

## **Technical Note – Drainage**

### **Solar Farm – Nantycaws Waste Management Centre, Carmarthen**

#### **Introduction**

This Drainage Technical Note is prepared to support a planning application for a new solar farm on land at Nantycaws Waste Management Centre, Nantycaws, Carmarthen, grid reference SN472173

#### **Existing Site**

The site is located southwest of the main Nantycaws Waste Management Centre as indicated in Appendix A. The development site which covers circa 4ha is classified as greenfield land which is ancillary to and within the boundary of the wider waste management facility.

The existing site falls in a southerly direction towards existing ordinary watercourses along the eastern and southern boundaries which are tributaries of the Afon Bantwen.

The results of the Ground Investigation, undertaken by Earth Science Partnership was unavailable at the time of drafting this technical note. However, as the site forms part of the old landfill site it is anticipated that infiltration surface water disposal methods are unviable.

However, based on a desktop study, the ground conditions suggest an impeded drainage site, with surface water runoff discharging into local stream networks.

#### **Flood Risk**

The Development Advice Map (DAM) is a flood map published by NRW for land use planning purposes. The Map shows that the application site lies within Zone A area, described as “Considered to be at little or no risk of fluvial or tidal/coastal flooding”. As such, there is no need to consider flood risk further.

An assessment of surface water flood maps has been conducted by reviewing available information from the NRW Flood Map for Planning (FMfP). The FMfP map indicates some risk of flooding outside of the red line boundary of the development site following a localised depression. This development site is unaffected by surface water flooding, i.e., at very low risk, meaning less than 1 in 1000 annual probability of flooding.

#### **Proposed Development Site**

This application site includes forming a maintenance access road and an array of solar panels.

The proposed drainage strategy plan is included in Appendix B.

SuDS Approving Bodies (SAB's) agreement will be required in accordance with the Flood and Water Management act 2010 (Schedule 3).

The standards for this agreement are listed below;

- S1 – Surface Water Runoff Destination
- S2 – Surface Water Runoff Hydraulic Control
- S3 – Water Quality
- S4 – Amenity
- S5 – Biodiversity
- S6 – Design of Drainage for Construction, Operation and Maintenance

### S1 - Surface water Runoff Destination

#### **Collection for use**

As the development site requires no positive mains water supply, there will be no additional stresses on the local mains water supply network. The development therefore meets the exception criteria within G1.4 of the SuDS standards.

Surface water runoff from site to be collected within various SuDS features such as swales and a detention basin. Water is to be reused through the hydration of planting.

#### **Infiltration Methods**

Due to risk of contamination and based on a desk study review, infiltration disposal methods are deemed unviable. As such, other means of surface water disposal is required.

#### **Discharge to Surface Water Body**

A watercourse is located downslope of the development site in a southerly direction. It is anticipated that greenfield runoff currently discharges in this direction. As part of the development proposals, an attenuated connection at greenfield rate is proposed.

#### **Discharge to Surface Water Sewer**

Based on the above, this option should not be required.

#### **Discharge to Combined Sewer**

Based on the above, this option should not be required.

### S2 – Surface Water Runoff Hydraulic Control

This standard requires surface water to be managed to prevent as far as possible any discharge from the development for rainfall events of less than 5mm. The surface water runoff rate and volume for up to a 1 in 100-year return period plus 30% climate change should be managed to protect people, properties, and the receiving water body.

The total developable area for the site is 4ha and classified as 'greenfield'. The global greenfield run-off rates have been calculated using the FSR method and Table 1.1 summarises the run-off rates for each return period (1, 30 & 100).

Table 1.1 – Global Greenfield Run-off

<b>Return Period</b>	<b>Greenfield Run-off Rates (lit/sec/ha)</b>
1yr	9.4
30yr	19.01
100yr	23.29

The total hard paved area of the development equates to 0.25ha. Based on the existing discharge rates presented in Table 1.1, the equivalent total discharge from the development site in a 100yr + 30% climate would be 2 Lit/sec.

For the purpose of demonstrating viability and sufficient land availability on the layout, storage volumes are shown indicatively on the drainage plan in Appendix B with outline calculations presented in Appendix C. Exact arrangements for storage form, size and location would be agreed at detailed design stage and subject to agreement with the relevant adoption authorities.

### S3 – Water Quality

This standard requires treatment of surface water runoff to prevent negative impacts on the receiving water quality and/or protect downstream drainage systems including sewers.

The aim of the surface water management strategy with regards to water quality is to use natural processes that promote biodiversity and long-term sustainability. As such, it employs a SuDS management train approach, providing drainage components in series.

In accordance with Table G3.1 from the Statutory Standards, the level of hazard will vary at different locations of the development site, however it is typically classified as Medium Hazard.

### S4 – Amenity

This standard requires that the design of the surface water management system should maximise amenity benefits.

Detention basin and swales is an important part of the landscape design. The basin will be planted with wetland plants/ wildflower mixes to enhance their beauty and amenity contribution.

### S5 – Biodiversity

This standard requires that the surface water management system should maximise biodiversity benefits.

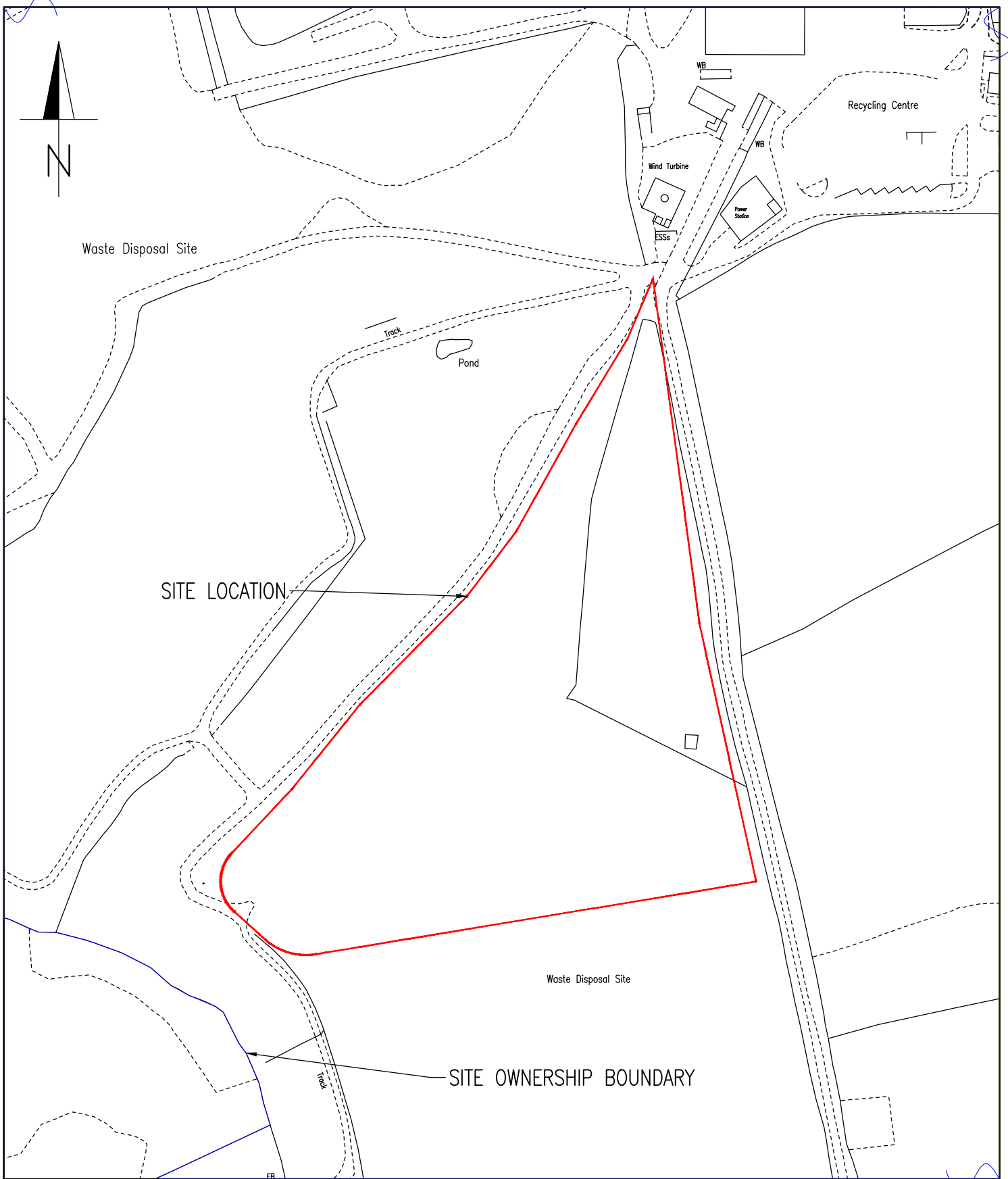
Detention basin and swales will be planted with native plant species to provide dense and durable cover of vegetation that creates appropriate habitat for indigenous species.

S6 – Design of Drainage for Construction and Maintenance and Structural Integrity

The surface water drainage system should be designed with the overriding ethos of simplicity in construction, use and maintenance. This then allows a very simple translation from the principles described within standard S6, namely that all elements of the surface water drainage system should be designed so that they can be constructed, as well as maintained and operated easily, safely and cost-effectively.

Information with regards to the construction methodology and requirements of the proposed system will be developed as part of the detailed design stage of the project, likewise the maintenance requirements and regime of the proposed system will be developed into the full maintenance strategy for the site during the next phase of design development

Appendix A  
Site Location Plan



GRID REF: 247209.78 217338.65



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Project  
**PROPOSED SOLAR FARM  
NANTYCAWS**

Drawing Title  
**SITE LOCATION PLAN**

Client  
**CWM ENVIRONMENTAL  
INFORMATION**

Project No.  
**C2230**

Drawing No.  
**C-SK01**

Scale 1:2500	Date 24.07.24	Revision
Drawn DN	Checked DH	Sheet Size A4

Appendix B  
Drainage Strategy Plan



**HEALTH AND SAFETY INFORMATION**

ALL WORKS SHALL BE CARRIED OUT BY COMPETENT PEOPLE IN ADDITION TO THE HAZARDS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING THE DESIGNERS HAVE REVIEWED THE RISKS AND DEVELOPED A DESIGNERS RISK ASSESSMENT THE CONTRACTOR SHALL REFER TO THE CONSTRUCTION PHASE PLAN AND ADOPT THE RISKS AND DESIGNERS RISK ASSESSMENT FINDINGS IN THE DEVELOPMENT OF THEIR RAMS, BEFORE UNDERTAKING ANY WORKS. PLEASE ALSO NOTE THE FOLLOWING:-

**DIFFICULT TO MANAGE**  
 THESE MAY BE COMMON RISKS BUT BE IN AWARD LOCATIONS EG SCAFFOLDING, DELIVERIES, PROXIMITY OF GAS MAINS OR POWER LINES, WORKING IN CLOSE PROXIMITY TO THE PUBLIC ETC.

**UNUSUAL**  
 THESE MAY BE COMMON RISKS OCCURRING IN UNUSUAL CIRCUMSTANCES THEY MIGHT ALSO BE UNUSUAL BECAUSE OF THE NATURE OF THE CONSTRUCTION METHOD OR SITE CONDITIONS, EG UNSTABLE OR CONTAMINATED GROUND, ASBESTOS, LEAD PAINT, SILICA DUST ETC.







**NOT LIKELY TO BE OBVIOUS TO A CONTRACTOR OR DESIGNER**  
 THE CONTRACTOR, AT THE PRICING STAGE, AS WELL AS DURING THE DESIGN, OUBLE MAY NOT BE AWARE OF SOME OF THE LESS OBVIOUS RISKS EG STRUCTURAL ISSUES ASSOCIATED WITH WORKING AROUND EXISTING FOUNDATIONS, FRAGILE ROOF'S OR FRAGILE SURFACES ETC.

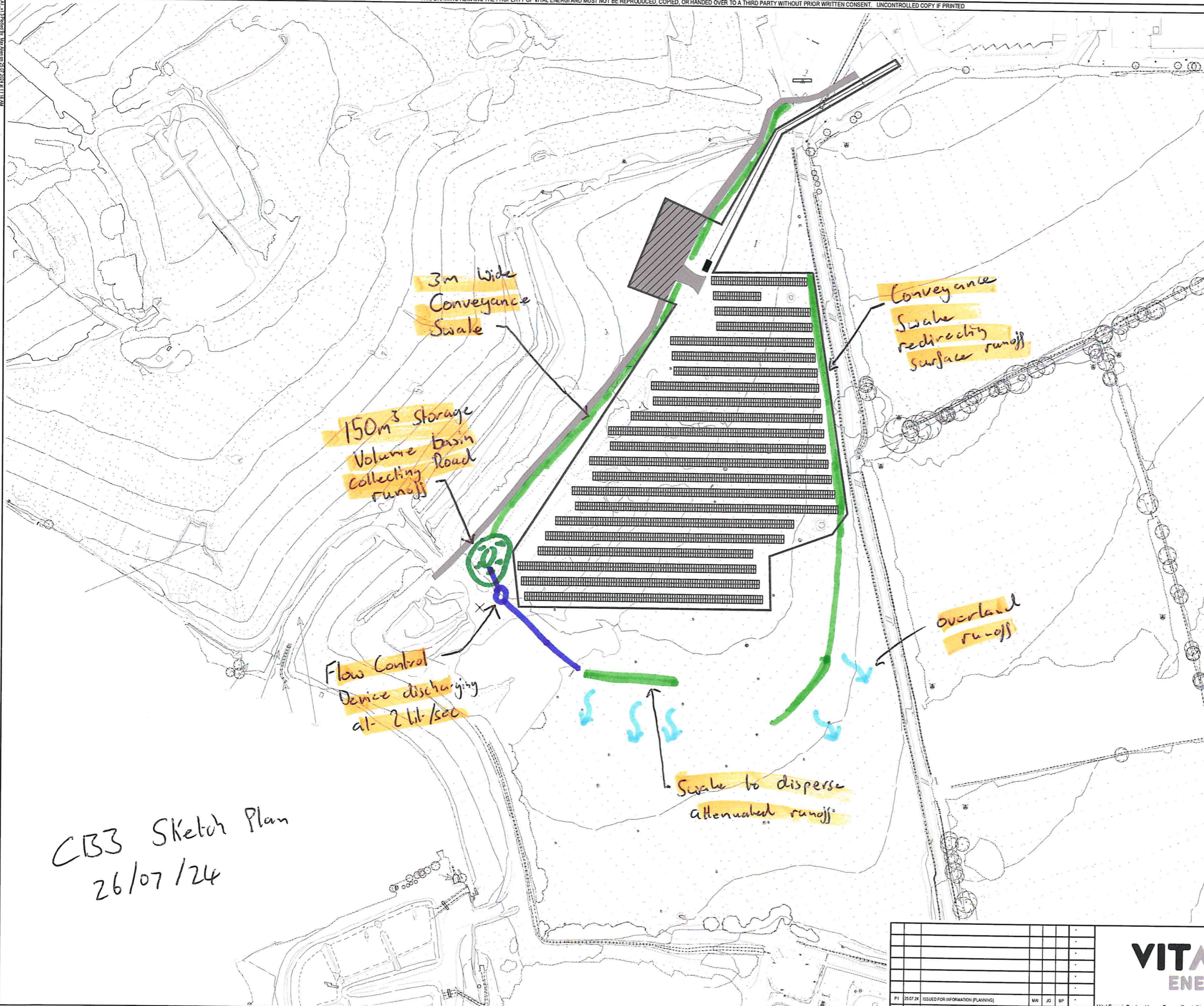
**OPERATIONAL ACCESS - HORIZONTAL, VERTICAL, PEDESTRIAN, VEHICLE/PLANT**  
 ARE THERE SIGNIFICANT ISSUES REGARDING ACCESS? IF YES OUTLINE BELOW OR REFER TO APPROPRIATE DOCUMENT ETC.

**OPERATIONAL HANDLING/LIFTING STRATEGY**  
 HAVE YOU IDENTIFIED AS REASONABLY PRACTICABLE REDUCED MANUAL LIFTING IDENTIFY ANY ITEMS THAT MAY REQUIRE EXCESSIVE LIFTING ARRANGEMENTS TO BE PUT IN PLACE AS WELL AS IDENTIFY ANY UNUSUAL RISKS ASSOCIATED WITH HANDLING AND LIFTING.

**HEALTH AND SAFETY FILE INCLUSIONS**  
 IDENTIFY ANY HAZARDS / SIGNIFICANT RISKS ASSOCIATED WITH MAINTENANCE OR REMOVAL / DEMOLITION OF THE CONTENTS OF THIS DRAWING AT A LATER DATE.

**KEY:**

- PV PANEL TABLE 
- SITE ACCESS TRACK 
- SITE COMPOUND 
- RED LINE BOUNDARY 
- LVHV SUBSTATION 
- HV PRIVATE WIRE 



CB3 Sketch Plan  
26/07/24

ISSUED FOR INFORMATION

REV	DATE	DESCRIPTION	DRN	CHK	APP	CAD	QA
P1	25.07.24	ISSUED FOR INFORMATION (PLANNING)	MAJ	JG	BP		



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Project: NANT Y CAWS HWRC SOLAR			
Title: SOLAR GROUND MOUNT GENERAL ARRANGEMENT			
DATE	SCALE	N.T.S	SHEET
25.07.2024			A1
INFORMATION		Status: S2	Stage: 2
20335-VE-SW-XX-DR-Y-5001		Drw-Nc	Rev: P1