

JBA Project Code	2025s0523
Contract	Virginia Park, Caerphilly
Client	Withey Developments Ltd
Day, Date and Time	6th May 2025
Author	Amy Evans BSc, MCIWEM, C.WEM
Reviewer / Sign off	George Baker BEng, FCIWEM, C.WEM, CEnv, IEng, AIEMA
Subject	Local Centre - Flood Risk Appraisal for Pre-application

1 Introduction

JBA consulting were commissioned by Withey Developments Ltd. to prepare a technical note detailing the flood risk at the site of a proposed Local Centre, Virginia Park, Caerphilly (hereafter referred to as 'the Site').

2 Site description

The Site is located on the car park and demolished driving range buildings of the former golf course near the clubhouse (now used as a youth centre). As such the site is regarded to be Previously Developed Land (PDL) in accordance with PPW.

The Local Centre was approved as part of the original outline permission (17/0804/OUT) which sought permission for *up to 350 homes, public open space, a local centre and community building, new vehicular, cycle and pedestrian accesses, associated engineering works and seek approval of access* and was approved in December 2019.

The Site and wider area is generally flat with elevations of between 76.4-78m AOD as shown in Figure 2-1. There is a slight fall within the Site to the south-east.

The proposed Local Centre will consist of a commercial ground floor building with 6 no. apartments occupying each of the first and second floor storeys. The proposal will also include separate commercial and residential parking within the red-line boundary. Access is proposed via an existing road to the north-west of the site. The proposed site layout is shown in Figure 2-2.

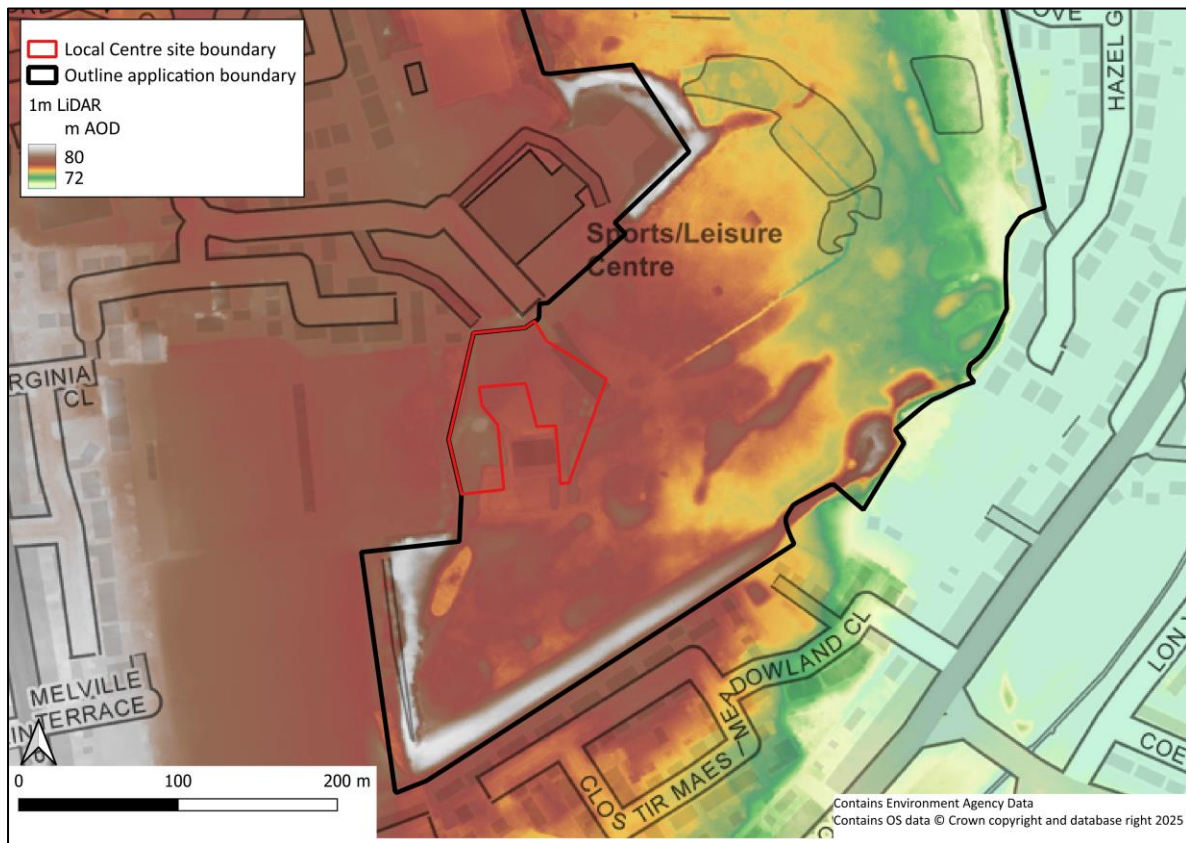


Figure 2-1: LiDAR elevation data demonstrating site topography



Figure 2-2: Proposed site layout

3 Policy Review

Planning Policy Wales (PPW)¹ sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales. These policies have the aim that all development in Wales is sustainable and improve the social, economic, environmental, and cultural wellbeing of Wales as set out in the Wellbeing of Future Generations Act 2015.

Technical Advice Note 15 (TAN15), introduced by the Welsh Government in 2004 and recently updated in March 2025, provides technical guidance relating to development planning and flood risk in Wales. The initial requirements of TAN15 are to identify the vulnerability classification(s) and flood zones within the Flood Map for Planning relevant to the proposed development, and to apply this information to the application of the Development Plans and Development Management Decisions detailed within the TAN.

The Site is mainly located in Flood Zone 2 of the Flood Map for Planning as shown in Figure 3-1 on account of the risk linked to overland flow originating from the Nant Yr Aber watercourse. The Site is outside of any TAN15 Defended Zones. The development of the Local Centre will be classed as redevelopment as it is proposed on Previously Developed Land as defined within Planning Policy Wales.

The commercial ground floor development is classified as Less Vulnerable development, but the apartments proposed on the upper floors is categorised as Highly Vulnerable development within TAN15.

Section 10.19 of TAN15 set out the guidance for redevelopment in Flood Zone 2; of which the key requirements are:

- They must also be accompanied by a FCA which clearly describes the flood risk and the risks must be acceptable.
- Proposals must be consistent with the acceptability considerations set out in section 11.
- Proposals for redevelopment on brownfield land of any vulnerability will need to assist, and be consistent with, the Development Plan strategy to regenerate an existing settlement or achieve key economic or environmental objectives.
- Where proposals for redevelopment include residential use, local authorities should ensure that such uses do not occur at ground floor level.

In response to the requirements set out above, it is acknowledged that a FCA will need to be prepared in support of a planning application and that this will need to demonstrate compliance with the Acceptability Criteria in Section 11 of TAN15. The proposed development is consistent with the aims and objectives of the Local Development Plan and

1 Welsh Government, 'Planning Policy Wales: Edition 12', February 2024

the Outline Planning application. No residential development is proposed on the ground floor of the development.

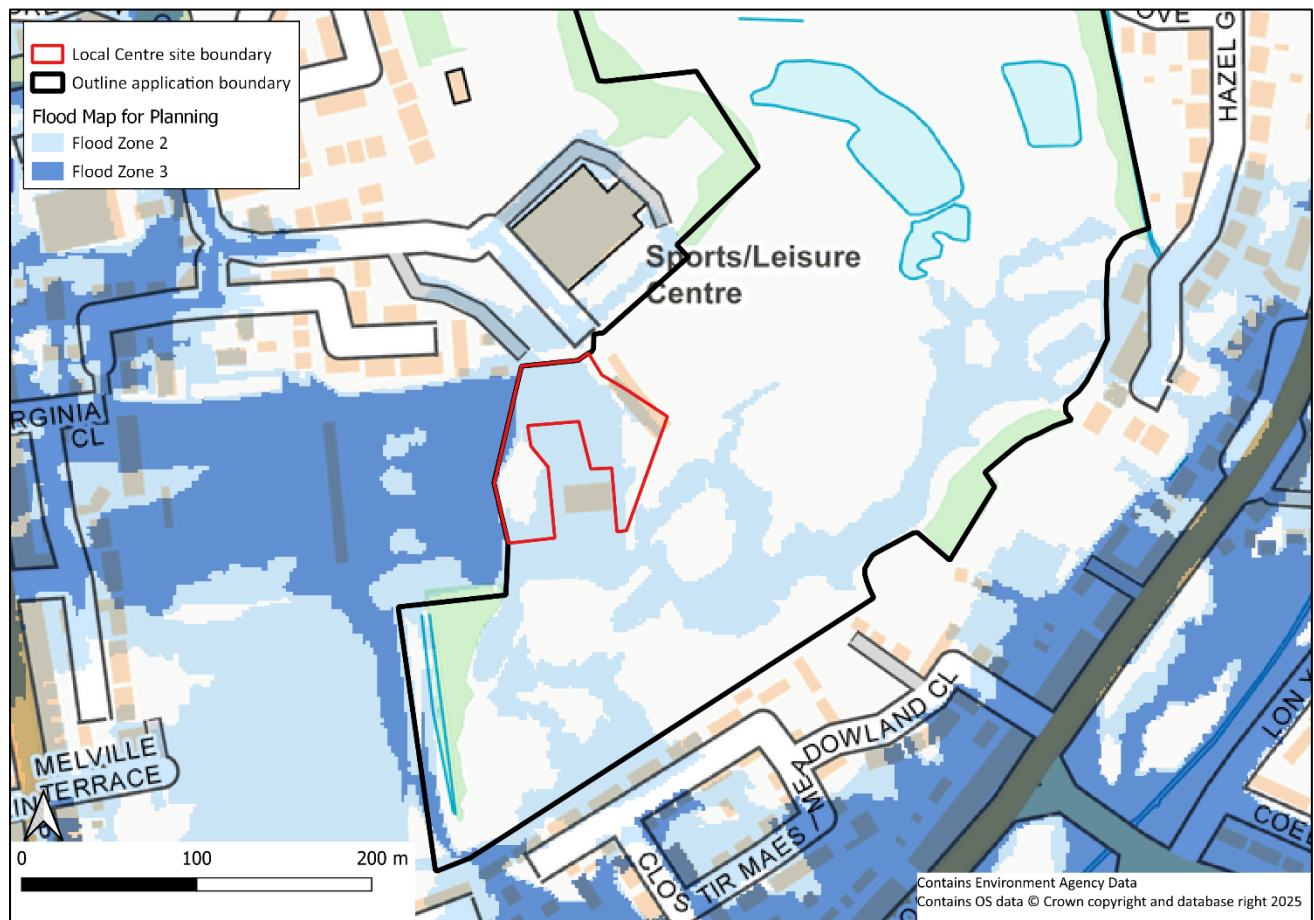


Figure 3-1: Flood Map for Planning

4 Flood Risk Assessment

4.1 Historical flooding

The site is shown to be outside of NRW's historical recorded flood extents.

4.2 Fluvial Flood Risk

The site is largely located in Flood Zone 2 Flooding from River of the Flood Map for Planning (FMfP) on account of the fluvial flood risk largely originating from the Nant Yr Aber watercourse. Flood Zone 2 Flooding from Rivers is defined as areas with a less than 1 in 100 (1%) but greater than 1 in 1000 (0.1%) chance of flooding in a given year, including climate change. Currently Flood Zone 2 at the site is derived from generalised flood modelling, and not a detailed local flood model.

4.2.1 Detailed Flood Modelling

In 2024, JBA conducted updated hydraulic modelling based on the NRW P7 Caerphilly Tributaries Model to inform the proposed development at the wider outline application site.. As most of the original modelling was carried out in 2014/2015, the model was updated to be in line with current TUFLOW/Flood Modeller best practice and NRW flood modelling guidance and to reflect a period of NRW consultation in this regard.

In early 2024, new model hydrology prepared by JBA was approved by NRW and applied to the updated model. Additional model updates conducted by JBA include:

- Updates to LiDAR digital terrain model where a review of old and new LiDAR shows key differences- *i.e. Ysgol Gyfun Cwm Rhymni Y Gwyndy Campus*. Topographic survey data which was included within the NRW approved model was retained.
- Updates to key hydraulic structures to comply with changes in best practice
- Updates to software versions
- Minor fixes and model stability improvements

4.2.2 Detailed Flood Modelling Results

The results show that the Site is at risk in the 1% AEP plus climate change and 0.1% AEP plus climate change modelled flood events. Maximum flood depths within the site boundary during these events are shown in Figure 4-1 and Figure 4-2. Furthermore, peak flood depths and levels within the Site boundary are summarised in Table 4-1.

As can be seen, peak flood depths during the 1% AEP plus climate change event at the Site are generally <15mm. Shallow overland flood water flows from north to south through the Site in line with the topography. The modelling found that the flood extents are highly sensitive due to shallow flow depths across a relatively flat area. Flood depths in the 0.1% AEP plus climate change event are also very shallow (typically <30mm). By way of contrast

NRW flood modelling of Surface Water and Small Watercourse Flood Risk typically does not display flooding with depths less than 100mm.

The access road to the north-west has localised peak flood depths of 400mm and 500mm during the 1% AEP plus climate change and 0.1% AEP plus climate change modelled fluvial flood events respectively. This is due to an isolated depression within the road topography which fills with the overland flow.

The events described above are critical for the assessment of the proposed development against the TAN15 Acceptability Test. To meet the requirements, the Site should be shown to be flood free during the 1% AEP plus climate change event and should have depths of <600mm during the 0.1% AEP plus climate change event. However, for redevelopment proposals, Section 11.8 of TAN15 advises that “*The thresholds may be applied with more flexibility for redevelopment, changes of use, conversions and extensions, where the ability to substantially redesign a development is limited. In those circumstances the thresholds are a guide.*”

It should be noted that there has been some earthworks and slight ground levels changes since the topographic survey used to represent the site ground level in modelling was collected and therefore there is a likelihood that refined modelling based on updated topographic data could change the predicted flood extents but that depths are likely to remain minimal.

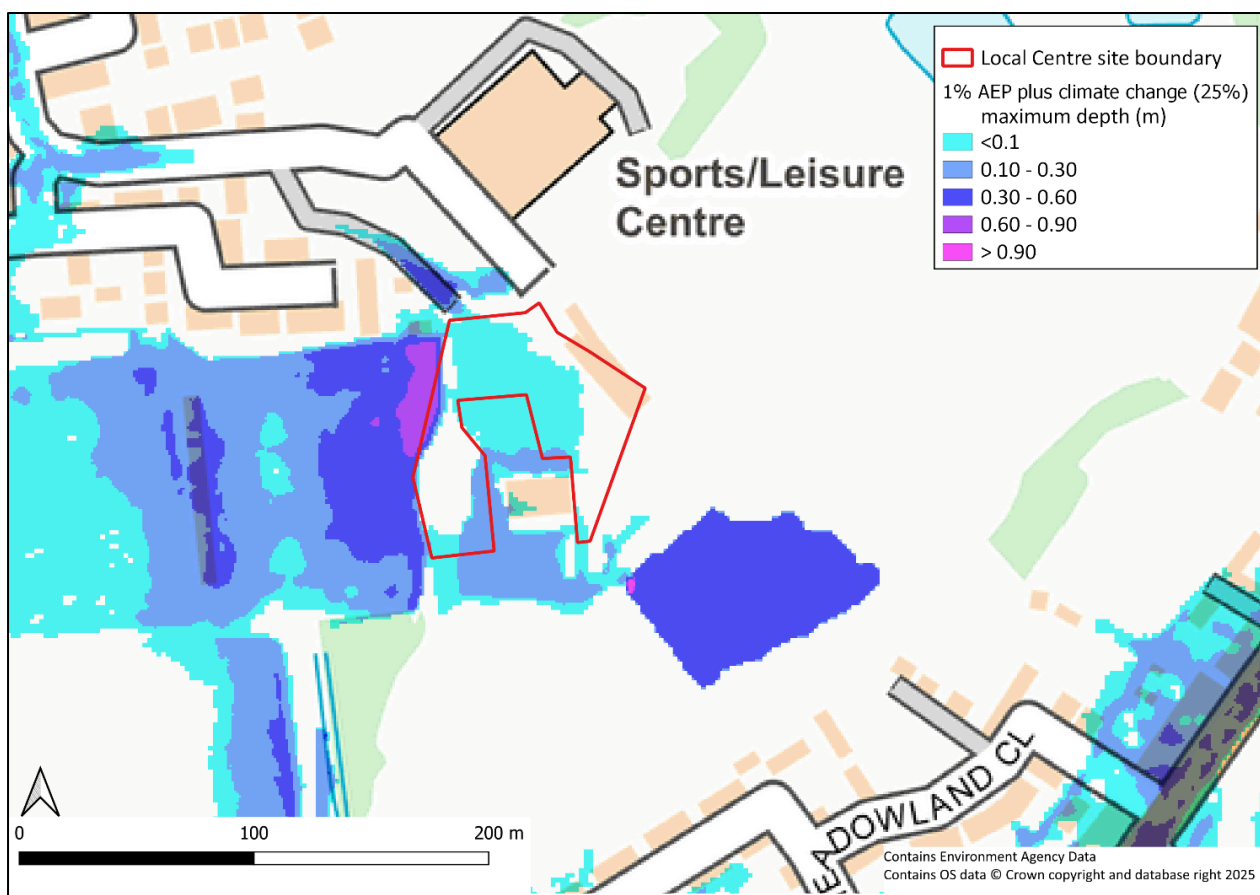


Figure 4-1: 1% AEP plus climate change (25%) peak flood depth

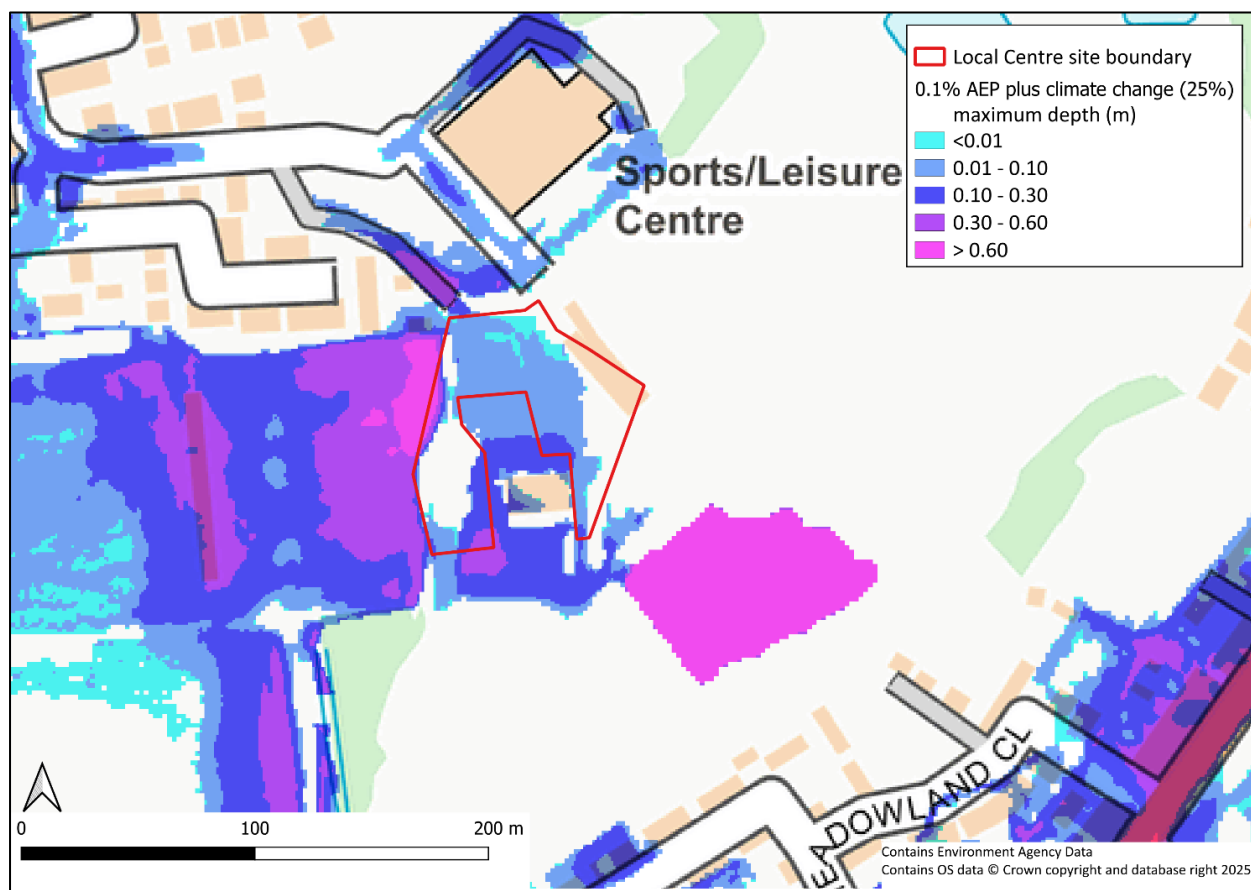


Figure 4-2: 0.1% AEP plus climate change (25%) peak flood depth

Table 4-1: Flood depths and water levels within the Site boundary

Event	Typical flood depths	Peak Flood Depth in areas where built development and infrastructure is proposed	Peak Flood Level
1% AEP plus climate change (25%)	<30mm	15mm	76.33-76.85m AOD
0.1% AEP plus climate change (25%)	<50mm	30mm	76.4-76.87m AOD

5 Flood Risk from other sources

The Flood Map for Planning- Surface Water and Small Watercourses shows that the site is largely at a very low risk of surface water flooding as shown in Figure 5-1. The only area at greater surface water flood risk is the area to the south-west of the site which is proposed for green infrastructure within the proposed site layout.

The localised depression within the access route to the north-west shows a higher surface water flood risk as with the fluvial flood risk. This is due to the depression filling with surface flows. During the detailed design, this risk should be reviewed to understand whether there are enhanced drainage features here or whether the access will be operational during frequent events.

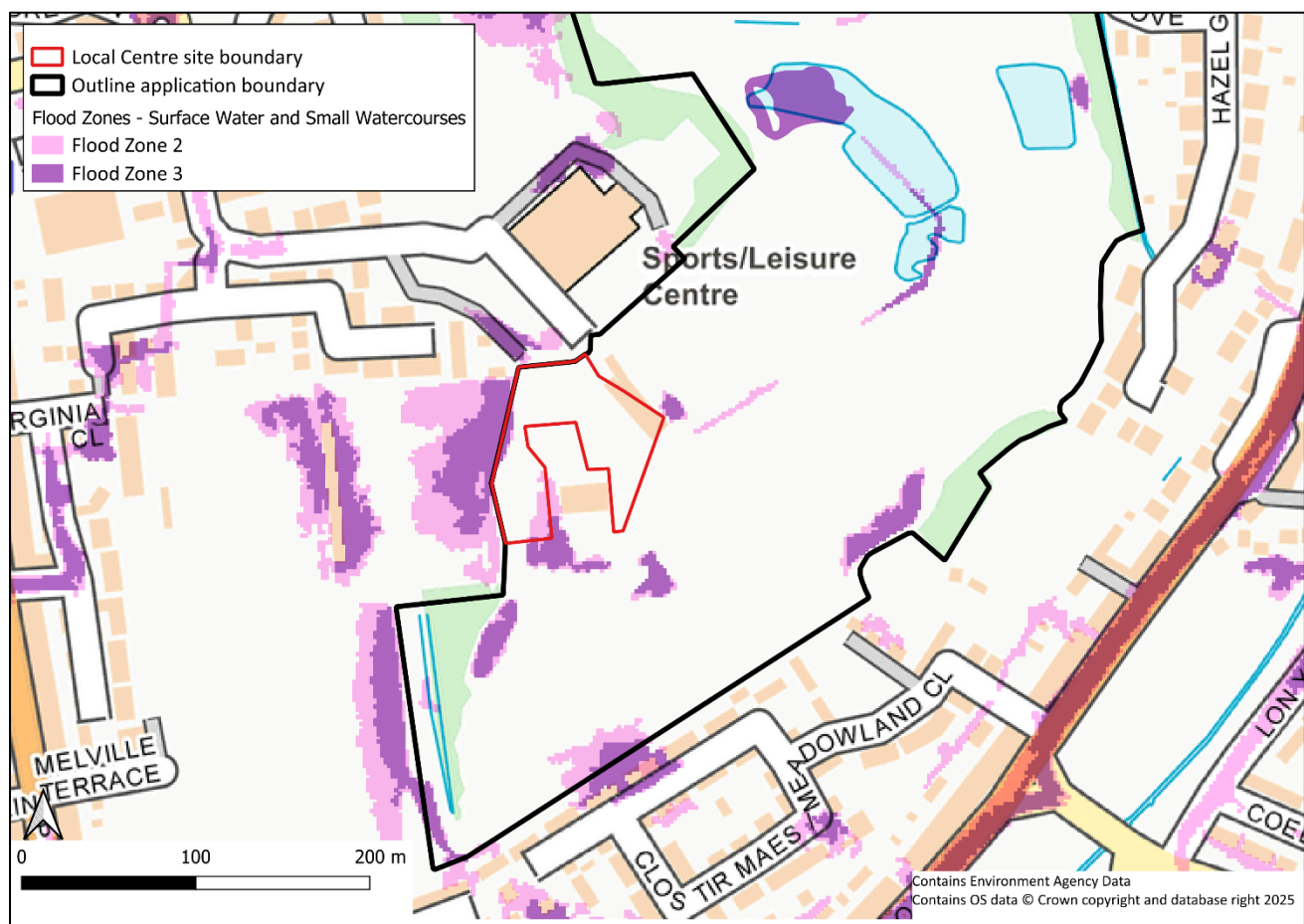


Figure 5-1: Flood Map for Planning - Surface water and small watercourses

With regards to groundwater flood risk, the Flood Consequences Assessment (FCA) used to support the 2017 application states that:

The site is underlain by a secondary aquifer which is unlikely to have the capacity to cause significant groundwater flooding. However, perched groundwater has been encountered at the interface between the base of the made ground/landfill and the underlying superficial deposits, and locally within the made ground itself. This should be borne in mind at the detailed design stage.

Therefore, although low risk, groundwater levels should be informed from ground investigation at the Site.

The Site is shown to be at risk of flooding as a result of a reservoir failure at Caerphilly Castle Moats as shown in Figure 5-2. However, the heavily regulated nature of reservoir management means that the likelihood of a failure is very low. Therefore, the flood risk at the Site due to this source is considered to be low.

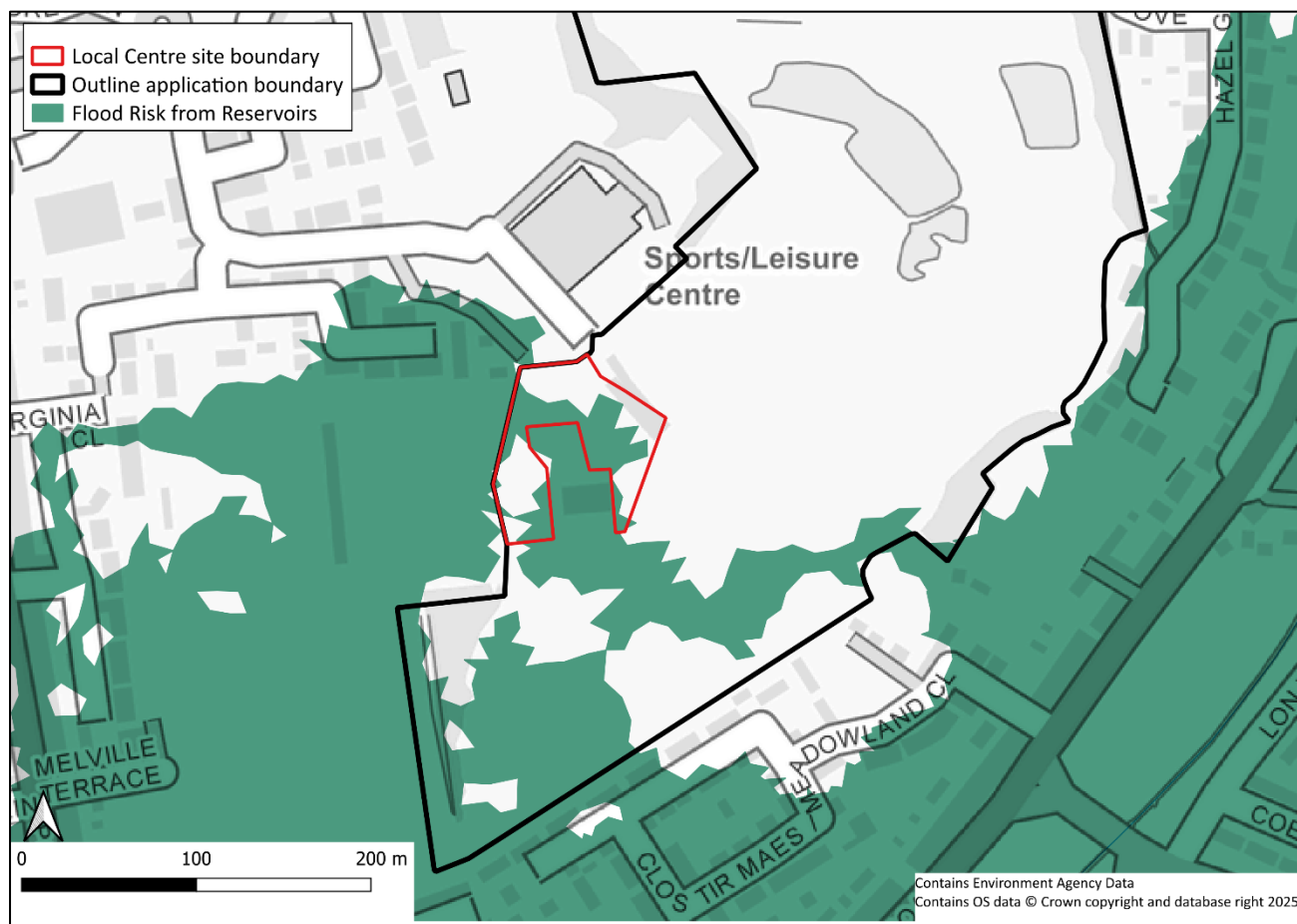


Figure 5-2: NRW Risk of Flooding as a result of a reservoir failure mapping

6 Flood Risk Mitigation

The proposed development is compatible with the Flood Zone in which it is located.

The Site is shown to be at risk from fluvial flooding. However, the risk is characterised by very shallow flood depths of <50mm.

The Finished Floor Level (FFL) of the proposed building will be raised by a minimum of 100mm, as required by building regulations. Consequently, the proposed building will be raised above the predicted flood level for the 0.1% AEP plus climate change event. This will satisfy both the flood frequency criteria (Sections 11.7-11.8) and tolerable conditions requirements (Sections 11.9-11.10) of TAN15, without adversely impacting third party flood risk.

All requirements of the acceptability criteria will be demonstrated through the final proposed modelling and supporting FCA.

Further consideration should be made for safe access and egress on account of the localised fluvial and surface water flood risk on the access route to the north-west as a result of an isolated depression in the topography.

A sustainable surface water drainage strategy will be developed in line with the SuDS Approval Body.

7 Conclusion

JBA consulting were commissioned by Withey Developments Ltd. to prepare a technical note detailing the flood risk at the site of a proposed Local Centre, Virginia Park, Caerphilly.

The Site is located on the previously developed land elements of the former golf course near the clubhouse. The Local Centre was approved as part of the original outline permission (17/0804/OUT).

The Local Centre will consist of a commercial ground floor building with 6 no. apartments occupying each of the first and second floor storeys. Access is proposed via an existing road to the north-west of the site.

The Site is mainly located in Flood Zone 2 of the Flood Map for Planning. The proposed development of the Local Centre will be classed as redevelopment as it is proposed on previously developed land as defined within Planning Policy Wales. The principle of redevelopment in Flood Zone 2 is compatible with TAN15, subject to satisfying various tests and requirements.

Updated fluvial hydraulic modelling shows that the Site is at risk in the 1% AEP plus climate change and 0.1% AEP plus climate change modelled flood events. Peak flood depths during the 1% AEP plus climate change and 0.1% AEP plus climate change event events at the Site are generally <30mm and <50mm respectively.

It should be noted that there have been some earthworks and slight ground levels changes since the topographic survey used to represent the site ground levels in modelling was collected. Therefore, there is a likelihood that refined modelling based on updated topographic data could change the flood extent but it is likely that any flood depths will remain very shallow.

The Site is at low risk of flooding as a result of surface water, groundwater or as a result of a reservoir failure.

A localised depression in the access route to the north-west (outside of the site boundary) is shown to be associated with both fluvial and surface water flood risk. A further assessment of the impact of this on safe access and egress will be made as proposals are further developed.

By slightly raising the proposed building and/or careful topographical changes, the proposed building will remain flood free in all design flood events. Consequently, the proposals shall satisfy the key requirements of the Acceptability Criteria of TAN15 Section 11.

Full compliance with TAN15 will be demonstrated through a complete and comprehensive Flood Consequences Assessment (FCA) in support of the full planning application.