
DRAINAGE STRATEGY AND FLOOD RISK ASSESSMENT

for

120/121 HIGH STREET, MERTHYR TYDFIL, CF47 8BN

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1. Introduction

Intrado Consulting Engineers have been appointed to prepare an engineering report for conversion of the existing property into commercial on the ground floor and residential on the upper floors at 120/121 High Street, Merthyr Tydfil CF47 8BN.

This report is produced for the sole benefit of Mr Rob Price from whom it was commissioned and has been prepared in response to their requirements and brief. This report may not be relied upon by any other party.

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1.1 FCA Requirements

The FCA follows Welsh Government guidance on development and flood risk set out in Technical Advice Note 15: Development and Flood Risk (TAN-15). The following aspects of flood risk are to be addressed, where possible, in all planning applications over the development's expected lifetime in flood risk areas:

- The likely mechanisms of flooding
- The likely source of flooding
- The depths of flooding through the site
- The speed of inundation of the site
- The rate of rise of flood water through the site
- Velocities of floodwater across the site
- Overland flow routes
- The effect of flooding on access and egress and infrastructure, for example public sewer outfalls, combined sewer outflows, surface water sewers and effluent discharge pipes from wastewater treatment works
- The impacts of the development in terms of flood risk on neighbouring properties and elsewhere on the floodplain.

2. Site Description

The proposed development site is located in the centre of Merthyr Tydfil. The site comprises three-storey, terraced properties on High Street, in the centre of Merthyr Tydfil, as shown in Figure 2-1.

The ground floor of 120 and 121 High Street was used for class A5 – hot food takeaway and a retail outlet respectively.

The development will remain as commercial on the and residential on the upper floors as per the proposals by Studio 4B. The coordinates for the site are 304925 206168.

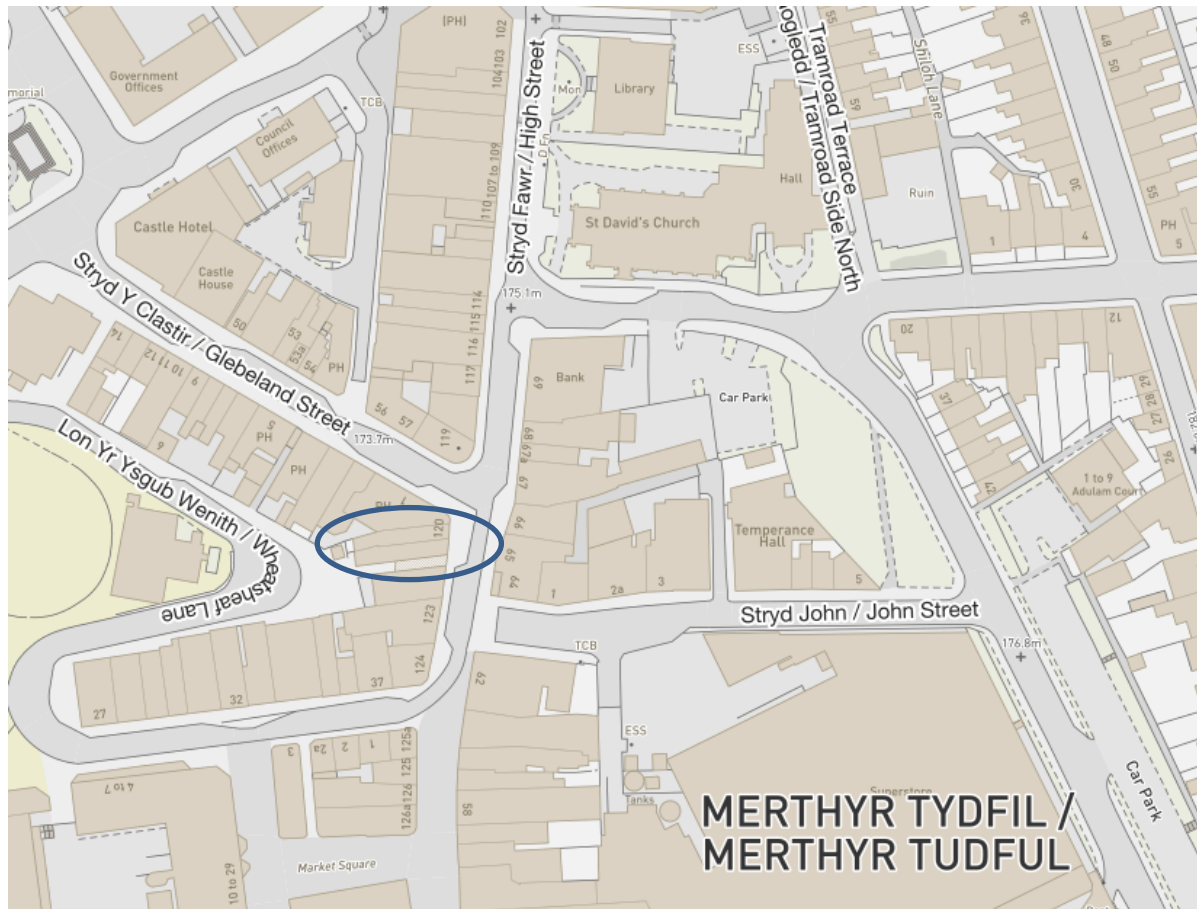


Figure 2-1: Site Location

The site is relatively flat, with a gradual rise from the southwest corner towards the east of the site. A survey has been carried out by Jon Barton, however this survey is to a local datum and not ordnance datum.

2.2 Watercourses and Flood Defences

As shown in Figure 2-3, the River Taff is an NRW designated main river and is located approximately 200m to the west of the site and flows in a southerly direction towards Cardiff. The Nant Morlais, a tributary of the River Taff, is located approximately 200m north of the site and is classed as an ordinary watercourse. No flood defences are present along these watercourses.

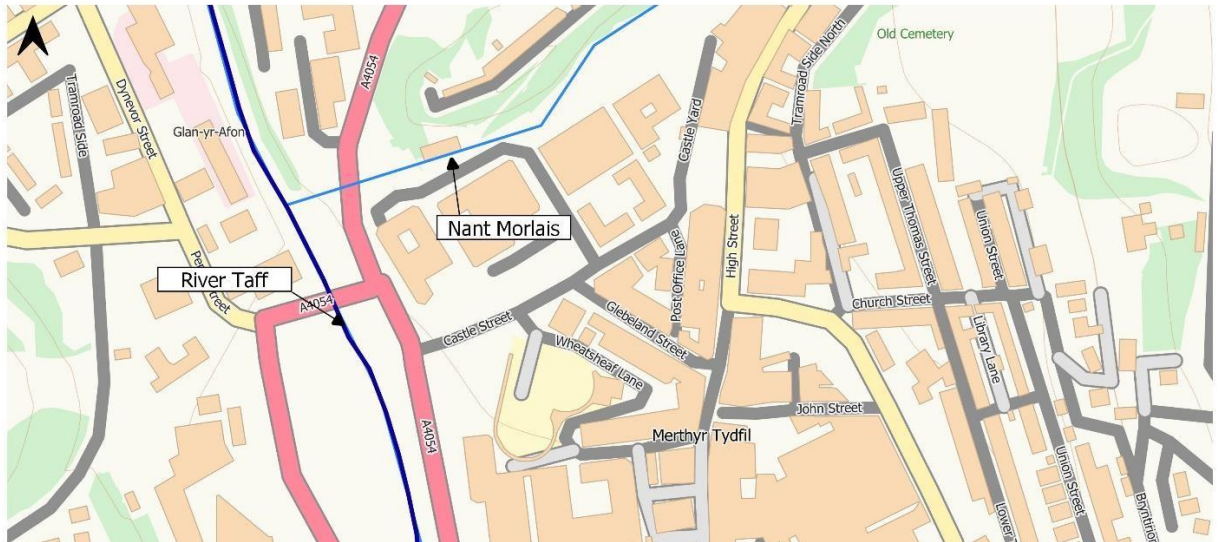


Figure 2-3 Watercourses near the site

2.3 Development Proposal

The client is seeking planning permission for a change of use of the existing building.

The development proposal includes changing the existing building from a former take away and retail outlet to a bar/restaurant on the ground floor and residential on the upper floors. The tenants will have a separate entrance at the side of the property. From here, the tenants will be able to access the upper floors.

3. Planning Policy and Flood Risk

3.1 Planning context

TAN-15 provides technical guidance related to development planning and flood risk in Wales and is based on the Welsh Government's Development Advice Map (DAM). Its initial requirement is to identify the flood zones and vulnerability classification relevant to the proposed development, based on an assessment of current and future conditions.

3.2 Vulnerability classification

TAN-15 assigns one of the three flood risk vulnerability classifications to development, as shown in Table 3-1. The proposed development consists of a mix of residential and commercial units. Residential development is classed as highly vulnerable development, whilst commercial units are classed as less vulnerable development. TAN-15 indicates that the highest vulnerability class should be applied to a proposed development. Therefore, the development is classed as 'highly vulnerable development'.

The site is currently commercial on all floors with no residential space.

Development category	Types
Emergency services	Hospitals, ambulance stations, fire stations, police stations, coastguard stations, command centres, emergency depots and buildings used to provide emergency shelter in time offlood.
Highly vulnerable development	All residential premises (including hotel and caravan parks), public buildings (e.g. schools, libraries, leisure centres), especially vulnerable industrial development (e.g. power stations, chemical plants, incinerators), and waste disposal sites.
Less vulnerable development	General industrial, employment, commercial and retail development, transport and utilities infrastructure, car parks, mineral extraction sites and associated processing facilities, excluding waste disposal sites.

Table 3-1: TAN-15 Categories

3.3 Development Advice Map (DAM) classification

Figure 3-1 presents the DAM zones for the proposed development. The DAM is used to trigger different planning actions based on a precautionary assessment of flood risk.

The proposed development site is located in Zone C2 of the DAM. Zone C2 is described as areas of the floodplain without significant flood defence infrastructure. This zone is used to indicate that only less vulnerable development should be considered subject to the application of the Justification Test, including the acceptability of flood consequences. Highly vulnerable development is not typically considered acceptable in Zone C2. However, TAN-15 does not provide guidance as to whether re-development or change of use can be considered within Zone C2.

The extract from the Development advice map is in Figure 3-1 below.

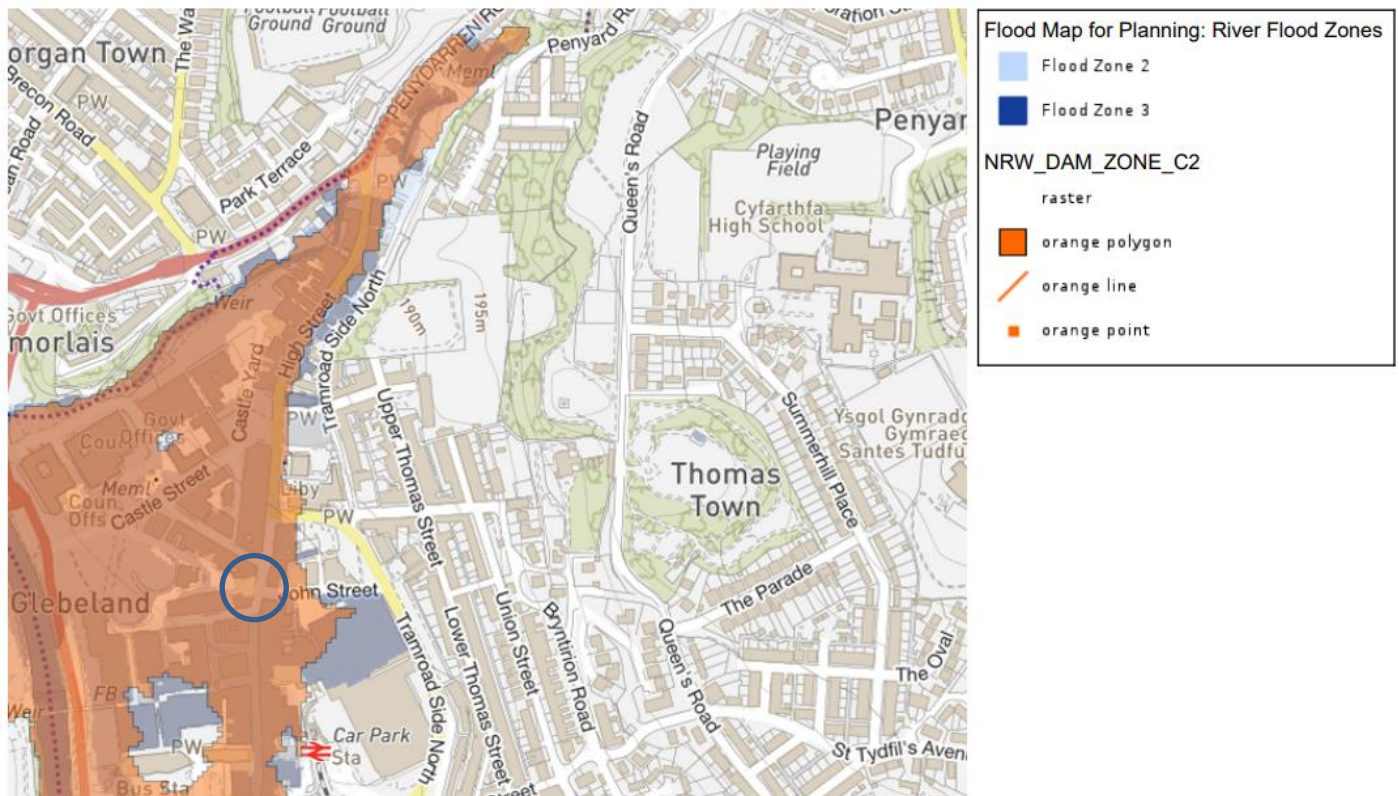


Figure 3-1 Development Advice Map

3.4 Justification test

TAN-15 states that “new development” will be justified if it can be demonstrated that:

- 1 Its location in zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy required to sustain an existing settlement;
- or
- 2 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,
- 3 It concurs with the aims of Planning Policy Wales and meets the definition of previously developed land;
- and,
- 4 The potential consequences of a flooding event for the particular type of development have been considered and found to be acceptable.

There is no advise within TAN15 as to how the justification test should be applied to a change of use application, particularly where there will be no increase in the vulnerability of the development. Therefore, the proposed re-development has been assessed against the requirements of the Justification Test, with the results summarised in Table 3-2. All the criteria have been satisfied with regards to the proposed development.

TAN 15 Justification Criteria	Comments	Is it Achievable?
Its location is necessary to assist a local authority regeneration initiative or strategy, or contribute to key employment objectives necessary to sustain an existing settlement or region	The proposed development will deliver Merthyr Tydfil's Local Development Plan policies EcW5, EcW7, and SW11 of the Replacement Local Development Plan (2016-2031).	Yes
The site meets the definition of previously developed land (i.e. it is not a Greenfield site) and concurs with the aims of Planning Policy Wales (i.e. the presumption in favour of sustainable development)	There is an existing building on site, currently comprised of two units. The site has already been developed and therefore meets the definition of previously developed land.	Yes
A Flood Consequence Assessment has been produced to demonstrate that the potential consequences of a flood event up to the extreme flood event (1 in 1000 chance of occurring in any year) have been considered and meet the [Acceptability Criteria] ... in order to be considered acceptable	Sections 4 and 5 describe the flood risk assessment at the site, using a combination of existing NRW mapping and hydraulic modelling carried out by Capita at Merthyr Tydfil Bus Station FCA.	•

Table 3-2: Justification test applied to the proposed site

4. Review of Existing Flood Risk Data

This section assesses the risk to the proposed development from all sources of flooding, the risk of increased flooding to others, and how flood risks can be managed. It is a Level 1 FCA and as such the flood risk assessment is based solely on a desk-based analysis of existing flood risk data.

4.1 Review of existing flood risk data

A review of the existing flood risk data relating to the site has been undertaken. The main sources of risk have been published by Natural Resources Wales (NRW) and within MTCBC Flood Risk documents.

Flood Risk from Rivers - The site is at low flood risk from rivers.

Flood Risk from the Sea - The site is not at risk of flooding from the sea.

Flood Risk from Surface Water and Small Watercourses - The site is at very low risk of surface water flooding.

Flood Risk from Groundwater - The site is at very low risk of flooding from groundwater.

Flood risk from Reservoirs - The site is at low risk of flooding from reservoir failure.

Flood risk from Reservoirs - The site is at low risk of sewer flooding.

4.2 Historical flooding

Data Map Wales does not show any evidence of historic flooding on the site (refer to Figure 4-1 for the extract).

No further historic flooding records were identified at the site in the MTCBC Local Flood Risk Management Strategy, Preliminary Flood Risk Assessment Report or the Flood Risk Management Plan.

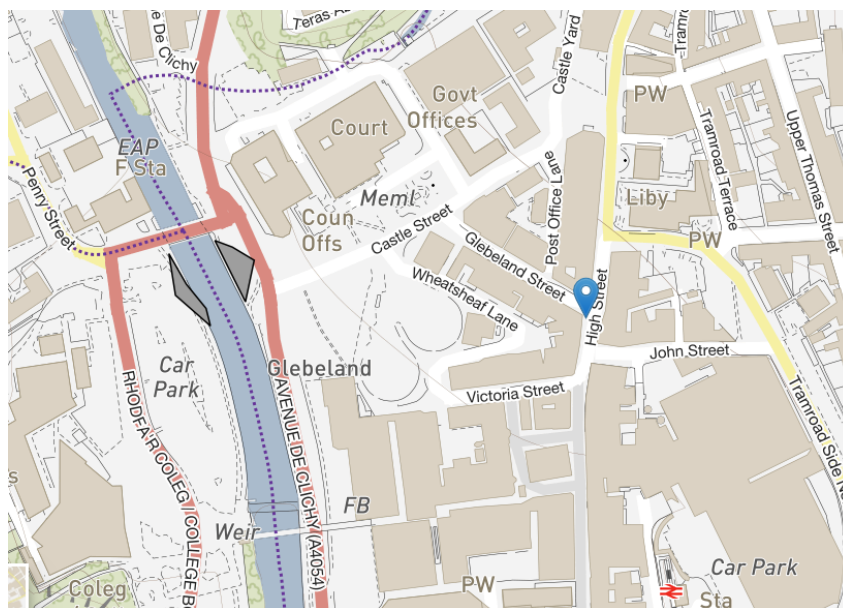


Figure 4-1: NRW Historic Flooding records

4.3 Flood Risk from Rivers

NRW's Flood Risk Assessment Wales (FRAW) map for Flood Risk from Rivers shows that the proposed development site is at low risk of fluvial flooding from the River Taff. This means that the site has between a 1 in 1000 (0.1%) and 1 in 100 (1%) year chance of flooding during a flood event (refer to Figure 4-2).

Given the DAM C2 designation of the site and to confirm the risk of flooding posed by the River Taff, further assessment using detailed flood modelling data is discussed in Section 5.

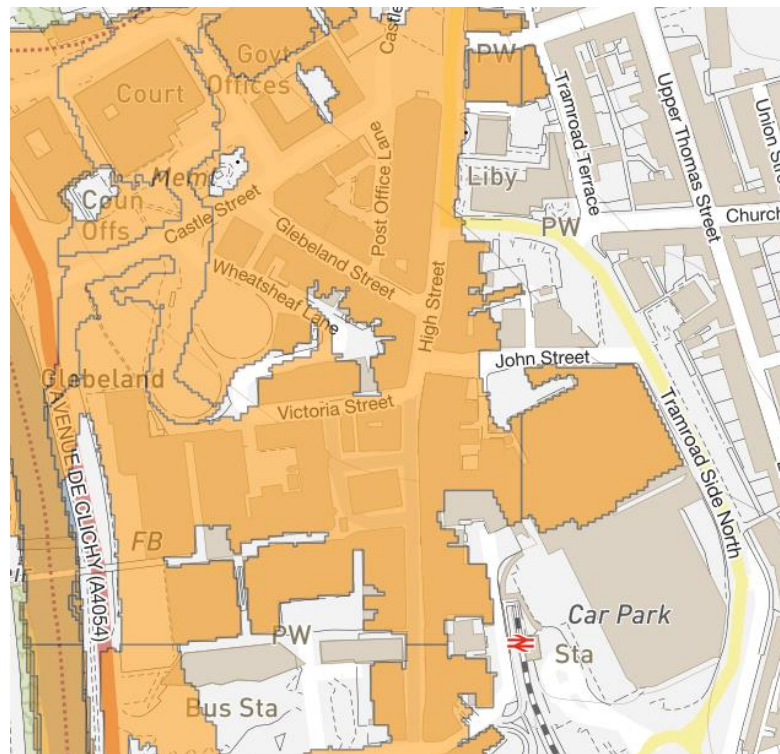


Figure 4-2: Risk of flooding from rivers

4.4 Flood Risk from the Sea

The NRW FRAW Flood Risk from the Sea map shows that the site is not at risk of tidal flooding.

4.5 Flood Risk from Surface Water and Small Watercourses

NRW's FRAW Surface Water and Small Watercourse map indicates that the site is not at risk of surface water flooding, (refer to Figure 4-3). However, there is a flow path down the High Street from north to south. This is identified as a high risk on the FRAW. This flow path does not affect the site and is confined to the carriageway. NRW categories a high risk as the area has a chance of flooding of greater than 1 in 30 (3.3%). However, as this is confined to the carriageway it was not pose a risk to the development.



Figure 4-3 Risk of Flooding from Surface Water and Small Watercourses

4.6 Flood Risk from Groundwater

Groundwater flooding is caused by unusually high groundwater levels. It occurs as excess water emerges at the ground surface or within manmade structures such as basements. Groundwater flooding tends to be more persistent than surface water flooding, in some cases lasting for weeks or months and can result in damage to property. The risk of groundwater flooding depends on the nature of the geological strata underlying the site and the local topography.

MTCBC Local Flood Risk Management Strategy, Preliminary Flood Risk Assessment Report and the Flood Risk Management Plan states that groundwater is 'not a major problem in MTCBC'. It can therefore be concluded that the risk of groundwater flooding at the site is very low.

4.7 Flood Risk from Reservoirs

The site is at risk from reservoir flooding, however NRW advised reservoir flooding is extremely unlikely to happen. All large reservoirs must be inspected and supervised by reservoir panel engineers. NRW is the enforcement authority for the Reservoirs Act 1975 in Wales, and they ensure that reservoirs are inspected regularly, and essential safety work is carried out.

4.7 Flood Risk from Sewers

The MTCBC Local Flood Risk Management Strategy, Preliminary Flood Risk Assessment, Report and the Flood Risk Management Plan show no evidence of historic sewer flooding on the site. It can therefore be concluded that the risk of sewer flooding at the site is low.

5. Detailed Fluvial Flood Risk Assessment

5.1 Flood Data Availability

A data request was submitted to NRW and the Merthyr Tydfil County Borough Council (MTCBC) for the most up to date flood risk information for the proposed development site. Both NRW and MTCBC confirmed that they did not hold a detailed hydraulic model that covered the proposed development. However, NRW indicated that a detailed model was constructed as part of the Merthyr Bus Station Flood Consequence Assessment in 2016 CS/074270.

A hydraulic model was developed to provide flood levels for the Merthyr Bus Station FCA. The flood maps within report cover the site of 120/121 High Street. As planning permission was granted for the Merthyr Bus Station, it can be concluded that the model was deemed acceptable by NRW for representing flood risk in the area.

Model results presented in this section are for the 'Proposed' scenario presented in the Merthyr Bus Station FCA.

1% AEP(100 year) plus climate change event

In the 1% AEP plus climate change event, the site is predicted to remain flood free (refer to Figure 5-1). This meets the requirement of TAN15, which requires the development site to remain flood free in the fluvial 1% AEP event plus climate change.

0.1% AEP event

In the 0.1% AEP event, the site remains flood free, as shown in Figure 5-1. This satisfies the requirement of section of TAN15, which requires flood depths on-site to be no greater than 0.60m in a 0.1% AEP event.

120/121 High Street is within the blue oval on Figure 5-1. The site outlined in red is the Merthyr Bus Station and does not relate to this application.

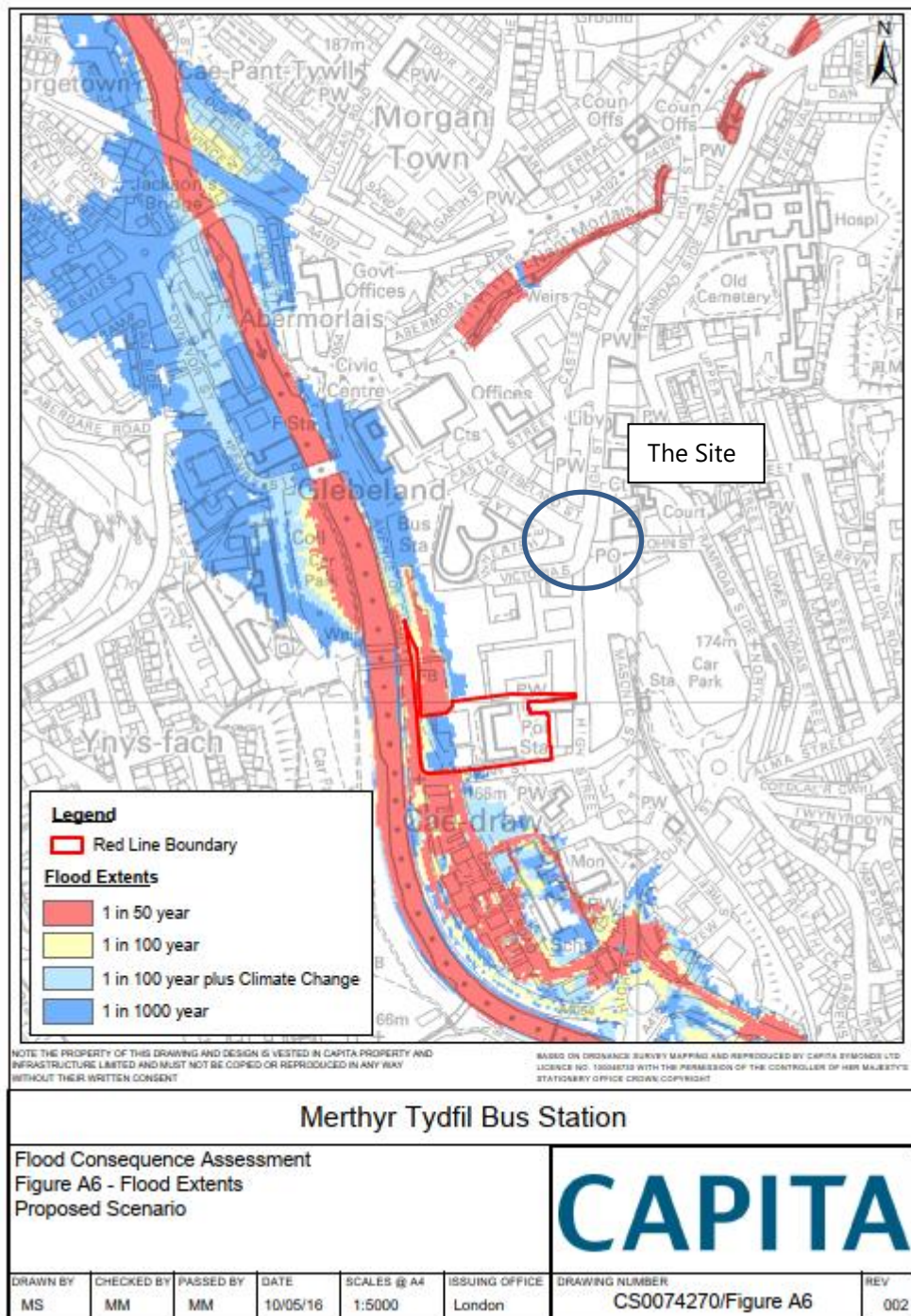


Figure 5-1 Extract from FCA for Merthyr Bus Station

6. Assessment of Acceptability Criteria

6.1 Acceptability Assessment

Table 6-1 assesses the proposed development against the acceptability requirements of TAN15.

TAN-15 Acceptability Criteria	Comments	Is the Criteria Satisfied?
Developer is required to demonstrate that the site is designed to be flood free for the lifetime [Ref: TAN-15 A1.5] of development for a 1 in 100 (1%) chance (fluvial) flood event including an allowance for climate change in accordance with TAN-15 table A1.14.	During the 1% AEP plus climate change event the proposed development is predicted to remain flood free.	Yes
In respect of the residual risk to the development it should be designed so that in an extreme (1 in 1000) event there would be less than 600mm of water on access road and within the property, the velocity of any water flowing across the development would be less than 0.4/second.	During the 0.1% AEP event the proposed development is predicted to remain flood free.	Yes
No flooding elsewhere.	The proposed development is predicted to be flood free during all design events. No additional impermeable areas are being generated as part of the development and therefore does not increase the flood risk elsewhere.	Yes
Flood defences must be shown by the developer to be structurally adequate particularly under extreme overtopping conditions (i.e. that flood with a 1 in 1000 chance of occurring in any given year).	The proposed site does not rely upon any formal flood defences in the area	Yes
Effective flood warnings are provided at the site.	The site is located within the NRW 'River Taff' flood alert area and the 'River Taff at Merthyr Tydfil' flood warning area.	Yes
The developer must ensure that future occupiers of the flooding risks and consequences.	The building occupants are not at risk of flooding, however they signing up to the NRW Flood Warning Service will provide warning in the event of an extreme flood event in the area.	Yes

Escape/evacuation routes are shown by the developer to be operational under all conditions.	The access and egress are as existing. A safe access and egress route is available up to and including the 0.1% AEP event.	Yes
The development is designed by the developer to allow the occupier the facility for rapid movement of goods/possessions to areas away from flood waters.	The proposed development site is predicted to be flood free during all design events.	Yes
Development is designed to minimise structural damage during a flooding event and is flood proofed to enable it to be returned to its prime use quickly in the aftermath of the flood.	The proposed development site is flood free during all design events.	Yes

Table 6-1 Assessment of accessibility criteria

7. Conclusion

Intrado Limited were commissioned by Mr Rob Price to prepare a Flood Consequence Assessment (FCA) to support the proposed re-development of an existing commercial unit on High Street, Merthyr Tydfil.

The flood risk assessment has been carried out in accordance with TAN15.

The proposed development site is located in Zone C2 as designated by the Welsh Government's Development Advice Maps (DAM). Zone C2 is defined as areas of the floodplain without significant flood defence infrastructure.

The proposed development site is at low risk of fluvial flooding and reservoir flooding. The site is at very low risk of groundwater, surface water and sewer flooding.

Existing flood risk mapping based on hydraulic modelling carried out by Capita for the Merthyr Tydfil Bus Station FCA in 2016. This shows that the proposed development site is predicted to be flood free in the 1% AEP plus climate change event and the 0.1% AEP event.

In all flood events up to and including the 0.1% AEP event, safe access and egress can be provided from the development site.

It is concluded that on the grounds of flood risk, the proposed development at 120/121 High Street meets the principles and requirements set out in TAN-15.