

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement

JBA
consulting

1 Introduction

1.1 Terms of Reference

JBA Consulting were commissioned by Bingham Hall Partnership Ltd to prepare a Flood Risk Statement (FRS) for a proposed new teaching block at Ysgol Gyfun Ystalyfera School.

1.2 Site Description

The proposed site is located in Ysgol Gyfun Ystalyfera School in Ystalyfera, South Wales. The River Twrch flows 120 metres east of the site before joining the River Tawe 380m downstream, as shown in Figure 1-1.

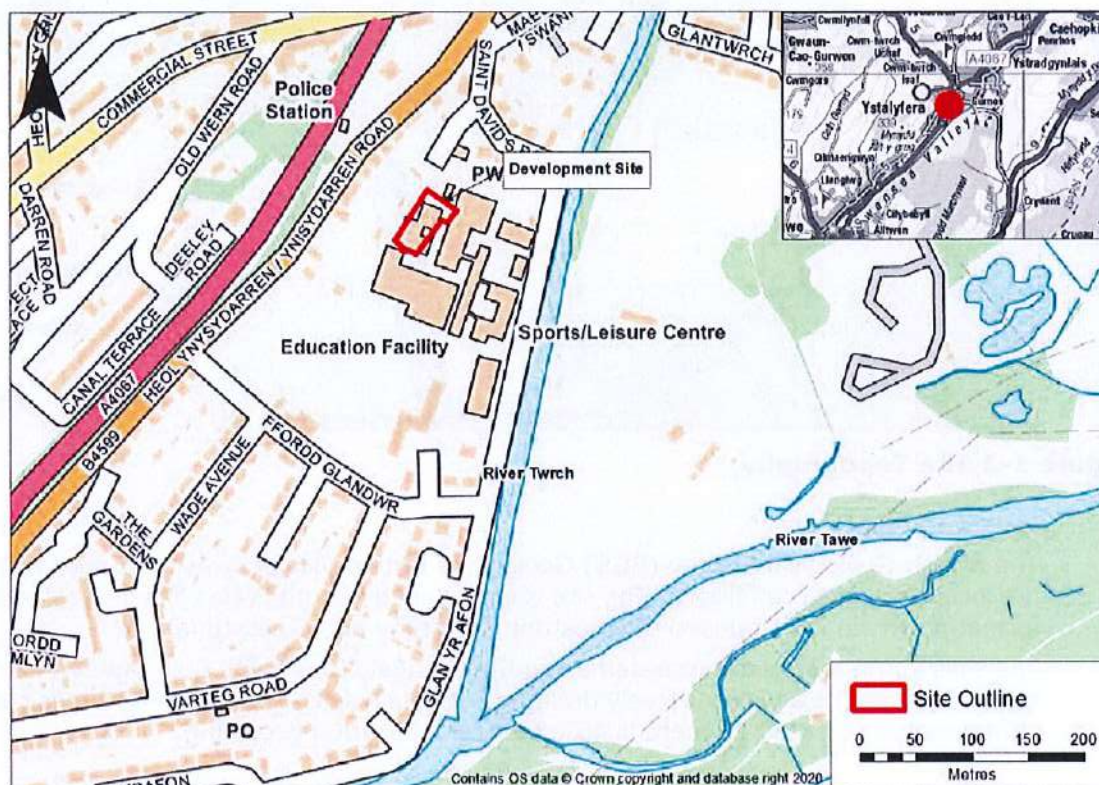


Figure 1-1 Location of proposed development site

1.3 Proposed Development and Site Topography

The proposed development is for a new teaching block forming part of the Ysgol Gyfun Ystalyfera School. The existing buildings in the development area will be demolished. The development will use the existing access route of St David's Road north of the development site.

The proposed development site is very flat with a current elevation of 64.5mAOD as shown in Figure 1-2.

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement

JBA
consulting

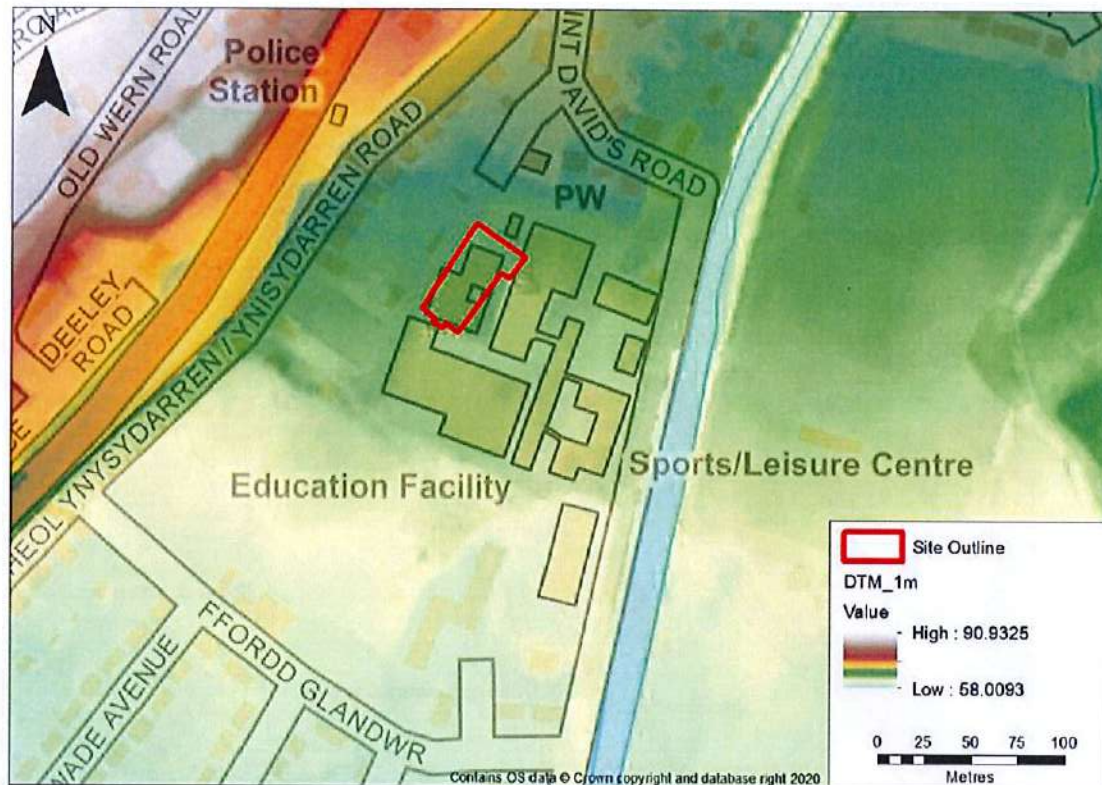


Figure 1-2 Site Topography

1.4 Soils and Geology

The British Geological Survey (BGS) Geology of Britain Viewer¹ was consulted to identify the local geological conditions. The site is underlain by South Wales Middle Coal Measures formation which is composed of Mudstone, Siltstone and Sandstone.

The soils in the area were accessed using the Cranfield University Soilscape Viewer². The soils on site are described as freely draining floodplain soils. However, the site is currently impermeably surfaced so there is little natural infiltration occurring.

¹ British Geological Survey Geology of Britain Viewer <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

² Cranfield University Soilscape Viewer <http://www.landis.org.uk/soilscales/>

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement

JBA
consulting

2 Planning Policy Wales and TAN-15 Guidance

2.1 Planning Policy

Technical Advice Note 15 (TAN-15)³ was introduced in 2004 by the Welsh Assembly Government. It is technical guidance relating to development planning and flood risk and uses a characterisation of risk based on Natural Resources Wales (NRW) Development and Flood Risk Advice Maps (DAM).

The development site is classified as a highly vulnerable development by TAN-15. Highly vulnerable development describes development where "the ability of occupants to decide on whether they wish to accept the risks to life and property associated with flooding or be able to manage the consequences of such a risk, is limited". The design life of the development is 75 years due to the non-residential nature of the development⁴. Developments in Zone B generally are suitable for most forms of development.

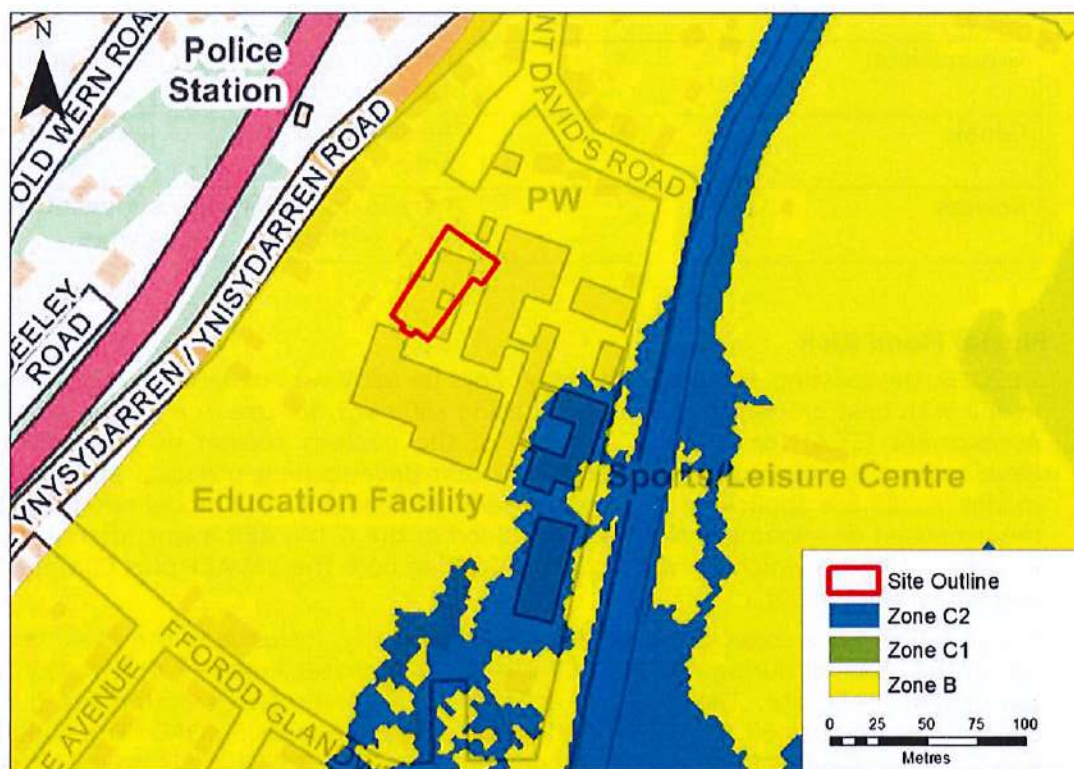


Figure 2-1 NRW Development Advice Map Zones

The site is located within Zone B of the DAM, as shown in Figure 2-1. TAN-15 defines Zone B as "Areas known to have been flooded in the past evidenced by sedimentary deposits". It is used to indicate that as part of a precautionary approach site levels should be checked against the extreme (0.1% AEP) flood level.

³ Planning Policy Wales Technical Advice Note 15: <https://gov.wales/sites/default/files/publications/2018-09/tan15-development-flood-risk.pdf>

⁴ Flood Consequence Assessment: Climate Change Allowances: <https://gov.wales/sites/default/files/publications/2018-11/flood-consequence-assessments.pdf>

TECHNICAL NOTE

JBA Project Code	2020s0441
Contract	Ystalyfera School Phase 3
Client	Bingham Hall Partnership Ltd
Date	20th March 2020
Author	Clare Burnell
Reviewer	Beth Jones
Subject	Flood Risk Statement

3 Flood Risk Assessment

A review of existing data on flood risk from all sources has been undertaken and summarised in Table 3-1 below.

Table 3-1 Summary of flood risk

Source of Flooding	Onsite Presence	Description
Tidal and Fluvial	x	The site is located in Flood Zone 1
Surface Water	✓	The site has a low risk of surface water flooding, with a small area of flooding on the north eastern boundary of the site (Section 3.3)
Reservoirs	x	The site has a very low risk of surface water flooding
Groundwater	x	The site has a very low risk of ground water flooding
Canals	x	The site is not at risk of flooding from canals
Sewers	x	There is no evidence to suggest the site is at risk of flooding from sewers

3.1 Fluvial Flood Risk

In 2016, the existing 1D-2D Flood Model held by NRW was updated by JBA Consulting, in line with best practice and latest modelling software, for use in a Flood Consequence Assessment (FCA) for the development of the eastern section of the school⁵. This development is 100 metres east of the current development proposal and as such the model results are applicable to the proposed development. The model results show that the proposed development site does not flood in the 0.1% AEP event, demonstrated in Figures 3-1 to 3-4 which show flood depths during both the 1% AEP plus Climate Change and 0.1% AEP events.

Figure 3-5 shows a cross section of the site topography, inclusive of the peak water level within the channel during a 0.1% AEP event. Flood water does not flow out of bank at the development site. The peak water level of the River Twrch during the 0.1% AEP event is recorded as 62.6mAOD and the level of the site is 64.5mOAD. The flood level is less than the site level and therefore complies with TAN-15. There is no requirement to consider flood risk further.

⁵ JBA Consulting, Ysgol Gyfun Ystalyfera School Flood Consequence Assessment (2016)

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement

JBA
consulting

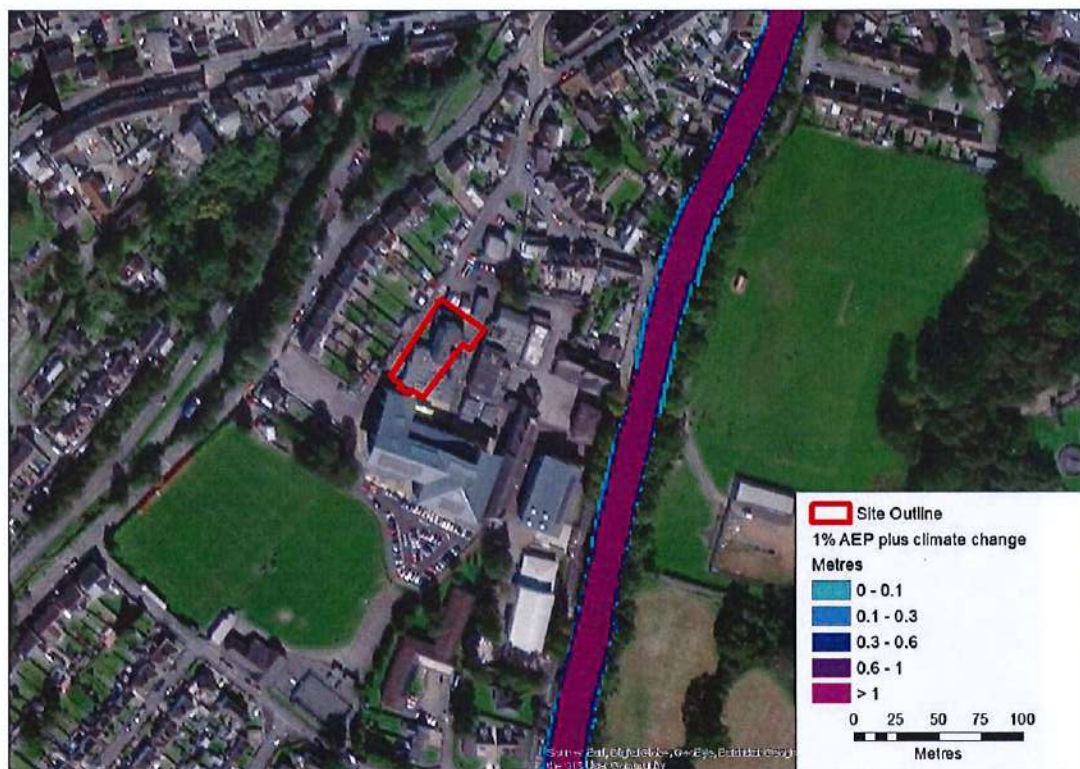


Figure 3-1 – Flood Depth during 1% AEP event plus Climate Change

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement

JBA
consulting

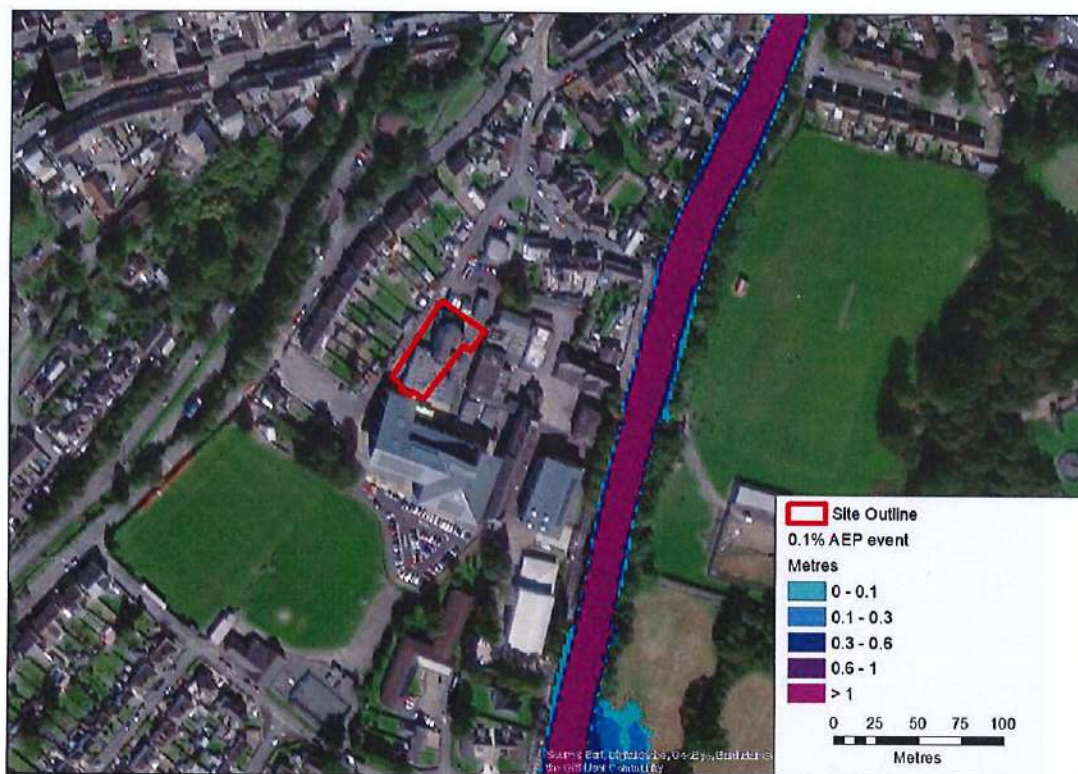


Figure 3-2 - Flood Depth during 0.1% AEP event

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement

JBA
consulting

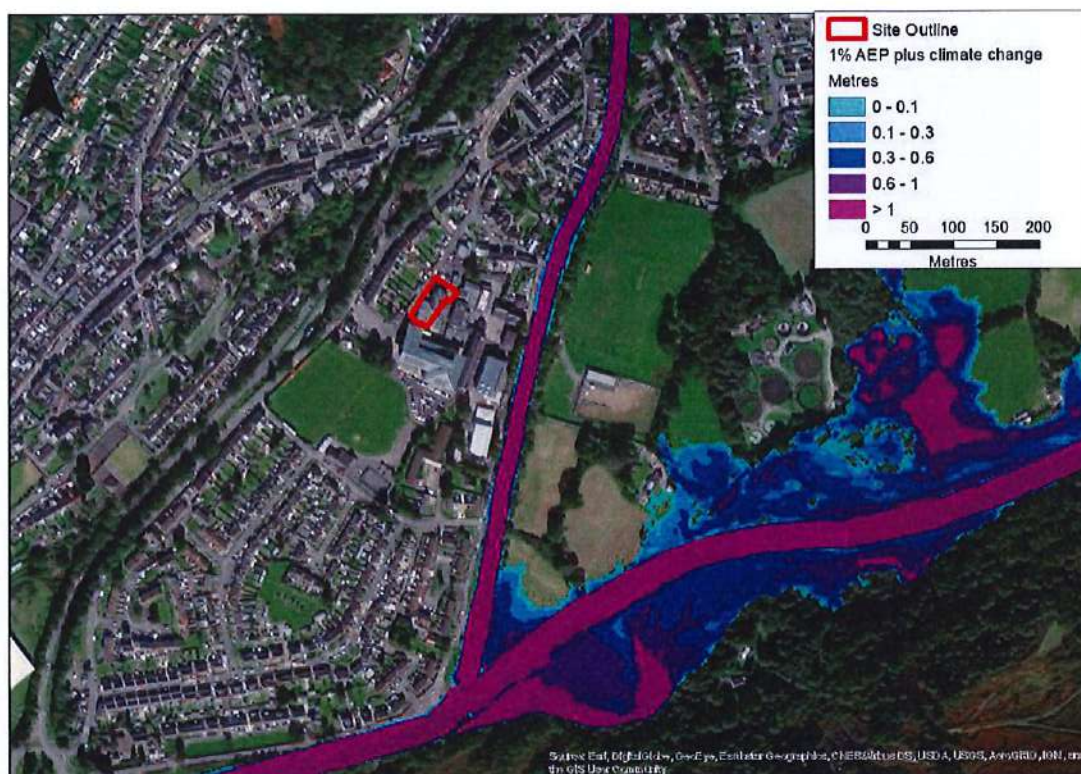


Figure 3-3 Flood Depth during 1% AEP event plus Climate Change - wider area

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement

JBA
consulting

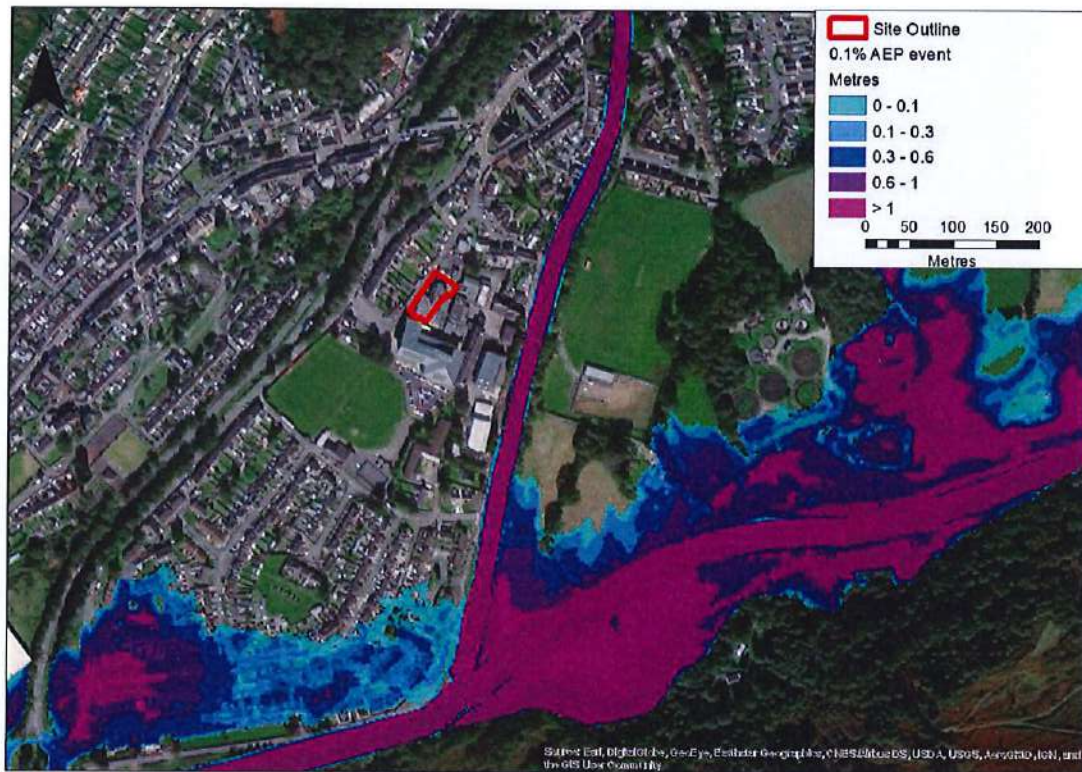


Figure 3-4 - Flood Depth during 0.1% AEP event - wider area

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement

JBA
consulting

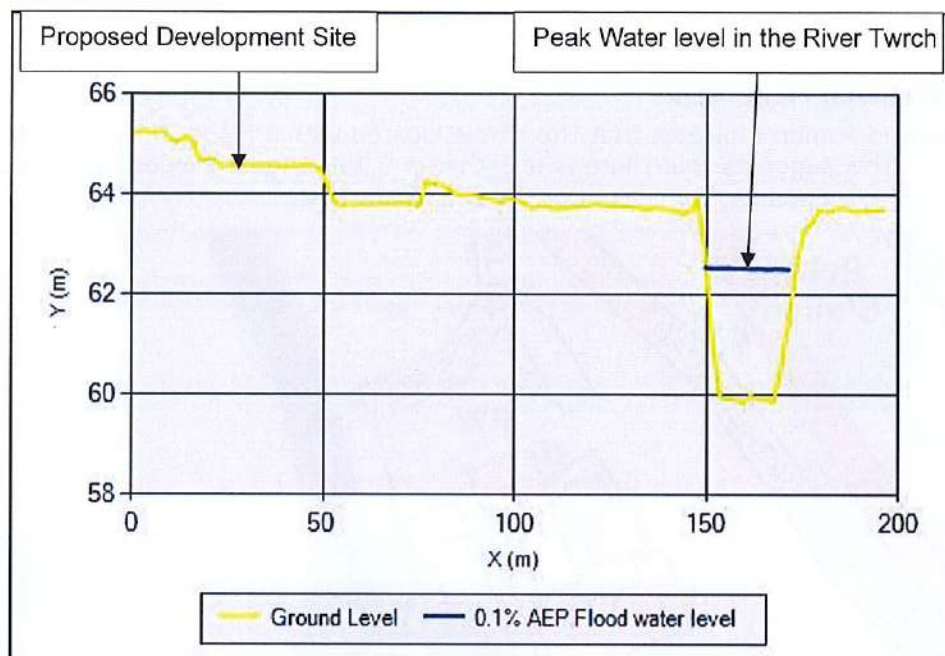


Figure 3-5 Cross section at the proposed development site (64.5mAOD), including peak water level during 0.1% AEP event (62.6mAOD).

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement

JBA
consulting

3.2 Tidal and Fluvial Flood Risk

NRW's flood risk map indicates that the site is located within Flood Zone 1 as shown in Figure 3-1. This suggests that there is less than a 0.1% Annual Exceedance Probability (AEP) of the site flooding from rivers or the sea in any year.

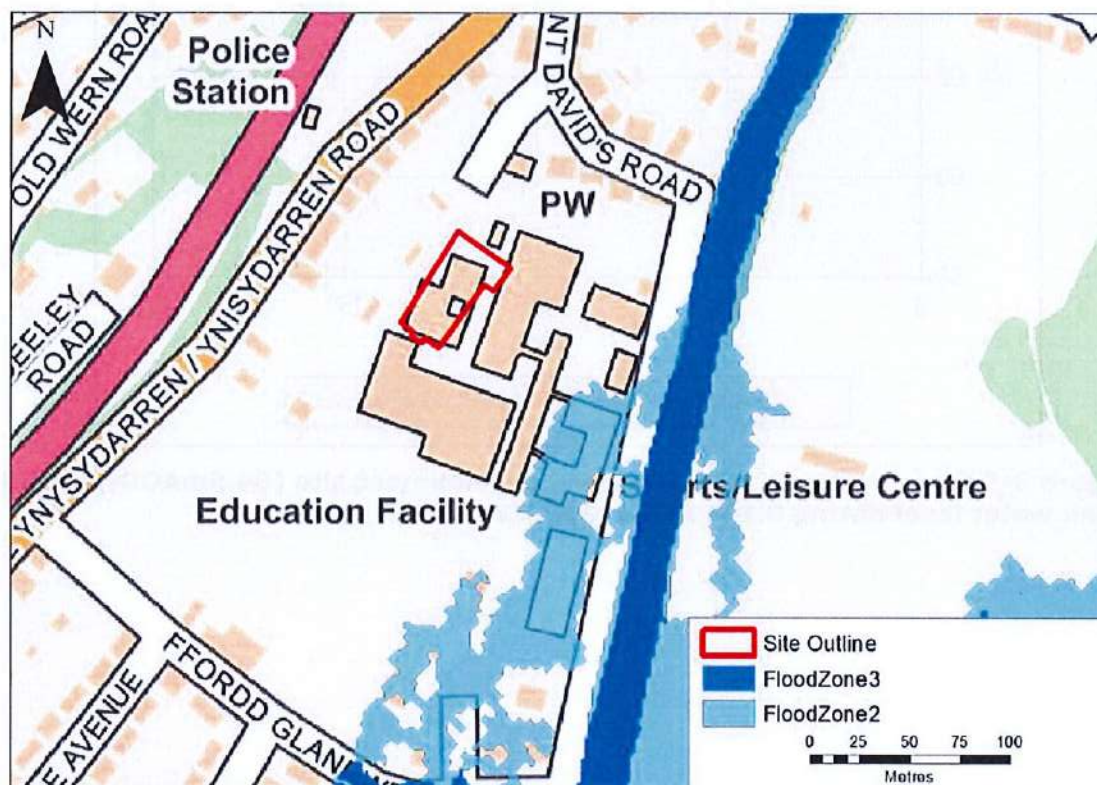


Figure 3-1 NRW Fluvial and tidal flood risk

3.3 Extreme Sea Level Predictions

In line with the precautionary principle set out within TAN-15, the latest Extreme Sea Level data was used to understand the current and future flood risk at the proposed development site. This dataset provides predicted extreme tidal levels within Swansea Bay. The nearest data point to the proposed development site is point 486 which is located 23km south of the proposed development site. This data predicts an extreme tidal level of 6.66m AOD for the current 0.1% AEP event. This level reflects the source of the Flood Zone 2 mapping and DAM. The development site levels are greater than the flood levels used to define the adjacent extreme flood outline therefore, in line with TAN-15, there is no need to consider flood risk further."

As a precautionary measure, the 2095 0.1% AEP predicted tidal levels were calculated, which reflect 75 years of climate change related sea level rises. The current extreme

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement



levels were amended using the latest Welsh Government climate change guidance⁶ to predict 2095 levels. The 2095 predicted extreme tidal level is 7.39m AOD for the 0.1% AEP event. Both the proposed site (64.5m AOD) and the access (67.5m AOD) is predicted to be flood free during the extreme tidal events for the design life of the development. Table 3-2 summarises the extreme sea levels compared to the site levels. Predicted levels for the 0.5% AEP are included for interest.

Table 3-2 Summary of tidal levels compared with site levels

Description	2020 level (mAOD)	2095 level (mAOD)
0.5% AEP tidal prediction	6.37	7.10
0.1% AEP tidal prediction	6.66	7.39
Site Level	64.5	64.5
Access road level	67.5	67.5

3.4 Risk of Surface Water Flooding

NRW's flood maps for surface water indicates that the majority of the site is at very low risk of surface water flooding. One small area in the north east of the development site is categorised as having a low risk of surface water flooding, as shown in Figure 3-2.

⁶ Climate Change allowance for planning purposes. Welsh Government 2016

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement

JBA
consulting

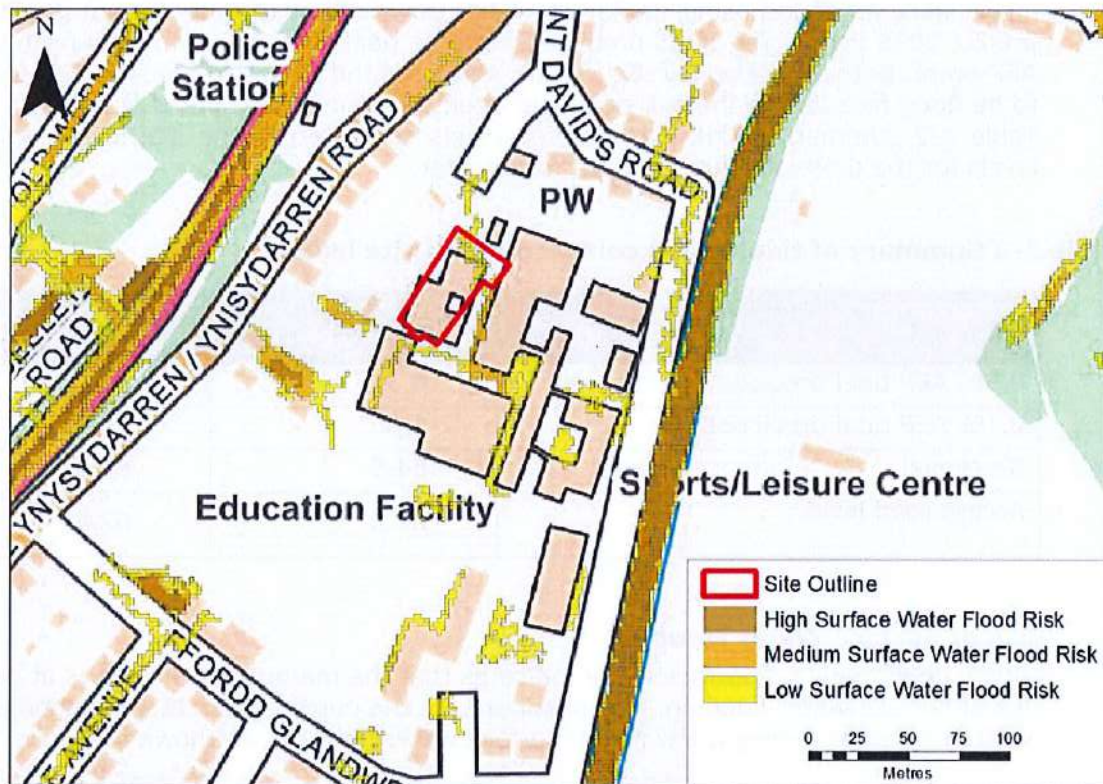


Figure 3-2 NRW Surface water flood risk

3.5 Risk of Flooding from Groundwater

Groundwater flooding is caused by unusually high groundwater levels. It occurs as excess water emerging 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 significant damage to property. The risk of groundwater flooding depends on the nature of the geological strata underlying the site, as well as on the local topography.

Neath Port Talbot Councils Flood Risk Management Plan⁷ highlights that there are "no specific areas of historical groundwater flooding recorded in the NPT area". It is therefore considered that groundwater flood risk to the site is very low.

⁷ Neath Port Talbot Council (2015) Flood Risk Management Plan:
<https://www.npt.gov.uk/media/5399/floodriskmanagementplan15.pdf?v=20170627002320>

TECHNICAL NOTE

JBA Project Code
Contract
Client
Date
Author
Reviewer
Subject

2020s0441
Ystalyfera School Phase 3
Bingham Hall Partnership Ltd
20th March 2020
Clare Burnell
Beth Jones
Flood Risk Statement



4 Conclusion and Recommendations

- JBA Consulting were commissioned by Bingham Hall Partnership Ltd to prepare a Flood Risk Statement (FRS) for a proposed new teaching block at Ysgol Gyfun Ystalyfera School.
- The proposed development is for a new building as part of the Ysgol Gyfun Ystalyfera School. The existing buildings in the development area will be demolished.
- The proposed site is located in Ysgol Gyfun Ystalyfera School in Ystalyfera, South Wales. The River Twrch flows 120 metres east of the site before joining the River Tawe 380m downstream.
- Flood risk from fluvial sources, groundwater, reservoir failure and surface water are also considered to be low or very low.
- The site is located within Zone B of the Development Advice Map (DAM). TAN-15 defines Zone B as "Areas known to have been flooded in the past evidenced by sedimentary deposits". It is used to indicate that "as part of a precautionary approach, levels should be checked against the extreme (0.1% AEP) flood level.
- The latest Extreme Sea Level data (2019) set was used to determine the current extreme tidal levels within the River Ebbw. The 2020 0.1% AEP tidal level is 6.66m AOD. The development site levels (64.5m AOD) are greater than the flood levels used to define the adjacent extreme flood outline.
- The latest 1D-2D flood hazard model of the area shows that the peak water level within the River Twrch during the 0.1% AEP event is 62.6m AOD, which is also below the level of the site (64.5m AOD). As the proposed development site does not flood in the 0.1% AEP event and the water level is less than the site level, the development proposal complies with TAN-15 and there is no requirement to consider flood risk further.
- The proposed development is at a low risk of flooding from all sources and meets the requirements of TAN-15.

