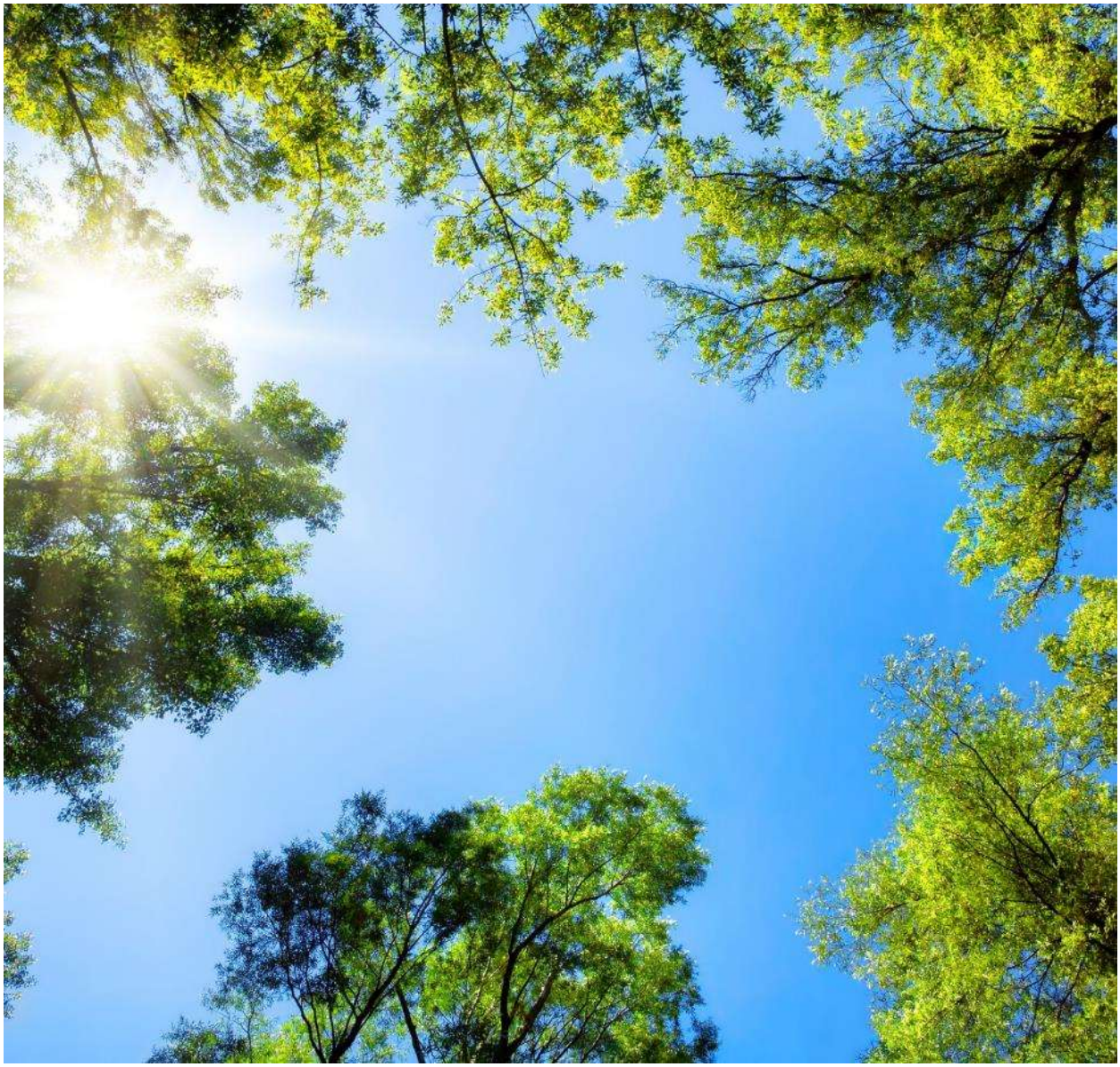


Land at Dyfed Powys Police Headquarters, Llangunnor, Carmarthen

Flood Risk Assessment and Drainage Strategy

June 2025

Waterman Infrastructure & Environment Limited
Alan House | 5th Floor |, Clumber St, |, Nottingham NG1 3ED
www.watermangroup.com

Client Name:	Police and Crime Commissioner for Dyfed Powys
Document Reference:	WIE21662-103-R-1-1-1_FRA_DS
Project Number:	WIE21662

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue	Date	Prepared by	Checked by	Approved by
1st	19/05/2025	Lauryn Birch	Darryl Pearson	Rob Forsyth

Disclaimer

This report has been prepared by Waterman Infrastructure & Environment Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client, and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

Contents

Figures

Tables

No table of figures entries found.

Appendices

1. Introduction

1.1 Background

Waterman Infrastructure & Environment ('Waterman') have been commissioned by CBRE Ltd on behalf of the Police and Crime Commissioner for Dyfed Powys ("the client") to produce a Flood Risk Assessment for a full planning application and achieve approval from the drainage and SuDS approving statutory body for a proposed development of Photovoltaic Panels (PVP) and Battery Storage at Dyfed Powys Police Headquarters (DPP HQ), Llangunnor, Carmarthen.

This FRA would set out potential sources for flooding, identify potential impacts of flooding and measures to alleviate this through mitigation and consider future residual risks after implementation of the scheme and any associated mitigation.

1.2 Site Description

The site is located in south Wales, 600m west of Tregynwr, and southeast of Carmarthen. The address is Police Headquarters, Carmarthen SA31 2PF. The site is located immediately north of Heol Llangynnwr and south of The Welsh Ambulance Services NHS Trust and Dyfed Powys Police. To the east, south and west of the site lies fields.

Shown below is the redline boundary, detailing the extents of the application site. The proposed layout can be found in **Appendix A.**

Figure 1-1: Base Map

1.3 Development Proposals

The site is shown to be located in an area that has low risk of being flooded from rivers, surface water or small water courses. To support the planning application and achieve approval from the drainage and SuDS approving statutory body, a Flood Risk Assessment (FRA) will be prepared. The FRA would set out potential sources for flooding, identify potential impacts of flooding and measures to alleviate this through mitigation and consider future residual risks after implementation of the scheme and any associated mitigation.

The development involves a proposed development of Photovoltaic Panels (PVP) and Battery Storage at Dyfed Powys Police Headquarters (DPP HQ), Llangunnor, Carmarthen.

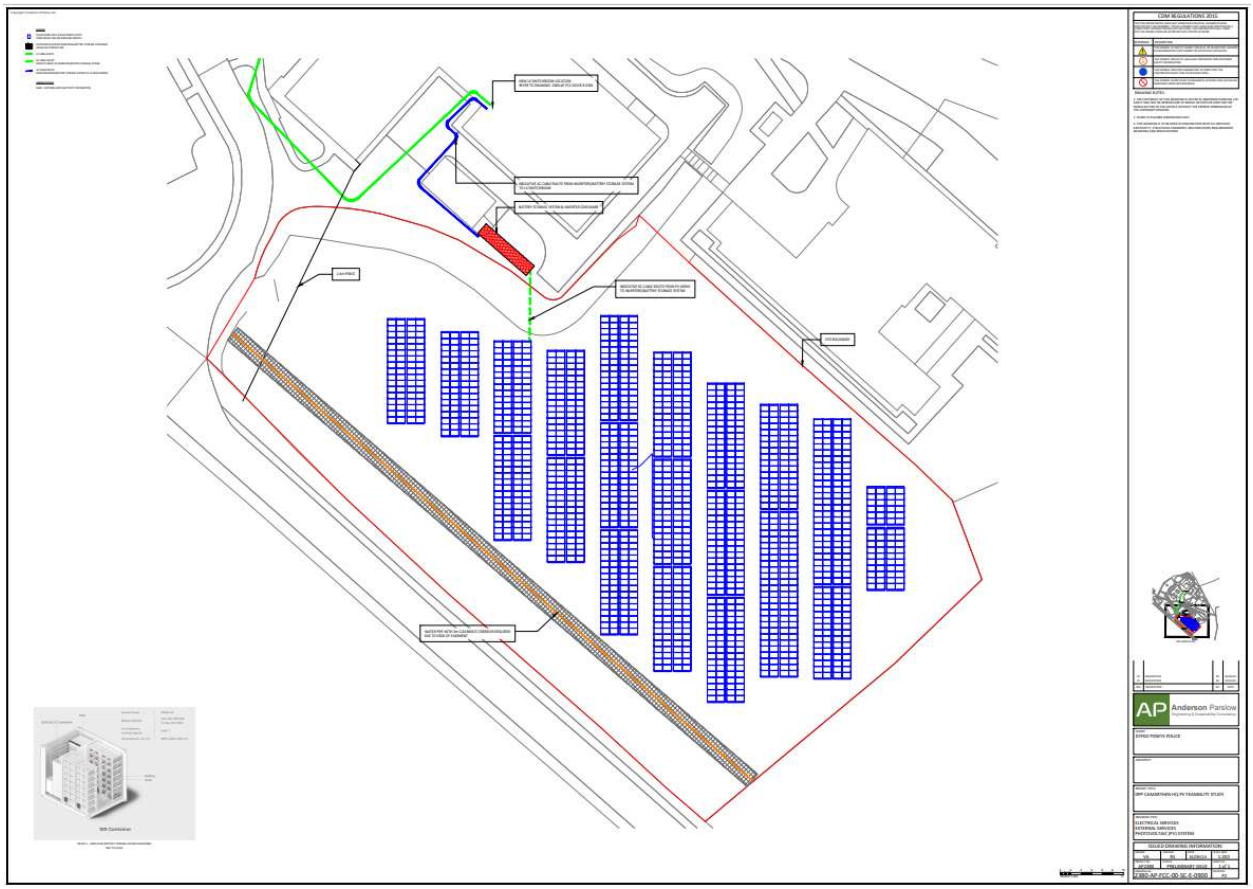


Figure 1-2: Site Masterplan

2. Baseline Conditions

2.1 Topography

The sites highest point is 53m AOD and slopes north-west to an elevation of 50.5m AOD. Figure 2-1 below shows an elevation map of the site and surrounding area.

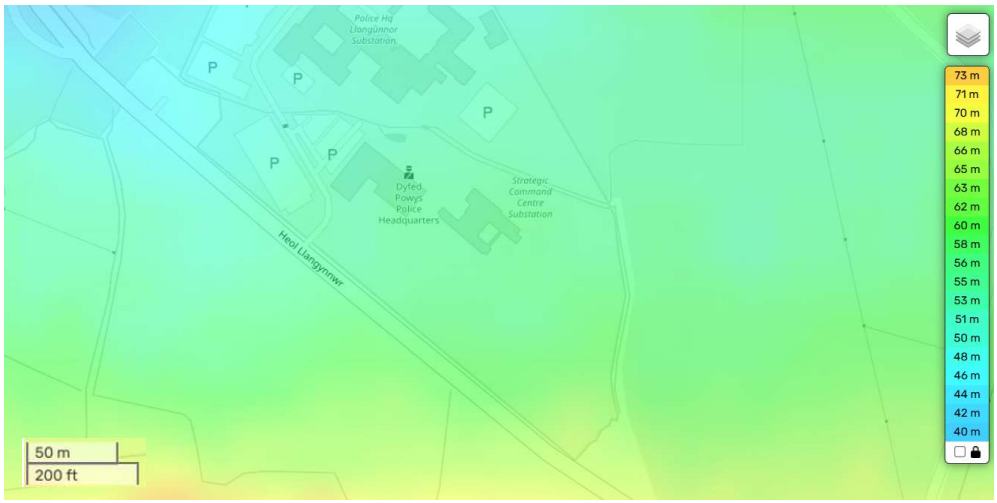


Figure 2-1: Topographic map of the site.

2.2 Hydrology

River Towy (Tywi) is the closest main river and lies north-west of the site. The River Tywi is approximately 111km in length from its source in the Cambrian Mountains to the sea at Llansteffan & Ferryside, where it flows into Carmarthen Bay alongside the rivers Taf and Gwendraeth.

There is an unnamed watercourse that runs from north-west of the site towards the main river. Figure 2-2 shows the watercourses near the site.

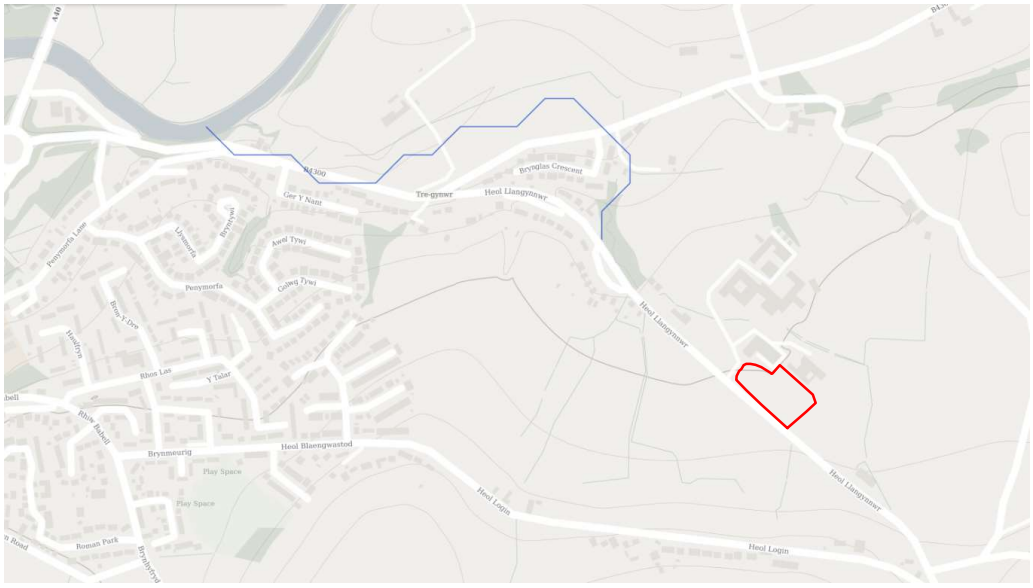


Figure 2-2: Watercourses near the site.

2.3 Geology

The superficial geology of the site is Till, Devensian - Diamicton. Sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period. It is generally dense and slowly permeable and contains occasional pockets of clay, sand and gravel.

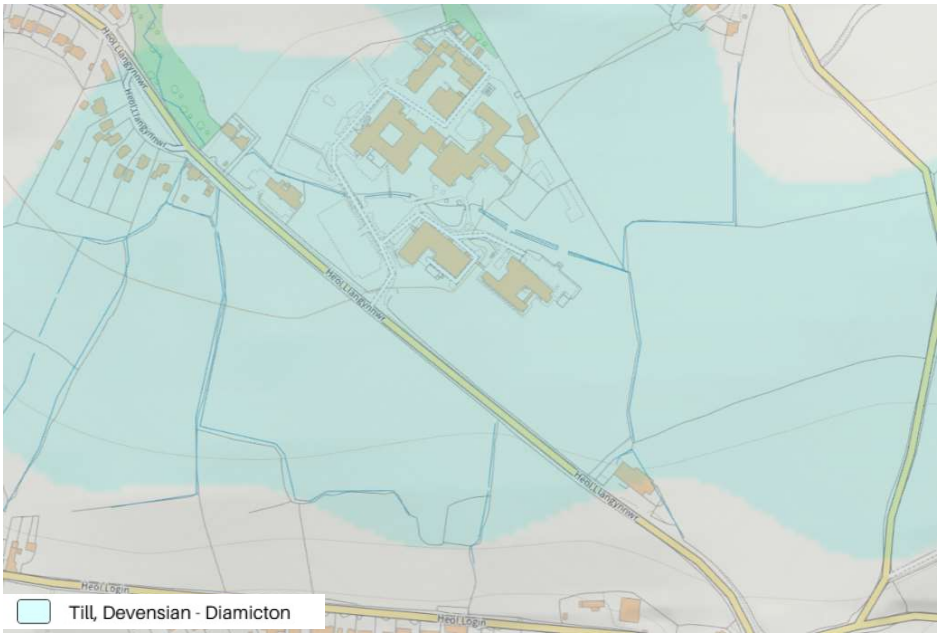


Figure 2-3: Superficial Geology (British Geological Society)

The bedrock geology is Tetragraptus Beds - Sandstone. Sedimentary bedrock formed between 477.7 and 465.5 million years ago during the Ordovician period. Sandstone is highly permeable due to its high porosity.

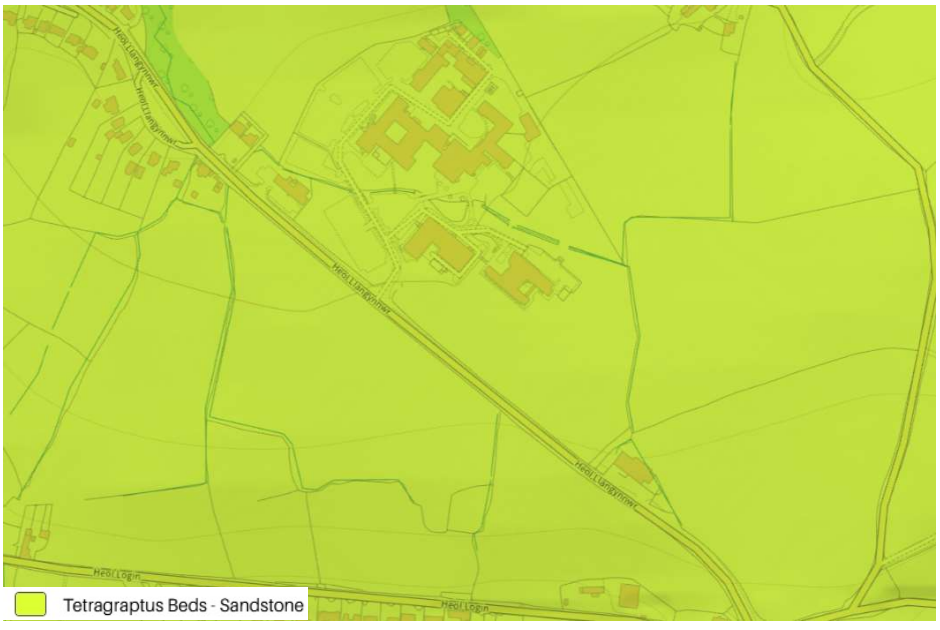


Figure 2-4: Bedrock Geology (British Geological Society)

2.4 Borehole Data

No nearby boreholes with accessible data.

3. Planning Policy and Guidance

Detailed Planning Policy and Guidance can be found in **Appendix A.**

3.1 National Planning Policy and Guidance

The chapter takes into account the national planning policy and guidance

- Land Drainage Act, (1991)
- Water Framework Directive (WFD) (2000)
- Flood Risk Regulations, (2009)
- Flood and Water Management Act, (2010)
- Water Act, (2014)
- DEFRA Sustainable Drainage System: Non-Statutory Technical Standards (2015)
- The Non-Statutory National Technical Standards for Sustainable Drainage (The National Standards) (2015)
- Planning Policy Wales (2024)
- Planning Policy Wales Technical Advice Note 15 Development, flooding and coastal erosion (2025)

3.2 Regional Planning Policy and Guidance

- South West Wales – Stage 1 Strategic Flood Consequence Assessment (SFCA) (2022)

3.3 Local Planning Policy

- Carmarthenshire County Local Flood Risk Management Strategy (LFRMS) (2024)
- Carmarthenshire & Pembrokeshire Stage 1 Strategic Flood Consequence Assessment (SFCA) (2019)

4. Sources of Potential Flooding

4.1 Rivers

Flooding from rivers occurs when water levels rise higher than bank levels, causing floodwater to spill across adjacent land (floodplain). (SFCA, 2022)

Figure 4-1 shows Natural Resources Wales Food Map for Planning, Flood Risk from Rivers. The site is not within 'High', 'Medium' or 'Low' flood zones. This means it had no risk of flooding from rivers.

Figure 4-1: Natural Resources Wales Flood Map for Planning, Flood Risk from Rivers.

4.2 Tidal

Flooding from the sea occurs when water levels in the sea rise above ground levels of coastal land. This can occur during normal high tides, when there are extreme atmospheric effects, and when wind action causes water levels of the sea to rise. Tidal flooding can be particularly severe, with rapid inundation, the possibility of multiple overtopping events and the increased damage caused by saltwater. These effects can be even more severe if a breach of sea defences occurs. (SFCA, 2022)

Figure 4-2 shows Natural Resources Wales Food Map for Planning, Flood Risk from the Sea. The site is

not within ‘High’, ‘Medium’ or ‘Low’ flood zones. This means it had no risk of flooding from the Sea.

Figure 4-2: Natural Resources Wales Flood Map for Planning, Flood Risk from the Sea.

4.3 Surface Water

Surface water flooding occurs when intense, often short duration rainfall is unable to soak into the ground or enter drainage systems and can be exacerbated when soils are saturated. The excess water then ponds in low points, overflows or concentrates in minor drainage lines that are usually dry. This type of flooding is usually short lived and associate with heavy downpours of rain. Often there is limited warning before this type of localised flooding occurs. (SFCA, 2022)

Figure 4-3 shows Natural Resources Wales Food Map for Planning, Flood Risk from Surface Water and Small Watercourses. The site is not within ‘High’, ‘Medium’ or ‘Low’ flood zones. This means it had no risk of flooding from Surface Water and Small Watercourses.

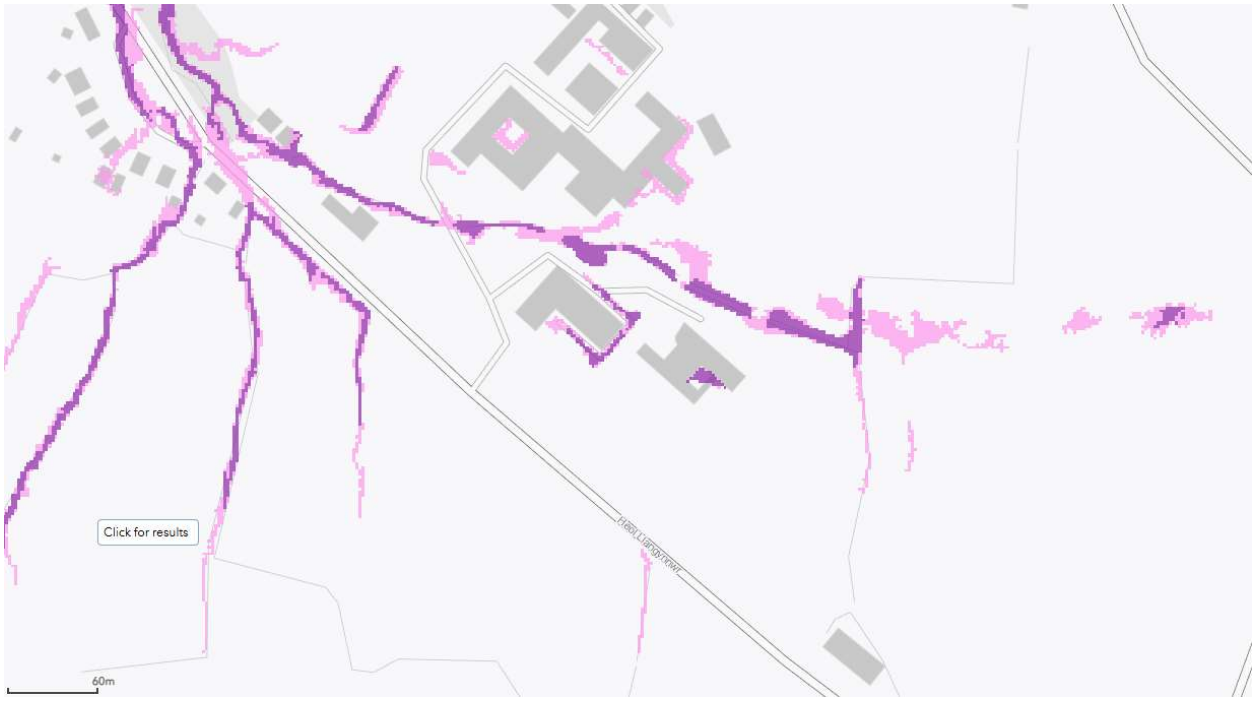


Figure 4-3: Natural Resources Wales Flood Map for Planning, Flood Risk from Surface Water and Small Watercourses.

4.4 Groundwater

Groundwater flooding is caused by the emergence of water originating from sub-surface permeable strata. Groundwater flooding can happen at point or diffuse locations, and it tends to be long in duration, developing over weeks or months and prevailing for days or weeks. (SFCA, 2022)

According to the SFCA (2022) no records of groundwater flooding were made available at the time of writing.

The bedrock geology across Carmarthenshire County is varied but predominantly comprised of Mudstone, Siltstone, and Sandstone. Mudstone tends to have low porosity and permeability whilst sandstone is regarded as more permeable and allows for the storage and movement of groundwater. As a result, upward percolation of groundwater and subsequent flooding should be considered in these areas. (SFCA, 2022)

Figure 4-4 below shows the site to have a flood depth of both ‘at least 5m below the ground surface’ and ‘between 0.5m and 5m below the ground surface’.

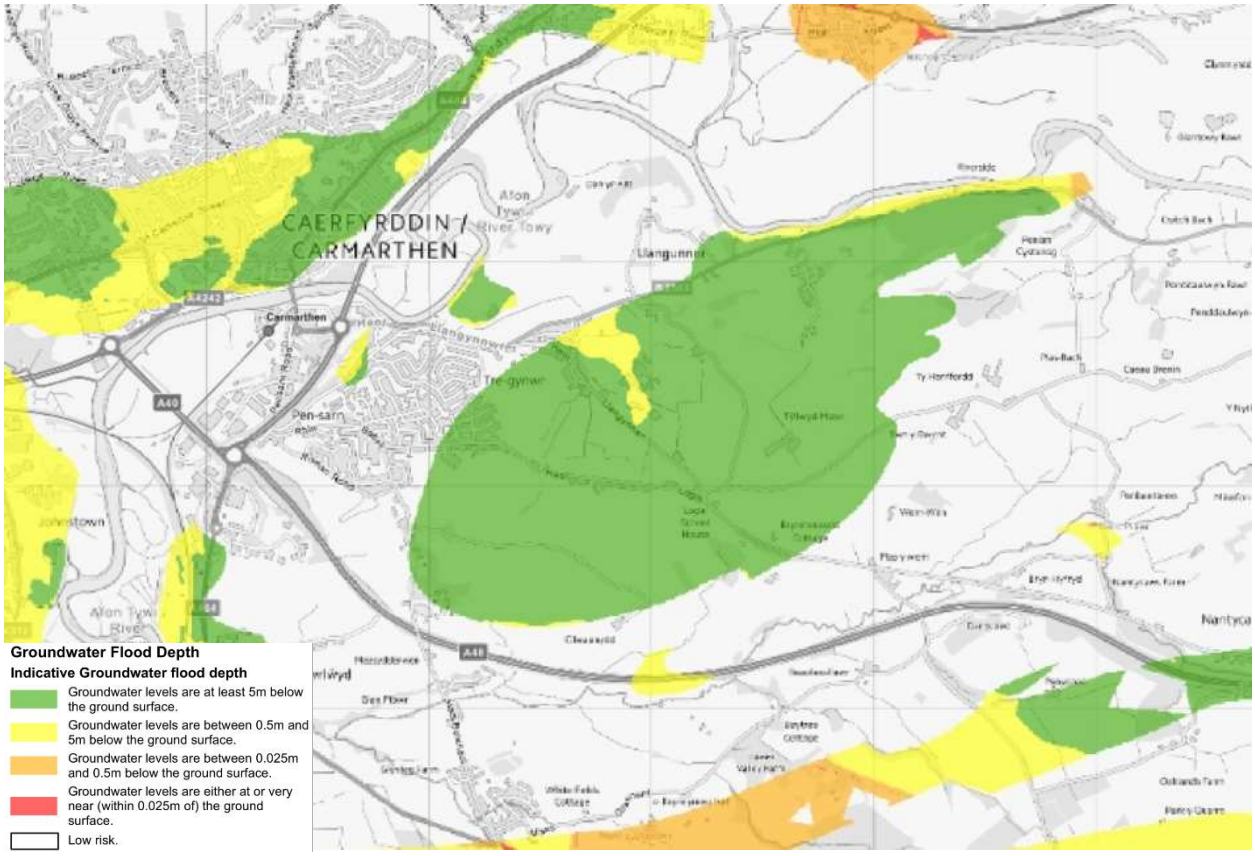


Figure 4-4: Flood Risk from Groundwater Carmarthenshire County Council

4.5 Flooding from Drainage Systems

Flooding from sewers occurs when rainfall exceeds the capacity of networks or when there is infrastructure failure. This includes combined and surface water sewers, sewer pumping stations and water treatment facilities. (SFCA, 2022)

The site is currently a greenfield area with no existing built development, and the only notable infrastructure is a sewer that crosses the site from southeast to northwest.

4.6 Reservoir, Canal and Artificial Sources

Figure 4-4 shows Natural Resources Wales Food Map for Planning, Flood Risk from Reservoirs. The site is not within the' flood zone. This means it had no risk of flooding from Reservoirs.

Figure 4-5: Natural Resources Wales Flood Map for Planning, Flood Risk from Reservoirs.

According to the SFCA (2022) no records of flooding from artificial sources were made available at the time of writing.

4.7 Climate Change

The Senedd was the first Parliament in the world to declare a climate emergency. Climate change is likely to increase the risk of flooding across Wales, not only through sea level rise but also from more frequent and intense storms, flash flooding and storm surges (LFRMS, (2024). Below are the steps set out by the council to tackle climate change.

- Use of the Flood Map for Planning (FMfP) in undertaking flood risk assessment, which includes climate change allowances.
- Utilisation of the WG guidance on Adapting to Climate Change4, with climate change allowances for FCERM scheme designs.
- Development and promotion of natural flood management schemes and nature-based solutions to reduce our capital works carbon footprint.

Climate change is causing more frequent and more severe flooding to occur in Wales. The Climate Change Committee provides independent advice to the Welsh Government on setting and meeting carbon budgets and preparing for climate change. It has stated that it expects the climate in Wales to become warmer and wetter, with significant increases in the sea level around the coast and the frequency and intensity of storm events. this will increase the risk of flooding and it is also reasonable to expect the incidence and seriousness of flood events to increase. (SFCA, 2022)

5. The Sequential Test

The Welsh government has removed the Justification Test (Sequential Test) in favour of defining acceptability criteria of flood consequences.

Acceptability criteria for flooding consequences

Whether a development should proceed or not will depend upon whether the consequences of flooding can be safely managed, including its effects on flood risk elsewhere.

There are requirements that must be in place for any development that is permitted to be located in flood risk areas. In all circumstances, developers and planning authorities should ensure the following conditions are met:

• No increase in flooding elsewhere

• Occupiers aware of flood risk

• Escape/evacuation routes present

• Flood emergency plans and procedures agreed and in place

• Flood resistant and resilient design

• Acceptable consequences for type of use (see detailed guidance below)

6. Drainage Strategy

The proposed development involves the installation of a solar farm, which is considered a low-impact, non-intrusive form of development. As such, it is not envisaged that a formal drainage strategy involving engineered systems will be required.

The existing ground conditions will largely remain undisturbed, with solar panels mounted on pile-driven or shallow foundations that do not significantly alter the permeability or topography of the site. While there may be minor areas of concentrated surface water runoff beneath the panels due to rainfall shedding, this is expected to infiltrate naturally into the ground, consistent with the current greenfield runoff regime. The limited increase in impermeable area and the retention of vegetated ground cover will ensure that the risk of surface water flooding is negligible. All works will be designed to maintain existing overland flow paths and avoid any adverse impact on the sewer infrastructure. Therefore, the development is not anticipated to result in any significant change to surface water drainage or increase flood risk on or off-site.

7. Conclusions

This Flood Risk Assessment and Drainage Strategy report has been prepared by Waterman Infrastructure & Environment Limited ("Waterman") to accompany a detailed (full) planning application for Photovoltaic Panels (PVP) and Battery Storage at Dyfed Powys Police Headquarters (DPP HQ), Llangunnor, Carmarthen.

Based on the assessment in this report, our conclusions are as follows:

- The sites highest point is 53m AOD and slopes north-west to an elevation of 50.5m AOD The Site lies within Flood Zone 1.
- The site is not within 'High', 'Medium' or 'Low' flood zones. This means it had no risk of flooding from rivers.
- The site is not within 'High', 'Medium' or 'Low' flood zones. This means it had no risk of flooding from the Sea.
- The site is not within 'High', 'Medium' or 'Low' flood zones. This means it had no risk of flooding from Surface Water and Small Watercourses.

APPENDICES

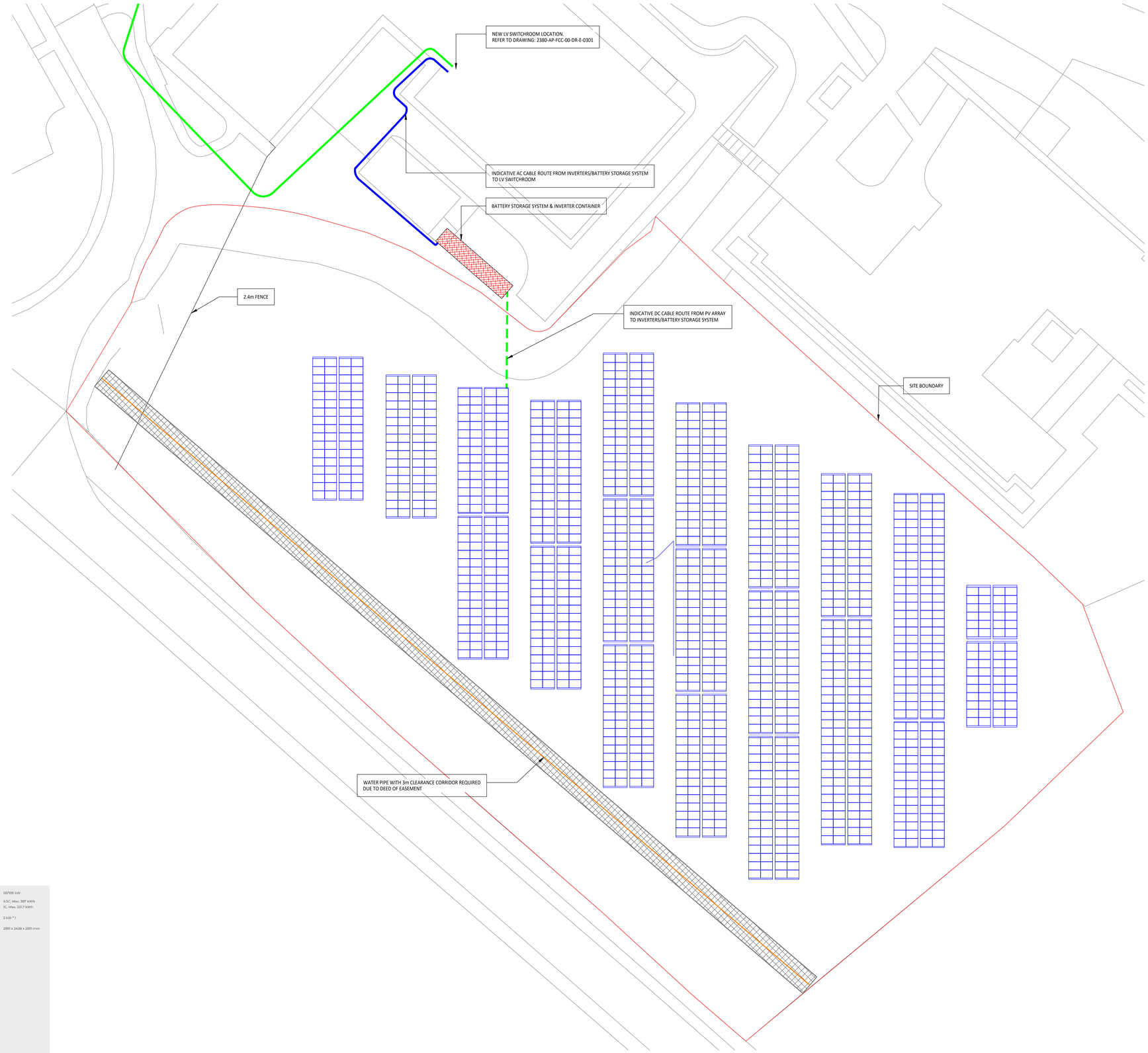
A. Proposed Site Plan

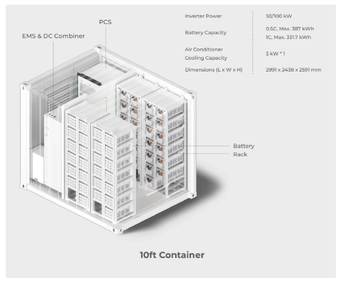
LEGEND

- SOLAR PANEL WITH 450W POWER OUTPUT
  TRINA SOLAR TSM-450-DE09R.08 VERTEX S
- OUTDOOR IP54 RATED INVERTER & BATTERY STORAGE CONTAINER
  ALPHA ESS STORION T300
- LV CABLE ROUTE
- DC CABLE ROUTE
  FROM PV ARRAY TO INVERTERS/BATTERY STORAGE SYSTEM
- AC CABLE ROUTE
  FROM INVERTERS/BATTERY STORAGE SYSTEM TO LV SWITCHROOM

ABBREVIATIONS

NGED - NATIONAL GRID ELECTRICITY DISTRIBUTION





DETAIL 3 - INDICATIVE BATTERY STORAGE SYSTEM CONTAINER
NOT TO SCALE

CDM REGULATIONS 2015

THE FOLLOWING NOTES HIGHLIGHT SIGNIFICANT RESIDUAL HAZARDS & RISKS IDENTIFIED BY THE DESIGNER. TYPICAL HAZARDS THAT SHOULD BE IDENTIFIED BY A COMPETENT CONTRACTOR ARE NOT INCLUDED. THE CONTRACTOR SHALL CARRY OUT THE WORKS USING AN APPROVED SAFE SYSTEM OF WORK.

REFERENCE	DESCRIPTION
⚠	THIS SYMBOL IS USED TO SIGNIFY UNUSUAL OR SIGNIFICANT HAZARDS OR INFORMATION THAT CANNOT BE EFFECTIVELY MITIGATED.
ⓘ	THIS SYMBOL SERVES TO HIGHLIGHT IMPORTANT AND PERTINENT SAFETY INFORMATION.
●	THIS SYMBOL INDICATES MANDATORY ACTIONS THAT THE CONTRACTOR MUST TAKE TO MITIGATE RISKS.
⊘	THIS SYMBOL IS EMPLOYED TO DESIGNATE ACTIONS THAT SHOULD BE REFRAINED FROM OR PROHIBITED.

DRAWING NOTES:

1. THE COPYRIGHT OF THIS DRAWING IS VESTED IN ANDERSON PARSLOW LTD AND IT MAY NOT BE REPRODUCED IN WHOLE OR PART OR USED FOR THE MANUFACTURE OF ANY ARTICLE WITHOUT THE EXPRESS PERMISSION OF THE COPYRIGHT HOLDERS.

2. WORK TO FIGURED DIMENSIONS ONLY.

3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S, STRUCTURAL ENGINEER'S AND EMPLOYERS REQUIREMENTS DRAWINGS AND SPECIFICATIONS.

SITE WIDE PLAN

REV:	DESCRIPTION:	BY:	DATE:
P2	DESCRIPTION	RS	05/06/25
P1	DESCRIPTION	RS	10/01/25

Anderson Parslow
Engineering & Sustainability Consultancy

CLIENT:
DYFED POWYS POLICE

ARCHITECT:

PROJECT TITLE:
DPP CAMARTHEN HQ PV FEASIBILITY STUDY

DRAWING TITLE:
ELECTRICAL SERVICES
EXTERNAL SERVICES
PHOTOVOLTAIC (PV) SYSTEM

ISSUED DRAWING INFORMATION:

DRAWN:	CHECKED:	DATE:	SCALE @A0:
VA	RS	16/09/24	1:200
PROJECT No:	STATUS:		SHEET No:
AP2380	PRELIMINARY ISSUE		1 of 1
DRAWING No:			REVISION:
2380-AP-FCC-00-SC-E-0900			P2

2 0 2 4 6 8 10 m
SCALE 1:200

B. Planning Policy and Guidance

National Planning Policy and Guidance

Land Drainage Act, (1991)

The Land Drainage Act was published in 1991 and requires that a watercourse be maintained by its owner in such a condition that the free flow of water is not impeded. It provides the general guidance of the flood risk management works.

Flood Risk Regulations, (2009)

The Flood Risk Regulations 2009, implement the European Floods Directive and require the Lead Local Flood Authority (LLFA)and the EA to prepare and publish Flood Risk Management Plans on a six-year cycle.

The regulations identify and take action in areas with the most significant flood risks and require the following to be produced:

- Preparation of a Preliminary Flood Risk Assessment Report (PFRA) including the identification of flood risk areas;
- Preparation of Flood Hazard Maps and Flood Risk Maps;
- Preparation of Flood Risk management Plans; and
- Cooperating with the EA and other LLFAs.

Oxfordshire County Council Preliminary Flood Risk Assessment Under the Regulations, all LLFAs were required to prepare a PFRA report. This is a high-level screening exercise to identify areas of significant risk as Indicative Flood Risk Areas across England where 30,000 people or more are at risk from flooding for reporting to Europe. A PFRA26 was prepared for OCC in 2011 to provide a high-level overview of flood risk from local flood sources and includes flooding from surface water (i.e. rainfall resulting in overland runoff), groundwater, ordinary watercourses (smaller watercourses and ditches) and canals. It excludes flood risk from Main Rivers, the sea, or large raised reservoirs, burst water mains or from any part of a sewerage system, unless it is caused by an increase in the volume of rainwater, as these are assessed nationally by the Environment Agency.

The PFRA report looks at past flooding and where future flooding might occur across the area and the consequences it might have to people, properties, and the environment. The report was used to help OCC in the development of their Local Flood Risk Management Strategy required under the FWMA.

Flood and Water Management Act, (2010)

(http://www.legislation.gov.uk/ukpga/2010/29/contents)

The Flood and Water Management Act was implemented in 2010 to help improve flood risk management and ensure the security of water supplies in England and Wales. The Act updates legislation to ensure better protection from flooding, manage water more sustainably, improve public services and secure water resources during periods of drought.

The Act helps to reduce flood risk by:

- Clarifying who is responsible for managing all sources of flood risk;
- Encouraging more sustainable forms of drainage in new developments; and
- Making it easier to resolve misconnections to sewers.

Water Act, (2014)

The Water Act was published in 2014. The aim of the Act was to reform the water industry to make it more innovative and responsive to customers and to increase the resilience of water supplies to natural hazards such as droughts and floods.

Policies and objectives which are of particular relevance to flood risk and drainage include:

“To enable developers and any new water or sewage companies to connect new building developments to the water mains and sewage system; and

- Provide measures to restore sustainable abstraction of water and the encouragement for the use of Sustainable Drainage Systems (SuDS)."

The Non-Statutory National Technical Standards for Sustainable Drainage (The National Standards) (2015)

(www.gov.uk/government/publications/sustainabledrainage-systems-non-statutory-technical-standards)

The non-statutory National Standards (April 2015) cover the generic requirements for design of SuDS. They provide requirements for: flood risk outside the development; peak flow control; volume control; flood risk within the development; structural integrity; designing for maintenance considerations; and construction. In terms of the overall viability of a proposed development, expecting compliance with the technical standards is unlikely to be reasonably practicable if more expensive than complying with building regulations - provided that where there is a risk of flooding the development will be safe and flood risk is not increased elsewhere. Similarly, a particular discharge route would not normally be reasonably practicable when an alternative would cost less to design and construct.

DEFRA Sustainable Drainage System: Non-Statutory Technical Standards (2015)

"This document sets out non-statutory technical standards for sustainable drainage systems. They should be used in conjunction with the National Planning Policy Framework and Planning Practice Guidance."

Water Framework Directive (WFD) (2000)

CDC have a duty to consider the WFD in all plans and decision making processes, and have the opportunity to deliver wider environmental objectives and requirements, as set out in the Water Framework Directive28. The WFD was transposed into UK national law through The Water Environment Regulations 200329, and states that CDC should have regard to the River Basin Management Plans (RBMPs) when exercising its functions as a public body. The Environment Agency is responsible for preparing RBMPs for river basin districts in England and Wales. The plans outline the characteristics of the river basin district, identify the pressures that the local water environment faces, and specify the actions that will be taken to address any problems before 2015. The main River Basin Management Plan (RBMP) relevant to the Cherwell district is the Thames RBMP; there are also small areas of the district within the Anglian and Severn RBMP. RBMPs can both influence and be influenced by planning policy within their areas. The follow section is extracted from the River Basin Planning Guidance30 and sets out the relationship and roles of the LPA, 3.8.1 Relationship of LPAs and RBMPs "Changes in land use can have impacts on ecological and chemical quality and the physical characteristics of water bodies, and hence on the achievement of WFD objectives. The land use planning system helps to ensure the delivery of sustainable development which seeks to achieve economic, social and environmental gains, including contributing to the protection and enhancement of the natural environment. In England the local plan prepared by local planning authorities is at the heart of the planning system Spatial planning and river basin planning are separate processes and planners should ensure that there is genuine twoway liaison between them. − This will be an iterative process because of different planning timetables. − There will be issues resulting from the differences between the river basin district boundaries (which will be used for river basin planning) and local planning authority boundaries. Development plans should influence RBMPs. Emerging local plans will be an important source of information on future pressures that can help the Agencies refine their understanding of the current status of water bodies, and how this might change if no action was taken.

Planning Policy Wales (2024)

Planning Policy Wales - Edition 12

Development and Flood Risk

6.6.22

The climate emergency is likely to increase the risk of flooding as a result of sea-level rises, increased storminess and more intense rainfall. Flooding as a hazard involves the consideration of the potential consequences of flooding, as well as the likelihood of an event occurring. Planning authorities should adopt

a precautionary approach of positive avoidance of development in areas of flooding from the sea or from rivers. Surface water flooding will affect choice of location and the layout and design of schemes and these factors should be considered at an early stage in formulating development proposals.

6.6.23

The continued construction of hard engineered flood defences to protect development in areas of floodplain is not sustainable. Government resources for flood and coastal defences are directed at protecting existing developments and are not available to provide defences in anticipation of future development. Account should be taken of shoreline management plans and measures such as managed realignment, the creation of washlands and flood plain restoration as alternatives to engineered flood defences.

6.6.24

Development Advice Maps enable planning authorities to take a strategic approach to flood risk and consider the catchment as a whole by providing a preliminary representation of flood risks, which inform decisions on the location of new development and the requirements necessary to support any applications which may be proposed. Together with flood consequences assessments they should assist understanding of how natural and man-made defences work as integral components of places and provide a means by which the cumulative effects of development can begin to be understood.

6.6.25

Development should reduce, and must not increase, flood risk arising from river and/or coastal flooding on and off the development site itself. The priority should be to protect the undeveloped or unobstructed floodplain from development and to prevent the cumulative effects of incremental development.

6.6.26

In areas of flood plain currently unobstructed, where water flows in times of flood, built development should be wholly exceptional and limited to essential transport and utilities infrastructure. Such infrastructure should be designed and constructed so as to remain operational even at times of flood, to result in no net loss of floodplain storage, to not impede water flows and to not increase flood risk elsewhere. TAN 15: Development and Flood Risk should be referred to for further policy advice on development and flood risk. It will be important to note that developments located within flood risk areas remain at risk from flooding even if mitigation measures are applied.

6.6.27

Planning authorities should be aware of the risk of surface water flooding, usually caused by heavy rainfall, and ensure developments are designed and planned to minimise potential impacts. Development should not cause additional run-off, which can be achieved by controlling surface water as near to the source as possible by the use of SuDS. Care should be taken in places of shallow groundwater or where flooding is caused by combined surface and groundwater processes. In such situations direct infiltration SuDS may not be appropriate. Consultation with drainage bodies and NRW should be undertaken and relevant evidence and information drawn from Area Statements taken into account.

6.6.28

New or improved flood defences in coastal and/or riverside locations should be carefully planned, ensuring all potential environmental effects, both on and off-shore, and relevant Shoreline Management Plan policies are taken into account. Flood defence works can provide opportunities to achieve wider social, economic and environmental benefits, which should be maximised where possible. Nature based solutions should be the first consideration given the opportunity to deliver other multiple benefits, including habitat creation, biodiversity enhancement and water quality improvements. Overall, green infrastructure opportunities can benefit ecosystem resilience and provide opportunities for leisure facilities or renewable energy generation.

6.6.29

The ability of emergency services to respond to flood events should be taken into account when considering if a development in a flood risk area is appropriate. This may involve consultation with emergency planners, local resilience forums and other professional partners such as fire rescue, police and ambulance services.

Sequential Test

4.3.18

The Welsh Government operates a ‘town centres first’ policy in relation to the location of new retail and commercial centre development. Future Wales provides further context on ‘town centres first’ policy in respect of large scale and out of centre development. In implementing this policy, planning authorities should adopt a sequential approach to the selection of new sites in their development plan and when determining planning applications for retail and other complementary uses. By adopting a sequential approach first preference should be to locate new development within a retail and commercial centre defined in the development plan hierarchy of centres.

4.3.19
If a suitable site or building is not available within a retail and commercial centre or centres, then consideration should be given to edge of centre sites and if no such sites are suitable or available, only then should out-of-centre sites in locations that are accessible by a choice of travel modes, including active travel and public transport, be considered. Developers should demonstrate that all potential retail and commercial centre options, and then edge-of-centre options, have been thoroughly assessed using the sequential approach before out-of-centre sites are considered. The onus of proof that central sites have been thoroughly assessed rests with the developer.
4.3.20
Edge-of-centre or out-of-centre sites should be accessible by a choice of public and private modes of travel. New out-of-centre retail developments or extensions to existing out-of-centre developments should not be of a scale, type or location likely to undermine the vibrancy, attractiveness and viability of those retail and commercial centres that would otherwise serve the community, and should not be allowed if they would be likely to put development plan retail strategy at risk. The extent of a sequential test should be agreed by pre-application discussion between the planning authority and the developer.
4.3.21
The sequential approach applies to retail and all other uses complementary to retail and commercial centres. Other complementary uses include, for example, financial and professional services (A2), food and drink (A3), offices (B1), hotels (C1), residential institutions (C2), educational and other non-residential establishments (D1), leisure (D2) and certain other uses such as launderettes and theatres39. However, some education, healthcare and community uses may have specific accessibility requirements which mean they need to be located close to the communities they serve. Planning authorities should be flexible in their approach where it is necessary. The nature of a proposed use is likely to determine what type of centre (i.e. higher or lower order centre) is most appropriate as a starting point for the sequential approach process.
4.3.22
When preparing development plans, planning authorities should take a positive approach, in partnership with the private sector, in identifying sites which accord with the sequential approach and are in line with the development plan retail strategy in terms of the size, scale and format of new developments needed. In allocating sites for different types of retail and commercial centre uses planning authorities should take account of factors such as floorspace, quality, convenience, traffic generation and attractiveness of the site. Planning authorities should not prescribe rigid floorspace limits on allocated sites that would unreasonably inhibit the retail industry from responding to changing demand and opportunity.
4.3.23
Some types of retail store, such as those selling bulky goods and requiring large showrooms, may not be able to find suitable sites or buildings within existing retail and commercial centres. Where this is the case such stores should in the first instance be located on sites identified for such a purpose in the development plan, preferably on an edge of centre site. Where such sites are not available or suitable, other sites at the edge of retail and commercial centres, followed by out-of-centre locations may be considered, subject to application of the needs and impact tests.
4.3.24
Planning authorities should include policies in their plans to protect existing retail sites from inappropriate development. However, where a planning authority has evidence an existing retail site is no longer required for the use it was intended, the authority should consider what alternative uses may be appropriate and include policies in its plan.

Planning Policy Wales Technical Advice Note 15 Development, flooding and coastal erosion (2025)

Acceptability of flood consequences

11.1 If the planning authority is satisfied that a development proposed in a flood risk zone is acceptable, the justification will be in the knowledge that those developments may experience flooding and will need to be planned accordingly. A full understanding of the potential risks and consequences will be required to inform the planning authority in its decision. Before the planning authority determines an application, a Flood Consequences Assessment must be undertaken, which is appropriate to the nature and scale of the proposed development. The assessment must provide the decision maker with sufficient information to consider flooding implications and to balance them against other considerations.

11.2 The public and private costs of flooding require a careful approach to development within flood risk areas, which acknowledges the uncertainty of current forecasts. It is important that these uncertainties are taken fully into account within the assessment to ensure that informed decisions can be made.

Acceptability criteria for flooding consequences

11.3 Whether a development should proceed or not will depend upon whether the consequences of flooding can be safely managed, including its effects on flood risk elsewhere.

11.4 There are requirements that must be in place for any development that is permitted to be located in flood risk areas. In all circumstances, developers and planning authorities should ensure the following conditions are met:

• No increase in flooding elsewhere

• Occupiers aware of flood risk

• Escape/evacuation routes present

• Flood emergency plans and procedures agreed and in place

• Flood resistant and resilient design

• Acceptable consequences for type of use (see detailed guidance below)

11.5 The Flood Consequences Assessment should establish if suitable avoidance and mitigation measures can be incorporated, in a manner compatible with the placemaking aims of Planning Policy Wales, within the site design to ensure that development is safe and there is:

• minimal risk to life;

• minimal disruption to people living and working in the area;

• minimal potential damage to property;

• minimal impact of the proposed development on flood risk generally; and

• minimal disruption to the sustainable management of natural resources.

11.6 To inform their planning decision, the planning authority will need to arrive at a judgement on the acceptability of the flooding consequences and they should only permit development where the developer has demonstrated the risks and consequences of flooding are manageable and meet the criteria set out below.

Frequency thresholds: designing development to be flood free

11.7 The required design standard for new development is to be flood free during the 1% river flood (i.e. a flood with a 1 in 100 chance of occurring in any year) and the 0.5% flood from the sea (i.e. a flood with a 1 in 200 chance of occurring in any year), plus an allowance for climate change over the lifetime of development. Local authority and emergency services command centres and hubs for the emergency services should be designed to be flood free during any 0.1% event (i.e. a flood with a 1 in 1000 chance of occurring in any year), including an allowance for climate change. Where appropriate, an assessment against a breach and blockage scenario should be undertaken against return periods up to and including the 1 in 1000 year flood event, including an allowance for climate change. Detailed guidance on climate change allowances for planning purposes is published separately by the Welsh Government.

11.8 The following table summarises frequency thresholds for different types of development and is described in terms of annual probability of occurrence. The thresholds may be applied with more flexibility for redevelopment, changes of use, conversions and extensions, where the ability to substantially redesign a development is limited. In those circumstances the thresholds are a guide. If they cannot reasonably be met, the planning authority should seek the views of the relevant risk management authorities on the

resilience measures proposed to help it reach a decision

Figure 5 – Flood events in which development must be flood-free

Vulnerability Categories		Flood event type	
		Rivers	Sea
Highly vulnerable development	Emergency services (command centres and hubs)	0.1%+CC (1 in 1,000)	0.1%+CC (1 in 1,000)
	All other types	1% +CC (1 in 100)	0.5%+CC (1 in 200)
Less vulnerable development Water compatible development that may be occupied by people		1% +CC (1 in 100)	0.5% +CC (1 in 200)

Tolerable conditions: managing consequences in an extreme flood event

11.9 The flood free thresholds outlined above relate to very serious but not the most extreme flood events (with the exception of thresholds for emergency services). During extreme flood events there is recognition that it may not be possible to keep all development flood-free. In these circumstances it is imperative that flooding does not endanger life, therefore it needs to be demonstrated that conditions within the development during an extreme event will be tolerable.

11.10 Figure 6 below indicates the tolerable flood depth and velocity conditions for highly vulnerable and less vulnerable development when assessed against the 0.1% extreme flood event, including an allowance for climate change.

11.11 Mitigation and flood resilience measures are not sufficient justification to permit a development if the tolerable conditions are exceeded during an extreme flood event. High velocities and/or depths of floodwater pose a potential risk to life, may cause structural damage to buildings and could impact on human health and wellbeing.

Figure 6 – Tolerable conditions in an extreme flood event

Types of new development	Maximum depth of flooding (mm)	Maximum velocity of flood waters (metres/sec)
Highly vulnerable development	600	0.15
Less vulnerable development Infrastructure associated with highly vulnerable development e.g. car parks, access, paths and roads Water compatible development (limited to those built elements of development that may be occupied by people)	600	0.3

11.12 The above figures are tolerances below which new development may be acceptable. Each site, however, must be considered individually, and a judgement taken in the context of the circumstances which could prevail at that site. Emergency services developments are not shown because they must be flood-free in a 0.1% event, as set out in Figure 5. For emergency services developments other than command centres or hubs, the conditions for highly vulnerable development should be applied.

11.13 When deciding if the consequences of an extreme flood event can be acceptably managed, planning authorities should refer to relevant policies and actions identified in their Development Plan and by Risk Management Authorities in local contingency plans. This is of particular relevance to emergency access and evacuation requirements.

11.14 Flooding causes danger when either the water is deep or it is moving quickly. It is particularly dangerous when both occur at the same time. The flood hazard matrix at Figure 7 below can help planning authorities assess how hazardous a flood event may be to different people. The matrix can be used to assess the levels of danger inside and outside buildings located in flood risk areas, by plotting the expected water depths and velocities during the flood event.

11.15 The planning authority should consider all potential and likely users of any proposed development when assessing whether the development can be considered to provide a safe environment during an extreme flood event. If a safe environment cannot be provided, the planning application should be refused. The matrix shows that flood events involving deep and fast moving water are dangerous to all, including the emergency services. It would not be appropriate to approve any type of development that could experience this degree of danger during an extreme flood event

Regional Planning Policy and Guidance

South West Wales – Stage 1 Strategic Flood Consequence Assessment (SFCA) (2022)

Flood risk mitigation

219.

TAN-15 outlines the complementary role that planning and building regulations have in flood management, and the requirement for the use of flood mitigation and damage resistant measures to ensure the consequences of flooding are acceptable if the development can be justified. Any new development in Zones 2 and 3 and the TAN-15 Defended Zones must have resilience to flooding built in at site and property level, as stated in TAN-15 Section 13.2 (Resilient Design). Where possible, development should still be directed to Flood Zone 1 (where there is a lower flood risk of flooding).

220.

Measures to help mitigate flood risk on a site are outlined below. Although it should be recognised that even with these measures it will not be possible to develop all sites in compliance with TAN-15. 9.1.1 Site level flood risk mitigation

221.

Flood risk from all sources should be considered at an early stage in deciding the layout and design of a site to provide an opportunity to reduce flood risk within the development. Site level resistance and resilience measures should have the twin aim of reducing the amount of flood water that can enter the site and effectively managing any water that does reach the site so it does not impact on households and other occupiers/users.

222.

Flood mitigation and resilience can involve the use of blue and green infrastructure and SuDS to deliver wider benefits alongside flood mitigation such as water quality, amenity, and biodiversity. Site layout and design

223.

A sequential, risk-based approach should be applied to try and locate more vulnerable development use away from flood zones to higher ground, while more flood compatible development (e.g. landscaping, recreational space) is located in higher risk areas. However, water compatible development or less vulnerable uses in floodplains should consider the nature of the development, flood depths and hazard including evacuation procedures and flood warning. The nature of risk of water quality may also need to be considered and mitigated in some cases, particularly with parking areas so accumulated hydrocarbons and other vehicle related pollutants are not released to the aquatic environment.

224. Waterside areas, or areas along known flow routes, can be incorporated into the masterplan as multi-functional green infrastructure, being used for recreation, amenity and environmental purposes, allowing the preservation of flow routes and flood storage, and at the same time providing valuable social and environmental benefits contributing to other sustainability objectives. Landscaping should ensure safe access to higher ground from these areas and avoid the creation of isolated islands as water levels rise.

Surface Water Management

237.

Suitable surface water management measures should be incorporated into new development designs in order to reduce and manage surface water flood risk to and posed by the proposed development. This should be achieved by incorporating SuDS. SuDS are typically softer engineering solutions inspired by natural drainage processes such as ponds and swales which manage water as close to its source as

possible.

238.

The integration of SuDS into developments is an opportunity to achieve multiple positive outcomes, by combining crucial drainage and flood defence assets with green infrastructure and high-quality public realm. All new developments are now required to include Sustainable Drainage Systems which comply with National Statutory SuDS Standards. Developers must gain approval for their drainage from a SuDS Approval Body (SAB) before construction can begin. Further guidance on SuDS is available from the Welsh Government website18. 9.2 Flood Response Planning

239.

Flood response planning is one option to help manage flood related incidents. From a flood risk perspective, flood response planning can be broadly split into three phases: before, during, and after a flood. These measures involve developing and maintaining arrangements to reduce, control or mitigate the impact and consequences of flooding and to improve the ability of people and property to absorb, respond to, and recover from flooding. TAN-15 (Section 7.6) states that development plans must be based on a sound understanding of the emergency services' ability to respond to flooding, therefore key stakeholders and the emergency services should be consulted at SFCA stages 2 and 3 when considering specific allocations and policies.

240.

Safety is a key consideration for any new development and includes residual risk of flooding, the availability of adequate flood warning systems for the development, safe access and egress routes, and evacuation procedures.

241.

Further guidance on incorporating resistance and resilient into development through design is available from the Construction Industry Research and Information Association (CIRIA), including a Code of Practice and Guidance for Property Flood Resilience19.

Local Planning Policy and Guidance

Carmarthenshire County Local Flood Risk Management Strategy (LFRMS) (2024)

9.1 How we assess flood risk (methodology) Our assessment of flood risk is central to achieving our aims and objectives. Without an understanding of flood risk in Carmarthenshire, we are not able to prioritise our resources, or focus on helping those at greatest risk.

There are many sources of data that can be utilised to develop our knowledge of flood risk. Flood risk maps, together with improved asset data and modelling, has provided us with a much more enhanced and accurate understanding of local flood risk.

For the purpose of identifying the areas in Carmarthenshire at greatest risk from flooding, we have used the community at risk register (CaRR) as our primary data set, and then supplemented that with our own flood incident data.

The CaRR has been developed to provide an objective means of identifying risk and prioritising flood risk management activities at a Wales-wide, community level. It applies a standard methodology across all flood sources to calculate a theoretical 'danger score' that allows comparative risks to be quantified and ranked (from High to Low).

The CaRR comprises a spreadsheet that identifies and ranks individual communities for,

1. a natural, ‘undefended’ scenario, and

2. a mitigated scenario (based on the presence of defences and flood warning).

9.2 Carmarthenshire's Strategic Flood Risk The first part of our strategic assessment was to use the CaRR data to provide a high-level overview of flood risk in Carmarthenshire. Using the GIS risk data, we have been able to calculate that there are over 12,600 addresses at risk of flooding in Carmarthenshire. This same data set also allows us to break down those addresses into categories including by the source of flood risk.

9.3 Flood risk, a national comparison While not a primary focus of managing flood risk in Carmarthenshire, we must acknowledge that WG fund nationally, on a risk basis, and they are predominately focused on reducing and managing residential flood risk. Other national partners such as DCWW and NRW also operate nationally and prioritise on a national rather than regional level.

9.3.1 Comparing pluvial (surface water) flood risk nationally In terms of pluvial flood risk, the Rhondda Cynon Taf (RCT) area has the greatest number of properties at low risk of flooding with a little under 20,000 residential properties Swansea is ranked second with just under 8000 residential properties at low risk. In comparison Carmarthenshire has 6,023 residential properties at low risk of pluvial flooding; and we are ranked 7th nationally for the number of properties at risk, Pembrokeshire is ranked 22nd with 1448 properties at low risk.

9.3.3 Comparing fluvial flood risk nationally Carmarthenshire ranks 5th nationally in terms of low-risk fluvial flooding behind only Cardiff, Neath Port Talbot, RCT and Conwy but above Swansea and Newport. There are 4,744 residential properties at low risk of fluvial flooding in Carmarthenshire but over 16,000 in Cardiff which has the greatest number of properties at low risk of fluvial flooding, In terms of our medium and high-risk areas, we have less properties at risk and our national rank falls to 8th and then 9th accordingly.

Carmarthenshire & Pembrokeshire Stage 1 Strategic Flood Consequence Assessment (SFCA) (2019)

The overarching aim of this precautionary framework is to direct new development away from those areas which are at high risk of flooding. In particular, vulnerable development must be directed away from flood risk areas. Definitions of vulnerable development and advice on permissible uses in relation to the location of development and the consequences of flooding are described in TAN15.

Where development has to be considered in high risk areas, only those developments which can be justified on the basis of tests described in TAN 15 are permissible. Highly vulnerable developments, such as housing, schools and hospitals and other emergency services in flood risk areas will not be permitted unless they can be demonstrated to meet the justification criteria as set out in planning policy guidance (See Section 2 below).

The aim of this Stage 1 scoping study is to identify the principal flood risks affecting the proposed development sites in Carmarthenshire and Pembrokeshire. This desk-based study examines existing flood datasets to provide information on the potential level of flood risk for each Candidate Site and existing allocation. This allows the LPAs to make strategic, informed decisions on which of the Candidate Sites and existing LDP allocations are included within the Replacement/ Revised LDPs. This aims to encourage development towards the zones with the lowest flood risk, or failing that, to ensure that flood risk is appropriately managed. This study includes analysis on the allocation sites for the existing LDPs in Carmarthenshire (adopted in 2014) and Pembrokeshire (adopted in 2013), which are due to finish in 2021.

It is important to note that a Stage 1 SFCA is a broad level assessment of flood risk and thus some sites may still be subject to a more detailed assessment at a later stage, including site specific Flood Consequence Assessments (FCA). This document does not remove the need for site-specific FCAs to be undertaken by developers in the planning process.

C. Topographical Survey

D. Borehole Data