

Parc Solar Caenewydd, Swansea

SURFACE WATER DRAINAGE STRATEGY

Development of National Significance in the Renewable Energy Sector
Application Submission



SURFACE WATER DRAINAGE STRATEGY

PARK SOLAR CAENEWYDD,

ON BEHALF OF TAIYO POWER AND STORAGE LTD



Pegasus Group

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1. INTRODUCTION

Background

- 1.1 Pegasus Group Ltd has been appointed by Taiyo Power & Storage Limited (herein referred to as "the Applicant"¹) to undertake a Surface Water Drainage Strategy for a proposed Non-EIA¹ utility-scale solar and battery storage facility on land fronting the A484 and Swansea Road (B4560) at Gowerton, Swansea. It will deliver a host of landscape, biodiversity, soil and hydrological enhancements. The proposal includes measures to strengthen habitat connectivity through this part of the valley, the creation of green buffer zones and public right of ways improvements. The development is called 'Parc Solar Caenewydd'.
- 1.2 This Surface Water Drainage Strategy forms part of a suite of documents supporting a planning application for Development of National Significance for the construction, operation, management and subsequent decommissioning of a co-located solar farm and battery storage facility on land fronting the A484 and Swansea Road (B4560) at Gowerton, Swansea ("the application site").
- 1.3 The Surface Water Drainage Strategy is being published to accompany the Flood Consequence Assessment report and is further to a pre-application carried out under Articles 8 and 9 of the Development of National Significance (Procedure) (Wales) Order 2016.
- 1.4 Land within the solar array areas will be available for continued agricultural use for the duration of the development as the fields will be capable of being grazed by sheep.
- 1.5 This report is a drainage strategy, and its purpose is to manage surface water runoff. No foul water will be produced by the development.

¹ On August 2022, Planning & Environmental Decision Wales adopted its Environmental Impact Assessment (EIA) Screening Direction. The Welsh Ministers direct that the development is not EIA development within the meaning of the Regulations.

2. PROPOSED DRAINAGE STRATEGY

Proposed Impermeable Areas

- 2.1 The entirety of the site is a greenfield site and is currently 100% permeable. The proposed development will not increase the impermeable area, whilst the post-construction swards under the arrays will enable current conditions to be mimicked and bettered. The hardstanding areas are minimal, due to the small plinths for the transformers & substation and supporting plinths for battery containers sit within permeable gravel beds.

Surface Water Management

- 2.2 The SuDS hierarchy demands that surface water run off should be disposed of as high up the following list as practically possible:

- Into the ground (infiltration) and re-use, or then;
- To a surface water body, or then;
- To a surface water sewer, highway drain or another drainage system, or then;
- To a combined sewer.

- 2.3 In order to determine the most suitable method of surface water disposal from the site the options listed above have been considered as follows:

Infiltration

- 2.4 The underlying bedrock is noted as Mudstone and overlain by superficial deposits of Sand and Gravel Member.
- 2.5 Infiltration is unlikely to be feasible given the underlying geology is Mudstone and not of a permeable nature, however, the overlying sand and gravels are likely to offer some near-surface percolation zones.

Discharge into surface water bodies

- 2.6 There are several watercourses/ditches located across the site which may be retained and utilised for surface water run-off; however, the main watercourse is

the Afon Llan and is likely this will be the main area of outfall from the development site.

Table 2.1 – Assessment of SuDS Suitability

SuDS Technique	Potentially suitable for this development	Justification
Rainwater Harvesting	No	Not practical for type of development.
Green Roofs	No	Not practical for type of development.
Infiltration Systems (Soakaways, etc.)	Possibly	Infiltration is likely to be limited. Soakaways and swales will aid
Filter Drains	Yes	Can be used but provides limited water quality benefits and does increase land take.
Swales	Yes	to be utilised as main SuDS train combined with other SuDS features.
Bioretention Systems	No	Not practical for type of development.
Trees	Yes	Within landscaped areas - new tree planting are deliberately designed to be in locations which will retain waters for gradual infiltration / evaporation above Flood Zones B & C2 / Flood Zone 3 [TAN 15 2023 FMfP]

Underground storage	No	The use of overland SuDS features are to be used for this development.
Detention basins & ponds	Yes	Although not suitable to solar developments.
Wetlands	Yes	Although not suitable to solar developments.
Permeable Paving	Yes	In the form of gravel tracks.

Surface Water Drainage Strategy

- 2.7 All surface water runoff will be collected by a series of SuDS features and conveyed to the existing watercourses. The drainage options will likely be a series of linked up SuDS features that will form a SuDS train throughout the site. A copy of the proposed Surface Water Betterment Plan and Planting Plan can be found in Appendix A.

Water Quality

- 2.8 The SuDS Manual (CIRIA C753) states that the design of surface water drainage should consider minimising contaminants in surface water runoff discharged from the site. The level of treatment required depends on the proposed land use, according to the pollution hazard indices.
- 2.9 Permeable paving has been incorporated into the design at location of gravel yards surrounding the transformers, substation and battery containers to allow improvements in water quality of surface water run-off.

Operation and Maintenance

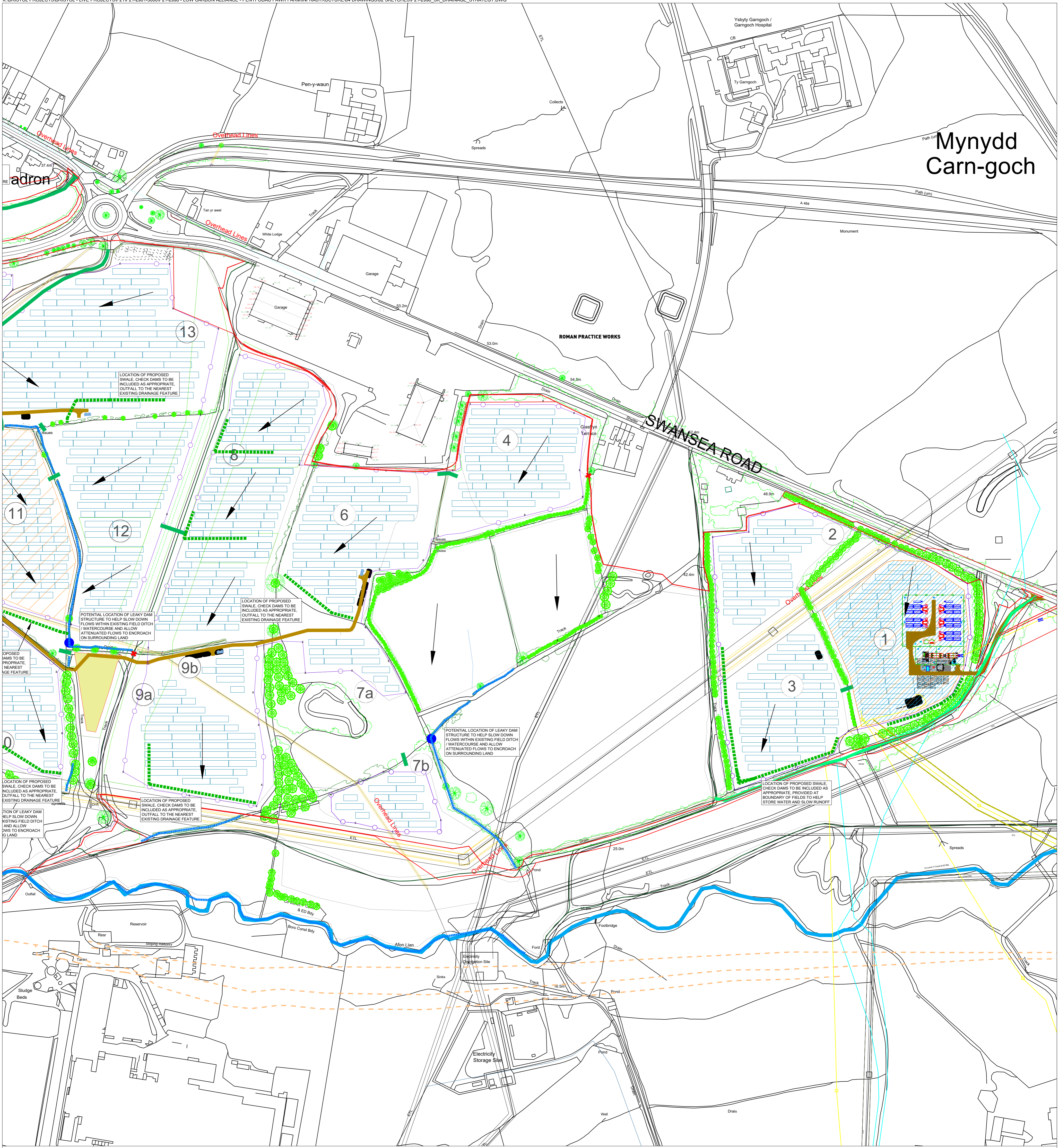
- 2.10 The maintenance of the proposed drainage systems will need to be assessed and the relevant owners responsible for each aspect identified within a site specific 'Operations and Maintenance Manual'.

2.11 SAB approval will be sought after consent has been granted for the scheme.

3. SUMMARY

- 3.1 The site is comprised of agricultural fields areas, trees and other vegetation. The BGS records show the bedrock geology is mudstone, siltstone and sandstone. The Soilscape mapping shows the site to be in an area of impeded drainage.
- 3.2 Land within the solar array areas will be available for continued agricultural use for the duration of the development as the fields will be capable of being grazed by sheep.
- 3.3 The proposed development has a life of at least 40 years, after which the modules would be decommissioned and removed from the site and the site returned to agricultural use.
- 3.4 Infiltration may only be possible across the upper slopes given the underlying strata at the site. Therefore, it is considered a series of SuDS features will be provided throughout the site to drain surface water run-off. The ecological and arboriculture proposals would further add to the water storage retention capacity of the proposed SuDS features.
- 3.5 The proposed development will not add any significant areas of impermeable surfacing. Surface water runoff will drain partially to ground, as existing, and overland flows collected via new swale systems to slow run-off and improve water quality. The site will benefit from the absence of intensive farming.
- 3.6 A series swales as flood compensation / enhancement features are proposed across the entire site to assist in slowing run-off from the fields and providing storage during extreme flood events.
- 3.7 The proposed development, consisting of solar panels and inverters will generate minimal impermeable area which will be contained at source by gravel surrounding areas.
- 3.8 Separate SAB approval will be required for the site drainage proposals aside from any planning application, this will be obtained after the DNS process. The SAB team have been consulted prior to the submission of the planning application to PEDW.

Appendix A – Surface Water Betterment Plan



Mynydd Carn-goch



EXAMPLES OF SWALE LAYOUTS



TYPICAL SOLAR PANEL ARRANGEMENT RAISED ABOVE GROUND

- KEY**
- PROPOSED SHALLOW SWALE. DEPTH VARY (APPROX. 0.5m - 1.0m DEEP) WITH 1:3 SIDE SLOPES. WIDTHS VARY.
 - LOCATION OF WATERCOURSE / DRAINAGE DITCH / FIELD DITCH
 - OVERLAND FLOW ROUTE

First Floor, South Wing, Equinox North Great Park Road, Almondsbury, Bristol, BS32 4QL 01454 625945 www.pegasusgroup.co.uk Planning Design Environment Economics		Pegasus Group		REV DATE BY DESCRIPTION CHK APD A 16.06.2022 MR UPDATED LAYOUT LAJ LAJ C 09.08.2022 NF DAMS ADDED, SWALE ADDED ABOVE CONTAINERS LAJ LAJ D 11.08.2022 NF LAKE AMENDED TO POND, SWALES REALIGNED LAJ LAJ E 08.03.2023 LAJ UPDATED LAYOUT LAJ LAJ F 09.05.2023 MR MINOR UPDATES LAJ LAJ G 09.10.2023 LAJ NEW SITE LAYOUT LAJ LAJ H 08.12.2023 LAJ NEW SITE LAYOUT LAJ LAJ
CLIENT: TAIYO POWER & STORAGE LTD PROJECT: PARC SOLAR CAENWEYDD		SCALE @ A1: 1:2000	CHECKED: LAJ APPROVED: LAJ	
TITLE: PROPOSED DRAINAGE STRATEGY SHEET 2		DATE: 01/02/2022	DESIGN-DRAWN: MR DRAWING-STATUS: PLANNING	
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