



Candwr Solar Farm

Pre Application Consultation

Outline Drainage Operation Maintenance Manual

2 July 2026





Document Management

Version	Date	Author	Checked	Approved	Reason for revision
V01	08/05/2026	MG	OM	CT	N/A
VO2	22/06/2026	LG	LG	CT	Updated Report Name and Corrected Client Name



Contents

1. Introduction.....	1
2. Guidance	2
Caerphilly and Monmouthshire SuDS Approval Bodies	2
Sustainable Drainage Systems Standards for Wales	2
Product Specific Guidance	2
The SuDS Manual	2
3. Operation and Maintenance Plan	4
Flow Control Chambers	4
Swales	6
Permeable Aggregate Subbase.....	8
Other Drainage Infrastructure.....	9
4. Conclusion.....	10
Surface Water Drainage Visual Inspection Proforma.....	12

Tables

Table 1: Flow Control Chamber Maintenance Requirements	4
Table 2: Swale Maintenance Requirements	6
Table 3: Permeable Aggregate Subbase Maintenance Requirements	8

1. Introduction

- 1.1. This Operation and Maintenance (O&M) Plan has been prepared by Pegasus Group on behalf of Candwr Solar Farm Ltd in respect of the operational phase surface water drainage system for the proposed solar farm on Land at Court Farm, Ponthir, Monmouthshire.
- 1.2. The site sits within the Monmouthshire Local Authority Area (LAA) of the Monmouthshire County Council (MCC), the Torfaen County Borough Council (TBC) and the Newport City Council (NCC) LLA.
- 1.3. This report should be read in conjunction with the Flood Consequences Assessment (FCA) and Surface Water Drainage Strategy (ref: R001v1-IN_P24-2075 Flood Consequence Assessment & Surface Water Drainage Strategy) prepared by Pegasus Group.
- 1.4. This O&M plan is intended to give an overview of the operation and maintenance for the range of Sustainable Drainage Systems (SuDS) features included with the operational phase drainage strategy and in relation to typical details only.
- 1.5. All drainage systems require regular maintenance to ensure their effective operation. Maintenance of drainage systems should be undertaken on a regular basis.
- 1.6. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.
- 1.7. All components within the system will be designed in accordance with minimum pipe diameters and self-cleansing velocities.
- 1.8. This report is specific to the surface water drainage system only.
- 1.9. The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no issues with their operation and can then adjusted to suit the site requirements.
- 1.10. It is intended that the surface water network will remain private. Therefore, it is the responsibility of the developer (Candwr Solar Farm Ltd) to appoint a suitable management company to provide the required maintenance.
- 1.11. If there are any variances between the Drainage Strategy proposed for the planning application and the final construction design, this document should be updated accordingly.
- 1.12. It is recommended that an As-Built Drainage Survey is undertaken and appended to the overarching O&M Manual to provide an accurate record of the location and specification of all drainage features.

2. Guidance

Caerphilly and Monmouthshire SuDS Approval Bodies

- 2.1. The site lies within both the Caerphilly and Monmouthshire SuDS Approval Bodies (SAB). Both SABs have been consulted in both Summer 2023, and Summer/Autumn 2025. Further details on the consultation responses can be found within the Flood Consequence Assessment (FCA) and Sustainable Drainage Strategy (Ref: R001v1_IN-P24-2075 Court Farm FCA and Sustainable Drainage Strategy).

Sustainable Drainage Systems Standards for Wales

- 2.2. The Welsh Government publish Sustainable Drainage Systems Standards for Wales (2018), which details guidance for the design, construction, operation and maintenance of SuDS features (Guidance on Standard S6).
- 2.3. Standard S6, G6.6 states that 'the design should include a proposed Maintenance Plan which addresses:
- 'Inspection and maintenance required for the system to function as designed with regard to meeting the performance levels set by compliance with these Standards'
 - 'Inspection and maintenance required during the establishment of vegetative components and for the long-term management of that vegetation'
 - 'Locations where sediment removal is necessary to ensure sediment control measures continue to function as designed, together with the anticipated frequency and appropriate means of sediment removal and disposal'

Product Specific Guidance

- 2.4. Manufacturer specific drainage products will be determined at construction stage. The specific products will have their own maintenance guidance which should be followed in the first instance.

The SuDS Manual

- 2.5. Guidance published by the CIRIA in The SuDS Manual (2015) provides a framework for the planning, design, construction, and ongoing maintenance of SuDS. Whilst manufacturer or product specific instructions should be adhered to in the first instance, the following sections set out typical maintenance requirements for each component of the proposed surface water drainage system, based on the general principles outlined in the manual.
- 2.6. Maintenance activities are categorised in accordance with CIRIA guidance as:
- Routine maintenance (including inspections)

- Occasional maintenance
- Remedial maintenance

2.7. The frequency of maintenance activities should be determined by:

- The type of SuDS component
- The size of the contributing catchment
- The associated land use
- The construction works within the catchment
- The planning schemes
- Present habitat types
- Amenity and visual requirements of the area

3. Operation and Maintenance Plan

Flow Control Chambers

- 3.1. Flow control chambers are proprietary products and as such, the manufacturer's recommendations should be followed.
- 3.2. Flow control chambers (in this case mainly orifice plate controls) are intended to restrict the surface water runoff discharge rate from the site to a designed. Orifice plate flow controls are circular or rectangular openings of a prescribed shape and size that allows a controlled rate of outflow when submerged. When not submerged, the orifice opening acts as a weir.
- 3.3. Regular inspection and maintenance are important to identify areas which have been obstructed/clogged and may not be draining correctly, thus exposing the development to a greater level of flood risk. As the surface water network is to remain private, the developer (Candwr Solar Farm Ltd) should appoint a suitable management company to provide the required maintenance.
- 3.4. After periods of heavy rainfall or a storm event, sediment may need to be removed from the flow control, to allow for effective operation.
- 3.5. **Table 1** sets out the typical maintenance requirements and associated timescales for flow control chambers, in accordance with CIRICA C753 The SuDS Manual (2015).

Table 1: Flow Control Chamber Maintenance Requirements

Maintenance Schedule	Required Action	Typical Frequency
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Rod through poorly performing runs to inspect for blockages.	As required
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required if above does not improve performance
Monitoring	Initial inspection should be provided as post construction CCTV survey.	N/A

Maintenance Schedule	Required Action	Typical Frequency
	Inspect for evidence of poor operation via water level in chambers and if required, take remedial action	Three monthly, 48 hours after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Swales

- 3.6. The swales will require regular maintenance to ensure continuing operation to design performance standards, with the details of maintenance activities and frequencies provided within **Table 2**. The effectiveness of the swales is dependent on the short and long term maintenance, and remedial actions taken to rectify any ineffectiveness.
- 3.7. Occasionally sediment and litter will need to be removed from the swales. Litter should be removed before any other maintenance activities are undertaken. Sediment should be removed once deposits exceed 25mm in depth and should be disposed of in accordance with the correct waste disposal protocol.
- 3.8. Any damage due to sediment removal or erosion and scour resulting from major events (i.e. heavy rainfall or storm events) should be repaired and reseeded.
- 3.9. Regular mowing around maintenance access routes and across the main storage area is required regularly. Where swales are located adjacent to access tracks, maintenance can be provided from the track. Where swales are located at solar array parcel perimeters can be accessed from adjacent landscaped areas or array areas.
- 3.10. Mowing should ideally retain grass lengths of 75-150mm across the treatment surface to assist in filtering pollutants, as stated within the CIRIA SuDS Manual (2015). Grass clippings should be disposed of outside of the basin area or removed off site.
- 3.11. **Table 2** sets out the typical maintenance requirements and associated timescales for attenuation basins, in accordance with CIRICA C753 The SuDS Manual.

Table 2: Swale Maintenance Requirements

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for signs of physical damage	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for >48 years	Monthly, or when required

Maintenance Schedule	Required Action	Typical Frequency
	Manage other vegetation and remove nuisance plants	Monthly (for 6 months), then as required
	Inspect vegetation coverage	Monthly (for 6 months), quarterly for 2 years, then half yearly.
	Inspect inlets and basin surface for silt accumulation, remove silt once depth of sediment built up greater than 25mm.	Half yearly, or when sediment depth is greater than 25mm.
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions if required	As required or if bare soil is exposed over 10% or more of the basin treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseedling	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up soil deposits and prevent compaction of the soil surface	As required
	Remove and dispose of oils or petrol residues (using a licensed waste disposal company).	As required

Permeable Aggregate Subbase

- 3.12. All substation areas will be underlain with a permeable aggregate subbase, of which will require regular maintenance to ensure continuing operation to design performance standards, with the details of maintenance activities and frequencies provided within **Table 3**. The effectiveness of the permeable aggregate subbase is dependent on the short and long term maintenance, and remedial actions taken to rectify any ineffectiveness.
- 3.13. Occasionally sediment and litter will need to be removed from the swales. Litter should be removed before any other maintenance activities are undertaken. All litter should be removed off site, and should be disposed of in accordance with the correct waste disposal protocol.
- 3.14. Maintenance activities noted within Table 3 are based upon gravel filter drains (as within the CIRIA SuDS Manual (2015)). This is considered to be a suitable proxy in lieu of a specific maintenance schedule for permeable aggregate subbases.

Table 3: Permeable Aggregate Subbase Maintenance Requirements

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter and debris, from surfaces, access chambers and pre-treatment devices.	Monthly, or as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect structures, pipework etc for signs of physical damage or blockages	Monthly
Occasional maintenance	Remove or control tree roots if encroaching on the sides of the subbase area (using recommended methods such as NJUG, 2007 or BS 3998:2010)	As required or if bare soil is exposed over 10% or more of the basin treatment area
	Clear perforated pipework or blockages	As required

Other Drainage Infrastructure

- 3.15. Other features (including pipe work, access chambers and manholes) will require general maintenance measures, of which have been detailed below.
- 3.16. Drainage covers should always remain clear and accessible, with no surfacing installed over the top which may limit their access and should not be overloaded.
- 3.17. Significant vegetation or large trees should not be planted adjacent to the drainage pipework as roots may cause damage.
- 3.18. Access chambers, manholes, and rodding eyes should be subject to regular inspection to identify any signs of damage and to ensure they remain accessible, functional, and safe.
- 3.19. All inlets and outlets should be visually inspected at regular intervals to confirm they remain clear and free from obstruction. Any blockages identified should be removed, with debris taken out of the system wherever practicable, rather than being pushed or flushed through. Forcing material through the system can lead to pollution of the receiving surface water environment (e.g. a surface water body downstream) or result in blockages in less accessible sections of the drainage network.
- 3.20. CCTV surveys should be carried out to assess and document the condition of the below-ground drainage infrastructure and should be undertaken every 5–10 years.
- 3.21. Where pipework needs cleaning, the below details the requirements:
- Covers of inspection chambers and manholes should be removed and the sides, benching and channels cleaned.
 - Main and branch drains should be cleaned and afterwards should be flushed with clean water. Any obstructions found should be removed and not flushed into the system.
 - Accumulated deposits in gullies should be removed. The traps should then be plunged and thoroughly flushed out with clean water.
 - Covers of inspection chambers and gullies should be replaced, bedded on suitable grease or other sealing material and/or bolted down as appropriate to the type. Missing bolts and broken items should be renewed.

4. Conclusion

- 4.1. This O&M Plan has been prepared by Pegasus Group on behalf of Candwr Solar Farm Ltd in respect of the surface water drainage network for the proposed solar farm, on Land at Court Farm, Ponthir, Monmouthshire.
- 4.2. Maintenance responsibility for the proposed development will be with the site owners, who should appoint a suitably qualified management company to undertake the required maintenance. Details of the appointed management company should be appended to this plan.
- 4.3. The general guidance on inspection, maintenance and required frequency for each surface water drainage component detailed within the SWDS are included within this O&M Plan. **Appendix A** details an example proforma for the inspection of SuDS features and should be used as a guide for undertaking regular inspections and the subsequent maintenance requirements.
- 4.4. In addition to the regular maintenance activities, it is recommended that additional inspections are undertaken following periods of heavy rain, extended dry spells and any surface water of fluvial flood events.



Appendix A – Visual Inspection Proforma



Surface Water Drainage Visual Inspection Proforma

Site Name: Court Farm Solar Farm
Maintenance Company:
Contact Number:
Person Undertaking Inspection:
Date of Visual Inspection:

General Inspection

Yes No

- Are drainage covers clear and accessible?
- Is there any evidence that drainage covers and pipework **are** overloaded?
- Is there any evidence that drainage covers and pipework **have been** overloaded?
- Is there any vegetation in close proximity to the drainage network?
- Are access chambers, manholes and rodding eyes in good visual condition?
- Are inlets and outlets in good condition?

Swale

Yes No

- Is the swale operating correctly?
- Is the vegetation around and within the swale managed?
- Are there any blockages, clogging or standing water within the swale?
- Are the pre-treatment systems, inlets and pipework free of sediment?
- Are the post-treatment systems, outlets and pipework free of sediment?
- Are the inlets, outlets and overflows in good condition?

Flow Controls

Yes No

- Are the flow controls operating correctly?
- Is there any litter within the inlets and outlets of flow controls?
- Is there any leakage from the flow control?
- Is there any cracking, rust, corrosion or other defects on the flow control?
- Are inlets and outlets in good working condition?
- Is there any standing water in the chamber?

Permeable Aggregate Subbase

Yes No

- Is the permeable subbase operating correctly?
- Is there any vegetation/litter around and within the subbase?
- Are there any blockages, clogging or standing water within the subbase?
- Are the post-treatment systems, inlets, outlets and pipework free of sediment?



Recommended Actions	Completed?

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