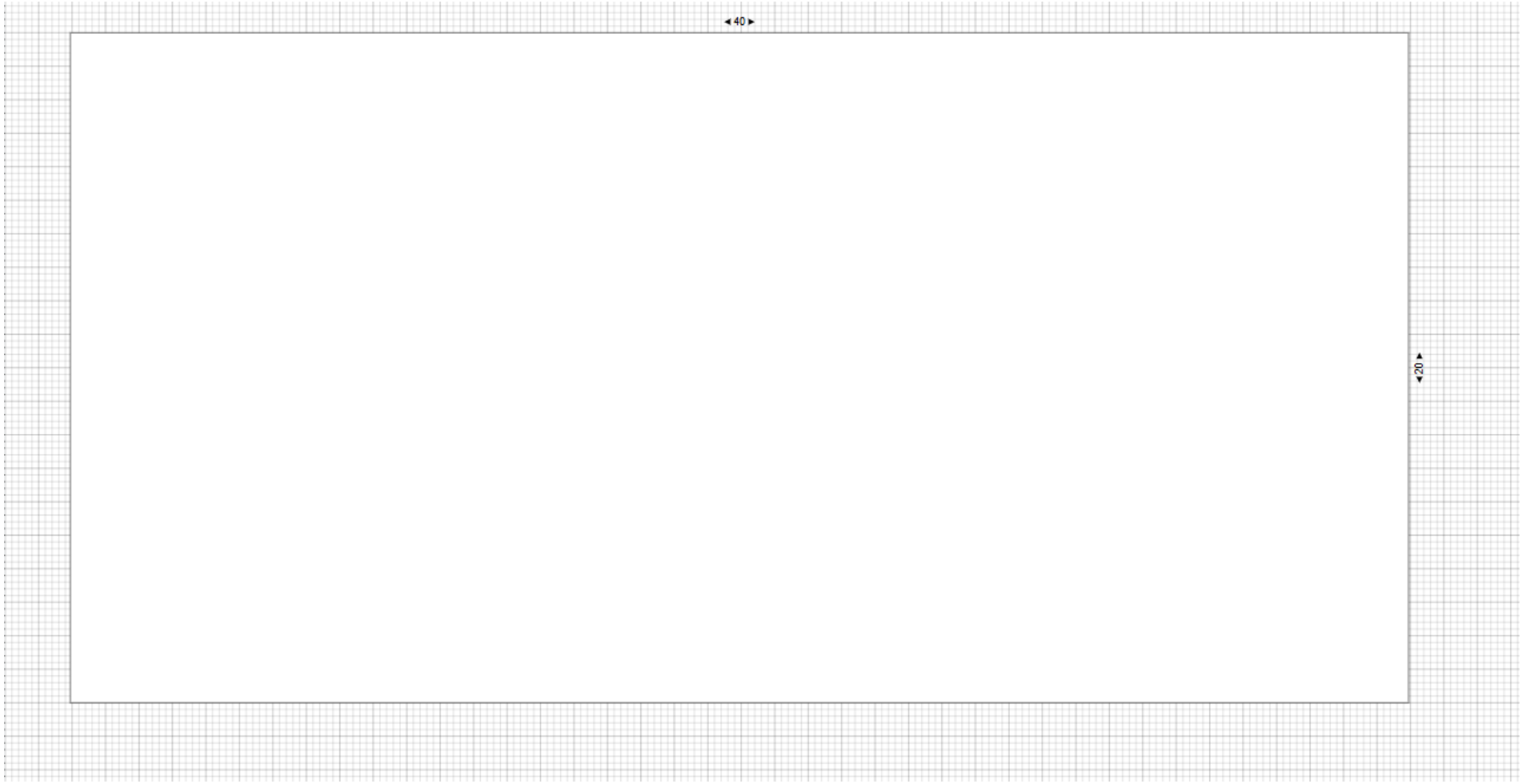
10 m
Scale 1:500 (at A3)

N

July 2025

Floor Plan of proposed menage / riding arena

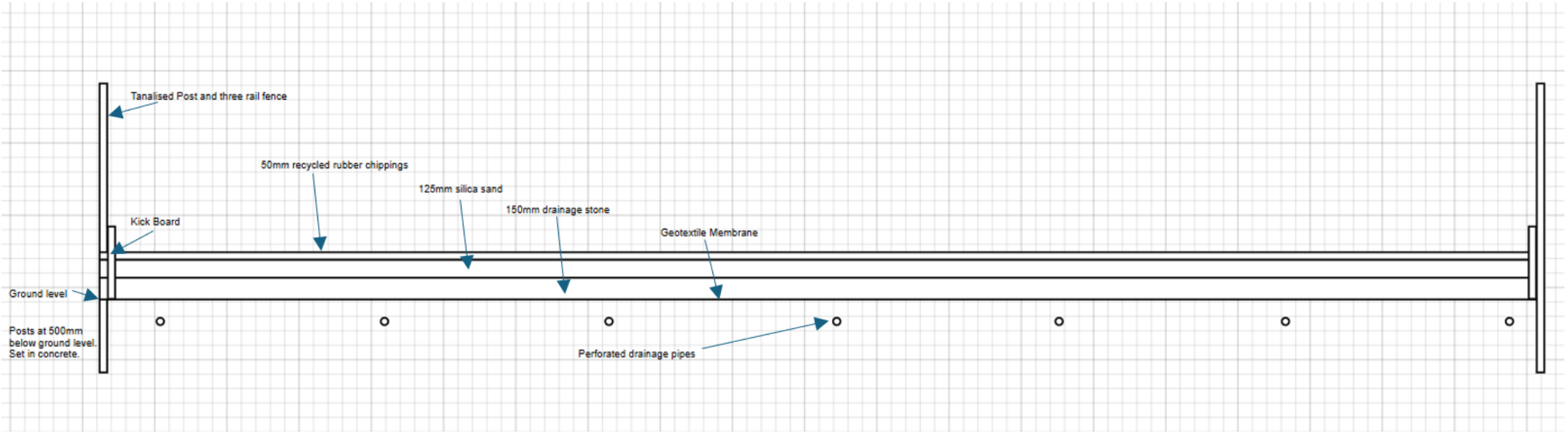
at Cwmtawe Ganol Farm, Godrergraig, Swansea Valley, SA9 2NX



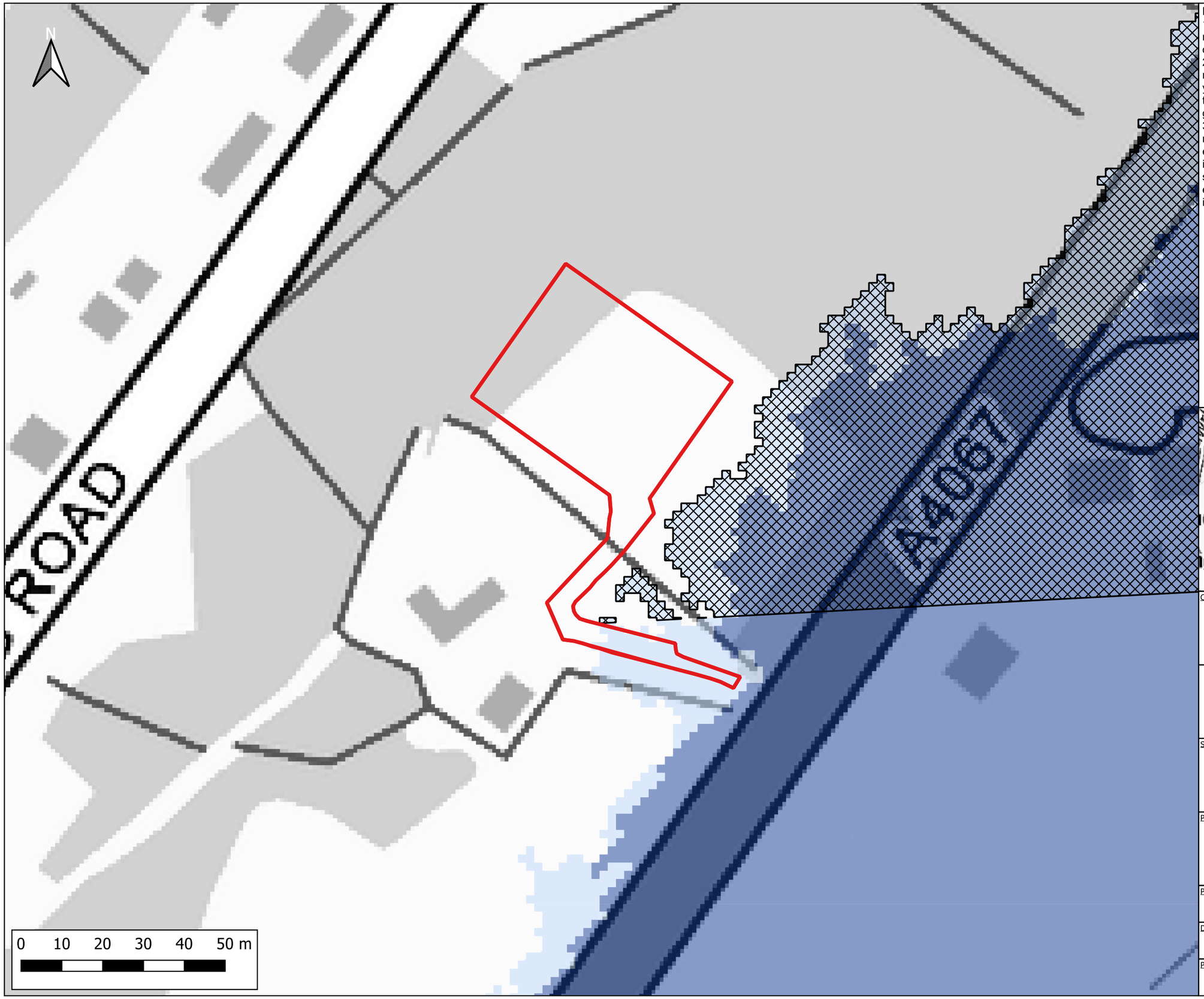
July 2025

Cross-section of proposed menage / riding arena

at Cwmtawe Ganol Farm, Godrergraig, Swansea Valley, SA9 2NX



Appendix E NRW Maps



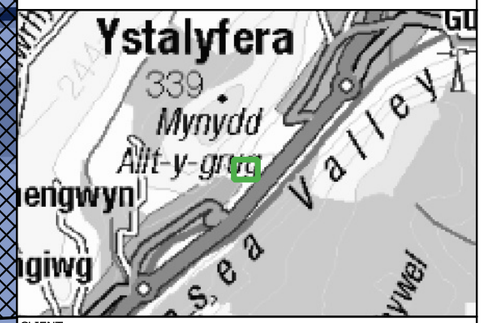
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
2) Flood Zone 3 displays the extent of flooding from rivers with a 1% AEP or greater of flooding in a given year including and allowance for climate change and the sea with a 0.5% AEP or greater of flooding in a given year including and allowance for climate change
3) Flood Zone 2 displays the extent of flooding from rivers with a less than 1% AEP but greater than or equal to 0.1% AEP of flooding in a given year including and allowance for climate change and the sea with a less than 0.5% AEP but greater than or equal to 0.1% AEP of flooding in a given year including an allowance for climate change

LEGEND

- Site Boundary
- TAN15 Defended Zones

Flood Map for Planning

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

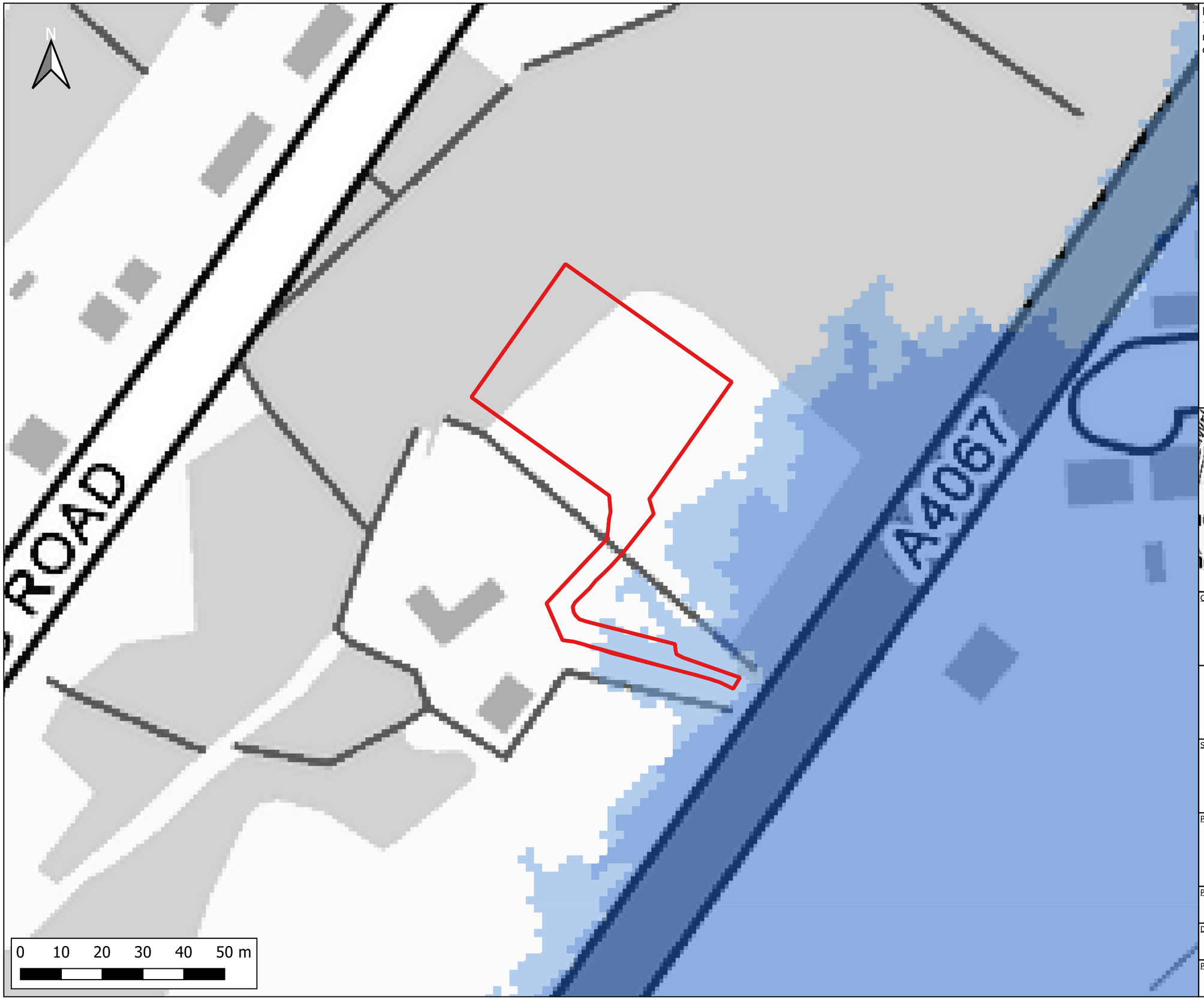
PLOT TITLE:
NRW Flood Map for Planning (Rivers and Sea)
Data published May 2025

PLOT STATUS:	DATE:
FINAL	19-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:900

PLOT NAME:	REVISION:
17239_NRW_FMfP	-

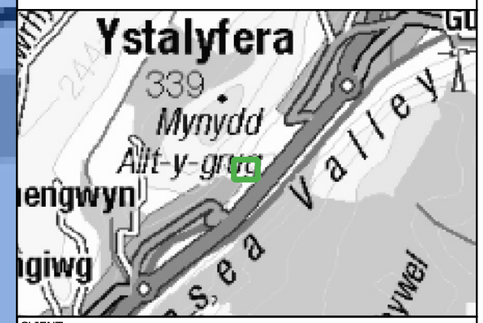
CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Flood Zones - Rivers
  - Flood Zone 1
  - Flood Zone 2
  - Flood Zone 3



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

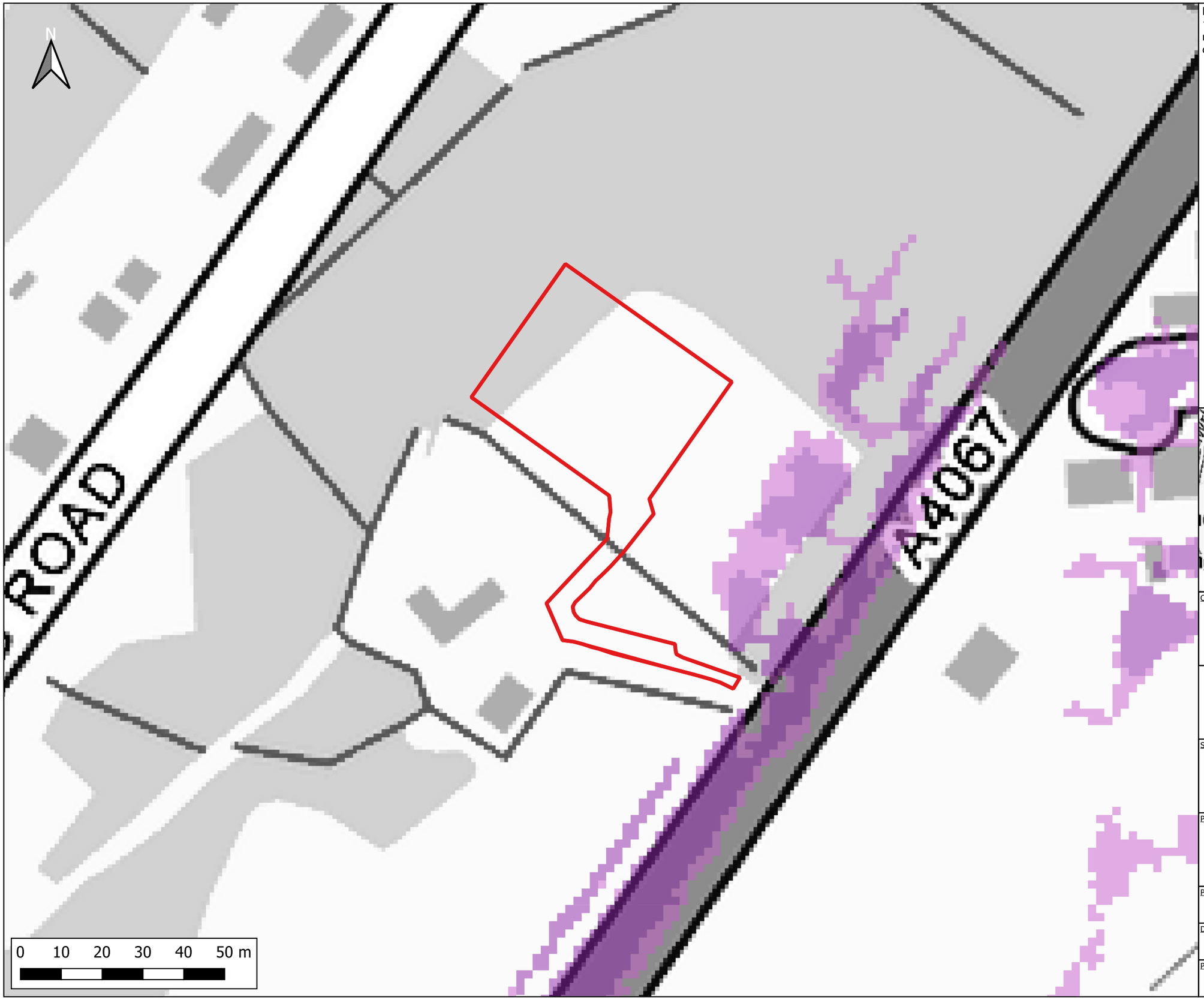
PLOT TITLE:
NRW Flood Zones - Rivers
Data published May 2025

PLOT STATUS:	DATE:
FINAL	19-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:900

PLOT NAME:	REVISION:
17239_NRW_Flood_Zones_Rivers	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

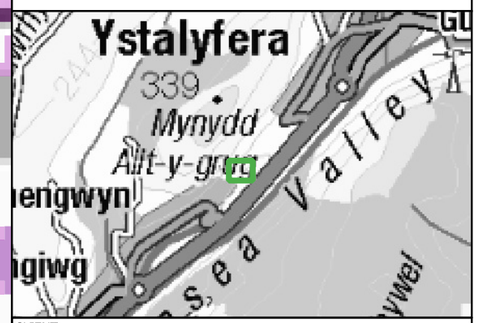
Site Boundary

Flood Zones - Surface Water & Small Watercourses

Flood Zone 1

Flood Zone 2

Flood Zone 3



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

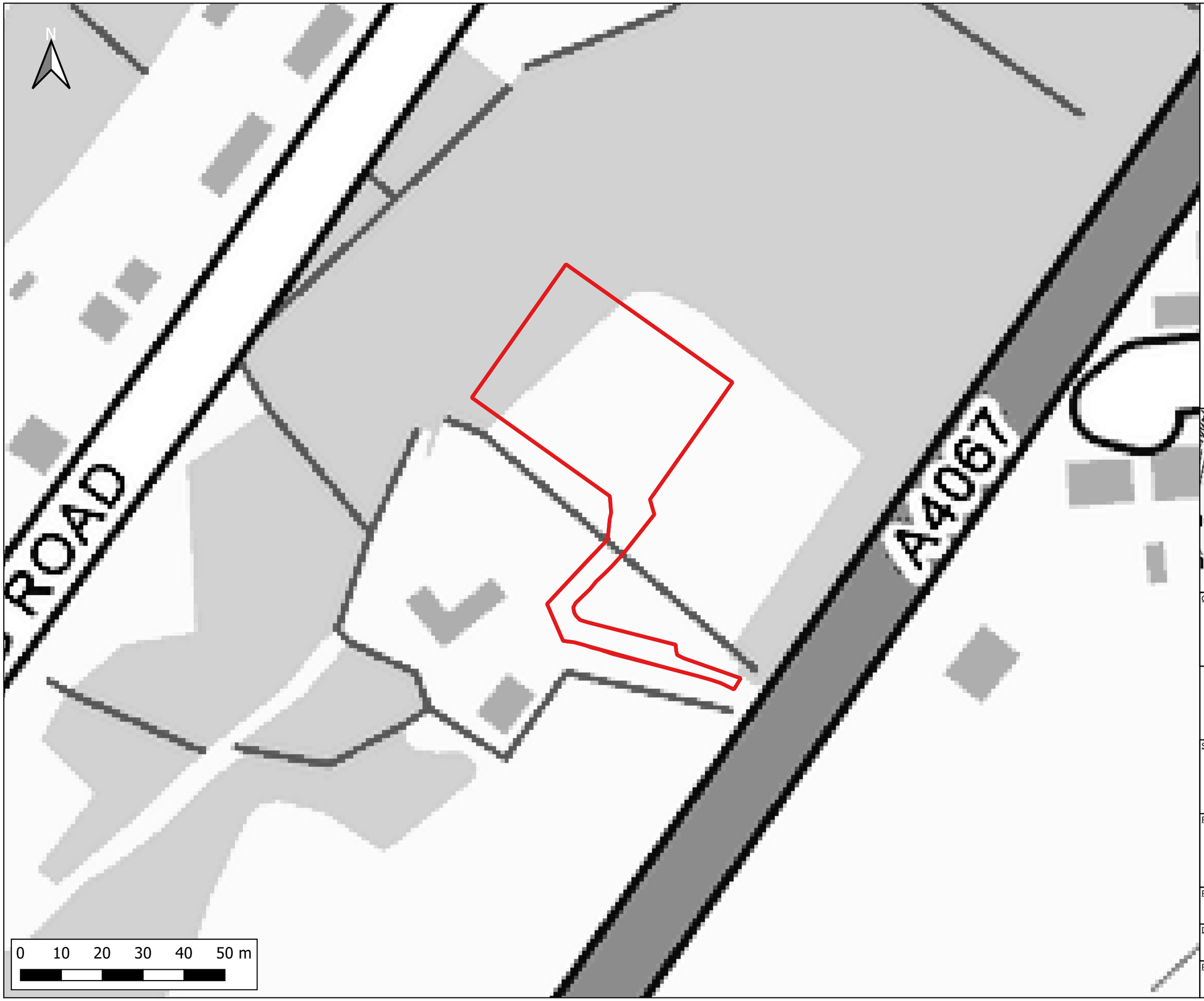
PLOT TITLE:
NRW Flood Zones - Surface Water & Small Watercourses
Data published May 2025

PLOT STATUS:	DATE:
FINAL	19-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:900

PLOT NAME:	REVISION:
17239_NRW_Flood_Zones_Surface_Water	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.



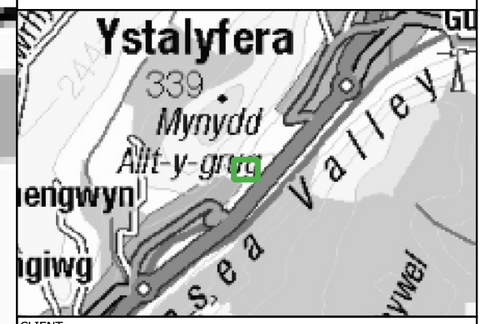
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Flood Zones - Sea

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:
Conway Morgan

Waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

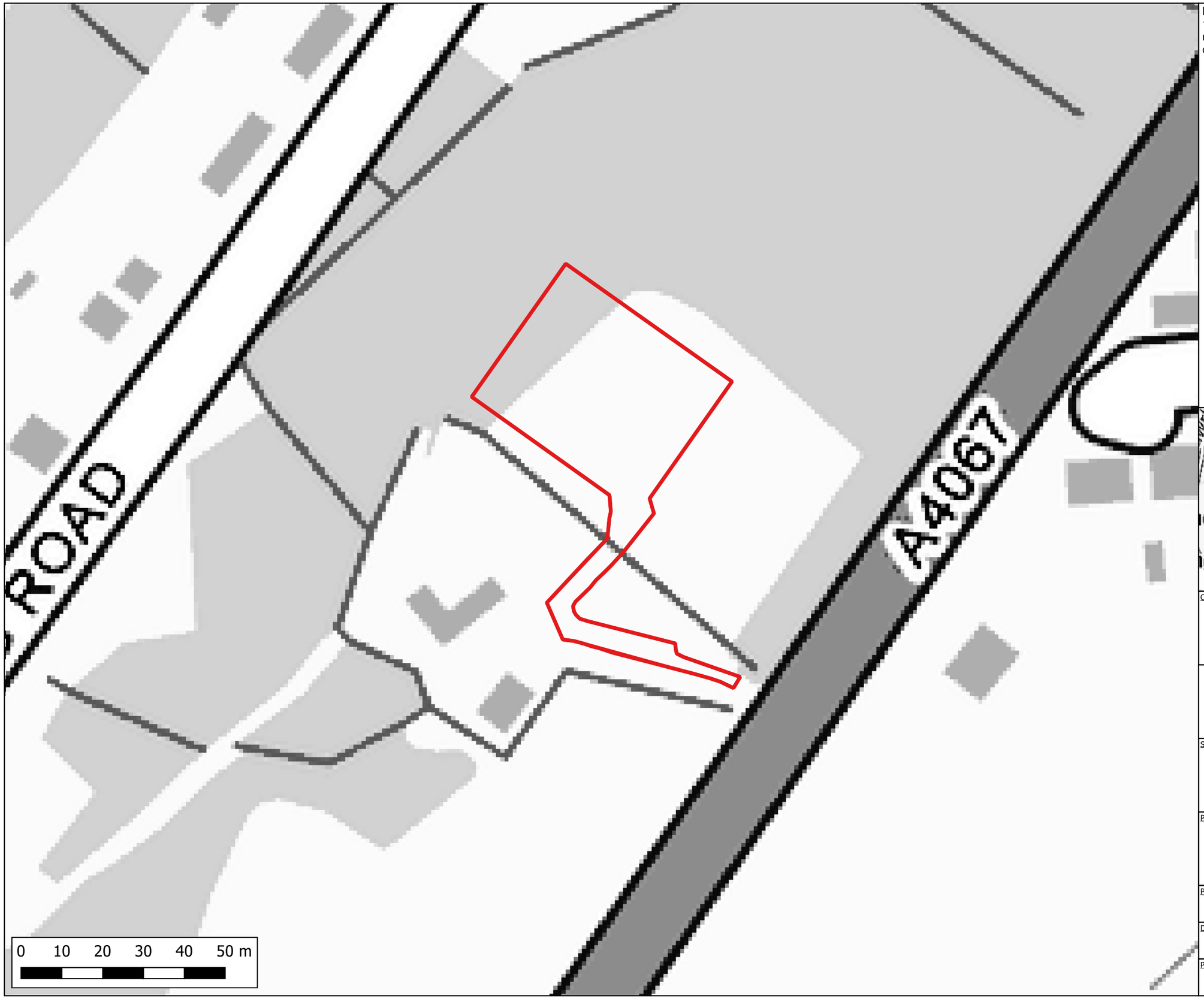
PLOT TITLE:
NRW Flood Risk from the Sea
Data published May 2025

PLOT STATUS:	DATE:
FINAL	19-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:900

PLOT NAME:	REVISION:
17239_NRW_Flood_Zones_Sea	-

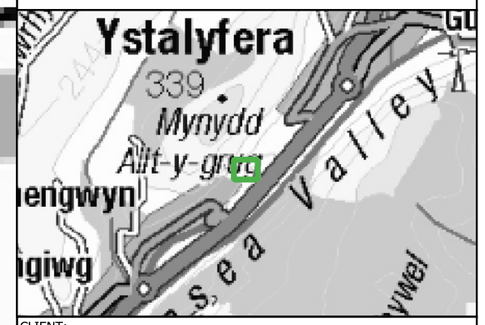
CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- NRW Recorded Flood Extents



CLIENT:
Conway Morgan

Waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
NRW Recorded Flood Extents
Data published May 2025

PLOT STATUS:	DATE:
FINAL	19-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:900

PLOT NAME:	REVISION:
17239_NRW_Recorded_Flood_Extents	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED.

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.

LEGEND

- Site Boundary

Surface Water Flood Depth (m)

- <= 0.2
- 0.2 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- > 0.9



CLIENT:
Conway Morgan

Waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm,Godrergraig

PLOT TITLE:
NRW - Surface Water Flood Depth
Present Day
3.3% AEP Event
Data accessed February 2026

PLOT STATUS:	DATE:
FINAL	17-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:500

PLOT NAME:	REVISION:
17239_NRW_SW_Depth	

0 10 20 30 40 50 m

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
© ENVIRONMENT AGENCY COPYRIGHT AND/OR DATABASE RIGHT 2025. ALL RIGHTS RESERVED.

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated

LEGEND

Site Boundary

Surface Water Flood Depth (m)

- <= 0.2
- 0.2 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- > 0.9



0 10 20 30 40 50 m

CLIENT:
Conway Morgan

www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm,Godrergraig

PLOT TITLE:
NRW - Surface Water Flood Depth
Present Day
1% AEP Event
Data accessed February 2026

PLOT STATUS:	DATE:
FINAL	17-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:500

PLOT NAME:	REVISION:
17239_NRW_SW_Depth	

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
© ENVIRONMENT AGENCY COPYRIGHT AND/OR DATABASE RIGHT 2025. ALL RIGHTS RESERVED.

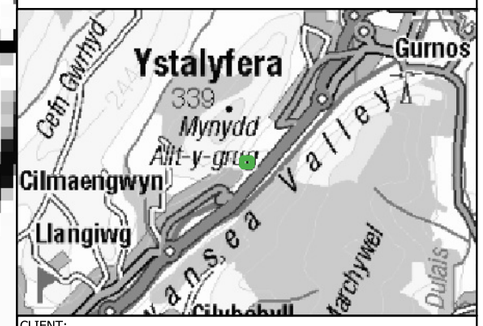
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Surface Water Flood Depth (m)

- <= 0.2
- 0.2 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- > 0.9



0 10 20 30 40 50 m

CLIENT:
Conway Morgan

www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm,Godrergraig

PLOT TITLE:
NRW - Surface Water Flood Depth
Present Day
0.1% AEP Event
Data accessed February 2026

PLOT STATUS:	DATE:
FINAL	17-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:500

PLOT NAME:	REVISION:
17239_NRW_SW_Depth	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
© ENVIRONMENT AGENCY COPYRIGHT AND/OR DATABASE RIGHT 2025. ALL RIGHTS RESERVED.

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.

LEGEND

- Site Boundary

Surface Water Flood Depth (m)

- <= 0.2
- 0.2 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- > 0.9



CLIENT:
Conway Morgan

Waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
NRW - Surface Water Flood Depth
Climate Change
3.3% AEP Event
Data accessed February 2026

PLOT STATUS:	DATE:
FINAL	17-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:500

PLOT NAME:	REVISION:
17239_NRW_SW_Depth	

0 10 20 30 40 50 m

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
© ENVIRONMENT AGENCY COPYRIGHT AND/OR DATABASE RIGHT 2025. ALL RIGHTS RESERVED.

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated

LEGEND

Site Boundary

Surface Water Flood Depth (m)

- <= 0.2
- 0.2 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- > 0.9



0 10 20 30 40 50 m

CLIENT:
Conway Morgan

www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
NRW - Surface Water Flood Depth
Climate Change
1% AEP Event
Data accessed February 2026

PLOT STATUS:	DATE:
FINAL	17-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:500

PLOT NAME:	REVISION:
17239_NRW_SW_Depth	

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
© ENVIRONMENT AGENCY COPYRIGHT AND/OR DATABASE RIGHT 2025. ALL RIGHTS RESERVED.

N

0 10 20 30 40 50 m

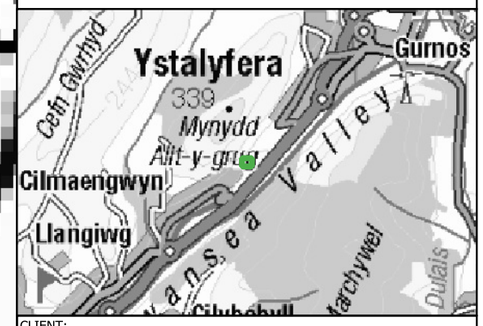
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site Boundary

Surface Water Flood Depth (m)

- <= 0.2
- 0.2 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- > 0.9



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
NRW - Surface Water Flood Depth
Climate Change
0.1% AEP Event
Data accessed February 2026

PLOT STATUS:	DATE:
FINAL	17-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:500

PLOT NAME:	REVISION:
17239_NRW_SW_Depth	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
© ENVIRONMENT AGENCY COPYRIGHT AND/OR DATABASE RIGHT 2025. ALL RIGHTS RESERVED.

Appendix F Modelled Outputs – Cwm Twrch 2018 & 2022

Pantyffynnon

GRAIG NEWYDD

CARREGYRAM

GRAIG FOREST

GRAIG ROAD

A4067

Afon Twrch

0 25 50 75 100 125 m

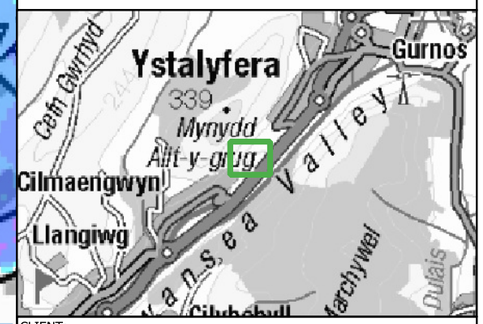
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Depth

- <= 0.3m
- 0.3m - 0.6m
- 0.6m - 1.2m
- 1.2m - 2.4m
- > 2.4m



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM FLOOD DEPTH
CWM TWRCH FLUVIAL
10% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q10UNDEF_dMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Map Scale 1:750

0 10 20 30 40 50 m

A4067

GRAIG NEWYDD

CARREG YRAF

GRAIG FFOREST

GRAIG ROAD

A4067

0 25 50 75 100 125 m

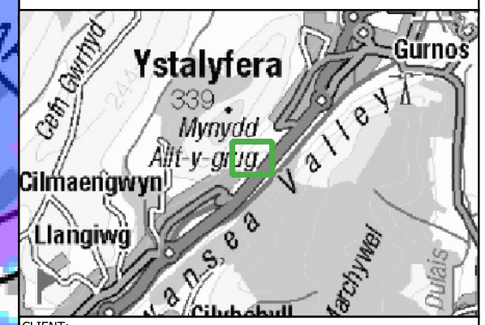
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Depth

- <= 0.3m
- 0.3m - 0.6m
- 0.6m - 1.2m
- 1.2m - 2.4m
- > 2.4m



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

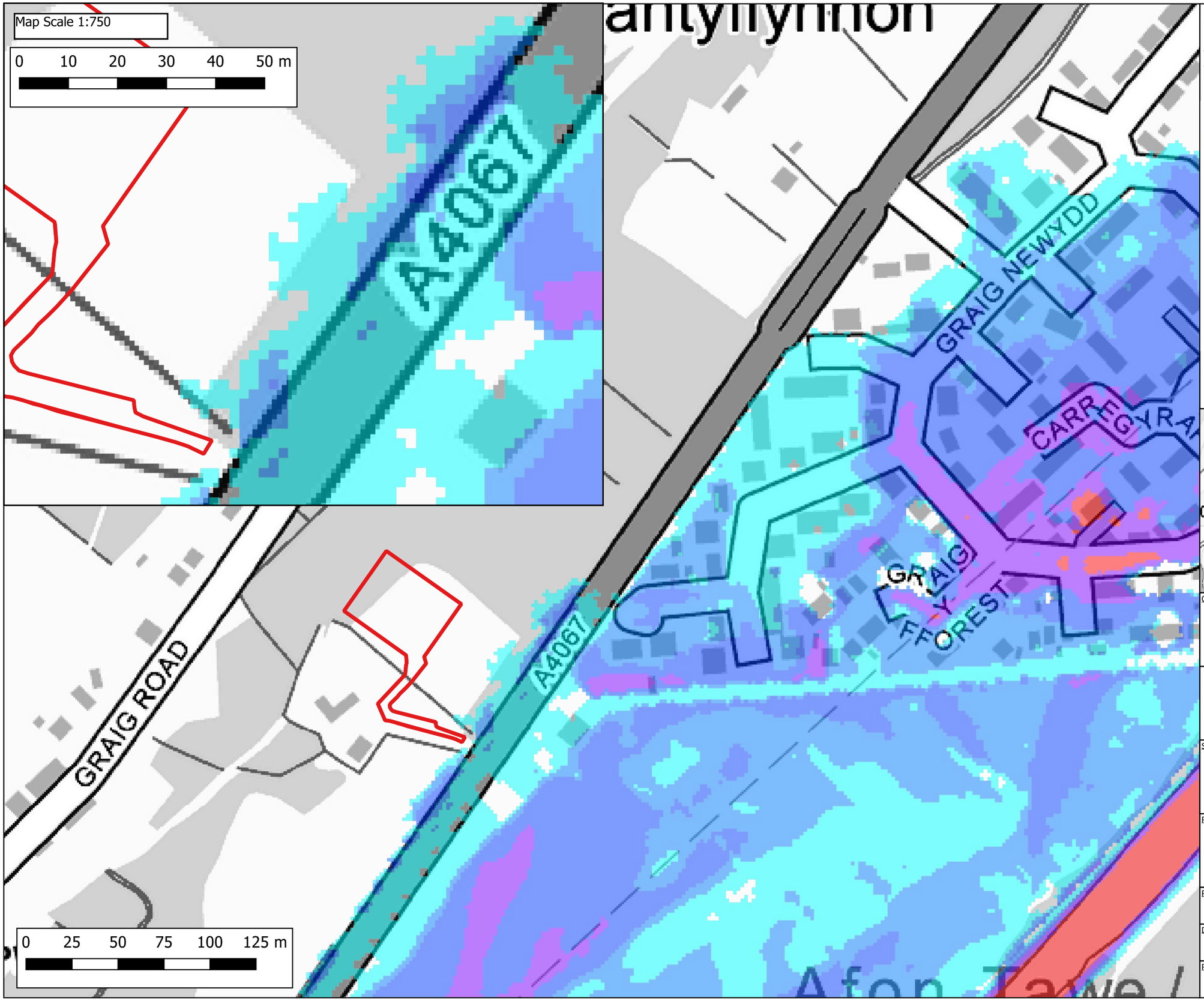
PLOT TITLE:
MAXIMUM FLOOD DEPTH
CWM TWRCH FLUVIAL
2% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q50UNDEF_dMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



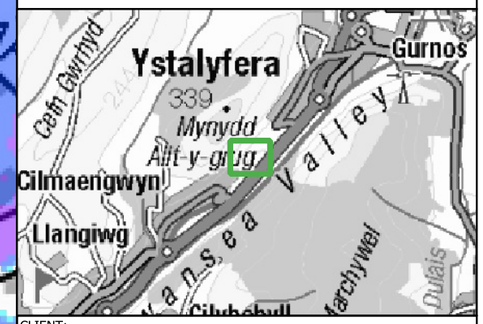
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Depth

- <= 0.3m
- 0.3m - 0.6m
- 0.6m - 1.2m
- 1.2m - 2.4m
- > 2.4m



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

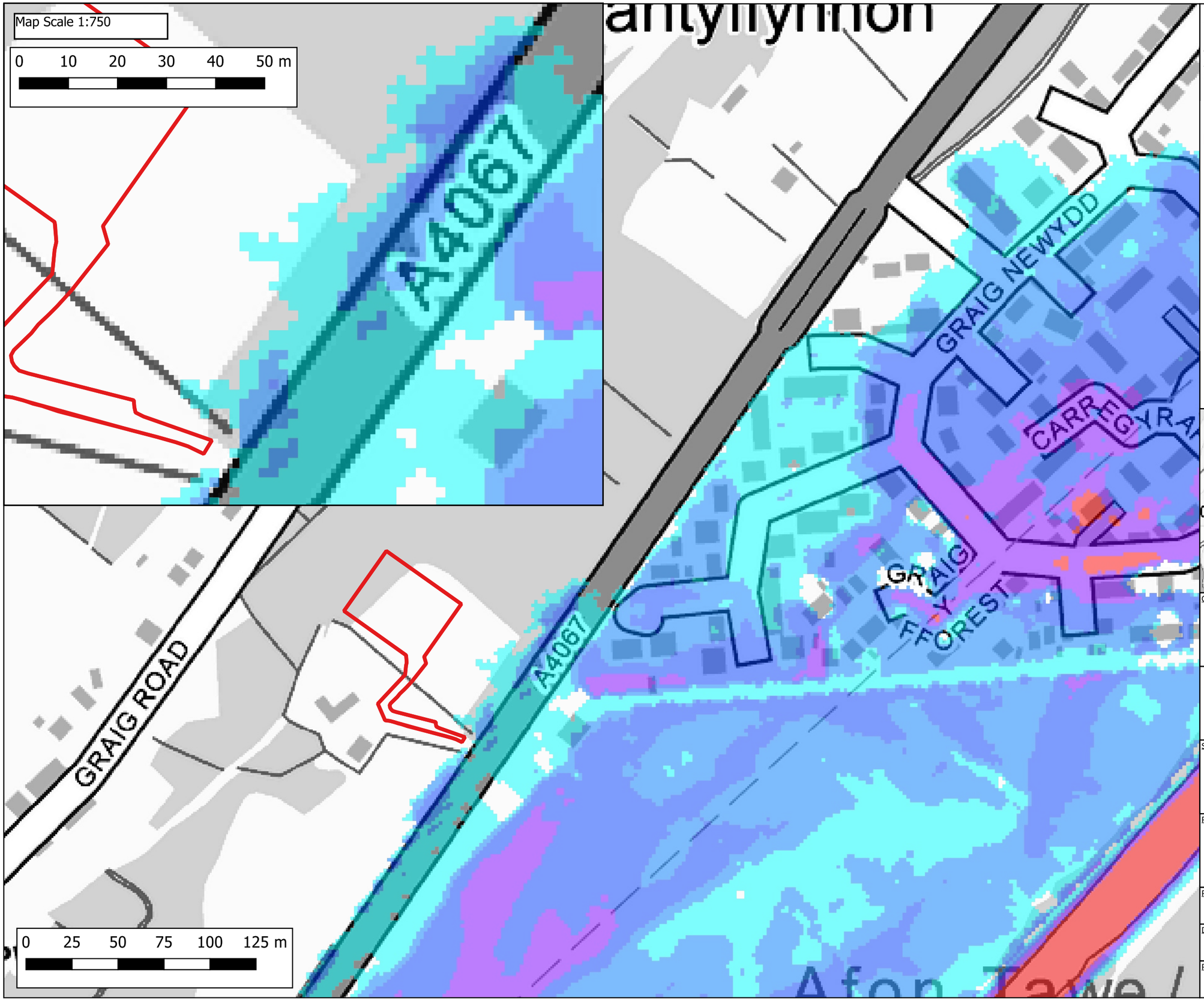
SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM FLOOD DEPTH
CWM TWRCH FLUVIAL
1.33% AEP
UNDEFENDED

PLOT STATUS:			DATE:
FINAL			02-03-2026
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q75UNDEF_dMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



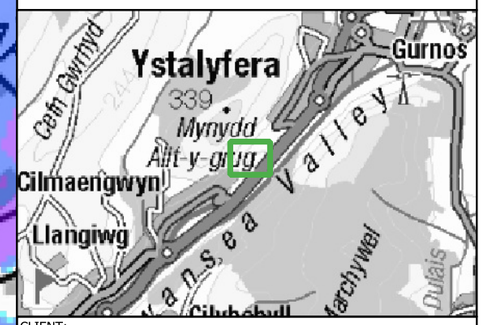
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Depth

- <= 0.3m
- 0.3m - 0.6m
- 0.6m - 1.2m
- 1.2m - 2.4m
- > 2.4m



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM FLOOD DEPTH
CWM TWRCH FLUVIAL
1% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q100UNDEF_dMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Map Scale 1:750

0 10 20 30 40 50 m

A4067

GRAIG NEWYDD

CARREGYRAF

GRAIG FFOREST

GRAIG ROAD

A4067

0 25 50 75 100 125 m

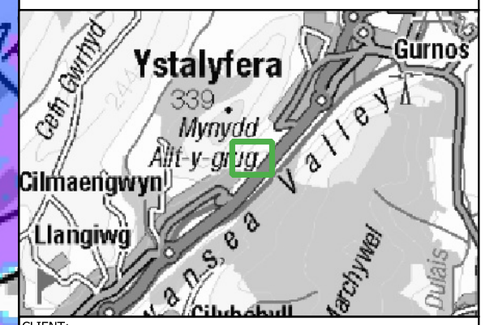
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Depth

- <= 0.3m
- 0.3m - 0.6m
- 0.6m - 1.2m
- 1.2m - 2.4m
- > 2.4m



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM FLOOD DEPTH
CWM TWRCH FLUVIAL
1% AEP + CC (30%)
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q100CCUNDEF_dMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



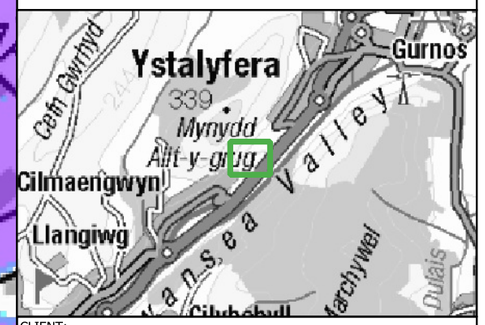
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Depth

- <= 0.3m
- 0.3m - 0.6m
- 0.6m - 1.2m
- 1.2m - 2.4m
- > 2.4m



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM FLOOD DEPTH
CWM TWRCH FLUVIAL
0.1% AEP
UNDEFENDED

PLOT STATUS:			DATE:
FINAL			02-03-2026
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q1000UNDEF_dMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Pantyffynnon

GRAIG NEWYDD

CARREGYRAF

GRAIG Y FFOREST

GRAIG ROAD

A4067

0 25 50 75 100 125 m

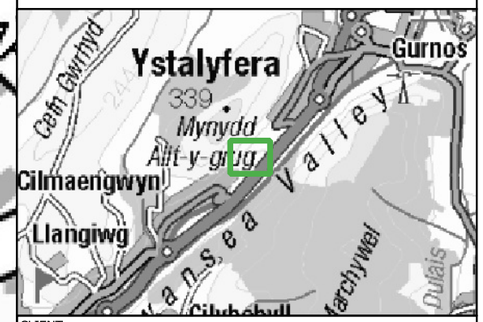
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

Site Boundary

Maximum Flood Depth

- <= 0.3m
- 0.3m - 0.6m
- 0.6m - 1.2m
- 1.2m - 2.4m
- > 2.4m



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM FLOOD DEPTH
CWM TWRCH FLUVIAL
1% AEP
DEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q100DEF_dMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Pantyffynnon

GRAIG NEWYDD

CARREGYRAF

GRAIG Y FFOREST

GRAIG ROAD

A4067

Afon Tawe

0 25 50 75 100 125 m

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

Site Boundary

Maximum Flood Depth

- <= 0.3m
- 0.3m - 0.6m
- 0.6m - 1.2m
- 1.2m - 2.4m
- > 2.4m



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM FLOOD DEPTH
CWM TWRCH FLUVIAL
1% AEP + CC (30%)
DEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q100CCDEF_dMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Depth

- <= 0.3m
- 0.3m - 0.6m
- 0.6m - 1.2m
- 1.2m - 2.4m
- > 2.4m



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM FLOOD DEPTH
CWM TWRCH FLUVIAL
0.1% AEP
DEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q1000DEF_dMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Map Scale 1:750

0 10 20 30 40 50 m

0 25 50 75 100 125 m

GRAIG ROAD

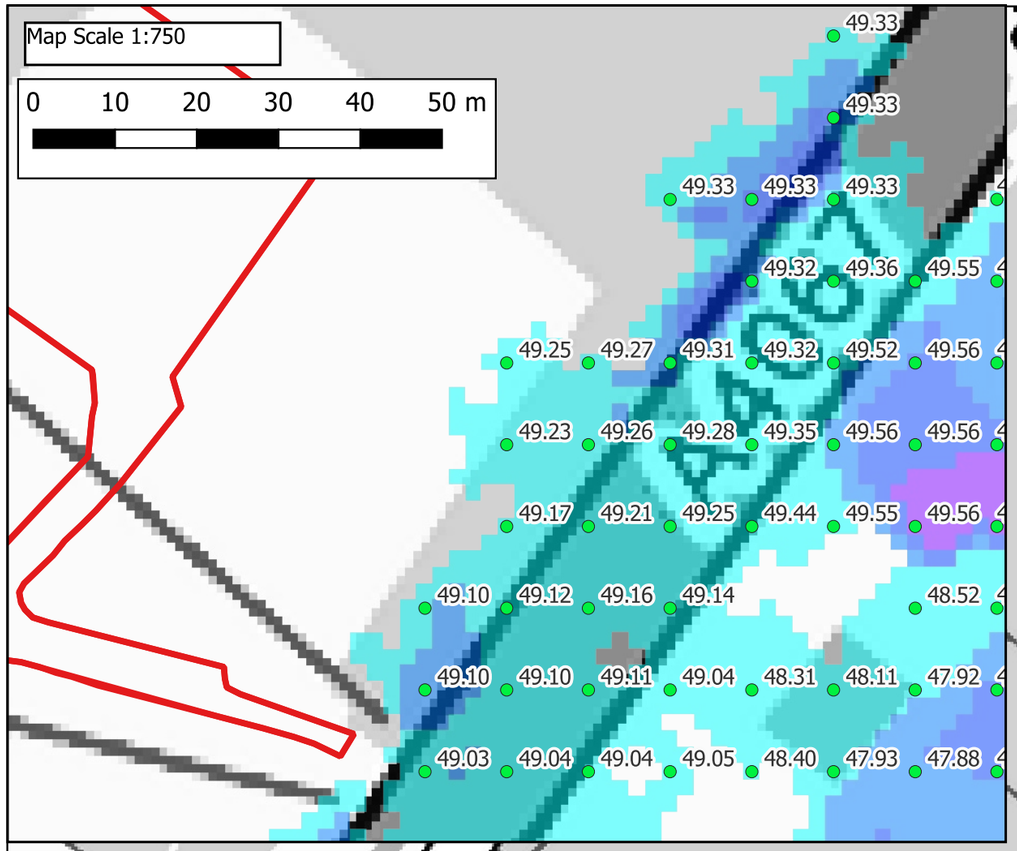
A4067

GRAIG NEWYDD

CARREG YRAF

GRAIG FFOREST

Afon Twrch



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary
- Maximum Flood Depth
  - <= 0.3m
  - 0.3m - 0.6m
  - 0.6m - 1.2m
  - 1.2m - 2.4m
  - > 2.4m
- Maximum Water Level (m AOD)



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

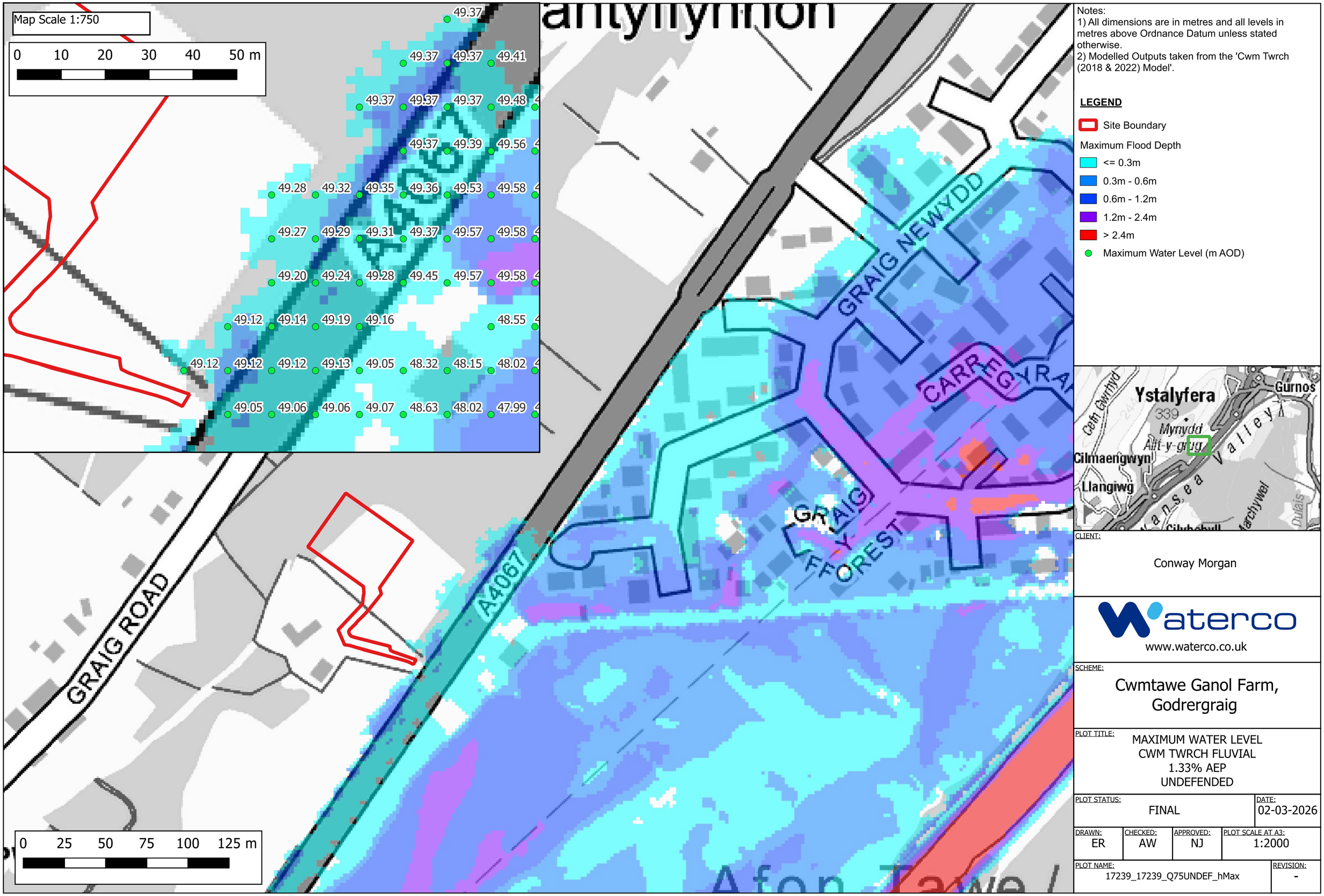
PLOT TITLE:
MAXIMUM WATER LEVEL
CWM TWRCH FLUVIAL
2% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q50UNDEF_hMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary
- Maximum Flood Depth
  - <= 0.3m
  - 0.3m - 0.6m
  - 0.6m - 1.2m
  - 1.2m - 2.4m
  - > 2.4m
- Maximum Water Level (m AOD)

CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM WATER LEVEL
CWM TWRCH FLUVIAL
1.33% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q75UNDEF_hMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Map Scale 1:750

0 10 20 30 40 50 m

0 25 50 75 100 125 m

GRAIG ROAD

A4067

GRAIG NEWYDD

CARREGYRAF

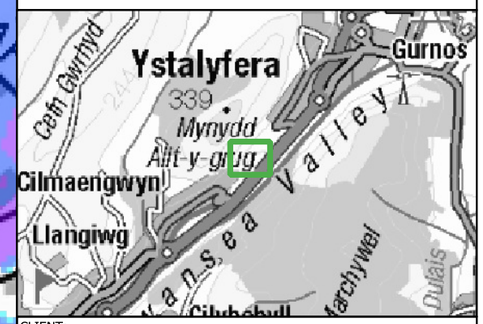
GRAIG FFOREST

Afon Twrch

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary
- Maximum Flood Depth
  - <= 0.3m
  - 0.3m - 0.6m
  - 0.6m - 1.2m
  - 1.2m - 2.4m
  - > 2.4m
- Maximum Water Level (m AOD)



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM WATER LEVEL
CWM TWRCH FLUVIAL
1% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q100UNDEF_hMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Map Scale 1:750

0 10 20 30 40 50 m

0 25 50 75 100 125 m

GRAIG ROAD

A4067

GRAIG NEWYDD

CARREGYRAF

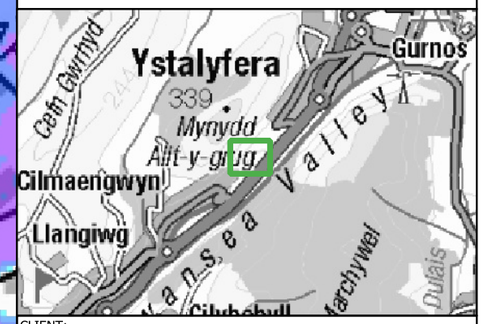
GRAIG FFOREST

Afon Twrch

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary
- Maximum Flood Depth
  - <= 0.3m
  - 0.3m - 0.6m
  - 0.6m - 1.2m
  - 1.2m - 2.4m
  - > 2.4m
- Maximum Water Level (m AOD)



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM WATER LEVEL
CWM TWRCH FLUVIAL
1% AEP + CC (30%)
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q100CCUNDEF_hMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Map Scale 1:750

0 10 20 30 40 50 m

0 25 50 75 100 125 m

GRAIG ROAD

A4067

GRAIG NEWYDD

CARREGYRAM

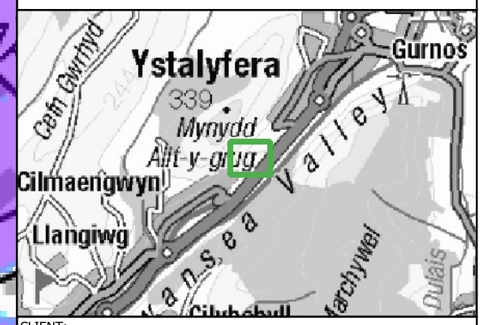
GRAIG FFYNNON FOREST

Afon Tawe

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary
- Maximum Flood Depth
  - <= 0.3m
  - 0.3m - 0.6m
  - 0.6m - 1.2m
  - 1.2m - 2.4m
  - > 2.4m
- Maximum Water Level (m AOD)



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM WATER LEVEL
CWM TWRCH FLUVIAL
0.1% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q 1000UNDEF_hMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary
- Maximum Flood Depth
  - <= 0.3m
  - 0.3m - 0.6m
  - 0.6m - 1.2m
  - 1.2m - 2.4m
  - > 2.4m
- Maximum Water Level (m AOD)



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

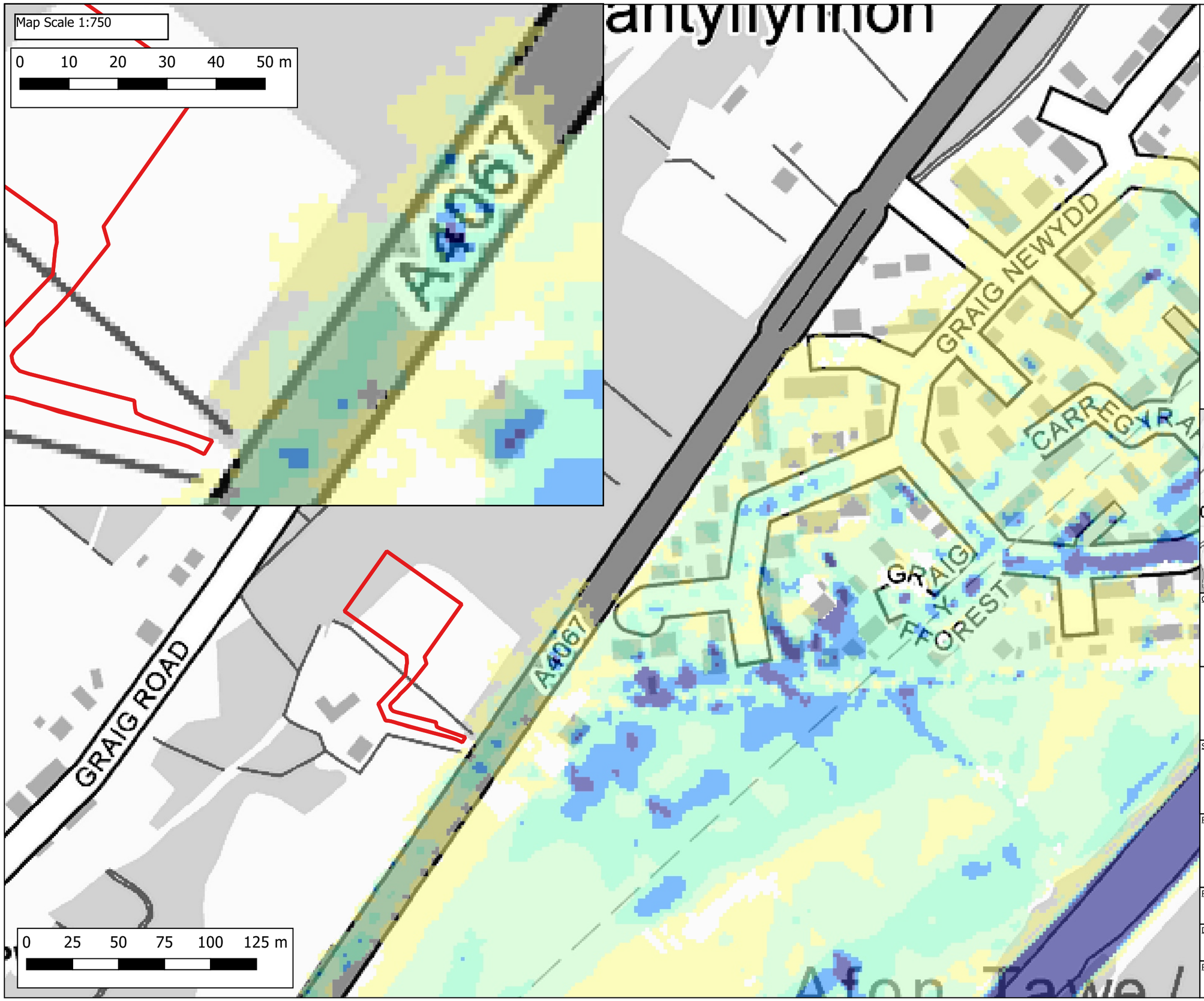
PLOT TITLE:
MAXIMUM WATER LEVEL
CWM TWRCH FLUVIAL
0.1% AEP
DEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q100DEF_hMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

Site Boundary

Maximum Flood Velocity (m/s)

- 0.0 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- 0.9 - 1.2
- > 1.2



CLIENT: Conway Morgan

waterco
www.waterco.co.uk

SCHEME: Cwmtawe Ganol Farm, Godrergraig

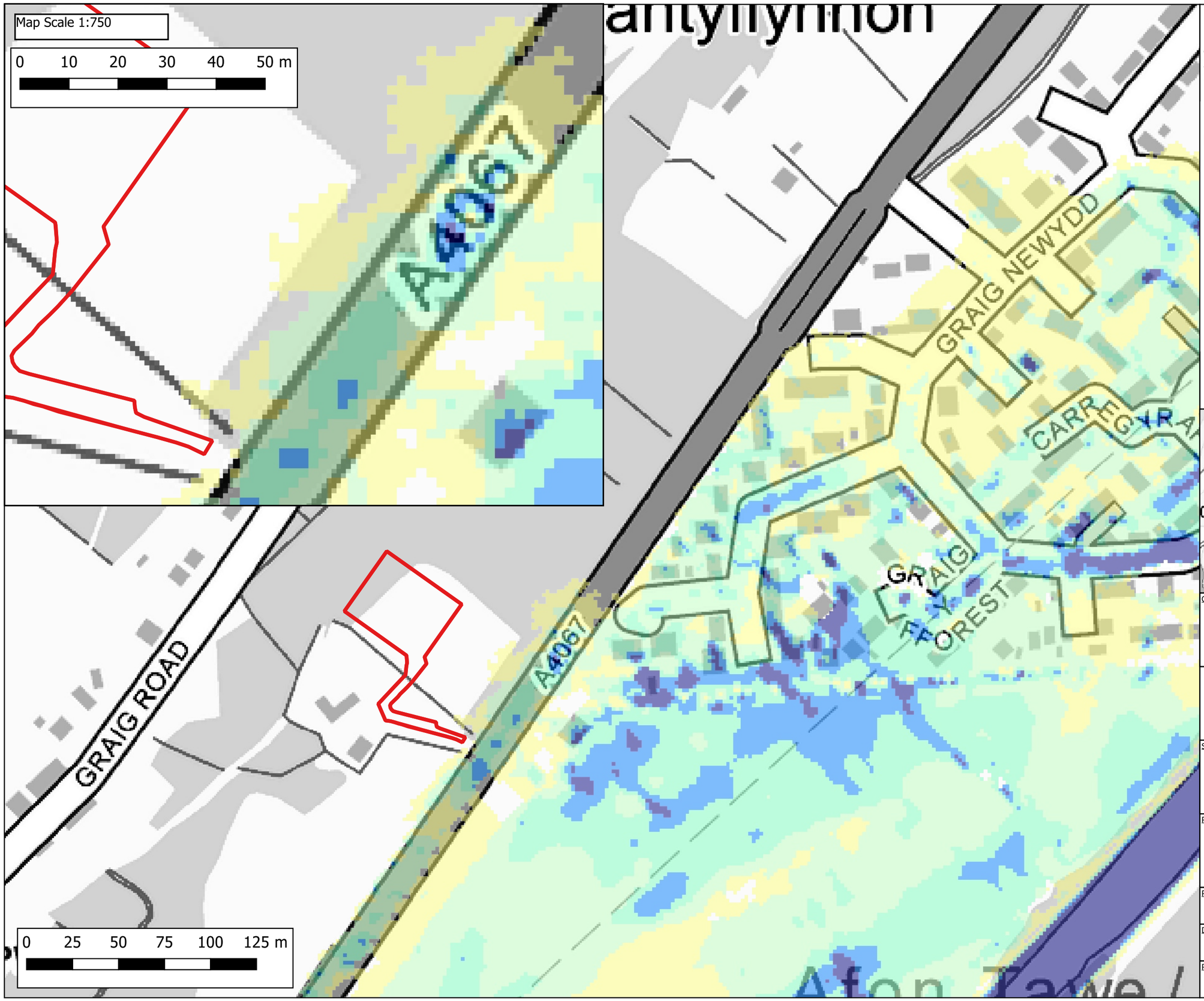
PLOT TITLE: MAXIMUM WATER VELOCITY
CWM TWRCH FLUVIAL
2% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q50UNDEF_vMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Velocity (m/s)

- 0.0 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- 0.9 - 1.2
- > 1.2



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

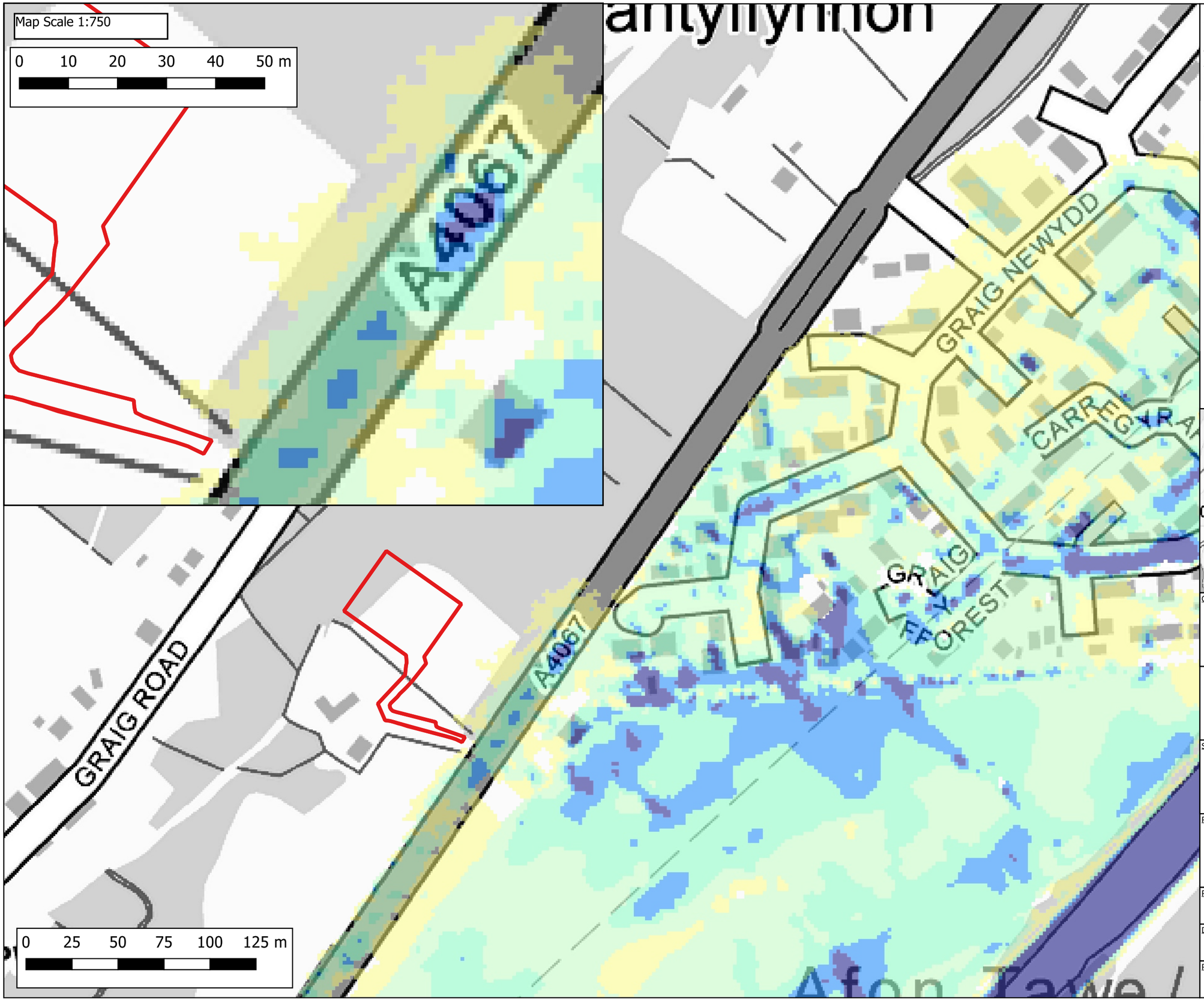
PLOT TITLE:
MAXIMUM WATER VELOCITY
CWM TWRCH FLUVIAL
1.33% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q75UNDEF_vMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Velocity (m/s)

- 0.0 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- 0.9 - 1.2
- > 1.2



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM WATER VELOCITY
CWM TWRCH FLUVIAL
1% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q100UNDEF_vMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

Site Boundary

Maximum Flood Velocity (m/s)

- 0.0 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- 0.9 - 1.2
- > 1.2



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

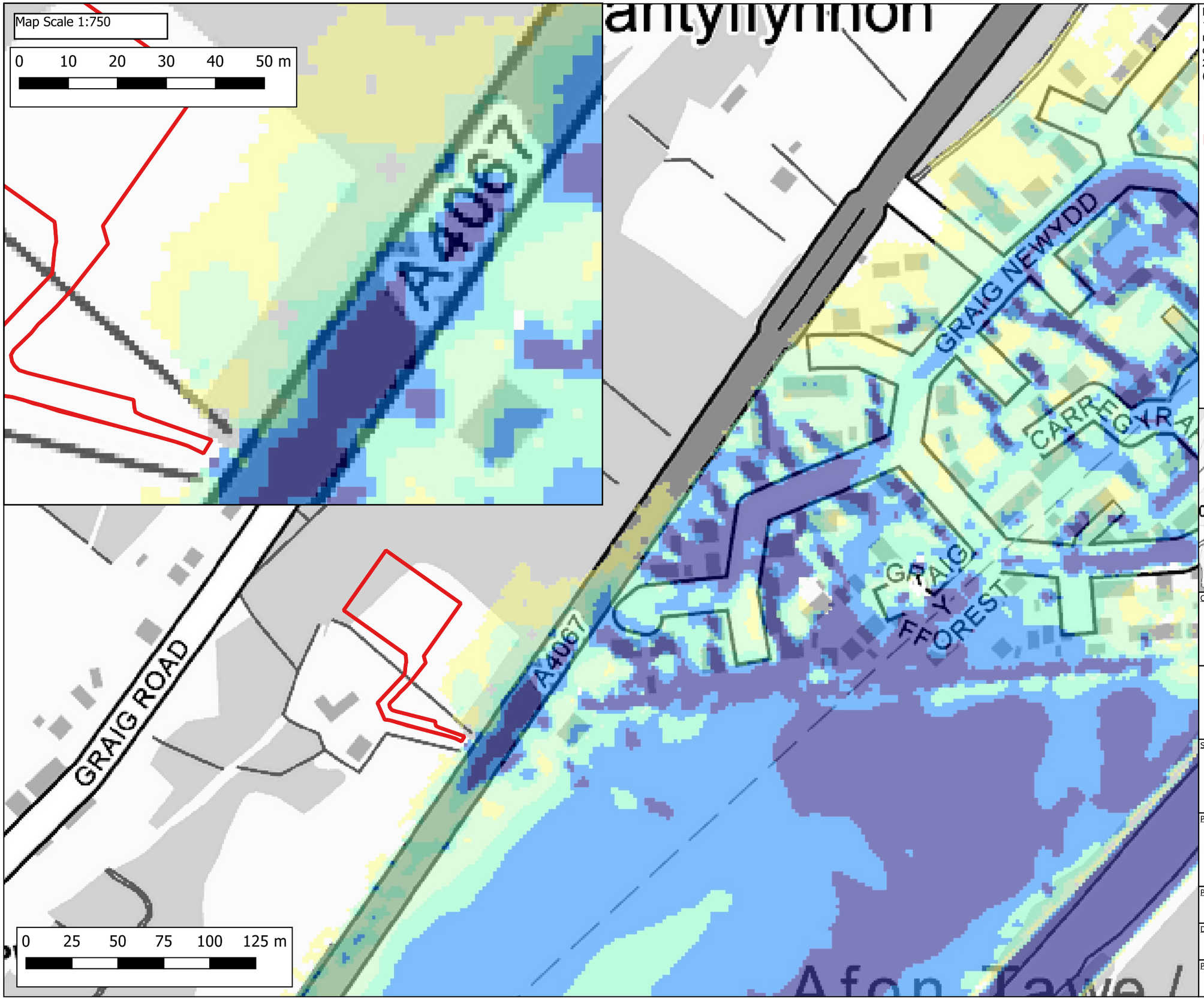
PLOT TITLE:
MAXIMUM WATER VELOCITY
CWM TWRCH FLUVIAL
1% AEP + CC (30%)
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q100CCUNDEF_vMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Velocity (m/s)

- 0.0 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- 0.9 - 1.2
- > 1.2



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

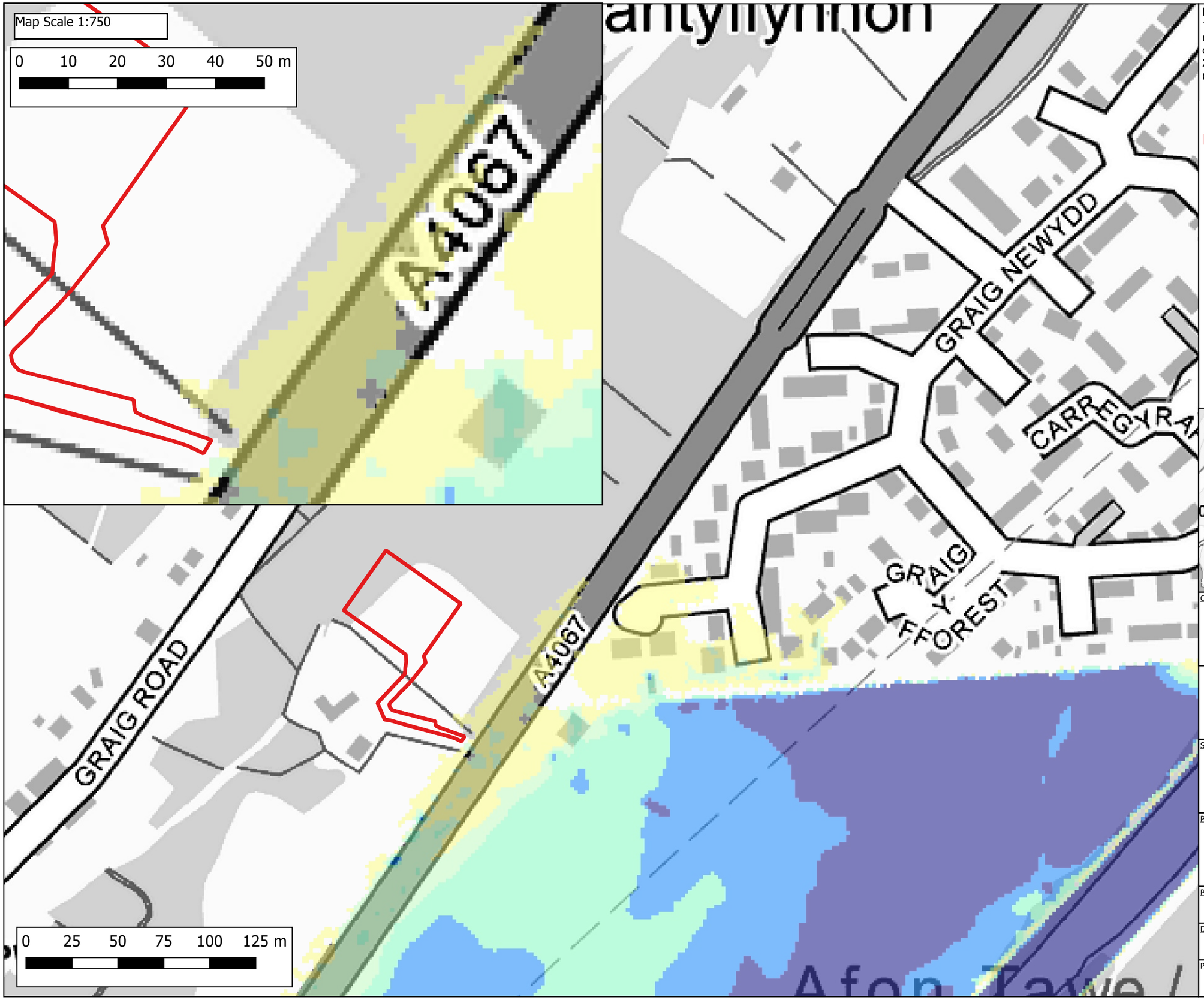
PLOT TITLE:
MAXIMUM WATER VELOCITY
CWM TWRCH FLUVIAL
0.1% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q 1000UNDEF_vMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Maximum Flood Velocity (m/s)

- 0.0 - 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- 0.9 - 1.2
- > 1.2



CLIENT:
Conway Morgan

Waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
MAXIMUM WATER VELOCITY
CWM TWRCH FLUVIAL
0.1% AEP
DEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q100DEF_vMax	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Map Scale 1:750

0 10 20 30 40 50 m

A4067

GRAIG NEWYDD

CARREGYRAF

GRAIG Y FFOREST

GRAIG ROAD

A4067

0 25 50 75 100 125 m

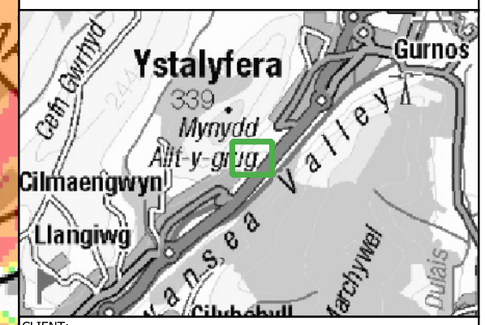
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Flood Hazard Rating (FD2321)

- Caution
- Danger for Some
- Danger for Most
- Danger for All



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
FLOOD HAZARD RATING
CWM TWRCH FLUVIAL
2% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q50UNDEF_ZUK0	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Map Scale 1:750

0 10 20 30 40 50 m

A4067

GRAIG NEWYDD

CARREG YR

GRAIG Y FFOREST

GRAIG ROAD

A4067

0 25 50 75 100 125 m

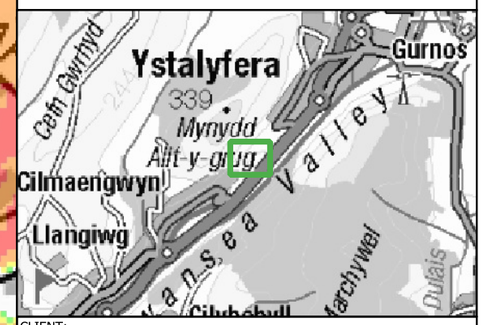
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Flood Hazard Rating (FD2321)

- Caution
- Danger for Some
- Danger for Most
- Danger for All



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

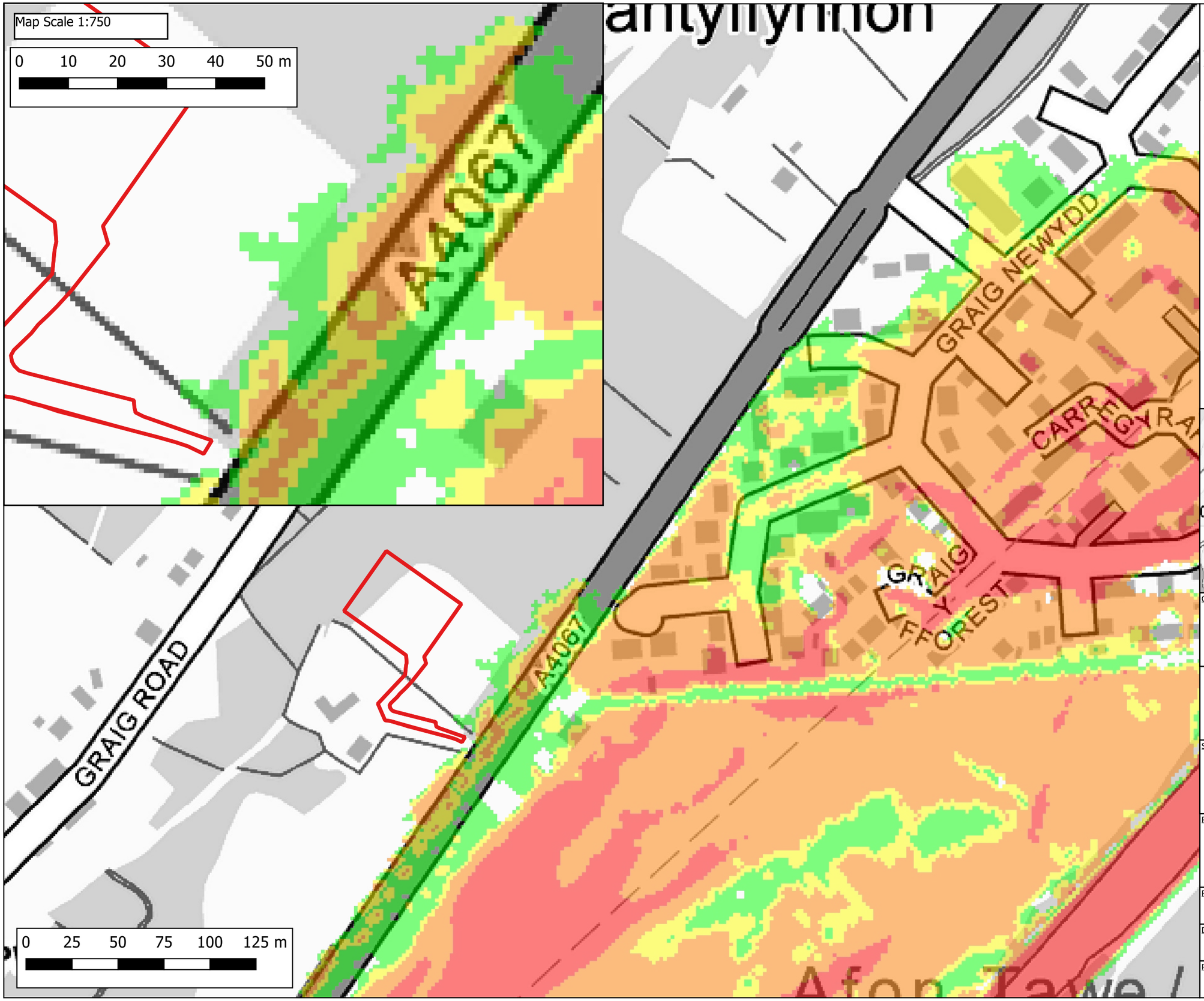
PLOT TITLE:
FLOOD HAZARD RATING
CWM TWRCH FLUVIAL
1.33% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q50UNDEF_ZUK0	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



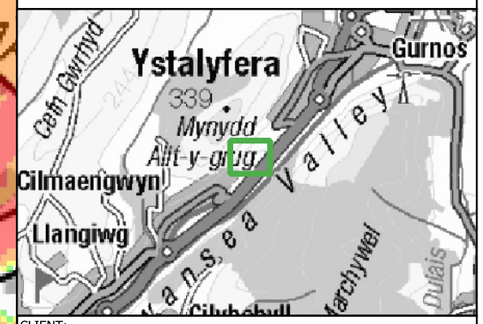
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Flood Hazard Rating (FD2321)

- Caution
- Danger for Some
- Danger for Most
- Danger for All



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

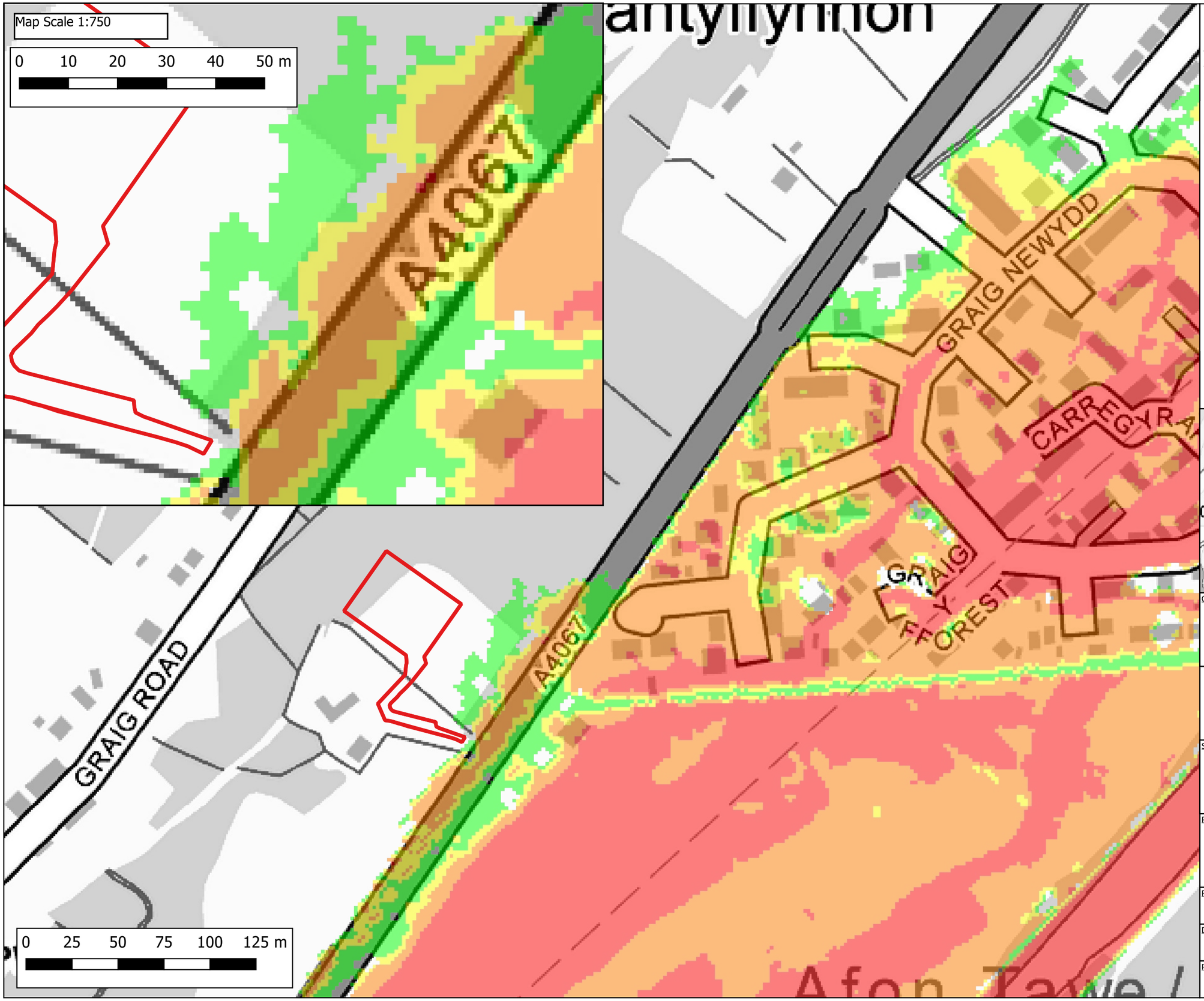
PLOT TITLE:
FLOOD HAZARD RATING
CWM TWRCH FLUVIAL
1% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q50UNDEF_ZUK0	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



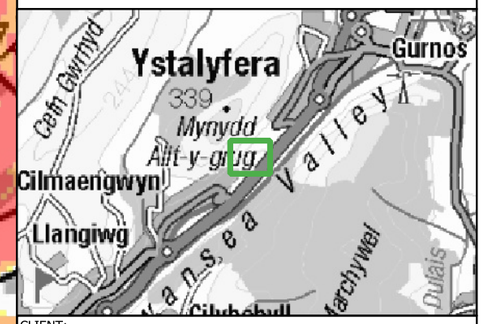
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Flood Hazard Rating (FD2321)

- Caution
- Danger for Some
- Danger for Most
- Danger for All



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

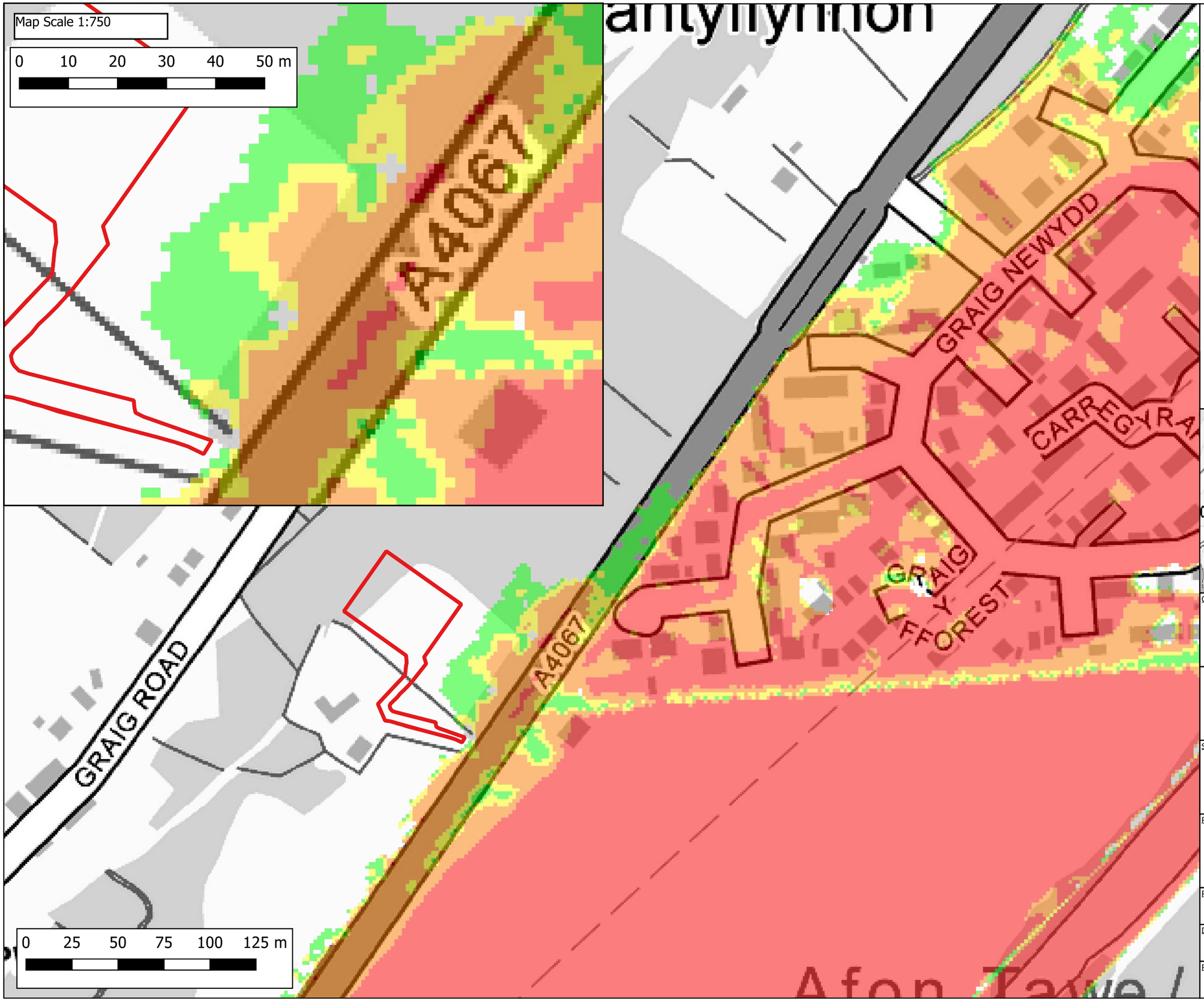
PLOT TITLE:
FLOOD HAZARD RATING
CWM TWRCH FLUVIAL
1% AEP + CC (30%)
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q50UNDEF_ZUK0	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



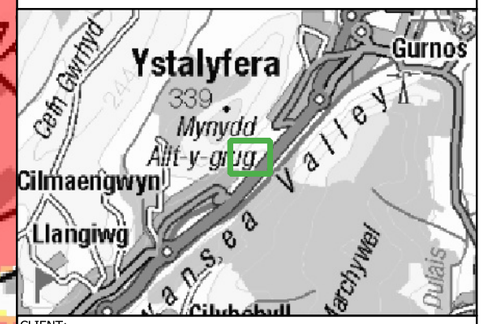
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Flood Hazard Rating (FD2321)

- Caution
- Danger for Some
- Danger for Most
- Danger for All



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
FLOOD HAZARD RATING
CWM TWRCH FLUVIAL
0.1% AEP
UNDEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q50UNDEF_ZUK0	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.
2) Modelled Outputs taken from the 'Cwm Twrch (2018 & 2022) Model'.

LEGEND

- Site Boundary

Flood Hazard Rating (FD2321)

- Caution
- Danger for Some
- Danger for Most
- Danger for All



CLIENT:
Conway Morgan

waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
FLOOD HAZARD RATING
CWM TWRCH FLUVIAL
0.1% AEP
DEFENDED

PLOT STATUS:	DATE:
FINAL	02-03-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
ER	AW	NJ	1:2000

PLOT NAME:	REVISION:
17239_17239_Q50UNDEF_ZUK0	-

CONTAINS OS DATA © CROWN COPYRIGHT (2026)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED

Appendix G ReFH2 Greenfield Runoff Rates

DOCUMENT VERIFICATION RECORD	
Project:	17239-Cwmtawe Ganol Farm, Godrergraig
Client:	Conway Morgan
Report Title:	FCA & Drainage Strategy
Date:	28-01-2026
	Greenfield Runoff Rates for proposed stable, concrete yard and menage

DOCUMENT REVIEW & APPROVAL	
Author:	Louis Hunt BSc (Hons) GradCIWEM
Checker:	Adam McCulloch BSc (Hons)
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES*	
Return Period (Years)	**As-rural Peak Flow (l/s)**
1	1.04
2	1.16
5	1.57
10	1.86
30	2.32
50	2.55
75	2.74
100	2.88
200	3.24
1000	4.33

*Runoff Rates printed from the ReFH Flood Modelling software package

Appendix H MicroDrainage Outputs

Summary of Results for 100 year Return Period (+30%)

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	49.202	0.202	0.8	47.2	O K
30 min Summer	49.292	0.292	0.8	68.3	O K
60 min Summer	49.403	0.403	0.8	94.4	O K
120 min Summer	49.491	0.491	0.8	114.9	O K
180 min Summer	49.551	0.551	0.8	128.8	O K
240 min Summer	49.596	0.596	0.8	139.5	O K
360 min Summer	49.663	0.663	0.8	155.2	O K
480 min Summer	49.711	0.711	0.9	166.3	Flood Risk
600 min Summer	49.746	0.746	0.9	174.6	Flood Risk
720 min Summer	49.774	0.774	0.9	181.1	Flood Risk
960 min Summer	49.813	0.813	0.9	190.2	Flood Risk
1440 min Summer	49.854	0.854	0.9	199.8	Flood Risk
2160 min Summer	49.876	0.876	0.9	205.1	Flood Risk
2880 min Summer	49.890	0.890	0.9	208.4	Flood Risk
4320 min Summer	49.910	0.910	1.0	212.8	Flood Risk
5760 min Summer	49.927	0.927	1.0	216.8	Flood Risk
7200 min Summer	49.949	0.949	1.0	222.0	Flood Risk
8640 min Summer	49.972	0.972	1.0	227.5	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	106.118	0.0	45.5	16
30 min Summer	77.090	0.0	62.9	31
60 min Summer	53.654	0.0	95.5	62
120 min Summer	33.131	0.0	116.2	122
180 min Summer	25.129	0.0	127.6	182
240 min Summer	20.684	0.0	130.8	242
360 min Summer	15.718	0.0	131.0	362
480 min Summer	12.933	0.0	130.9	482
600 min Summer	11.113	0.0	131.1	602
720 min Summer	9.816	0.0	131.6	720
960 min Summer	8.065	0.0	134.1	960
1440 min Summer	6.115	0.0	137.7	1440
2160 min Summer	4.640	0.0	270.8	1836
2880 min Summer	3.829	0.0	267.9	2220
4320 min Summer	2.951	0.0	264.6	3028
5760 min Summer	2.480	0.0	428.5	3912
7200 min Summer	2.194	0.0	472.8	4752
8640 min Summer	2.000	0.0	502.5	5616

©1982-2020 Innovyze

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Summer	49.998	0.998	1.0	233.5	Flood Risk
15 min Winter	49.202	0.202	0.8	47.2	O K
30 min Winter	49.292	0.292	0.8	68.3	O K
60 min Winter	49.403	0.403	0.8	94.4	O K
120 min Winter	49.491	0.491	0.8	114.8	O K
180 min Winter	49.551	0.551	0.8	128.9	O K
240 min Winter	49.597	0.597	0.8	139.6	O K
360 min Winter	49.664	0.664	0.8	155.4	O K
480 min Winter	49.712	0.712	0.9	166.7	Flood Risk
600 min Winter	49.749	0.749	0.9	175.2	Flood Risk
720 min Winter	49.777	0.777	0.9	181.9	Flood Risk
960 min Winter	49.818	0.818	0.9	191.4	Flood Risk
1440 min Winter	49.863	0.863	0.9	202.0	Flood Risk
2160 min Winter	49.885	0.885	0.9	207.2	Flood Risk
2880 min Winter	49.894	0.894	1.0	209.3	Flood Risk
4320 min Winter	49.904	0.904	1.0	211.5	Flood Risk
5760 min Winter	49.906	0.906	1.0	212.1	Flood Risk
7200 min Winter	49.912	0.912	1.0	213.5	Flood Risk
8640 min Winter	49.920	0.920	1.0	215.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	1.860	0.0	490.4	6448
15 min Winter	106.118	0.0	45.5	16
30 min Winter	77.090	0.0	63.0	31
60 min Winter	53.654	0.0	95.5	62
120 min Winter	33.131	0.0	116.2	120
180 min Winter	25.129	0.0	127.6	180
240 min Winter	20.684	0.0	130.8	238
360 min Winter	15.718	0.0	131.0	356
480 min Winter	12.933	0.0	130.7	474
600 min Winter	11.113	0.0	130.9	590
720 min Winter	9.816	0.0	131.4	706
960 min Winter	8.065	0.0	133.8	932
1440 min Winter	6.115	0.0	137.2	1382
2160 min Winter	4.640	0.0	270.1	2008
2880 min Winter	3.829	0.0	267.2	2276
4320 min Winter	2.951	0.0	264.2	3240
5760 min Winter	2.480	0.0	428.5	4152
7200 min Winter	2.194	0.0	472.9	5112
8640 min Winter	2.000	0.0	503.6	5968

©1982-2020 Innovyze

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
10080 min Winter	49.930	0.930	1.0	217.6	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	1.860	0.0	492.2	6864

©1982-2020 Innovyze

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 275572 207091 SN 75572 07091
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.180

Time (mins) From:	To:	Area (ha)
0	1	0.180

©1982-2020 Innovyze

Model Details

Storage is Online Cover Level (m) 50.000

Tank or Pond Structure

Invert Level (m) 49.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	234.0	1.000	234.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0047-1000-1000-1000
Design Head (m)	1.000
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	47
Invert Level (m)	48.995
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

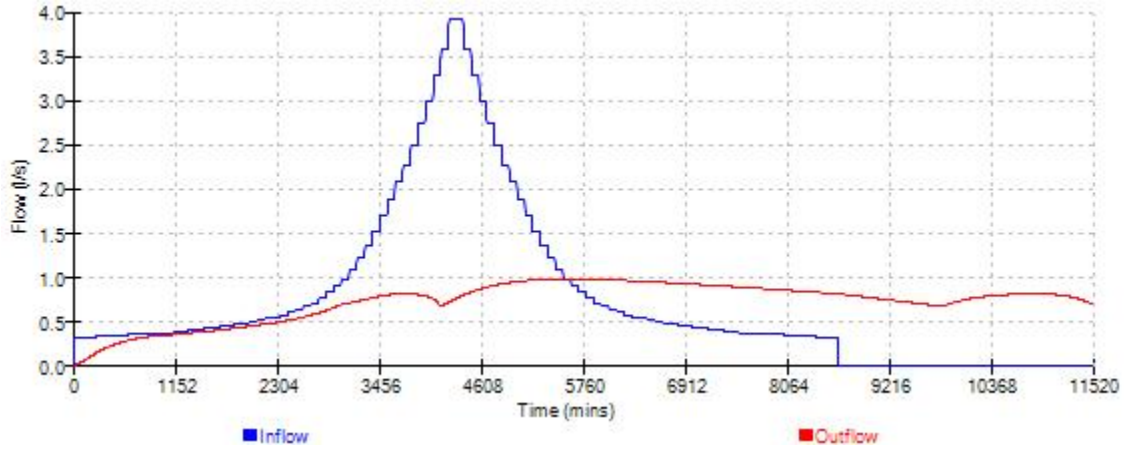
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.0
Flush-Flo™	0.205	0.8
Kick-Flo®	0.415	0.7
Mean Flow over Head Range	-	0.8

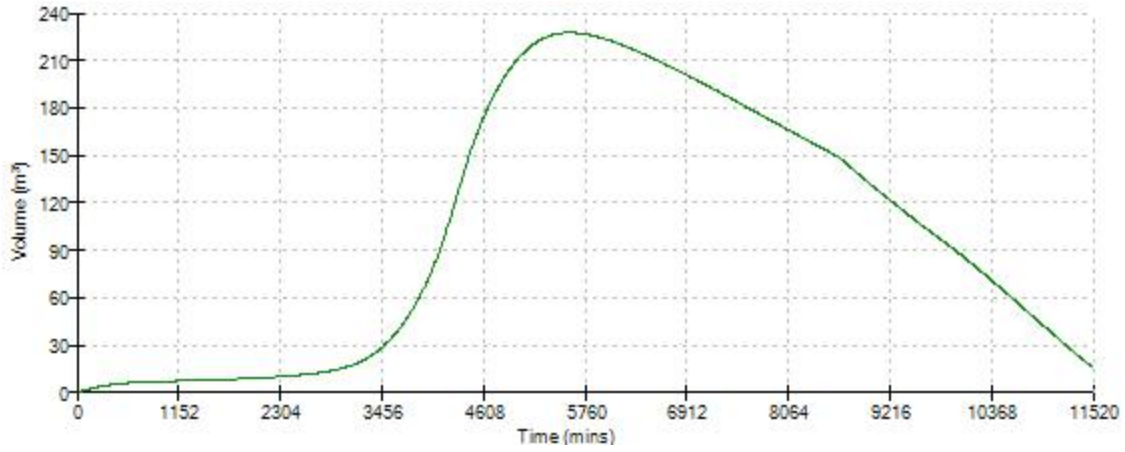
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

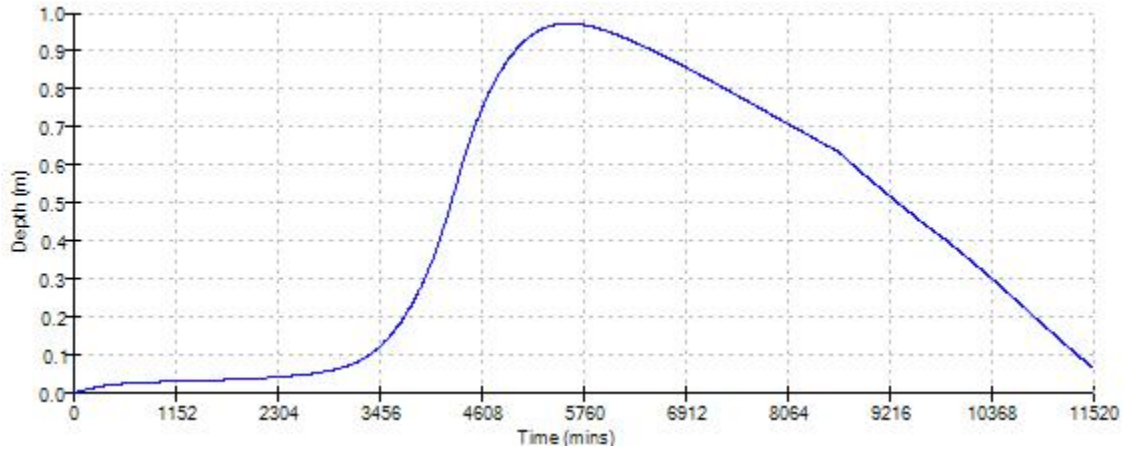
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.8	1.600	1.2	5.000	2.1
0.200	0.8	1.800	1.3	5.500	2.2
0.300	0.8	2.000	1.4	6.000	2.3
0.400	0.7	2.200	1.4	6.500	2.3
0.500	0.7	2.400	1.5	7.000	2.4
0.600	0.8	2.600	1.5	7.500	2.5
0.800	0.9	3.000	1.6	8.000	2.6
1.000	1.0	3.500	1.8	8.500	2.7
1.200	1.1	4.000	1.9	9.000	2.7
1.400	1.2	4.500	2.0	9.500	2.8

©1982-2020 Innovyze

Event: 8640 min Summer

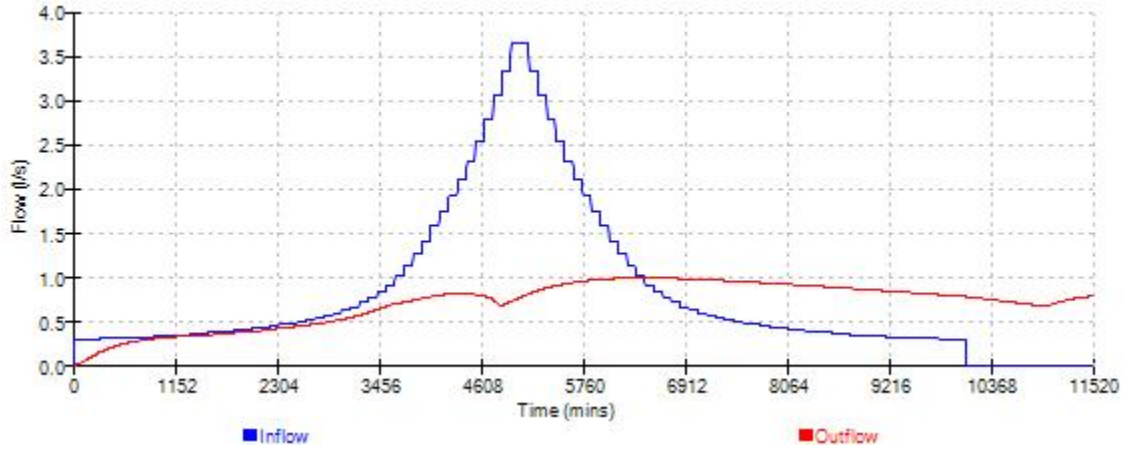


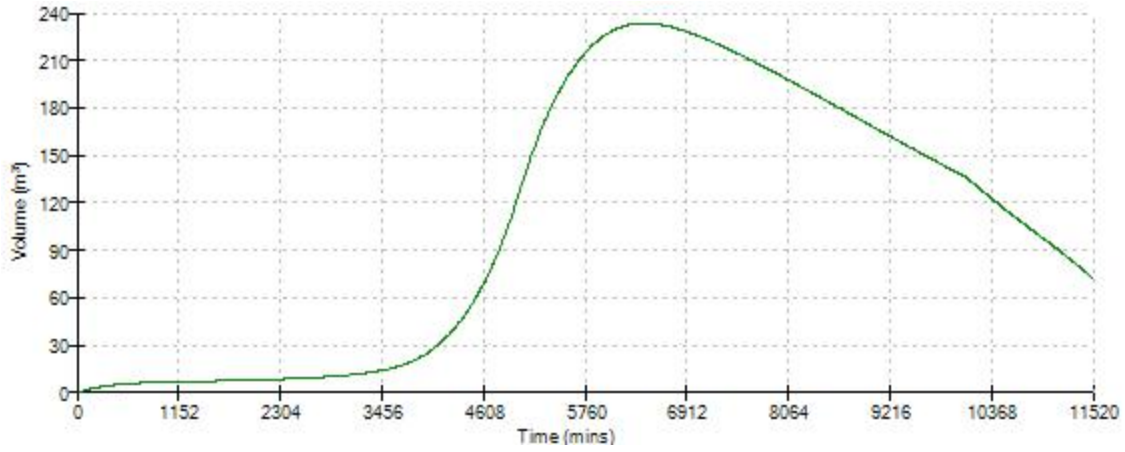


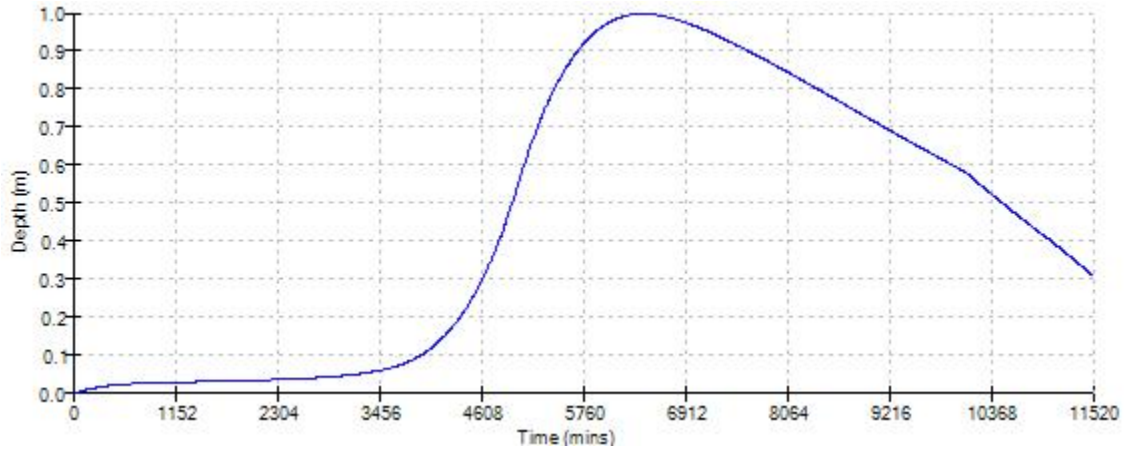


©1982-2020 Innovyze

Event: 10080 min Summer

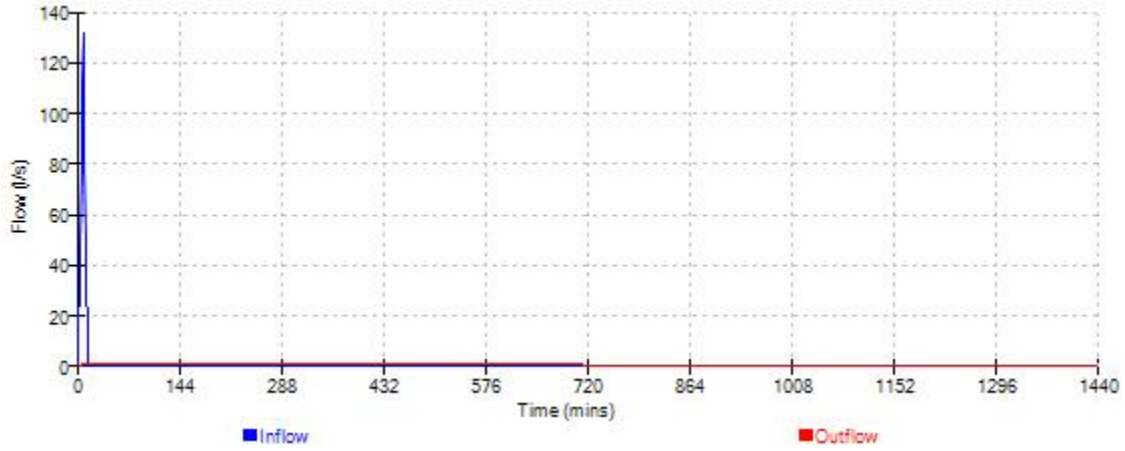


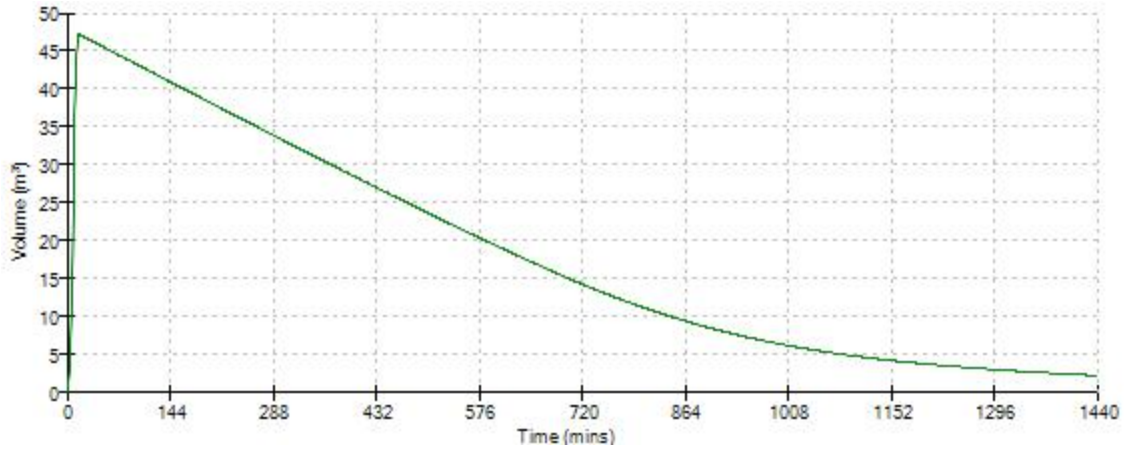


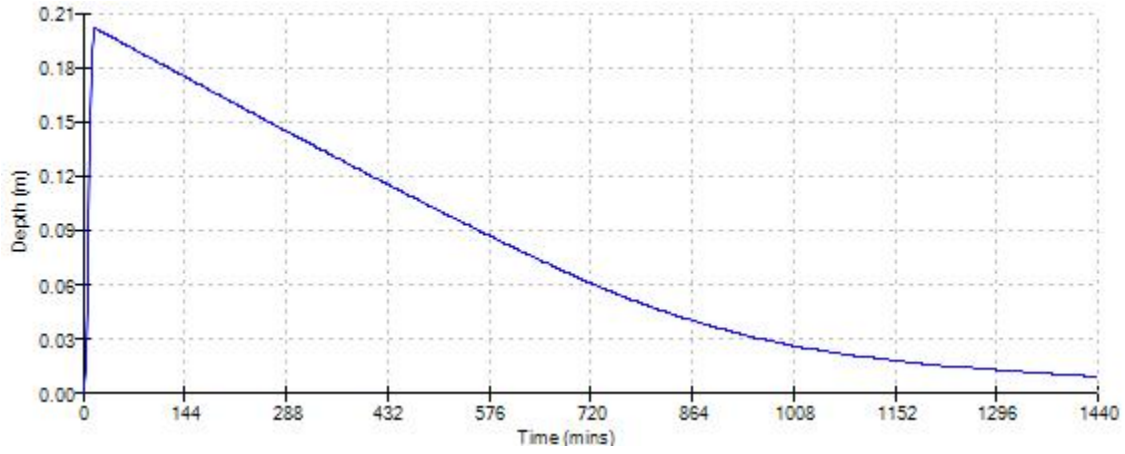


©1982-2020 Innovyze

Event: 15 min Winter







©1982-2020 Innovyze

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	49.321	0.321	1.9	46.5	O K
30 min Summer	49.461	0.461	1.9	66.8	O K
60 min Summer	49.630	0.630	1.9	91.4	O K
120 min Summer	49.749	0.749	1.9	108.7	Flood Risk
180 min Summer	49.823	0.823	1.9	119.3	Flood Risk
240 min Summer	49.873	0.873	1.9	126.6	Flood Risk
360 min Summer	49.934	0.934	1.9	135.5	Flood Risk
480 min Summer	49.965	0.965	2.0	139.9	Flood Risk
600 min Summer	49.979	0.979	2.0	142.0	Flood Risk
720 min Summer	49.988	0.988	2.0	143.3	Flood Risk
960 min Summer	49.996	0.996	2.0	144.5	Flood Risk
1440 min Summer	49.993	0.993	2.0	144.0	Flood Risk
2160 min Summer	49.969	0.969	2.0	140.4	Flood Risk
2880 min Summer	49.939	0.939	1.9	136.2	Flood Risk
4320 min Summer	49.879	0.879	1.9	127.4	Flood Risk
5760 min Summer	49.824	0.824	1.9	119.5	Flood Risk
7200 min Summer	49.782	0.782	1.9	113.4	Flood Risk
8640 min Summer	49.746	0.746	1.9	108.2	Flood Risk
10080 min Summer	49.716	0.716	1.9	103.8	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	106.118	0.0	47.7	16
30 min Summer	77.090	0.0	69.3	31
60 min Summer	53.654	0.0	96.5	62
120 min Summer	33.131	0.0	119.2	122
180 min Summer	25.129	0.0	135.6	182
240 min Summer	20.684	0.0	148.9	240
360 min Summer	15.718	0.0	169.7	360
480 min Summer	12.933	0.0	186.2	480
600 min Summer	11.113	0.0	200.0	558
720 min Summer	9.816	0.0	212.0	612
960 min Summer	8.065	0.0	232.0	742
1440 min Summer	6.115	0.0	262.8	1010
2160 min Summer	4.640	0.0	300.6	1432
2880 min Summer	3.829	0.0	330.8	1848
4320 min Summer	2.951	0.0	382.3	2680
5760 min Summer	2.480	0.0	428.5	3512
7200 min Summer	2.194	0.0	473.8	4320
8640 min Summer	2.000	0.0	518.2	5104
10080 min Summer	1.860	0.0	562.5	5944

©1982-2020 Innovyze

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Winter	49.321	0.321	1.9	46.5	O K
30 min Winter	49.460	0.460	1.9	66.7	O K
60 min Winter	49.630	0.630	1.9	91.4	O K
120 min Winter	49.750	0.750	1.9	108.8	Flood Risk
180 min Winter	49.825	0.825	1.9	119.6	Flood Risk
240 min Winter	49.876	0.876	1.9	127.0	Flood Risk
360 min Winter	49.940	0.940	1.9	136.3	Flood Risk
480 min Winter	49.974	0.974	2.0	141.2	Flood Risk
600 min Winter	49.990	0.990	2.0	143.6	Flood Risk
720 min Winter	49.996	0.996	2.0	144.5	Flood Risk
960 min Winter	49.997	0.997	2.0	144.6	Flood Risk
1440 min Winter	49.980	0.980	2.0	142.1	Flood Risk
2160 min Winter	49.924	0.924	1.9	134.0	Flood Risk
2880 min Winter	49.862	0.862	1.9	124.9	Flood Risk
4320 min Winter	49.735	0.735	1.9	106.6	Flood Risk
5760 min Winter	49.598	0.598	1.9	86.7	O K
7200 min Winter	49.452	0.452	1.9	65.6	O K
8640 min Winter	49.360	0.360	1.9	52.2	O K
10080 min Winter	49.294	0.294	1.9	42.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	106.118	0.0	47.7	16
30 min Winter	77.090	0.0	69.3	31
60 min Winter	53.654	0.0	96.5	62
120 min Winter	33.131	0.0	119.2	120
180 min Winter	25.129	0.0	135.6	178
240 min Winter	20.684	0.0	148.9	236
360 min Winter	15.718	0.0	169.7	350
480 min Winter	12.933	0.0	186.2	462
600 min Winter	11.113	0.0	200.0	570
720 min Winter	9.816	0.0	212.0	670
960 min Winter	8.065	0.0	232.0	760
1440 min Winter	6.115	0.0	262.9	1080
2160 min Winter	4.640	0.0	300.6	1536
2880 min Winter	3.829	0.0	330.8	1992
4320 min Winter	2.951	0.0	382.3	2896
5760 min Winter	2.480	0.0	428.6	3800
7200 min Winter	2.194	0.0	473.8	4400
8640 min Winter	2.000	0.0	518.3	5104
10080 min Winter	1.860	0.0	562.6	5752

©1982-2020 Innovyze

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 275572 207091 SN 75572 07091
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.180

Time (mins) From:	To:	Area (ha)
0	1	0.180

©1982-2020 Innovyze

Model Details

Storage is Online Cover Level (m) 50.000

Tank or Pond Structure

Invert Level (m) 49.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	145.0	1.000	145.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0067-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	67
Invert Level (m)	48.995
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

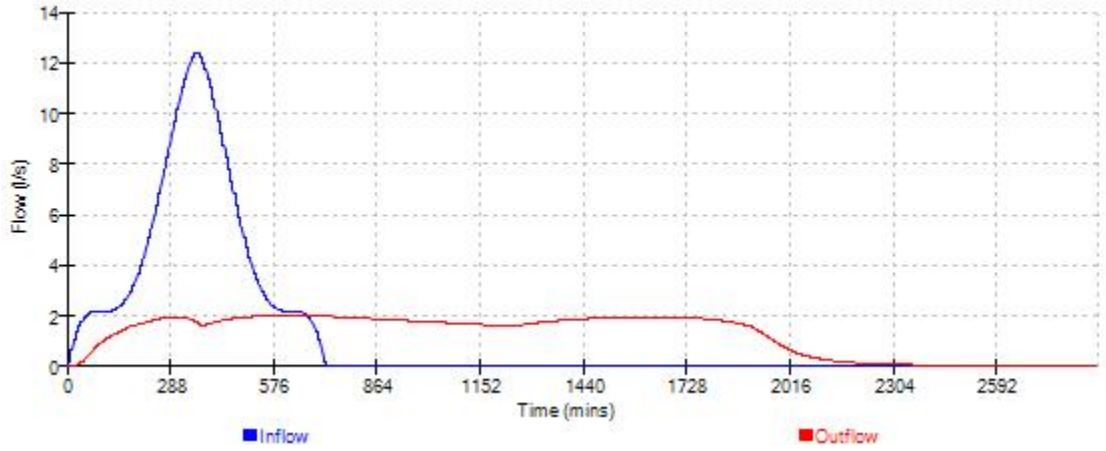
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.0
Flush-Flo™	0.296	1.9
Kick-Flo®	0.599	1.6
Mean Flow over Head Range	-	1.7

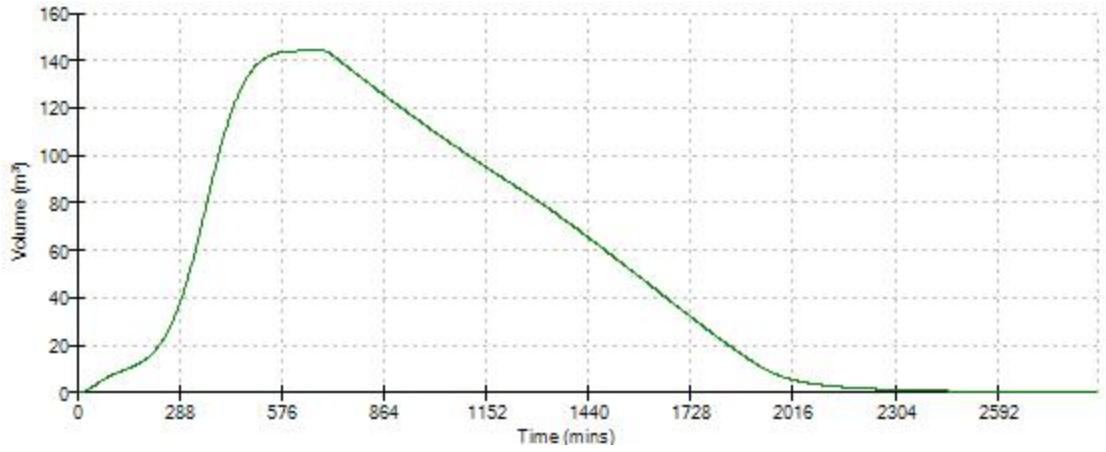
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

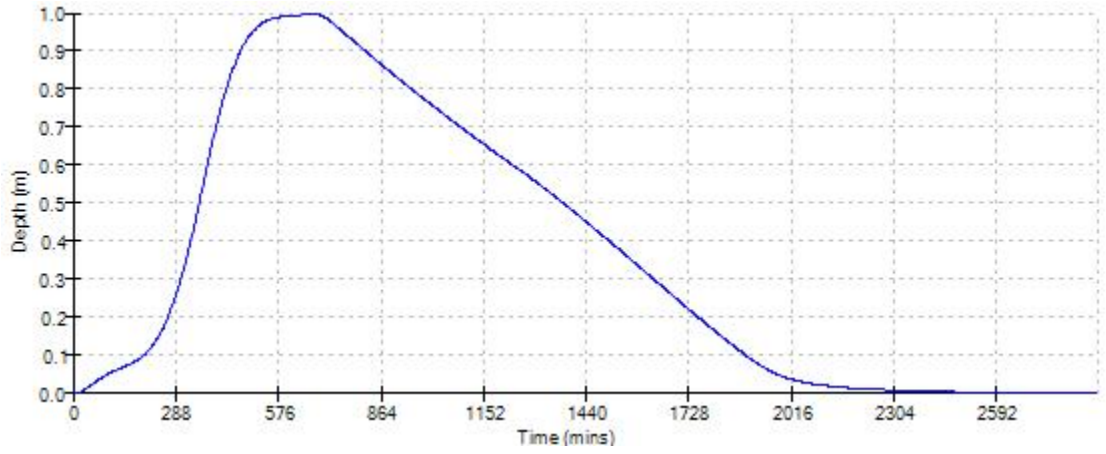
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.6	1.600	2.5	5.000	4.2
0.200	1.9	1.800	2.6	5.500	4.4
0.300	1.9	2.000	2.7	6.000	4.6
0.400	1.9	2.200	2.9	6.500	4.7
0.500	1.8	2.400	3.0	7.000	4.9
0.600	1.6	2.600	3.1	7.500	5.1
0.800	1.8	3.000	3.3	8.000	5.2
1.000	2.0	3.500	3.5	8.500	5.4
1.200	2.2	4.000	3.8	9.000	5.5
1.400	2.3	4.500	4.0	9.500	5.7

©1982-2020 Innovyze

Event: 720 min Winter

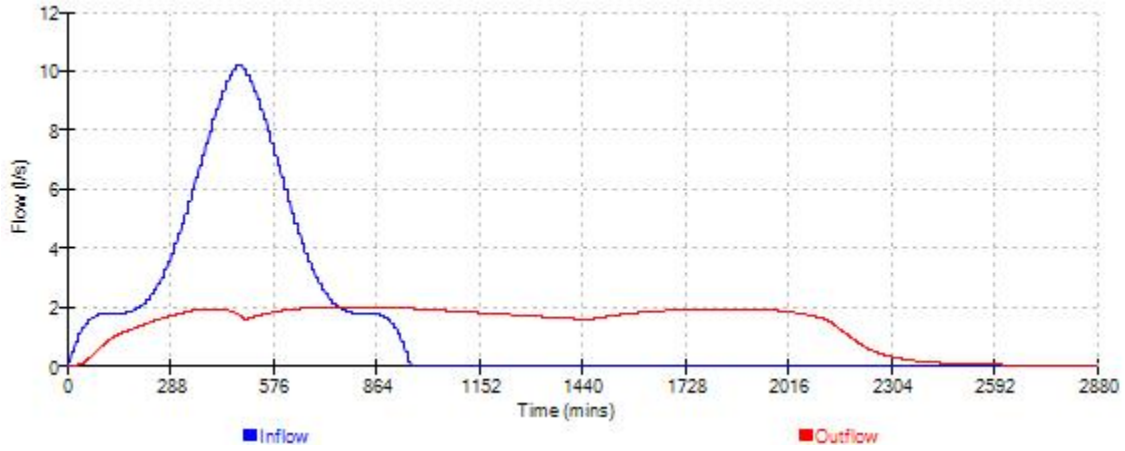


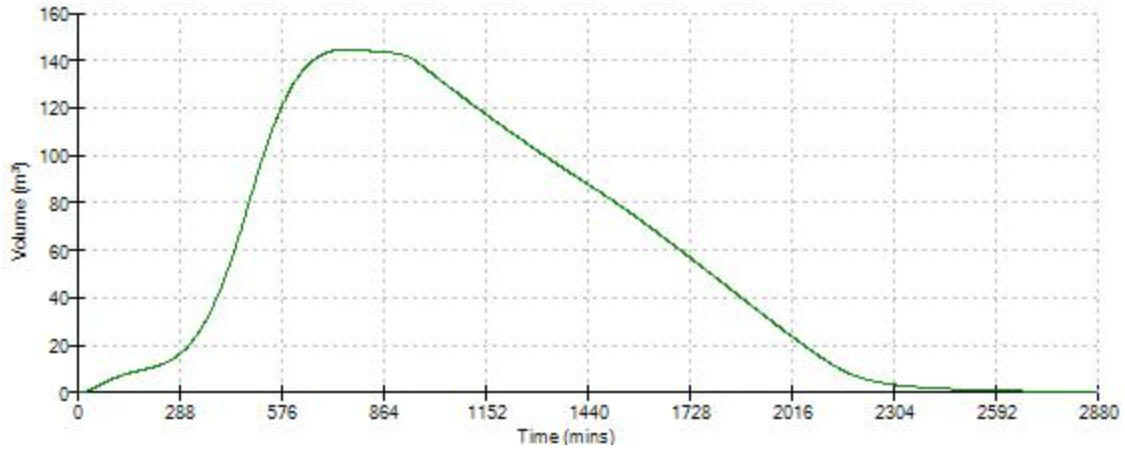


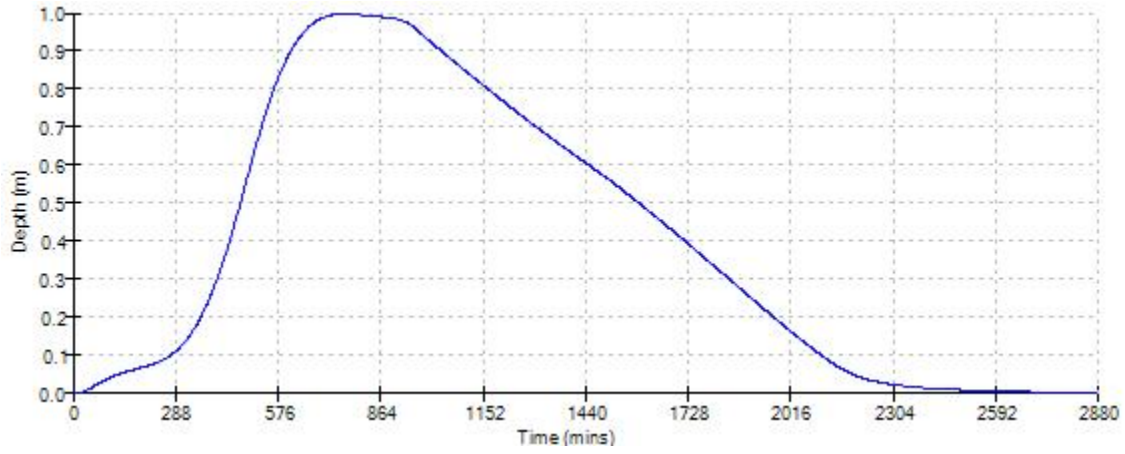


©1982-2020 Innovyze

Event: 960 min Winter

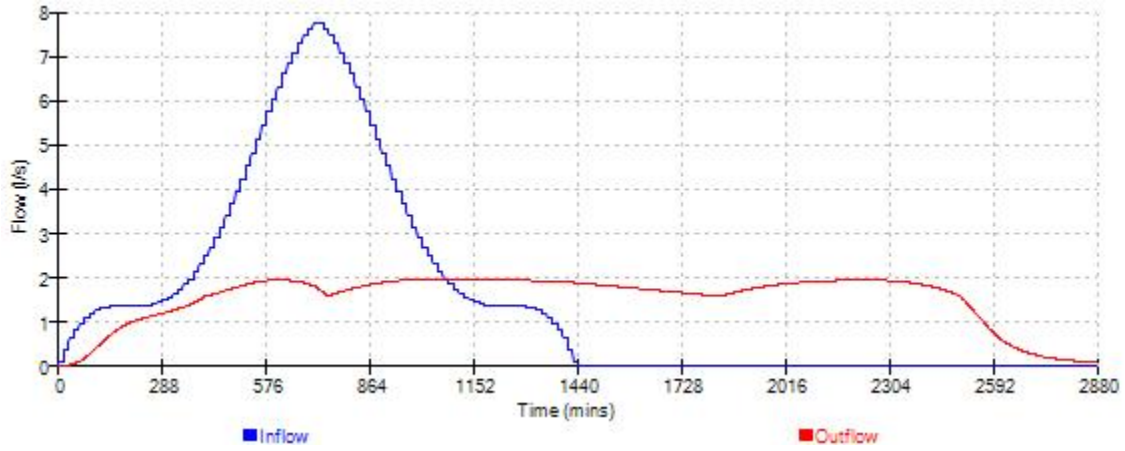


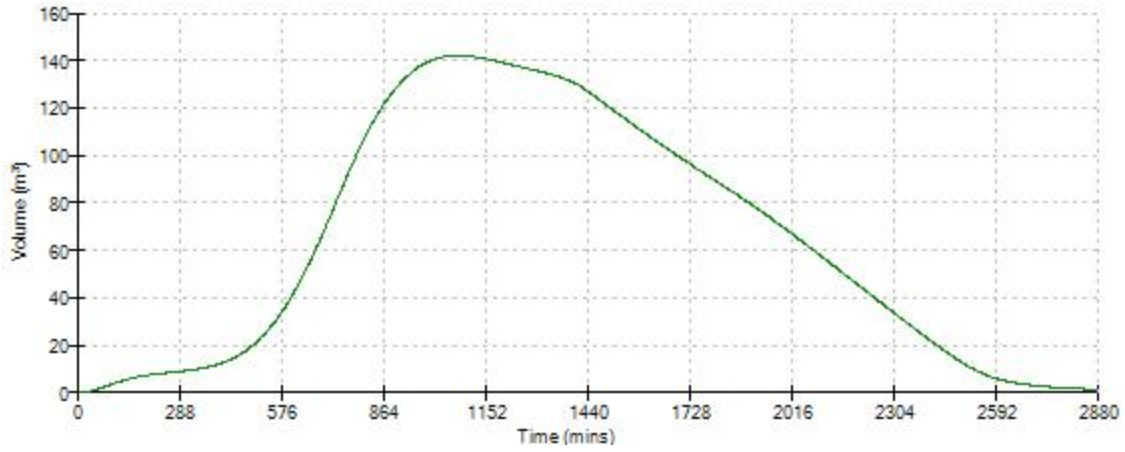


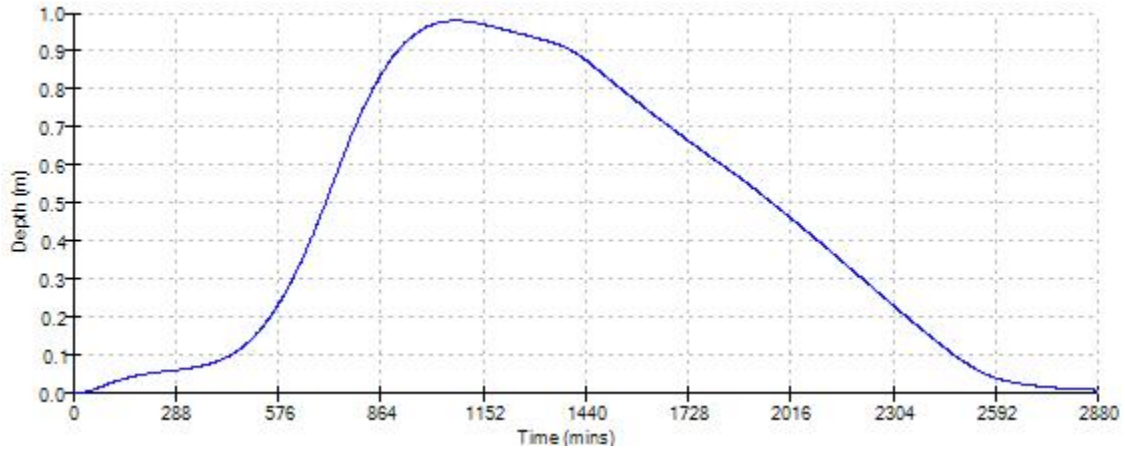


©1982-2020 Innovyze

Event: 1440 min Winter

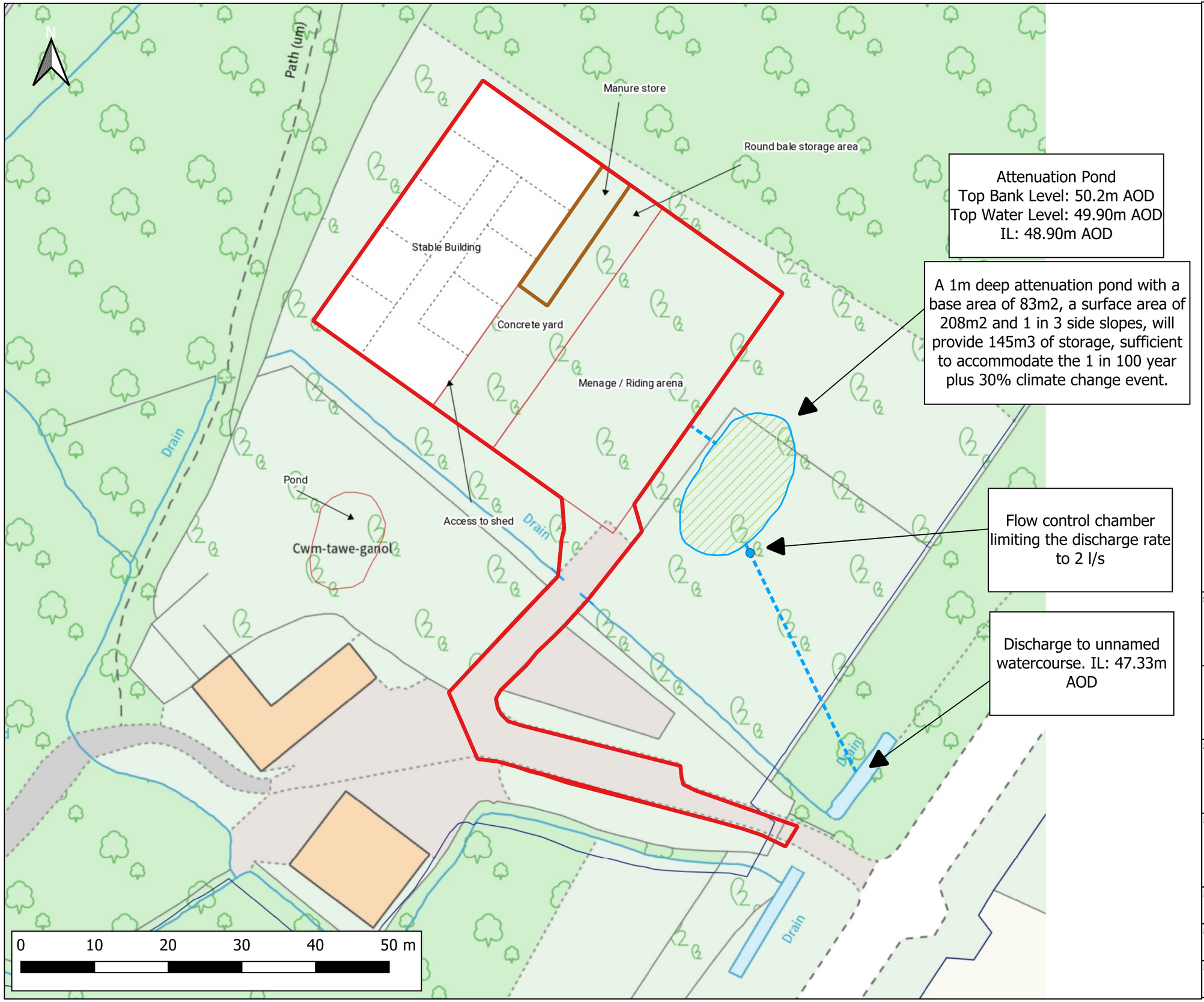






©1982-2020 Innovyze

Appendix I Concept Drainage Sketch



Notes:
1) This sketch has not been subject to formal checks or approvals. Its validity and use must therefore be limited to discussion and information purposes only.
2) Unless otherwise noted the risks associated with this proposal are not considered to be extra ordinary and within the remit of an experienced and competent contractor.
3) All dimensions in millimetres and all levels in metres above ordnance datum unless shown otherwise.
4) This drawing is an ammendment of the 'Block Plan' by 'Rural Advisor'. This drawing provides a concept only and is not intended for detailed design.

LEGEND

- Site Boundary
- Manure Store
- Attenuation Pond
- Surface Water Drain
- Flow Control Chamber

CLIENT:
Mr Conway Morgan

Waterco
www.waterco.co.uk

SCHEME:
Cwmtawe Ganol Farm, Godrergraig

PLOT TITLE:
Concept Drainage Sketch

PLOT STATUS:	DATE:
SKETCH	19-02-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
LH	AW	NJ	1:500

PLOT NAME:	REVISION:
17239_Concept_Drainage_Sketch	-

Appendix J SuDS Maintenance Schedules

Operation and Maintenance Requirements for Flow Control Chambers and Devices

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. Take remedial action if required.	Monthly (at start, then half yearly)
	Debris removal from catchment surface	Monthly
	Visual inspection of flow control chamber to assess if system is draining down correctly and the orifice or flow control device is not blocked. Assess if there is any build up of silt in chamber sump.	Monthly (at start, then half yearly) & after large storm events
	Removal of accumulated silt from silt trap and catchpit sumps.	As required
Remedial actions	Repair/rehabilitation of inlets/outlets.	As required

The maintenance requirements detailed above are to be undertaken by the site owner.

Name : ----------

Position : ----------

Date : ----------

Signed on behalf of the site owner : ----------

Operation and Maintenance Requirements for Piped Drainage Systems

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. Take remedial action if required.	Monthly (at start, then half yearly)
	Debris removal from catchment surface	Monthly
	Visual inspection of up/downstream chambers to assess if pipe length is draining down correctly and/or is blocked. Assess if there is any build up of silt in chamber sump.	Monthly (at start, then half yearly) & after large storm events
	Removal of accumulated silt from silt trap and catchpit sumps.	As required
Occasional Maintenance	CCTV Survey to confirm condition of pipework, identify any repairs/replacement works and action as required.	Following Poor Performance.
Remedial actions	Repair/rehabilitation of inlets/outlets.	As required

The maintenance requirements detailed above are to be undertaken by the site owner.

Name : ----------

Position : ----------

Date : ----------

Signed on behalf of the site owner : ----------

Operation and Maintenance Requirements for Ponds and Wetlands

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season), or as required
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage, and / or physical damage.	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options.	Half yearly
	Check any mechanical devices e.g. penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
	Remove sediment from any forebay	Every 1 – 5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, e.g. 25-50 years
Remedial actions	Repair erosion or other damage	As required
	Replant where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate of Inlets, outlets and overflows	As required

Ref. Table 23.1 CIRIA C753 'The SuDS Manual'

The maintenance requirements detailed above are to be undertaken by the site owner.

Name :

Position :

Date :

Signed on behalf of the site owner :

Appendix K CDRA

CONCEPT DESIGNER'S RISK ASSESSMENT

Project:	Cwmtawe Ganol Farm, Godrergraig	**Project No:**	17239
Client:	Mr Conway Morgan		
Report Reference:	17239 - FCA & Drainage Strategy		

Prepared by:	Louis Hunt	**Date:**	19/02/2026
Checked by:	Adam McCulloch	**Date:**	20/02/2026
Reviewed by:	Nigel Jones	**Date:**	02/03/2026

Requirement:

The Construction (Design and Management) Regulations 2015 (CDM 2015) place an obligation on the Designer to take all reasonable steps to provide, with the design, sufficient information about the design, construction or maintenance of the structure, to adequately assist the client, other designers and contractors to comply with their duties under CDM. The Designer has undertaken this assessment to identify any extra-ordinary risks, or those that would not be expected on this particular project by an experienced and competent Contractor. The aim is to avoid needless paperwork and bureaucracy and ensure the assessment is project specific, relevant and proportionate to the risk.

DRA Summary

Each of the following risk areas has been considered using the question below. Is a risk present which is considered to be **extra-ordinary or unexpected** in this instance?

If **YES** - A detailed risk assessment is required at design stage
If **UNKNOWN** - Insufficient information has been provided at concept design stage and the risks are unknown. Further consideration must be given at design stage(s)
If **NO** - No further action is required.

Hazard Ref.	Risk Areas	YES, UNKNOWN or NO	Comments
1	Ground Conditions	Unknown	Site comprises undeveloped land
2	Hazardous Environment	Unknown	To be considered at detailed design stage
3	Existing Working Environment	No	Site comprises undeveloped land
4	Existing Services	Unknown	To be considered at detailed design stage
5	Proximity to Other Structure(s)	Unknown	Barn building located west of the site
6	Near Waterbody / flood risk	Yes	Drainage ditches on site, site access is adjacent to Flood Zone 2/3 extent
7	Proximity to Other Activities	Unknown	To be considered at detailed design stage
8	Sequence of Construction	Unknown	To be considered at detailed design stage
9	Access	Yes	Access to the site from A4067
10	Interfaces	Unknown	To be considered at detailed design stage
11	Confined Space Working	Unknown	To be considered at detailed design stage
12	Maintenance Considerations	Yes	Attenuation Pond and Manure Store proposed
13	Working at Height	Unknown	To be considered at detailed design stage
14	Steep Slopes	Yes	Steep slope in the north-western extent of the site
15	Demolition / Refurbishment / Repair	No	No demolition required
16	Welfare	Unknown	To be considered at detailed design stage
17	Occupational Health	Unknown	To be considered at detailed design stage
18	Environmental Issues	Unknown	To be considered at detailed design stage
19	Other Significant Hazards not Identified Above	Unknown	To be considered at detailed design stage
20	Residual Risk to Future Users	Unknown	To be considered at detailed design stage