Appendix 2-10 Surface Water Management Plan

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Scart Mountain Wind Farm

Surface Water Management Plan

Scart Mountain Windfarm

Surface Water Management Plan

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1.0 INTRODUCTION

This Surface Water Management Plan (SWMP) details control measures for avoiding, preventing or reducing any significant adverse impacts on the surface water environment during proposed construction, as identified in Chapter 9 (Water) and associated technical appendices.

The objective of this SWMP is to manage the movement of surface water during the construction, operation and decommissioning of the proposed Scart Mountain Wind Farm (proposed project). The measures implemented for the proposed construction phase will provide flow management for the operational and decommissioning phases.

The measures in the SWMP are consistent with those detailed within the Chapter 9 (Water) of the Environmental Impact Assessment Report (EIAR). This is a working document and will be finalised by the appointed Contractor following appointment and prior to commencing works on the proposed project to include any additional conditions stipulated by An Bord Pleanála.

All of the content provided in this SWMP will be delivered by the appointed Contractor and its finalisation by the appointed Contractor will not affect the robustness and adequacy of the information presented here and relied upon in the EIAR and Natura Impact Statement (NIS). Relevant guidelines were considered in the development of this surface water management plan[1].

1.1.1 Overview of the Proposed Project

The proposed wind farm site is located approximately 4 km northeast of Cappoquin and approximately 13 km northwest of Dungarvan. The proposed project will supply power via tail-fed 110kV underground cables (approximately 15.5 km total cable length of which approximately 13.3 km is on the public road corridor) to the existing Dungarvan 110kV substation in the townland of Killadangan, Co. Waterford. In relation to the proposed Turbine Delivery Route (TDR), it is proposed that the turbine components will be delivered to the proposed wind farm site via Belview Port in south County Kilkenny. TDR works range from hedgerow trimming/clearing to facilitate oversail of turbine blades to the temporary placement of hardcore along with some offroad works at Boheravaghera crossroads.

[1] The following guidelines were considered in the development of this surface water management plan:

- COFORD (2004) Forest Road Manual, Guidelines for the design, construction and management of forest roads
- CIRIA Document C741 'Environmental Good Practice on Site'
- CIRIA document C532 – 'Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors'
- CIRIA document C648 and C649 – 'Control of Water Pollution from Linear Construction Projects'
- The Irish Wind Energy Association (2012) Best Practice Guidelines
- 2006 Wind Energy Planning Guidelines, Department of Environment, Heritage and Local Government;
- Inland Fisheries Ireland, (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters;
- Scottish Natural Heritage (2010) A Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with particular reference to Wind Farm Developments in Scotland;
- Consultation with Inland Fisheries Ireland, with responses to the EIAR Scoping Report detailed in Chapter 1 Introduction

2.0 PROPOSED SITE DRAINAGE

2.1 DRAINAGE DESIGN OVERVIEW

The drainage measures described will be implemented for the construction phase of the proposed project and the majority of the measures will remain in place for the operational phase. The measures described within Section 2 apply to the proposed wind farm site.

The surface water drainage system takes into account the recommendations of sustainable urban drainage systems (SuDS) and uses SuDS measures. The principal behind SuDS is to reduce the quantity of discharge from developments to predevelopment flows and to also improve the quality of run-off from proposed projects.

A drainage evaluation has been carried out for the proposed project using the HR Wallingford Website (http://geoservergisweb2.hrwallingford.co.uk/uksd/index.htm) to identify appropriate SuDS measures for use on the proposed wind farm site.

For the proposed wind farm site the drainage design will decrease the quantity of run-off by using permeable road construction for the access roads and on the hardstanding areas and by providing surface water sedimentation/storage ponds. The following SuDS features are included in the drainage design for the proposed wind farm site:

- **Swales/Check Dams:** Sloped channels with check dams will slow down water flow, improving water quality, infiltration and reducing erosion:
- **Filter strips:** a gently sloped, vegetated area designed to treat stormwater runoff by filtering pollutants and allowing water to infiltrate into the soil. Filter strips are utilised at the level spreader locations:
- **Settlement Ponds:** Vegetated ponds designed to temporarily store surface water runoff, aiding in flood control; and
- **Hydrocarbon Interceptor:** a device designed to remove hydrocarbons, silt and other pollutants from surface water runoff before it enters the drainage system. The hydrocarbon interceptor will be located at the substation.

The layout of the proposed wind farm site has been designed to collect surface water runoff from hardstanding areas and discharge to settlement/storage ponds within the proposed wind farm site boundary. From here the water will discharge to the ground by means of finger drains in a fan arrangement at the appropriate greenfield run off rates. A drawing of the proposed settlement ponds is shown in Drawing 11303-2019, in Appendix A.

Check dams will be provided in drainage channels to reduce the velocity of surface water run-off and are depicted in Figure 2-1. Swales will be constructed adjacent to the access road (See Appendix A) to provide drainage as depicted in Figure 2-2.

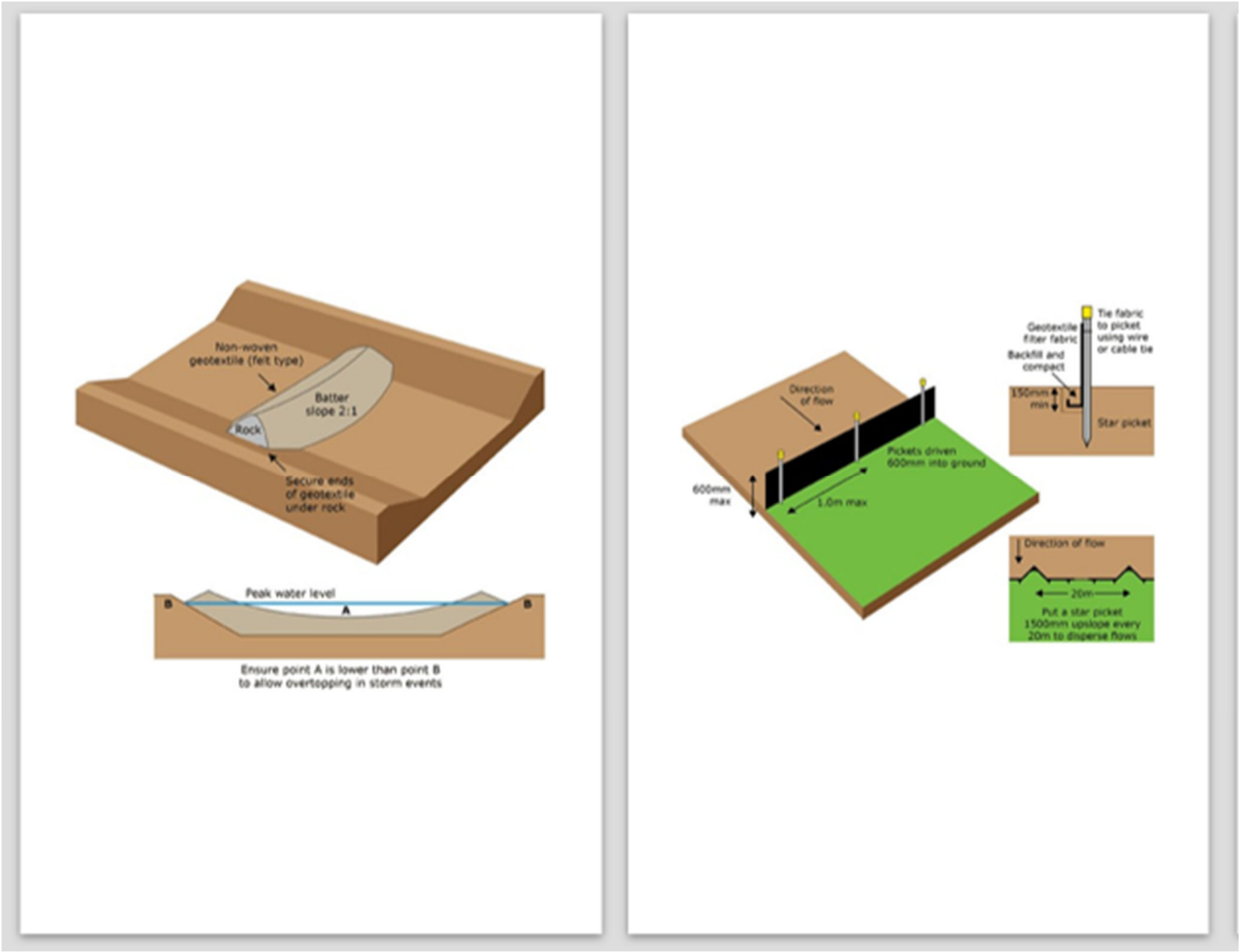


Figure 2-1 Check dam and silt fence examples (Source: Guidelines for Environmental Management, EPA Australia, 2004)

Figure 2-2 Vegetated swale

2.2 FORESTRY DRAINAGE

Forest felling will be undertaken during the initial phase of the construction works. The Felling and Reforestation Standards describe the universal standards that apply to all felling (thinning, clear felling) and reforestation projects on all proposed wind farm sites, will be implemented under a felling licence issued by the Department of Agriculture, Food & the Marine.

All associated tree felling will be undertaken using good working practices as outlined in the Forestry Report and Construction Environmental Management Plan (CEMP) (Appendices 2-5 and 2-8 of this EIAR), the Forest Service 'Forestry Harvesting and Environment Guidelines' (2000) and the 'Forestry and Water Quality Guidelines '(2000). The latter guidelines deal with sensitive areas, erosion, buffer zone guidelines for aquatic zones, ground preparation and drainage, chemicals, fuel and machine oils. Brash mats will also be used to support harvesting and forwarding machinery. The brash mats reduce erosion of the surface and will be renewed as they become used and worn over time.

Trees will be manually felled inside the 25m stream buffer. During the near stream construction work, silt traps and a triple row silt fences will be placed immediately down-gradient of the construction area for the duration of the construction phase.

2.3 FLOOD RISK ATTENUATION

The creation of impermeable areas, such as hardstands, has the potential to locally increase rates of runoff and this may increase flood risk and flood severity downstream. The proposed wind farm site is relatively low permeability and will have limited potential to increase flows.

The risk of flooding associated with the proposed wind farm site is minimal based on the project specific Flood Risk Assessment carried out for the proposed project (See Appendix 9-4 of the EIAR). The layout of the proposed wind farm site will minimise the flood risk to people, property, the economy, and the environment.

It is proposed to provide the temporary storage within the drainage channels by creating check dams within them at regular intervals. The spacing of the dams is every 50 metres on average but depends on the channel slope, with steeper channels requiring shorter intervals. Runoff from the impermeable areas will be directed to swales and settlement ponds. The outflow from the settlement ponds will be released in a controlled and diffuse manner onto the vegetation and existing drains.

2.4 TURBINE DELIVERY ROUTE AND GRID CONNECTION ROUTE

There will be limited construction activities required for the Grid Connection Route (GCR) and works areas of the proposed Turbine Delivery Route (TDR). Further details in relation to the grid connection cable route and road/junction accommodation works on the TDR are outlined in the CEMP in Appendix 2-8 of the EIAR.

No refuelling of machinery will take place within 50m of a watercourse. Excavated material will not be stockpiled or side-cast within 50m of a watercourse. Appropriate steps will be taken to prevent soil/dirt generated during the temporary upgrade works to the TDR from being transported on the public road. Road sweeping vehicles will be used as required, to ensure that the public road network remains free of soil/dirt from the location of the TDR works when required. This will reduce the potential for sedimentation of surface watercourses locally.

Silt fencing will be erected at the location of all stream crossings along the GCR. Where existing drainage ditches need to be realigned (e.g., around substation), new ditches will match profile of existing ditch in relation to width, existing side slope profile (or lower) and material at base of channel will be reused. The sizing of any new culverts will be designed to maintain existing flow characteristics and depth of flow. Within the proposed wind farm site, culverts will be assessed to ensure no barriers to fish migration occur. Where barriers occur, such culverts will be improved to increase fisheries potential.

3.0 WATER QUALITY MEASURES

The drainage design measures outlined in Section 2 will manage flow and quality within the proposed wind farm site and near the works areas of the proposed TDR and GCR. Specific water quality measures in relation to sediment, concrete and fuel management are detailed below.

3.1.1 Concrete

Concrete is required for the construction of the proposed turbine bases and foundations. After concrete is poured at a construction site, the chutes of ready mixed concrete trucks must be washed out to remove the remaining concrete before it hardens. Wash out of the main concrete bottle will not be permitted within the proposed wind farm site and wash out is restricted only to chute wash out. Wash down and wash out of the concrete transporting vehicles will take place at an appropriate facility away from the proposed wind farm site i.e., at the premises of the concrete supplier. The collected concrete washout water and solids will be emptied on a regular basis.

3.1.2 Fuels, Oils and Chemicals – Spill Control

The following will be employed on the proposed wind farm site:

- Fuels and chemicals will be stored within bunded areas as appropriate to guard against potential accidental spills or leakages. The bund area will have a volume of at least 110% of the volume of such materials stored;
- Store all containers of oil and fuel in a secure, bunded area.
- Regularly check tanks, containers and bunds for damage and leaks.
- Supervise all fuel and oil deliveries.
- Lock containers and tanks when not in use.
- Seek advice from a line manager before disposing of waste fuel or oil, or contaminated spill granules or absorbent mats – all contaminated materials to be disposed of in the appropriate manner.
- Liaise with a line manager to organise removal of contaminated water from bunds and trays by an appropriate contractor.
- Do not store fuel and oil, or carry out refuelling, within 50 m of a watercourse or drain.
- All on-site refuelling will be carried out by a trained competent operative. Use a funnel when refuelling small plant. Use an automatic shut off or pistol grip delivery system when refuelling plant.
- Clear up and report all spillages immediately.
- Place a drip tray or absorbent mat under all static plant and mobile plant during fuelling.
- Mobile measures such as drip trays and fuel absorbent mats kept with all plant and bowsers and will be used as required during all refuelling operations;
- A spill kit will be stored with the bowser and the person operating the bowser will be trained in their use;
- All equipment and machinery will have regular checking for leakages and quality of performance and will carry spill kits;
- Any servicing of vehicles will be confined to designated and suitably protected areas such as construction compounds; and
- Additional drip trays and spill kits will be kept available on the proposed wind farm site, to ensure that any spills from vehicles are contained and removed off-site.

3.2 EROSION AND SEDIMENT CONTROL MEASURES

It is proposed, that during the ground clearance of the proposed project, the contractor will implement water control measures to limit the impact on water quality using standards measures. Suspended solid (silt) removal features will be implemented in accordance with the Construction Industry Research and Information Association (CIRIA) C697 SuDS Manual, and CIRIA C648 Control of water pollution from linear construction projects.

Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. These flows will discharge diffusely overland, within the buffer zone before entering any watercourse. Regular cross flow and energy dissipation devices will be installed to divert overland flows and prevent these flows from entering the borrow pits

All drainage from the proposed wind farm site shall be designed to have as a minimum three stages of treatment, as defined in the SuDS Manual. Management of runoff will include the following:

- Filtration of water through filter media (sand/stone check dam, silt fence);
- Detention/settlement in settlement ponds or behind check dam in swales; and
- Conveyance of shallow depths of water in vegetated swale.

All surface water run-off from the proposed wind farm site will pass through settlement ponds. It is proposed to locate settlement ponds downstream of borrow pits and associated stockpile areas, each hardstand and along all the proposed wind farm site access tracks. Drainage drawings are presented in Drawing 11303-2040 to 11303-2042, in Appendix A.

3.2.1 Check Dams/Silt fences

Track edge drainage/swales are required to control run-off from the running surface to lower water levels in the subgrade, to control surface water and to carry this flow to outlet points. Swales will be re-vegetated by hydro-seeding with indigenous seed mix as soon as is practicable following excavation. This will reduce the flow velocity, treat potential pollutants, increase filtration and silt retention.

Swales will be installed in advance of the main construction phase. Check dam/Silt fence are presented in Drawing 11303-2019. On sections of track where there is significant longitudinal gradient, regular surface water interception channels will be employed – these will typically be at 10-20m intervals to collect any surface water that is discharging as sheet flow along the track and discharge the flow into the trackside swale. Additional cross flow locations are required between T2 and T5.

Check dams will have a minimum 0.2m freeboard (from top of check dam) to top of swale level, to prevent overtopping of flows onto the access track. All check dams, etc to be checked at least once weekly via a walkover survey during the period of construction. All excess silts will be removed. Where check dams have become fully blocked with silt, they will be replaced. The following measures will be implemented:

All stockpiled material will be battered back (Slope of 1:2 or less) to reduce the rainfall erosion potential. Silt fencing will be utilised as the base of stockpiles.

Silt fencing is to be installed in the path of sheet flow runoff to filter our heavy sediments. Silt fences are to be located at the toe of stockpiled areas to reduce sediment transport. Additional

silt fencing and emergency spill kits will be kept on the proposed wind farm site for use in emergencies. All silt fencing on the proposed wind farm site will also require regular cleaning and maintenance in accordance with manufactures guidelines.

Silt build ups, within settlement ponds, check dams, silt fences are to be removed as required to ensure no carryover/breakthrough of suspended matter downstream in the drainage system. Any sediment removed will be disposed of so as to prevent any reintroduction into the drainage system.

3.2.2 Settlement ponds

Settlement ponds will be located downstream of road swale sections and at turbine/hardstand locations, to manage/buffer volumes of runoff discharging from the drainage system during periods of high rainfall, thereby reducing the hydraulic loading to watercourses. Settlement ponds are designed in consideration of the greenfield runoff rates. A longitudinal cross-section and plan of a settlement pond is presented in Drawing 11303-2019, in Appendix A.

The proposed settlement pond design consists of a sediment forebay, which removes the majority of suspended solids from the inflow water. Inflow water enters the sediment forebay via an energy break, which removes energy from the incoming water resulting in a decrease in the incoming waters capacity to transport suspended solids and the deposition of material in the sediment forebay. The water then flows over a section of elevated channel bed into the flow control bay. Here the flow is controlled by a weir constructed of tightly fixed straw bales (or silt fence or equivalent). The straw acts as an effective silt trap for any remaining suspended solids while allowing the water to filter through its medium. Once the water has been filtered by the flow control device it then outfalls to an area of intact vegetation, which acts as a secondary filter. The outflow control from the settlement device is designed such that in an extreme event the device can overflow into adjacent vegetated areas.

Settlement ponds will be installed concurrently with the formation of the road. Additional settlement ponds will be constructed as required on the proposed wind farm site. Settlement ponds are to be located as close to the source of sediment as possible with a buffer zone between the settlement pond outfall and any existing watercourse.

The settlement pond design (Drawing 11303-2019, Appendix A) is based on primary settling out of suspended solids from aqueous suspension. The theory behind the design of the settlement ponds is the application of Stoke's Law. The settlement ponds will be designed to provide sufficient retention time and a low velocity environment to allow suspended solids of small particle size to fall out of suspension prior to allowing the water to outfall to the receiving environment.

Runoff will be maintained at Greenfield (pre-development) runoff rates. The layout of the development has been designed to collect surface water runoff from hardstanding areas within the development and discharge to associated surface water attenuation lagoons adjacent to the proposed infrastructure. It will then be managed by gravity flow at Greenfield runoff rates.

3.2.3 Works near Watercourses

As mentioned above, where main drain crossings and stream crossings occur (i.e., access tracks), it is proposed to use a clear-span design bridge or bottomless culverts. Installation of such features will take place during dry periods to reduce the risk of sediment entering the watercourse. Smaller drains with be crossed using normal culverts.

One new clear span bridge is required to cross the Glenshelane River for access to T1 to T5, and a design has been developed to account for its importance taking into account consultation with the Office of Public Works (OPW) and Inland Fisheries Ireland (IFI). A Section 50 Consent application will be prepared and submitted to the OPW prior to construction. No instream works are proposed.

As a further precaution, near-stream construction work will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works guidance document *"Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites"*.

Culverts will be designed to be of a size adequate to carry expected peak flows in accordance with CIRIA Culvert design and operation guide (C689). Culverts will be installed to conform, wherever possible, to the natural slope and alignment of the drainage line. Where required, culverts will be buried at an appropriate depth below the channel bed and the original bed material placed at the bottom of the culvert. The sizing of any new internal drainage crossings will maintain existing depth of flow and channel characteristics.

An upgrade is required to an existing bridge to the west of the onsite substation – a crossing of the Boherawillin stream. Culverts will be required at drain crossings along the access roads and to allow for cross drainage on the proposed windfarm. Precast concrete culverts or uPVC drainage pipes shall be provided for drain culverts, detail of which is shown in Drawing 11303-2020, in Appendix A. Earth embankments constructed for bridge approaches will be protected against erosion e.g., by re-vegetation or rock surfacing etc.

4.0 Surface Water Monitoring

Details of the proposed surface water monitoring and maintenance activities are given in this section of the SWMP. No operational phase monitoring is required due to the low risk of contamination.

Records of all monitoring and maintenance activities will be retained by the Contractor for the construction phase.

4.1 RECORDING AND REPORTING

Inspections will be recorded for the proposed project. In the event that pollution indicators are observed, works will cease, and sampling will immediately be undertaken as described for the weekly monitoring, and an investigation of the potential cause will be undertaken by the appointed Contractor.

- Where the construction works are identified as the source causing the exceedance, the following details will be recorded (the requirement for this will be included in the Project SWMP): Nature of the impacts and mechanism of pollution;
- Details of the activity identified as causing the incident or, in the event no clear pathway still exists, activities capable of causing the incident and an assessment undertaken as to the most likely source; and
- Details of measures proposed and implemented to ensure that such an incident does not re-occur.

This information will be shared with the Employer and the regulators. Through monitoring and this open and transparent reporting, there is a much reduced likelihood of a small incident becoming a serious one that may require regulator action; proactively providing this information gives the regulator and the Client comfort that these issues are taken seriously on the proposed wind farm site and addressed in a professional manner.

4.2 DETAILS OF MONITORING LOCATIONS ON SITE

There are 7 no. surface water monitoring locations (see Figure 4-1) to monitor surface water quality. These points are focussed on areas where turbines are located close to streams/rivers. The proposed monitoring schedule is robust and sufficient for the scale of the proposed wind farm site and in line with the relevant guidance. It is discussed below in detail.

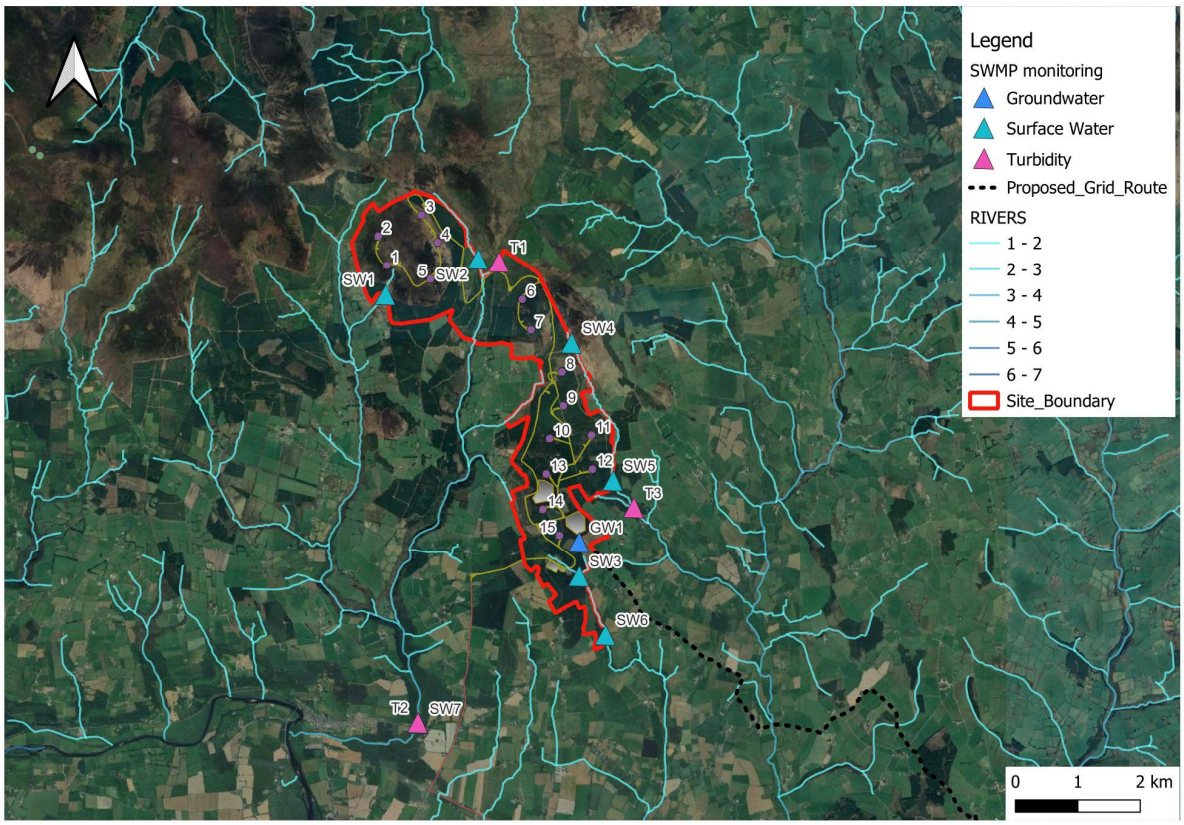


Figure 4-1 Surface Water Monitoring Locations for the SWMP

4.2.1 Surface Water Monitoring Schedule

All surface water control measures for the proposed project will be adhered to in accordance with the CEMP (Appendix 2-8 of the EIAR). A surface water monitoring schedule for the construction stage of the proposed wind farm site has been developed (See Table 4-1 below) and outlines the selected parameters with their associated trigger limits (See Table 4-2 below), as well as the frequency of monitoring to be completed prior to, during, and at the post construction phase of the project.

4.2.2 Schedule of Monitoring

The critical water parameters in terms of their potential to cause damage to aquatic life, ecosystems, human health and water quality in the receiving waters are outlined in the surface water monitoring schedule (see Table 4-1 below).

Table 4-1Surface Water Monitoring Schedule for Scart Mountain Wind Farm

Phase	Preconstruction	Construction	Post construction
Monitoring Period	3 Months	24 Months	3 Months
Frequency	Continuous		
Parameters	Turbidity	Turbidity	Turbidity
Frequency	Daily		
Surface Water Parameters		Turbidity and visual checks (examination of surface drainage/sediment control measures/watercourses)	Turbidity and visual checks (examination of surface drainage/sediment control measures/watercourses)
Frequency	Weekly		
Surface Water Parameters	pH, Electrical Conductivity, Turbidity, Temperature (Handheld Meter)	pH, Electrical Conductivity, Turbidity, Temperature (Handheld Meter) Monitoring during clearance phase and construction works at Turbines	N/A
Frequency	Monthly		
Surface Water Parameters	Conductivity, Chloride, Dissolved Oxygen, Molybdate Reactive Phosphorus, Mineral Oil, pH, Turbidity, Total Ammonia, Total Phosphorus, Total Suspended Solids (Grab Samples)	Conductivity, Chloride, Dissolved Oxygen, Molybdate Reactive Phosphorus, Mineral Oil, pH, Turbidity, Total Ammonia, Total Phosphorus, Total Suspended Solids (Grab Samples)	Conductivity, Chloride, Dissolved Oxygen, Molybdate Reactive Phosphorus, Mineral Oil, pH, Turbidity, Total Ammonia, Total Phosphorus, Total Suspended Solids (Grab Samples)
Frequency	Quarterly		
Surface Water Parameters	N/A	Conductivity, Chloride, Dissolved Oxygen, Molybdate Reactive Phosphorus, Mineral Oil, BTEX, pH, Turbidity, Nitrate, Total Ammonia, Total Phosphorus, Total Suspended Solids (Grab Samples)	N/A
Frequency	Pre-Construction Report	Monthly and Quarterly Monitoring Report	Final Monitoring Report
Surface Water Parameters	Upgrade limits/trigger values for construction phase water monitoring	Results screened against construction phase surface water monitoring trigger levels	Results screened against construction phase surface water monitoring trigger levels

4.2.3 Surface water Monitoring Trigger Values

Surface Water Quality Monitoring (SWQM) will be conducted by the appointed Contractor in accordance with the monitoring schedule proposed in Table 4-1 above. Prior to the commencement of construction, baseline preconstruction monitoring will be carried out. The

results of this monitoring suite will determine the baseline and trigger values for the construction monitoring phase of the development. This will be completed in order to establish if local trigger values are required due to existing water quality exceedances.

The final details of the monitoring schedule will be agreed with the relevant authorities, prior to the commencement of construction. Construction and post construction sampling results will be screened against the agreed trigger values as proposed in Table 4-2, except where local triggers are required.

Table 4-2 Analysis and Proposed Trigger Values (Pre-Construction)

Parameter	Proposed Limits	Units
Conductivity	1,000 µS/cm or within preconstruction values	µS/cm
Chloride	200 mg/l or lower. I.e. within trigger values established by preconstruction monitoring	mg/l
Dissolved Oxygen	80% to 120%	% Saturation
Molybdate Reactive Phosphorus	0.035 mg/l annual average or within preconstruction values	mg/l
BTEX	<0.005 mg/l	mg/l
Mineral Oil	10 µg/l or within preconstruction values	µg/l
pH	6-9	pH units
Turbidity	50 NTU or within preconstruction values	Nephelometric Turbidity Unit (NTU)
Nitrate	50 mg/l or within preconstruction values	mg/l
Total Ammonia	0.14 mg/l (95%ile) or within preconstruction values	mg/l
Total Phosphorus	0.1 mg/l or within preconstruction values	mg/l
Total Suspended Solids	<0.25 mg/l or within preconstruction values	mg/l

Field measurements will be taken by the contractor on a weekly basis during the main earthworks stage of the construction period. In addition, daily visual inspections of the surface drainage and sediment control measurements and the watercourses will be completed. Daily

turbidity monitoring will also be undertaken on the proposed wind farm site. Indicators that show evidence of water quality issues include the following and will be noted.

- Changes in water quality; and
- Changes in water transparency.

In-situ field monitoring will also be conducted during major rainfall events i.e., 15 mm in a 6-hour period. The clerk of works will undertake monitoring during the rainfall events.

Laboratory samples will be taken on a monthly basis during construction as shown in Table 4-1.

4.2.4 Surface Water Quality Monitoring Locations

Monitoring will be undertaken at 7 no. locations around the proposed wind farm site (see Figure 4-1). The proposed monitoring for the construction phase will be completed at the following locations along the following streams.

- SM1 – Knocknanask River
- SM2 – Glenshelane River – upgradient (UG)
- SM3 – Boherawillin River
- SM4 – Farnane 18 (UG)
- SM5 – Farnane 18 (DG))
- SM6 – Boherawillin River
- SM7 – Glenshelane River – upgradient (UG)

Monitoring records should include the date and time of the monitoring period and relate to the relevant consent conditions, where applicable. A written log of the environmental performance of the works will be maintained. A monthly monitoring report on the findings of the monitoring exercises will be prepared within two weeks of receipt of analytical results. The monthly monitoring reports will cover the construction and post construction works.

4.2.5 Proposed Monitoring Frequency and Parameters

4.2.5.1 Pre-Construction Monitoring

It is proposed that the surface water monitoring will be scheduled in conjunction with the pre-construction stage. Continuous turbidity monitoring will be undertaken upgradient and downgradient on the Glenshelane and Farnane River preconstruction and during construction.

4.2.5.2 Construction Stage Monitoring

Surface water monitoring will be undertaken daily during the construction stage of the proposed project. The daily monitoring will include for a walk around the proposed wind farm site, visual inspection of the watercourses and field measurements for turbidity to be undertaken as required and, as a minimum, on a weekly basis. Weekly surface water monitoring will take place as per the daily surface water inspection and will include for a routine weekly measurement of turbidity at the surface water locations.

Monthly surface water samples will be collected during the construction stage of the proposed project and laboratory analysis will be undertaken for those monitoring parameters included in Table 4-2 of this SWMP.

4.2.5.3 Post-Construction

Immediately post-construction for three months, surface water samples will be collected, and laboratory analysis will be undertaken for those monitoring parameters included in Table 4-1 of this SWMP.

4.2.6 Trigger Values

The trigger values for the surface water monitoring programme are those listed in Table 4-3 of this SWMP and where relevant Surface Water Quality standards given in the Surface Water (Environmental Objectives) Regulations S.I. 272 of 2009, or as otherwise agreed with the Planning Authority in consultation with Inland Fisheries Ireland where required.

An Environmental Manager will be engaged for construction stage monitoring. Should the trigger values not be met, the Environmental Manager will have 'Stop Works Authority' to direct the contractor's construction manager to cease all works and activities on the proposed wind farm site pending further instruction.

Table 4-3 Proposed Surface Water Parameters and Trigger Values

		Proposed Trigger Values	SI No. 272 of 2009 EU Surface Water Environmental Objective Regulations (as amended)	SI No. 293 of 1988 EC Regulations (Quality of Salmonid Waters)
Parameter	Units			
Electrical Conductivity (EC)	µS/cm	1,000		
pH	pH units	>4.5 and <9	Soft Water 4.5< pH < 9.0	>6 and <9
MRP	mg/l	0.025 (mean – high status) 0.035 (mean- good status)	0.025 (mean – high status) 0.035 (mean- good status)	
Dissolved Inorganic Nitrogen as N	mg/l	2.6	2.6	
Total Suspended Solids	mg/l	25		25
BOD	mg/l	<5	<2.6 (95%ile) good status <2.2 (95%ile) high status	<5
COD	mg/l	40		
Dissolved Iron	ug/l	200		
Sulphate	mg/l	200		
Total Alkalinity as $CaCO_3$	mg/l	No abnormal change		No abnormal change

		Proposed Trigger Values	SI No. 272 of 2009 EU Surface Water Environmental Objective Regulations (as amended)	SI No. 293 of 1988 EC Regulations (Quality of Salmonid Waters)
Hydroxide Alkalinity as $CaCO_3$	mg/l	No abnormal change		No abnormal change

4.3 MAINTENANCE ACTIVITIES

4.3.1 Construction Phase

Settlement ponds will be regularly cleaned/maintained to provide effective and successful operation throughout the works. Outfalls and ditches should be cleaned, when required, starting up stream with the outfalls blocked temporarily prior to cleaning. Settlement pond management will also include the following:

Sediment/silt removed via the contractor from ponds is to be disposed of at suitable locations on the proposed wind farm site, away from watercourses. Machine access is required to enable the accumulated sediment to be excavated.

Settlement pond maintenance and/or cleaning will not take place during periods of extended heavy rain. Settlement ponds will be clearly marked for safety.

Settlement ponds will be constructed on even ground and not on sloping ground and where possible will discharge into vegetation areas to aid dispersion.

The settlement ponds will be monitored closely over the construction timeframe to ensure that they are operating effectively.

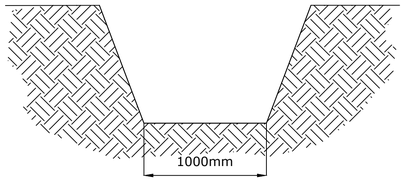
4.3.2 Operation Phase

During the operational phase impediments to flows can generally occur as a result from blockages to watercourse crossings, ditches and watercourses themselves, resulting from vegetation and erosion debris. The surface water infrastructure will be maintained by the operator through the lifetime of the planning permission.

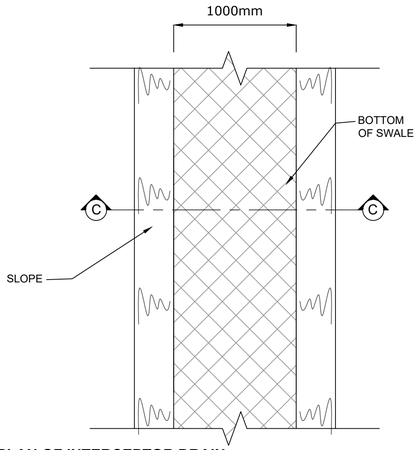
4.3.3 Decommissioning Phase

A review of the relevant guidelines will be undertaken prior to the decommissioning phase. The operational phase surface water management infrastructure will be utilised for the decommissioning phase. The operational road layout will remain in place and therefore limit the potential for siltation during the decommissioning phase. Water quality measures as outlined in Section 3 will be implemented.

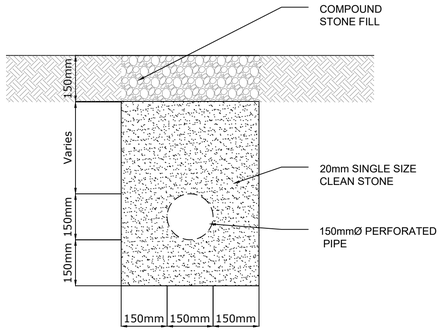
Appendix A: Drainage Drawings



SECTION C-C
SCALE 1:25



PLAN OF INTERCEPTOR DRAIN
SCALE 1:25



FILTER DRAIN DETAIL
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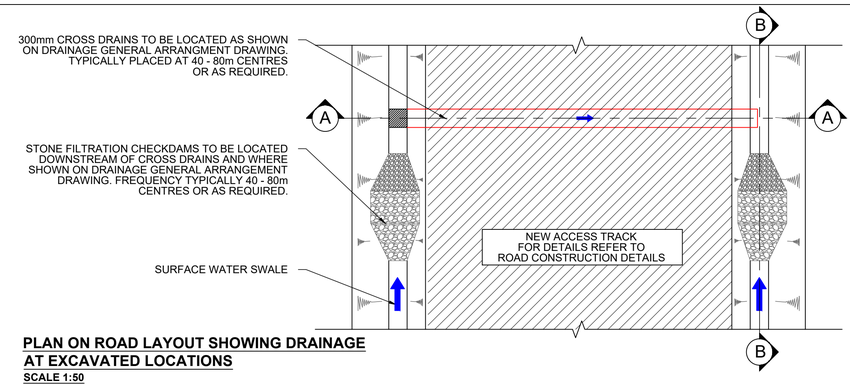
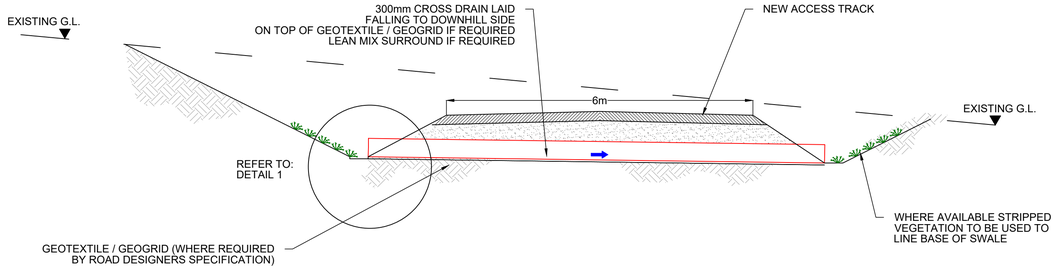
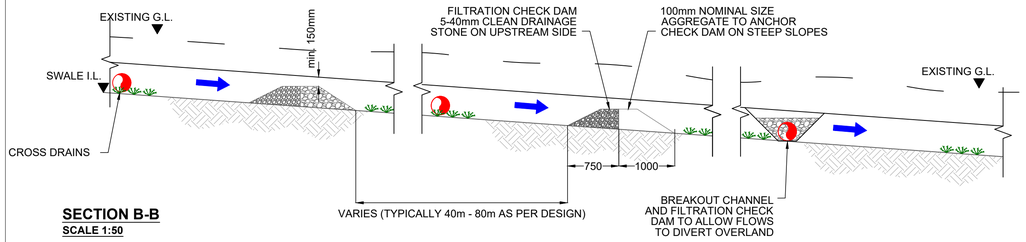


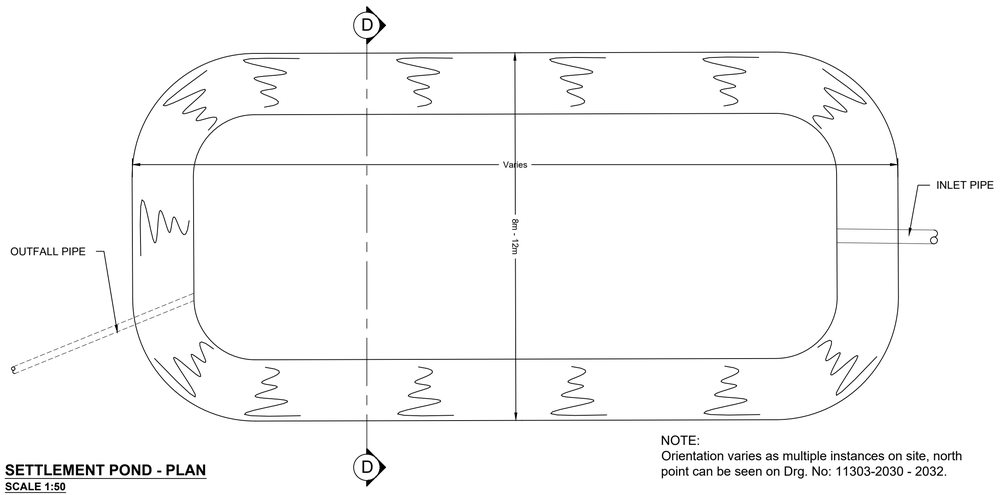
PLAN ON ROAD LAYOUT SHOWING DRAINAGE AT EXCAVATED LOCATIONS
SCALE 1:50



SECTION A-A
SCALE 1:50

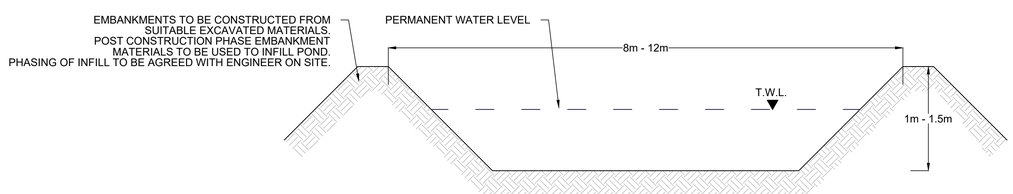


SECTION B-B
SCALE 1:50



NOTE:
Orientation varies as multiple instances on site, north point can be seen on Drg. No: 11303-2030 - 2032.

SETTLEMENT POND - PLAN
SCALE 1:50



SECTION D-D
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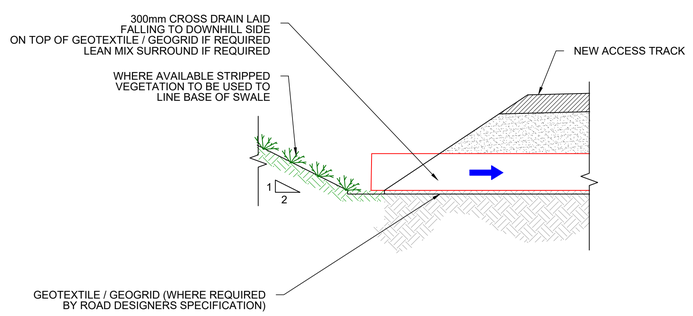

DETAIL 1
SCALE 1:100

Rev	Date	Description	By	Chkd.
A	13.11.24	PLANNING ISSUE	MN	JS

Clie

Ireland
FuturEnergy

Project:

SCART MOUNTAIN WIND FARM

Title:

ROAD SWALES, DRAINS & SETTLEMENT POND DETAILS

Scale @ A1: As Shown

Prepared by:	Checked by:	Date:
M. Nolan	J. Staunton	November '24

Drawing Status: Planning

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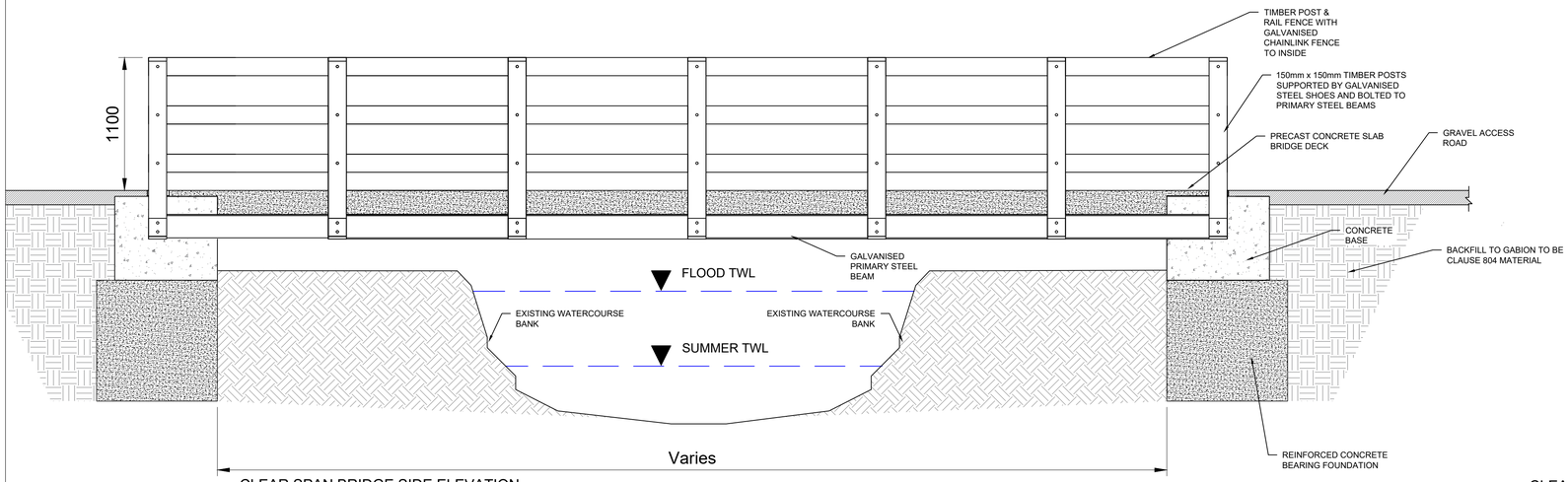
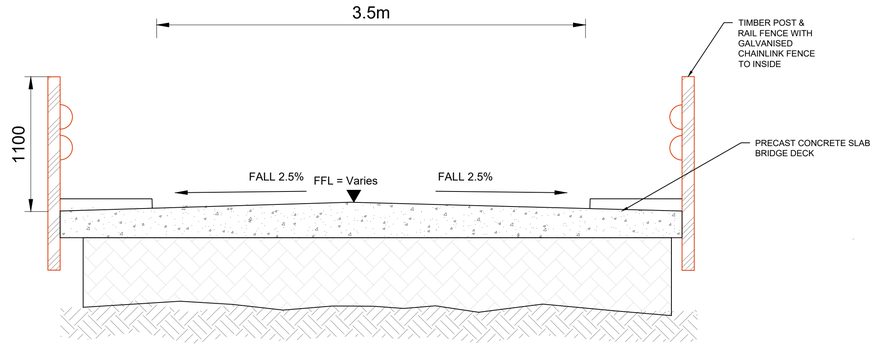
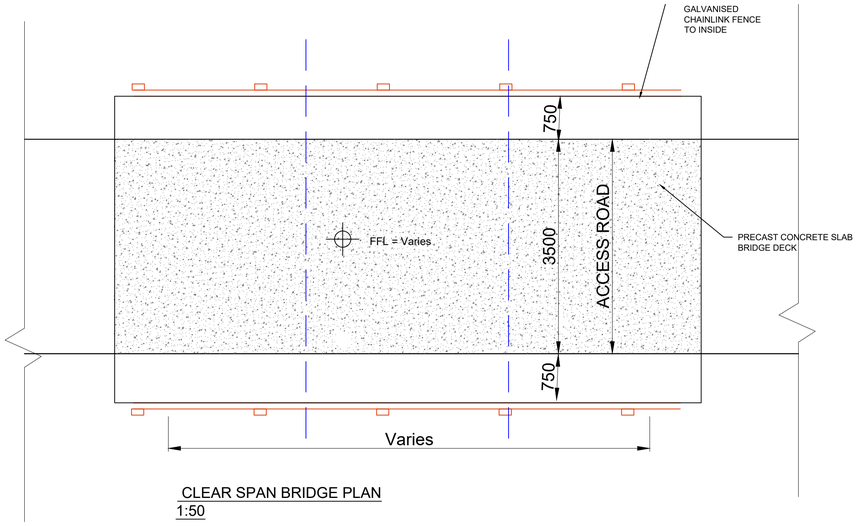
Drawing No.:	Revision:
11303-2019	A



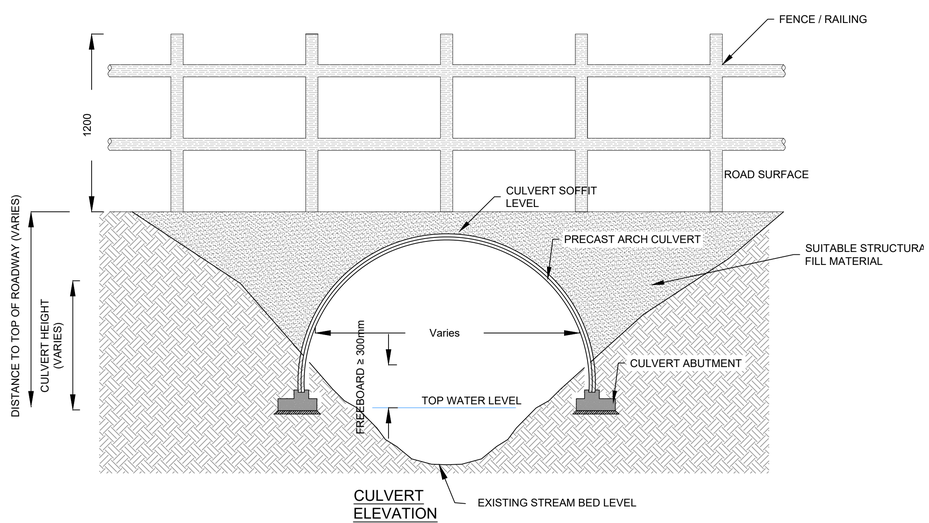
CLEAR SPAN BRIDGE SIDE ELEVATION
1:25



CLEAR SPAN BRIDGE FRONT ELEVATION
1:25



CLEAR SPAN BRIDGE PLAN
1:50



CULVERT
ELEVATION
1:25

CULVERT
PLAN 1:50

NOTE:
Orientation varies as multiple instances on site, north point can be seen on Drg. No: 11303-2003.

Rev	Date	Description	By	Chkd.
A	13.11.24	PLANNING ISSUE	MN	JS

Client: Ireland FuturEnergy

Project:
SCART MOUNTAIN WIND FARM

Title:
CLEAR SPAN BRIDGE & CULVERT DETAILS

Scale @ A1: As Shown

Prepared by: M. Nolan
Checked by: J. Staunton
Date: November '24

Drawing Status: Planning

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Drawing No.: 11303-2020
Revision: A

Notes:

1. Intercept drainage and SuDS measures to be constructed prior to access tracks.
2. Access tracks design and construction to Engineer's Specification.
3. Check dams will be installed within drainage ditches located within the proposed development site boundary. Check dams will be keyed 200mm into the drain. Well graded stone will be used to complete the check dam to a height of 500 to 750 mm above the invert of the swale/drain. Aggregate size for stone check dams will be between 10-40mm clean stone.
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11. Silt fences to be used also around spoil to mitigate silt runoff. silt fences may be removed when suitable vegetation cover is established

KILNACARRIGA

KNOCKNANASK

Check Dam
@ 50m Centers

T1

T2

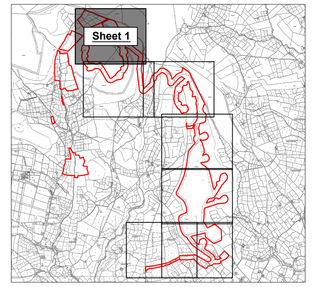
T3

T4

GENERAL LEGEND

- APPLICATION BOUNDARY
- EXISTING CONTOURS
- PROPOSED TURBINE HARDSTAND
- PROPOSED TURBINE LOCATION
- ROADSIDE FILTER DRAIN
- INTERCEPTOR DRAIN
- PROPOSED SILT FENCING
- SURFACE WATER SETTLEMENT POND
- RIVER LOCATION
- SILT TRAP & LEVEL SPREADER
- OVERLAND FLOW DIRECTION

KEY PLAN



NOTES:

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5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.

Co. Waterford

OSI 1:5,000 Sheet No's: 5760, 5761, 5762, 5763
5832, 5833, 5834, 5903, 5904 & 5905.

50m 0 50m 100m 150m

Rev	Date	Description	By	Chkd.
A	13.11.24	PLANNING ISSUE	MN	JD

Client: Ireland FuturEnergy

Project: SCART MOUNTAIN WIND FARM

Title: DRAINAGE LAYOUT PLAN - Sheet 1 of 7 -

Scale @ A1: 1:2,500 Scales as agreed with ABP 20.11.24

Prepared by: M. Nolan | Checked by: J. Dillon | Date: November '24

Drawing Status: Planning

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Drawing No.: 11303-2040 | Revision: A

T1

T5

Check Dam
@ 50m Centers

Check Dam
@ 50m Centers

TOORANARAHEEN

Kenny's Bridge

Notes:

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GENERAL LEGEND

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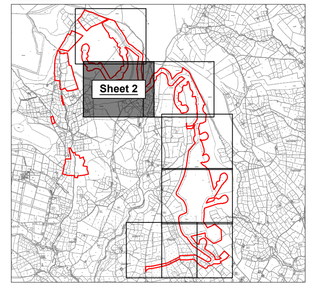
- SILT TRAP & LEVEL SPREADER
- OVERLAND FLOW DIRECTION

KEY PLAN



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OSI 1:5,000 Sheet No's: 5760, 5761, 5762, 5763
5832, 5833, 5834, 5903, 5904 & 5905.

50m 0 50m 100m 150m

Rev	Date	Description	By	Chkd.
A	13.11.24	PLANNING ISSUE	MN	JD

Client: Future Energy Ireland

Project:

SCART MOUNTAIN WIND FARM

Title:

DRAINAGE LAYOUT PLAN
- Sheet 2 of 7 -

Scale @ A1:	1:2,500	Scales as agreed with ABP 20.11.24
Prepared by: M. Nolan	Checked by: J. Dillon	Date: November '24
Drawing Status:	Planning	

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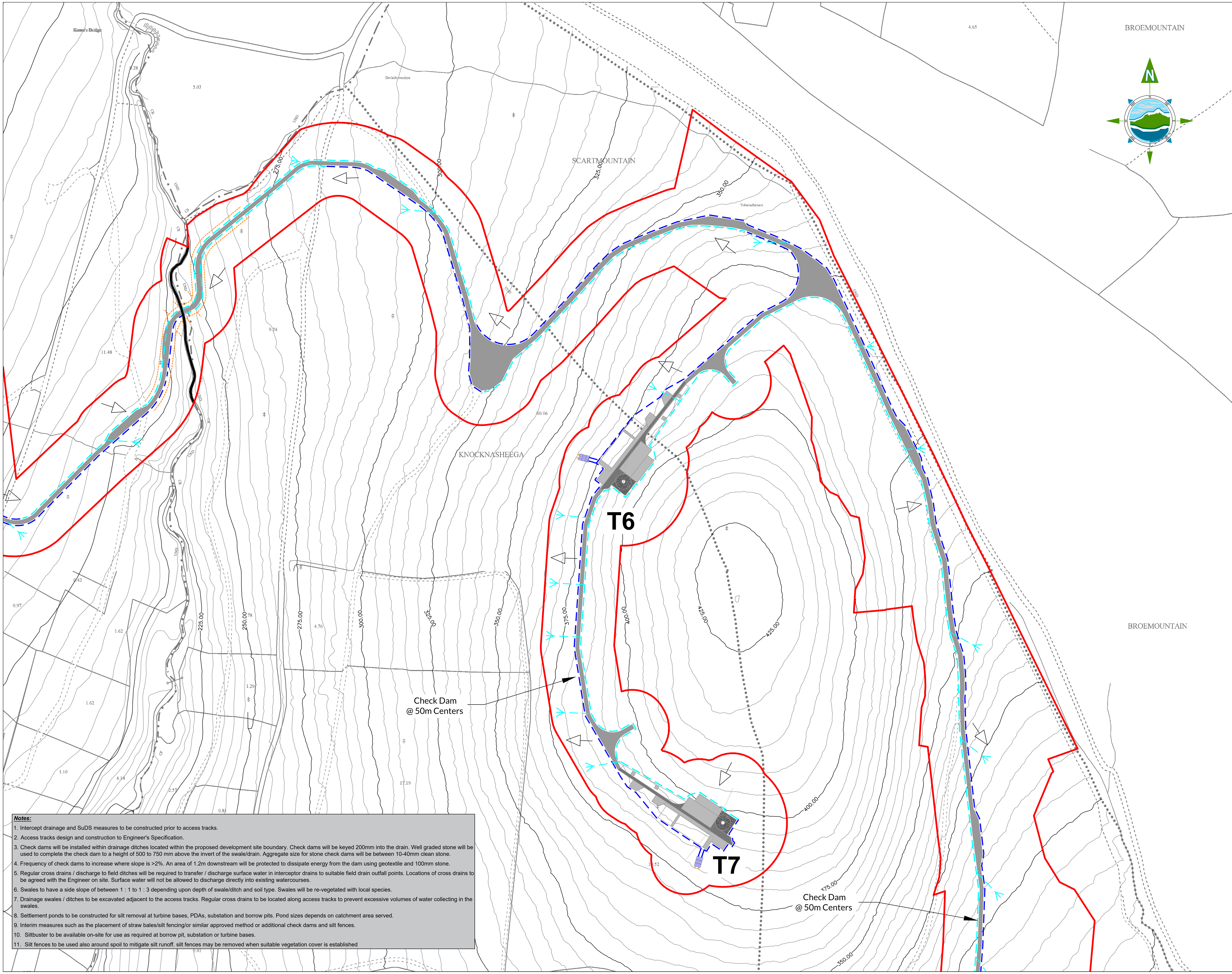
Revision: A



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- SURFACE WATER SETTLEMENT POND
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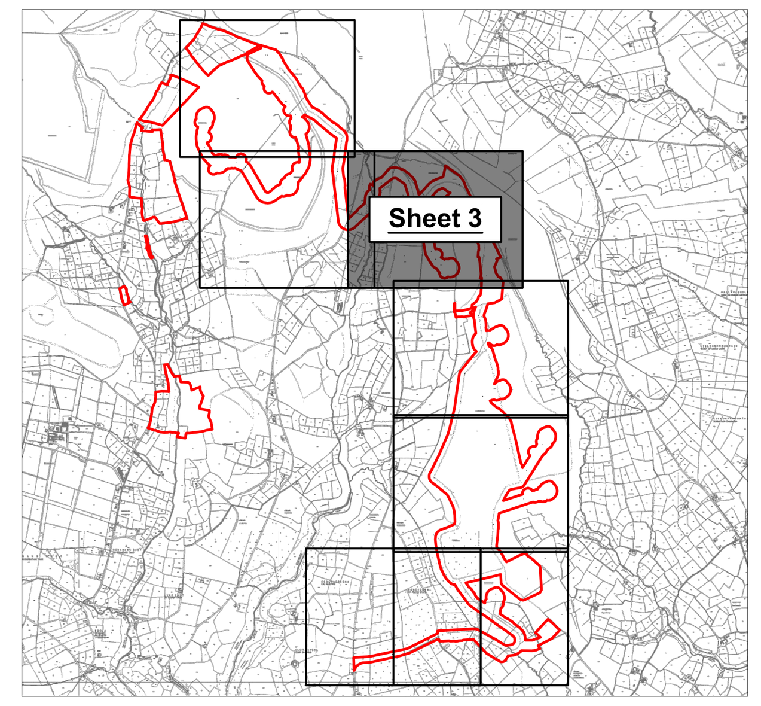
KEY PLAN



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5832, 5833, 5834, 5903, 5904 & 5905.

50m 0 50m 100m 150m

Rev	Date	Description	By	Chkd.
A	13.11.24	PLANNING ISSUE	MN	JD

Client: FuturEnergy Ireland

Project: SCART MOUNTAIN WIND FARM

Title: DRAINAGE LAYOUT PLAN - Sheet 3 of 7 -

Scale @ A1: 1:2,500 Scales as agreed with ABP 20.11.24

Prepared by: M. Nolan | Checked by: J. Dillon | Date: November '24

Drawing Status: Planning

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