



Foel Trawsnant Wind Farm

Construction Environmental Management Plan

Prepared for



Alerion UK Limited

September 2026
5277-CEMP-01



Document Control

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1.0 INTRODUCTION

1.1 Introduction

1.1.1 This report comprises a combined Construction Environmental Management Plan (CEMP) and Construction Method Statement (CMS) for the construction of the Foel Trawsnant Wind Farm ('the Approved Development') at Bryn, Port Talbot ('the Site'). It also incorporates the surface water drainage strategy for the Approved Development through the Flood Risk and Drainage Statement included at Appendix C.

1.1.2 The CEMP has been prepared to support the discharge of Conditions 5, 10 and 11 attached to Planning Permission P2022/0517 and sets out the environmental management arrangements, construction methods and drainage measures that will apply throughout the construction works.

1.2 The Site

Development Site Address

1.2.1 The Approved Development is located approximately 2.3 km to the north-west of Maesteg. The central grid reference is approximately 283905, 193920. The site lies entirely within the Neath Port Talbot local authority area.

Site Description

1.2.2 The development site occupies an area of approximately 46.5 ha located on the southern and western slopes of Foel Trawsnant between the Llynfi Valley to the south and east and the Afan Valley to the north.

1.2.3 The centre of the Site is approximately 2.3 km to the north-west of Maesteg, with the central grid reference being approximately 283905, 193920. The Site lies entirely within the Neath Port Talbot local authority area.

1.2.4 The settlements of Brynheulog, Caerau, Dyffryn, Spelter and Nantyffyllon occupy the lower slopes and floor of the Llynfi Valley and form a northern extension of Maesteg. The smaller settlements of Cynonville and Duffryn Rhondda are located on the lower southern slopes of the Afan Valley to the north and north-east of the development site. Cwmafan lies approximately 5.5 km to the southwest of the site.

- 1.2.5 The proposed 8 no. turbines would be sited on currently open land, which is currently primarily used for grazing of livestock. The Site rises to a maximum height of approximately 371 m AOD and occupies a position toward the northern end of an area of higher ground between the Afan and Llynfi Valleys.
- 1.2.6 Access to the site will be via the B4282, between Bryn and Maesteg.
- 1.2.7 Habitats present at the site include semi-improved grassland, mire communities, as well as areas of upland heath and acid grassland, with the predominant land use being stock grazing. Existing agricultural practices can continue during and following construction of the wind farm.
- 1.2.8 The closest sensitive receptors to the site include the following nine properties: Tonnau Defaid; Penylan; Sunnyview; Teras Griffiths; Hendre Owen Farm; Ty'n-y Pant Farm; Nant-yr-hwyaid Farm; Tycanol; and Neuadd-wen. These sensitive receptors will be fully considered during the construction works to minimise any disturbance.

1.3 The Approved Development

- 1.3.1 Planning permission was originally granted on 25 November 2021 (Decision Notice reference DN P2014/0825) by Neath Port Talbot Council (NPTC) for the installation of 11 wind turbines with a maximum blade tip height of 145 m together with ancillary infrastructure at Foel Trawsnant. The full description of development was as follows:

“Installation of 11 wind turbines with a maximum tip height of 145 m, together with ancillary development including substation and control building, on site underground electrical cables, stone site access tracks, temporary construction compounds, turbine foundations and temporary crane pads”.
- 1.3.2 In 2022, the incumbent operator applied under Section 96a of The Town and Country Planning Act 1990 for a Non-Material Amendment (NMA) application (Planning Reference: P2022/0344). The NMA was to allow for a reduced number of turbines to be installed, with the operator planning to install only 8 of the proposed turbines. The NMA amended planning permission P2014/0825 to include the words ‘up to’, so that it reads:
- 1.3.3 “Installation of up to 11 wind turbines with a maximum tip height of 145 m, together with ancillary development including substation and control building, on site

underground electrical cables, stone site access tracks, temporary construction compounds, turbine foundations and temporary crane pads”.

- 1.3.4 Following the approval of the NMA in 2022, the operator subsequently applied under Section 73 of the TCPA to vary the conditions attached to the approved planning consent. This submission, under Planning Reference: P2022/0517, amended the approved drawings listed under Condition 3 of planning permission P2014/0825 to allow for the revised rotor diameters at 8 turbines and the removal of the remaining three (turbines T3, T4 and T7). This Section 73 application was approved on 4 April 2023 and forms the current approved development.

1.4 Planning Conditions 5, 10 and 11

- 1.4.1 The following planning conditions attached to the Decision Notice for Planning Permission P2022/0517 relate to the construction of the approved development:

- i) Condition 5 – Construction Environmental Management Plan;
- ii) Condition 10 – Construction Method Statement; and
- iii) Condition 11 – Surface Water Drainage Strategy.

- 1.4.2 This document has been prepared to discharge Conditions 5 and 10 and, together with the Flood Risk and Drainage Statement included at Appendix C, Condition 11.

Condition 5 - CEMP

- 1.4.3 Condition 5 stipulates:

“No development shall take place, including vegetation clearance, until such time as a Construction Environmental Management Plan (CEMP) has been submitted to and approved in writing by the Local Planning Authority. The CEMP shall provide full details of the works to be undertaken including the construction timetable, details of the means of avoidance and inter alia, mitigation of any impacts on species and habitats as set out in table 9.12 in the Environmental Statement, and the pollution prevention measures to be implemented during the site preparation and construction phases of the development. The CEMP shall be implemented as approved”.

- 1.4.4 Table 9.12 of the 2019 ES sets out the predicted construction and decommissioning impacts and associated effects on three identified non-statutory designated



ecological sites within 2 km of the Site. The below text is taken from the Environmental Statement, along with Table 9.12:

“9.8.3 There are three main effect pathways that potentially exist for the non-statutory designated sites:

- Indirect effects by air: off-site dust deposition from site-based activities;*
- Indirect effects by water: changes in water quality (increase in suspended solids/changes to pH) from site-derived run-off entering connected watercourses; and*
- Direct trampling / landtake / disturbance.*

9.8.4 Unmitigated airborne dust deposition from construction is generally limited to within several hundred metres of a development site, but suspended solids may travel further downstream within connected watercourses, though this is dependent upon many factors (e.g. time, volume of water, periodicity of ‘flash’ events). Therefore, of the nine sites within 2 km to Foel Trawsnant only three sites could potentially be affected by the proposed development because an effect pathway exists (Table 9.12), i.e. they are situated on or adjacent to the wind farm site. All other non-statutory sites are located a sufficient distance away that it is considered an effect pathway does not exist (the sites are located >250 m away and/or no surface water connections exist). The three sites relevant to the assessment are discussed below.

Table 1.1: Approved ES Table 9.12: Non-statutory Sites within 2 km where an Effect Pathway Potentially Exists

Site Name	Designation and Reason for Designation	Distance and Direction From Site (nearest point)	Type of Potential Effect and Effect Pathway	Rationale
Caerau West	Site of Importance for Nature Conservation (SINC) Marsh/marshy grassland, flush spring, acid/ neutral flush, sphagnum blanket bog, sphagnum wet modified bog, wet dwarf shrub heath, dry heath acid mosaic, dry dwarf shrub heath, semi-improved acid grassland, scattered bracken.	Partially within and adjacent to the eastern boundary of the site	• Trampling: Yes (direct) • Deposition by air: Yes (indirect) • Sedimentation /run- off: Yes (direct)	On site and in close proximity to the wind farm site

Site Name	Designation and Reason for Designation	Distance and Direction From Site (nearest point)	Type of Potential Effect and Effect Pathway	Rationale
Caerau North	SINC Marsh/ Marshy grassland, fen, dry modified bog, sphagnum blanket bog, semi-improved acid grassland, wet dwarf shrub heath, broad-leaved semi-natural woodland, acid dry dwarf shrub heath.	Immediately adjacent to the north eastern boundary of the site	- Trampling: Yes (direct) - Deposition by air: Yes (indirect) - Sedimentation /run- off: Yes (direct)	Adjacent to the wind farm site
Nant-y-Crynwydd	SINC Marsh/ marshy grassland, semi-improved neutral and acid grassland, sphagnum blanket bog, broad-leaved semi- natural woodland, dense continuous scrub.	~ 1.2 km to the south of the main site, but directly adjacent to the proposed access track	- Trampling: No - Deposition by air: No - Sedimentation /run- off: Yes (direct)	Adjacent to wind farm access track

Notes: ¹ except where indicated otherwise

9.8.5. The wind farm infrastructure site layout has been designed to avoid the sensitive wetland habitats associated with the Caerau West SINC, and will be micrositied during construction to avoid these if necessary. In addition, the pollution prevention measures outlined in Table 9.9 will ensure any potential effects associated with dust deposition or sediment-laden run-off will be avoided/minimised.”

- 1.4.5 A copy of Table 9.9 referenced in the ES is included in Appendix A of this report.
- 1.4.6 The ES concludes that the effect upon the above three SINC's will be negligible and not significant, subject to the implementation of the specified mitigation.
- 1.4.7 This report provides the information required to discharge Condition 5, as follows:
- iv) *Details of the works to be undertaken* – Sections 1.6 and 5.3 to 5.11;
 - v) *Construction timetable* – Section 5.2 and Appendix C;
 - vi) *Avoidance and mitigation of impacts on species and habitats identified in Table 9.12 of the Environmental Statement* – Section 7.8 and Appendix A; and
 - vii) *Pollution-prevention measures during site preparation and construction* – Sections 6 and 7.

Condition 10 - CMS

- 1.4.8 Condition 10 stipulates:

"No development shall commence until a Construction Method Statement has been submitted to and approved in writing by the Local Planning Authority. The construction of the development shall only be carried out in accordance with the approved Statement. The statement shall be implemented and maintained for the duration of the construction works and shall address the following matters:

- a) A full drainage scheme for the management of surface water. This shall detail both the temporary and permanent drainage strategy and include details of the hydraulic calculations to control flow rates and detail measures to be implemented.*
- b) Details of the timing of the works and methods of working for cable trenches and foundation works.*
- c) Disposal of surplus material.*
- d) The construction of the access into the site and the creation and maintenance of the visibility splays and to include temporary speed reduction measures in the vicinity of the site access.*
- e) Wheel cleaning facilities.*
- f) Arrangements for keeping the site entrance and adjacent public highway clean.*
- g) All activities associated with the construction of the development shall be carried out in accordance with British Standard 5228, 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites -Part 1 -Noise, Part 2 - Vibration.*
- h) A scheme for the protection and conservation of soil at the site in order to prevent pollution of the water environment. The scheme shall include the pollution prevention techniques to be deployed during the construction and restoration phase.*
- i) Details of the timing of works and methods of working for cable trenches and foundation works.*
- j) Details of the timing of works and construction of construction compound and substation*
- k) Dust management.*
- l) A construction noise management plan (including identification of access routes, locations of material lay-down areas, details of equipment to be employed, operations to be carried out, mitigation measures and a scheme for the monitoring of noise).*

- m) *Temporary site illumination.*
- n) *Post-construction restoration and reinstatement of the working areas including removal of construction equipment and the construction compound.*
- o) *Details of any proposed temporary site compounds for storage of materials, machinery and operative/visitor parking within the site, to include the siting of temporary buildings and all means of enclosure and oil/fuel and chemical storage.*
- p) *Details of the method of borrow pit working including means of extraction, handling, storage and re use of soil, drainage control and restoration.*
- q) *A scheme for recycling/disposing of waste resulting from construction works.*
- r) *Arrangements to prevent wildlife becoming trapped in excavation works.*
- s) *Programme of works*
- t) *Working site speed limit*
- u) *Hours of working on site.”*

1.4.9 This report covers the requirements of condition 10, as follows:

- i) *a) Temporary and permanent surface water drainage, hydraulic calculations and implementation measures – Section 6 and Appendix C;*
- ii) *b) and i) Timing and methods of working for cable trenches and foundation works – Sections 5.2, 5.7 and 5.9;*
- iii) *c) Disposal of surplus material – Section 3.5;*
- iv) *d) Construction of the site access, visibility splays and temporary speed-reduction measures – Sections 4.1, 5.3 and 5.6;*
- v) *e) and f) Wheel cleaning and arrangements for keeping the site entrance and adjacent public highway clean – Sections 3.3 and 7.5;*
- vi) *g) Compliance with BS 5228 – Section 7.2;*
- vii) *h) Protection and conservation of soil and prevention of pollution of the water environment – Sections 5.3, 5.11 and 7.5;*
- viii) *j) Timing and construction of the construction compounds and substation – Sections 5.2, 5.5 and 5.10;*
- ix) *k) Dust management – Section 7.3;*
- x) *l) Construction noise management – Section 7.2;*
- xi) *m) Temporary site illumination – Section 7.7;*

- xii) n) *Post-construction restoration and reinstatement* – Section 5.11;
- xiii) o) *Temporary compounds, parking, buildings, enclosure and storage of materials, machinery, fuels and chemicals* – Sections 3.2, 3.4 and 5.5;
- xiv) p) *Borrow-pit working* – Section 5.7;
- xv) q) *Recycling and disposal of construction waste* – Section 3.5;
- xvi) r) *Prevention of wildlife becoming trapped in excavations* – Section 3.8;
- xvii) s) *Programme of works* – Section 5.2 and Appendix C;
- xviii) t) *Working site speed limit* – Section 3.3; and
- xix) u) *Hours of working* – Section 3.3.

Condition 11 – Surface Water Drainage Strategy

1.4.10 Condition 11 stipulates:

“No development shall commence until a surface water drainage strategy has been implemented in accordance with details that shall first have been submitted to and approved in writing by the local planning authority. Before these details are submitted an assessment shall be carried out of the potential for disposing of surface water by means of a sustainable drainage system in accordance with the principles set out in Appendix 4 of TAN 15 (or any subsequent version), and the results of the assessment provided to the local planning authority. The drainage strategy shall include:

- a) information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the site and the measures taken to prevent pollution of the receiving groundwater and/or surface waters;*
- b) a timetable for its implementation; and*
- c) Provide a management and maintenance plan for the lifetime of the development.*
- d) Additional information identified within item 9 of the further Environmental Information dated June 2019.”*

1.4.11 Condition 11 is addressed through Section 6 of this CEMP and the Flood Risk and Drainage Statement prepared by Pell Frischmann, which is included at Appendix C. These parts of the document should be read together.



- 1.4.12 Section 6 summarises the proposed surface water drainage arrangements and sets out how the temporary and permanent drainage measures will be implemented, managed, inspected and maintained as part of the construction works. Appendix C provides the supporting assessment of flood risk and sustainable drainage options, together with the proposed drainage layouts, hydraulic calculations, discharge controls, attenuation requirements, water-quality measures and maintenance provisions.
- 1.4.13 The drainage measures will be installed in accordance with the construction programme and in advance of, or concurrently with, the relevant construction activities. Once installed, the drainage system will be inspected and maintained for the lifetime of the Approved Development in accordance with Section 6 and Appendix C.
- 1.4.14 The requirements of Condition 11 are addressed as follows:
- i) *Assessment of the potential for disposal through sustainable drainage systems* – Section 6.2 and Appendix C;
 - ii) *Design storm, discharge control, attenuation and pollution-prevention measures* – Sections 6.3 to 6.6 and 7.5 to 7.6, together with Appendix C;
 - iii) *Timetable for implementation* – Sections 5.2 and 6.6 and Image 5.1; and
 - iv) *Lifetime management and maintenance arrangements* – Section 6.6 and Appendix C.

1.5 Scope of Construction Works

- 1.5.1 The construction period for the wind farm will last for approximately 12 months possibly extending up to 15 months if poor weather conditions are experienced. The construction process will consist of the following principal activities:
- i) Formation of site compound including hardstanding and temporary site office facilities;
 - ii) Upgrading of existing tracks and construction of new access tracks and passing places inter-linking the turbine locations and substation, which will require import of suitable roadstone;
 - iii) Remedial works to the public highway to facility delivery of turbines;
 - iv) Construction of crane hardstanding areas to facilitate delivery and erection of turbines;

- v) Construction of turbine foundations and transformer bases where required by the selected turbine;
 - vi) Construction of site substation;
 - vii) Excavation of trenches and cable laying adjacent to site roads;
 - viii) Connection of on-site distribution and signal cables;
 - ix) Delivery and erection of wind turbines;
 - x) Commissioning of site equipment; and
 - xi) Site restoration following completion of construction works.
- 1.5.2 Many of these operations will be carried out concurrently, although predominantly in order identified above to minimise the length of construction programme. In addition, development will be phased such that at different parts of the site, the civil engineering works will be continuing whilst wind turbines are being erected. Site restoration will be programmed and carried out to allow restoration of disturbed areas as early as possible and in a progressive manner.
- 1.5.3 Construction phasing will also avoid ornithological constraints (i.e. during the breeding season).
- 1.5.4 The construction works described above will be undertaken in accordance with the construction programme included at Appendix C, the Flood Risk and Drainage Statement included at Appendix C and the environmental management and pollution-control measures contained within this CEMP. Where separate management plans or condition-discharge documents apply to particular aspects of the works, the construction activities will also be undertaken in accordance with those approved documents.
- 1.5.5 Public rights of way within and adjoining the Site will be managed in accordance with the separate Public Rights of Way Management Plan prepared pursuant to Condition 12 of Planning Permission P2022/0517 ('the PRowMP'). The PRowMP sets out the route-specific measures for the protection and management of public rights of way during construction, including safety signage, temporary access arrangements, inspections, recording and reinstatement.
- 1.5.6 This CEMP does not replace or amend the PRowMP. Construction activities affecting, crossing or taking place adjacent to a public right of way will be undertaken in accordance with the PRowMP as approved by the Local Planning Authority.

2.0 CONSTRUCTION MANAGEMENT

2.1 Site Personnel

- 2.1.1 In conjunction with Alerion, the Construction Contractor shall be responsible for the construction of the Approved Development. Table 2.1 below identifies the key personnel responsible for environmental matters, with relevant contact details.

Table 2.1: Project Contacts

Position	Name	Contact Details
Project Manager	Michael Rands (Alerion)	Mobile: [REDACTED] Email: [REDACTED]
Site Manager	Alejandro Pascual Marquez (Alerion)	Mobile: [REDACTED] Email: [REDACTED]
Health, Safety and Environment (HS&E) Manager	Martin Glover (Alerion)	Mobile: [REDACTED] 6 Email: [REDACTED]
Principal Designer	##	Mobile: 07#### ##### Email: ##
Principal Contractor	###	Mobile: 07### ##### Email: ##
Environmental Advisor	Steve Harding (Axis)	Mobile: [REDACTED] Email: [REDACTED]
Ecological Clerk of Works	Marcus Wainright-Hicks (Fenland Ecology)	Mobile: [REDACTED] Email: [REDACTED]
Archaeological Clerk of Works	Victoria Oleksy (AOC Archaeology)	Mobile: [REDACTED] Email: [REDACTED]

* Highlighted entries to be completed upon appointment of relevant disciplines

2.2 Key Roles and Responsibilities

Project Manager – Michael Rands

2.2.1 Responsibilities:

- Principal contractors and principal designers have been selected with due regard to Environmental considerations and that they are issued with this CEMP as well as other related environmental documentation.
- Making suitable arrangements for managing the project
- Ensuring Welfare is provided
- Making sure the principle designer and contractor comply with their CDM duties
- Ensure the construction phase plan is provided
- Ensure the health and safety file is prepared
- Monitor and maintain the health and safety file, and pass it onto any future owner.

Site Manager – Alejandro Pascual Marquez

2.2.2 Responsibilities:

- i) Ensure all necessary safety and environmental inspections have been carried out
- ii) Ensure all necessary safety inspections have been carried out
- iii) Ensure the project is completed in line with CDM and environmental policies
- iv) Communicate effectively with workers
- v) Ensure that all workers are aware of the safety and environmental hazards
- vi) Ensure that workers follow best practices and site rule
- vii) Reporting
- viii) Liaise and motivate site staff

Environment and Health and Safety Manager – Martin Glover

2.2.3 Responsibilities:

- i) Reviewing and assessing current environmental practices against current regulations and laws
- ii) Visiting sites as part of continuous monitoring
- iii) Advising on environmental risks for the project
- iv) Reporting non-compliance
- v) Leading on environmental accidents
- vi) Developing emergency response plans and conducting drills
- vii) Conducting regular risk assessments and inspections
- viii) Training employees on safety procedures and environmental practices
- ix) Advising on energy efficiency and cost-effectiveness
- x) Investigating accidents and incidents and taking corrective actions

Environmental Advisor – Steve Harding

2.2.4 Responsibilities:

- i) Advising the Developer and Principal Contractor on implementation of this CEMP and compliance with relevant environmental requirements;
- ii) Reviewing construction activities against planning conditions, Environmental Statement commitments and approved management plans;



- iii) Providing advice on pollution prevention, waste management, drainage, noise, dust and other environmental controls;
- iv) Supporting the preparation and review of environmental risk assessments, method statements and toolbox talks;
- v) Reviewing environmental inspection, monitoring and incident records;
- vi) Advising on corrective and preventative measures where non-compliance or environmental risks are identified;
- vii) Liaising with the Ecological Clerk of Works, Archaeological Clerk of Works and other environmental specialists, as appropriate;
- viii) Supporting liaison with the Local Planning Authority, Natural Resources Wales and other relevant bodies where required; and
- ix) Assisting with the investigation and reporting of environmental incidents and complaints.

Principal Designer – [TBC]

2.2.5 Responsibilities:

- i) Plan, manage and monitor the pre-construction phase
- ii) Coordinate health and safety during the pre-construction phase
- iii) Identify and eliminate or control risks to anyone constructing, maintaining or using the designed structure
- iv) Ensure all designers comply with their duties
- v) Coordinate cooperation between the team with the client, the principal designer and each other
- vi) Provide pre-construction information, including this CEMP to designers and contractors
- vii) Liaise with the principal contractor and share information
- viii) Prepare the health and safety file

Principal Contractor – [TBC]

2.2.6 Responsibilities:

- i) Plan, manage and monitor the construction phase.
- ii) Coordinate health and safety during the construction phase.
- iii) Ensure contractors comply with legal requirements for health and safety.

- iv) Ensure all contractors adhere to this control measure contained within this CEMP.
- v) Organise cooperation between contractors.
- vi) Enforce compliance with the construction phase plan.
- vii) Provide a suitable site induction.
- viii) Prevent unauthorised access.
- ix) Ensure welfare facilities are provided.
- x) Liaise with the principal designer and share information.

Ecological Clerk of Works – Marcus Wainwright-Hicks

2.2.7 Responsibilities:

- i) Monitor compliance with planning conditions, ES/EIAR commitments and the approved CMS/CEMP
- ii) Provide on-site environmental advice to the Developer and Principal Contractor
- iii) Undertake pre-works ecological checks and supervise works in sensitive areas
- iv) Monitor pollution prevention measures, drainage controls and watercourse protections
- v) Oversee soil and peat handling, storage and reinstatement
- vi) Inspect excavations and construction activities to protect wildlife
- vii) Audit compounds, fuel storage and high-risk construction activities
- viii) Maintain inspection records, report incidents and recommend corrective actions
- ix) Attend site during critical construction phases and liaise with regulators as required
- x) Exercise stop-work authority where significant environmental risk or non-compliance is identified.

Archaeological Clerk of Works – Vicky Oleksy

2.2.8 Responsibilities:

- i) Monitor compliance with archaeological planning conditions and Written Scheme of Investigation (WSI)
- ii) Provide on-site archaeological oversight during ground-breaking works
- iii) Undertake watching briefs during topsoil stripping, track formation, foundations and cable trenching



- iv) Inspect borrow pit excavation and substation construction where required
- v) Identify, record and assess archaeological features or finds encountered
- vi) Advise the Developer and Contractor on appropriate mitigation measures
- vii) Exercise stop-work authority where significant archaeological remains are discovered
- viii) Liaise with the Local Authority Archaeologist and statutory consultees
- ix) Maintain site records, photographic logs and context sheets
- x) Prepare interim and final reports to discharge archaeological conditions

2.3 Training, Awareness and Competency

- 2.3.1 All persons prior to commencing operations on site shall receive a full safety, health and environmental induction from the Site Manager or a designated deputy.
- 2.3.2 Construction site inductions will cover a range of health, safety and environmental topics. Critical to the inductee's retention is the requirement that the first slide of the induction will cover the main hazards or risks. Inductees will be briefed on the sensitivity of the local environment, including local groundwater and hydrology, habitats and residential receptors, and the subsequent mitigation measures to be deployed on site:
 - i) Store waste within skips.
 - ii) Use of visqueen or hard standing areas for the storage of skips and drip trays when using liquids (chemicals, greases, hydrocarbons).
 - iii) Use of double skin bowsters.
 - iv) Location(s) of spill kits.
 - v) Reporting of spilling or loss of containment to the site manager.
- 2.3.3 Visitors to site, after signing in, will receive a visitor's induction unless always accompanied by a previously inducted person who will take responsibility whilst on site.
- 2.3.4 The locations of public footpaths and bridleways within and adjoining the Site, the approved arrangements for their protection and management, and the need to comply with all fencing, signage, crossing and access requirements contained within the PRowMP.



Toolbox Talks

- 2.3.5 To retain information and maintain standards, toolbox talks will be communicated during morning briefings. It is envisaged that bespoke toolbox talks will be required at appropriate stages of construction relating to:
- i) Residential receptors – the sensitivity of these receptors to noise, odour and visual intrusion.
 - ii) Hydrology – the importance of groundwater protection and the implications of surface water runoff.
 - iii) Biodiversity – highlighting the local biodiversity features that could be susceptible to construction activity.
 - iv) Incident Response – the procedures to be followed should any site incidents take place.
 - v) Public Rights of Way – the protection of public users, arrangements for works adjacent to or crossing public routes, management of construction traffic and plant, and the procedures contained within the approved PRowMP.

Site Rules

- 2.3.6 Site rules will be communicated to all site personnel and visitors at induction and posted on the site notice board. The following rules apply to all persons entering the site:
- i) No unauthorised persons are allowed on site.
 - ii) All operatives entering the site for the first time must report to the site office for a visitors or full site HS&E induction.
 - iii) All operatives must sign in and out of site each time they enter/exit site.
 - iv) All visitors are to report to the site office and shall sign the visitor's book.
 - v) No unauthorised vehicles shall be allowed on site. Parking in designated areas only. Site plant and transport routes to be specified.
 - vi) All accidents and unsafe situation or occurrences must be reported to the site manager immediately.
 - vii) No plant, materials or material waste shall be removed from the site without the authorisation of the site manager and by authorised waste contractors.
 - viii) Permits for hot works, breaking ground or excavations are required prior to the start of works.

- ix) Plant and equipment must be operated by authorised and trained persons only.
- x) No temporary or permanent part of the works shall be damaged or defaced.
- xi) Relevant test certificates or certificates of thorough examination for plant and equipment shall be submitted to the site manager before use.
- xii) All instructions and directions of the site manager must be complied with.
- xiii) Risk assessment and method statement to be strictly complied with.
- xiv) No smoking on site, except in designated areas.

2.3.7 Disciplinary procedure for safety or environmental related breaches on this site consists of verbal and written warnings. Serious breach will be treated as gross misconduct and liable to instant removal from site.

2.4 Site Management, Inspection and Monitoring

2.4.1 All personnel are responsible for the safe operation of the construction site. This will be achieved through the active monitoring of site works, such as:

- i) Effective site management;
- ii) Boundary and watercourse inspection;
- iii) Health, Safety and Environment (HS&E) Inspection;
- iv) Environmental Duty Holders Site Inspection;
- v) Senior Manager Tours; and
- vi) Internal audits.

Responding to Incidents

2.4.2 All personnel will be trained to respond to any incidents or complaints through reactive monitoring, following the correct procedures, i.e. how to respond to an incident / spill or complaint, such as:

- i) Incident reporting;
- ii) Complaint recording and investigation;
- iii) Dust;
- iv) Noise and vibration monitoring; and
- v) Water sampling where necessary.

2.4.3 A site incident response plan will follow these logical steps:



- i) Assess the spill to establish what has been spilt and what measures (such as PPE) are required to deal with the contents.
- ii) Stop the spill at the source, if safe to do so e.g. lifting container up or blocking the leak, turning equipment off.
- iii) Contain the spill using spill kits e.g. booms, spill mat, granules.
- iv) Protect watercourses, land using spill kits to prevent the spill percolating into the ground.
- v) Clean Up and dispose of waste granules, spill mats into the designated hazardous waste containers.
- vi) Record the spill location and quantity and report to the site manager.

2.5 Community Liaison and Communications

- 2.5.1 In line with the Considerate Contractor scheme, a construction site community information board will be mounted on the site hoarding or perimeter fence to keep local residents and businesses informed and engaged. Key site personnel contact information shall be included on the board, along with details of the site's complaints procedure.
- 2.5.2 Information concerning any temporary management of public rights of way, including relevant route signage and public information, will be provided in accordance with the approved PRowMP.
- 2.5.3 The board shall also include key dates for the construction programme to keep members of the public informed on expected more disruptive site activities and any changes to construction completion dates.

2.6 Complaints Procedure

- 2.6.1 It is important that members of the public or interested parties are able to make valid complaints about construction works and operational activity. Such complaints can provide a valuable feedback mechanism which could help reduce potential impacts on sensitive features and also allow the construction and maintenance techniques to be refined and improved.
- 2.6.2 Contact details shall be placed at the entrance to the construction site to allow complainants to contact the site management team. Nearby residential receptors will



- be letter dropped with these details. This CEMP will be held by NPTC Environmental Health Officers, and will be updated should any contact details require amending.
- 2.6.3 Any complaints made by members of the public regarding construction activities will be reported in the first instance to the site management team. Complaints shall be reviewed and documented appropriately within a logbook and acted upon within 24 hours of receiving a valid complaint.
- 2.6.4 The Site Manager shall instruct corrective / mitigation actions if required (name and contact details in Table 2.1 above and will be available on the site notice board).

3.0 SITE OPERATIONS

3.1 Introduction

3.1.1 This section sets out how the site will operate in terms of access; layout; parking; hours of construction activity; and general daily environmental management operations, including: waste management, site cleanliness, fire, security and energy usage.

3.2 Construction Compound Arrangements

Compound Locations

3.2.1 Two temporary site construction compounds, approximate dimension 7,495m² and 5,055m² will be located within the site as shown in Image 3.1 below.

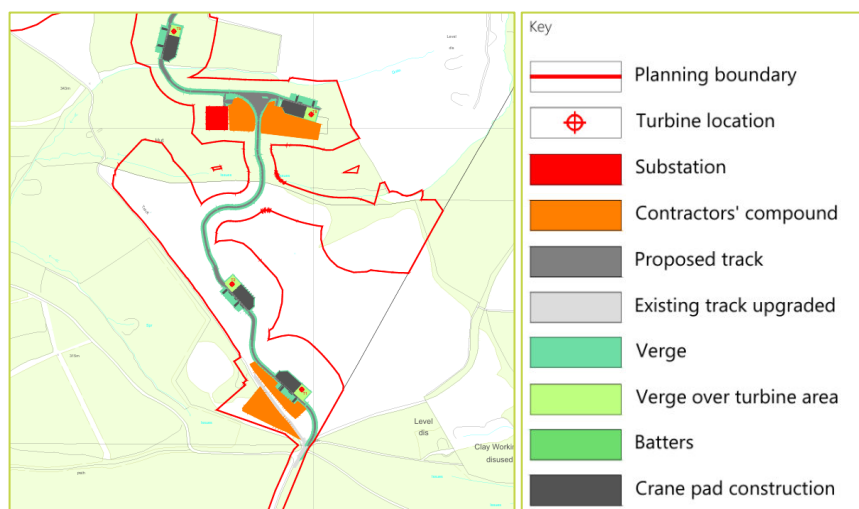


Image 3.1: Location of construction compounds

3.2.2 The exact location and layout of the two construction compounds will only be finalised once the Principal Contractor has been appointed and has undertaken preliminary due diligence of the site.

3.2.3 Construction welfare facilities shall be provided by the Principal Contractor and shall not be used until they have been approved by the Developer as being suitable and in line with Schedule 2 of CDM 2015.

3.2.4 Other temporary fenced compound areas will be established on turbine craneage areas as appropriate for security of plant in remote parts of the site. These will not require any additional hardstanding to that proposed for the craneage areas.

Compound Layout

- 3.2.5 The internal layout of each construction compound will be confirmed by the Principal Contractor before the compound is established. The layout will remain within the compound areas shown on the construction drawings and will provide for temporary offices and welfare facilities, operative and visitor parking, plant and machinery storage, material laydown, waste storage, and secure storage of fuels, oils and chemicals.
- 3.2.6 In finalising the compound layouts, the Principal Contractor will take account of site levels, access and vehicle manoeuvring requirements, existing drainage patterns and the proximity of watercourses, wetland habitats, ecological features, public rights of way and noise-sensitive receptors. Temporary buildings, lighting, plant and material storage areas will be positioned, as far as reasonably practicable, to minimise noise, visual disturbance, light spill and the risk of pollution. Clean and potentially contaminating activities will be separated, and fuels, oils and chemicals will be stored within designated secure and appropriately bunded areas in accordance with Section 3.4.
- 3.2.7 Construction compounds, parking, material-storage areas and associated access arrangements will be positioned and managed so that they do not obstruct or adversely affect public rights of way, except where temporary arrangements are specifically identified within the approved PRowMP.
- 3.2.8 Surface water from the compounds will be managed in accordance with the drainage measures set out in Section 6 and the Flood Risk and Drainage Statement at Appendix C. Pollution-prevention measures will be installed before the relevant compound areas are brought into use, and access to drainage infrastructure, spill-response equipment and waste-storage areas will be maintained throughout the construction period.
- 3.2.9 Welfare facilities will be self-contained and located within the construction compounds. Foul water and sewage will be retained within sealed storage tanks or other suitable contained systems and removed from the Site by an appropriately licensed contractor. No foul water or untreated welfare effluent will be discharged to the ground, surface water drainage system or nearby watercourses.

- 3.2.10 Each construction compound will be enclosed by suitable temporary security fencing and provided with controlled access arrangements, with the fencing type and height selected by the Principal Contractor having regard to site security, landscape and ecological considerations.

3.3 Construction Site Operations

- 3.3.1 The Principal Contractor will prepare a Construction Phase Plan, to include all site pedestrian and vehicle arrangements, inclusive of speed limits, site roads to be used for construction traffic, any speed control measures, any areas where construction traffic is not to go, any permit requirements for vehicular / pedestrian access, pedestrian routes, etc. The Construction Phase Plan will be cognisant of the requirements set out in this CEMP, with particular emphasis of the remainder of the Section 3.

Site Rules

- 3.3.2 The Principal Contractor will be required to establish site rules as part of the developed Construction Phase Plan. As a minimum, these will include:
- i) All visitors to report to site office and sign in/out and follow the site security requirements.
 - ii) Any vehicles manoeuvring around the site must be fully supervised by a banksman, where applicable.
 - iii) Public and staff areas must be kept in a condition that is suitable and safe to use.
 - iv) Adequate safety signs and notices will be displayed indicating the construction area where requested by the Client and suitable measures must be provided to prevent unauthorised access to the construction site.
 - v) All delivery vehicles will use the designated routes and comply with any site restrictions.
 - vi) Work will cease if material suspected as being asbestos or hazardous in nature is discovered.
 - vii) Provision of appropriate firefighting equipment and establish a safety zone during hot works.
 - viii) PPE is to be worn where site rules specify this.
 - ix) Drugs and alcohol policy to be in place by the Principal Contractor.
 - x) No smoking on site unless in a designated area.

- xi) All personnel shall be properly and correctly trained for the work on which they are employed.
- xii) All dust, noise and pollution shall be kept to a minimum and all measures are to be taken to prevent any nuisance to residents or adjoining owners arising from the carrying out of the works.
- xiii) Parking for vehicles must be within the contractor's compound and not obstructing the works entrance or adjacent public roads.
- xiv) No fires on site; the Principal Contractor must comply with the Joint Code of Practice Fire Prevention on Construction Sites, 5th Edition.
- xv) All site operatives and personnel, including visitors, shall be aware of the evacuation procedures in case of an emergency.
- xvi) Principal Contractors own Site Safety Rules will also apply.
- xvii) Public rights of way will not be obstructed by parked vehicles, plant, stored materials, waste, fencing or other construction activities except where expressly provided for within the approved PRowMP.
- xviii) Construction vehicles and plant crossing or using a public right of way will do so only in accordance with the approved PRowMP and any associated traffic-management, signage and banksman requirements.
- xix) Fencing, gates and public rights of way signage will be maintained in a safe and effective condition throughout the construction period. Any damage, displacement or obstruction will be reported to the Site Manager and remedied promptly.

Site Working Hours

3.3.3 Construction would be limited to:

- i) 07:00 to 19:00 Monday to Friday;
- ii) 08:00 to 13:00 Saturday; and
- iii) No work on Sundays or Public Holidays.

3.3.4 There shall be no construction traffic movements during the following periods:

- i) No construction traffic movements outside the hours of 07:00 to 19:00 Mondays to Fridays;
- ii) No construction traffic movements outside the hours of 08:00 to 13:00 on Saturdays; and

- iii) No construction traffic movements on Sundays and Public Holidays.

Site Speed Limit

3.3.5 Speed limits will form part of the overall site traffic management strategy and will be enforced throughout the construction period. The key objectives of the site speed limit strategy are to:

- i) Maintain a safe working environment for all site personnel, contractors and visitors;
- ii) Reduce the likelihood of vehicle-related accidents and near misses;
- iii) Minimise dust generation from unbound track surfaces;
- iv) Limit noise associated with vehicle movements;
- v) Protect the integrity of the access tracks and site infrastructure;
- vi) Ensure compliance with relevant health, safety and environmental requirements.

Speed Limit Controls

3.3.6 Appropriate speed limits will be established across the site, taking into account the nature of the works, road conditions, visibility, and interaction between vehicles and pedestrians.

3.3.7 Typical speed limits will include:

- i) 15 mph (16 km/h) on internal access tracks and within active construction areas;
- ii) 5 mph (8 km/h) within compounds, laydown areas, and near welfare facilities;
- iii) Lower speed limits where required in areas of constrained visibility, tight turning radii, or where sensitive receptors (e.g. ecological features) are present.

3.3.8 Speed limits will be clearly communicated and enforced at all times.

Signage and Physical Measures

3.3.9 Speed limits will be supported through the provision of appropriate signage and physical controls, including:

- i) Installation of speed limit signs at the site entrance and at regular intervals along access tracks;

- ii) Use of warning signage at key locations, such as bends, junctions, and pedestrian crossing points;
 - iii) Provision of physical measures, where necessary, such as temporary speed ramps or rumble strips;
 - iv) Clear demarcation of pedestrian routes and crossing points.
- 3.3.10 Signage will be maintained in good condition and adjusted as necessary to reflect changes in site layout or construction activities.

Driver Management and Induction

- 3.3.11 All drivers accessing the site will be subject to site rules and procedures, including compliance with speed limits. Measures will include:
- i) Site induction for all personnel, including briefing on speed limits and traffic management arrangements;
 - ii) Display of site rules within welfare facilities and at access points;
 - iii) Requirement for all drivers to hold appropriate licences and certifications;
 - iv) Implementation of a code of conduct for drivers, including safe driving practices.

Monitoring and Enforcement

- 3.3.12 Compliance with site speed limits will be actively monitored and enforced throughout the construction period. This will include:
- i) Regular supervision by site management and banksmen;
 - ii) Spot checks of vehicle speeds where appropriate;
 - iii) Investigation and recording of any breaches or near misses;
 - iv) Implementation of corrective actions, which may include warnings, retraining, or removal from site for repeated non-compliance.

- 3.3.13 A culture of safety will be promoted across all site activities.

Environmental Considerations

- 3.3.14 The control of vehicle speeds will contribute to reducing environmental effects associated with construction traffic, including:
- i) Dust suppression, by limiting vehicle speeds on unbound surfaces;



- ii) Noise reduction, particularly in proximity to site boundaries and sensitive receptors;
- iii) Protection of soils and track surfaces, reducing rutting and erosion.
- iv) These measures complement other environmental controls set out within this CEMP.

Review and Adaptation

3.3.15 Speed limits and associated traffic management measures will be subject to ongoing review to ensure their effectiveness. Adjustments will be made where necessary to reflect:

- i) Changes in construction activities or site layout;
- ii) Seasonal conditions (e.g. wet or icy conditions);
- iii) Feedback from site personnel or monitoring results.

Compliance

3.3.16 All site personnel and contractors will be required to comply with the site speed limits and associated traffic management measures. These requirements will be enforced through contractual obligations and site management procedures.

3.3.17 Failure to comply with site rules may result in disciplinary action, including removal from site.

Wheel Wash Facilities

3.3.18 Wheel washing facilities onsite would be utilised to minimise the transfer of soil onto the local road network. Therefore, they would be sited close to the main exit from the Site.

3.3.19 The anticipated wheel washing facilities would consist of either a drive-over ramp system or jet spray, depending on the site ground conditions (i.e. if mud is wet it can usually be jet sprayed off, but if it 'clings' to wheels, a ramp system may be required). Hence, the chosen method used would be dependent on the site conditions and the most efficient method would be used.

3.3.20 The washing of any plant or machinery must take place at least 10 m away from any surface water and the washings will not be allowed to enter any surface waters.



- 3.3.21 The road condition will be monitored on ongoing basis by the Principal Contractor. Street cleaning vehicles will be deployed to ensure the adjacent public highway remains clean of construction debris.

3.4 Storage of Materials and Machinery

- 3.4.1 Plant and materials utilised will be stored securely on-site. The plant and materials will be stored on an area of hardstanding or gravel, which will be the responsibility of any appointed construction contractor.
- 3.4.2 The Control of Pollution (Oil Storage) (England) Regulations 2001, the Water Environment (Controlled Activities) (Scotland) Regulations 2005, the Water Environment (Oil Storage) (Scotland) Regulations 2006 and the Control of Pollution (Oil Storage) Regulations (northern Ireland) 2010 impose requirements aimed at preventing leakage and pollution. Although these regulations do not yet apply in Wales, meeting these requirements will help prevent water pollution.
- 3.4.3 Bunding will be utilised to manage the use of diesel or chemicals with drips trays utilised when in use. The site will identify areas for waste management, storage of hydrocarbons, raw materials and surface gravel with signage and a dedicated site layout on appointment of the main contractor. The objective of the site layout is to avoid cross contamination of materials and provide an efficient use of space.
- 3.4.4 Plant and materials will be stored in a part of the Site which is not proximal to any environmental or policy protected sites, within Flood Zone 1 and at least 10 m away from any surface water and in a location which is visually screened from sensitive receptors as far as practicable.
- 3.4.5 Cement will be poured into an excavated foundation by cement mixer therefore not requiring any storage on site. There will be no concrete washout at the site, this will be undertaken off-site.

3.5 Waste Management / Disposal of Surplus Material

- 3.5.1 Site waste management will be under the scope of the Principal Contractor following UK guidance and will need to consider the below changes for compliance with Welsh requirements will follow the hierarchy shown on **Image 3.2** below.



Image 3.2: Waste Management Hierarchy



- 3.5.2 All waste produced at the site will be managed in accordance with the company's waste handling procedures. Where appropriate, waste will be segregated in suitable and clearly identified containers / skips. Where possible, a waste collection area shall be established with due consideration given to access / egress of collection vehicles, possible contamination of adjacent watercourses etc.
- 3.5.3 All waste with the potential to leach (e.g. general, waste oil, waste water) shall be held on a nonpermeable base, and at least 10 m away from surface drains. All chemical storage will follow the 10 m rule from field drainage.
- 3.5.4 Suitable excavated soils and other materials will, wherever practicable, be retained and reused within the Site for backfilling, profiling, verge construction and reinstatement. Topsoil and subsoil will be stored separately and will not be mixed with construction waste or contaminated material. Material that cannot be suitably reused will be characterised and removed from the Site by a registered waste carrier to an appropriately authorised facility.

Waste Movement and Monitoring

- 3.5.5 Transfer notes will be stored on site along with any permits. Records of Waste Carriers Registration Certificate, Waste Disposal Site licenses and limitations on type and quantities of waste shall be available from the Developer on request.

Waste Carriers

- 3.5.6 All waste will be transported using registered waste carriers and will be disposed of at licensed waste disposal sites or in accordance with a valid Environmental Permit (formally Waste Exemption). All Waste Carrier Licences and all Waste Management Licences / Permits are valid and appropriate, shall be available within the site environmental file.

Waste Disposal Sites

- 3.5.7 Only Waste Disposal Sites and Waste Transfer Stations that hold a valid Waste Management Licence or Permit (formerly Exemption) will be used.

3.6 Fire Control

- 3.6.1 The project will ensure that operations are carried out in compliance with the “Joint Code of Practice on Fire Prevention on Construction Sites”. A full fire management will be produced in conjunction with the nominated Responsible Person and relevant parties as appropriate. This document will identify duty holders, defines responsibilities, and establishes procedures on fire prevention. There are basic rules that apply to all of our construction sites which aid in the prevention and control of fires.

- 3.6.2 A Site Fire Safety Coordinator will be appointed to ensure adherence to the Site Fire Safety Plan. In addition, they will coordinate the issues below:

- i) General Housekeeping;
- ii) Fire extinguishers fire detection and alarms;
- iii) Hot Work Permit regime;
- iv) Fire escapes and communications (evacuation plans and procedures for calling the fire brigade);
- v) Fire brigade access, facilities and coordination;
- vi) Fire drills and training;
- vii) Effective security measures to minimise the risk of arson; and
- viii) Materials storage and waste control regime.

- 3.6.3 An initial fire risk assessment of each area will be undertaken and updated as the risks change. In addition, weekly inspections of all areas will be carried out and the



findings recorded on a weekly inspection report. All areas will be kept clean and tidy and stored materials will be properly coordinated and controlled.

3.7 Site Security

- 3.7.1 The site is located in private land several hundred meters away from public access. Present site security is via a locked gated access (pedestrian bypass access available), controlled by Natural Resource Wales Forestry. This will remain in situ for the duration of the construction period and project lifecycle.
- 3.7.2 Two temporary site/security offices will be constructed, one near to the site entrance from the B4282 and the second at the entrance to the turbine platform area (within the smaller of the two temporary construction compounds).
- 3.7.3 The Developer will require for all site security arrangements to be detailed within the Principal Contractors Construction Phase Plan.

3.8 Wildlife Awareness

- 3.8.1 All excavations would have sloped sides or have a means of escape for entrapped animals. Excavations to be checked each morning by operatives prior to continued work within the excavation. Should any wildlife be observed within an open excavation, the Site Manager shall be informed and the ECoW contacted for advice.
- 3.8.2 As part of the site induction process, and any Tool Box Talks provided by the ECoW, site operatives will be reminded of the implications of the Wildlife and Countryside Act 1981 with regard to construction activity.



4.0 CONSTRUCTION ACCESS ROUTES

4.1 Site Access Route

- 4.1.1 The principal point of access to the Site will be from the B4282, which links Maesteg and the village of Bryn, to the north of Maesteg Golf Club. Construction traffic, including site personnel, concrete deliveries, aggregate deliveries and wind turbine components, will enter the Site through the approved access point.
- 4.1.2 The site access will be constructed and managed to accommodate the anticipated type and volume of construction traffic. The location and general arrangement of the access are shown on the relevant construction figures included at Appendix B.

4.2 Relationship with Other Access and Movement Documents

- 4.2.1 Construction traffic movements will be undertaken in accordance with the approved Construction Traffic Management Plan. The methodology for constructing the site entrance and internal access tracks is set out in Section 5.6. Wheel-cleaning and highway-cleanliness measures are set out in Section 3.3, with associated dust, silt and mud controls provided in Section 7.
- 4.2.2 Public rights of way within and adjoining the Site will be managed in accordance with the separate PRowMP prepared pursuant to Condition 12. Where construction access routes, internal tracks or working areas intersect with or run alongside a public right of way, the route-specific fencing, signage, crossing controls, access restrictions and public information measures contained within the approved PRowMP will be implemented before the relevant works commence.
- 4.2.3 Nothing in this CEMP alters the separate requirements relating to public rights of way and turbine separation or diversion under Conditions 13 and 29 of Planning Permission P2022/0517.



5.0 CONSTRUCTION PROGRAMME AND METHODS

5.1 Introduction

- 5.1.1 This section sets out the anticipated construction programme and the principal methods that will be used to construct the Approved Development. It distinguishes between the preliminary access works required to establish the development and the subsequent main construction works.

5.2 Construction Programme

Overview

- 5.2.1 The construction of the Proposed Development, with the exception of the Preliminary Works identified to be undertaken over a two-month period in 2026, will be undertaken over an approximate 18-month period, with an additional period for commissioning and final reinstatement.
- 5.2.2 The construction programme has been developed to:
- i) avoid or minimise works during sensitive ecological periods where practicable;
 - ii) allow for pre-commencement ecological checks;
 - iii) integrate mitigation measures secured through this CEMP; and
 - iv) ensure that construction traffic and activities are appropriately managed.
- 5.2.3 The timing and sequencing of works will be subject to ongoing review to ensure compliance with environmental commitments and planning conditions.
- 5.2.4 The anticipated programme for project delivery, including construction, is summarised below and illustrated in Image 5.1.



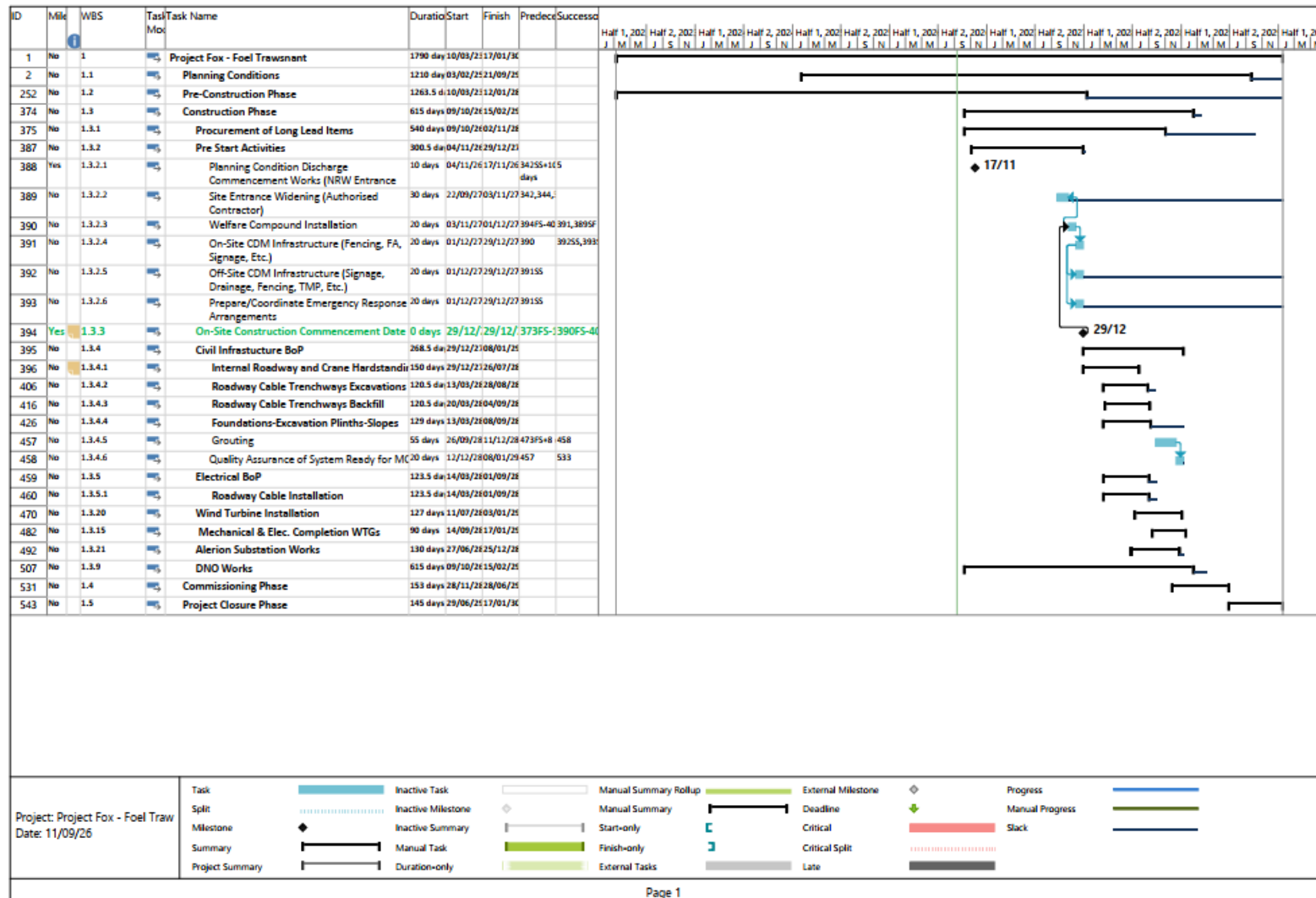


Image 5.1: Indicative construction programme

Pre-Construction Phase

5.2.5 Prior to the commencement of construction, a period of enabling and pre-construction activities will be undertaken between January 2026 and October 2026, including:

- i) Discharge of pre-construction planning conditions.
- ii) Completion of detailed design and site-specific surveys.
- iii) Procurement of long-lead items, including turbines and electrical infrastructure.

5.2.6 These activities will ensure that all necessary approvals and safeguards are in place prior to the commencement of physical works.

Preliminary Works

5.2.7 The Preliminary Works will commence between November and December 2026.

5.2.8 The Preliminary Works will constitute the first phase of permanent construction of the Approved Development and will comprise:

- i) construction of a section of the approved site access track from the B4282;
- ii) upgrading of sections of the existing forestry tracks;
- iii) construction of selected passing places, verges, batters, localised widening and earthworks;
- iv) installation of the temporary and permanent drainage measures required in relation to the preliminary works;
- v) establishment of the temporary working, storage and welfare areas required to undertake the works; and
- vi) stabilisation and progressive reinstatement of land adjoining the completed sections of access track.

5.2.9 These works will facilitate safe and efficient access to the Site for construction traffic.

5.2.10 Construction of the permanent internal access-track network will commence during the Preliminary Works and will progress through the main wind farm site in accordance with the detailed construction programme. The precise sections and lengths completed by spring 2027 will be determined by the progress of construction, ground and weather conditions and the management of environmental constraints.



Construction Phase

- 5.2.11 The main construction phase is anticipated to take place between July 2027 and February 2029, with on-site construction commencing in September 2027.
- 5.2.12 The construction works will be undertaken in the following sequence:
- i) Site mobilisation and establishment, including temporary compounds, welfare facilities, and security measures.
 - ii) Construction of access tracks and crane hardstandings.
 - iii) Excavation and construction of turbine foundations.
 - iv) Installation of underground electrical cabling across the Site.
 - v) Construction of the on-site substation and associated infrastructure.
 - vi) Delivery and erection of wind turbines, including tower sections, nacelles, and blades.
- 5.2.13 Construction activities will be phased to allow parallel working where practicable, reducing the overall programme duration.

Commissioning and Grid Connection

- 5.2.14 Following completion of construction, a period of commissioning will be undertaken between January 2029 and June 2029, including:
- i) Electrical testing of installed infrastructure.
 - ii) Turbine commissioning and performance testing.
 - iii) Grid connection and DNO energisation (anticipated March 2029).
- 5.2.15 The Proposed Development is expected to achieve operational control in Spring 2029.

Site Reinstatement and Completion

- 5.2.16 Post-construction reinstatement and demobilisation will be undertaken between March 2029 and September 2029, including:
- i) Removal of temporary compounds and construction infrastructure
 - ii) Reinstatement of disturbed areas
 - iii) Implementation of landscape and ecological mitigation measures



5.3 Construction Methods – Preliminary Access Works

- 5.3.1 The Preliminary Works will comprise the commencement of permanent construction of the Approved Development, including construction of a section of the approved site access track and construction of permanent internal access tracks.

General Approach

- 5.3.2 Construction of the site access and permanent internal access tracks will be undertaken progressively in accordance with the detailed construction programme..

- 5.3.3 The works will comprise, as applicable to each section:

- i) establishment and demarcation of the approved working corridor;
- ii) vegetation clearance and soil stripping;
- iii) excavation, cut-and-fill operations and preparation of the track formation;
- iv) installation of geotextile or geogrid reinforcement where required;
- v) placement and compaction of stone to form the permanent track;
- vi) construction of passing places, verges, batters and localised widening;
- vii) installation of temporary and permanent drainage infrastructure; and
- viii) stabilisation and progressive reinstatement of disturbed areas adjoining the tracks.

- 5.3.4 All elements of the Preliminary Works will be undertaken in accordance with the approved layout, the construction details included at Appendix B and the emerging detailed design, the drainage strategy in Section 6 and Appendix C, and the environmental-management measures contained within this CEMP.

Pre-Construction Activities

- 5.3.5 Prior to the commencement of construction works, the following activities will be undertaken:

- i) Completion of detailed site surveys, including topographical and utilities surveys, to confirm design levels and identify constraints;
- ii) Confirmation and setting out of the approved site access, permanent internal access-track alignments, associated working corridors, passing places and visibility splays;



- iii) Ecological pre-construction checks, with supervision by an Ecological Clerk of Works (ECoW) where required;
 - iv) Archaeological checks or supervision in accordance with the relevant approved archaeological documentation;
 - v) Identification and demarcation of watercourses, drainage features, wetland habitats and other environmental constraints;
 - vi) Installation of temporary runoff, sediment and pollution-control measures;
 - vii) Implementation of the relevant public rights of way measures contained within the approved PRowMP.
 - viii) Installation of temporary traffic management measures on the B4282, which will be agreed with the highway authority;
 - ix) Establishment of a temporary site compound, including welfare facilities, plant storage, and materials laydown areas.
- 5.3.6 These activities will ensure that construction proceeds efficiently and in accordance with environmental and safety requirements.
- 5.3.7 Where preliminary access works affect or are located adjacent to a public right of way, the relevant temporary fencing, safety signage, public information and route-management measures specified in the approved PRowMP will be installed before construction begins. A record of the condition of the affected route will be made in accordance with the PRowMP.

Vegetation Clearance and Topsoil Management

- 5.3.8 Vegetation clearance will be undertaken within the defined working corridor for the access road and associated visibility splays. Clearance will be carried out using appropriate mechanical plant, with any sensitive features identified and protected in advance.
- 5.3.9 Topsoil will be stripped from the access route to a typical depth of between 150 mm and 300 mm, or to the depth of suitable subsoil, and will be stored in temporary bunds adjacent to the working area. Soil storage mounds will be kept to a maximum height of approximately 2 m to maintain soil structure and viability.
- 5.3.10 Appropriate measures will be implemented to prevent erosion and sediment runoff, including the installation of silt fences, straw bales, or other temporary drainage controls as required.

Earthworks and Formation

- 5.3.11 Following topsoil stripping, earthworks will be undertaken to form the access road alignment. This will include:
- i) Excavation to formation level along the route of the access track;
 - ii) Cut and fill operations to achieve the required gradients and cross-fall;
 - iii) Formation of side slopes (batters) and verges;
 - iv) Compaction of the subgrade using suitable compaction plant; and
 - v) Installation of geotextile or geogrid reinforcement where required by the ground condition
- 5.3.12 Where ground conditions are weak or variable, geotextile or geogrid reinforcement may be installed to improve load-bearing capacity and prevent rutting.
- 5.3.13 The design seeks to minimise earthworks by following existing contours; however, some localised grading will be required, particularly in areas where the gradient exceeds 1:8.

Permanent Internal Access-Track Construction

- 5.3.14 The permanent tracks will generally have a running width of approximately 5 m, with verges on either side, subject to the approved details, detailed design and ground conditions. Localised widening will be provided at bends, junctions and passing places where required to accommodate construction and turbine-delivery vehicles.
- 5.3.15 The permanent tracks will be constructed using a flexible pavement suitable for heavy construction traffic. The typical construction build-up will comprise:
- i) a prepared and compacted subgrade;
 - ii) a geotextile separation or reinforcement layer where required;
 - iii) a capping layer where required due to weak ground conditions;
 - iv) a sub-base formed from suitable well-graded crushed stone; and
 - v) a compacted aggregate running surface.
- 5.3.16 Stone used to construct the tracks will be obtained from an appropriate off-site source. Material will be placed and compacted progressively so that completed sections provide stable access for subsequent construction operations.



- 5.3.17 The precise length of permanent internal track completed during the Preliminary Works will depend on construction progress, ground and weather conditions and the management of environmental constraints. Construction of any outstanding sections will continue during the main construction phase.

Drainage Installation

- 5.3.18 Temporary runoff and sediment-control measures will be installed before or concurrently with the associated earthworks. Permanent drainage will be installed alongside the site access and internal access tracks as construction progresses.
- 5.3.19 The drainage measures will include, where applicable:
- i) trackside ditches or swales to intercept and convey runoff;
 - ii) check dams to reduce flow velocities, sediment transport and channel scour;
 - iii) relief drains and cross-drainage culverts to maintain existing flow paths;
 - iv) silt traps and other sediment-control measures; and
 - v) erosion protection at drainage outlets and other vulnerable locations.
- 5.3.20 Drainage infrastructure will be constructed in accordance with Section 6 and the Flood Risk and Drainage Statement included at Appendix C. Where a watercourse crossing is required, the relevant crossing detail and any necessary approvals will be confirmed before construction of the crossing begins.
- 5.3.21 Temporary drainage and sediment-control measures will remain in place until the relevant permanent drainage infrastructure is operational and the adjoining ground has been adequately stabilised.

Stabilisation and Reinstatement

- 5.3.22 Upon completion of the main construction works, finishing works will be undertaken to reinstate disturbed areas and integrate the access road into the surrounding landscape. This will include:
- i) regrading of disturbed land adjoining the tracks;
 - ii) replacement of stored topsoil and subsoil in the appropriate sequence;
 - iii) seeding or revegetation using an appropriate mix;
 - iv) removal of temporary working areas no longer required; and

- v) inspection and repair of any affected public rights of way in accordance with the approved PRowMP.

5.3.23 These measures will help to stabilise soils, reduce erosion risk, and minimise visual impacts.

Environmental Protection and Good Practice

5.3.24 All works will be undertaken in accordance with the environmental management measures set out in this CEMP, including:

- i) Implementation of pollution prevention measures, including the use of bunded fuel storage, designated refuelling areas, and spill response procedures;
- ii) Control of dust through damping down and appropriate material handling;
- iii) Management of construction noise and vibration in accordance with best practice;
- iv) Protection of retained vegetation and ecological features outside the working corridor;
- v) Regular inspection and maintenance of drainage and sediment control measures.

Phasing

5.3.25 The Preliminary Works will be undertaken between November and December 2026. The indicative sequence of works will comprise:

- i) establishment of temporary working, welfare and environmental-control arrangements;
- ii) ecological, archaeological and other pre-construction checks;
- iii) setting out of the site access and permanent internal access-track working corridors;
- iv) vegetation clearance and soil stripping;
- v) earthworks and preparation of track formations;
- vi) construction of sections of the approved site access track;
- vii) construction of sections of permanent internal access tracks, selected passing places and associated widening;
- viii) installation of temporary and permanent drainage infrastructure; and
- ix) stabilisation, inspection and progressive reinstatement of disturbed areas.

- 5.3.26 The Principal Contractor may refine the detailed sequencing of the works in response to construction logistics, ground and weather conditions and environmental constraints, provided that both elements remain within the scope of the Preliminary Works and are undertaken in accordance with this CEMP.

Embedded Mitigation

- 5.3.27 The design and construction methodology incorporate a number of embedded mitigation measures to reduce environmental effects, including:
- i) Alignment of the access road to follow existing landform and minimise earthworks;
 - ii) Use of permeable track construction to limit surface water runoff;
 - iii) Early installation of drainage and sediment control measures;
 - iv) Retention of vegetation outside the defined working corridor; and
 - v) Progressive reinstatement of disturbed areas.

5.4 Construction Methods – Main Works

- 5.4.1 This section describes the method of construction for the following works:
- i) Formation of site compound including hardstanding and temporary site office facilities;
 - ii) Installation of temporary speed reduction measures around site entrance;
 - iii) Construction of the new site access on to the B4282
 - iv) Upgrading of existing tracks and construction of new access tracks and passing places inter-linking the turbine locations and substation, which will require import of suitable roadstone;
 - v) Construction of crane hardstanding areas to facilitate delivery of turbines;
 - vi) Construction of turbine foundations and transformer bases where required by the selected turbine;
 - vii) Construction of site substation;
 - viii) Excavation of trenches and cable laying adjacent to site roads;
 - ix) Connection of on-site distribution and signal cables;
 - x) Delivery and erection of wind turbines;
 - xi) Commissioning of site equipment; and
 - xii) Site restoration following completion of construction phase.

Site Access Construction

- 5.4.2 The new access junction with the B4282 will be constructed to accommodate both standard construction vehicles and abnormal loads. The works will include:
- i) Formation of a widened bellmouth access;
 - ii) Localised widening of the carriageway where required;
 - iii) Creation and maintenance of visibility splays in both directions;
 - iv) Tie-in works to the existing highway, including saw cutting and surfacing transitions;
 - v) Installation of verge treatments or kerbing as appropriate to the rural context.
- 5.4.3 Construction at the highway interface will be undertaken under appropriate traffic management arrangements, which may include temporary lane closures, traffic signals, or banksman-controlled movements, depending on the nature of the works.
- 5.4.4 Temporary traffic-management and speed-control measures will be implemented on the B4282 during construction of the site access where required by the relevant highway authority. These may include advance warning signs, temporary speed restrictions, traffic signals, lane closures and banksman-controlled vehicle movements. The measures will be agreed with the highway authority before the relevant works commence and maintained for as long as necessary.
- 5.4.5 The access track will be constructed using a flexible pavement design suitable for heavy construction traffic. The typical construction build-up will comprise:
- i) A prepared and compacted subgrade;
 - ii) A geotextile separation layer where required;
 - iii) A capping layer (where necessary in areas of poor ground conditions);
 - iv) A sub-base layer formed from well-graded crushed stone (e.g. Type 1 aggregate);
 - v) A running surface comprising compacted aggregate suitable for construction traffic.
- 5.4.6 The track will be constructed to an appropriate width to accommodate abnormal loads, with localised widening provided on bends and at passing places.

Site Set-up and Construction Compounds

- 5.4.7 The construction compounds will be established during the site mobilisation phase, following completion of the access required to serve them and installation of the relevant temporary drainage and pollution-control measures. They will remain in use during the main construction works and will be removed and reinstated following completion of construction, except where any infrastructure is required for the operational development.
- 5.4.8 Two temporary site/security offices will be constructed, one near to the site entrance from the B4282 (area 262 m²) and the second at the entrance to the turbine platform area (within the smaller of the two temporary construction compounds).
- 5.4.9 Other temporary fenced compound areas will be established on turbine craneage areas as appropriate for security of plant in remote parts of the site. These will not require any additional hardstanding to that proposed for the craneage areas.

Excavation Works

- 5.4.10 Excavation works for the wind farm will be required for the access tracks, electrical cabling and wind turbine foundations.

Borrow Pits

- 5.4.11 There are no proposals to establish borrow pits within the site boundary and aggregates will be sourced from offsite (local quarries).

Cable Trenching

- 5.4.12 Underground cables will link the turbines to each other and to the on-site sub-station. Detailed construction and trenching specifications will depend on the ground conditions encountered at the time, but typically cables will be laid in a trench 750 mm deep and 450 mm wide. To minimise ground disturbance, cables will be routed along the side of the access tracks wherever practicable.
- 5.4.13 Cable trenching will generally follow construction of the associated access tracks and will be undertaken before turbine erection and final track reinstatement. Trenches will be opened in manageable sections and, as far as reasonably practicable, cables will be installed and the trenches backfilled without unnecessary delay. Excavated soils will be separated according to soil type and replaced in the



appropriate sequence. Open trenches will be protected and inspected in accordance with the wildlife-protection measures set out in Section 3.8.

Crane Hardstanding Areas

- 5.4.14 Each wind turbine requires an area of hardstanding to be built adjacent to the turbine foundation. This provides a stable base on which to lay down turbine components ready for assembly and erection, and to site the two cranes necessary to lift the three tower section, nacelle and rotor into place. The crane hardstanding will be left in place following construction in order to allow for the use of similar plant should major components need replacing during the operation of the wind farm. These could also be utilised during de-commissioning at the end of the wind farms life. The total area of hard standing at each turbine location including the turbine foundations and the crane pad will be approximately 895 m². Approximately a third of this area will be dressed back with topsoil and landscaped into the surrounding area upon completion of turbine erection.
- 5.4.15 Concrete for construction of the turbine foundations and sub-station structures will be imported to site.

Turbine Foundations, Transformer Bases and Turbine Erection

Turbine Foundations and Transformer Bases

- 5.4.16 Foundation works will commence once access to the relevant turbine location and the associated working platform have been established. Excavation will be followed by preparation of the formation, installation of reinforcement and embedded components, concrete pouring, curing, backfilling and reinstatement. Temporary drainage and pollution-control measures will be installed before excavation begins and maintained until the foundation area has been stabilised.
- 5.4.17 Where rockhead, or suitable bearing, is relatively shallow (<2 m), the wind turbine foundations will bear directly onto rock. Where rockhead or suitable bearing, is between 2-5 m depth, the existing overburden will be excavated and replaced with suitable load-bearing material, most likely to be imported stone.
- 5.4.18 The foundation design will depend on the results from detailed ground investigation, it is currently expected that turbines will not require piled foundations. Should piling be necessary, it is proposed to agree the methodologies for this and any conditions



which may be appropriate with the determining authority prior to construction. It is expected that the conditions would vary depending on the relative location of the turbine to potential receptors for any adverse environmental impacts.

- 5.4.19 The turbines will be installed on foundations, comprising both stone and concrete. These will measure approximately 17.3 m x 17.3 m in plan with concrete depth of approximately 2 m, and stone overlay of 1 m, dressed back with topsoil to allow re-vegetation. Turbine foundations could be larger or smaller, depending on imposed loadings, ground conditions and drainage design.

Delivery and Erection of Wind Turbines

- 5.4.20 Wind turbine towers, nacelles and blades will be transported to site via low bed trailers, come incorporating rear steering. The towers will be delivered in three or four sections, which will be stored at each turbine lay-down area until lifted into position. Some storage of components may also be required at the site compound dependent on weather conditions and access track construction progress at the time of delivery.
- 5.4.21 Two teams will carry out erection, each using either two road-going cranes (of approximately 100 tonne capacity and 500 or 800 tonne capacity) or crawler cranes. The construction contractors would determine the actual cranes used, together with the exact programme and number of teams on site.

Substation and Grid Connection

- 5.4.22 All wind farms need to be connected into the grid distribution system, though such connections are subject to a different consenting process to the wind farms themselves. The site sub-station will connect the wind farm into the national distribution system on site (to be via a 132kv connection in the sub-station compound). The substation is to be located a short distance from Turbines 8 and 9.
- 5.4.23 Construction of the substation will commence following formation of the access and substation platform. The anticipated sequence will comprise platform and drainage works, foundations, building construction, installation of electrical equipment, cabling, testing and commissioning.
- 5.4.24 The sub-station will comprise a hard standing area of approximately 41.5 m x 39 m containing the main equipment (isolators, circuit breakers, transformers) a 14 m



x 10 m single storey building which will house switchgear and metering protection and control equipment and also welfare facilities. The sub-station switchroom will be faced in stone with a slate roof, associated fencing will be either moorland green/brown or dark grey in order to blend with either the existing landscape colours or traditional building colours for the area.

- 5.4.25 The applicant has accepted an offer of a grid connection from National Grid Electricity Distribution (NGED), which is the electricity distribution company for South West England and South and West Wales. The confirmed offer is for a connection to tie into the 132kv network at Pyle substation, utilising an existing 5 km tower line not currently in use, plus a new 7 km stretch of wooden pole circuit.

Commissioning of Site Equipment

- 5.4.26 Commissioning is the final phase of the installation process of the wind turbines, where all mechanical, electrical and control systems are rigorously tested to ensure they function safely before being handed over for commercial operation.
- 5.4.27 This will also include checking noise outputs to ensure they do not exceed the noise limits set out in planning condition 44 attached to Planning Permission P2022/0517.

5.5 Post-Construction Restoration and Highway Remedial Works

- 5.5.1 Following completion of construction, temporary offices, welfare facilities, fencing, plant, machinery, storage containers, waste-storage areas and other temporary construction equipment will be removed from the Site. Temporary compound areas will be cleared, decompacted where necessary, reprofiled, covered with stored soils and revegetated to integrate with the surrounding land, unless any part is required for the operation of the Approved Development.
- 5.5.2 Restoration following the completion of the construction of the Foel Trawsnant Wind Farm shall include:
- i) Assessment and waste removal:
 - a. Walkover of the site to identify any hazards, such as open pits, unstable ground, or leftover debris
 - b. Debris clearing to remove any construction waste or leftover earthworks and hazardous materials.
 - c. Hazard mitigation and removal of any sharp objects leftover.

- ii) Landform and soil restoration:
 - a. Installation of temporary erosion control measures like silt fences, geotextiles and mulching to hold soil in place until permanent vegetation takes place.
 - b. Planting to reintroduce native species, grasses and shrubs to stabilise the soil in the long-term, improving biodiversity and rebuilding natural habitats.
 - iii) Site monitoring to ensure establishment of planting, monitor soil health and control any potential soil erosion.
- 5.5.3 Public rights of way affected by construction will be inspected, repaired and reinstated in accordance with the approved PRowMP. Records of inspections, defects, repair works and final reinstatement will be retained and made available to the Local Planning Authority where required.
- 5.5.4 Temporary public rights of way fencing, signs and route-management measures will not be removed until the relevant construction activities have been completed and the affected route is safe and suitable for public use.

Remedial Works to Public Highway

- 5.5.5 Any remedial works to the public highway will be agreed with NPTC highways department through the post construction dilapidation survey.

5.6 Decommissioning of Wind Farm

- 5.6.1 This CEMP principally relates to the construction of the Approved Development. The following information is provided for context only, as the detailed decommissioning and restoration arrangements will be controlled separately through Conditions 31 and 32 of Planning Permission P2022/0517.
- 5.6.2 Planning condition 32 attached to Planning Permission P2022/0517 requires a decommissioning and site restoration scheme to be submitted to the local planning authority and shall include:
- i) Details of the removal of all the wind turbines and the surface elements of the development plus one metre of the turbine bases below ground level;
 - ii) A de-construction method statement;

- iii) Details of measures to prevent/minimise impacts upon important habitats and species including any protected species surveys;
 - iv) Details of all habitat restoration measures including methods and any seed mixes.
- 5.6.3 The wind farm operator will comply with the requirements of conditions 31 and 32 to decommission the wind farm in circa 25 years.

6.0 SITE DRAINAGE STRATEGY

6.1 Drainage Context

- 6.1.1 The detailed assessment of flood risk and the surface water drainage strategy for the Approved Development are set out in the Flood Risk and Drainage Statement (FRDR) prepared by Pell Frischmann and included at Appendix C. This section should be read in conjunction with the FRDR.
- 6.1.2 The FRDR identifies the Site as being at generally low risk of flooding from the principal sources considered. Natural surface water flow paths are present across the Site and follow the approximate routes of small watercourses. The introduction of new hardstanding and other less permeable surfaces therefore requires management to ensure that construction and operation of the Approved Development do not increase downstream flood risk.
- 6.1.3 The surface water drainage strategy is based on sustainable drainage principles and will manage runoff from the access tracks, turbine hardstandings, construction compounds, substation and other relevant infrastructure through a combination of source control, conveyance, attenuation and controlled discharge to surface water.
- 6.1.4 The FRDR establishes the overarching drainage principles for the Approved Development. Detailed drainage design will be developed on a phase-by-phase basis as construction progresses. Each detailed design package will include the drainage arrangements applicable to that phase and will be progressed through the relevant SuDS Approval Body (SAB) process where required. Detailed designs will accord with the principles established by the FRDR and this CEMP.
- 6.1.5 Temporary pollution-prevention, runoff and sediment-control measures will be installed before the associated vegetation clearance, soil stripping or earthworks commence. Permanent drainage measures will be installed in advance of, or concurrently with, the infrastructure that they are intended to serve.
- 6.1.6 Nothing in this CEMP removes the requirement to obtain or comply with any separate statutory drainage, watercourse or SAB approval required for the works.

6.2 Drainage Layout and SuDS Hierarchy

- 6.2.1 The proposed drainage arrangements and indicative standard details for the Approved Development are shown on Drawings 10110902_PF_DR_0001–0003 contained within Appendix A of the FRDR at Appendix C of this CEMP.
- 6.2.2 Current best practice for sustainable surface water management is set out in the CIRIA SuDS Manual (C753). The hierarchy for the disposal of surface water is:
- i) water reuse;
 - ii) infiltration to ground;
 - iii) discharge to surface water; and
 - iv) discharge to sewer.
- 6.2.3 The suitability of these options has been considered within the FRDR. There is no identified operational demand for water reuse and this option has therefore been discounted.
- 6.2.4 Infiltration drainage has also been discounted as a principal means of surface water disposal. The Site contains areas of relatively low-permeability superficial geology and historic shallow mine workings. Concentrated infiltration into or above former mine workings could present risks associated with ground stability, mine-water mobilisation and uncontrolled subsurface flow.
- 6.2.5 The drainage strategy is therefore based on attenuation and controlled discharge to the small watercourses within and adjoining the Site at rates which reflect the existing greenfield runoff characteristics.
- 6.2.6 Some incidental infiltration may occur through crushed-stone track and hardstanding surfaces. However, infiltration is not relied upon as a method of surface water disposal or in determining the required capacity of the proposed drainage system.

6.3 Existing Runoff

- 6.3.1 Greenfield runoff rates have been estimated using the IH124 methodology, as set out within the Interim Code of Practice for SuDS. The hydrological characteristics of the Site have been incorporated into the MicroDrainage modelling, with the calculated runoff rates presented in Table 6.1. The supporting calculations are included within Appendix B of the FRDR at Appendix C.



6.3.2 The parameters adopted in the calculations are:

- i) Substation Platform – 0.16 ha;
- ii) Turbine Hardstanding – 0.25 ha;
- iii) Average Annual Rainfall (SAAR) – 1,644 mm;
- iv) Soil Index – 0.4;
- v) UK Hydrological Region – 9; and
- vi) Urban Extent – 0

Table 6-1 Estimation of Greenfield Runoff Rates (Pre-development)

AEP (%)	Return Period	Greenfield Runoff (l/s/ha)
50	2	11.10
	<u>QBAR</u>	11.95
3.3	30	21.08
1	100	26.05

6.4 Proposed Runoff Rates

- 6.4.1 Surface water discharge from the areas of hardstanding will be restricted to the corresponding greenfield runoff rate for the relevant return period. The proposed limiting discharge rates and attenuation requirements for the substation, turbine hardstandings and construction compounds are set out in Table 6.2.
- 6.4.2 For the purposes of the drainage calculations, the contributing areas have conservatively been treated as 100% impermeable. In practice, some areas will comprise crushed-stone construction and may permit incidental infiltration; however, no allowance has been made for this when calculating attenuation requirements.
- 6.4.3 Where the calculated limiting discharge is below 2 l/s, a minimum discharge rate of 2 l/s has been adopted as the lowest practicably achievable rate using the proposed flow-control arrangement without creating an unacceptable blockage risk..

Table 6-2 Proposed Discharge Restrictions

Location	Return Period	Limiting Discharge (l/s)	Attenuation requirements (m ³)
Substation (0.16ha)	2	1.78 (2)	98
	30	3.37	130
	100	4.17	155
Turbine Hardstanding (0.25ha)	2	2.78	166
	30	5.27	203
	100	6.51	242
Construction Compound 1 (0.45ha)	2	4.99	300
	30	9.49	366
	100	11.72	436
Construction Compound 2 (0.64ha)	2	7.10	427
	30	13.49	520
	100	16.67	620

6.5 Surface Water Attenuation

- 6.5.1 Surface water runoff from the principal hardstanding areas will be attenuated before controlled discharge. Attenuation features will be provided to serve the substation, turbine hardstandings and construction compounds identified in Table 6.2, with the final size and configuration of each feature confirmed through detailed drainage design.
- 6.5.2 Table 6.2 identifies the attenuation volumes associated with the 2-year, 30-year and 100-year return-period events. The calculations for the 100-year event include an upper-end climate-change allowance of 45%.
- 6.5.3 The proposed attenuation features will be designed to accommodate the 1-in-30-year design event. For events exceeding the design capacity, flows will be routed overland into the surrounding ground and existing drainage catchments. The rural nature of the Site and the location of the drainage features will allow exceedance flows to remain within the Site and avoid impacts on buildings or third-party property.
- 6.5.4 The detailed location, dimensions, levels, flow controls and outfall arrangements for individual attenuation features will be confirmed as part of the relevant detailed drainage design and SAB approval. The detailed design will maintain the principles and discharge restrictions established by the FRDR.

6.6 SUDS Features, Management and Maintenance

6.6.1 The proposed strategy is based on sustainable drainage principles, employing SuDS features to manage the surface water runoff across the site. Principally, all surface water will ultimately be discharged into the small watercourses running through the site.

6.6.2 Whilst attenuation basins are principally selected to address the quantity of water that is to be attenuated, they also have water quality benefits, especially if planted with vegetation. They can also provide additional habitats for wildlife and increase biodiversity.

Trackside Drainage

6.6.3 The proposed typical trackside drainage arrangements for the Approved Development are shown on Drawings 10110902_PF_DR_0001–0003 contained within the Flood Risk and Drainage Statement at Appendix C.

6.6.4 Trackside drainage will be designed to collect and convey runoff from the access tracks and adjoining upslope catchments while maintaining existing hydrological connectivity across the Site. Open trackside ditches will generally be used where sufficient corridor width is available. The ditches will be sized at detailed design stage to accommodate surface runoff from the track for the 1-in-30-year design storm event.

6.6.5 All permanent drainage will be installed concurrently with the adjacent infrastructure that it serves. Drainage channels will be formed as wide as reasonably practicable to allow wildlife to enter and exit safely, with channel banks formed at a minimum slope of 1 vertical to 3 horizontal.

6.6.6 Permanent check dams will be installed within trackside ditches where required to reduce flow velocity, limit sediment transport and prevent channel scour. Check dams will be constructed from clean aggregate graded approximately 50–300 mm and embedded into the sides and invert of the ditch by at least 100 mm. The detailed number and spacing of check dams will be determined by the local track gradient, with a minimum provision of one check dam per 75 m length of ditch.



- 6.6.7 Relief drains and other cross-drainage measures will be provided to maintain hydrological continuity across the access tracks. Their detailed spacing will be determined at the detailed design stage and will not exceed 200 m.
- 6.6.8 In locations where the available track corridor is insufficient to accommodate open trackside drainage channels, filter drains will be installed parallel to the access tracks. These will collect runoff from the track surface and provide treatment as water passes through the filter medium to perforated pipes at the base of the drain. Flows will then be conveyed to attenuation basins for further treatment and controlled discharge. The dimensions and gradients of the filter drains will be determined at the detailed design stage.
- 6.6.9 The detailed trackside drainage design will be developed as part of the relevant phase-specific drainage design and will accord with the principles established in the Flood Risk and Drainage Statement and any applicable SAB approval.

Attenuation Basins

- 6.6.10 Attenuation basins or equivalent attenuation features will be provided to manage runoff from the relevant turbine hardstandings, construction compounds and substation areas. The features will be located downslope of the areas that they serve and will attenuate runoff before controlled discharge.
- 6.6.11 At turbine locations, runoff from the hardstanding will generally shed towards the adjacent attenuation feature. Vegetated basins will provide temporary storage and treatment and will allow exceedance flows to overtop in a controlled manner and continue downslope along the existing catchment flow path.
- 6.6.12 The attenuation features will be designed to accommodate the 1-in-30-year event, taking account of runoff from the temporary and permanent contributing areas. The typical contributing area for a turbine hardstanding is illustrated in Image 6.1.





Image 6.1: Turbine hardstanding contributing areas

Water Quality

- 6.6.13 The Simple Index Approach contained within the CIRIA SuDS Manual has been used to assess the pollution-treatment performance of the proposed drainage strategy.
- 6.6.14 The proposed land use is classified as a low pollution hazard. As shown in Table 6.3, the mitigation indices associated with detention basins meet the required indices for total suspended solids, metals and hydrocarbons.
- 6.6.15 Vegetated attenuation features will therefore provide both hydraulic control and treatment of runoff before discharge to receiving surface waters. Additional pollution-control measures applicable during the construction phase are set out in Sections 7.5 and 7.6.

Table 6-3 SuDS Mitigation Indices (from CIRIA SuDS Manual)

SuDS Component	Mitigation Indices		
	<i>Total Suspended Solids</i>	<i>Metals</i>	<i>Hydrocarbons</i>
Land Use Pollution Index			
Low Traffic Roads	0.5	0.4	0.4
SuDS Mitigation Index			
Detention Basin	0.5	0.5	0.6
Mitigation Requirement Met?	Yes	Yes	Yes

- 6.6.16 Therefore, the detention basins are considered suitable SuDS features to manage the surface water pollution potential expected from the proposed development to ensure suitable water quality standards in the downstream receiving watercourses.

Biodiversity and Planting

- 6.6.17 Attenuation features will be vegetated using native species appropriate to the hydrological conditions within the feature and the character of the surrounding Site. Planting will be designed to support the hydraulic and water-quality functions of the SuDS features while providing opportunities for biodiversity enhancement.
- 6.6.18 Planting will distinguish between the wetter basin base and aquatic margins, seasonally wet basin slopes and the drier upper banks and crest. The detailed species selection and seed mixes will accord with the recommendations contained in the FRDR at Appendix C and will be refined, where appropriate, having regard to local soil conditions and ecological constraints.

Implementation of the Drainage Strategy

- 6.6.19 The drainage strategy will be implemented progressively alongside construction of the Approved Development. The indicative sequence will be:
- i) temporary runoff, erosion and sediment-control measures will be installed before vegetation clearance, soil stripping or earthworks commence within the relevant working area;
 - ii) drainage serving the Preliminary Works, including the site access and sections of permanent internal access track constructed during that phase, will be installed before or concurrently with the associated infrastructure;
 - iii) trackside ditches, filter drains, check dams, relief drains and other cross-drainage measures will be installed concurrently with the associated access tracks;
 - iv) drainage and attenuation serving turbine hardstandings will be installed before the relevant hardstanding is brought fully into use;
 - v) drainage and attenuation serving the construction compounds and substation will be installed before those areas become operational;
 - vi) temporary drainage and sediment-control measures will remain in place until the relevant permanent drainage infrastructure is operational and disturbed ground has been adequately stabilised; and

vii) completed drainage infrastructure will be inspected before completion of the relevant construction phase.

6.6.20 The detailed sequence of individual drainage features may be refined by the Principal Contractor to reflect the construction programme, phase-specific detailed design, ground and weather conditions and environmental constraints, provided that the principles and environmental outcomes secured through this CEMP and the FRDR are maintained..

Management, Inspection and Maintenance

6.6.21 During construction, the Principal Contractor will be responsible for implementing, inspecting and maintaining temporary and permanent drainage measures within active working areas. The Site Manager will ensure that inspections are undertaken and recorded, with advice from the Environmental Advisor and Ecological Clerk of Works where appropriate.

6.6.22 Inspections will include, as applicable, trackside ditches, filter drains, check dams, relief and cross-drains, culverts, inlets, outfalls, flow-control structures, attenuation features and erosion-protection measures. Inspections will be undertaken regularly and following periods of heavy or prolonged rainfall. Sediment accumulation, blockages, erosion, damage or other defects will be recorded and remedied promptly.

6.6.23 Following completion of construction, responsibility for the permanent drainage system will pass to the operator of the Approved Development. The operator will arrange for the system to be inspected, managed and maintained throughout the lifetime of the development. Records of inspections, maintenance and remedial works will be retained.

6.6.24 Maintenance of vegetated attenuation features will also have regard to biodiversity. Management will include appropriate seasonal cutting of grassland and wildflower areas, removal of cut vegetation where required to avoid nutrient enrichment, rotational management of wetland vegetation and measures to minimise harm to amphibians and other fauna during maintenance.

6.6.25 Sediment removed from permanent attenuation basins, forebays or associated wetland features will be managed in accordance with the FRDR. Where appropriate,



removed sediment will initially be placed at the basin margin for a short period to allow trapped aquatic fauna to return to the feature before the material is removed to an appropriate designated location.

- 6.6.26 Manufacturer-specific maintenance requirements will be followed for proprietary drainage components. Table 6.4 sets out the minimum management and maintenance requirements for attenuation basins.

Table 6-4 Operation and Maintenance Requirements for Attenuation Basins

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove Litter and Debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly (for first year), then annually or required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlets pool – where provided	Annually (as set out in Chapter 23)
	Reseed areas of poor vegetation growth	As required
Occasional Maintenance	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
	Repair erosion or other damage by reseedling or re-turfing	As required
Remedial actions	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets, and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

6.7 Decommissioning Phase

- 6.7.1 Many activities undertaken during decommissioning will be comparable to construction activities and the relevant drainage, erosion-control and pollution-prevention principles contained within this CEMP will therefore also apply during decommissioning, subject to the separate decommissioning scheme required by Conditions 31 and 32.
- 6.7.2 Removal of infrastructure will be phased so that effective protection of the water environment is maintained throughout. Drainage infrastructure and sediment-control measures will remain operational until the infrastructure and disturbed areas that they serve have been removed or stabilised.
- 6.7.3 The detailed treatment of permanent drainage infrastructure at decommissioning will be determined through the approved decommissioning and restoration scheme.



7.0 POLLUTION CONTROL MEASURES

7.1 Introduction

- 7.1.1 Pollution control on construction sites is a critical environmental management process designed to mitigate any impact on air, water, soil quality, and any human and ecological receptors.

7.2 Construction Noise and Vibration Management

- 7.2.1 Construction noise and vibration will be managed in accordance with BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014, or any subsequent equivalent standard current at the time of construction.
- 7.2.2 The principal activities capable of generating construction noise will include access and track construction, earthworks, excavation, foundation construction, concrete deliveries and pouring, operation of cranes, turbine delivery and erection, substation construction and general movement of construction vehicles.
- 7.2.3 Construction traffic will use the access routes identified in the approved Construction Traffic Management Plan. The principal material laydown and plant-storage areas will be located within the construction compounds and turbine working areas shown on the construction figures.
- 7.2.4 The Principal Contractor will select plant appropriate to the task and will use modern, properly maintained equipment fitted with effective silencers and acoustic covers where applicable. Plant will be switched off when not in use and will not be left idling unnecessarily. Static or semi-static noisy equipment will be positioned, where reasonably practicable, to maximise separation from noise-sensitive receptors and make use of intervening landform, buildings or temporary screening.
- 7.2.5 Site personnel will be instructed through induction and toolbox talks to avoid unnecessary revving of engines, sounding of horns, slamming of vehicle doors and other avoidable noise. Reversing alarms will be selected and managed to minimise disturbance while maintaining site safety.
- 7.2.6 Compliance will be monitored through routine site inspections and review of complaints. Where particularly noisy works are proposed close to a sensitive receptor, or where a substantiated complaint is received, attended noise monitoring

will be undertaken by a suitably competent person where considered necessary. The results will be reviewed by the Site Manager and Environmental Advisor and additional mitigation introduced where appropriate.

- 7.2.7 Construction activities will be limited to the working hours set out in Section 3.3, except where otherwise agreed in writing with the Local Planning Authority or where emergency works are required.

Implementation of Best Practicable Means

- 7.2.8 Construction noise effects are normally of a temporary nature and result from both moving and static sources. Best practice measures will be used to minimise disturbance on nearby receptors by:

- i) Construction workers will be given a toolbox talk on noise sensitivity, to cover how construction vehicles and machinery should be used in proximity to residential properties, such as operating at low engine speed, avoiding use of alarms or sounding horns, slamming doors, and avoiding excessively loud communication with co-workers.
- ii) All plant and machinery will be switched off when not in use.
- iii) Locating construction workers amenity areas away from receptor directions.
- iv) Access and egress to site will follow the Construction Traffic Management Plan to minimise noise and disruption to local residents.
- v) Operatives exposed to noise will wear suitable hearing protection in line with the Control of Noise at Work Regulations 2005.

- 7.2.9 All activities associated with the construction of the development shall be carried out in accordance with British Standard 5228, 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites -Part 1 -Noise, Part 2 - Vibration.

7.3 Dust Management

- 7.3.1 Dust on construction sites is primarily generated through high-energy mechanical tasks and the movement of heavy machinery and vehicles.
- 7.3.2 Best environmental practices shall be deployed to control dust emissions and mitigate against any nuisance problems arising. This includes:



- i) Dampening access roads and areas within the site during warm / dry weather to reduce dust and particulates becoming air-bound. A bowser stored on site and transported to where needed via site plant would likely be used to spray necessary surfaces.
- ii) Wheel washing facilities onsite would be utilised to minimise the transfer of soil onto the local road network. The anticipated wheel washing facilities would consist of either a drive-over ramp system or jet spray, depending on the site ground conditions (i.e. if mud is wet it can usually be jet sprayed off, but if it 'clings' to wheels, a ramp system may be required). Hence, the chosen method used would be dependent on the site conditions and the most efficient method would be used.
- iii) Use of sheeting to cover soil mounds.

7.4 Air Quality

- 7.4.1 Polluting emissions from plant on site (SO₂, NO_x) are considered to be in insufficient quantities to have a measurable adverse air quality impact. Plant will be inspected regularly and maintained in line with the manufacturers' instructions. Should any exhaust emissions be deemed smoky, the machine will be removed from service; the machine will only be reintroduced into service following a satisfactory repair.
- 7.4.2 All plants and machinery will be turned off when not in use.

7.5 Silt, Run-Off and Mud

- 7.5.1 Construction activities including vegetation clearance, soil stripping, earthworks and excavation have the potential to generate sediment-laden runoff which, if uncontrolled, could affect the quality of receiving surface waters and associated habitats. Construction vehicles also have the potential to transfer mud and debris onto the public highway.
- 7.5.2 Surface water generated during construction will be managed in accordance with the drainage strategy set out in Section 6 and the Flood Risk and Drainage Statement (FRDR) at Appendix C. Temporary runoff, erosion and sediment-control measures will be installed before the associated vegetation clearance, soil stripping or earthworks commence and will remain in place until the relevant permanent drainage infrastructure is operational and disturbed ground has been adequately stabilised.

- 7.5.3 Construction activities will be undertaken in accordance with applicable good-practice pollution-prevention guidance, including relevant Natural Resources Wales Guidance for Pollution Prevention.
- 7.5.4 To control silt and run-off into watercourses, the following measures will be applied:
- i) all contractors will be made aware through site induction and toolbox talks of the requirement to prevent pollution of surface water and groundwater;
 - ii) appropriate stand-off distances will be maintained between construction activities, material storage areas and watercourses, drainage features and sensitive wetland habitats. Fuel, oil and chemical storage will be located on suitable hardstanding or other impermeable surfaces, appropriately bunded and separated from surface water features in accordance with the pollution-prevention measures set out in Section 7.6;
 - iii) vegetation clearance and soil disturbance will be limited to the defined working areas;
 - iv) temporary drainage and sediment-control measures will be established before or concurrently with soil stripping and earthworks;
 - v) clean runoff from undisturbed areas will, where practicable, be kept separate from runoff generated within active construction areas;
 - vi) temporary runoff drains, cut-off drains, silt fencing, silt traps, geotextile barriers, check dams or other appropriate measures will be used to intercept, slow and treat sediment-laden runoff before it reaches the permanent drainage system or a receiving watercourse;
 - vii) permanent trackside ditches, filter drains, check dams, relief drains and other cross-drainage measures will be installed progressively in accordance with Section 6 and the phase-specific detailed drainage design;
 - viii) temporary and permanent drainage measures will be inspected regularly and following periods of heavy or prolonged rainfall, with increased inspection frequency before and after forecast significant rainfall events;
 - ix) earthworks and other activities with a high potential to generate sediment-laden runoff will be planned having regard to prevailing and forecast weather conditions, and activities will be modified or suspended where conditions would create an unacceptable pollution risk; and
 - x) disturbed ground will be stabilised and reinstated progressively as construction advances.

- 7.5.5 These measures complement the permanent SuDS arrangements described in Section 6, which provide attenuation, treatment and controlled discharge of surface water from the Approved Development.

Construction Compounds

- 7.5.6 Surface water from the construction compounds will be managed through the drainage and SuDS arrangements described in Section 6 and the FRDR at Appendix C.
- 7.5.7 The FRDR concludes that the proposed SuDS treatment features provide the required level of treatment for the anticipated pollution hazard and therefore no interceptors are proposed as part of the surface water treatment strategy. Pollution risk associated with fuels, oils and chemicals will instead be controlled at source through secure storage, bunding, drip trays, spill prevention and spill-response measures as set out in Sections 3.4 and 7.6.
- 7.5.8 This is the key change from the existing CEMP, which currently commits compound drainage to an oil interceptor and subsequently refers to inspection of hydrocarbon interceptors.

Dewatering

- 7.5.9 Where dewatering of excavations, trenches or other working areas is required, the water will be assessed before discharge and an appropriate discharge location and treatment method identified.
- 7.5.10 Sediment-laden water will not be discharged directly to a watercourse or permanent drainage feature without appropriate treatment. Where necessary, water will be passed through settlement or filtration measures before discharge.
- 7.5.11 Water contaminated by cement, concrete, fuels, oils or other potentially polluting substances will not be discharged to the surface water drainage system or receiving watercourses. Such water will be contained and removed from the Site by an appropriately licensed waste contractor where required.

Inspection and Maintenance

- 7.5.12 Drainage and sediment-control measures will be subject to auditable inspection throughout construction. Inspections will include, as applicable:



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- i) trackside ditches and filter drains;
 - ii) check dams, relief drains and cross-drainage measures;
 - iii) culverts and watercourse crossings;
 - iv) temporary silt fencing, sediment traps and settlement features;
 - v) inlets, outlets and flow-control structures;
 - vi) attenuation basins and forebays;
 - vii) erosion-protection measures;
 - viii) watercourses downstream of active construction areas; and
 - ix) fuel, chemical and other potentially polluting material-storage areas.
- 7.5.13 Any sediment accumulation, blockage, erosion, damage or other defect will be recorded and remedied promptly.
- 7.5.14 Maintenance activities involving sediment removal will, where practicable, be undertaken during suitable dry-weather conditions. Sediment removed from permanent attenuation basins or forebays will be managed in accordance with the FRDR. Dredged material will initially be placed at the basin margin for approximately 24–48 hours, where appropriate, to allow trapped aquatic fauna to return to the feature, before being removed to a designated site compound or appropriate off-site facility.
- 7.5.15 I would delete the existing sentence saying removed silt will simply be moved onto adjacent banks/land to drain and consolidate, because that no longer reflects the FRDR approach.

Water Quality Monitoring

- 7.5.16 Water-quality sampling and testing will be undertaken fortnightly on the Nant yr Hwyaidd, which is the watercourse considered most likely to be affected by the Approved Development because of the proportion of infrastructure located within its catchment.
- 7.5.17 Samples will be submitted to a UKAS- and MCERTS-accredited environmental laboratory for analysis of the parameters identified in the approved monitoring regime, including: pH; alkalinity; total hardness; ammonia/ammonium; nitrite; nitrate; soluble reactive phosphorus; sodium; chloride; Biochemical Oxygen Demand;

suspended solids; turbidity; total petroleum hydrocarbons; sulphate; iron; dissolved organic carbon; and total organic carbon.

- 7.5.18 If monitoring identifies a significant deterioration in water quality, the cause will be investigated promptly and appropriate corrective measures implemented.

Response to Sediment Run-Off

- 7.5.19 Where significant sediment-laden runoff is identified:
- i) the activity generating the runoff will be suspended where necessary to prevent further release;
 - ii) the source and extent of the sediment release will be identified;
 - iii) clean runoff will, where practicable, be diverted around the affected working area;
 - iv) remedial measures such as additional silt fencing, check dams, sediment traps, geotextile barriers, brash bunds or temporary cut-off drains will be installed as close to the source as practicable;
 - v) any affected drainage or sediment-control measures will be inspected and repaired or cleared;
 - vi) the Environmental Advisor and Site Manager will be notified and the Ecological Clerk of Works consulted where ecological receptors may be affected; and
 - vii) Natural Resources Wales or another relevant regulatory body will be notified where required having regard to the nature and severity of the incident.
- 7.5.20 Temporary measures will not be installed within a natural watercourse except where necessary as an emergency response and where permitted by the relevant regulatory requirements.

Mud and Highway Cleanliness

- 7.5.21 As set out in Section 3.3, wheel-washing facilities will be provided to minimise the transfer of mud and soil from the Site onto the public highway.
- 7.5.22 The condition of the Site access and adjacent public highway will be monitored throughout the construction period. Street-cleaning vehicles or other suitable cleaning equipment will be deployed as required to remove mud, soil or other construction debris.



- 7.5.23 Runoff and wash-water generated by wheel washing or road-cleaning activities will be contained and managed so that it does not discharge untreated to a watercourse or surface water drainage feature.

Soil Protection and Conservation

- 7.5.24 Soil disturbance will be limited to the approved working areas. Topsoil and subsoil will be stripped and stored separately, with stockpiles clearly identified and protected from contamination, compaction and erosion.
- 7.5.25 Soil handling will be avoided during excessively wet conditions where this would result in smearing, compaction or deterioration of soil structure. Soil stockpiles will be positioned away from watercourses and drainage features and managed to prevent sediment-laden runoff.
- 7.5.26 Plant will not travel over stored soils, and fuels, chemicals and waste will not be stored on soil stockpiles.
- 7.5.27 Following construction, soils will be replaced in the appropriate sequence and disturbed areas will be regraded, stabilised and revegetated as soon as reasonably practicable.

Soil Protection and Conservation

- 7.5.28 Soil disturbance will be limited to the approved working areas. Topsoil and subsoil will be stripped and stored separately, with stockpiles clearly identified and protected from contamination, compaction and erosion. Soil handling will be avoided during excessively wet conditions where this would cause smearing, compaction or loss of soil structure.
- 7.5.29 Soil stockpiles will be positioned away from watercourses and drainage features and managed to prevent sediment-laden runoff. Plant will not travel over stored soils, and fuels, chemicals and waste will not be stored on soil stockpiles. Following construction, soils will be replaced in the appropriate sequence and disturbed areas will be regraded and revegetated as soon as reasonably practicable.

7.6 Accidental Spills and Leakages

- 7.6.1 Accidental releases of fuels, oils, chemicals, paints, solvents, concrete products or other potentially polluting substances have the potential to contaminate soil, surface



water and groundwater. Pollution risk will therefore be managed primarily through prevention and containment at source, supported by appropriate spill-response arrangements.

- 7.6.2 The quantities of fuel, oil and chemicals brought onto the Site will be limited to those reasonably required for the construction works. All substances will be stored and handled in accordance with applicable legal requirements, manufacturers' instructions and appropriate pollution-prevention good practice.

Prevention, Containment and Cleaning Up Spillages

- 7.6.3 Control of Substances Hazardous to Health (COSHH) assessments will be undertaken for relevant substances and appropriate control measures implemented.

- 7.6.4 The following measures will apply:

- i) fuels, oils and chemicals will be stored within designated, secure areas on suitable impermeable surfaces and away from surface water features and drainage infrastructure;
- ii) fuel tanks and other bulk liquid-storage containers will be provided with secondary containment capable of retaining at least 110% of the capacity of the largest container;
- iii) pipes, valves, gauges and other ancillary equipment associated with bulk storage will be located within the secondary containment area where practicable;
- iv) mobile fuel bowzers will be double-skinned or otherwise provided with suitable secondary containment;
- v) drums and smaller containers will be stored on appropriate drip trays or within bunded storage areas;
- vi) mobile plant will use drip trays where there is a foreseeable risk of leakage;
- vii) refuelling and transfer of fuels or oils will be undertaken in designated locations and managed to minimise the risk of spills;
- viii) spill kits appropriate to the materials being stored or used will be provided at fuel and chemical-storage areas, refuelling locations and other appropriate points across the Site; and
- ix) site personnel handling fuels, oils or chemicals will be briefed on the relevant storage, handling and spill-response procedures.
- x) These source-control measures will operate alongside the surface-water drainage and pollution-control measures described in Sections 6 and 7.5.

Other Materials

- 7.6.5 Where bituminous or similar surface-treatment materials are required, consideration will be given to delivery in a form that minimises the need for heating or processing on Site.
- 7.6.6 Water-based paints will be used where appropriate and will be stored securely when not in use.
- 7.6.7 Dry or dusty materials will be stored and handled to minimise the risk of spillage or dispersal. Materials will be covered where necessary, and waste containers will be managed in accordance with Section 3.5.

Spill Response

- 7.6.8 Where an accidental spill or loss of containment occurs, the following actions will be taken as appropriate:
- i) the affected activity will be stopped immediately where it is safe to do so;
 - ii) ignition sources will be removed where the material is flammable;
 - iii) the source of the spill will be identified and stopped or isolated where practicable;
 - iv) the spill will be contained using appropriate spill kits, absorbent materials, booms or other containment equipment;
 - v) drainage features and watercourses will be protected to prevent the spread of contamination;
 - vi) the Site Manager will be informed immediately and the Environmental Advisor notified where appropriate;
 - vii) contaminated absorbents, soils or other materials generated during the clean-up will be collected and managed as appropriate waste;
 - viii) a specialist spill-response contractor will be contacted where the nature, quantity or location of the spill requires specialist intervention; and
 - ix) the incident will be recorded and investigated in accordance with the site incident-reporting procedures.
- 7.6.9 Where a spill enters, or presents an immediate risk of entering, a watercourse or the surface-water drainage system, appropriate emergency containment measures will be implemented and Natural Resources Wales and any other relevant regulatory body will be notified where required.

- 7.6.10 Following containment and clean-up, the affected area and any relevant drainage infrastructure will be inspected and any necessary remedial measures implemented. The causes of the incident will be reviewed and additional preventative measures introduced where necessary.

7.7 Artificial Lighting

- 7.7.1 The site lighting arrangement shall incorporate the following measures to minimise impacts on residential properties birds and other nocturnal wildlife:
- i) Construction works will typically be undertaken in daylight hours, though due to the latitude of the site, and dependent of the timing of construction, there is potential for standard construction hours to be in periods of darkness. Whilst construction would not routinely require artificial illumination, lighting may be required for certain tasks or during winter months. There is the potential for poorly aimed or controlled lighting to cause environmental pollution to human and ecological receptors.
 - ii) All lighting on site during the construction period will be kept to a minimum (whilst ensuring safety or workers is achieved / security of site). Lighting installed on site during construction will be downward facing to avoid excess spill into the surrounding environment.
 - iii) The site lighting arrangement shall incorporate the following measures to minimise impacts on residential properties birds and other nocturnal wildlife:
 - a) Light spill beyond the site boundary to be avoided where reasonably practicable, including through the use of cowls/ hoods where appropriate.
 - b) All lighting to be directed away from boundary habitats, mature trees and woodland areas.
 - c) Where used, lighting should be task specific (i.e., general site lighting should be avoided where reasonably practicable).

7.8 Avoidance and Mitigation of Any Impacts on Habitats and Species

- 7.8.1 This subsection details the means of avoidance and inter alia, mitigation of any impacts on species and habitats set out in Table 9.12 of the approved Environmental Statement, in line with Condition 5 attached to Planning Permission P2022/0517.



Sites of Importance for Nature Conservation

- 7.8.2 The locations of Caerau West SINC, Caerau North SINC and Nant-y-Crynwydd SINC will be identified during the site induction process and shown on relevant site environmental constraints plans. Construction personnel, plant and materials will be restricted to the approved working areas. Where construction works are located within or immediately adjacent to a SINC, the boundary of the working area will be clearly demarcated using suitable wildlife-friendly fencing or other visible markers before works commence. Access outside the demarcated working areas will be prohibited unless authorised by the Ecological Clerk of Works.
- 7.8.3 The effects of construction and operation of the Wind Farm on these SINC's include trampling, dust and sedimentation run-off. During the site induction process all site personnel will be made aware of the locations of the SINC's, and the areas to avoid.
- 7.8.4 The Wind Farm infrastructure site layout has been designed to avoid the sensitive wetland habitats associated with the Caerau West SINC, and will be micro-sited during construction to avoid these if necessary. The Caerau West SINC will be protected wildlife friendly fencing during the construction phase and access prohibited for all onsite personnel.
- 7.8.5 As set out in the above subsections, the construction works will implement best practice measures to control pollution caused by the construction works.

Bats

- 7.8.6 Construction activities would be restricted to normal working hours, and thus would be largely restricted to daylight hours during the spring-autumn period when bats are active. When working during darkness is unavoidable, lighting would be restricted to the area required to be illuminated, to avoid light spill on to bat habitat. Please see subsection 7.7 above for more details on artificial lighting.

Otter and Water Vole

- 7.8.7 Vehicle movement outside of daylight hours would be restricted, vehicle speeds controlled, and operatives warned of the presence of mammals in order to reduce the risk of collisions.

- 7.8.8 All excavations would have sloped sides or have a means of escape for entrapped animals. Excavations to be checked each morning by operatives prior to work within the excavation.

Badger

- 7.8.9 A pre-construction badger survey would be carried out to identify any active setts (though none have been identified to date); if any recently created active setts would be adversely affected by the proposed development, either the infrastructure would be micro-sited scheme would be amended to avoid this or the sett would be closed under licence from NRW, thus avoiding any contravention of the legislation.

7.9 Summary

- 7.9.1 Table 7.1 below summarises the pollution control measures and monitoring proposed to be implemented during the construction works.

Table 7.1: Summary of Pollution Control Measures

Pollution Type	Potential Receptors	Monitoring and Control Measures
Noise / Vibration	Human	- Toolbox talk for construction workers to reinforce good site etiquette and consideration for noise sensitive receptors, including following site protocols to minimise any disruption. - Plant and machinery will be switched off when not in use - Operatives exposed to noise will wear suitable hearing protection.
Dust	Land, water & air	- Damping down to take place as appropriate. - Wheel washing facilities used to prevent soil transfer to local road network. - Use of sheeting to cover soil mounds. - Dust to be monitored as required.
Air Quality	Air	- Plant will be inspected regularly and maintained in line with the manufacturers' instructions. - All plants and machinery will be turned off when not in use.
Silt run-off	Land & water	- Toolbox talk will include a briefing on water pollution prevention and best practice measures. - Measures to be put in place to prevent run off into the watercourse; filtration trench and silt settlement tank / pond. - Regular monitoring and maintenance of drainage features. - Water quality sampling and testing would be undertaken fortnightly on the Nant yr Hwyaid.
Wheel born mud and soils	Roads	- Road condition to be monitored on ongoing basis by site management. - Wheel wash to be used on site to limit transfer of muds and soils onto the adjacent highway. - Street cleaning vehicles will be deployed to ensure the adjacent public highway remains clean of construction debris.
Storage of Materials	Land & water	Toolbox talk will include a briefing on best practice measures for storing material on site.

Pollution Type	Potential Receptors	Monitoring and Control Measures
		- Monitor the amount of oil and fuel brought to the site to ensure it is kept to a minimum. - Materials to be stored in line with storage regulations.
Accidental Spills and Leakages	Land & water	- Spill kits will be available at various points around the site. - A Specialist Emergency Spill Contractor will be appointed and will be contacted if the need arises or the spill breaches a watercourse.
Artificial Lighting	Human & protected species	- All lighting on site during the construction period will be kept to a minimum. - All lighting to be directed away from boundary habitats, mature trees and woodland areas.

Appendix A – Table 9.9 of the Approved Environmental Statement (P2014/0825)



Table 9.9 of Approved Environmental Statement: Summary of Proposed Mitigation Measures

Receptor	Change(s) and Potential Effects	Incorporated Measures	Likely Effectiveness
Receptors Scoped-in to the EIA			
Features of designated sites Vegetation	Construction (to air): Airborne dust deposition during construction resulting in indirect changes to vegetation and change in the characteristics of the site for which they were designated	- Construction works would be undertaken using all necessary and practical measures to minimise the release of dust including: wheel wash facilities on site, enclosed and screened storage of aggregates; damping down haul roads during dry weather; and ensuring that lorries transporting material onto or off site are sheeted when conditions warrant, e.g. during dry periods or when carrying fine materials. - Adherence to all standard best-practice measures as guidance including the Good Practice Guide for Handling Soils (MAFF 2000), the Environment Agency Pollution Prevention Guidance Notes PPG1, 5, 6, 21 and 22 (EA and Environmental Handbook for Building and Civil Engineering Projects (Venables et al. 2000).	Fully effective
	Construction (to water): Increased sedimentation via run-off during construction resulting in changes to water quality indirectly affecting flora/fauna for which the sites are designated	- Construction works would be undertaken using all necessary and practical measures to minimise the release of additional sediment-laden run-off into nearby watercourses including (see Chapter 12): - Implementing a 20 m buffer zone around all natural surface water features/drains and wetland areas where possible. - Placing excavated spoil on downhill slopes; - Using temporary lateral drains on uphill slopes; - Using temporary run-off drains alongside tracks; - Use of temporary silt traps and settlement lagoons; - Limiting construction activities with a high run-off risk during the winter months; - Regularly monitoring the effectiveness of temporary drainage/silt-capture methods during construction so that any defects can be immediately remedied;	Substantially effective
	Operational (to water): Increased sedimentation via run-off from infrastructure resulting in changes to water quality indirectly affecting flora/fauna for which the sites are designated	- Using appropriate materials for construction of the access tracks (e.g. granular material to encourage infiltration rather than run-off; non-acidic material); - Installing permanent run-off drains (vegetated swales) alongside tracks; - Installing cross bars and cross-drains at regular intervals in the access track.	Substantially effective
	Construction/operation: Direct permanent (operational)/temporary (construction) landtake	- The windfarm infrastructure layout has been designed to avoid loss of key habitats on-site (wetland habitats/semi-natural habitats), i.e. the infrastructure is located within poor semi-improved grassland/marshy grassland. - Implementing a 20 m buffer zone around wetland areas where possible.	Substantially effective



Receptor	Change(s) and Potential Effects	Incorporated Measures	Likely Effectiveness
Peat	Construction/operation: Damage or loss	The windfarm infrastructure layout has been designed to avoid areas of substantial peat (i.e. are located in areas <0.5m depth of peat)	Substantially effective
Bats	Operation: Rotating turbine blades during operation, with risk of collision and/or barotrauma (injury from pressure changes - resulting in fatalities/injuries)	A minimum of 50m stand-off would be maintained between turbine blade tips and the nearest point of linear/foraging features likely to be well used by bats such as trees, wetland habitats, watercourses and walls (allowing for potential growth of vegetation during the lifetime of the scheme).	Substantially effective
	Construction/operation: Light, noise or vibration during construction and operation of turbines and associated infrastructure, causing displacement from foraging areas and commuting routes.	- Construction activities would be restricted to normal working hours, and thus would be largely restricted to daylight hours during the spring-autumn period when bats are active. When working during darkness is unavoidable, lighting would be restricted to the area required to be illuminated, to avoid light spill on to bat habitat. - The turbines and associated infrastructure would be unlit during the operational phase.	Substantially effective
Otter and water vole	Construction (to water): Increased sedimentation via run-off during construction resulting in changes to water quality in turn resulting in reduced foraging resources	See measures above for designates sites/habitats	Substantially effective
	Construction: Collisions with construction traffic causing death or injury/ entrapment within excavations	- A method statement would be prepared under which: - vehicle movement outside of daylight hours would be restricted, vehicle speeds controlled, and operatives warned of the presence of mammals in order to reduce the risk of collisions. - all excavations would have sloped sides or have a means of escape for entrapped animals. Excavations to be checked each morning by operatives prior - to work within the excavation.	Substantially effective
	Construction/operation: Direct permanent (operational)/temporary (construction) landtake	The wind farm infrastructure site layout has been designed to avoid the habitats that may support otter and water vole.	Substantially effective
	Construction/operation: Light, noise or vibration during construction and operation of turbines and associated infrastructure, causing displacement from foraging areas and commuting routes.	- Construction activities would be restricted to normal working hours, and thus would be largely restricted to daylight hours when otter are less active. When working during darkness is unavoidable, lighting would be restricted to the area required to be illuminated, to avoid light spill on to otter habitat. - The turbines and associated infrastructure would be unlit during the operational phase.	Substantially effective



Receptor	Change(s) and Potential Effects	Incorporated Measures	Likely Effectiveness
	Operation: Restriction of otter movement during operation, due to the construction of new culverts over watercourses	Culvert crossing for access tracks s would be designed to ensure movement of otters and water voles along watercourses is not impeded	Substantially effective
<i>Receptors scoped out of the EIA (but for which measures are required for legal compliance)</i>			
Badger	Construction/operation: Sett disturbance or destruction during construction causing death or injury	A pre-construction badger survey would be carried out to identify any active setts (though none have been identified to date); if any recently created active setts would be adversely affected by the proposed development, either the infrastructure would be micro-sited scheme would be amended to avoid this or the sett would be closed under licence from NRW, thus avoiding any contravention of the legislation.	Substantially effective
	Construction: Collisions with construction traffic causing death or injury/ entrapment within excavations	A method statement would be prepared under which: - vehicle movement outside of daylight hours would be restricted, vehicle speeds controlled, and operatives warned of the presence of badgers in order to reduce the risk of collisions. - all excavations would have sloped sides or have a means of escape for entrapped animals. Excavations to be checked each morning by operatives prior to work within the excavation.	Substantially effective
Reptiles	Construction: Habitat removal prior to construction of turbines and associated infrastructure, resulting in possible injury or death of reptiles/ Entrapment within excavations (harm/injury).	- The wind farm infrastructure site layout has been designed to avoid, as far as possible, the habitats that may support individual reptiles. - All excavations would have sloped sides or have a means of escape for entrapped animals. Excavations to be checked each morning by operatives prior to work within the excavation	Substantially effective

Notes:

Key to predicted success of mitigation:

- Fully - Impact fully mitigated and no effects predicted.
- Substantially - Mitigation would be largely successful at reducing impact. Some effects possible.
- Partly - Mitigation would be successful at reducing impacts, but some effects likely.



Appendix B – Construction Figures

Figure 5.2 Site Layout Foel Trawsnant Wind Farm S73 Application Environmental Statement Addendum

Figure 5.2 Site Access Plan – Original P2014/0825 ES

Figure 5.3 Site Road Cross-Section – Original P2014/0825 ES

Figure 5.4 Culvert Detail – Original P2014/0825 ES

Figure 5.5 Turbine Pad Foundation – Original P2014/0825 ES

Figure 5.6 Crane Hardstanding – Original P2014/0825 ES

Figure 5.7 Cable Trench Detail – Original P2014/0825 ES

Figure 5.8 Site Control Building & Substation Compound – Original P2014/0825 ES

Figure 12.2 Hydrological Salient Features and Catchment Map – Original P2014/0825 ES



Notes:

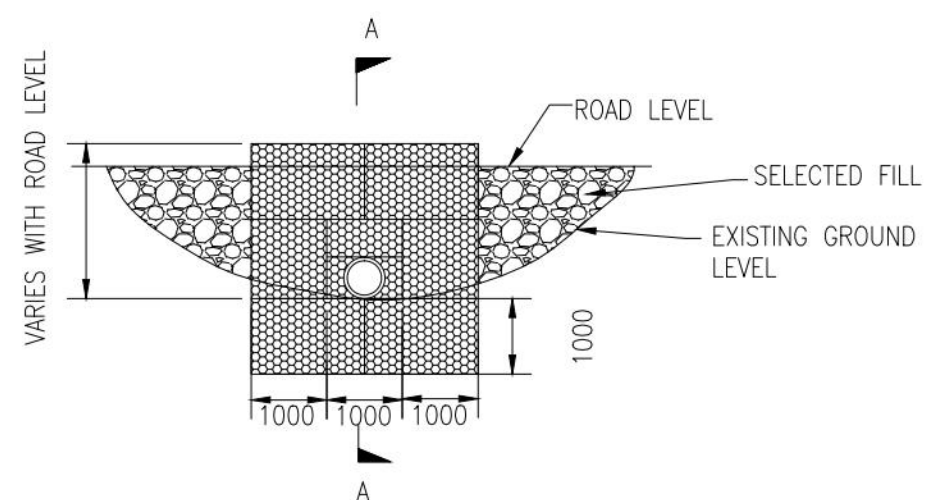
1. All dimensions are in millimetres unless otherwise stated
2. The culvert details are indicative. the type and size of culvert specified will depend on further hydrological studies, design work & consultation with NRW
3. Minimum diameters and invert levels are based on CIRIA recommendations
4. Edge protection barriers and road markers to be located as required

TWIN WALLED PIPE 450 DIAMETER ON SINGLE SIZE BEDDING

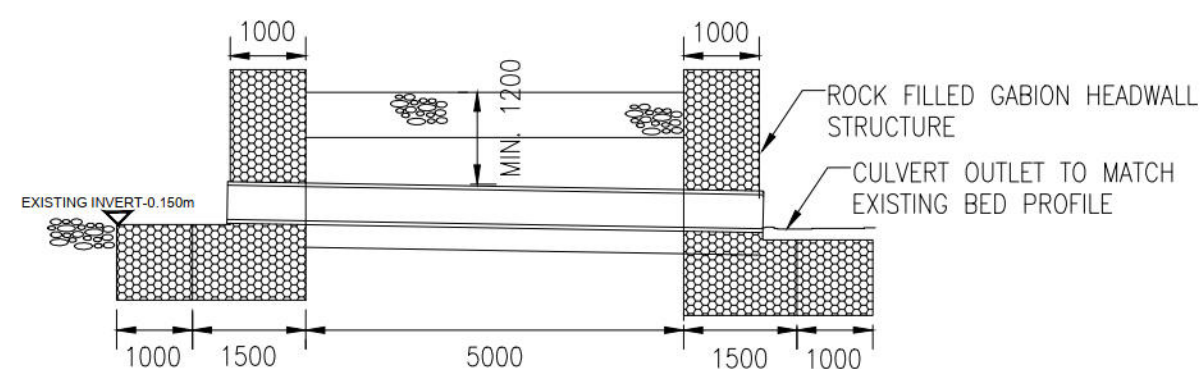
GABION BASKET STRUCTURE

SITE TRACK

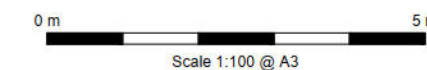
PLAN VIEW OF CULVERT



ELEVATION ON CULVERT HEADWALL

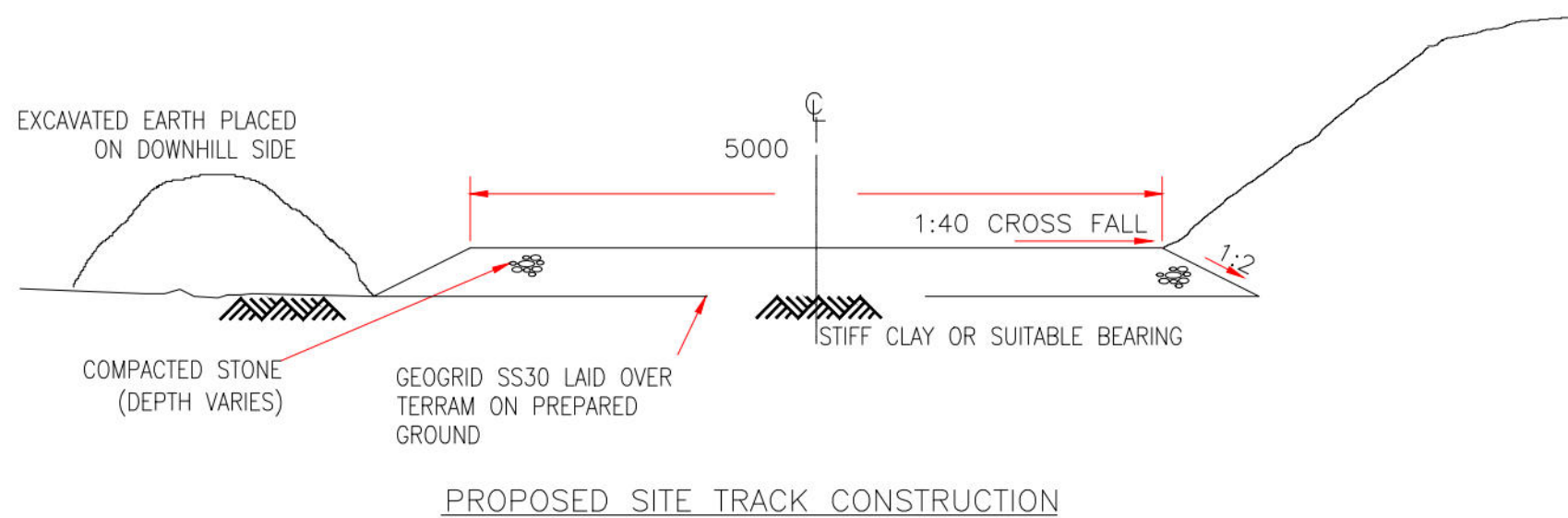


CROSS SECTION A-A THROUGH CULVERT



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Foel Trawsnant Wind Farm
Environmental Statement

Figure 5.4
Culvert Detail



Notes:

1. All dimensions are in millimetres unless otherwise stated.
2. General roadstone to be dot type 1.
3. Running surface to be a minimum 150mm type 1.
4. Proposed track width is constant 5m with 2m verges either side apart from at site entrance.

Not to Scale

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Foel Trawsnant Wind Farm
Environmental Statement

Figure 5.3
Site Road Cross-Section

Notes:

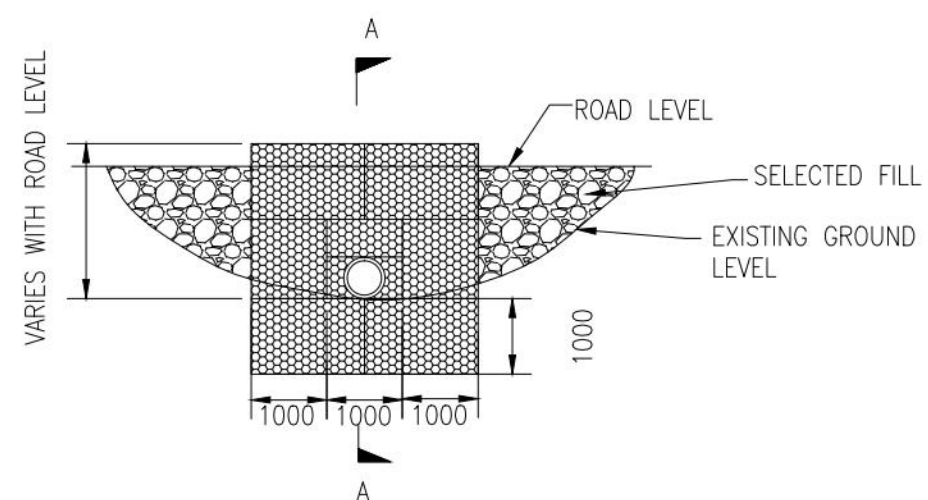
1. All dimensions are in millimetres unless otherwise stated
2. The culvert details are indicative. the type and size of culvert specified will depend on further hydrological studies, design work & consultation with NRW
3. Minimum diameters and invert levels are based on CIRIA recommendations
4. Edge protection barriers and road markers to be located as required

TWIN WALLED PIPE 450 DIAMETER ON SINGLE SIZE BEDDING

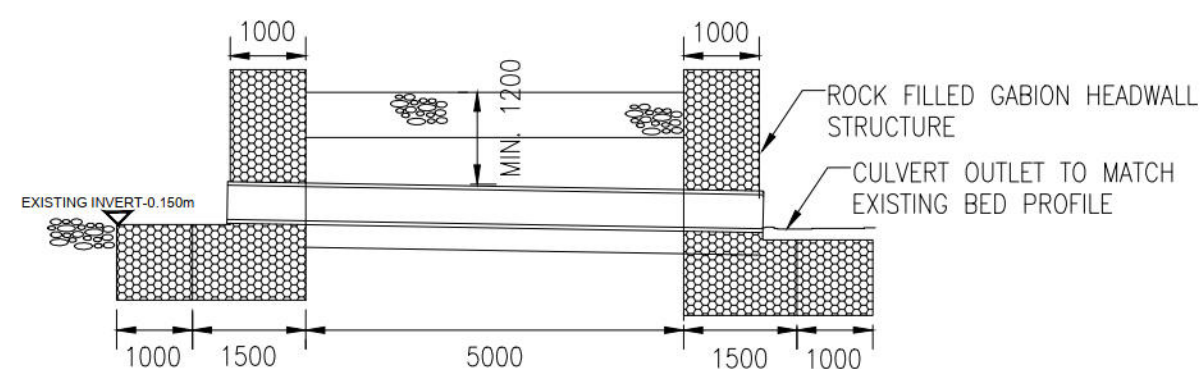
GABION BASKET STRUCTURE

SITE TRACK

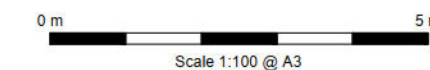
PLAN VIEW OF CULVERT



ELEVATION ON CULVERT HEADWALL

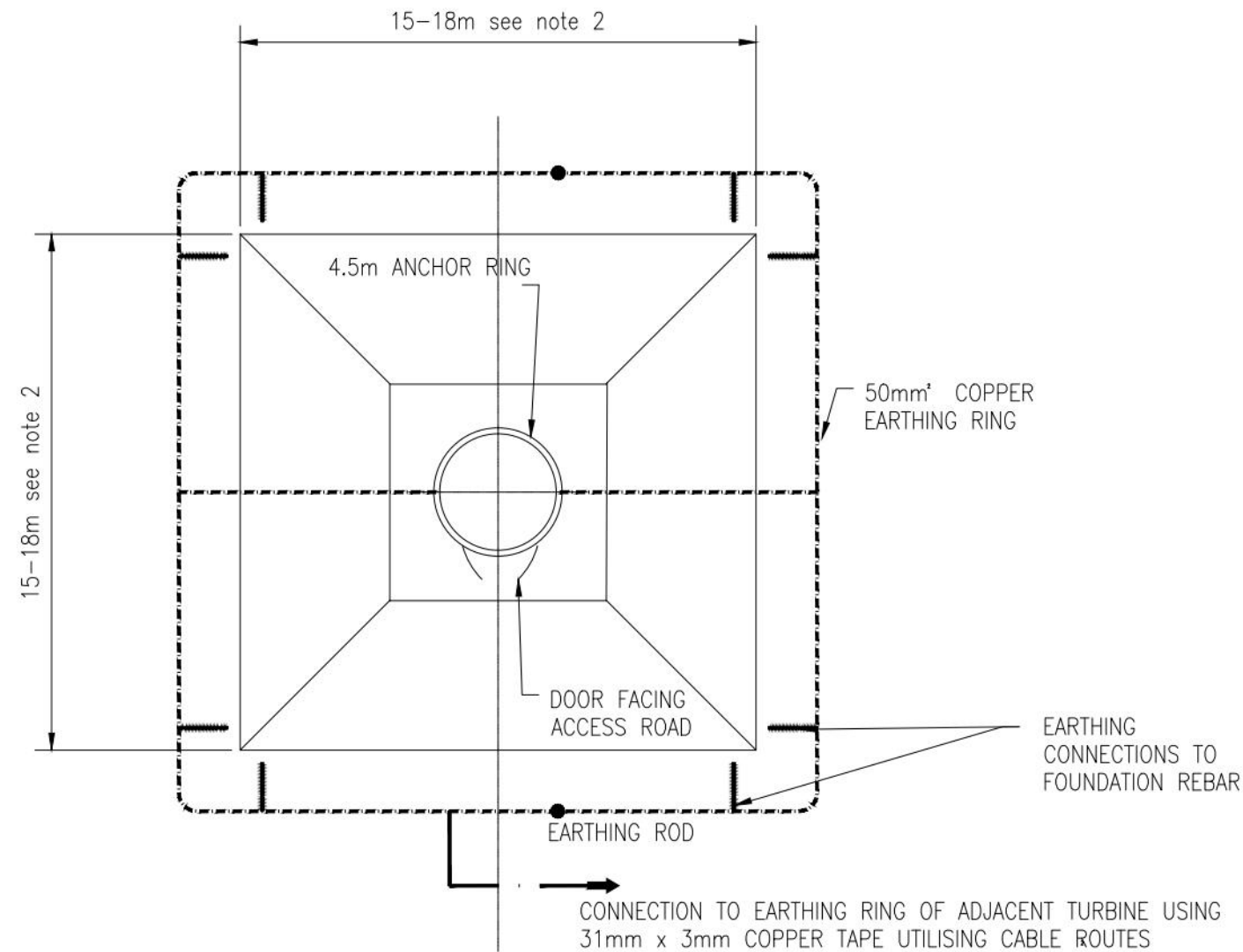


CROSS SECTION A-A THROUGH CULVERT

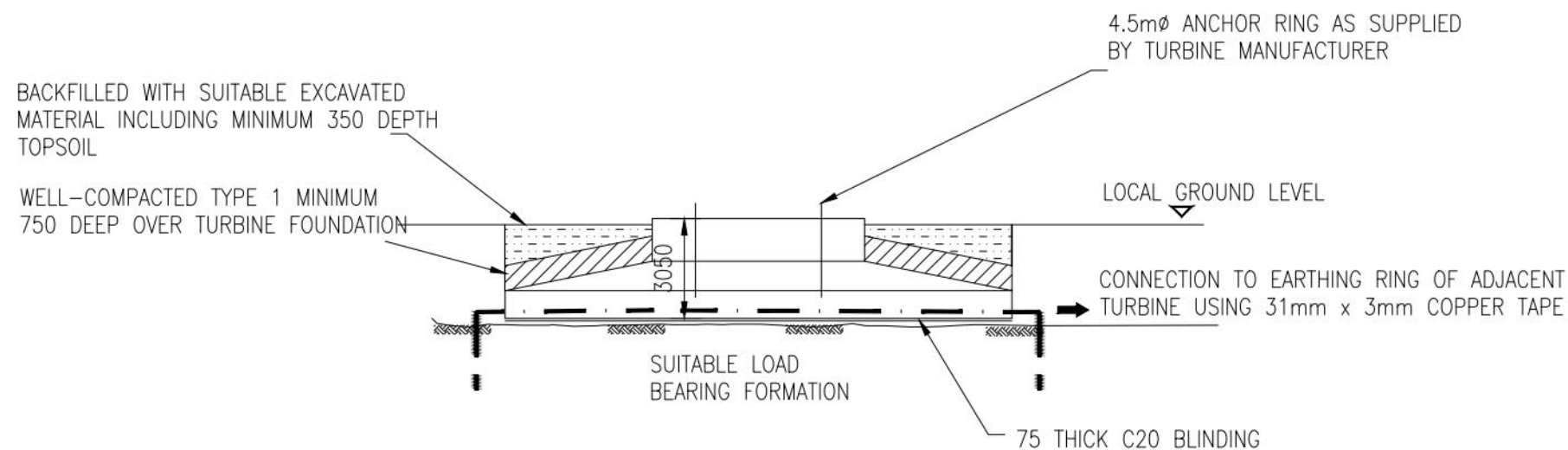


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Environmental Statement

Figure 5.4
Culvert Detail



FOUNDATION ON SUITABLE BEARING



SECTION THROUGH RC TURBINE BASE

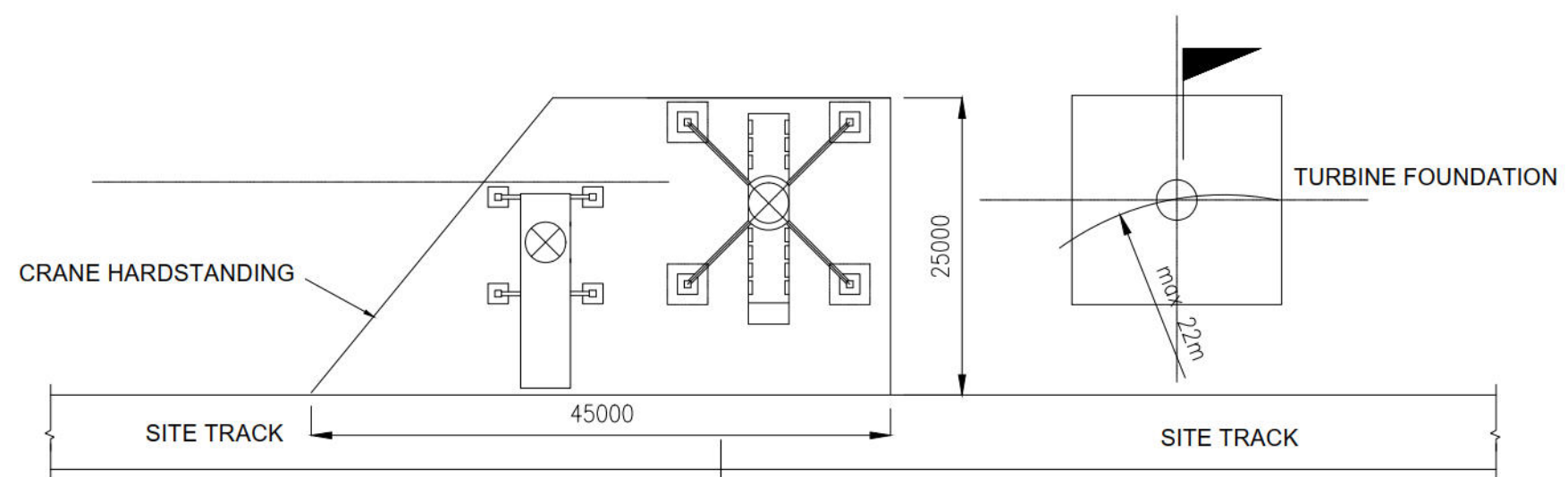
Notes:

1. All dimensions are in millimetres unless otherwise stated
2. The foundation size is indicative only and will depend upon ground conditions, groundwater level and wind loadings
3. Inserts and ducting to be supplied by turbine manufacturer
4. Earthing details are indicative, subject to turbine supplier approval
5. Suitable formation to be specified by turbine supplier

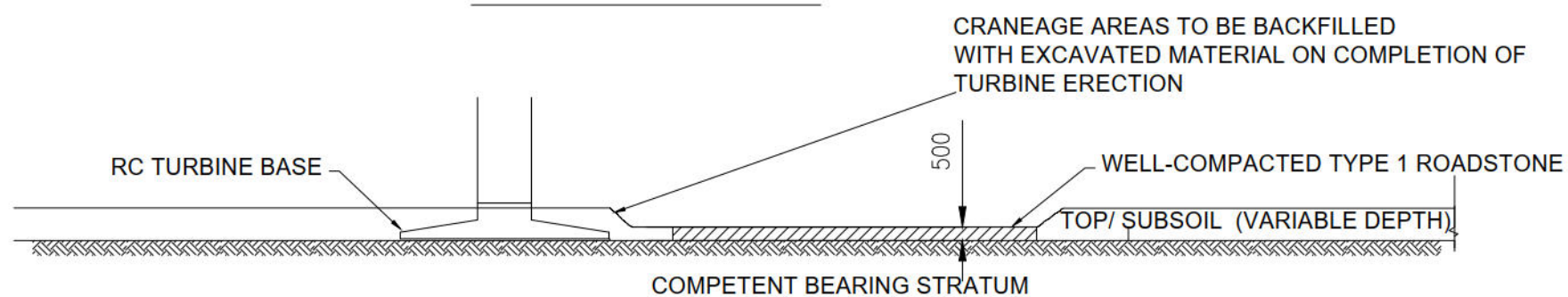
0 m 10 m
Scale 1:200 @ A3

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Foel Trawsnant Wind Farm
Environmental Statement

Figure 5.5
Turbine Pad Foundation



TYPICAL PLAN



TYPICAL SECTION

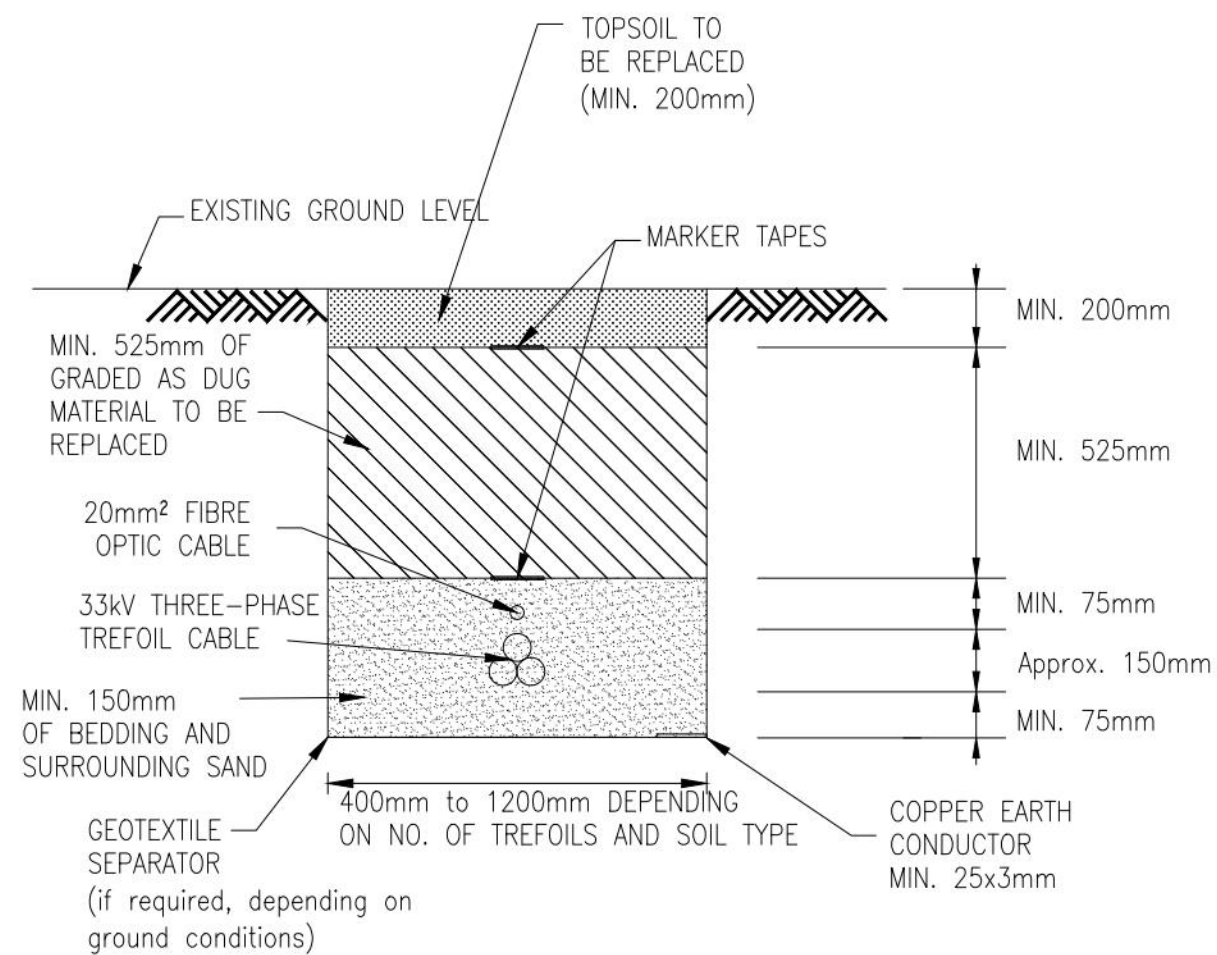
Notes:

1. All dimensions are in millimetres unless noted otherwise
2. Craneage areas are to be accurately levelled
3. If no suitable bearing stratum is found then piling will be required

0 m 30 m
Scale 1:500 @ A3

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FoeIT Trawsant Wind Farm
Environmental Statement

Figure 5.6
Crane Hardstanding



TYPICAL CABLE TRENCH DETAIL

(Typically adjacent to site tracks)

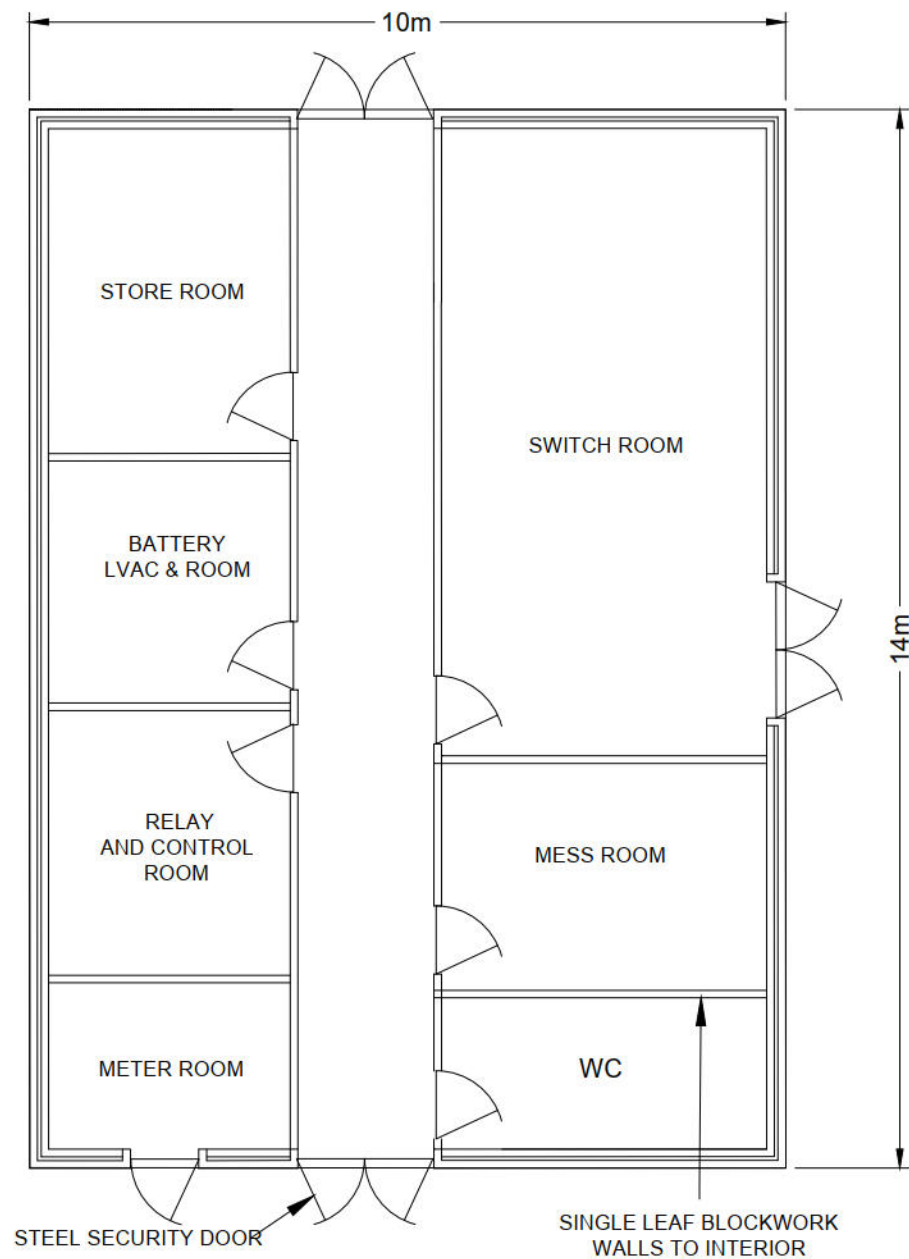
Notes:

1. Cable routes to run adjacent site roads
2. Above ground cable markers to be located as required

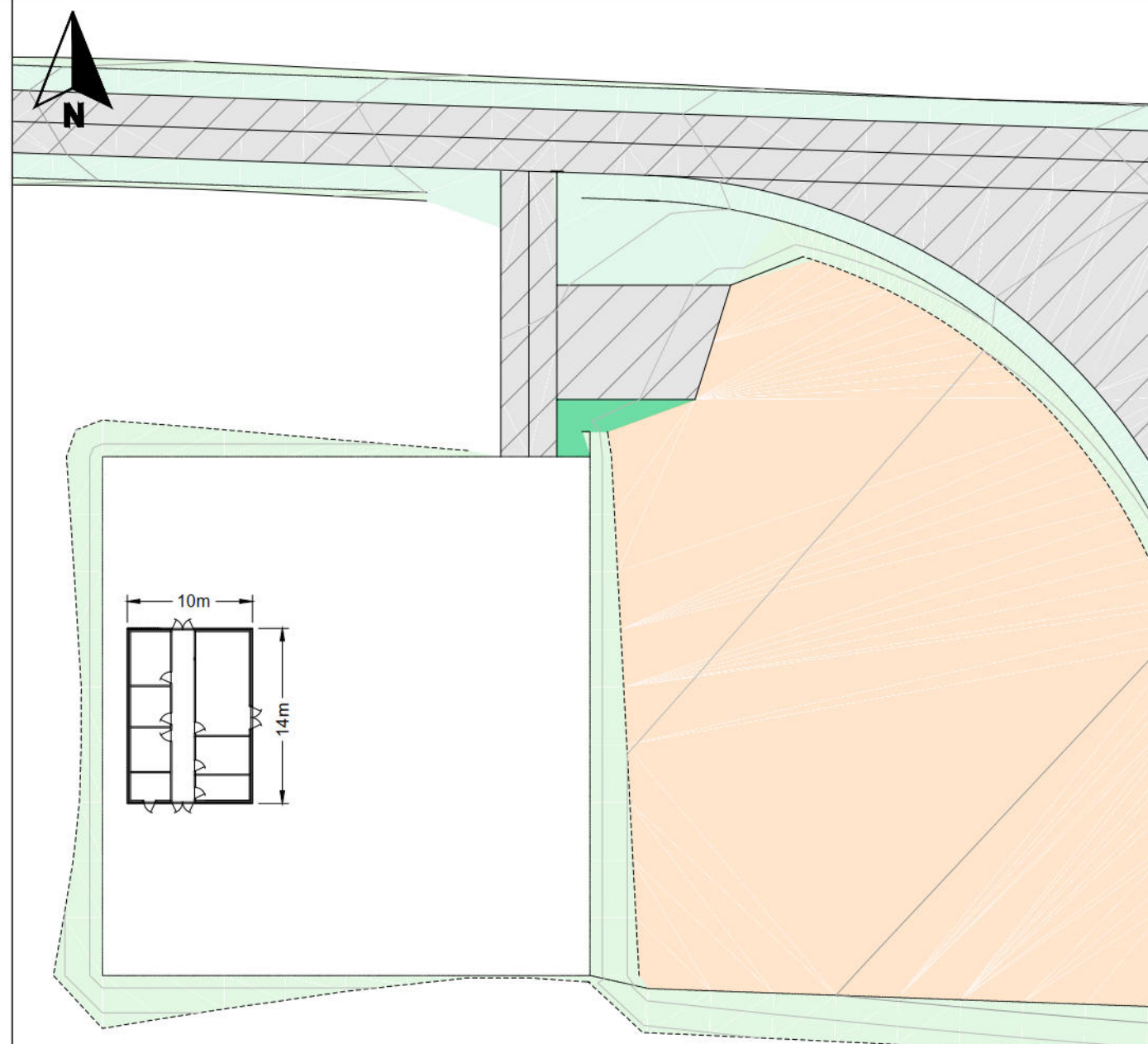
Not to Scale

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Environmental Statement

Figure 5.7
Cable Trench Detail



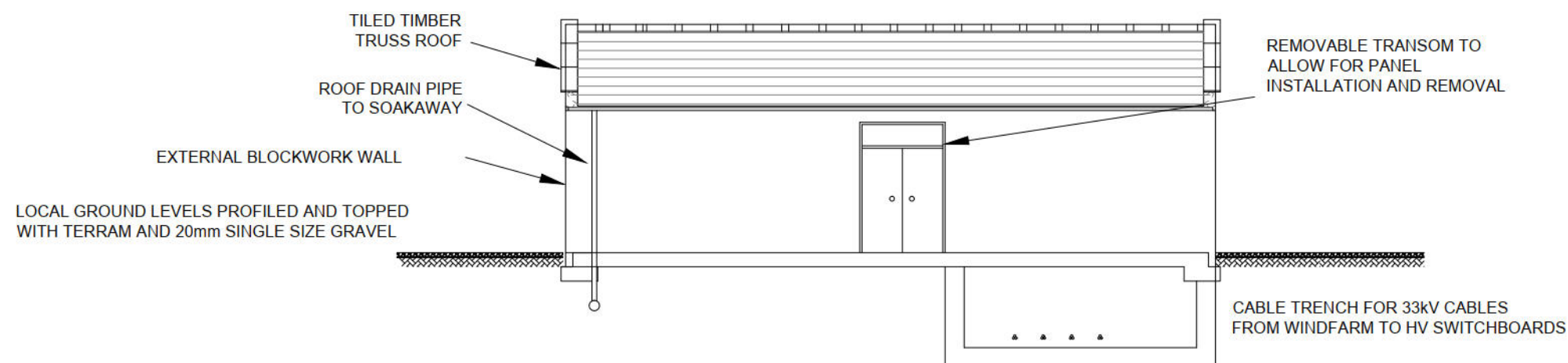
PLAN OF CONTROL BUILDING DETAIL
SCALE 1:100



PLAN OF CONTROL BUILDING IN COMPOUND
SCALE 1:25

Notes:

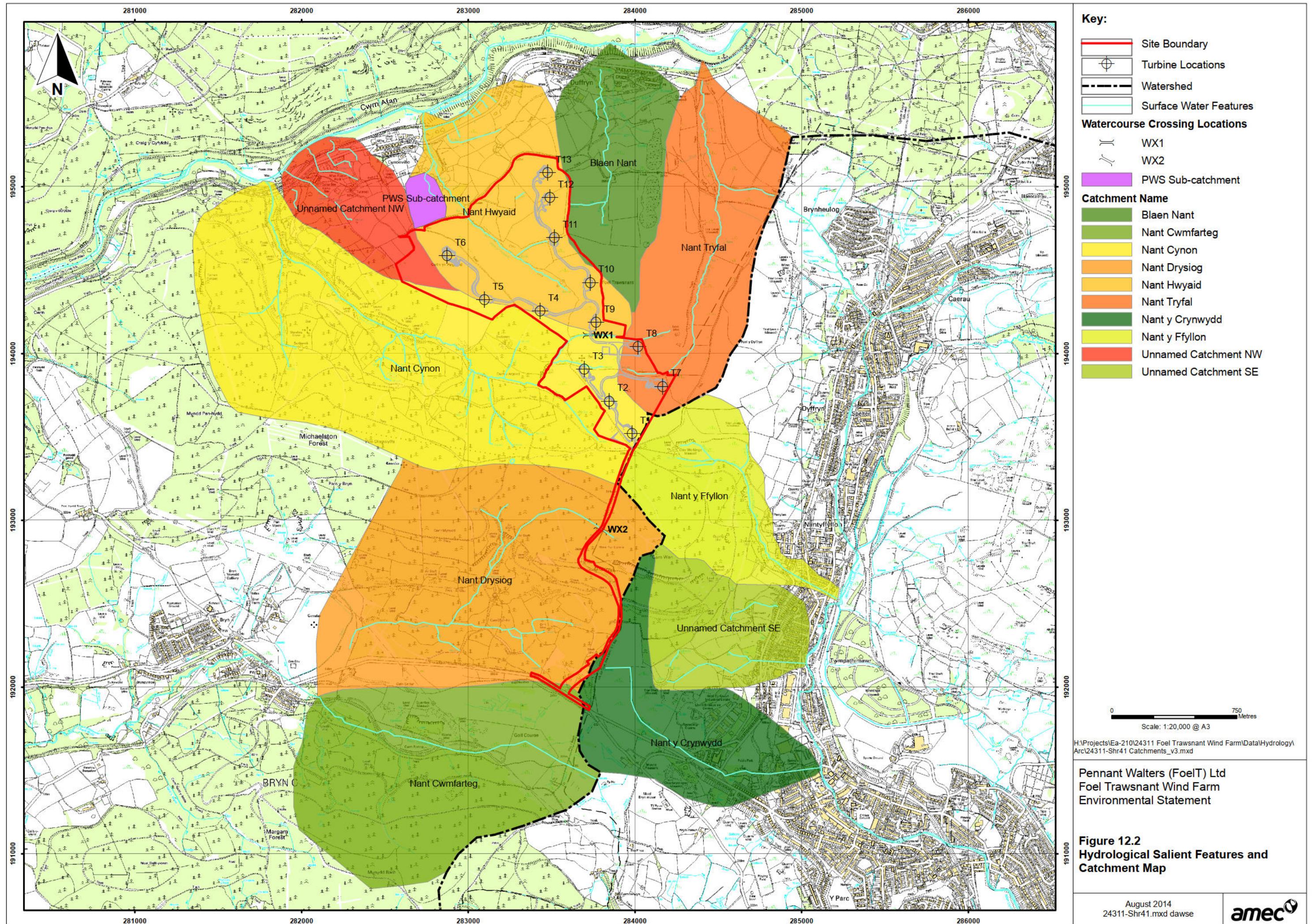
1. All dimensions are in metres unless noted otherwise
2. The control building and substation size is indicative pending further design work
3. Septic tank and water supply to be provided by others



ELEVATION OF CONTROL BUILDING
SCALE 1:25

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Figure 5.8
Site Control Building & Substation Compound



Appendix C – Flood Risk and Drainage Statement



Pell Frischmann

Alerion Foel Trawsnant

Flood Risk and Drainage Statement

September 2026

10110890

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02		First Issue	27/05/2026	D Warren	D Warren	S McGarva
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- Appendix A: Drainage Layout Plan
- Appendix B: Microdrainage Calculations

1 Introduction

1.1 Purpose of the Report

Pell Frischmann Consultants Limited (PF) has been commissioned by Alerion (“the Applicant”) to undertake a combined Flood Risk and Drainage Report (FRDR) to support a planning application for the creation of a wind farm development. The Proposed Development is located approximately 1 kilometres (km) west of Maesteg within the Bridgend County Borough Council (Cyngor Bwrdeistref Sirol Pen-y-bont ar Ogwr) administrative area.

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1.2 Report Structure

Following this introduction, the report is structured as follows:

- Section Two describes the Proposed Development;
- Section Three details the flood risk in the vicinity of the site;
- Section Four details the initial drainage proposals developed; and
- Section Five provides a summary of the report.

1.3 Sources of Information

A review of the relevant information from a range of sources has been undertaken and includes the following:

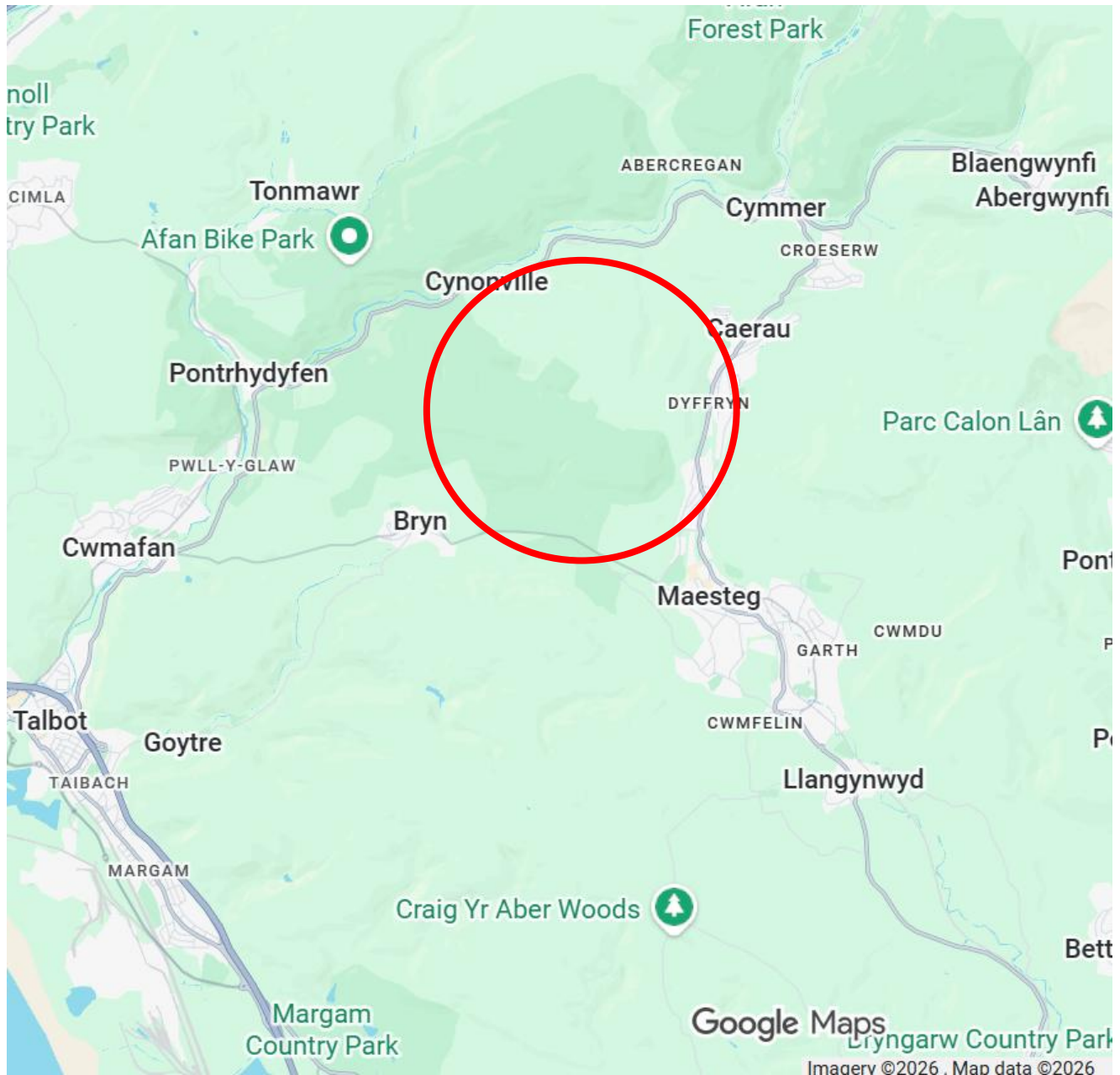
- Planning Policy Wales (PPW) Edition 11, 2021;
- Technical Advice Note 15 (TAN 15): Development, Flooding and Coastal Erosion, 2025;
- Flood and Water Management Act 2010 (SuDS implementation 2019); and,
- Statutory SuDS Standards for Wales, 2018.

2 Development Description

2.1 Development Location and Layout

The Site is located approximately 1 kilometres (km) west of Maesteg and approximately 10km to the south-east of Neath. The location of the Site is shown in Figure 2-1.

Figure 2-1 Proposed Development Location



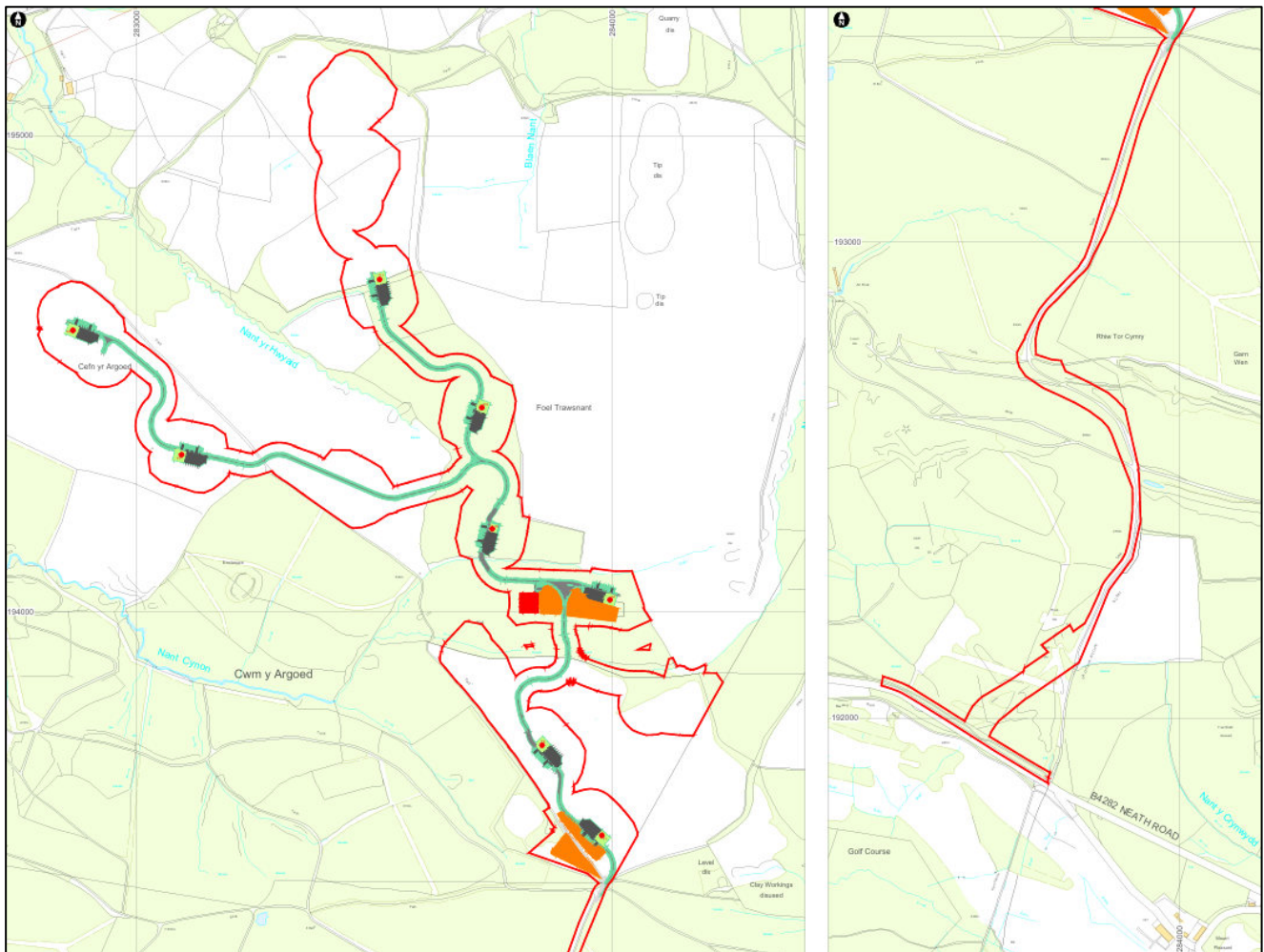
The proposed development would include:

- Up to 8 no. wind turbines with a maximum height to blade tip of 145m;
- A permanent substation and compound;
- Two temporary construction compounds;
- Temporary site offices;
- Crane pads and cabling;
- Access track construction; and

- Minor highways works on the B4282 to accommodate a new site access.

The layout of the Proposed Development is illustrated in Figure 2.2.

Figure 2-2 Proposed Development Layout



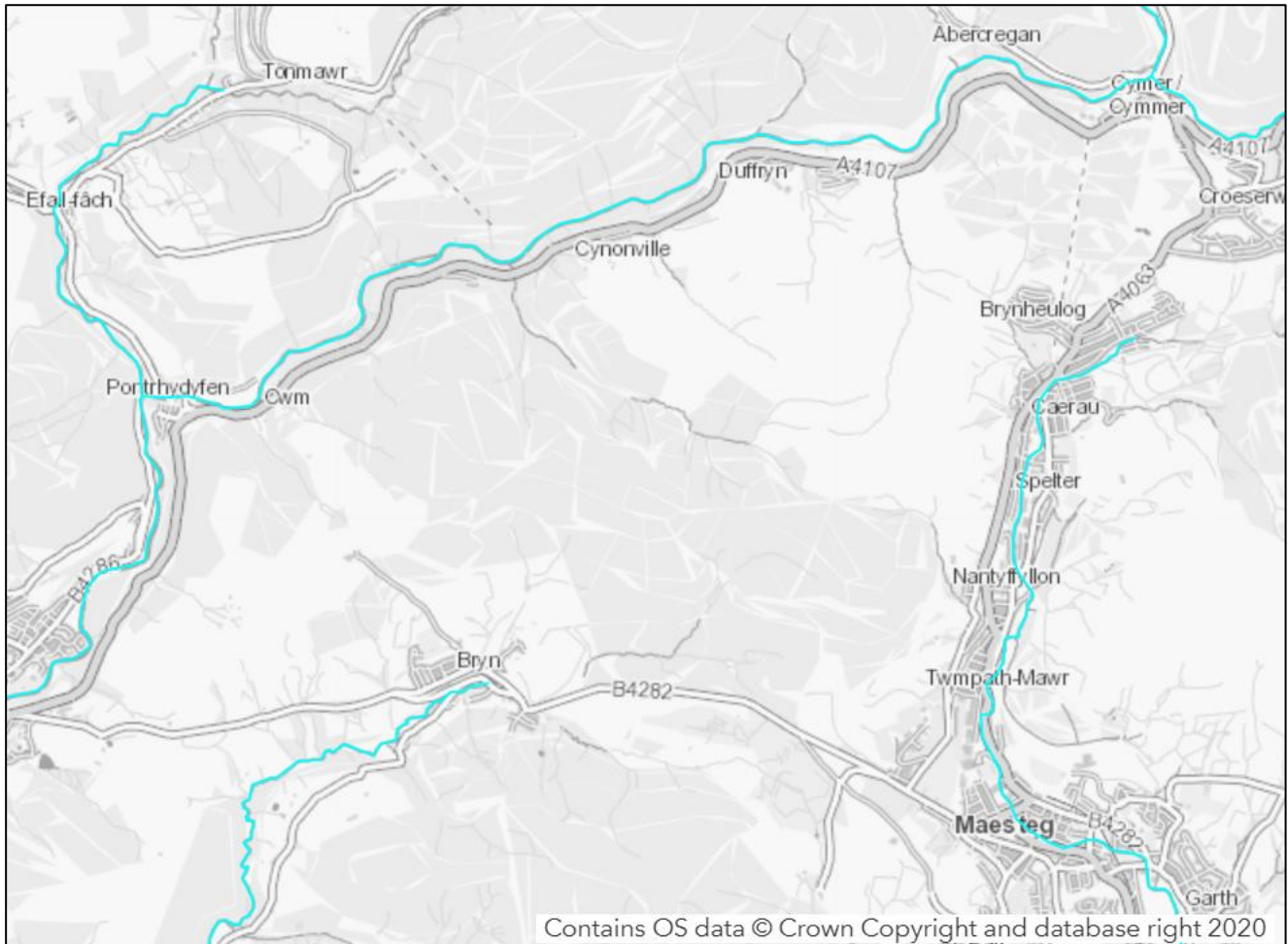
The proposed development is to be constructed in phases with preliminary works to include the new access track linking the B4282 Neath Road with the existing NRW access track on site. Phase 1 will include the construction of a new tie in to the existing NRW track, Phase 2 will be the formation of a new bell mouth junction off the B4282, Phase 3 will consist of the track linking the two, and then future phases will follow which will build out the whole site.

It is proposed that for each phase, a detailed design package is produced which will include detailed drainage design including SuDS, and an accompanying SAB application. The detailed designs will follow the principles set out in this surface water drainage strategy document.

2.2 Local Watercourses

A review of the Natural Resource Wales dataset shows no main rivers within and around the Site. The Llynfi on Ogmore extends from North to South within Maesteg but is out with the catchment boundary for the site. This can be seen in Figure 2-3.

Figure 2-3 Local Watercourses



2.3 Site Geology

Geological Survey (BGS) mapping indicates pockets of the Site are underlain by a superficial geology comprising Till, Devensian-Diamicton. These sedimentary deposits are glacial in origin. They are detrital, created by the action of ice and meltwater, they can form a wide range of deposits and geomorphologies associated with glacial and inter-glacial periods during the Quaternary. The remainder of the Site is shown to have no recorded superficial geology. An extract of the BGS superficial geology mapping is included as Figure 2-4. This glacial till is considered to typically have low permeability.

BGS mapping shows the majority of the Site to be primarily underlain by a bedrock geology formed of Rhondda Member-Sandstone, with smaller bands of Llynfi Member-Mudstone, siltstone and sandstone, South Wales Upper and Middle Coal Measures Formation-Mudstone, siltstone and sandstone and South Wales Middle Coal

Measures Formation-Sandstone. An extract of the BGS superficial bedrock mapping is included as Figure 2-5. The Rhondda Member sandstones typically have a low to moderate primary intergranular permeability.

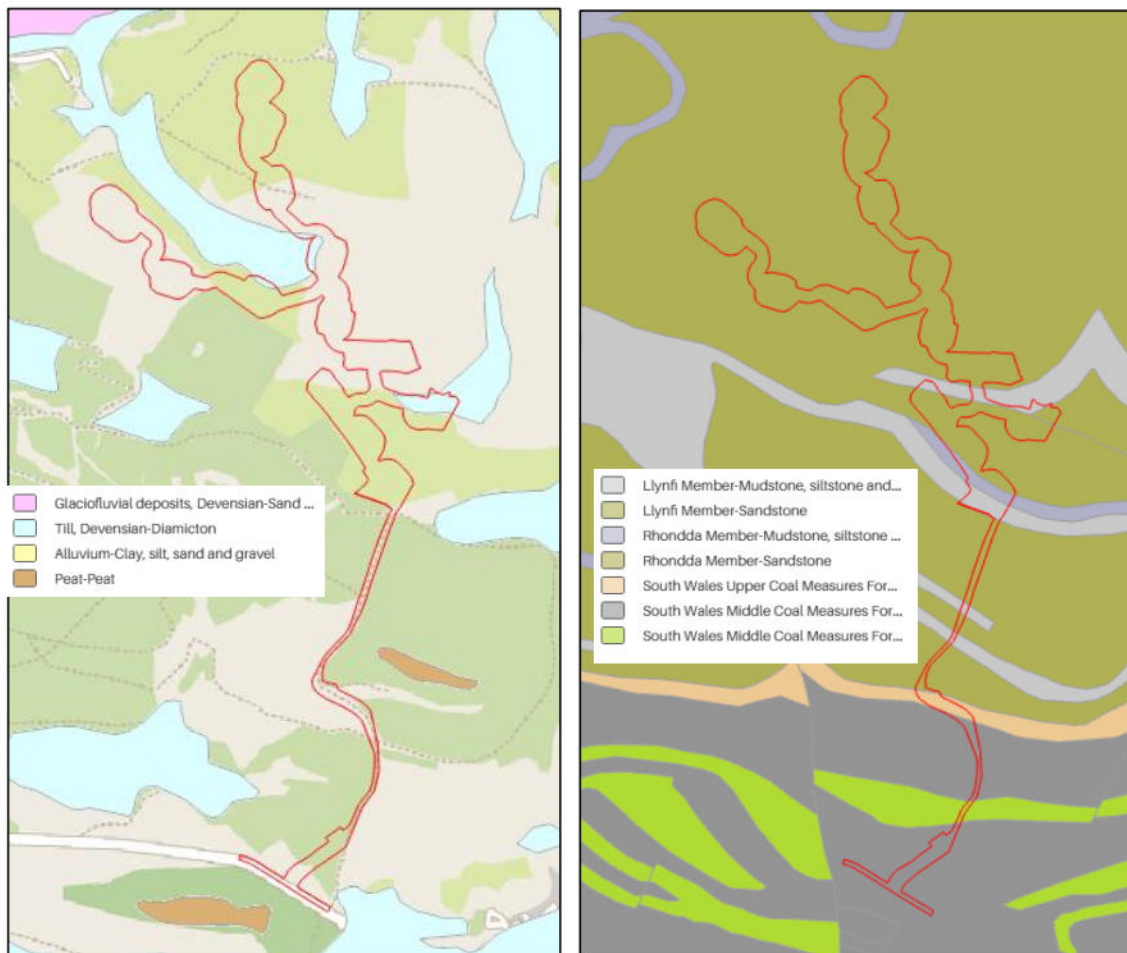


Figure 2-4 Superficial geology (left)

Figure 2-5 Bedrock geology (right)

Borehole records on BGS borehole GeoIndex shows the presence of a number of boreholes immediately adjacent to the Site boundary. However, the details of these boreholes have not been recorded onto the GeoIndex and so no further details are available for them.

Aquifer designations by DEFRA show the superficial drift classification to be small parcels of Secondary Undifferentiated within the Site. This is defined as when it is not possible to attribute a classification of Secondary A or B due to the rock type having variable characteristics, they contain only minor value.

The bedrock strata has been wholly classified as Secondary A. This is defined as permeable layers capable of supporting water supplies at a local rather than strategic scale and in some cases forming an importance source of base flow to rivers.

Historic Mine Workings

The Mining Remediation Authority Map Viewer¹ has been used to establish the location and extents of historic mine workings on site. Figure 2-6 illustrates the coal seams and past shallow mine workings (blue) located both on site and immediately adjacent to the site. There are also noted probable shallow coal mine workings (purple), mine entries (cross & dot) and Development High Risk Areas (hatched with the black and white cross

¹ <https://datamine-cauk.hub.arcgis.com/>

hatch). These high risk areas represent a designated spatial zone containing recorded coal mining legacy features at the surface or shallow depth that pose potential risks to surface stability and public safety². The construction of infiltration drainage in these areas requires extreme caution as introducing concentrated surface water into the ground above historic coal mining activity can trigger severe safety and structural issues.

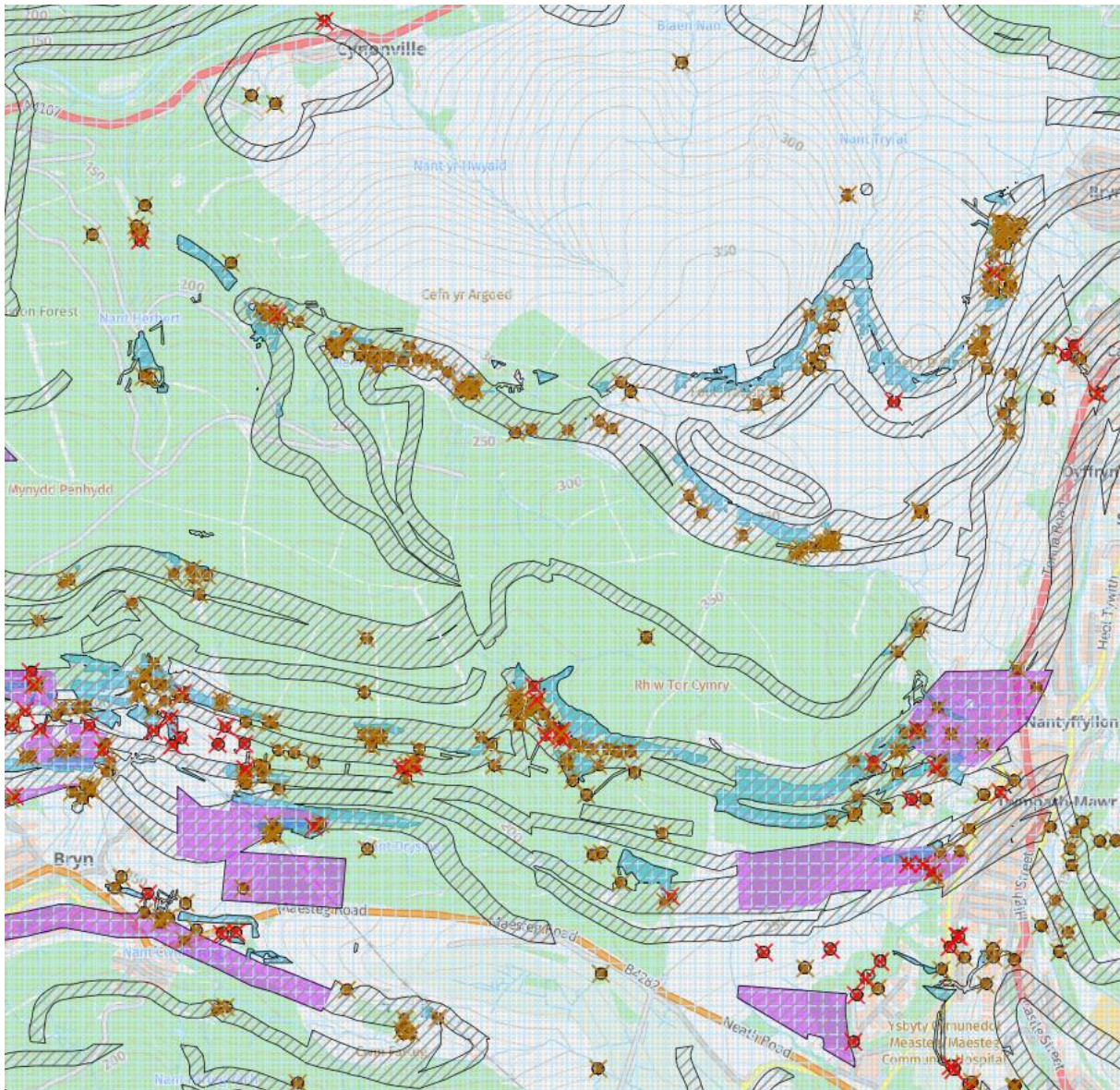


Figure 2-6 Mining Remediation Authority Map Viewer Plan

Infiltration SuDS features such as soakaways and infiltration basins are unsuitable for surface water disposal in these areas due to major geotechnical, environmental, and structural risks associated with the historic shallow coal mining. This includes:

Risk of Ground Instability and Mine Collapse

Discharging surface water directly into the sub-surface can soften surrounding mudstones and shales, weakening mine pillars (pillar degradation) and causing room-and-pillar void collapses. Infiltrating water can wash out overburden/fines into shallow coal seams or unrecorded mine workings, triggering sudden sinkholes,

² <https://www.data.gov.uk/dataset/b39be416-c1ca-41a0-ba0d-f32e6a1f6c31/coal-development-high-risk-area>

ground collapse or crown holes at the surface. Flooding adits (horizontal mine shafts) or vertical shafts can lubricate weak backfill material, leading to shaft settlement or sudden shaft blowout.

Mobilization of Mine Water Pollution

Water passing through historic coal seams reacts with iron pyrite (FeS_2), causing oxidation that produces acidic, iron- and sulfate-rich water, known as Acid Mine Drainage (AMD). High water flow through old workings mobilizes heavy metals (e.g., iron, manganese, aluminum) and leaches them into nearby watercourses or deep aquifers, violating Natural Resources Wales (NRW) water quality objectives.

Hydraulic and Hydrogeological Hazards

Excess infiltration can artificially elevate the local water table within connected mine workings, causing acidic mine water to break out at low-lying adit outlets or off-site surface locations, which would be uncontrolled. Uncontrolled subsurface water flow compromises the soil bearing capacity and ground stability directly under heavy wind turbine bases, access roads, and crane pads.

Suitable Alternatives

To prevent ground collapse and pollution while managing site runoff, drainage strategies in these areas must focus on non-infiltrating SuDS features:

- Attenuated Surface Outfalls: Attenuation ponds or detention basins lined with impermeable clay or geosynthetic liners (GCL) to prevent infiltration.
- Controlled Outfalls: Discharging attenuated surface runoff directly into nearby surface watercourses at Greenfield rates, as approved by NRW and the local SuDS Approval Body (SAB).

3 Policy Context

3.1 National Planning Policy Framework & Planning Practice Guidance

- Planning Policy Wales (PPW) (Edition 11, 2021; updated periodically)
The overarching planning policy for Wales. Requires development to avoid areas at flood risk where possible, ensure no increase in flood risk elsewhere, and incorporate sustainable drainage systems (SuDS) and climate resilience.
- Technical Advice Note 15 (TAN 15): Development, Flooding and Coastal Erosion (2025)
The primary flood risk policy in Wales. Introduces a risk-based approach using Flood Map for Planning (NRW), requires Flood Consequences Assessments, and ensures development demonstrates acceptable flood risk over its lifetime, including climate change allowances.
- Flood and Water Management Act 2010 (implemented for SuDS in Wales from 2019)
Legislation requiring sustainable drainage systems (SuDS) for most developments. Drainage must be approved by the SuDS Approval Body (SAB) and must not increase surface water flood risk.
- Statutory SuDS Standards for Wales (2018)
Provides technical requirements for drainage design. Requires runoff to be managed at greenfield rates, prioritises infiltration, and ensures developments mimic natural drainage patterns.

3.2 Local Planning Policy

- Bridgend Local Development Plan (LDP) (Adopted 2013; Replacement LDP 2018–2033 adopted 2024)
Sets local planning policies for the Maesteg area. Includes requirements to avoid development in flood risk areas in line with TAN 15, ensure appropriate drainage strategies and SuDS are in place, and protect local watercourses and hydrological systems.

4 Flood Risk

4.1 Natural Resource Wales Flood and Coastal Erosion Maps

Flooding can occur from a variety of sources individually, or in combination and can result from both natural and artificial processes.

Table 4-1 provides an initial desk-based review of the level of flood risk from all sources, which are then assessed in further details where the risk is considered significant and merits further investigation.

Table 4-1 Desk-Based Assessment of Flood Risk

Sources of Flood Risk	Degree of Risk			Comments
	Significant	Moderate	Low	
Fluvial			X	The Site is wholly within Flood Zone 1.
Coastal & Tidal			X	The Site is removed from the extent of tidal flooding, now and in the future.
Groundwater			X	Low potential susceptibility to groundwater flooding across the area.
Surface Water			X	A flow path can be seen running through the Site.
Sewers			X	Limited extent of sewers in the immediate vicinity with low risk from sewers along roads.
Canals			X	None nearby.
Reservoirs & Waterbodies			X	Low risk posed.

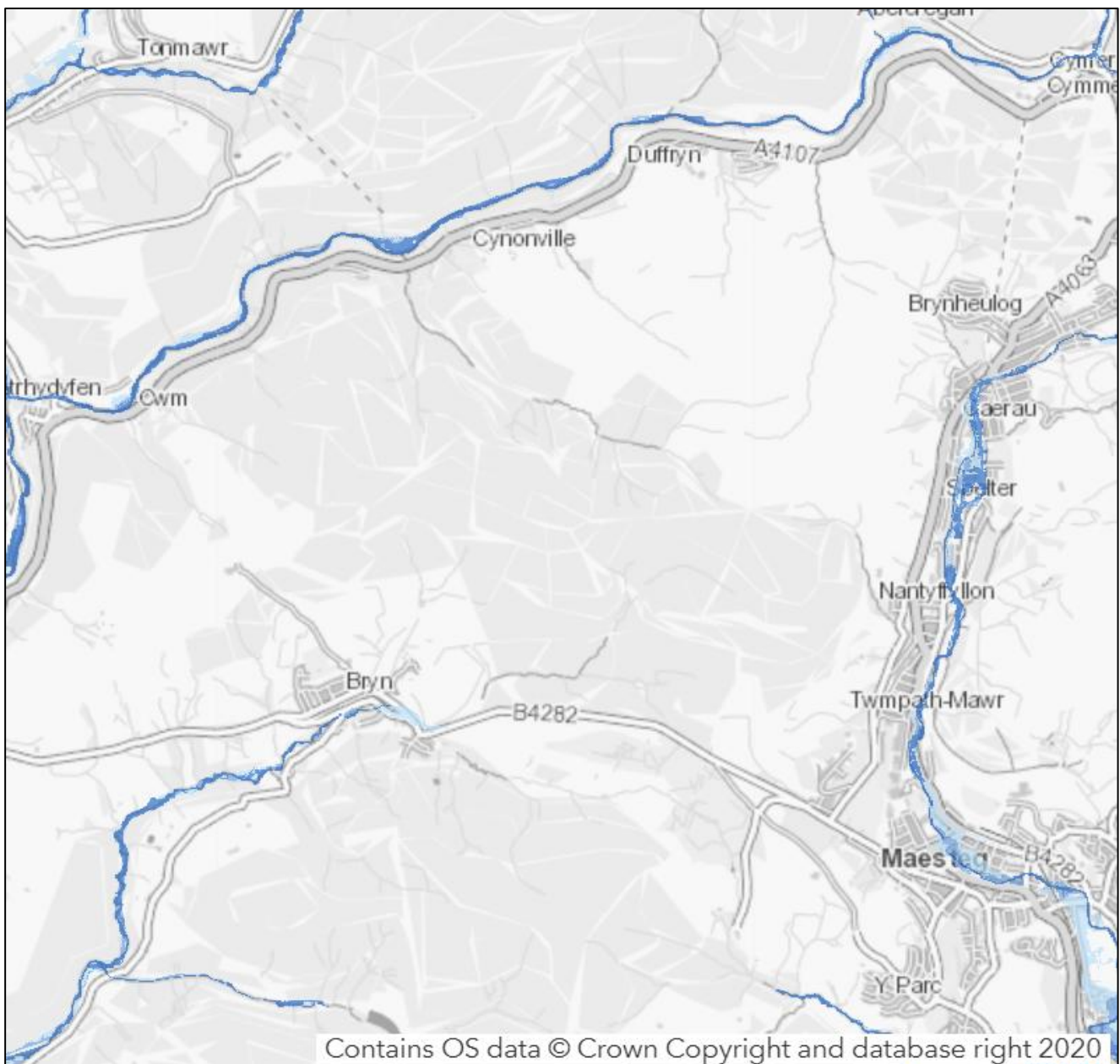
4.2 Fluvial Flood Risk

Natural Resources Wales (NRW) has produced the Flood Map for Planning, which identifies areas at risk of flooding from rivers and the sea. An extract of this mapping is provided as Figure 4.1.

The mapping shows that the Site lies entirely within Flood Zone 1, which is defined as land at low probability of flooding. There are no main rivers or significant watercourses located within the Site boundary, and the NRW flood mapping indicates that the Site is not affected by fluvial flooding.

As such, the Site is considered to be at low risk of flooding from rivers and local watercourses.

Figure 4-1 Flood Map for Planning



4.3 Coastal & Tidal

The Site is located inland and is not hydraulically connected to any coastal or tidal waterbodies. Based on its location and topography, there are no pathways for tidal influence or coastal inundation to affect the Site.

4.4 Surface Water (Pluvial)

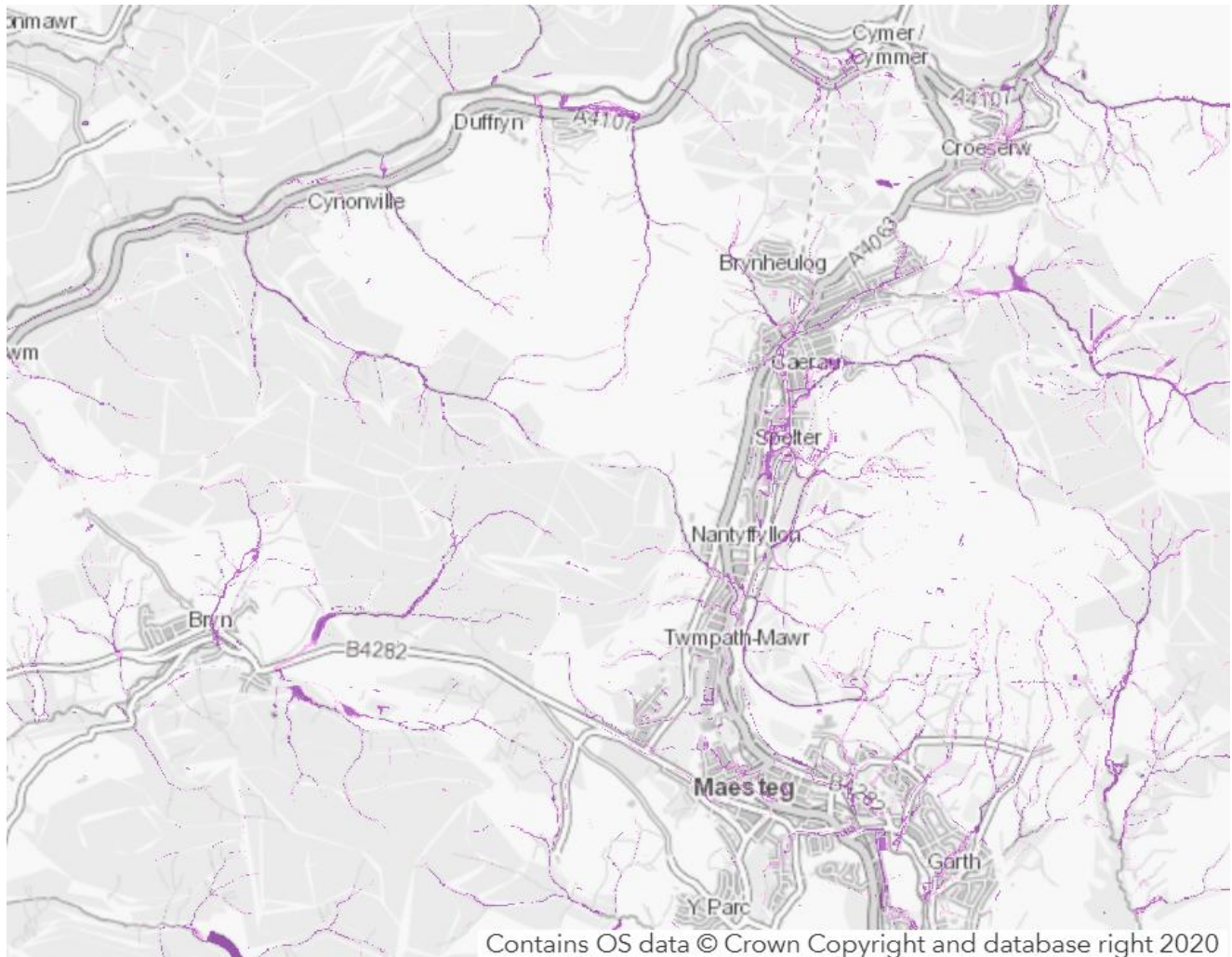
The mapping indicates the Site to generally be at a low risk of flooding from surface water. Despite this, surface water flow routes are identified throughout the Site, following the approximate route of small watercourses.

It should be noted, the mapping used by Natural Resource Wales to provide the risk of flooding from surface water does not take into account continual losses to the ground through infiltration. Whilst infiltration rates are

likely to be low due to the underlying geologies. It is likely there would be some loss, resulting in a reduction of the flows through the centre of the Site.

Due to the above, the risk posed to the Site from surface water flooding is considered to be low and thus mitigation will not be required. An extract of the mapping used can be found in Figure 4-2.

Figure 4-2 Surface Water Flooding



4.5 Sewers

Flooding from sewers typically results from the network capacity being exceeded or blockage of key elements. Flooding usually occurs by way of surcharging manholes, gullies or other features that allow water from sewers to reach the surface, resulting in overland flows that can affect nearby properties.

Records do not show private sewer infrastructure or the existence of a private sewer network within the Site boundary.

Given the above, the Site is considered to be at low of flooding from sewers.

4.6 Canals

There are no canals present that pose a risk to the Site, as such the risk of flooding from this source is

considered to be negligible.

4.7 Reservoirs

This mapping confirms that there are no reservoirs located within or in proximity to the Site, and no potential inundation pathways affecting the Site have been identified.

4.8 Impact of the Proposed Development

The Site is not within defined floodplains or nearby watercourses and is unlikely to detrimentally affect floodplain volumes or conveyance routes.

The introduction of an increased impermeable footprint on the Site would give rise to an increase in the rates and volumes of water being discharged if not managed appropriately. This could result in increases in flood risk downstream and would require suitable mitigation.

5 Drainage Water Drainage Strategy

5.1 Drainage Layout

The proposed drainage layout and standard details for the Proposed Development are shown in Drawings 10110902_PF_DR_0001-0003 (Appendix A).

Current best practice relating to sustainable surface water management is outlined in the SuDS Manual (CIRIA Report C753) which provides details on the use of SuDS for managing surface water runoff:

- Prevention – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (e.g. minimise areas of hard standing).
- Source Control – control of runoff at or very near its source (such as the use of rainwater harvesting, permeable paving or green roofs).
- Site Control – management of water from several sub-catchments (including routing water from roofs and car parks to one or several soakaways or attenuation ponds for the whole site).
- Regional Control – management of runoff from several sites, typically in a retention pond or wetland.

It is generally accepted that implementation of SuDS, as opposed to conventional drainage systems, provides several benefits by:

- Reducing peak flows to watercourses or sewers and potentially reducing the risk of flooding downstream.
- Reducing the volumes and frequency of water flowing directly to watercourses or sewers by removing pollutants from diffuse pollutant sources.
- Improving water quality over conventional surface water sewers by removing pollutants from diffuse pollutant sources.
- Reducing potable water demand through rainwater harvesting.
- Improving amenity through the provision of public open spaces and providing biodiversity and wildlife habitat enhancements.
- Replicating natural drainage patterns, including the recharge of groundwater so that the baseflows are maintained.

The Surface Water Drainage Strategy for the Proposed Development will comprise the management of surface water runoff from the hardstanding and impermeable areas. In accordance with CIRIA Report C753, the hierarchy for favoured disposal of surface water runoff from development sites is as follows:

- Water reuse, where a demand is identified.
- Infiltration to Ground, where ground conditions permit.
- Discharge to Surface Waters.
- Discharge to Sewer.

No water demand is present on site and so water reuse has been discounted.

On site BRE365 soakaway testing is often required to provide verification as to the infiltration capabilities of a site, however due to the nature of the historic workings on site, as noted in section 2.3, it is highly possible that during testing an area of shallow workings or mine entry/adit may be encountered which would provide an unrealistic infiltration rate. It may also be unsafe to undertake this testing in certain circumstances due to the instability risks noted above.

Based upon the geological information included in Section 2.3, the conditions on site are considered not favourable for infiltration drainage. As such the drainage strategy discounts this discharge method and is based upon discharge to watercourses.

5.2 Existing Runoff

Greenfield runoff rates have been estimated through application of methodology outlined in IH124 as set out within the Interim Code of Practice for SuDS (ICPSuDS). The IH124 method can be used to estimate Greenfield runoff rates for a range of Annual Exceedance Probability (AEP) events or return periods by applying regional growth curve factors to the mean annual peak runoff (i.e. QBAR). The UK hydrological region for the Site is Region 9 therefore the appropriate growth curve factors for this region have been incorporated into the analysis undertaken in the MicroDrainage software suite. The hydrological characteristics for the catchment have been incorporated into the runoff modelling and results are presented below in Table 5-1 for a range of AEP storm events. Full Calculations are included in Appendix B.

- Site Area: Substation Platform – 0.16ha; Turbine Hardstanding – 0.25ha; Construction Compound – 1ha
- Average Annual Rainfall (SAAR): 1644
- Soil Index: 0.4
- UK Hydrological Region: 9
- Urban Extent: 0

Table 5-1 Estimation of Greenfield Runoff Rates (Pre-development)

AEP (%)	Return Period	Greenfield Runoff (l/s/ha)
50	2	11.10
	<u>QBAR</u>	11.95
3.3	30	21.08
1	100	26.05

5.3 Proposed Runoff Rates

In accordance with DEFRA guidance³ the limiting discharge rate for surface water drainage from impermeable surfaces on the proposed development should be limited to the greenfield runoff for the equivalent return period. Therefore, the discharge restrictions for the substation, turbine hardstanding and construction compound are detailed in Table 5-2. As a conservative approach it has been assumed that these areas would be 100% impermeable, however it is likely that a large portion of this would be constructed from crushed stone and would allow for a degree of infiltration.

Where the calculations show the limited discharge to be below 2l/s, a minimum of 2l/s has been used as this is the lowest flow rate achievable using a standing orifice plate to prevent blockages.

³ <https://assets.publishing.service.gov.uk/media/5a815646ed915d74e6231b43/sustainable-drainage-technical-standards.pdf>

Table 5-2 Proposed Discharge Restrictions

Location	Return Period	Limiting Discharge (l/s)	Attenuation requirements (m ³)
Substation (0.16ha)	2	1.78 (2)	98
	30	3.37	130
	100	4.17	155
Turbine Hardstanding (0.25ha)	2	2.78	166
	30	5.27	203
	100	6.51	242
Construction Compound 1 (0.45ha)	2	4.99	300
	30	9.49	366
	100	11.72	436
Construction Compound 2 (0.64ha)	2	7.10	427
	30	13.49	520
	100	16.67	620

5.4 Surface Water Attenuation

In order to treat and attenuation the surface water runoff prior to discharge, SuDS features are proposed which will facilitate this for each of the areas of hardstanding across the site. Each area of hardstanding listed in Table 5-2 will have an attenuation basin similar to that shown on drawing 10110902 PF DR C 00001 in Appendix A, to be sized to the commensurate requirement stated in the final column of Table 5-2.

Table 5-2 also presents proposed attenuation volumes required for each return period for each location on site based upon the limiting discharge rates. The 100yr events also include an upper end 45% uplift allowance for climate change.

It is proposed that the attenuation features are designed to accommodate the 1 in 30yr event, with any exceedance flows routing overland and into the surrounding ground. As the site is rural in nature, overland exceedance flows will be retained on site and will not have any impact upon buildings or third-party properties.

The final design of these features will be confirmed at the detailed design stage and approval through the SAB approval process, but these detailed designs will be in accordance with this surface water drainage strategy.

5.5 SUDS Features

The proposed strategy is based on sustainable drainage principles, employing SuDS features to manage the surface water runoff across the site. Principally, all surface water will ultimately be discharged into the small watercourses running through the site.

Whilst attenuation basins are principally selected to address the quantity of water that is to be attenuated, they also have water quality benefits, especially if planted with vegetation. They can also provide additional habitats for wildlife and increase biodiversity.

Trackside Drainage

The proposed typical trackside drainage layout for the Proposed Development is shown in Drawing 10110902_PF_DR_0001-0003 (Appendix A).

The ditches will be sized by the contractor at the detailed design stage to accommodate surface runoff from the track for the 1 in 30-year design storm event.

All permanent drainage should be installed concurrently with all adjacent infrastructure. All drainage channels should be sufficiently wide as is practicable to allow wildlife to safely enter and exit the channel. The channel banks shall be at a minimum slope of 1 in 3.

Permanent check dams should be specified at the detailed design stage. They should be spaced at regular intervals within the drainage ditches. Check dams are required to reduce the velocity and slow down sediment transportation while also preventing channel scour.

Check dams are proposed to be constructed of clean aggregate graded 50mm-300mm and embedded into the side walls and invert of the excavation by at least 100mm. The number and location of check dams will be dependent on the slope gradient with a minimum spacing of 1 check dam per 75m length of ditch.

The spacing of relief drains crossing the access tracks should be determined at the detailed design stage. The spacing of relief drains should not exceed 200m as per best practice.

In certain locations, the width of the track corridor will not be sufficient to allow trackside channels to be included, and so in those locations it is proposed to utilise filter drains running parallel to the tracks. These will collect the runoff from the track surface, provide treatment as it infiltrates to the perforated pipes at the base, and then route the flows to attenuation basins to provide further treatment and control of discharge from the site. The dimensions and gradients of these filter drains will be determined at the detailed design stage.

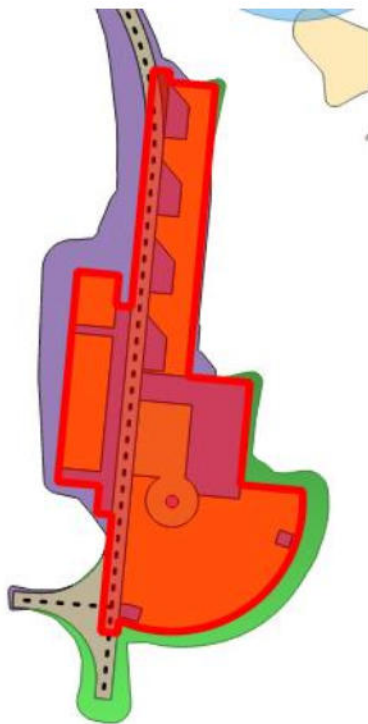
Attenuation Basins

Attenuation features will be located adjacent to and downslope of each turbine hardstanding area, with runoff shedding overland into the basin features. These will be vegetated basins and will allow any exceedance flows to overtop and shed back into the surrounding downslope, thus maintaining existing overland flow routes within the catchment. These flows eventually route into the watercourses within and adjacent to the site. The sizing of these is noted within Table 5-2.

The features will be designed to accommodate the 1 in 30 year event, with a conservative estimate of all flows from the temporary and permanent working areas contributing. This is shown by the red hatched areas in the typical hardstanding layout Figure 5-1.

.

Figure 5-1 Turbine hardstanding contributing areas



Water Quality

The Simple Index Approach for assessing pollution prevention outlined in the SuDS Manual has been used to quantify the water quality impacts of the proposed SuDS solution to determine their effectiveness.

The proposed use of the development would be considered a low pollution hazard level, so pollution values have been copied from the SuDS Manual and compared to the mitigation index values as per Table 5-3.

Table 5-3 SuDS Mitigation Indices (from CIRIA SuDS Manual)

SuDS Component	Mitigation Indices		
	<i>Total Suspended Solids</i>	<i>Metals</i>	<i>Hydrocarbons</i>
Land Use Pollution Index			
Low Traffic Roads	0.5	0.4	0.4
SuDS Mitigation Index			
Detention Basin	0.5	0.5	0.6
Mitigation Requirement Met?	Yes	Yes	Yes

Therefore, the detention basins are considered suitable SuDS features to manage the surface water pollution potential expected from the proposed development to ensure suitable water quality standards in the downstream receiving watercourses.

No interceptors are planned to be installed to treat water as the proposed SuDS features would provide the required levels of treatment for the runoff. If the land use pollutant index increased in the future, additional mitigation measures would be required and that may include interceptors, however natural SuDS features would be preferable where available space allows for them.

Biodiversity and planting

SuDs standards for Wales Standard 5 – Biodiversity – states that the design of the surface water management system should maximise biodiversity benefits. As such the below planting regime is recommended for the attenuation features on site.

To deliver Biodiversity Net Gain (BNG), planting must focus on UK-native species adapted to Welsh upland environments (often acidic or damp soils) while offering strong ecological value for pollinators, amphibians, and invertebrates.

1. Basin Base & Aquatic Margin (Permanently Damp / Frequently Inundated)

This zone lies at the bottom of the basin where water lingers longest or where a small permanent micro-pond/wetland pocket is maintained for ecological resilience. Recommended planting includes:

Table 5-4 Attenuation basin base planting

Common Name	Botanical Name	Ecological Benefit	Growth / Function
Marsh Marigold	<i>Caltha palustris</i>	Vital early-season nectar for early-emerging pollinators.	Clump-forming, spring-flowering broadleaf.
Yellow Flag Iris	<i>Iris pseudacorus</i>	Excellent cover and breeding habitat for dragonflies & damselflies.	Robust root architecture; aids in soil stabilization.
Water Mint	<i>Mentha aquatica</i>	High nectar source for hoverflies, bees, and aquatic larvae.	Aromatic, fast-spreading cover for water edges.
Purple Loosestrife	<i>Lythrum salicaria</i>	Late-summer nectar bar for long-tongued bees and butterflies.	Tall spikes providing structural diversity.
Soft Rush	<i>Juncus effusus</i>	Sheltering habitat for amphibians (e.g., Great Crested Newts, Toads).	Dense clumps that reduce flow velocities.
Jointed Rush	<i>Juncus articulatus</i>	Native cover for aquatic invertebrates.	Fine, low-growing turf ideal for damp mud.
Ragged Robin	<i>Silene flos-cuculi</i>	Native floral food source for declining farmland butterflies.	Delicate flowers suited to acidic Welsh wet meadow soils.

2. Basin Slopes (Seasonally Wet / Moist Soil)

The side slopes experience transient water flow during storm events and drying conditions during prolonged dry spells. Plants here require deep rooting structures to prevent slope erosion.

Seed Mix Specification (e.g., Emorsgate EG8 or Equivalent Native Mix) Sown at 4 g/m², containing a 20% Wildflower / 80% Grass ratio:

Wildflowers (20%)

- Meadowsweet (*Filipendula ulmaria*) – High food value for larvae of moths; fragrant summer blooms.
- Cuckoo Flower / Lady's Smock (*Cardamine pratensis*) – Primary food plant for Orange-tip butterfly caterpillars (*Anthocharis cardamines*).
- Selfheal (*Prunella vulgaris*) – Low-growing, resilient ground cover that withstands occasional traffic or maintenance.
- Greater Bird's-foot Trefoil (*Lotus pedunculatus*) – Key caterpillar food plant and nitrogen-fixer suited to wet, peaty soils.
- Sneezewort (*Achillea ptarmica*) – Excellent native composite flower supporting solitary bees.
- Devil's-bit Scabious (*Succisa pratensis*) – Crucial larval food plant for the Marsh Fritillary butterfly (*Eurodryas aurinia*), a priority species in South Wales.

Grasses (80%)

- Creeping Bent (*Agrostis stolonifera*)
- Sweet Vernal-grass (*Anthoxanthum odoratum*)
- Meadow Foxtail (*Alopecurus pratensis*)
- Tufted Hair-grass (*Deschampsia cespitosa*) – Forms tussocks that create overwintering habitat for beetles and small mammals.

3. Upper Banks & Dry Crest (Buffer Zone)

The top of the basin transitions into the surrounding landscape. Planting here provides structural connectivity for wildlife moving across the wind farm site.

- Species: Native species-rich grassland (e.g., Emorsgate EM2) blended with local heath/moorland edge species if applicable (e.g., *Calluna vulgaris*, *Ulex gallii* depending on local soil pH and vegetation survey data).
- Scrub Margins: Scatter small clusters of low-growing native shrubs around outer embankments (e.g., Guelder Rose *Viburnum opulus*, Hawthorn *Crataegus monogyna*, and Grey Willow *Salix cinerea*) to break up visual lines and provide bird nesting sites.

Maintenance and Adoption

For the proposed surface water drainage system to function correctly, it will need to be appropriately maintained.

The maintenance schedule for the network must be comprehensive and detail the specific maintenance requirements for each element of the drainage system. The CIRIA SuDS Manual has extensive information relating to the maintenance of SuDS which should be consulted when specifying the requirements.

For pipes, manholes and gullies, both general best practice and specific manufacturer maintenance protocols should be followed. Example maintenance activities and frequencies for the proposed attenuation basins given in Table 5-5.

.

Table 5-5 Operation and Maintenance Requirements for Attenuation Basins

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove Litter and Debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly (for first year), then annually or required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlets pool – where provided	Annually (as set out in Chapter 23)
Occasional Maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseedling or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets, and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

To protect and promote biodiversity while keeping SuDS features functional:

Wildflower Slopes & Dry Crest

Timing: Always cut in late summer/early autumn (late August to late September). This allows native wildflowers (like Devil's-bit Scabious and Cuckoo Flower) to set seed and provides food for late-season pollinators.

- **Arisings Management: Crucial Step.** All grass cuttings/arisings must be raked and removed from the basin within 48 hours. Leaving arisings adds nutrients to the soil, which encourages aggressive weeds (docks, nettles, coarse grasses) to choke out delicate native flora.
- **Wildlife Protection:** Set mower height to a minimum of 75mm–100mm to avoid harming amphibians (newts, toads) and small mammals hiding in the sward.

Wetland & Aquatic Basin Base

- Rotational Thinning: Never clear the entire basin floor at once. Remove over-dominant vegetation in staggered phases (e.g., 30% of the basin area per year) during autumn (October–November) to ensure continuous refuge for dragonflies, damselflies, and aquatic invertebrates.
- Silt Disposal: Dredged silt from the basin floor or forebay should be left on the bank edge for 24–48 hours to allow trapped aquatic fauna to escape back into the water, then removed to a designated site compound or off-site facility.

6 Summary

This Flood Risk Assessment has been written to support an application for full planning permission for the development known as Foel Trawsnant.

To summarise the findings of the FRA:

- **Flood Zone 1 Classification:** The entire site is located within Flood Zone 1, indicating a low probability of flooding from rivers or the sea.
- **Fluvial & Coastal Risk:** There are no main rivers or significant watercourses within the site boundary, and the inland location eliminates any risk from tidal or coastal influence.
- **Surface Water (Pluvial):** While NRW mapping identifies natural flow paths following small watercourses through the site, the overall risk is categorized as low and does not require specific mitigation.
- **Other Sources:** Risk from groundwater, sewers, canals, and reservoirs is considered negligible or low due to the site's rural topography and lack of nearby infrastructure.

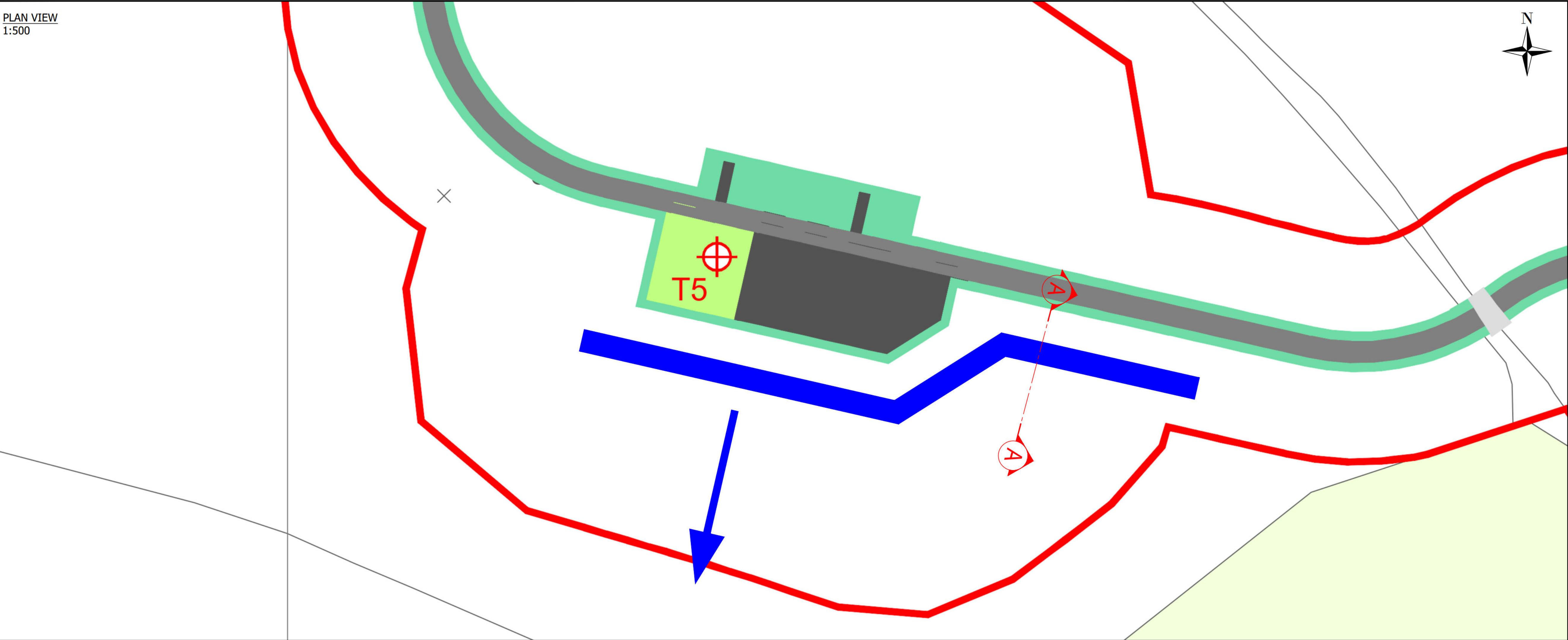
The below summarises the outline drainage strategy for the Site:

- **Greenfield Runoff Rates:** All surface water discharge will be restricted to existing greenfield rates to ensure no increase in flood risk downstream.
- **Minimum Discharge Limit:** A minimum discharge rate of 2.0 l/s is adopted for small catchments to prevent blockages in flow control devices (standard orifice plates).
- **SuDS Hierarchy:** The strategy prioritizes sustainable management through attenuation basins before discharging into local small watercourses.
- **Climate Change Resilience:** Drainage calculations for the 100-year event include a 45% "Upper End" uplift to account for increased rainfall intensity.
- **Source & Site Control:** The system utilizes trackside filter drains or ditches with check dams to manage sediment and vegetated attenuation basins to treat water quality and control peak flow volumes.

The detailed drainage design is proposed to be secured through pre-commencement planning condition attached to the future full planning permission.

Appendix A Drainage Layout Plans

PLAN VIEW
1:500

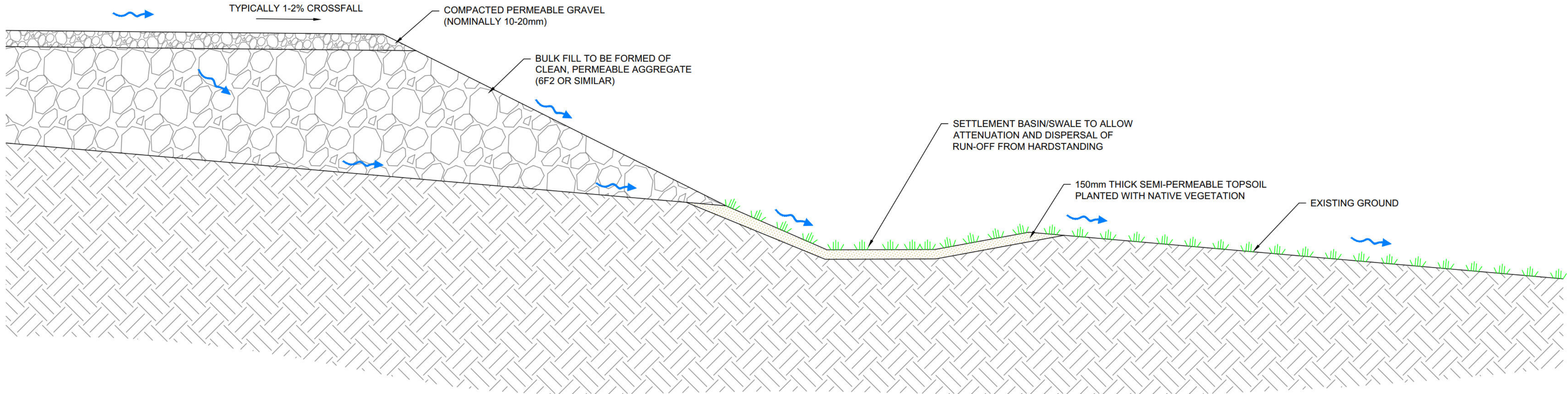


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KEY:

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SECTION A-A
1:50



P01	-	AD	AD	NM	DW	16.04.26
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Foel Trawsnant Wind Farm

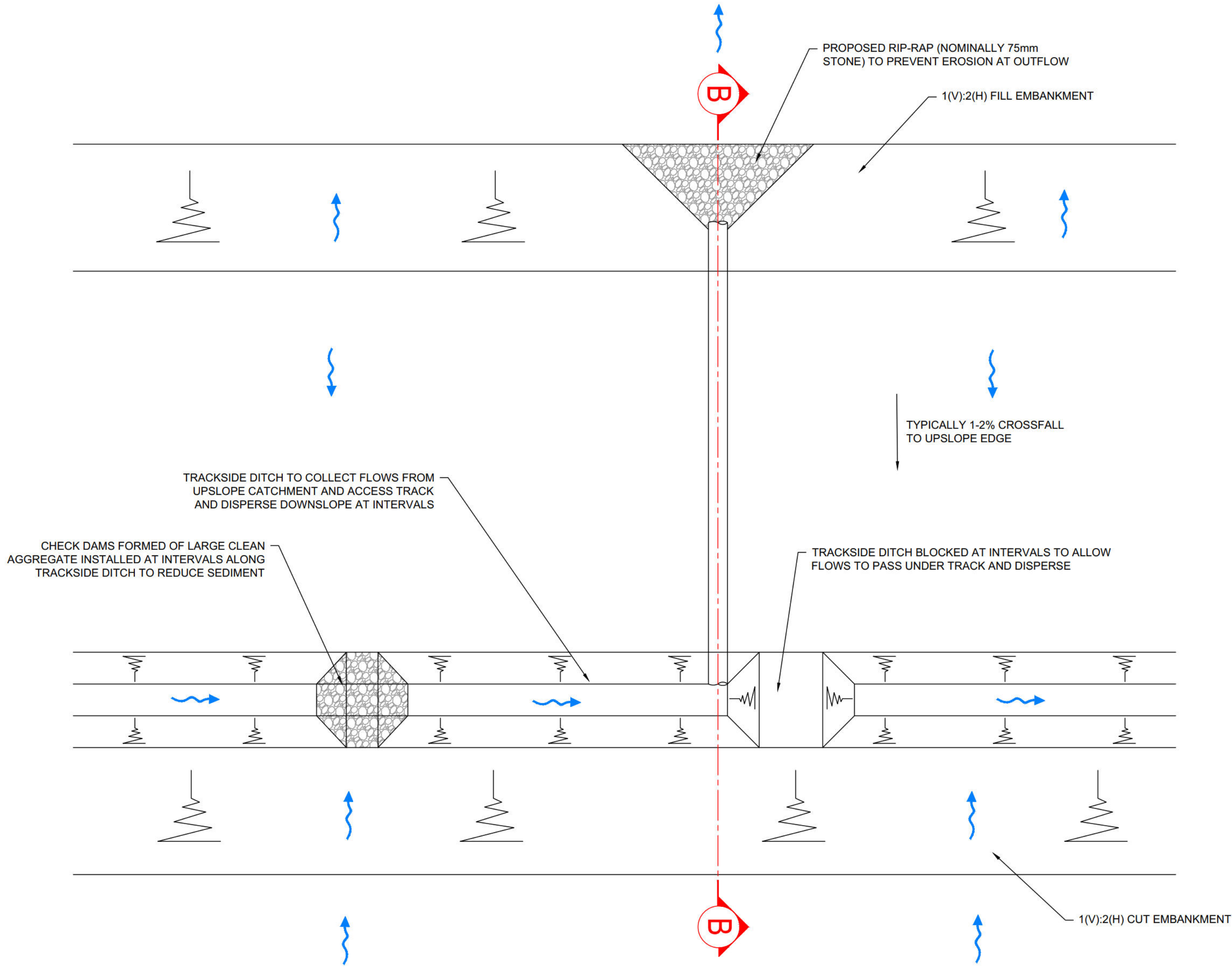
Drawing Title

**Indicative Hardstanding
Drainage Arrangement**

Drawing Status			
PRELIMINARY			
Drawn	Name A.DIMITROV	Date 16.04.2026	Status Code S0
Designed	A.DIMITROV	16.04.2026	Scale 1:500 @ A1
Eng Chk	N.MCKIM	16.04.2026	Revision
Approved	D.WARREN	16.04.2026	P01

Drawing No.

10110902 - PF - DR - C - 00001

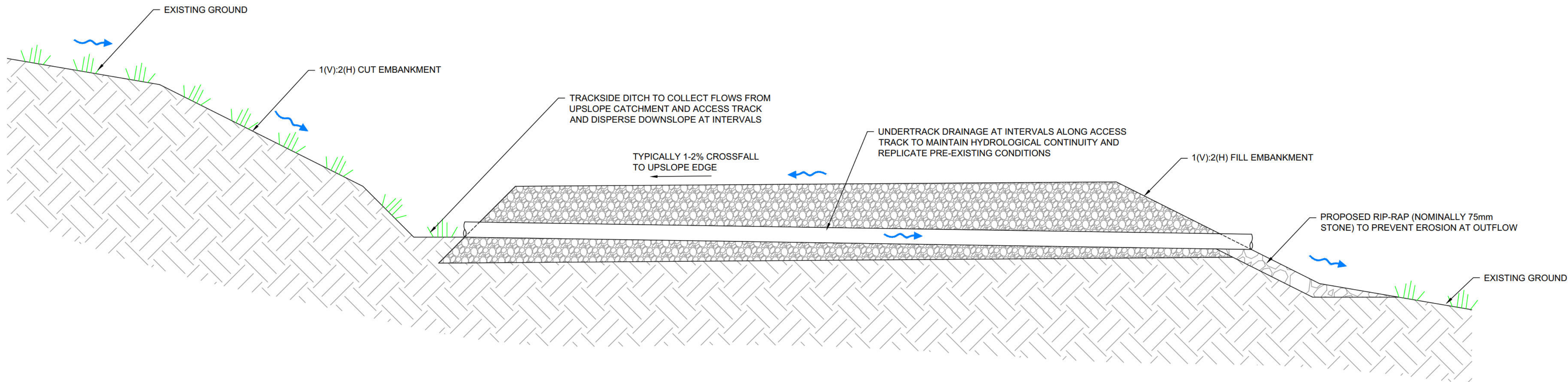


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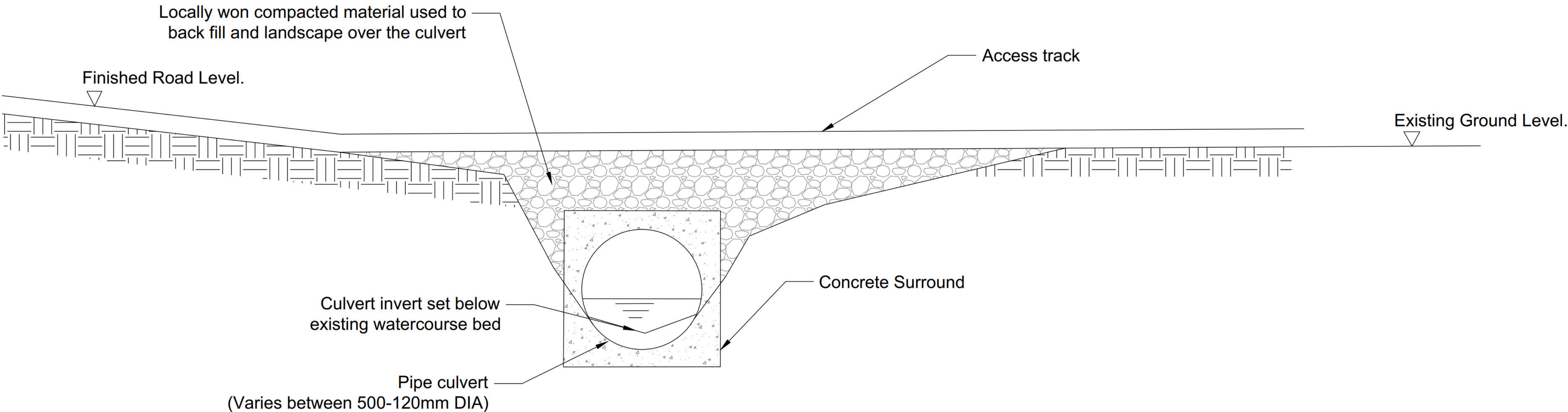
Foel Trawsnant Wind Farm

Drawing Title

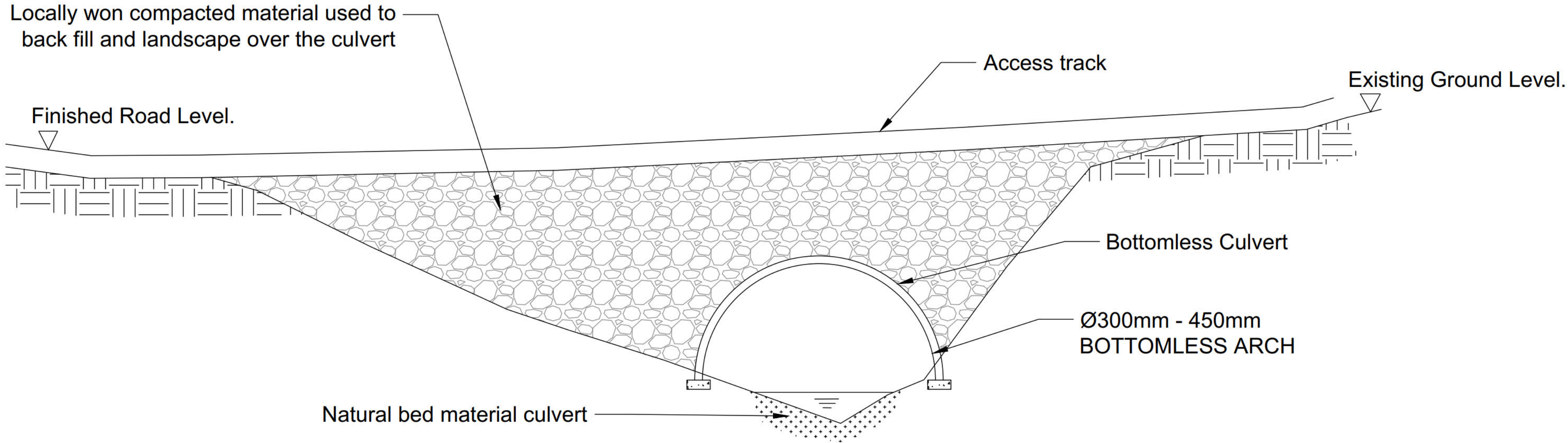
**Indicative Trackside
Drainage Arrangement**

Drawing Status			
PRELIMINARY			
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Designed	A.DIMITROV	16.04.2026	Scale 1:50 @ A1
Eng Chk	N.MCKIM	16.04.2026	Revision
Approved	N.MCKIM	16.04.2026	P01

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Drawing Title

Typical Watercourse Crossing
Construction Details

Drawing Status			
PRELIMINARY			
Drawn	Name A.DIMITROV	Date 16.04.2026	Status Code S0
Designed	A.DIMITROV	16.04.2026	Scale 1:200 @ A1
Eng Chk	N.MCKIM	16.04.2026	Revision
Approved	N.MCKIM	16.04.2026	P01

Drawing No.

10110902 - PF - DR - C - 00001

Appendix B MicroDrainage Calculations

Pell Frischmann		Page 1
5 Manchester Square London W1U 3PD		
Date 20/04/2026 12:15 File	Designed by NMCKim Checked by	
Innovyze	Source Control 2020.1.3	

IH 124 Mean Annual Flood

Input

Return Period (years)	100	Soil	0.400
Area (ha)	4.810	Urban	0.000
SAAR (mm)	1644	Region Number	Region 9

Results l/s

QBAR Rural	57.5
QBAR Urban	57.5
Q100 years	125.3
Q1 year	50.6
Q2 years	53.4
Q5 years	69.6
Q10 years	81.6
Q20 years	93.8
Q25 years	98.0
Q30 years	101.4
Q50 years	111.3
Q100 years	125.3
Q200 years	142.0
Q250 years	147.8
Q1000 years	183.4

Warning: It is unusual to use the IH124 method with an area < 50ha. The Interim Code of Practice recommends that the IH124 method is applied with 50ha and the resulting discharge is linearly interpolated for the required area. The ICP SUDS tab will do this automatically.

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