

Pencoedtre High School

Flood Consequence Assessment

Vale of Glamorgan Council

Project number: 60571312

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Quality information

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Table of Contents

1.	Intro	Introduction			
	1.1	Commission	4		
	1.2	Policy Context	4		
	1.3	Aims and Objectives	5		
2.	Site I	Description	6		
	2.1	Location	6		
	2.2	Environmental Setting	6		
	2.3	Topography	8		
	2.4	Proposed Development	8		
3.	Plani	ning Policy & Guidance	9		
	3.1	Technical Advice Note 15	9		
	3.2	Local Development Plan	10		
	3.3	Strategic Flood Consequence Assessment	10		
	3.4	Preliminary Flood Risk Assessment	10		
	3.5	Local Flood Risk Management Strategy	10		
	3.6	SuDS Guidance	11		
4.	Flood Risk – To Development				
	4.1	Overview	13		
	4.2	Tidal / Fluvial	13		
	4.3	Groundwater	13		
	4.4	Surface Water	13		
	4.5	Artificial Sources	14		
	4.6	Sewers	14		
5.	Floor	Flood Risk – From the Development			
	5.1	Overview	15		
	5.2	Surface Water Management	15		
6.	Cond	Conclusion			
	6.1	Overview	17		
	6.2	Flood Sources	17		
	6.3	Surface Water Management	17		
Appe	endix A	- Proposed Masterplan	18		

1. Introduction

1.1 Commission

AECOM Infrastructure & Environment UK Limited (AECOM) has been commissioned by Vale of Glamorgan Council (VoGC) (hereafter referred to as the 'Client') to undertake a Flood Consequence Assessment (FCA) for submission with a planning application for the development of the existing Pencoedtre School.

1.2 Policy Context

The Development Advice Map (DAM) presented on the Natural Resources Wales (NRW) website, shows that the entire site is located in DAM Zone A (Figure 1-1). Areas located in DAM Zone A are classified as being at little or no risk of fluvial or coastal/tidal flooding. As the risk of flooding from rivers or seas is classified as low, the principal consideration of the FCA is surface water management.

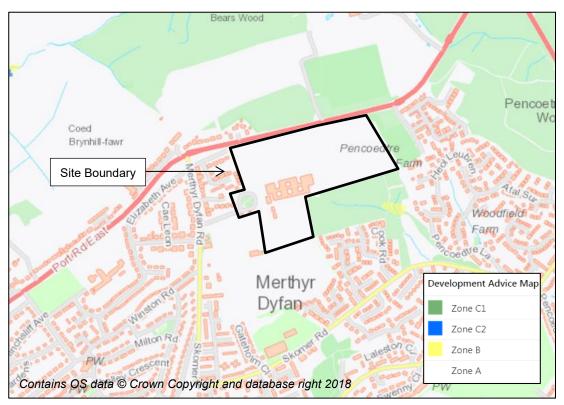


Figure 1-1: Natural Resources Wales Flood Map

(Adapted from NRW flood risk maps. Date Accessed: 23/10/18)

This report has been prepared in accordance with the *Technical Advice Note 15 (TAN15):* Development and Flood Risk¹. The Welsh Government's accompanying TAN15 DAMs, alongside the NRW flood maps have also been used to inform this assessment. As the development is situated within DAM Zone A, a justification test is not applicable. However, as the surface water flood risk for the site is high in small localised areas of the Site, an FCA report has been produced to demonstrate requirements for surface water management with potential options.

¹ Technical Advice Note (TAN 15). Available from: https://gov.wales/docs/desh/publications/040701tan15en.pdf. Last Accessed: 09/05/18.

1.3 Aims and Objectives

The aim of this FCA is to consider the flood risk posed to and arising from the Proposed Development. In order to achieve this, the following objectives are required to be met:

- Collect and review existing flood risk data including topographic data, surface water drainage, NRW information, scheme proposals and the VoGC Strategic Flood Consequence Assessment (SFCA);
- Assess and interpret available information to identify potential sources of flood risk including groundwater, surface water and infrastructure failure;
- Summary of Surface Water drainage elements undertaken by Cambria Consulting Ltd; and,
- Produce an FCA report in full accordance with TAN15 to accompany the planning application.

2. Site Description

2.1 Location

The Proposed Development site is located within Colcot, which is approximately 1.5km north of the centre of Barry, in the Vale of Glamorgan. The approximate Ordnance Survey National Grid Reference (OSNGR) centred on the application site is ST 311954 170289. The approximate postcode for the site is CF62 9YQ.

The site is approximately 15ha and is bound to the north by Port Road West (A4050), the west and east by residential estates and the south by Barry Rugby Football Club. This is shown within Figure 2-1 below.

2.2 Environmental Setting

As seen in Figure 1-1, there is a low flood risk to the site from fluvial or tidal sources. In addition, due to the distance from the Docks (2.7km to the south) no risk of flooding to the site from this tidal source is presented.

The Nant Brynhill watercourse is located approximately 700m north of the site and a small stream is situated about 25m southeast of the site. Due to the distance from the site, the local topography and direction of flow (away from the site), it is unlikely that these watercourses would have an effect on the site.

According to the GeoIndex Onshore Map², the bedrock geology at the site is made up of Porthkerry Member limestone and mudstone, interbedded with a small area to the south of the site, superficial deposits containing alluvium clay, silt, sand and gravel have been recorded.

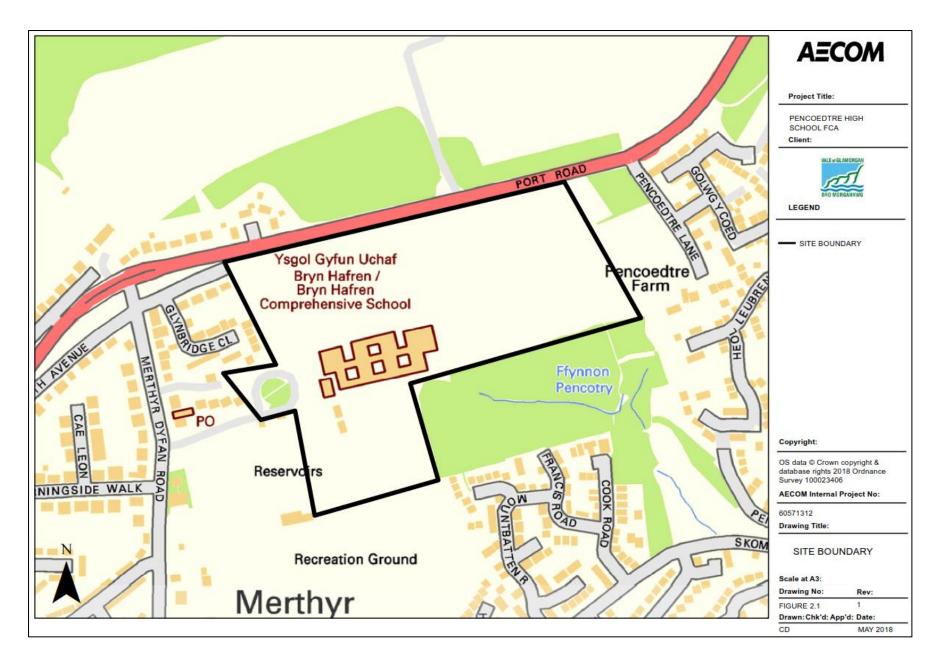
NRW classifies zones around potable groundwater abstraction points as Groundwater Source Protection Zones (SPZ) and these are designed to limit potential pollution activities. The site is not in a SPZ and there are no SPZ limits within approximately 1km of the site boundary. In addition, DEFRA's Magic Map³ shows that the site is within a Secondary A Aquifer. These are considered as permeable layers capable of supporting water supplies at a local level, and in some cases, form an important source of base flow to local watercourses.

The ten trial borehole scans found on the BGS website show that shattered limestone in a clay matrix was recorded below the topsoil for each borehole. These heavy clay soils at the site suggest low surface water percolation rates, which reduces the risk of groundwater flooding. In addition, according to the Local Flood Risk Management Strategy, the proposed development is in an area that is <25% susceptible to groundwater flooding.

Prepared for: Vale of Glamorgan Council

² GeoIndex Onshore Flood Map. British Geological Society. Available from: http://www.bgs.ac.uk/geoindex/. Last Accessed: 09/05/18.

³ DEFRA Magic Map. Available from: http://www.natureonthemap.naturalengland.org.uk/magicmap.aspx. Last Accessed 10/5/18



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2.3 Topography

Figure 2-2 displays the contour lines surrounding and within the site boundary. The topography peaks at approximately 85m Above Ordnance Datum (AOD) at the northern boundary of the site. This level then slopes down-gradient to approximately 75m AOD towards the south of the site boundary.

The slope from 85m AOD to 80m AOD is gentle. A steeper gradient can be seen from the west of the school building going in a southeast direction towards a small spring at approximately 75m AOD.

Further drainage investigation should be carried out in order to check the likelihood of using standard infiltration techniques as a means of surface water disposal for the developed site. The underlying geology is likely to mean that management through attenuation SuDS will be more appropriate for the site.

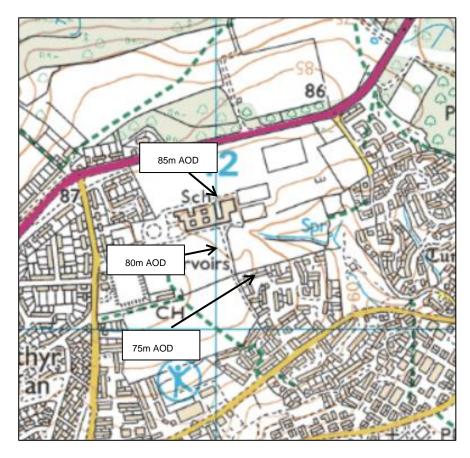


Figure 2-2: OS Contour Map

(Last Accessed 8/5/18)

2.4 Proposed Development

The Proposed Development will include construction of a replacement secondary school building at the site of the existing Pencoedtre High School and the demolition of the existing school building. Development will also include sports pitches and car parking. The proposed masterplan can be found within Appendix A.

3. Planning Policy & Guidance

3.1 Technical Advice Note 15

Technical Advice Note 15 (TAN15) provides guidance which supplements the policy set out in Planning Policy Wales⁴ (PPW) in relation to development and flooding. A precautionary framework is set out which advises caution in respect of new development in areas at high risk of flooding and this is used as a guide for planning decisions. The overall aim of the precautionary framework is to direct new development away from those areas that have a high risk of flooding; and development will only be justified in these areas if it meets the criteria and tests specified in this guidance.

The operation of the precautionary framework is governed by DAMs which are made up of three zones (Table 3-1), used to trigger the appropriate planning test and definitions of vulnerable developments. The DAMs are based on the best available information considered adequate to determine when flood risk needs to be taken into consideration with future development.

Table 3-1: Flood Zone designations, their associated flood risk definition and use within the precautionary framework (source: TAN 15)

DAM Zone	Definition	Use within the precautionary framework
A	Little or no risk of fluvial/ tidal flooding	Justification test is not applied and do not need to consider further
В	Areas known to have flooded historically evidenced by sedimentary deposits.	Used as part of the precautionary approach to indicate where site levels should be checked against the extreme (0.1% annual probability) flood. No need to consider flood risks further if site levels are greater than the extreme flood level
С	Based on Environment Agency extreme flood outline (0.1% annual probability)	Indicates that flooding issues should be considered as an integral part of the decision making by the application of the justification test, including FCA
C1	Areas of Zone C which are developed and served by significant infrastructure, including flood defences	Indicates that development can take place subject to the application of the justification test, including acceptability of consequences
C2	Areas of Zone C without significant flood defence infrastructure	Indicates that only 'less vulnerable' development should be considered, subject to the application of the justification test, including acceptability of consequences. Emergency services and highly vulnerable development should not be considered.

The precautionary framework identifies the vulnerability of different land uses to flooding, and classifies proposed uses accordingly as detailed in Table 3-2. This is because certain flooding consequences may not be acceptable for particular development types.

Table 3-2: Development Categories (source: TAN 15)

Flood Zone Definition	Use within the precautionary framework
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.

⁴ Planning Policy Wales. Available from: https://gov.wales/topics/planning/policy/ppw/?lang=en. Last Accessed: 10/5/18.

According to TAN 15, new development should be directed away from Zone C and towards more suitable land in Zone A, otherwise to Zone B, where river or coastal flooding will be less of an issue.

Table 3-2 highlights that public developments such as schools are classified as 'Highly Vulnerable'; the proposed site is located within DAM Zone A (Figure 1-1).

Built development tends to increase the surface area of impermeable ground, thus reducing percolation and increasing rapid surface run-off. This FCA addresses these risks with runoff calculation that can be used to inform surface water management options at the next stage of the development which should help prevent the increase of surface water flood risk to the site and surrounding area.

3.2 Local Development Plan

The Local Development Plan⁵ provides the local planning policy framework, which was adopted by VoGC on 28th June 2017. Local Development Plan policies relevant to water and flood risk are summarised below:

- MD1 Location of New Development. New development on unallocated site should provide a positive context for the management of the water environment by avoiding areas of flood risk in accordance with the sequential approach set out in national policy and safeguard water resources. Development will be expected to avoid unnecessary flood risk and to meet the requirements of TAN 15. No highly vulnerable development will be permitted within DAM Zone C2 and development will only be considered in areas at risk of flooding where it can be demonstrated that the site can comply with the justification and assessment requirements set out in TAN 15.
- MD7 Environmental protection: this policy seeks to ensure that development does not
 increase flood risk. In accordance with TAN15: Development and Flood Risk, no highly
 vulnerable development will be permitted in DAM Zone C2. Development will only be
 considered in other areas at high risk of flooding where it can be demonstrated that the site
 can comply with the justification and assessment requirements of TAN 15.

3.3 Strategic Flood Consequence Assessment

No Strategic Flood Consequence Assessment is available from VoGC at the time of writing.

3.4 Preliminary Flood Risk Assessment

VoGC developed a Preliminary Flood Risk Assessment⁶ (PFRA) in 2011 which examined the areas within the Vale of Glamorgan that have historically suffered from flooding and potential future floods areas and to identify significant flood risk areas. No indicative Flood Risk Areas have been identified within the Vale of Glamorgan.

3.5 Local Flood Risk Management Strategy

In 2012, VoGC developed a Local Flood Risk Management Strategy (LFRMS)⁷; this document highlights the responsibilities of VoGC as Lead Local Flood Authority (LLFA) with respect to flooding from surface water, ordinary watercourses and groundwater.

The Local Strategy encourages effective flood risk management by enabling people, communities, business and the public sector to work together to:

Prepared for: Vale of Glamorgan Council

⁵ Vale of Glamorgan Local Development Plan (LDP). Available from:

http://www.valeofglamorgan.gov.uk/en/living/planning_and_building_control/Planning/planning_policy/local_development_plan/Local-Development-Plan.aspx. Last Accessed: 09/05/18.

⁶ Preliminary Flood Risk Assessment (PFRA) Vale of Glamorgan Council. Available from:

http://www.valeofglamorgan.gov.uk/Documents/Living/Highways%20&%20infrastructure/Exec-Summary-ENG.pdf. Last Accessed: 09/05/18.

⁷ Local Flood Risk Management Strategy, December 2013. Vale of Glamorgan Council. Available from: http://www.valeofglamorgan.gov.uk/en/living/planning_and_building_control/Planning/planning_policy/local_development_plan/Local-Development-Plan.aspx. Last Accessed: 09/05/18.

• Ensure a clear understanding of the risks of flooding and erosion, nationally and locally, so that investment in risk management can be prioritised more effectively;

- Set out a clear and consistent plan for risk management so that communities and businesses can make informed decisions about the management of the residual risk;
- Encourage innovative management of flood and coastal erosion risks, taking account of the needs of communities and the environment;
- Form links between the local flood risk management strategy and local spatial planning;
- Ensure that emergency plans and responses to flood incidents are effective and that communities are able to respond properly to flood warnings; and
- Help communities to recover more quickly and effectively after incidents.

The PFRA refers to two major historic flooding incidents in October 1998 and July 2007, these were classified as 'locally significant harmful consequences'. On 20th July 2007, Barry, together with a number of other locations in the Vale of Glamorgan, was subject to intense rainfall. Significant flooding of properties and roads were reported as watercourses and land drainage systems were unable to cope with the intensity of the event. One of the most significant areas of flooding was along the route of the Coldbrook watercourse which runs from the Colcot area (approximately 960m from the Proposed Development) to the open stream adjacent to the A4231 Barry Docks Link Road (approximately 1.5km from the Proposed Development). Approximately 100 residential properties and four schools were flooded along the route of the watercourse or within its catchment area and local roads were closed.

The locally agreed surface water information dataset combines local information on surface water flooding with the NRW's Flood Map for Surface Water. The analysis was completed on a county wide basis and Barry was not identified as at significant risk from surface water flooding.

In addition, localised groundwater flooding is reported to have occurred in Eqenny Village, St Brides Major, East Monkton, Rhoose and Barry. However, it is shown within Figure 2-4-2 in the LFRMS that the Proposed Development is in an area that is <25% susceptible to groundwater flooding.

3.6 SuDS Guidance

From 7th January 2019, all new developments of more than 1 dwelling house or where the construction area is 100m² or more, will require a Sustainable Drainage System (SuDS) for surface water. From this date, SuDS on new development must be designed and built in accordance with the Statutory SuDS Standards published by Welsh Ministers and SuDS schemes must be approved by the local authority (Vale of Glamorgan Council) acting in its Sustainable Drainage Approval Body (SAB) role before construction work begins.

The principles which underpin the design of surface water management schemes to meet the Standards are as follows:

- Mange water on or close to the surface and as close to the source of the runoff as possible;
- Treat rainfall as a valuable natural resource;
- Ensure 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 the 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 drainage components in 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, that serves 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 by the system.

For more information regarding surface water design criteria (including the mandatory standards that need to be achieved within the National SuDS standards) and the methodology applied to the design of the surface water drainage strategy for the Proposed Development, the reader is directed to Section 5.

4. Flood Risk – To Development

4.1 Overview

TAN15 requires that all potential flood sources that could affect the Proposed Development be considered. This chapter includes flooding from rivers and the sea, directly from rainfall on the ground surface, rising groundwater, overwhelmed sewers and drainage systems. Flooding from reservoirs, canals, lakes and other artificial sources should also be considered. There should be demonstration of how these should be managed so that the development remains safe throughout its lifetime, taking into account climate change.

4.2 Tidal / Fluvial

As discussed in Section 1.2, the Proposed Development site is located within DAM Zone A, which are areas classified as having little or no risk of tidal/ fluvial flooding. Given the DAM Zone designation, the level of the site and distance from the coast, tidal and fluvial flood risks are considered to be low and are not considered further in this investigation.

4.3 Groundwater

Groundwater flooding occurs where groundwater levels rise above ground surface levels. The geology has a major influence on where this type of flooding takes place; it is most likely to occur in low-lying areas underlain by permeable rocks.

As outlined in Section 3.5, the LFRMS states that localised groundwater flooding is reported to have occurred in Barry; however no specific flood incidents have been recorded at the site.

The BGS maintains an archive of historical exploratory logs throughout the UK and as part of this project; AECOM has searched the database and taken information from borehole ST17SW46. This borehole scan displays cross sections of ten trial boreholes just to the north of the school building. According to the notes, six trial boreholes were recorded as dry. The remaining four trial boreholes had groundwater towards the bottom of the borehole at around 1.8m below ground level (bgl). Approximately 15 to 25cm of groundwater was found in these boreholes.

In addition, according to the Local Flood Risk Management Strategy, the proposed development is in an area that is <25% susceptible to groundwater flooding.

Based on the information derived from the borehole log combined with no site specific flood incidents, the risk from groundwater is considered to be low.

4.4 Surface Water

Overland flow routes can form from rainfall that fails to infiltrate the surface and travels over ground; this is exacerbated where the permeability of the ground is low due to the type of soil/geology (such as clayey soils) or urban development. Surface water is also promoted in areas of steep topography which can rapidly convey water that has failed to penetrate the surface.

As discussed in Section 2.2, the soil is made up of firm to stiff clay, which would reduce the permeability of the ground leading to an increased likelihood of surface water flood risk.

Figure 4-1 shows NRW's Surface Water Flood Risk Map⁸. The dark orange shading (high risk) shows areas that have a chance of flooding of greater than 3.33% AEP. The light orange shading (medium risk) shows areas have a chance of flooding between 1% AEP and 3.33% AEP. The yellow shading (low risk) shows areas have a chance of flooding between 0.1% AEP and 1% AEP.

According to Figure 4-1, the majority of the Site is not considered to be at risk from surface water flooding. There is an area of high and medium flood risk surrounding the majority of the school building, which is due to the presence of an impermeable building represented within the model.

Prepared for: Vale of Glamorgan Council

⁸ Source: Natural Resources Wales Flood Map for Surface Water. Available from: https://flood-warning-information.service.gov.uk/long-term-flood-risk. Last accessed 09/05/18.

The land slopes down from approximately 80m AOD at the western edge of the school to 75m AOD at the small spring towards the southeast of the school, creating a flow path along this lower lying area, as discussed in Section 2.3.

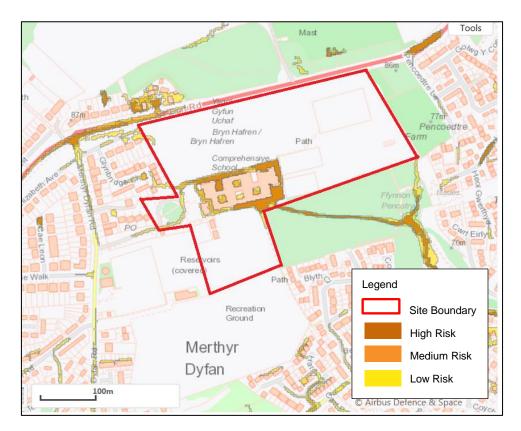


Figure 4-1 Flood Map for Surface Water (source: NRW)

(Last Accessed 8/5/18)

Overall it is considered that the flood risk from surface water is low at the Proposed Development site. There are localised areas where the risk from flooding increases (up to high around the building footprint) and consequently it is recommended that development is steered away from these areas. This is discussed in more detail within Section 5.

4.5 Artificial Sources

Artificial flood sources include raised channels such as canals or storage features such as ponds and reservoirs. The NRW Flood Risk from Reservoirs Map⁹ indicates that the nearest reservoir flooding extents at Penarth Cwm Cydfin are approximately 7.5km west of the proposed scheme.

According to the LFRMS, the Warren Mill Pond, which is approximately 8.7km north of the site, has been identified as a large reservoir, but does not exceed the volume criteria set by NRW for potential breach mapping. Due to the large distance from the flood extent, the risk from artificial sources is considered to be low and not considered further within this assessment.

4.6 Sewers

Flooding can occur as a result of infrastructure failure, e.g. blocked sewers or failed pumping stations. Sewer flooding can occur when the system surcharges due to the volume or intensity of rainfall exceeding the capacity of the sewer, or if the system becomes blocked by debris or sediment.

Due to the lack of historical flood information on sewer flooding in this area combined with the proposed drainage options (Section 5), flood risk from sewers is considered low and so will not be considered further within this investigation.

⁹ Natural Resources Wales Flood Map. Available from: https://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk/?lang=en. Last Accessed: 09/05/18.

5. Flood Risk – From the Development

5.1 Overview

National Policy highlights how built development tends to increase the risk of flooding by increasing surface water runoff. Development often increases the area of impermeable surfaces thereby promoting rapid runoff to surface water sewers or watercourses rather than percolation into the ground. The effect has potential to lead to an increase in both total volume and peak water flows, contributing to flooding.

5.2 Surface Water Management

In July 2019, Cambria Consulting Ltd provided the general principles relating to the surface water drainage strategy for the Proposed Development in line with national policy. This section summarises these principles and details how the drainage strategy will comply with the mandatory standards within the National SuDS standards which have been identified by Cambria Consulting Ltd. The majority of these will be confirmed during the detailed design stage and will require discussion with the SAB (as specified).

Standard S1: Surface Water Run-off Destination. This standard details the disposal routes for surface water run-off. The destinations are split into 5 levels with Level 1 being the most preferential and Level 5 being the least preferred and only used in exceptional circumstances. The following levels have been considered as part of the drainage strategy:

- Priority Level 1: Surface water runoff is collected for use The feasibility of utilising rainwater harvesting systems/rainwater collection systems will be assessed.
- Priority Level 2: Surface water is infiltrated to ground infiltration testing has been
 undertaken and the results show no significant potential for infiltration techniques of
 drainage. Additional infiltration testing is to be undertaken in accordance with comments
 from the SAB. Where possible infiltration methods of drainage will be utilised in the SuDS
 design.
- Priority Level 3: Surface water runoff is discharged to a surface water body the nearest surface water body to the development is the brook/stream to the east of the site in Pencoedtre wood. It is proposed to discharge to this watercourse at a restricted rate. The SAB will have to confirm this rate.

Standard S2: Surface Water runoff hydraulic control. The Greenfield runoff rate for the Proposed Development site will be calculated using the FEH method. Attenuation volumes for the proposed impermeable areas will be calculated using the confirmed runoff rate.

Interception mechanisms will be required to ensure compliance with the requirement of zero runoff for the first 5mm rainfall for 80% of storm events during the summer and 50% in winter. With reference to Table G2.1 'Interception mechanisms with assumed compliance' of the National SuDS standard interception mechanisms will be achieved through the use of infiltration structures, permeable paving, swales, rain gardens, bioretention areas, detention basins and ponds.

Standard S3: Water Quality. SuDS shall be utilised wherever possible and designed in accordance with the National SuDS standards and the SuDS Manual. The table below identifies suitable SuDS techniques that are currently considered appropriate for the development.

Table 5-1: Indicative Suitability of SuDS Components within the Management Train (Cambria Consulting Ltd)

SuDS Component	Interception	Primary Treatment (close to source)	Secondary Treatment	Tertiary Treatment	Site Suitability
Rainwater Harvesting	Υ				N
Filter Strip	Υ	Υ			Υ
Swale	Y	Υ	Υ		Y

SuDS Component	Interception	Primary Treatment (close to source)	Secondary Treatment	Tertiary Treatment	Site Suitability
Filter Trench	Υ		Y		Υ
Permeable Pavement	Υ	Υ			Y
Bioretention	Υ	Υ	Υ		Y
Green Roof	Υ	Υ			N
Detention Basin	Υ	Υ	Υ		Y
Pond		Υ	Υ	Υ	Y
Wetland		Υ	Υ	Υ	Y
Infiltration System	Υ	Υ	Υ	Υ	Y
Attenuation Storage Tanks	Υ				Y
Proprietary Treatment Systems		Υ	Υ	Y	Y

A SuDS treatment train solution will need to be incorporated prior to discharging the surface water runoff from the site to avoid detriment to the water quality of the receiving watercourse and runoff through the site. With reference to the SuDS Manual chapter 26 a simple index approach to water quality risk management will be undertaken. This approach would need to be agreed with the SAB.

Standard S4 & S5: Amenity and Biodiversity

The aim of the Standard S4 & S5 is to ensure the SuDS scheme makes the best contribution to development design by maximising benefits for amenity and biodiversity as well as water quantity and quality. Potential above ground features to satisfy these criteria would be the use of swales, rain gardens, bioretention areas, detention basins and ponds, which can be incorporated within soft landscaping areas of the site.

Standard S6: Design of Drainage for Construction, Operation and Maintenance

A SuDS maintenance plan would need to be provided for all SuDS features and submitted as part of the SuDS application to the SAB.

6. Conclusion

6.1 Overview

This FCA has assessed flood sources to and from the Proposed Development in context of the existing and proposed development. The Proposed Development is classified as a highly vulnerable development located within DAM Zone A.

6.2 Flood Sources

The following potential sources of flooding which could affect the Proposed Development have been considered and assessed as follows:

- The current risk from fluvial and tidal sources is considered to be low. The site is located within DAM Zone A;
- The risk of groundwater flooding is considered to be low;
- The risk of surface water flooding to the majority of the site is considered to be low, with the exception of localised areas against the building footprint (which is due to the presence of an impermeable building represented within the model). Any potential off-site impacts will be addressed through a surface water drainage strategy which will be produced during the next stage of the development process once a more detailed Proposed Option is available;
- The risk of sewer flooding is considered to be low; and
- The risk of flooding from other sources is considered to be low.

6.3 Surface Water Management

Cambria Consulting Ltd have provided general principles relating to the surface water drainage strategy which considers sustainable options to manage runoff from the Proposed Development. With no significant potential for infiltration SuDS, it is proposed to discharge runoff to the watercourse located to the east of the site at a controlled rate. This will however need to be confirmed with the SAB.

Other SuDS options will also be considered and assessed as part of the next phase of works. This is detailed throughout Section 5 of this FCA.

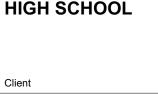
Appendix A – Proposed Masterplan



Check all dimensions on site. Do not scale from this drawing Report any discrepancies and omissions to HLM Architects
This Drawing is Copyright ©

> PL - FOR PLANNING

Project 15-1050-01 PENCOEDTRE HIGH SCHOOL







PROPOSED MASTERPLAN

