



Commercial Street, Risca

Newport

Flood Consequences Assessment & Drainage Strategy

February 2025

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Introduction

Waterco has been instructed to prepare a Flood Consequences Assessment (FCA) and Drainage Strategy in respect of a proposed mixed-use residential and commercial development at the site of the existing Lidl Store, Commercial Street, Risca, NP11 6AW.

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. This 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 also includes a Drainage Strategy. The aim of the Drainage Strategy is to identify water management measures, including Sustainable Drainage Systems (SuDS), to provide surface water runoff reduction and treatment. This report has been prepared in accordance with the Welsh Government 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems' (2018) – herein referred to as 'the Statutory Standards for SuDS'.

This Flood Consequences Assessment has been supported by and should be read in conjunction with the Waterco Hydraulic Modelling Report (document reference: 15679-HMR-01). The modelling report has been prepared for an application site 525m south-east of the site considered by this report. However, the model outputs cover the site considered by this report.

Existing Conditions

The site covers an area of approximately 6,783m² and is located at National Grid Reference (NGR) 323922, 190215. A location plan and an aerial image are included in Appendix A.

Online mapping (including Google Maps / Google Streetview imagery accessed February 2025) shows that the site comprises a Lidl store with associated access and parking. The site is bordered by a sports complex and a church to the north-west, Commercial Street with residential properties beyond to the north-east, residential properties and undeveloped land to the south-east and the Ebbw River to the south-west. Access to the site is provided from Commercial Street.

Local Topography

A topographical survey has been undertaken by EDI Surveys Ltd in January 2025. The topographical survey shows that site levels vary from 45.6 meters Above Ordnance Datum (m AOD) in the west to 44.98m AOD in the centre of the site. The centre of the site forms a topographical low point within the site. Lowest site levels are shown adjacent to drainage channels within the existing car park.

Topographic levels to m AOD have also been derived from a 1m resolution NRW composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). A review of LiDAR data shows that the site is relatively flat with levels consistent with those identified by the topographical survey.

Topographical data is included as Appendix B.

Ground Conditions

The British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the site is underlain by superficial deposits of Alluvium, generally comprising clay, silt, sand and gravel. The site is identified as being underlain by bedrock of the Brownstones Formation and St Maughans Formation, comprising sandstone and argillaceous rocks.

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

The closest historical BGS borehole record (BGS reference: ST29SW50) is located approximately 100m west of the site and is included in Appendix C together with a borehole location plan. The borehole record identifies:

Fill (ashes) from ground level to 1.4 metres below ground level (m.bgl);

Firm brown sandy clay from 1.4m.bgl to 1.8m.bgl;

Very dense sandy gravel with cobbles and boulders from 1.8m.bgl to 5.6m.bgl.

According to NRW's Aquifer Designation data, obtained from the BGS GeoIndex online mapping [accessed February 2025], the underlying bedrock is classified as a Secondary A Aquifer.

Secondary A Aquifers are 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'.

Local Drainage

Public sewer records have been obtained from Dwr Cymru Welsh Water (DCWW) and are included in Appendix D. The DCWW sewer records show that there is a 225mm combined sewer overflow crossing the site flowing south. The combined sewer overflow discharges to the Ebbw River approximately 60m south-east of the site.

The sewer records also show a 900mm public combined sewer north-east of the site within Commercial Street flowing south-east. There is also a 150mm public combined sewer overflow east of the site within Commercial Street flowing south-east.

Existing drainage features on site are identified on the topographical survey (Appendix B). Surface water flows are directed towards the Ebbw River however the surface water drainage system could not be fully surveyed as chambers were surcharged. Foul flows are directed towards the public combined sewer in Commercial Street via a 150mm diameter pipe.

Development Proposals

The proposed development is for the demolition of the existing Lidl Store and the erection of 42no. residential properties and a commercial unit with associated parking, access, landscaped areas and an attenuation pond. Proposed development plans are included in Appendix E.

The proposed development will result in a reduction in hardstanding areas. Proposed hardstanding in the form of buildings, parking areas and roads will comprise approximately 4,800m² or 70.7% of the total site area. The remaining permeable, soft landscaped areas will occupy 1,983m² or 29.3% of the total site area. Measurements have been taken from a PDF copy of the 'Illustrative Site Layout' and are approximate only.

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 C1 – an area considered to be at flood risk, but served by significant infrastructure, including flood defences, with a 0.1% (1 in 1000) or greater annual probability of flooding.

The NRW 'Flood Map for Planning' (Appendix F) shows that the site is located within Flood Zone 3 – an area considered to be at flood risk with a 1% (1 in 100) or greater annual probability of fluvial flooding, including the effects of climate change. The site is shown within a 'TAN15 Defended Zone', meaning it benefits from the protection offered by flood defences.

Development Vulnerability Classification

The proposed residential element of the 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). The proposed commercial element of the development is considered to be 'less vulnerable' development in accordance with Figure 2 of TAN15.

TAN15 states that highly vulnerable development can be considered in Flood Zone C1 subject to the application of the TAN15 Justification Test and satisfying specific TAN15 acceptability criteria. The specific TAN15 'acceptability criteria' are assessed in the following sections.

Local Policy

The Caerphilly County Borough Council Local Development Plan (adopted November 2010) contains the following policies relating to flood risk and drainage:

'Promote resource efficient settlement patterns

As a general the Plan seeks to locate development away from the floodplain. However where development is considered appropriate having regard to the role and function of settlements and can be justified within the context of TAN 15, suitable mitigation measures will need to be incorporated within the design of any new development to ensure that it is as safe as possible. In particular, where development is proposed in vulnerable

areas, the need for a flood consequences assessment will be highlighted as a requirement of any future planning application on sites allocated in the LDP. These assessments will be prepared in consultation with the Environment Agency. Wherever possible in such locations, redevelopment will also be planned in such a way as to provide increased protection for existing vulnerable urban areas.'

Local guidance documents including the South East Wales Strategic Flood Consequences Assessment (SFCA) (November 2022) and the Caerphilly County Borough Council Preliminary Flood Risk Assessment (PFRA) (May 2011) have been reviewed and inform this report.

Consultation

A consultation request was submitted to the SAB in January 2025. In their response (Appendix G), the SAB have stated that:

'Proposed Mixed-Use Development at Lidl Store, Pontymister – Initial SAB Advice

Thank you for your enquiry regarding the proposed Flood Consequences Assessment and Drainage Strategy for the site at Lidl Store, Commercial Street, Pontymister. I would advise that Pre Application advice sought, which will provide further specific guidance to your queries however, in the first instance, I note the following key points:

Discharge Strategy:

It is noted that infiltration may be unfeasible due to underlying geology, but confirmation via infiltration testing will be required to satisfy the drainage hierarchy. Formal Pre-Application advice is recommended, to provide further details.

The proposed discharge to the Ebbw River at a restricted greenfield runoff rate of 2.1 l/s appears appropriate however, calculations would be required, demonstrating compliance with statutory SuDS standards.

Attenuation Measures:

The proposed attenuation pond and sub-grade storage beneath car parking spaces are noted.

Further details on the attenuation design, including volume calculations, storage provisions, and long-term maintenance arrangements, would be required at Full Application stage however, guidance would be provided at pre-application stage.

We would encourage the inclusion of additional SuDS components where feasible to provide water quality benefits prior to discharge into the river – reference is drawn to S3 – Surface Water Quality Management, G3.1.

Use of ReFH2:

The derivation of greenfield runoff rates using ReFH2 is typically required, provided that the input parameters align with guidance from the CIRIA SuDS Manual and Welsh Government statutory requirements. Further, post-development calculations shall use the most recent rainfall data available for the area, typically FEH22 data.'

A pre-development enquiry request was submitted to DCWW in January 2025. In their response (Appendix H), DCWW have stated that:

Public Sewerage Network

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

The proposed site is crossed by public combined sewer with the approximate position being marked on the attached Statutory Public Sewer Record. Under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times. No operational development will be permitted within 3 metres either side of the centreline of the public sewer. Arrangements can be made for Company Staff to undertake a sewer trace on request of the developer to accurately locate the asset and to establish its relationship to the proposed development. You are advised that there is a charge for this service. Should the proposed development be located within the protection zone of the public sewer there would be a need for the applicant to either re-locate the building outside of the required protection zone or apply to divert the public sewer under Section 185 of the Water Industry Act 1991.

Our strong recommendation is that your site layout takes into account the location of the assets crossing the site and should be referred to in any master-planning exercises or site layout plans submitted as part of any subsequent planning application.

Surface Water Drainage

We note that surface water will drain to a watercourse, and we welcome this approach as a more sustainable alternative to a public sewer. In addition, please note that no highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system.

Foul Water Drainage – Sewerage Network

We advise that the flows should be communicated to the 150mm combined sewer at or downstream of manhole ST01897980 located in Waun Wen or the 150mm combined sewer at ST23909103 located in Commercial Lane as indicated on the extract of public sewer record provided. Should a planning application be submitted for this development we will seek to control this point of communication via appropriate planning conditions and therefore recommend that any drainage layout or strategy submitted as part of your application takes this into account. However, should you wish for an alternative connection point to be considered please provide further information to us in the form of a drainage strategy, preferably in advance

of a planning application being submitted.'

Sources of Flooding and Probability

Fluvial

The nearest watercourse is the Ebbw River which is located immediately south-west of the site. The Ebbw River flows south-east in this location.

Fluvial flooding could occur if the Ebbw River overtopped its defences during or following an extreme rainfall event. Flooding could also occur or be exacerbated by a blockage of the B4591 (Newport Road) bridge located approximately 640m south-east of the site.

The NRW 'Recorded Flood Extents' map (Appendix F) indicates that the site falls within the extent of river flooding which occurred in December 1979. Since the December 1979 flooding, flood defences in the form of high ground and a flood wall have been constructed on the northern bank of the Ebbw River. The defences have a standard of protection of 100 years (meaning they protect the site and surrounding area during a flood event with a 1 in 100 annual probability of occurrence).

Waterco Modelled Fluvial Output Data

The NRW integrated 1-Dimensional (1D) / 2-Dimensional (2D) hydraulic model of the Ebbw River and its tributaries has been obtained and updated by Waterco in November 2024 to quantify the existing flood risk to the site. Two scenarios, namely normal conditions (no structure blockages), and a 25% blockage at the B4591 Road Bridge, have been considered. Modelled outputs including flood depth and water level mapping are included as Appendix I.

Full details of the hydraulic modelling and associated hydrology assessment are provided in the Waterco Hydraulic Modelling Report (reference: 15679-HMR-01).

Normal Conditions Scenario

A review of the modelled outputs (Appendix I) show that the site is flood free during the 1% Annual Exceedance Probability (AEP) defended scenario.

As shown in Figure 1, during the 1% AEP plus 25% climate change (CC) event, the site is flood free. Flooding is estimated to Commercial Street with flood depths less than 150mm.

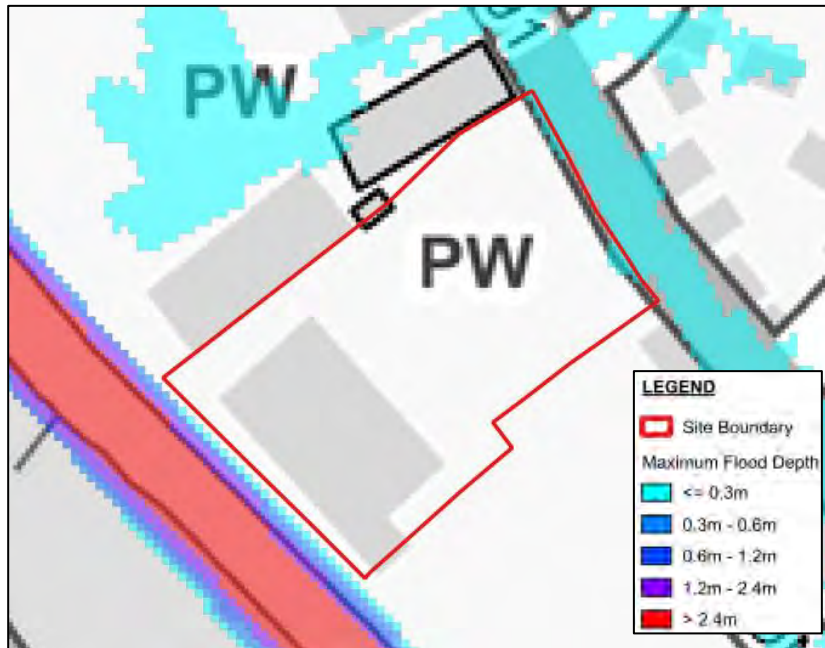


Figure 1 – 1% AEP Plus 25% CC Event – Maximum Flood Depths – Defended – Normal Conditions

As shown in Figure 2, during the 1% AEP plus 70% CC event, the site is estimated to flood. A maximum flood depth of 1.05m is estimated in the centre of the site. A maximum water level of 46.19m AOD is estimated in the western extent of the site. The water level reduces to 45.8m AOD in the south-eastern extent of the site.

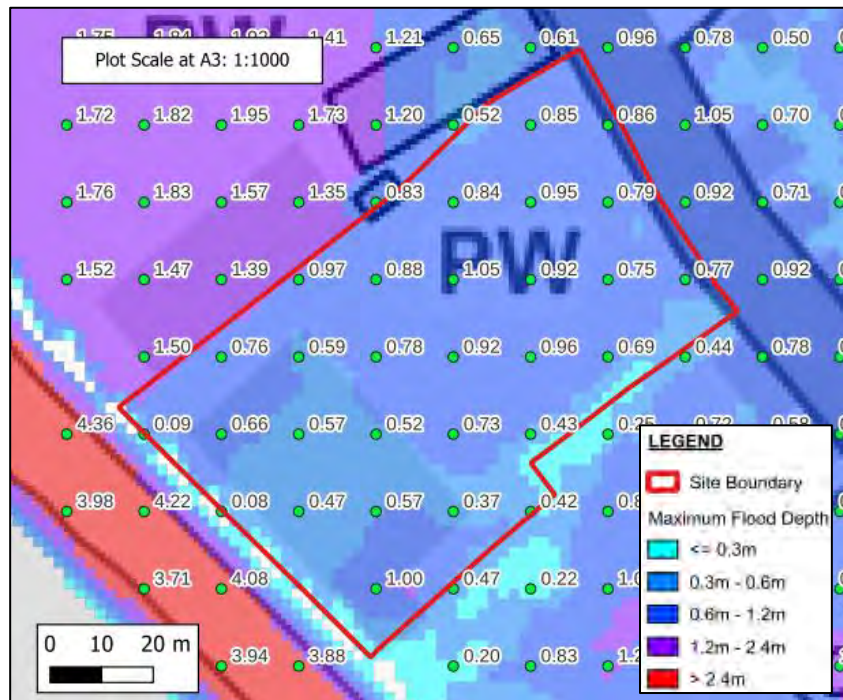


Figure 2 – 1% AEP Plus 70% CC Event – Maximum Flood Depths – Defended – Normal Conditions

As shown in Figure 3, during the 0.1% AEP event, the site is estimated to flood with a maximum flood depth of 0.88m estimated in the southern extent of the site (in the location of the existing Lidl Store loading bay). Flood depths area generally less than 600mm. A maximum water level of 45.94m AOD is estimated in the

western extent of the site. The water level reduces to 45.68m AOD in the south-eastern extent of the site.

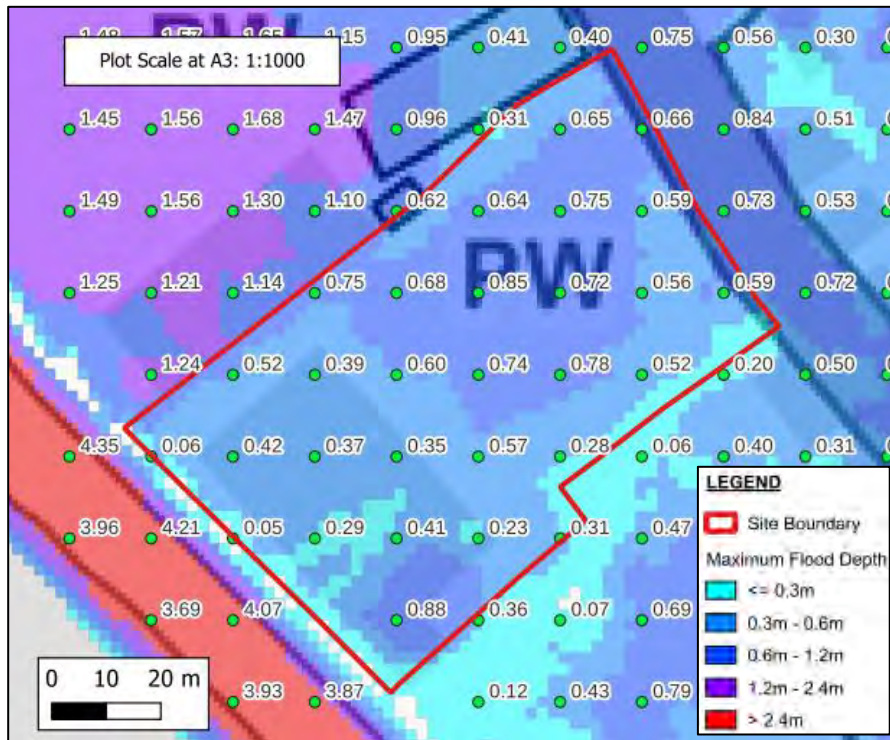


Figure 3 – 0.1% AEP Event – Maximum Flood Depths – Defended – Normal Conditions

Blockage Scenario

As shown in Figure 4, the site is flood free during the 1% AEP plus 25% CC blockage event. Flooding is estimated to Commercial Street. The flood depth and extent remain unchanged when compared to the normal condition (no blockage) scenario.

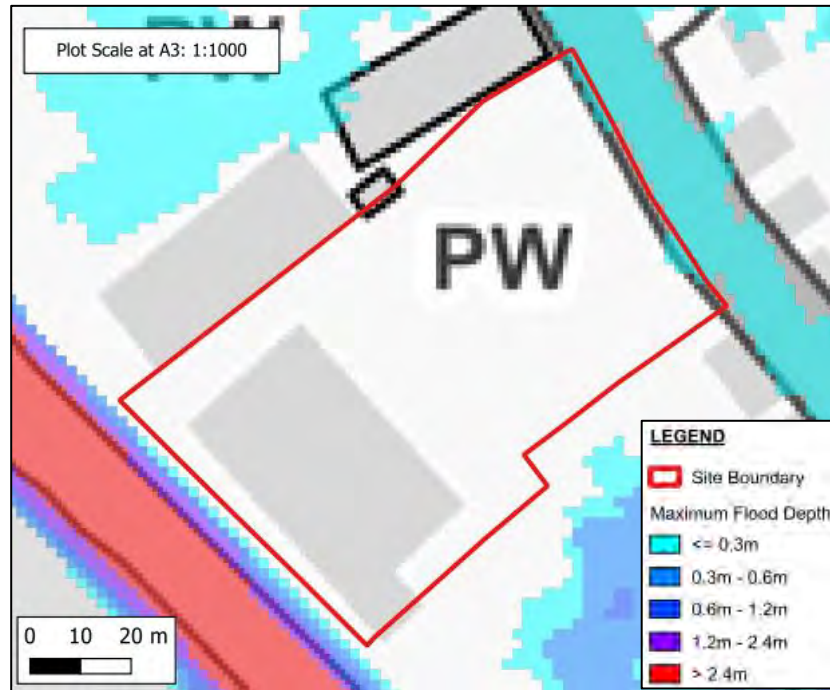


Figure 4 – 1% AEP Plus 25% CC Event – Maximum Flood Depths – Defended – Blockage

During the 1% AEP plus 70% CC blockage event and the 0.1% AEP blockage event, the flood depths and water levels predominantly remain unchanged when compared to the normal condition (no blockage) scenario.

It can therefore be concluded that the site is flood free during all events up to and including the 1% AEP plus 25% CC event, including a blockage of the B4591 road bridge. The site is at risk of fluvial flooding during the 1% AEP plus 70% CC event and the 0.1% AEP event.

Tidal

The site is situated at a minimum of approximately 44.98m 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 'Flood Zones - Surface Water and Small Watercourses' map (Appendix F) shows that the south-western extent of the site is located within Flood Zone 1, meaning it has a less than 0.1% annual probability of surface water flooding, including the effects of climate change.

The centre of the site falls within surface water Flood Zone 3. Flood Zone 3 is defined as having a greater than 1% annual probability of surface water flooding, including the effects of climate change. The flood extent is limited to the existing car park area which forms a topographical low point on site. Land adjacent to Flood

Zone 3, and generally constrained to the existing car park, is shown within Flood Zone 2. Flood Zone 2 is defined as having between a 1% and 0.1% annual probability of surface water flooding, including the effects of climate change.

The surface water flooding on NRW mapping is attributed to surface water ponding in a localised topographical low point within the site. The proposed development will include a sustainable drainage system which will accommodate surface water runoff from all rainfall events up to and including the 1% AEP plus 40% climate change event. The proposed drainage system together with minor ground elevation changes to remove topographical low points (through cut and fill techniques) will mitigate the risk of surface water ponding in low points on site.

Any potential surface water flooding arising in Commercial Street would be contained within the road and directed south-east, away from the site, following the local topography. The north-eastern extent of the site is locally elevated above Commercial Street.

There are no records of surface water flooding affecting the site. It can be concluded that the risk of surface water flooding is low.

Sewer

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

The DCWW sewer records (Appendix D) show that there is a 225mm combined sewer overflow crossing the site flowing south. The combined sewer overflow discharges to the Ebbw River approximately 60m south-east of the site. The sewer records also show a 900mm public combined sewer north-east of the site within Commercial Street flowing south-east. There is also a 150mm public combined sewer overflow east of the site within Commercial Street flowing south-east.

Flow within the 225mm combined sewer overflow (CSO) crossing the site are controlled by the CSO chamber approximately 170m north (upstream) of the site. There are no additional inflows downstream of the CSO chamber. As such the likelihood of exceedance of the 225mm CSO crossing the site is very low.

Any potential flooding arising from the public combined sewers within Commercial Street would be directed south-east, away from the site, following the local topography.

There are no records of sewer flooding at or near to the site. It can be concluded that the risk of sewer flooding is very low.

Groundwater

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

As described above, the site is underlain by superficial deposits of Alluvium, generally comprising clay, silt,

sand and gravel.

Groundwater levels correspond with river levels. As such, a high water table may be present during periods of prolonged high water levels in the Ebbw River.

The Caerphilly County Borough Council PFRA states that '*there are no historic groundwater flooding records with consequences*'. There are no records of groundwater flooding affecting the site.

No basement levels are identified on plans and it can be concluded that the risk of groundwater flooding (groundwater emergence at the surface) is low.

Artificial Sources

There are no canals in the immediate vicinity of the site. The NRW 'Flood Risk from Reservoirs' map (Appendix F) shows that the site is at risk of flooding from a failure of the following reservoirs:

Table 1 – NRW Flooding from Reservoirs

Name	Location (NGR)	Owner
Pen-y-Fan Pond	319660, 200522	Caerphilly County Borough Council
Blaen-y-Cwm	317380, 213110	Dwr Cymru Welsh Water

NRW state that reservoir flooding is extremely unlikely to happen. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement agency for the Reservoirs Act 1975 in Wales, NRW ensure that reservoirs are inspected regularly, and essential safety work is carried out.

It can therefore be concluded that the risk of flooding from artificial sources is very low.

Summary of Potential Flooding

It can be concluded that fluvial flooding from the Ebbw River is the main potential source of flood risk at this site. The site is flood free during all events up to and including the 1% AEP plus 25% CC event, including a blockage of the B4591 road bridge. The site is at risk of fluvial flooding during the 1% AEP plus 70% CC event and the 0.1% AEP event. During the 0.1% AEP event, flood depths are generally less than 600mm with the exception of the topographical low point in the existing car park in the centre of the site. The associated risk has been used to inform mitigation design.

Mitigation

The site is flood free during the 1% AEP plus 25% CC event and as such complies with A1.15 of TAN15.

In accordance with Section A1.15 of TAN15, maximum tolerable flood depths of up to 600mm are considered acceptable during the 0.1% AEP event. To comply with A1.15 of TAN15, ground levels in the topographical

low point in the centre of the site will be raised by a maximum of 250mm. To avoid floodwater displacement, the site raising will be achieved through cut and fill. The fill material will be taken from the higher western extent of the site where flood depths are generally less than 400mm. Detailed site levels will be considered at the reserved matters stage, however, will be formed to ensure that flood depths do not exceed 600mm during the 0.1% AEP event.

In accordance with the Welsh Government 'Flood Consequences Assessment: Climate change allowances' guidance, design levels should be based on a central climate change estimate. The central climate change estimate for this site is 25%. The site is flood free during the 1% AEP plus 25% CC design event. The guidance states that an assessment of risk should be made using the upper end estimate and that the information derived from this assessment should be used to inform mitigation measures to ensure the long-term resilience of the development. The upper end climate change allowance for this site is 70%.

The 1% AEP plus 70% CC and 0.1% AEP events have been used to inform flood resilient design. The following flood resilience measures should be applied where practical:

- Raise finished floor levels as high as possible. Where possible, finished floor levels will be set at or above the 0.1% AEP flood levels shown on the water level mapping in Appendix I. This generally equates to a finished floor level of 45.83m AOD for the majority of plots on site, increasing to 45.91m AOD for the apartment blocks.
- Use robust construction materials (engineering bricks) to a height of 46.14m AOD (highest water level in the location of the proposed properties during the 1% AEP plus 70% CC event).
- Raise electronic control units and sockets as high as possible.
- Install smart air bricks or air brick covers.
- Use non-hygroscopic renders, where applicable.
- Install flood guards to all doors.
- Seal cable entry points.
- Use plastic and stainless-steel fixtures and fittings and avoid wooden alternatives.
- Fit non-return valves to drains.
- Where possible, place all sleeping accommodation at first floor level.

Flood Warnings and Evacuation

Flood Warnings cover this area. Residents, site management and staff should register to receive Flood Warnings. Flood Warnings is a free service that provides prior warning of a fluvial flood event.

The site owner should prepare a flood plan to inform residents and staff of the flood risk and to provide advice on what to do in the event of a flood. When a Flood Warning is in place, the commercial unit should be closed to the public and all staff and customers should leave the site. When a Flood Warning is in place, residents should be prepared to evacuate the site. The flood plan should include details of a safe evacuation route to be used upon receipt of a Flood Warning. A flood evacuation route plan is included as Appendix J and shows the fastest route to safety in the event of a flood. Safe evacuation is available via Station Road heading north.

When flooding occurs without warning, safe refuge is available at first floor level of the buildings.

Impact on Flood Risk Elsewhere

Minor ground level modifications will be made on site using a cut and fill techniques. No material will be imported to raise site levels. The development will therefore not remove flood storage from the floodplain.

Justification

In accordance with TAN15, highly vulnerable development will be justified in Flood Zone C1 if it can be demonstrated that:

- i. Its location in Zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy to sustain an existing settlement: or,
- ii. Its location in Zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain an existing settlement or region

and,

- iii. It concurs with the aims of Planning Policy Wales (PPW) and meets the definition of previously development land (PPW fig 2.1); and,
- iv. The potential consequences of a flooding event for the particular type of development have been considered, and in terms of the criteria contained in sections 5 and 7 and appendix 1 [of TAN15] found to be acceptable.

With reference to point i) above, the development will provide employment opportunities and contribute to housing targets.

With reference to point iii) above, the site comprises a Lidl Store and therefore meets the definition of previously developed land.

The acceptability of the consequences of a flooding event have been considered in this FCA. The site is shown to be flood free during the 1% AEP plus 25% CC event. The development is therefore considered to comply with A1.14 of TAN15. Minor ground modifications will be made on site (through cut and fill techniques) to ensure that flood depths are below 600mm during the 0.1% AEP event. The proposed development therefore complies with A1.15 of TAN15.

Surface Water Management

The site currently comprises a Lidl store with associated access and parking. Surface water is currently assumed to drain to Ebbw River.

The proposed development will result in 4,800m² of hardstanding in the form of buildings, roads and parking.

In order to comply with the Statutory Standards for SuDS, surface water discharge from the site will be controlled and attenuation storage will be provided to accommodate storm events up to and including the 1 in 100 year plus 40% CC event.

Discharge Method

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

Priority Level 1: Surface water runoff is collected for use;

Priority Level 2: Surface water runoff is infiltrated to ground;

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

Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system;

Priority Level 5: Surface water runoff is discharged to a combined sewer.

Priority Level 1: Surface water runoff collected for use

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

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

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

Where possible, water butts will be installed on rainwater downpipes to encourage external water re-use.

Priority Level 2: Surface water runoff is infiltrated to ground

As described above, the site is underlain by superficial deposits of Alluvium, generally comprising clay, silt, sand and gravel.

Given the proximity of the site to the Ebbw River, groundwater levels may be high and as such would limit the feasibility of infiltration techniques. G3.32 of the Statutory standards for sustainable drainage systems states that there should be a minimum depth of unsaturated ground of 1m between the base of any infiltration system and the maximum likely groundwater level.

Ground investigations should be undertaken to confirm groundwater levels and any potential contamination risk. Where no contamination risk is identified and groundwater levels are not a constraint, infiltration tests should be undertaken in accordance with the BRE365 specification to determine the feasibility of infiltration techniques such as of soakaways. Soakaways should be located a minimum of 5m from habitable dwellings.

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

Where infiltration is not suitable (subject to the findings of ground investigations), a connection to watercourse is the next consideration. The nearest watercourse is the Ebbw River which is located immediately south of the site. Discharge to the Ebbw River, at a limited discharge rate, appears to be feasible. The Ebbw River is a designated Main River and a flood risk activity permit would be required for any new outfall structures (and any works within 8m of the river).

Ground levels adjacent to the Ebbw River are identified on the topographical survey (Appendix B). The ground level on the water line of the Ebbw River is situated at 42.8m AOD. The minimum existing site level is 44.98m AOD. As such, a gravity connection can be achieved.

Discharge Rate

In order to establish the proposed limited discharge rate, greenfield runoff rates have been estimated using the ICP SuDS method within MicroDrainage. A summary of the greenfield runoff rates for a range of events is provided as Appendix L. The 1 in 1 year greenfield runoff rate for the 0.6783ha site is 4.2 l/s. A limited discharge rate of 4.2 l/s is therefore proposed.

Attenuation Storage

In order to achieve a discharge rate of 4.2 l/s, attenuation storage will be required. Attenuation storage will be distributed across the site with separate attenuation storage features serving the residential element the site and the commercial element of the site. A plan showing the drainage catchments is provided as Appendix

L.

The proposed discharge rate will be split between the two drainage catchments. Drainage area 1 (commercial / mixed use element) will have a limited discharge rate of 1 l/s. Drainage Area 2 (residential element of the site) will have a limited discharge rate of 3.2 l/s.

Attenuation storage estimates have been provided using MicroDrainage and are included in Appendix M.

Drainage Area 1

An estimated storage volume of 104m³ will be required to accommodate the 1 in 100 year plus 40% CC. The storage estimate is based on a discharge rate of 1 l/s, storage within a tank structure, an impermeable drainage area of 0.11ha, a design head of 1m and hydro-brake control.

Drainage Area 2

An estimated storage volume of 351m³ will be required to accommodate the 1 in 100 year plus 40% CC event. The storage estimate is based on a discharge rate of 3.2 l/s, storage within a tank or pond structure, an impermeable drainage area of 0.37ha, a design head of 1m and hydro-brake control.

Sustainable Drainage Systems

Drainage Area 1

Attenuation storage will be provided in the form of a below ground attenuation tank beneath the mixed-use car parking area. A 28m long x 5m wide x 0.8m deep geo-cellular storage tank (with a 95% void ratio) would provide 106.4m³ of storage, sufficient to accommodate the 1 in 100 year plus 40% CC event.

Drainage Area 2

Attenuation storage will be provided in the form of an attenuation pond and below ground attenuation tanks.

A 0.8m deep attenuation pond with an invert (base) area of 40m², 1 in 3 side slopes and a total surface area of 112m² would provide 60.76m³ of storage.

The remainder of the storage will be provided within multiple attenuation storage tanks. Multiple tanks are required due to site constraints associated with the 3m easement from the CSO which crosses the site. The following attenuation tank sizes provide sufficient storage:

A 29m long x 4m wide x 0.8m deep attenuation tank with a 95% void ratio would provide 88.16m³ of storage.

A 23m long x 7m wide x 0.8m deep attenuation tank with a 95% void ratio would provide 122.36m³ of storage.

A 12.5m long x 8.5m wide x 0.8m deep attenuation tank with a 95% void ratio would provide 80.75m³ of storage.

The attenuation pond and 3no. attenuation tanks serving the residential area would provide a combined attenuation volume of 352.03m³, sufficient to accommodate the 1 in 100 year plus 40% CC event. The invert levels will be consistent, and one flow control device used downstream of the pond. All runoff will pass through the attenuation pond prior to discharge to Ebbw River.

Concept Surface Water Drainage Scheme

Where infiltration techniques are not feasible, surface water runoff will be discharged to the Ebbw River located immediately south-west of the site at a limited 1 in 1 year greenfield runoff rate of 4.2 l/s. Surface water runoff up to the 1 in 100 year plus 40% climate change allowance event will be attenuated on site. A total attenuation volume of 455m³ will be required to achieve the discharge rate and will be provided in the form of attenuation tanks located beneath access roads and car parking areas, and an attenuation pond located in the western extent of the site. All runoff will pas through the attenuation pond.

At the detailed design stage, consideration will be made to the use of permeable surfacing for parking areas.

The proposed surface water drainage scheme will ensure no increase in runoff over the lifetime of the development.

A Concept Drainage Sketch is included in Appendix N.

Exceedance Event

Storage will be provided for the 1 in 100 year plus 40% CC event. Storm events in excess of the 1 in 100 year plus 40% CC event should be permitted to produce temporary shallow depth flooding within the parking areas, access road and landscaped areas.

Finished floor levels will be set above surrounding ground levels ensuring exceedance flooding will not affect the buildings.

A non-return valve should be fitted to the outfall to the Ebbw River as to prevent backflow in times of flooding of the Ebbw River.

Consideration should be given to a high level overflow in the flow control chamber to allow continued discharge in times when the outfall to the Ebbw River is surcharged.

Surface Water Treatment

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

S3 - Surface water quality management

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

In accordance with the CIRIA C753 publication 'The SuDS Manual' (2015), residential roofs have a 'very low' pollution hazard level, with low traffic roads classified as having a 'low' pollution hazard level. Commercial

roofs have a 'low' pollution hazard level, with non-residential car parks with infrequent change classified as having a 'low' pollution hazard level. Table 2 shows the pollution hazard indices for each land use.

Table 2 – Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Low Traffic Roads	Low	0.5	0.4	0.4
Commercial Roofs	Low	0.3	0.2	0.05
Low Traffic Roads / Non-Residential Parking	Low	0.5	0.4	0.4

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

* Indices values range from 0-1.

Runoff from all land used will be directed to an attenuation pond prior to discharge to the River Ebbw. Table 3 demonstrates that an attenuation pond provides sufficient treatment.

Table 3 – SuDS Mitigation Indices

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

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

Amenity

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

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

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

Biodiversity

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

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

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

Construction, Operation and Maintenance

Standard S6 of the Statutory Standards for SuDS states;

S6 – Design of drainage for Construction, Operation and Maintenance

- 1) All elements of the surface water drainage system should be designed so that they can be constructed easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).
- 2) All elements of the surface water drainage system should be designed to ensure maintenance and operation can be undertaken (by the relevant responsible body) easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).
- 3) The surface water drainage system should be designed to ensure structural integrity of all elements under anticipated loading conditions over the design life of the development site, taking into account the requirement for reasonable levels of maintenance.

All drainage systems will be readily accessible for maintenance access.

The shared elements of the drainage system will be offered to adoption to the SAB who will then be responsible for maintenance.

Maintenance schedules for an attenuation tank and the attenuation pond are included in Appendix O.

Other Considerations

Maintenance access to the NRW flood defences along the Ebbw River will be retained. The buffer from the Ebbw River defences to developed areas of the site is increased when compared to the existing situation. No buildings are proposed within 8m of the Ebbw River.

A 3m clearance is provided either side of the combined sewer overflow crossing the site.

A flood risk activity permit will be required from NRW for any works within 8m of Ebbw River.

Foul Drainage

Correspondence from DCWW (Appendix H) states that:

'Foul Water Drainage – Sewerage Network

We advise that the flows should be communicated to the 150mm combined sewer at or downstream of manhole ST01897980 located in Waun Wen or the 150mm combined sewer at ST23909103 located in

Commercial Lane as indicated on the extract of public sewer record provided.

Foul flows will therefore be discharged to the 150mm public combined sewer in Commercial Street. A gravity connection is currently made to the public combined sewer from the existing store. The invert level of the final foul chamber on site is 43.12m AOD. A gravity connection is therefore assumed to be achievable from the proposed development however will need to be confirmed following survey to determine the invert of the receiving 150mm public combined sewer in Commercial Street.

Conclusions

The proposed development is for the demolition of an existing Lidl Store and the erection of 42no. residential properties and a commercial unit with associated parking, access, landscaped areas and an attenuation pond.

Flood Risk

The site is located within Flood Zone C1 on the Welsh Government Development Advice Map – an area considered at flood risk, but served by significant infrastructure, including flood defences, with a 0.1% (1 in 1000) or greater annual probability of flooding.

The risk of flooding from all sources has been assessed and the main potential source of flooding at this site is fluvial flooding from the Ebbw River. The site is flood free during all events up to and including the 1% AEP plus 25% CC event.

The site is at risk of fluvial flooding during the 1% AEP plus 70% CC event and the 0.1% AEP event. A maximum flood depth of 1.05m is estimated in the centre of the site during the 1% AEP plus 70% CC event. During the 0.1% AEP event, flood depths are generally less than 600mm with the exception of the topographical low point in the existing car park in the centre of the site.

The site is flood free during the 1% AEP plus 25% CC event and as such complies with A1.15 of TAN15. In accordance with Section A1.15 of TAN15, maximum tolerable flood depths of up to 600mm are considered acceptable during the 0.1% AEP event. To comply with A1.15 of TAN15, ground levels in the topographical low point in the centre of the site will be raised by a maximum of 250mm. To avoid floodwater displacement, the site raising will be achieved through cut and fill. The fill material will be taken from the higher western extent of the site where flood depths are generally less than 400mm. Detailed site levels will be considered at the reserved matters stage, however will be formed to ensure that flood depths do not exceed 600mm during the 0.1% AEP event.

Drainage

To comply with the Statutory standards for sustainable drainage systems, flow control will be used and attenuation provided on site to accommodate storm events up to and including the 1 in 100 year plus 40% climate change event.

All methods of surface water discharge have been assessed. Discharge of surface water to the Ebbw River at a limited 1 in 1 year greenfield runoff rate of 4.2 l/s appears to be the most practical option. The proposed discharge rate will be split between two drainage areas. Drainage area 1 (mixed-use extent of the site) will have a limited discharge rate of 1 l/s. Drainage area 2 (residential element of the site) will have a limited discharge rate of 3.2 l/s.

Attenuation storage will be required on site in order to restrict surface water discharge to a combined rate of 4.2 l/s. Attenuation can be provided within attenuation tanks located beneath access roads and car parking areas, and an attenuation pond located in the south-western extent of the site. All storm water will pass through the attenuation pond prior to discharge to Ebbw River.

The attenuation pond will provide water quality, amenity and biodiversity value.

It is proposed to discharge foul flows to the 150mm public combined in Commercial Lane as requested by DCWW.

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

Recommendations

1. Submit this Flood Consequences Assessment and Drainage Strategy to the Planning Authority in support of the outline planning application.
2. Install the flood resistance / resilience measures detailed in this report.
3. Undertake BRE 365 infiltration testing to determine the suitability of infiltration techniques (subject to groundwater levels).
4. Verify the attenuation volumes included in this report when undertaking detailed drainage design.
5. Survey the public combined sewers in Commercial Street to determine invert levels (and confirm that a gravity connection can be achieved).
6. Obtain a flood risk activity permit for any works within 8m of the Ebbw River, including any new surface water drainage outfalls.

Appendix A Location Plan & Aerial Image



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

LEGEND

- ▭ Site Boundary
- Watercourses
- ▭ Waterbodies



CLIENT:
 Lidl Great Britain Limited



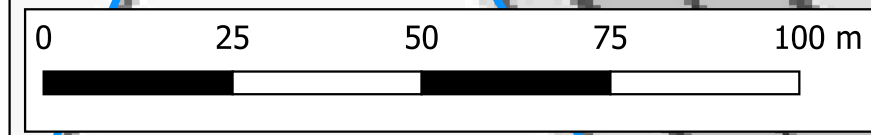
SCHEME:
 Commercial Street, Risca

PLOT TITLE:
 Location Plan

PLOT STATUS: FINAL
 DATE: 10-01-2025

DRAWN: AM	CHECKED: AW	APPROVED: NJ	PLOT SCALE AT A3: 1:1000
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PLOT NAME: 16295_Location_Plan	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



CLIENT:
 Lidl Great Britain Limited



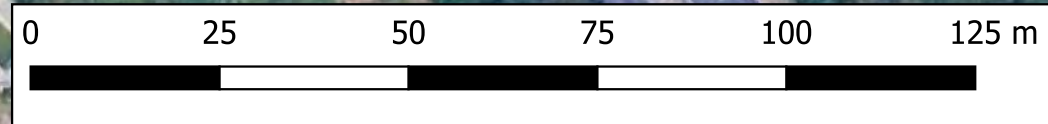
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PLOT TITLE:
 Aerial Plan

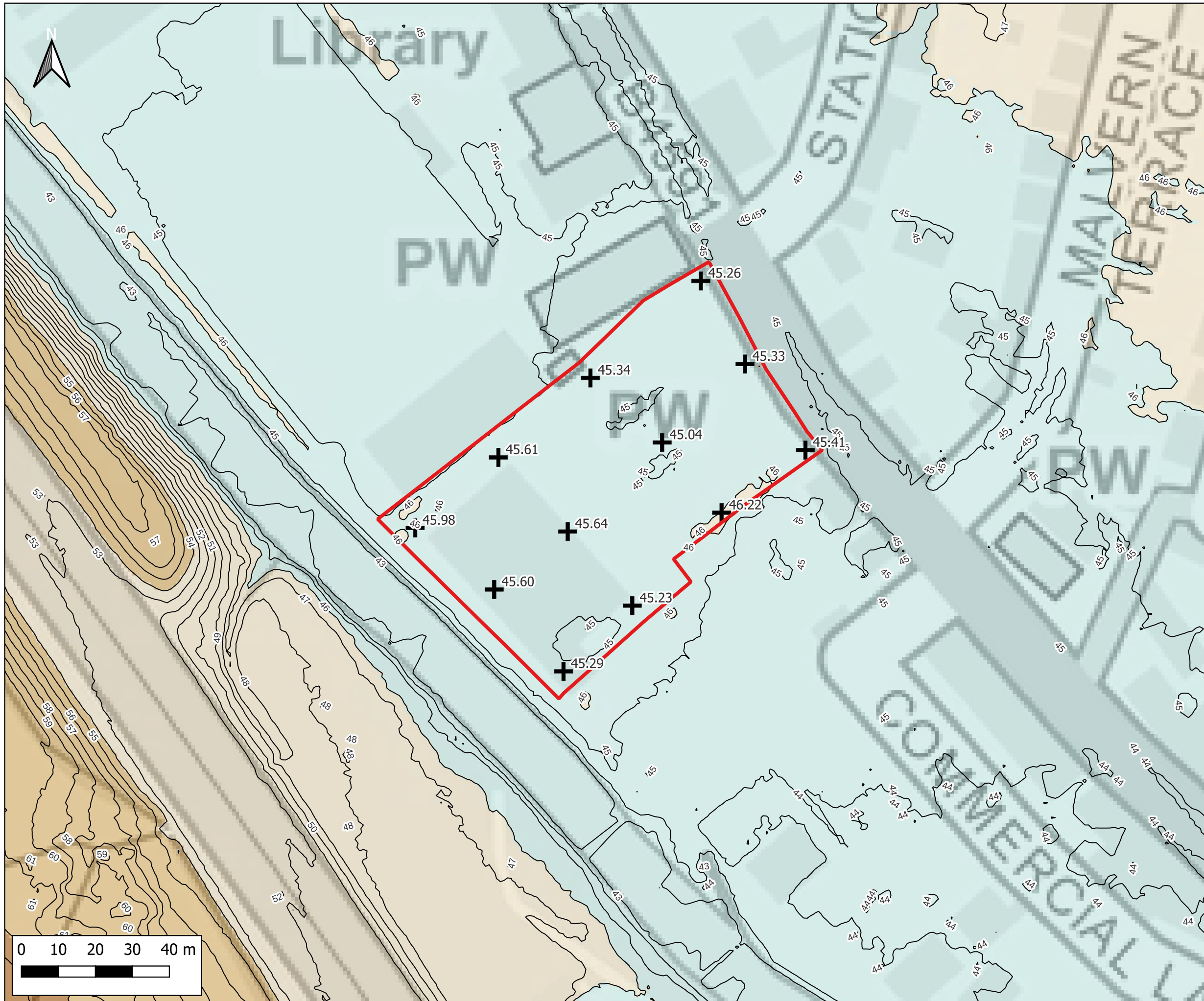
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PLOT NAME: 16295_Aerial_Plan	REVISION: -
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Appendix B Topographical Data



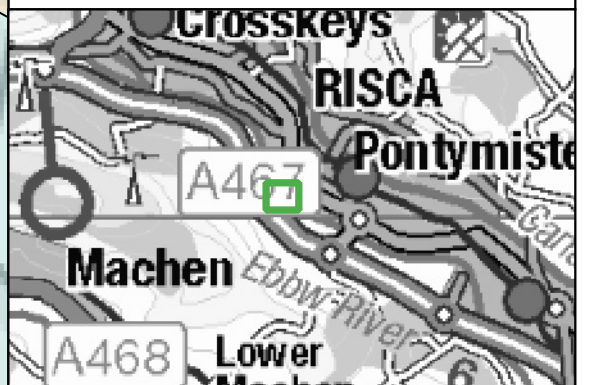
Notes:
 1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- + Site Levels (m AOD)

Ground Elevations (m AOD)

- <= 38
- 38 - 46
- 46 - 54
- 54 - 62
- > 62



CLIENT:
 Lidl Great Britain Limited



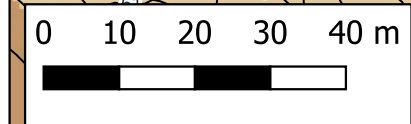
SCHEME:
 Commercial Street, Risca

PLOT TITLE:
 LiDAR Plan
 1m Resolution
 Data from Natural Resources Wales

PLOT STATUS: FINAL
 DATE: 13-02-2025

DRAWN: AM	CHECKED: AW	APPROVED: NJ	PLOT SCALE AT A3: 1:1000
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PLOT NAME: 16295_LiDAR_Plan	REVISION: -
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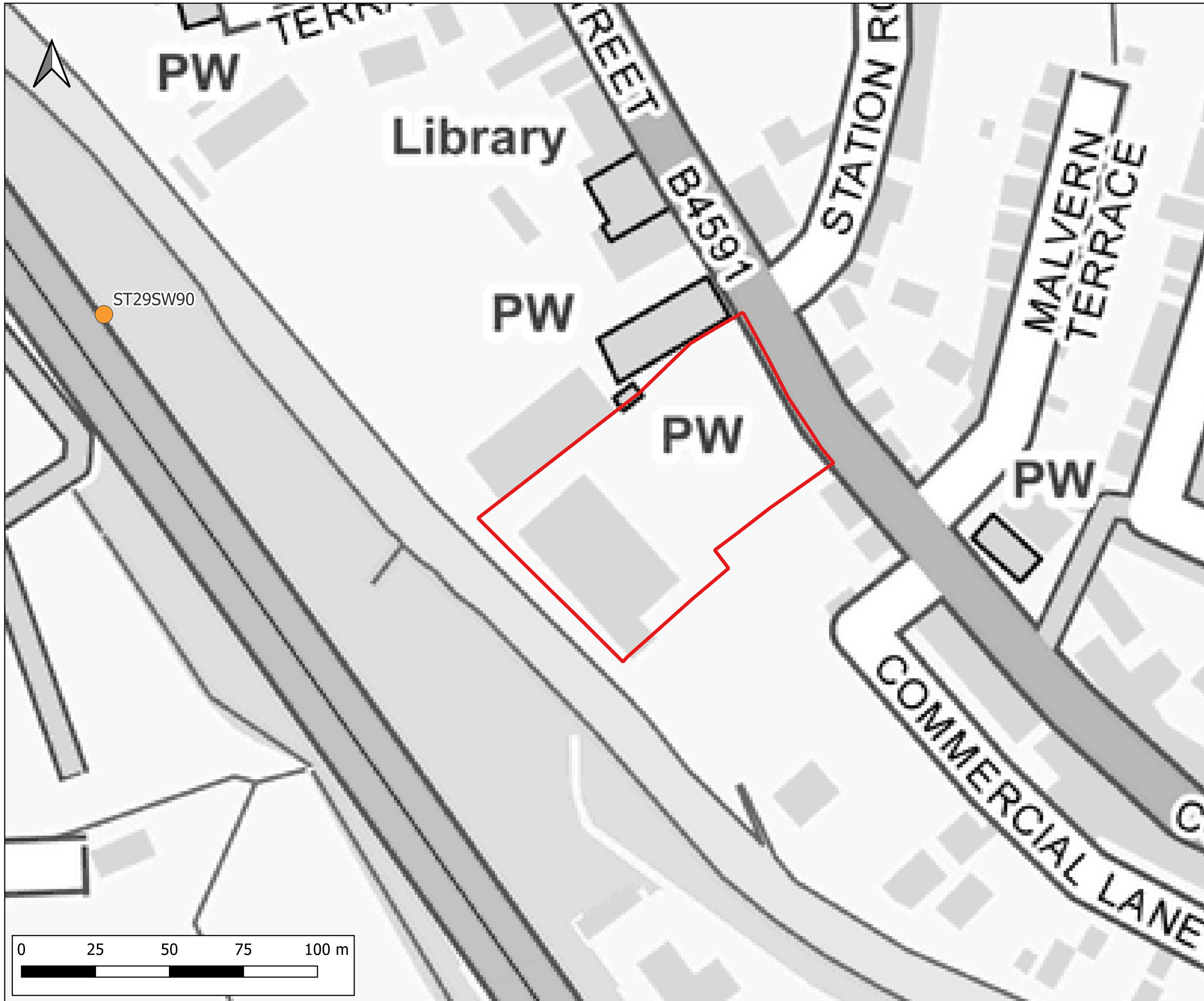
Appendix C BGS Borehole Record & Location Plan

ST 29SW/50
2379 9022
1"249

RECORD OF BOREHOLE 322

Ground level: 56.75m above O.D. Dia. of boring: 0.25m
Method of boring: Shell and Auger Lining tubes: 0.25m to 2.00m

Daily Progress	Samples		Change of Strata			Description of Strata
	Depth	Type	Legend	Depth	O.D. Level	
						FILL (ashes)
28.11.72	1.50-1.80	U(4)*		1.40	55.35	Firm brown sandy CLAY
	2.00 2.00	D. BD		1.80	54.95	
29.11.72	3.00-3.10	C(70) [⊕]				Very dense sandy fine to coarse GRAVEL with COBBLES and BOULDERS
	3.30	BD				
30.11.72	4.15-4.25	C(30)				
	5.00 5.30	C(60) [⊕] BD		5.60	51.15	
Key to type of sample: U(4) — 102mm (4in.) dia. undisturbed sample D — disturbed sample BD — bulk disturbed sample V — vane test S () — standard penetration test C () — dynamic cone penetration test <small>Figure in brackets is No. of blows for penetration given in depth column (see Notes, page 1).</small>			Remarks: (Observations on ground-water, etc.) Water was added to assist boring below 2.50m depth. * Full penetration of sampler not attained. ⊕ Seating blows only. ⊕ No penetration.			
Lab. Ref. No. S/ 9398	A 467 RISCA BY-PASS				FIG.21	



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

LEGEND

- Site Boundary
- BGS Borehole Location



CLIENT:
 Lidl Great Britain Limited



SCHEME:
 Commercial Street, Risca

PLOT TITLE:
 Historical BGS Borehole Location Plan Data from the British Geological Survey (BGS)

PLOT STATUS: FINAL	DATE: 14-01-2025
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DRAWN: AM	CHECKED: AW	APPROVED: NJ	PLOT SCALE AT A3: 1:1300
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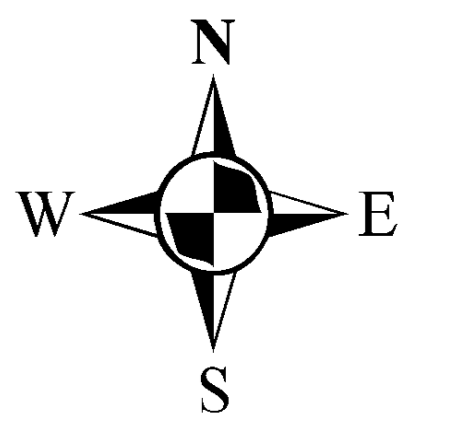
PLOT NAME: 16295_BGS_Borehole_Location_Plan	REVISION: -
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Appendix D DCWW Sewer Plan

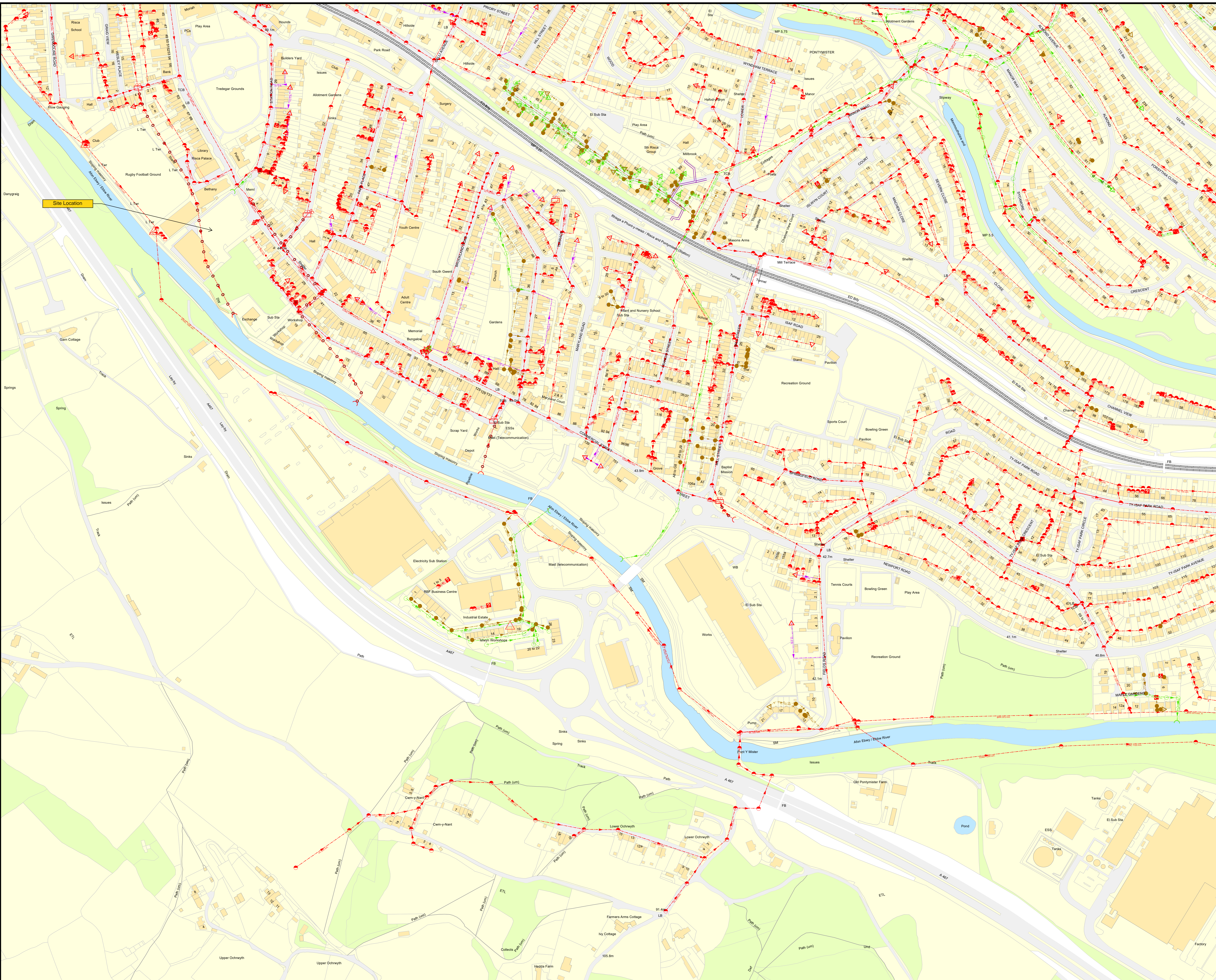


Dŵr Cymru
Welsh Water

Land at Pontymister, Risca Commercial
Street Risca Newport NP11 6EE



- Waste network:**
- Foul chamber
 - Surface water chamber
 - Combined chamber
 - Combined sewer overflow
 - Special purpose chamber
 - Treatment works
 - Pumping station
 - Outfall
 - Lamphole
 - Storm Overflow
 - Rising main
 - Gravity sewer
 - Private sewer
 - Private sewer subject to Sect. 124 relaxation agreement
 - Private Sewer Transfer
 - Lateral Drains
 - Inspection Chamber
- NS:** Sewer symbol/colour indicates the type:
 RED - Combined
 GREEN - Surface Water
 BROWN - Foul
 Purple - Former S24 sewers (for indicative purposes only)



Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases, pipe material (other than Asbestos Cement or Pitch Fibre (PF)). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

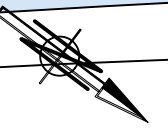
Dŵr Cymru (the Company) gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and is warranted as to its correctness in so far as the extent of excavations or other works made in the vicinity of the Company's apparatus. The users of locating apparatus before carrying out any excavations reads entirely on their own. The information which is supplied by the Company is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989 or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provisions of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

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

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Map Ref: 324414,189887
 Map scale: 1:1500
 Printed by: Warren Rees
 Printed on: 25 Jul 2024

Appendix E Proposed Development Plans



RED LINE BOUNDARY
6783 SQM / 1.67 ACRES
0.6783 HECTARES



LARGE ATTENUATION BASIN SUBJECT TO CONSULTANTS DESIGN AND COMMENTS

COMMUNAL GARDENS WITH RIVER OUTLOOK ALONG SOUTH WEST

ORANGE HATCHED AREA - 8m EASEMENT FROM FLOOD DEFENCE

BLUE HATCHED AREA - 3m EASEMENT FROM C/S OF FOUL DRAIN OVERFLOW PIPE AS PER WASTE NEWPORT MAPS DWR CYMRU WELSH WATER MAP

RED LINE BOUNDARY
6783 SQM / 1.67 ACRES
0.6783 HECTARES

SITE PLAN KEY

RETAIL
3770 SQFT OPEN PLAN UNIT
9 CAR PARK SPACES IN TOTAL (R)
DEDICATED DELIVERY AREA
CYCLE PARKING

RESIDENTIAL (42 UNITS)

HOUSES 1-5, 31-36
(2 BEDROOM)
FLATS 6-30, 37-42
(1-2 BEDROOM)
CIRCULATION TO UPPER FLOORS

49 CAR PARK SPACES IN TOTAL (RX.X)

VISITOR SPACES

6 CAR PARK SPACES IN TOTAL

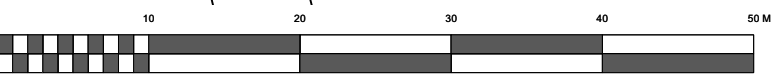
PRIVATE GARDENS FOR RESIDENTIAL PROPERTIES 1-5, 31-36

EXISTING LANDSCAPE AREA TO BE REPLANTED TO CREATE SUFFICIENT LANDSCAPE VISUAL BUFFER FROM RESIDENTS ALONG COMMERCIAL STREET

PRIVATE
PUBLIC AREA

ENHANCING STREET SCENE AND STREET REGENERATION. IMPROVING PUBLIC REALM IN FRONT OF RETAIL UNIT

44.7m



Appendix F NRW Flood Maps