

Former Magnet Trade, East Tyndell Street - Flood Consequences Assessment

Version 1

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Prepared for:

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Abbreviations

AEP	Annual Exceedance Probability
BGS	British Geological Survey
DTM	Digital Terrain Model
FCA	Flood Consequence Assessment
FMfP	Flood Map for Planning
FRMP	Flood Risk Management Plan
LDP	Local Development Plan
LiDAR	Light Detection and Ranging
LLFA	Lead Local Flood Authority
mAOD	metres Above Ordnance Datum
NGR	National Grid Reference
NRW	Natural Resources for Wales
OS NGR	Ordnance Survey National Grid Reference
PPW	Planning Policy Wales
TAN15	Technical Advice Note 15: Development and Flood

1 Introduction

1.1 Terms of Reference

JBA Consulting were commissioned by YourSpace Projects to undertake a Flood Consequences Assessment (FCA) at the former Magnet Trade on East Tyndall Street, Cardiff. This FCA demonstrates the suitability of the proposed development in terms of flood risk.

1.2 FCA Requirements

This FCA follows the Welsh Government guidance on development and flood risk set out in the Technical Advice Note 15: Development, Flood Risk and Coastal Erosion (TAN-15). TAN-15 states that:

'The prime objective of a Flood Consequences Assessment is to develop a full appreciation of:

- The risks and consequences of flooding on the development; and
- The risk and consequences (i.e the overall impacts) of the development on flood risk elsewhere.'

To achieve this, the FCA should establish if suitable avoidance and mitigation measures can be incorporated, in a manner compatible with the placemaking aims of Planning Policy Wales, within the site design to ensure that development is safe and there is:

- Minimal risk to life;
- Minimal disruption to people living and working in the area;
- Minimal potential damage to property; and
- Minimal disruption to the sustainable management of natural resources.

2 Site Description

2.1 Site Summary

The site is located on East Tyndall Street, in the Splott area of Cardiff. The 0.374 ha site is approximately 2.25km from Cardiff City Centre. The site is currently a former Magnet Trade store with access from East Tyndall Street.

Figure 2-1 below depicts the site location. The site is bounded to the north and east by residential properties, to the south by East Tyndell Street and the west by Jubilee Trading Estate. A summary of site details is contained in Table 2-1.

The existing building is located in the northeast of the site boundary, with a car park and access road located in the southeast of the site boundary.



Figure 2-1 Site Overview

Table 2-1 Site Summary

Site Name	Former Magnet Trade Site
Site area (ha)	0.373
Existing Land use	General Industrial
Purpose of Development	Residential Apartments and Town Houses

Site Name	Former Magnet Trade Site
OS NGR	ST 20022 76373
Local Planning Authorities	Cardiff Council

2.2 Site Topography

The Natural Resources Wales (NRW) Open Source 1m Light Detection and Ranging (LiDAR) data has been used to assess the site topography in the absence of a site-specific topographic survey, as shown in Figure 2-2.

Ground levels across the site are mostly flat with an average ground level of 8 mAOD. The site is slightly elevated toward the southern boundary, with highest ground levels ranging from 8.2 mAOD to 8.74 mAOD. The southeast of the site has the lowest ground levels of 7.88 mAOD, indicating a slight topographic depression.

The external ground levels to the northeast of the site boundary slope slightly to ranges between 7.47 mAOD and 8.2 mAOD.



Figure 2-2 NRW 1m LiDAR DTM

2.3 Watercourses and Flood Defences

No watercourses cross the proposed development site. As shown in Figure 2-3, the development site is located approximately 2.2km distance away from both the River Rhymney and the River Taff. The site is not located in an area that currently benefits from the presence of flood defences.

Planning permission (planning reference-21/02138/MJR) was granted in September 2021 for the Cardiff Coastal Flood Defence scheme. This scheme will provide improved flood defences along the banks of the River Rhymney and the Severn Estuary. The coastal defences comprise four main sections and will enhance the standard of protection across this area to increase resilience to climate change for much of eastern Cardiff including the area of Splott, in which the site is located. Construction of the flood defences commenced in late 2024, with construction due to be completed by 2027/28.

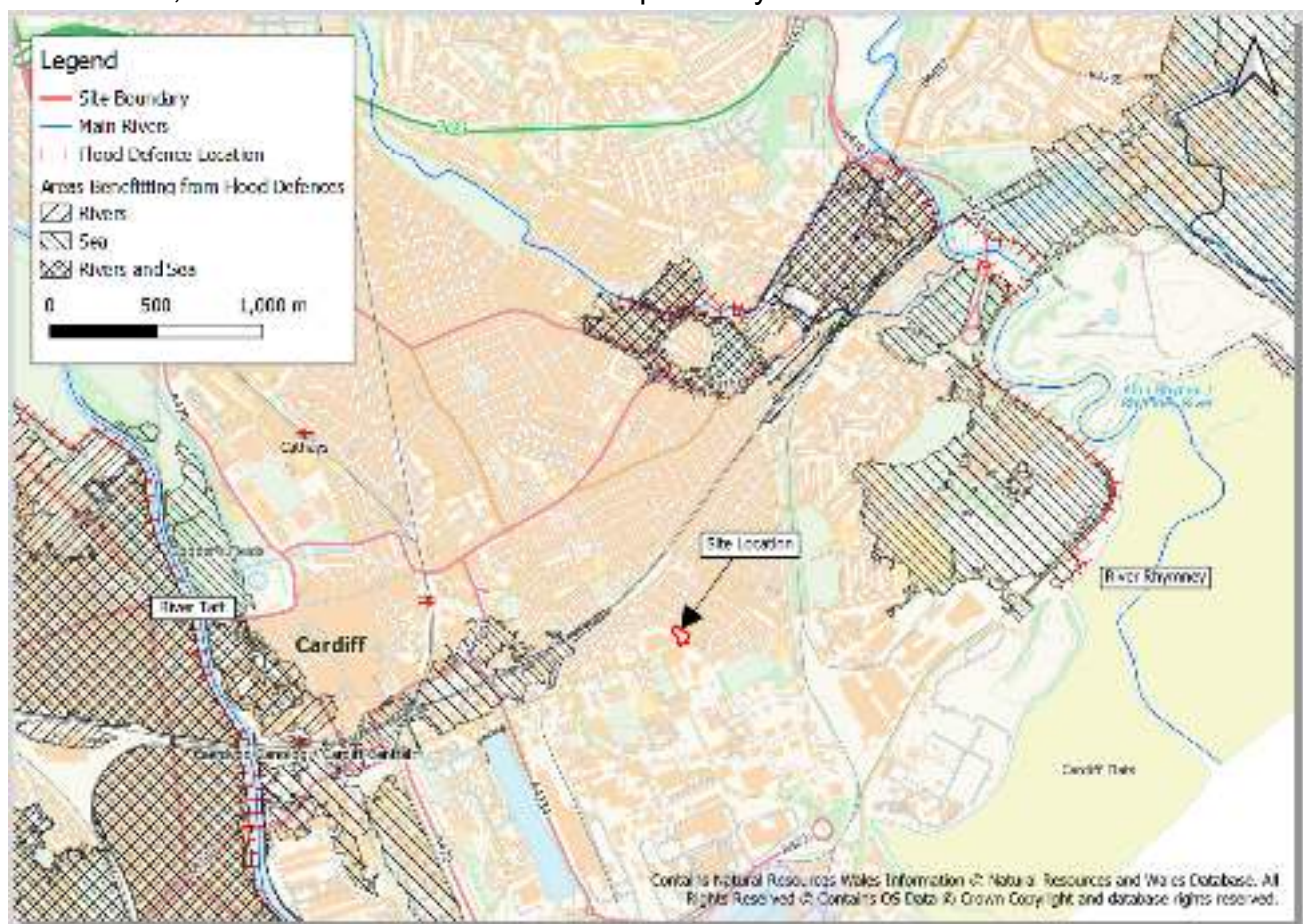


Figure 2-3 Watercourses and Defences

2.4 Soils and Geology

The geology on site has been assessed using the British Geological Society (BGS) GeoIndex¹. The bedrock geology is shown to comprise of Mercia Mudstone, with superficial deposits of sand and gravel.

The soils on site have been assessed on the Cranfield University Soilscales Viewer². The underlying soils are shown to be freely draining slightly acidic loamy soils.

2.5 Proposed Development

The development proposals are for the demolition of the existing Magnet trade building and the construction of five 3-storey residential blocks with car parking space, 50 apartments, and 6 common access flats. The apartment block will be built to Welsh Development Quality Guidance (WDQG) standard with the aim of providing quality residential housing within the Splott area of Cardiff. The proposed development site is shown below in Figure 2-1 and in Appendix A.



Figure 2-4 Proposed Development

1 <https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>

2 <https://www.landis.org.uk/soilscales/>

3 Planning Policy and Flood Risk

3.1 Planning Context

Planning Policy Wales (PPW) 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 aim to make all development in Wales 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), originally introduced by the Welsh Government in 2004 and most recently updated in March 2025, provides technical guidance relating to development planning and flood risk in Wales. TAN15 provides a framework within which the flood risks arising from rivers, the sea and surface water, and the associated risk of coastal erosion can be assessed. The approach set out in the most recent update to TAN15 ensures flooding and coastal erosion are accorded appropriate consideration in plan-making and development management decisions.

3.2 Form of Development

TAN15 recognises two key forms of development; New Development and Redevelopment. The definition of both terms is provided in Table 3-1.

Table 3-1 Form of Development

Form of Development	Definition
New Development	Any Development on greenfield land
Redevelopment	Any Development on previously developed land as defined in Planning Policy Wales

As detailed in Section Figure 2-1, the site is brownfield land and has previously been developed. As such, the proposed development is classified as **Redevelopment**.

3.3 Vulnerability Classification

TAN15 assigns one of three flood risk vulnerability classifications to developments, as shown in Table 3-2. Development proposals are for residential properties and are consequently defined as a **Highly Vulnerable Development**.

Table 3-2 TAN15 Vulnerability Classification

Development Category	
Highly Vulnerable Development	<p>All residential premises (including hotels, Gypsy and Traveller sites, caravan parks and camping sites).</p> <p>Schools and childcare establishments, colleges and universities. Hospitals and GP surgeries.</p> <p>Especially vulnerable industrial development (e.g. power generating and distribution elements of power stations, transformers, chemical plants, incinerators), and waste disposal sites.</p> <p>Emergency services, including ambulance stations, fire stations, police stations, command centres, and emergency depots.</p> <p>Buildings used to provide emergency shelter in time of flood.</p>
Less Vulnerable Development	<p>General industrial, employment, commercial and retail development. Transport and utilities infrastructure.</p> <p>Car parks.</p> <p>Mineral extraction sites and associated processing facilities (excluding waste disposal sites).</p> <p>Public buildings including libraries, community centres and leisure centres (excluding those identified as in Highly Vulnerable category and emergency shelters).</p> <p>Places of worship.</p> <p>Cemeteries.</p> <p>Equipped play areas. Renewable energy generation facilities (excluding hydro generation).</p>
Water Compatible Development	<p>Boatyards, marinas and essential works required at mooring basins.</p> <p>Development associated with canals.</p> <p>Flood defences and management infrastructure. Open spaces (excluding equipped play areas).</p> <p>Hydro renewable energy generation.</p>

3.4 Lifetime of Development

An FCA should help the planning authority determine whether the risk and consequences of flooding are acceptable over the lifetime of development. TAN-15 states:

'Generally, it is appropriate to think of new dwellings as having a lifetime of 100 years. Lifetimes for other types of development will vary, but 75 years is considered a reasonable rule of thumb'.

As the proposals are for a residential development a 100-year lifetime of development has been considered in this assessment.

3.5 Flood Map for Planning

The Flood Map for Planning (FMfP) is the starting point for consideration of flood risk. The map uses flood zones to indicate the degree to which land is at risk of flooding from rivers, the sea, surface water and small watercourses. The main zones are Zone 1, Zone 2, Zone 3 and the Defended Zone. The FMfP displays predicted future flood risk with an allowance made for climate change over a 100 year lifetime of development.

Proposals for development located partially or wholly in Flood Zone 2 or 3 must be supported by a Flood Consequences Assessment (FCA).

3.5.1 Flood Map for Planning - Flood Risk from Rivers

The site is shown to be in Flood Zone 1 for the FMfP - Flood Risk from Rivers as shown in Figure 3-1. This represents a less than 0.1% AEP (1 in 1000 year) chance of flooding from fluvial mechanisms in any given year, including the effects of climate change. Flood Zone 1 is shown as transparent on the FMfP.

All forms of development are suitable within Flood Zone 1.



Figure 3-1 Flood Map for Planning - Flood Risk from Rivers

3.5.2 Flood Map for Planning - Flood Risk from the Sea

The site is located entirely within a TAN15 Defended Zone for the sea as shown in Figure 3-2. The TAN15 Defended Zone for the sea indicates areas that benefit from Risk Management Authority flood defences with a minimum Standard of Protection of 1 in 200 years (present day) for the sea.

The site is defended by both the Cardiff Bay Barrage and existing coastal flood defences along Rover Way.

The presence of the site within the TAN-15 Defended Zone triggers the requirement for an FCA and has been assessed in detail in Section 5.



Figure 3-2 Flood Map for Planning - Flood Risk from the Sea

3.5.3 Flood Map for Planning - Flood Risk from Small Watercourses and Surface Water

Figure 3-3 shows that the existing building footprint lies with Flood Zone 1 of the Flood Map for Planning - Flood Risk from Small Watercourses and Surface Water. This indicates that there is a less than 0.1% AEP (1 in 1000 year) chance of flooding in any given year including climate change.

The southeast of the development site lies predominantly within Flood Zone 2, with some a small area in the centre of the former car park located in Flood Zone 3. Flood Zone 2 indicates a less than 1% AEP (1 in 100 year) but greater than 0.1% AEP (1 in 1000 year) chance of flooding in a given year including climate change. Flood Zone 3 indicates a greater than 1% AEP (1 in 100 year) chance of flooding in a given year including climate change.

Further assessment of the risks associated with surface water and small watercourse flooding at the site is contained within Section 4.4.



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

3.6 Local Development Plan

The Local Development Plan³ is a land use document in which Cardiff Council sets out its land use development aspirations for a 20-year period. The current LDP was adopted in 2016 and expires in 2026 with work already begun on the development of the new LDP.

KP1 of the LDP states Cardiff Council's intention of making *'provision of 45,415 new dwellings to deliver a housing requirement of 41,415 new dwellings in Cardiff between 2006-2026'*. The proposed development at this site would aid Cardiff Council's objective of meeting this housing need.

³ <https://www.cardiffldp.co.uk/wp-content/uploads/Final-Adopted-Local-Development-Plan-English.pdf>

4 Flood Risk Assessment

This section assesses the risk to the proposed development from all sources of flooding, the risk of increased flooding to others, and how flood risk can be managed.

4.1 Review of Existing Flood Risk Data

The latest available information on flood risk at the site is summarised in Table 4-1, and detailed in the subsequent section.

Table 4-1 Summary of flood risk

Source of flooding	Onsite presence	Description
Flood Risk from Rivers	✗	The site is at very low risk of flooding from rivers.
Flood Risk from the Sea	✓	Refer to Chapter 5 for detailed assessment
Flood Risk from Surface Water and Small Watercourses	✓	The site is at low risk of flooding from surface water and small watercourses.
Flood Risk from Groundwater	✗	Low - it has been documented that groundwater flood risk in Cardiff is low
Flood Risk from Reservoirs	✓	Low - The risk of reservoir failure is low
Flood Risk from Sewers	✗	Low - The site is at low risk of flooding from sewers.

4.2 Historical Flooding

NRW's map of recorded flood extents does not show any evidence of historic flooding on the site. Furthermore, the Cardiff Local Flood Risk Management Strategy⁴ does not mention any previous site-specific events for this area of the city.

4.3 Flood Risk from Rivers

As previously detailed in Section 3.5.1, the Flood Map for Planning - Flood Risk from Rivers shows that the site is not at risk of flooding from this source. Consequently, the site is assessed to be at **very low risk** of flooding from rivers.

4.4 Flood Risk from Surface Water and Small Watercourses

As shown in 3.5.3, the FMfP - Flood Risk from Surface Water and Small Watercourses mapping shows surface water flooding of the former car park.

⁴ <https://www.cardiff.gov.uk/ENG/Your-Council/Strategies-plans-and-policies/Local-flood-risk-management-strategy/Pages/default.aspx>

This prediction of flooding is caused by the slight topographical depression of the car park, and the potential for excess runoff from the large existing building and surrounding development. The small area of Flood Zone 3 is associated with the drain gullies in the centre of the car park, where floodwater is most likely to pond. This is a deliberate drainage feature to assist in the positive drainage of the car park, a fact not accounted for by the generalised modelling.

NRW's mapping of this surface water and small watercourse flood risk is derived from generalised national scale modelling and therefore only includes generalised assumptions for urban surface water drainage features and limited representations of structures such as culverted watercourses. This can lead to significant overestimation of flooding in some locations, and underestimation in others. Therefore, the flood map for surface water and small watercourses should be regarded as indicative of the potential risks and reviewed alongside other sources of information such as flood history, Lead Local Flood Authority records, and surface water drainage plans.

The National Flood Hazard Mapping has been used to assess the flood depths associated with the Surface Water and Small Watercourses flood risk. In the flood event associated with Flood Zone 3, this shows that the limited area of flooding associated with the low point in the centre of the car park may flood to depths of 180mm (Figure 4-1). In the Flood Zone 2 event, these depths may increase to 360mm.

As there are no significant off-site flow paths it should be possible to adequately manage the risks of surface water flooding with the appropriate application of on-site SuDs drainage techniques. The proposed development plan included within Appendix A, shows a significant increase in the area given over to green infrastructure, SuDs, and permeable surfaces. This includes block paving, raingardens, and amenity grass alongside the building layout. Therefore, once developed, the risk of surface water flooding will be well managed and consequently the risk of flooding from this source is concluded to be **low**.

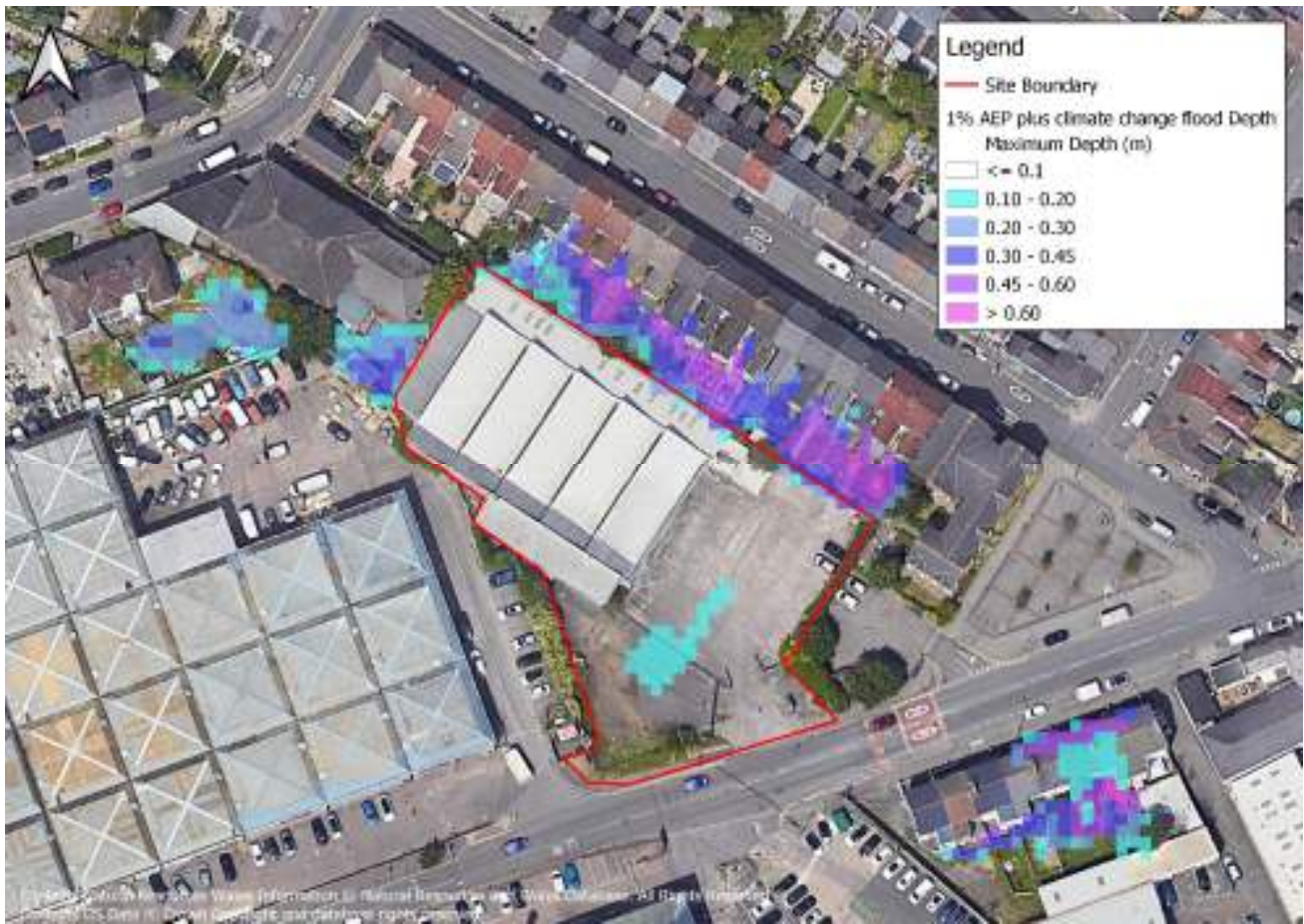


Figure 4-1 National Flood Hazard Mapping - Surface Water and Small Watercourses: 1% AEP plus climate change flood depth

4.5 Flood Risk from Groundwater

The Cardiff Local Flood Risk Management Strategy⁵ also states that “there is little documented evidence of groundwater flooding in Cardiff and therefore the risk of flooding from this source is considered to be small”. Therefore, the site is assessed to be at **low risk** of groundwater flooding.

4.6 Flood Risk from Reservoirs

The NRW FRAW mapping shows that the site is at risk of flooding in the event of reservoir failure, as seen in Figure 4-2.

However, it is worth noting that reservoir flooding is extremely unlikely to occur as all large reservoirs must be inspected and supervised by reservoir panel engineers under the Reservoirs Act 1975. In Wales, NRW ensure that reservoirs are inspected regularly, and essential safety work is carried out. Therefore, the risk of flooding from reservoir failure has been assessed to be **low**.

⁵ <https://www.cardiff.gov.uk/ENG/Your-Council/Strategies-plans-and-policies/Local-flood-risk-management-strategy/Pages/default.aspx>



Figure 4-2 FRAW - Flood Risk from Reservoirs

4.7 Flood Risk from Sewers

Cardiff's Flood Risk Management Plan⁶ suggests there is no evidence of historic sewer flooding at the site. The FRMP concluded that flooding from sewers does not have significant consequences at a strategic scale, so it can be concluded that the risk of sewer flooding at the site is **low**.

⁶ <https://www.cardiff.gov.uk/ENG/Your-Council/Strategies-plans-and-policies/Local-flood-risk-management-strategy/Pages/default.aspx>

5 Detailed Tidal Flood Risk Assessment

5.1 Hydraulic Model Availability

A detailed tidal flood model for Cardiff and the River Rhymney was developed by JBA Consulting in 2020 to support proposals for the Cardiff Coastal Flood Defence Scheme. This model was subsequently updated in 2022. The updated model was used to simulate results for a 100-year lifetime of development to the year 2122.

The model simulates the risk of flooding with and without the Cardiff Coastal Flood Defence Scheme. For this assessment, only the defended scenario with the new defences has been used as construction defences commenced in 2024 and is due to be completed by 2027/28.

Given the nature of the proposals and level of flood risk assessed, it is considered disproportionate to update the model to reflect the additional years of climate change from 2021 to 2025 as this would have negligible impact on the results.

The potential for tidal flooding from Cardiff Bay has not been directly modelled. The tidal flood risk in the Bay is managed by the Cardiff Barrage to a very high standard of protection which is understood to exceed the design events of TAN15. This source of flood risk can therefore be discounted.

5.2 Model Results

Figure 5-1 and Figure 5-2 indicate that the site is predicted to be flood-free in both the 2122 0.5% AEP and 0.1% AEP events including climate change, with no flooding predicted within approximately 1.1km of the site.



Figure 5-1 2122 0.5% AEP plus climate change event: Maximum Flood Depths (m)



Figure 5-2 2122 0.1% AEP plus climate change event: Maximum Flood Depths (m)

6 Flooding and the Plan Led System

Whether a development should proceed or not will depend upon whether the consequences of flooding can be safely managed, including its effects on flood risk elsewhere. TAN15 Section 11 sets out the key conditions that should be met to demonstrate that development is appropriate for its location.

6.1 Application of Flood Zones to Development Management Decisions

When considering a site for development, TAN15 sets out the requirements for the form of development in any given flood zone.

For a proposed redevelopment site within the TAN15 Defended Zone, Section 10.23 of TAN15 states:

"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."

It is considered that the proposals do not result in an over intensification of use as a result of the predominantly residential nature of the area in which its located, and the minimal flood risk predicted to the site.

Highly Vulnerable Development must be compliant with the tolerable conditions set out within Section 11 of TAN-15, which is demonstrated in below in Section 7.

6.2 Acceptability Criteria

The site has been assessed against the Acceptability Criteria of Section 11 of TAN15, as shown in Table 6-1 below.

Table 6-1 Assessment of Acceptability Criteria

TAN15 Acceptability Criteria	Comments	Achieved
No increase in flooding elsewhere	As the site is predicted to be flood-free in all tidal and fluvial design events there will be no impact on flooding elsewhere as a result of the proposals.	Yes
Occupiers aware of flood risk	N/A - The site is shown to be flood-free for the duration of its lifetime.	Yes
Escape/evacuation routes present	N/A - The site, and the surrounding area is shown to be flood-free for the duration of its lifetime.	Yes

TAN15 Acceptability Criteria	Comments	Achieved
Flood emergency plans and procedures agreed and in place	N/A - The site is shown to be flood-free for the duration of its lifetime	Yes
Flood resistant and resilient design	N/A - The site is shown to be flood-free for the duration of its lifetime.	Yes
Acceptable consequences for type of use	Detailed in Sections 6.3 and 6.4	Yes

6.3 Frequency thresholds: designing development to be flood free

The required design standard for new development is to be flood free during the 0.5% AEP tidal event, plus an allowance for climate change over the lifetime of development. This threshold may be applied with more flexibility for redevelopment.

As per Section 5 of this report, the proposals meet this frequency threshold.

6.4 Tolerable conditions: managing consequences in an extreme flood event

The flood free thresholds relate to very serious but not extreme flood events. During extreme flood events there is recognition that it may not be possible to keep development flood-free. Figure 6 of TAN-15 provides indicative tolerable flood depth and velocity conditions for the 0.1% AEP event, including an allowance for climate change. Up to 600mm of flooding is considered tolerable within Highly Vulnerable Developments, and it is understood that some flexibility to this indicative value is afforded to redevelopment sites.

As per Section 5 of this report, the site is predicted to be flood free in the extreme event and therefore complies with the tolerable conditions as outlined in Figure 6 of TAN-15.

7 Conclusion

- JBA Consulting were commissioned by YourSpace Projects to Prepare a Flood Consequences Assessment (FCA) to support a proposed residential development at the Former Magnet Trade site, Cardiff.
- Development proposals are for the demolition of the existing Magnet trade building, and the construction of five 3-storey residential blocks with car parking space, 50 apartments, and 6 common access flats.
- The residential proposals are classified as highly vulnerable development under TAN-15, which has an assumed lifetime of development of 100 years.
- The site is located within the TAN-15 Defended Zone. Redevelopment proposals within the TAN-15 Defended Zone are justified provided that they are consistent with the acceptability considerations set out in Section 11 of TAN-15.
- Planning permission (planning reference-21/02138/MJR) was granted in September 2021 for the Cardiff Coastal Flood Defence scheme. This scheme will provide improved flood defences along the banks of the River Rhymney and the Severn Estuary. The coastal defences will enhance the standard of protection across this area to increase resilience to climate change for much of eastern Cardiff, including the Splott area of Cardiff. Construction of the scheme commenced in late 2024 and is due to be completed in 2027/28. Therefore, when considering future flood risk, the FCA has assumed presence of these new flood defences. The site also benefits from tidal flood protection from the Cardiff Bay Barrage, which offers an excellent standard of protection now and in the future.
- Flood risk from rivers, groundwater, reservoir failure and sewers are shown to be low across the site.
- Presently, the flood risk from the sea is low, but is predicted to increase with climate change over the lifetime of the development. Consequently, a detailed assessment of the tidal flood risk at the site has been undertaken.
- Detailed tidal modelling demonstrates that the site shall be flood free during both the 2122 0.5% AEP event and the 2122 0.1% AEP Event, complying with the acceptability criteria for flood frequency and tolerable conditions during the extreme flood event.
- The FMfP mapping indicates surface water flooding at the former car park due to a slight topographical depression and runoff from nearby buildings, with a small area of Flood Zone 3 linked to central drain gullies designed for positive drainage—something not fully captured by the generalised national-scale modelling used by NRW. This modelling often overlooks urban drainage features and culverted watercourses, potentially misrepresenting flood risks. National Flood Hazard Mapping shows that in a Flood Zone 3 event, water could reach depths of 180mm,

increasing to 360mm in a Flood Zone 2 event. However, with no significant off-site flow paths and the proposed development plan incorporating extensive green infrastructure, SuDS, and permeable surfaces like block paving and raingardens, the surface water flood risk is expected to be effectively managed and considered low.

- The proposals have been assessed against the acceptability considerations and shown to meet all requirements.
- Consequently, it can be concluded that on the grounds of flood risk, the proposed development meets the requirements set out in TAN-15 and the aims of Planning Policy Wales.

Appendix A - Development Proposals



Block A: Apartments 4/5 Storey
2P 1B : 32 No.
3P 2B : 18 No.

Total : 50 No.
Two flats at GF omitted for Bins/cycles/meters

Block B: Town Houses: 3 Storey
5P 3B : 5 No.
Parking : 5 No.
Ground floor to be Parking, cycle and Bins Storage

Block C: Common Access Flats 3 Storey
2P 1B : 6 No.

Total 61

- Meadow Grass, Raingardens
- Amenity Grass
- Tarmac or block paved road
- Footpath
- Existing tree subject to tree survey
- Proposed tree, see landscape drawing for details
- 1.8m Close boarded timber fence
- 2m high timber acoustic fence
- 1.1m high hoop top fence
- Existing stone and brick walls, various heights

Note: Landscaping layout is indicative only. For more details refer tio Landscape drawing prepared by DLP

Rev : Date	Description
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Project

**Proposed Apartments
East Tyndall St Cardiff**

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Title	Date	
Proposed Site Plan Option 2	28 11 2024	
Status	Scale @ A3	
Pre Application Advice	1:400	
Job Number	Revision	Drawn by
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