



**Consulting Civil & Structural Engineers**

QuadConsult Limited  
Columbus House  
Village Way  
Greenmeadow Springs Business Park  
Cardiff  
CF15 7NE

Tel: +44 (0)29 2077 9644  
email: [contactus@quadconsult.co.uk](mailto:contactus@quadconsult.co.uk)  
Web: [www.quadconsult.co.uk](http://www.quadconsult.co.uk)

## Flood Consequence Assessment

*Report*

on

*Phase 1, Dyffryn Road Residential Development, Ammanford*

for

*Amity Planning*

Date August 2021

Project no. 21255

Revision A

**Directors**  
Chris Usher BSc(Hons) CEng FStructE MICE AaPS  
Andrew Willis  
**Consultant**  
Steve McCarthy BEng(Hons) MSc CEng MICE MCIHT



QuadConsult Limited registered in England and Wales reg.no. 06880193  
Columbus House, Village Way  
Greenmeadow Springs Business Park  
Cardiff, CF15 7NE

# Flood Consequence Assessment

Dyffryn Road, Ammanford



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## Phase 1, Dyffryn Road Residential Development, Ammanford

Flood Consequence Assessment

### Document Control

Responsible for	Job Title	Name	Date	Signature
Content	Graduate Engineer	Alice Cox	17/08/2021	
Checked	Consultant	Steve McCarthy	18/08/2021	
Approval	Director	Andrew Willis	19/08/2021	
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3			

# Flood Consequence Assessment

Dyffryn Road, Ammanford



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## References

- 1 Development Advice Maps (DAM) – Natural Resources Wales
- 2 Flood Risk Maps – Natural Resources Wales
- 3 Google Earth - Mapping
- 4 Technical Advice Note 15 – Welsh Assembly Government
- 5 Geology of Britain Map - British Geological Survey

## Abbreviations

AOD	Above Ordinance Datum
DAM	Development Advice Maps
FCA	Flood Consequence Assessment
NRW	Natural Resources Wales
TAN 15	Technical Advice Note 15

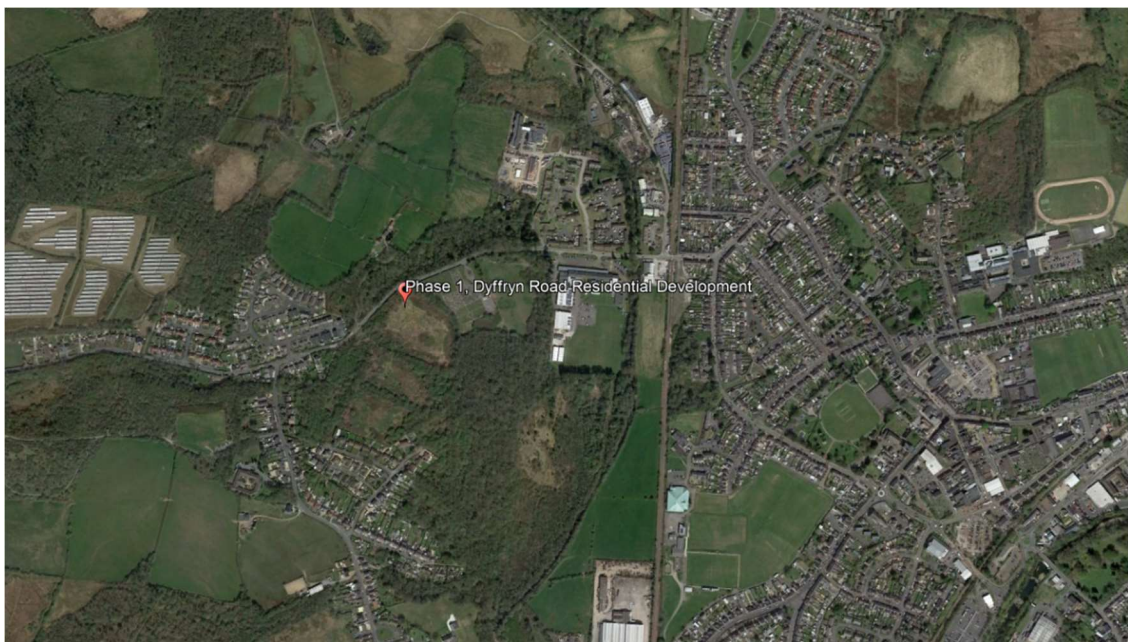
## 1.0 INTRODUCTION

- 1.1 QuadConsult Ltd has been commissioned by Amity Planning to undertake a Flood Consequence Assessment (FCA) for the proposed residential development at Dyffryn Road, Ammanford. This FCA is to assess the flood risk associated with the first phase of the development which consists of circa 37 dwellings.
- 1.2 The site is in Ammanford, South Carmarthenshire, directly south west of the existing Tir-y-Dail Cemetery and South of Dyffryn Road from which access to the development is proposed.
- 1.3 The Nant-y-Ci watercourse enters phase 1 at the western extents before crossing under Dyffryn Road and running west to east along the northern side of Dyffryn Road for the remainder of the first phase extents.
- 1.4 The site is also in vicinity of the River Loughor. Thus, the flood risk of the site is to be considered in this report to identify the flood risk posed to the proposed development and any increased risk posed to downstream properties arising from the construction of the residential development at this location.
- 1.5 Access to the site is proposed to be via Dyffryn Road, which referring to the Development Advice Map (DAM) is situated in both Zone B and Zone C2. Therefore, it is important that the access and egress of the development is considered within this report.
- 1.6 The FCA will investigate and highlight potential flood risks that may exist on and around the site in relation to the proposed residential development. Any proposed mitigation measures will comply with the recommendations in Technical Advice Note 15, Development and Flood Risk (TAN 15) published by the Welsh Government, and Natural Resource Wales (NRW) guidance.

## 2.0 SITE LOCATION & DESCRIPTION

- 2.1 The site area for phase 1 of the development is 1.37 ha. This phase is located approx. 470m west of the western bank of the River Loughor, at national grid reference E:261818, N:212612 and approximately 1.2km west of the centre of Ammanford, meaning the site falls within the jurisdiction of Carmarthenshire County Council.
- 2.2 A site location plan showing the extents of the overall development area can be seen within Appendix E. The proposed layout for the first phase can be seen in Appendix F. An aerial photo showing the location of phase 1 can be seen in figure 1.
- 2.3 The proposed development area is bounded by Dyffryn Road to the north, the cemetery to the north east and woodland to the east. To the south and west is existing residential development.
- 2.4 The site in its existing condition appears to be greenfield land, however there is evidence that the land could have previously been developed on the topographical survey, including a tarmac site access and buried concrete noted at a couple of locations. For this report the site has been considered as greenfield as from Google Earth images the site has not been developed for some time.
- 2.5 No evidence of existing drainage features or a previously used drainage system is present within topographical information, and thus it is assumed that there is no existing drainage infrastructure on site apart from land drainage ditches situated within later phases of the development.
- 2.6 The River Loughor flows north to south near to the proposed development and ultimately discharges into Carmarthen Bay.
- 2.7 The Nant-y-Ci watercourse runs through the site at the north western extent of Phase 1 and then along the northern edge of Dyffryn Road. Further to the east it crosses back under Dyffryn Road via a culvert and flows south alongside the eastern boundary of the land ownership boundary (as shown in blue on the Location Plan) before discharging into the River Loughor.
- 2.8 The overall development site's topography peaks at the approx. centre of the overall development, with Phase 1 falling from the south east to the north west before a steep bank separates the proposed site and existing highway of Dyffryn Road. Generally, for all phases the gradients steepen towards the edge of the development area.
- 2.9 Elevations within Phase 1 range from 56m AOD at the centre of the overall development to 49m AOD at the top of bank adjacent to the highway. The existing site access ties in with Dyffryn Road at a level of circa 48m AOD.
- 2.10 From the British Geological Survey's Geology of Britain Map, the ground conditions at the site location consists of a bedrock of mudstone, sandstone and siltstone overlaid with superficial deposits of Devensian till deposits. As till is a clay type soil containing silt and gravel this material indicates that the percolation rate is unlikely to be suitable for the implementation of infiltration systems.
- 2.11 The existing site banks down to highway levels along the north western boundary, providing some flood protection via the existing elevated levels of the site above the watercourse.
- 2.12 The Development Advice Map (DAM) considers the proposed site to be mostly sited within Flood Zone A, considered to be at little or no risk of fluvial or coastal flooding. The remainder of the site is Flood Zone B which are areas which are known to have been flooded in the past evidenced by sedimentary deposits. An overlay of the proposed site layout and the DAM can be seen in Appendix H.

- 2.13 Extracts of NRW's flood risk maps for fluvial and surface water / small watercourses are shown in Appendices B & C respectively. These maps demonstrate that the flood risk in vicinity of the proposed development is a mixture of fluvial (main rivers) and small watercourse flood risk. Flood defences are also shown on these maps which demonstrate that there are no maintained flood defences between Nant-y-Ci watercourse or the River Loughor and the proposed site location.
- 2.14 Due to the site location, there is no tidal flood risk associated with the proposed development, as confirmed by NRW Flood Risk Maps.
- 2.15 There are records of local flooding shown on the Flood Risk Maps created by NRW as shown in Appendix D, but the extents of reported flooding as well as flood warnings and alerts for the local area do not come within 200m of the proposed development extents.

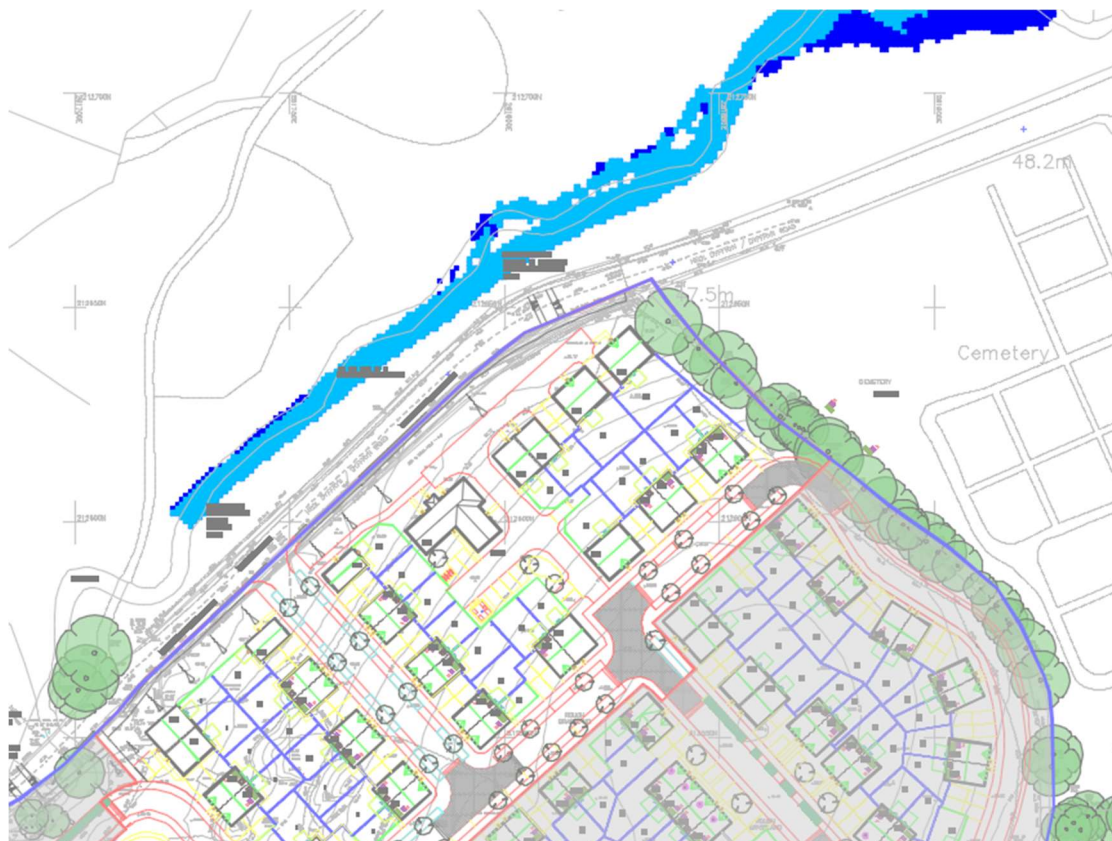


© Google Earth

**Figure 1 – Site Location**

## 3.0 FLOOD MODEL DATA & MODEL VALIDITY CONSIDERATIONS

- 3.1 Detailed Flood Modelling data was obtained from NRW, which was interpreted using 3D modelling software to obtain the 1000 year return period and 100 year return period plus climate change flood levels for Phase 1 of the proposed development.
- 3.2 The flood modelling data supplied is from the Ammanford Flood Alleviation Scheme Model which is accompanied by a user report dated April 2018. The model combines two previous models undertaken in 2014 to provide a more focused assessment of the combined flood risks within Ammanford.
- 3.3 Topography used within the model is collated from surveys undertaken for the models created between 2011 and 2012, which contributes a degree of uncertainty in that the survey information was six years old when the model was undertaken and is now nearly ten years old and so the topography may not be reflective of current conditions. Due to the large area which the model encompasses it would not be reasonable to survey and confirm the topography of the whole area but inspection of maps and aerial photos of the site and surrounding area there appears not to have been any significant changes to the topography at least in vicinity of the site. No hydraulic modelling has been undertaken directly for the purposes of this report.
- 3.4 The extents of the flood modelling for the 1000 year return period and 100 year return period plus climate change events can be seen in Figure 2, which sets flood levels of circa 44.40m and 44.23m AOD respectively.



**Figure 2 – Flood Model Data**



# Flood Consequence Assessment

Dyffryn Road, Ammanford

- 3.5 The lowest ground level within the phase 1 extents is circa 49.0m AOD as shown on the topographical survey, and thus the existing site ground levels can be assumed to be above the required flood level.
- 3.6 In addition, the 44.4m AOD 1 in 1000 year flood level is circa 3.5m lower than the surveyed road levels of Dyffryn Road adjacent to the site. As the road continues to the west where it appears that the level increases further, it can be assumed that there is a site access route which would not be affected during a local flood event.
- 3.7 Although the model is three years old based on the user report, it is not believed that the risk of flooding to the site would increase to any significant degree.
- 3.8 The model does not cover the full extents of the phase 1 boundary and as such flood levels are not provided where the Nant-y-Ci watercourse enters the proposed site, adjacent to the western extents of phase 1. Therefore, the flood level is anticipated to be higher than the 44.40m AOD provided by the flood modelling data.
- 3.9 As there is a significant natural defence (banking) along the south eastern side of the watercourse which is not replicated on the other opposite bank of the watercourse, the topography at this location would overflow the watercourse onto the north western bank and Dyffryn Road with lowest levels at this location of circa 47m AOD. The lowest top of bank level within the development area is circa 49.90m AOD and therefore it is assumed that flood protection to the site is provided by the existing banks of the watercourse.
- 3.10 Therefore, we are confident that the model outputs demonstrate that there is no significant flood risk posed to the site currently or for the 100 year lifetime of the development.

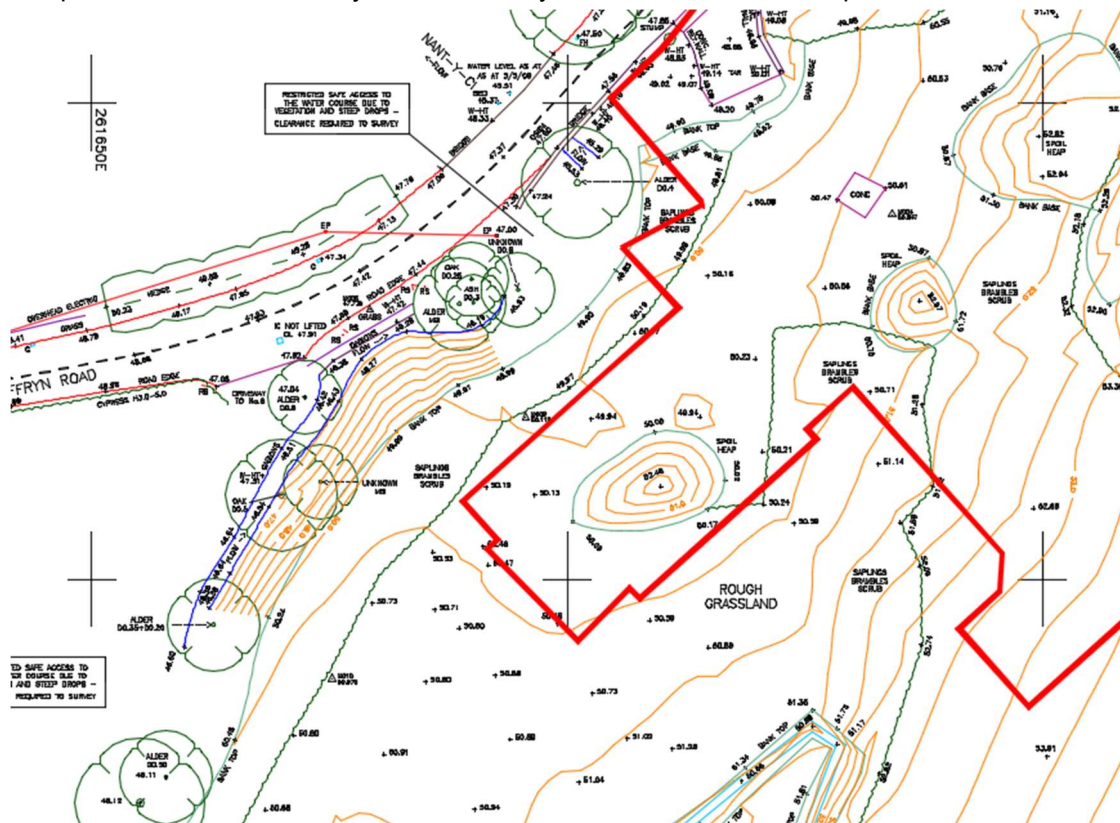


Figure 3 – Topographical Survey Extract with Phase 1 Boundary

## 4.0 PROPOSED DEVELOPMENT & PHASE 1 SURFACE WATER STRATEGY

- 4.1 This report is to assess the flood risk associated with the first phase of the proposed residential development. Phase 1 comprises of circa 37 residential units with associated infrastructure works to serve the development. In total the development is to be circa 270 units, which is proposed to be constructed in six phases. Please see Appendix F for the proposed phase 1 layout.
- 4.2 TAN 15 considers residential developments as 'highly vulnerable' in terms of flood consequence. Residential developments should be considered for a lifetime of 100 years; hence this report will consider flood consequences up to the year 2121.
- 4.3 A Site Layout can be seen in Appendix F. Although the north western edge of the site encroaches into Zone B, large banks are proposed along the boundary with Dyffryn Road to maintain existing levels. If required, there is the possibility of increasing levels at the top of the bank to not only improve the flood protection but provide a flatter gradient across the proposed development. These enhanced natural defences will be maintained by the development's management company as part of regular maintenance to the development.
- 4.4 A topographical survey has identified that there are no ditches present within the proposed Phase 1 extents. Therefore, no diversion works to existing drainage ditches are required for this phase of the development. During later phase construction however, there will be a requirement for ditches to be infilled. From the survey information available and considering the topography of the site, it can be assumed that the ditches on site convey surface water landing within the site extents, which will be incorporated into the drainage system for the development. This should be confirmed on site prior to detailed design.
- 4.5 As the proposed development will introduce more impermeable surfacing to the site, it is important that the surface water is suitably collected and stored, allowing the site to discharge at a rate that is equal to or less than the calculated greenfield runoff.
- 4.6 As the site is to be constructed in stages, with this report covering the flood risk associated with the first phase only, care must be taken to ensure that the discharge rate reflects the developed area at any given time. For the phase 1 area, a greenfield run-off rate of 15.4 l/s has been calculated as can be seen in Appendix G. To avoid increasing the downstream flood risk where flooding events are known to have occurred, surface water discharge from the site is proposed to be maintained at the calculated  $Q_{bar}$  of 15.4 l/s.
- 4.7 A secondary method of surface disposal which can be explored during detailed design would be infiltration into the existing ground. Based on British Geological Society information, clay type till is anticipated which is not thought to have significant infiltration properties. However, subject to site testing, if infiltration rates are found to be sufficient it should be utilised to reduce the overall volume of surface water discharge into the watercourse and thus better mimic existing conditions.
- 4.8 Although access routes to the site including Dyffryn Road are situated within the C2 risk flood zone, the existing levels of the site and road are significantly higher than the flood levels established from modelling. Even with the limitation of the model extents not extending as far west as the extents of Phase 1, site levels are to be from circa 49m AOD and above, which is 4.6m higher than the flood level obtained from the model. In addition, the watercourse is evidenced to have a large steep embankment between the proposed site and existing watercourse which naturally provides the site with flooding protection in its current condition.
- 4.9 The location of the proposed development has been chosen so that the development is close to the town of Ammanford but not built in a location which is likely to flood, due to the high vulnerability of residential developments. The site is well suited due to the presence of existing

- steep embankments which elevate the proposed development significantly above the Nant-y-Ci watercourse.
- 4.10 No site specific measures are thought to be required regarding flood protection of the proposed dwellings, due to the elevated ground levels of the proposed site area.
- 4.11 A footbridge is shown on the site layout which will link the proposed development to Dyffryn Road. This bridge must be designed and constructed to ensure the structure would not impede flood flows or pose a blockage risk.
- 4.12 In terms of drainage strategy for the surface water, Phase 1 should positively drain to the north west and into the Nant-y-Ci watercourse to mimic the existing site conditions. Discharge will be controlled to limit the discharge rate to a maximum of  $Q_{bar}$  which has been calculated as 15.4 l/s for phase 1.
- 4.13 It is anticipated from the site layout that the attenuation within phase 1 is to serve later phases of this development also. If this assumption is correct, care must be taken in planning of the works to ensure that the discharge rate of the proposed system is not larger than the  $Q_{bar}$  value for the construction phases only, as undeveloped areas which are yet to be incorporated into the site will continue to discharge into the watercourse as per existing conditions.
- 4.14 To achieve a maximum discharge rate of 15.4 l/s, surface water will be restricted by a flow control with the additional flows stored in attenuation which will be sized to suit a 100 year plus 40% climate change rainfall event.

## 5.0 FLOOD ZONE DEFINITION

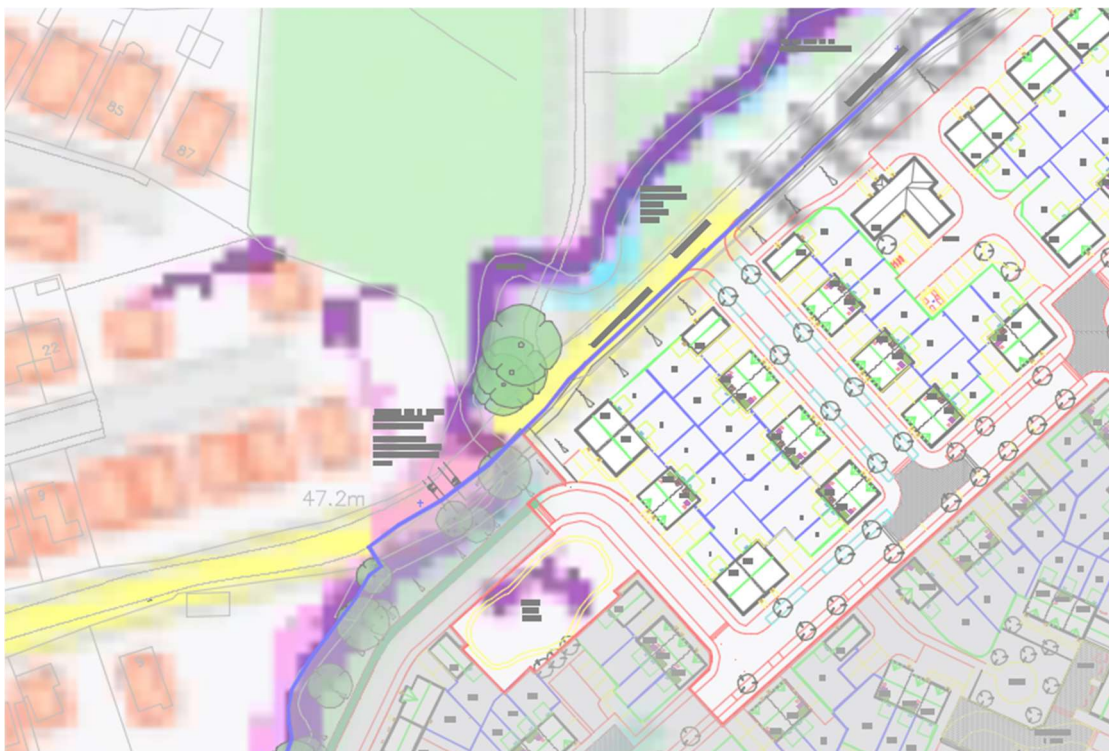
- 5.1 The current NRW Development Advice Map (Appendix A) indicates that the majority of the site is within Zone A – At little to no risk of fluvial or tidal/coastal flooding. Dyffryn road from which the proposed site is to be accessed is shown to lie within Zones B and C2.
- 5.2 As set out in Planning Policy Wales TAN15: Development & Flood Risk, flood zones are defined within the following Figure 4.

Description of Zone		Use within the precautionary framework
Considered to be at little or no risk of fluvial or tidal/coastal flooding.	A	Used to indicate that justification test is not applicable and no need to consider flood risk further.
Areas known to have been flooded in the past evidenced by sedimentary deposits.	B	Used as part of a precautionary approach to indicate where site levels should be checked against the extreme (0.1%) flood level. If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further.
Based on Environment Agency extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal)	C	Used to indicate that flooding issues should be considered as an integral part of decision making by the application of the justification test including assessment of consequences.
Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.	C1	Used to indicate that development can take place subject to application of justification test, including acceptability of consequences.
Areas of the floodplain without significant flood defence infrastructure.	C2	Used to indicate that only less vulnerable development should be considered subject to application of justification test, including acceptability of consequences. Emergency services and highly vulnerable development should not be considered.

**Figure 4 – Extract TAN15: Development & Flood Risk Description**

## 6.0 FLOOD RISK SUMMARY

- 6.1 Surface Water Flooding (Flash Flooding) – The Flood Risk Map considers the proposed Phase 1 extents to mostly be at little or no risk of surface water flooding from surrounding watercourses. One small area of surface water flood risk is identified on the map as shown in Appendix C and overlain onto the proposed site layout in figure 5 below. Upon reviewing the existing site topography, it has been identified that the flood risk shown on the Flood Risk Maps is posed by surface water run-off from within the development area collecting in a slight depression in the ground surface. The surveyed height difference between the Nant-y-Ci watercourse and site levels and separation of this small flood risk area from the larger watercourse risk extents concur that the small area is due to surface water run-off. As the development will positively drain surface water landing within the development extents, this flood risk will be eliminated by the proposed development. Therefore, the site layout has utilised this low point to make use of the natural site topography without reducing the capacity of the attenuation pond at this location.



**Figure 5 – Surface Water & Small Watercourse Flood Risk & Site Layout Overlay**

- 6.2 Fluvial Flooding – The Development Advice Maps (DAM) considers the proposed development area to mostly sit within a Flood Zone A - Considered to be at little or no risk of fluvial flooding. This is assumed to be due to the height difference between the existing Nant-y-Ci watercourse and existing site levels as indicated by NRW Flood Model Data which indicate that the flood level for the proposed development is circa 4m lower than the existing lowest ground level and thus due to such a large height difference the residential development is not expected to experience flooding during the development lifetime. As the discharge rate is proposed to match existing greenfield run-off calculations, it is anticipated that there will not be an increase in flood risk to downstream properties and watercourses, which considering the existing flood risks for the town of Ammanford is crucial.

## 6.3 OTHER SOURCES OF FLOODING

- 6.3.1 The main potential sources of flooding are presented by the failure of the proposed drainage system. To reduce the risk of this as much as reasonably possible, on site conveyance systems are proposed to use self-cleansing gradients where possible and to provide adequate maintenance access so that any blockages in the system can be resolved quickly.
- 6.3.2 The Flood Risk NRW maps show that there are recorded flood events within the last 40 years to the east of the development, including the college building adjacent to the River Loughor. As can be seen from Appendix D, flood warnings and alerts also have not extended to incorporate any of the proposed development for past flood events.
- 6.3.3 Based on the elevations and topography of the existing ground, the site is not considered to be at risk from groundwater flooding.
- 6.3.4 Localised flooding risk from the proposed development itself is to be managed through design of the drainage system which will be modelled to ensure that flooding does not occur within a 100 year plus 40% climate change return period event. This is particularly important due to the existing steep embankments down to Dyffryn Road and the Nant-y-Ci watercourse which could cause run-off to enter the watercourse at above the greenfield run-off rate and thus increasing flood risk to downstream properties.
- 6.3.5 No artificial potential sources of flooding have been identified that could impact the proposed development.
- 6.3.6 Site access routes are within a Flood Zone C2 which is at risk of flooding from the adjacent Nant-y-Ci watercourse and River Loughor. However, the flood levels from the model indicate that access routes would not be compromised for a 1 in 1000 year flood event.

## 7.0 SUMMARY & CONCLUSION

### 7.1 SUMMARY

- 7.1.1 The proposed residential development is situated primarily within a Flood Zone A although the north western boundary appears to encroach into Zone B.
- 7.1.2 The flood level obtained from the NRW Ammanford flood model is circa 4.5m below the lowest site level and therefore existing site levels are believed to be above the flood level for the upstream unmodelled watercourse.
- 7.1.3 The development is also considered to be at little or no risk of flooding from Surface Water as the proposed drainage system will manage surface water. NRW mapping identifies small areas of surface water flood risk. From review of the topographical survey this area of flood risk has been identified as being from overland flows from the development area. As surface water run-off will be positively drained and managed for the proposed development this flood risk will be eliminated and therefore this low point has been selected as an attenuation pond/basin location to make use of the natural site topography.
- 7.1.4 There is no increase in flood risk posed by the development to adjacent properties or nearby environmentally protected zones, via the maintenance of site levels as close to existing and limited maximum site discharge to equal the calculated greenfield runoff. Although calculated as 15.4 l/s for the purposes of this report, the engineer undertaking the drainage strategy for the site will confirm this rate and surface water attenuation requirements.
- 7.1.5 Flood risk associated with access routes to the site has been shown to not be critical, based on the comparison of the maximum flood level to topographical survey levels. However, as the site can also be accessed from the western approach along Dyffryn Road, access to the site is anticipated to be maintained.
- 7.1.6 Existing banking at the north western site extent provides flooding protection to the development area so its integrity needs to be safeguarded.

### 7.2 CONCLUSION

- 7.2.1 The proposed development area is not at significant risk of flooding according to mapping information and flood model data provided by NRW. It is noted that the DAM is at the time of writing under review, but flood model data has provided sufficient confidence that site levels are above the appropriate flood levels.
- 7.2.2 As above for the DAM, NRW are also in the process of reviewing the Flood Risk Maps which are due to be publicly available from 'Late Summer 2021' according to their website. At the time of writing these are not available for use, but they should be compared with the findings of this report once available so that the flood risk for this development can be confirmed with updated information.
- 7.2.3 Residual risks for the development area such as on site surface water flooding are to be managed via good design for the proposed surface water system.
- 7.2.4 Areas downstream of the development are at risk of fluvial flooding based on flood records and model data from NRW. Therefore, it is imperative that the proposed development does not impact upon the flood risk to the surrounding area of Ammanford and further downstream the River Loughor.
- 7.2.5 Flood risk to downstream properties is to be managed by limiting the surface water discharge rate compared to mimic existing conditions. Also, the surface water drainage is to be designed to ensure that no on site flooding occurs which could overflow onto the existing highway Dyffryn Road or into the Nant-y-Ci watercourse at an unrestricted rate.
- 7.2.6 Although access routes to the site involve passing through a Flood Zone C2, flood levels obtained from NRW Ammanford flood modelling indicate a circa 4m plus height difference between the 1 in 1000 year flood level and existing road levels and hence the access is not expected to flood during high rainfall events.

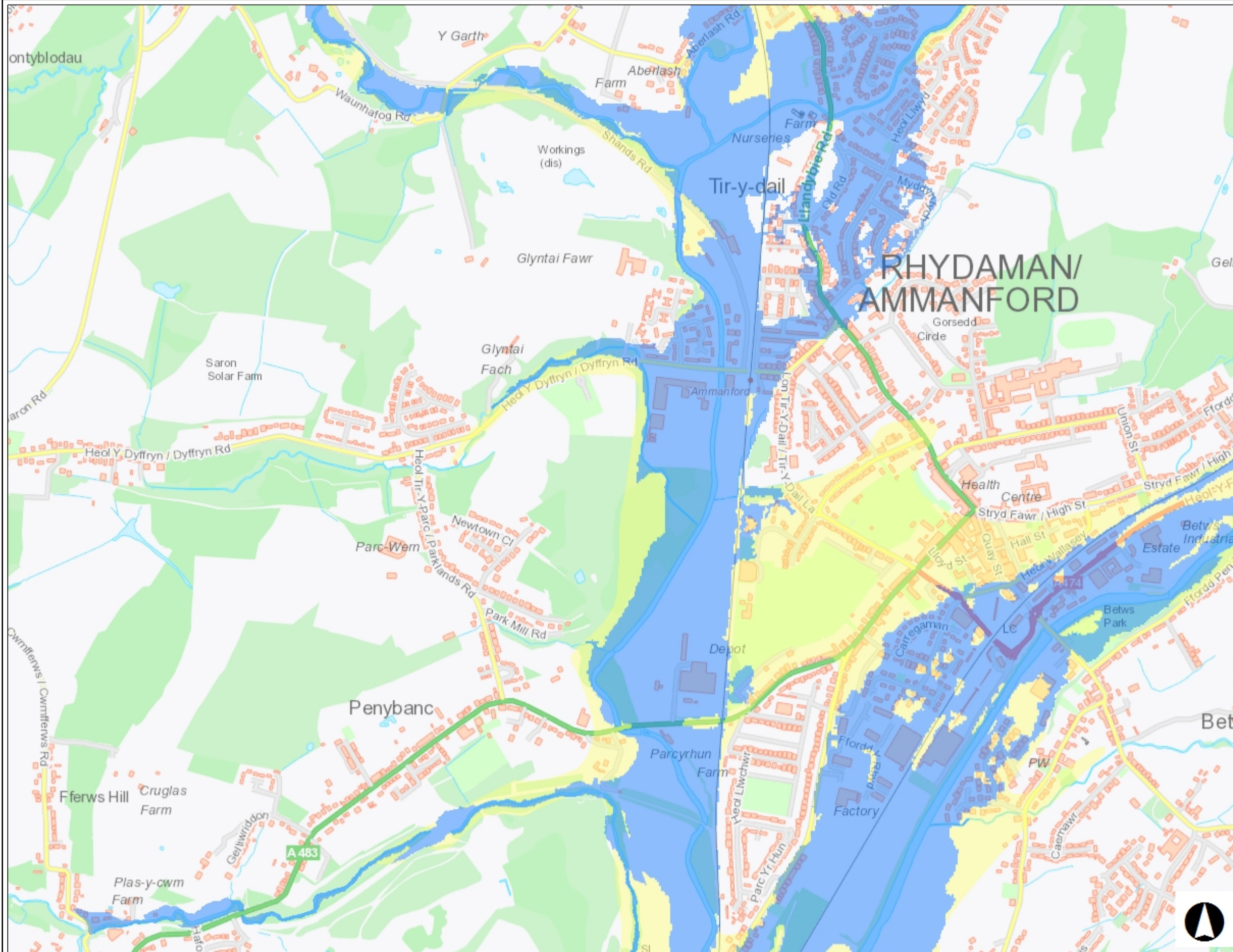
**APPENDIX A  
NATURAL RESOURCES WALES  
DEVELOPMENT ADVICE MAP (DAM)**



Development Advice Map - Dyffryn Road  
Phase 1

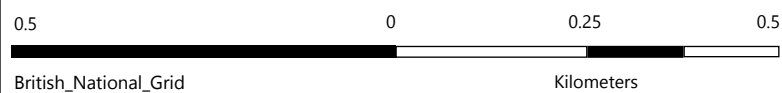
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- Zone C1
- Zone C2
- Zone B
- Zone A



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19/08/2021



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**APPENDIX B  
NATURAL RESOURCES WALES  
FLOOD RISK MAP – FLUVIAL FLOOD RISK**

Flood Risk Fluvial - Dyffryn Road Phase 1

Allwedd / Map Key

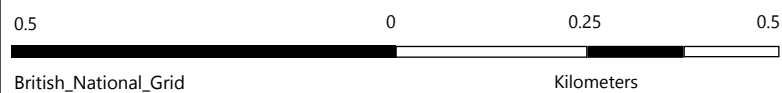
- + Flood Defence Locations
- Flood Risk from Rivers - Extent

  - High
  - Medium
  - Low



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16/08/2021







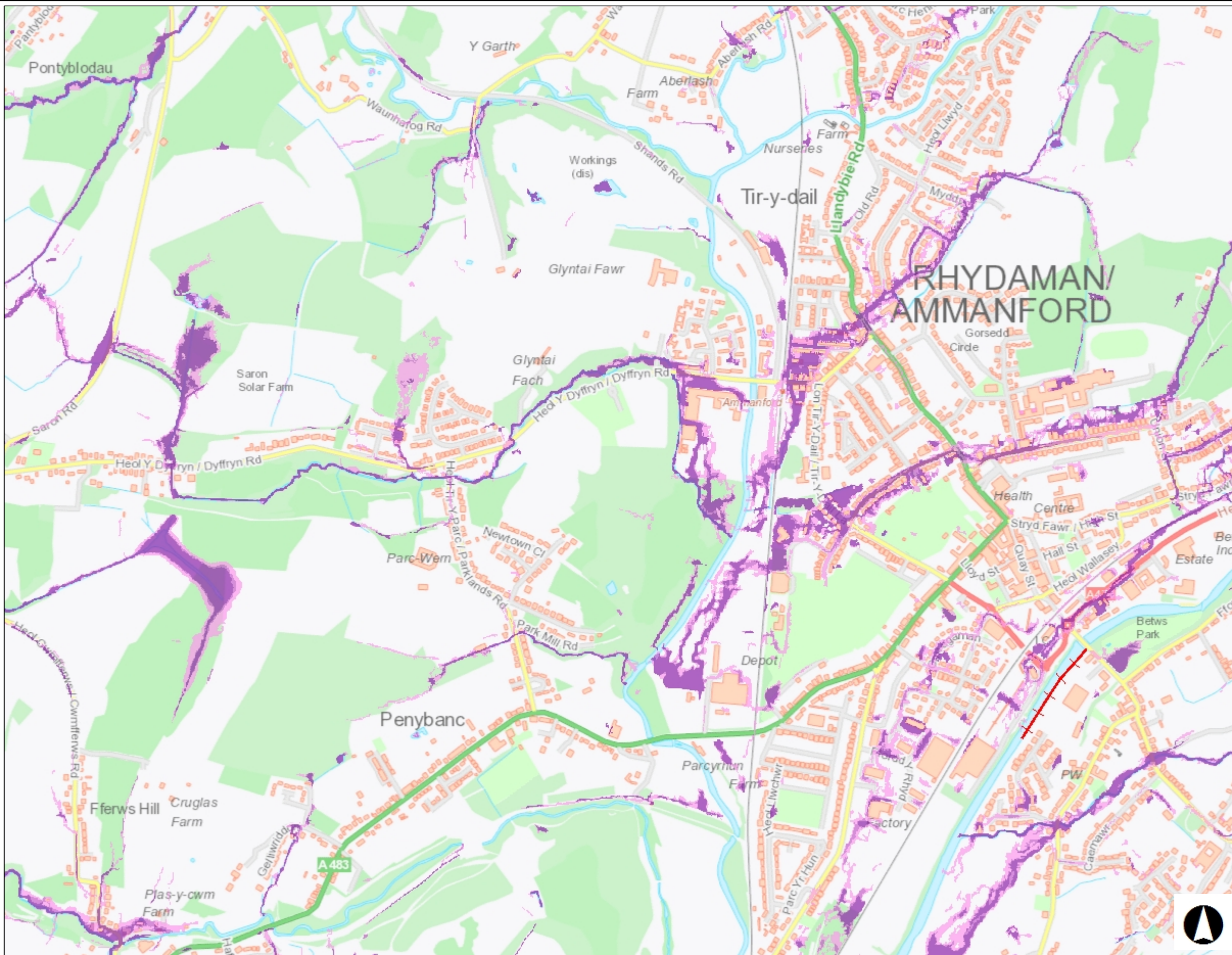
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**APPENDIX C**  
**NATURAL RESOURCES WALES**  
**FLOOD RISK MAP – SURFACE WATER & SMALL WATERCOURSES FLOOD RISK**

Flood Risk Small Watercourses - Dyffryn Road Phase 1

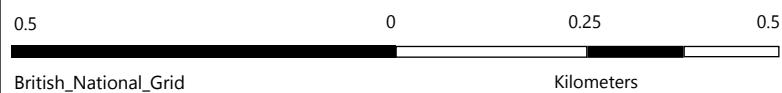
Allwedd / Map Key

-  Flood Defence Locations
- Flood Risk from Surface Water & Small Watercourses - Extent**
-  High
-  Medium
-  Low



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16/08/2021






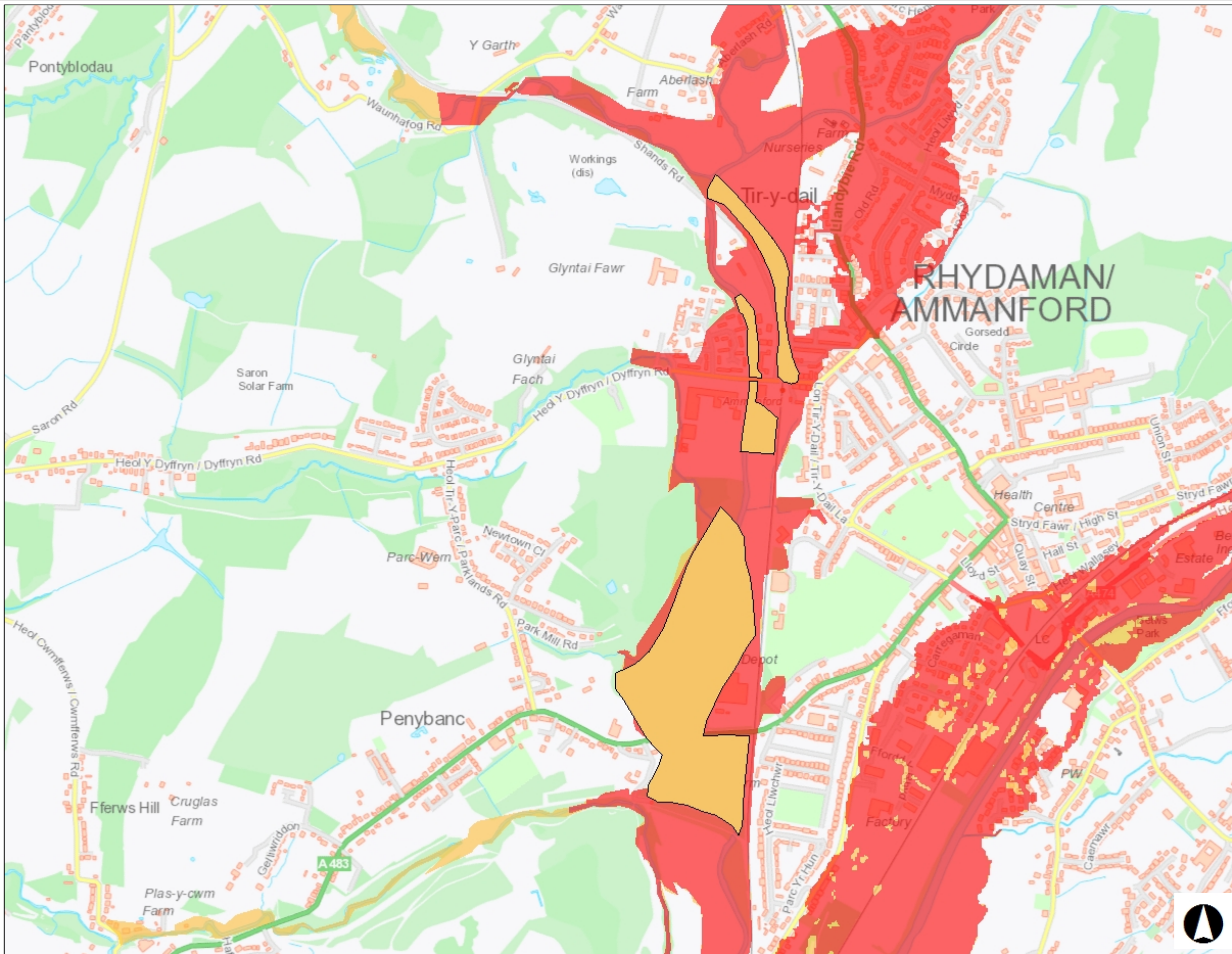
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**APPENDIX D  
NATURAL RESOURCES WALES  
FLOOD RISK MAP – RECORDED FLOOD EVENTS & WARNINGS**

Recorded Flood Events & Warnings - Dyffryn Road Phase 1

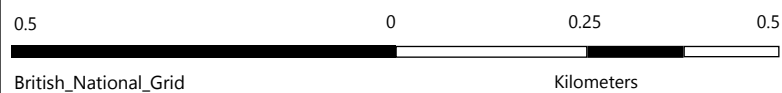
Allwedd / Map Key

-  Recorded Flood Extents
-  Flood Warning Area
-  Flood Alert Area



Graddfa / Scale at A3 1:10,000

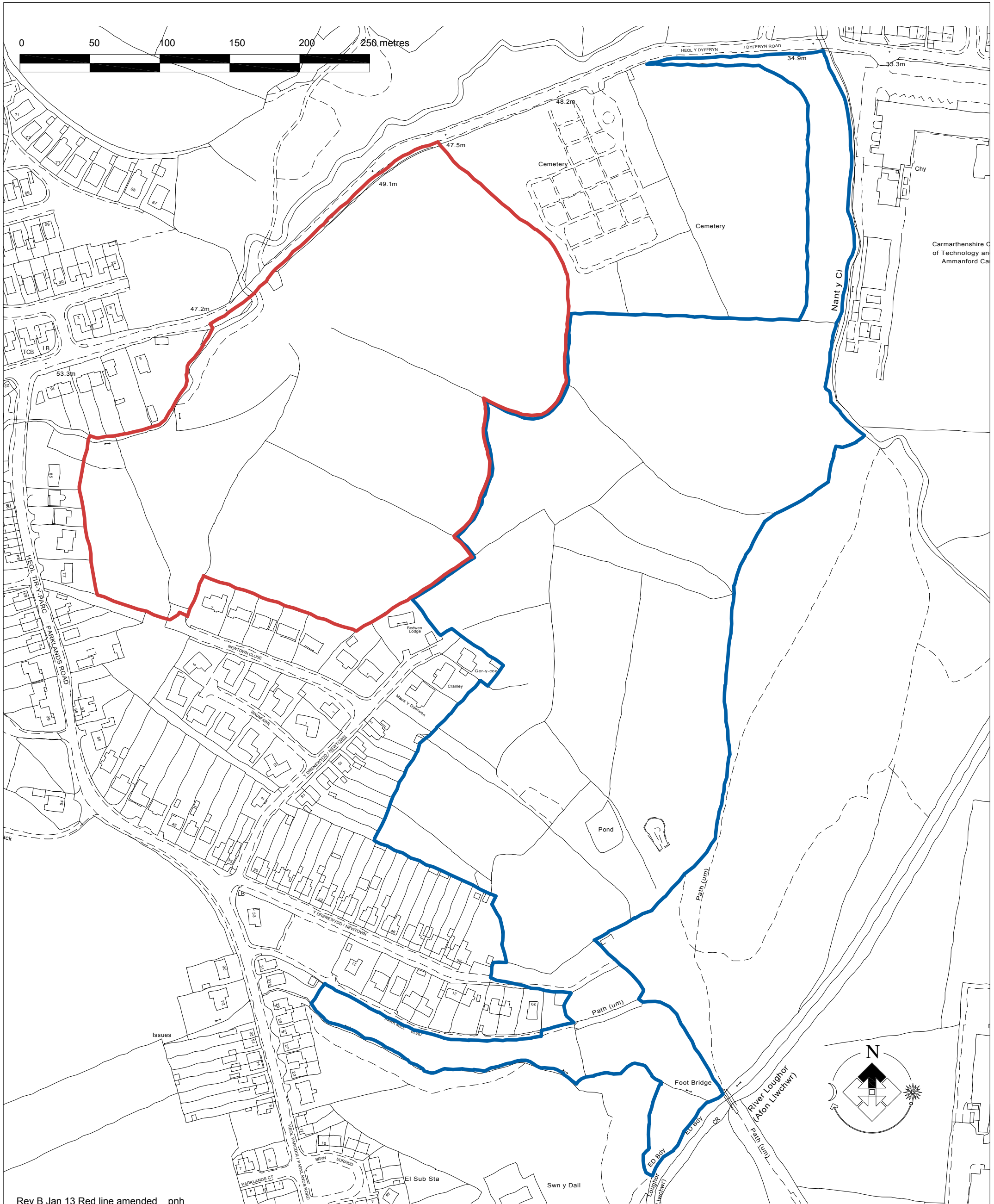
Dyddiad / Date  
16/08/2021



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**APPENDIX E  
CADSQUARE ARCHITECTURAL AND URBAN DESIGN  
SITE LOCATION PLAN (ALL PHASES)**





Rev B Jan 13 Red line amended pnh  
 Rev A Dec 09 Red line amended along route of Nant-Y-Ci pnh

Client:

**SWALLOW  
 PROPERTY  
 DEVELOPMENTS**

Site Address:  
 DYFFRYN FARM  
 AMMANFORD  
 SWANSEA  
 CARMARTHENSHIRE

Drawing Number: 09-012/01 REV B

Date: AUGUST 2009

Status:

**PLANNING**

AutoCAD Reference: CADREF

Drawn:

Description:

LOCATION PLAN

Scale: 1:2500 @ A3

Checked:

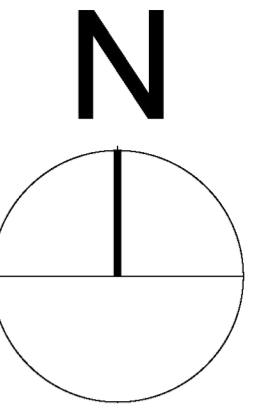
**Cadsquare Midlands Ltd**  
 The Stables  
 Woodbury Lane  
 Norton  
 Worcestershire  
 WR5 2PT  
 t: 01905 761580  
 f: 01905 764051  
 www.cadsquaremidlands.co.uk



**ARCHITECTURAL AND URBAN DESIGN**

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**APPENDIX F  
SPRING DESIGN  
ARCHITECT SITE LAYOUT - PHASE 1**



**Site key**

- Site Boundary
- 1.8m High Timber Closeboard Fence
- SW 1.8m High brick screen wall with brick piers
- Indicates Areas of brick paviers
- Indicates Rain Gardens
- Indicates potential locations for tree planting
- Indicates Existing trees

**Schedule of Accommodation**

Affordable					
Ref	Description	Sqft	M <sup>2</sup>	No.	
211	1 Bed Flat	540	51	6 No.	
321(Bung)	2 Bed(Bungalow)	861	80	3 No.	
421	2 Bed	882	82	17 No.	
531	3 Bed	1011	92	4 No.	
741	4 Bed	1227	114	7 No.	
				<b>Total</b>	<b>37 No.</b>



**Status: PLANNING**

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rev	date	description
A	07.07.21	Turning heads adjacent to plots 5 & 22 added
B	30.07.21	House type mix amended
C	24.08.21	321 Bungalows amended

by  
CC  
CC  
CC

Drawn: CC  
Checked:  
Date: November 2020  
Scale: 1:500 @ A1 & 1:1000 @ A3

Client: Dyffryn Road  
Project: Pobl Group  
Title: Site Layout  
Ref: 2501-13(02)113

Rev: C



Unit 2 Chapel Barns | Merthyr Mawr  
Bridgend | CF32 0LS | 01656 656267  
mail@spring-consultancy.co.uk

**APPENDIX G  
UK SUDS  
GREENFIELD RUN-OFF ESTIMATION CALCULATIONS**

Calculated by:

Site name:

Site location:

**Site Details**

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

**Runoff estimation approach**

**Site characteristics**

Total site area (ha):

**Methodology**

Q<sub>BAR</sub> estimation method:

SPR estimation method:

**Soil characteristics**

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

**Hydrological characteristics**

	Default	Edited
SAAR (mm):	1443	1443
Hydrological region:	9	9
Growth curve factor 1 year:	0.88	0.88
Growth curve factor 30 years:	1.78	1.78
Growth curve factor 100 years:	2.18	2.18
Growth curve factor 200 years:	2.46	2.46

**Notes**
**(1) Is Q<sub>BAR</sub> < 2.0 l/s/ha?**

When Q<sub>BAR</sub> is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

**(2) Are flow rates < 5.0 l/s?**

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

**(3) Is SPR/SPRHOST ≤ 0.3?**

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

**Greenfield runoff rates**

	Default	Edited
Q <sub>BAR</sub> (l/s):	15.4	15.4
1 in 1 year (l/s):	13.55	13.55
1 in 30 years (l/s):	27.41	27.41
1 in 100 year (l/s):	33.56	33.56
1 in 200 years (l/s):	37.87	37.87

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at [www.uksuds.com](http://www.uksuds.com). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [www.uksuds.com/terms-and-conditions.htm](http://www.uksuds.com/terms-and-conditions.htm). The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

# Flood Consequence Assessment

Dyffryn Road, Ammanford



Consulting Civil & Structural Engineers

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## APPENDIX H DEVELOPMENT ADVICE MAP & SITE LAYOUT OVERLAY

