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Cardiff Council Strategic Flood Consequences Assessment - Image House, East Tyndall Street

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Contract

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This report describes work commissioned by Cardiff Council, by an instruction dated 23rd of January 2026. The Client's representative for the contract was Stuart Williams of Cardiff Council. Ella Courtney of JBA Consulting carried out this work.

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The conclusions and recommendations contained in this Report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by JBA has not been independently verified by JBA, unless otherwise stated in the Report.

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Contents

List of Figures

List of Tables

1 Introduction

JBA Consulting has been commissioned by Cardiff Council to prepare an independent Flood Risk Appraisal as part of a Stage 2 Strategic Flood Consequences Assessment (SFCA) for sites considered for allocation in its replacement Local Development Plan.

This assessment will evaluate the risk of flooding from all sources to "Image House, East Tyndall Street", the proposed development site, as well as the appropriateness of development at the site in accordance with Welsh Government Policy, as outlined in Technical Advice Note 15 (TAN15). Furthermore, recommendations will be provided to mitigate the risk of flooding at the proposed development site as well as recommendations for further works.

2 Site Description

The key characteristics of the site are summarised in Table 2-1 and the location and site boundary are shown in Figure 2-1 below.

Table 2-1 Site Summary

Site Name	Image House, East Tyndall Street
Site ID	65
Site Area	0.33ha
Existing Land Use	Commercial
Purpose of Development	Residential
OS NGR	319819 176288
Access Location	East Tyndall Street

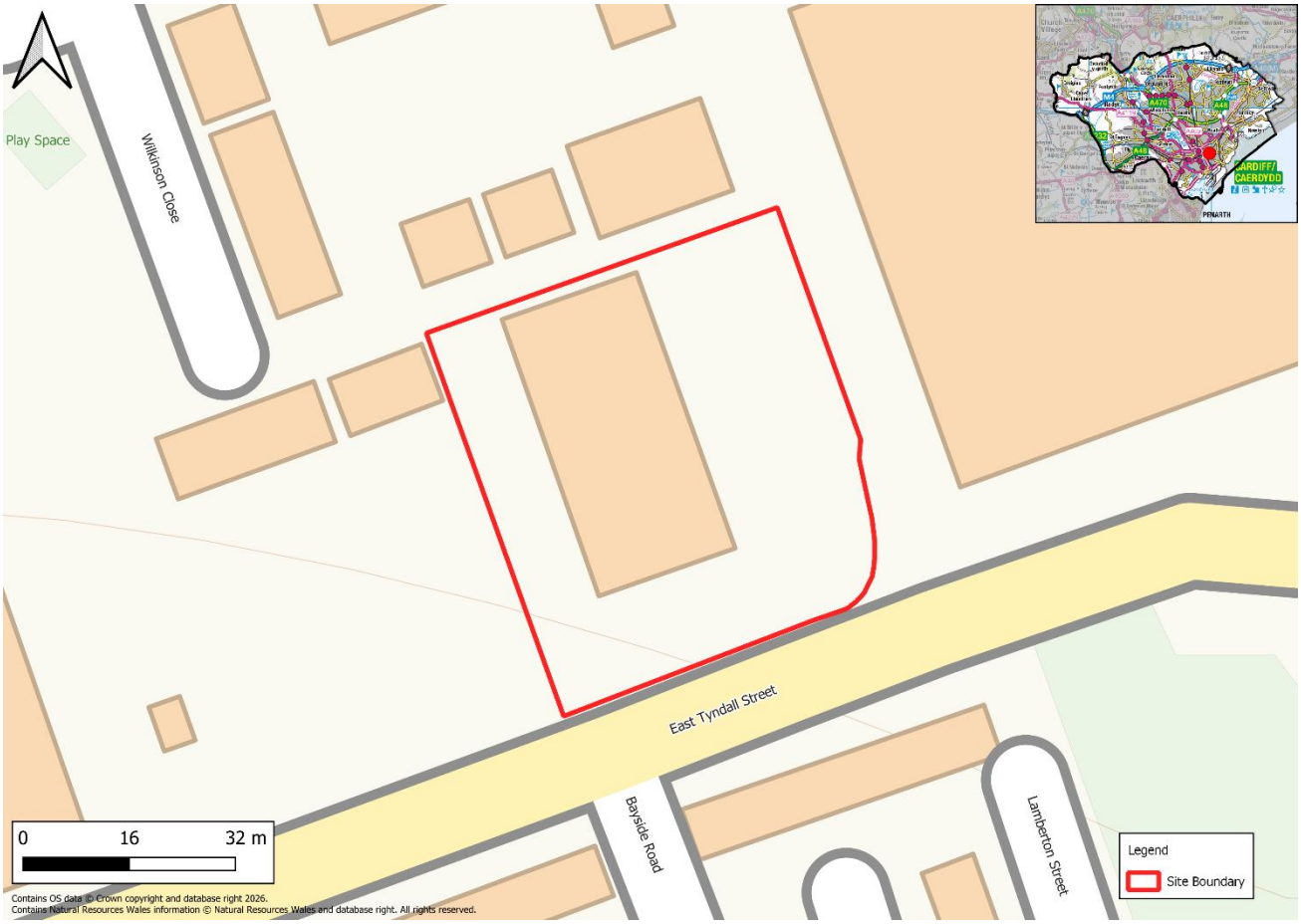

Figure 2-1 Site Location

2.1 Development Proposals

The proposed development is for residential use on previously developed land and is classed as a Highly Vulnerable development.

No indicative site layout is available for this assessment.

2.2 Topography

The Natural Resources Wales (NRW) Open Source 1m Light Detection and Ranging (LiDAR) data across the site has been reviewed and is shown in Figure 2-2.

The LiDAR data shows that the proposed development site is relatively flat with levels on site ranging between approximately 8.75mAOD and 9.44mAOD. The highest elevation of 9.44mAOD can be found in the southwest corner of the site on the boundary with East Tyndall Street, and the lowest elevation is found in front of the existing building of Image House.

Figure 2-2 Site Topography

2.3 Watercourses and Flood Defences

No Main Rivers or ordinary watercourses cross the proposed development site, as shown in Figure 2-3 below. The nearest Main River is the River Taff which is located approximately 1.8km to the west of the proposed site, and the River Rhymney is located approximately 2km to the west of the site. The site is not located in an area that benefits from flood defences.

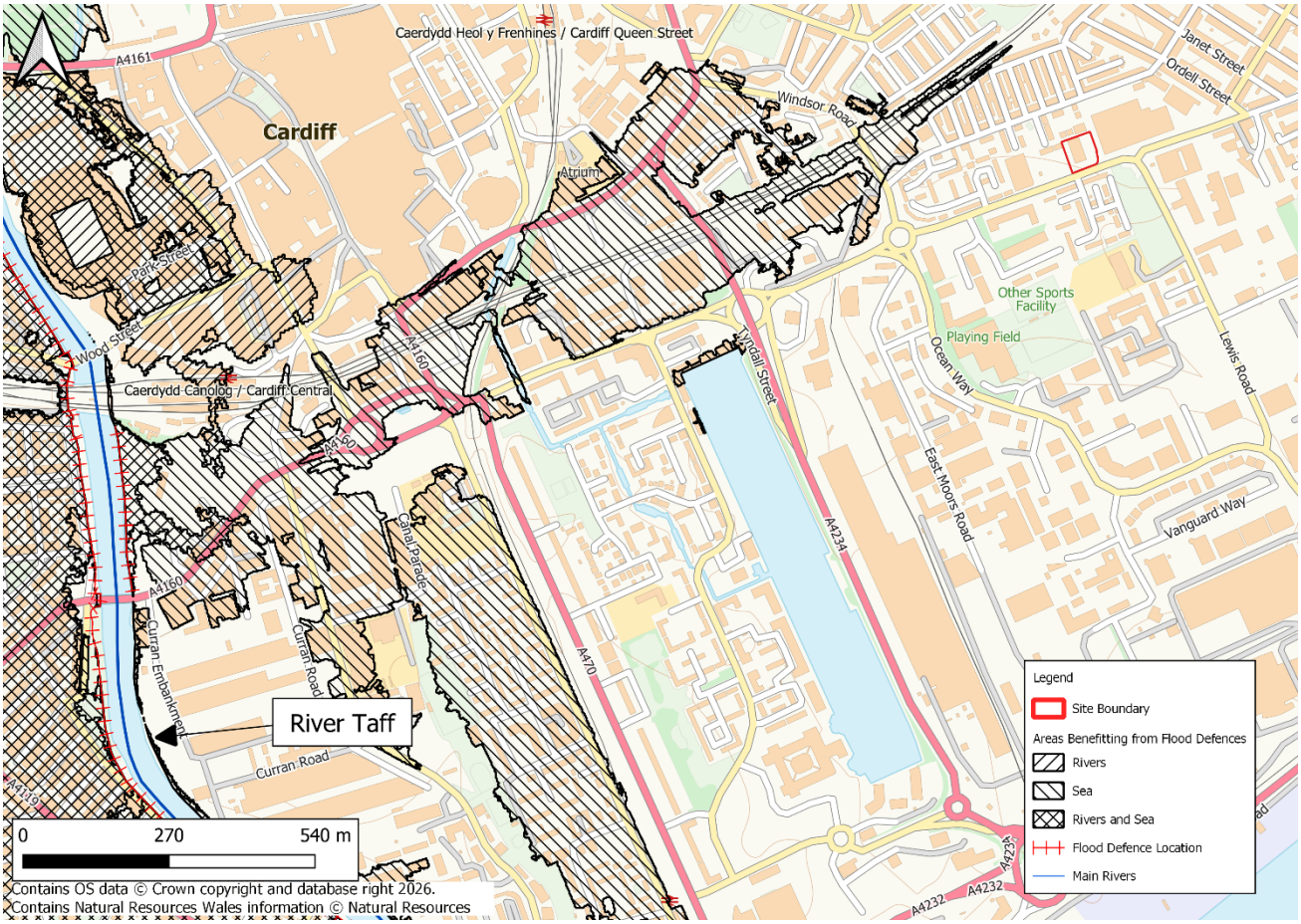

Figure 2-3 Watercourses and Flood Defences

3 Planning Policy and Flood Risk

TAN-15 provides a framework within which flood risk arising from rivers, the sea and surface water can be assessed. TAN-15 adopts a risk-based approach, which emphasises the ability to avoid or minimise risk depending on the type of development proposed.

The following table identified the form of development, vulnerability classification and Flood Map for Planning classification (as defined in TAN-15) for the proposed development site.

Table 3-1 TAN-15 Development Classification Summary

TAN-15 Classification	Classification
Development Proposal	Residential Development
Form of Development	Redevelopment
Vulnerability Classification	Highly Vulnerable Development
Flood Map for Planning - Rivers	Flood Zone 1
Flood Map for Planning - Sea	Flood Zone 2 and 3, TAN-15 Defended Zone - As shown in Figure 3-1.
Flood Map for Planning - Surface Water and Small Watercourses	Flood Zones 1, 2 and 3 - shown in Figure 3-2.

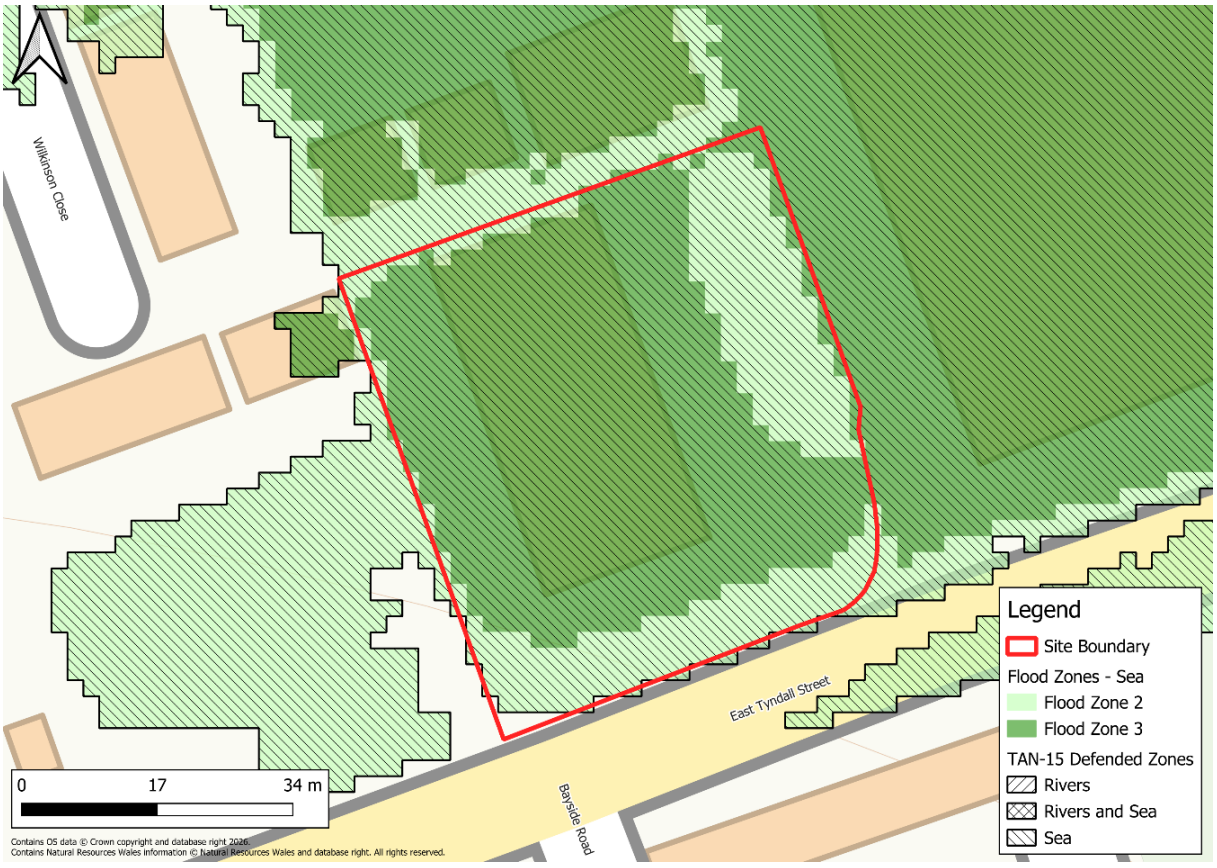

Figure 3-1 Flood Map for Planning - Flood Risk from the Sea

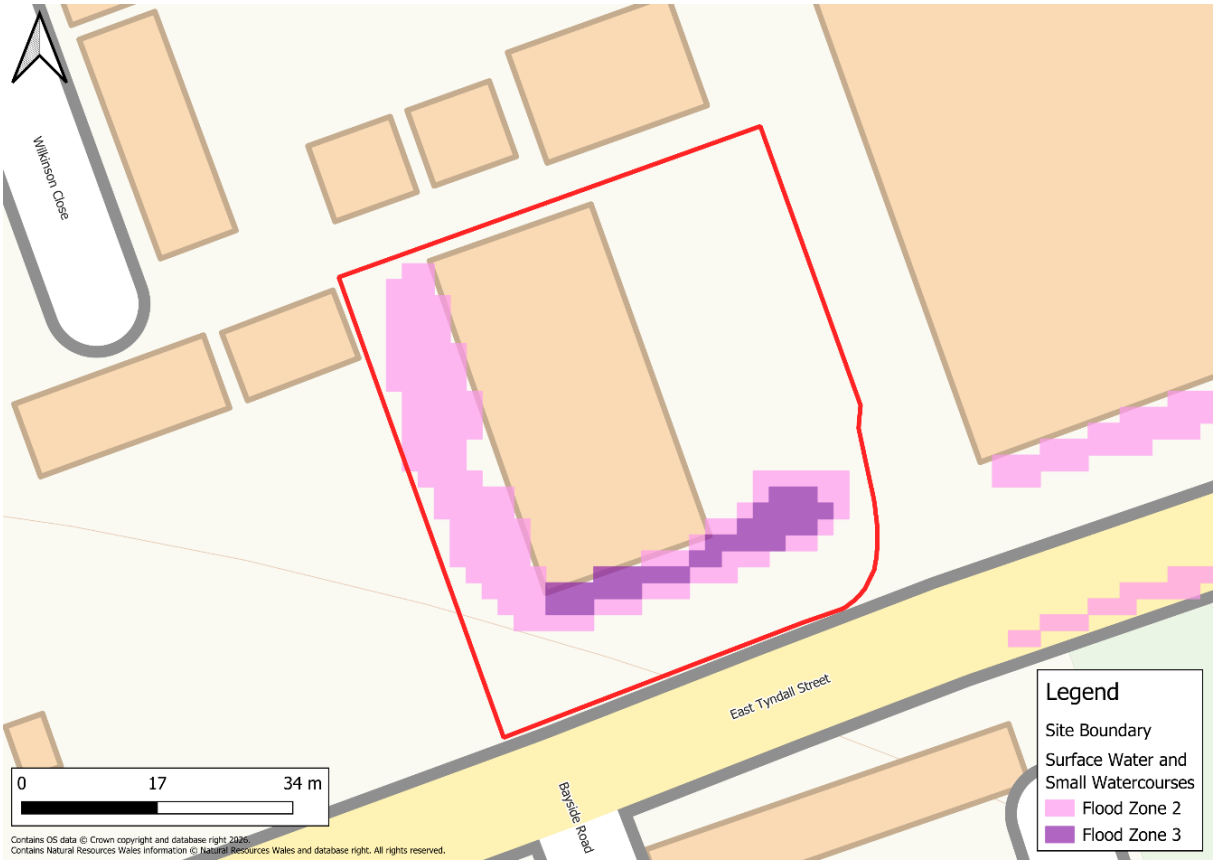

Figure 3-2 Flood Map for Planning - Flood Risk from Surface Water and Small Watercourses

4 Assessment of Flood Risk

The latest available information on flood risk at the site, published by Natural Resources Wales (NRW) and datasets used in the SFCA is summarised in Table 4-1 below.

Table 4-1 Summary of Flood Risk

Source of Flooding	Onsite Presence	Description
Flood Risk from Rivers	×	The site's location within Flood Zone 1 of the FMfP for Rivers indicates that the site is at **very low** risk of fluvial flooding.
Flood Risk from the Sea	×	The site's location within Flood Zone 2 and 3 of the FMfP for the Sea indicates that the site is at a moderate to high risk of tidal flooding. **Tidal Flood risk is further assessed in Section 4.1**
Flood Risk from Surface Water and Small Watercourses	✓	The site's is predominantly at low risk of surface water flooding due to its location within Flood Zones 1 of the FMfP for Surface Water and Small Watercourses. Small areas are within Flood Zones 2 and 3, indicating a moderate to high risk of flooding from this source to these areas. **Surface Water and Small Watercourse flood risk is further assessed in Section 4.2**.
Flood Risk from Groundwater	✓	JBAs Groundwater Risk of Emergence map indicates the majority of the site as **'High Risk'.** **Groundwater flood risk is further assessed in Section 4.3.**
Flood Risk from Reservoirs	✓	The NRW Flood Map for Planning shows that the site is located in an area at risk of reservoir flooding. **Reservoir flood risk is further assessed in Section 4.4.**

Source of Flooding	Onsite Presence	Description
Flood Risk from Sewers		The DCWW sewer flood history data has identified 174 sewer flooding incidents within the Splott electoral ward in which this site is located. However, no specific sewer flooding incidents have been named within the site. Therefore, it is considered that the risk of sewer flooding at the site is **low**.

4.1 Flood Risk from the Sea

The Flood Map for Planning for the Sea a risk of tidal flooding to the site, with the site located within the TAN-15 Defended Zone for the Sea. The TAN-15 Defended Zone shows areas that benefit from flood defence infrastructure maintained by a Risk Management Authority (RMA), which has a minimum, present-day level of protection of 0.5% (1 in 200) AEP for sea (plus climate change and freeboard). The presence of the site within the TAN-15 Defended Zone triggers the requirement for an FCA.

The site is defended by the Cardiff Bay Barrage, which provides substantial tidal protection to Cardiff with a standard of protection greater than required to protect against the 0.1% AEP plus climate change event. Therefore, no further assessment is necessary and the tidal flood risk to the site is concluded to be very low.

The site is also defended by the Cardiff Coastal Flood Defence Scheme, as detailed in Section 4.1.1 below.

4.1.1 Model Availability

A detailed tidal flood model for Cardiff and the River Rhymney was developed by JBA Consulting in 2020 and updated in 2022. The updated model was used to simulate results for a 100-year lifetime of development, to the year 2122. Furthermore, the model simulated the risk of flooding both with and without the Cardiff Coastal Flood Defence Scheme. For this assessment, only the defended scenario with the new defences has been used due to the commencement of the scheme in 2024.

As the proposed development is residential, it is assumed that this development would have a lifetime of 100 years, in line with TAN-15 guidance. As the model was last updated in 2022, it does not model exactly 100 years from now (2126), the 2122 scenario is the closest available modelled epoch to the end of the development lifetime and is therefore considered a representative output. Additionally, the four-year difference between 2122 and 2126 is negligible within the context of the future multi decadal climate change projections.

The Welsh Government have since updated the climate change allowances in April 2026[1]. The updated climate change allowances did not provide updates for sea level rise and therefore result in little to no change in the predicted tidal flood risk to the site.

4.1.2 Model Results

Predicted flood risk for both the 2122 0.5% and 0.1% AEP events are shown in Figure 4-1 and Figure 4-2, respectively. The site and access routes are predicted to be flood free during this scenario.

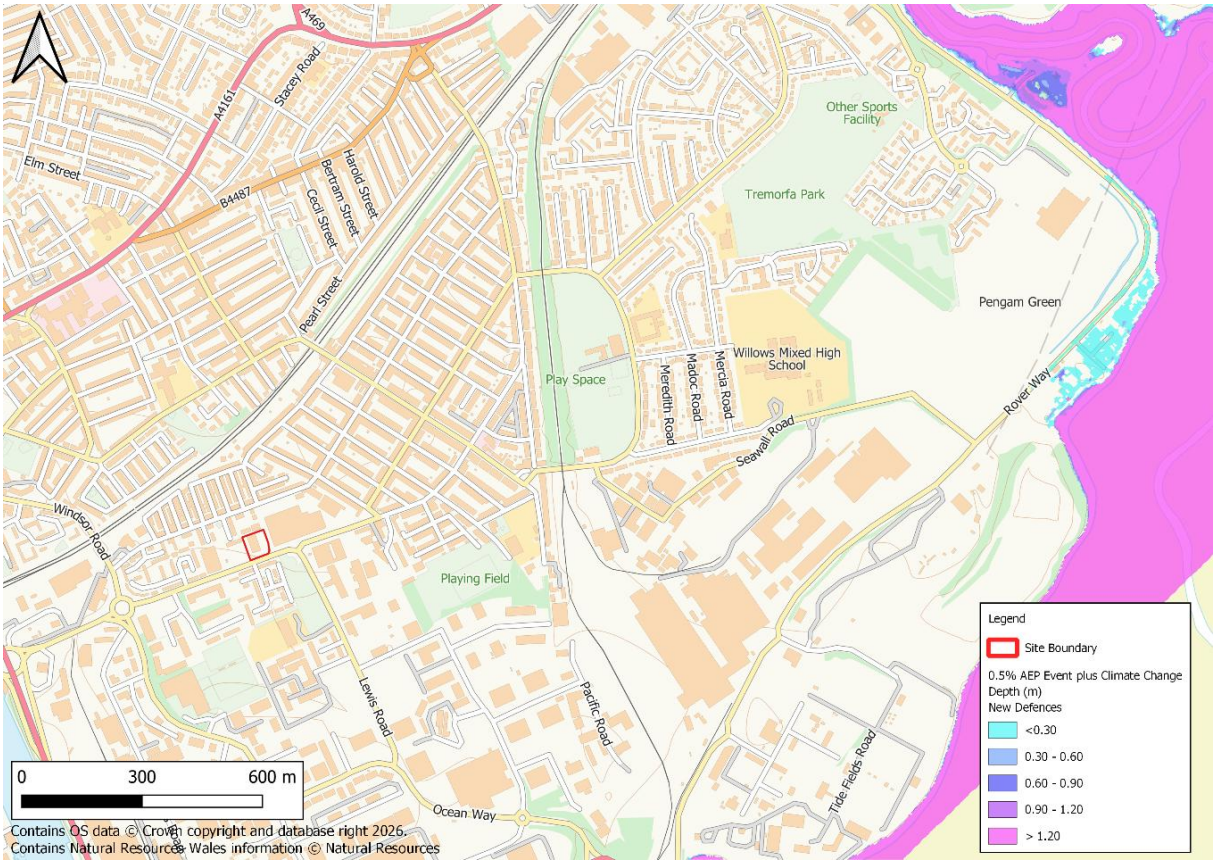

Figure 4-1 Flood Risk from the Sea - 0.5% AEP event plus climate change

1 Climate change allowances and flood consequence assessments

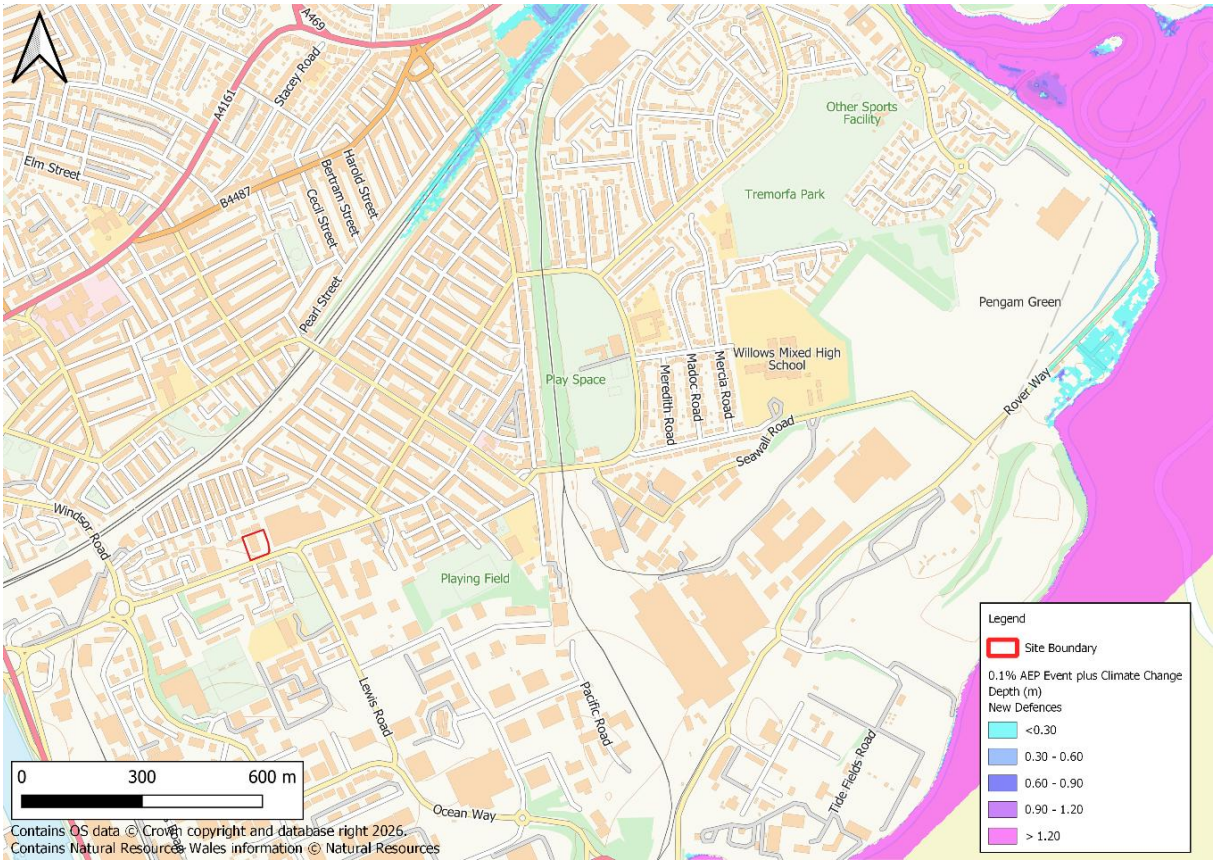

Figure 4-2 Flood Risk from the Sea - 0.1% plus climate change event

4.1.3 Breach

Breach and blockage guidance published by NRW in March 2026 details that breach events should be considered the 'design event' against which new developments should be assessed. In order to inform this SFCA and site appraisals, JBA undertook engagement with NRW in April 2026 to determine their requirements for breach for the site assessments. The NRW breach guidance states that once a defence is overtopped, the greater the risk of failure of that defence, particularly for earth embankments. The modelling presented above demonstrates that the defences will not be overtopped in all design events. The defences do not comprise an earth embankment, rather a rock revetment, and given their recent construction, the likelihood of breach is considered very low. As such, modelling of a breach scenario is not considered necessary for this defence. This approach has been agreed with NRW

4.2 Flood Risk from Surface Water and Small Watercourses

The Flood Map for Planning - Surface Water and Small Watercourses indicates that whilst the site is predominantly at very low risk of flooding from this source, there is some risk of surface water flooding occurring across the site. Flooding is primarily predicted around the existing building, along both the western and southern facade. The western facade lies within Flood Zone 2 (0.1%-1% AEP including climate change), while the southern facade contains areas of Flood Zone 3 (>1% AEP including climate change).

In the absence of detailed modelling, the National Flood Hazard Maps (NFHM) have been used to provide a more detailed assessment of surface water flood risk on the site.

As shown in Figure 4-3, during the 1% AEP plus climate change event, predicted flood depths range from 150-200mm along the southern façade of Image House. For the 0.1% AEP plus climate change event, as shown in Figure 4-2, depths of 120-300mm are predicted within this area. During the extreme event, the flood extent extends along the western façade of the existing Image House, to depths of 110-220mm.

These areas of surface water flood risk are associated with topographic low points on site, associated with a fall in level from the highway to Image House and its associated car park. Given the nature of the modelling underpinning this dataset, surface water drains along topography, from the highway to Image House, unable to drain away. Existing surface water infrastructure, as identified in aerial imagery, is not represented in the broadscale modelling, and is likely to manage this surface water risk on site.

The access route, East Tyndall Street, is predicted to remain flood free during the 1% AEP plus climate change event, within minor areas of localised surface water flooding in the extreme event. In these locations, flood depths are predicted to be shallow, and access is unlikely to be impacted.

It is envisaged that the predicted surface water flood risk to the site can be managed through the good site design and application of an adequate surface water drainage strategy that makes use of SuDS features, in line with the statutory standards for SuDS in Wales.

Figure 4-3 NFHM 1% AEP plus Climate Change event

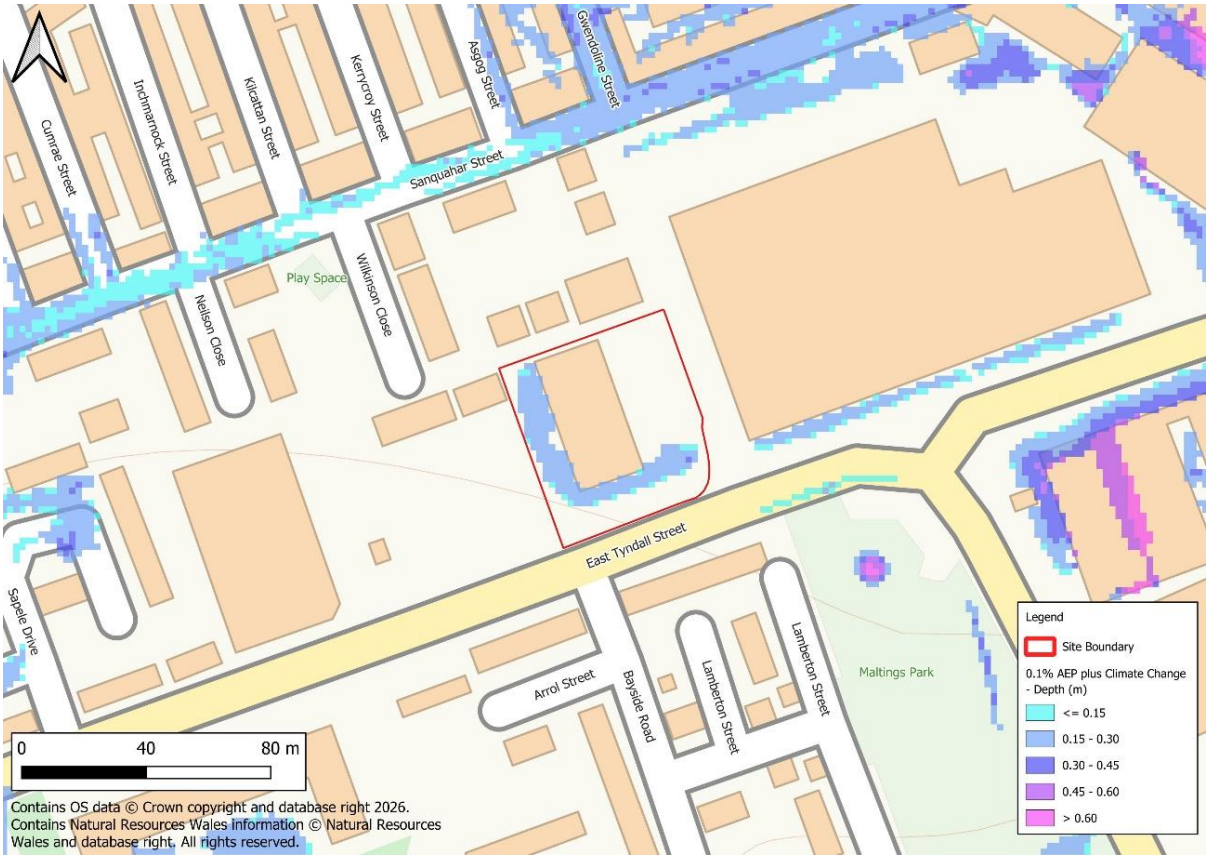

Figure 4-4 NFHM 0.1% AEP plus Climate Change event

4.3 Flood Risk from Groundwater

Figure 4-5 shows JBA's Groundwater Emergence Map, which shows that most of the site is at a 'high' risk of groundwater emergence. The majority of the site, excluding the southern boundary has groundwater levels either at or very near (within 0.025m) the ground surface. Along the southern boundary of the site the mapping indicates this area to have a 'very low' risk of groundwater emergence.

It is recommended that any site-specific assessment considers the potential for groundwater emergence across the site. This should be informed by groundwater monitoring, ideally conducted over a 12-month period to capture seasonal variations, as well as detailed site-specific ground investigations.

Understanding the groundwater regime is particularly important where Sustainable Drainage Systems (SuDS) are proposed. Infiltrating SuDS features, such as soakaways or infiltration basins, typically require a minimum 1-metre clearance between the base of the asset and the highest recorded groundwater level. Failure to meet this requirement could compromise the effectiveness of infiltration-based drainage and may necessitate alternative SuDS solutions.

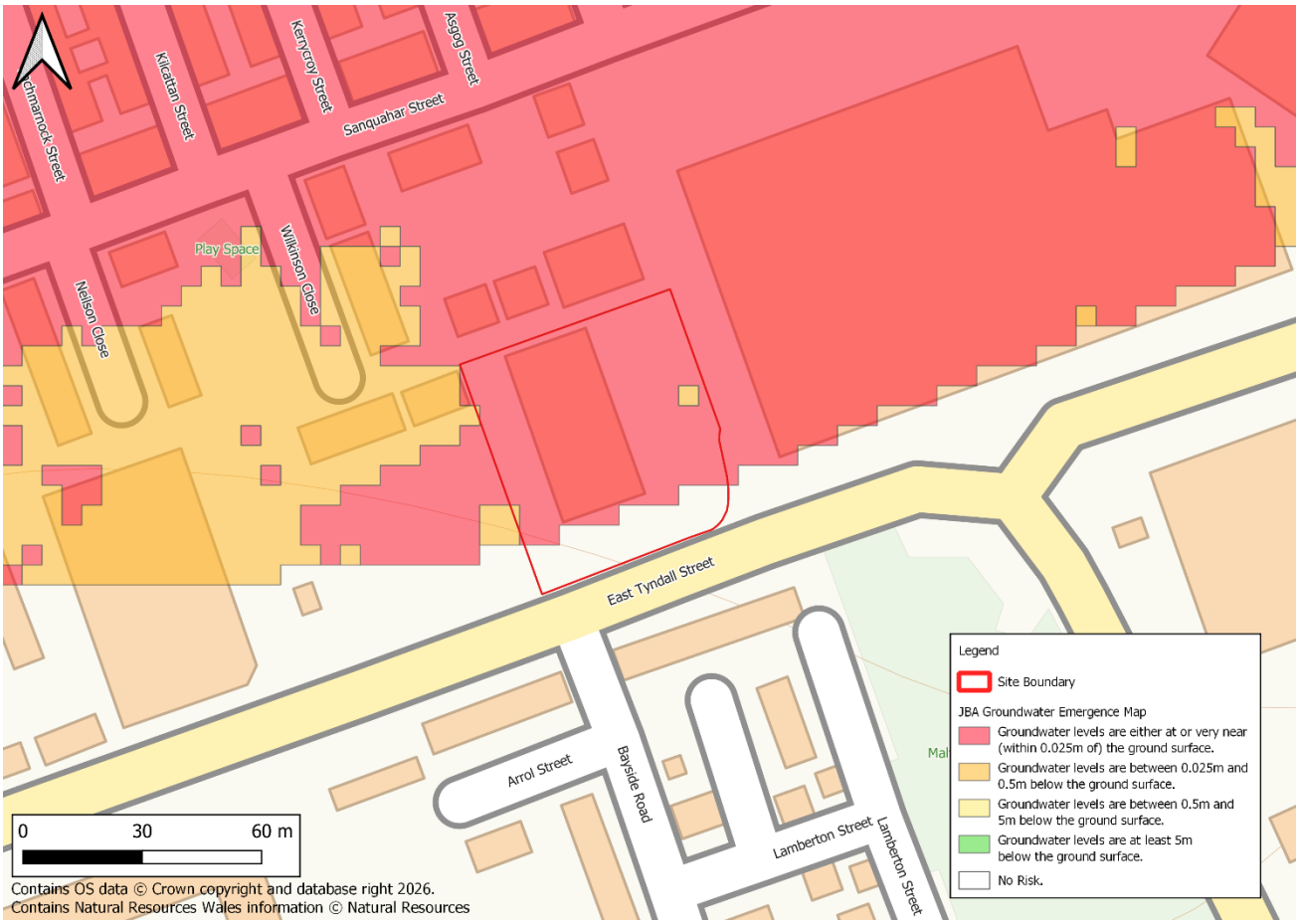

Figure 4-5 Risk of Groundwater Emergence

4.4 Flood Risk from Reservoirs

Figure 4-6 below shows the reservoir flood extent within the site. This indicates that the centre of the site is at risk of reservoir flooding. The risk of flooding is associated with the Roath park Lake reservoir.

However, the regulation of reservoirs means that a failure event is very unlikely. It should be noted that failure of reservoirs is rare and there has been no loss of life in the UK from reservoir flooding since 1925.

Figure 4-6 Flood Map for Planning - Flood Risk from Reservoirs

5 Application of Flood Zones to Development Management Decisions

5.1 Flood Risk from the Sea

When considering a site for development, Sections 10 and 11 of TAN-15 outline the requirements for the type of development permitted in any given flood zone.

The proposed development is located within a TAN-15 Defended Zone for the Sea. The site is located on previously developed land and is therefore considered as redevelopment.

TAN-15 states the following for redevelopment within the Defended Zone:

"On brownfield sites redevelopment proposals should not over intensify use neither should they reduce the area's ability to absorb flood water nor cause problems with flooding elsewhere. All applications should consider opportunities to incorporate flood resilient design as appropriate and any proposal involving highly vulnerable development must be compliant with the tolerable conditions set out in section 11."

Development proposals must be consistent with the acceptability considerations set out in Section 11, which should be demonstrated within a site-specific FCA. Flexibility may be afforded due to the redevelopment nature of the proposals The site is considered to be at low risk of tidal flooding due to protection from the Cardiff Bay Tidal Barrage and the Cardiff Coastal Defence Scheme and therefore meets the acceptability considerations as set out in Section 11 of TAN-15.

Due to the presence of the TAN-15 Defended Zone for the Sea, a planning application should be accompanied by a site-specific FCA.

5.2 Flood Risk from Surface Water and Small Watercourses

While the site is predominantly located within Flood Zone 1 for surface water and small watercourses, some areas of the site are located in Flood Zones 2 and 3. These areas are associated with surface water accumulation within topographical depressions on the site.

Sections 10 and 11 of TAN-15 outline the requirements for the type of development permitted in any given flood zone. However, Section 10 and Figures 5 (flood frequency) and 6 (tolerable conditions) of Section 11 do not explicitly apply to the surface water and small watercourse zones in which this proposed development site lies.

Due to the presence of Flood Zones 2 and 3 of the FMfP for Surface Water and Small Watercourses across the site, a planning application should be accompanied by a site-specific FCA to assess this risk to the development proposals.

Surface water flood risk within the NFHM is likely to be overestimated, as the model does not account for the surface water drainage system visible on aerial imagery within the south of the site.

Access and egress via East Tyndall Street is considered acceptable.

A Drainage Statement shall be required demonstrating how surface water shall be managed on site, in line with the Statutory Standards for SuDS in Wales, and TAN-15.

6 Summary and Recommendations

The site is located in the TAN-15 Defended Zone in accordance with the FMfP - Sea, and Flood Zones 2 and 3 of the FMfP - Surface Water and Small Watercourses. As the site is located within these zones it triggers the requirement for an FCA to be undertaken.

The site is predicted to be flood free from tidal sources as a consequence of defences along the Cardiff coastline. Flood risk from surface water sources is likely to be an overestimation of the actual risk to the site due to the broadscale nature of the modelling underpinning the FMfP. Surface water flooding is likely to be adequately managed through a comprehensive surface water drainage strategy.

It is therefore considered that the site is likely to satisfy the requirements of TAN-15, subject to the following recommendations:

- Any planning application for the site should be accompanied by an FCA which demonstrates how the proposals meet the requirements of TAN-15.
- A Drainage Statement shall be required demonstrating how surface water shall be managed on site, in line with the Statutory Standards for SuDS in Wales, and TAN-15.
- Any site-specific FCA should further assess the risk of groundwater emergence at the site. Groundwater monitoring should be conducted over a 12-month period to capture groundwater variations, alongside site specific ground investigations.

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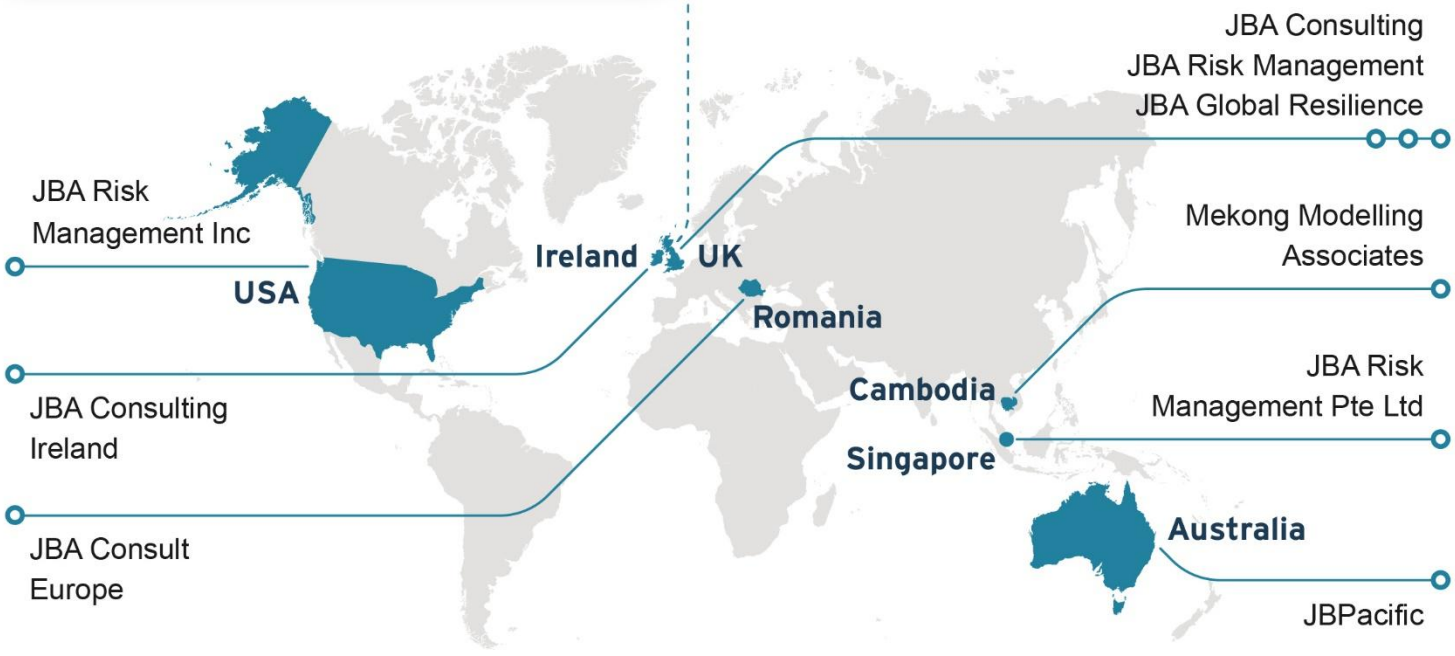

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