

Harbour Way, Port Talbot - Flood Consequences Assessment

Version 1

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This report describes work commissioned by Paul North on behalf of Runtech Ltd, by an email dated 4th October 2022. Rebekah Alford of JBA Consulting carried out this work.

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Purpose

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1 Introduction

1.1 Terms of Reference

JBA Consulting (JBA) were commissioned by Paul North on behalf of Runtech Ltd to undertake a Flood Consequences Assessment (FCA) to support a planning application for the construction a steel building on a site located off Harbour Way in Port Talbot

1.2 FCA requirements

This FCA follows Welsh Government guidance on development and flood risk set out in Technical Advice Note 15: Development and Flood Risk (TAN-15). Where appropriate, the following aspects of flood risk should be addressed in all planning applications over their expected lifetime:

- 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 flood water across the site
- Overland flow routes
- The effect of 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

2.1 Site Summary

The proposed development site is within an established storage yard located off Harbour Way in Port Talbot. The site location and proposed building footprint is shown in Figure 2-1.

The site is approximately 0.02 ha and accessed from Harbour Way to the northeast. The site is bound to the west by several industrial buildings and building yards, to the northeast by Harbour Way and a track to the southwest.

Table 2-1 summarises the key characteristics of the site.

Table 2-1 Site summary

Site name	Harbour Way
Site area	Approximately 0.02 ha
Existing land use	Yard used for vehicle parking
Purpose of development	Industrial workshop/Garage
OS NGR	SS 76887 89131
Local Planning Authorities	Neath Port Talbot Council
Lead Local Flood Authority	Neath Port Talbot Council



Figure 2-1 Site Location

2.2 Site Topography

Natural Resources Wales (NRW) Open Source 1m Light Detection and Ranging (LiDAR) data has been used to analyse existing ground levels across the site and within the surrounding area (shown in Figure 2-2). NRW LiDAR data demonstrates that the ground level is flat with a

very small rise of 3.4 mAOD to 3.5 mAOD at the centre of the proposed building. The ground level is lowest in the southeast corner of the building footprint.

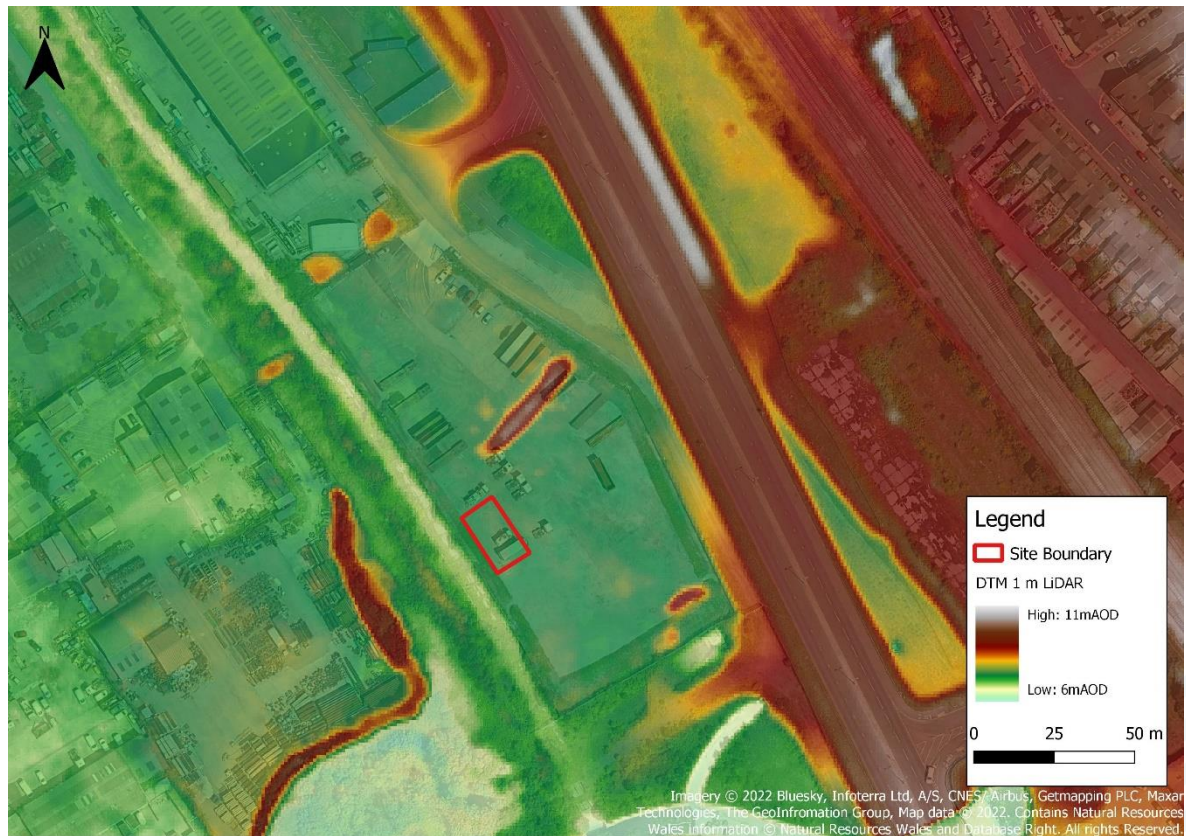


Figure 2-2 LiDAR Topographic data from NRW (2m resolution) with sample points

2.3 Soils and Geology

The geology of the site has been assessed using the British Geological Survey (BGS) Geology of Britain Viewer¹. The bedrock is shown to be South Wales Middle Coal Measures Formation comprised of mudstone, siltstone and sandstone. The superficial geology is formed of Tidal Flat Deposits comprised of clay, silt and sand.

The soils on site have been assessed on the Cranfield University Soilscape viewer² and are shown to be loamy and clayey soils of coastal flats with naturally high groundwater.

2.4 Watercourses

Two NRW designated Main Rivers are located in close proximity to the site, as shown in Figure 2-3. The River Afan is located 950m to the north-west of the site, and the Ffrwd Wyllt 60m southeast of the site. The Port Talbot Docks are located approximately 140m to the southeast of the site.

The proposed development site does not benefit from the presence of flood defences.

¹ https://mapapps.bgs.ac.uk/geologyofbritain/home.html?&_ga=2.235342593.1646683261.1643098406-854211532.1643098406

² Cranfield Soil Scapes Viewer. <http://www.landis.org.uk/soilsapes/>

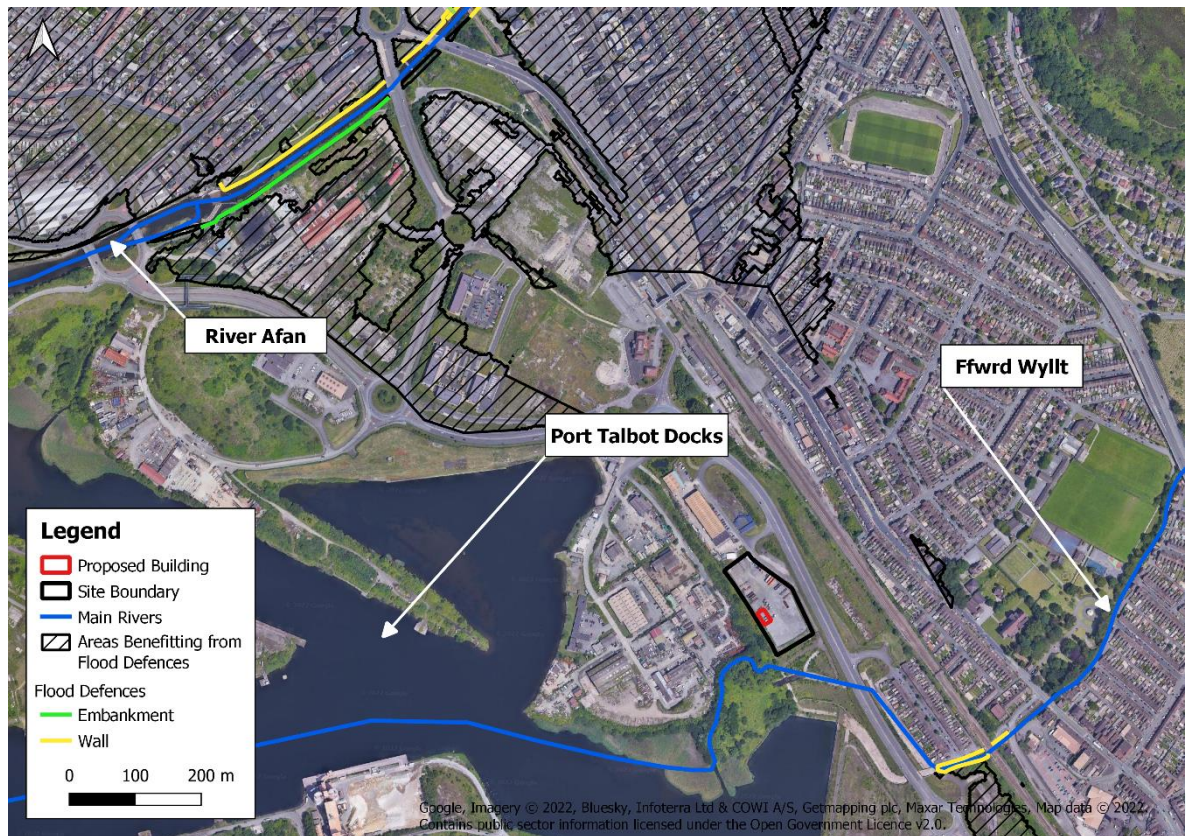


Figure 2-3 Nearby watercourses

2.5 Development Proposal

Development proposals for the site are to construct a steel building underlain by a concrete base on the southwestern boundary of the site. The concrete base will provide a minor raise in the finished floor level of the building. The proposed building will be used as a workshop/industrial garage in relation to the client's business. The development plan is shown in Appendix A.

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 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 (TAN-15), introduced by the Welsh Government in 2004, provides technical guidance relating to development planning and flood risk in Wales. The initial requirements of TAN-15 are to identify the vulnerability classification(s) and flood zones relevant to the proposed development, and to apply this information to the application of the justification tests.

An update for TAN-15 was released in October 2021 and was due to come in force on the 1st December 2021. However, Welsh Government have since suspended the implementation of the new TAN-15 until 1st June 2023. Although the new TAN-15 is not a material consideration, Welsh Government and NRW advise that some consideration is given to the draft Flood Map for Planning (FMfP) as best available information. Therefore, where a site is located in a FMfP flood risk zone it is recommended that an FCA is carried out.

As a result of the above, both the DAM and the FMfP are considered as part of this FCA.

3.2 Vulnerability Classification

TAN-15 assigns one of three flood risk vulnerability classifications to a development, as shown in Table 3-1. The proposed development is classed as general industrial. Consequently, the development is classified as Less Vulnerable.

Table 3-1 Development categories defined by TAN-15

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 of flood.
Highly vulnerable development	All residential premises (including hotels 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.

3.3 Development Advice Map Classification

Figure 3-1 shows that the site is located in Zone B and Zone C2 of the Development Advice Map (DAM). Zone B is described as areas known to have been flooded in the past evidenced by sedimentary deposits. Zone C2 is described as “areas of the floodplain without significant flood defence infrastructure”.

Less vulnerable development within Zone C2 can occur subject to the application of a Justification Test, including the acceptability of consequences.

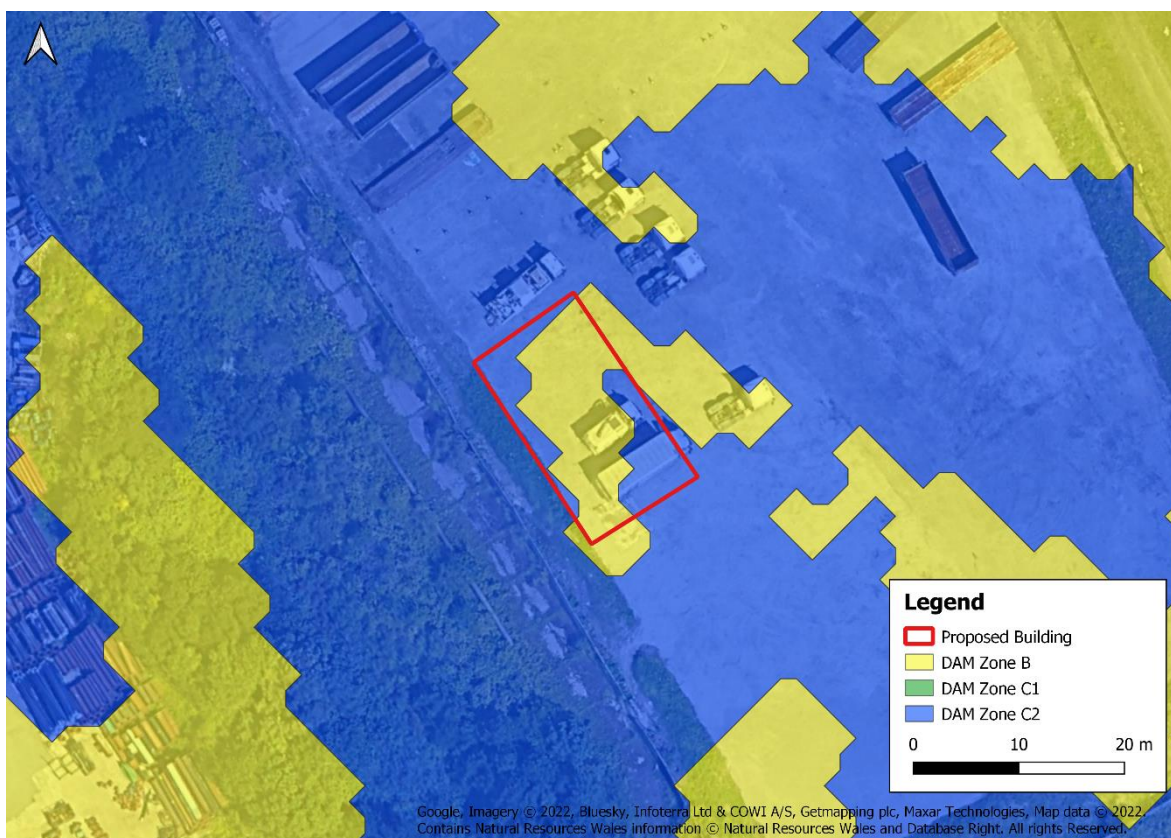


Figure 3-1 Development Advice Map

3.4 Flood Map for Planning Classifications

The new TAN15 will replace the DAM with the Flood Map for Planning (FMfP). Whilst the new TAN15 is not a material consideration until implemented, it does illustrate the current policy thinking of Welsh Government and in some cases the FMfP may constitute best available information. Consequently, information on the FMfP is provided for information only.

3.4.1 Flood Map for Planning – Rivers

As shown in Figure 3-2, the majority of the site is located within Flood Zone 2 for the Flood Map for Planning for Rivers. Flood Zone 2 represents areas which have less than 1 in 100 (1%) but greater than 1 in 1000 (0.1%) chance of flooding in a given year, including climate change.

A small part of the site, along the southwestern edge, is located within Flood Zone 3 for the Flood Map for Planning for Rivers. Flood Zone 3 represents areas which have a greater than 1 in 100 (1%) chance of flooding in a given year, including climate change.

3.4.2 Flood Map for Planning - Sea

As shown in Figure 3-2, the site is located within Flood Zone 3 for the Flood Map for Planning for Sea. Flood Zone 3 represents areas which have a greater than 1 in 200 (0.5%) chance of flooding in a given year, including climate change.



Figure 3-2 Flood Map for Planning – Rivers.



Figure 3-3 Flood Map for Planning – Sea.

3.5 Local Development Plan

The Local Development Plan (LDP) is a land-use document in which the council sets out its land use development over a 15-year period. The current LDP for Neath Port Talbot³ was adopted in 2011 and provides a framework to guide future development and set out where, when, and how much new development can take place within the plan period (2011-2026).

The proposed development complies with 'Policy EC 3 Employment Area Uses' which specifies that within existing employment areas, only uses within specific employment land use classes will be deemed appropriate for development. As the proposed development is located in an existing employment area, Llewellyn's Quay, it meets the criteria of this policy.

The proposed development also supports the LDP vision that 'previously developed, underused, and unsightly former industrial and commercial areas are redeveloped'. SP16 gives preference to the development of brownfield sites over greenfield sites, and as the proposed development will redevelop an existing brownfield land site, it supports the LDP vision.

3.6 Justification Test

Development in Zone C2 is subject to the justification test. TAN-15 states that development will be justified if it can be demonstrated that:

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

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

It concurs with the aims of Planning Policy Wales and meets the definition of previously developed land;

and,

The potential consequences of a flooding event for the particular type of development have been considered and found to be acceptable.

The proposed 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.

³ Neath Port Talbot Local Development Plan: <https://www.npt.gov.uk/7328>
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Table 3-2 Justification Test applied to the proposed development

TAN 15 Justification Criteria	Comments	Achieved
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 development involves constructing a workshop / industrial garage to benefit an existing business, and complies with Policies EC3, maintaining the current economic function of the site.	✓
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)	The proposed development site meets the criteria of previously developed land as it is currently part of an industrial yard.	✓
The potential consequences of a flooding event for the particular type of development have been considered and found to be acceptable.	The flood consequences have been assessed and are detailed further in Sections 4 and 5.	✓

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 risks can be managed. As a Level 1 FCA, 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

The latest available information on flood risk at the site, published by Natural Resources Wales (NRW) 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 is at low risk of river flooding.
Flood Risk from the Sea	×	The site is at very low risk of tidal flooding.
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 the Cwmwernderi Reservoir.
Flood Risk from Sewers	×	A review of the Neath Port Talbot Local Flood Risk Management strategy suggests there is a low to moderate 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. No other records of historic flooding at the site were identified in Neath Port Talbot Preliminary Flood Risk Assessment⁴ and Flood Risk Management Strategy⁵.

4.3 Flood Risk from Rivers

NRW's Flood Risk Assessment Wales (FRAW) flood mapping indicates that most of the site is located outside of the mapped flood extent, as shown in Figure 4-1; therefore, is at very low risk of fluvial flooding (<0.1% AEP). However, the north-west and southeast corners of the proposed building footprint are at low risk of fluvial flooding (0.1% - 1% AEP).

As discussed previously in Section 3.4, Flood Map for Planning for flood risk from Rivers (shown in Figure 3-2) shows that the site is potentially at high risk of river flooding assuming 100 years of climate change. To better understand the risk of fluvial flooding and the implications of climate change, further assessment using detailed flood modelling data was undertaken and is discussed in Section 5.

⁴ Neath Port Talbot Preliminary Flood Risk Assessment (2011). Retrieved from https://www.npt.gov.uk/media/4629/pfra_report_2011.pdf?v=20171123145433

⁵ Rhondda Cynon Taff Flood Risk Management Strategy (2013). Retrieved from https://www.npt.gov.uk/media/4930/lfrms_npt_local_flood_risk_management_strategy.pdf?v=20170627002244
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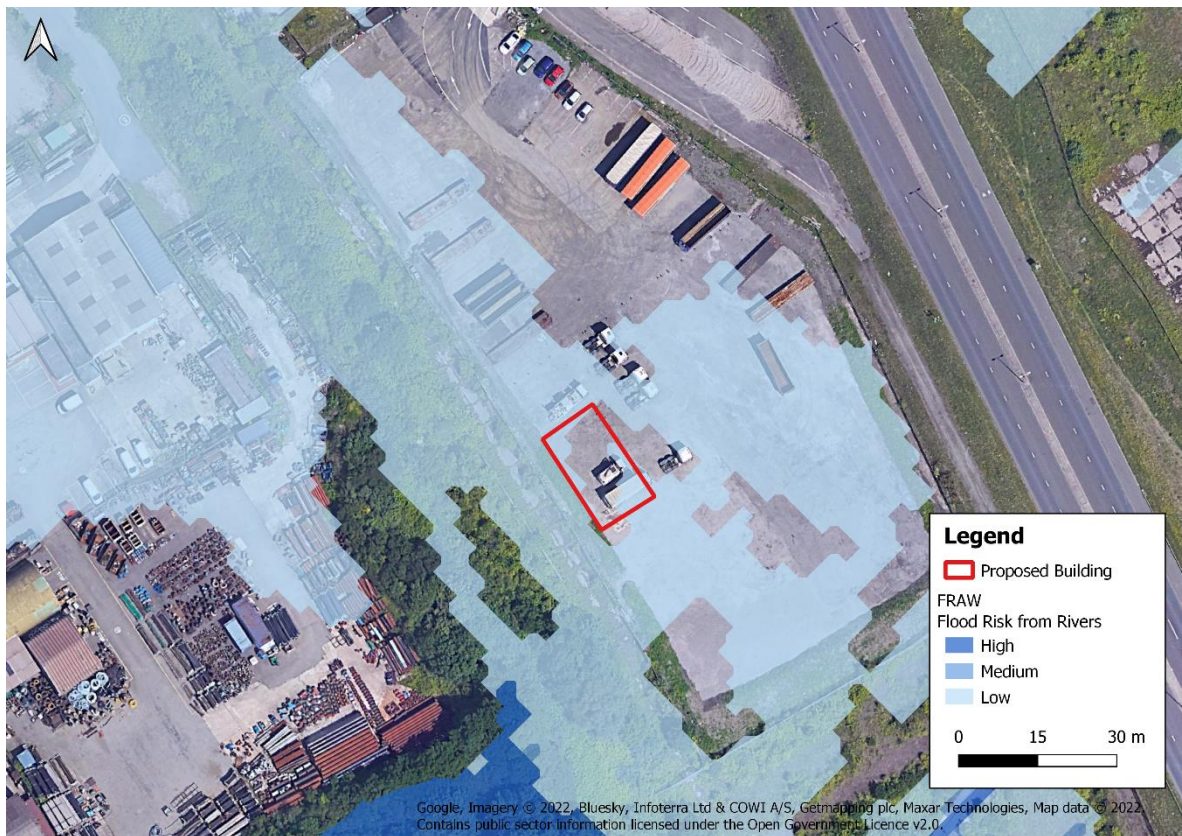


Figure 4-1 FRAW map – Risk of flooding from Rivers

4.4 Flood Risk from the Sea

The NRW FRAW Flood Risk from the Sea mapping shows that the site is at **very low risk** of tidal flooding.

However, as discussed previously in Section 3.4, Flood Map for Planning for flood risk from the Sea (shown in Figure 3-3) shows that the site is at risk of sea flooding assuming 100 years of climate change. To better understand the risk of tidal flooding and the implications of climate change, further assessment using detailed flood modelling data was undertaken and is discussed in Section 5.



Figure 4-2 FRAW map – Risk of flooding from the sea

4.5 Flood Risk from Surface Water and Small Watercourses

The NRW FRAW Surface Water and Small Watercourse map, shows that the site is at **very low risk** of Surface Water flooding as shown in Figure 4-3.



Figure 4-3 FRAW map - 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. This risk of groundwater flooding depends on the nature of the geological strata underlying the site and the local topography.

The Neath Port Talbot Council Preliminary Flood Risk Assessment Report, states that 'there are no specific areas of historical groundwater flooding recorded in the Neath Port Talbot area and overall groundwater is not believed to be a major source of flooding in the County'. It can therefore be concluded that the risk of groundwater flooding at the site is **very low**.

4.7 Flood Risk from Reservoirs

As shown in Figure 4-4, NRW flood risk mapping indicates the site is at risk of flooding due to reservoir failure. The site lies within the reservoir flood zones of the Cwmwernderi Reservoir. As the enforcement authority for the Reservoirs Act 1975 in Wales, NRW ensure that reservoirs are inspected regularly, and essential safety work is carried out. The regulatory nature of reservoir management means that the probability of a failure at a statutory reservoir is very low.

The Cwmwernderi Reservoir which presents a risk to the site is >4km away allowing substantial warning time if a failure should occur. It is therefore concluded, given the probability and consequences of such an event, that the risk at the proposed development site as a result of reservoir failure is **low**.



Figure 4-4 FRAW map - Risk of flooding from Reservoirs

4.8 Flood Risk from Sewers

The Neath Port Talbot Flood Risk Management Strategy⁵ highlights a total of 430 sewer flooding events recorded by Dŵr Cymru Welsh Water, of which 355 were identified as being at high risk. There is, however, no specific mention of flooding to the proposed development site as a result of sewers. It can therefore be concluded that there is a **low to moderate risk** of sewer flooding at the site.

5 Detailed Fluvial and Tidal Flood Risk Assessment

As identified in Section 4, a small section on the site boundary is considered to be at risk of fluvial flooding and the Flood Map for Planning for Sea suggests the site is at risk of tidal flooding. To better understand the risk of fluvial and tidal flooding posed to the site and the potential implications of climate change, further assessment using detailed hydraulic modelling is provided in this section.

5.1 Hydraulic Modelling Availability

The 1D-2D linked ESTRY-TUFLOW Model of Port Talbot was developed by JBA Consulting in August 2017 on behalf of NPTBC, and approved by NRW at the time.

The Port Talbot flood model has been used by JBA to inform a number of other developments in Port Talbot since 2017. Most recently the model was updated and approved by NRW in 2021 for a development at Julian Terrace, Port Talbot (planning reference P2020/0303). The model updates included running the latest version of TUFLOW and apply that latest climate change guidance. Consequently, these results have been used to inform this assessment.

The 2021 model used the updated coastal flood boundary (CFB) extreme sea level dataset⁶ to derive the tidal boundary conditions. Climate change uplifts were applied to provide a base year of 2096 on the basis of a 75 lifetime of development, and 2121 on the basis of a 100-year lifetime of development as used in the FMfP. These updates were made in accordance with Flood Consequence Assessments: Climate change allowances guidance⁷.

Table 2-1 summarises the sea level rise uplifts applied to the tidal boundary conditions and the resulting peak tide levels.

Table 2-1 Sea level rise uplifts and peak tide levels

Scenario	Sea level rise uplift (m)	Peak tide level (m AOD)	
		0.5% AEP	0.1% AEP
2096	0.711	7.08	7.40

The results for the 0.5% AEP plus climate change and 0.1% plus climate change were used to assess the risk of tidal flooding. The 1% AEP plus climate change and 0.1% AEP scenarios were used for this assessment to assess the risk of fluvial flooding. The results from these TAN15 design events are detailed below.

5.2 Fluvial Flood Risk

5.2.1 1% AEP Plus Climate Change

Figure 5-1 shows the proposed development is predicted to be **flood free** during the 1% AEP plus climate change fluvial flood event. As the proposed development will remain flood-free in this design event, the proposed development satisfies the requirements of A1.14 of TAN15.

⁶ Coastal Design Sea Levels - Coastal Flood Boundary Extreme Sea Levels. 2018. Environment Agency

⁷ Climate change allowances and flood consequence assessments (CL-03-16). 2016. Welsh Government. JBJ-JBAU-XX-XX-RP-Z-0001-S3-P01-Harbour_Way_FCA.docx

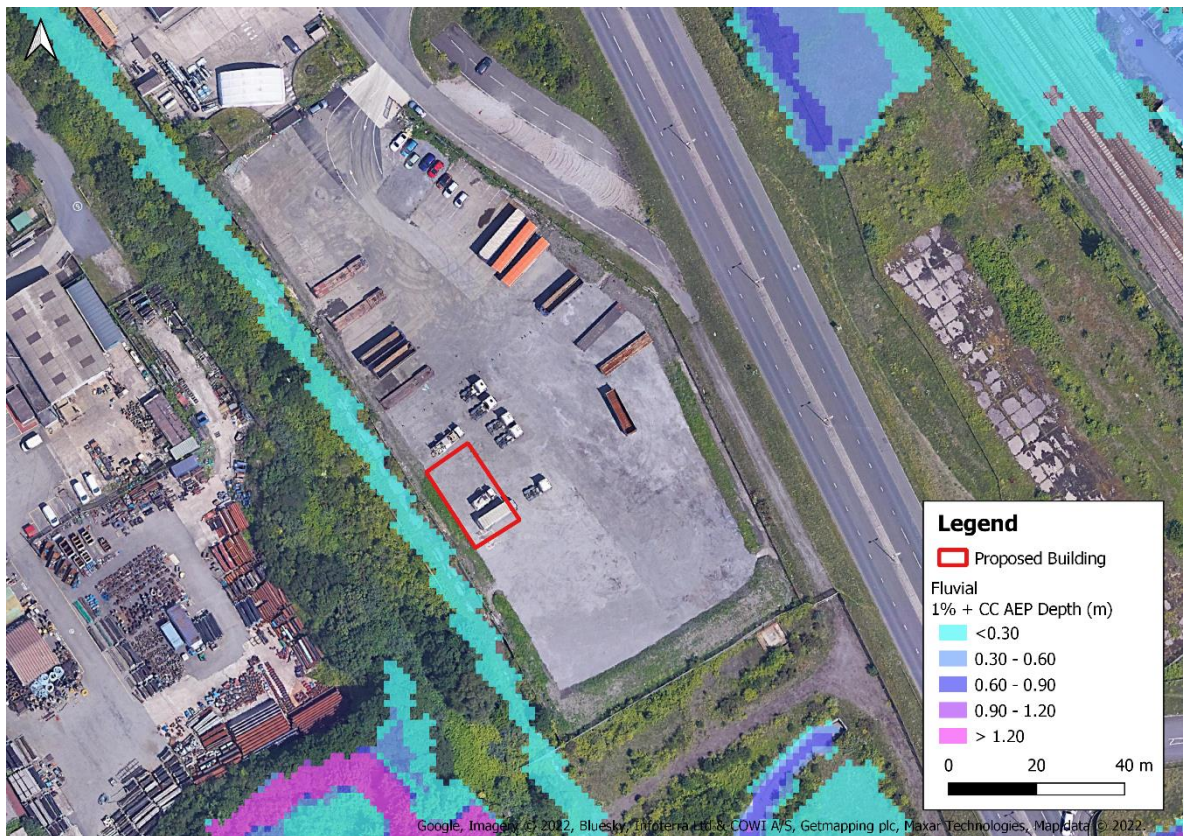


Figure 5-1 1% AEP plus climate change maximum fluvial flood depth

5.2.2 0.1% AEP

Figure 5-2 shows that most of the site is predicted to be **substantively flood free** during the 0.1% AEP plus climate change fluvial flood event, with only the north-west corner is subject to flooding. Flooding across the site is very shallow with a maximum predicted flood depth of 0.02m.

As the flood depths within the proposed development site are under 0.6m in this design event, the proposed development satisfies the requirements of A1.15 of TAN15.

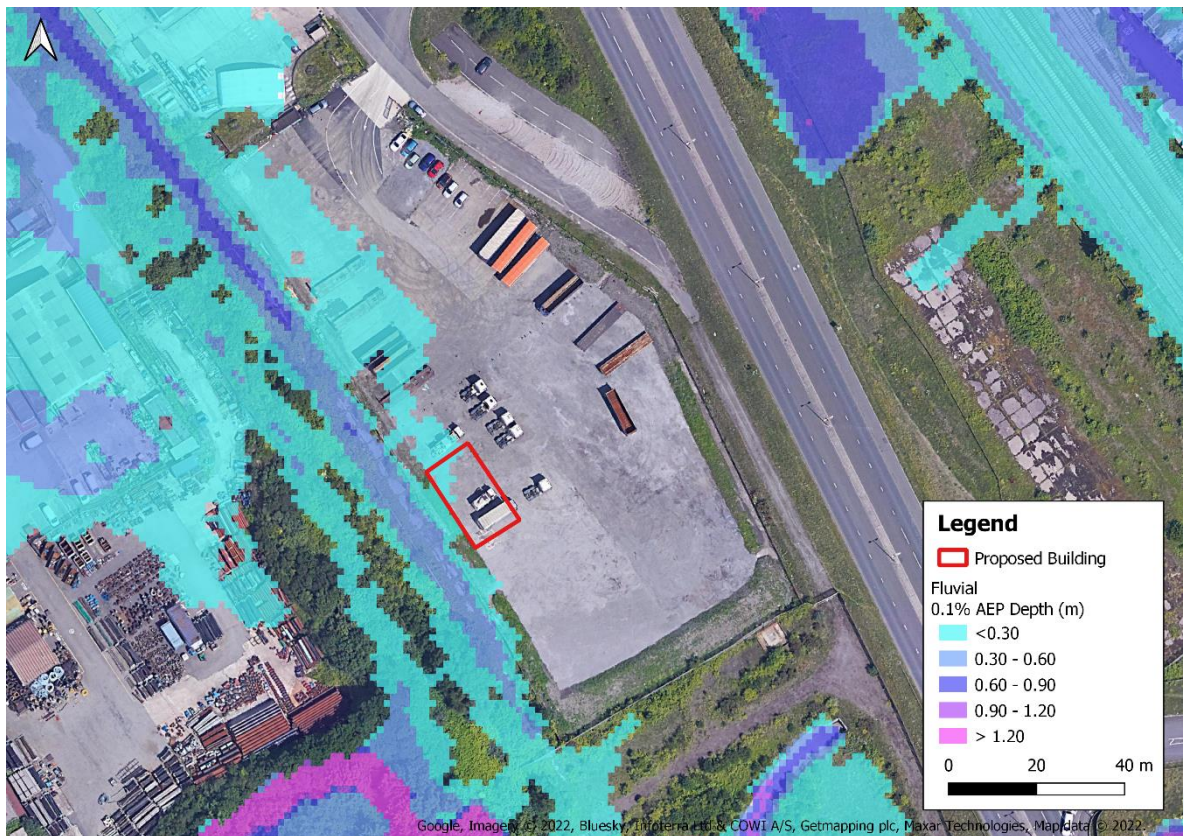


Figure 5-2 0.1% AEP maximum fluvial flood depth

5.3 Tidal Flood Risk

5.3.1 0.5% AEP Plus Climate Change

Figure 5-3 shows that the property is predicted to be **flood free** during the 0.5% AEP plus climate change tidal flood event. As the proposed development will remain flood-free in this design event, the proposed development satisfies the requirements of A1.14 of TAN15.

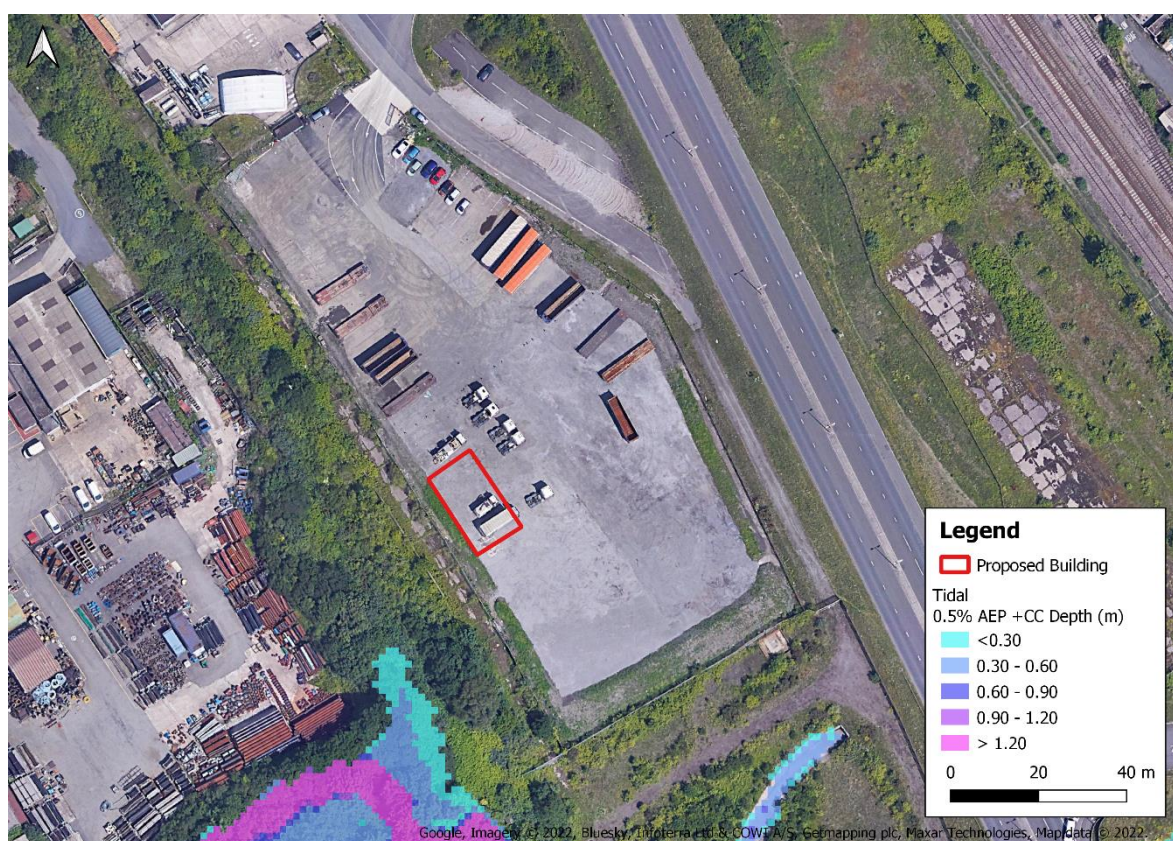


Figure 5-3 0.5% plus climate change maximum tidal flood depth

5.3.2 0.1% AEP

Figure 5-4 shows that the site is predicted to be **flood free** during the 0.1% AEP plus climate change tidal flood event. As the flood depths within the proposed development site will remain under 0.6m in this design event, the proposed development therefore satisfies the requirements of A1.15 of TAN15.

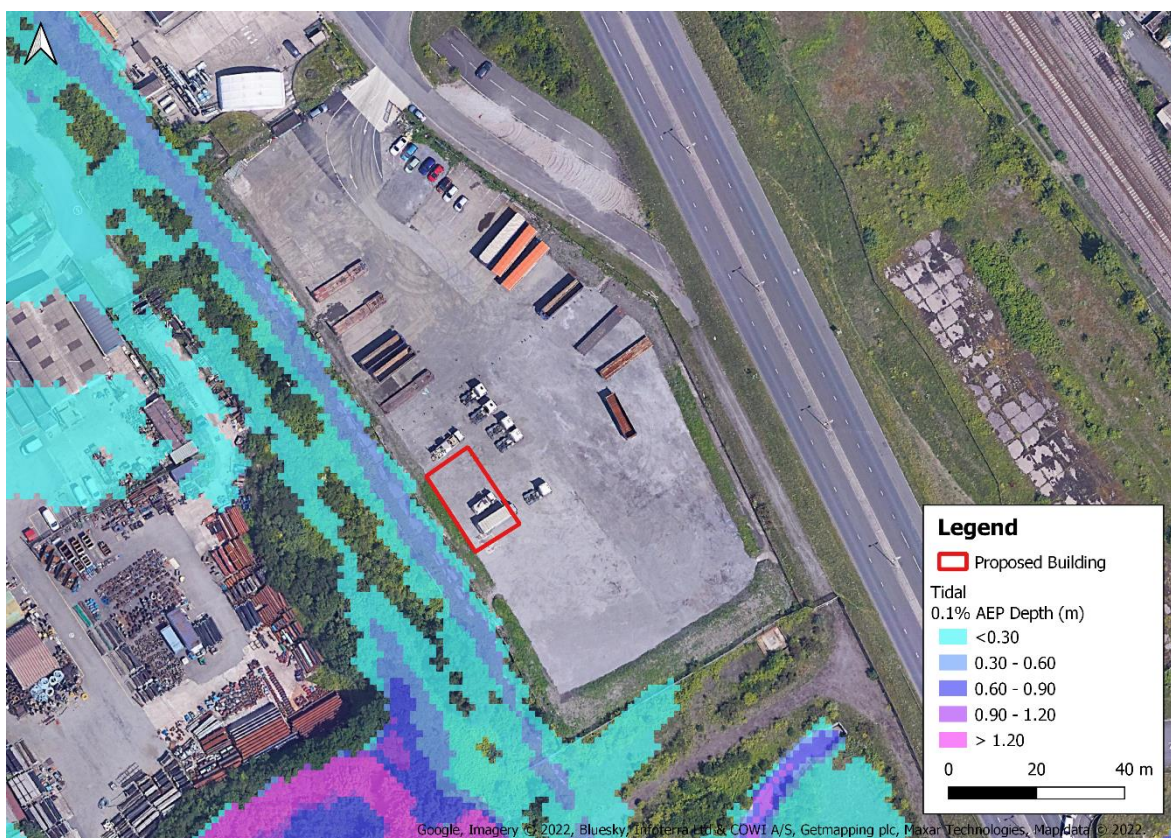


Figure 5-4 0.1% maximum tidal flood depth

6 Assessment of Acceptability Criteria

TAN-15 states that for less vulnerable development to be considered within Zone C2, the site must meet both the Justification Test and the Acceptability Criteria. Section 3.6 details the assessment of the proposed development site against each criteria of the Justification Test. Our assessment of the Acceptability Criteria, as set out in TAN-15, is summarised in Table 6-1 below. These criteria must be satisfied for the proposed development to comply with all aspects of TAN-15.

Table 6-1 Assessment of accessibility criteria

TAN 15 Justification Criteria	Comments	Achieved
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) and 1 in 200 (0.5%) chance (tidal) flood event including an allowance for climate change in accordance with TAN-15 table A1.14.	The proposed development will be flood free in the 1% AEP plus climate change fluvial flood event and the 0.5% AEP plus climate change tidal flood event.	Yes
The development should be designed so that in an extreme (1 in 1000 chance) event there would be less than 600mm of water on access roads and within the property.	In the 0.1% AEP fluvial flood event, maximum flood depths for the development are predicted to reach 0.02m, with most of the site being flood free. In the 0.1% plus climate change tidal flood event, the proposed development will be flood free	Yes
No flooding elsewhere.	In most design events the development is predicted to be flood free and therefore will be unable to alter flooding elsewhere. In the 0.1% AEP fluvial event, very limited and shallow flooding of the development is predicted. However, given the extent and depth of this flooding any potential displacement of floodwater will be negligible in volume and consequence.	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).	Not applicable. The proposed development is not served by flood defences.	Yes
The developer must ensure that future occupiers of development are aware of the flooding risks and consequences	Little or no flooding is predicted on the site. The occupier will be made aware of the flood risk through this report.	Yes
Effective flood warnings are	The site is included within the	Yes

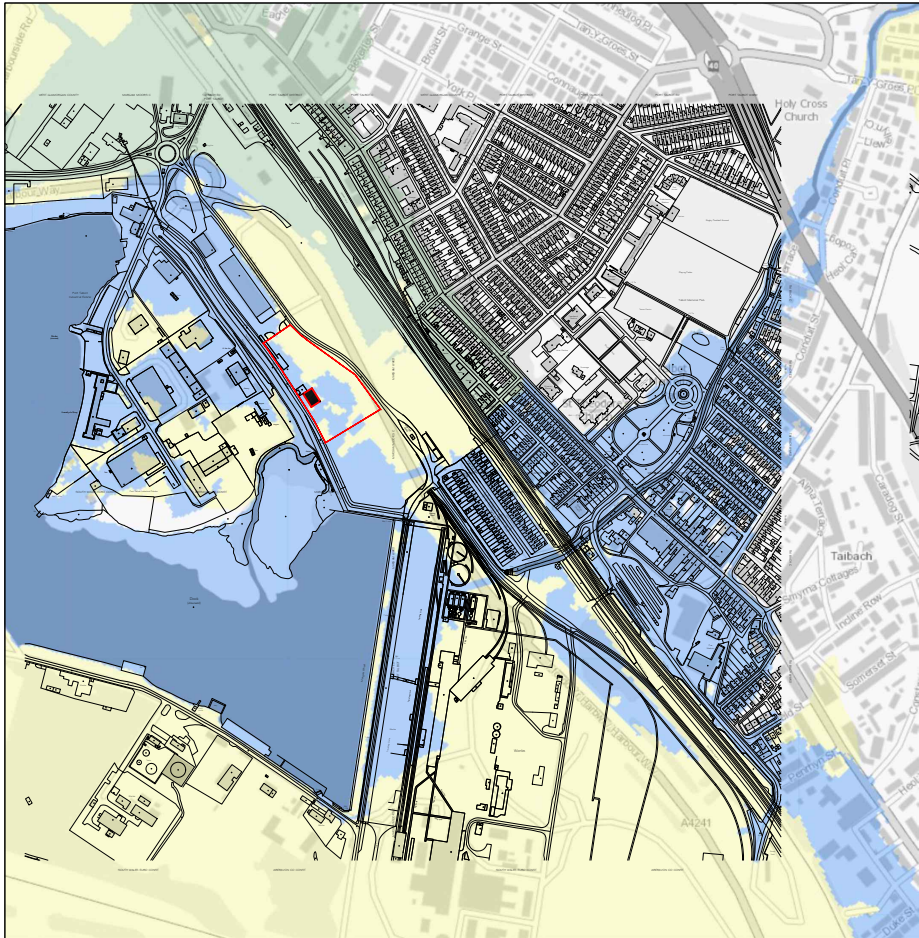
provided at the site	"River Tafen at Port Talbot" Flood Warning Area and the "Rivers Afan and Kenfig" Flood Alert Area.	
Escape/evacuation routes are shown by the developer to be operational under all conditions.	Flood free access will be available under all conditions.	Yes
The development is designed by the developer to allow the occupier of the facility for rapid movement of goods/possessions to areas away from flood waters.	Flooding, should it occur, will be extremely shallow and shall not impact the movement of goods/possessions.	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.	Flooding, should it occur, will be extremely shallow. Therefore, structural damage is very unlikely.	Yes

7 Conclusions and Recommendations

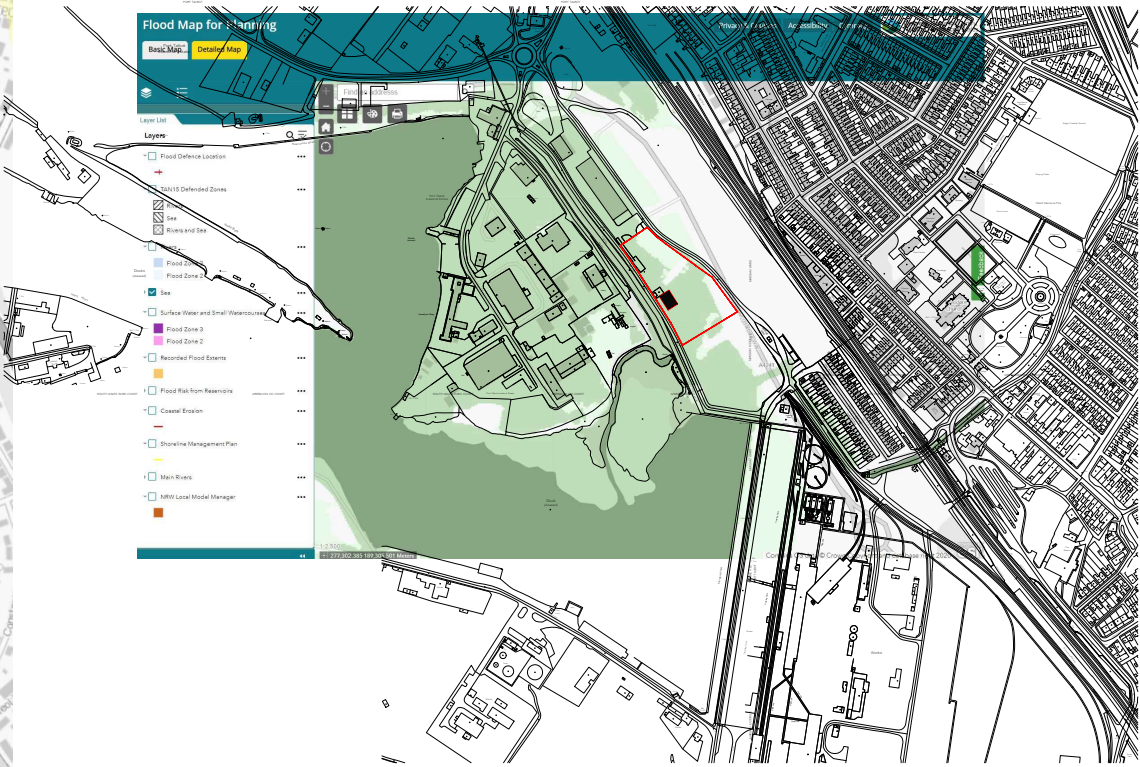
- JBA Consulting were commissioned by Runtech Ltd. to prepare a Flood Consequence Assessment (FCA) in support of a planning application for the construction of a steel industrial workshop/garage on a site off Harbour Road, Port Talbot.
- The overall site is 0.02 hectares in size and is currently a yard for vehicles.
- The River Afan is located 950m to the north west of the site and the Ffrwd Wylt 60m southeast of the site. The Port Talbot Docks are located approximately 140m to the southeast of the site.
- The proposal is classed as less vulnerable development by TAN-15.
- The site is located within Zone B and C2, as categorised by NRW's Development Advice Maps. Zone B is described as areas known to have been flooded in the past evidenced by sedimentary deposits. Zone C2 is described as areas of the floodplain without significant flood defence infrastructure. Less vulnerable development within Zone C2 can occur subject to the application of a Justification Test, including the acceptability of consequences.
- The site is at very low risk of surface water and groundwater flooding, at low risk of reservoir flooding and low-moderate risk of sewer flooding.
- To better assess the tidal and fluvial flood risks, an up-to-date detailed flood model of Port Talbot has been used.
- The proposed development site is predicted to be flood free during the tidal 0.5% AEP plus climate change and 0.1% AEP plus climate change and fluvial 1% AEP plus climate change events, satisfying the requirements of A1.14 and A1.15 of TAN-15.
- During the 0.1% AEP fluvial event, the proposed development is predicted to experience shallow flooding, to a maximum depth of 0.02m, satisfying the requirements of A1.15 of TAN-15.
- The site satisfies all the requirements of the Justification Test and Acceptability Criteria.
- It is concluded that on the grounds of flood risk, the proposed development site is compliant with the aims and objectives of Planning Policy Wales and TAN-15.

A Appendices

Development Plan



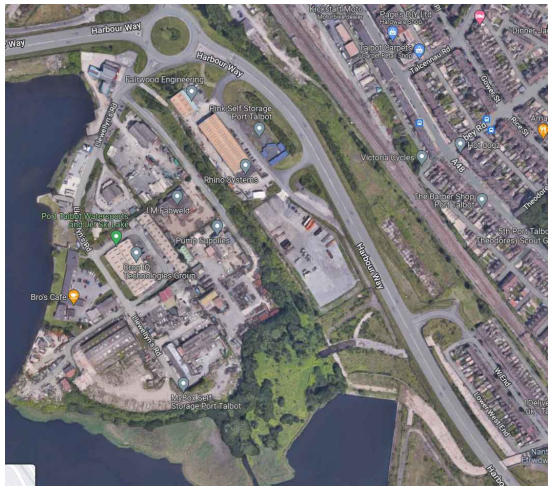
Current Tan15 Development Advice Map 1:10,000



Sea Map 1:10,000



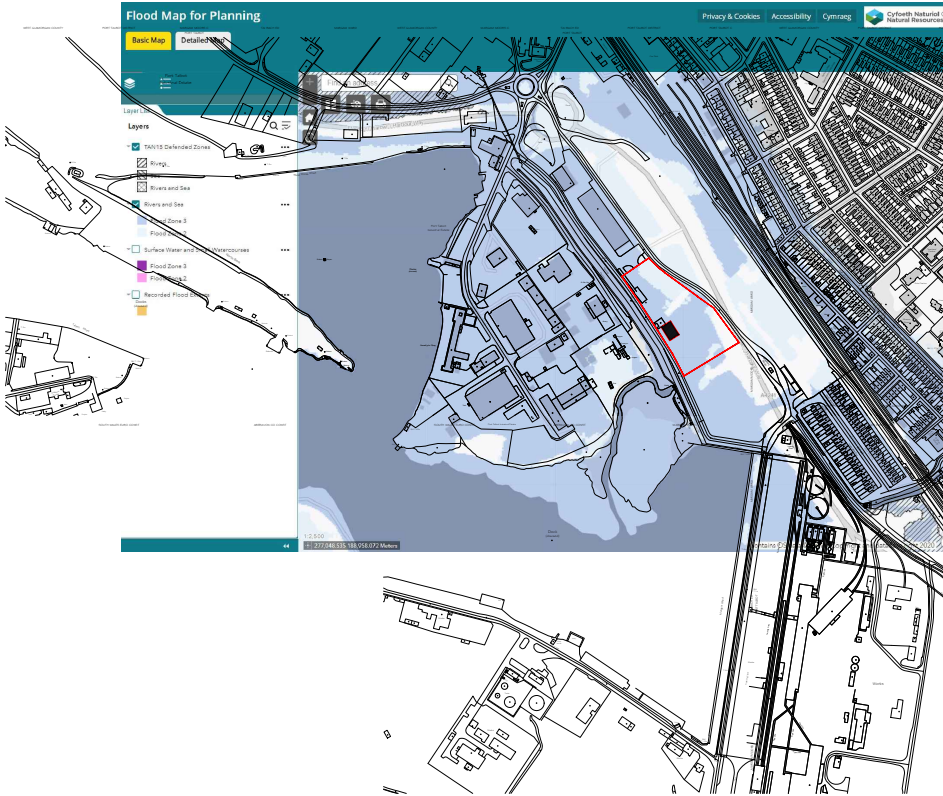
Reservoir Map 1:10,000



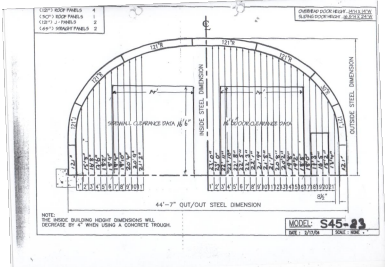
Aerial n.t.s



NRW Local model 1:10,000



River and Sea Map 1:10,000



Proposed Building n.t.s

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