Land at Pontymister, Risca

Hydraulic Modelling Report

January 2025

Waterco

Assessment | Modelling | Design

Scheme Information	
Scheme:	Land at Pontymister, Risca
Report Title:	Hydraulic Modelling Report
Client:	Lidl Great Britain Limited
Instruction:	The instruction to undertake this modelling was received from Rhydian Griffiths of Lidl Great Britain Limited.
File Ref:	15679-HMR-02
Supporting Documents:	This Hydraulic Modelling Report should be read in conjunction with the associated Flood Consequences Assessment and Drainage Strategy written by Waterco in November 2024 (15679-FCA and Drainage Strategy-02).

Approval Record	
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Document History		
Revision	Date	Comment
1	29/11/2024	First issue
2	24/01/2025	Second issue – Updated with revised site layout

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This report will remain valid for a period of twelve months (from the date of last issue) after which the source data should be reviewed in order to reassess the findings and conclusions on the basis of latest available information.

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Glossary and Modelling Short Codes

Table 1: Glossary of Technical Terms

Term / Acronym	Definition
1D (model)	One dimensional – A type of model typically built using watercourse cross-section survey data to represent the watercourse and adjacent floodplain
2D (model)	Two dimensional – A type of hydraulic model typically built using LiDAR and site-specific topographic data to represent the wider floodplain
1D-2D (model)	A combination of 1D and 2D modelling (i.e. typically a representation of the watercourse and floodplain respectively)
AEP	Annual Exceedance Probability – the probability that a storm event will occur in any given year
Defra	Department for Environment, Food and Rural Affairs
DfI	Department for Infrastructure – one of nine departments in Northern Ireland responsible for regional strategic planning and development policy
EA	Environment Agency – non-departmental public body responsible for the protection and enhancement of the environment in England
ESTRY	Industry standard flood modelling software (1D engine built into TUFLOW)
FCA	Flood Consequence Assessment
FRA	Flood Risk Assessment
FFL	Finished Floor Level
Flood risk	The product of the frequency or likelihood of a flood event and the consequences (such as loss, damage, harm, distress and disruption)
FMP	Flood Modeller Pro – industry standard flood modelling software
HMR	Hydraulic Modelling Report
IDB	Internal Drainage Board
LA	Local authority
LiDAR	Light Detection and Ranging (i.e. Ground elevation data)
LLFA	Lead Local Flood Authority
Main river	A watercourse on which the relevant regulatory body (e.g. EA/NRW/SEPA/DfI) has permissive powers, but not a duty, to carry out maintenance, improvement, or construction work.
MIKE (11/21/FLOOD)	Industry standard flood modelling software
NGR	National Grid Reference
NRW	Natural Resources Wales – Welsh Government sponsored body responsible for managing the environment and natural resources of Wales
Ordinary watercourse	A river, stream, ditch, cut, sluice, dyke or non-public sewer that is not a designated main river, and for which the LA has flood risk management responsibilities and powers.

Term / Acronym	Definition
SEPA	Scottish Environment Protection Agency – non-departmental public body responsible for the protection and enhancement of the environment in Scotland
TN	Technical Note
TUFLOW	Industry standard flood modelling software

Short codes are used in the naming and referencing of model files, events and scenarios to ensure a consistent, high-quality naming convention is followed and to simplify communication of model results.

Table 2: Modelling Short Codes

Model Short Code	Definition
ABC	Model identifier
BL[*x*]-[*y*]	A *y*% blockage at location *x* (e.g. BL1-67 – 67% blockage at location "1")
BR[*x*]-[*y*]	A *y* metre wide breach scenario at location *x* (e.g. BR2-50 – 50m wide breach at location "2")
CC	Climate change
DEV	Post-development site layout
EXG	Existing (pre-development) site layout
MIT	Flood mitigation option
NC	"Normal conditions" A model setup representative of present channel and floodplain conditions throughout the study area – no additional structure blockages, defence breaches or pump failures
OPT	Development option
Q[*x*]	1 / *x* % AEP fluvial event
R[*x*]	1 / *x* % AEP pluvial event
ST[*x*]	Sensitivity test *x* (e.g. ST1 – channel and floodplain roughness +20%)
T[*x*]	1 / *x* % AEP tidal event

Introduction

Waterco has been commissioned to undertake a hydraulic modelling study in support of a Flood Consequences Assessment (FCA) for the proposed development of a Lidl store along Commercial Street, Risca, Newport, NP11 6EE, herein referred to as the site.

The main objective of this hydraulic modelling study is to quantify existing flood risk to the site and the change in flood risk elsewhere (if any) as a result of the proposed development. To enable this, the NRW linked 1D/2D[1] hydraulic model (EBBWLowerICM_5_V1.0_2018) has been utilised. This report summarises the hydraulic modelling works completed and should be read in conjunction with the associated FCA produced by Waterco.

Site Description

An overview of the site is detailed in Table 3. A location plan and an aerial photograph of site is included in Appendix A.

Table 3: Site Overview

Site Overview	
Location	The site comprises of a hardstanding area with industrial containers at Commercial Street, Pontymister, Risca, Newport, NP11 6EE.
NGR (Located at centre of site)	324398, 189871
Topographic Survey	A topographical survey of the site was undertaken by EDI Surveys Ltd in December 2023 and is included in Appendix B.
Watercourses	Ebbw River
Current Site Use	Industrial
Regulatory Body	NRW

Proposed Development

The proposed development comprises of a Lidl store and car park with associated landscaping. A proposed development plan is included in Appendix C. As part of the proposed development layout, the finished floor levels (FFLs) of the store will be set to 44.409m AOD as outlined by the client.

[1] A 1D/2D hydrodynamic model is comprised of a 1-Dimensional (1D) river network model (based on surveyed river cross-sections) coupled with a 2-Dimensional (2D) Digital Terrain Model (DTM) of the potential floodplain (created from LiDAR).

Flood Risk & History

Table 4 provides a brief overview of the flood risk pertaining to the site.

Table 4: Site Flood Risk

Site Flood Risk	
Type of Flood Risk	Fluvial
Primary Source of Flood Risk	The potential of out of bank flows from the Ebbw River that flows adjacent to the site.
NRW Development Advice Map	Site within Zone C1 – a developed area of the floodplain served by significant infrastructure including flood defences. The flood map is included in Appendix D.
NRW Flood Map for Planning (Published May 2024)	Flood Zone 2 - an area considered to be at moderate risk of fluvial and/or tidal flooding with an annual probability of flooding from rivers of between 1% and 0.1% and from the sea of between 0.5% and 0.1%. Flood Zone 3 - an area considered to be at high risk of fluvial flooding with an annual probability of the flooding greater than 1%. The flood map is included in Appendix D.
Historical Flood Risk	NRW Historic Flood Map indicates that the western side of the site was flooded in December 1979, due to the channel capacity being exceeded (no raised defences). No other information is available on this flood event.

Hydraulic Modelling

The information provided in this section details the modelling works carried out as part of this scheme. The current NRW Ebbw River integrated 1D/2D FMP-TUFLOW hydraulic model (EBBWLowerICM_5_V1.0_2018), defended (DEF) scenario has been used as a base for this scheme. The hydraulic model includes the Ebbw River and its tributaries.

The model log[2] provided with the FMP/TUFLOW model files (Model Reference: 15679-30063-027) should be consulted if further details are required. An explanation of the file, event and scenario naming convention used is provided in the model log.

A proposed hydraulic modelling and hydrological assessment methodology was sent to NRW for comment prior to commencing the model build (01/03/2024). NRW requested that the 2017 hydrology assessment was updated. Following this a revised methodology was submitted (24/08/2024) which NRW confirmed acceptance of (18/09/2024). All correspondence with NRW regarding the modelling approach is included in Appendix D.

Baseline Model Updates

The current NRW model has been updated to quantify the existing flood risk in the study area. A plan of the 1D/2D model extent is included in Appendix E. A number of updates have been made to the current NRW

[2] Doc ref: 15679-30063-Model_Log.xlsm

model to produce a more appropriate and site-specific model; these updates are detailed below:

The upstream extent of the NRW Ebbw River model was truncated to EBBW_12077.3, downstream of the confluence of the Ebbw River and Sirhowy River. This is suitable distance upstream of the site (2.68km).

The 2D domain, 1D Flood Modeller network, 1D-2D links and other model build shapefiles were clipped to the truncated upstream boundary. Existing NRW model shapefiles not within the updated model extent were removed.

As requested by NRW, the hydrology assessment was updated in line with the current NRW guidance. The most upstream model inflow (EBBW_US) has been updated and applied to the most upstream cross section (EBBW_12077.3). Downstream of the site, the existing NRW model inflows remain as per the current NRW model (AE10, AE11 and AE12). For details on the hydrology assessment undertaken, see the FEC Record in Appendix F.

Between EBBW_11528 and EBBW_7932 a number of 1D bank levels were updated to match the 2D defence levels where required.

Bank levels have been enforced along the 1D-2D links at EBBW_10204 to EBBW_9857.5 and EBBW_9075 to EBBW_9019 using thick z-line features. The elevations within these z-lines are based on the 1D cross section bank levels.

Existing site topographical survey levels have been applied in the form of a Triangular Irregular Network (TIN). The topographical survey is included in Appendix B. Areas not covered by the survey data have been represented using the LiDAR in the current NRW model which was found to better match the surveyed levels than the latest Welsh Government 1m LiDAR dataset (2020-2022).

A blockage scenario at the B4591 Road Bridge has been considered. Details of the blockage scenario are detailed in Table 6. To simulate a blockage, a 'dummy' blockage unit was added to the 1D Flood Modeller network at EBBW_9284. Within this unit, the blockage proportion and the inlet and outlet loss coefficients were set to 0. During the blockage scenario simulations, a separate IED file was applied which contained the blockage proportion which was applied for the entire duration of a simulation.

1D cross section conveyance was reviewed and updated where required with the addition of panel markers.

The simulation run time was extended to 25 hours to account for the updated hydrology.

The model has been simulated in the latest software versions. Flood Modeller (version 7.1) and TUFLOW (version 2023-03-AF-iSP HPC).

Baseline Model Stability Fixes

The following updates were carried out to aid model stability.

FLC coefficients have been applied to the 1D-2D links along the left bank, between nodes EBBW_9151.59 and EBBW_8883 and on both banks between EBBW_8149 and EBBW_7932. An FLC value of 0.5 was applied to represent the energy loss as water flows over the banks.

The Dflood value was updated to 10 (4 in NRW model).

The maximum iterations value was updated to 11 (35 in NRW model).

Synchronise HPC timestep was unticked.

A 2D roughness patch of 0.1 was added to the right bank at EBBW_7080.

A 2D roughness patch of 0.05 was added to the left bank at EBBW_4008.

No other updates have been made.

Proposed Development Model Setup

To quantify the impact the proposed development has on flood extents and depths elsewhere, the proposed development has been incorporated into the baseline model. A plan of the proposed development can be found in Appendix C.

The proposed development modelled briefly comprises:

Z-shape polygons have been used to represent the proposed FFL (44.409m AOD) and external levels as per the proposed levels strategy (included in Appendix C).

Where proposed levels have not been specified, existing levels from the topographical survey have been used.

A 2D roughness layer has been applied within the site boundary, specifying altered Manning's n values that correspond to the proposed development layout.

Model Simulation Setup

Primary Simulations

Primary simulations have been modelled for a range of fluvial design events and site scenarios during the defended (DEF) model scenario.

Table 5: Primary simulations under normal conditions (NC)

Fluvial Design Event (AEP)	Climate Change Allowance	Scenario	Site Layout
1%	-	Defended (DEF)	Existing (EXG)
1% CC1	+25%		
1% CC2	+70%		
0.1%	-		
0.1% CC1	+25%		
0.1% CC2	+70%		
1%	-		Proposed Development (DEV)
1% CC1	+25%		
1% CC2	+70%		
0.1%	-		
0.1% CC1	+25%		
0.1% CC2	+70%		

Blockage Simulations

Structure blockages have been assessed at one location with respect to the 1% AEP + 25% CC, 1% AEP + 70% CC and 0.1% AEP fluvial events, for both EXG and DEV site layout scenarios. Details of the studied blockages can be found in Table 6.

Blockage percentages were chosen based on a review of upstream land-use (e.g. woodland/vegetation), trash screen presence, channel slope and width, orifice shape and size and worst-case blockage estimate should the structure collapse.

Table 6: Structure blockage details

Blockage Location (Model Short Code)	Coordinates	Structure Details	Considerations	Blockage %	Fluvial Event (AEP)	Site Layout
BL1 (BL1-25)	324441, 189785	Road Bridge	Structure located immediately downstream of the site.	25	1% + 25% CC 1% + 70% CC 0.1%	EXG DEV

Model Limitations

Model Limitations

Model Limitations

This section presents the steps taken throughout the modelling process to reduce uncertainty and improve confidence in the model outputs. Efforts have been made to assess and reduce the levels of uncertainty at each stage of the modelling process. The most appropriate available information has been used to construct the model to represent flooding mechanisms. The assumptions made are generally conservative for modelled water levels at the proposed scheme location and are therefore appropriate for the assessment of flood risk.

In the absence of available calibration data, sensitivity testing of two identified sources of uncertainty has been carried out and a review of the model's performance rating. Table 7 lists and ranks identified sources of uncertainty and the assumptions made as part of the model build process.

Limitations and Assumptions

Table 7: Sources of uncertainty and assumptions

Rank	Source	Selected method	Assumptions
1	Friction parameters	Manning's n roughness coefficient based on available guidance (Chow 1959)	Channel and floodplain roughness utilised in the current NRW model have been reviewed against available survey data and aerial photographs and found to be appropriate for use in this study.
2	Inflow hydrology	FEH Statistical	See FEC Record in Appendix F for details. In addition, sensitivity tests have been carried out to quantify the impact of a significant change in flows to the flood extents.
3	Topography	DTM and survey data	As per the current NRW model, 1m/2m resolution LiDAR data has been used to represent the floodplain topography and the watercourse alignment and bank levels are informed by surveyed cross sections and points and LiDAR data in the existing model. There has been no additional watercourse/bank level survey applied. The existing site layout have been informed by a topographical survey. For the proposed scheme, the existing ground levels were modified within the proposed scheme footprint using elevation polygons such as z shapes.
4	Grid size	4m cell size	This is suitable to represent the floodplain features across the model extents to an appropriate level of detail and to attain suitable model run times. Finer features have been incorporated into the grid using breaklines.
5	Structures	Flood Modeller Pro defaults.	There have been no changes to the hydraulic

Rank	Source	Selected method	Assumptions
			coefficients of structures applied within the current NRW model.
6	Change in climate condition	Predictions of anticipated change to watercourse flow	Climate change events selected based on TAN15 guidance.
7	Watercourse survey data	NRW EBBWLowerICM_5_V1.0_2018 model	The majority of the survey within the updated model extent is from the 2005 Ebbw FRM Survey. Check survey was obtained in 2016 which confirmed the existing survey was suitable. Although the survey is dated, it would be unproportionate to the objectives of this study for new survey data to be obtained.

Sensitivity Tests

Sensitivity testing of two sources of uncertainty (see Table7) has been carried out. A total of four sensitivity tests have been carried out (ST1-4) with respect to the 1% AEP + 25% CC fluvial event. Details of these sensitivity tests can be found in Table 8.

Table 8: Sensitivity test details

Sensitivity Test Short Code	Varied Parameter	Adjustment	Fluvial Event (AEP)	Site Layout
ST1	Inflow	+20%	1% + 25% CC	EXG
ST2	Inflow	-20%	1% + 25% CC	EXG
ST3	Control Number Factor	+20%	1% + 25% CC	EXG
ST4	Control Number Factor	-20%	1% + 25% CC	EXG

The results of sensitivity tests ST1 and ST2 show that significantly varying the inflows used at the most upstream nodes by +/-20% respectively causes an increase/decrease in maximum water levels and flood extents throughout the model. During ST1, the increase can be attributed to the additional overtopping of the defences due to the increase to in-channel water levels. Additionally, the increase in flow causes the EBBW_9284 bridge to become surcharged causing an increase in upstream water levels adjacent to the site. Two differing flow estimation methods have been used to produce the final design hydrographs used in the model. Both flow estimation methods have been subject to scrutiny in accordance with EA guidance and detailed in the FEC Record (Appendix F)- the final design hydrographs are deemed reliable and robust.

The results of sensitivity tests ST3 and ST4 show that varying the Control Number Factor by +/-20% respectively does not affect the assessment of flood risk at the site.

Model Validation

The NRW historical flood outline map (included in Appendix D) states that the 27th December 1979 flood event that flooded the western extent of the site occurred due to the channel capacity being exceeded when there were no raised defences. Flood defences were constructed following this flood event. The Ebbw River

model utilised in this study contains NRW defences in the vicinity of the site, therefore a comparison would not be appropriate. Therefore, increased significance has been placed on sensitivity testing to understand confidence in the model outputs.

Model Performance and Stability

Run performance has been monitored throughout the model build process and then during each simulation carried out to ensure a suitable model convergence was achieved. As discussed above, a number of stability fixes have been carried out on the existing model in order to stabilise the model.

1D Stability

A review of the 1D log files shows that there are no comments, warnings or errors warranting attention.

The mass balance is within the tolerable limits of +/- 1% during all considered events.

There are instances of non-convergent timesteps reported (up to four), however these do not occur at cross sections near the site (EBBW_21160u, EBBW_4008, EBBW_7066, EBBW_7080 and EBBW_-2155) nor near time of peak flow and result in 0% of the simulations being unconverged. They are therefore considered acceptable and will not affect the assessment of flood risk at the site.

2D Stability

A review of the 2D log files shows that there are no comments, warnings or errors warranting attention.

The mass balance is within the tolerable limits of +/- 1% during all considered events.

During the 1% AEP + 70% CC event and higher, there is some minor glass walling in the 2D domain near The Parc Golf Club (NGR 327238, 183416) at the downstream boundary. This is over 10km from the site and will not affect the assessment of flood risk at the site, therefore is deemed acceptable.

Model Results

This section of the report discusses the results obtained from the hydraulic model simulations for the existing and proposed development scenarios, as well as the blockage scenario.

Maximum flood depth, velocity and hazard mapping has been provided for each primary simulation in Appendix G. Flood hazard ratings have been calculated in accordance with DEFRA document 'FD2320: Flood Risks to People' and EA guidance document 'Supplementary Note on Flood Hazard Ratings and Thresholds'.

Existing Site Layout Simulations (EXG)

The results of the hydraulic modelling show that the site is flood free up to and including the 1% AEP event. Almost the entire site remains flood free during the 1% + 25% CC event, with a very small area of the site in the west experiencing minor shallow flooding.

During the 1% AEP + 70% CC event and the 0.1% AEP event, floodwater overtops the left bank of the Ebbw River upstream of the site (between EBBW_9644.03 and EBBW_9580.73) and flows east towards the site. Floodwater overtopping the banks upstream of the site (up to the upstream model extent, node EBBW_12077.3 during the 0.1% AEP event) flows downstream across the Ebbw River floodplain and along Commercial Street until it reaches the western site boundary where it flows southeast across the site. Some

floodwater attempts to enter the Ebbw River adjacent to the site (EBBW_9397.91 to EBBW_9284), while some continues through the site, leaving along the northern and eastern boundary and flowing onto the B4591 and Commercial Street. Floodwater then flows east away from the site, flooding areas including Mill Street, Fields Road, Ty-Isaf Crescent, Park Road, Park Avenue and Springfield Road.

Post-Development Site Layout Simulations (DEV)

When the proposed development is considered, hydraulic modelling shows the site remains flood free up to and including the 1% AEP event, with only a small area of shallow flooding along the western boundary shown during the 1% + 25% CC event.

The proposed store is flood free up to and including the 1% AEP + 25% CC event.

Similar to the existing scenario, during the 1% AEP + 70% CC event and higher, floodwater overtops the left bank of the Ebbw River upstream of the site and flows east towards the site and enters the site along the western boundary. Some of the floodwater flows across the site where some is diverted around the proposed store and builds up behind it until the flood depths exceed the proposed finished floor level when it then flows south across the proposed store and car park. Some floodwater attempts to re-enter the channel along the southern boundary, whilst some leaves the site along the eastern boundary, overtopping the B4591 and Commercial Street, flooding areas downstream including Mill Street, Fields Road, Ty-Isaf Crescent, Park Road, Park Avenue and Springfield Road.

Blockage Scenario

During all considered events, a 25% blockage of the B4591 bridge causes the site and proposed store to flood during the existing and proposed development scenario.

During the 1% AEP + 25% CC event and higher existing scenario, the blockage of the bridge causes additional left bank overtopping onto the site. Overtopping between EBBW_9460.13 and EBBW_9397.91 flows northwest away from the site. Floodwater that has overtopped the banks downstream of EBBW_9397.91 to EBBW_9284 flows north across the site and onto Commercial Street and then northeast onto the B4591.

During the 1% AEP + 25% CC event and higher proposed development scenario, the blockage of the bridge causes additional left bank overtopping onto the site, from the southwestern corner where floodwater flows northwest out of the site and north along the access road. The floodwater then flows east along Commercial Street and behind the proposed store. There is also overtopping in the southeast corner of the site adjacent to the B4591 bridge where floodwater flows northeast, leaving the site and flowing onto the B4591. There is some overtopping of the left bank between EBBW_9397.91 and EBBW_9336.71. Floodwater is diverted around the proposed store until the depths exceed the proposed finished floor level. The floodwater then flows across the proposed store from the north and south and leaves the site via the eastern and northeast boundary.

Flood Risk Elsewhere

The potential impact of the proposed development on flood risk elsewhere has been quantified by comparing the equivalent EXG and DEV simulation results. To provide a detailed assessment of the relative changes in flood depths throughout the floodplain, a series of maximum flood depth difference maps have been created and are included in Appendix G.

The flood depth difference maps show that there is no change to flood risk elsewhere during and up to the 1% AEP + 25% CC event.

The flood depth difference maps show that during the 1% AEP + 70% CC event and 0.1% AEP event the proposed development is shown to cause a betterment (up to 300mm) and a minor (generally less than 30mm) increase in flood risk off site.

During the 1% AEP + 70% CC and 0.1% AEP events, there is an increase in flood depths west and north-west of the site along Commercial Street. During the 0.1% AEP event, there is a general increase of up to 30mm to land west and north-west of the site.

The modelled assessment of off-site impact has been made on the basis that the existing site is undeveloped. However, the site is currently used for storage of building supplies and materials which could remove flood storage from the floodplain. Full details of the impact of the development on flood risk elsewhere is provided in the FCA (reference 15679-FCA & Drainage Strategy-02).

Conclusions

Waterco has been commissioned to undertake a hydraulic modelling study in support of a Flood Consequences Assessment (FCA) for the proposed development of a Lidl store along Commercial Street, Risca, Newport, NP11 6EE, herein referred to as the site.

The main objective of this hydraulic modelling study is to quantify existing flood risk to the site and the change in flood risk elsewhere (if any) as a result of the proposed development. To enable this, the NRW linked 1D/2D hydraulic model (EBBWLowerICM_5_V1.0_2018) has been utilised. This report summarises the hydraulic modelling works completed and should be read in conjunction with the associated FCA.

The proposed development comprises of a Lidl store and car park with associated landscaping. As part of the proposed development layout, the finished floor levels (FFLs) of the store will be set to 44.409m AOD as outlined by the client.

The hydraulic modelling indicates that during the EXG and DEV normal condition simulations, the site is almost entirely flood free up to and including the 1% AEP + 25% CC event and the proposed store is flood free up to and including the 1% AEP + 25% CC event. A small area of the western edge of the site experiences shallow flooding during the 1% AEP + 25% CC event.

A 25% blockage of the B4591 bridge causes the site and proposed store to flood during the existing and proposed development scenario.

Recommendations

This hydraulic model is considered suitable to support the FCA being prepared by Waterco for the proposed development at Commercial Street, Risca.

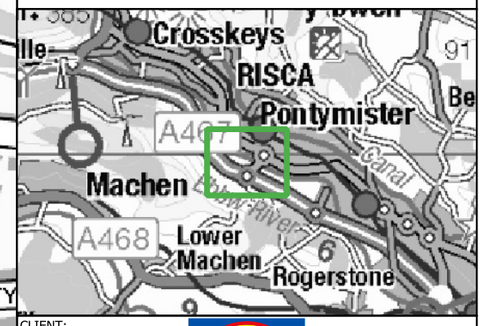
This hydraulic model and associated report should be submitted to NRW for review and approval as a reasonable representation of the fluvial flood risk at the site from the Ebbw River when both the existing and proposed development levels / arrangements are considered.

Appendix A Location Plan, Aerial Image and Photographs

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

LEGEND

- Site Boundary
- Location of NRW Flood Defences
- Watercourses
- Waterbodies



CLIENT:

www.waterco.co.uk

SCHEME:

Land at Pontymister, Risca

PLOT TITLE:

Location Plan

PLOT STATUS:			DATE:
FINAL			26-11-2024
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	AA	LS	1:4000
PLOT NAME:			REVISION:
15679_Location_Plan			-

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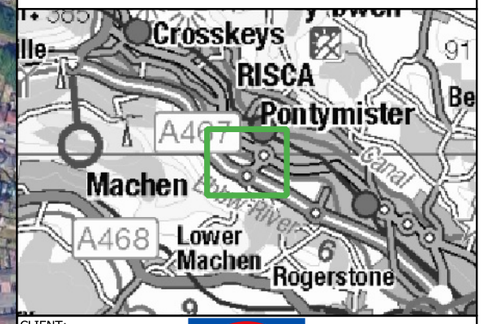
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site Boundary



CLIENT:

www.waterco.co.uk

SCHEME:

Land at Pontymister, Risca

PLOT TITLE:

Aerial Plan

PLOT STATUS:	DATE:
FINAL	26-11-2024

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	AA	LS	1:4000

PLOT NAME:	REVISION:
15679_Aerial_Plan	-

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Appendix B Topographical Survey

Original Drawing Size: A0

GRID NORTH

NOTES:-

The accuracy and content of the drawing is commensurate with the graphical scale at which it is plotted and the original specification. The drawing should only be used for its original intended purpose.

Drainage pipe sizes (where shown) have been gauged from the surface for safety reasons and should be regarded as approximate only. Unless indicated otherwise connections between inspection covers are shown as direct.

Tree species (where shown) are indicative, if crucial expert identification by an arborist is advised.

Boundary features may not represent the extent of legal ownership.

Please note that not all buried pipes, cables and ducts can be detected and mapped in congested areas and that some services may not be detectable by any method of survey. Even an appropriate and professionally executed survey may not be able to achieve a 100% detection rate. Where an area of utilities is likely to affect client project requirements, it is strongly recommended that a PAS128 Quality Level A verification survey is carried out.

LEGEND

Features:
- BH Bore Hole
- ACU Air Conditioning Unit
- AV Air Valve
- BO Bollard
- BOL Bollard Light
- BP Boundary Post
- BT Bus Stop
- CP Control Telecom
- EL Electric
- COL Column
- CTV Cable TV Cover
- DC Drinking Channel
- DF Drinking Fountain
- DS Drained
- GK Gas Kerb
- GPC Damp proof Course
- EJC Electricity JC
- EJ Expansion Joint
- ER Earth Rod
- FB Flower Bed
- FH Fire Hydrant
- FHR Fire Hose Reel
- FS Flagstaff
- FV Flow Valve
- G Gully
- HR Handrail
- IC Inspection Cover
- IL Invert Level
- JBX Junction Box
- LB Letter Box
- LP Lamp Post
- LTB Litter Bin
- LTP Light Top LP
- LT Lamp Post
- MP Marker Post
- OHP Overhead Pipe
- OP Overflow Pipe
- PM Parking Meter
- PP Power Pole
- RAD Radiator
- RE Rodding Eye
- RP Road Name Plate
- RV Road Valve
- RSD Roller Shutter Door
- RWP Rain Water Pipe
- SD Service Duct
- SV Sluice Valve
- TCB Telephone Call Box
- TH Threshold Level
- TL Traffic Light
- TS Traffic Signal
- TB Top of Retaining Beam
- UB Unknown
- UM Unknown
- UL Unknown
- VC Vehicle To Lift
- V Vent
- VP Vent Pipe
- WT Water Meter
- WO Wash Out
- WP Waste Pipe
- WB Weld Safety Barrier

Building Level Detailed:
- D Door
- EL Eave Level
- FFL Floor Level
- GL Ground Level
- HL Head Level
- PPL Pimpled Level
- RL Ridge Level
- SL Sill Level
- SP Springer of Arch
- TA Top of Arch
- W Window
- CLG Ceiling/Beam Soffit

Boundary Types:
- BRK Brick Wall
- BRB Brick & Rail
- CB Close Boarded
- CH Chainlink
- CP Chainlink Top
- CPT Chestnut Paling
- HH Hit and Miss
- IR Iron Railing
- M Metal
- LW Larch Lap
- PL Palisade
- PA Picket
- PR Post & Rail
- PW Post & Wire
- TWR Timber Knee Rail
- RTW Retaining Wall
- WMF Wire Mesh Fence

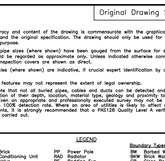
Surfaces & Finishes:
- B Brickwork
- BB Breeze Block
- C Concrete
- CT Ceramic Tiles
- CP Carpet
- CPS Concrete Paving Slabs
- CR Chippings
- CS Concrete Render
- CT Ceramic Tiles
- G Glass
- HBD Hardboard
- L Linoleum
- P Plaster
- RW Brick Pavions
- T Tiled work
- TF Terrazzo
- TSP Textured Safety Paving
- VT Vinyl Tiles

Survey Station
Building
Overhead Building Detail
Fence
Gate
Wall
Painted Road Markings
Tree
Edge of Vegetation
Kerb/Drop Kerb
Banks

Utilities
- (ETP) — CATV Cables
- E(P) — Electricity Cables
- FL(P) — Fuel Pipes
- (GP) — Gas Pipes
- SD(P) — Service ducts
- (TP) — Telecom Cables
- (UP) — Unidentified SPR
- W(P) — Water pipes
- Overhead Lines
- TFR — Taken From Records
- (ETP) — CCTV Cables
- F(P) — Fibre Optic
- FW(P) — Foul Water Drain
- HD(P) — Heating duct
- SW(P) — Storm water drain
- (TP) — Telecom Cables
- (UP) — Unidentified Ele.
- (UP) — Unidentified Trace
- EOT — End Of Trace
- UTT — Unable To Trace
- NPV — No Pipes Visible
- 100/6 — Pipe Diameter/Flow
- Extent of utility survey

Control: All levels and co-ordinates are related to the datums described.
The horizontal control of this survey is based on Ordnance Survey grid as translated from GPS coordinates using Leica's SmartNet service. We have applied a reverse scale factor to the ground measurements to convert them to the OS grid. The vertical control of this survey is based on OS datum as translated from GPS coordinates using the OSGM15 transformation as supplied by the OS. This may differ from the existing OS benchmarks in the area which should be disregarded, all levels should be taken from EDI survey stations.

SHEET LAYOUT:



This survey has been carried out to PAS 128 Detection Method M2: EML search transects at 5m intervals and 2m for GPR.

Utility Depths:-
Depths obtained by EML are to the centre of the utility
Depths obtained by GPR are to the top of the utility
All depths are shown in metres in the format 0.70
Utility Confidence Levels:-
(A) Horizontal and vertical position verified visually
(Accuracy: none - estimated from observations)
(B1) Horizontal and vertical position detected by multiple methods
(Estimated Accuracy: ±150mm OR ±15% of detected depth)
(B2) Horizontal and vertical position detected by a single method
(Estimated Accuracy: ±250mm OR ±40% of detected depth)
(C) Horizontal position detected, depth unknown
(Accuracy: horizontal ±300mm to a horizontal - Depth is undefined)
(EM) A utility segment is known is suspected to exist but has not been detected and is therefore shown as an assumed route
(C) Route transcribed from utility asset plans and correlated to visual indications and surface features (accuracy undefined)
(D) Route transcribed from utility asset plans (accuracy undefined)

Station Schedule

Station	Easting	Northing	Level	Type
1	324350.475	189979.404	43.730	HIRI Nail
2	324376.728	189956.332	43.916	HIRI Nail
3	324411.898	189948.152	44.248	HIRI Nail
4	324470.858	189894.771	43.801	HIRI Nail
19	324327.468	189588.519	44.361	HIRI Nail
20	324474.017	189631.928	43.853	HIRI Nail
21	324474.017	189631.928	43.853	HIRI Nail
C3	324368.506	189891.108	43.933	HIRI Nail

Rev	Job No	Date	Revision Detail		
				--	---
				Surveyor	Check

CLIENT
Ltd Great Britain Ltd & Countrywide Farmers PLC
Waterton Industrial Estate
off Cowbridge Road
Bridgend
CF31 3PH

PROJECT
Topographic Survey & Buried Utilities
Commercial Street
Risca
Newport
NP11 6EE

Job No.	Surveyor	Checked	Date	Scale
21673	C.Chilvers	AR	Dec. 2023	1:200

EDI SURVEYS LTD
163-165 Ranelagh Road, Ipswich, Suffolk IP2 0AH
Telephone | 01473 211222
Email | admin@ediSurveys.co.uk
Our Services:- Topographic Surveys, Measured Building Surveys, GPS Surveying and Control, 3D Laser Scanning, UAV Surveys, Utility Surveying and CCTV Drainage Investigation.
Click the link below to visit our website and find out more.
www.ediSurveys.co.uk

DRAWING No. 21673/TU/01-02 | REV. -

Original Drawing Size: A1

GRID NORTH

NOTES:–

The accuracy and content of the drawing is commensurate with the graphical scale of mapping and the original specification. The drawing should only be used for its original intended purpose.

Drainage pipe sizes (where shown) have been gauged from the surface for safety reasons and should be regarded as approximate only. Unless indicated otherwise connections between inspection covers are shown as direct.

Tree species (where shown) are indicative, if crucial expert identification by an arborist is advised.

Boundary features may not represent the extent of legal ownership.

Please note that not all buried pipes, cables and ducts can be detected and mapped in consideration of their depth, location, material type, geology and proximity to other utilities. Even an appropriate and professionally executed survey may not be able to achieve a 100% detection rate. Where an area of utilities is likely to affect client project requirements, it is strongly recommended that a PAS128 Quality Level A verification survey is carried out.

LEGEND

Features:

AB	Air Brick	PP	Power Pole
ACU	Air Conditioning Unit	RAD	Radiator
AV	Air Valve	RE	Rodding Eye
BD	Bollard	RNP	Road Name Plate
BH	Borehole	RS	Road Sign
BP	Boundary Post	RSD	Roller Shutter Door
BS	Bus Stop	RWP	Rain Water Pipe
BT	British Telecom	SD	Service Duct
CL	Cover Level	SV	Stop Valve
COL	Column	TCB	Telephone Call Box
CTV	Cable TV Cover	THL	Threshold Level
DCH	Drainage Channel	TP	Telegraph Pole
DF	Drinking Fountain	TS	Traffic Signal
DIS	Disused	TW	Top of Wall
DK	Drop Kerb	UB	Universal Beam
DPC	Damp proof Course	UNK	Unknown
EC	Electricity IC	UR	Urinal
EJ	Expansion Joint	UTL	Unable To Lift
ER	Earth Rod	V	Vent
FB	Flower Bed	VP	Vent Pipe
FH	Fire Hydrant	WM	Water Meter
FHR	Fire Hose Reel	WO	Wash Out
FS	Flagstaff	WP	Waste Pipe
GV	Gas Valve	VSB	Vehicle Safety Barrier
GY	Gully		
HR	Hand Rail		
IC	Inspection Cover		
IL	Invert Level		
JBX	Junction Box		
KO	Kerb Outlet		
LB	Letter Box		
LBN	Litter Bin		
LLP	Low Level LP		
LP	Lamp Post		
MP	Marker Post		
OHL	Overhead Line		
OP	Overflow Pipe		
PM	Parking Meter		

Building Level Details:

D	Door
EL	Eave Level
FFL	Floor Level
FRL	Flat Roof Level
HL	Head Level
PPL	Parapet Level
RL	Ridge Level
SL	Sill Level
SP	Springer of Arch
TA	Top of Arch
W	Window
(12.34)	Ceiling/Beam Soffit

Boundary Types:

BW	Barbed Wire
BWK	Brick Wall
CB	Close Boarded
CH	Chainlink
CI	Corrugated Iron
CP	Chestnut Paling
HM	Hit and Miss
IR	Iron Railing
IW	Interwoven
LL	Larch Lap
PAL	Palisade
PI	Picket
PR	Post & Rail
PW	Post & Wire
TKR	Timber Knee Rail
RTW	Retaining Wall
WMF	Wire Mesh Fence

Surfaces & Finishes:

B	Brickwork
BB	Breeze Block
C	Concrete
CLT	Ceiling Tiles
CT	Carpet
CPS	Concrete Paving Slabs
CPT	Carpet Tiles
CR	Concrete Render
CT	Ceramic Tiles
FT	Floor Tiles
HBD	Hardboard
L	Linoleum
P	Plaster
PAV	Brick Paviors
S	Steel work
T	Tarmac
TSP	Textured Safety Paving
VT	Vinyl Tiles

Building — Overhead Building Detail — Wall — Tree — Kerb/Drop Kerb

Survey Station — Fence — Gate — Painted Road Markings — Edge of Vegetation — Banks

Utilities

C(BP)	CATV Cables
E(BP)	Electricity Cables
FL(BP)	Fuel Pipes
G(BP)	Gas Pipes
SD(BP)	Service ducts
TC(BP)	Traffic Control
GPR(BP)	Unidentified GPR
W(BP)	Water pipes
	Overhead Lines
TFR	Taken From Records
	Extent of utility survey
CCTV(BP)	CCTV Cables
FO(BP)	Fibre Optic
FW(BP)	Foul Water Drain
HD(BP)	Heating duct
SW(BP)	Storm water drain
TEL(BP)	Telecom cables
UNK(BP)	Unidentified EML
UNK(BP)	Unidentified Trace
EOT	End Of Trace
UTT	Unable To Trace
NPV	No Pipes Visible
150ø	Pipe Diameter/Flow

Control: All levels and co-ordinates are related to the datums described.

The horizontal control of this survey is based on Ordnance Survey grid as translated from GPS coordinates using Leica's SmartNet service. We have applied a reverse scale factor to maintain true ground distances, based on station ST21. The vertical control of this survey is based on OS datum as translated from GPS coordinates using the OSGM15 transformation as supplied by the OS. This may differ from the existing OS benchmarks in the area which should be disregarded; all levels should be taken from EDI survey stations.

SHEET LAYOUT:

Station Schedule

Station	Easting	Northing	Level	Type
1	324350.475	189979.404	43.730	Hilti Nail
2	324376.728	189956.332	43.916	Hilti Nail
3	324411.898	189948.152	44.248	Hilti Nail
4	324470.888	189894.771	43.801	Hilti Nail
19	324327.468	189888.519	44.361	Hilti Nail
20	324438.759	189790.113	44.453	Hilti Nail
21	324474.017	189821.908	43.853	Hilti Nail
C3	324368.506	189891.108	43.933	Hilti Nail

Rev	Job No	Date	Revision Detail	Surveyor	Check
–	---	--/--/--		--	--

CLIENT

Lidl Great Britain Ltd & Countrywide Farmers PLC
Waterton Industrial Estate
off Cowbridge Road
Bridgend
CF31 3PH

PROJECT

Topographic Survey & Buried Utilities
Commercial Street
Risca
Newport
NP11 6EE

Job No.	Surveyor	Checked	Date	Scale
21673	C.Chilvers	AR	Dec. 2023	1:200

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163–165 Ranelagh Road, Ipswich, Suffolk IP2 0AH
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Email | admin@edisurveys.co.uk
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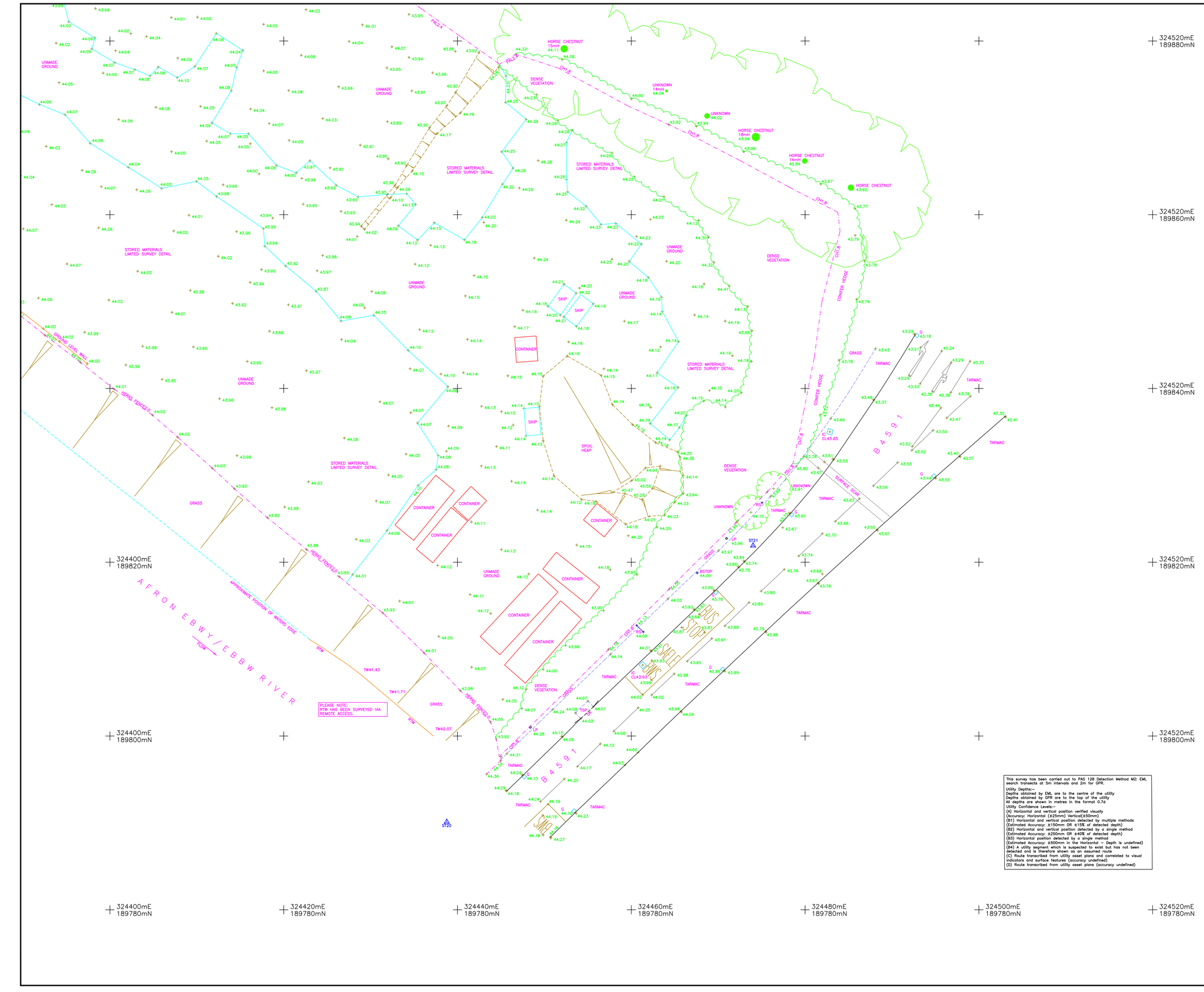
DRAWING No. 21673/TU/02–02 | REV. –

This survey has been carried out to PAS 128 Detection Method M2: EML search transects at 5m intervals and 2m for GPR.

Utility Depths:–
Depths obtained by EML are to the centre of the utility
Depths obtained by GPR are to the top of the utility
All depths are shown in metres in the format 0.7d

Utility Confidence Levels:–
(A) Horizontal and vertical position verified visually
(Accuracy: Horizontal (±25mm) Vertical(±50mm)
(B1) Horizontal and vertical position detected by multiple methods
(Estimated Accuracy: ±150mm OR ±15% of detected depth)
(B2) Horizontal and vertical position detected by a single method
(Estimated Accuracy: ±250mm OR ±40% of detected depth)
(B3) Horizontal position detected by a single method
(Estimated Accuracy: ±500mm in the Horizontal – Depth is undefined)
(B4) A utility segment which is suspected to exist but has not been detected and is therefore shown as an assumed route
(C) Route transcribed from utility asset plans and correlated to visual indicators and surface features (accuracy undefined)
(D) Route transcribed from utility asset plans (accuracy undefined)



Appendix C Proposed Development Plan

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DO NOT SCALE!
ALL DIMENSIONS SHOULD BE CHECKED ON SITE BEFORE WORK COMMENCES

DESIGN SUBJECT TO FOLLOWING:
HIGHWAYS ENGINEER DESIGN AND COMMENT
TREE & TPO SURVEY
M+E DESIGN
FLOOD RISK ASSESSMENT
GROUND INVESTIGATION
LANDSCAPE ARCHITECTS DESIGN
LEVELS REVIEW
DRAINAGE DESIGN
TITLE DEED REVIEW

LIDL DESIGN BASED OFF OF LATEST BBS 2023 LIDL SPECIFCATION - FEBRUARY 2024

HIGHWAYS DRAWINGS BASED ON CORUN DRAWING: 23-00849 PL01 Rev B Potential Ghost Island Junction

SITE AREA = 10,710 SQ M / 2.64 ACRES

EXISTING TELECOMS POLE WITH OVERHEAD UTILITIES - SHOWN IN TURQUOISE

EXISTING TREES TO REMAIN - RPA TO BE SURVEYED, ANY EXCAVATION TO BE DONE AS PER SPECIALIST INSTRUCTION

SCHEDULE OF AREAS (TYPE 1300)

SALES	=1334 m²
WAREHOUSE	=410 m²
ANCILLARY	=218 m²
GIA	=1962 m²

SALES AREA
1334 m²

112 Car Parking Spaces
Inc 9 P&C, 7 Accessible & 2 EVC

EXISTING RIGHT OF WAY TO SLIGHTLY MODIFIED TO BE BROUGHT AWAY FROM THE PROPOSED ROADWAY AND STRIAGHTEN UP TO CONNECT TO BRIDGE CROSSING

FLOOD RISK ASSESSMENT = LOW TO MEDIUM

SITE ACCESS AND HIGHWAYS BASED ON CORUN HIGHWAYS DRAWING: 23-00849 PL01 Rev B

PROPOSED LANDSCAPING BASED ON LANDSCAPE ARCHITECTS DESIGN. REFER TO CA 2024-RISCA-03 LANDSCAPEPROPOSALSOVERALL FOR MORE INFORMATION

Rev.	Date	Description	Drawn
W	23/01/2025	Scale bar added, north point adjusted, general annotation moved.	KA
V	13/11/2024	Proposed landscaping scheme updated as per Corscadden drawing:173 CA-2024- RISCA-0 REV B	KA
U	11/11/2024	Proposed rear retaining wall location adjusted.	KA
T	06/11/2024	Scheme updated as per new topographical survey recieved 04/11/24 and updated as per Corscadden Landscaping scheme.	KA
S	04/10/2024	Lidl Flagpole added	KA

htcarchitects
York Place Studio
8 Britannia Street
Leeds
LS1 2DZ
T:(0113) 244 3457
W: www.htcarchitects.co.uk
E: info@htcarchitects.co.uk

client: Lidl GB Ltd.

project: Commercial Street Risca

drawing title: Proposed Setting Out Plan

date: September 2024
status: Planning
scale: 1:500 @ A3
drawn: KA checked: BM
job no.: 3067 dwg no.: P402 rev.: W

0m 10m 20m 30m 40m 50m

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DO NOT SCALE!
ALL DIMENSIONS SHOULD BE CHECKED ON SITE BEFORE WORK COMMENCES

DESIGN SUBJECT TO FOLLOWING:
HIGHWAYS ENGINEER DESIGN AND COMMENT
TREE & TPO SURVEY
M+E DESIGN
FLOOD RISK ASSESSMENT
GROUND INVESTIGATION
LANDSCAPE ARCHITECTS DESIGN
LEVELS REVIEW
DRAINAGE DESIGN
TITLE DEED REVIEW

LIDL DESIGN BASED OFF OF LATEST BBS 2023 LIDL SPECIFCATION - FEBRUARY 2024

HIGHWAYS DRAWINGS BASED ON CORUN DRAWING: 23-00849 PL01 Rev B Potential Ghost Island Junction

Retaining Wall Length approx. 42.3m

0.2m Retaining Wall
0.3m Retaining Wall
0.8m Retaining Wall
0.8m Retaining Wall
1.0m Retaining Wall
0.3m Retaining Wall
Approximate end retaining wall - limited existing survey levels

SITE AREA = 10,710 SQ M / 2.64 ACRES

FFL = 44.409m

1.25m RETAINING

SUB STATION

BILLBOARD

TROLLEY BAYS

CANOPY OVER

KEY:

86.85m	EXISTING EXTERNAL LEVEL
86.85m	ESTIMATED LEVELS
	PROPOSED EXTERNAL LEVEL
FFL = 86.850	PROPOSED INTERNAL FLOOR LEVEL
	DIRECTION OF FALL - INCLUDING FALL ANGLE SET AT 1:X - OUTSIDE DIMENSIONS INDICATE THE LEVELS (PROPOSED/EXISTING)
x.xm RETAINING	PROPOSED RETAINING WALL HEIGHT INDICATOR - AVERAGE HEIGHT IN LOCATION NOTED FROM **EXISTING** GROUND LEVEL
	PROPOSED RETAINING WALL
	SITE BOUNDARY
	INDICATIVE LOW POINTS
	EXISTING RETAINING WALL TO BE REMOVED

0m 10m 20m 30m 40m 50m

Rev.	Date	Description	Drawn
J	23/01/2025	Scale bar added, north point adjusted, general annotation moved.	KA
I	13/11/2024	Proposed landscaping scheme updated as per Corscadden drawing 173 CA-2024- RISCA-0 REV B	KA
H	11/11/2024	Retaining wall location adjusted	KA

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LS1 2DZ
T:(0113) 244 3457
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E: info@htcarchitects.co.uk

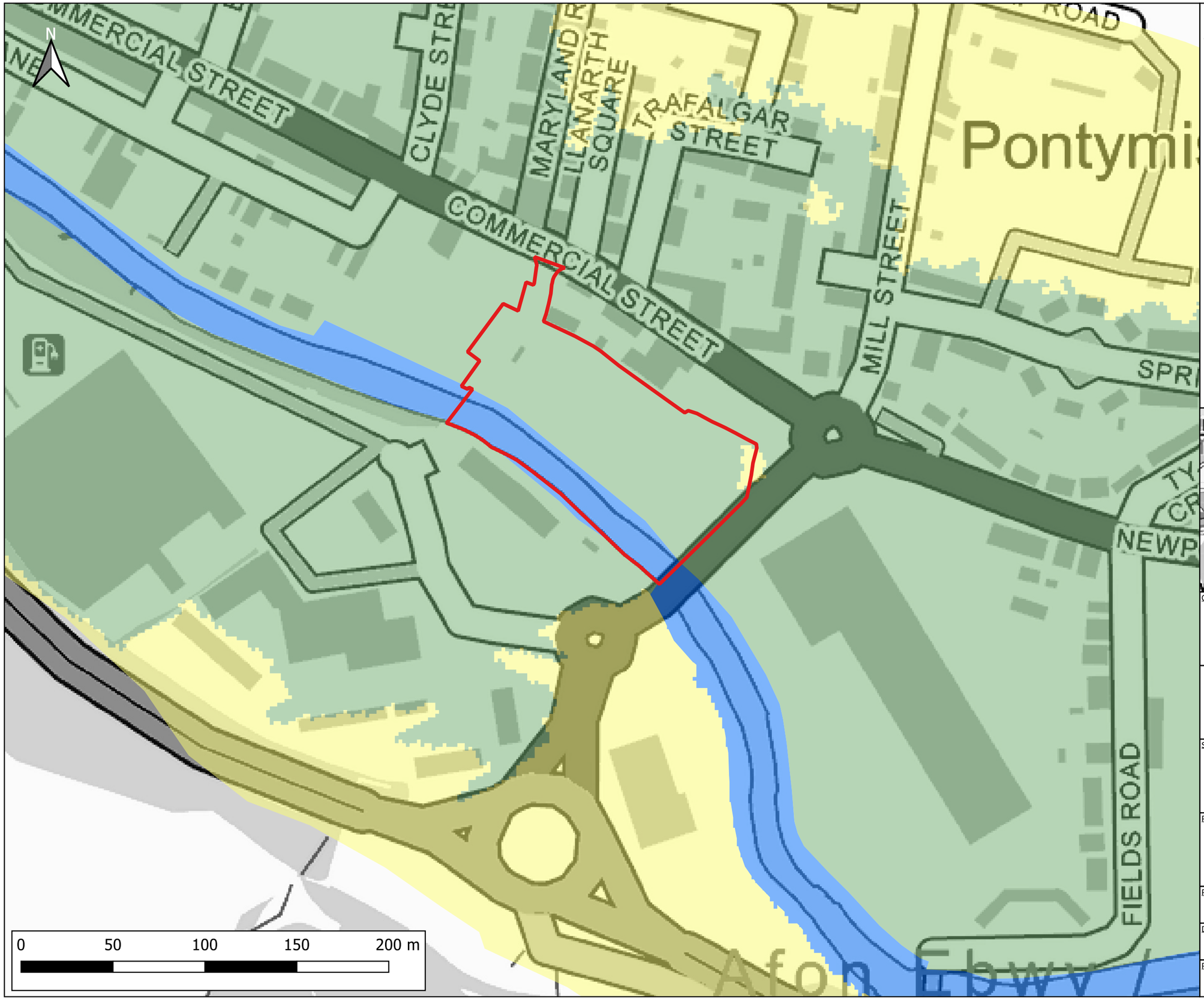
client
Lidl GB Ltd.

project
Commercial Street
Risca

drawing title
Proposed Levels Strategy

date September 2024
status Planning
scale 1:500 @ A3
drawn NG checked BM
job no. 3067 dwg no. P405 rev. J

Appendix D NRW Flood Maps and Correspondence



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

LEGEND

- Site Boundary

Development Advice Map (TAN15)

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

CLIENT: LIDL

waterco
www.waterco.uk

SCHEME:
Land at Pontymister, Risca

PLOT TITLE:
NRW Development Advice Map
Data published October 2022

PLOT STATUS:	DATE:
FINAL	26-11-2024

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	AA	LS	1:2000

PLOT NAME:	REVISION:
15679_NRW_DAM_Map	-

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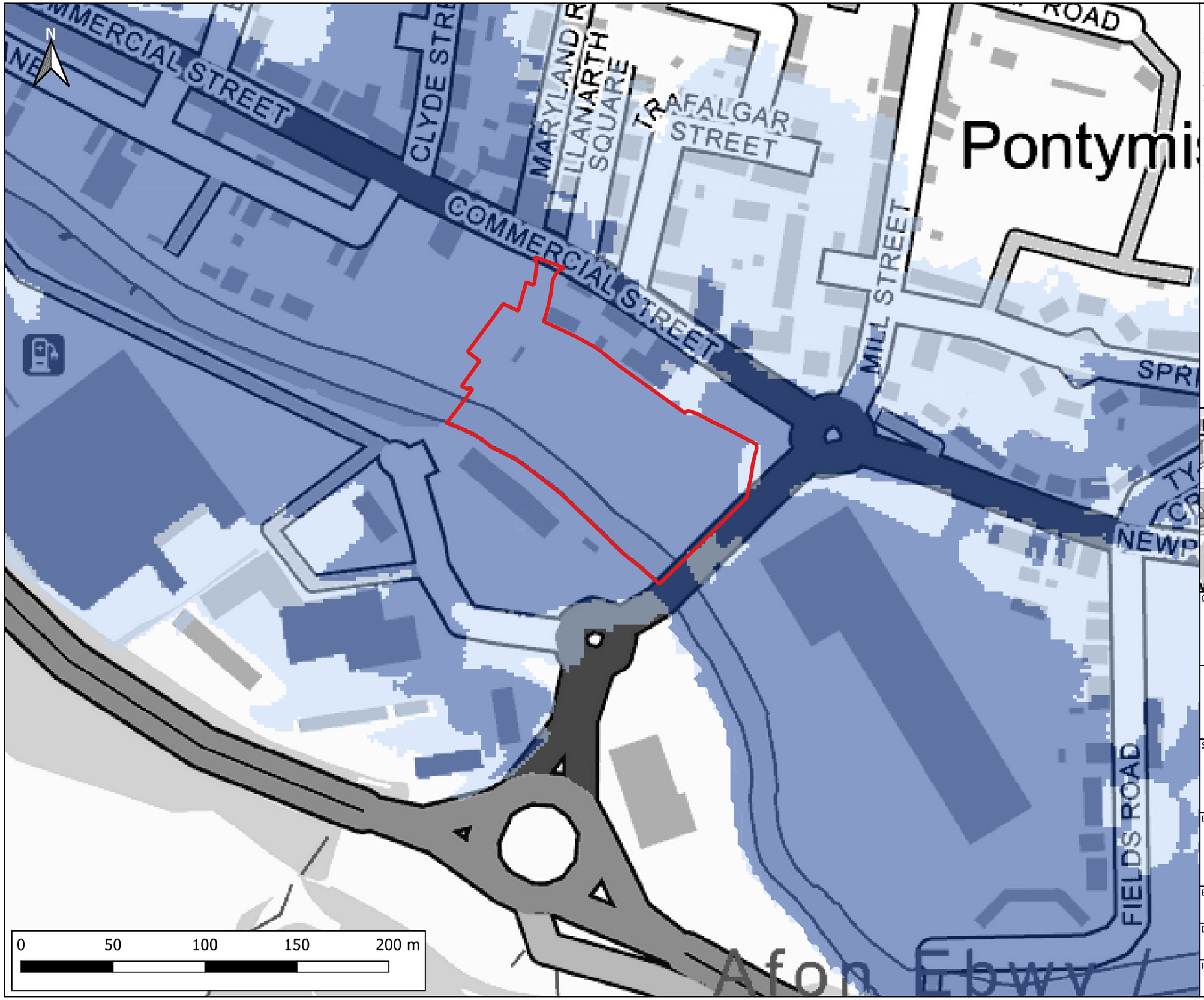


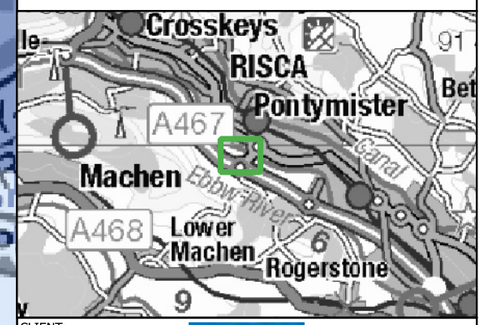
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
2) Flood Zone 3 displays the extent of flooding from rivers with a 1% AEP or greater of flooding in a given year including and allowance for climate change and the sea with a 0.5% AEP or greater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

LEGEND

- Site Boundary

NRW Flood Map for Planning

- Flood Zone 2
- Flood Zone 3



CLIENT: LIDL

waterco
www.waterco.co.uk

SCHEME:
Land at Pontymister, Risca

PLOT TITLE:
NRW Flood Map for Planning (Rivers and Sea)
Data published May 2024

PLOT STATUS:			DATE:
FINAL			26-11-2024
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	AA	LS	1:2000

PLOT NAME: 15679_NRW_FMfP
REVISION: -

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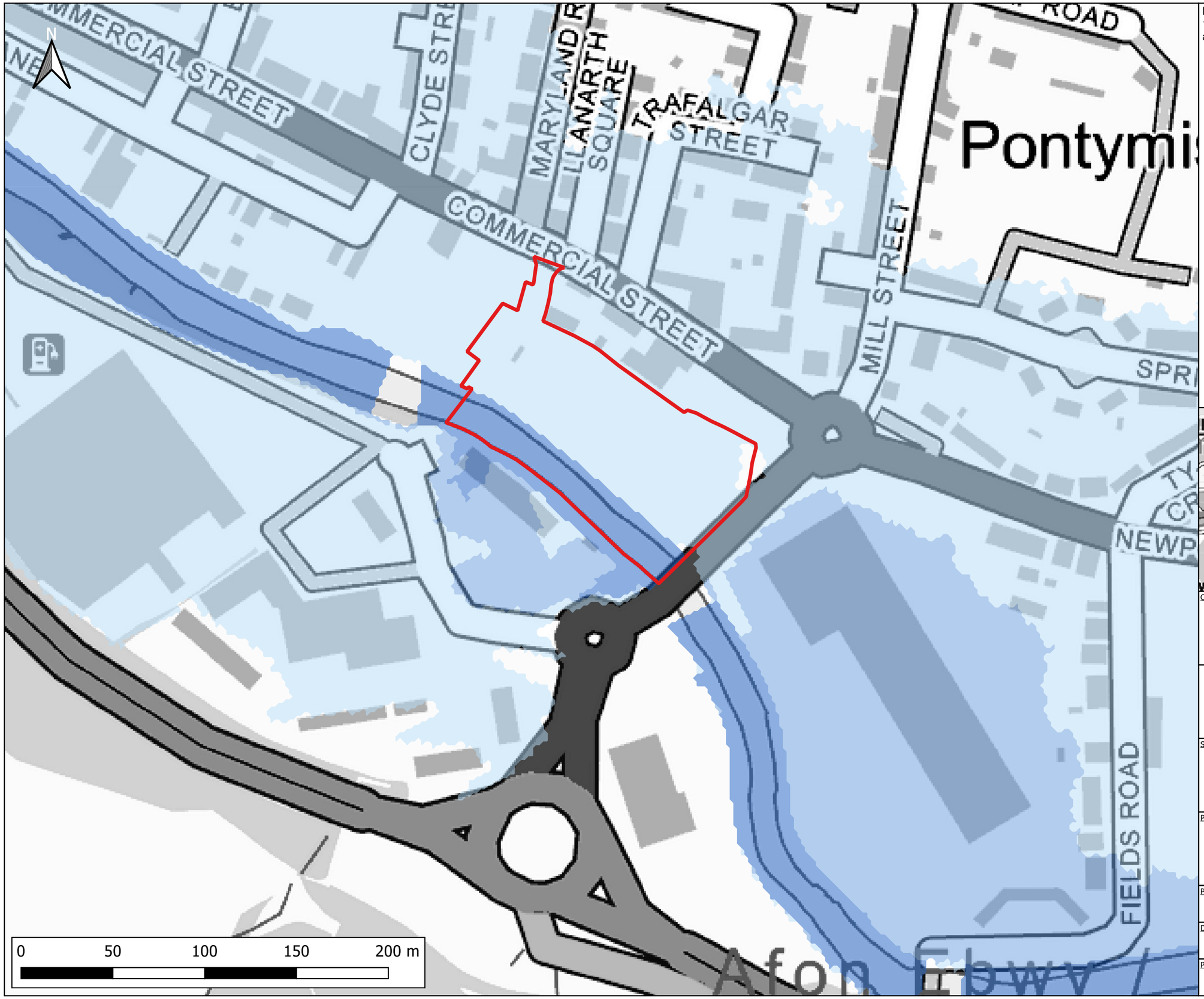


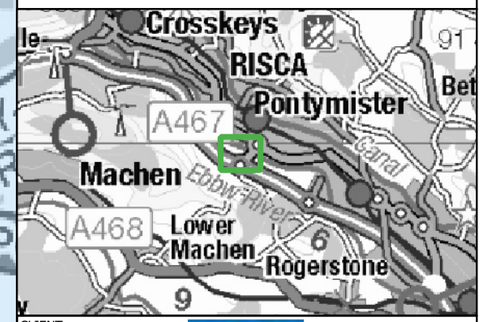
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Flood Risk from Rivers

- High (greater than 3.3% AEP)
- Medium (between 1% and 3.3% AEP)
- Low (between 0.1% and 1% AEP)



CLIENT:

LIDL

waterco
www.waterco.co.uk

SCHEME:

Land at Pontymister, Risca

PLOT TITLE:

NRW Flood Risk from Rivers
Data published May 2024

PLOT STATUS:			DATE:
FINAL			26-11-2024
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	AA	LS	1:2000
PLOT NAME:			REVISION:
15679_NRW_Flood_Risk_from_Rivers			-

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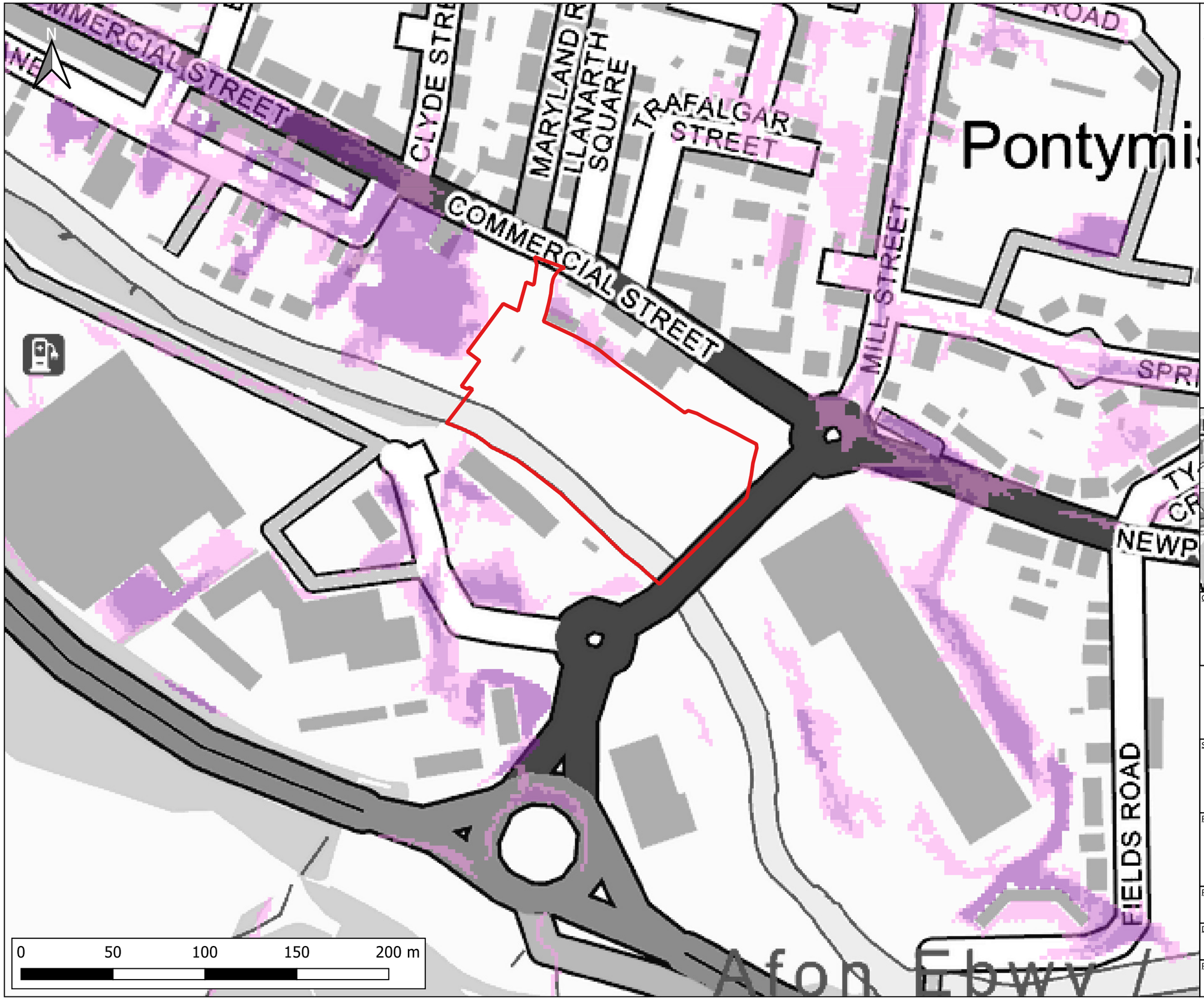


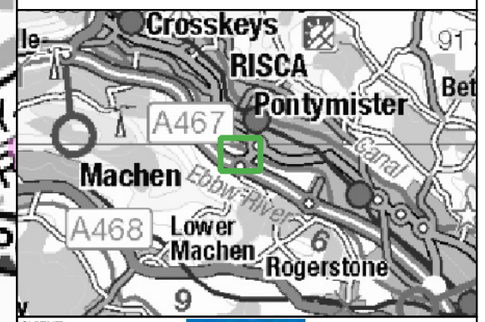
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site Boundary

Flood Risk from Surface Water & Small Watercourses

- High (greater than 3.3% AEP)
- Medium (between 1% and 3.3% AEP)
- Low (between 0.1% and 1% AEP)



CLIENT:

www.waterco.co.uk

SCHEME:

Land at Pontymister, Risca

PLOT TITLE:

NRW Flood Risk from Surface Water & Small Watercourses
Data published May 2024

PLOT STATUS:	DATE:
FINAL	26-11-2024

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	AA	LS	1:2000

PLOT NAME:	REVISION:
15679_NRW_Flood_Risk_from_Surface_Water	-

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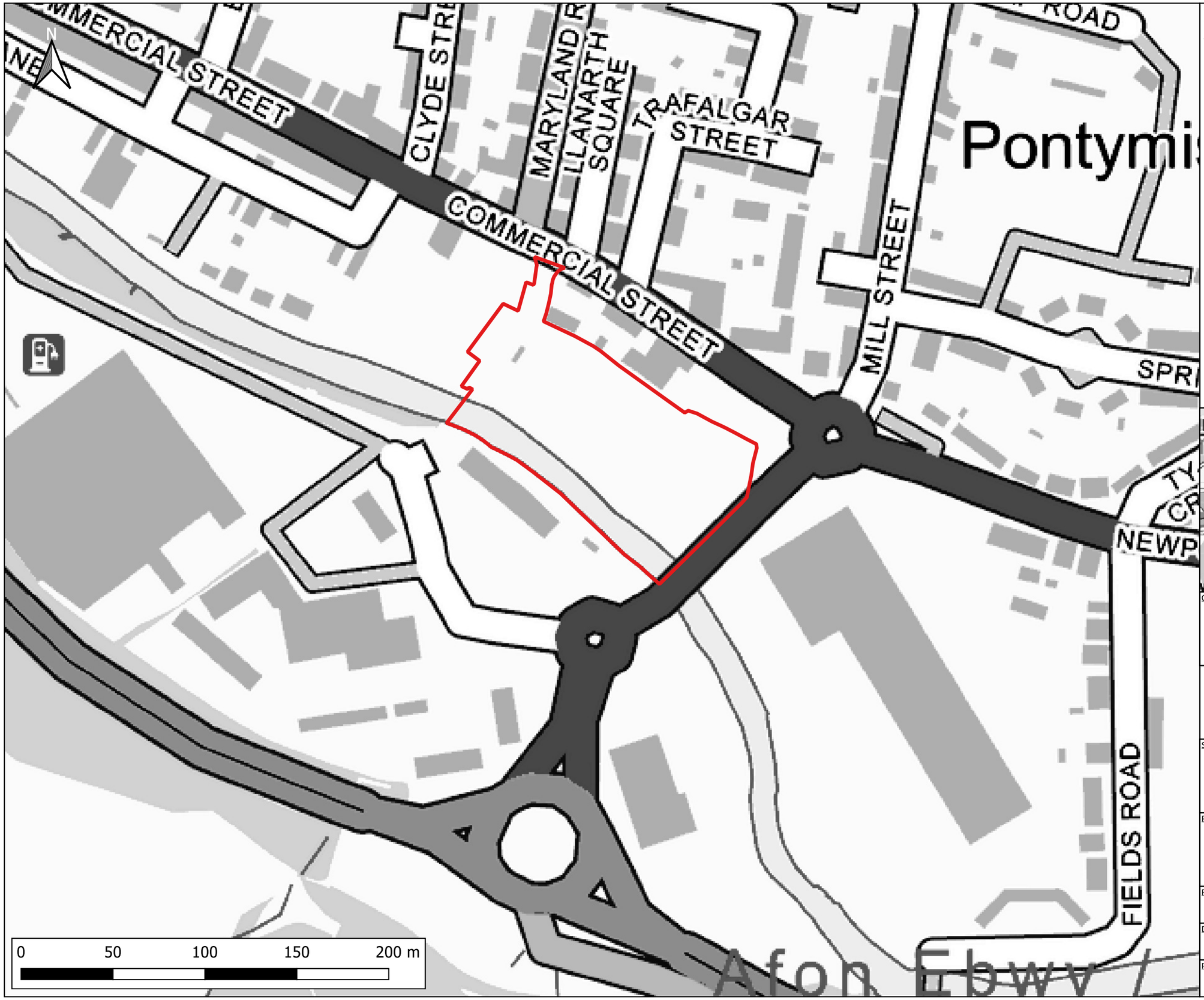


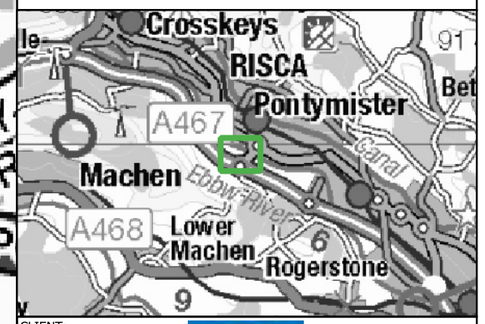
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Flood Risk from the Sea

- High (greater than 3.3% AEP)
- Medium (between 0.5% and 3.3% AEP)
- Low (between 0.1% and 0.5% AEP)



CLIENT:

www.waterco.co.uk

SCHEME:

Land at Pontymister, Risca

PLOT TITLE:

NRW Flood Risk from the Sea
Data published May 2024

PLOT STATUS:	DATE:
FINAL	26-11-2024

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	AA	LS	1:2000

PLOT NAME:	REVISION:
15679_NRW_Flood_Risk_from_the_Sea	-

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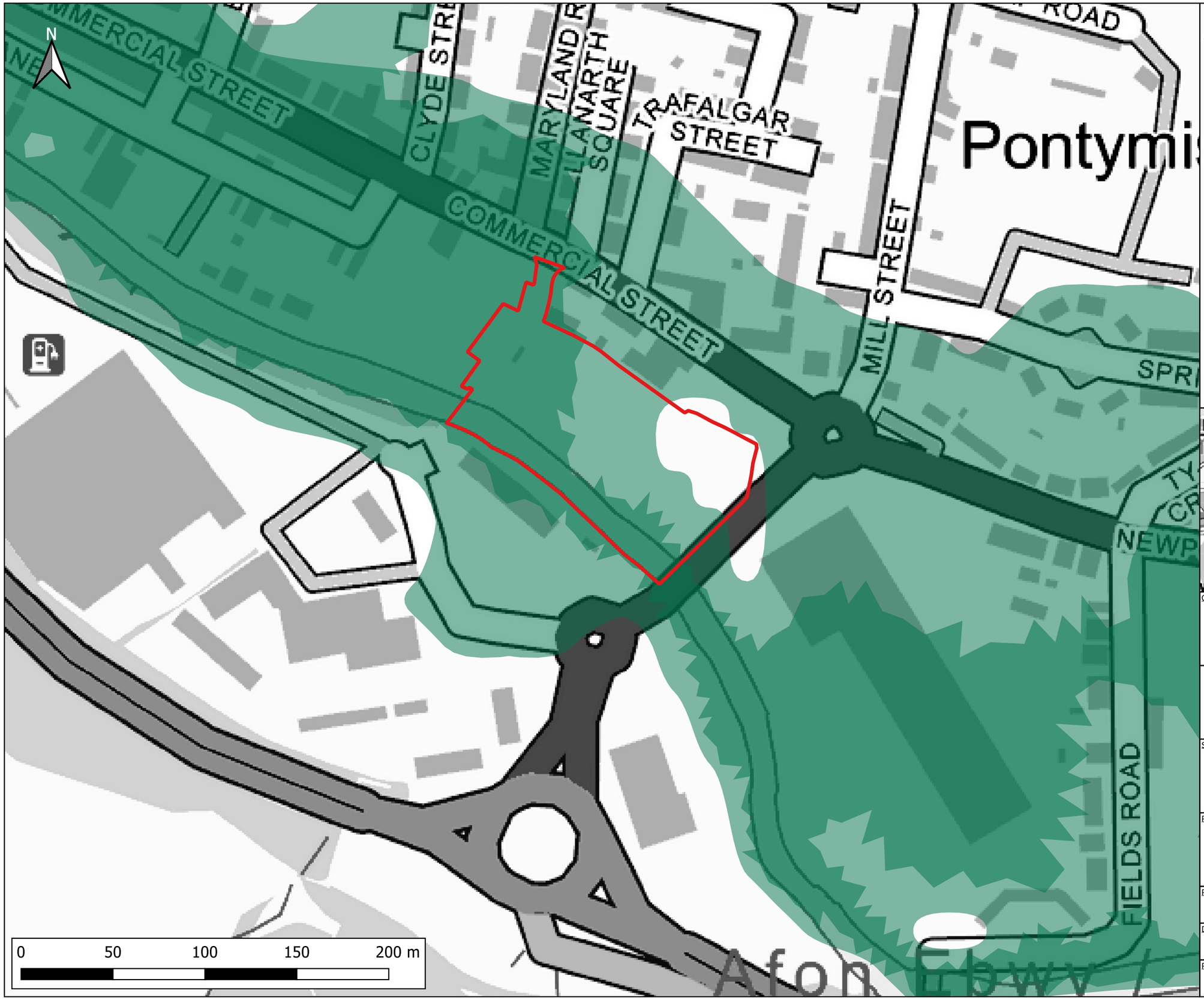
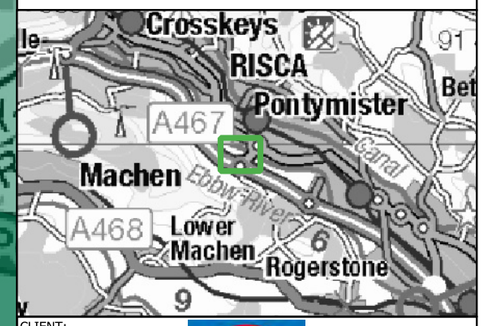


Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Flood Risk from Reservoirs Extent



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SCHEME:

Land at Pontymister, Risca

PLOT TITLE:

NRW Flood Risk from Reservoirs
Data published February 2017

PLOT STATUS:	DATE:
FINAL	26-11-2024

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	AA	LS	1:2000

PLOT NAME:	REVISION:
15679_NRW_Flood_Risk_from_Reservoirs	-

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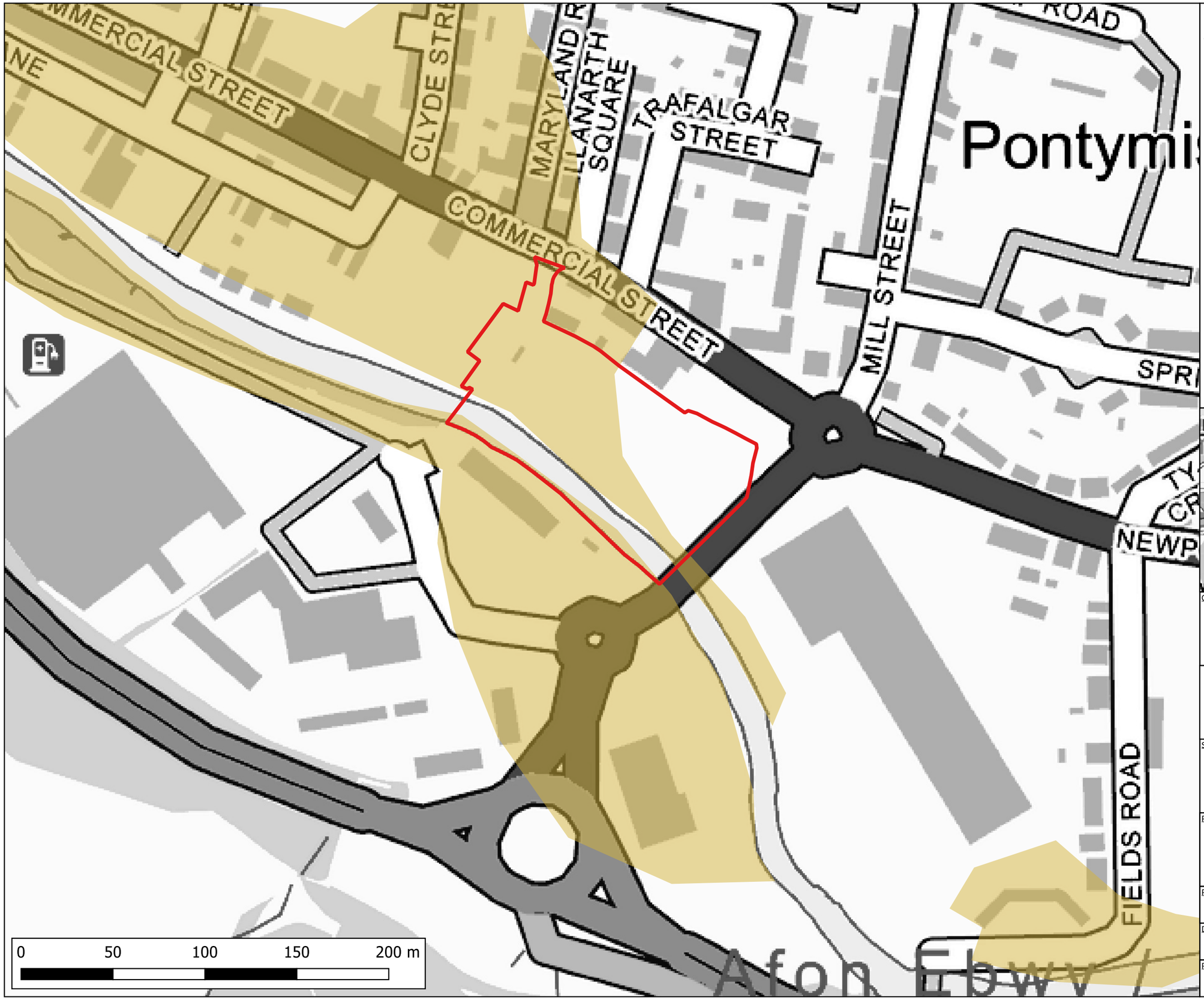
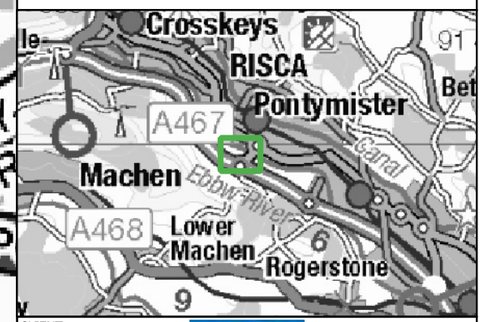


Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- NRW Recorded Flood Extents



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SCHEME:

Land at Pontymister, Risca

PLOT TITLE:

NRW Recorded Flood Extents
Data published May 2024

PLOT STATUS:			DATE:
FINAL			26-11-2024
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	AA	LS	1:2000

PLOT NAME:	REVISION:
15679_Recorded_Flood_Extents	-

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15679 – Land at Pontymister, Risca
Proposed hydraulic modelling methodology for NRW comment – Existing NRW Model Build

March 2024

Background

We are currently undertaking hydraulic modelling of the River Ebbw through Risca to inform a Flood Consequences Assessment for a proposed commercial development site at Commercial Street, Risca, Newport, NP11 6EE (NGR: 324398, 189871). A location plan and aerial image is included in Appendix A.

Prior to progressing works further, we are seeking your advice and comment with regard to our proposed modelling methodology. We find that discussing our approach with Natural Resources Wales (NRW) at the early stage saves all parties involved time and ensures your team's site-specific requirements are fully accounted for. As such, please find below our proposed methodology for your consideration. Your advice or comment would be very much appreciated.

Model Details & Requirements

Waterco have been provided with the NRW River Ebbw Integrated Catchment model (2019) in a recent data request (January 2024 – ATI 26398a). A detailed review of the existing model has been carried out by Waterco to assess its suitability for use to inform the flood risk to the proposed development. The results of the model review are as follows:

- The site is located within the Risca domain. At this stage, we are not proposing to truncate the model, however if run times or model stability becomes an issue, then this would be reviewed.
- There are a sensible number of cross sections in the vicinity of the site, spaced ~20m to ~50m apart.
- The downstream boundary of the model is tidally influenced. There is no tidal influence at the site and therefore tidal calculations will not be updated. This will also not be applicable if the model is truncated at a later date.
- The model will be run in the latest versions of the software.
- Most recent climate change allowances would need to be considered on the appropriate events. Please see below for more details.
- The model DTM will be reviewed against latest available data. If there are differences in levels within the model extent then the latest data will be used within the model.

Based on the findings of the model review, it is believed the model is fit for purpose (post review updates) to provide an up-to-date, site-specific assessment of flood risk at the existing (EXG) site. Therefore, we propose to utilise the current NRW hydraulic model of the River Ebbw to provide the required output data. Given the existing model was a detailed and thorough assessment of the flood risk to the catchment, and that the nature of the development is 'less vulnerable' development, it is deemed a proportionate approach. The existing model will also be used to quantify the impact of the development on flood risk elsewhere (if any) through simulation and comparison of the proposed development (DEV) site arrangement. Model outputs will then be used to support the Flood Consequences Assessment being prepared for the development.

Please advise if you are your team are aware of any pre-existing issues with the model – any additional information at this stage is useful. Thank you.

The site is shown to be located within NRW Defended Flood Zone 3 on the 'NRW Flood Map for Planning – Rivers'.

Model and Simulation Type

Software:	FMP-TUFLOW
Approach:	Fluvial and Tidal.
Extent:	Please find the model extent included in Appendix B.

Hydrological Calculations

A robust and detailed hydrology assessment was carried out by NRW (July 2019) to produce the model inflows. The flows were also calibrated to local data to improve confidence in the model inflows. Due to the detail of the previous hydrology assessment carried out in the existing model, we propose to utilise the existing watercourse inflows and boundary conditions contained in the model and simply re-run with site-specific updates. We trust this is acceptable.

Events / Scenarios Considered

Model study to simulate and compare the flood risk at the site for the existing (EXG) and proposed development (DEV) level. Table 1 provides a summary of the proposed events and scenarios.

Proposed Climate Change Allowance (CCA) for this site during the 3.33%, 1% AEP and 0.1% AEP events are + 25% (Central – CC1) and 70% (Upper – CC2) in accordance with NRW guidance (Site located in River Severn River Basin; development considered 'less vulnerable' with predicted 100 year lifetime).

Site located in the Severn River Basin Management Catchment District.

Development considered 'less vulnerable'.

Blockage Scenario

Blockage scenarios based on the latest NRW blockage guidance document will be carried out simulating a 25% blockage of the B4591 Road Bridge (at approximately NGR: 324440, 189784) during the 1% AEP plus CC1, 1% AEP plus CC2 and 0.1% AEP events only. A 25% blockage has been deemed applicable due to the size of the bridge.

Sensitivity Tests

Sensitivity Tests (ST) will not be considered as we are proposing to utilise the existing NRW model, which has undergone sensitivity testing and calibration previously. However, if the model is truncated at a later stage, a sensitivity test will be carried out on the downstream boundary.

Table 1 Summary Table of Proposed Model Scenarios and Events

Event (AEP)	Scenario		
	Existing site layout and level (EXG)	Proposed site layout and levels (DEV)	Blockage (BL)
5%	✓	✓	
3.3%	✓	✓	
3.3% + CC1	✓	✓	
3.3% + CC2	✓	✓	
1%	✓	✓	
1% + CC1	✓	✓	✓
1% + CC2	✓	✓	✓
0.1%	✓	✓	✓
0.1% + CC1	✓	✓	
0.1% + CC2	✓	✓	

For Your Consideration

Please provide comment on our above methodology and whether you are in agreement with the approach outlined? Please also confirm if any hydrology updates are required?

Waterco Contact

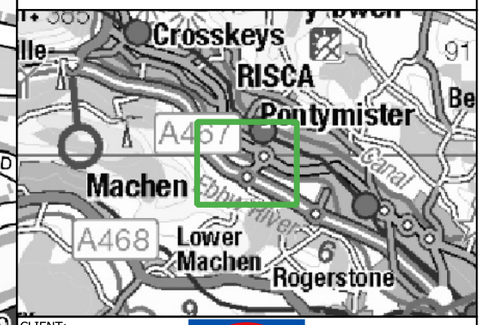
Awel Roberts
01244 986024
01824 702220
awel.roberts@waterco.co.uk

Appendix A Location Plan and Aerial Image

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

LEGEND

- Site Boundary
- Location of NRW Flood Defences
- Watercourses
- Waterbodies



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SCHEME:

Land at Pontymister, Risca

PLOT TITLE:

Location Plan

PLOT STATUS:			DATE:
FINAL			28-02-2024
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
RM	AMR	AP	1:5000

PLOT NAME:	REVISION:
15679_Location_Plan	-

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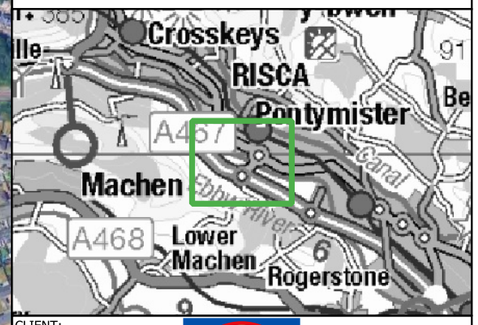
LEGEND

Site Boundary



CLIENT:

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SCHEME:

Land at Pontymister, Risca

PLOT TITLE:

Aerial Plan

PLOT STATUS:	DATE:
FINAL	28-02-2024

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
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PLOT NAME:	REVISION:
15679_Aerial_Plan	-

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Appendix B Proposed Model Extent