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Newport Centre - FCA Addendum

Version 2

Prepared for
WEPCo Ltd

Date
August 2026



Document Status

Issue date	August 2026
Issued to	WEPCo Ltd
BIM reference	Client reference: NE0101-JBA-XX-XX-RP-Z-00001 JBA reference: PZN-JBA-XX-XX-RP-Z-0001-Newport_Leisure_Centre_FCA_Update
Revision	P02
Status	A2
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Contract

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This report describes work commissioned by WEPCo Ltd, by an instruction dated 29th May 2025. The Client's representative for the contract was Anne McDonald of WEPCo Ltd. Polly Stradling of JBA Consulting carried out this work.

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The methodology adopted and the sources of information used by JBA in providing its services are outlined in this Report. The work described in this Report was undertaken between May 2025 and April 2026 and is based on the conditions encountered and the information available during the said period. The scope of this Report and the services are accordingly factually limited by these circumstances.

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Abbreviations

AEP	Annual Exceedance Probability
DTM	Digital Terrain Model
FCA	Flood Consequence Assessment
GIS	Geographical Information System
JBA	Jeremy Benn Associates
LiDAR	Light Detection And Ranging
mAOD	metres Above Ordnance Datum
NRW	Natural Resources for Wales
OS NGR	Ordnance Survey National Grid Reference
TAN-15 Risk	Technical Advice Note 15: Development and Flood Risk
TUFLOW	Two-dimensional Unsteady FLOW

1 Introduction

1.1 Terms of Reference

This report has been commissioned by WEPCo and prepared by JBA Consulting in support of the proposed redevelopment of the former Newport Leisure Centre into an education facility on behalf of Coleg Gwent.

The development benefits from an approved outline planning application submitted in August 2022 under planning reference 22/0814. Condition 04 of the outline application decision notice requires that any reserved matters application(s) for 'layout' and/or 'appearance' submitted pursuant to Condition 02 shall be informed by an updated Flood Consequences Assessment (FCA).

The condition requests that the addendum must provide details of conveyance routes, assess any impacts of floodwater displacement on third parties, and identify any necessary mitigation measures. This report forms the required Addendum, submitted with the intention to discharge the planning condition.

1.2 Development Proposals and Planning History

Development proposals are for the redevelopment of the former Newport Leisure Centre into an education facility on behalf of Coleg Gwent. The development has had a successful outline planning application that was submitted in August 2022, planning reference 22/0814.

An FCA undertaken by JBA Consulting was submitted alongside this outline planning application, with reference: HHX-JBAU-XX-XX-RP-Z-0001-S3-P01-Newport_Centre_FCA. The FCA outlined the high-level stage of development planning and detailed the flood risk to the site alongside policy position. The FCA provided a detailed assessment of tidal flood risk to the site, based on the NRW Newport Tidal Flood Model. Section 5.7, and specifically Table 5-2 of the FCA provides a range of mitigation measures for the site dependant on the lifetime of development of the final proposals. Table 5-2 from the original FCA is presented below for clarity. For a 75-year lifetime of development, it is recommended that the proposed development has a Finished Floor Level (FFL) of at least 9.27mAOD to comply with the requirements of TAN15. Where practical, higher FFLs could be considered.

Table 5-2 Mitigation options

Development lifetime	Mitigation option
75 years (educations, retail, commercial)	Finished floor levels must be raised to a minimum of 9.27mAOD to be flood free in the 0.5% AEP plus climate change event. Using this level would mean that the site floods to 0.28m during the 0.1% AEP event. If practical, finished floor levels should be raised to a minimum of 9.55mAOD to be flood free in the 0.1% AEP plus climate change event. This higher minimum design level will provide a measure of freeboard and reassurance to the design.
100 years (hotel)	Finished floor levels must be raised to a minimum of 9.55mAOD to be flood free in the 0.5% AEP plus climate change event. Using this level would mean that the site floods to 0.34m during the 0.1% AEP event. If practical, finished floor levels should be raised to a minimum of 9.89mAOD to be flood free in the 0.1% AEP plus climate change event. This higher minimum design level will provide a measure of freeboard and reassurance to the design.

Figure 1-1 Table 5-2 of FCA reference HHX-JBAU-XX-XX-RP-Z-0001-S3-P01-Newport_Centre_FCA

Planning permission on the outline application was granted in October 2022. Two conditions were applied to the approval in relation to flood risk. Condition 04 of the outline application decision notices states:

The reserved matters application(s) for 'layout' and/or 'appearance' submitted in pursuance of condition 02 shall be informed by an updated Flood Consequences Assessment, which shall provide details of conveyance routes, any impacts of flood water displacement on third parties and any necessary mitigation measures. The development shall be carried out in accordance with the updated Flood Consequences Assessment and any mitigation contained therein.

Condition 27 of the decision notice states:

The Finished Floor Levels at ground floor level of the development hereby approved shall be set in accordance with the Flood Consequences Assessment version 1.0 (JBA consulting, April 2022).

1.3 Purpose of Report

This report forms the requested FCA addendum required by Condition 04 of the decision notice, demonstrating how flood risk has been considered further against the fixed development proposals, and flood risk mitigation has been considered in line with the minimum recommendations of the original FCA (Condition 27).

Having regard to the publication of an updated TAN15 by Welsh Government in March 2025 and therefore coming into force in the intervening period between planning permission

being granted and this addendum, it is noted that consideration of planning policy does not form a part of the condition detail. Planning permission has been granted to the site under the outline application reference 22/0814. Consequently, the principles of the proposed development have already been approved. Rather, the conditions request that the impact of the development on flood risk is considered and demonstrated further, with appropriate measures in place to mitigate the risk of flooding both to the development and third parties.

In the interest of clarity, the considered tidal design events are the same under both TAN15 (2004) and the updated document (TAN15 2025), with these design events being the 0.5% AEP event and the 0.1% AEP event, both with an allowance for climate change over the lifetime of development.

Climate change has been considered in line with Welsh Government guidance on climate change, most recently updated in March 2026. However, it is also noted that there is minimal change to climate change in relation to sea level published in this most recent guidance. Consequently, the climate change allowances used in the original FCA are the same as those considered within this addendum, albeit increased to 2025 - the date at which work commenced on this project.

2 Detailed Flood Risk Assessment

2.1 Development Proposals

The previous Outline FCA considered a range of potential uses for the site, as the end use was undecided at that stage. Consequently, outline planning permission was sought for the redevelopment of the site for educational use, or alternatively for any use falling within Use Classes A1, A2, A3, B1, C1, D1 and D2, with all matters reserved. These potential uses included retail, offices, hotel, education and general leisure.

Since that time, the development proposals have evolved and are now fixed. As shown in Figure 2-1, the current proposal comprises the redevelopment of the site to deliver a new Coleg Gwent campus, including a café, examination hall, numerous classrooms and specialist teaching spaces to support a range of education and vocational courses such as catering, hair and beauty, welding, brickwork and other practical disciplines.

The proposed finished floor level of the building is set at 9.40m AOD.



Figure 2-1 Indicative site plan

2.1.1 Lifetime of Development

The previous Outline FCA studied both a 100-year assessment period to the year 2122 and a shorter lifetime of development to the year 2097. This range of lifetime was applied because the proposed use of the site had not been confirmed at that stage, and there was

potential for the development to include residential use, for which a longer development lifetime is appropriate.

As the proposals now represent a less vulnerable form of development with a clearly defined end use, an assessment period extending to the year 2100 has been adopted. This reflects Welsh Government advice which indicates that less vulnerable development should be assessed over a lifetime of development of 75 years.

2.2 Data Availability

The assessment of tidal flood risk in the original FCA was based the best available and updated flood modelling of Newport at the time. This was therefore based on version 7.0 of NRW's Newport Tidal Flood Model (June 2020), which was prepared by JBA Consulting for a successful Flood Map Challenge at the time. The version 7.0 model was further updated to support the 2022 assessment. The 2022 NRW tidal model of the Usk has been further updated by JBA Consulting to inform this addendum.

The model grid resolution of 10m and model timesteps have been retained from the original model as these are considered appropriate and provide an acceptable balance between model run times.

The below updates have been applied to the model:

- The revised model has been simulated using the latest available TUFLOW version at the time this project was commissioned (2025.1.0-iSP).
- A site-specific topographic survey was undertaken by Walters in 2025 to better represent the ground levels at the site. The topographic survey was provided by the client and covers an area of approximately 0.83 ha. The topographic survey was added into GIS and converted into a Triangular Irregular Network (TIN) file, before being converted into an Ascii DTM file to read into the model.
- The model has incorporated the latest available LIDAR data using the Natural Resources Wales 2023 LiDAR DTM dataset.
- Climate change uplifts have been applied to the previous 2022 model. A range of epochs were run, including the 2025 present day, 2075, and 2100 events.

2.3 Baseline Model Results

To inform this addendum, the baseline scenario was updated to reflect the present day 2025 event, and the lifetime of development of 75 years (2100) event.

During the 2100 0.5% AEP event the development site is shown to be predominantly flood-free, with shallow flood depths of up to 296mm located in the southeastern area of the site, flowing from the River Usk, as shown in Figure 2-2.

During the 2100 0.1% AEP Event, the entire development site is predicted to flood with maximum flood depths of 928mm along the western site boundary. Flood depths of up to 130mm are predicted across the centre of the site, as shown in Figure 2-3.

A summary of flood depths and levels for a range of epochs is contained in Table 2-1 below.

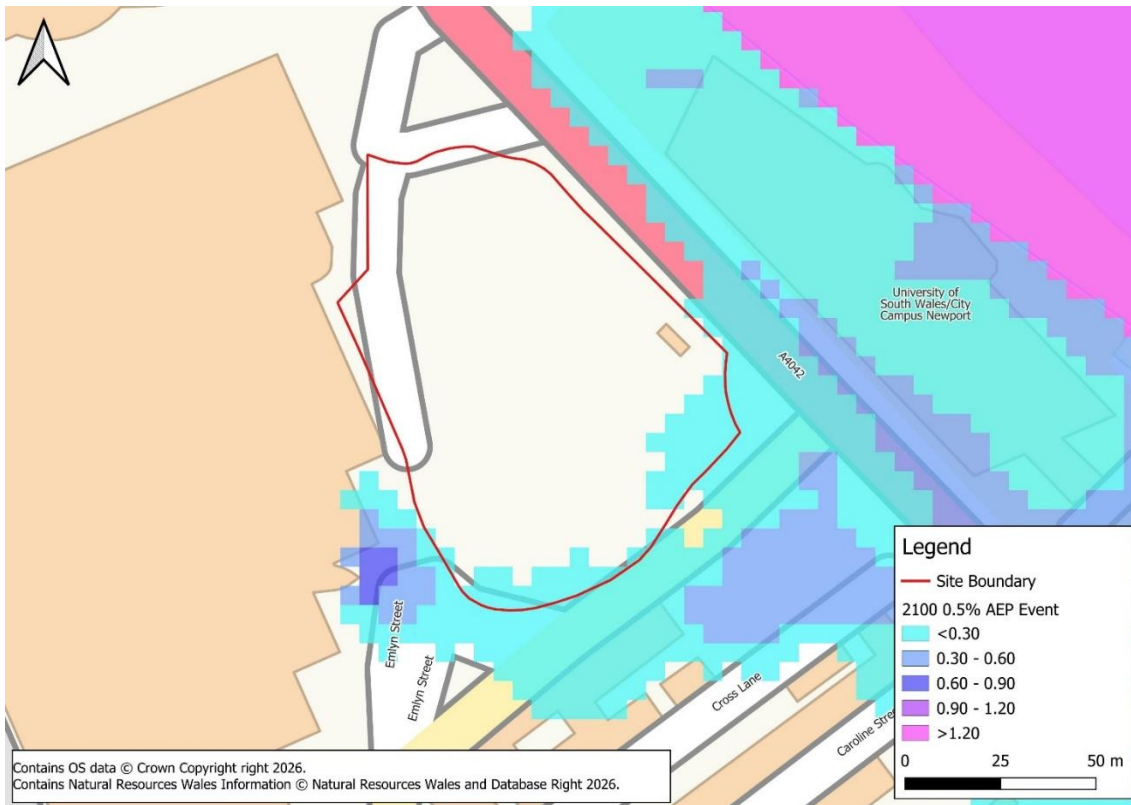


Figure 2-2 Baseline 2100 0.5% AEP Event

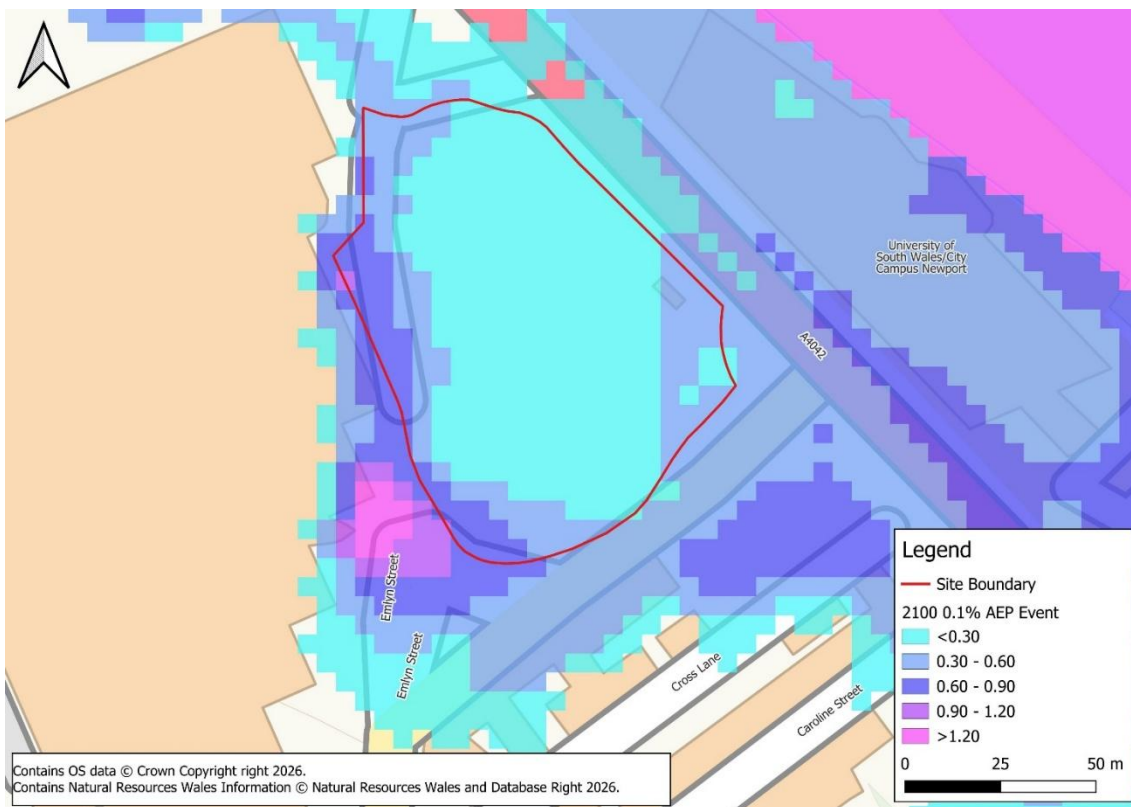


Figure 2-3 Baseline 2100 0.1% AEP Event

Table 2-1 Summary of Baseline Tidal Model Results

Epoch	Design Life	Maximum flood level on site (mAOD)		Maximum flood depth on site (m)	
		0.5%	0.1%	0.5%	0.1%
2025	Present Day	N/A	N/A	N/A	N/A
2075	50 years	N/A	9.30	N/A	0.33
2100	75 years	9.26	9.53	0.30	0.93

2.4 Post Development Modelling

2.4.1 Post development options

In line with Condition 27 of the decision notice, the FFLs of the ground floor level of the development should be set in accordance with the original FCA. The original FCA set out the following requirements:

- FFLs must be raised to a minimum of 9.27mAOD to result in flood free development in the 0.5% AEP climate change event.
- If practical, the FFL should be raised to 9.55mAOD to mitigate against the 0.1% AEP climate change event

To meet the requirements of Condition 04, post-development options were modelled to determine the impact of the proposed development on flood flow conveyance and the impact of the proposed development on third parties.

Initially, an FFL of 9.55 mAOD was tested to raise the ground floor above the revised 0.1% AEP climate change event, allowing for some freeboard against the predicted flood level. However, modelling results indicated that this higher FFL resulted in increased flood depths to existing residential properties, developments and infrastructure located to the south of the site, when compared to the baseline scenario. It is therefore not considered practical to raise FFLs across the development to this extent.

As a result, a sensitivity assessment was undertaken whereby the FFL was incrementally lowered until the adverse effects on nearby properties were significantly reduced. This process identified an appropriate FFL of 9.40 mAOD.

It is noted that this FFL matches that of the previous building occupying the site and represents a balance between mitigating on-site flood risk and avoiding increased flood risk to surrounding area. It also meets the requirements of Condition 27 of the decision notice, and is higher than the minimum required FFL of 9.27 mAOD.

2.4.2 Post Development results

A 2D Z-shape polygon, georeferenced from the post-development layout provided by the client, was used to represent the proposed building footprint within the model. Retaining

walls shown on the proposed layout were also incorporated using 2D Z-shape polygons. Areas of vegetated landscaping were represented through the application of spatially varied 2D roughness values.

The following section presents the post-development modelling results utilising the proposed FFL of 9.40 mAOD.

In both design events, some degree of flooding is predicted, with flood water approaching the site from a south and easterly direction flooding. This flood mechanism to the site is the same as that experienced in the baseline scenario.

During the 2100 0.5% AEP event, flood depths of up to approximately 250 mm are predicted within the south-eastern corner of the development site, shown in Figure 2-4. Under this scenario, the post-development building layout, with the proposed FFL of 9.40 mAOD, is predicted to remain flood-free.

During the 2100 0.1% AEP event, flood depths of up to approximately 608 mm are predicted within the western area of the development site, as shown in Figure 2-5. Within the proposed building footprint, flood depths of up to approximately 191 mm are predicted during this event.

A summary of flood depths and levels for a range of epochs is provided in Table 2-2 below.

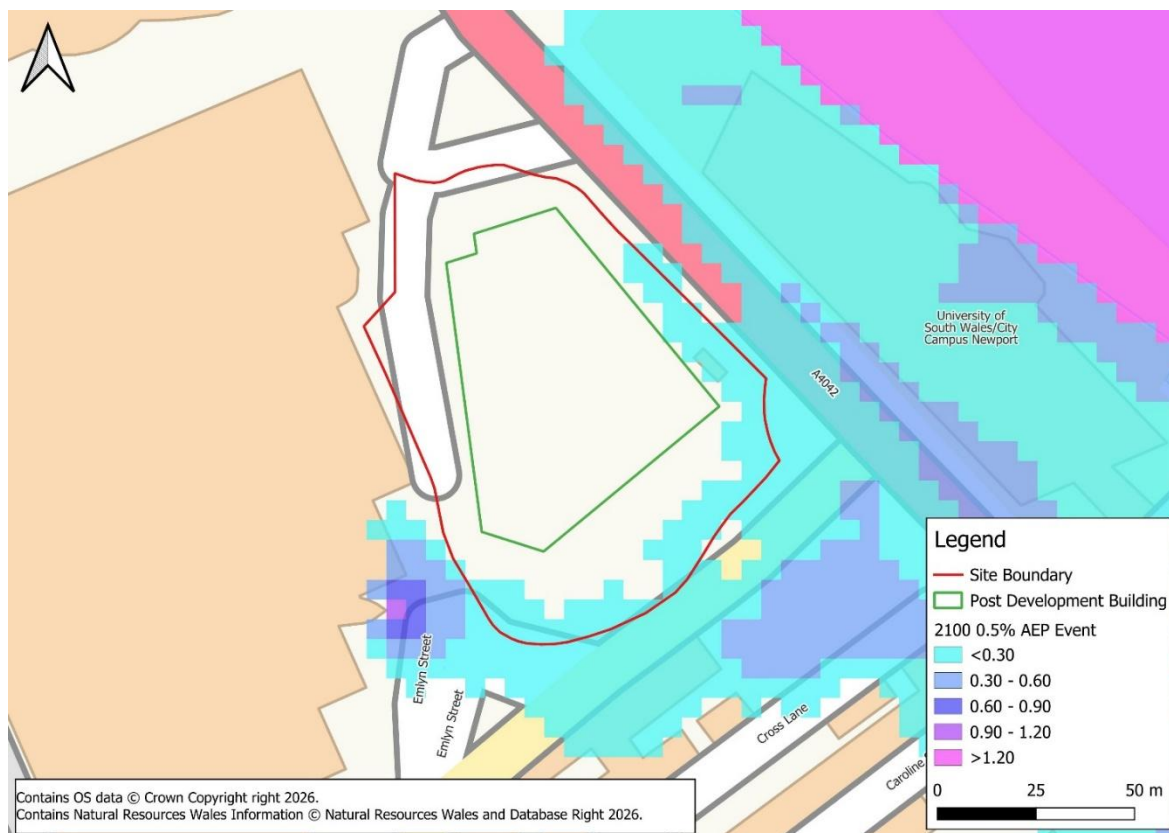


Figure 2-4 0.5% AEP Event - Post Development Scenario

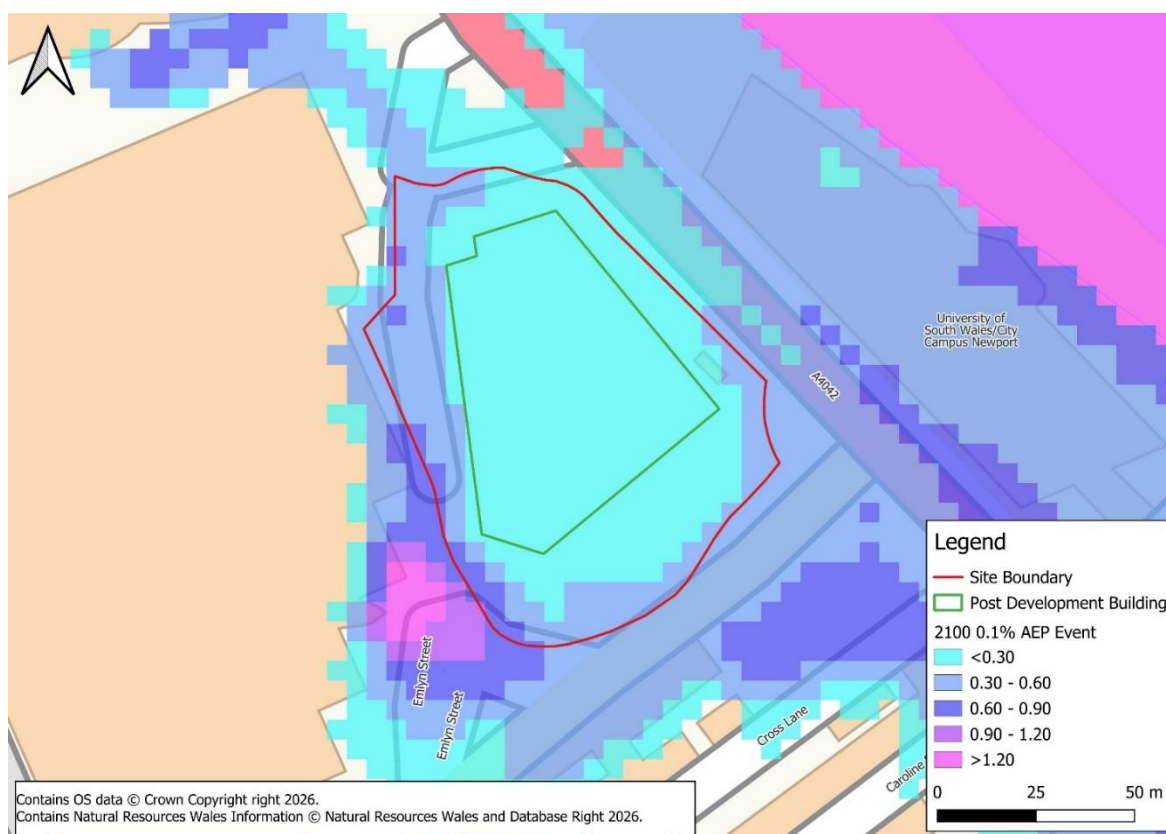


Figure 2-5 0.1% AEP Event - Post Development Scenario

Table 2-2 Summary of Post - Development Tidal Model Results

Epoch	Design Life	Maximum flood level on site (mAOD)		Maximum flood depth on site (m)		Post-Development Building Flood Depths (m) with 9.40mAOD FFL	
		0.5%	0.1%	0.5%	0.1%	0.5%	0.1%
2025	Present Day	N/A	N/A	N/A	N/A	N/A	N/A
2075	50	N/A	9.29	N/A	0.32	N/A	N/A
2100	75	9.26	9.53	0.23	0.69	0	0.13

2.5 Third-Party Impacts

Condition 04 requires the demonstration that the proposed development will not worsen the flood risk to others (third parties). Any development within a built-up area will in some way alter flood flows either by disrupting flow paths, reducing floodplain storage, or combining both. Therefore, to assess this risk and determine the impact on predicted water levels, comparisons of pre- and post-development maximum water depths were undertaken. NRW guidance defines 0.005m (5mm) as the measurable threshold for identifying an increase in flooding. Consequently, mapping and analysis has been undertaken to identify areas of

±5mm change within the flood model between the pre- and post-developments model results.

2100 0.5% AEP event

Figure 2-6 illustrates the differences in maximum flood depths between the pre- and post-development scenarios for the 2100 0.5% AEP event. During this event, all depth changes exceeding 50mm are confined to areas within or immediately adjacent to the site boundary. Given the use of a 10 m model grid, it is likely that this increase in risk is contained entirely within the site, although individual grid cells appear to extend slightly beyond the development footprint.

This is expected due to the introduction of the proposed building and associated ground level changes. An increase in flood depth across the development site is considered acceptable by the client, as these changes are confined to the site itself.

A small area of detriment is identified to the southwest of the development, within the 25mm - 50mm depth difference range. The maximum depth increase in this location is 41mm, occurring across Emyln Street. This increase is represented by an isolated model pixel, with the majority of depth differences in the surrounding area falling within the lower range of 25mm - 38mm. The identified depth differences are confined to the carriageway only, with no associated increase in flood risk to residential properties, critical infrastructure, or access to emergency services. During this event, in the baseline scenario, Emyln Street would be impassable due to baseline depths of up to 719mm. Consequently, this predicted increase in depth to 758mm in the post-development scenario does not present a change in risk, or impact use of the carriageway in this design event.

Flood depths during this event are widespread across the wider Newport area. As such, it is considered unlikely that pedestrian or vehicular activity would be occurring at the time, particularly given the presence of established flood forecasting and early warning systems. Considering the isolated nature, and non-residential location of the identified detriment, it is concluded that the proposed development does not result in any increase in flood risk to third parties or the surrounding area.

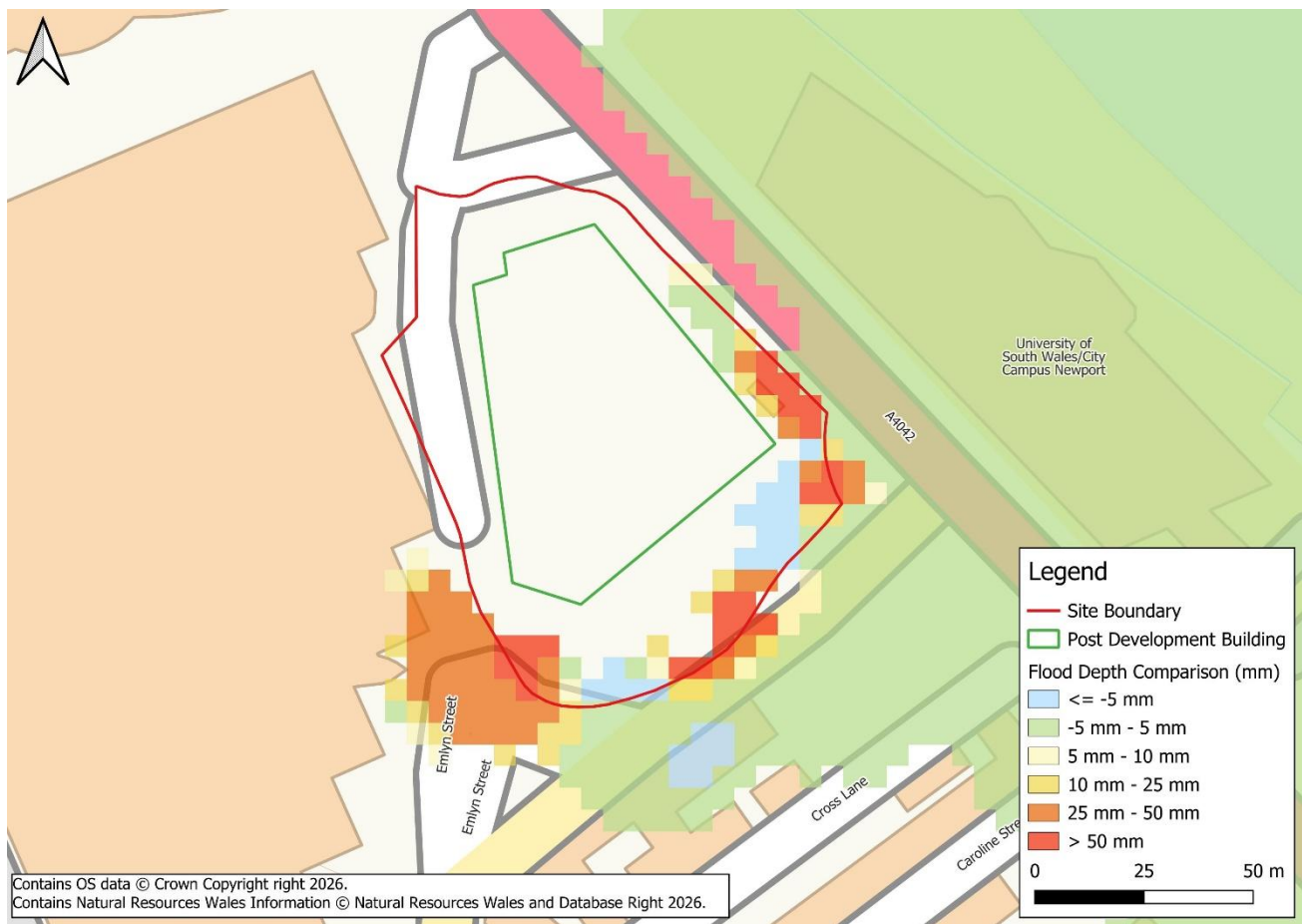


Figure 2-6 Post Development - 0.5% AEP Flood Depth Comparison

2100 0.1% AEP event

Figure 2-7 shows the differences in maximum flood depths between the pre- and post-development scenarios for the 2100 0.1% AEP event. Similarly to the 0.5% AEP plus climate change event, the highest depth changes of 97mm are located within the development site therefore not increasing the risk to surrounding areas.

Outside the development boundary during this event, the proposals have a negligible impact on flood risk across the majority of the surrounding area. The majority of depth changes exceeding 50mm are confined to areas within or immediately adjacent to the site boundary. Again, as with the baseline scenario, given the use of a 10 m model grid, it is likely that this increase in risk is contained entirely within the site, although individual grid cells appear to extend slightly beyond the development footprint.

However, two minor, very localised areas of increased flood depths are identified beyond the site boundary. To the south of the site, across an existing residential dwelling on Emlyn Street, flood depths in the post development scenarios have increases of up to 247 mm predicted. In addition, to the west of the site, a small, localised area of the existing Kingsway Shopping Centre is shown to have flood depths increase by up to 270 mm.

These areas of higher detriment are considered to be influenced by the baseline model pixels being flood-free, whilst the post-development scenario predicts shallow flood depths

of 247 mm, and 270mm, respectively. This transition from dry to shallowly wet cells result in a relatively large, calculated depth change, which is reflected in the flood depth comparison, despite the flood depths remaining shallow and less than 300mm.

It is noted that these properties are predicted to flood in the baseline scenario, and such detriment is shown to where the adjacent flood cell is shown to flood in the post-development scenario. This minor change in flood extent results in no change of flood frequency or duration to the impacted receptors, with minimal change in extent to buildings already predicted to flood. This minor change in flood extent is therefore considered negligible in the context of flood risk to the area.

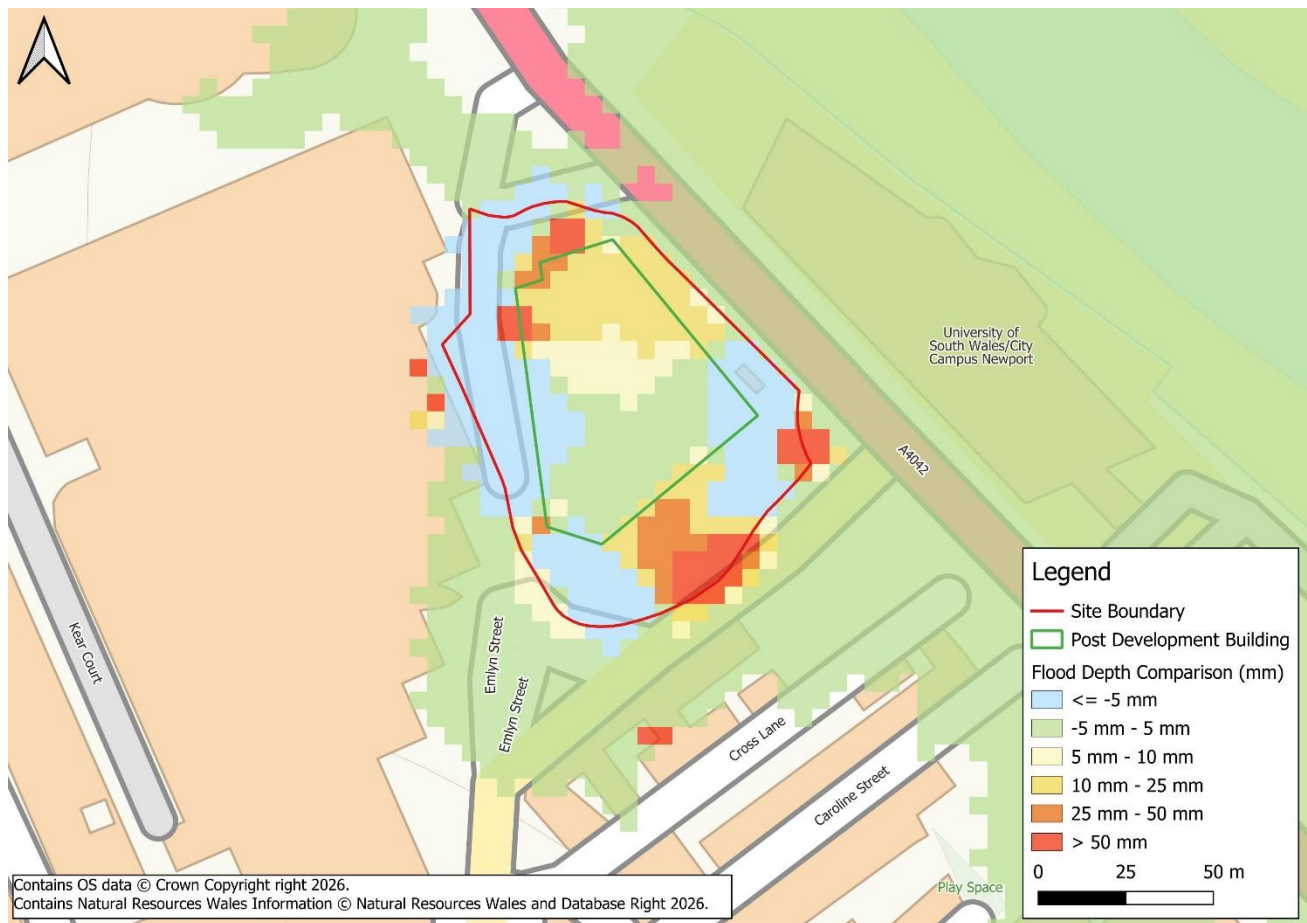


Figure 2-7 Post Development - 0.1% AEP Flood Depth Comparison

3 Conclusions

An addendum to the existing Flood Consequences Assessment (FCA) has been commissioned by WEPCo and prepared by JBA Consulting in support of the proposed redevelopment of the former Newport Leisure Centre into an education facility on behalf of Coleg Gwent.

The assessment incorporates updated baseline tidal hydraulic modelling using the latest climate change allowances to reflect current guidance. Post-development modelling was also undertaken to assess a range of potential finished floor levels (FFLs) for the proposed building, with the aim of ensuring that no significant detriment is caused to third parties.

Post-development modelling has also been undertaken to determine appropriate mitigation measures in relation to flood risk. A FFL of 9.4mAOD has been identified as the optimum level to balance mitigation of flood risk to the development, and to third parties. This complies with the requirements of Condition 27 of the planning decision notice.

The modelling results demonstrate that the proposed development, with an FFL of 9.40 mAOD, remains flood-free during the 0.5% AEP plus climate change event, with only shallow flooding of up to approximately 0.12 m predicted across parts of the building footprint during more extreme event.

A detailed detriment analysis was undertaken, in line with the requirements of Condition 04 of the decision notice, comparing pre- and post-development flood depths across the wider model domain. The results confirm that the 9.40 mAOD FFL scenario does not result in any significant increase in flood risk to third parties, and that observed changes in flood depths are localised and minimal.

It is therefore concluded that the proposed redevelopment satisfies the requirements of Condition 04 of the decision notice demonstrating that the proposals have considered appropriate mitigation measures and evidenced that the development shall have minimal impact on third parties in relation to flood risk.

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