

Mount Surgery Flood Consequence Assessment March 2021



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Executive Summary

Site Name	Mount Surgery
Location	Mount Surgery, Margam Road, Port Talbot
Client	Swansea University Health Board
Grid Reference	SS 77572 88591
Area (ha)	0.01
NRW Flood Zone	Flood Zone 2
NRW DAM	Zone C2
Current Site Use	Doctor's surgery / Medical Centre
Description of proposed	Constructing an extension to the existing medical centre.
Vulnerability Classification	Less Vulnerable
History of Flooding	Site is outside extents of recorded flood outlines
Flood Defences	Flood defence wall located 460m north of the site (no impact on development site)
Summary of Pre-development Risks	• Fluvial Flood Risk: Low Risk • Tidal Flood Risk: No Risk • Flood Risk from Surface Water and Sewers: Low Risk • Groundwater Flood Risk: Very Low Risk • Flood Risk from Artificial Sources: Very Low Risk

1. Introduction

1.1 Requirement

Capita has been commissioned by Swansea Bay University Health Board, to undertake a Flood Consequence Assessment (FCA) to form part of an outline planning application for an extension to the existing surgery.

The purpose of this FCA is to identify all sources flood risk to the proposed development and also flood risk potentially arising from the development.

The FCA has been prepared in compliance and with regard to relevant planning policies including national policy (Planning Policy Wales) and the accompanying Technical Advice Note TAN15: Development and Flood Risk. The FCA also includes the consideration of climate change based on guidance in CL-03-16, Climate change allowance for Planning Purposes and Guidance for Flood Consequence Assessments: Climate Change Allowances

1.2 Development Proposals

The application is to provide an extension to the existing surgery building. The proposal will provide 3 additional consulting rooms, 1 treatment room and a utility room. The existing car park will also be redesigned to retain the current number of parking spaces.

1.3 Report Objectives

The contents of this FCA describes potential flood risk both to and arising from the proposed development. The aim of this assessment is to provide the level of detail necessary to demonstrate that the potential effects of flood risk (to the proposal), including the possible effects of climate change, have been addressed by:

- Identifying any sources of flood risk to the proposed development and associated construction infrastructure;
- Determining the consequences of flooding to and from the proposed development and advising on how this will be managed, if necessary;
- Proposing appropriate mitigation measures if applicable, to reduce the adverse effects of flooding; and
- Demonstrating the flood risk issues described in this assessment are compliant with the relevant guidance.

The aim of this assessment is to provide an evidence base which determines whether the proposed development is compliant with relevant legislation, policy and guidance with regard to flood risk.

1.4 Limitations

This report relies on publicly available information and information from suppliers which Capita assumes to be correct. Capita cannot and does not verify accuracy of this data, and it is outside the scope of this commission to do so.

1.5 Sources of Information

Sources of information used during the compilation of this report include:

- Neath Port Talbot County Borough Council Local Plan (2011-2026)
- Neath Port Talbot County Borough Council Preliminary Flood Risk Assessment (March 2011)
- Neath Port Talbot County Borough Council Strategic Flood Consequences Assessment (September 2014)
- Neath Port Talbot County Borough Council Local Flood Risk Management Strategy (June 2013)
- Neath Port Talbot County Borough Council Flood Risk Management Plan (2015)
- Western Wales River Basin Management Plan 2015-2021 (December 2015)
- Ogmore to Thawe (including Thaw and Cadoxton) Catchment Flood Management Plan (January 2010)
- Natural Resources Wales, Port Talbot Harbourside PAR Modelling Results and Reports (JBA, May 2016)
- Natural Resources Wales website – Flood Risk Map Viewer [Accessed 02/03/2021]
- Natural Resources Wales / Welsh Government – Lle Geo-Portal [02/03/2021]
- British Geological Survey (BGS) website – Geology of Britain Viewer [Accessed 02/03/2021]
- Cranfield Soil and Agrifood Institute website – Soilscales map [Accessed 02/03/21]

2. Updated Policy and Guidance

2.1 Flood and Water Management Act, 2010

Combined with the Flood Risk Regulations 2009 ('the Regulations'), (which enact the European Union (EU) Floods Directive in the England and Wales) the Flood and Water Management Act 2010 ('the Act') places significantly greater responsibility on Local Authorities to manage and lead on local flooding issues. The Act and the Regulations together raise the requirements and targets Local Authorities need to meet, including:

- Playing an active role leading Flood Risk Management;
- Development of Local Flood Risk Management Strategies (LFRMS);
- Implementing requirements of Flood and Water Management legislation;
- Development and implementation of drainage and flooding management strategies; and
- Responsibility for first approval, then adopting, management and maintenance of SuDS where they service more than one property.

2.2 National Strategy for Flood and Coastal Erosion Risk Management in Wales, October 2020

This strategy sets out how it is intended to manage the risks from flooding and coastal erosion across Wales. It sets objectives and measures for all partners to work towards over the life of the Strategy document, which is 10 years unless significant policy updates are required prior to that time. The aim of the strategy is to reduce the risks to people and communities from flooding and coastal erosion. In order to meet this aim five objectives have been set:

- Improving understanding and communication of risk;
- Preparedness and building resilience;
- Prioritising investment to the most at risk communities;
- Preventing more people becoming exposed to risk; and
- Providing an effective and sustained response to events.

Delivery of the strategy will involve a number of key stakeholder and Risk Management Authorities (RMAs) with specific roles and responsibilities. An overview of roles and responsibilities is shown below:

- Welsh Government: Set direction and objectives and prioritise funding
- NRW Oversight: General supervision and communication of flood and coastal erosion risk management in Wales
- Risk Management Authorities: Identify and manage risks.

2.3 Planning Policy Wales (11th Edition, 2021)

The Planning Policy Wales (PPW) sets out the National Planning Policy Framework for addressing land use planning issues in preparing and developing Local Development Plans (LDPs). The PPW is supplemented by a series of Technical Advice Notes (TANs), including TAN 15: Development and Flood Risk.

2.4 Technical Advice Note 15 (TAN15): Development and Flood Risk, July 2004

TAN15 provides technical guidance which advises on development and flood risk. It sets out a precautionary framework to guide planning with regard to flood risk. This is achieved by:

- A Development Advice Map (DAM) which contains three flood risk zones and should be used to trigger the appropriate tests; and
- Definitions of vulnerable development and advice on permissible uses in relation to the location and consequences of flooding.

DAMs have been drawn up for the whole of Wales, dividing it into three Development Advice Zones which represent different levels of risk from flooding. Zone C is further subdivided into Zone C1 and C2. The Development Advice Zones are described fully in Table 2-1.

Table 2-1 Development Advice Zones as defined by TAN15

Zone	Description of Zone	Use within the precautionary framework
A	Considered to be at little or no risk of fluvial or tidal/coastal flooding.	Used to indicate that justification test is not applicable and no need to consider flood risk further
B	Areas known to have been flooded in the past evidence by sedimentary deposits	Used as part of a precautionary approach to indicate where site levels should be checked against the extreme (0.1%) flood level. If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further.
C	Based on NRW (EA) extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal).	Used to indicate that flood issues should be considered as an integral part of decision making by the application of the justification test including assessment of consequences.
C1	Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.	Used to indicate that development can take place subject to application of justification test, including the acceptability of consequences.
C2	Areas of floodplain without significant flood defence infrastructure.	Used to indicate that only less vulnerable development should be considered subject to application of justification test, including acceptability of consequences. Emergency services and highly vulnerable development should not be considered.

As well as the risk of flooding, the type of development proposed is important when assessing flood risk. The precautionary framework identifies the vulnerability of different land uses to flooding and has sub-divided development into three categories as shown in Table 2-2.

Table 2-2 Development categories from TAN15

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), vulnerable industrial developments (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.

Development including transport infrastructure, will only be justified if it can be demonstrated that:

- i. 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;
- ii. 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,
- iii. It concurs with the aims of PPW and meets the definition of previously developed land; and
- iv. The potential consequences of a flooding event for the particular type of development have been considered, and in terms of the criteria contained in sections 5 and 7 and appendix 1 of TAN15 are found to be acceptable.

Assessing Flood Consequences

When a development passes the justification test, the potential of flooding is recognised and requires consideration in the planning of the development. A development should only proceed if the consequences of flooding can be managed to an acceptable level. It should be established whether suitable mitigation measures can be incorporated within the design to provide a development that is as safe as possible and there is:

- Minimal risk to life;
- Minimal disruption to people living and working in the area;
- Minimal potential damage to property
- Minimal impact of the proposed development on flood risk generally; and
- Minimal disruption to natural heritage.

TAN15 also provides indicative guidance for different types of development, for the probability of flood risk when the development should be flood free up to the appropriate threshold frequencies (see Table 2-3). The lifetime of the development should be considered when referring to the indicative guidance and appropriate climate change allowance applied if necessary.

Table 2-3 Flooding frequency thresholds for different development types from TAN15

Type of Development	Threshold frequency (years)	
	Fluvial	Tidal
Residential	1%	0.5%
Commercial/retail	1%	0.5%
Industrial	1%	0.5%
Emergency Services	0.1%	0.1%
General Infrastructure	1%	0.5%

Beyond the threshold frequency it is expected that the development would be flooded during extreme conditions. TAN 15 provides indicative guidance on what it considers to be tolerable conditions, in terms of flood depth, velocity, rate of rise and speed of inundation, for different types of development (Table 2-4).

Table 2-4 Indicative guidance on tolerable conditions in an extreme flood from TAN15

Type of Development	Maximum depth of flooding (mm)	Maximum rate of rise of floodwaters (m/hr)	Maximum speed of inundation of flood risk area (hrs)	Maximum velocity of flood waters (m/s)
	Property Access			Property Access
Residential	600 600	0.1	4	0.15 0.3
Commercial/retail	600 600	0.3	2	0.15 0.3
Industrial	1000 1000	0.3	2	0.3 0.45
Emergency Services	450 600	0.1	4	0.15 0.3
General Infrastructure	600 600	0.3	2	0.3 0.3

It should be noted that TAN15 has been subject to a review consultation which closed in January 2020. The draft updated TAN included proposals to:

- Replace the development advice map with a new Wales flood map accounting for climate change within the flood zones;
- Place a greater emphasis on the development plan and the value of strategic flood consequences assessments;
- Integrate guidance on coastal erosion with flood risk issues in TAN15; and
- Provide guidance for regeneration initiatives affecting communities in flood risk areas.

2.5 The SuDS Manual, CIRIA, 2015

This guidance provides best practice on planning, design, construction, operation and maintenance of SuDS to facilitate their effective implementation within developments.

It looks at how to maximise amenity and biodiversity benefits and deliver the key objectives of managing flood risk and water quality. There is also supporting information covering topics such as materials, landscape design, maintenance, community engagement, and costs and benefits. The information presented in the publications is a compendium of good practice, based on existing guidance and research both in the United Kingdom (UK) and internationally, and the practical experience of the authors, project steering group, and industry.

The guidance provides the framework for designing SuDS with confidence and to maximise benefits. Its contents are relevant for a wide-range of professions, and roles, and it highlights that through engagement and collaboration SuDS can be integrated into the design of urban areas, to create high quality places for future generations.

2.6 Welsh Government SUDS Guidance, October 2018

In October 2018, the Welsh government published a series of standards for the design of SUDS in proposed developments. They had defined a series of principles to underlie the design of SUDS, these are defined below:

- To manage water on or close to the surface and as close to the source of runoff as possible;
- Treat rainfall as a valuable natural resource;
- Ensure that pollution is prevented at source, rather than relying on the drainage system to treat or intercept it;
- Manage rainfall to help protect people from increased flood risk, and the environment from morphological and associated ecological damage resulting from changes in flow rates, patterns and sediment movement caused by development;
- Take account of likely future pressures on flood risk, the environment and water resources such as climate change and urban creep;
- Use the “SUDS Management Train”, using damage components in a series across a site to achieve a robust surface water management system (rather than using a single “end of pipe” feature, such as a pond, to serve the whole development);
- Maximise the delivery of benefits for amenity and biodiversity;
- Seek to make the best use of available land through multifunctional usage of public spaces and the public realm;
- Perform safely, reliably and effectively over the design life of the development taking into account the need for reasonable levels of maintenance;
- Avoid the need for pumping where possible; and
- Be affordable, taking into account both construction and long-term maintenance costs and the additional environmental and social benefits afforded the system.

The legislation states that all new developments where the construction area is 100m² or more, will require sustainable drainage systems for managing surface water.

2.7 Sustainable Drainage Approval Body

On 7th January 2019 Schedule 3 of the Flood and Water Management Act (2010) was implemented. The legislation applies to new development of more than one house or where the construction area is greater than 100m².

Each Local Authority in Wales has a statutory duty as a Sustainable Drainage Approval Body (SAB) to manage surface water from developments. This means that all compliant developments will need technical approval from the SAB for the design and construction of surface water drainage systems. It is the role of the SAB to assess the design of SuDS against the national standards for sustainable drainage and local policy requirements.

The duty of the SAB is to:

- Evaluate and approve drainage applications where construction work has drainage implications;
- Adopt and maintain surface water drainage systems according to Section 7 of Schedule 3 (FWMA);
- Inspect and enforce approved systems; and
- Offer non-statutory pre-application advice.

2.8 UK Climate Impact Programme (UKCP09 and UKCIP18)

In June 2009 the UK Climate Impact Programme released guidance with respect to climate change predictions (superseding UKCIP02). The predictions moved from a deterministic approach (i.e. one range of outcomes) to a probabilistic approach (i.e. a range of possible outcomes based on a range of climate change scenarios). In 2018 the latest climate change predictions were published (UKCP18). Work is still ongoing by the various lead organisations to incorporate this into the guidance for climate change allowances for fluvial flood risk. Therefore, the current NRW guidance, based on the UKCP09 predictions, is used in this FCA.

The UKCIP09 predicts that, by the 2050s, temperatures across Wales could rise by between 2.0 and 2.5°C. Annual average rainfall is expected to remain the same, but there is some difference expected in the seasonal variations of the storm events with winter rainfall expected to be more intense, but short-lived, rainfall events and summer rainfall may decrease with more frequent short term droughts.

The sea level along the Welsh coast is expected to rise and result in more severe coastal erosion and inundation in low lying coastal areas.

The Welsh Government development guidance on Climate Change Allowances (Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities in Wales, December 2017). Guidance is also provided in CI-03-16 – Climate change Allowances for Planning (August 2016) and guidance for Flood Consequence Assessments: Climate Change Allowances (August 2016)

The information provided in Table 2-5 below is derived for change to river flow likelihood of a 1 in 50 (2%) chance of occurring in any year. For extrapolation of these projections to other events, the research suggested that the regional allowances are likely to remain relatively constant with increasing return periods. The climate change allowances provided correspond to the central estimate of change from the research. The projections are percentage changes to a 1961-90 baseline.

Table 2-5 Changes to river flood flows for the Western Wales river basin district (use 1961-90)

	Total potential change anticipated for 2020s (2015- 2039)	Total potential change anticipated by the 2050s (2040- 2069)	Total potential change anticipated by the 2080s (2070- 2115)
Western Wales			
Upper end (90 th)	25%	40%	75%
Central (50 th)	15%	25%	30%
Lower end (10 th)	5%	10%	15%

Only maximum daily total rainfall data have been considered from the climate model projections. It is recommended that changes to rainfall intensity presented in Table 2-6 are used as the best available estimate.

Table 2-6 Change to extreme rainfall intensity compared to a 1961-90 baseline

	Total potential change anticipated for 2020s (2015- 2039)	Total potential change anticipated by the 2050s (2040- 2069)	Total potential change anticipated by the 2080s (2070- 2115)
Applies across all Wales			
Upper estimate	10%	20%	40%
Central estimate	5%	10%	20%

As with river flood flows, it is recommended that the 2080s changes are used when considering any time beyond 2115.

3. Local Policy and Plans

3.1 Neath Port Talbot County Borough Council Local Plan (2011-2026) (Adopted January 2016)

Neath Port Talbot County Borough Council (NPTCBC) is required under the Planning and Compulsory Purchase Act 2004 to prepare a Local Development Plan (LDP)¹ which sets out where, when and how much new development can take place over the next 15 years (2011-2026).

Section 3.0.5 further reiterates that new developments will be expected to avoid unnecessary flood risk and to meet the requirements of TAN15.

In addition, Strategic Policy 2 (SP2) – ‘Addressing health and sickness issues through the retention of accessible leisure, recreational, health, social and community facilities of the Local Plan is relevant to this proposed development. Part of the strategy for the plan, namely section 2.5.18 highlights that poor health has been identified as a key issue for Neath Port Talbot and that a number of principles to help foster a healthier community with access to services are key. Section 3.0.8 further states that the multi-use facilities and the co-location of new health and community facilities are also encouraged.

3.2 Neath Port Talbot County Borough Council Preliminary Flood Risk Assessment (March 2011)

The Preliminary Flood Risk Assessment (PFRA)² is required to help manage local flood risk and deliver the requirements of the Flood Risk Regulations (2009) which defines Neath Port Talbot County Borough Council as the Lead Local Flood Authority (LLFA). The PFRA for Neath Port Talbot County Borough Council is intended to provide a high-level assessment of local flood risk across the study area, including information on past floods and the potential consequences of future floods. It is not the intention of the PRFA to cover in any great detail instances of localised flooding.

The PFRA considers past flooding and possible future flooding from the following local flood sources:

- Surface water;
- Groundwater;
- Ordinary watercourses; and
- Canals (in certain circumstances).

The key objectives for the PFRA can be summarised as follows:

- To identify relevant partner organisations involved in future assessment of flood risk; and summarise means of future and ongoing stakeholder engagement;

¹ Local Development Plan, Neath Port Talbot County Borough Council, https://www.npt.gov.uk/media/7321/ldp_written_statement_jan16.pdf?v=20170727124344, adopted 2016

² Preliminary Flood Risk Assessment, Neath Port Talbot County Borough Council, [npt.gov.uk/media/4629/pfra_report_2011.pdf](https://www.npt.gov.uk/media/4629/pfra_report_2011.pdf), March 2011

- To describe arrangements for partnership and collaboration for ongoing collection, assessment and storage of flood risk data and information;
- To provide a summary of the systems used for data sharing and storing, and provision for quality assurance, security and data licensing arrangements;
- To summarise the methodology adopted for the PFRA with respect to data sources, availability and review procedures;
- To assess historic flood events within the study area from local sources of flooding (including flooding from surface water, groundwater and ordinary watercourses), and the consequences and impacts of these events;
- To establish an evidence base of historic flood risk information, which will be built up on in the future and used to support and inform the preparation of the Council's Local Flood Risk Strategy; and
- To assess the potential harmful consequences of future flood events within the study area; Review the provisional national assessment of indicative Flood Risk Areas provided by the Environment Agency and provide explanation and justification for any amendments required to the Flood Risk Areas.

3.3 Neath Port Talbot County Borough Council Strategic Flood Consequence Assessment (September 2014)

The Strategic Flood Consequences Assessment (SFCA)³ informs planning policies, assists in a realistic approach to managing risk of flooding and is intended to provide a sufficient evidence base for the LDP.

The SFCA process is split into three stages:

- Stages 1 & 2: involve assessing the information available on flood risk in order to identify areas at risk from flooding and discussion of how this relates to the areas proposed for development and growth in the LDP; and
- Stage 3: presents more detailed and technical investigations where required for specific proposals which lie within flood risk areas.

The following objectives have been identified from this document:

- To identify the various relevant sources of flooding;
- To identify existing flood defences and flood management regimes in order that these can be taken into account;
- To identify those areas of the county borough that may have been identified for growth and development over the LDP period that may be vulnerable to any type of flooding; and
- To assess the likely consequences of flooding in relevant areas and assess whether these can be managed or mitigated.

The main areas of concern in relation to flood consequences that the SFCA concluded were:

- Low lying coastal areas with the potential impacts from tidal surges and stormy weather;
- Extensive portions of the valley floors being at risk from flooding;
- The risk of rapid changes in water level in the area's fast flowing rivers and streams;

³ Strategic Flood Consequences Assessment Stages 1 & 2, Neath Port Talbot County Borough Council, https://www.npt.gov.uk/media/5137/ldp_submission_eb01.pdf, September 2014

- The need to take into account the increased impacts likely to follow from climate change; and
- The in-combination cause of flooding where the watercourses meet tidal or storm surges.

3.4 Neath Port Talbot County Borough Council Local Flood Risk Management Strategy (June 2013)

A Local Flood Risk Management Strategy (LFRMS)⁴ is required to be produced by all LLFAs to set out how local flood risks will be managed in the county, who will deliver them and how they will be funded. It is the LLFAs responsibility to manage the risks associated with flooding from these sources:

- Surface water
- Groundwater
- Ordinary watercourses.

The LFRMS determines the locally significant flood risk for the area, focusing mainly on flooding from surface water, groundwater and ordinary watercourses, and helps everyone affected to understand and manage flood risk. It also considers significant interactions with main rivers and sewer.

3.5 Neath Port Talbot County Borough Council Flood Risk Management Plan (2015)

Flood Risk Management Plans (FRMPs)⁵ are a requirement of the Flood Risk Regulations (2009) and establish long term policies in order to manage flood risk in a sustainable way with their designated stakeholders. The NPTCBC FRMP is a further extension of the work previously undertaken for the PFRA and LFRMS providing a greater focus on the areas at risk of flooding and identifies measures to reduce that risk by taking forward the objectives and actions laid out in the LFRMS.

The four overarching objectives are:

- Reducing the consequences for individuals, communities business and the environment from flooding and coastal erosion;
- Raising awareness of and engaging people in the response to flood and coastal erosion risk;
- Providing an effective and sustained response to flood and coastal erosion events; and
- Prioritising investment in the most at risk communities.

The development site is within the community area of Margam.

⁴ Local Flood Risk Management Strategy, Neath Port Talbot County Borough Council, <https://www.npt.gov.uk/4520>, June 2013

⁵ Flood Management Plan, Neath Port Talbot County Borough Council, <https://www.npt.gov.uk/6789>, 2015

3.6 Western Wales River Basin Management Plan 2015-2021 (December 2015)

Under the EU Water Framework Directive (WFD) a management plan is required for each River Basin District (RBD) with the Western Wales River Basin Management Plan (RBMP)⁶ being first published in 2009. This document is scheduled to be reviewed in 2021 with an update to be published following the review as river basin management details a continuous cycle of planning and delivery.

The purpose of this management plan is to protect and improve the water environment for the wider benefits to people and wildlife. In order to achieve this, the plan includes a summary of the Programme of Measures needed to achieve the objectives of the WFD together with the predicted environmental outcomes over the next six years. Collectively, the approach and actions set out in this plan will have an effect on all types of water across the catchments that make up the management plan, this includes; rivers, lakes, canals, groundwater, wetlands, estuaries and coastal waters. The plan aims to be integrated at the catchment scale ensuring a connection across the wider environment for people and wildlife, from catchment to coast.

3.7 Ogmore to Tawe (including Thaw and Cadoxton) Catchment Flood Management Plan (January 2010)

The role of Catchment Flood Management Plans (CFMPs) is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. The CFMP considers all types of inland flooding, from rivers, groundwater, surface water and tidal flooding, but not flooding directly from the sea (coastal flooding), which is covered by Shoreline Management Plans (SMPs).

The Ogmore to Tawe (including Thaw and Cadoxton) CFMP⁷ is situated in South Wales. It covers approximately 1,300 km² and around 196,000 properties, in an area extending from Swansea docks to Penarth point and the Brecon Beacons to the north.

The CFMP identified that there is a risk within Port Talbot sub-catchment of fast responding rivers with a risk of overtopping of defences on the Afon Afan and Ffrwd Wyllt.

⁶ Western Wales River Basin Management Plan 2015-2021, Natural Resources Wales, <https://cdn.cyfoethnaturiol.cymru/media/676165/wwrbdsunmary.pdf?mode=pad&rnd=1315963694000000>, December 2015

⁷ Catchment Flood Management Plan, Environment Agency Wales, [https://www.npt.gov.uk/ldpexamination/SWW04%20Ogmore%20to%20Tawe%20CFMP%20\(EA%20Wales%202010\).pdf](https://www.npt.gov.uk/ldpexamination/SWW04%20Ogmore%20to%20Tawe%20CFMP%20(EA%20Wales%202010).pdf), January 2010

4. Development Site

4.1 Site Location and Description

The site is an existing surgery located on Margam Road, Port Talbot (NGR: SS 77572 88591). The proposed development is for an extension to the existing surgery to provide 3 consulting rooms, a treatment room and a utility room. The existing car park will also be redesigned to retain the number of available parking spaces. The access to the site will remain unchanged as a result of the construction. The area of the proposed extension is approximately 0.01ha / 116m².

The South Wales Main Line railway runs along the south-eastern border of the existing site with Margam Road to the north east.

The site location with existing structure is shown below in Figure 4-1. This boundary has been estimated from drawings provided by the client.

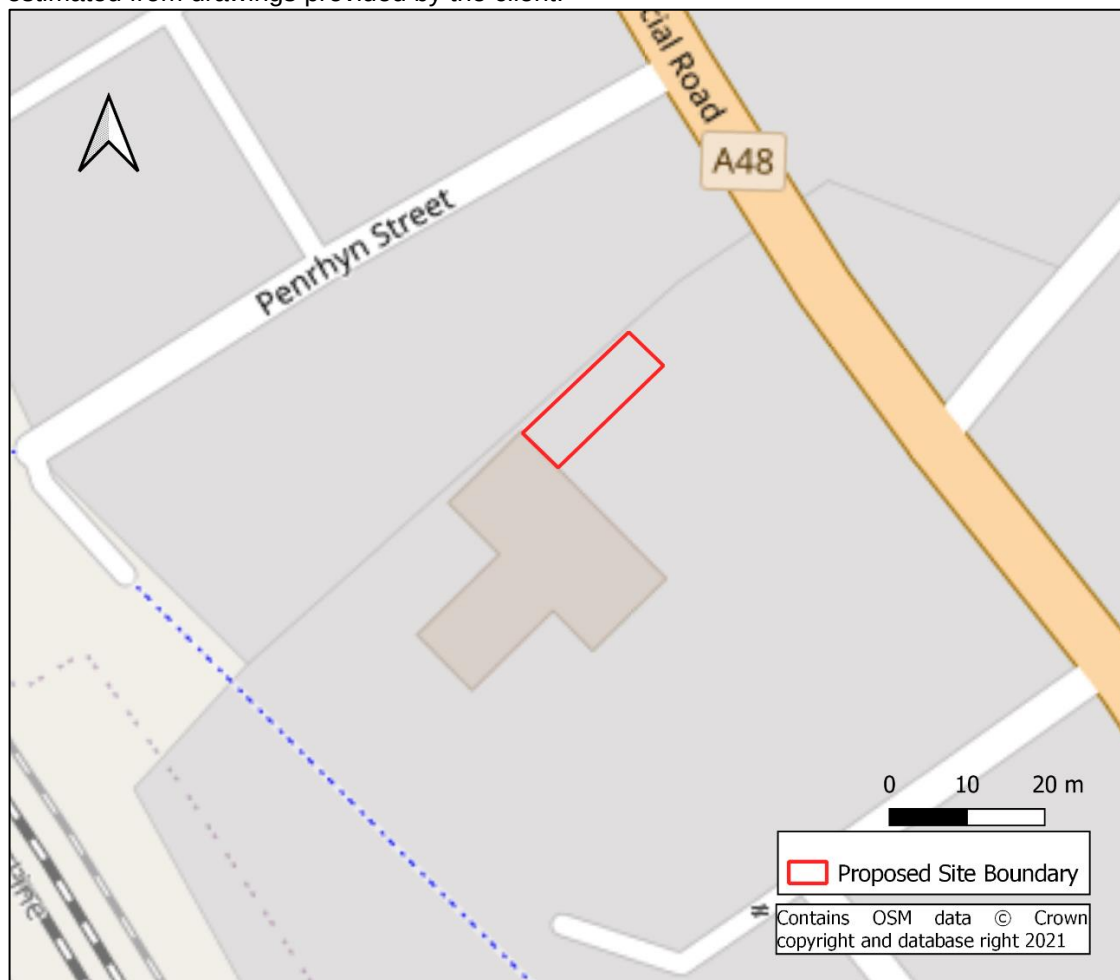


Figure 4-1 Proposed site location

4.2 Topographic Survey and Site Levels

Topographic survey of the site was not available at the time of this study. Site levels have been extracted from LIDAR and are shown on Figure 4-2.

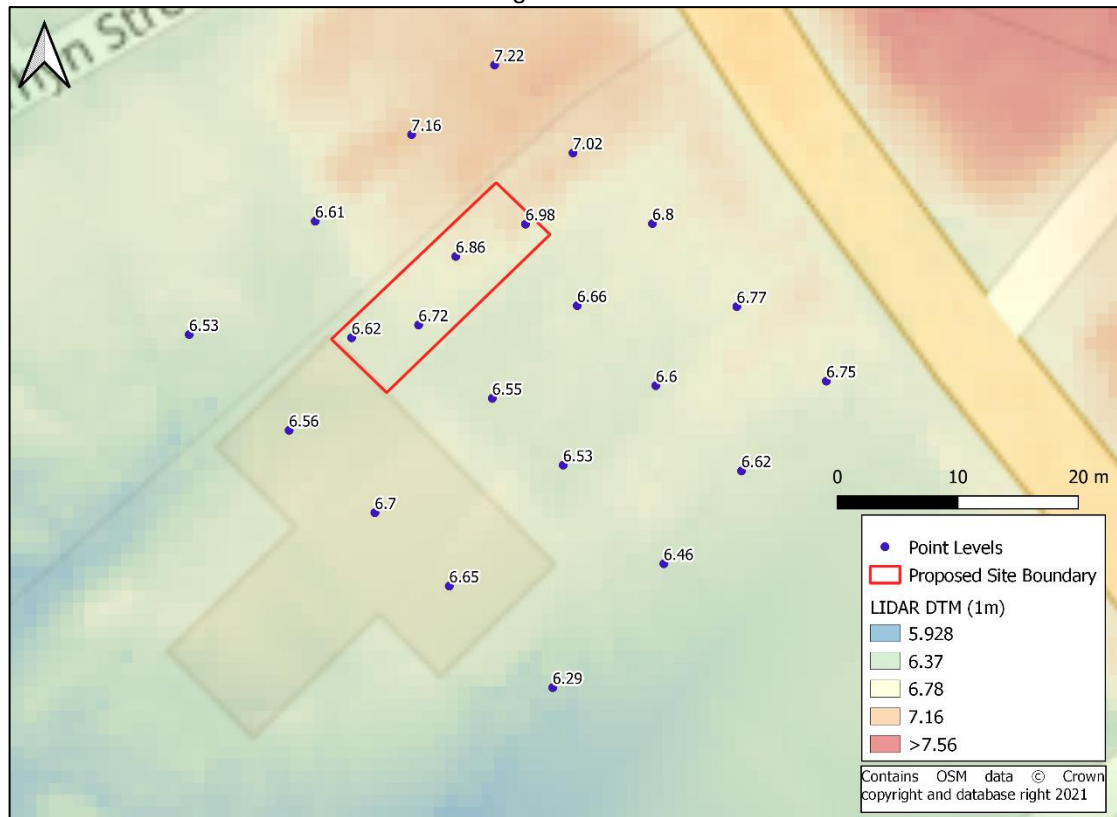


Figure 4-2 Ground levels across the proposed site

Ground levels are shown to be between 6.62mAOD and 6.98mAOD in the proposed development site. There is a slight increase in gradient with the ground levels rising towards the north of the site. Levels on Margam Road are between 6.7mAOD and 6.9mAOD.

4.3 Local Geology

BGS 1:50,000 Geology of Britain Viewer indicates the site is underlain by superficial deposits of Tidal Flat Deposits, consisting of clay, silt and sand. The superficial deposits are underlain by bedrock of the South Wales Middle Coal Measure Formation consisting of mudstone, siltstone and sandstone. Borehole records in close proximity to the site (approximately 80m to the south of the site) indicate a layer of made ground consisting of loose sandy ash, cinder and brick overlying clay, gravel and sand.

4.4 Soil Geology

Soil records across the proposed site have been shown to have characteristics of freely draining acid loamy soils over rock.

4.5 Surface Water Features

The nearest surface water features to the site is a Main River, listed as Nant Ffrwdwyllt, which flows from north east to south west, eventually flowing into Swansea Bay. This Nant Ffrwdwyllt is fed by multiple ordinary watercourses further upstream including the Nant Cwm-Y-Garn and Nant Cwmwernderi, the latter of which flows from the Cwmwernderi reservoir, located north west of the development site.

4.6 Development Advice Map (DAM)

The DAM shows the proposed site boundary to be mostly within Zone C2 with a small area at the northern end being in Zone B, see Figure 4-3.

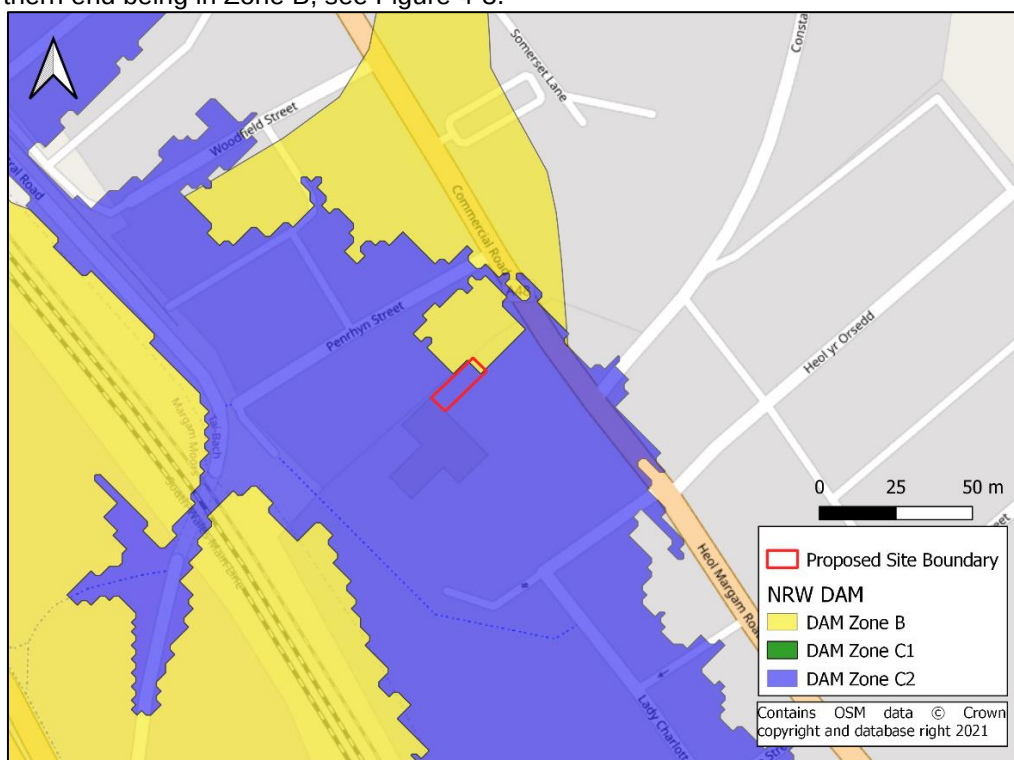


Figure 4-3 Development Advice Map Zones

The NRW website currently advises that the DAM will be replaced in Spring 2021 by the new Flood Map for Planning.

4.7 Climate Change

When considering new development proposals, TAN15 states that it is necessary to take account of the potential impact of climate change over the lifetime of development. This includes taking account of allowances for the potential impacts of climate change on flood risk.

The climate change allowances shown in Table 2-5 and Table 2-6 provide the details of these allowances for Western Wales. The guidance for Flood Consequence Assessments: Climate Change Allowances (August 2016) states that it is recommended that the central estimate, for the 2080s for the relevant river basin district should be used to assess the potential impact of climate change as part of a flood consequence assessment. This equates to an increase of 30% on the peak flow estimates for the study area.

4.8 Flood Defences

The NRW spatial flood defence information indicates there is a flood defence present approximately 460m north west of the site:

- A fluvial flood defence wall on the banks of Nant Ffrwdwyllt near the railway crossing of the watercourse and Harbour Way. The asset has a designed standard of protection of 100 years and a condition rating of 3/fair⁸.

The proposed development is shown to be outside the 'Areas Benefitting from Flood Defences' layer from NRW mapping in addition to being in DAM Zone C2 (areas of the floodplain without significant flood defence infrastructure) meaning that the proposed site is not considered to be protected by this defence.

4.9 Vulnerability Classification

The proposed development is considered to fall under the classification of 'Less Vulnerable' land use as shown in Table 2-2.

4.10 Justification Test

TAN15 (Section 6.2) highlights that new development should be directed away from DAM Zone C and towards Zone B or Zone A where river/coastal flooding is less of an issue. For development within Zone C, the justification test needs to be applied to demonstrate that any development in these zones has been justified and the assessment of consequences following a flood event has been accepted. Further details are provided in chapter 6.

⁸ Guidance on Determining Asset Deterioration and the Use of Condition Grade Deterioration Curves, Environment Agency 2009, Table 1.1.

5. Sources of Flooding – Flood Risk

It is necessary to consider the risk of flooding from all sources within an FCA. This section provides a review of flooding from land, sewers, groundwater and artificial sources, in addition to that from rivers and the sea.

5.1 Fluvial Flood Risk

NRW's Flood Risk Assessment Map indicates the development site is situated almost entirely within areas classed as being at low risk. Areas of medium risk are shown to the south and west of the existing site, originating from the Nant Ffrwdwyllt.

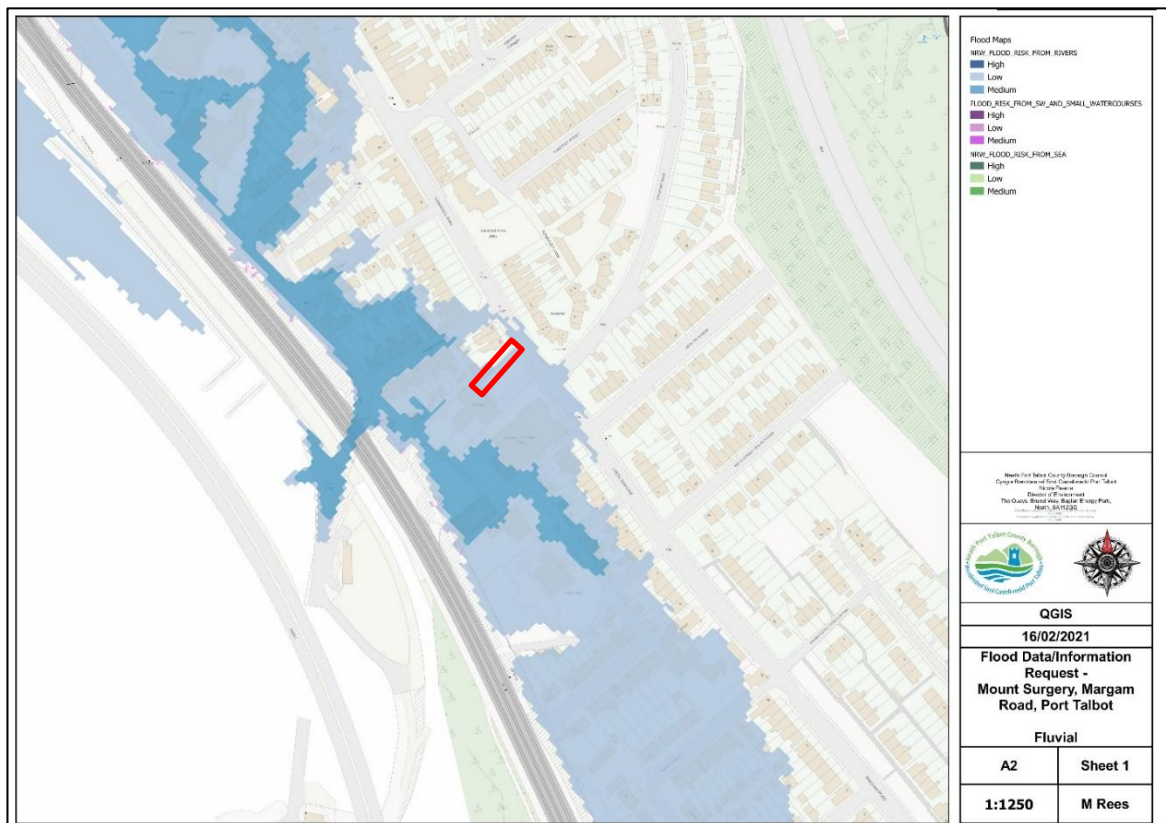


Figure 5-1 Development site with NRW Flood Risk from Rivers Extent mapping

Flood extent, water level, depth and velocity data was provided by NRW based on the hydraulic modelling undertaken by JBA Consulting in 2016 for the Port Talbot Harbourside Project Appraisal Report (PAR). Flood extents for the defended scenario 1% AEP and 0.1% AEP events match with Medium and Low risk flood extents shown in Figure 5-1. The proposed development site is shown to be outside the 1% AEP (defended) flood extents though the site is mostly within the 0.1% AEP (defended) flood extents.

The 1% AEP climate change; defended scenario extent is shown on Figure 5-2. The climate change modelling for the 2116 scenario undertaken as part of the NRW Port Talbot Harbourside Project Appraisal Report study, increased fluvial inflows by 30%, matching the central estimate for the 2080s. In this event, flood outlines are shown to extend over the southern third of the site with land to the south also being inundated. Margam Road remains outside the flood extents and so safe access/egress for the site is achievable from the main road.



Figure 5-2 Development site with 1% AEP plus CC 2116 defended scenario flood extents

Flood depths within the development site for the extension; in the 1% AEP CC event are approximately 0.03m, so very low. Flood depths are slightly increased in the car park for this event though depths are approximately 0.1m so still very low. It is recommended that the finished floor levels are set 300mm above the 1% CC flood level of 6.67mAOD.

The proposed development will comply with section A1.14 of TAN15; the development will be flood free during the 1% AEP design flood event. When considering future climate change the proposed extension to the building will remain flood free in the 1% AEP design event. The existing car park is at risk in the 1% AEP with climate change scenario, but flood depths are <0.1m. Flood risk management measures are proposed in section 6.

The proposed development site is within the 0.1% AEP (defended) flood extents. Within the proposed extension site, flood depths in the 0.1% AEP event are mainly predicted to be between 0.01 and 0.3m with depths being between 0.1 and 0.3m in the car park.

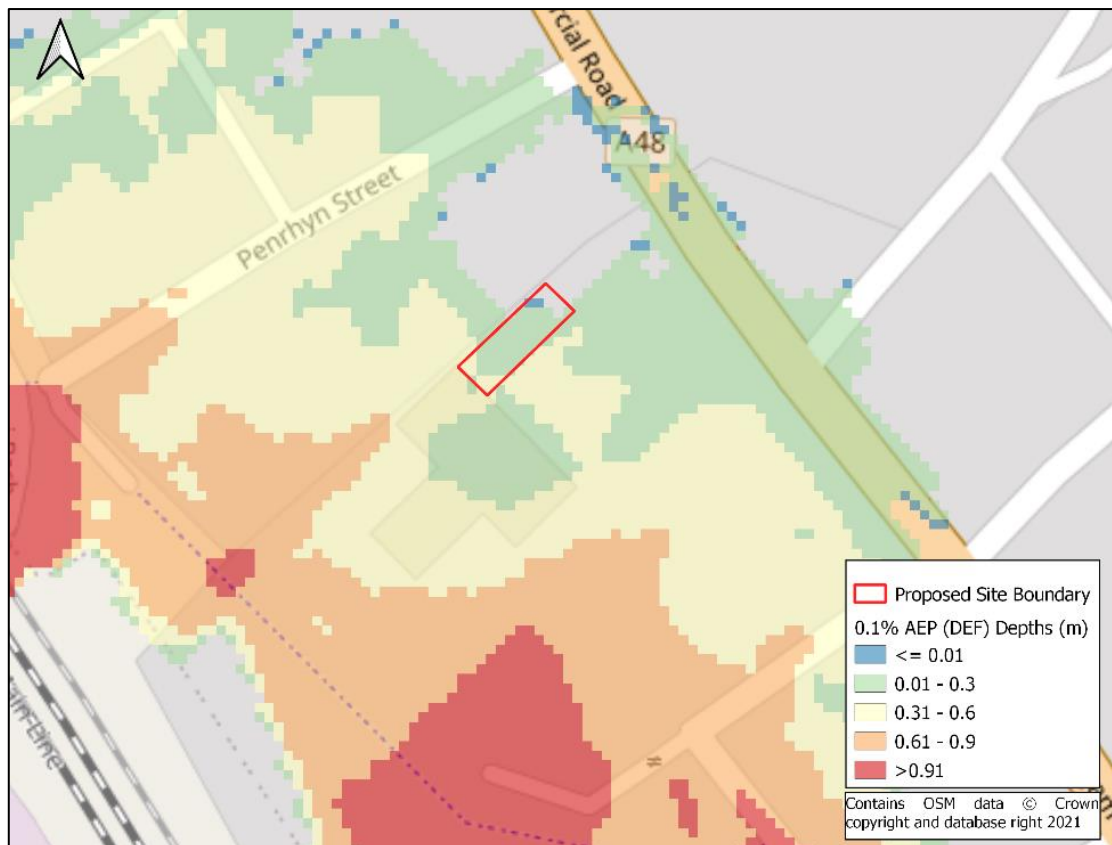


Figure 5-3 Development site with 0.1% AEP (defended) flood depths (m)

The velocities of flood water during a 0.1% AEP (defended) event within the extension site boundary are modelled at 0.01-0.3m/s with these velocities being the same across the car park also, see Figure 5-4.

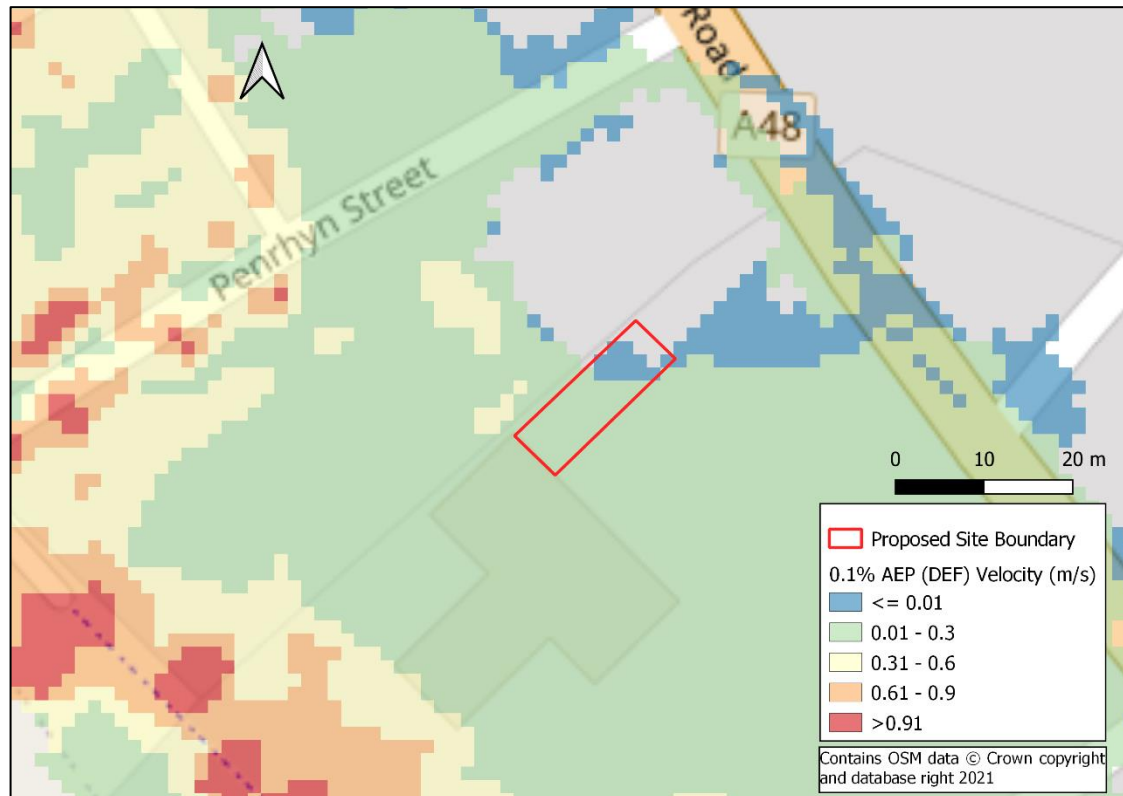


Figure 5-4 Development site with 0.1% AEP (defended) velocities (m/s)

The rate of rise of flood water (m/hr) to the development site has been calculated from the model as being 0.21m/hr with the speed of inundation of floodwater also calculated as approximately 3 hours.

Fluvial flood risk to the proposed development is concluded to be low.

5.2 Flood Risk from the sea

Tidal flooding occurs when a high tide exceeds the level of coastal land or coastal flood defences. This may be in combination with a storm surge. Coastal flooding can also be caused by wave overtopping.

Flooding can also be caused as a result of 'tide locking' rivers or estuaries. Tide locking prevents a river from discharging into the sea, causing 'backing up' and resulting in tidal/fluvial flooding.

The development is shown to be outside areas at risk of flooding from the sea according to NRW Flood Risk Assessment Wales map for flood Risk from the sea.

Flooding from sewers occur when the sewer is overwhelmed by heavy rainfall, becomes blocked or is inadequately designed. Sewers are generally designed to cope with mid to low order rainfall events (i.e. not to flood during events up to the 1 in 30-year return period).

Mapping supplied by the council showed there to be several gullies on Margam Road near the existing Surgery.

The Neath Port Talbot County Borough Council FRMP (2015) identified that according to the DG5 register, there had been a total of 430 sewer flooding events that had been recorded by water companies across the county borough of which 355 were identified as being at high risk. However, information supplied by the Neath Port Talbot County Borough Council highlighted that there have been no known or recorded flood incidents in the vicinity of the development site including from drains and sewers.

Surface water risk to the proposed development site is concluded to be low.

5.4 Groundwater Flood Risk

Groundwater flooding occurs when the water table rises above ground level as a result of substantial groundwater flow through permeable ground from surrounding land or from a spring line. Below ground structures such as basements are at particularly risk from groundwater.

The Ogmore to Tawe CFMP highlighted that groundwater flooding is not well documented within the CFMP area and so there is a general lack information regarding groundwater flood risk in the catchment. The CFMP does state that it should be expected that groundwater risk will increase over time.

The Neath Port Talbot PFRA states that there is no local information which provides evidence of future groundwater flood risk as well as highlighting that there are no specific areas of historical flooding recorded in the Neath Port Talbot area. The report concludes that overall groundwater is not considered to a major source of flooding in the county.

The risk to the development site from groundwater is concluded to be very low.

5.5 Flood Risk from Artificial Sources

Artificial sources of flooding include reservoirs, canals, ponds and mining abstractions.

The NRW Flood Risk map shows the development site to be within the 'Flood Risk from Reservoirs' extent, with the source of potential flooding being the Cwmwernderi Reservoir, ~4.3km north west of the development site. NRW states that reservoir flooding is extremely unlikely to happen, with there being no loss of life in the UK from an incident since 1925. The reservoir flood maps do not indicate any likelihood of a flood occurring and instead shows the worst-case scenario for the area that could be flooded if a reservoir were to fail and release the water it holds.

There are no canals with the potential to breach / overtop in the vicinity of the proposed development.

No further artificial waterbodies have been identified within the vicinity of the site. It is concluded that the site is at a very low risk of flooding from artificial sources.

5.6 Historical Flood Risk

NRW's 'Recorded Flood Extents' dataset does not record any historic flooding that overlaps with the proposed development site.

5.7 Summary of Flood Risk

Table 5-1: Summary of Flood Risk

Source of risk	Ongoing risk
Fluvial Flood Risk	Low Risk
Tidal Flood Risk	No Risk
Flood Risk from Surface Water and Sewers	Low Risk
Groundwater Flood Risk	Very low Risk
Flood Risk from Artificial Sources	Very low Risk

6. Flood Risk Management Considerations and Assessment

6.1 Principles of Flood Risk Management and the Justification Test

TAN15 requires a precautionary approach to be undertaken when making land use planning decisions regarding flood risk. This is partly due to the considerable uncertainty surrounding flooding mechanisms and how flooding may respond to climate change. The aim should be to direct new development away from areas at risk of flooding, if possible. However, section 6.1 of TAN15 also recognises that some flexibility is necessary to enable the risks of flooding to be addressed whilst recognising the negative economic and social consequences if policy were to preclude investment in existing urban areas, and the benefits of reusing previously developed land.

Flood risk is a combination of the probability of flooding and the consequences of flooding. Hence 'managing flood risk' involves managing either, the probability of flooding or the consequences of flooding, or both.

TAN15, states that general employment is considered less vulnerable development. These types of development are compatible in all DAM zones but where the site is within DAM Zone C2 (as is the case with the proposed site), the justification test and acceptability criteria need to be met. Development should be directed towards areas with least risk of flooding.

As the development site is almost wholly within DAM Zone C2, development must be shown as being justified in its location following the application of the justification test (section 6, TAN15). Section 2.4 discusses the test and the criteria required to be met and passed for a development. For the proposed development it can be demonstrated that the development meets criteria i to iii:

- i and ii - The Neath Port Talbot Local Plan highlights several strategies focused on improving health and wellbeing benefits in communities (Section 2.5.18, NPT Local Plan) as well as promoting access to facilities (Section 3.0.8, NPT Local Plan). The extension of the existing surgery site will increase availability of health care facilities; and
- iii - The development site is on land currently used as a car park and so is previously developed.

The fourth element of the justification test requires that the potential consequences of flooding have been considered. The potential impacts and consequences of flooding to the site have been discussed in Section 5 of this assessment.

The primary risk to the site has been identified as fluvial flooding with a secondary risk from surface water. Modelling shows the site being outside the flood extents of the 1% AEP defended event though it is within the extents for the 0.1% AEP defended event. Depths from the 0.1% AEP are between 0.01-0.3m within the site boundary increasing towards the existing doctor's surgery structure with flood depths on Margam Road also being between 0.01-0.3m. With the addition of climate change, southern parts of the development site are shown to be at risk TAN15 details several recommendations to inform acceptability of flood risk at a development site. The rate of rise for floodwater to the site development site is 0.21m/hr which is below the TAN15 guidance

value of 0.3m/hr. The maximum speed of inundation to the site was also calculated from the modelling as 3hrs which is again within the threshold recommended by TAN15. The development has thus shown to be within the guidance and recommendations that TAN15 provides, shown in Table 2-3 and Table 2-4.

TAN15 states that these recommendations are not prescriptive and only provide indicative guidance on what is considered tolerable conditions for different types of developments. The requirements are indicative and reflect conditions in which, given the presence of adequate warnings and preparation, appropriately equipped personnel could undertake emergency activities. However, they are not definitive. Each site must therefore be considered individually, and a judgement taken in the context of the particular circumstances which could prevail at that site.

Surface water poses a secondary risk to the development site with southern areas of the site within low risk extents as well as land to the south and west though Margam Road remains outside these extents. The low risk extents can be used as a proxy for the effects of climate change on surface water meaning that the proposed development would remain largely free from surface water risk plus climate change.

The proposed development is not anticipated to increase flood risk elsewhere as the inclusion of SuDS into the design has the potential to successfully manage surface runoff and flood risk from the development with an aim to better greenfield runoff rates. The small footprint of the proposed extension is unlikely to significantly impact on flood risk elsewhere.

Flooding from tidal, ground water, sewers and drains and artificial sources were shown to present a very low or low risk to the site.

The probability of flooding to the site is low, and with the flood mitigation and management measures outlined in section 6.2 there will be:

- minimal risk to life;
- minimal disruption to people living and working in the area,
- minimal potential damage to property;
- minimal impact of the proposed development on flood risk generally

6.2 Management of Flood Risk at the Site

No drainage strategy or detailed design plans are currently available for the development site so recommendations for flood risk have been made based on available information.

Finished flood levels (FFLs) for the proposed extension should be at minimum constructed above the 1% AEP CC level of 6.67mAOD (plus 300mm freeboard) to mitigate the fluvial flood risk shown by the modelling.

Signage should be included in the car park to warn users there is a risk of flooding along with implementation of a time limit on parking to minimise risk to individual users of the Surgery.

The existing surgery has confirmed they are signed up to weather alerts from the Met Office, but they are located outside of the area covered by National Resources Wales flood

The Existing surgery have confirmed that have a continuity plan & recovery toolkit which includes procedures to follow in the event of flooding.

The NRW surface water risk map (Figure 5-5) demonstrates the flood extents to follow the boundary of the existing structure with the doctor's surgery remaining outside these extents. As such, the FFL of the extension should at least match the current floor level of the existing surgery to remain outside surface water flood risk extents.

Access and egress to the site from the Margam Road should be made achievable at all times as this is primary transport route and will act as the access/egress route during a flood event.

A drainage strategy should be included with the planning application to demonstrate that runoff and drainage within the development can be effectively managed without increasing the risk off-site. As the development site is >100m², approval from a SAB will be required for any drainage strategy to be put in place, see Section 2.7.

7. Conclusions & Recommendations

The Flood Consequence Assessment has been undertaken to review the flood risk associated with the proposed extension to Mount Surgery, Margam Road, Port Talbot.

The proposed development site has been shown to satisfy criteria i to iii of TAN15 with criteria iv being assessed through this report.

The majority of the site is within DAM Zone C2. Overall flood risk to the site from various sources has been determined to be low, with fluvial and surface water risk being identified as the primary and secondary sources of flooding. The site is within the flood extents for the 0.1% AEP event and 1% AEP +CC event though in both these events, flood depths within the site are predicted by modelling at between 0.01-0.3m. Flooding velocities during the 0.1% AEP have been modelled as between 0.01-0.3m/s with average velocities of 0.1m/s within the extension site boundary and the car park. Surface water extents overlap with southern areas of the development and bound the site to the south and west. Rate of rise of floodwater is 0.21m/hr with speed of inundation to the development site being 3hrs.

The justification test has been applied due to the site's vulnerability classification and location within Zone C2 with the development shown to be within the guidance recommendations from TAN15.

The drainage strategy (not currently available) should be included with the planning application to demonstrate how runoff can be sufficiently managed at the site. It should demonstrate that flood risk will not be increased as a result of development and if possible, a betterment can be achieved. As the development site is $>100\text{m}^2$, approval from a SAB will be required for any drainage strategy to be put in place, see Section 2.7.

For future development at this site, finished flood levels (FFLs) for the proposed extension and car park should be at minimum constructed above the 1% AEP CC level of 6.67mAOD (plus 300mm freeboard) to mitigate the fluvial flood risk depths shown by the modelling.

Signage should be included in the car park to warn users of the site of the potential risk of flooding. It is understood that the surgery is already signed up to available weather warnings and a flood continuity plan and toolkit are in place to be used in the event of flooding.

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