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51040-00 Talbot Green, Mwyndy

Burroughs

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Concept Drainage Strategy

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51040-00 Talbot Green, Mwyndy

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1.0 Introduction

Burroughs have been appointed by Talbot Green Developments Limited (TGDL) to undertake a concept drainage strategy assessment for the proposed light industrial or infrastructure development options at the Mwyndy site, south-east of Talbot Green, South Wales.

1.1 Purpose and Scope

This Concept Drainage Strategy has been prepared to support the two applications for employment development – Light Industrial (Option 1) and Data Centre (Option 2) and provide information for consideration at the pre-SAB stage. Its purpose is to demonstrate, how surface water and foul water arising from the proposed development can be appropriately managed in line with current legislation, and Local Authority requirements.

This document outlines existing site conditions, highlights relevant constraints and opportunities, and sets out indicative drainage options for further development at the detailed design stage. This strategy is intended to give assurance that a compliant and sustainable drainage solution is achievable, forming a sound basis for ongoing dialogue with the approving authorities.

The Drainage Strategy document is limited to the following:

- An overview of the existing site drainage features.
- An assessment of the impermeable areas and associated discharge rates from the corresponding catchment areas.
- A description of the proposal for managing surface water runoff throughout the site.

1.2 Design Standards and Drainage Guidance Policies

The following standards have been used when drafting this document:

- ⊕ Welsh Government guidance and information relating to Sustainable Drainage Systems on New Developments
- ⊕ Welsh Government Statutory standards for sustainable drainage systems – designing, constructing, operating, and maintaining surface water drainage systems 2018.
- ⊕ CIRIA Report C753 – The SuDS Manual-v1
- ⊕ BRE Digest 365 – Soakaway Design

2.0 Site Location and Description

2.1 Overview

The site is located on the outskirts of Talbot Green just off the A4119 – which is accessed from a smaller through road on which the Arthur Llewellyn Jenkins warehouse is located; Grid reference and coordinates are as follows:

- ⊕ NGR: ST 05432 82226
- ⊕ Coordinates: 305432E, 182226N

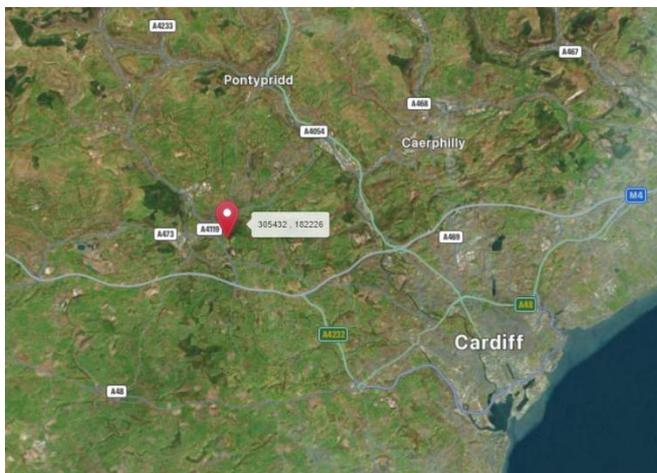


Figure 1 – Site location plan



Figure 2 – Site boundary

2.2 Existing Site

The existing site is currently utilised as agricultural land. It is made up of two adjacent parcels, adjacent to a through road on the Western boundary. In close proximity to the site there is a cemetery and the Arthur Llewellyn Jenkins commercial premises. To the north of the site is the Afon Clun.

2.3 Topographical Information

A topographical survey of the proposed development indicates a general fall of approximately 3%, falling from the Southern extent to the North. The site levels fall by roughly 10m over the length of the site.

2.4 Existing Surface Water Drainage

The existing site currently does not have any positive drainage and is assessed to infiltrate and run-off overland following the natural ground slope to the Main River to the North, the Afon Clun River and the Ordinary Water Course to the East.

2.5 Pre-applicant Advice with RCT (ref 24/5038/41)

Pre-application advice received from the Local Planning Authority confirms that the development will need to be aware of the requirements of Schedule 2 of the Flood and Water Management Act.

It also states the areas of high, medium and low surface water flood risk across the site which are associated with surface water accumulation and an unnamed ordinary watercourse along the eastern site boundary. As a result of this, any works that affect this unnamed watercourse will require Ordinary Watercourse Consent.

With regards to previous mine workings, the pre-application advice response confirms the site falls partly within the defined Development High Risk Area (DHRA) and that a mine shaft 305182-003 is present within the northern half of the site. Furthermore, it also outlines mining risks where SuDS features are proposed as part of the development scheme, consideration will need to be given to the implications of this in relation to the stability and public safety risks posed by coal mining legacy. The developer should seek advice from a technically competent person or organisation to ensure that a proper assessment has been made of the potential interaction between hydrology, the proposed drainage system and ground stability, including the implications this may have for any mine workings which may be present beneath the site.

3.0 Preliminary Site Investigation

A preliminary Site Investigation was undertaken by Integral Geotechnique (14391/FM/24/SI). This makes note of the mine workings and recommends targeted intrusive investigation works to further assess the potential mining risk at the site.

The Report included soakaway testing in three areas, one of which recorded negligible results. The results are outlined below:

Table 9: Summary of Soil Infiltration Test Results				
Test Location	Excavation Depth (m bgl)	Soil Infiltration Rate (m/s)		
		Test Cycle 1	Test Cycle 2	Test Cycle 3
SA01	2.35 - 2.55	2.36×10^{-4}	1.57×10^{-4}	9.93×10^{-5}
SA02	2.65 - 2.52	1.93×10^{-3}	1.22×10^{-3}	8.24×10^{-4}
SA03	2.60	Negligible infiltration recorded		

Figure 3 – Extract from PSI

The report described anomalous behaviour at SA02, whereby during the first cycle of testing, a 0.3m void/cavity opened up at the base of the trial pit resulting in rapid water drainage, indicating a potential underlying cavity. This should be reviewed in later design stages in line with the mine workings onsite.

Looking at the Cranfield Soilscape map, it can be observed that the site area is of the same ground type. This being made up of ‘Slowly permeable seasonally wet acid loamy and clayey soils’ with ‘Grassland with some arable and forestry’ landcover.

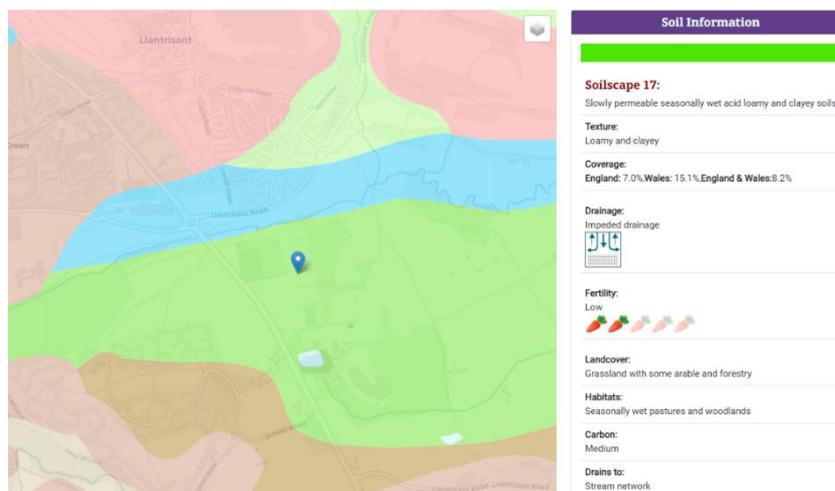


Figure 4 – Extract from Soilscape Map

4.0 Flood Risk

When assessing the development, it is essential to understand the flood risk characteristics of the site. The Natural Resources Wales Flood Maps for Planning, extracted below, demonstrates that the land to the north of the development plot is subject to significant flood risk and part of the Afon Clun flood plain, while the site itself is elevated above the potential flooding influence, considered to be at little or no risk of fluvial flooding.

The small purple shading is a local depression surrounding and established ancient tree and will be preserved/undeveloped.

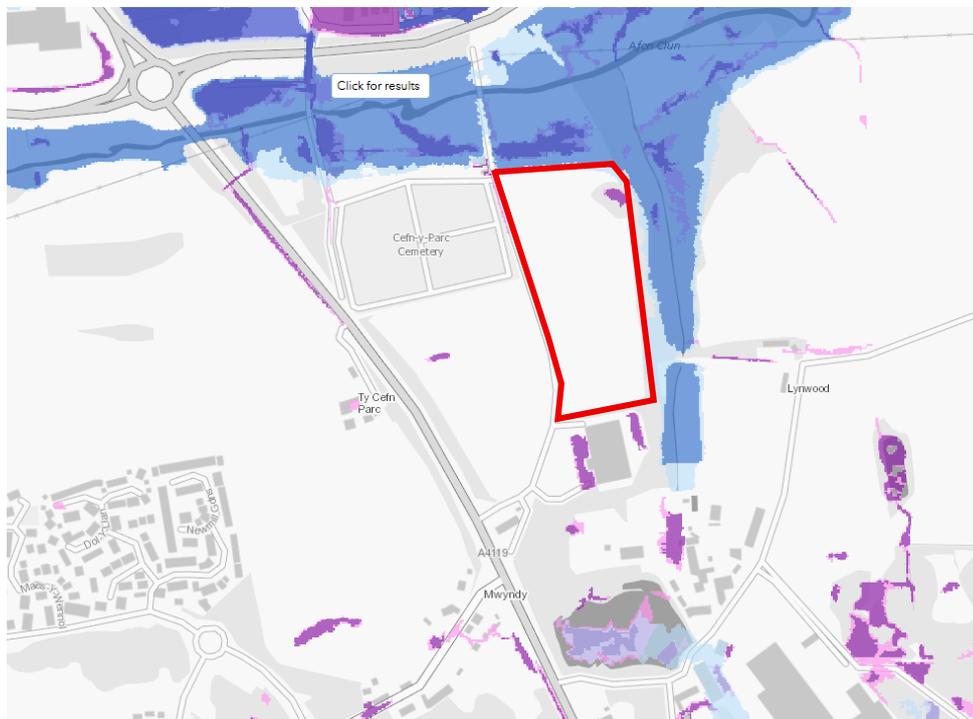


Figure 5 – Extract from NRW's Flood Maps for Planning (Site boundary shown in red)

The defined threshold for the flood plain in this location is around 48.92mAOD and is considered to represent a no-go barrier to proposed development. This has been respected as part of the design proposal with no influence or development within this zone.

Due to the generally sloping topography, development is limited to the area outside the current flood influence, which is as per recommendations set out in TAN 15 and will classify the development at low risk.

5.0 Surface Water Drainage Strategy

5.1 Proposed Development

The proposed scheme involves the design and construction of a Data Centre or multi-use commercial/light industrial units. In both cases the primary element will be a single large building shell occupying much of the development plot. The building will have perimeter access and associated parking facilities.

Within the building it is expected that there will be proportionate welfare facilities, office space, storage and plant areas, this will vary in composition between the two options but are limited to within the building envelope.

Spatial provision is included for associated green infrastructure to manage surface water runoff from the site which will be explained in greater detail below. Importantly this spatial consideration is also cognisant of existing trees and their root protection areas.

5.2 Strategy Overview

The aim of the proposed surface water drainage shall be to manage surface water runoff at source by infiltration if this proves possible during the later design stages, but as a minimum with SAB compliant soft-engineered drainage features for interception compliance leading to peak flow attenuation storage for volume and flow management. It is expected that the peak flow and resulting drainage outfall will mimic natural expected greenfield run off.

The most practical surface water drainage solution will:

- Introduce Sustainable Drainage Systems (SuDS) to manage surface water flows at-source and provide a softer alternative to a traditional “end of pipe” solution. Systems such as permeable paving and shallow perimeter swales are anticipated to collect run off and provide interception for paved areas and access routes.
- The proposed features will treat, attenuate, and infiltrate into the ground where possible, mimicking greenfield runoff characteristics
- Improve amenity and biodiversity benefits of the site by means of the green SuDS infrastructure and making more of the created features for the benefit of the site operatives and users
- Peak loads from the roof will prove more challenging since the nature of the development does not lend itself to the space required above ground at source. These point loads will be dropped to ground and directed to an

attenuation feature, where it is expected the drainage management processes would perform.

- Provide a comprehensive construction methodology and maintenance for the SuDS features

The solution employed will utilise appropriate sustainable drainage systems (SuDS). Hardstanding areas of the site will be divided into sub-catchments, where each SuDS system will discharge to networks which balances intercepting the first flush against the potential flood risk and cost of drainage.

5.3 Proposed Surface Water Drainage

Permeable surfacing is proposed across the site where practicable, prioritising lightly trafficked areas such as parking bays. Infiltration through the pavement sub-base will be encouraged to manage surface water at source. However, due to potential risks associated with historic mine workings, infiltration to natural ground has not been assumed in the current site volumetric calculations or greenfield runoff rate assessment.

Soakaway testing produced generally favourable results, although one test failed and another indicated a possible structural issue or underlying cavity, potentially linked to previous mining activity. In addition, pre-application advice from the Local Planning Authority (October 2024) confirms that Coal Authority records identify a mine shaft within the northern part of the site.

Until further site investigations confirm that infiltration to ground is viable and safe, SuDS features will be designed as lined systems and infiltration will not be relied upon as the primary discharge mechanism. Should infiltration prove feasible, this would allow for a more favourable SuDS solution.

Impermeable paved areas will drain via over-edge discharge into shallow swales and filter drains, which will convey flows to attenuation basins. Roof drainage will be collected by gutters and downpipes and directed via gravity systems into detention basins. Where required, runoff will pass through proprietary treatment systems (e.g. oil interceptors) prior to discharge to the basins.

Attenuation storage will be designed to accommodate the 1-in-100-year storm event plus a 40% climate change allowance. Preliminary calculations indicate that, based on approximately 2.5 ha of hardstanding (circa 4,000 m³ storage requirement), a single deep pond would be required. This is not considered feasible due to site levels and floodplain constraints to the north.

In accordance with Table G2.1 of the SuDS Standards, the design will aim to achieve an interception ratio of 1:5 to satisfy SAB requirements. The proposed attenuation strategy will comprise a composite system:

- A shallow surface basin at development plateau level, sized to accommodate lower order storm events and provide amenity and water quality benefits through vegetated treatment.
- During higher order events, exceedance flows from the shallow basin will discharge into a secondary subterranean storage system (e.g. buried geocellular crates).

Both storage elements will have controlled outfalls restricted to the site's pre-development greenfield runoff rate. The shallow basin will discharge via a controlled connection to the site outfall pipe running north toward the Afon Clun.

A designed exceedance route will allow flows in extreme events to safely bypass the development and discharge directly to the Main River and established floodplain to the north. The client owns the full extent of this exceedance pathway.

The proposed outfall connection to the Afon Clun will be subject to approval by NRW and the LLFA. Discharge will be restricted to the pre-development greenfield runoff rate, estimated at a QBAR of approximately 45.5 l/s.

6.0 Foul Water Drainage Strategy

6.1 Existing Foul Network

There is an existing 150mm vitrified clay foul sewer running along the through road directly adjacent to the site on the Western perimeter. The capacity of this sewer will need to be verified with Dwr Cymru Welsh Water (DCWW) in later design stages to determine sufficient capacity to allow a new foul connection at this point. It is observed that a short distance downstream, this foul line connects into a larger 450mm combined sewer, the expectation is that relatively low flows from this site could be successfully accommodated.

6.2 Proposed Foul Drainage

A connection to public foul sewer looks to be viable but will be subject to consultation with DCWW. A S104 Adoption Application may be required to bring a new connection into the site, and a subsequent S106 Approval will be needed to communicate with DCWW assets and make this new connection live.

Subject to final site levels, this connection would be prioritised as gravity connected however if levels do not allow for a gravity connection, a localised pumped solution could be used, discharging to the same proposed destination.

7.0 Further Considerations

7.1 Flood Exceedance

In the event of the drainage network surcharging and becoming a flooding issue (e.g. a flood event greater than a 1 in 100-year return period storm event +40% climate change), flood volumes would be expected to overtop the attenuation features and follow the existing topography draining Northward towards the Afon Clun. This matches the current site should these exceedance events be experienced without development.

A flood exceedance plan will form part of the documentation drafted for inclusion in the pre-SAB and full SAB applications.

8.0 Conclusion

This report sets out a Concept Drainage Strategy for the proposed development at Mwyndy, Talbot Green, demonstrating that a safe, efficient and SAB-compliant surface water management system can be delivered for the site. The strategy has been developed in accordance with SuDS principles and relevant planning policy, with the objective of ensuring no detrimental impact on the existing environment or downstream receptors.

Surface water runoff from roofs and hardstanding areas will be directed to shallow swales and soft-engineered attenuation features designed to provide water quality treatment, flow attenuation and ecological enhancement. Attenuation basins are proposed to the northern part of the site to restrict discharge to greenfield runoff rates. Subject to detailed loading assessments and ground investigations, permeable paving is proposed within parking bays and access roads to promote infiltration to natural ground where feasible. The viability of infiltration will remain subject to contamination testing, soakaway testing and further investigation in respect of historical mine workings.

Where additional water quality treatment is required, proprietary treatment measures, such as oil interceptors upstream of infiltration or attenuation features, will be incorporated to supplement the primary SuDS components. Peak flows will be attenuated within basins and, where necessary, storm storage structures prior to controlled discharge to a suitable outfall at the agreed greenfield runoff rate. Exceedance flows will be managed to ensure safe overland routing without increasing flood risk on or off site.

Progression of the strategy will require ongoing consultation with Dŵr Cymru Welsh Water in respect of foul water connections and discharge points, Natural Resources Wales regarding surface water discharge to the Afon Clun, and the Lead Local Flood Authority to confirm alignment with SAB requirements. In addition, further ground investigations, including soakaway testing and detailed assessment of mine workings, will be necessary to refine the detailed design and confirm infiltration feasibility.

In summary, the proposed drainage strategy demonstrates that the development can be sustainably drained in accordance with SuDS legislation and local policy requirements. Subject to the completion of the recommended investigations and statutory consultations, there are no overriding drainage constraints that would preclude the development from progressing to detailed design and SAB approval.



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