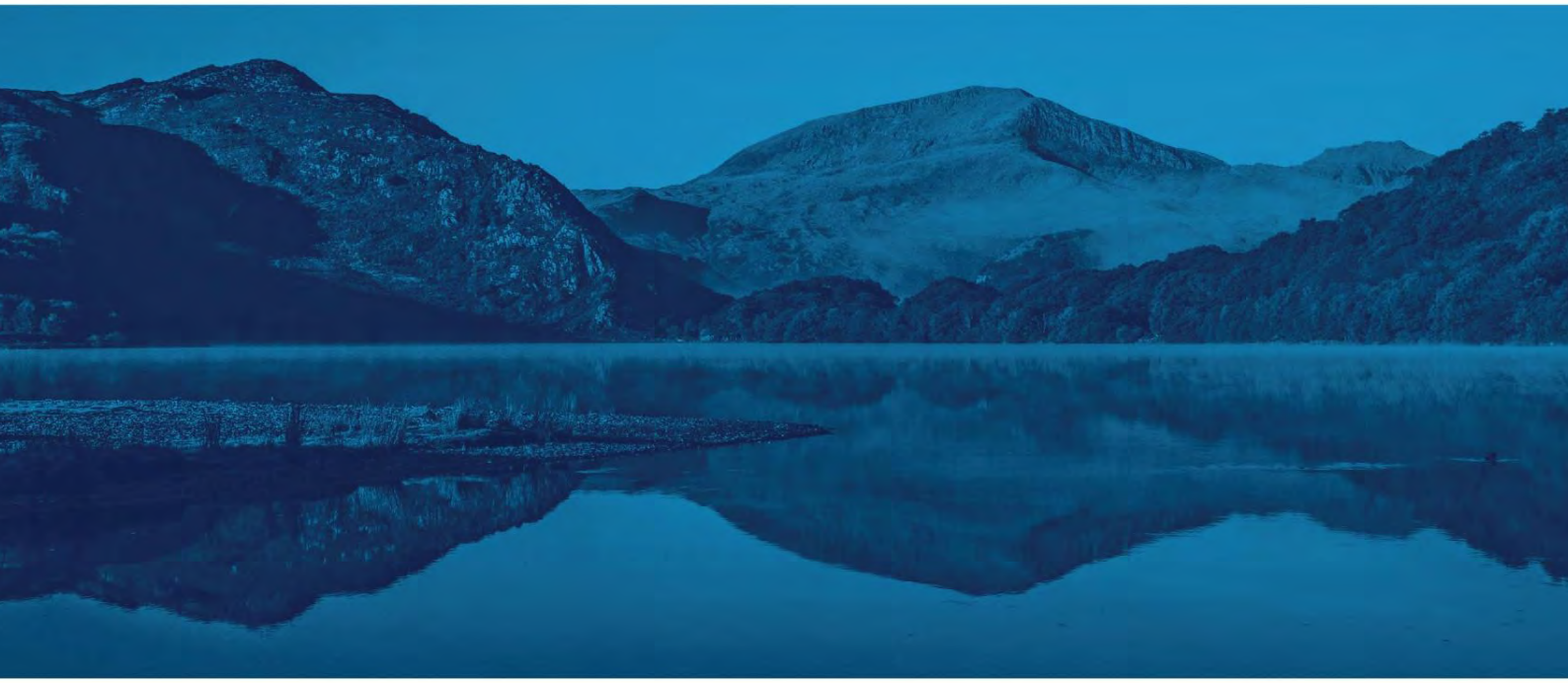
Wrexham Road, Abermorddu

Flood Consequences Assessment

April 2017



Assessment / Modelling / Design

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Introduction

Waterco Consultants have been instructed to prepare a Flood Consequences Assessment (FCA) in respect of a proposed residential development on land at Wrexham Road, Abermorddu, Wrexham, LL12 9DG.

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 Flood Risk.

This report has been prepared in consultation with Natural Resources Wales (NRW) and Flintshire County Council (FCC).

Site Description

The 3.53ha site is located at National Grid reference: 330786E 356737N. A location plan and an aerial image are included in Appendix A.

The site is greenfield and is bordered by undeveloped land to the north and west, Wrexham Road and residential properties to the east and Abermorddu County Primary School to the south. Access to the site is provided from Wrexham Road.

Abermorddu Stream intersects the site at the western boundary, flowing south-east. The Abermorddu Stream is culverted on site under a field access track. This culvert is a 300mm diameter pipe culvert referred to as the 'Access Track Culvert' herein. The route of Abermorddu Stream through the site and the location of the access track culvert are shown on the location plan in Appendix A.

Local Topography

A Topographical Survey has been undertaken by Powers & Tiltman Ltd in July 2016 and is included in Appendix B. The Topographical Survey shows that the site slopes from a high of 95.26metres Above Ordnance Datum (m AOD) in the west to a low of 87.90m AOD in the south-east.

Development Proposals

The proposed development is for 83 residential dwellings with associated access and soft landscaping. The proposed access road leading to the southern area of the development crosses Abermorddu Stream. The existing Access Track Culvert (pipe) will be replaced with a larger and longer box culvert (Access Road Culvert). A proposed development plan is included in Appendix C.

Ground levels on site will be altered to accommodate the development. Land will be raised in development area B (shown on the proposed development plan in Appendix C) to a minimum of 90.74m AOD. The proposed access road north and south of Abermorddu Stream will also be raised to a minimum of 90.47m AOD.

Consultation

Correspondence from NRW in July 2016 included in Appendix D outlines the requirement for a FCA at this site. NRW state:

'You'll be aware that one of the limitations of our Flood Risk Mapping is that any watercourses with a catchment less than 3km^2 have not generally been assessed in our national mapping exercise. For this reason, the site is shown to lie outside of the extreme flood risk outline and hence shown as Zone A on the Development Advice Map. The updated Flood Map for Surface Water Flooding, shows that the site lies partially within an area at risk of surface water flooding.

I'd agree that there may be some merits in creating a development free "green corridor" through the site, and such a proposal could reduce potential flood risks to the development. However, as the flood risks from those watercourses are currently undefined and "unknown", it would be difficult to assume that such a measure would be sufficient to protect the development from any potential flood risk. Therefore, it would be advisable for an FCA to be undertaken to assess the potential food risks from the watercourse(s) over its development lifetime (i.e. climate change will need to be considered). It would be preferable for a detailed hydraulic and hydrological assessment to be undertaken to inform the FCA.

Consideration of culvert blockage should also be assessed i.e. if the culverted sections within the site / in [the] vicinity of the site became blocked during flood conditions, what would the potential flood risks and flood consequences be, and could mitigation measures be incorporated into the development to reduce any identified risks.'

Correspondence from FCC is included in Appendix E. With regards to a proposed box culvert in place of a 300mm pipe culvert, FCC state:

'…We are happy in principle with the proposed box culvert (structure 2). We could deal with the details as part of the flood defence consent application process.

I presume this new culvert was the structure you were also referring to in relation to a screen or lack of. We would recommend a screen or similar at structure 3 given the length, size and probably condition of the downstream pipework.'

Flood Zone Category and Policy Context

Flood Zone Category

The Welsh Government Development Advice Map included in Appendix F shows that the site is located within Flood Zone A – an area considered to be at little or no risk of fluvial or tidal flooding, with a less than 0.1% (1 in 1000) annual probability of flooding.

The NRW 'Flood Risk – Rivers and Sea' map included in Appendix F shows that 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 flooding.

However, and as stated by NRW, any watercourses with a catchment less than 3km², such as Abermorddu Stream, have not generally been assessed by NRW in their national mapping exercise. For this reason, the site is shown to lie outside of the extreme flood risk outline and hence shown as Zone A on the Development Advice Map.

Development Vulnerability Classification

The proposed residential development is considered to be 'highly vulnerable' development in accordance with Figure 2 of the Welsh Government's Technical Advice Note 15 – Development and Flood Risk (TAN15).

TAN15 states that highly vulnerable development can be considered in Flood Zone A subject to satisfying specific TAN15 acceptability criteria. However, as requested by NRW, an assessment of the watercourses within the vicinity of the site is required. In accordance with TAN15, no residential

development should be proposed within Flood Zone C2 – land assessed as having a 0.1% annual probability or greater of fluvial flooding.

Local Policy

The Flintshire Unitary Development Plan (FUDP) is the adopted development plan for the 15 year period 2000 – 2015. The aim of the FUDP is to provide a framework for making rational and consistent decisions on planning applications and to guide development to appropriate locations. Although the adopted UDP expired at the end of 2015, it remains the adopted development plan for the County. The FUDP includes the following policy in relation to flood risk;

EWP 17 Flood Risk

Development which would seek to reduce the impact and frequency of flood risk to areas at risk of flooding will be generally supported provided:

a. *the design and character of the works is appropriate to the locality:*
b. *the works do not adversely impact on interests of acknowledged nature conservation and recreation importance; and*
c. *the works do not increase flood risk elsewhere*

Other development within areas at risk of flooding will only be permitted where the Council considers that the development is justified and is satisfied that:

a. *the consequences of a flooding event can be effectively managed;*
b. *it would not increase the risk of flooding elsewhere;*
c. *appropriate alleviation or mitigation measures have been incorporated into the proposal and will be available for the lifetime of the development; and*
d. *it would not have any adverse effects on the integrity of tidal and fluvial flood defences.*

Local guidance documents including the Flintshire County Council Preliminary Flood Risk Assessment (PFRA) (June 2011) have been reviewed for site specific information.

Sources of Flooding and Probability

Fluvial

Abermorddu Stream intersects the site at the western boundary. Abermorddu Stream flows south-east through the site and discharges into a culvert known as Wrexham Road Culvert at the south-eastern boundary. Abermorddu Stream discharges into the River Alyn approximately 320m east of the site.

A tributary of Abermorddu Stream is located immediately west of the site. The tributary discharges into Abermorddu Stream to the west of the site.

Fluvial flooding could occur if Abermorddu Stream or its tributary overtopped their banks during or following an extreme rainfall event. Flooding could also occur from a blockage at the inlet of the culvert located on site.

The PFRA contains no records of fluvial flooding at the site.

Waterco Modelled Flood Levels

An integrated 1-Dimensional / 2-Dimensional (1D/2D) hydrodynamic model of Abermorddu Stream, its tributary and the surrounding floodplain was constructed by Waterco Consultants using the latest MIKE FLOOD Software (MIKE2016 SP3) to estimate flood levels, extents, depths, velocities and hazards for the site. This report should be read in conjunction with the Waterco Hydraulic Modelling Report, dated April 2017 (document ref: w3246-170419-HMR).

The modelling results, including flood depth, velocity, hazard rating and water depth variation (showing variance between pre- and post-development scenarios) maps are included in Appendix G.

Figure 1 overleaf shows that a small area in the south-eastern extent of the site is at risk of flooding during the 5% Annual Exceedance Probability (AEP) event. Flood depths are generally below 150mm, with maximum flood depths of 400mm adjacent to Wrexham Road at the south-eastern boundary of the site. Maximum velocities are 0.85 m/s.

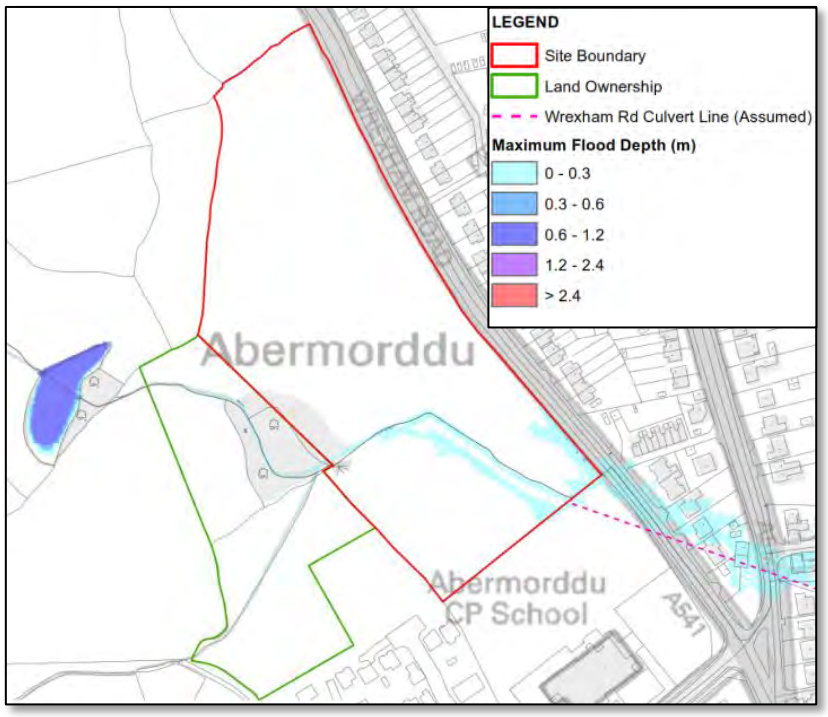

Figure 1 – Maximum Flood Depth – 5% AEP event

Figure 2 overleaf shows that similar to the 5% AEP event, the south-eastern extent of the site, local to Abermorddu Stream, is at risk of flooding during the 1% AEP event. Flood depths are generally below 150mm, with maximum flood depths of 430mm adjacent to Wrexham Road at the south-eastern boundary of the site. Maximum velocities are 1.2 m/s. The flood hazard rating across most of the flood extent is 'Caution' with a small area considered 'Danger For Some' adjacent to Wrexham Road.

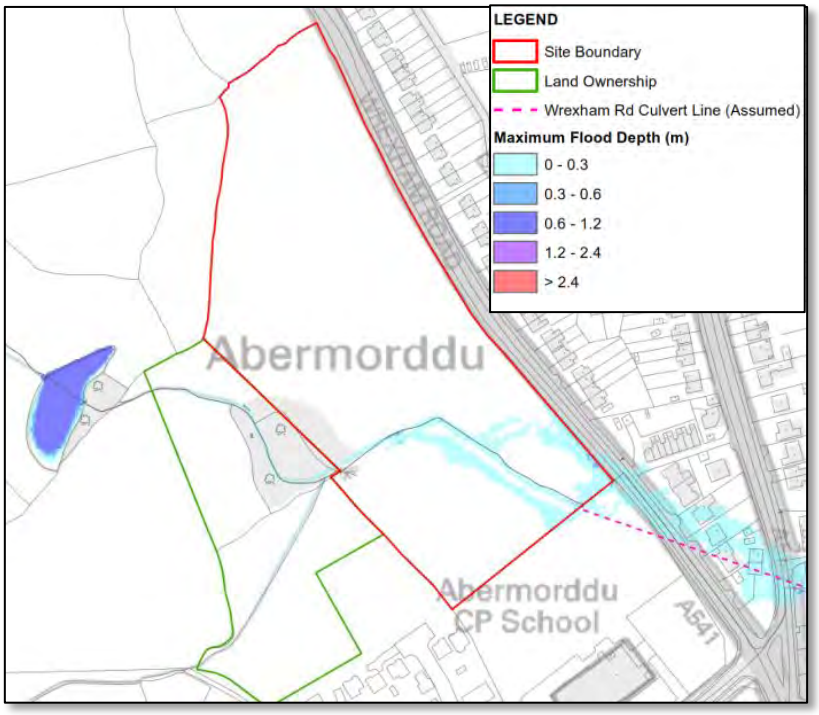

Figure 2 – Maximum Flood Depth – 1% AEP event

Figure 3 overleaf shows the flood extent is slightly increased during the 1% AEP plus 20% climate change (CC) event when compared to the 1% AEP event. Flood depths are generally below 150mm, with maximum flood depths of 440mm adjacent to Wrexham Road at the south-eastern boundary of the site. Maximum velocities within floodplain are 1.2 m/s.

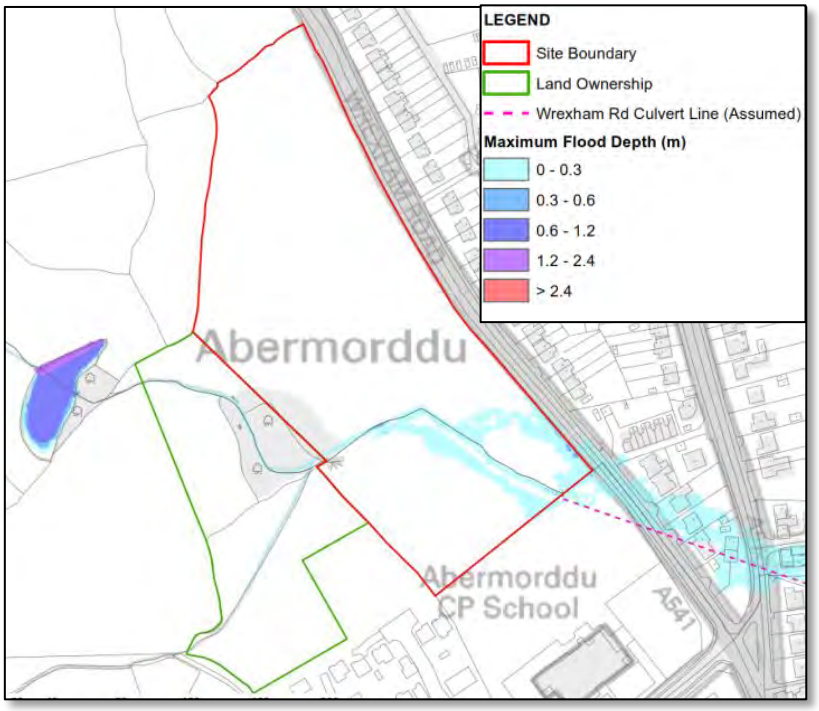

Figure 3 – Maximum Flood Depth – 1% AEP + 20% CC event

During the 1% AEP plus 40% CC event, the flood extent remains similar to the 1% AEP plus 20% CC event. Flood depths of 450mm are estimated adjacent to Wrexham Road and maximum velocities are 1.26 m/s.

Figure 4 overleaf shows that the flood extent is slightly increased during the 0.1% AEP event when compared with the 1% AEP plus 20% CC event. Flood depths are generally below 150mm, with maximum flood depths of 460mm adjacent to Wrexham Road at the south-eastern boundary of the site. Maximum velocities within floodplain are 1.4 m/s. The flood hazard rating across most of the flood extent on-site is 'Caution' with some small areas considered 'Danger For Some'.

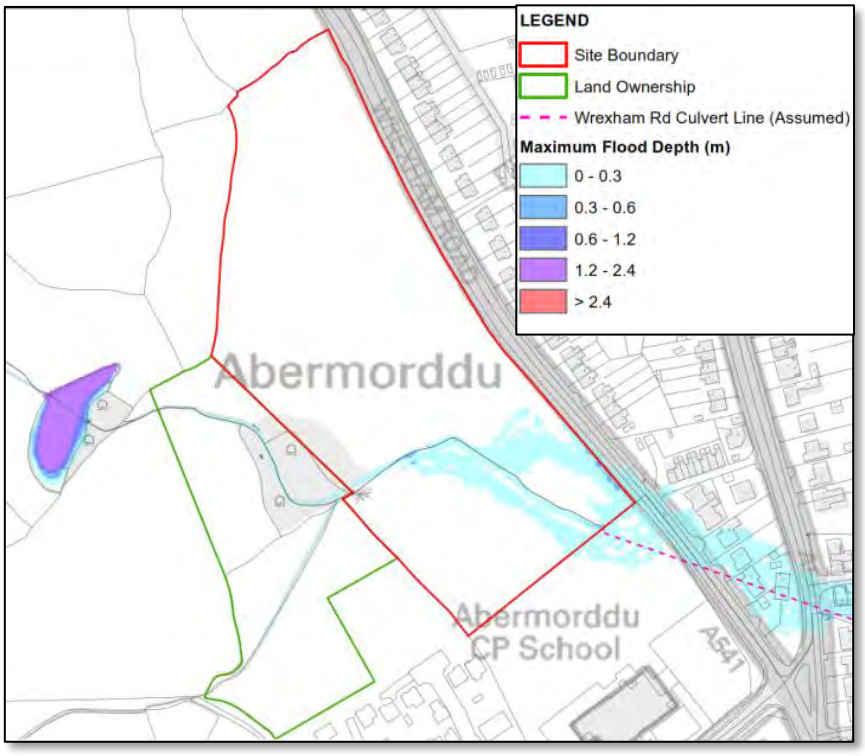

Figure 4 – Maximum Flood Depth – 0.1% AEP event

The majority of the site (circa 85% - 90%) is flood free during all events up to and including the 0.1% AEP event.

Proposed Site Arrangement

It is proposed to raise site levels in the south-western extent of the site to 90.74m AOD. It is also proposed to form an access road crossing Abermorddu Stream. An existing 300mm pipe culvert associated with an existing access track over Abermorddu Stream will be replaced with a box culvert. The proposed access road will be raised to 90.64m AOD.

During all simulated proposed site layout simulations, the increased capacity of the box culvert (Access Road Culvert) results in flow staying within the channel where water was previously spilling over the right bank upstream of the Access Track Culvert. As a result of the changes, flood water is now spilling over the left bank of Abermorddu Stream and directed into land in the south-eastern extent of the site where no development is proposed. The proposed access is not at risk of fluvial flooding during any of the modelled simulations under free-flowing conditions.

Figure 5 overleaf shows the flood extent during the 0.1% AEP event (the most extreme event considered). Flood depths are generally below 100mm, with maximum flood depths of 460mm in the south-eastern boundary adjacent to Wrexham Road, similar to the existing scenario. Maximum

velocities within the floodplain are 1.12 m/s. The flood hazard rating across most of the flood extent on-site is 'Caution', with the exception of a small area adjacent to Wrexham Road which is classed as 'Danger For Some' and 'Danger for Most'.

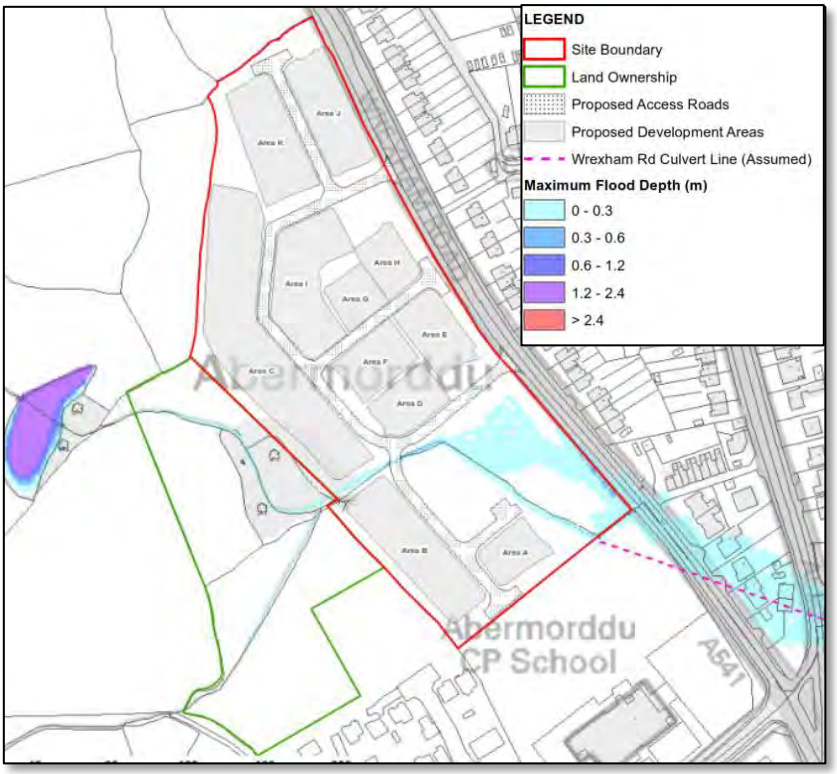

Figure 5 – Maximum Flood Depth – 0.1% AEP event – Proposed Site Layout

The 'Maximum Depth Difference' mapping included in Appendix G shows that the increase in channel and culvert capacity has led to a reduction in the flood extent across the site and has displaced floodwaters into an area on the site where no development is proposed (i.e. south-east corner). Figure 6 overleaf shows the flood depth variation on site during the extreme 0.1% AEP event. No additional flooding is shown to third party properties.

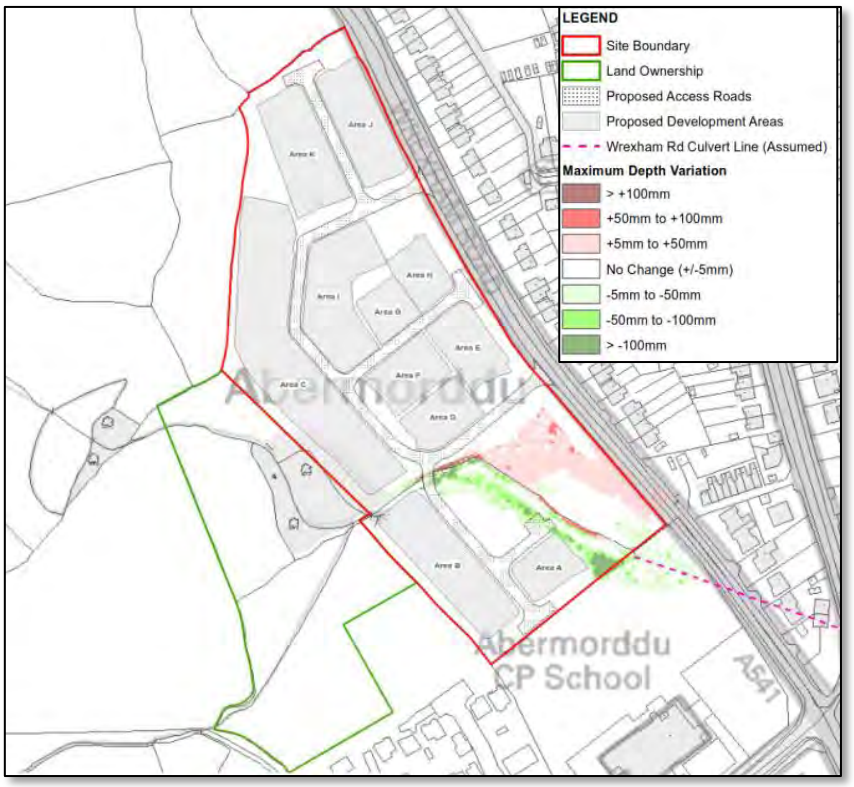

Figure 6 – Maximum Flood Depth – Maximum Flood Depth Variation (Existing vs Proposed Development Scenario) – 0.1% AEP event

Blockage Scenarios

Blockage scenarios simulating a 100% blockage of the Wrexham Road Culvert and the proposed Access Road Culvert during the extreme 0.1% AEP event have been simulated.

As shown in Figures 7 & 8 overleaf, during a 100% blockage of the Wrexham Road Culvert or the proposed Access Road Culvert, all proposed housing areas are shown to be flood free.

Flooding is shown to a minimal extent of a proposed road located adjacent to development area B. Flood water spills onto the road and is directed east onto lower ground downstream. Estimated flood depths on the road are less than 60mm and the hazard rating is classified as 'Low'.

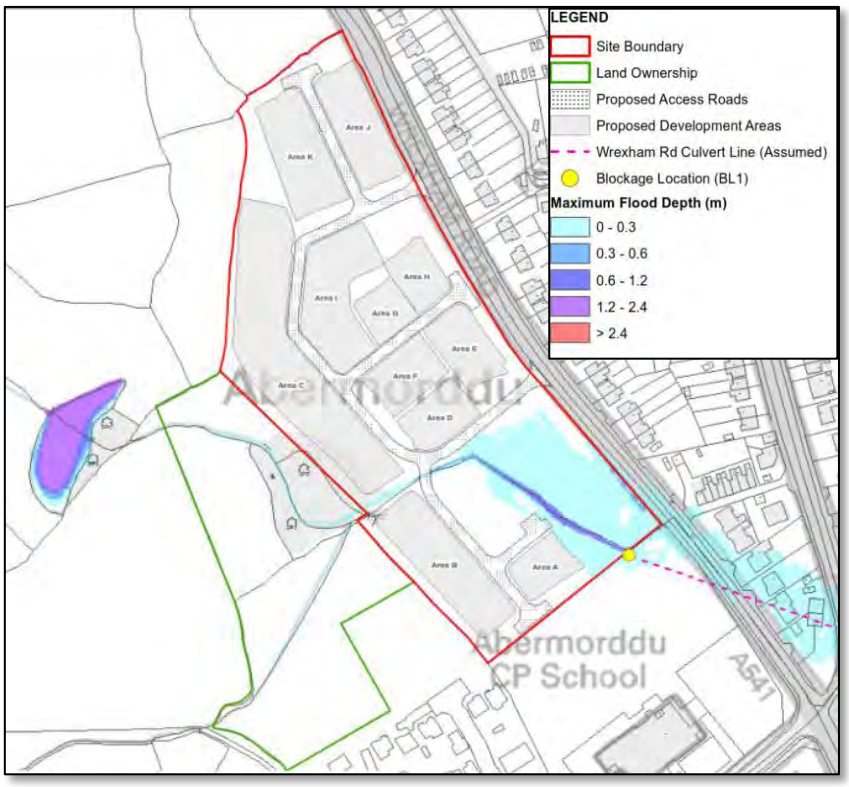

Figure 7 – Maximum Flood Depth – 0.1% AEP event – Proposed Site Layout 100% Blockage Wrexham Road Culvert

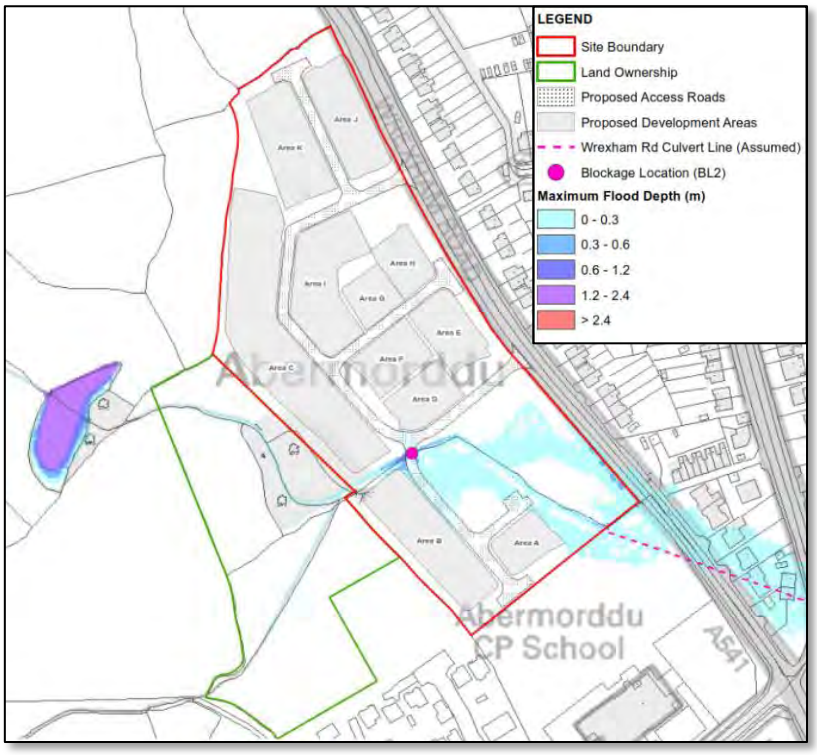

Figure 8 – Maximum Flood Depth – 0.1% AEP event – Proposed Site Layout 100% Blockage Access Road Culvert

Tidal

The site is situated at a minimum of 87.9m AOD and is significantly above sea level. The site is therefore not at 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 'Surface Water Flood Map' (Appendix F) shows that the majority of the site is at very low risk of surface water flooding, meaning it has a less than 0.1% annual probability of flooding. The eastern extent of the site, limited to land immediately adjacent to Wrexham Road, is identified at low risk of surface water flooding, meaning it has between a 1% and 0.1% annual probability of flooding.

The PFRA contains no records of surface water flooding at the site. Any potential surface water flooding arising at or near to the site would be directed south-east, away from the site, following the local topography.

It can be concluded that the risk of surface water flooding is low.

Sewer Flooding

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 Dŵr Cymru Welsh Water sewer records show that there are no public sewers crossing the site. There is a 125mm public combined rising main located immediately east of the site within Wrexham Road.

The PFRA contains no records of sewer flooding at the site. The flow within the 125mm public combined rising main is controlled by a pumping station upstream. Therefore, there is limited flood risk associated with this structure.

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

Groundwater Flooding

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 contains no records of groundwater flooding at or near to the site. It can therefore be concluded that the risk of groundwater flooding is low.

Artificial Sources of Flooding

There are no canals in the immediate vicinity of the site. The online NRW 'Risk of Flooding from Reservoirs' map shows that the site is not at risk of flooding from reservoirs. It can therefore be concluded that there is no risk of flooding from artificial sources.

Summary of Potential Flooding

It can be concluded that fluvial flooding is the main potential source of flood risk at this site. The associated risk has been used to inform mitigation design as discussed further in this report.

Mitigation

The majority of the developable site area is located outside of the extreme 0.1% AEP flood extent. It is proposed to raise land in the location of development area B (south-western extent of the site). This will ensure that all residential dwellings and the site access roads in this area will be located outside the extreme 0.1% AEP flood extent and 1% AEP plus 40% CC flood extent. No properties or access roads will be located in an area at flood risk.

The proposed layout and land raising will ensure that all development is situated within Flood Zone A and will therefore be compliant with TAN15.

A residual risk of flooding to a proposed access road arises from a 100% blockage of a proposed Access Road Culvert. During a blockage event coinciding with a 0.1% AEP event, flood depths on the road are minimal (60mm) and the flood hazard rating is low.

In accordance with Building Regulations, finished floor levels should be set 150mm above surrounding ground levels.

Flood Warnings and Evacuation

The NRW Flood Warnings service does not cover this area. It is considered safe for residents to remain within properties and utilise all proposed access roads during a flooding event. Residents should be made aware that the south-eastern extent of the site (undeveloped area) may be prone to flood risk.

Impact on Flood Risk Elsewhere

It is proposed to raise site levels in the south-western extent of the site. The associated impact on flood risk elsewhere has been assessed within the hydraulic modelling undertaken by Waterco Consultants, with flood depth variation maps included in Appendix G.

In the areas surrounding the site, model results show that there is no increase in flood extent and/or maximum depth to any existing buildings. During the 0.1% AEP event there is a small area along the already flooded section of Wrexham Road showing a minimal increase in flooding (<15mm). However, model outputs show existing flood risk in the school playing fields to the south of the proposed development to be reduced. Overall it can be concluded that the development will not negatively impact flood risk elsewhere.

Other Considerations

The developer should consider installation of a debris screen at the Wrexham Road Culvert.

The proposed site layout design should include provision of maintenance access to Abermorddu Stream and any associated culvert structures.

Conclusions

The proposed development is for 83 residential dwellings with associated access and soft landscaping. It is also proposed to replace an existing pipe culvert (beneath a field crossing) with a larger and longer box culvert (beneath a proposed access road). Site level raising is also proposed in the south-western extent of the site.

The site is located within Flood Zone A – an area considered to be at little or no risk of fluvial or tidal flooding, with a less than 0.1% (1 in 1000) annual probability of flooding. It is understood that existing flood mapping does not take into account flood risk from Abermorddu Stream which intersects the site.

Detailed hydraulic modelling of Abermorddu Stream and its tributary has been undertaken by Waterco Consultants and shows that the majority of the site is flood free during all modelled events up to and including the 0.1% Annual Exceedance Probability (AEP) event, including 100% blockage of the Wrexham Road and Access Road Culverts. The south-eastern extent of the site is shown at flood risk.

It is proposed to raise land levels in the south-western extent of the site. The land raising increases the flood extent in the south-eastern extent of the site. Flood depths are generally less than 150mm. No development is proposed in the south-eastern extent of the site. All development including access will be set outside of the 1% AEP plus 40% climate change and 0.1% AEP flood extents.

A residual flood risk arises from a 100% blockage of the Access Road Culvert coinciding with an extreme 0.1% AEP event. During this event flood water flows over the proposed access road with estimated depths of less than 60mm. The hazard rating on the road is low. This event does not affect any proposed buildings.

In order to mitigate against the identified flood risk, it is proposed to raise ground levels in the location of development area B to 90.74m AOD. This will ensure the developable area of the site is located outside the extreme 0.1% AEP flood extent.

Raising ground levels and the replacement of a culvert structure is shown to have no increase in flood extent and/or flood depths to any existing buildings. A small area along an already flooded section of Wrexham Road is shown to have a minimal increase in flooding (<15mm). Flood levels are shown to decrease in the school playing fields south of the site.

During a flood event, it is considered safe for residents to remain within properties and utilise the sites access roads.

The development is compliant with TAN15.

Recommendations

1. Submit this Flood Consequences Assessment to the Planning Authority in support of the Planning Application;
2. Set finished floor levels 150mm above proposed ground levels;
3. Allow suitable maintenance access to Abermorddu Brook and its associated culvert structures within the layout design.

Appendix A – Location Plan & Aerial Image

N

Abermorddu

Abermorddu CP School

Abermorddu Farm

A541

0 25 50 100 150 200 250 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)
- Access Track Culvert
- Watercourse / Water Body

CLIENT:

FISHER GERMAN

waterco consultants

Waterco Ltd
Eden Court, Ruthin, LL15 1NJ

01824 702220
www.waterco.co.uk

SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

LOCATION PLAN

PLOT STATUS:	DATE:
FINAL	25/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:2,000 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV1C-BL1-100-V	A

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NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

CLIENT: FISHER GERMAN

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SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

AERIAL PLAN

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:2,000 (UNLESS STATED OTHERWISE)

PLOT NAME: w3246-Q1000-DEV1C-BL1-100-V

REV: -

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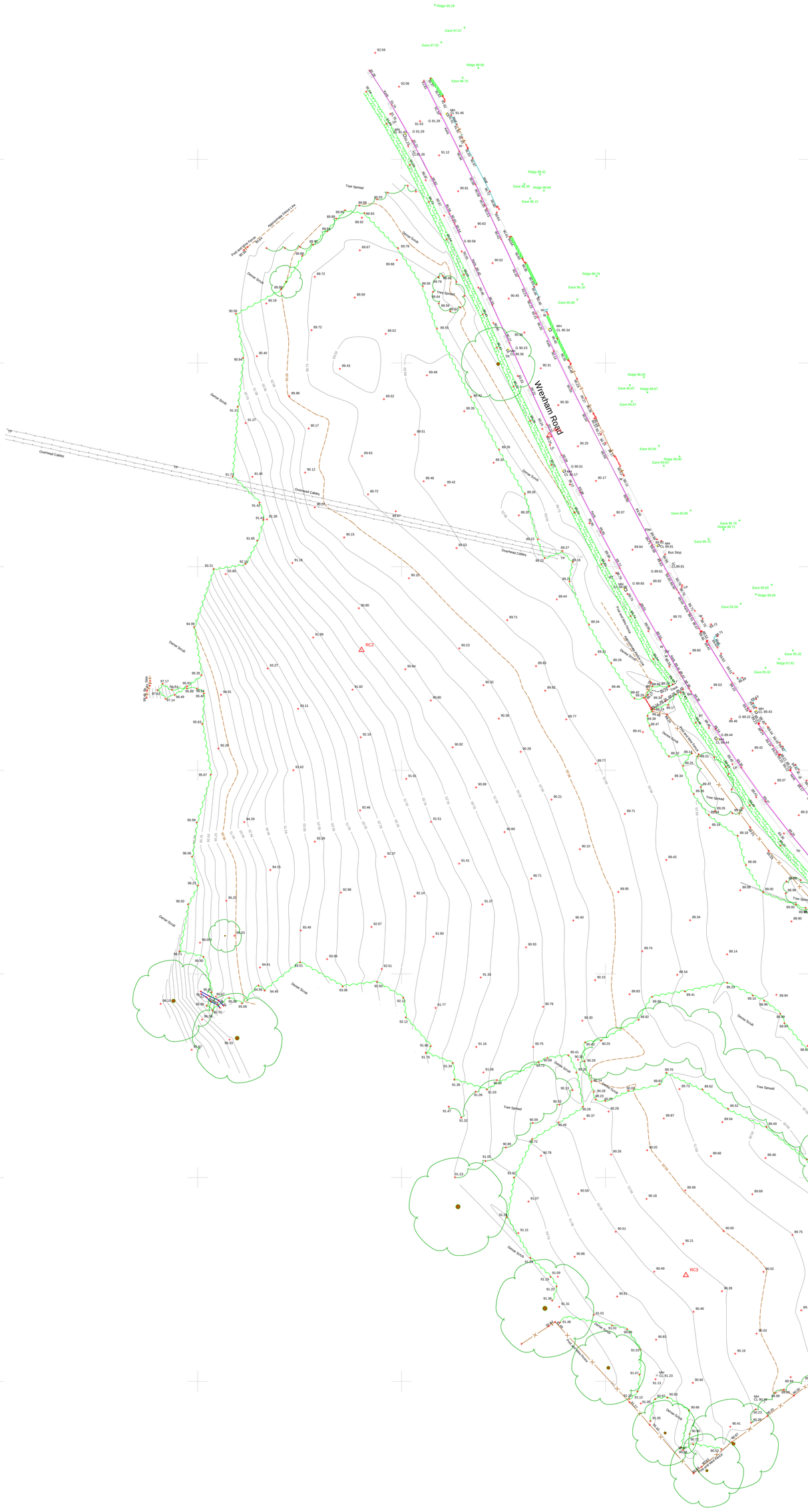
Appendix B – Topographical Survey



Legend

AV	Air valve
BH	Borehole
BOL	Bollard
BT	British Telecom cover
CATV	Cable television cover
CL	Cover level
DPC	Damp proof coarsing level
Earth/ER	Earthing rod
ELEC	Electric cover
EP	Electricity pole
Fence I/R	Iron railing fence
Fence C/B	Closeboard fence
Fence C/P&P	Concrete post & panel fence
Fence P/a	Palisade fence
Fence P/W	Post and wire fence
Fence P/R	Post and rail fence
Fence P/P	Post and panel fence
FFL	Finished floor level
F/B	Flower bed
FH	Fire Hydrant
G	Gulley
GAS	Gas cover
IC	Inspection chamber
IL	Invert level
INV	Invert level
LP	Lamp post
LT	Light
MH	Manhole
Nynex	Telecommunications cover
OSBM	Ordnance Survey Bench Mark
PTM	Parking ticket machine
RE	Rodding eye
RS	Road sign
Rtt wall	Retaining wall
SBX	Switch box
SP	Sign post
SPS	Safety playing surface
ST	Stop tap
SV	Service valve
TBM	Temporary Bench Mark
TP	Telegraph pole
TRP	Trial pit
TRL	Traffic light
W	Water cover
WL	Water level
WO	Wash out

SURVEY STATIONS

Name	Easting	Northing	Height
RC1	330786.217	356832.217	90.217
RC1A	330893.525	356676.626	88.693
RC2	330740.157	356779.492	91.243
RC3	330819.736	356626.013	90.420

KEY DIMENSIONS SHOULD BE CHECKED ON SITE BEFORE COMMENCEMENT OF ANY WORKS

NOTE

Grid and Levels
Related to OS
Via Active GPS Network

Amendments

	Date	Surveyor	Description of work

Powers & Tiltman Ltd
Land Surveyors

Meridian House
58/60 Hillside Road, Frodsham, Cheshire WA6 6AG
Tel: 01928 734473 Fax: 01928 735573
Email: mail@powerstiltman.co.uk
www.powerstiltman.co.uk

Wrexham Road

Abermorddu

Topographical Survey

Client : Fisher German

Surveyed By : RM	Date : 06/07/16	A0 @ 1:500
Drawn By : RM	Drawing No : 7558/01	
Checked By : MP	Amendment :	

Appendix C – Proposed Development Plan

N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

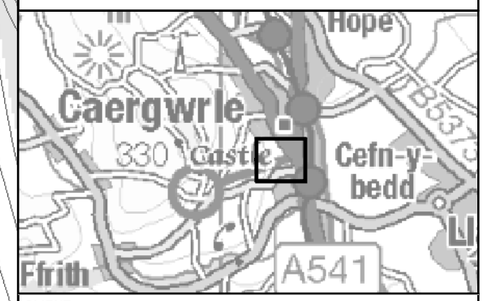
WREXHAM ROAD
CROSSWAYS
Abermorddu
Abermorddu CP School
Abermorddu Farm
A541

0 25 50 100 150 200 250 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Wrexham Rd Culvert Line (Assumed)
- Proposed Development Areas



CLIENT:
FISHER GERMAN

waterco consultants
Waterco Ltd
Eden Court, Ruthin, LL15 1NJ
01824 702220
www.waterco.co.uk

SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
PROPOSED DEVELOPMENT PLAN

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:2,000 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV1C-BL1-100-V	-

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OS MASTERMAP © CROWN COPYRIGHT AND DATABASE RIGHTS [2017] OS 0100042840

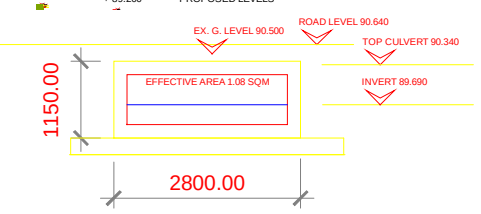
DWELLING TOTALS

A	TYPE A SEMI DETACHED	4 NO
B	TYPE B DETACHED	8 NO
C	TYPE B DETACHED	15 NO
D	TYPE A SEMI DETACHED	6 NO
E	TYPE A SEMI DETACHED	6 NO
F	TYPE A SEMI DETACHED	6 NO
G	TYPE A SEMI DETACHED	4 NO
H	TYPE A SEMI DETACHED	4 NO
I	TYPE A SEMI DETACHED	10 NO
J	TYPE A SEMI DETACHED	10 NO
K	TYPE A SEMI DETACHED	10 NO

DETACHED 23 NO
SEMI DETACHED 60 NO

KEY

- POS AND PLAY AREA
- STREAM WITH CLEAR ZONE
- PEDESTRIAN WAY
- EXISTING TREES RETAINED
- ROAD OVER STREAM CONCRETE BOX CULVERT INDICATIVE SIZE 2000 X 1000 MM
- OVERHEAD POWER LINE
- GREEN LINK
- PLOT FRONTAGE
- VEHICLE ENTRANCE
- AREA REFERENCE
- MODIFIED EXISTING FLOOD PLAIN 0.1% AEP EVENT WITH 100% BLOCKAGE DOWN STREAM
- PLANTING AND ATTENUATION AREA SURFACE WATER
- HOUSING AREA
- PLANTING AREA
- EXISTING OVER GROWN HEDGE AND UNDER GROWTH AREA
- PROPOSED POND
- OTHER LAND IN OWNERSHIP SITE LIMITS
- + 89.200 PROPOSED LEVELS



TYPICAL CULVERT SECTION

ARCHITECTS / URBAN DESIGNERS
CHAPEL HOUSE, CITY ROAD, CHESTER CH1 3AE
Tel : 01244 310388 Fax : 01244 325643
E-mail : enquiries@tnw-architecture.co.uk
Web : www.tnw-architecture.co.uk

SCALE BAR 0 20m 40m 60m 80m 100m 1:1000

ALL DIMENSIONS TO BE CHECKED ON SITE AND NOT SCALED FROM THIS DRAWING.
ALL ERRORS AND OMISSIONS TO BE REPORTED TO THE ARCHITECTS. ©COPYRIGHT

REV.	DATE	BY	DESCRIPTION
A	20/12/16	BWL	Flood storage area indicated and housing omitted in area "F"
B	6/02/17	BWL	Flood storage area indicated and housing altered to avoid flood plain
C	13/03/17	BWL	Flood storage and surface water area indicated and housing layout altered

DRAFT + OVERLAY

CLIENT/PROJECT:
THE CLARK ESTATE

LAND AT ABERMORDDU

DRAWING TITLE:
INDICATIVE SITE PLAN

NORTH

SCALE: 1:1000
1:500@A3

SIZE: A1

DATE: 05:07:16

DRAWN BY:

CHECKED BY:

JOB/DRAWING NUMBER:
1610 :SK05

REVISION: C

STATUS:

Appendix D – NRW Correspondence

Jordan Jones

Subject: FW: Wrexham Road, Abrmorddu

From: Knowles, Ryan [mailto:Ryan.Knowles@cyfoethnaturiolcymru.gov.uk]
Sent: 27 July 2016 11:38
To: Rhys Hughes <Rhys.Hughes@weetwood.net>
Subject: RE: Wrexham Road, Abrmorddu

Hi Rhys,

Thanks for your enquiry.

You'll be aware that one of the limitations of our Flood Risk Mapping is that any watercourses with a catchment less than 3km^2 have not generally been assessed in our national mapping exercise. For this reason, the site is shown to lie outside of the extreme flood risk outline and hence shown as Zone A on the Development Advice Map. The updated Flood Map for Surface Water Flooding, shows that the site lies partially within an area at risk of surface water flooding.

I'd agree that there may be some merits in creating a development free "green corridor" through the site, and such a proposal could reduce potential flood risks to the development. However, as the flood risks from those watercourses are currently undefined and "unknown", it would be difficult to assume that such a measure would be sufficient to protect the development from any potential flood risk. Therefore, it would be advisable for an FCA to be undertaken to assess the potential food risks from the watercourse(s) over its development lifetime (i.e. climate change will need to be considered). It would be preferable for a detailed hydraulic and hydrological assessment to be undertaken to inform the FCA.

Consideration of culvert blockage should also be assessed i.e. if the culverted sections within the site / in vicinity of the site became blocked during flood conditions, what would the potential flood risks and flood consequences be, and could mitigation measures be incorporated into the development to reduce any identified risks?

I hope that this is of assistance.

Regards, Ryan

Ryan Knowles
Dadansoddi Risg Llifogydd /Flood Risk Analysis
Cyfoeth Naturiol Cymru / Natural Resources Wales,
Ffordd Gaer, Bwcle, Sir y Fflint, CH7 3AJ / Buckley Office, Chester Road, Buckley, CH7 3AJ.
Ffôn/Tel: 0300 065 3906
Gwefan / Website:
www.cyfoethnaturiolcymru.gov.uk / www.naturalresourceswales.gov.uk
Ein diben yw sicrhau bod adnoddau naturiol Cymru yn cael eu cynnal, eu gwella a'u defnyddio yn gynaliadwy, yn awr ac yn y dyfodol.
Our purpose is to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future.

Appendix E – Flintshire County Council Correspondence

Jordan Jones

From: Ruairi Barry <ruairi.barry@flintshire.gov.uk>
Sent: 13 April 2017 14:36
To: Laura Smith
Cc: Ryan Knowles - NRW (Ryan.Knowles@cyfoethnaturiolcymru.gov.uk)
Subject: RE: w3246-wrexham road, abermorddu

Hi Laura,

Just to confirm that we are happy in principle with the proposed box culvert (structure 2). We could deal with the details as part of the flood defence consent application process.

I presume this new culvert was the structure you were also referring to in relation to a screen or lack of. We would recommend a screen or similar at structure 3 given the length, size and probably condition of the downstream pipework. On a related note you may need to consider culvert crossings at the two site entrances, from memory there is a roadside ditch running parallel to Wrexham Road here. I can have a look and confirm when I'm next passing the site.

Regards

Ruairi

From: Laura Smith [mailto:Laura.Smith@waterco.co.uk]
Sent: 13 April 2017 14:07
To: Ruairi Barry <ruairi.barry@flintshire.gov.uk>
Subject: w3246-wrexham road, abermorddu

As discussed

Kind regards,
Laura

Laura Smith BSc (Hons) MCIWEM
Senior Environmental Consultant

0161 214 0850 (Primary office number)
01824 702 220 (Head office)

waterco consultants

Ruthin - Chester - Manchester - Hyderabad

Assessment, Modelling, Design

For email confidentiality, limitations and company details please see our disclaimer webpage. Registered in Wales under company no. 3577754. Waterco Ltd, Eden Court, Ruthin LL15 1NJ

****

We welcome correspondence in Welsh. We will respond to correspondence received in Welsh without delay.

Opinions advice, conclusions and other information in this

message that do not relate to the official business of

Flintshire County Council shall be understood as neither

given nor endorsed by it or on its behalf, and consequently

Flintshire County Council shall bear no responsibility

whatsoever in respect thereof.

Rydym yn croesawu gohebiaeth Gymraeg. Ymatebwn yn ddi-oed i ohebiaeth a dderbynnir drwy gyfrwng y Gymraeg.

Deellir na fydd unrhyw safbwyntiau, na chynghorion, na

chasgliadau nac unrhyw wybodaeth arall yn y neges hon,

nad ydynt yn berthnasol i waith swyddogol

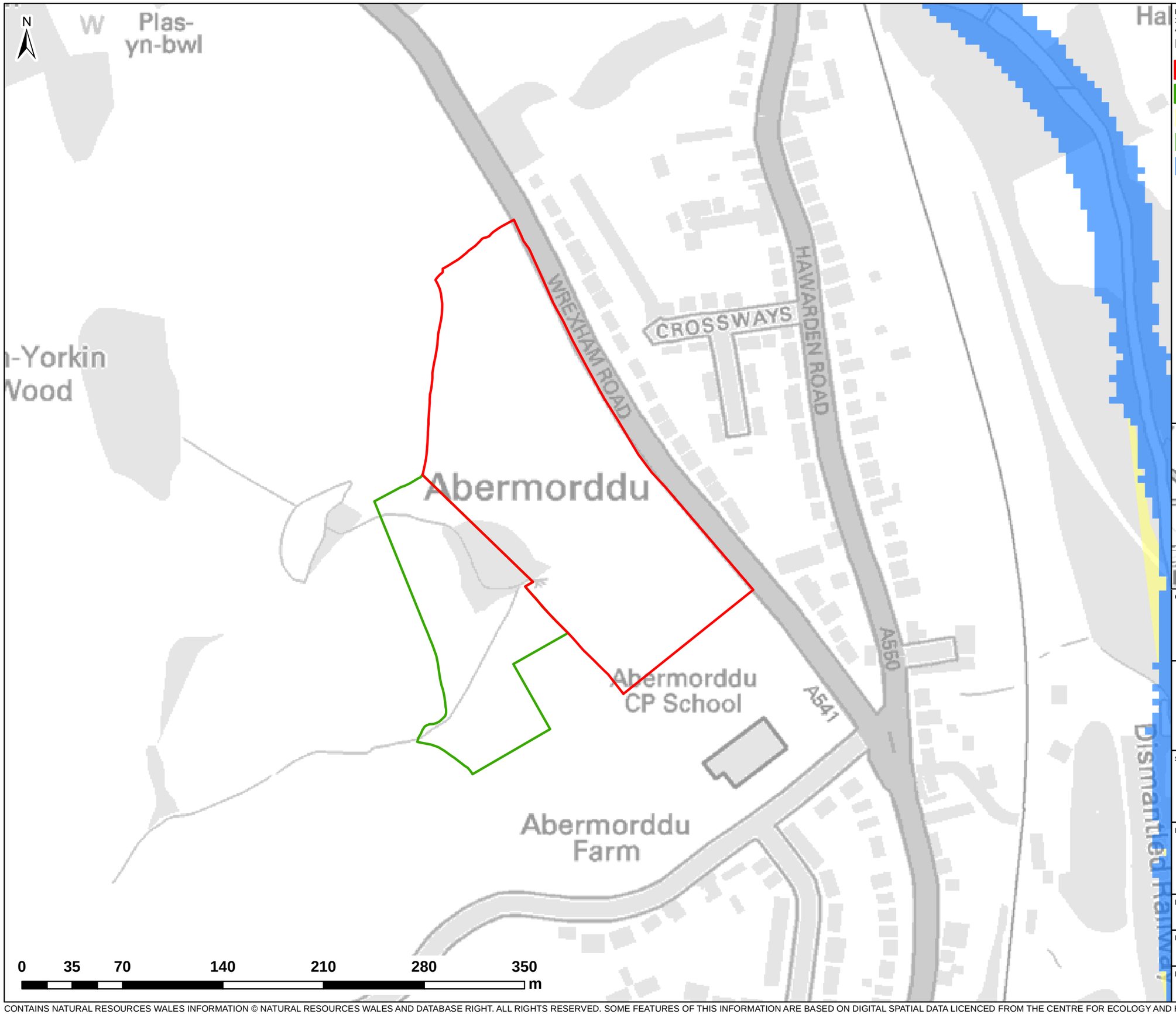
Cyngor Sir y Fflint, yn cael eu cynnig na'u cadarnhau ganddo

nac ar ei ran, ac felly ni fydd Cyngor Sir y Fflint yn derbyn

unrhyw gyfrifoldeb am y rhannau hynny o'r neges.

****

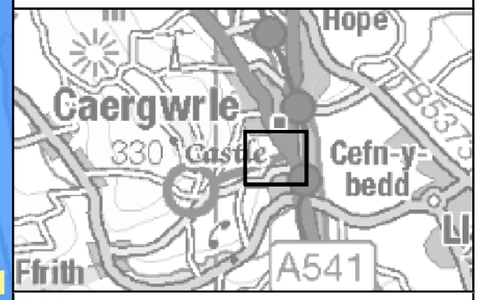
Appendix F – NRW Flood Maps & DAM



NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Zone B
- Zone C1
- Zone C2



CLIENT:

FISHER GERMAN

waterco consultants

Waterco Ltd
Eden Court, Ruthin, LL15 1NJ

01824 702220
www.waterco.co.uk

SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

WELSH GOVERNMENT DEVELOPMENT ADVICE MAP
APRIL 2017

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:2,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV1C-BL1-100-V	-

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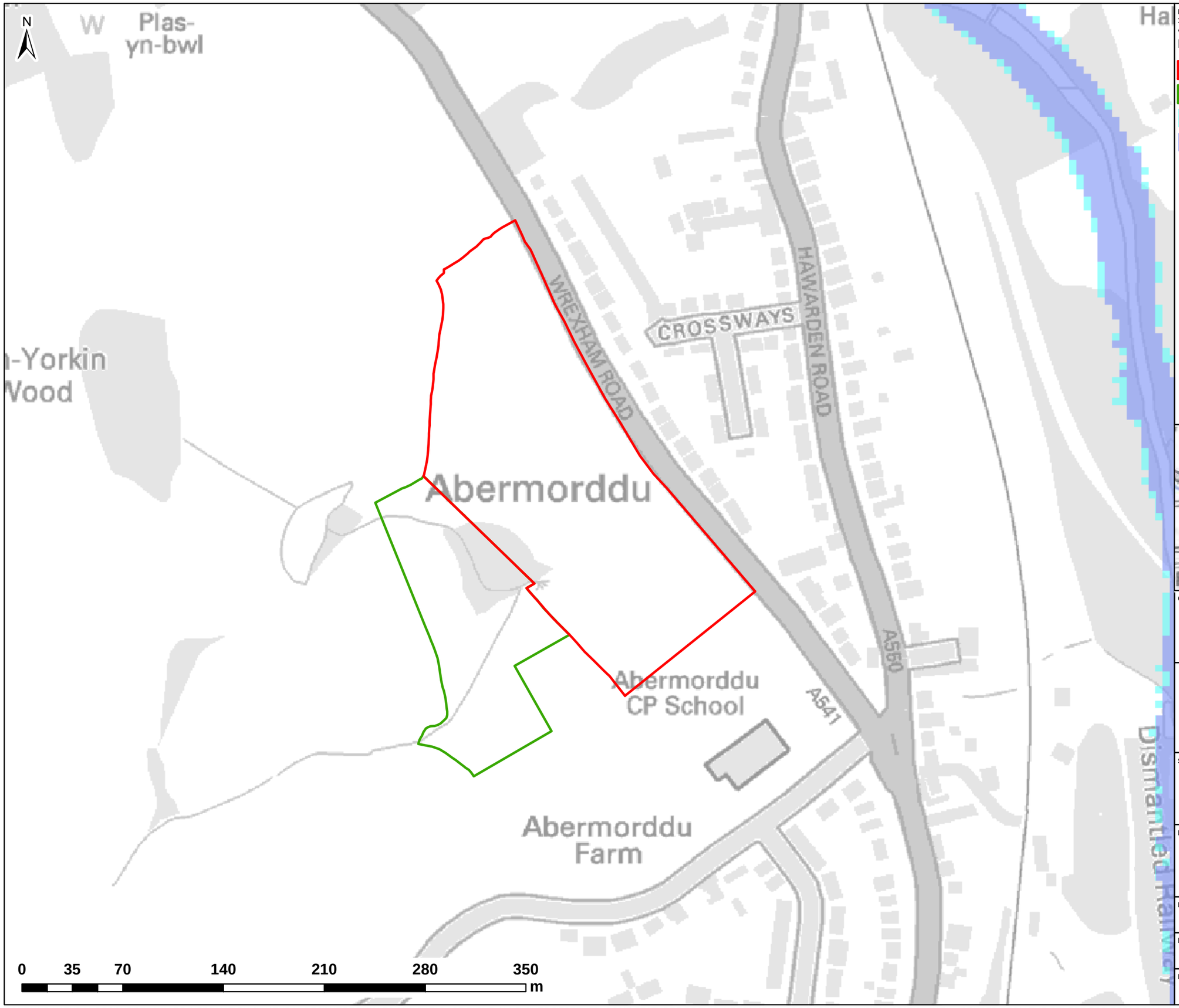

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- NRW Flood Zone 2
- NRW Flood Zone 3

CLIENT: FISHER GERMAN

waterco consultants

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Eden Court, Ruthin, LL15 1NJ

01824 702220
www.waterco.co.uk

SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

NRW FLOOD MAP FOR PLANNING
APRIL 2017

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:2,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV1C-BL1-100-V	-

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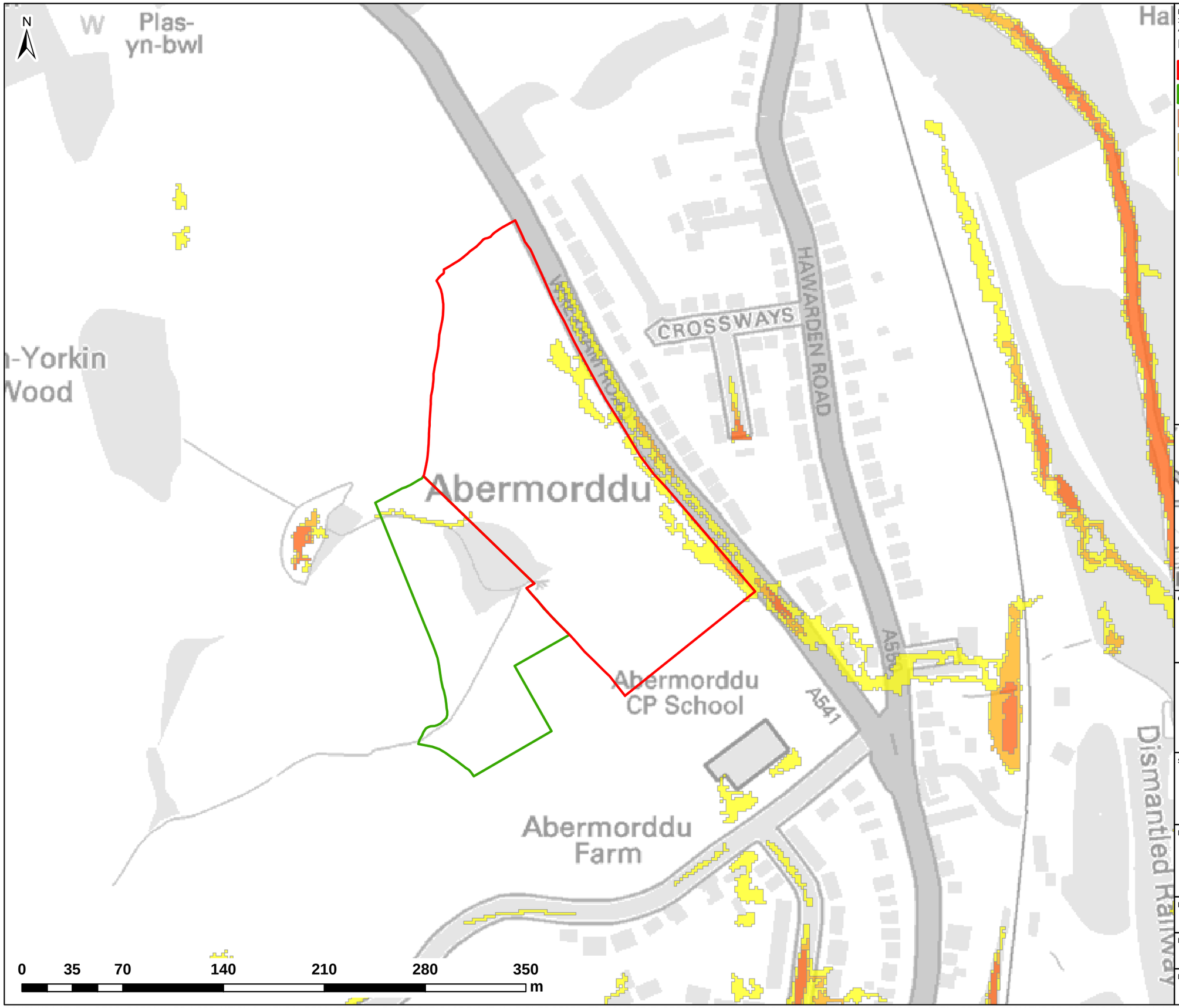

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Surface Water Flood Risk - High
- Surface Water Flood Risk - Medium
- Surface Water Flood Risk - Low

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Eden Court, Ruthin, LL15 1NJ

01824 702220
www.waterco.co.uk

SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

NRW SURFACE WATER FLOOD MAP
APRIL 2017

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:2,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV1C-BL1-100-V	-

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Appendix G – Hydraulic Modelling Results

N

Abermorddu

Abermorddu CP School

A541

A541

0 20 40 80 120 160 200 m

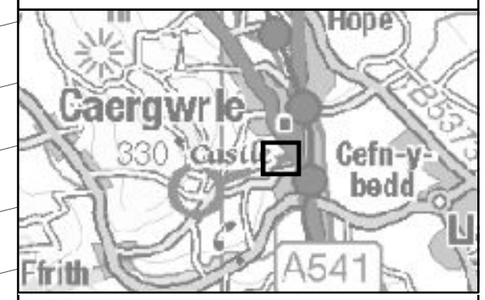
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



CLIENT: FISHER GERMAN

waterco consultants

Waterco Ltd
Eden Court, Ruthin, LL15 1NJ
01824 702220
www.waterco.co.uk

SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM FLOOD DEPTH
5% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q20-EXG-NFC-D	-

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N

Abermorddu

Abermorddu CP School

A541

A541

0 20 40 80 120 160 200 m

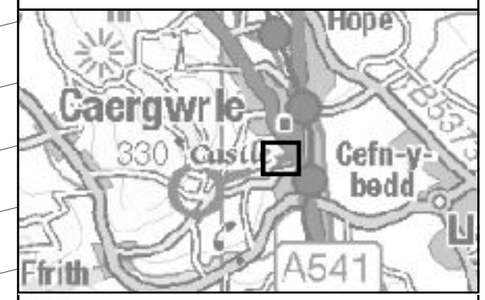
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



CLIENT:
FISHER GERMAN

waterco consultants
Waterco Ltd
Eden Court, Ruthin, LL15 1NJ
01824 702220
www.waterco.co.uk

SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM FLOOD DEPTH
1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100-EXG-NFC-D	-

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N

Abermorddu

Abermorddu CP School

A541

A541

0 20 40 80 120 160 200 m

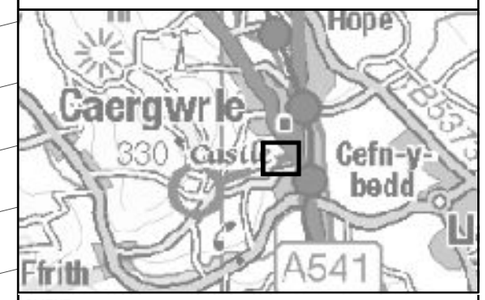
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



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Waterco Ltd
Eden Court, Ruthin, LL15 1NJ
01824 702220
www.waterco.co.uk

SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM FLOOD DEPTH
1% AEP + 20% CC FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100CC1-EXG-NFC-D	-

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N

Abermorddu

Abermorddu CP School

A541

A541

0 20 40 80 120 160 200 m

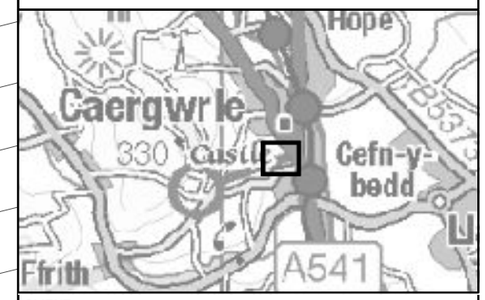
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



CLIENT: FISHER GERMAN

waterco consultants

Waterco Ltd
Eden Court, Ruthin, LL15 1NJ

01824 702220
www.waterco.co.uk

SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

MAXIMUM FLOOD DEPTH
1% AEP + 45% CC FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100CC2-EXG-NFC-D	-

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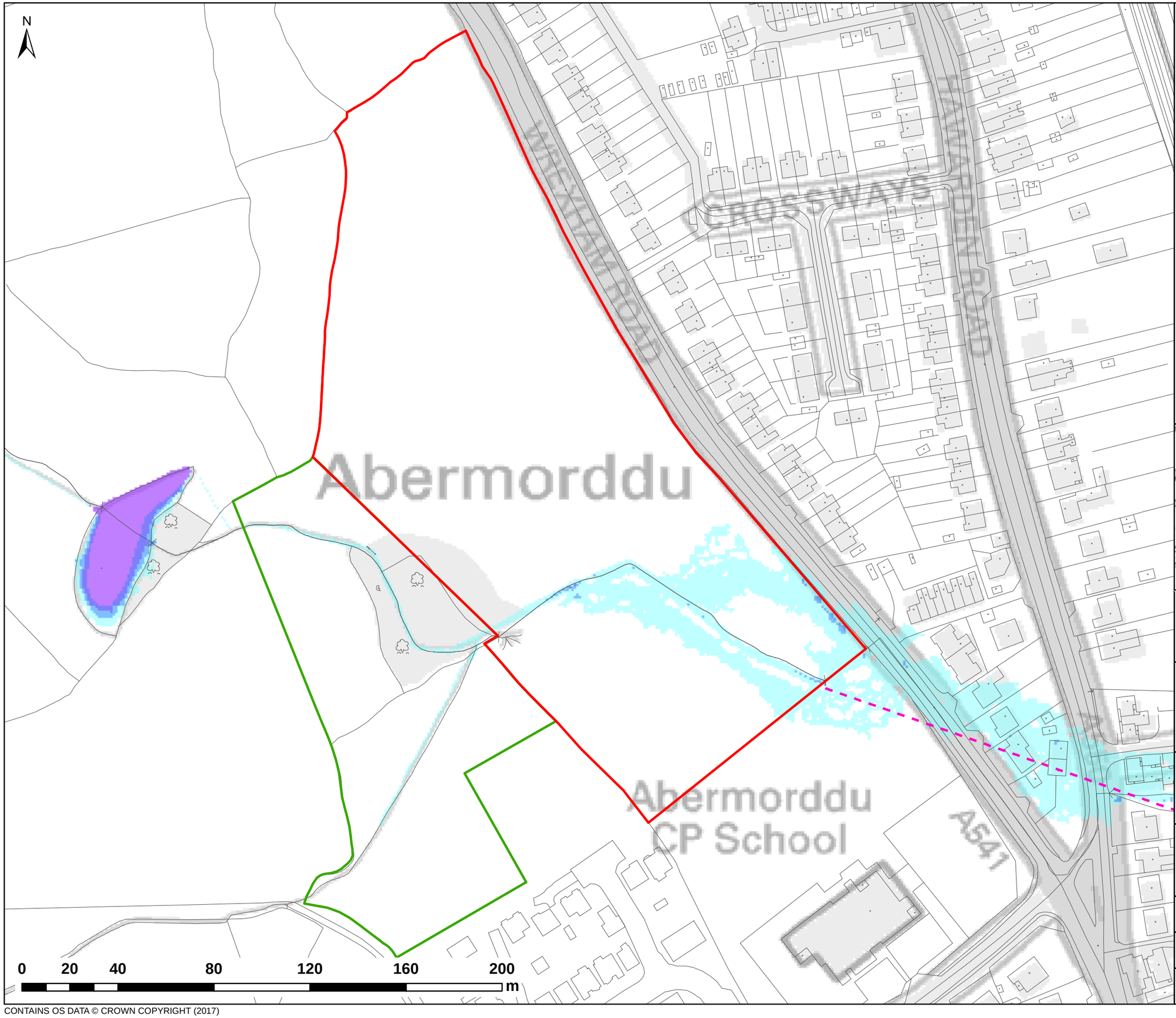


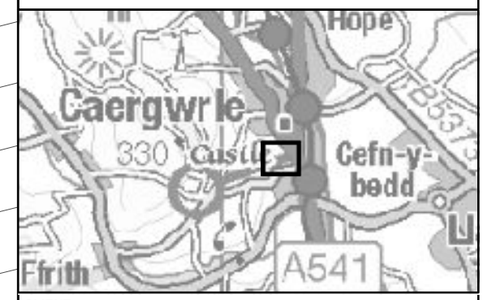
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



CLIENT:

FISHER GERMAN

waterco consultants

Waterco Ltd
Eden Court, Ruthin, LL15 1NJ

01824 702220
www.waterco.co.uk

SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

MAXIMUM FLOOD DEPTH
0.1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-EXG-NFC-D	-

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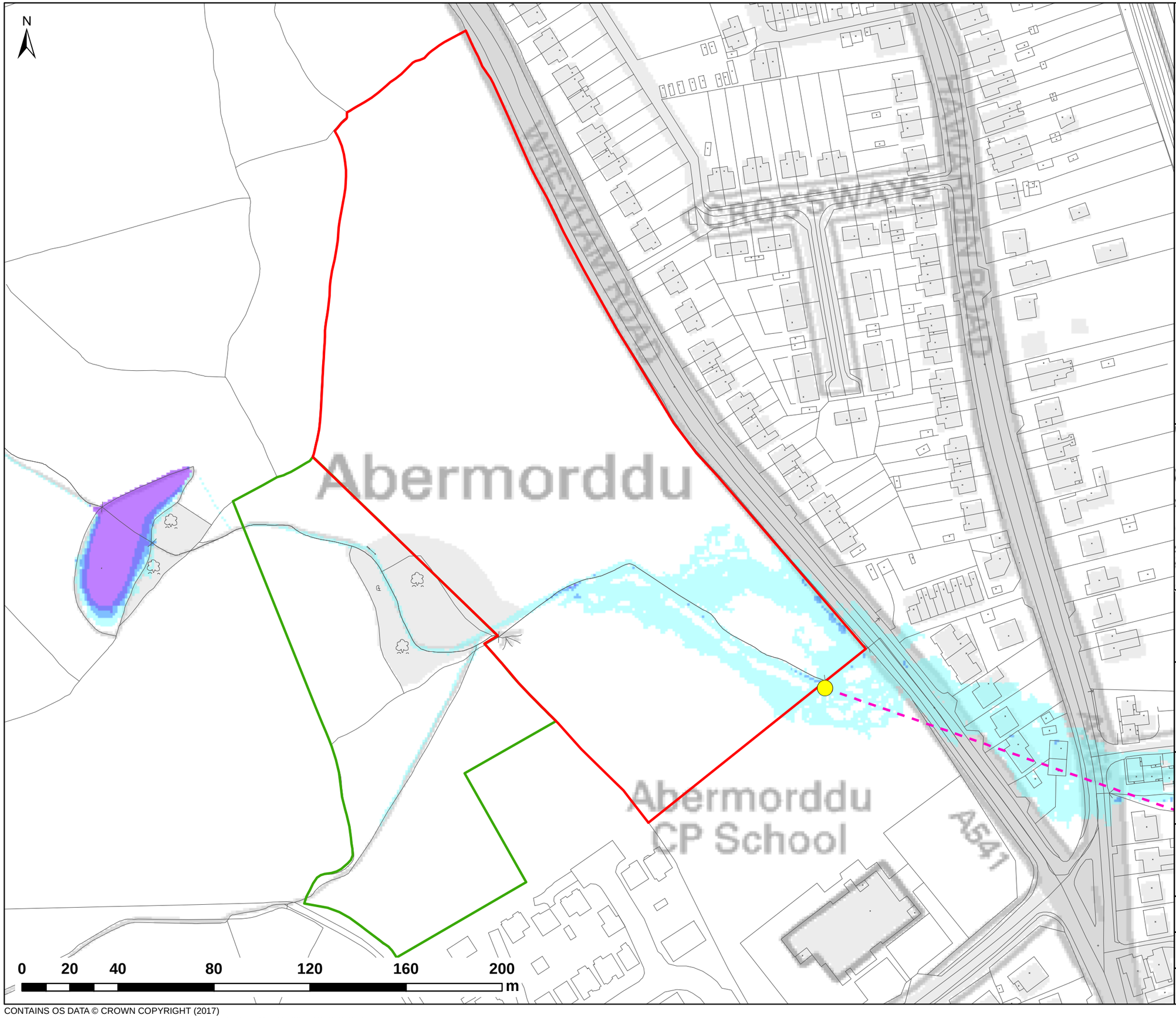


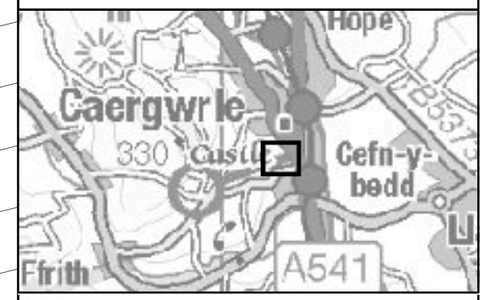
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL1)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



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Eden Court, Ruthin, LL15 1NJ

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www.waterco.co.uk

SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

MAXIMUM FLOOD DEPTH
0.1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
WREXHAM RD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-EXG-BL1-D	-

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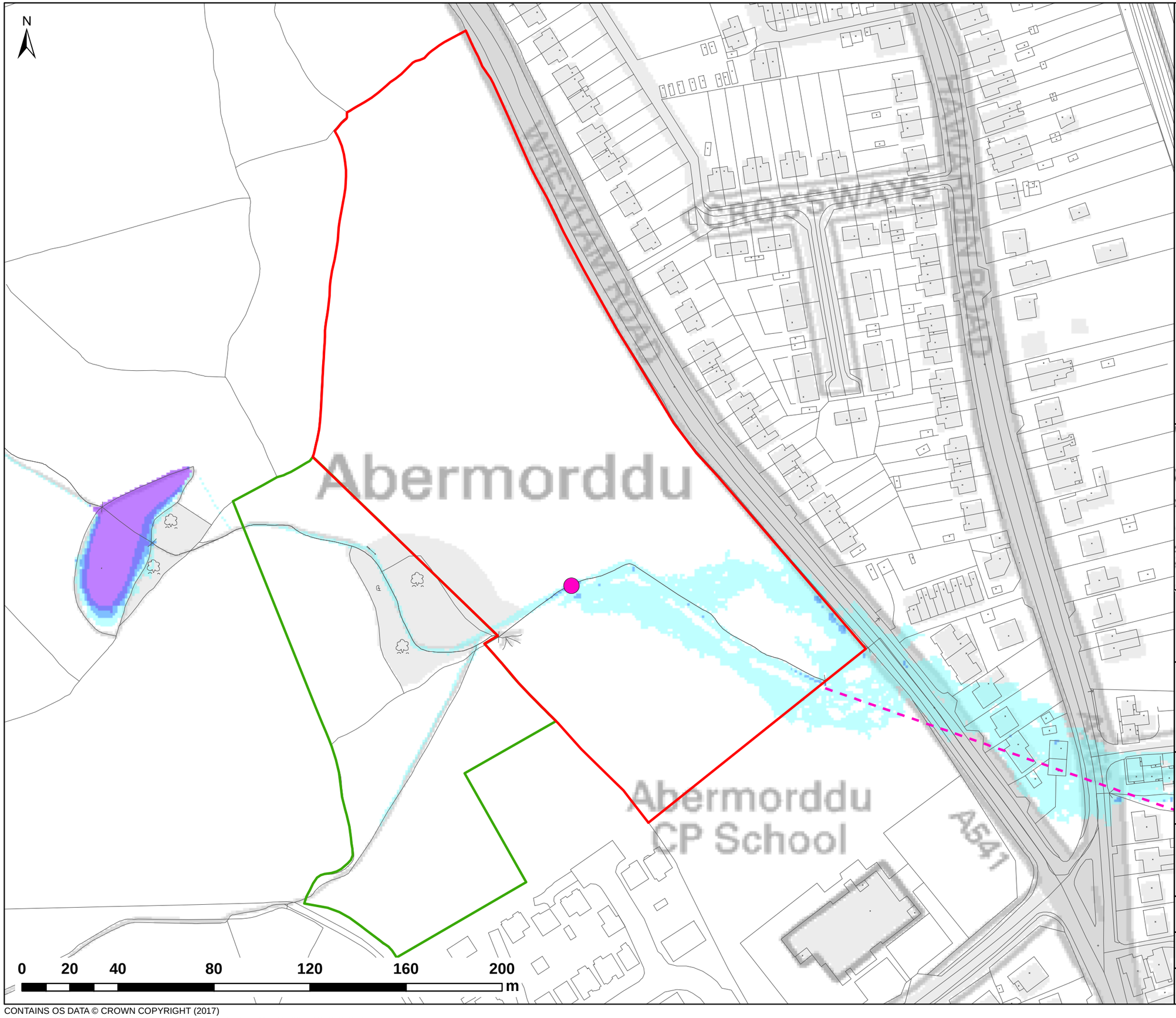


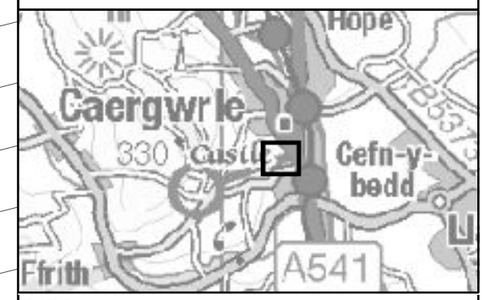
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL2)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



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SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

MAXIMUM FLOOD DEPTH
0.1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
ACCESS TRACK CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-EXG-BL2-D	-

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0 20 40 80 120 160 200 m

NOTES:
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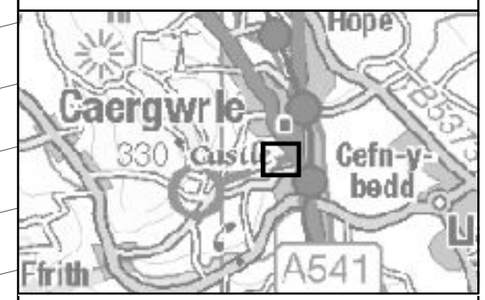
LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Velocity (m/s)

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



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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
5% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q20-EXG-NFC-V	-

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0 20 40 80 120 160 200 m

NOTES:
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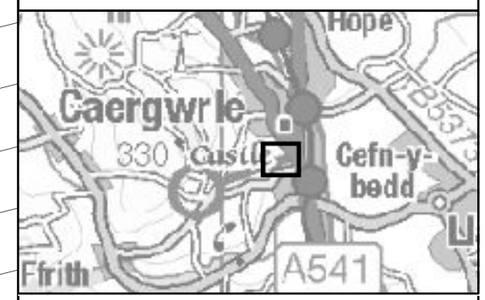
LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Velocity (m/s)

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



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100-EXG-NFC-V	-

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0 20 40 80 120 160 200 m

NOTES:
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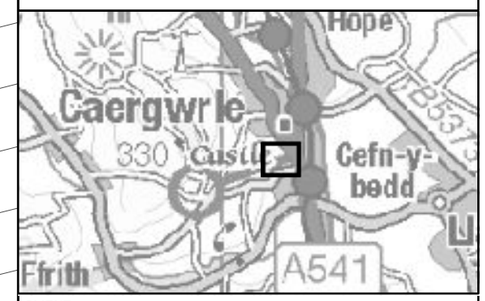
LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Velocity (m/s)

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



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
1% AEP + 20% CC FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100CC1-EXG-NFC-V	-

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NOTES:
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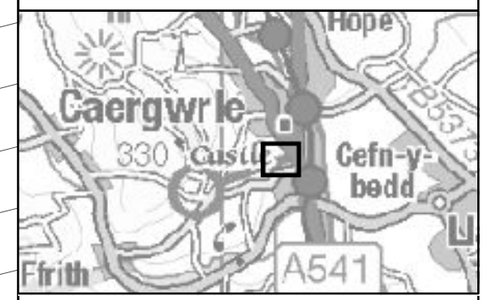
LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Velocity (m/s)

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



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PLOT TITLE:
MAXIMUM VELOCITY
1% AEP + 45% CC FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
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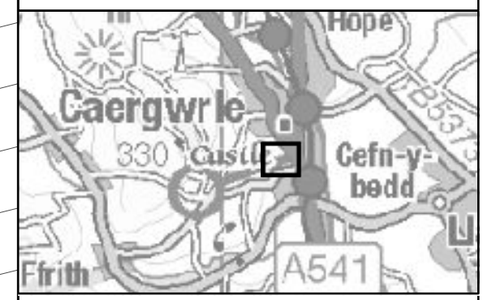
LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Velocity (m/s)

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



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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
0.1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
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NOTES:
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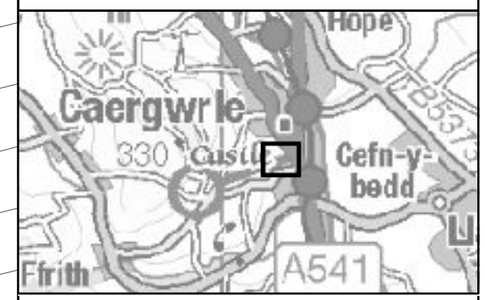
LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL1)

Maximum Velocity (m/s)

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



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CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
0.1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
WREXHAM RD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-EXG-BL1-V	-

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0 20 40 80 120 160 200 m

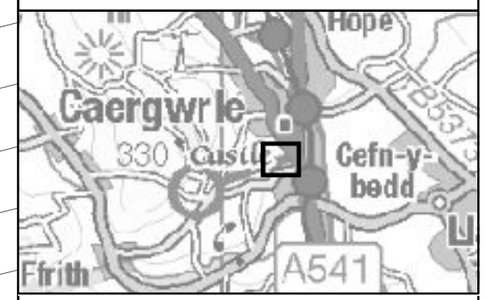
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL2)

Maximum Velocity (m/s)

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



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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
0.1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
ACCESS TRACK CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
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NOTES:
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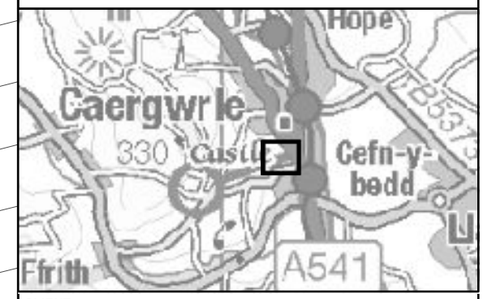
LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
- > 2.0 (Danger for All)



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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
5% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q20-EXG-NFC-HZ	-

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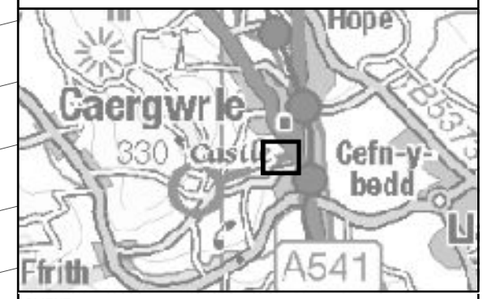
LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
- > 2.0 (Danger for All)



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100-EXG-NFC-HZ	-

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NOTES:
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LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
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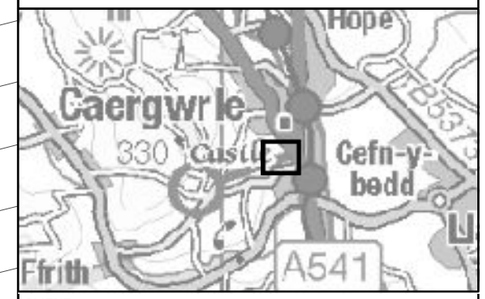

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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
1% AEP + 20% CC FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100CC1-EXG-NFC-HZ	-

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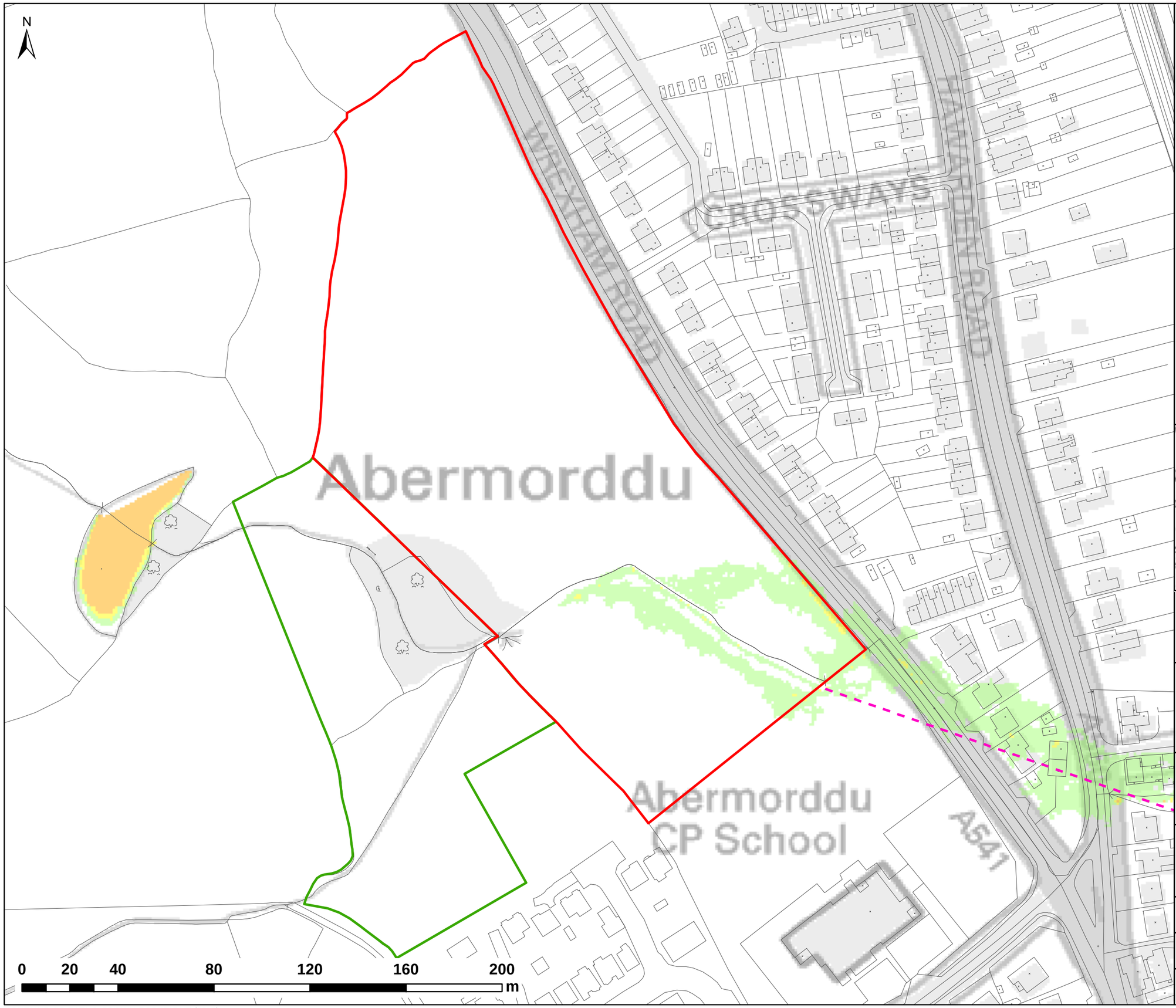

NOTES:
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LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Hazard Rating (FD2320)

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- 0.75 - 1.25 (Danger for Some)
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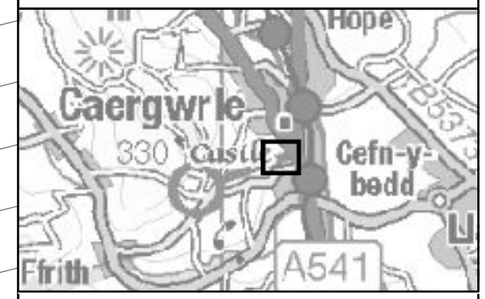

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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
1% AEP + 45% CC FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100CC2-EXG-NFC-HZ	-

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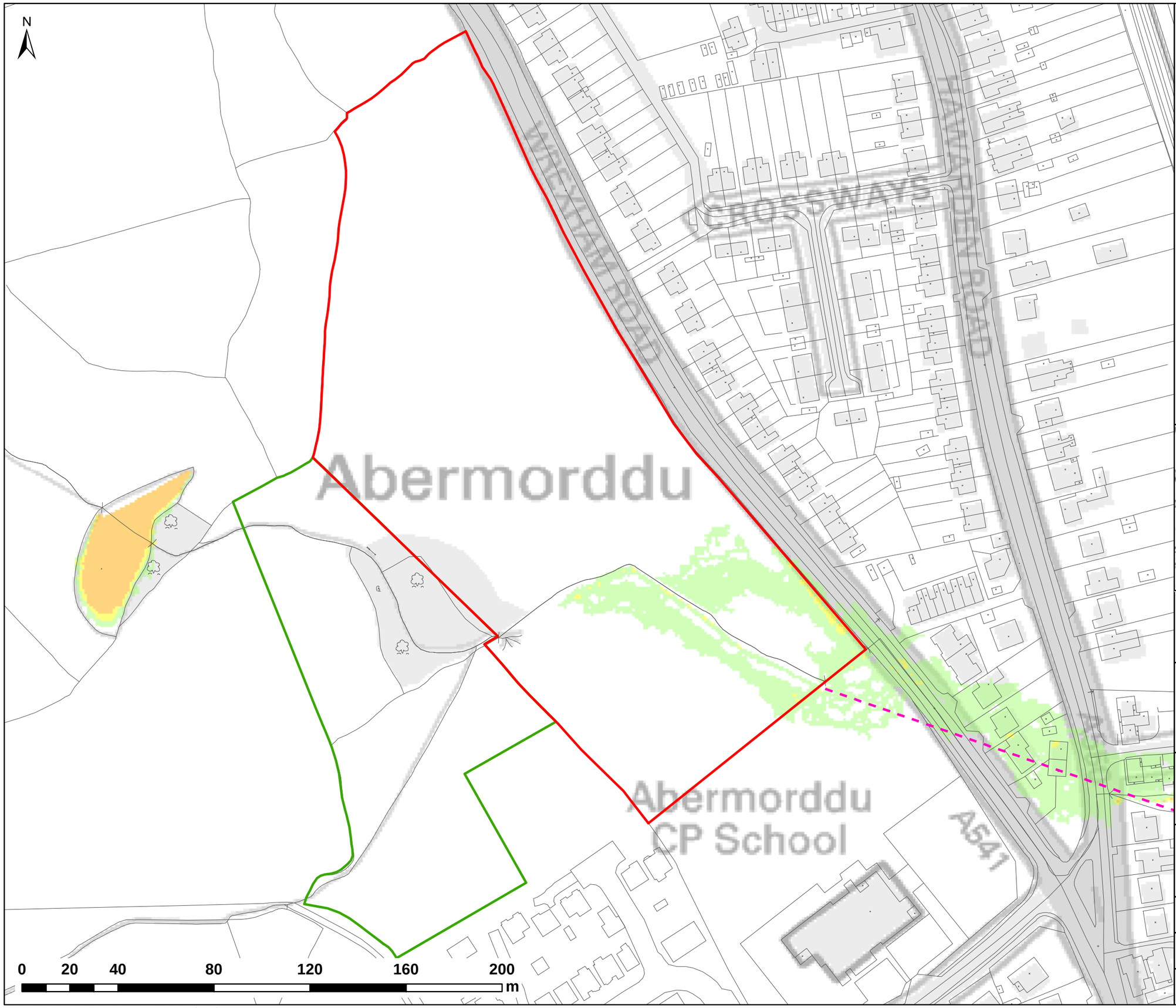

NOTES:
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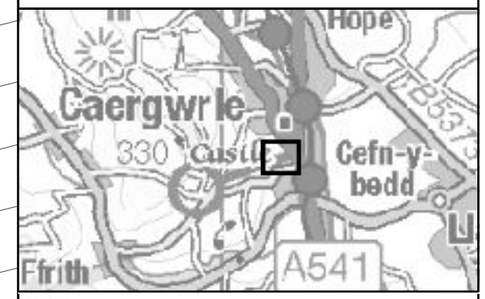
LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
- > 2.0 (Danger for All)



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SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

FLOOD HAZARD RATING
0.1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-EXG-NFC-HZ	-

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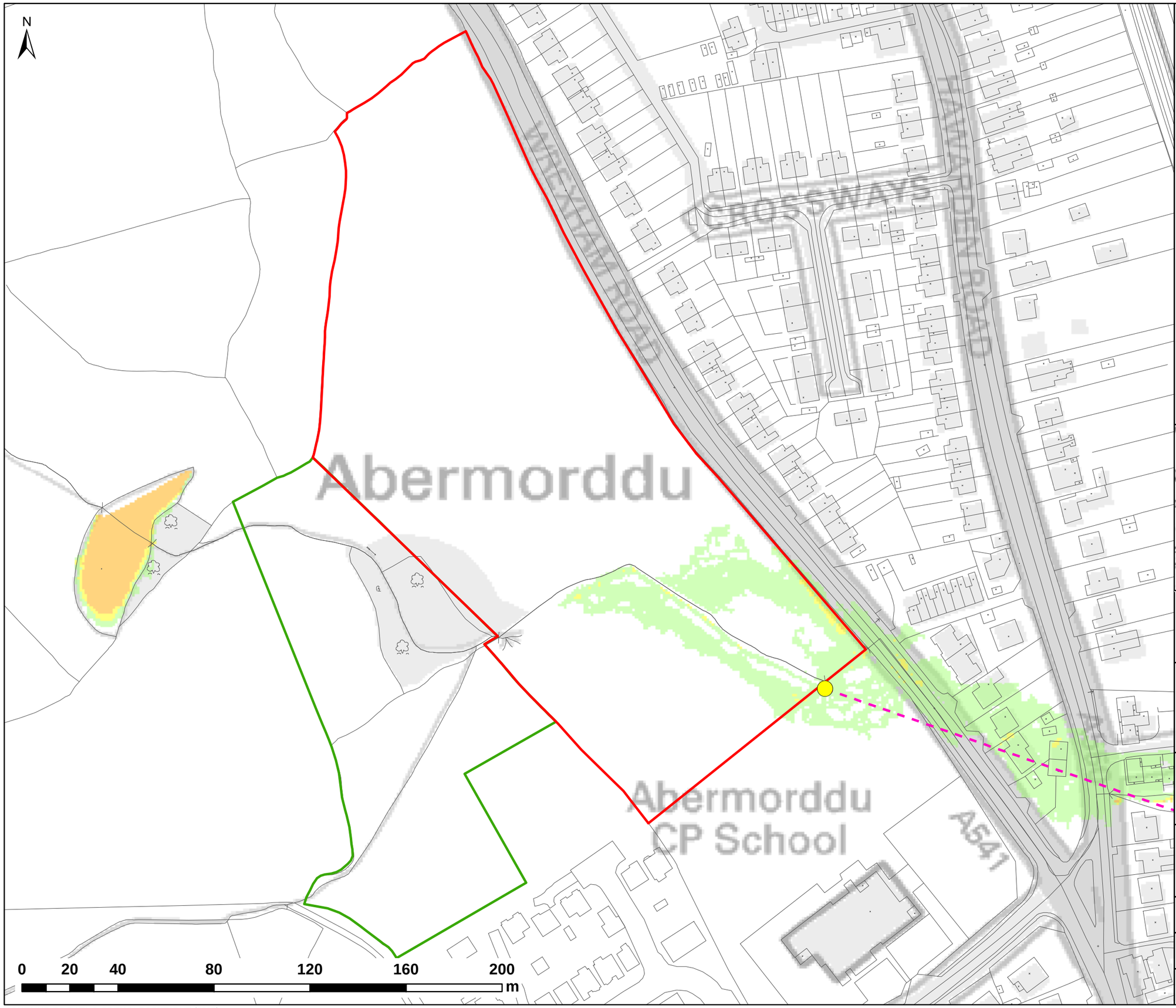


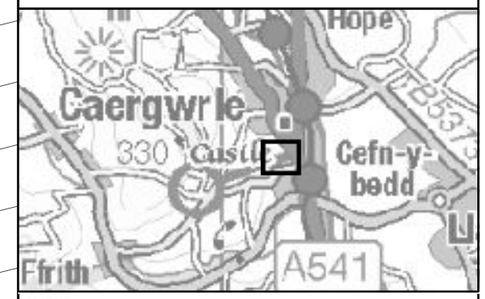
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL1)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
- > 2.0 (Danger for All)



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SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

FLOOD HAZARD RATING
0.1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
WREXHAM RD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-EXG-BL1-HZ	-

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Abermorddu

Abermorddu CP School

CROESWAYS

A541

0 20 40 80 120 160 200 m

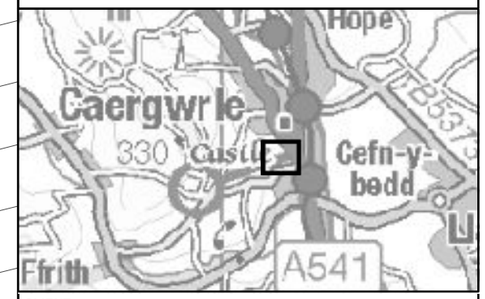
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL2)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
- > 2.0 (Danger for All)



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
0.1% AEP FLUVIAL EVENT
EXISTING SITE LAYOUT (EXG)
ACCESS TRACK CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-EXG-BL2-HZ	-

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N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

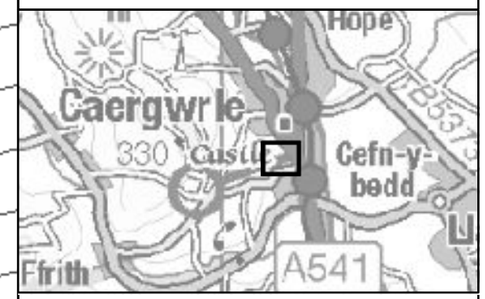
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM FLOOD DEPTH
5% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q20-DEV-NFC-D	-

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N

Area J
Area K
Area H
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Area G
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Area F
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Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

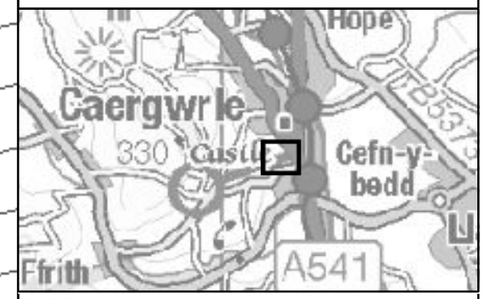
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Depth Variation

- > +100mm
- +50mm to +100mm
- +5mm to +50mm
- No Change (+/-5mm)
- -5mm to -50mm
- -50mm to -100mm
- > -100mm



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM DEPTH VARIATION
5% AEP FLUVIAL EVENT
EXG vs DEV
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q20-DEV-NFC-D-DIFF	-

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N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

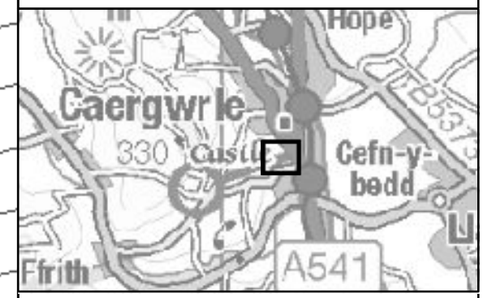
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM FLOOD DEPTH
1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100-DEV-NFC-D	-

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N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Depth Variation

- > +100mm
- +50mm to +100mm
- +5mm to +50mm
- No Change (+/-5mm)
- -5mm to -50mm
- -50mm to -100mm
- > -100mm

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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM DEPTH VARIATION
1% AEP FLUVIAL EVENT
EXG vs DEV
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME: w3246-Q100-DEV-NFC-D-DIFF
REV: -

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N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

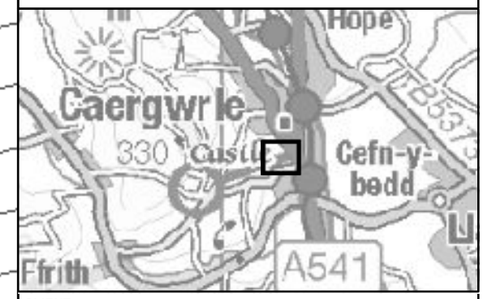
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM FLOOD DEPTH
1% AEP + 20% CC FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100CC1-DEV-NFC-D	-

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N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Depth Variation

- > +100mm
- +50mm to +100mm
- +5mm to +50mm
- No Change (+/-5mm)
- -5mm to -50mm
- -50mm to -100mm
- > -100mm

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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM DEPTH VARIATION
1% AEP + 20% CC FLUVIAL EVENT
EXG vs DEV
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME: w3246-Q100CC1-DEV-NFC-D-DIFF
REV: -

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N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

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A541

0 20 40 80 120 160 200 m

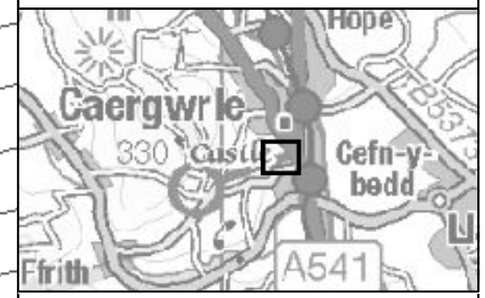
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM FLOOD DEPTH
1% AEP + 45% CC FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100CC2-DEV-NFC-D	-

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N

Area J
Area K
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Area G
Area E
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Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Depth Variation

- > +100mm
- +50mm to +100mm
- +5mm to +50mm
- No Change (+/-5mm)
- -5mm to -50mm
- -50mm to -100mm
- > -100mm

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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM DEPTH VARIATION
1% AEP + 45% CC FLUVIAL EVENT
EXG vs DEV
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
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N

Area J
Area K
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Area C
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Area B
Area A

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A541

0 20 40 80 120 160 200 m

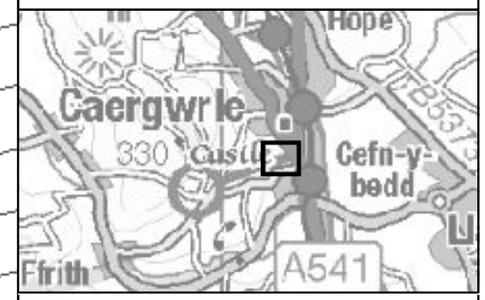
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM FLOOD DEPTH
0.1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV-NFC-D	-

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N

Area J
Area K
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Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Depth Variation

- > +100mm
- +50mm to +100mm
- +5mm to +50mm
- No Change (+/-5mm)
- -5mm to -50mm
- -50mm to -100mm
- > -100mm

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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM DEPTH VARIATION
0.1% AEP FLUVIAL EVENT
EXG vs DEV
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV-NFC-D-DIFF	-

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N

Area J
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Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

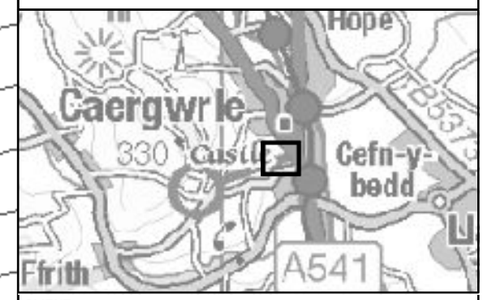
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL1)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM FLOOD DEPTH
0.1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
WREXHAM RD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV-BL1-D	-

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N

Area J
Area K
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Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

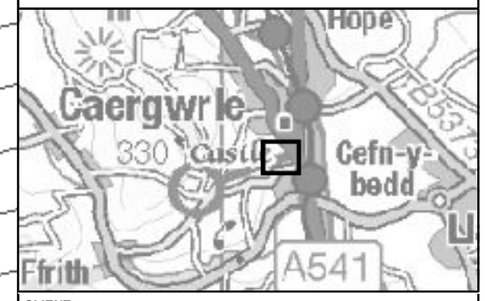
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL1)

Maximum Depth Variation

- > +100mm
- +50mm to +100mm
- +5mm to +50mm
- No Change (+/-5mm)
- -5mm to -50mm
- -50mm to -100mm
- > -100mm



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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM DEPTH VARIATION
0.1% AEP FLUVIAL EVENT
EXG vs DEV
WREXHAM RD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME: w3246-Q1000-DEV-BL1-D-DIFF
REV: -

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N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

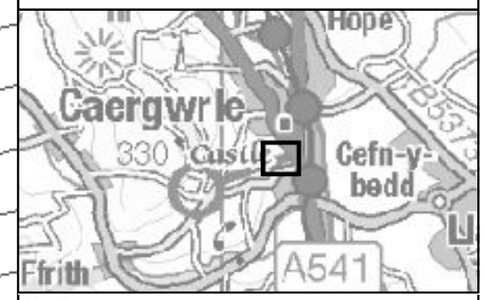
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL2)

Maximum Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.2
- 1.2 - 2.4
- > 2.4



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Eden Court, Ruthin, LL15 1NJ
01824 702220
www.waterco.co.uk

SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM FLOOD DEPTH
0.1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
ACCESS ROAD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV-BL2-D	-

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N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL2)

Maximum Depth Variation

- > +100mm
- +50mm to +100mm
- +5mm to +50mm
- No Change (+/-5mm)
- -5mm to -50mm
- -50mm to -100mm
- > -100mm

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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM DEPTH VARIATION
0.1% AEP FLUVIAL EVENT
EXG vs DEV
ACCESS ROAD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME: w3246-Q1000-DEV-BL2-D-DIFF
REV: -

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N

Area J
Area K
Area H
Area I
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Area E
Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

NOTES:
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LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Velocity (m/s)

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

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SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

MAXIMUM VELOCITY
5% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q20-DEV-NFC-V	-

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N

Area J
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Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

NOTES:
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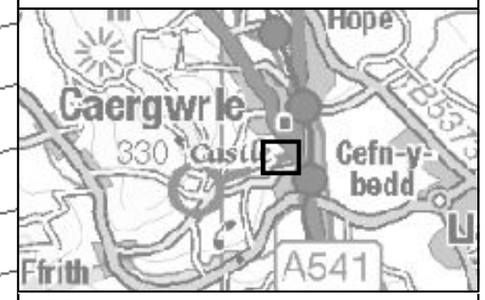
LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Velocity (m/s)

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



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SCHEME:

CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:

MAXIMUM VELOCITY
1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100-DEV-NFC-V	-

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N

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NOTES:
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LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Velocity (m/s)

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

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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
1% AEP + 20% CC FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100CC1-DEV-NFC-V	-

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N

Area J
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Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Velocity (m/s)

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

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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
1% AEP + 45% CC FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q100CC2-DEV-NFC-V	-

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Area J
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Area A

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A541

0 20 40 80 120 160 200 m

NOTES:
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LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Velocity (m/s)

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

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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
0.1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME: w3246-Q1000-DEV-NFC-V
REV: -

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N

Area J
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Area B
Area A

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A541

0 20 40 80 120 160 200 m

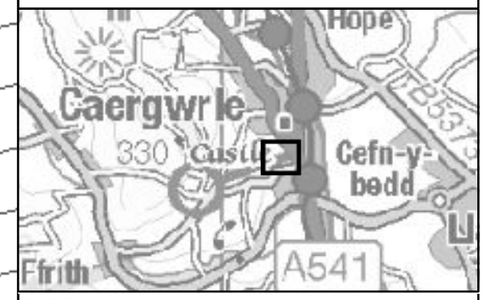
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL1)

Maximum Velocity (m/s)

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



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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
0.1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
WREXHAM RD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV-BL1-V	-

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N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
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Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL2)

Maximum Velocity (m/s)

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

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WREXHAM RD, ABERMORDDU

PLOT TITLE:
MAXIMUM VELOCITY
0.1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
ACCESS ROAD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV-BL2-V	-

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N

Area J
Area K
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Area I
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Area F
Area C
Area D
Area B
Area A

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A541

0 20 40 80 120 160 200 m

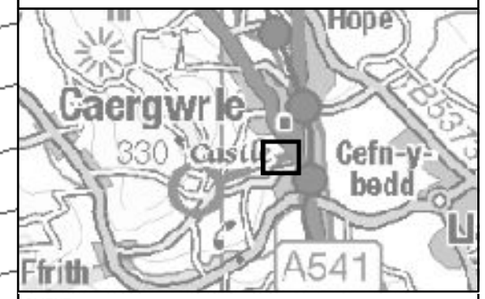
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
- > 2.0 (Danger for All)



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
5% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q20-DEV-NFC-HZ	-

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N

Area J
Area K
Area H
Area I
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Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

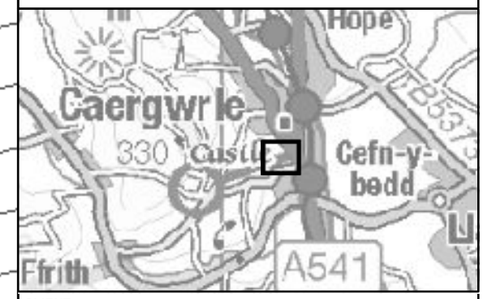
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
- > 2.0 (Danger for All)



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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME: w3246-Q100-DEV-NFC-HZ
REV: -

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N

Area J
Area K
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Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

NOTES:
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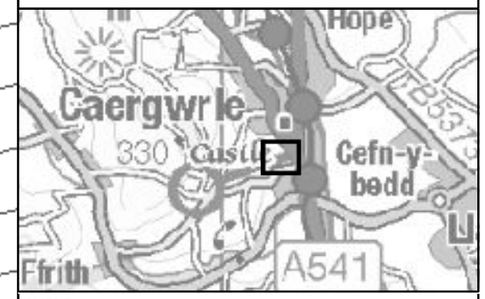
LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
- > 2.0 (Danger for All)



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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
1% AEP + 20% CC FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
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PLOT NAME:	REV:
w3246-Q100CC1-DEV-NFC-HZ	-

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- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
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SCHEME:
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WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
1% AEP + 45% CC FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
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- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
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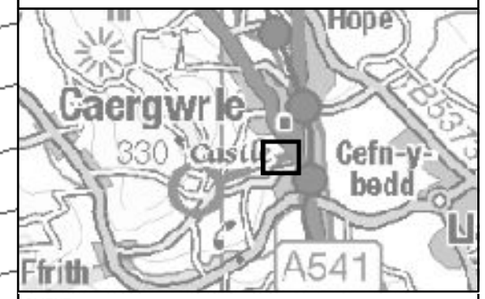

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SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
0.1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
NORMAL FLOW CONDITIONS

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV-NFC-HZ	-

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NOTES:
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LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL1)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
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CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
0.1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
WREXHAM RD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV-BL1-HZ	-

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N

Area J
Area K
Area H
Area I
Area G
Area E
Area F
Area C
Area D
Area B
Area A

Abermorddu CP School

A541

0 20 40 80 120 160 200 m

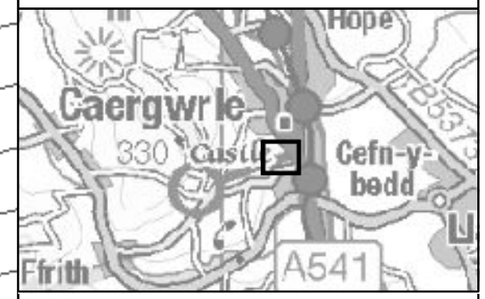
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Land Ownership
- Proposed Access Roads
- Proposed Development Areas
- Wrexham Rd Culvert Line (Assumed)
- Blockage Location (BL2)

Maximum Flood Hazard Rating (FD2320)

- < 0.75 (Caution)
- 0.75 - 1.25 (Danger for Some)
- 1.25 - 2 (Danger for Most)
- > 2.0 (Danger for All)



CLIENT:
FISHER GERMAN

waterco consultants
Waterco Ltd
Eden Court, Ruthin, LL15 1NJ
01824 702220
www.waterco.co.uk

SCHEME:
CLARK ESTATE
WREXHAM RD, ABERMORDDU

PLOT TITLE:
FLOOD HAZARD RATING
0.1% AEP FLUVIAL EVENT
PROPOSED SITE LAYOUT (DEV)
ACCESS ROAD CULVERT BLOCKAGE (100%)

PLOT STATUS:	DATE:
FINAL	07/04/2017

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
RCL	LS	VG	1:1,500 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
w3246-Q1000-DEV-BL2-HZ	-

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