Stride Treglown Ltd

FITZALAN HIGH SCHOOL (LAWRENNY AVENUE) PITCHES

Flood Consequences Assessment

6653-FR-RP-001-00
NOVEMBER 2023

PUBLIC

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1 INTRODUCTION

WSP (UK) Ltd, has been appointed by Stride Treglown to undertake a Flood Consequences Assessment (FCA) for reserved matters application at Fitzalan High School, Lawrenny Avenue, Cardiff CF11 8XB.

This Flood Consequences Assessment (FCA) has been undertaken in accordance with Technical Advice Note 15 (TAN15) and is based on data sets provided by the client and licenced from Natural Resources Wales (NRW).

To help ensure that the level of detail of a FCA is proportionate to the degree of flood risk, the Construction Industry Research and Information Association (CIRIA) has defined a tiered three-level approach to flood risk assessment (C624)[1] which has been used to identify the level of detail required for this FCA proportionate to the degree of flood risk. The three levels defined are as follows:

- Level 1 Screening study to identify whether there are any flooding issues related to a development site which may warrant further consideration;
- Level 2 Scoping study to be undertaken for each potential flood risk issue that is identified as being associated with a site during a Level 1 FCA. A Level 2 FCA involves a qualitative assessment of the flood risk to the site, and the impact of the site on flood risk elsewhere; and
- Level 3 Detailed study to be undertaken if the Level 2 study concludes that quantitative analysis is required to assess flood risk issues related to the development site.

In the case of the high school, a Level 2 study is considered sufficient to determine the reserved matters application by Cardiff Council.

Following this introduction, the report first outlines the current understanding of flood risk in Section 2, before outlining the requirements of TAN15 in Section 3 and ending with the report's conclusions (§4) and recommendations (§5).

1.1 LOCATION

The location of the site is illustrated in Figure 1-1 overleaf[2] which shows the site location near Ordnance Survey National Grid Reference 315950, 176050. The site is currently occupied by the existing Fitzalan High School accessed off Lawrenny Avenue. The red line boundary is some 5.8 ha with ground levels identified from topographical survey as being between 6.5 m AOD to 7.3 m AOD. Considering the site's hydrological environment: the site is some 400 m north west of the lower reaches of the Afon Ely which flows north east to south west past the site into Cardiff Bay and about 1 km to the west of the lower reaches of the Afon Taff which flows north south past the site into Cardiff Bay. Cardiff Bay is an impounded water body 3.3 km from the site controlled by the Cardiff Barrage which controls flows between the Bay and the Bristol Channel.

[1] Lancaster, J.W. Preene, M. & Marshall, C.T. (2004) *Development and flood risk - guidance for the construction industry* CIRIA C624 ISBN 0-86017-624-X

[2] OS OpenMap Local raster. Contains OS data © Crown copyright and database right (2023)

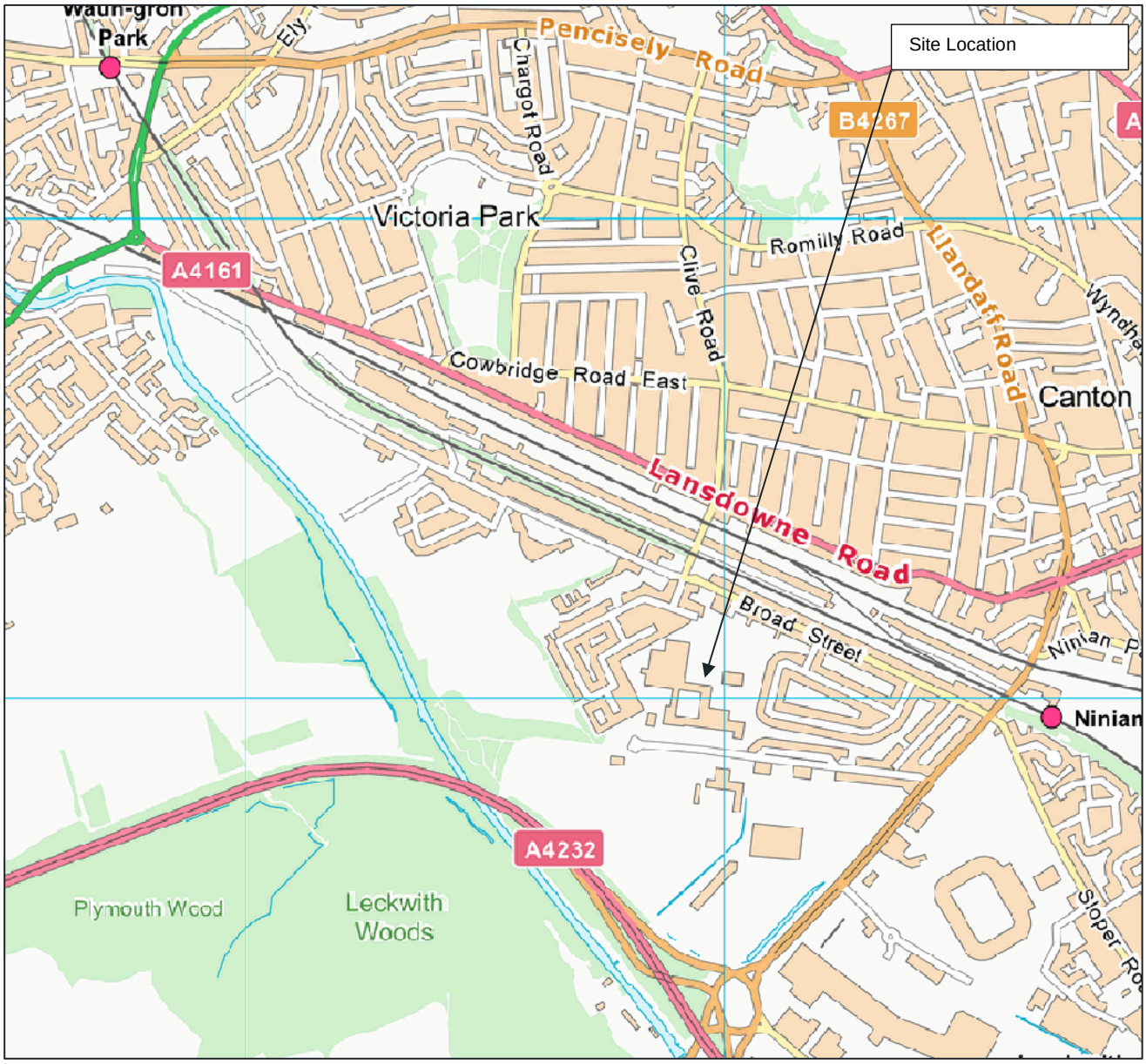


Figure 1-1: Site Location Plan

1.2 GEOLOGY

According to the British Geological Survey 50k mapping the site is believed to be on Mercia Mudstone Group overlain by tidal flat / alluvial deposits (Clay, Silt, Sand, Gravel) with the expected soil consistency clay to sandy loam; however, it should be noted that the site is surrounded by known artificial deposits which may encroach into the site over Lansdowne Avenue.

1.3 DEVELOPMENT PROPOSAL

The proposed works consist of demolishing part of the existing high school, establishing a new grass rugby/sports pitch and two Multi Use Games Areas (MUGAs) plus a 104 space cycle parking shelter, in the east half of the site, which will be associated with the new school replacement on the opposite side of Lawrenny Avenue. A pedestrian and cycleway link is also to be constructed between Broad Street and Lawrenny Avenue. The proposal can be clearly seen in Figure 1-2 below and in Appendix A.

The proposed pitch levels tend to fall from west to east and from 7.4 m AOD to 6.8 m AOD, approximately with the centre of the pitch close to existing levels. These levels tend to raise ground levels in the north and the southwest of the site but this is required to ensure an effective/positive drainage system. The swales which abut the pitch on the east reduce from ground levels to circa 5.6 to 5.8 m AOD, which allow the conveyance of runoff from the lowest part of the pitch. This can be seen more clearly in the drawing Proposed Site Levels (6653-WSP-ZZ-ZZ-DR-CV-0100) and Figure 1-3 below which shows an extract of the Isopachyte which is included in full in Appendix A.

Public Buildings (e.g. schools) such as the existing use are considered as 'Highly Vulnerable' by Technical Advice Note 15 (TAN15). The sports pitches are ancillary to the main development and are better defined with a lower vulnerability classification. TAN15 states that: *'Proposals for public open space, outdoor recreational uses and agricultural developments, are likely to be acceptable in all areas where there is a risk of flooding'.* Furthermore, the school will be able to manage these intermittently used areas in accordance with a Flood Action Plan to ensure that risks and consequences remain low.

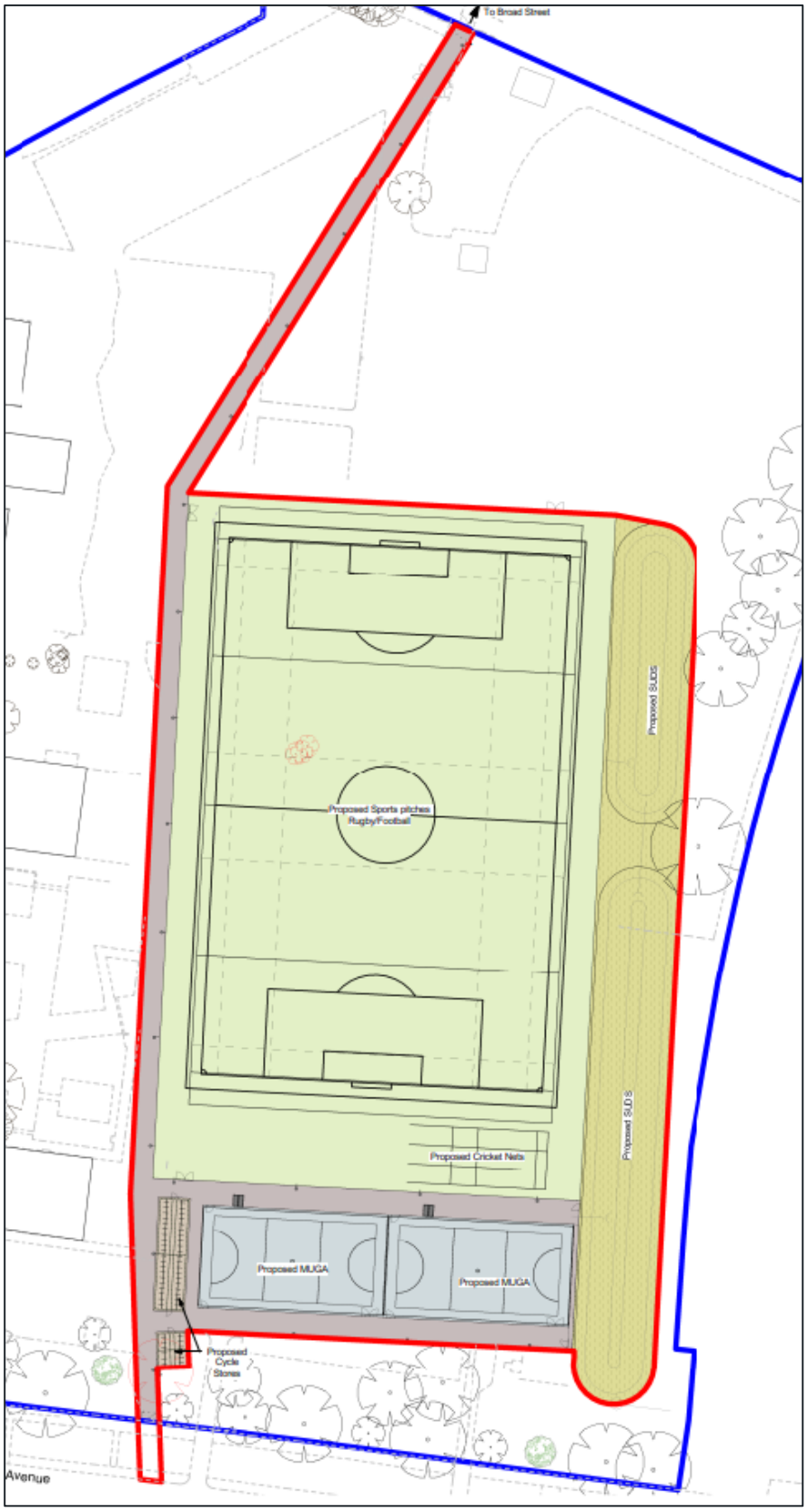


Figure 1-2: Proposed Layout

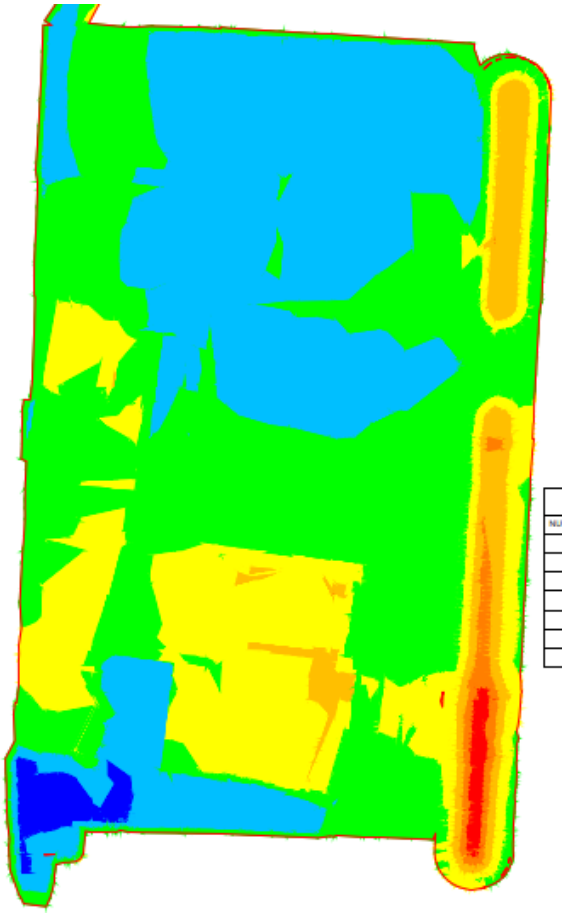


Figure 1-3: Isopachyte Drawing

2 EXISTING UNDERSTANDING OF FLOOD RISK

The site is considered to be at an overall low risk of flooding from most sources, this section first considers the key online flood maps (§2.1), followed by data licenced from NRW (§2.2), the NRW model updated by WSP (§2.3),then relevant local policy (§2.4 & 2.5) before concluding with historic flood data (§2.6).

2.1 NATURAL RESOURCES WALES FLOOD MAPS

The current Development Advice Map (DAM) shows that the site is entirely within Zone C1. DAM Zone C1 is the area defined by NRW as served by significant infrastructure, including flood defences. According to TAN15, outdoor recreational space may be permissible in Zone C1. Figure 2-1 below shows an extract from the DAM.

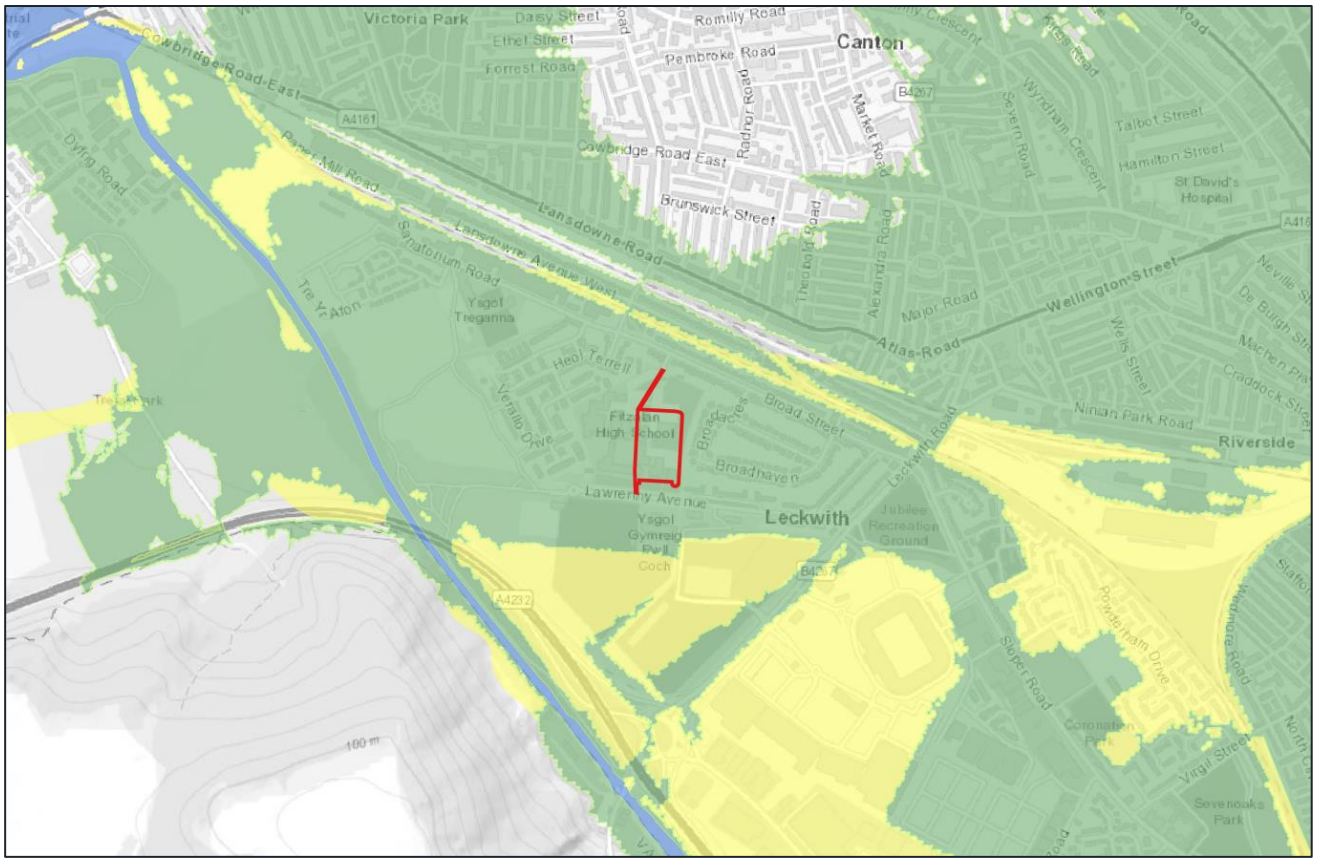


Figure 2-1: NRW Development Advice Map

It should be noted that the DAM is considered by Natural Resource Wales to be out of date as there have been no updates for over two years and no future updates are anticipated; however, it remains the reference point for the current policy document TAN15.

NRW's flood risk from rivers map shown in Figure 2-2 below confirms that NRW consider the site to be in an area with a low risk of flooding from rivers. Based on location and local knowledge this would be anticipated to be dominated by flooding from the Afon Ely but with the Afon Taff also a source of risk.

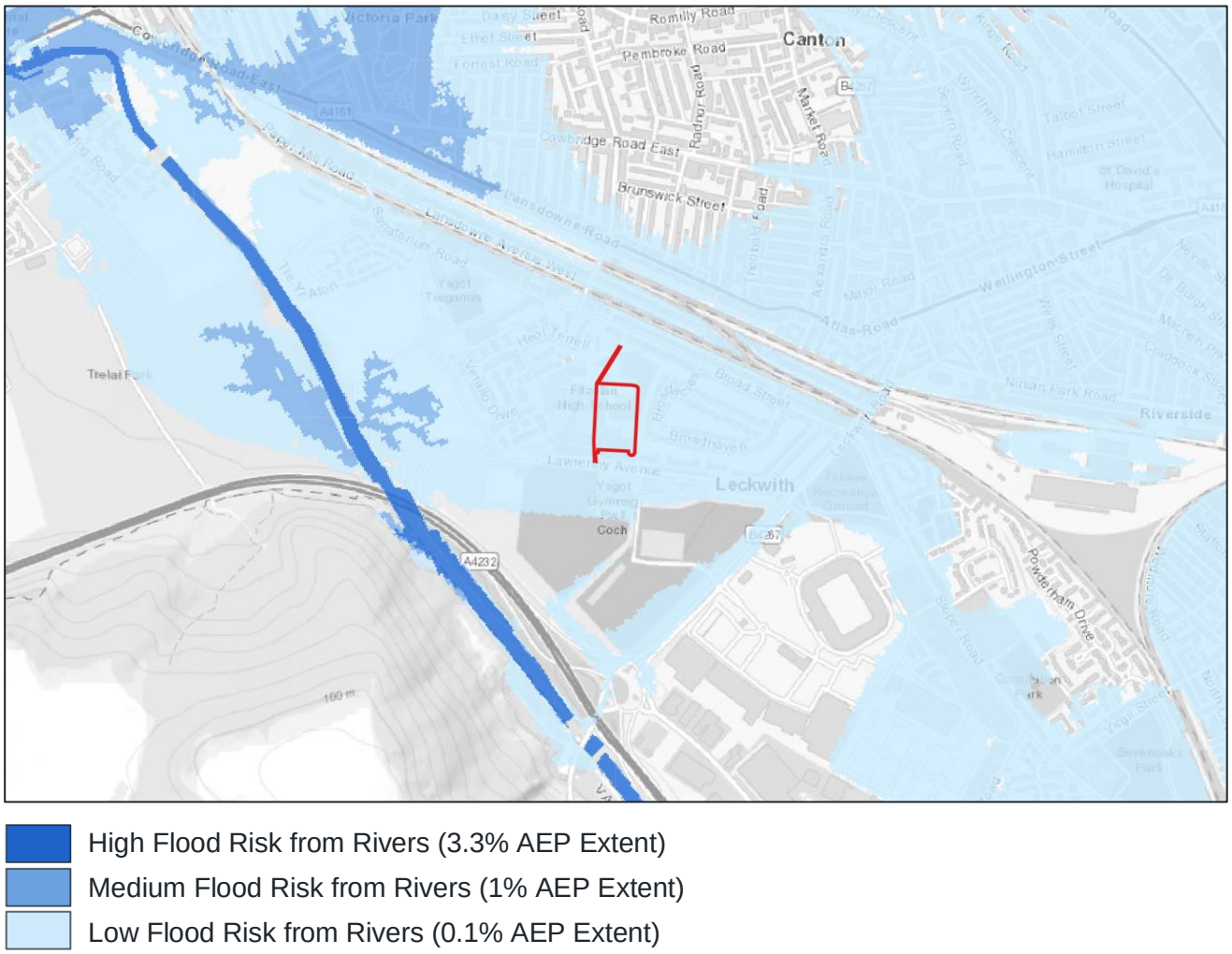
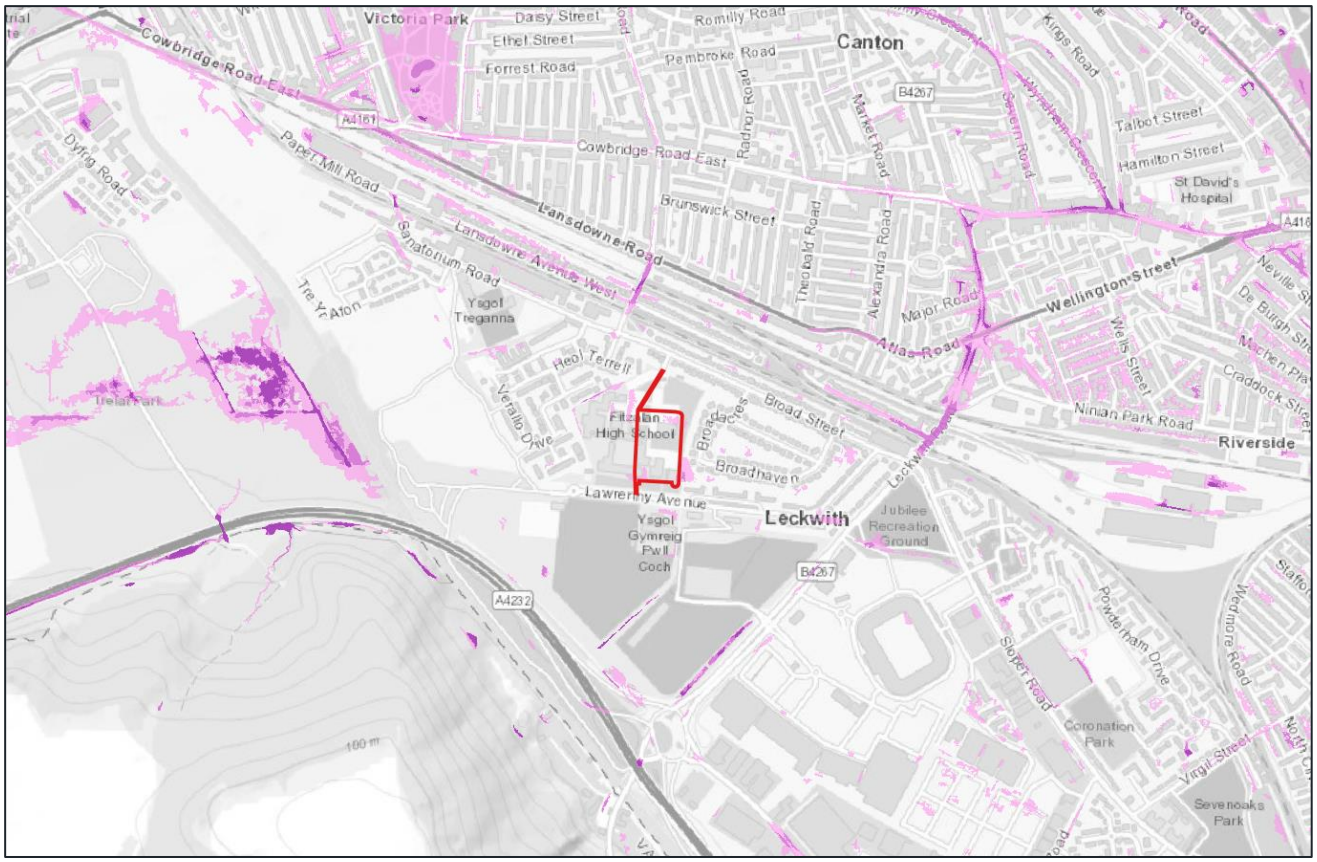


Figure 2-2: NRW Risk of Flooding from Rivers

NRW's flood risk from the sea mapping, reproduced in Figure 2-3 below, shows that the site is considered to be at low risk of flooding from the sea.

Figure 2-3: NRW Flood Risk From the Sea

The NRW surface water flood map Figure 2-4 shows that the majority of the site is considered to be at negligible risk of flooding from surface water but does highlight low points on site where there may be an increased risk of surface water flooding.



High Risk
Medium Risk
Low Risk

Figure 2-4: NRW Surface Water Flood Risk Map

In September 2021, the Flood Map for Planning was published by Natural Resources Wales in support of the updated TAN15; however, the application of the updated TAN15 has been postponed.

A review of Natural Resources Wales Flood Map for Planning illustrates the extents of modelled flood risk from both fluvial sources, and tidal sources. This mapping shows the future level of risk, including the anticipated effects of climate change, and as a result, the site shown to be situated within a TAN15 Defended Zone (Flood Zone 3) within this mapping.

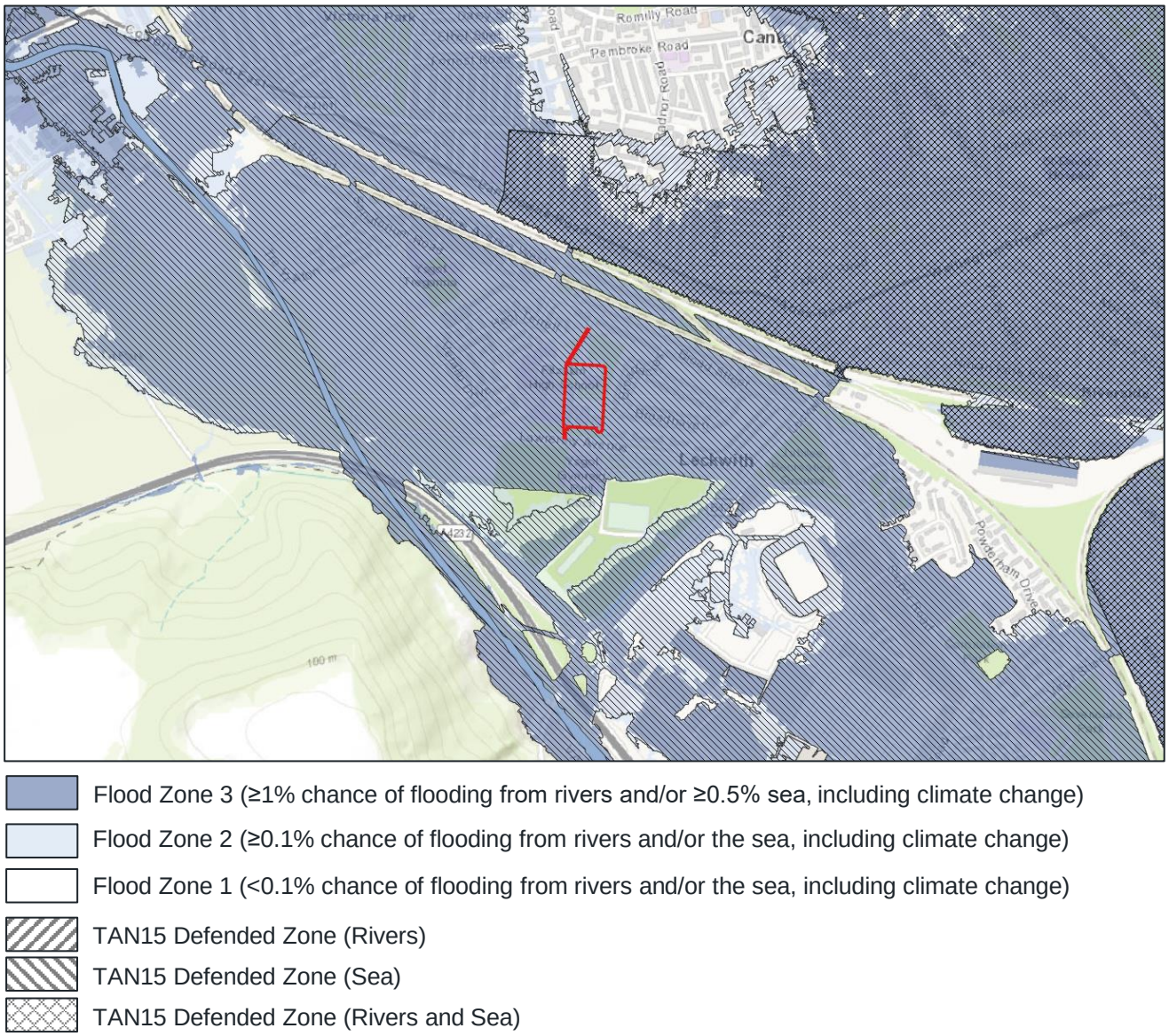


Figure 2-5: Flood Map for Planning (Rivers & Sea Combined)

2.1.1 FLOOD RISK FROM OTHER SOURCES

The Natural Resource Wales map for flood risk from reservoirs highlights that the site is at risk of flooding from either the Beacons Reservoir, the Cantref Reservoir or Pontsticill Reservoir (Taf Fechan). A review of the available mapping identifies other waterbodies in the vicinity, such as the ponds in Victoria and Fairwater Parks, St Fagan's Park and Hensol Hospital within the catchment. These are considered in Section 3.9.

Other than the Afon Ely which may be considered navigable, there are no canals or navigable waterways identified in the vicinity and therefore the site is not considered to be at risk from canal flooding.

It is understood that groundwater flooding is not considered an issue for the area (§2.4).

- The site *is* within a Flood Alert area and a Flood Warning area.
- NRW hold **no** recorded historic flood outlines at the site though record a flood extent on Leckwith Avenue / Leckwith Mews in December 1979 some 340 m distant.
- The site is **not** within a source protection zone.
- The site *is* situated within a Low productivity aquifer zone.
- The site is **not** within an Internal Drainage District (IDD).

2.2 NATURAL RESOURCES WALES DATA

To inform this FCA, data has been licenced from the NRW flood models, NRW hold two models of interest for this site a 2016 Cardiff wide model and a 2013 model focused on the Ely Paper Mills Development. The 2016 Cardiff wide model is an update of the 2015 Cardiff model with uprated flows and configuration to include the then latest climate change allowances, it models both the Ely and the Taff through Cardiff. The 2013 Paper Mills model is focused on the Paper Mills development simulating the Ely only and includes the associated flood improvement works which have not yet been incorporated into the Cardiff wide model, but are understood to be substantially completed given that residential properties within the development are inhabited and for sale at time of writing.

Stage levels have been extracted from the available data at the site of interest and are reported in Table 2-2 beneath. These show that the site is considered to be at risk of flooding from fluvial sources in the design event.

The NRW's data expresses Return Periods (RP) in terms of years, this is the average anticipated interval between events of this magnitude or greater and corresponds to the more intuitive AEP (Annual Exceedance Probability). The AEP percentage is the probability of an event of this magnitude or greater occurring in any given year. The equivalence between the two methods of describing the rarity of events is shown in Table 2-1 below.

Table 2-1: Flood Event Probability Description

Return Period (1 in *X* Years)	2	5	10	30	50	75	100	200	1000
AEP (%)	50	20	10	3.3	2	1.3	1	0.5	0.1

The equivalence[3] reported in the above table holds for return periods substantially greater than one year.

For fluvial flood events there are two events which need particular consideration, the hundred-year event (1% AEP) with a climate change allowance (1%cc) referred to as the key event or design event and the thousand-year event (0.1% AEP) referred to as the extreme event. For tidal events there are two events which need particular consideration, the two hundred-year event (0.5% AEP) with a climate change allowance (0.5%cc) referred to as the key event or design event and the thousand-year event (0.1% AEP) referred to as the extreme event.

[3] The equivalence $AEP \approx \left(\frac{1}{RP}\right) * 100$ as reported in table should more accurately be $AEP = \left(1 - e^{(-1/RP)}\right) * 100$

2.2.1 FLUVIAL DATA

NRW's fluvial models do not fully agree as to the level of flood risk at this site with the Cardiff Wide model identifying flooding occurring more frequently but the Paper Mills model identifying more severe flooding in the extreme event.

Table 2-2: NRW Predicted Fluvial Stage Levels at the Site

Event (Return Period Years)	Predicted Stage Level (m AOD)
Cardiff Wide 100cc (defended)	7.84
Cardiff Wide 1000 (defended)	8.37
Cardiff Wide 1000 (undefended)	8.74
Paper Mills 100cc (defended)	N/A
Paper Mills 1000 (defended)	8.49

Compared to an average existing ground level of 7.0 m AOD these results suggest the range of depths predicted on site is between dry in the design event and 0.84 m deep and between 1.37 and 1.49 m deep in the extreme event (defended).

Compared to the proposed pitch level of 6.8 – 7.40 m AOD these results suggest the range of depths predicted on site is between dry in the design event and 1.04 m deep and between 0.97 and 1.69 m deep in the extreme event (defended).

2.2.2 TIDAL DATA

The site is understood to be at limited risk of flooding from tidal sources in the present day which are reduced by the presence of the tidal barrage. The barrage is understood to protect against the 1000 year return period event (0.1% AEP); however, it should be recognised that the risk of tidal flooding may increase over the lifetime of the development depending on the rate of sea level rise.

2.3 WSP MODEL DATA

To inform this project, WSP have undertaken a model study combining the two NRW fluvial models and updating the flows. It should be noted that this updated NRW model has not yet been approved by NRW.

Stage levels have been extracted from the available data at the site of interest and are reported in Table 2-3 beneath. These show that the site is considered to be at risk of flooding from fluvial sources in the design event.

For fluvial flood events there are two events which need particular consideration, the hundred-year event (1% AEP) with the Central Estimate allowance for climate change (1%CE) referred to as the key event or design event and the thousand-year event (0.1% AEP) referred to as the extreme event.

Table 2-3: WSP Predicted Fluvial Stage Levels

Event (AEP %)	Predicted Stage Level (m AOD)
WSP Cardiff Combined Model 1% (defended)	N/A
WSP Cardiff Combined Model 1%CE (defended)	8.48
WSP Cardiff Combined Model 0.1% (defended)	8.67

Compared to an average ground level of 7.0 m AOD these results suggest the water depth predicted on site is circa 1.48 m in the design event and 0.84 m deep and circa 1.67 m deep in the extreme event.

Compared to the proposed pitch level of 6.8 – 7.40 m AOD these results suggest the range of depths predicted on site is between 1.08 and 1.68 m deep in the design event and between 1.27 and 1.87 m deep in the extreme event.

2.4 STRATEGIC FLOOD CONSEQUENCES ASSESSMENT

The site has not been specifically considered in the SFCA[4] though some are registered in this vicinity with 36LBR (Former Lansdowne Hospital) the closest to this site. The document identifies that there is a known issue from sewer flooding within the wider area and that there are no anticipated issues with groundwater flooding within the wider area stating:

> *The Taff and Ely CFMP states that groundwater flooding is not considered to be a significant issue within the catchment. It is noted that a large groundwater control scheme was introduced as part of the Cardiff Barrage scheme. There is a groundwater control system built into the Millennium Stadium. There are other similar schemes dotted throughout the low lying areas, designed to keep the groundwater levels low. It is not perceived that groundwater flooding would be a significant issue for the study sites. However,*

[4] Atkins (November 2011) Cardiff Strategic Flood Consequences Assessment Phase 2 Part 1 Update Extend Development Lifetime to 2110 Areas A, G, H and I Cardiff Council Ref: 5097656-DG-017

risks associated with groundwater should be investigated as part of site-specific FCAs. It is recommended that assessments should be made of additional control measures which may be required for specific sites.

Section 5.4.3 (pg. 54)

2.5 SHORELINE MANAGEMENT PLAN

The relevant Shoreline Management Plan[5] (SMP) for this stretch of coastline is SMP19 (Anchor Head to Lavernock Point Policy Unit CAR1). The policy identified in the plan is to 'hold the line' across all epochs and the erosion is expected to be negligible. Therefore, the policy suggests that this area will remain protected in the foreseeable future; however, it should be noted that this is an intention of policy only and that there is no guarantee this will not be altered by a future review nor that funding for this policy is assured.

2.6 HISTORIC FLOOD DATA

A search of the Chronology of British Hydrological Events[6] for the term 'Cardiff' returned 10 relevant results between 1696 and 1968, which are included in Appendix B though these do not specifically describe flooding at the school. One particular item of interest is a flood mark in St Luke's Church Canton recording a water height of 2 feet and 4 inches in 1927.

Discussions with the Facilities Manager have identified that the existing school has known issues with surface water flooding in low points following rainfall events. Photographic evidence of this has been provided, however given the potential sensitivities of vulnerable persons present in some of the images these have not been included in this public document. Records held by NRW do not cover the site and no specific events have been found online. The Phase 1 Strategic Flood Consequence Assessment[7] does identify a number of historic flood events in the wider area:

There have only been three notable events in the River Ely catchment within the last few decades, March 1998, October 2000 and September 2008. The March 1998 & October 2000 events – flooding from the River Ely affected a small number of properties in the Ely Bride area of Cardiff, Sandbags were issued in the Ely Bridge area of Cardiff. The September 2008 event flooding affected areas including the Ely Bridge area; 6 properties along Wroughton Place and 21 properties on Mill Road and Cowbridge Road West. Environment Agency Wales report states that initial flooding occurred from highway drains followed by overtopping of the river banks. Anecdotal evidence from residents following the event suggests that the roads in the area have flooded on previous occasions, although no properties were known to have flooded in the last 20 to 25 years leading up to 2008.

Section 2.3.1 (pg8)

[5] Atkins (December 2010) *Severn Estuary Shoreline Management Plan Review SMP2* Severn Estuary Coastal Group

[6] http://www.cbhe.hydrology.org.uk/ [Accessed November 2023]

[7] Atkins (June 2009) *Cardiff Strategic Flood Consequences Assessment: Report on Phase 1 (Scoping Study) and Proposed Methodology for Offer of Services for Phase 2 – the Assessment* Cardiff Council Doc Ref: 5076243.56.DG.045.4 – Ph.1 Final Report.doc

3 REQUIREMENTS OF TECHNICAL ADVICE NOTE 15

This report assesses the suitability of the proposed development against the requirements of the Technical Advice Note 15 (TAN15). This section outlines the risks identified in the report and explains the steps required for the development to comply with current legislation.

According to the Development Advice Map the site is located within Flood Zone C1. The development classification based on use is outdoor recreational space which has a lower vulnerability than the existing (Highly Vulnerable School) and is typically permitted in all areas where there is a risk of flooding. Preliminary advice from NRW, in response to the outline planning permission is in general agreement with this point:

> *…NRW consider the proposal is a betterment to the existing site use and an improvement on the current situation, therefore NRW have no objection to the application as submitted in relation to flood risk.*
>
> *20/01647/MJR 21/08/2020*

Notwithstanding this, NRW do state in their response that they presume the site as Highly Vulnerable as it is associated with an education facility, this appears to go further than a strict reading of TAN15 which states:

> *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.*
>
> *Figure 2 pg7 TAN15 (2004)*

i.e. there are no public buildings on site which solely includes outdoor space for use (though not sole use) of the school.

This definition is expanded in the paragraph below the aforementioned figure in TAN15:

> *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.*
>
> *§5.2 pg7 TAN15 (2004)*

NRW consider the development to be Highly Vulnerable due to its association with an education facility and whilst the 'occupants' of the pitch include children, it is within a supervised environment. The practical difference between this space and any other outdoor recreational space which would be 'occupied' by this same demographic, whether managed or unmanaged, is debatable. Therefore, whilst this assessment does not explicitly endorse the decision previously reached by NRW on the site's vulnerability, the site is assessed herein as both a Highly Vulnerable development as well as an outdoor recreational space.

Although the site is generally considered to be at a low risk of flooding from all sources except fluvial flooding which is likely to be an elevated risk, advice on the reduction of flood risk and flood consequence has been provided for consideration. In particular the contents of the Environment

Agency (EA) publications 'Prepare your property for flooding'[8] and 'Prepare your business for flooding'[9] should be considered.

3.1 FLUVIAL FLOOD RISK

The site is located some 400 metres from the Afon Ely, the range of predicted flood depths as identified in Sections 2.2.1 & 2.3 is between dry 0.00 and 1.68 m deep in the design event and between 0.97 and 1.87 m deep in the extreme event. This level of risk is likely to be permissible for outdoor recreational space.

A number of recommendations are made in Section 4 in order to reduce the risks and consequences of fluvial flooding.

3.2 TIDAL & OVERTOPPING FLOOD RISK

The site is understood to be at limited risk of flooding from tidal sources in the present day which are reduced by the presence of the tidal defences which are understood to protect against the thousand year return period. It should be noted that the risk of tidal flooding will increase over the lifetime of the development depending on the rate of sea level rise.

3.3 PLUVIAL & SURFACE WATER RISK

As identified in Section 2.1 and Section 2.6 the site is considered to have a risk of surface water flooding, although the predicted flood map does not consider local drainage systems. It should be noted that the predicted surface water flooding arises on the site itself and this will be mitigated against by a suitably designed and maintained surface water drainage system. A SuDS application will be submitted for the approval of the SuDS Approving Body (SAB) prior to construction, and following this the risk of flooding from this source may be considered low.

3.4 ACCESS, EGRESS & EVACUATION

Access and egress to the proposed development is predicted to become impeded in significant fluvial events (i.e. > 1% AEP). The site is located within a NRW flood warning area and the response of the lower reaches of the River Ely, following a significant rainfall event, is anticipated to peak after some 24 hours for the critical storm. Given this and the fact that this is a managed site it is likely that Access, Egress and Evacuation can be suitably managed via a site specific Flood Action Plan.

[8] Environment Agency (October 2009). *Prepare your property for flooding*. Available at: https://www.gov.uk/government/publications/prepare-your-property-for-flooding. [Accessed March 2020].

[9] Environment Agency (March 2015) *Prepare your business for flooding*. Available at: https://www.gov.uk/government/publications/preparing-your-business-for-flooding. [Accessed March 2020].

3.5 FLOOD COMPENSATION

The development is at risk of flooding in a fluvial flood event; therefore, additional structures and/or significant re-profiling of ground levels could displace or re-direct floodwater. The demolition of buildings and minor changes in ground level are unlikely to have significant impact, particularly due to the retention of a buffer of low lying ground adjacent to the eastern site boundary. Figure 1-3 above shows an extract of the Isopachyte which is included in full in Appendix A.

3.6 GROUNDWATER FLOOD RISK

The level of groundwater flood risk should be reconsidered following geological site investigations; however, it is noted that the SFCA (as quoted §2.4) does not consider the area to be at a known risk from this source of flooding. Additionally, according to the NRW flood maps, the site is not located within any source protection zones, defined around large and public potable groundwater abstraction zones. Furthermore, groundwater tends to emerge slowly and would typically follow the existing drainage networks and flowpaths, thus is unlikely to pose an emergency and the risk would remain limited. It is understood that the proposal does not include basements and/or sub-levels, therefore, based on these assumptions and the information within this report, groundwater flooding is considered a residual risk, subject to the findings of any site specific intrusive investigations.

3.7 SURFACE WATER DRAINAGE

The current site is brownfield but without due consideration the re-development could theoretically increase surface water runoff. In this case it is understood that, the proposed drainage will be designed and submitted for approval through Cardiff Council through the SAB process, in line with Schedule 3 of the Flood and Water Management Act 2010. This includes designing the drainage network for up to 100 year +40% climate change rainfall events and proposing SuDS features to the guidance provided in SuDS Manual C753. The drainage will also be designed in accordance with the Building Regulations 2010 Part H where applicable and, if appropriate, offered for adoption, the drainage will be designed to Sewers For Adoption 7th Edition. Therefore, as the Surface Water drainage system addresses this risk, and once it has been approved by the SAB, this risk can be considered low.

3.8 AWARENESS OF FLOOD RISK

Whilst the site is generally at a low risk of flooding from most sources, the developer should be aware that the site is not immune from the impacts of flooding, either within the site or to the surrounding area. The site is covered by an existing Flood Warning Area and it is recommended that anyone responsible for the site is encouraged to sign up to the service. It is recommended that flood warning notices are suitably displayed alongside fire evacuation signs. A flood action plan should also be formulated to ensure a strategic response is in place should a flood event be predicted or occur.

3.9 RESERVOIR & INFRASTRUCTURE FLOOD RISK

The Afon Ely could be considered navigable along this reach by small craft, but a breach resulting from impact or other means is unlikely, given the site is higher than the watercourse. There are no other canals or navigable waterways known in the vicinity. In the event of an uncontrolled release of water from either: The Beacons Reservoir, the Cantref Reservoir or Pontsticill Reservoir (Taf Fechan) the site is expected to flood; however, considering inspection and maintenance regime of reservoirs in the UK, this risk is considered residual and in the opinion of this report acceptable, assuming there are no outstanding concerns with these structures. Other waterbodies in the vicinity, such as the ponds in Victoria and Fairwater Parks and St Fagan's Park, are unlikely to be sufficient to significantly affect the flood risk at the site, whereas Hensol Hospital Lake has been assessed as not effecting the Afon Ely this far downstream.

Having considered the flood risk from lakes, reservoirs and canals, two principal infrastructure sources remain: a burst water main and the drainage network. A burst water main would likely have a similar effect as a sizable rainfall event to which the development is not considered vulnerable (§3.3). Similarly, a surcharging foul (or combined) sewer would likely follow a similar flowpath away from the site and although the SFCA notes a heightened risk of sewer flooding in this vicinity the proposal is not anticipated to increase loading on the network or be particularly vulnerable to this source of risk. Therefore, subject to commentary from the sewerage undertaker as a statutory consultee on the planning application, the risk of flooding from this source can be considered as residual and should not forestall development.

3.10 COMPLIANCE WITH TAN15

Section 9 of TAN15 summarises: the planning requirements, acceptability criteria and development advice for a Highly Vulnerable development and an outdoor recreational space (other) development in DAM Zone C1.

The planning requirements set out in the aforementioned section for Highly Vulnerable developments are: that the Justification Test is applied, the consequences are acceptable and that surface water requirements are met. These are each discussed in the following sub-sections.

The planning requirements set out in the aforementioned section for outdoor recreational space (other) developments are: that the consequences are acceptable and that surface water requirements are met. These are each discussed in the following sub-sections.

3.10.1 JUSTIFICATION TEST

Since the proposed development is located wholly within Flood Zone C1, a Justification Test is not strictly required for outdoor recreational space (other) developments, but is still a useful exercise. The Justification Test would, however, be required for Highly Vulnerable developments. Section 6 of TAN15 recognises that flexibility is required for developments in Zone C as dogmatically preventing all infrastructure in previously developed areas defined as Zone C in Wales would have negative social and economic consequences; therefore, a balanced judgement is required. The Justification Test does however seek to steer development from Zone C towards lower vulnerability areas.

Section 6 of TAN15 states that:

'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 (PPW fig 4.1); 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 found to be acceptable.'

The site may contribute to local authority strategy under point i being associated with a new school development and being brownfield is clearly compliant with point iii. Concerning point iv this document provides a consideration of the predicted flood consequences and the criteria within TAN15 against which the development can be assessed. It should also be noted that mitigative measures outlined in this report are recommended (§4).

3.10.2 ACCEPTABILITY CRITERIA

Section 9 of TAN15 sets out Acceptability Criteria for outdoor recreational space (other) developments in DAM Zone C1 and these are:

- Acceptable Consequences for Nature of Use,
- Occupiers Aware of Flood Risk,
- Desirable if effective flood warning and evacuation routes/procedure provided depending on nature of proposal,
- No increase in flooding elsewhere.

Each of the above are addressed in turn in the subsections following. In summary, however, these criteria are arguably met.

Section 9 of TAN15 sets out Acceptability Criteria for Highly Vulnerable developments in DAM Zone C1 and these are:

- Acceptable Consequences for Nature of Use,
- Flood Defences Adequate,
- Agreement for Construction and Maintenance Costs Secured,
- Occupiers Aware of Flood Risk,
- Escape or Evacuation Routes Present,
- Effective Flood Warnings Provided,
- Flood Emergency Plans and Procedures,
- Flood resistant design
- No increase in flooding elsewhere

Each of the above are addressed in turn in the subsections following. In summary, however, these criteria are arguably met.

3.10.2.1 Acceptable Consequences for Nature of Use

This point is required for both Highly Vulnerable as well as outdoor recreational space (other) developments.

This FCA considers that the level of flood risk for the majority of the site is low from most sources and an elevated fluvial risk, and that the proposed development both lowers the vulnerability classification (from Highly Vulnerable to outdoor recreational space) as well as lowering the numbers of 'occupants' at risk. As set out within this FCA, this may be considered to be commensurate with the anticipated level of flood risk from the various data available. Acceptability criteria are considered in further in Sections 3.10.4, 3.10.5, 3.10.6 and 3.10.7.

3.10.2.2 Flood Defences Adequate

This point is required only for Highly Vulnerable developments and is not required for outdoor recreational space (other) developments.

The preliminary advice from NRW which states:

> *NRW consider the risk of tidal flooding to the proposed development is negligible, as the site benefits from the presence of the Cardiff Bay Barrage. This operates in a flood risk capacity, providing significant protection to Cardiff from tidal flood risk.*
>
> *20/01647/MJR 21/08/2020*

as well as the presence of the TAN15 Defended Zone strongly implies that the existing defences can be considered adequate.

3.10.2.3 Agreement for Construction & Maintenance Costs Secured

This point is required only for Highly Vulnerable developments and is not required for outdoor recreational space (other) developments.

The site is considered to benefit from significant flood defences, hence being in DAM Zone C1. Specifically, this includes the Cardiff Bay Tidal Barrage. No additional defences are proposed for this redevelopment. Therefore, it may be presumed that maintenance costs are secured.

3.10.2.4 Occupiers Aware of Flood Risk

This point is required for both Highly Vulnerable as well as outdoor recreational space (other) developments.

The site is within a NRW Flood Alert and Flood Warning Zone. It is recommended within this report that a flood action plan is developed for the site. This document should be reviewed, practised, and revised on a frequent and regular basis; hence ensuring an appropriate awareness of flood risk. It is also recommended that flood warning notices outlining key points from the flood action plan (e.g. evacuation or safe refuge) are posted in appropriate locations (e.g. alongside fire evacuation guidance).

3.10.2.5 Escape or Evacuation Routes Present

This point is required for Highly Vulnerable developments but is only considered desirable for outdoor recreational space (other) developments.

Access and egress considerations have been provided in Section 3.4. This highlights that access and egress is likely to remain feasible in more frequent events (≤ 1% AEP) but may become impeded on certain routes in larger events (> 1% AEP); however, evacuation to the school, safe refuge within the school and site / school closures preceding an event are alternatives which may be considered acceptable.

3.10.2.6 Effective Flood Warnings Provided

This point is required for Highly Vulnerable developments but is only considered desirable for outdoor recreational space (other) developments.

It is understood that the site is within a Natural Resource Wales Flood Watch & Flood Alert area, therefore, it is recommended that persons responsible for the site should sign up to receive these flood alerts and warnings. This will facilitate flood warning measures, which can be taken when risk is present or anticipated. Appropriate measures or systems should be developed to ensure all users of the site are, and can be, made aware of flood risk and flood events when they occur. These measures should be documented in a Flood Action Plan.

3.10.2.7 Flood Emergency Plans and Procedures

This point is required only for Highly Vulnerable developments and is not required for outdoor recreational space (other) developments.

This report recommends that a Flood Action Plan should be practised, reviewed and developed by the site staff and those otherwise responsible for the site on a regular basis.

3.10.2.8 Flood Resistant Design

This point is required only for Highly Vulnerable developments and is not required for outdoor recreational space (other) developments.

This report recommends that Flood Resilience and resistance measures should be incorporated into the design to ensure that the site can be safely remediated following a flood event.

3.10.2.9 No Increase in Flooding Elsewhere

This point is required for both Highly Vulnerable as well as outdoor recreational space (other) developments.

As described in Section 3.5, the proposed development is not anticipated to increase flooding elsewhere.

3.10.3 DEVELOPMENT ADVICE

TAN15 advises the following for 'Highly Vulnerable' developments within DAM Zone C1.

> *"Plan allocations or applications for all development can only proceed subject to justification in accordance with section 6 and acceptability of consequences in accordance with section 7 and Appendix 1."*

TAN15 advises the following for 'other' (outdoor recreational space) developments within DAM Zone C1.

"Plan allocations or applications for development should only be made if considered acceptable in accordance with section 7 and Appendix 1."

3.10.4 TAN15 SECTION 7.2

Under Section 7.2 of TAN15 the three key criteria of acceptability are whether:

- The consequence of flooding can be managed down to an acceptable level including its effects on existing development,
- Safe access can be achieved, and
- Timely flood warnings can be provided.

The consequences of flooding are likely acceptable given that the change of use does not increase the change of vulnerability (arguably lowers it). Given that there is a risk however, further mitigation is recommended (§4).

Consideration of access has been set out in Section 3.4, and it is a matter for the Local Authority whether the access arrangements, or evacuation and safe refuge measures, are acceptable.

Flood alerts should be available from Natural Resource Wales given the site's location within a flood alert area.

The recommendations set out within this report will assist in further meeting the intent of these three criteria which are arguably met.

3.10.5 TAN15 SECTION 7.3

Section 7.3 of TAN15 notes that if a development is justified, mitigation measures should be incorporated into the design to make it as safe as possible (Section 4) and that there is:

- Minimal risk to life;

  The development can be evacuated and closed sufficiently in advance of a flood event, flood waters are not anticipated to suddenly inundate the site which can be actively managed in accordance with a Flood Action Plan, therefore, the risk to life is arguably minimal.

- Minimal disruption to people living and working in the area;

  It is generally accepted that developments proposed for outdoor recreational may be permitted to flood. In the event that the development becomes flooded and closed for use, alternative facilities within the Cardiff area may be identified in accordance with the Flood Action Plan, but the disruption to people living and working in the area would be anticipated to be minimal as a result.

- Minimal potential damage to property;

  The development is predicted to flood in significant events, however, by: incorporating resilience and resistance measures up to the extreme flood event, planning for an event in the management and maintenance plans alongside suitable mitigative measures and flood warnings will minimise damage to property.

- Minimal impact of the proposed development on flood risk generally, and;

The development potentially provides the opportunity to reduce surface water runoff. There is a potential that the demolition of the existing school could increase conveyance through the site, however this is not expected to generate significant impacts.

- Minimal disruption to natural heritage.

  The proposed development is on brownfield land, but without due care could cause disruption to natural heritage if species of interest have established themselves on site. It is recommended that input is sought from ecologists and landscape engineers to minimise disruption to natural heritage and amenities as well as considering how the proposed layout can maximise potential benefits.

  This report provides details concerning the flood risk, such as details on the probable flood mechanisms and recommendations to mitigate against the flood risks and consequences.

3.10.6 TAN15 SECTION A1.14

Section A1.14 of TAN15 sets out the threshold of flooding criteria for development types, identifying that most developments should not typically flood in the 1% AEP event. However, it does not explicitly include a classification for open space and recreation (or other). Recreational open space is not included in the classification list, being considered a separate non-standard classification under 11.21. Furthermore, A1.14 notes within its text that it is not prescriptive but indicative guidance. Any strict assessment against these standard threshold criteria contradicts the text of 11.21 where it states that:

> *'Proposals for public open space, outdoor recreational uses and agricultural developments, are likely to be acceptable in all areas where there is a risk of flooding.'*

Thus, this document identifies that there is an expectation that NRW should advise on acceptability of outdoor recreational use outside of the typical A1.14 and A1.15 classifications. Given the text of 11.21:

> *'The Environment Agency will advise on the requirements of appendix 1 as far as these are required in relation to the scale and nature of the proposal.'*

It may be useful for NRW to refer to other outdoor recreational spaces situated upon floodplains throughout Wales as well as reflect on newer guidance available in England which is more explicit on this matter and considers outdoor recreational space as a water-compatible development.

It is noted that the existing development is predicted to flood in the design event (based on flood model outputs provided by NRW) and that the change of use does not change the vulnerability classification and arguably lowers it. Mitigation is proposed to reduce the risk and A1.14 notes it is indicative guidance and not prescriptive, however it should be noted the development does not flood in the present-day typical guidance event (1% AEP).

3.10.7 TAN15 SECTION A1.15

Section A1.15 of TAN15 describes indicative guidance as to what may be considered as tolerable flood conditions in the extreme event. However, it neither includes public open space and recreation nor school playing fields. Section 11.21 of TAN15 identifies that it is NRW who will advise on the requirements, as per Section 3.10.6 above. Notwithstanding the above, the headings contained within Section A1.15 are described below, against which NRW can provide their advice.

- Maximum Depth of flooding (m).
  As set out in Sections 2.2.1 & 2.3 above, the maximum predicted depths in the extreme event (0.1% AEP) are predicted as between 0.97 and 1.69 m in the NRW model or between 1.27 and 1.87 m in the WSP model in the proposed scenario.
- Maximum Depth of flooding to access (m).
  The acceptability of access is a matter for the local authority; however, maximum predicted depths in the baseline extreme event (0.1% AEP) are circa 1.3 m at the Lawrenny Avenue / B4267 junction, as predicted by the WSP model. The school opposite has access to higher ground in which safe refuge may be acceptable; however, whilst this route avoids the aforementioned junction, it still crosses Lawrenny Avenue over which depths of circa 1.2 m are predicted by the WSP model.
- Maximum rate of rise of floodwaters (m/hr).
  In the baseline extreme event (0.1% AEP), the rate of rise as measured in the WSP model for a point near the centre of the proposed pitch, depends on the time interval selected:
  - From first wetting of the site at 23 hours to maximum depth at 29 hours the rate of rise is 0.35 m/hr.
  - From first wetting of the site at 23 hours at the 1 hour intervals recorded by the model, the maximum rate of rise is within the 1st hour at 0.76 m/hr.
  - Other durations may also be valid (e.g. from onset of storm, form overtopping at sanitorium park, from Ely overtopping upstream, or to initial flooding of the site), any combination of start and end times to produce these values of rate of rise, if of interest, can be determined.
- Maximum Speed of inundation (hrs).
  Flood waters are predicted by the baseline extreme (0.1% AEP) WSP model to reach the site in the extreme event by 23 hours from the start of the storm, noting that the Afon Ely overtops into Sanitorium Park, circa 18 hours into the simulation (though is out of bank upstream earlier).
- Maximum Velocity of flooding to the development (m/s)
  In the extreme event (0.1% AEP), the rate of rise as measured in the WSP Baseline model velocities are clearly affected by the presence and situation of buildings with flow corridors around existing features showing increased velocities. These ‘hot spots’ may exceed 0.8 m/s or be as low as 0.02 m/s where in shadow / on footprint. An average of circa 0.2 m/s within the redline footprint is reported.
- Maximum Velocity of flooding to access (m/s).
  The acceptability of access is a matter for the local authority; however, maximum predicted velocities in the extreme event (0.1% AEP) exceed 1.1 m/s at both the Lawrenny Avenue / B4267 junction and the B4267 / Brian Clark Way junction, as predicted by the baseline WSP model. The school opposite has access to higher ground in which safe refuge may be acceptable; however, whilst this route avoids the aforementioned junctions it still crosses Lawrenny Avenue over which velocities of up to 0.5 m/s are predicted by the baseline WSP model.

The best available data suggest that the site is outside of the indicative guidance of most criteria for most of the types of development noted (excepting speed of inundation). It should, however, be reiterated that the TAN15 guidance values are not prescriptive and that TAN15 states that outdoor recreational uses are likely to be acceptable in all areas where there is a risk of flooding. The values above have been provided such that the level of risk can be reasonably understood.

3.11 TAN15 UPDATE

An updated TAN15 is currently under consultation and is to be supported by the new Flood Map for Planning, which has been reprinted as Figure 2-5 within Section 2.1 of this report.

It is understood that vulnerability classes for developments remain similar, but with some small differences.

Currently, the site is classified as being within a TAN15 Defended Zone (Flood Zone 3) on the Flood Map for Planning. It is noted that this FCA is written based on the current version of TAN15 at time of writing and is founded on the best available data.

4 RECOMMENDATIONS

- Mitigative measures should be included to reduce both the risk and the impact of flooding with passive measures considered preferentially over active measures. These could include but are not limited to:
  - The site should be designed to passively accommodate flood waters, with readily accessible egress to safety.
  - Non-return valves fitted to drains and water in/outlet pipes as appropriate,
  - The structural and façade design of any features, etc within the site should suitably consider or account for the predicted flood flows over their lifespan.
- A drainage strategy should be developed to ensure there is no increase in surface water runoff, it is recommended that this is developed alongside early engagement with the SAB and supported by onsite ground investigation study. The maintenance schedule should include consideration of actions post flood event. A drainage strategy has been prepared by WSP UK Ltd (ref: 6653-WSP-RP-C-003).
- Mitigative measures should be considered to reduce both the risk and the impact of flooding. Such measures could include: a site wide flood action plan, incorporating flood resilience and resistance into the proposed features as well as warning notices to describe flood risk and any flood access constraints.
- A Site-specific Flood Action Plan should be developed, either for managing the site specifically or for the wider school (having principal use of this development), or both. This should include clear responsibilities and chain of command including procedures for confirming actions and coping with absences. It should give due consideration to Evacuation and closure procedures. The plan should be reviewed and practiced sufficiently frequently to ensure all staff understand and are competent in their designated roles and responsibilities. It is suggested that induction orientation/training and warning notices should describe the flood risk as well as any flood access constraints.
- Anyone responsible for the site or its operation should be encouraged to sign up to flood warnings direct.
- It is recommended that highly vulnerable developments, (including accommodation) are neither incorporated into the design nor added at a later date and that the site is neither used for storing hazardous materials nor for other more vulnerable uses even on a temporary basis; unless suitably supported by a specific FCA.
- The site should not be proposed as an emergency gathering point unless made safe for such purpose and no other location more suitable for said purpose can be identified.

5 CONCLUSIONS

This report assesses that there is a low risk of flooding from all sources, except fluvial, at the site as currently understood. Therefore, a number of recommendations have been made to reduce the risks and consequences of flooding and these may be required prior to these works being granted for reserved matters approval.

The development proposal is a change of use from existing school buildings and external areas to recreational open space (albeit still associated with the school) that arguably lowers the vulnerability classification, hence reducing flood consequences. These risks and consequences can, however, be further lowered by incorporating the recommendations within this report.

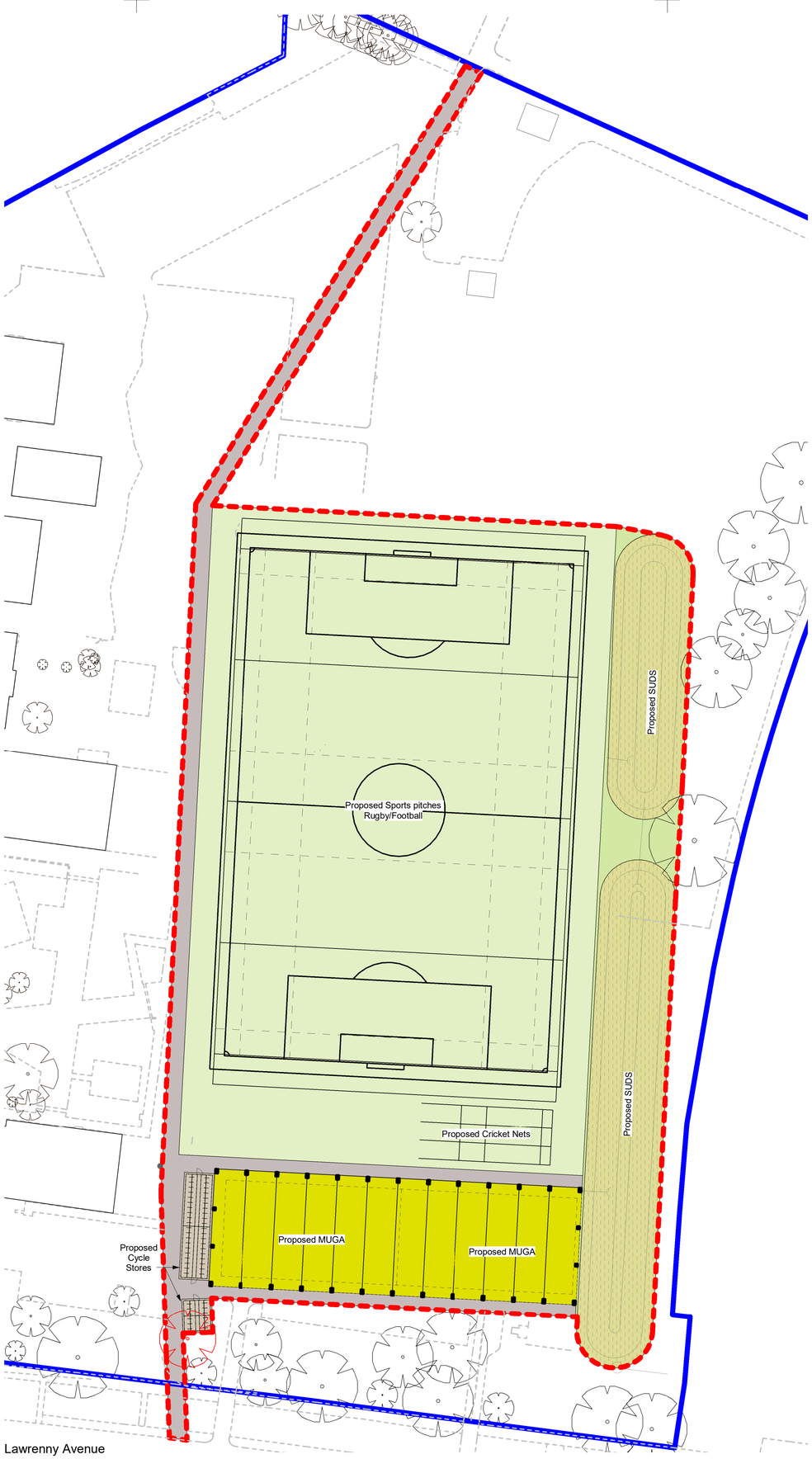
The existing site is at risk of flooding and may be non-compliant if considered as solely a school site (highly vulnerable). The proposal is, however, compliant with several criteria and the proposed development can be seen as an improvement over the existing situation. Furthermore, it is argued that it is for situations such as the proposals herein that TAN15 criteria are identified as non-prescriptive and includes the guidance that outdoor recreational use developments are likely to be acceptable in areas of risk.

Whilst this report assesses that there is a risk of flooding at the site as currently understood, a number of recommendations have been made to reduce the risks and consequences of flooding. It is considered that once these are implemented through the design process, the level of risk may be considered commensurate with the development proposals.

Appendix A

SITE TOPOGRAPHY & PROPOSED LAYOUT


« Broad Street »
« Lawrenny Avenue »



Key:

Cardiff City Council ownership boundary

Development Redline boundary

Hard Landscape

Proposed Hard surface
Proposed tarmac footpath

Proposed Bike Store
Proposed secure covered bike store for 102 bikes

Proposed Hard Surface
Proposed permeable tarmac MUGA

Existing site buildings retained during Phase 2 & 3

Soft Landscape

Proposed Sports field
Proposed grass rugby/football pitch and cricket nets

Proposed SUDS

Proposed wildflower
Proposed wildflower meadow seed mix to SUDS and redline boundary

Existing site trees

Removed tree

Exist Levels

Prop Levels

STATUS	REV	DATE	DESCRIPTION
S1	P09	26/10/2023	Team coordination

CLIENT
Cardiff City Council

REVISED BY
LC

CHECKED BY
CS

ORIGINATOR NO
155461

CONSULTANT
STRIDE TREGLOWN
www.stridetreglown.com

PROJECT
Fitzalan Old School Site
Lawrenny Avenue

DRAWING TITLE
Landscape General Arrangement

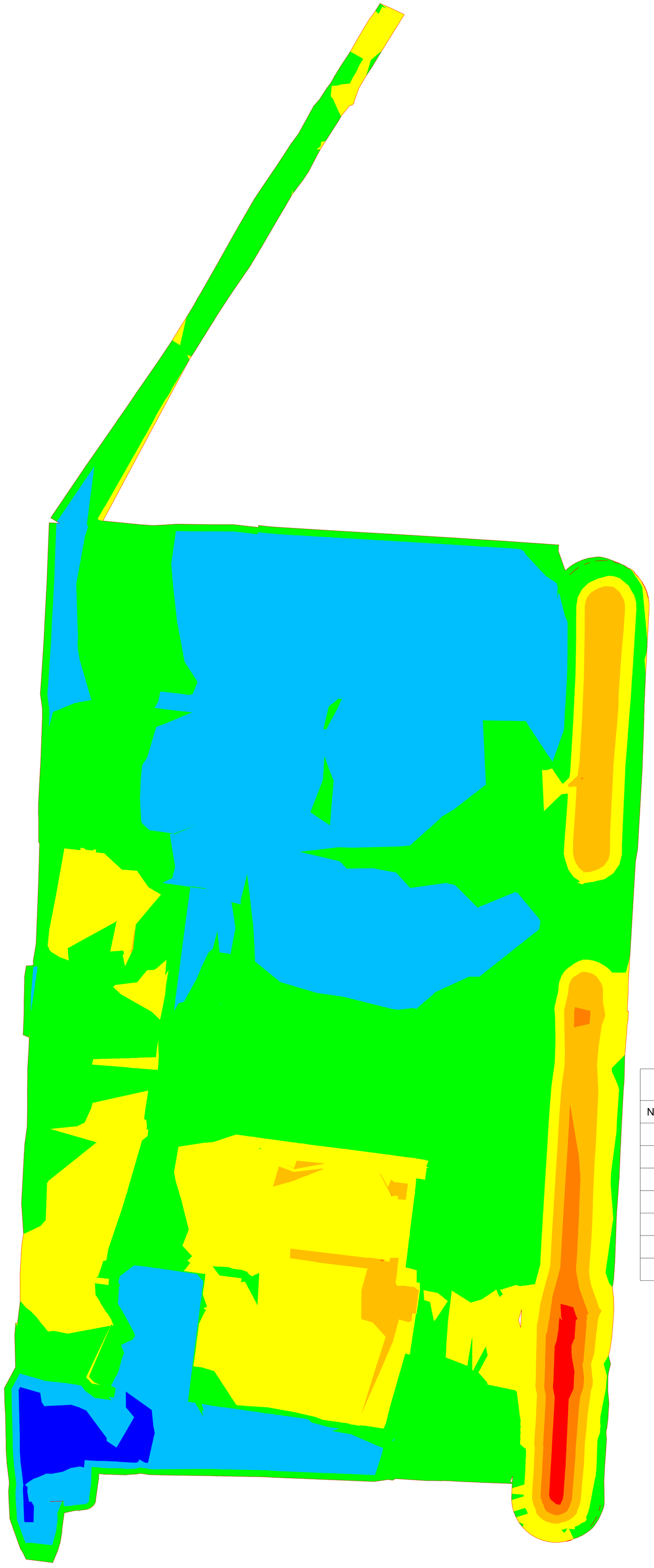
STATUS CODE
S1 : Suitable for coordination

SCALE
1 : 500@A1

DRAWING USAGE:

PROJECT - ORIGINATOR - VOLUME - LEVEL - TYPE - ROLE - CLASS. - NUMBER
155461-STL-XX-00-DR-L-ZZZZ-9002

STATUS _ REVISION
S1_P09



SURFACE LEVEL DATA				
NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	AREA
1	-1.349	-1.200		89.631m²
2	-1.200	-0.800		206.498m²
3	-0.800	-0.400		820.021m²
4	-0.400	0.000		3219.000m²
5	0.000	0.400		6998.330m²
6	0.400	0.800		5144.690m²
7	0.800	0.943		215.044m²

Appendix B

CHRONOLOGY OF BRITISH HYDROLOGICAL EVENTS

University of Dundee

British Hydrological Society

CHRONOLOGY OF BRITISH HYDROLOGICAL EVENTS

Search Results

Matching Search Item:

Results Per Page: 10 | 25 | 50 | 100

ID	Date	Quotation	Area	Contributor
10334	1696	1696 p15: Central Cardiff: "... The name 'Kings Castle' was also taken by one of Canton's oldest and largest private houses [on the site later taken by the Memorial Hall] ... The house and its occupants featured in a court case of 1696 in which Nicholas Greene blocked a water-course and flooded Cowbridge Road ... 'to vex and oppose Henry Fox ...'". [ha 057, Taff]	057 - Taff (Glamorgan) Group	Frank Law
12534	27-01-1795	Such a rare and sudden thaw that ice floes swept away the temporary works for a new bridge over the River Taff in Cardiff.	057 - Taff (Glamorgan) Group	Frank Law
10333	1827	1827 p37: "This photograph of Cardiff [Canton] Bridge in 1891 shows the remains of the 1796 bridge. The first stone bridge - to replace the earlier wooden structures often destroyed by debris brought down by floods - was probably raised in 1582 and rebuilt after the damage caused in the Civil War. A new bridge built in 1796 was destroyed by floods about 1827 ..." [ha 057, River Taff]	057 - Taff (Glamorgan) Group	Frank Law
11836	14-07-1875	P 56: "The amounts recorded in Cardiff for May 27th [1931] were the largest recorded there since July 14th, 1875, when 4.84 inches, 4.80 inches and 4.75 inches fell at Lisvane, Pentyrch and Ely respectively. On that occasion the rivers Taff and Ely overflowed ther banks in many places and there was considerable damage to hay, etc."	057 - Taff (Glamorgan) Group	Frank Law
10444	15-07-1875	1875 July 15 "Cardiff: The rivers Taff and Ely overflowed their banks in many places; the damage to hay was immense ... Flocks of sheep have been washed down both rivers, and also horses and a large number of pigs. At St Fagans the railway was more than 2 ft. under water, near Canton Common, at Grangetown, and in the village of Ely many houses had the water 4 or 5 ft. deep, so that the inhabitants could only be visited or removed in boats. The turnpike road between Cardiff and St Nicholas was impassable for one whole day ... Tongwynglais: The Taff rose to a great height; the Pentyrch works were flooded, and at Nangarw there was 6 ft. of water over the turnpike road." [ha 057, Taff]	057 - Taff (Glamorgan) Group	Frank Law
11251	14-07-1875	1875 July 14 Daily rain at Cardiff of 4.75 in. [ha 057]	057 - Taff (Glamorgan) Group	Frank Law
8079	1893	1893 April For these reasons I select, for special notice, only droughts, of sixty days or upwards, which have begun in February or March and finished in April, May or June. That the spring is the usual period for such droughts is strikingly proved by the fact that this limitation excludes only two out of the eight long partial droughts of the present century..." 1893 rain records show Greenwich - partial drought from Feb 28 to May 16 or 78 days, including an absolute drought of 30 days from Mar 18 to April 15.Camden Square - Partial drought from Feb 28 to May 16, or 78 days, including an absolute drought of 29 days from March 18 to April 15...The area over which the drought has been severe is that S.E. of a line joining Cardiff to Hull, and it has been worst along the south coast from Dover to Exeter.""	039 - Thames	Frank Law

ID	Date	Quotation	Area	Contributor
10332	03-11-1927	1927 November 3 p97: Central Cardiff: "A Swansea-Cardiff train passing the paper mill on 3 November, 1927. After those floods, which began two days earlier, the [Cardiff] Council straightened the course of the River Ely and undertook other work which prevented their recurrence [but note flood of 5/12/1960 on photos, p10 and p123, of Cowbridge Road]. In St Luke's Church a tide-mark can still be seen which records the height of the water there: 2 feet, 4 inches." [ha057, River Ely]	057 - Taff (Glamorgan) Group	Frank Law
11835	27-05-1931	P 54-56, inc isohyetal map:More than 4 inches fell over 104 square miles, and between 3 and 4 inches over 218 square miles, lying roughly north-south from Breconshire to Glamorgan.Largest fall was 4.50 inches at Penarth (Council Offices). The fall recorded in Cardiff (4.18 inches at Penylan) was the largest since July 14th, 1875.	057 - Taff (Glamorgan) Group	Frank Law
13852	05-12-1939	"At 1-40 pm on 5th December 1939 after a period of heavy rainfall a large slide of a [coal waste] tip belonging to the Albion Colliery (owned by the Powell Duffryn Company) occurred at Cilfynydd Common near Abercynon some five miles from Aberfan [south of Merthyr Tydfil]. The tip situated on the hillside adjoining the main Cardiff-Merthyr road slid some 710 feet to the road crossed it and then progressed a further 720 feet to beyond the river bed. The width of the slide below the tip was 400 feet the main road was blocked for 585 feet to a depth of 20 ♦ 25 feet the Glamorgan Canal was filled for 540 feet and the railway for 500 feet. The River Taff was blocked to a depth of 15 feet for some 500 feet and substantially diverted. It was estimated that the total weight of tip material in the slide was some 18000 tons." [page 41] "Mr Brynmor Davies a consultant civil and mining engineer ... concluded that unusually heavy rainfall had caused a rotational slide." [page 42]	057 - Taff (Glamorgan) Group	Henry Gunston

Total Number of Records: **11** **Displaying Records: 1 - 10**

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Appendix C

NRW OUTLINE PLANNING PERMISSION RESPONSE

Should the proposal alter during the course of the application process we kindly request that we are re-consulted and reserve the right to make new representation.

6.3 GGAT has no archaeological objection and no conditions are recommended.

6.4 NRW recommend request the following conditions be imposed on any planning permission granted:

Condition 1: Land Affected by Contamination
No development or phase of development shall commence until the following components of a scheme to deal with the risks associated with contamination at the site, has been submitted to an approved in writing by the Local Planning Authority:

1.A Preliminary risk assessment which has identified:•All previous uses
- Potential contaminants associated with those uses
- A conceptual model of the site indicating sources, pathways and receptors
- Potentially unacceptable risks arising from contamination of the site

2.A Site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.

3. The results of the site investigation and the detailed risk assessment referred to in (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.

4.A Verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action. The remediation strategy and its relevant components shall be carried out in accordance with the approved details.

Justification: To ensure the risks associated with contamination at the site have been fully considered prior to commencement of development as controlled waters are of high environmental sensitivity; and where necessary remediation measures and long-term monitoring are implemented to prevent unacceptable risks from contamination.

Condition 2: Contamination Verification Report
Prior to the occupation of the development of phase of development a verification report demonstrating completion of works set out in the approved remediation strategy and the effectiveness of the remediation shall be submitted to and approved in writing by the Local Planning Authority. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met. It shall also include a long-term monitoring and maintenance plan for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action, identified in the verification plan. The long-term monitoring and maintenance plan shall be

carried out in accordance with the approved details.

Justification: To ensure the methods identified in the verification plan have been implemented and completed. In addition, the risk associated with the contamination at the site has been remediated prior to occupation or operation, to prevent both future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems. Furthermore, to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors.

Condition 3: Unsuspected Contamination
If, during development, contamination not previously identified is found to be present at the site, then no further development (unless otherwise agreed in writing by the Local Planning Authority) shall be carried out until a remediation strategy detailing how this unsuspected contamination shall be dealt with has been submitted to an approved in writing by the Local Planning Authority. The remediation strategy shall be carried out as approved.

Justification: To ensure the risks associated with previously unsuspected contamination at the site are dealt with through remediation strategy, to minimise the risk to both future users of the land and neighbouring land, and to ensure that the development can be carried out safely without unacceptable risks. A site investigation may not uncover all instances of contamination and this condition ensures that contamination encountered during the development phase is dealt with appropriately.

Condition 4: Surface Water Drainage
No infiltration of surface water drainage into the ground site is permitted other than with the express written consent of the Local Planning Authority, which may be given for those parts of the site where it has been demonstrated that there is no resultant unacceptable risk to controlled waters. The development shall be carried out in accordance with the approval details.

Justification: To prevent both new and existing development from contributing to or being put at unacceptable risk from or being adversely affected by unacceptable levels of water pollution.

Condition 5: Piling
No development shall commence until details of piling or any other foundation designs using penetrative methods sufficient to demonstrate that there is no unacceptable risk to groundwater, have been submitted to and approved in writing by the Local Planning Authority. The piling/foundation designs shall be implemented in accordance with the approved details.

Justification: Piling/foundation details should be submitted to ensure there is no unacceptable risk to groundwater during construction and methods/design are agreed prior to the commencement of development or phase of development.

Flood Risk

The planning application proposes highly vulnerable development (a sports pitch, 2 multi-use games areas and a cycle parking shelter associated with an education facility). NRW's Flood Risk Map confirms the site to be within Zone C1 of the Development Advice Map (DAM) contained in TAN15 and the 1% (1 in 100 year) and 0.1% (1 in 1000 year) annual probability fluvial flood outlines and the 0.5% (1 in 200 year) and 0.1% (1 in 1000 year) annual probability tidal flood outlines of the River Ely.

Section 6 of TAN15 requires the Local Planning Authority to determine whether the development at this location is justified. The tests set out in Section 6.2 of TAN15 are relevant as to whether the proposal meets the tests set out in criteria (i) to (iii), then the final test (iv) is for the Applicant to demonstrate, through the submission of an FCA, that the potential consequences of flooding can be managed to an acceptable level.

NRW says that no final ground levels have been provided for the proposed development. However, according to the FCA, the current ground levels range from 6.5-7.3m AOD, with an average ground level of 7m AOD. Based on the average ground level of 7m AOD, the flood data shows:

- During a 1% (1 in 100 year) plus 25% for climate change annual probability fluvial flood event, the predicted flood level is 7.84m AOD, therefore the development site is predicted to flood to a maximum depth of 840mm. This fails to meet the requirements of A1.14 of TAN15, which advises that the site should be flood free in such an event.
- During a 0.1% (1 in 1000 year) annual probability fluvial flood event, the predicted flood level is 8.37m AOD for the Cardiff Wide Model and 8.49m AOD for the Paper Mills Model. Therefore, the development site is predicted to flood to a maximum depth of 1370-1490mm. This exceeds the tolerable limits of A1.15 of TAN15, which states the maximum velocity of highly vulnerable development should not exceed 0.3m/s. As the development is at risk of flooding in a fluvial flood event, additional structures and/or significant re-profiling of ground levels could displace or re-direct floodwater, however, NRW note such proposals are yet to be finalised. Further consideration will need to be given to this matter as the design develops.

Whilst NRW's advice shows the FCA has not demonstrated that the risks and consequences of flooding can be managed to an acceptable level, recognising the nature of the application, NRW consider the proposal is a betterment to the existing site use and an improvement on the current situation, therefore NRW have no objection to the application as submitted in relation to flood risk

NRW consider the risk of tidal flooding to the proposed development is negligible, as the site benefits from the presence of the Cardiff Bay Barrage. This operates in a flood risk capacity, providing significant protection to Cardiff from tidal flood risk. Therefore, we have no further comments regarding tidal flood risk in this instance.

It is for the Planning Authority to determine whether the risks and consequences of flooding can be managed in accordance with TAN15.

NRW note that bats are present at the application site but have no objection to the application as submitted on grounds of protected species. NRW do not consider that the development is likely to be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in its natural range. Therefore, NRW do not object to the proposal.

(A copy of NRW's letter has been forwarded to the applicant's agent).

7. REPRESENTATIONS

7.1 Local Members have been consulted. No comments have been received to date but will be reported to Committee if received.

7.2 The proposal has been advertised in the press and by site notices as a major application.

7.3 Neighbouring occupiers were consulted by letter. One representations has been received to date quoting this application's reference but that is believed to be in respect of another application.

7.4 Canton RFC state:
Canton RFC met with Cardiff Council & Keir representatives on 24/09/2020 to discuss issues re. phase 2 enabling works.

It was asked by the club if the existing steps that run down the grass bank from the 3G pitch to car park could be reinstated/retained. This being so, the 3m high boundary fence (running from MUGA 15 to Ysgol Pwll Coch) would require an aligned gate installed which would be locked during school hours but only accessible out of school hours when required.

The above issue was raised due to the fact that the club may be able to book & have use of the 3G pitch in the future. This amendment would significantly benefit supporter access to the 3G pitch.

8. ANALYSIS

Policy

8.1 The demolition of Fitzalan HS would not commence until the replacement school is available for use in order to ensure no disruption to pupils.

8.2 The proposed development relates to the replacement of Fitzalan High School, to accommodate sports facilities. These facilities are necessary to meet the Welsh Government Design Guidance BB98, and the objectives of TAN 16 and the Planning for Health and Well-being SPG.

8.3 The proposed development is therefore deemed acceptable in land use terms

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