

GATHABAWN WINDFARM PROJECT

Construction Environmental Management Plan 2026



September 2026

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1 Introduction to the Construction Environmental Management Plan

This is the Construction Environmental Management Plan (CEMP) for the Gathabawn Windfarm Project. This CEMP describes the approach to environmental management during the construction and early operational stages for the Gathabawn Windfarm Project.

1.1 Objectives of the CEMP

The objectives of the CEMP are to:

- (a) identify management responsibilities and reporting requirements for environmental management;
- (b) identify the relevant Environmental Commitments;
- (c) set out the environmental protection measures to be implemented;
- (d) Outline how compliance with the CEMP will be achieved; and
- (e) Promote best environmental practices for the duration of the development.

1.2 Purpose of the CEMP

The purpose of this document is to communicate environmental protection measures that apply to the development of the Gathabawn Windfarm Project to those with responsibility for carrying out works or activities on site so that any likely significant adverse effects of the development on the receiving environment can be prevented.

An Environmental Clerk of Works will be appointed and it will be their responsibility to ensure that the CEMP is implemented through liaising with the Construction Site Manager and the Project Manager and by carrying out weekly audits on CEMP compliance. The CEMP will be an important contract document for the main construction contractor (Contractor) who will be contractually obliged to comply with the CEMP and the requirements of the Environmental Clerk of Works.

1.2.1 Scope of the CEMP

This CEMP covers the construction stage of the Gathabawn Windfarm Project.

1.2.1.1 Review and Update of the CEMP

The CEMP is considered a dynamic document and as such will be reviewed and updated as required throughout each stage of the Gathabawn Windfarm Project development to ensure it contains the latest relevant information, Environmental Commitments and Environmental Protection Measures.

2 General Project Description

An overview of the Gathabawn Windfarm Project is provided below, the full description of the project is provided in [Chapter 5: Description of the Proposed Development](#) of the [Proposed Gathabawn Windfarm Environmental Impact Assessment Report \(EIAR\) 2026](#).

The proposal is to build a windfarm, ancillary and associated works. The proposed Gathabawn Windfarm will comprise the following elements:

- Twelve (12) wind turbines with a rotor diameter of 136m. Two hub heights are proposed – 82m for Turbine T6, T7 & T9, and 102m for all other turbines, thus giving an uppermost tip height of 150m for T6, T7 & T9, and 170m for all other turbines. Construction of 12 No. turbine foundations and adjacent hardstandings;
- Site roads of 8km in total length, comprising 6.7km in length of new roads and the upgrading and widening of 1.3km of existing private farm tracks;
- Two (2) electrical Control Buildings - one in the Ballylehaun area and one in the Ballyring area. The buildings measure 20m x 10m, with a height of 7m and contain electrical and communications equipment, along with a storage room, canteen and welfare facilities;
- Underground electrical cabling linking the wind turbines together into a turbine 'string' and ultimately connect these strings to the two Control Buildings;
- One (1) 30m lattice tower mast and one (1) LiDAR unit for measuring on-site meteorological conditions;
- Seven (7) site entrances from the public road, comprising both existing and newly created entrances;
- Temporary works to facilitate the transport of the large components to the turbine locations. These works comprise temporary access road; some minor public road widening; temporary hardstanding area; and temporary widening of existing field entrances off the public road;
- Installation of an integrated drainage system to manage surface water run-off during all phases of the proposed development;
- All associated infrastructure, services and ancillary site works including excavation, earthworks, temporary and permanent overburden storage berms; temporary and permanent fencing; and hedgerow and tree removal, reinstatement and enhancement;
- Two (2) temporary construction compounds and two (2) on-site temporary borrow pits;
- Creation of a Biodiversity area for the protection, enhancement and creation of habitats to serve as a functioning high level biodiversity resource for local flora and fauna communities.
- The grid connection point for the proposed Gathabawn Windfarm, has not yet being confirmed by Eirgrid but is likely to be the Eirgrid Ballyragget Substation, circa 7km to the east of the proposed windfarm site. This grid connection (to be called Candidate Gathabawn Gird Connection in the Application Documents) comprises underground cabling along the public road c. 5.6km in length between the control buildings a cross-country underground cable route from the Ballyring Control Building to Parksgrove townland, 8.8km to the east. Also includes the construction of a new substation and substation compound at Parksgrove and then a further 1.5km of underground cabling from Parksgrove to the Eirgrid Ballyragget Substation at Moatpark townland.

The relevant Figure/Drawings are listed in the table below

Figure 5.01.1	Gathabawn Windfarm Project - Location on Discovery Mapping	End of this Chapter
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2.1 Location and overview description of Gathabawn Windfarm Project

The proposed Gathabawn Windfarm is located entirely within County Kilkenny, with the wind turbines located on two areas of high ground – at Ballylehaun and at Ballyring. The nearest village is Gathabawn village which is

1km southeast from the nearest Ballylehaun turbine and 3km west from the nearest Ballyring turbine. Lisdowney village is located 3km to the northeast of the nearest Ballyring turbine, and 6km from the Ballylehaun turbines. The town of Ballyragget is located 6km northeast of Ballyring and 10km east of Ballylehaun, while the town of Johnstown is located 6km from Ballylehaun and 9km from Ballyring.

In neighbouring County Laois, Cullahill village is located 3km north of the nearest Ballylehaun turbine and 6km northwest of the nearest Ballyring turbine, while Durrow town is located 9km to the northeast of the nearest turbines.

Wind Turbines: The turbines will be of the generic three-bladed up-wind rotor, horizontal axis, tubular tower turbines. The towers will be of tubular steel design, tapering from the base to the top where the nacelle will be mounted. The blades which are made of fiberglass reinforced epoxy. The nacelle at the top of each turbine tower will contain the generator and control unit. Access to the tower is via a staircase located outside on the hardstand and a secure hinged door into the tower.

Turbine Foundations and Crane Hardstanding Areas: Each wind turbine is secured to a reinforced concrete foundation that is installed below the finished ground surface. The turbines require the construction of foundations comprising concrete, steel reinforcement and aggregate, designed to engineer's specifications depending on the turbine model chosen. The foundation design will be dictated by the turbine manufacturer. A hard-core hardstanding area will be constructed adjacent to each wind turbine location to facilitate erection of the turbine during the construction phase and maintenance works during the operational phase.

Windfarm Roads: The windfarm site access roads comprise of newly constructed windfarm access roads, and the upgrading of existing private farm tracks.

Windfarm Cabling: Underground electrical cabling will link the turbines together into a turbine 'string' and connect these strings to the on-site electrical Control Buildings. Windfarm Internal Cabling is generally under the windfarm roads.

Control Buildings: Two electrical control buildings, one at Ballylehaun and one at Ballyring, will gather and regulate the electricity from the wind turbine cable strings. The Control Buildings will comprise a compound containing a control building, electrical and communications equipment, along with a storage room, canteen and welfare facilities.

Ancillary Works include met mast and telecom relay pole, site entrances, watercourse crossing, drainage system, site compounds, borrow pits, overburden management, hedgerow removal and fencing, as per:

- Met Mast, with a height of 30m with meteorological equipment attached at Ballylehaun;
- LiDAR unit at Ballyring;
- Seven site entrances from local roads which provide access to various parts of the windfarm;
- Drainage measures will be implemented during construction of Gathabawn Windfarm, including surface water drains, upslope and downslope of works areas which will keep clean water separate from runoff from construction works areas that may be contaminated by sediment; and sediment control measures (such as silt traps and settlement ponds) to ensure that all water discharged is clean;
- Two temporary construction compounds, to be used during the construction phase of Gathabawn Windfarm. Construction Compound No. 1 will be located in Glashare townland and Construction Compound No. 2 will be located in Ballyring Upper townland;
- Two borrow pits proposed on the Gathabawn Windfarm site which will be used to quarry stone for construction. Post construction, borrow pits will be backfilled and covered with topsoil and reseeded;

- Overburden will be stored in berms alongside the turbine hardstands and along some of the access roads. Both temporary and permanent storage will be required;
- Removal of hedgerow along some field boundaries to facilitate access and to create the bat buffer zone around the turbines. To mitigate this loss of habitat, new hedgerow will be planted as part of the proposed development and lengths of existing hedgerow will be improved by interplanting new hedging into gaps in the existing field boundaries;
- Erection of fencing – the boundaries of construction works will be fenced with livestock proof fencing. Following the completion of construction, a permanent livestock fence will be erected around the turbines and along the site access roads;
- Facilitating Works along the turbine delivery route – Minor works along the public road network and in private lands to facilitate the transport of large components to the windfarm site. These include temporary access road, minor public road widening, temporary hardstanding area, and temporary widening of existing field entrances off the public road.

Windfarm Haul Routes: Construction traffic is proposed to access the Ballylehaun Area from the R639, turning onto the L58141 local road at Coolnacrutta/Glashare. Construction traffic will access the Ballyring Area from the N77, turning onto the L1807 at Parksgrove, through Lisdowney village and continuing along the L1806 and turning onto the L18062 at Ballyring Upper.

Relevant Figures (*included in Section 8 of this CEMP*):

Figure 5.01.1– Gathabawn Windfarm Project – Location on Discovery Mapping

2.2 Overview description of the Candidate Gathabawn Grid Connection

Parksgrove Substation: A new EirGrid specification 110kV substation at Parksgrove townland which will consist of a hardcore compound yard, surrounded by palisade fencing with entrance gates. Inside the palisade fence, in the hardcore compound yard are 2 No. control buildings with self-contained welfare facilities to be installed; electrical equipment and apparatus, a lightening protection monopole; and underground and overhead cabling.

Ballylehaun-Ballyring Underground Cabling: The electricity gathered and regulated at the Control Building at Ballylehaun will be transmitted via underground cabling 5.6km in length to the Control Building at Ballyring. The cabling will be installed under windfarm site roads and under public roads.

Ballyring-Parksgrove Underground Cabling: The electricity gathered and regulated at the Control Building at Ballyring will be transmitted via underground cabling 8.8km in length to the Parksgrove Substation. The cabling will be installed under agricultural lands, hardcore areas and the public road.

Parksgrove-Moatpark Underground Cabling: The electricity gathered and regulated at the Parksgrove Substation will be transmitted via underground cabling 1.5km in length to the existing EirGrid Substation at Moatpark. The cabling will be under agricultural lands and the public road, and will cross the River Nore.

Ancillary Works include:

- One permanent site entrance and 5 no. temporary site entrances to access the Parksgrove Substation, Ballyring-Parksgrove UGC and Parksgrove-Moatpark UGC.
- One temporary construction compound at the Parksgrove Substation.
- Overburden will be stored in berms along the underground cable routes and at the Parksgrove Substation. Both temporary and permanent storage will be required.

- Six watercourse crossings will be required at the Candidate Gathabawn Grid Connection. 2 no. of these crossings will be located along the route of the Ballylehaun-Ballyring UGC, 3 no. crossings will be located along the Ballyring-Parksgrove UGC, while 1 no. crossing will be located along the Parksgrove-Moatpark UGC;
- Removal of hedgerow along the route of the Ballyring-Parksgrove UGC. This hedgerow will be replanted following the works. An area of scrub will be cleared at the Parksgrove Substation;
- Erection of fencing – the boundaries of construction works will be fenced with livestock proof fencing. Following the completion of construction, construction works area fencing will be left in place until the land has revegetated following reinstatement works.

2.3 Main Construction Stage Activities

Construction stage activities will involve the following main works:

Table 1: Construction stage activities

• Pre-Construction Activities	• Overburden Storage Areas
• Site Compounds	• Turbine Foundations – excavation, steel reinforcement
• Site Entrances	• Turbine Foundations – pouring of concrete
• Construction Works Area Preparation	• Control Building civil works
• Windfarm Roads	• Electrical Works
• Watercourse and wet drainage channel crossing works	• Wind turbine delivery and erection
• Removal of Hedgerows	• Reinstatement of Lands
• Crane Hardstanding areas	• Hedgerow planting and enhancement

2.3.1 Method Statements

Method statements are used to explain project requirements through planned systems of work including work instructions for site staff and construction personnel. They are prepared for activities identified in the civil engineering and electrical works (outlined in the table above). Method statements are issued to all responsible personnel and those involved with the specified activity.

Method Statements will also be relevant to site safety and be attached to the site safety file for the project. However, any Method Statements relevant to environmental protection will be developed and appended to the CEMP and communicated with the appropriate personnel. A register of Method Statements required throughout the project will be maintained in the site office.

Method Statements will be developed by the main contractor and approved by the PSCS ahead of any works on site. These will be included as Tab 8 at the end of this document.

As the project progresses, new activities or amendments will also require Method Statements. Method Statements may also be revised based on new information or improvements on site.

2.3.2 Construction Schedule

The main construction period will take c.12 months. The Contractor appointed to the construction of the project will be responsible for preparing a detailed construction schedule, taking account of any relevant planning conditions, seasonal requirements and health and safety considerations.

The detailed construction schedule will include a sequence of elements such as;

- Road widening works
- Clearance and construction of hardcore area for temporary compound and mobilisation of site offices.
- Construction of bunded area for fuel and diesel tanks.
- Construction of new access roads and hardstandings.
- Construction of drainage per Surface Water Management Plan.
- Excavation of the turbine foundations and hardstanding areas and storage of overburden for backfilling and re-use.
- Construction of the turbine hardstanding areas.
- Construction of turbine foundations, and pouring and curing of concrete for the foundations.
- Installation of underground ducting and construction of jointing chambers/bays for the Windfarm Cabling.
- Installation of underground ducting and construction of jointing chambers/bays for the Ballylehaun-Ballyring Underground Cabling, Ballyring-Parksgrove Underground Cabling and Parksgrove-Moatpark Underground Cabling, including Horizontal Directional Drilling works under the River Nore.
- Construction and electrical commissioning of the Windfarm Control Buildings and the Parksgrove Substation.
- Connection works for the Candidate Gathabawn Grid Connection in the EirGrid Substation at Moatpark.
- Facilitating works for the transport of turbine components to the windfarm site.
- Installation of meteorological mast and LiDAR unit.

The construction programme will be developed by the main contractor in consultation with Kilkenny County Council ahead of works on site. These will be included as Tab 9 at the end of this document.

2.4 Other Activities in the vicinity of the Gathabawn Windfarm Project

Other activities at and in the immediate vicinity of the Gathabawn Windfarm Project site are:

- Agriculture – mainly cattle rearing, dairy and silage cutting
- Walking – presence of walkers along public roads
- Traffic – on public and private roads

3 Contractors & Personnel

A typical organisational structure, a format for Contact Details Sheets for the construction stage of the Gathabawn Windfarm Project, along with the duties and responsibilities of various personnel and a description of environmental training and communication processes are outlined below.

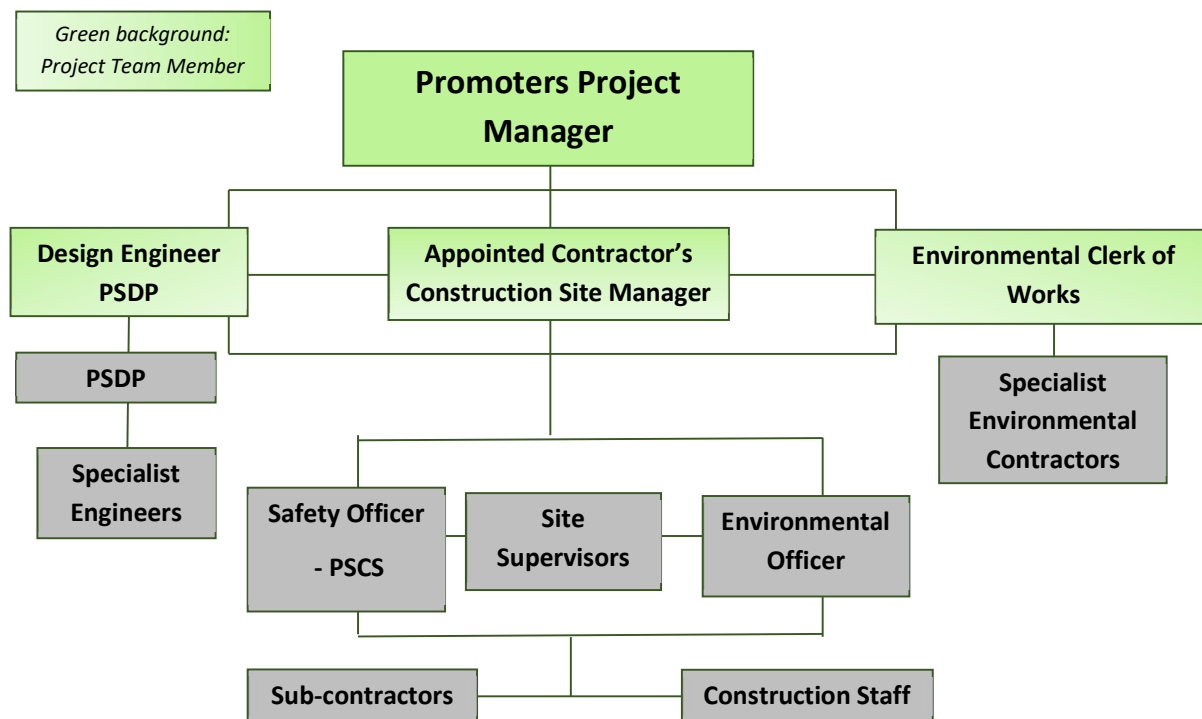
The construction Project Manager and Main Contractor will be appointed by the Promoter prior to commencement of the works. On appointment, the Project Manager and the Main Contractor will be required by the Project Promoter to update the outline organisational structure, the specific duties, roles and responsibilities of appointed personnel, contact details for these personnel, implement training programs and policies regarding communications.

It should be noted that the contractors and personnel for the construction stage are also relevant to the pre-construction stage.

3.1 Organisational Structure and Hierarchy

The organogram below illustrates the typical reporting and hierarchal structures which will be implemented during the various stages of the Project development. These organograms will inform the duties and responsibilities of all personnel under the CEMP.

3.1.1 Construction Stage



3.2 Contact Details

Contact details of relevant personnel are provided in Tables 2 to 4 below to ensure the efficient reporting of environmental incidents. The details will be frequently reviewed by the Environmental Clerk of Works to ensure that they are up-to-date.

3.2.1 Construction Stage Contact Details

Table 2: Project Promoters Contacts

Position Title	Name	Mobile Phone Number	Email Address
Project Manager	TBC		
Design Engineer	TBC		
Environmental Clerk of Works	TBC		

Table 3: Main Contractors Contacts

Position Title	Name	Mobile Phone Number	Email Address
Construction Site Manager	TBC		
Environmental Officer	TBC		
Safety Manager – PSCS	TBC		
Safety Officers (24-hour number)	TBC		
Site Emergency Number (24-hour)	TBC		

Table 4: Third Party Contacts

Organisation	Name	Position Title	Phone Number	Email Address
Emergency Services	TBC			
Health & Safety Authority	TBC			
Kilkenny County Council	TBC			
Inland Fisheries Ireland	TBC			
National Parks & Wildlife Service	TBC			
Environmental Protection Agency	TBC			
Uisce Eireann	TBC			
Waste Management	TBC			
Emergency Oil Spill Response	TBC			

3.3 Duties & Responsibilities

3.3.1 Project Promoter

The Project Promoter (the 'Project Promoter' or 'Promoter') of the Gathabawn Windfarm Project has overall responsibility for the implementation of the environmental commitments and of environmental management of the works during construction and operation.

3.3.2 Project Team Members – Construction Stage

The project team will be appointed prior to the commencement of the construction stage. The roles and responsibilities outlined below are indicative at this stage in the project and will be updated pending planning consent, conditions of planning and the appointment of the Main Contractor, details of the personnel involved along with their responsibilities will be added to the CEMP. An outline of potential duties and responsibilities for various members of the project team is provided below. These details will require revision prior to the commencement of construction.

3.3.2.1 Project Promoters Project Manager

A Project Manager is appointed by the Project Promoter to manage and oversee the entire project.

The Project Manager's responsibilities include, but are not limited to, the following:

- management of the construction project, including the production of a construction schedule and the procurement of construction materials;
- liaison with the Project Promoter;
- liaison with the Main Contractor, Construction Site Manager and Project Team;
- liaison with the Environmental Clerk of Works
- implementing of the Construction Environmental Management Plan;
- implementing the CEMP sub-plans, and the Safety and Health Plan;
- assigning duties and responsibilities in relation to the CEMP;
- maintaining a site project diary.

3.3.2.2 Construction Site Manager

The Construction Site Manager manages all the works to construct the windfarm, on behalf of the Main Contractor. The Construction Site Manager reports to the Promoters Project Manager. In relation to the CEMP, the Construction Site Manager is responsible for:

- Being aware of and familiar with all Environmental Commitments and Environmental Protection Measures;
- Ensuring that all relevant information on project programming, timing, construction methodology, etc., is communicated to the Promoters Project Manager and to the Environmental Clerk of Works, in a timely and efficient manner, in order to allow pre-emptive actions relating to the environment to be taken where required;
- Ensuring that the Environmental Commitments are implemented;
- Ensuring that adequate resources are provided to design and install any environmental interventions;
- Liaising with the Design Engineer and providing information on environmental management to the Design Engineer during the course of the construction phase;

- Liaising with the Project Team in assigning duties and responsibilities in relation to the CEMP to individual members of the main contractor's project staff;
- Preparing site-specific Method Statements for all works and activities where there is a risk of environmental damage, by incorporating relevant Environmental Protection Measures;
- Liaising with the Environmental Clerk of Works in reviewing and updating site-specific Method Statements for all Works activities where Environmental Protection Measures had been altered, and
- Liaising with the Environmental Clerk of Works where third-party agreement is required in relation to site-specific Method Statements and Environmental Protection Measures.

3.3.2.3 Design Engineer

The Design Engineer reports to the Promoters Project Manager and is responsible for:

- Design of the Works;
- Reviewing and approving relevant elements of the method statements – assisting the Construction Site Manager with the overall review;
- Consulting and liaising with Third Parties, where required;
- Updating/amending designs where required;
- Ensuring the Gathabawn Windfarm Project is constructed according to the planning drawings and consent.

3.3.2.4 Environmental Clerk of Works

The Environmental Clerk of Works is appointed by the Promoter and is independent of the Appointed Contractor. The Environmental Clerk of Works reports directly to the Promoters Project Manager. The duties and responsibilities of the Environmental Clerk of Works are outlined in the subsections below.

3.3.2.4.1 General

- Manage a team of Environmental Managers and assigning duties and responsibilities in relation to the CEMP to individual members
- Being familiar with the contents, environmental commitments and requirements contained within the Reference Documents outlined in Section 4.1 of this CEMP;
- Provision of information on environmental management to the Design Engineer during the course of the construction phase;
- Liaising with the Project Promoter in relation to environmental issues;
- Monitoring construction activities and auditing compliance of construction works with Environmental Protection Measures; and
- Monitoring the implementation of the Environmental Commitments;
- Preparing weekly CEMP Compliance Reports.

3.3.2.4.2 Compliance Auditing

- Carrying out daily documented inspections and audits of the site and construction works to check that work is being carried out in accordance with the Environmental Commitments and Environmental Protection Measures set out in Section 4 and Section 5 of this CEMP.
- Carrying out daily inspections of the fuel/oil storage area and the site drainage system.

- Liaising with the Construction Site Manager to organise any repairs or maintenance required following the regular inspections of the site.
- Weekly reporting on the compliance of the construction works with the CEMP
- Reporting on the environmental effects of the project against the predictions made during the Environmental Impact Assessment process;
- Reporting on the effectiveness of the environmental management of the project;
- Reporting on the adequacy of the Promoters and Contractors response to any Corrective Action Requests
- Appending copies of the inspection reports to the CEMP.

3.3.2.4.3 Detailed Method Statements

- Liaising with the Construction Site Manager regarding Method Statements for all works activities where there is a risk of environmental damage to ensure that these method statements incorporate the relevant Environmental Protection Measures.
- Liaising with the Construction Site Manager in reviewing and updating the Method Statements where Environmental Protection Measures have been altered.

3.3.2.4.4 Third Party Consultations

- Overseeing, ensuring coordination and playing a lead role in third party consultations required statutorily, contractually and in order to fulfil mitigation/best practice requirements;
- Ensuring that the minutes of environmental meetings, action lists, formal communications, etc., are well documented;
- Liaising with all prescribed bodies during any site visits, inspections and consultations;
- Where new Environmental Protection Measures are agreed as a result of third-party consultation, ensuring that the CEMP is amended accordingly and liaising with the Construction Site Manager to ensure that any relevant Method Statements are updated.

3.3.2.4.5 Licensing

- Confirming that all relevant works have (and are being carried out in accordance with) the required, planning consents, permits, licences etc.;
- Where relevant, liaising with the designated licence holders with respect to licences granted pursuant to the Wildlife Act, 1976, as amended;
- Bringing to the attention of the Project Team any timing and legal constraints that may be imposed on the carrying out of certain tasks.

3.3.2.4.6 Engaging Specialist environmental contractors

- Identifying requirements for specialist environmental contractors (for example ecologists, spill clean-up specialists etc.) before commencement of the project;
- Procuring the services of specialist environmental contractors when required and liaising with them with respect to site access and report production;
- Ensuring that the specialist environmental contractors are competent; and
- Co-ordinating the activities of all specialist environmental contractors.

3.3.2.4.7 Environmental Induction Training and Environmental Toolbox Talks

- Confirming that Environmental Induction Training is carried out for all site personnel. No personnel will be allowed to work on the site without proof of attendance at an Environmental Induction.
- Confirming that toolbox talks on Environmental Protection Measures associated with Site-specific Method Statements have been provided by the Contractor to those who will undertake the work.

3.3.2.4.8 Environmental Incidents/Spillages

- Have the authority to temporarily stop works over part of the site to avoid an environmental offence being committed;
- Prepare and be in readiness to implement at all times environmental emergency response measures, see Tab 4 of this CEMP.
- Notifying the relevant statutory authority of environmental incidents, and
- Carrying out an investigation and producing a report regarding environmental incidents. The report of the incident and details of remedial actions taken will be made available to the relevant authority, the Promoter and the Project Team.

3.3.2.5 Other Roles**3.3.2.5.1 Specialist Environmental Contractors****Project Ecologist**

An ecologist will be appointed by the Environmental Clerk of Works and will be responsible for:

- Advising the Environmental Clerk of Works, Project Manager, Construction Manager and Project Promoter on relevant wildlife/environmental legislation and aid in the development of practical solutions
- carrying out the habitat and species surveys during the appropriate periods
- aiding with the implementation of biodiversity related planning conditions
- monitoring and aiding with the implementation of biodiversity related Environmental Protection Measures
- monitoring vegetation clearance
- monitoring the success of the re-vegetation work, including hedgerow planting and enhancement.

Project Hydrologist

A hydrologist will be appointed by the Environmental Clerk of Works and will be responsible for:

- Monitor the implementation of the Surface Water Management Plan (SWMP)
- Carrying out of site inspections in accordance with the SWMP
- carrying out of water quality monitoring prior to, during and post construction

Project Archaeologist

An archaeologist will be appointed by the Environmental Clerk of Works and will be responsible for:

- communicating with the National Monument Service regarding licences etc.
- carrying out of archaeological surveys during the appropriate periods at the identified locations
- monitoring of groundworks associated with the development.

3.3.2.5.2 **Project Supervisor Construction Stage - PSCS**

The PSCS for the construction project is appointed by the Main Contractor in line with the Construction Regulations:

- carrying out duty of Project Supervisor Construction Stage
- responsible for safety induction of all staff and personnel on site
- implementing the Health and Safety Plan
- auditing and updating the Health & Safety Plan
- all other relevant legal Safety duties
- implement and record the Waste Management Plan
- Holding copies of all permits and licences provided by waste contractors;
- Ensuring that any operations or activities that require certificates of registration, waste collection permits, waste permits, waste licences, etc., have appropriate authorisation, and
- Gathering and holding documentation with the respect to waste disposal.

3.3.2.5.3 **Community Liaison Officer (CLO)**

The CLO is responsible for communicating with the local community and wider public, including;

- Responding to any concerns or complaints raised by the public in relation to the construction of the Gathabawn Windfarm Project;
- Liaising with the Environmental Clerk of Works on local community concerns relating to the environment;
- Keeping the local community informed of project progress and any construction activities which may cause inconvenience to them.

3.3.2.5.4 **Landowner Liaison Officer (LLO)**

The LLO is responsible for communicating with the landowners involved in the Project, including;

- Monitoring the erection and maintenance of the construction works area boundary fences;
- Liaising with the landowners regarding the location of access gates along the construction works area boundary fences;
- Keeping the landowners informed of project progress and any construction activities which affect them;
- Responding to any concerns or complaints raised by the landowners in relation to the construction of the Gathabawn Windfarm Project;
- Liaising with the Environmental Clerk of Works on landowner concerns relating to the environment.

3.3.2.5.5 **All site personnel**

All site personnel are responsible for:

- Adhering to the relevant Environmental Protection Measures and site-specific Method Statements
- Reporting immediately, to the Construction Site Manager and the Environmental Clerk of Works, any incidents where there has been a breach of agreed procedures including any spillage of a potentially environmentally harmful substance; damage to a protected habitat, etc.

3.4 Environmental Awareness Training

Environmental Awareness Training will be provided to ensure that all of the appointed Contractors site personnel have the appropriate knowledge to successfully implement the CEMP. The main objective of the training is to make sure that site personnel are aware of the relevant Environmental Commitments and Environmental Protection Measures and that site personnel are aware of the steps to take in an environmental emergency situation.

3.4.1 CEMP and Contractual Requirements Briefing

The Environmental Clerk of Works will regularly brief the relevant project team members on the compliance with the CEMP and on the Environmental Commitments which must be met and the Environmental Protection Measures which must be implemented during the construction.

3.4.2 Environmental Induction Training

The Environmental Clerk of Works will provide Environmental Induction Training for all project team members. All other site personnel, including sub-contractor personnel, will receive relevant environmental induction training in conjunction with safety induction training.

Every member of the main Contractors and sub-contractor's teams must have access to and have read the CEMP prior to beginning works – this will be a strict requirement for all people working on this project. No workers will be allowed to work on this project without having attended a formal Environmental Induction. The induction training will ensure that both Contractors employees and subcontractors are fully informed of their responsibilities regarding specific environmental obligations. The induction will outline the objectives for the environmental management of the site, identify the relevant environmental sensitivities and outline the Environmental Protection Measures to be put in place to prevent significant adverse impacts to the environment. Signed training records will be kept by the Environmental Clerk of Works for all environmental training provided.

3.4.3 Task Specific Training – Toolbox Talks

Where a site-specific Method Statement (one which incorporates Environmental Protection Measures) has been devised for a works activity, all site personnel involved in that activity will receive a toolbox talk outlining the Environmental Protection Measures. The Site Supervisor will be responsible for providing the toolbox talk and will provide signed training records to the Environmental Clerk of Works.

3.5 Communication

Procedures for both internal and external communication of information regarding specific elements of the Gathabawn Windfarm Project will be implemented during the construction of the development.

3.5.1 Internal Communication

During construction, the Environmental Clerk of Works will be responsible for communicating the Environmental Commitments, Environmental Protection Measures and Emergency Contingency Measures to the main Contractor, who will communicate them to the Site Supervisors, who in turn will bring the relevant Environmental Protection Measures to the attention of all site personnel.

Important environmental information on specific elements of the Gathabawn Windfarm Project will be communicated to contractors and site personnel through site inductions, site management meetings, safety

meetings and toolbox talks. The Environmental Clerk of Works will attend and report on environmental issues at the site management meetings.

3.5.2 External Communication with Landowners and the General Public

Communications with landowners will be managed by a Landowner Liaison Officer (LLO), while communication with local residents and the general public will be managed by a Community Liaison Officer (CLO), appointed by the Promoter.

A two-way mechanism will be put in place whereby landowners and members of the public will be able to communicate with the LLO or CLO, as appropriate, and the LLO or CLO will be able to communicate important information on various aspects of the development to the landowners or to the general public, as appropriate.

A complaints register will form part of the public communications strategy. Any complaints will be handled by the Community Liaison Officer with the complainant receiving a response within one week after lodging the complaint.

All environmental complaints will be directed to the Environmental Clerk of Works.

4 Environmental Commitments

The Environmental Commitments are the obligations and requirements which will be implemented during the development of the Gathabawn Windfarm Project to avoid, prevent or minimise significant adverse impacts to the environment.

The current List of Environmental Commitments, listed in Table 5 below, arises from the **Proposed Gathabawn Windfarm Environmental Impact Assessment Report**

Table 5: List of Environmental Commitments (ECs) – to be updated

Environmental Commitment	Implemented By: Construction Manager/ Env. Clerk of Works / Project Manager / Other	Method by which the EC will be met
The Project Promoter is committed to constructing the Project in accordance with the permitted layout and final detailed design (Tab 1 and Tab 2)	Project Team	Planning Conditions and Planning Drawings incl. Drainage Drawings
The Project Promoter is committed to implementing the Mitigation & Monitoring Arrangements contained in Tab 3 , Temporal Restrictions contained in Section 5.1 and Environmental Survey Requirements contained in Section 5.2	Project Team and specialist environmental and engineering experts	Incorporation of the Mitigation Measures listed below into Method Statements/ Management Plans/ Environmental Management Procedures/ Temporal Restrictions / Surveying Requirements.
The Project Promoter is committed to implementing the Environmental Response Procedures (Tab 4)	Project Team	Implementation of Emergency Response actions if required
The Project Promoter is committed to implementing the Traffic Management Plan (Tab 6)	Project Team	Traffic Management Plan
The Project Promoter is committed to implementing the Surface Water Management Plan (Tab 5) and constructing the site drainage system (Tab 2).	Project Team Site Hydrologist	Surface Water Management Plan Drainage Drawings
The Project Promoter is committed to implementing the Waste Management Plan (Tab 7)	Project Team	Waste Management Plan
The Project Promoter is committed to monitoring the development to check that the project is in practice, conforming to the predictions made in the EIA Report.	Project Team and specialist environmental and engineering experts	CEMP Compliance Record Sheets Environmental Surveying Requirements (monitoring arrangements)

4.1 Reference Documents

The List of Environmental Commitments will be updated with any relevant changes to the Reference Documents, listed in Table 6.

Table 6: List of Reference Documents

Location	Reference Document Title
Tab 1	Grant of Permission including Planning Conditions
Tab 2	Site Drainage Drawings
Tab 3	Mitigation & Monitoring Arrangements
Tab 4	Emergency Response Procedures
Tab 5	Surface Water Management Plan
Tab 6	Traffic Management Plan
Tab 7	Waste Management Plan
Tab 8	Contractors Method Statements
Tab 9	Construction Programme
Tab 10	Invasive Species Management Plan

5 Environmental Protection Measures

The current Environmental Protection Measures comprise:

- Tab 3 - Mitigation & Monitoring Arrangements Environmental Management Procedures – Temporal Restrictions and Environmental Survey Requirements
- Tab 5 -Surface Water Management Plan
- Tab 6 -Traffic Management Plan
- Tab 7 - Waste Management Plan Management Plans: – Traffic, Surface Water, Waste, and Biodiversity Management Plans,
- Tab 10 – Invasive Species Management Plan

The Environmental Protection Measures will be reviewed regularly by the Environmental Clerk of Works and kept up to date to reflect additional environmental conditions attached to planning conditions, conditions of licences, following third party feedback or any additions to the Environmental Commitments.

6 Monitoring

Adverse effects on the environment due to the development of the Gathabawn Windfarm Project mostly relate to the construction stage. Monitoring of the construction works will check that the project in practice conforms to the predictions made in the EIA Report during the planning process. This audit of the conformity with the EIA Report will be carried out through the CEMP by the Environmental Clerk of Works.

6.1.1 Environmental Clerk of Works

The Project Promoter of the Gathabawn Windfarm Project (the 'Promoter') will employ a suitably qualified Environmental Clerk of Works (minimum NEBOSH Certificate in environmental management) who will be independent of the Main Contractor. The Environmental Clerk of Works will be employed for the duration of the pre-construction, construction and for early (c.6 months) operational stages, and will have a full-time presence during the construction stage. The Environmental Clerk of Works will be adequately resourced to engage and manage specialist environmental consultants, such as ecologists, hydrologists and archaeologists, as required.

The Environmental Clerk of Works will monitor the compliance of the construction works with the CEMP and all relevant planning conditions.

The Environmental Clerk of Works will have a 'stop-works' authority to temporarily stop works at a works location in order to avoid or react to an unforeseen adverse environmental event. Works will not be allowed to recommence until the issue is resolved.

6.1.2 Compliance Auditing

On-going audits, will be carried out by the Environmental Clerk of Works, during the construction of the Gathabawn Windfarm Project. The audits will record the:

- compliance with this CEMP;
- environmental effects of the project against the predictions made during the EIA process;
- effectiveness of the environmental management of the project; and
- adequacy of the Promoters and Contractors response to any Corrective Action Requests.

6.1.3 Reporting

An CEMP Compliance Report will be prepared weekly during the construction stage, issued to the Project Supervisor Construction Stage (PSCS) for distribution and will be presented at all project Environment, Health & Safety (EHS) meetings to ensure that 'live' issues are dealt with in a time efficient manner.

The CEMP Compliance Report will detail the findings and recommendations of the preceding monitoring and auditing activities and will include a detailed response from the Contractor to any of the recommendations contained in the previous report.

Template reporting and record sheets are included in Section 7 of this CEMP for:

- Non-Compliance Report
- Register of Non-Compliance Reports Issued
- Environmental Training Record
- Register of Environmental Training Environmental Incident Record
- Environmental Incident Record

- Register of Environmental Incidents
- Environmental Public Complaint Record
- Register of Environmental Public Complaints

6.1.4 Corrective Actions

Where non-compliance is detected, a system of follow up and corrective action will be implemented. Corrective Action Requests (CARs) will be issued to the Contractor to ensure that prompt action is agreed and committed to, with a view to the effective resolution of any deviations from the CEMP requirements.

CARs may be raised as a result of:

- A compliance audit; or
- A suggestion for improvement by a Statutory Body; or
- An incident or potential incident;
- An unexpected failure of a mitigation measure;
- An unexpected or unforeseen adverse effect on the environment; or
- An internal or external communication.

All Corrective Action Requests will be numbered and logged.

7 Records & Reporting

7.1 Non-Compliance Record Sheet

Non-Compliance Record Sheet		
Date	Time	Logged By
<u>Contractor or Subcontractor Details:</u> Contractor Name: Contact Name: Telephone:		
<u>Nature of Non-Compliance</u> (specify Environmental Protection Measure breached)		
<u>Time Specified for becoming compliant:</u>		
Contractor or Subcontractor's confirmation of receipt of NCR Yes ☐ No ☐ Contractors or Subcontractors signature: _____ Date of Signing: _____		

[illegible]

7.3 Environmental Training Record Sheet

[illegible]

7.4 Register of Environmental Training

Register of Environmental Training								
Date	Training Title	Training Description	External Trainers	Name of Training Company	Name of Trainer	Duration	Name of Trainee	Job Title of Trainee

7.5	Environmental Incident Record Sheet
------------	--

Environmental Incident Record Sheet																			
Date	Time	Logged By																	
How was Incident Detected?																			
Nature of Incident (e.g. Water pollution/Dust/Noise/Fuel Spill)																			
Investigation Findings																			
Corrective/Preventative Action Taken/Contingency Measures Employed																			
Follow up reporting: <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">EPA</td> <td style="width: 15%;">Letter ☐</td> <td style="width: 15%;">Phone ☐</td> <td style="width: 37%;">Date: _____</td> </tr> <tr> <td>Kilkenny County Council</td> <td>Letter ☐</td> <td>Phone ☐</td> <td>Date: _____</td> </tr> <tr> <td>Office of Public Works</td> <td>Letter ☐</td> <td>Phone ☐</td> <td>Date: _____</td> </tr> <tr> <td>Inland Fisheries Ireland</td> <td>Letter ☐</td> <td>Phone ☐</td> <td>Date: _____</td> </tr> </table>				EPA	Letter ☐	Phone ☐	Date: _____	Kilkenny County Council	Letter ☐	Phone ☐	Date: _____	Office of Public Works	Letter ☐	Phone ☐	Date: _____	Inland Fisheries Ireland	Letter ☐	Phone ☐	Date: _____
EPA	Letter ☐	Phone ☐	Date: _____																
Kilkenny County Council	Letter ☐	Phone ☐	Date: _____																
Office of Public Works	Letter ☐	Phone ☐	Date: _____																
Inland Fisheries Ireland	Letter ☐	Phone ☐	Date: _____																
Signed: _____																			

7.6 Register of Environmental Incidents

Register of Environmental Incidents								
Date	Time	How was Incident detected	Nature of Incident	Nature of Complaint	Investigation findings	Corrective / preventative action	Follow up Reporting	Incident logged by

7.7 Environmental Complaint Record Sheet

Environmental Complaint Record Sheet		
Date	Time	Logged By
Complainants Details (if known) Name: _____ Address: _____ Telephone Number: _____ Mode of Complaint: _____ (e.g. telephone/letter/verbal/via statutory body)		
Nature of Complaint (e.g. Water pollution/Dust/Noise/Fuel Spill) 		
Response to Complaint <i>(including investigation findings, corrective actions/preventative action taken if required)</i> 		
Corrective/Preventative Action Taken/Contingency Measures Employed 		
Follow up correspondence: To complainant/ _____: Letter ☐ Phone ☐ Date: _____ Further correspondence from complainant: Letter ☐ Phone ☐ Date: _____ 		
Signed: _____		

7.8 Register of Environmental Complaints

Register of Environmental Complaints								
Date	Time	Complainant's Details	Mode of complaint	Nature of Complaint	Responder to Complaint	Follow up correspondence	Complaint logged by	Date

7.9 Control of Spread of Alien Species Record Sheet

Contractor/Employee Name:		
Contractor Equipment List: (list all main equipment cleaned)		
Construction Location: (tick as appropriate)	• • (Specify exact location)	☐ ☐
Cleaning Location (specify location where cleaning took place, e.g. name of garage)		
Method of Cleaning (Specify nature of cleaning e.g. High-pressure steam, manual removal of vegetation, high pressure power hose, disinfection etc.)		
Date of Cleaning:		
Contractor Declaration: I hereby declare that all equipment used at the construction location indicated above has been thoroughly cleaned in accordance with the cleaning methodology set out above before entering the construction site. The machine I am using has not left site and re-entered since it was cleaned. Signed: _____ Date: _____		

8 Mapping & Figures

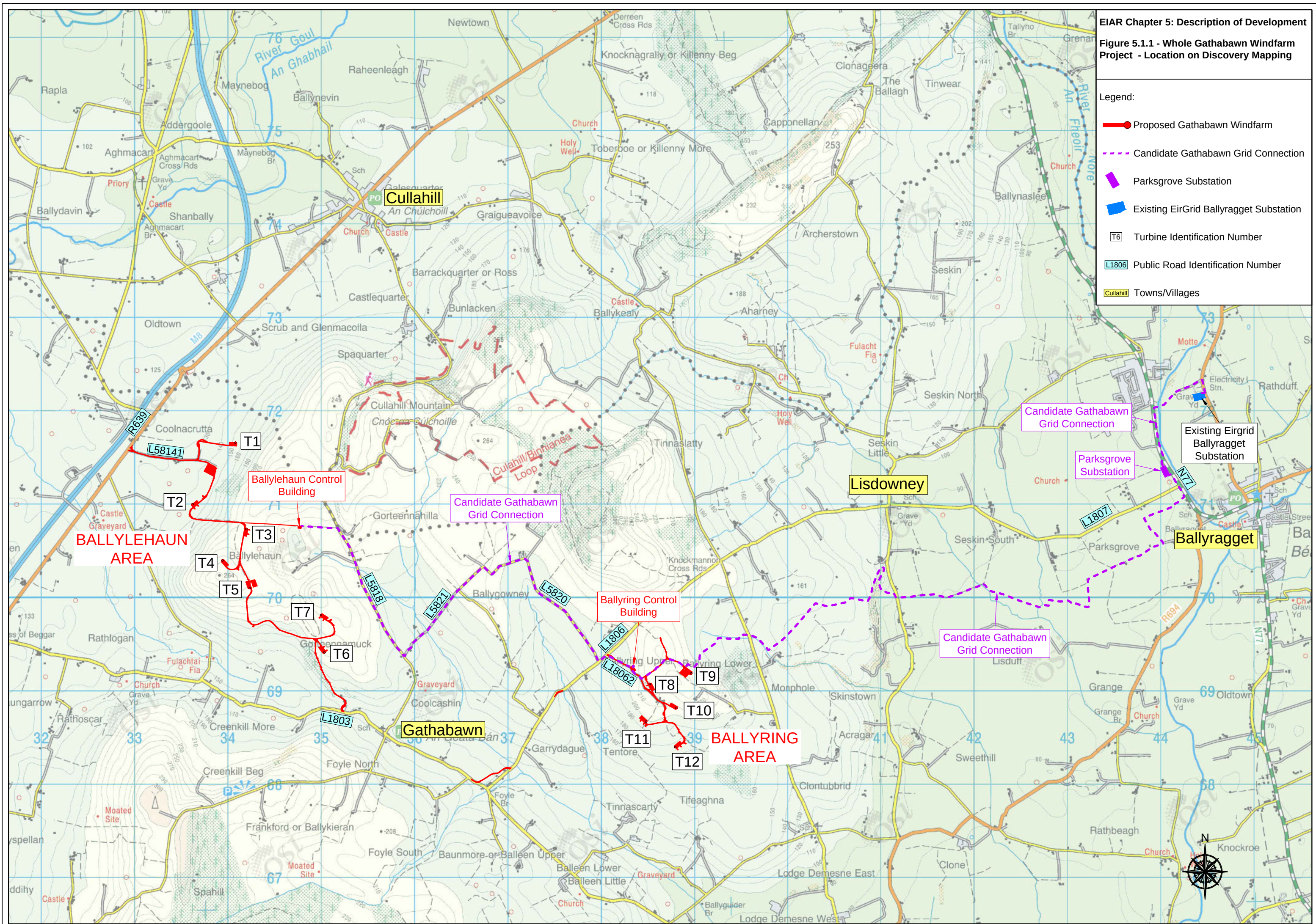
The following mapping and figures are included:

Figure No.	Figure Title
Figure 5.01.1	Gathabawn Windfarm Project - Layout on Discovery Mapping

Figure 5.1.1 - Whole Gathabawn Windfarm Project - Location on Discovery Mapping

Legend:

- Proposed Gathabawn Windfarm
- - - Candidate Gathabawn Grid Connection
- Parksgrove Substation
- Existing EirGrid Ballyragget Substation
- T6 Turbine Identification Number
- L1806 Public Road Identification Number
- Cullahill Towns/Villages



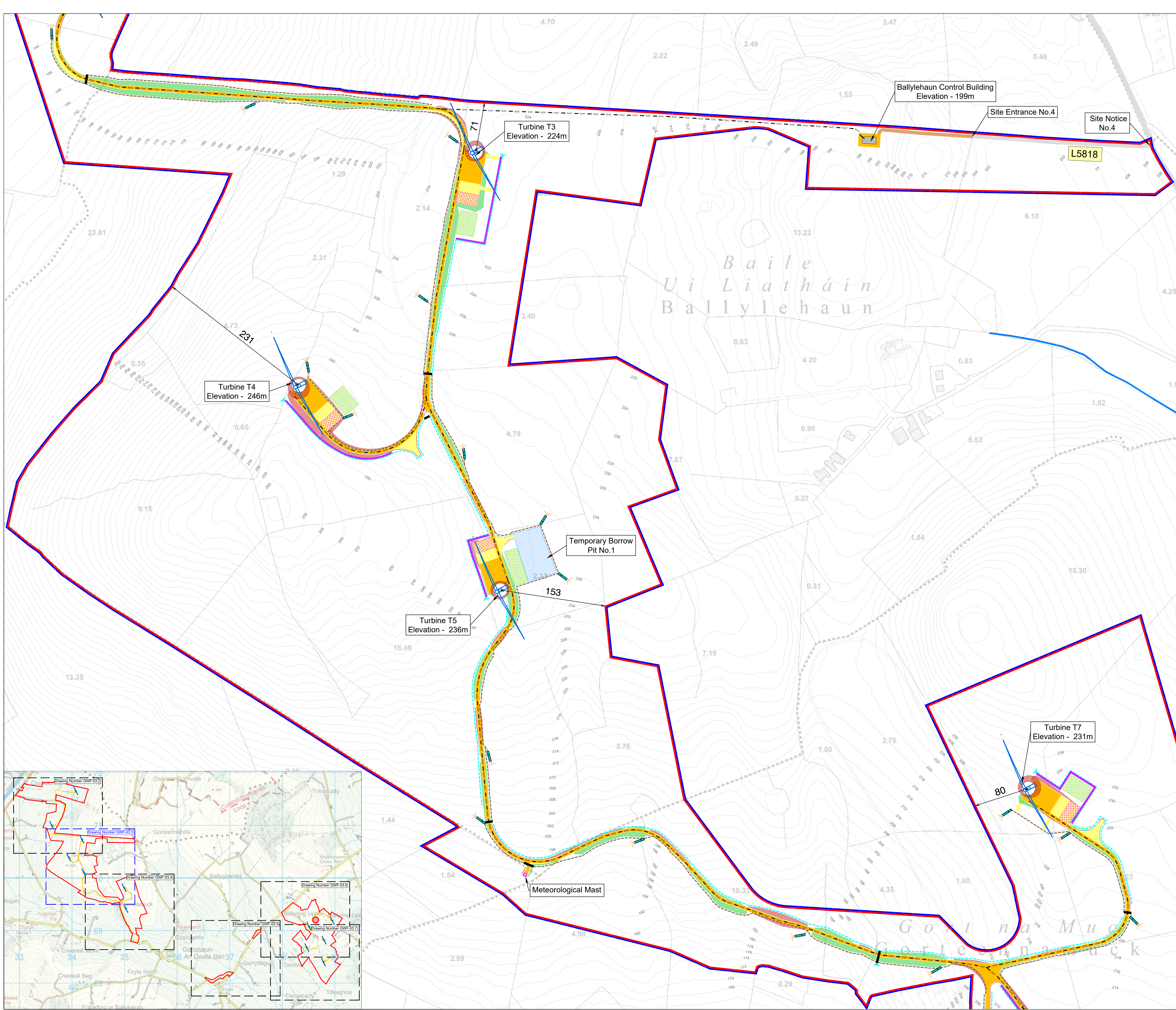
Tab 1

Grant of Permission including Planning Conditions

(to be added post consent)

Tab 2

Site Drainage Drawings



Legend

80

Distance in meters to the nearest Boundary

180

Contour line with elevation in meters

PROPOSED

Site Boundary outlined in red

Blue Line Boundary

Fill Extent

Cut Extent

Turbine

Turbine Foundation

New Roads and Crane Hardstands

Internal Windfarm Cabling

Long-Term Storage Berms for Overburden

Temporary Hardcore Area to be reinstated following turbine erection

Overburden Storage Area

Borrow Pit

Ballylehaun Control Building

Metrological Mast

Drainage Bund

Clean Water Drain

Dirty Water Drain

Drainage Culvert

Clean Water Drain with Outlet Weir

Settlement Pond

EXISTING

EPA Watercourse

Existing Track to be upgraded

Public Road

L58141

Public Road Identification Number

Notes:

1. All dimensions in meters

2. Excavations in will be sloped at ratio of 1(v):1(h) in rock and 1(v):1.5(h) in overburden

3. Maps Printed under Ordnance Survey Ireland Licence No. CYAL50556753 Copyright Ordnance Survey Ireland Government of Ireland OSI Sheet(s): 4463, ITM_2216

Project:

Gathabawn Windfarm

Drawing Title:

Site Layout Map 2 of 6

Drawing Number: GWF-03.3

Sheet Size:

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Scale:

1:2500

Drawn by:

Aoife Butler

Checked by:

Conor Brett

Date produced:

26 September 2026

Aoife Butler

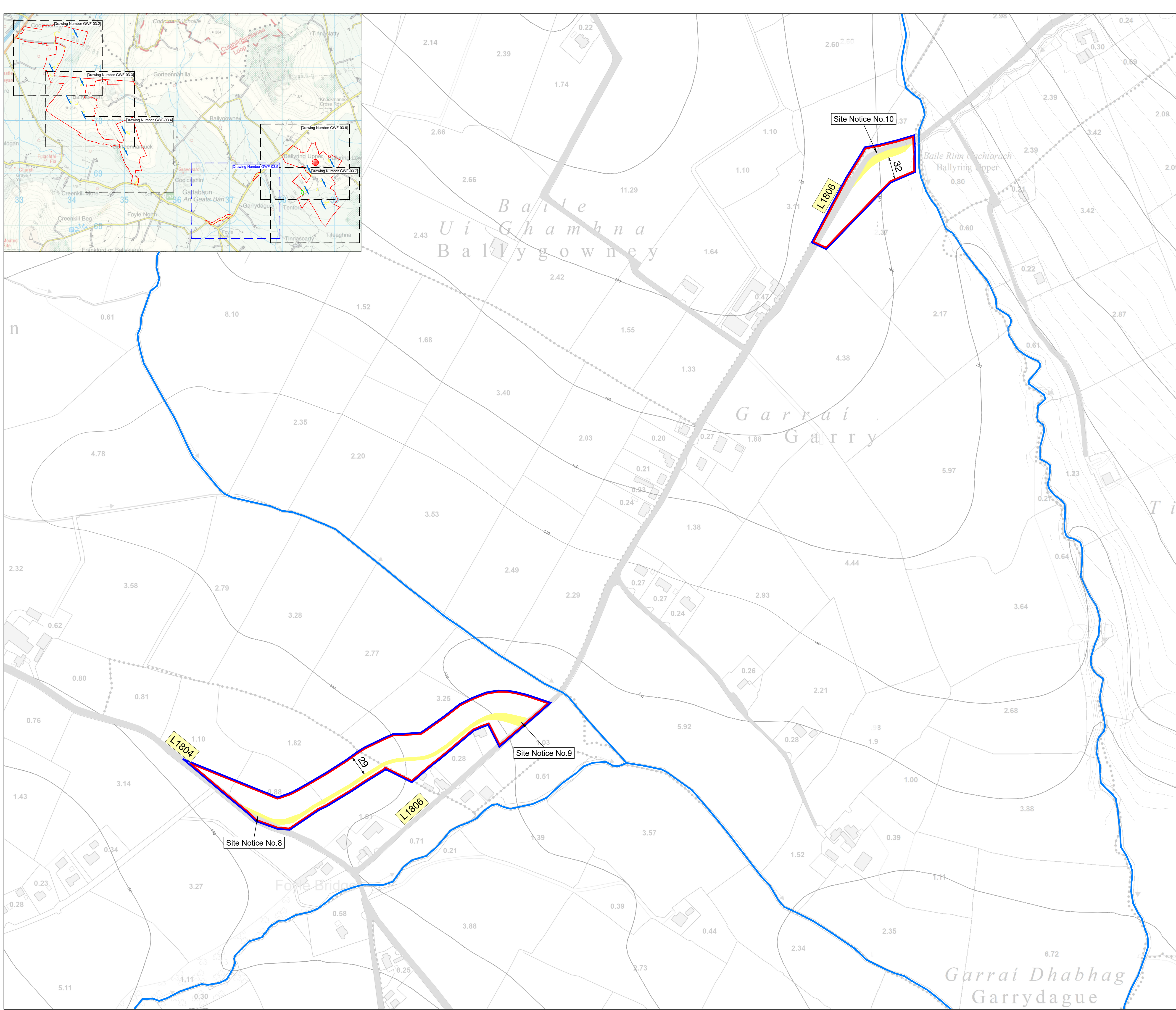
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Legend

↔ 80

Distance in meters to the nearest Boundary

— 180 —

Contour line with elevation in meters

PROPOSED

Site Boundary outlined in red

Blue Line Boundary

Temporary Hardcore Area to be reinstated following turbine erection

EXISTING

EPA Watercourse

Public Road

L58141

Public Road Identification Number

Notes:

1. All dimensions in meters
2. Excavations in will be sloped at ratio of 1(v):1(h) in rock and 1(v):1.5(h) in overburden
3. Maps Printed under Ordnance Survey Ireland Licence No. CYAL50556753 Copyright Ordnance Survey Ireland Government of Ireland OSI Sheet(s): 4464, 4523, ITM_2216

Project:

Gathabawn Windfarm

Drawing Title:

Site Layout Map 4 of 6

Drawing Number:

GWF-03.5

Sheet Size:

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Scale:

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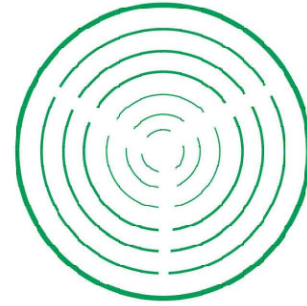
Aoife Butler

Checked by:

Conor Brett

Date produced:

26 September 2026



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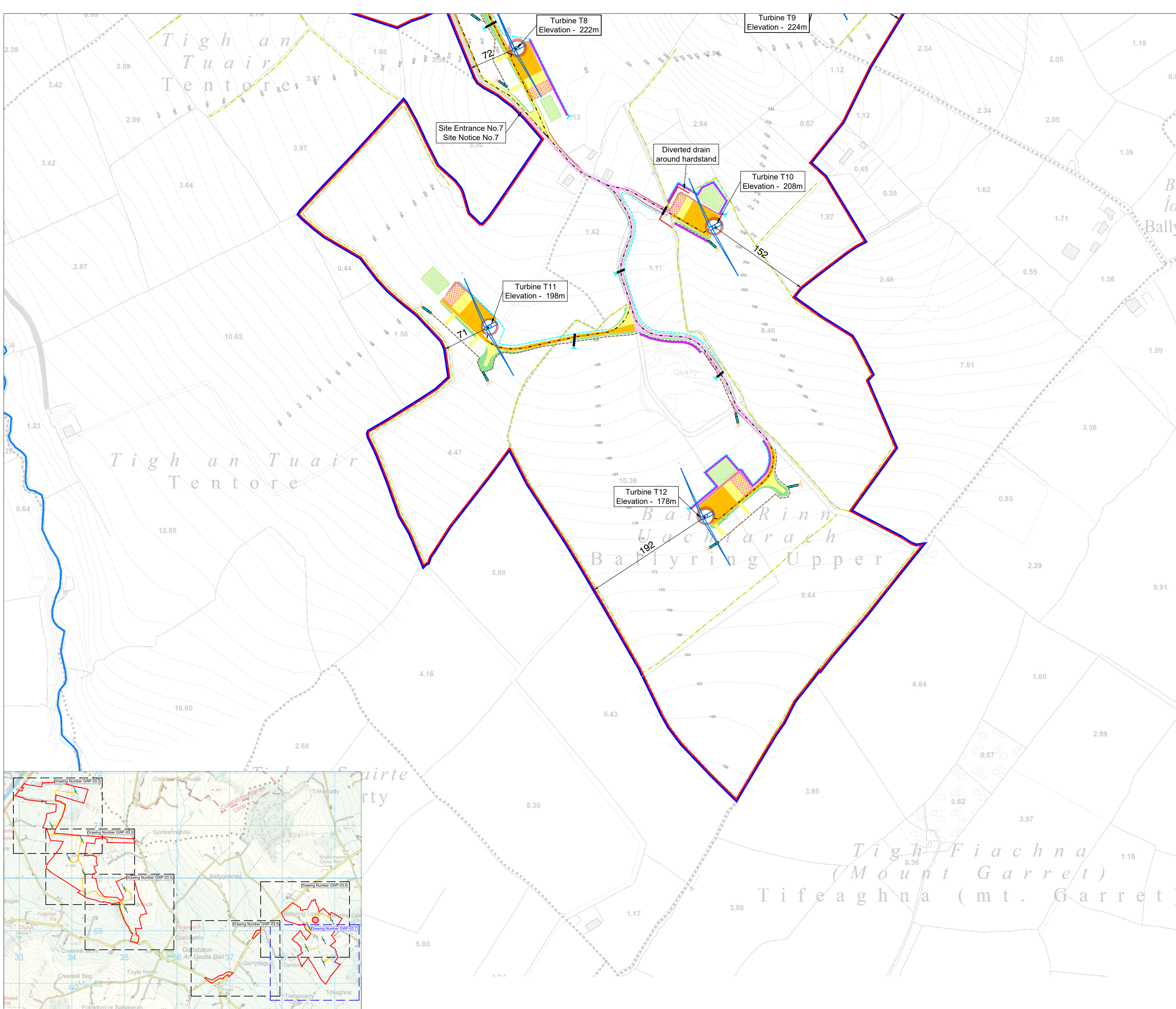
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80

Distance in meters to the nearest Boundary

180

Contour line with elevation in meters

PROPOSED

Site Boundary outlined in red

Blue Line Boundary

Fill Extent

Cut Extent

Turbine

Turbine Foundation

New Roads and Crane Hardstands

Internal Windfarm Cabling

Long-Term Storage Berms for Overburden

Temporary Hardcore Area to be reinstated following turbine erection

Overburden Storage Area

Diverted drain around hardstand

Drainage Bund

Clean Water Drain

Dirty Water Drain

Drainage Culvert

Clean Water Drain with Outlet Weir

Settlement Pond

EXISTING

EPA Watercourse

Existing Farm Drains

Existing Track to be upgraded

Public Road

Notes:

1. All dimensions in meters

2. Excavations in will be sloped at ratio of 1(v):1(h) in rock and 1(v):1.5(h) in overburden

3. Maps Printed under Ordnance Survey Ireland Licence No. CYAL50556753 Copyright Ordnance Survey Ireland Government of Ireland OSI Sheet(s): 4464, 4523, ITM_2216

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Project:

Gathabawn Windfarm

Drawing Title:

Site Layout Map 6 of 6

Drawing Number: GWF-03.7

Sheet Size:	A1	Scale:	1:2500
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		Date produced:	26 September 2026

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LEGEND

Site Boundary outlined in red

Turbine

Hardstands and Roadways

GWF-03.2
to
GWF-03.7

Site Layout Map Extents and Drawing Numbers

Notes:

- All dimensions in meters
- Maps Printed under Ordnance Survey Ireland Licence No. CYAL50556753
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Project:

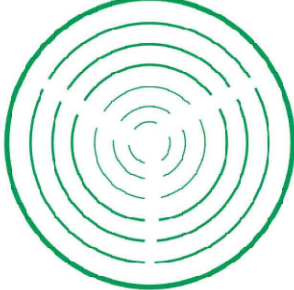
Gathabawn Windfarm

Drawing Title:

Keyplan for Site Layout Maps

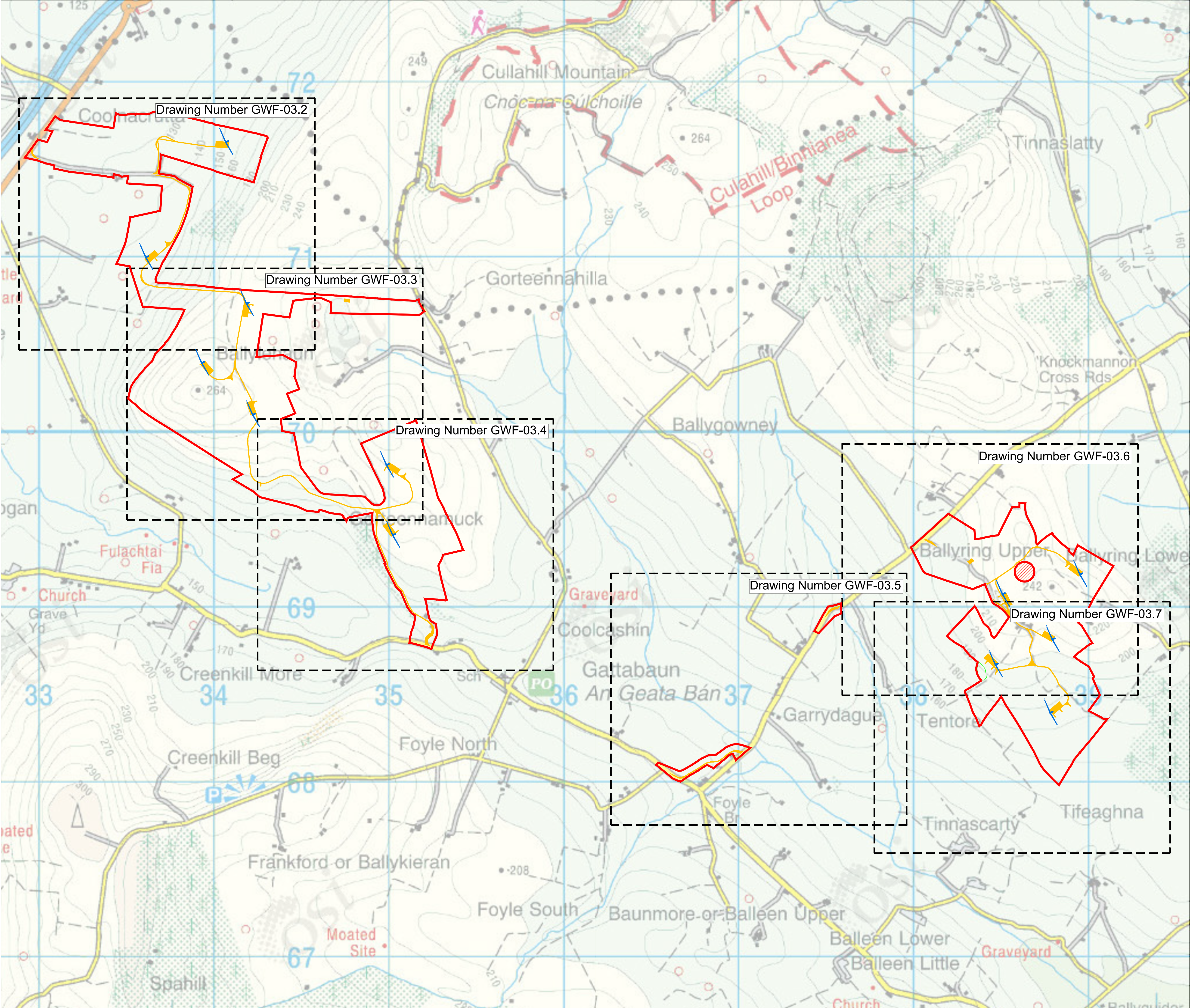
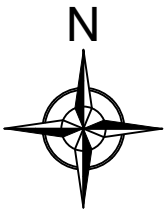
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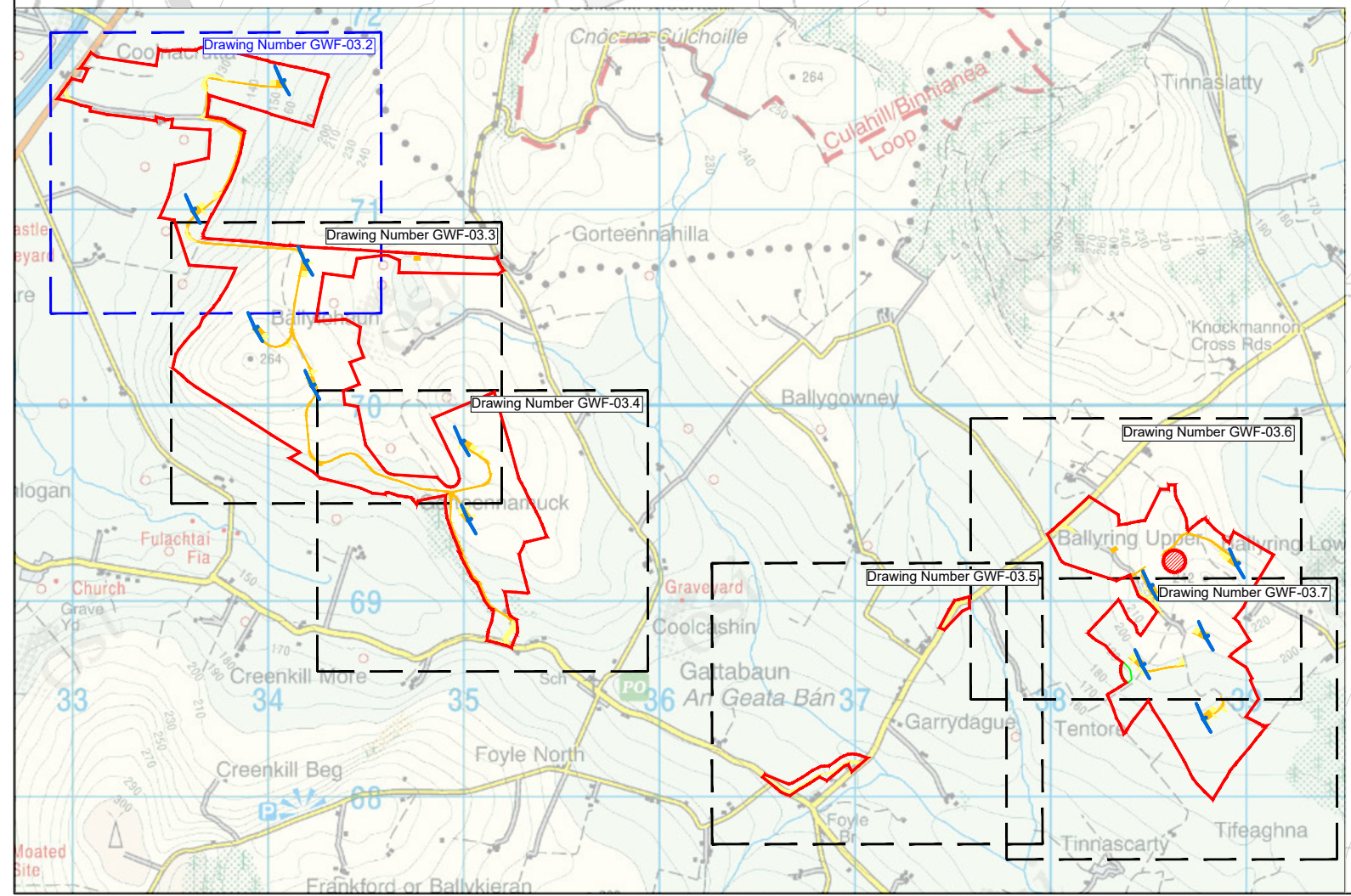
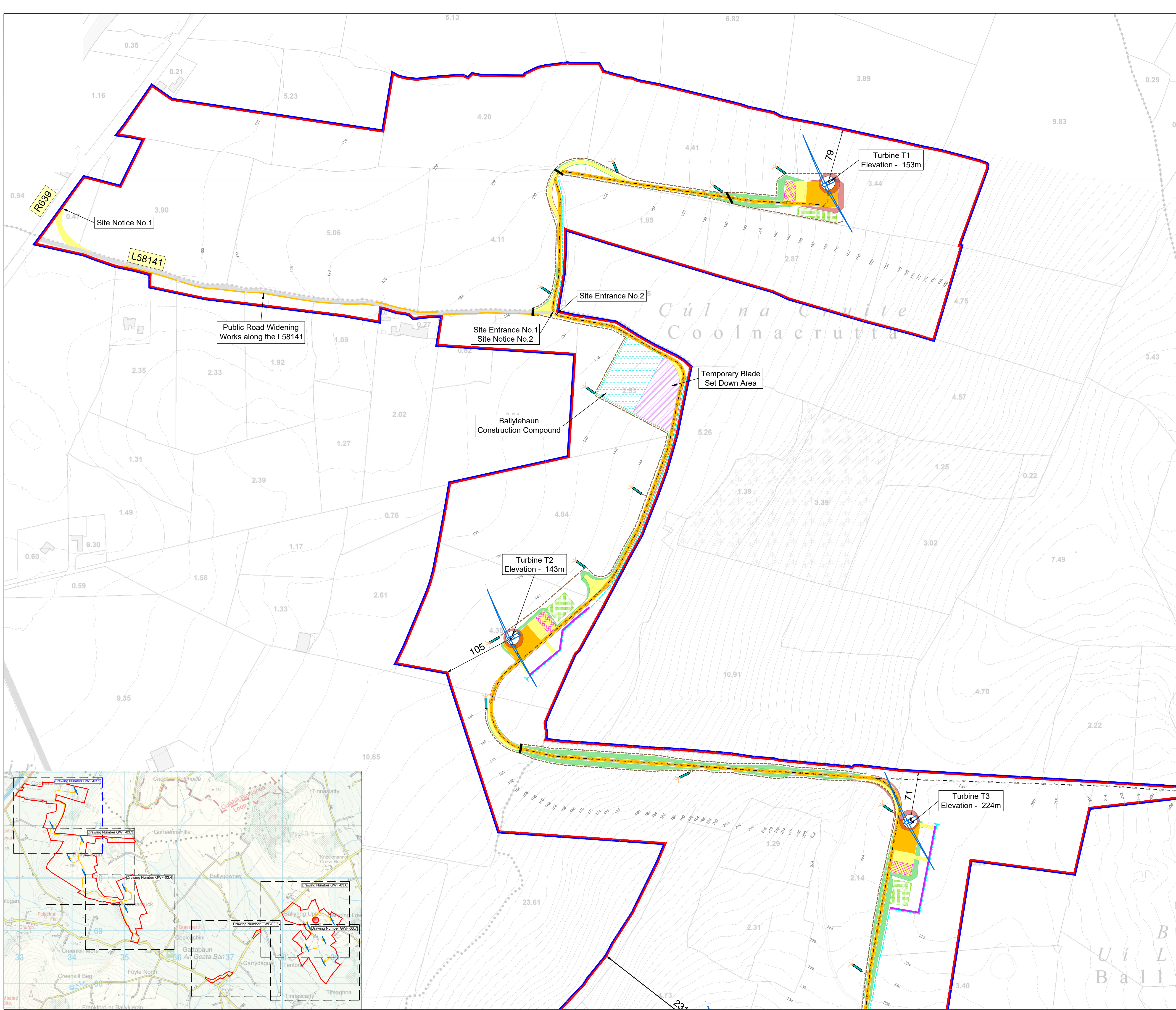
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Drawn by:	Aoife Butler	Checked by:	Conor Brett
		Date produced:	26 September 2026



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LEGEND

Distance in meters to the nearest Boundary

Contour line with elevation in meters

PROPOSED

Site Boundary outlined in red

Blue Line Boundary

Fill Extent

Cut Extent

Turbine

Turbine Foundation

New Roads and Crane Hardstands

Internal Windfarm Cabling

Long-Term Storage Berms for Overburden

Temporary Hardcore Area to be reinstated following turbine erection

Overburden Storage Area

Temporary Blade Set Down Area

Ballylehaun Construction Compound

Drainage Bund

Clean Water Drain

Dirty Water Drain

Drainage Culvert

Clean Water Drain with Outlet Weir

Settlement Pond

EXISTING

Existing Track to be upgraded

Public Road

Public Road Identification Number

Notes:

1. All dimensions in meters

2. Excavations in will be sloped at ratio of 1(v):1(h) in rock and 1(v):1.5(h) in overburden

3. Maps Printed under Ordnance Survey Ireland Licence No. CYAL50556753 Copyright Ordnance Survey Ireland Government of Ireland OSI Sheet(s): 4463, ITM_2216

Project:

Gathabawn Windfarm

Drawing Title:

Site Layout Map 1 of 6

Drawing Number: GWF-03.2

Sheet Size:

A1

Scale:

1:2500

Drawn by:

Aoife Butler

Checked by:

Conor Brett

Date produced:

26 September 2026

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Tab 3

Mitigation & Monitoring Arrangements

Construction Phase Mitigation Measures & Monitoring Arrangements

The following Environmental Protection Measures will apply during the construction phase of the Gathabawn Windfarm Project:

	Preconstruction Surveying & Monitoring
WM01 GM01	<u>Engineering Review</u> : A suitably qualified engineer will review and approve the civil contractor's method statements and final detailed design prior to the commencement of construction works.
WM02 GM02	<u>Water Quality Monitoring</u> : Confirmatory surface water quality monitoring will be carried out prior to the commencement of construction works at the water quality monitoring locations to determine the pre-construction status of surface water quality in downstream watercourses. This monitoring will include laboratory analysis of water samples which will be carried out by an independent and appropriately certified laboratory. The monitoring of water quality parameters and collection of samples will be undertaken by the Environmental Clerk of Works, who will be appropriately trained on the required monitoring methods and the use, calibration and maintenance of all monitoring equipment used. Records will be kept of biological and chemical monitoring undertaken carried out prior to the commencement of construction works.
WM03 GM03	<u>Pre-construction surveys for invasive species</u> will be carried out to determine if any new infestations of invasive species have been established in the interim period between the submission of the planning application and the commencement of construction works. These pre-construction confirmatory surveys for invasive species will be carried out at the construction works areas plus 7m, by the Project Ecologist, to accurately determine the extent of new invasive species infestations. Mapping, showing the most up to date distribution and extent of each infestation, will be distributed to the Environmental Clerk of Works and to the Project Engineer.
WM04	<u>Pre-construction surveys for Otter holts</u> will be carried out by an experienced Ecologist to determine if any new Otter holts have been established in the interim period between the submission of the planning application and the commencement of construction works. These pre-construction confirmatory surveys for Otter holts and activity (particularly holts at which breeding females or cubs are present) will be carried along the Ballyring Upper Stream, 150m upstream and downstream of facilitating works near the road bridge at Garrydague.
GM04	<u>Pre-construction surveys for Otter holts</u> will be carried out by an experienced Ecologist to determine if any new Otter holts have been established in the interim period between the submission of the planning application and the commencement of construction works. These pre-construction confirmatory surveys for Otter holts and activity (particularly holts at which breeding females or cubs are present) will be carried out 150m upstream and downstream of watercourse crossing locations.
WM05	<u>Pre-construction surveys for Kingfisher nests</u> will be carried out to determine if any new Kingfisher nests have been established in the interim period between the submission of the planning application and the commencement of construction works. These pre-construction confirmatory surveys will be carried out by a suitably qualified Ornithologist along the Ballyring Upper Stream, 300m upstream and downstream of facilitating works near the road bridge in

	Coolcashin/Garrydague and will be undertaken between March and April (early visit) and again between May and June (late visit).
GM05	<u>Pre-construction surveys for Kingfisher nests</u> will be carried out to determine if any new Kingfisher nests have been established in the interim period between the submission of the planning application and the commencement of construction works. These pre-construction confirmatory surveys will be carried out by a suitably qualified Ornithologist within the construction works area boundary and within 300m upstream and downstream of watercourse crossing locations and will be undertaken between March and April (early visit) and again between May and June (late visit).
WM06 GM06	<u>Pre-construction surveys for Badger setts</u> will be carried out to determine if any new Badger setts have been established in the interim period between the submission of the planning application and the commencement of construction works. These pre-construction confirmatory surveys will be carried out by the Project Ecologist within the construction works area boundary and within 50m of the construction works areas and carried out no more than 10-12 months in advance of proposed construction activities.
WM07 GM07	<u>Pre-construction surveys for Bat roosts</u> will be carried out at all trees and buildings identified as having bat roost potential during initial pre-planning surveys. Surveys will be carried out by the Project Ecologist at a time of year that is appropriate to the type of roost e.g. June to August for maternity roosts, or November to February for hibernation roosts. If the location or status of roosts has changed, then the use of lighting at nearby construction works locations will be adapted accordingly by the Project Ecologist.
WM08 GM08	<u>Pre-construction licenced archaeology surveys</u> and investigations will be carried out in advance of construction works taking place, at identified locations within the construction works area boundary. These surveys will include photographic surveys, townland/civil parish boundary surveys, wade and detection surveys, geophysical surveys and/or archaeological test trenching as required. The nature and scope of these surveys will be agreed with the National Monuments Service (NMS). The archaeologists will also provide a toolbox talk to construction teams. This will aim to outline the importance of archaeology, the legal implications of destroying it without appropriate reporting and recording, how to identify potential archaeology, outline a protocol and who to report it to when potential archaeology is found,
WM09	<u>Confirmatory road condition surveys</u> involving pre-construction and post-construction inspections, high-definition video surveys and FWD surveys will be undertaken along road widening locations on the L18062, and L58141, and along the routes of concentrated construction traffic between the R639 / N77 and the windfarm Site Entrances – i.e. the L58141, L1803, L5818, L1804, L1806, L18062 and L1807.
GM09	<u>Confirmatory road condition surveys</u> involving pre-construction and post-construction inspections and high-definition video surveys will be undertaken along the routes of concentrated construction traffic and road works locations the affected sections of the N77, the R432, the L1807, L1811, L1808, L1806, L1804, L5818, L5821 and L5820, and along road works locations on the L5818, L5820, L5821, L1806, L18062, L1808, L1811, L1807, N77 and R432.
WM10 GM10	<u>Confirmatory consultations with service operators</u> (i.e. Uisce Eireann, Eir, ESB Networks, and Gas Networks Ireland) and confirmatory ground surveys at service locations will be carried out ahead

	of, and throughout, excavation works or use of machinery in close proximity to existing overhead and underground services.
WM11 GM11	The <u>construction Method Statements</u> to be developed by the construction contractors will take full account of the EMP including the mitigation and monitoring measures and will be reviewed by the Project Engineer and the Environmental Manager prior to the commencement of construction works.
	During Construction Surveying & Monitoring
WM12 GM12	The <u>Environmental Management Team</u> will monitor construction works for compliance with the Environmental Management Plan. The project Environmental Management Team which includes an Environmental Clerk of Works, the Project Ecologist and specialists as required such as archaeologists, invasive species specialists and hydrologists, who are independent of the site contractors. The Environmental Management Team will report to the owner's Project Manager.
WM13 GM13	A <u>Landowner Liaison Officer</u> (LLO) will be appointed and will monitor the erection and maintenance of the construction works area boundary fences and will liaise with the landowners regarding the location of access gateways along the fence, and of livestock water supply pipes and livestock water supply sources. The LLO will keep the landowners up to date with relevant construction work schedules.
WM14 GM14	<u>Engineer Supervision</u> : a suitably qualified <u>engineer will supervise</u> all excavations and construction works.
GM15	<u>Inspections of the drainage network around the Parksgrove Substation</u> will be conducted regularly during the construction phase under the following schedule: Daily visual inspections by the Contractor; weekly inspections by the Environmental Management team; Event based inspections by the Contractor as follows: >10 mm/hr (i.e. high intensity localised rainfall event); or >25 mm in a 24 hour period (heavy frontal rainfall lasting most of the day); or, rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week). Inspections will examine the functioning of the various elements of the drainage system, and if evidence of sedimentation or scouring and any changes in the drainage water including discolouration, odour, oily sheen or the presence of litter, then the required corrective maintenance or actions will be identified and will be implemented immediately the Contractor.
WM15	<u>Drainage Network Inspections</u>: The windfarm drainage network will be inspected regularly during the construction phase under the following schedule: Daily visual inspections by the Contractor; weekly inspections by the Environmental Management team; Event based inspections by the Contractor as follows: >10 mm/hr (i.e. high intensity localised rainfall event); or >25 mm in a 24 hour period (heavy frontal rainfall lasting most of the day); or, rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week). All inspections will include all elements of the drainage systems to ensure that the systems are operating correctly. Inspections will examine the functioning of the various elements of the drainage system, and if evidence of sedimentation or scouring and any changes in the drainage water including discolouration, odour, oily sheen or the presence of litter, then the required corrective maintenance or actions will be identified and will be implemented immediately the Contractor. Weekly site inspections of the drainage network will be carried out by members of the Environmental Management Team during construction phase and for a period of 6 months

	following construction. If monitoring identifies sediment or contaminant polluted waters, then the Environmental Clerk of Works will establish the cause of the pollution, and if caused by the Project, then the Environmental Clerk of Works will have a 'stop-works' authority to temporarily stop construction works at the Project site and the Contractor will implement the necessary actions and measures to resolve the cause of the pollution.
WM16 GM16	<u>Surface water quality monitoring</u> of watercourses downstream of the works will be carried out at regular intervals by the Environmental Management team during the construction phase. Laboratory analysis of water samples will also be undertaken as part of the monitoring programme by an independent and appropriately certified laboratory. The surface water monitoring locations and sampling programme are defined in the Surface Water Management Plan which forms part of the Gathabawn Windfarm Project Environmental Management Plan. Surface water quality monitoring will include Total Suspended Solids [TSS] monitoring, with readings above 25mg per litre (as specified in the Salmonid Waters Regulations, SI 293 of 1988) triggering a non-compliance issue, and resultant remedial action by the construction Contractor, in line with the EMP. Records will be kept of biological and chemical monitoring undertaken before, during and after the works, and will be made available upon request to any authorised person as defined under the Local Government (Water Pollution) Acts.
WM17	<u>Additional WQ Monitoring at D2</u>: At Drain D2, monitoring of Q values and sediment build up will be carried out immediately downstream of the diversion works on this farm drainage channel. This monitoring will also be conducted as part of surface water monitoring before and after the crossing works in order to confirm that the Q values and sediment levels return to baseline levels. Prior to dam being removed at D2, where sediment build up poses significant downstream effects on the watercourse, this sediment will be removed.
GM17	At <u>W3, W4 and W5</u>, <u>monitoring of Q values and sediment build up</u> will be carried out immediately downstream of the dam locations during crossing works. This monitoring will be conducted throughout the construction works and also conducted as part of surface water monitoring in order to confirm that the Q values and sediment levels return to baseline levels. Prior to dam being removed at W3, W4 or W5, where sediment build up poses significant downstream effects on the watercourse, this sediment will be removed.
WM18 GM18	<u>Fit for Purpose</u>: All plant and machinery which will be used during construction will be fit for purpose and in good working order prior to mobilisation to works areas. The plant and machinery will be regularly inspected by the Contractor for leaks and maintained in good working order for the duration of the works.
WM19 GM19	<u>Fuel, oil and chemical stores</u> including tanks and drums will be regularly inspected for leaks and signs of damage.
WM20 GM20	<u>Liaison with Contractor</u>: The Project Ecologist will liaise with the Contractors on a weekly basis regarding the upcoming schedule of works and will advise the Contractors of any particular ecological protection requirements at specific locations on site.
WM21	<u>Treatment of the existing stand of Japanese Knotweed</u> at the Ballyring Area has commenced pre-application and will continue during the planning and pre-construction phase. Treatment of the

	existing Japanese Knotweed will be carried out an invasive species specialist consultant in accordance with best practice.
WM22 GM21	Any excavation <u>works in close proximity (7m) to an invasive species infestation location</u> will be carried out under the direct supervision of an invasive species specialist ecologist.
WM23 GM22	<u>Invasive Species Control</u> : Visual inspections will be carried out by the Contractor on all machinery and equipment (particularly for machinery and equipment which has come into contact with water or soils) for evidence of attached plant or animal material, or adherent mud or debris. Any attached or adherent material will be removed before entering or leaving the site, securely stored away from traffic for removal to a contaminated waste Community Liaison Officer bin at the temporary constructions.
WM24 GM23	<u>Monitoring – Dust</u> : During working hours, the construction contractor will monitor dust control methods and weather forecasts for dry and windy conditions and will carry out weekly on-site and off-site inspections to monitor dust caused by the construction works. Public roads will be regularly inspected for cleanliness and regular dust soiling checks of surfaces along public roads and within 100m of site access points will also be carried out. The frequency of monitoring will be increased when construction activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
WM25	<u>Monitoring of construction noise</u> will be carried out at a number of nearby residences during critical periods of the wind farm construction works.
WM26	<u>Archaeological Monitoring of all initial groundworks</u> will be carried out by the Project Archaeologist under licence during construction works. Test trenching is proposed in areas where geophysical features of an archaeological nature will be truncated by substantial groundworks, such as construction foundations, to first validate the presence of, or lack thereof, archaeological features. Strip, map and sampling can be undertaken in areas of soil stripping. The nature/scope of the groundworks monitoring will be agreed with the National Monuments Service (NMS).
GM24	<u>Archaeological Monitoring of initial groundworks</u> in Parksgrove and Moatpark will be carried out by the Project Archaeologist under licence during construction works. The nature/scope of the groundworks monitoring will be agreed with the National Monuments Service (NMS). This will include a Watching Brief on areas of track construction, soil stripping, or grid connection works that are within 10m of recorded or potential archaeology, including geophysical and LiDAR features.
WM27	<u>Ecological Monitoring</u> of initial groundworks and road construction works within 50m of the boundary of the Cullahill Mountain SAC. This monitoring will be conducted by the Ecological Clerk of Works, who will have a 'stop-works' authority to temporarily stop construction works and the Contractor will implement the necessary actions and measures to the satisfaction of the Ecological Clerk of Works, before construction works can once again commence.
WM28	<u>Marsh Fritillary</u> : A pre-construction survey of construction works plus 100m in all directions to determine the distribution of the Marsh Fritillary's food plant Devil's Bit Scabious (DBS) will be carried out by an ecologist during the last available August/September prior to commencement of construction works. Any areas of DBS that are located within construction works boundary during the Aug/September survey will be strimmed/cut to ground level in the last available April/early May period prior to commencement of construction.

GM25	<u>Section 12 Notification</u> applications for any works within a Zone of Notification shall be submitted and approved by the National Monuments Service, with mitigation agreed upon approval for these assets
	During Construction Mitigation Measures
WM29 GM26	<u>Environmental Management Plan</u>: The construction of the Gathabawn Windfarm Project will be carried out in accordance with the Environmental Management Plan (EMP). The EMP will include all of the mitigation measures and monitoring arrangements for the Project. An Environmental Clerk of Works will be appointed, independent of the main construction Contractor, and will carry out weekly audits on EMP compliance. If non-compliance is detected, then, prompt corrective action will be agreed and committed to by the Contractor, with a view to the swift and effective resolution of any deviations from the EMP requirements. The EMP will be an important contract document for the main construction contractor (Contractor) who will be contractually obliged to comply with the EMP and the requirements of the Environmental Clerk of Works. Furthermore, if a significant unforeseen environmental effect takes place, then, the Environmental Clerk of Works will have a '<u>stop-works</u>' authority to temporarily stop works until the issue is resolved.
WM30 GM27	<u>Fencing of works areas</u> : The boundaries of construction works areas in agricultural lands will be fenced to prevent the encroachment of construction phase personnel, machinery or materials beyond this boundary. Livestock proof fencing will be used, with landowner access maintained through the provision of openings along the boundary fences.
WM31	<u>Control of Movement of Machinery/Vehicles</u> : Construction traffic, personnel and materials will be restricted to the hardcore surfaces, particularly with respect to the newly constructed access roads. This means that machinery will be kept on the windfarm site roads and hardstanding areas, and, aside from advancing excavations, will avoid moving onto areas not delineated on the site drawings.
GM28	<u>Control of Movement of Machinery/Vehicles</u> : Construction traffic, personnel and materials will be restricted to within the construction works area fence and will avoid moving onto areas not delineated on the site drawings.
WM32 GM29	<u>Land reinstatement</u> will not be carried out during very wet weather or when the soil is waterlogged. If any compaction has occurred along the construction works area, these areas will be ploughed with a sub-soiler to loosen the subsoil layer.
WM33 GM30	<u>Excavation of Materials</u> : The excavation of earth materials during the construction stage will be kept to a minimum. The excavation of materials will be completed in accordance with best practices for the management and treatment of such materials. (i.e. British Standards BS6031:2009 Code of Practice for Earthworks, and MAFF (2000) Good Practice for Handling Soils).
WM34 GM31	<u>Storage of Overburden</u> : During construction works, excavated material will be removed for temporary or permanent storage at designated berms. All storage berms will be placed more than 50m away from any watercourse or wet drainage channel. Temporary silt control methods

	such as silt fencing or curtains will be placed around all overburden storage areas and/or installed between the berms and local watercourses or wet drainage channel, depending on the location, and the existing vegetative between the berms and watercourse / drainage features will be left in place.
WM35	<u>Protection of Soils in Berms</u> ; All storage berms will be graded and sealed following emplacement. Topsoil and subsoil will be stockpiled separately. Where possible, the upper vegetative layer (where still present) of excavated soil will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the stored spoil within the storage areas. Re-seeding will also be carried out in these areas. Measures such as interceptor ditches around the bases of these areas, and silt curtains will also be incorporated where required to prevent runoff of suspended solids, dust and soil erosion.
GM32	<u>Protection of Soils in Berms</u> ; All storage berms will be graded and sealed following emplacement. Topsoil and subsoil will be stockpiled separately. Re-seeding of permanent berms will be carried out as soon as practical in these areas. Construction works areas along cable routes in agricultural lands will be reseeded as soon as practical after reinstatement. Measures such as silt curtains around the bases of these areas and sediment traps will also be incorporated to prevent runoff of suspended solids, dust and soil erosion, if required.
WM36	<u>Protection of Karst</u> : A suitably qualified geotechnical engineer who is experienced with limestone and karst conditions will review the results of the pre-construction detailed geotechnical investigations, and will design the turbine foundations taking into account the results of the detailed investigations. The geotechnical engineer will inspect each turbine foundation excavation for evidence of a fracture network and will set out the required methods and mitigation measures to prevent cementitious material leaching into the bedrock.
WM37	<u>No storage of excavated material on the public road</u> along road widening sections of the L58141 or L18062. All excavations from public roads will be removed to licensed waste facilities in accordance with the Waste Management Plan.
GM33	<u>No storage of excavated material on the public road</u> along the UGC routes, all excavations from public roads will be removed to licensed waste facilities in accordance with the Waste Management Plan.
WM38 GM83	<u>Waste Management</u> : waste arising during construction works will be carried out according to a Waste Management Plan. The main contractor will engage an appropriately licensed waste company to deal with all its wastes during construction. The Waste Management Plan is included in the Construction Environmental Management Plan. The Construction Contractor will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.
WM39 GM84	<u>Reduction in Embodied Carbon</u> : Where feasible, standard concrete containing Portland cement will be replaced with an alternative concrete mix with lower associated embodied carbon, as per the Climate Action Plan. This will be a minimum of 30% GGBS replacement, or concrete with equivalent or lower associated embodied carbon.

WM40 GM85	<u>Reduction in Embodied Carbon</u> : Procurement contracts will ensure that material choices with lower associated embodied carbon relative to standard construction materials are considered favourably during the tender process for the wind farm.
WM41 GM34	<u>Protection of watercourses and existing drains</u> : Additional mitigation measures will be deployed within 50m of watercourses or wet drainage features, including the placement of silt trapping arrangements along preferential surface water flowpaths, and temporary drain blocking in existing drains. Works will not take place within this 50m zone during prolonged heavy or exceptional rainfall events.
WM42 GM35	<u>Weather forecasts</u> will be consulted in advance of works. If there is heavy prolonged rainfall or if an exceptional rainfall event occurs, then construction works will cease until peak flows have subsided.
GM36	<u>At Parksgrove Substation, a permanent surface water drainage network</u> will be installed at the substation compound and along the associated access road, and will ensure that all surface water runoff from the access road and new the hardstand areas will be captured and treated prior to discharge/release. The drainage infrastructure will not be installed during heavy or prolonged rainfall events or when the soil is waterlogged. The site drainage network will include check dams and settlement ponds which will settle suspended solids in water runoff while also slowing down the rate of water run-off from these areas. Water will be released to surrounding vegetation via buffered outfall weirs.
WM43	<u>Drainage network</u> : Windfarm site roads and hardstanding areas are designed to have a permanent surface water drainage network in place. Temporary works areas, such as turning heads, borrow pits and compounds will have a temporary surface water drainage network in place during works. The drainage infrastructure will not be installed during heavy or prolonged rainfall events or when the soil is waterlogged. The site drainage network will ensure that all surface water runoff from upgraded roads and new road surfaces (including hardstand areas) will be captured and treated prior to discharge/release. Transverse drains ('grips') will be constructed, where appropriate, in the surface layer of access tracks to divert any runoff into swales/track side drains; The site drainage network will include check dams and settlement ponds which will settle suspended solids in water runoff while also slowing down the rate of water run-off from these areas. Water will be released to surrounding vegetation at regular intervals via buffered outfall weirs, which also form part of the drainage network.
WM44	<u>On-Site Borrow Pits</u> : It is proposed that bedrock won from the on-site borrow pits during the construction phase will be used to construct the sub-base layer of proposed upgraded and new access roads and hardstand areas. Once installed the sub-base layer will be overlain by a capping layer of clean high-grade bedrock, such as limestone.
WM45 GM37	<u>Where dewatering of trenches</u> or excavations is required, there will be no direct discharge of treated water into any watercourse or drain or directly onto adjacent habitats. Rather, all pumped water will be discharged via a silt bag or infiltration trench or settlement pond, as appropriate, to surrounding vegetation.
WM46	<u>Isolation of flow</u> : Works in wet drainage channels will not be undertaken without isolation of flow within the drain. The water will be isolated from the works by over pumping, flume (pipe) or channel diversion methods.

GM38	<u>Any replacement culverts under the public road</u> (if required), will be sized to cope with a minimum 100-year flood event. In all cases, culverts will be oversized to allow mammals to pass through the culvert. The replacement of drain crossing structures will be carried out in accordance with the Office of Public Works (OPW) Guidelines Construction, Replacement or Alteration of Bridges and Culverts (2013), and also with the Department of Transport, Tourism & Sport Guidelines for Managing Openings in Public Roads (April 2017). Crossings will be designed to meet IFI's <i>Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters 2016</i> and <i>OPW's Design Guidance For Fish Passage On Small Barriers (2021)</i>.
GM39	<u>In-stream works – isolation of flow and electrofishing</u>: In-stream works at W3, W4 and W5 will not be undertaken without isolation of flow within the watercourse by over-pumping through a flume (pipe). The Project Ecologist will supervise all watercourse crossing works at W1 to W6 inclusive. A pre-works survey will be carried out by the Project Ecologist to identify any electrofishing requirements at the watercourses, and if required electrofishing of the isolated section will be carried out under licence prior to the commencement of excavation works.
GM40	<u>Instream works at W3, W4 and W5</u> will be followed by site-specific reinstatement measures to ensure the restoration of flow character and morphology within the affected reach. Measures will include: bank stabilisation using boulder armour or willow/brush bank protection; reinstatement of bank slope and character, creation of compound channels where necessary; reinstatement of instream flow features such as boulder substrates, pool / riffle sequences, or spawning cobbles; and planting along the riparian margin to stabilise banks, add flood protection and provide riparian buffer.
GM41	<u>HDD Control of Works</u>: The horizontal directional drilling works will be carried out by an experienced Drilling Contractor and supervised and managed by a competent and experienced Mud Engineer who understands the technicalities and challenges of drilling works. The Mud Engineer will advise the Construction Manager on the selection of competent drillers for the HDD works; monitor the watercourse bed during drilling works and will supervise the drilling works including the drilling pressures and the implementation of any contingency measures. From a surface water quality protection perspective, the area around the launch/reception pit, bentonite batching, pumping and recycling plant will be bunded using appropriate terram geotextile and/or sandbags in order to contain any spillages. Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area. Spills of drilling fluid will be cleaned up immediately and stored in an adequately sized watertight skip before being taken off-site to a suitably licensed waste facility. The HDD works from preparatory stage through to reinstatement will be supervised by the Project Ecologist. In the event of a break-out occurring, the Environmental Emergency Response Procedure for Frac-Out will be implemented which includes the following contingency measures; ▪ In the event of break-out occurring in the stream/river bed, the rig will immediately shut off the pumps and the drilling assembly will be pulled off to reduce annular pressures; ▪ In the event of break-out on the road an excavator will be available to dig a pit to contain fluid with vacuum trucks/pumps available to transfer drill fluid from the containment point back to the recycling point;

	and in either scenario, drilling fluid additives designed to plug the formation will be introduced to the circulation system and let set. Environmental Emergency Response Procedures are included in the Whole Gathabawn Windfarm Project Environmental Management Plan.
GM42	<u>Protective Barrier:</u> Prior to works commencing along the Parksgrove-Moatpark UGC, a silt curtain will be installed immediately inside the road boundary fence for the entire length of the UGC within the verge, and where the UGC enters agricultural land, a double silt curtain will be installed on the outside of the construction works area upto and around the drilling pit on the western side of the river. On the eastern side of the River Nore, prior to works commencing, a silt curtain will be installed along the entire length of the access road from the R432, with a double silt fence installed beyond the construction works area boundary upto and around the drilling pit on the eastern side of the river.
GM43	<u>Only precast concrete or double skinned HDPE pipes</u> will be used for new drain crossing structures, if required, along the Ballylehaun-Ballyring UGC. Only precast concrete chambers will be used at Joint Bays.
WM47	<u>Concrete control procedures</u> will be implemented and will include the following: ▪ No concrete batching will take place on site, all concrete will be ready-mixed and delivered just-in-time. ▪ The pouring of concrete will be scheduled for dry days. If a sudden rainfall event should occur, then suitable covers will be ready and available at the pour site to cover the concrete. ▪ The pour site will be kept free of standing water. ▪ All operators involved in pouring concrete will be trained and experienced in working with concrete. ▪ Run-off from wind turbine foundation concrete pours will not be permitted to flow over adjacent lands or enter drainage channels. The run-off will be contained within the foundation area and pumped into a skip to settle out; settled solids will be appropriately disposed of off-site. ▪ The Contractor will not permit the discharge of cement contaminated waters to the construction phase drainage system, onto adjacent lands or directly to any artificial drain or watercourse. ▪ Concrete trucks will be washed out at the supplier's facilities and not on site. The only concrete washing that will occur on site is the hand washing of the chutes at the rear of the trucks. Washing of chutes will only take place at the designated area and into a Roadside Concrete Washout unit.
GM44	<u>Concrete control procedures</u> will be implemented and will include the following: ▪ All concrete will be ready-mixed and delivered to site just-in-time; ▪ Dry granular cement will be used in UGC cable trenches; ▪ The pouring of concrete will be scheduled for dry days. If a sudden rainfall event should occur, then plastic covers will be ready and available at the pour site to cover the concrete. ▪ The pour site will be kept free of standing water; ▪ Designated trained operator experienced in working with concrete will be employed during concrete pouring; ▪ Concrete trucks will be washed out at the supplier's facilities and not on site. The only concrete washing that will occur on site is the hand washing of the chutes at the rear of the trucks. Washing of chutes will only take place at the designated area and into a Roadside Concrete Washout unit. ▪ No discharge of cement contaminated waters to any artificial drain or watercourse will be allowed.
WM48	<u>Refuelling control procedures</u> will be implemented and will include the following: ▪ On site re-fuelling of machinery will be carried out using a mobile double skinned fuel bowser. The fuel bowser carried on a double axel refuelling trailer, will be refuelled off-site, and will be towed around the site by a 4x4 vehicle to where machinery is located. The 4x4 vehicle will

	carry fuel absorbent material and pads in the event of any accidental spillage. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations. ▪ In addition, spill response apparatus including spill-kits and fuel absorbent mats will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment and in the implementation of the Emergency Response Plan, as contained in the Environmental Management Plan. ▪ The fuel bowser will be parked on a level area, away from main traffic activity, in a designated part of the construction compounds when not in use. Taps, nozzles or valves associated with mobile fuel bowser will be fitted with a lock system. Only designated trained and competent operatives will be authorised to refuel plant on site. A Permit to Fuel system will be put in place. ▪ There will be no refuelling of vehicles or plant permitted within 100m of a watercourse or wet drainage channel or local spring/well.
GM45	<u>Fuel/Oil control procedures</u> will be implemented and will include the following: On site re-fuelling of machinery will be carried out using a mobile double skinned fuel bowser. The fuel bowser, a double axel custom-built refuelling trailer, will be refuelled off-site, and will be towed around the site by a 4x4 jeep to where machinery is located. The 4x4 jeep will carry fuel absorbent material and pads in the event of any accidental spillage. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations. In addition, spill response apparatus including spill-kits and fuel absorbent mats will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment and in the implementation of the Emergency Response Plan, as contained in the Environmental Management Plan. The fuel bowser will be parked on a level area, away from main traffic activity, in a designated part of the construction compound when not in use. Taps, nozzles or valves associated with mobile fuel bowser will be fitted with a lock system. Only designated trained and competent operatives will be authorised to refuel plant on site. A Permit to Fuel system will be put in place.
GM46	<u>Along the cable routes, there will be no refuelling of plant or machinery within 100m of a watercourse or wet drainage channel or local spring/well.</u>
WM49 GM47	<u>Storage of Fuels, Oils and Chemicals:</u> All fuels or oils or chemicals, required during construction, will be stored in a designated, bunded, locked storage area within the temporary compounds. All fuel, oil and chemical storage areas will be bunded appropriately to 110% of the volume of oils/fuels each area contains for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area. Fuel, oil and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage. Safety data sheets for all chemicals used will be kept on-site. An emergency response plan to deal with accidental spillages will be contained within the Environmental Management Plan.
WM50 GM48	<u>Overnight parking</u> of plant and machinery will only be permitted at an existing hard-core surface at locations which are greater than 50m from watercourse/drainage features/Cullahill Mountain SAC. Drip trays and fuel traps will be used under and around parked plant and machinery to contain any potential leaks.
GM49	<u>In-stream works</u> (W3, W4 and W5) will only be undertaken during <u>the IFI specified period</u> (July, August and September) and will be carried out in accordance with the <i>Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters</i> (IFI, 2016). As requested by IFI

	during preplanning consultations for the windfarm, a site-specific method statement for each crossing will be provided to IFI and OPW at least one month ahead of works at each crossing.
WM51 GM50	<u>Treatment/management of invasive species infestations</u> : Any infestations of Japanese knotweed or other high-impact invasive species within 7m of works will be covered with high density polyethylene grass carpet terram prior to any works commencing at the location. The covering of any new infestations will only be carried out under the direct supervision of a specialist invasive species ecologist, and works within 7m of the infestation will be under the direct supervision of this specialist invasive species ecologist.
WM52	<u>Monitoring of invasive species</u> : Works within 7m of an invasive species infestation will only be carried out under the direct supervision of a specialist invasive species ecologist with prior experience of this type of work.
WM53 GM51	<u>Should an Otter holt be identified</u> during pre-construction surveys, then all construction works within 150m of the active otter holt, will be carried out during daylight hours and outside of 2 hours after sunrise or before sunset during summer/outside of 1 hours after sunrise or before sunset during winter. If an active holt (particularly holts at which breeding females or cubs are present) is located within 150 meters of the watercourse crossing points, no works will be undertaken while cubs are present in the holt and NPWS will be notified immediately. No wheeled or tracked vehicles (of any kind) will be used within 20m of active but non-breeding otter Holts – except under license, and light work, such as digging by hand or scrub clearance will not take place within 15m of such holts, except under license. The prohibited working area associated with otter holts will, where appropriate, be fenced with temporary fencing prior to any invasive works and declared as ‘out of bounds’. Appropriate awareness of the purpose of the enclosure will be conveyed through toolbox talks with site personnel and sufficient signage will be placed on each exclusion fence. All contractors or operators on site will be made fully aware of the procedures pertaining to each affected holt and subject to conformance audits.
WM54	<u>Traffic speed limits</u> of 50km/h along the Local Roads L1807, L1806, L1804 and L5818; 30km/hr along the local roads L58141, and L18062 and 15km/hr along windfarm site roads.
GM52	<u>Road traffic speed limits</u> of 50km/h along the Local Roads L1807, L1806, L1804, and L5818; 30km/hr along the local roads L5821, L5820 and L18062; and 15km/hr along windfarm site roads.
GM53	<u>Should a Badger sett be identified</u> within 50m of construction works areas during pre-construction surveys, then NWPS will be notified immediately and derogation licenses will be secured in consultation with NPWS to ensure the proposed works cause as limited an effect as possible.
WM55	<u>A barrier fence to control the extent</u> of construction works will be erected 5m from the boundary of the Cullahill Mountain SAC where works are within 75m of the SAC boundary. The placement of this barrier will be carried out before construction works commence in the area and under the supervision of the Ecological Clerk of Works. No works will take place beyond this barrier.
WM56	<u>Timing of Construction Works</u> : The construction of the windfarm site road between T2 and T3, and the main groundworks at T3 be limited to the Autumn and Winter period, i.e. September to

	February inclusive). Paving of the section of uphill section of this windfarm site road will take place before May of the year.
WM57	<u>Dry Stone Walls</u> : following the completion of construction works, historic dry-stone walls within the Ballylehaun Area of the Gathabawn Windfarm will undergo restorations by an experienced dry stone wall builder. The methodology will be provided to and agreed with the Conservation Officer of Kilkenny County Council before restoration works commence. Sections of walls affected by the construction works will undergo restorations where possible, any sections of wall at the Ballylehaun Area which show existing damage or collapse will be included in the restoration programme.
WM58	<u>Veteran Hawthorns</u> : Whilst the LiDAR has successfully been used as a method to record the remnant historical field boundaries within the Ballylehaun Area of the wind farm development, to preserve the historic landscape and prevent further impacts following the construction of the wind farm, the developers of the Project have agreed with the owners of the lands in the vicinity of Turbine T4 in Ballylehaun that the landowner will not remove the remnant field boundaries or fell the veteran hawthorn trees on the upland section of their farm unless considered necessary for the continued use of the land for agricultural purposes
WM59	<u>Parking Exclusion Zone</u> : Overnight parking of plant and machinery will only be permitted at locations which are greater than 50m from the Cullahill Mountain SAC.
WM60	<u>Road Paving</u> : In order to reduce the potential for dust emissions, the uphill section of the windfarm site road between T2 and T3 will be paved with tarmac. A dry wheel wash will be installed on level ground before and after this road to reduce dirt on the wheels of vehicles travelled near to the boundary of the Cullahill Mountain SAC.
WM61	<u>Marsh Fritillary</u> : In the event that Marsh Fritillary larval webs were detected within construction works areas during preconstruction surveys, then turves containing Devil's-bit Scabious will be translocated to a nearby location that would be suitable for the establishment of Devil's-bit Scabious. Before translocation, the soil of the mitigation site will be scarified to allow the roots of the plants take hold. These actions will help increase the success of the translocation of Devil's-bit Scabious from the donor site to the mitigation site. Weather conditions will be monitored, and where possible turves will be translocated when the soil is damp but not waterlogged, with a forecast for rain in the following days to aid establishment to ensure that the donor turves succeed. Long periods of drought will be avoided. All translocation works must be supervised by an ecologist with experience of habitat management and establishment of Devil's-bit Scabious.
WM62	<u>Should a Badger sett be identified</u> within 50m of construction works areas during pre-construction surveys, then NPWS will be notified immediately and derogation licenses will be secured in consultation with NPWS to ensure the proposed works cause as limited an effect as possible.
WM63 GM54	<u>Security lighting</u> will be used at compounds. All lighting will be cowled in order to prevent light spill, and no lighting will be left turned on overnight. Lighting will be controlled by motion and time sensors to minimise the amount of time the lights are operational.

GM55	<u>Noise and emissions from plant/machinery</u> : Plant and machinery will <u>not be permitted to idle</u> . Machinery used intermittently will be shut down when not in use. Any plant operating within 50m of the River Nore or within 200m of a bat roost (if any) will be fitted with noise dampeners and an acoustic enclosure or portable screen placed between the source of noise and the sensitive receptor.
GM56	<u>Hedgerow planting</u> : Any gaps created in hedgerows along the Ballyring-Parksgrove UGC will be reinstated with native hedgerow species in the next suitable planting period following the completion of the works. Hedging plants will be sourced from Department of Agriculture approved nurseries.
WM64	<u>A 50m bat buffer area</u> from the tips of Turbine blades will be created through the removal of hedgerows during the construction phase.
WM65	<u>Plant and machinery will not be permitted to idle</u> and any plant operating within 200m of a bat roost (if any) will be fitted with noise dampeners and surrounded by an acoustic enclosure or portable screen.
WM66	<u>Bat Boxes</u> will be installed under the supervision of the Project Ecologist. These bat boxes will be placed in a suitable location to compensate for any loss through disturbance of potential roosts during the construction works and to provide alternative roosting locations for local roosting bats.
WM67	<u>Hedgerow/tree planting</u> : 3.7km of new hedgerows will be planted during the construction phase. These new hedgerows will include c.100 no. trees (i.e. a new tree will be planted at 35-40m intervals in new hedges). 1.3km of existing hedgerow will be improved by interplanting new hedging into gaps in existing field boundaries. All new hedgerows and enhancement of hedgerows will take place outside of bat buffer zones. Hedgerows will be located to encourage bats to commute away from the turbines. A mix of native fruiting hedge species will be used for any new hedgerows and will comprise of hawthorn, along with blackthorn, holly, hazel, guelder rose, spindle, crab apple, and bird cherry. New trees will comprise a mix of native species such as oak, alder, birch, crab apple bird cherry and rowan. Hedging and trees will be of Irish provenance. Hedging plants will be sourced from Department of Agriculture approved nurseries.
WM68 GM57	<u>Bird breeding season</u> : Hedgerow removal, tree felling or pruning, and scrub clearance will take place outside of the bird breeding season (1st March to the 31st of August).
WM69 GM58	<u>Ground-nesting birds</u> : Where groundworks in grassland are scheduled to take place during the Meadow Pipit, Curlew, Snipe or Lapwing breeding season, surveys will be carried out by the Site Ecologist of suitable habitat, prior to ground/vegetation clearance works. Where active nests are present and the number of nests represents >1% of the local population, the works within close proximity to an active nest will not be carried out until fledging is completed.
WM70	<u>Should a Kingfisher nest be identified</u> within the Ballyring Upper Stream within 300m of the road bridge in Coolcashin/Garrydague during pre-construction surveys (see SM05), then no construction activities will be permitted within 300m of Kingfisher nest locations during the bird breeding season (March – August inclusive) or until nesting is confirmed as complete following supervision by a suitably qualified Ornithologist.

GM59	<u>Should a Kingfisher nest be identified</u> within 300m of watercourse crossing points during pre-construction surveys (<i>see GM05</i>), then no construction activities will be permitted within 300m of Kingfisher nest locations during the bird breeding season (March – August inclusive) or until nesting is confirmed as complete following supervision by a suitably qualified Ornithologist.
WM71 GM60	<u>Public Road – cleanliness</u> : To ensure that local roads are kept clean, a road sweeper will be used daily at road works locations, and as required at site access points.
WM72	<u>Dust control</u>: Dust minimisation measures will be implemented during the construction works as follows: • The site roads will be regularly inspected and swept to remove build up of mud and aggregate materials from their surface, • Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and windy conditions. • Vehicles delivering material with dust potential will be enclosed or covered with tarpaulin to restrict the escape of dust. Public roads in the vicinity of the site will be regularly inspected for cleanliness, and cleaned as necessary
GM61	<u>Dust Control</u> : Any loads of material which have the potential for dust emissions (such as aggregate) will be covered during transportation.
WM73 GM62	<u>Work hours</u> : Construction operations shall generally be restricted to between 0700-1900hrs Monday to Friday, and 0800-1300hrs on Saturdays. Site activities which are likely to create high levels of noise or vibration will be limited to these hours of operation, with no noisy operations on Sundays or Public Holidays. However, to ensure that optimal use is made of good weather period or at critical periods within the programme, it could be necessary on occasion to work outside of these hours.
WM74 GM63	<u>A Community Liaison Officer</u> (CLO) will be appointed. The CLO will liaise with and keep the local community up-to-date with relevant construction work schedules, through the use of letter drops to or direct contact with nearest neighbours. The CLO will be the point of contact for local residents and local landowners for matters relating to noise, dust or traffic. The Environmental Clerk of Works will liaise with the CLO and will be the point of contact between the contractor/developer and the Local Authority regarding any matters relating to noise or vibration from the construction works.
WM75	<u>Vibration along site roads</u> : The Windfarm Site Roads will be maintained to an even surface in order to reduce the potential for vibration from lorries travelling over them.
WM76 GM64	<u>Noise and emissions from plant/machinery</u>: Plant and machinery will not be permitted to idle. Machinery used intermittently will be shut down when not in use. The best means practicable, including proper maintenance of plant, will be employed to minimise the GHG emissions and noise produced by on-site operations. All vehicles and plant will be fitted with effective exhaust silencers. Noise dampeners will be fitted where required. To protect residential amenity, if any plant/machine is required to operate before 07:00hrs or after 19:00hrs Monday to Friday, or before 08:00hrs or after 13:00hrs on a Saturday, then it will be surrounded by an acoustic enclosure or portable screen.

WM77	<u>Noise management</u>: The Contractor undertaking the construction of the Gathabawn Windfarm will be obliged to take specific noise abatement measures when deemed necessary to comply with the recommendations of BS5228-1 (BSI 2014a). The Contractor will coordinate with the construction teams for other developments in order to minimise the cumulative noise effects.
WM78	<u>Noise – rock breaking</u>: If rock breaking is required at the borrow pits, then the following measures will be employed: (i) the rock-breaking tool will be fitted with a suitably designed muffler or sound reduction equipment (without impairing machine efficiency); (ii) the Contractor will ensure that all air lines are sealed, and regular checks will be carried out for air lines leaks; (iii) an acoustic screen will be erected between the compressor or generator and noise sensitive area; (iv) when possible, the line of sight between the top of the machine and reception point will be obscured; and (v) the breaker or rock drill will be enclosed in a portable or fixed acoustic enclosure with suitable ventilation.
WM79 GM65	<u>Preservation of Archaeological Records</u> during construction works will be through the following: • Strip, map and sample in areas where construction activities will strip the topsoil (turbine hard standing areas, borrow pits) and there are geophysical anomalies and LiDAR features present; • Watching brief on areas of soil stripping that are within 10m of recorded or potential archaeology, including geophysical and LiDAR features.
WM80 GM66	<u>Cultural heritage features</u>: Protective barriers or fencing will be installed/erected at identified cultural heritage features to prevent machinery or plant encroaching on the site/feature and to increase awareness of the presence of the site/feature with the construction personnel. Toolbox talks will be provided to construction personnel regarding the cultural heritage feature(s).
WM81	<u>Aviation safety</u>: the developer will notify the Irish Aviation Authority of their intention to commence crane operations at least 30 days prior to their erection. In addition, the as-constructed co-ordinates and elevations will be provided in the required format, and an aeronautical obstacle warning lighting scheme for the wind farm will be agreed with the Irish Aviation Authority
WM82	<u>Telecom operators</u> will be contacted prior to the erection of the permitted wind turbines to confirm (1) requirement for mitigation measure, and (2) form of mitigation measure to be implemented – i.e. one or a combination of (a) change of telecom equipment on the existing masts; (b) change of signal pathways; (c) installation of telecom apparatus onto the windfarm met mast.
WM83 GM67	<u>‘Goal Posts’</u> will be used to identify and highlight the height of nearby overhead lines.
WM84	<u>A banksman</u> will supervise all excavation works and use of large plant in close proximity to services.
GM68	<u>All excavation works and use of large plant</u> in close proximity to services will be supervised by a banksman; and a stock of repair materials for underground water mains will be kept at active works locations along the public road. Where Uisce Eireann assets are to be crossed by the UGC,

	the electrical cables will be installed under the Uisce Éireann asset in accordance with Eirgrid specifications and in accordance with Uisce Éireann's Standards Codes and Practices in relation to separation distances.
WM85	<u>Roadside boundaries</u> will be maintained during the construction phase and following the removal of the boundary to provide a widened transport area or to provide sightlines, a post and mesh boundary fence will be erected immediately.
GM69	<u>Roadside boundaries</u> will be maintained during the construction phase.
WM86	<u>Site Entrances - visibility</u> : Hedgerows and roadside vegetation within the visibility splays will be trimmed and maintained throughout the construction phase to ensure safe visibility at site entrances.
WM87 GM70	<u>Public Road Works</u> : Works along the public road network will be carried out in co-ordination with Kilkenny County Council and in accordance with "Guidelines for the Opening, Backfilling and Reinstatement of Openings in Public Roads (Department of Transport, Tourism & Sport, 2017).
WM88	<u>Public Road Repair</u> : Any damage to structures or road pavements along widening sections, cable routes or along concentrated construction haul routes, because of the construction works and deliveries to the works areas, will be repaired to at least as good a condition as pre-works.
GM71	<u>Public Road Repair</u> : Any damage to structures or road pavements along cable routes and along concentrated construction haul routes will be repaired to at least as good a condition as pre-works.
WM89 GM72	<u>The Traffic Management Plan</u> will be a key construction contract document and will be implemented to safely coordinate and manage traffic during the construction works. The Traffic Management Plan will be developed in coordination with Kilkenny County Council.
WM90 GM73	<u>Flag-men</u> will be used on public roads at road works locations. These flagmen will control the movement of traffic on the public road, so that road users can continue to use the public road network in a in a safe and efficient manner.
WM91 GM74	<u>Local Communication</u> : Local residents likely to be affected by road works, will be kept up to date on works schedules by the Community Liaison Officer.
WM92	<u>Traffic Volumes</u> : The largest traffic volumes are associated with the concrete pours for the turbine foundations. No other deliveries to the Ballylehaun Area or Ballyring Area of the Gathabawn Windfarm will be scheduled to occur on the concrete pour days in that Area.
WM93	<u>Local Traffic Flow</u> : Site entrance works and public road widening works on the L58141 and L18062 will be carried out prior to the main construction period at the Ballylehaun Area and at the Ballyring Area.
WM94	<u>A road safety and courtesy protocol</u> will be implemented for the duration of construction. All companies delivering to site will have to sign up to this protocol as part of their supply contract. Courtesy for other road users is fundamental to the protocol. Vehicles will slow down or stop, as appropriate, for other road users, in particular for pedestrians and cyclists along the

	construction haulage routes. Appropriate signage will be maintained for the duration of the project with clear signs at all junctions on the L1807, L1806 and L1804, L1803, L5818 and L58141 local roads.
GM75	<u>Steel plating</u> will be available to cover the open trench to ensure access to property is maintained.
GM76	<u>Timing of Works</u> : UGC works which overlap, or whose associated HGV traffic is along, the L1807, L1806 the will not be carried out during concrete pour days for the Gathabawn turbines in the Ballyring Area.
GM77	<u>TII</u> : As requested by TII during preplanning consultation for the windfarm, all proposals relating to the N77 national road agreed and licensed between the Road Authority and the applicant will be shared with TII.
GM78	<u>Uisce Eireann</u> : As requested by Uisce Eireann during preplanning consultations, excavated materials from cable trenches and joint bays along the public road network will be sampled to ensure the material is inert.
GM79	<u>N77 Crossing</u> : the Parksgrove-Moatpark UGC will cross the N77 by horizontal directional drilling (HDD) rather than open-cut trenching, with no works within the N77 carriageway itself.
GM80	<u>Controlling Extent of Works</u> : Cable trenching along the Candidate Gathabawn Grid Connection route will be carried out in short, progressive sections, no longer than 100m in length, with each section reinstated before the next is opened.
WM95 GM81	<u>Scheduling Deliveries to avoid school drop-off/pick-up times</u> : HGV deliveries to works or compounds that pass through Lisdowney village or Gathabawn village, will be scheduled to avoid drop-off and pick-up times associated with Scoil Bhríde National School and Scoil na Críon Coille National Schools (approximately 8:30-9:00am, 1:30-1:50pm and 2:30-2:50pm). Any deliveries within the school pickup/drop-off times will be subject to a banksman/escort protocol. Construction drivers will additionally be briefed on the reduced-speed environment at the school frontage and on the likelihood of encountering slow moving agricultural vehicles and machinery on the local road haul routes, with the construction traffic schedule having regard, where practicable, to seasonal peaks in agricultural activity such as the silage season. Consultation with the Scoil Bhríde and Scoil na Críon Coille schools and with Kilkenny County Council Roads Section on this measure will be completed prior to finalisation of the Construction Traffic Management Plan.
GM82	<u>Grid Connection Coordination</u> : The Applicant will engage with other renewable energy developers proposing grid connections to the EirGrid Ballyragget Substation, with a view to sharing or optimising the use of grid connection assets, trenching corridors and associated infrastructure, and coordinating the timing and sequencing of construction works to minimise cumulative and repeated disruption to the same sections of public road.
GM83	<u>Waste Management</u> : waste arising during construction works will be carried out according to a Waste Management Plan. The main contractor will engage an appropriately licensed waste company to deal with all its wastes during construction. The Waste Management Plan is included in the Construction Environmental Management Plan. The Construction Contractor

	will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.
GM84	<u>Reduction in Embodied Carbon</u> : Where feasible, standard concrete containing Portland cement will be replaced with an alternative concrete mix with lower associated embodied carbon, as per the Climate Action Plan. This will be a minimum of 30% GGBS replacement, or concrete with equivalent or lower associated embodied carbon.
GM85	<u>Reduction in Embodied Carbon</u> : Procurement contracts will ensure that material choices with lower associated embodied carbon relative to standard construction materials are considered favourably during the tender process for the wind farm.
GM108	The Parksgrove-Moatpark UGC works will not be carried out during the period 1st April to 31st July inclusive
GM109	The Promoter of the of the Gathabawn Windfarm Project will liaise with other renewable energy developers where there is potential for the timing of groundworks associated with grid connection works to overlap within a sub-catchment. The Promoter will liaise with the other developer(s) with the aim of jointly agreeing the timing of works to provide a buffer of time between works. The Project Ecologist will consult with NPWS and advise on the timing of the works to avoid or reduce cumulative impacts to habitats and species in downstream waterbodies and in the Parksgrove/Moatpark area.
During Operation Surveying, Monitoring & Supervision	
WM96 GM86	<u>Surface water quality monitoring</u> of watercourses downstream of the works will be carried out monthly for the first six months post construction, and thereafter annually during the Operational Years 1, 2, 3, 4 and 5, and then every 5 years thereafter, to record any change to baseline trends. Samples will be analysed by an appropriately certified laboratory and the resulting report submitted to Kilkenny County Council.
WM97 GM87	<u>Inspections of Drainage System</u> : The Asset Manager will inspect the drainage system during quarterly site inspections, and any necessary repairs or maintenance works carried out promptly.
WM98	<u>Bat Activity Surveys</u>: Post-construction bat activity and roost surveys will be carried out during the Operational Years 1, 2, 3, 5 and 10 to record any change to baseline roosting and activity trends. Operational Phase bat surveys will include carcass searches at the turbine locations. Carcass search methodology will involve searching a 100m² grid square for each turbine. Surveyors will walk a transect path every 5-10m within the square searching visually for carcasses. Due to the difficulty in locating smaller remains such as bats and taking into account the rotor diameter of the turbine blades, where available, specially trained detection dog teams will be used to conduct searches within a 60m radius of each turbine tower instead of visual searches. Detection dog teams have been shown to detect 70-100% of carcasses present where dogs and handlers are proficiently trained and experienced compared to visual searches being only 10-70% efficient depending on searcher expertise and terrain factors (McKeague et al., 2024; Paule et al., 2011). Both carcass search methods will be conducted with efficiency trials and carcass removal rate surveys on site to inform the collision rate estimates based on the number of carcasses found.

	The results of the operational phase bat surveys will inform further mitigation where the collision rate proves to be higher than predicted based on the field study data presented in this EIAR 2026. These measures are in line with the best practice guidance for post-construction monitoring of onshore windfarms for Bat species (NatureScot, 2021).
WM99	<u>Bird Surveys</u> ; Confirmatory bird activity surveys, including fatality monitoring (carcass searches, carcass removal rates and detection efficiency) during Years 1, 2, 3, 5, and every 5 years thereafter of the operational phase. (SNH, 2009).
WM100	<u>Annual Invasive Species Survey</u> : An invasive species survey will be conducted of the Biodiversity Areas, and the operational windfarm site. Should a new infestation be identified, remedial measures will be implemented. Any remedial works will be carried out by the Asset Manager or Environmental Manager for low to medium impact species, and by an invasive species specialist ecologist for high-impact invasive species.
WM101	<u>Invasive Species Survey during major maintenance</u> : Prior to facilitating works for turbine component transportation, the works locations will be surveyed for invasive plant species. Should a new infestation be identified, then the works within 7m of the infestation will be carried out under the direct supervision of an ecologist with prior experience of invasive species.
Operational Phase Mitigation Measures	
GM88	<u>The Asset Manager</u> will have responsibility for the implementation of the operational phase mitigation measures and will appoint environmental specialists as required.
WM114 GM89	<u>Vegetation Monitoring</u> : The rate of re-vegetation of exposed soils and growth of newly planted hedgerows and trees will be checked by the Asset Manager during quarterly site inspections. Where revegetation is slower than expected, that area will be prepared and re-seeded or replanted in an appropriate manner, as advised by a suitably qualified ecologist.
GM90	<u>Fuel/Oil control procedures</u> will be implemented and will include the following: All fuels or oils, required during operation, will be stored in a designated, bunded, locked storage area within the substation compound. All fuel storage areas and the transformer at Parksgrove Substation will be bunded appropriately to 110% of the volume of oils/fuels relevant for each area/or for the transformer. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area. Fuel, oil and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage. Safety data sheets for all chemicals used will be kept on-site.
WM120 GM91	<u>Security lighting</u> will be cowled in order to prevent light spill and no lighting will be left turned on overnight. Lighting will be controlled by motion and time sensors to minimise the amount of time the lights are operational.
WM103 GM92	<u>A Community Liaison Officer</u> will be appointed for the duration of the operational phase and will act as a point of contact for the local community.
WM102 GM93	<u>Environmental Management Plan for the Operational Phase</u> : Following the completion of the construction and commissioning of the Project, the Environmental Management Plan will be updated, and the operation of the Gathabawn Windfarm Project will be carried out in accordance with the updated Plan. A suitably qualified Environmental Manager will be appointed by the Project Promoter, and it will be their responsibility to ensure that the EMP is implemented through liaising with the Asset Manager and by carrying out regular audits on EMP compliance.

	The EMP will be an important contract document for the Asset Management contractor who will be contractually obliged to comply with the EMP and the requirements of the Environmental Manager.
WM104	<u>The Community Benefit Fund</u> will be distributed in line the Government's Renewable Energy Support Scheme (RESS) 'Community Benefit Fund Good Practice Principles Handbook'. The Fund will be registered with SEAI and a Report will be prepared annually and submitted to the SEAI, to demonstrate compliance with the RESS Handbook.
WM105	<u>The Community Benefit Fund</u> will be set up once the windfarm becomes operational and will be distributed annually. The Community Liaison Officer will be available to local community groups at the set-up stage of the Fund to assist in the organisation of a fund committee and thereafter during the distribution of funds. The latest recipients of the funding will be listed on the community website www.ecopowergathabawn.ie Annually, the opening of the fund for applications will be advertised on the community website, on Local Radio and in the Local Newspapers
WM106	<u>Cultural heritage interactive database</u> : Offsetting of effects will be further provided by the implementation of an interactive database which will enable members of the local community to record folklore and other intangible cultural heritage of the area around the Gathabawn Windfarm Project. This database will be available to the public, for example through the local libraries and online, the data will be checked before being made publicly available, and the database will be demonstrated in the local schools, community centres and with local heritage groups. The windfarm owner will fund the ongoing maintenance of this database.
WM107	<u>Curtailment Strategy – Noise</u> : A noise curtailment strategy will be developed and implemented to ensure that the operating windfarm complies with the prescribed operational noise criterion. In order to develop this strategy: (i) a pre-construction noise survey will be carried out to establish the background noise levels and to confirm the applicable wind turbine noise criteria at identified Noise Sensitive Locations (NSL) and (ii) following the commissioning of the Project and the commencement of operation of the wind farm, a second noise survey will be carried out at the NSLs to establish compliance with the noise limit conditions applied to the development. This survey will be carried out according to the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014). Where exceedances are confirmed during surveys, then appropriate sound power operating modes will be activated for specified turbines operating in specified wind conditions as required to reduce noise output when exceedance at a NSL is predicted by the wind turbines computer SCADA software. A third noise survey will be carried following the activation of sound power modes to confirm the effectiveness of the curtailment strategy.
WM108	<u>Amplitude modulation</u> : In the event of a complaint which indicates potential amplitude modulation (AM) associated with turbine operation, the windfarm operator will employ an independent acoustic consultant to assess the level of AM experienced by the complainant in accordance with the methods outlined in the Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) Amplitude Modulation Working Group Final Report: A Method for Rating Amplitude Modulation in Wind Turbine Noise (9 August 2016) or subsequent revisions. The measurement method outlined in the IOA AMWG document, known as the 'Reference Method', will provide a robust and reliable indicator of AM and yield valuable information on the frequency and duration of occurrence, which can be used to evaluate mitigation requirements. The mitigation measures, if required, will consist of the implementation of operational controls on

	specified turbines, which will curtail or stop the relevant turbines under specific operational conditions, so that OAM is eliminated.
WM109	<u>Shadow Flicker Control</u>: The wind turbines will be fitted with a Shadow Flicker Control Module, comprising a central processing unit (CPU) and light sensors. Should a complaint regarding shadow flicker be received from a neighbouring resident, the occurrence of shadow flicker at the receptor will be investigated and the Control Module will be set to automatically turn off the turbine at the request of the resident, if the defined parameters for shadow flicker events, at a given sensitive receptor, are predicted to occur. This will eliminate shadow flicker at the residence in question. A report on the operation of the Shadow Flicker Control Module and compliance with any planning condition limiting shadow flicker occurrence will be prepared and submitted to the Local Authority after Year 1 of operation, and every 3 years thereafter.
WM110	<u>TV Signals</u>: the Promoter will sign up to the 2RN Protocol Agreement to manage and rectify interference caused by the Gathabawn turbines to television services locally. To rectify interference on TV signals caused by the Gathabawn turbines, one of the following measures would be undertaken, decided on a case-by-case basis: (i) TV Antenna re-alignment and increase height - In instances where user dwelling antennas are misaligned and installed either at very low heights or in attic spaces, re-aligning the aerial and increasing its height may resolve TV interference. (ii) Antenna Re-tuning to an alternative transmitter could resolve TV issues for some residences. (iii) Subscription-Free Satellite TV service (SaorSat) which would provide digital TV to residences with a once-off installation charge (covered by the developer). This service can be deployed over satellite, which would incur no interference from the wind farm.
WM111	<u>WQ and Soil Protection at Turbine Delivery Facilitating Works locations</u>: During any reopening/re-widening of site entrances or facilitating works locations, any topsoil removed to reveal the hardcore underneath will be stored in an adjacent temporary deposition area, sealed to prevent erosion, and a silt curtain will be erected downslope of this deposition area. Following the completion of the transportation, the hardcore area will be covered over once again using the soil in the deposition area. The area will be reseeded/replanted as appropriate to the location. The area will be fenced from livestock until revegetation has occurred.
WM112	<u>Control of vehicle/machinery movement</u>: Operational phase traffic, personnel and materials will be restricted to the windfarm site roads and hardstanding areas.
WM113	<u>Maintenance of windfarm roads</u>: The windfarm roads will be maintained during the operational phase and kept in good working order and free of wheel ruts and potholes.
WM115	<u>Fuel/Oil control procedures</u> will be implemented and will include the following: On site re-fuelling of machinery (if required) will be carried out using a mobile double skinned fuel bowser. The fuel bowser, double-axle custom-built refuelling trailer, will be refuelled off-site, and will be towed onto the site by a 4x4 vehicle to where machinery is located. The 4x4 vehicle will carry fuel absorbent material and pads in the event of any accidental spillage. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations. In addition, spill response apparatus including spill-kits and fuel absorbent mats will be stored in each turbine and stored in the cabin of each vehicle and operators will be fully trained in the

	use of this equipment and in the implementation of the Emergency Response Plan, as contained in the Environmental Management Plan. All fuels or oils, required during operation, will be stored in a designated, bunded, locked COSSH storage area at the control buildings. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment will be contained within the bunded area. Fuel, oil and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage. Safety data sheets for all chemicals used will be kept on-site.
WM116	<u>Bat Boxes</u>: The new bat boxes will be checked annually for integrity and will be replaced if necessary.
WM117	<u>The bat buffer zone</u> will be maintained during operation by trimming existing trees and hedgerows, removing any scrub and additionally no new trees or hedgerows will be planted within the buffer zones. Grazing intensity and sward heights will be monitored, and where grazing has ceased in agricultural lands around a turbine that the grass will be mowed to maintain a low sward if required.
WM118	<u>Feathering the blades</u>: The rotational speed of the turbine blades when idling during low wind speeds will be reduced by 'feathering' the turbine blades, which means turning the turbine blades parallel to the wind. With feathering in place, the turbines can continue to rotate slowly, but at speeds that pose much less of a risk to bats (Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation - SNH 2019). The feathering will reduce the rotational speed of the turbine blades when idling so they do not exceed 2RPM.
WM119	<u>Curtailment Strategy - Bats</u>: Operational monitoring will be undertaken at each turbine, using automated detectors at ground level, for periods of at least ten nights, during spring (April, May), mid-summer (June, July) and autumn (August, September). Prevailing on-site weather data (temperature, wind speeds and rainfall) will be recorded concurrently with the bat activity monitoring, in order to identify conditions associated with high levels of Leisler's Bat activity. This monitoring will be carried out in order to collect sufficient data to inform the development of an effective curtailment strategy for the protection of Leisler's Bat, while avoiding curtailment of operating turbines unnecessarily. The monitoring will identify the periods in which there is risk to Leisler's Bat and will also identify periods where there is little or no risk to Leisler's Bat. For example, a curtailment strategy could comprise the following parameters: If the bats are only active in significant numbers between sunset and sunrise, then curtailment would be targeted only on these periods. Or where bat activity is strongly influenced by weather conditions such as temperature, wind speeds and rainfall, curtailment would reflect the suitable or unsuitable conditions. Where high Leisler's Bat activity is recorded during monitoring, curtailment would be deployed on turbines where the activity occurs when ALL of the following parameters are met: ▪ when wind speeds are below 6 m/s, and ▪ when air temperatures are above 9°C and ▪ between 1st April and 30th September throughout the night (starting 15 minutes prior to sunset and ending 30 minutes after sunrise). If the monitoring indicates that curtailment is required, then the relevant turbines will be curtailed similar to the parameters listed above and will be informed by the data gathered during monitoring.

	Annual reports on the curtailment strategy will be provided to relevant statutory bodies (where required). The report will also consider the latest bat monitoring and deterrent systems.
WM121	<u>Waste Management</u> : waste arising during the operation stage will be carried out according to a Waste Management Plan. An appropriately licensed waste company will be contracted to deal with all windfarm wastes. The Waste Management Plan will be included in the Environmental Management Plan for the operational project. The Asset Manager will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.
	Decommissioning Phase – Surveying, Monitoring and Mitigation Measures
WM123 GM94	<u>Up-to-date Best Practice</u> : Prior to the commencement of decommissioning works, a <u>review of these protective measures</u> listed herein will be carried out to ensure that the most up-to-date measures are implemented during decommissioning works to comply with best practice at the time.
WM122 GM95	<u>Environmental Management Plan</u> : Any decommissioning works will be carried out in accordance with the updated EMP. A suitably qualified Environmental Manager will be appointed by the Project Promoter, and it will be their responsibility to ensure that the EMP is implemented through liaising with the Asset Manager and the decommissioning Contractor(s) and by carrying out regular audits on EMP compliance. The EMP will be an important contract document for the decommissioning contractor(s) who will be contractually obliged to comply with the EMP and the requirements of the Environmental Manager
WM127 GM96	<u>Invasive Species Survey</u> : Before any decommissioning works commence, the works locations will be surveyed for invasive plant species infestations and should any be present within 7m of the works, then the works within 7m of the infestation will be under the direct supervision of an ecologist with prior experience of invasive species.
WM131 GM97	<u>Fit for Purpose</u> : All plant and machinery which will be used during decommissioning works will be fit for purpose and in good working order prior to mobilisation to works areas.
WM132 GM98	<u>Noise and GHG emissions from plant/machinery</u> : Plant and machinery will not be permitted to idle. Machinery used intermittently will be shut down when not in use. All vehicles and plant will be fitted with effective exhaust silencers. Noise dampeners will be fitted where required. The best means practicable, including proper maintenance of plant, will be employed to minimise noise and GHG emissions.
WM129 GM99	<u>Hours of Work</u> : Decommissioning operations will be restricted to between 0700-1900hrs Monday to Friday.
WM125 GM100	<u>A Community Liaison Officer</u> (CLO) will be appointed for the duration of the decommissioning phase and will be the point of contact for local residents.
WM124 GM101	<u>Consultation & Supervision of Works</u> : The works will be carried out in consultation with Kilkenny County Council and under the supervision of a suitably qualified engineer and ecologist. Re-vegetation of the site will be carried out under the supervision of a suitably qualified ecologist.
GM102	<u>Storage of Overburden</u> : During any reopening of jointing chambers in agricultural lands, topsoil removed to reveal the jointing chamber cover underneath will be stored in an adjacent temporary deposition area, covered to protect it from weathering, and a silt fence will be erected around this deposition area.
WM134 GM103	<u>Protection of WQ and Soils</u> : During decommissioning works, topsoil removed will be stored in an adjacent temporary deposition area, sealed to protect it from weathering, and a silt curtain will be erected around this deposition area.

WM126	<u>Fauna surveys</u> : It is recommended that a programme of pre-decommission monitoring of terrestrial habitats, marsh fritillary, bats, terrestrial mammals and birds be conducted in the period preceding the commencement of substantial decommissioning works to ensure adequate protection of these species is ensured during the process of decommissioning. The resulting survey data can inform the design of any mitigation that may be required and ensure that any such mitigation is fully and effectively implemented.
WM128 GM104	<u>Weather forecasting</u> warnings will be consulted in advance of works, and decommissioning works will not take place during periods of prolonged heavy rain or exceptional rainfall events.
WM130	<u>Control of Machinery/Vehicular Movements</u> : Decommissioning traffic, personnel and materials will be restricted to the decommissioning works areas. Machinery will be kept on the windfarm site roads and hardstanding areas, and, aside from reinstatement works, will avoid moving off the hardstanding areas where possible.
WM133	<u>Fuel Controls</u> : Overnight parking of plant and machinery will only be permitted at the turbine locations. There will be no refuelling of vehicles or plant permitted within 100m of a watercourse or drainage feature or within 100m of the Cullahill Mountain SAC or the Gales Hill Nature Reserve. Any re-fuelling of machinery on site will be carried out using a mobile double skinned fuel bowser which will carry fuel absorbent material and pads in the event of any accidental spillages. In addition, spill response apparatus including spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment.
GM105	There will be no <u>refuelling of plant or machinery</u> within 100m of a watercourse, wet drainage channel or private well/spring. Any re-fuelling of machinery on site will be carried out using a mobile double skinned fuel bowser. Spill response apparatus including spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment.
GM106	<u>Reinstatement Works</u> : Following cable pulling works, the covers will be replaced on the chambers, and ground above the chamber reinstated as appropriate to the location. If in agricultural lands, the area will be reseeded as appropriate and fenced from livestock until revegetation has occurred. Land reinstatement works will not take place during periods of prolonged heavy rain or exceptional rainfall events or when the soil is waterlogged.
WM135	<u>Land reinstatement</u> : Following the completion of decommissioning, the hardcore areas at the turbines and at widened site entrances and facilitating works locations will be covered over, using the soil in the deposition areas. The areas will be reseeded/replanted as appropriate to the location. The areas will be fenced from livestock until revegetation has occurred. Land reinstatement works will not take place during periods of prolonged heavy rain or exceptional rainfall events or when the soil is waterlogged.
WM136 GM107	<u>Revegetation</u> : The Asset Manager and Project Ecologist will check the rate of re-vegetation of exposed soils and reinstated areas quarterly following decommissioning works (until revegetation is attained). Where revegetation is slower than expected, that area will be prepared and re-seeded in an appropriate manner.
WM137	<u>Waste Management</u> : waste arising during the decommissioning stage will be carried out according to a Waste Management Plan. An appropriately licensed waste company will be contracted to deal with all decommissioning wastes. The Waste Management Plan will be

	included in the Environmental Management Plan for the decommissioning stage. The Asset Manager will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.

Tab 4

Environmental Emergency Response Measures

Environmental Emergency Procedure for Oil/Fuel Spillage	
Work Sections/Locations	
All parts of the construction works area boundary	
Responsibility of	Role/Duty
Construction Manager	- Ensuring that all personnel are trained in emergency procedure for oil/fuel spillage - Ensuring that all construction site plant, machinery and vehicles are equipped with spill kits - Alerting the Environmental Clerk of Works of the oil/fuel spillage.
Incidents involving oil spillage	
This procedure covers the accidental loss of oils that may arise from plant failures, fuelling, etc., - Ensure appropriately trained staff and necessary containment equipment is on site to allow immediate control of any spills. - Contractors will be required to check all fuel and hydraulic lines, service, and document all machinery prior to the commencement of construction - Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment - Spill response apparatus and infrastructure should be inspected on a regular basis to ensure that the kits are fully stocked and materials are of adequate condition, and where this is not the case kits should be replenished or replaced. - Spill kits shall be fitted with break seals and site operatives shall be required to notify the construction manager if these seals are broken. - Spill kits should be maintained at all fuelling and oil storage locations. All mobile fuelling and oil bow-sers/tankers shall have full spill kits, appropriate to their capacity. - All machines that utilise hydraulic systems, such as excavators, dumpers, and cranes, shall have appropriately sized spill kits on board at all times. - It is the construction manager's responsibility to ensure spill kits/material is available as specified. All hydrocarbons will be managed appropriately to prevent their potential release to surface or ground water. - All hydrocarbon containers will be stored in bunds. For above ground tanks, double skinned tanks will be used and all will be externally banded. All transfer of hydrocarbons will be undertaken in a banded area. - On arrival at spill site, assess the situation. If a volatile, flammable material is spilled, immediately warn everyone in the vicinity, control sources of ignition and ventilate the area. - If possible without risk of personal injury, stop and contain the spillage using the appropriate spill kit (as per material type). - Have all shores and surface water drains in area of spillage covered or protected as quickly as possible to prevent pollution. - Report all spills immediately to the Environmental Clerk of Works and Construction Manager who will mobilize specially trained site personnel to clean up and dispose of residues and clean-up materials in an appropriate manner.	

- Spill kit waste materials will be collected from the compound by a specialised hydrocarbon and hazardous waste service provider with a valid waste collection permit for reprocessing at a EPA waste licensed facility.

Environmental Emergency Procedure for significant pollution occurrence in local surface waters	
Work Sections/Locations	
All parts of the construction works area boundary	
Responsibility of	Role/Duty
Construction Manager	Will inform the Environmental Clerk of Works of any observed issues.
Environmental Clerk of Works	Will notify appropriate personnel in Kilkenny County Council, the EPA and Inland Fisheries Ireland
Incidents involving oil spillage	
In the unlikely event of a significant pollution occurrence in local surface waters relating to the works then the following protocol will be adopted: - Water quality monitoring will be undertaken visually, and the Construction Manager will have informed the Environmental Clerk of Works of any observed issues - If the source is from the works then the Environmental Manager will notify appropriate personnel in Kilkenny County Council, the EPA and Inland Fisheries Ireland - Work will not continue again until the source of the pollution is identified and eliminated	
Contact Details	
List of Contacts to be added, from this EMP Main document.	

Environmental Emergency Procedure for Frac-Out during Drilling Works	
Work Sections/Locations	
Horizontal Directional Drilling location – Watercrossings W2 & W6	
Responsibility of	Role/Duty
Construction Manager	Supervising water course bed and drilling works, including drilling pressures, implementation of contingency measures
Mud Engineer	Supervising water course bed and drilling works, including drilling pressures, implementation of contingency measures
Purpose of Frac-Out Contingency Measures	
- Minimize the potential for a frac out associated with horizontal directional drilling activities - Provide for the timely detection of frac outs; - Protect the watercourse - Ensure an organised, timely, and “minimum impact” response in the event of a frac out and the release of drilling mud.	
Contingency Measures	
- In the event of break-out occurring in the river bed, the rig will immediately shut off the pumps and the drilling assembly will be pulled off to reduce annular pressures. - In the event of break-out on the road an excavator will be available to dig a pit to contain fluid with vacuum trucks/pumps available to transfer drill fluid from the containment point back to the recycling point. - Drilling fluid additives designed to plug the formation will be introduced to the circulation system and let set.	

Tab 5

Surface Water Management Plan



Surface Water Management Plan

Gathabawn Wind Farm

Ecopower Developments Limited

Zetec House, Purcellsinch IDA Business Park, Old Dublin Road, Kilkenny, R95 PX5X

Prepared by:

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SLR Project No.: 501.065883.00001

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25 September 2026

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Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	25 September 2026	SB	CN	DB

Basis of Report

This document has been prepared by SLR Environmental Consulting (Ireland) Ltd (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Ecopower Developments Limited (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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1.0 Introduction

SLR Environmental Consulting (Ireland) Limited (SLR) has been appointed by Ecopower Developments Limited (the Client) to provide a Surface Water Management Plan to support the planning of the construction phase for Gathabawn Wind Farm (the Site), located within County Kilkenny.

This document outlines the principles, requirements and overall strategy for the drainage of surface water runoff from the temporary access tracks, compounds and staging/working areas which will be required during the construction phase of the proposed development. General criteria and good practice measures for the management of surface water runoff from temporary working areas during construction are also outlined and should be adopted by the Principal Contractor to ensure minimal impact on the existing flow regime, water quality, and runoff quantity.

1.1 Site Location

The Gathabawn Wind Farm Site is located in the northwest of County Kilkenny. The site is situated approximately 17.2km northwest of Kilkenny city centre, approximately 1km to the southeast of the village of Gathabawn and approximately 6km west of the town of Ballyragget. The wider scheme is split into two separate wind farm sections, with the Ballylehaun Section located to the northwest centred on IGRS S 34112 70821 and the Ballyring Section located to the southeast and centred on IGRS S 38735 68870. The general locations of both sections of the Site are shown in **Figure 1-1**.

Figure 1-1: Site Location



1.2 Project Description

The proposed development comprises the construction of a 12-turbine wind farm which is to be split into two separate groups referred to as the 'Ballylehaun Section' and the 'Ballyring Section'.

The Ballylehaun Section is located to the west of the Site and comprises 7 wind turbines of up to 159.5m in height, together with associated works which will include turbine foundations, hardstanding areas, access roads and tracks, underground cable routes and an electrical control building.

The Ballyring Section is located to the east of the Site and comprises 5 wind turbines of up to 159.5m in height, together with associated works which will include turbine foundations, hardstanding areas, access roads and tracks, underground cable routes, an electrical control building and a LiDAR monitoring unit.

The development will also comprise a Candidate Grid Connection Route to connect the scheme to the national electricity grid.

During the construction phase, the overall development will comprise permanent hardcored areas such as turbine crane hardstands and access tracks and temporary hardcored areas such as temporary construction compounds, temporary borrow pits, temporary turbine blade set-down areas.

2.0 Baseline

2.1 Topography

The local topography has been reviewed using the Copernicus 25m resolution Digital Elevation Model (DEM), with vertical elevations based upon the European Vertical Reference Frame 2000 (EVRS2000) datum.

The Site is situated in an area featuring undulating hills and valleys to the south of Cullahill Mountain. The Ballylehaun Section is situated at elevations ranging from 237m to 143m, with falls occurring predominantly in a south-westerly and a westerly direction. The Ballyring Section is situated around the peak of a hill at elevations ranging from 221m down to 178m, with falls away to the northeast, southwest and south.

The Parksgrove Substation which is part of the Candidate Gathabawn Grid Connection, is situated at a level of 70m.

2.2 Geology

Geological Survey Ireland (GSI) Bedrock Geology 100K mapping indicates the Ballylehaun Section of the Site is situated upon bedrock geology comprising Ballyadams Formation (Crinoidal wackestone/packstone limestone), Clogrenan Formation (Cherty, muddy, calcarenitic limestone) and Killeshin Siltstone Formation (Muddy siltstone and silty mudstone). The Ballyring Section of the Site is situated upon bedrock geology primarily comprising Bregaun Flagstone Formation (Thick flaggy sandstone and siltstone), with small parts of the Site situated upon Killeshin Siltstone Formation (Muddy siltstone and silty mudstone) to the north and south.

The Candidate Grid Connection is underlain by the Bregaun Flagstone Formation, Killeshin Siltstone Formation, Clogrenan Formation, Ballyadams Formation and Durrow Formation.



Environmental Protection Agency (EPA) SIS National Soils mapping¹ indicates that the Ballylehaun Section of the Site is situated upon soils comprising 'Elton – fine loamy drift with limestones' to the west and 'Crosstown – fine loamy drift with siliceous stones'. The Ballyring Section of the Site is indicated to be situated upon soils comprising Crosstown. The Candidate Grid Connection is indicated to be situated upon soils comprising primarily Elton, with Crosstown present to the western end of the corridor and 'River – river alluvium' to the east in proximity to the River Nore, west of Ballyragget.

2.3 Hydrogeology

The GSI Aquifer Classification mapping² designates the bedrock beneath the Ballylehaun Section of the Site as 'Regionally Important Aquifer – capable of supplying regionally important supplies.' The Ballyring Section of the Site is indicated to be situated upon bedrock geology designated as 'Poor Aquifer – bedrock which is generally unproductive except for local zones.' The Candidate Grid Connection corridor spans Poor Aquifer, regionally important aquifer and Locally Important Aquifer.

2.4 Climate Change

As per the EPA, the implications of climate change are recognised in that Ireland has seen increased levels of precipitation of approximately 5% during the period of 1981 – 2010 when compared to the 30-year period of 1961 – 1990. The impacts of climate change are also expected to have an effect on seasonal variability, with overall reductions in average annual, spring and summer rainfall. However, the frequency of heavy rainfall events is expected to increase during the autumn and winter months by approximately 20%.

In order to demonstrate a conservative approach, an allowance of 40% has been applied to the design of surface water drainage features in order to account for future climate change during the lifetime of the development.

¹ Environmental Protection Agency, SIS National Soils. Available at: <https://gis.epa.ie/geonetwork/srv/api/records/2cd0c5e9-83b2-49a9-8c3e-79675ffd18bf>. Accessed September 2025

² Geological Survey Ireland, Aquifer Classification. <https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/activities/understanding-ireland-groundwater/aquifer-classification/Pages/Aquifer-classification-how-to.aspx>. Accessed September 2025



3.0 Drainage Principles and Features

This section details how surface water runoff will be managed from the various construction elements of the scheme, to ensure that there is no risk to downstream flood risk and no risk of pollution of watercourses by sediment or other contaminants. In line with national and local guidance, together with best practice, SuDS will be utilised to ensure that natural drainage regimes are maintained while addressing the settlement of sediments and fines and improving the quality of discharge.

3.1 Sustainable Drainage Systems (SuDS)

The drainage for the wind farm site will ensure minimal impact on the existing flow regime, water quality, and runoff quantity. The nature of the ground conditions dictates the drainage methodology that can be employed.

Drainage serving the Site will include elements of SuDS design. SuDS are a sustainable method of reducing the quantity and quality of runoff into local watercourses, water features and to ground, particularly where groundwater sources must be protected from the risk of pollution. SuDS aim to replicate natural drainage patterns and have a number of benefits including:

- SuDS to attenuate runoff, reducing peak flow and can alleviate flooding issues that might arise downstream;
- SuDS provide a level of treatment for runoff, such as settlement ponds, that can reduce sediment and pollutants within runoff prior to release to the water environment; and,
- SuDS measures, such as lagoons or retention ponds, correctly designed and constructed, can produce beneficial habitats for wildlife and improve biodiversity.

SuDS are easily constructable at a large-scale for wind farms where space allows. Additionally, wind farm sites usually have established vegetation that when managed correctly can act as a form of SuDS, naturally intercepting pollutants and allowing for infiltration. Thus, the use of SuDS for wind farm sites can assist in reducing the risk of polluting the local environment and/or overwhelming drainage systems to a not significant level. There are several features of SuDS, however methods considered more suitable for wind farm developments are highlighted and summarised in Table 3-1.

Table 3-1: SuDS Elements

Drainage Element	Description
Clean water separation and diversion	Interception of upgradient runoff by a trench and diversion around work areas to then be discharged back into the same catchment downgradient of the work area to maintain the original hydrology regime.
Permeable surfaces and filter strips	Permeable surfaces such as gravel surfaces and gravel trenches, drain water through voids within the gravel prior to percolation into the soil and subsoil below. The access tracks to the wind turbines will be constructed using porous materials (aggregates), encouraging interception of surface water prior to generating runoff, followed by gradual infiltration process. Filter strips comprise a strip of vegetated ground that runoff can flow over. Considering wind farms are usually naturally hilly, runoff will flow down the hillside, and the vegetation will intercept the



Drainage Element	Description
	pollutants, such as silt, while water will infiltrate slowly into the soil below. Filter strips are typically constructed between the upland development/access tracks and the watercourses at the bottom of the development. However, it is noted that filter strips are not suitable for use at steep sites as this will limit their effectiveness.
Swales (also known as dirty water drains)	Swales are open drainage channels designed to capture potentially contaminated runoff from work areas that divert flow to a secondary treatment component (i.e. settlement pond) and generally include secondary features, such as check dams and silt traps. Swales can be used to laterally intercept surface water runoff prior to conveyance to a storage or discharge system to reduce flood risk and encourage gradual infiltration. Additionally, as pollutants will become captured in the top layer of the soil, it is possible for an impervious lining to be constructed under this layer where necessary. It is best practice that swales are designed to be dry during normal conditions.
Silt traps, fences and check dams	These features are generally constructed using a closely woven synthetic geotextile material, and are a quick and easy form of SuDS which can be used from the construction stage. They can be established along leading runoff routes, intercepting high runoff flows and pollutants, with high capabilities of intercepting the mass of pollutants during the construction stage, with further use as serving as temporary check dams, if required, for example within swales. Gravel check dams can also be incorporated at intervals within swales which assist with reducing flow velocities where required.
Settlement ponds	The Settlements Ponds design is to be constructed in line with the dirty water drains down slope of the access roads and hardstands. Settlement Ponds comprise of 2 or 3 chamber/pond which collects water and allows the sediment laden water from the dirty water drains to settle. Some of these ponds will be retained for the operation phase of the project giving the added benefit of attracting wildlife and can be a form of added amenity value while also permanent retaining water to offer water quality benefits downstream. Ponds also reduce flood risk while encouraging gradual infiltration into the soil below but can also be lined where necessary.
Wetlands	An extended form of shallow ponds which are usually highly vegetated and remain fully wet year-round. Wetlands will offer limited attenuation benefits but will provide substantial water quality and biodiversity benefits, while also offering increased amenity value.



Drainage Element	Description
Foul drainage	Foul waste from welfare facilities will be managed, with waste to be stored and contained in-situ prior to removal by tanker.

3.2 Clean Water Separation and Diversion

An important aspect of drainage management is that clean water from outside the works area is not mixed with dirty water from within the works area. This minimises the quantity of water to be treated and consequently improves their performance while reducing the size and quantity of settlement ponds where they are used.

Where possible, clean water (i.e. non-silty surface water) will be kept separate from turbid or potentially contaminated water from construction areas. Where adequate and appropriate space allows, up-gradient cut off ditches or other diversionary measures will be installed to intercept and divert upgradient surface water runoff from construction disturbed areas. These measures will be installed ahead of construction and excavation works wherever practical.

Clean diverted water will be discharged onto vegetation for dispersion and/or infiltration while maintaining natural flow paths. Dependant on ground conditions, silt traps, sandbags and silt fencing may be required at the discharge point to prevent scouring and erosion at the outlet, regulate flow and disperse water over a wider area of vegetation.

Discharge points from clean water diversion ditches will be located at sufficient distance from any watercourses to encourage infiltration and/or settlement of suspended solids prior to entering the watercourse.

An example of clean water separation and diversion is shown in **Plate 3-1**.

Plate 3-1: Example of Clean Water Diversion Ditch



3.3 Permeable Surfaces and Filter Strips

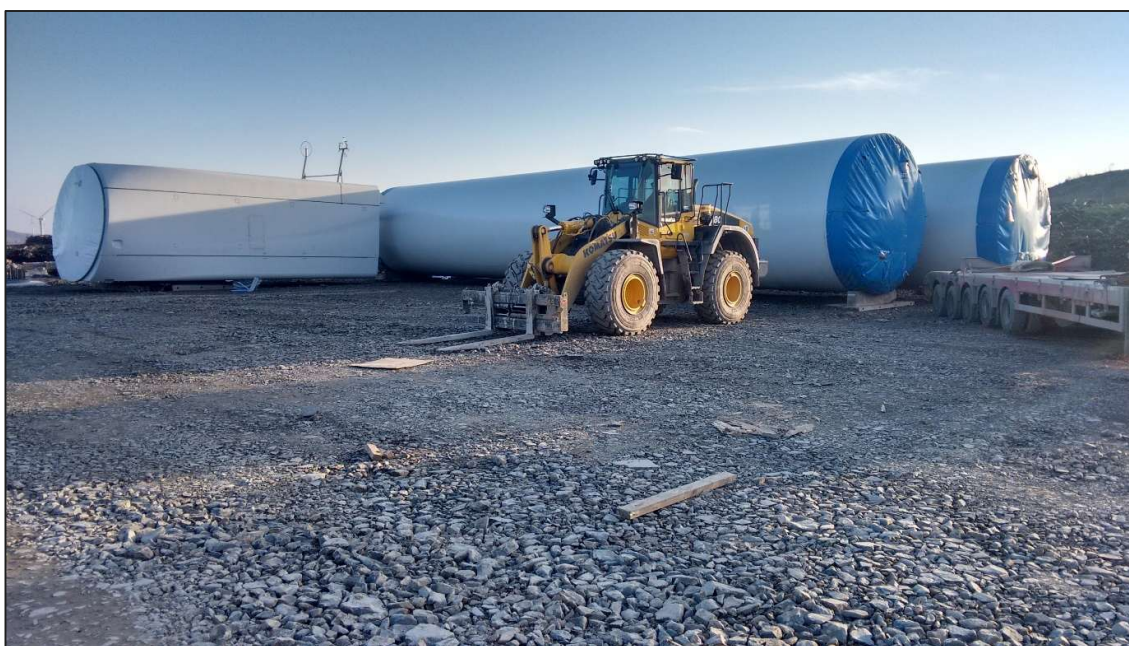
The majority of infrastructure associated with the consented development is made up of permeable material of aggregate rock, including the temporary construction compounds,



access tracks, turbine hardstanding and car parking. Some of this water infiltrates into the ground and the remainder, if any, runs off to the nearest watercourse downhill. Ensuring that almost the entire site adopts permeable surfaces avoids safety concerns around surface water ponding and flooding while maintaining the original hydrological regime. The permeable nature to most of the hardstanding offers some attenuation to remove sediments from runoff while utilising the filtration capacity of the vegetation immediately adjacent to infrastructure to filter suspended material from water as it passes through offers great benefits. As water moves through the porous media, flow rates slow and water is discharged back into the soil and subsoil over a diffuse area. An example of the permeable surfaces of hardstanding at wind farms is illustrated in **Plate 3-2**.

Filter strips are vegetated areas of land that receive runoff from drainage, the vegetation helps slow flow rates and allow sediments to settle. Filter strips will be marked out, and vehicle movements will be restricted to prevent damage to vegetation and soil compaction.

Plate 3-2: Example of Typical Turbine Hardstanding With Permeable Surfaces



3.4 Swales

Swales are permeable channels which direct sediment laden water away from working areas. These will also be referred to as Dirty Water drains through this document and within Volume B - Drawings Pack. They generally allow for water to infiltrate back into the soil/subsoil, although they can be lined where sensitive receptors are nearby and there is increased risk of pollution from upgradient works.

Where ground conditions allow, swales and drains should be constructed so that the gradient does not exceed 1:30 to limit flow rates, prevent erosion and encourage establishment of terrestrial and aquatic vegetation where possible. Where this is not possible, sufficient flow attenuation measures will be installed, including check dams and silt fences. An example of a swale and cross drain is presented in **Plate 3-3**.

The width and depth of drainage channels will be minimised as far as practical to limit ground disturbance and excavation footprint (and hence volume of excavated materials). Drainage channels and associated cross drains will require to be wide enough to allow wildlife to safely enter/exit the channel/pipe.



Cross drains will be installed along swales, where necessary, to maintain the original hydrological conditions, allowing drainage through raised features such as access tracks.

Plate 3-3: Example Swale and Cross Drain Serving Access Track



3.5 Silt Traps, Fences and Check Dams

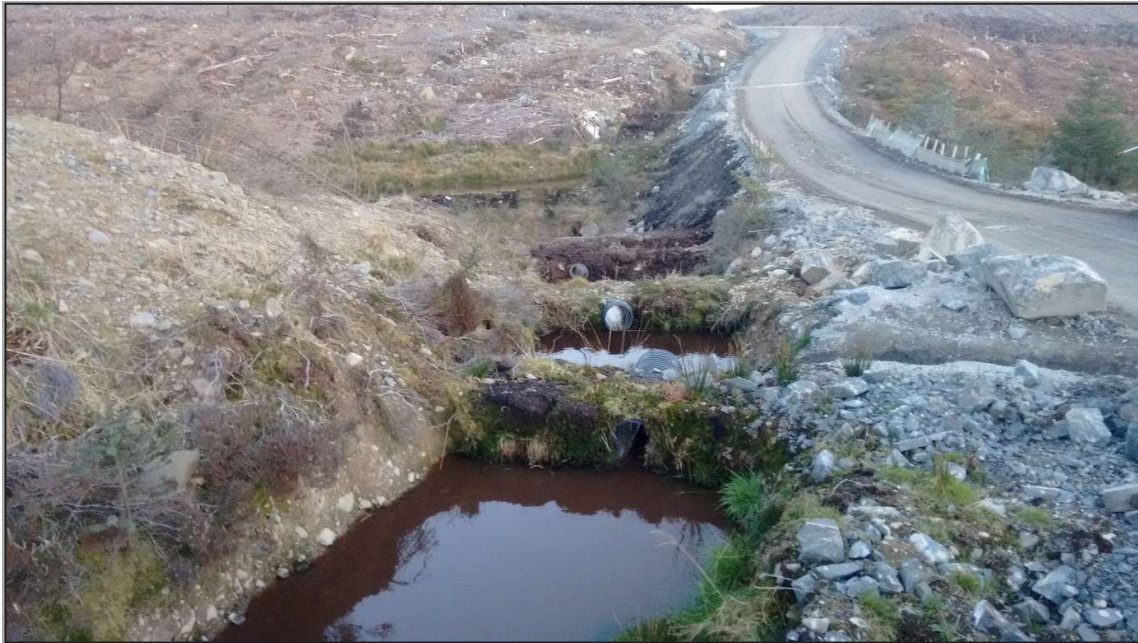
Silt traps, fences and check dams shall be utilised to trap and filter sediment-laden runoff. They can be used in a well-designed water control system across slopes where the water is directed towards grassy locations and/or sediment ponds/silt busters. The use of silt traps needs to be carefully planned as they are easily overwhelmed. Management and regular monitoring of the effectiveness of silt trap is paramount.

Silt traps, fences and/or check dams shall also be installed on the downgradient side of tracks, adjacent to watercourse crossings to avoid sediment being transferred into the wider hydrological system.

Silt traps will also be constructed at the inlet and outlet of any pipe culverts to prevent the pipes becoming blocked and to prevent erosion at the inlet and outlet points.



Plate 3-4: Example of Silt Traps in Series



Silt fences are permeable textiles that are dug into the ground and supported by posts that can prevent the migration of sediments while allowing water to flow through to prevent ponding and flooding. Silt fencing will be installed around the toe of material stockpiles, an example of their performance in this scenario is illustrated in **Plate 3-5**. Silt fencing can also be utilised within swales where ground conditions allow for them to be sufficiently anchored in the subsoil.

Plate 3-5: Example of Silt Fencing Around the toe of Soil Stockpile



Silt fencing will be adopted at watercourse crossings (including at the Horizontal Directional Drilling sites) to prevent runoff and surface water ponding directly entering the watercourse



during vehicular movement. An example of silt fencing used at watercourse crossing is presented in **Plate 3-6**.

Plate 3-6: Example of Silt Fences at Watercourse Crossing



Temporary or permanent check dams (flow barriers or dams constructed across the drainage channel) will be installed at regular intervals within any clean water or dirty water cut-off ditches.

Check dams reduce the velocity of water and therefore allow settlement of coarser sediment particles as well as silt at low flow conditions while slower velocities also prevent scouring of the channel itself.

Check dams are ideally constructed of clean hard rock aggregate, although sandbags may also be deployed in the short term.

The number and location of check dams will be dependent on the slope, flow and volume of water, although the following general rules will be applied:

- The maximum spacing between check dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam;
- The centre of the check dam should be at least 0.2m lower than the outside edges;
- Side slopes should be 1:2 or less;
- Check dams should be keyed at least 0.1m into the drainage channel bottom in order to prevent the dam washing out.

Sandbags may only be used as a temporary flow attenuation measure, and all bags will be removed and replaced with permanent measures upon completion of construction works where necessary.

Check dams, silt traps and fences should be maintained and monitored on a regular basis. Sediment should be removed before it reaches one half the original dam height or silt trap depth. An example of check dams is illustrated in **Plate 3-7**.



Plate 3-7: Example of Check Dams in Series on Swale



Any introduced or artificial materials required for temporary erosion or silt mitigation controls, such as silt fencing, sandbags etc. are required to be removed upon completion of construction works. Silt mitigation measures will be implemented during removal of these materials as disturbance may be caused in drains and ponds which have since bedded in.

3.6 Settlement Ponds

Silt laden runoff can result from areas of recently exposed soil or rock. This silt laden runoff will be captured and directed via swales/drains towards settlement ponds. These are generally a series of ponds that are designed to limit flow rates, consequently allowing sediments to settle. An example of a series of settlement ponds is presented in **Plate 3-8**. As their performance relates to the retention time of flow, their design must allow for the safe removal of accumulated sediments to maintain good performance. Enhanced filtration measures may be adopted, including flow attenuation measures such as weirs and rock bars within or between ponds.

The number, location and dimensions of settlement ponds, plus requirements for flow attenuation measures will depend on the volume of water requiring treatment, silt load characteristics, topography and access constraints.

Settlement ponds will be designed and constructed with sufficient capacity to allow settlement and allow contingency for unexpected increased rainfall events. Contingency measures may include additional capacity within an existing pond, or identification of additional areas within the vicinity which may be suitable for creation of additional ponds. The profile of their banks will allow for the safe exit for wildlife that may fall in.

Final discharge from any settlement pond will be over vegetated ground in order to mimic natural drainage regimes. Silt fences or other flow attenuation measures may be required at the discharge point in order to disperse the discharge and prevent build-up of sediments that could be remobilised.

The siting of settlement ponds will take into consideration access requirements for reinstatement and maintenance (for example: periodic silt removal, expansion of ponds or



incorporation of additional silt mitigation measures etc.). Additional temporary silt mitigation measures may be required during maintenance and reinstatement activities.

Where water depth within settlement ponds has the potential to exceed 0.5m, the perimeter of the ponds will be demarcated by safety fencing and appropriate warning signs.

The settlement ponds have two chambers arranged in series. The first allows rapid settlement of the heavier particles, while the second chamber is where the smaller particles are allowed to settle. The chambers are separated by a mound of drainage stone through which the flow from the first chamber migrates. This allows the flow to enter the chambers across its full cross-section so that it can operate efficiently.

Settlement ponds will require regular inspection and cleaning when necessary. This will be carried out under low or zero flow conditions so as not to contaminate the clean effluent from the pond. The water level will first be lowered to a minimum level by pumping without disturbing the settled sediment. The sediment will then be removed by mechanical excavator and disposed of in areas designated for deposition of spoil.

Plate 3-8: Example of Wind Farm Settlement Ponds



3.7 Wetlands

Wetlands are an extended form of settlement lagoons/ponds designed to be permanently wet, providing further amenity and biodiversity to the area including providing habitats for amphibians and invertebrates. They offer long retention times allowing finer sediments to settle while attenuating flow rates. Due to their larger size and challenges for removal of sediment, these are only to be used after several stages of sediment settlement. An example of a wetland is presented in **Plate 3-9**.



Plate 3-9: Example Wetland Downgradient of Drainage Management System



3.8 Water Quality – Pollution Hazard Potential

The Simple Index Method, as outlined within the SuDS Manual, provides a way of quantifying the benefit to water quality of the SuDS Management Train. The pollution hazard from the land use and the mitigation from the SuDS component are each assigned an index. The total mitigation index must be greater than the pollution hazard index for adequate treatment to be delivered.

$$\begin{array}{cc} \text{Total SuDS mitigation index} & \geq & \text{pollution hazard index} \\ \text{(for each contaminant type)} & & \text{(for each containment type)} \end{array}$$

The total SuDS mitigation is the summation of the first components mitigation index plus half the mitigation index of any subsequent components.

With reference to The SuDS Manual, surface water runoff generated from the development varies depending on the type of component. Each component, together with the pollution index this component is expected to generate, are presented in **Table 3-2** below. **Table 3-2** also includes the total SuDS mitigation index for all SuDS components within the treatment train for each specific development component, which will comprise the following as minimum measures: Permeable surfacing, a detention basin and subsequent infiltration trench for the permeable surfacing around turbines; swales adjacent to access tracks and roads; substation compounds and construction compounds.



Table 3-2: SuDS Performance: Water Quality Indices

Land Use	Pollution Hazard Level	Pollution Hazard and SuDS Mitigation Indices Comparison					
		Total Suspended Solids (TSS)		Metals		Hydro-Carbons	
		Pollution Index	SuDS Mitigation Index	Pollution Index	SuDS Mitigation Index	Pollution Index	SuDS Mitigation Index
Wind Turbines	Very Low	0.2	0.7	0.2	0.6	0.05	0.7
Access Roads	Low	0.5	0.5	0.4	0.6	0.4	0.6
Substation Compounds	Low - Medium	0.6	1.2	0.5	1.05	0.55	1.2
Construction Compounds	Low – Medium	0.6	1.2	0.5	1.05	0.55	1.2

As the SuDS Mitigation Index provided by the proposed SuDS measures are great than or equal to the Pollution Hazard Index, the water quality assessment criteria are deemed to be satisfied for the construction phase of the proposed development.

3.9 Inspection and Maintenance

The drainage and treatment system for the construction phase must be managed and monitored at all times, particularly following heavy rainfall events. The drainage and treatment system will be regularly inspected and maintained to ensure that any failures are quickly identified and repaired so as to prevent water pollution. A programme of inspection and maintenance will be designed by the contractor and dedicated construction personnel assigned to manage this programme. A checklist of the inspection and maintenance control measures will be developed by the contractor and records kept of inspections and maintenance works. These drainage controls should be kept in place including the operational phase of the wind farm until the vegetation is re-established.

This checklist would include the following:

- Condition of silt traps and settlement ponds/basins;
- Removal of silt from settlement ponds/basins;
- Erosion concerns; and
- Blockages of cross-drains, outfalls and watercourse crossings.

The final surface water discharge from basins and swales shall be regularly inspected for issues. Where necessary, surface water may require pumping on a temporary basis for maintenance purposes. Any pumping activities shall be supervised and authorised by the Principal Contractor.

Treated water shall be discharged with care in accordance with the following principles:

- Use of many small/mid diameter outlets, rather than collecting larger volumes of drainage flows to discharge to a smaller number of larger capacity outlet points;
- Not allowing direct, contaminated ditch discharge into watercourses or other potentially sensitive receptors; and
- Not diverting natural flows, unless under prior agreement with the relevant statutory authority.



4.0 Management of Construction Surface Water Runoff & Sediment

This section details the criteria and general good practice measures for the management of surface water runoff from temporary working areas during the construction of the development to ensure minimal impact on the existing flow regime, water quality, and runoff quantity. The principles outlined in this section should be adopted by the Principal Contractor.

All reasonably practicable measures will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment or other contaminants of, any existing watercourse, arising from construction activities. The measures will accord with the principles set out in industry guidelines including the CIRIA report 'C532: Control of water pollution from construction sites'³ and CIRIA report 'C648 Control of water pollution from linear construction sites'⁴. Measures may include use and maintenance of temporary lagoons, tanks, bunds and fabric silt fences etc., or silt screens as well as consideration of the type of plant used.

A temporary drainage system for the construction compounds, working areas and access tracks should be formulated per each individual component based upon the measures detailed above in Section 3. The drainage system should be developed to prevent surface water runoff contaminated with fine particulates or other contaminants from entering surface water drains and watercourses without treatment. Additional preventative measures may be required, such as identifying all land drains and water features in the order limits and ensuring that they are adequately protected using covers, sand or pea gravel bags (the latter being more appropriate in or near watercourses), earth bunds, temporary lagoons, tanks, geotextile silt fences silt screens, and silt mats etc. and road sweepers or wheel washes on entry and exit to the site. Percolation to ground (e.g., by spraying water onto grass fields) may also be an option. Consideration of the type of plant used, seeding or covering earth stockpiles, and the timing of works are all important factors contributing to the generation of fine sediment in runoff.

Where practical, earthworks will be undertaken during the drier months of the year and earth moving works will avoid periods of very wet weather, to minimise the risk of generating runoff contaminated with fine particulates. However, it is likely that some working during wet weather periods will be unavoidable, in which case other mitigation measures (see below) will be implemented to control fine sediment laden runoff. Water may also be required to dampen earthworks during dry weather to reduce dust impacts, and any runoff generated will need to be appropriately managed by the Principal Contractor.

To protect watercourses from fine sediment runoff, topsoil/subsoil will require storage a minimum of 20m from watercourses on flat lying land. Where this will not be practicable, and it is to be stockpiled for longer than a two-week period, the material will either be covered with geotextile mats, seeded to promote vegetation growth, or runoff prevented from draining to a watercourse without prior treatment.

Appropriately sized runoff storage areas for the settlement of excessive fine particulates in runoff will be provided.

Equipment and plant are to be washed out and cleaned in designated areas within the Site only, where runoff can be isolated for treatment before disposal as outlined above.

³ CIRIA (2001), Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors (C532).

⁴ CIRIA (2006), Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648).



Mud deposits will be controlled at entry and exit points to the Site using wheel washing facilities and/or road sweepers operating during earthworks activities or other times as required.

Debris and other material will be prevented from entering surface water drainage, through maintenance of a clean and tidy site, provision of clearly labelled waste receptacles, grid covers (where applicable) and the presence of site security fencing.

The Principal Contractor will coordinate drainage surveys to establish the existing drainage regime, including any related field drainage or natural watercourses that may be affected by the scheme and these will be marked where encountered. The Principal Contractor shall record the location, condition and characteristics (e.g. depth of installation, pipe type and diameter) of drains cut or disturbed by construction of the scheme (where applicable).

The Principal Contractor shall ensure that any existing drainage systems and watercourses are not compromised as a result of construction. Existing drainage ditches and watercourses will be maintained during construction and reinstated so far as reasonably practicable to a condition that is as effective as the previous condition on completion.

Any existing drainage affected by the scheme shall be either reinstated or diverted to secondary channels where reasonably practicable. Landowners and occupiers shall be informed, through the Environment Manager of the design and timing of drainage works required during construction and following completion of the Works, including, where relevant, in relation to pipe layout, falls, dimensions and outfalls.

During the Operational Phase of the project, much of the roadside drains will be left in place, as well as some of the settlement ponds. Water from these drains will be allowed runoff at regular intervals through the adjacent vegetated areas of land, which will slow flow rates.

5.0 Conclusions

SLR Environmental Consulting (Ireland) Limited (SLR) has been appointed by Ecopower Developments Limited (the Client) to provide a Surface Water Management Plan to support the planning of the construction phase for Gathabawn Wind Farm (the Site), located within County Kilkenny.

This document outlines the principles, requirements and overall strategy for the drainage of surface water runoff from the access tracks, compounds and staging/working areas which will be required during the construction phase of the proposed development. General criteria and good practice measures for the management of surface water runoff from temporary working areas during construction are also outlined and should be adopted by the Principal Contractor to ensure minimal impact on the existing flow regime, water quality, and runoff quantity.

Drainage serving the Site will include elements of SuDS design. SuDS are a sustainable method of reducing the quantity and quality of runoff into local watercourses, water features and to ground, particularly where groundwater sources must be protected from the risk of pollution. SuDS aim to replicate natural drainage patterns and have a number of benefits including reducing surface water runoff rates and volumes, providing water quality benefits through the removal of sediments and pollutants and providing biodiversity benefits.

The construction phase of the proposed development will comprise the use of permeable surfacing for compounds, working areas and access tracks where possible. Access tracks will utilise swales (dirty water drains) running adjacent to the track to ensure surface water volumes are managed and contained. Additional measures for surface water drainage and additional SuDS components, as outlined within this report, should be incorporated as necessary.

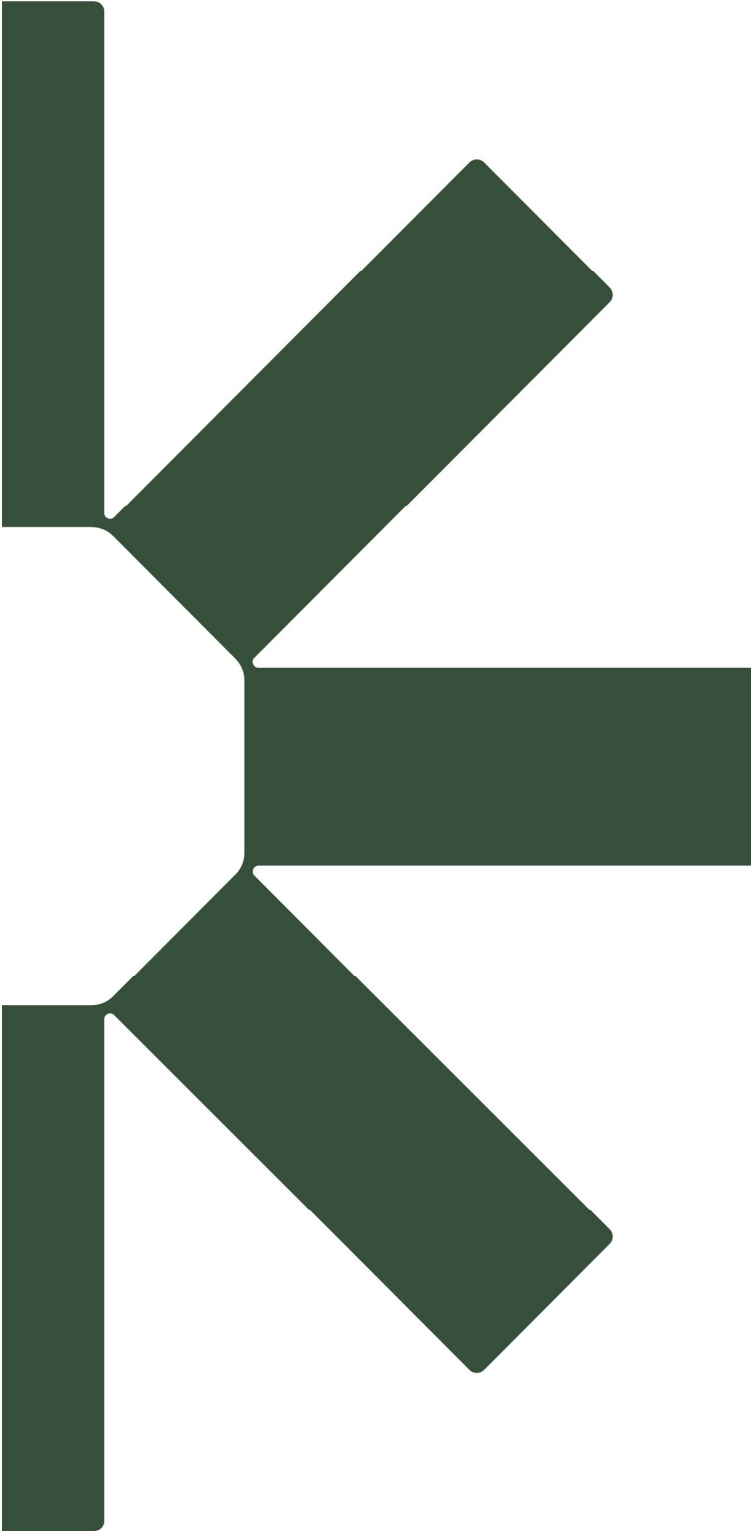


All reasonably practicable measures will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment or other contaminants of, any existing watercourse, arising from construction activities. The measures will accord with the principles set out in industry guidelines including the CIRIA report 'C532: Control of water pollution from construction sites' and CIRIA report 'C648 Control of water pollution from linear construction sites'.

The drainage and treatment system for the construction phase must be managed and monitored at all times, particularly following heavy rainfall events. The drainage and treatment system will be regularly inspected and maintained to ensure that any failures are quickly identified and repaired so as to prevent water pollution. A programme of inspection and maintenance will be designed by the contractor and dedicated construction personnel assigned to manage this programme. A checklist of the inspection and maintenance control measures will be developed by the contractor and records kept of inspections and maintenance works.

During the Operational Phase of the project, much of the roadside drains will be left in place, as well as some of the settlement ponds. Water from these drains will be allowed runoff at regular intervals through the adjacent vegetated areas of land, which will slow flow rates.





Tab 6

Traffic Management Plan

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1 Introduction

This Traffic Management Plan (TMP) for the public roads will be a key construction contract document, the implementation of which will reduce the potential for impacts to Public Roads and to Road Users which may occur due to the presence of construction traffic, in particular on the Local Roads in the vicinity. This TMP is a dynamic document and will be developed in consultation with Kilkenny County Council.

1.1 Objective of the Traffic Management Plan

The objective of this preliminary TMP is to control and minimise the traffic impacts of construction insofar as it may affect the road network, local residents and the travelling public on the public roads close to and adjacent to the construction site, through measures to maximise road safety while keeping traffic flowing as freely as possible.

1.2 Scope of TMP

This TMP **concentrates on the construction stage** of the Gathabawn Windfarm Project which is the critical phase in the context of safe and effective traffic management on the public roads and describes the traffic management for the transportation of construction materials and personnel along the public road network.

This TMP details the traffic management measures to be undertaken on the public roads;

- at and on approach to any road works locations;
- at and on approach to the site entrances for the Gathabawn Windfarm;
- along local roads on the routes of concentrated construction traffic;
- along the public roads during widening works
- at any points along the route where road repairs are required following completion of the works.

Control measures for traffic management at off-road construction works locations are outside the scope of this TMP and will be included in the Risk Assessment and Method Statements (RAMS) for the construction stage, which will be developed by the PSCS for the Appointed Contractor prior to the commencement of construction works.

The operational stage of the Gathabawn Windfarm Project is also outside the scope of this TMP. In contrast to the construction stage, negligible traffic is associated with the operational stage of the Gathabawn Windfarm Project and would only involve, for example, very occasional maintenance or repair work to widened road sections.

1.3 Responsibilities

This TMP will be updated from time to time to include any relevant planning conditions in addition to any new information on 3rd party road works or events, which could affect the timing, route or control measures for construction material deliveries.

The Appointed Contractor will be responsible for carrying out and managing the construction activities in accordance with the TMP.

The Environmental Clerk of Works will be responsible for monitoring the compliance with the TMP throughout the construction stage, through weekly auditing and point of interest inspections.

The Community Liaison Officer will be responsible for communicating with the local community and wider public during the construction stage, including keeping the local community informed of project progress and any construction activities which may cause inconvenience to them. Contact will be maintained with local residents on the day-to-day timing of traffic arrangements.

2 Project Life Cycle - Construction phase of Gathabawn Windfarm

2.1 Duration of Construction Works

The construction of the Gathabawn Windfarm Project will take c.12 months to complete. It is planned to construct all elements of the Gathabawn Windfarm Project concurrently using multiple specialist crews.

Table Error! No text of specified style in document.-1:Duration and timing of the construction phase

Construction Works & Activities	Duration	Timing of Construction Activities
Pre-Construction - detailed design, confirmatory surveys, vegetation clearance, setting out of construction works areas	6 months	Immediately prior to the commencement of the main construction period, or where seasonal timing is relevant to confirmatory surveys, works or activities
Gathabawn Windfarm - Main Civil and Electrical Construction Activities, Turbine erection, Windfarm Control Building, Internal Cabling, Ancillary Works.	10 months	Commencement of main construction period
The Candidate Gathabawn Grid Connection – Parkgrove Substation	12 month	Commencement of main construction period
The Candidate Gathabawn Grid Connection – Underground cabling element	8 months	Commencement of main construction period
Commissioning of the Gathabawn Turbines, Internal Windfarm Cabling, Windfarm Control Building	2 months	Commissioning will take place after the Main Construction is complete.

The duration of works provided are approximate and may be shorter or longer, depending on the final number of crews used, weather conditions etc. A formal programme of works will be prepared by the appointed Contractor prior to the commencement of construction activities.

2.2 Construction Personnel

It is expected that up to 80 workers will be involved in the pre-construction, main construction and commissioning works, broken down as follows:

Gathabawn Windfarm: c.80 personnel in total comprising

- c.10 main contractor, engineering and environmental consulting personnel will be involved in pre-construction activities both on and off-site; c.38 civil contracting personnel will be involved in construction of the temporary construction compound, and the roads, hardstands, turbine foundations, internal cabling ducting; c.12 turbine manufacture personnel will be involved in turbine deliveries and erection;
- c.10 electrical and civil contractor personnel will be involved in the electrical works and construction of the Windfarm Control Building;
- Security and canteen personnel as required.

Candidate Gathabawn Grid Connection

- Parksgrove Substation c.20 electrical and civil contractor personnel will be involved in the electrical works and construction of Parksgrove Substation including buildings and equipment installation.
- Ballylehaun-Ballyring UGC: c.10 personnel in total - 8 civil and electrical contracting personnel involved in cabling from the Windfarm Control Building to the Tinnalintan Substation and 2 electrical contracting personnel for cable pulling and jointing works along the cabling route.
- Ballyring-Parksgrove UGC: c.10 personnel in total - 8 civil and electrical contracting personnel involved in cabling from the Tinnalintan Substation to the EirGrid Ballyragget Substation and 2 electrical contracting personnel for cable pulling and jointing works along the grid connection cabling route.

Note: Some Civil and Electrical personnel will work on multiple elements of the Project concurrently.

2.3 Construction crews & use of machinery and equipment at works areas

Windfarm Civil and Electrical Works: Four crews for civil works, 2 crews at borrow pit extractions, 1 crew at electrical works; 1 crew for turbine erection; 1 crew for turbine delivery (escorting convoy)

Parksgrove Substation 1 crew for civil work, 1 crew for electrical works.

Ballylehaun-Ballyring UGC: 1 crew for civil work, 1 crew for cable pulling, 1 crew for cable jointing

Ballyring-Parksgrove UGC: 1 crew for civil work, 1 crew for cable pulling, 1 crew for cable jointing

Commissioning Works: 2 crews using specialist electrical commissioning equipment and tools, and vans.

2.4 Construction Hours of Work

Normal construction times will be between 07.00 to 19.00hrs Monday to Friday and 08.00 – 16.30hrs on Saturdays.

2.5 Imported Construction Materials

The construction materials, which will be brought onto the Gathabawn Windfarm Project site, are listed in the table below along with details of the quantity of the materials.

Table 2: Quantities of construction materials

Gathabawn Windfarm Materials	Approximate Quantities
Concrete for Turbine Foundations <i>(The majority of concrete at the windfarm site is for turbine foundations, and the maximum loads/day for concrete deliveries are associated with these foundation pours)</i>	636 No. loads <i>to the turbine location</i> . - 53 loads per day, 1 day per week, over 12 weeks.
Site Compound Setup, Construction of Control Buildings & Compound Fencing, Temporary Fencing Panels, Waste Removal, Met Mast and Lidar plinth and fencing.	300 No. loads <i>to the works location</i>
Aggregate for windfarm	800 No. loads <i>to the works location</i>
Reinforcing Steel and Anchor Cages	52 No. loads <i>to the turbine location</i>
Mast, LiDAR and Equipment	3 No. loads <i>to the works location</i>
Electrical Cabling, Communications Cabling	10 No. loads <i>to the construction compound</i>
Switchgear, Electrical Equipment, Apparatus and Plant	4 No. loads <i>to the control buildings</i>
HDPE Ducting	18 No. loads <i>split to the construction compounds</i>
Cable Protection Strips, Warning Tape; Marker posts, plates	2 No. load <i>to the construction compound</i>
General building and fencing materials	5 No. loads <i>to the construction compound</i>
Specialised Abnormal Load Deliveries – Gathabawn Windfarm (delivered to the turbine locations)	
Turbine Towers (4 sections per tower)	48 No. abnormal wide and long loads
Turbine Nacelle and Hub	24 No. abnormal wide Loads
Turbine Blades	36 No. abnormal wide and long loads
Crane components	15 No. abnormal wide loads, 2 No. normal loads

2.6 Haulage Routes for Construction Materials & Turbine Components

2.6.1 Delivery Vehicles – Axles

Delivery vehicles for construction materials will comprise standard 4-axle rigid HGV tipper units for aggregate and concrete deliveries, HGV tractor units with 2-4 axle articulated flat-beds or tautliner trailers for other material deliveries, vans, and 4WD vehicles towing single/double axle trailers for smaller parts. The maximum load per axle, for delivery of the turbine components and construction materials will be confined to within legal limits. Turbine Components will be delivered using specialist HGVs, semi-trailers and blade transport trailers.

2.6.2 Haulage Routes for Construction Materials

Aggregate, Concrete, Road Surface Dressing

Stone aggregates and concrete will be imported from local suppliers, such as Wholesale Suppliers Limited Coolbawn, Cemex Dunmore and Roadstone Bennettsbridge. Other materials and general building supplies will be sourced from the wider regional area and delivered by way of the national road network, before following the same routes as aggregates and concrete to the windfarm site and grid connection areas, as outline below:

Gathabawn Windfarm

- Ballylehaun Area – from the R639, turning onto the L58141 local road at Coolnacrutta/Glashare,
- Ballyring Area – from the N77 road, turning onto the L1807 road at Parksgrove, through Lisdowney village and continuing along the L1806 and turning onto the L18062 at Ballyring Upper.

Candidate Gathabawn Grid Connection:

- Parksgrove Substation/Construction Compound – from the N77 road, turning onto the L1807 road at Parksgrove, to Site Entrance No.8;
- Ballylehaun-Ballyring UGC works locations: from the L1806 and through Gathabawn village onto the L5818, L5821 and L5820, on the L1806 and L18062.
- Ballyring-Parksgrove UGC works locations: from the N77 road, turning onto the L1807 road at Parksgrove, travelling along the L1807 to the temporary site entrances on the L1807 at Parksgrove, L1811 at Lisdowney and the L1808 at Ballyring Lower and Lisdowney.
- Parksgrove-Moatpark UGC works locations: from the N77 road turning into the temporary site entrance on the eastern side of the N77, and from the N77 turning onto the L1807 to Site Entrance no.8; and from the N77 turning in Ballyragget onto the R432 as far as the temporary entrances at Moatpark.

Other Construction Material

Other materials, such as ducting, geotextile and other construction materials, will be sourced from various suppliers (locally where available) and will be transported using the same transport routes as the aggregate and concrete. These materials will be delivered to, and stored at, the Temporary Construction Compounds until required at works areas. A smaller truck or 4WD with trailer will then be used to deliver these materials to active works areas.

The relevant Figure/Drawings are listed in the table below

Figure 5.24	Construction Materials Haulage Route for the proposed Gathabawn Windfarm	End of this TMP
Figure 5.25	Construction Materials Haulage Route for the Candidate Gathabawn Grid Connection	End of this TMP

2.6.3 Haulage Routes for Turbine Components

Delivery of turbine components and large crane components will require abnormal (wide/long) loads. Special extendable flatbed semi-trailers are used to transport turbine components by road using the motorway, national and local road networks.

Delivery to the Ballylehaun Area: In relation to the Gathabawn Windfarm, the turbine component transportation vehicles will utilise the motorway network as far as Portlaoise, at which point they will leave the motorway and then travel along the N77 as far as Durrow, Co. Laois. The vehicles will then follow the

R639 south before accessing the Ballylehaun Area via the local road L58141, using the temporary access road and accessing the turbine locations via Site Entrances No.1 and No.2.

Delivery to the Ballyring Area: The Ballyring turbines will travel along the Ballylehaun site roads to Site Entrance No.3, turning onto the L1803, travelling through Gathabawn village and continuing on the L1804, and then turning left onto the L1806 via a new temporary access road, travelling along the L1806 as far as the junction with the L18062 in Ballyring Upper, utilising the temporary widening at the junction to turn onto the L18062, and accessing the Ballyring turbines from Site Entrance No.7 along the L18062 public road.

The relevant Figure/Drawings are listed in the table below

Figure 5.10	Turbine Delivery Route	End of this TMP
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2.7 Construction Works & Activities

2.7.1 Site Entrances

The construction of Site Entrances will involve the provision of hardcore areas and clearance of roadside boundaries to ensure adequate visibility in both directions and to provide adequate hardstanding to facilitate deliveries including large turbine components.

Construction of the Site Entrances will involve excavations to remove the roadside boundary to achieve the sightlines in both directions, and excavations at the entrance splay to provide adequate hardstanding to facilitate deliveries including large turbine components. The excavation of the splay area will involve vegetation, topsoil and subsoils being removed to formation level, the adjacent drainage channels will be excavated, and culvert piping installed across for concealed roadside drain; geotextile matting will be laid out where necessary, a minimum sub-base will be laid which will consist of 350mm deep layer of 50mm crushed stone. A surface layer will be laid which will consist of 100mm compacted granular fill to accommodate HGV traffic. A vibrating roller will compact the stone in layers. The surface of the new entrance will be finished with a 2.5% gradient to allow water run-off. A temporary post and mesh fence and double access gates will be erected to maintain road boundary during the construction works.

The relevant Figure/Drawings are listed in the table below

GWF-13.1 to GWF-13.8	Site Entrance Drawings	End of this TMP
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2.7.2 Turbine Delivery

Component delivery is a highly controlled activity, and the transport delivery plan and schedule for the turbine components from port to site will be coordinated with Kilkenny County Council and An Garda Síochána.

The delivery of turbine components are expected to take place overnight or during off-peak hours due to the oversize nature of some of the components such as the blades. A normal delivery consists of three trucks in convoy with escorts. The entire delivery will be fully escorted. One of the escorts will precede the convoy and request any oncoming traffic to pull into the nearest convenient passing locations.

Works on Public Roads

Public road works or widening will be carried out in co-ordination with Kilkenny County Council and in accordance with "Guidelines for the Opening, Backfilling and Reinstatement of Openings in Public Roads (Department of Transport, Tourism & Sport, 2017).

Road Opening Licence: These lane closures will be managed through the Roads Management Office (RMO) in co-ordination with Kilkenny County Council; will be carried out in accordance with Transport Infrastructure Ireland (TII) “Requirements for the Reinstatement of Openings in National Roads (May 2019)”.

Road Reinstatement: The road pavements/built surfaces will be reinstated according to the conditions of the Road Opening Licence, and in accordance with the Department of Transport, Tourism & Sport Guidelines for Managing Openings in Public Roads (April 2017).

Contact with Local Residents: Contact will be maintained with local residents on the day to day timing of the works. A Community Liaison Officer (CLO) will be appointed as the point of contact between the Contractors and local residents. The CLO will keep active contact with local residents on the traffic arrangements around the works day to day and a project website setup and kept updated.

3 Works Locations and Traffic Management Measures

3.1 Site Entrances

It is proposed that the windfarm site will be accessed from the public road, through both existing and newly created entrances. These entrances are identified as Site Entrance No.1 to No.7 and described in the table below. The entrances will be setback 2.4m from the road and existing trees and hedgerow on either side will be removed/pruned as required in order to provide sightlines in either direction.

Table 3: Size and design of site entrances

Entrance #	Townland	Road	New / Existing Entrance	Permanent / Temporary	Project Element Accessed	Sight Lines (m)	Width of Splay (m)	Existing Roadside boundary to be removed(m)
1	Coolnacrutta	L-58141	New	Permanent	Turbine T1	East: n/a - end of cul-de-sac West: 90m	38m	85m
2	Glashare	L-58141	Existing	Permanent	Turbine T2 Turbine T3 Turbine T4 Turbine T5 Turbine T6 Turbine T7 Construction Compound No. 1 Met Mast	East: n/a (end of cul-de-sac) West: 90m	25m	150m
3	Gorteennamuck	L-1803	Existing	Temporary	Turbine T6 Turbine T7	n/a. entrance only used during turbine haulage.		
4	Ballylehaun	L-5818	Existing	Permanent	Control Building	n/a - end of cul de sac	4.5m	n/a
5	Ballyring Upper	L-18062	Existing	Permanent	Control Building Temporary access for Construction Compound No.2	East: 90m West: 90m	10m	120m
6	Ballyring Upper	L-18062	Existing	Permanent	Turbine T8 Turbine T9 LiDAR	North: 46m* South: 90m	15m	110m
7	Ballyring Upper / Tentore	L-18062	Existing	Permanent	Turbine T8 Turbine T9 Turbine T10 Turbine T11 Turbine T12 Borrow Pit No.2 LiDAR	n/a – end of cul de sac	4.5m	n/a

Traffic Management Measures: Advanced warning signs and flagmen will alert traffic to the presence of works. The local roads are very lightly trafficked. During tie in of the Site Entrance with the public road Stop/Go system will be put in place and flagmen will be present to allow vehicle pass the works and keep traffic flowing.

At Site Entrance No. 6 (looking north) only 46m sight lines can be achieved. It should be noted that Site Entrance No. 6 is an existing farm entrance and the Public Road L-18062 has very low existing traffic levels

The relevant Figure/Drawings are listed in the table below

GWF-13.1 to GWF-13.8	Site Entrance Drawings	End of this TMP
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3.2 Turbine Component Delivery Facilitating Works

The turbines will be delivered from the port of entry using the motorway network as far as Portlaoise. Some temporary street furniture removal will be required on the M7/N77 interchange at Portlaoise.

From the Portlaoise M7/N77 interchange, the turbines will be transported down the N77, straight through Abbeyleix and Durrow towns, onto the R639 and straight through Cullahill village before turning left off the R639 onto the L58141 at Coolnacrutta. No works or activities are required in Abbeyleix, Durrow or Cullahill to facilitate the movement of the turbine components through these towns and village.

An assessment of the turbine delivery route has been carried out using site visits, topographical surveys and AutoTrack software. A number of pinch points were identified, and temporary works in the vicinity of the windfarm site are proposed to facilitate the transport of the large components to the turbine locations. These works include the construction of:

Access into the Ballylehaun site

- FW1: Temporary access road (630m²) in the townlands of Coolnacrutta and Glashare. This temporary road will provide access off the R639 road onto the L58141 local road;
- FW2: Permanent widening of 495m on the southern side of the L58141 by 0.5m to 2m. A new hedgerow will be planted along the new alignment of the roadside boundary; and Further down the L58141, permanent widening of 80m into the northern verge by 0.5m to 2m, and the removal of two trees.
- FW3 and FW4: Temporary widened site entrance at Site Entrance No. 1 (220m²), No.2 (35m²)
- FW5: Temporary site access roads before turbine T1.
- FW6: A temporary hardstanding area (4090m²) will be constructed in an agricultural grassland field at the Ballylehaun site, close to Site Entrance No.2 and the Temporary Construction Compound. This area will provide a temporary set down area for turbine blades for Turbines T1, T4 and T5 as no turbine set down areas are proposed at these turbine locations.

Access to the Ballyring site

- FW7: Temporary widening of Site Entrance No.3 in Gorteenamuck (2410m²), exiting the Ballylehaun site to turn onto the L1803 local road
- FW8: Temporary access road 2840m² in the townlands of Foyle South and Coolcashin. This temporary road will provide access from the L1804 to the L1806 local road.
- FW9: Temporary widening of 800m² of the L1806 local road into a grassland field in Garrydague

- FW10: Temporary hardcore area (610m²) in a grassland field at the junction of the L1806 and L18062 to facilitate turning into the Ballyring site.
- FW11: Permanent widening of 620m of the L18062 by up to 1m into a grassland field on the eastern boundary. Establishment of a new field drain and roadside boundary.
- FW12: Temporary site access roads to Turbine T8 coming from the south.

Most of the facilitating works are temporary and the land and road boundaries will be reinstated following the completion of the turbine transportation. However, the proposed widening of the public road will be permanent and will involve the permanent removal of roadside verge/boundary bank or hedge and underlying soils on one side of the existing road carriageway, and the laying of hardcore followed by surface dressing along the excavated verges to create a suitable load-bearing surface. Any existing field drains will be reinstalled along the newly widened roadside boundaries.

3.3 Candidate Grid Connection works in public roads

The trenches will be excavated ahead of the ducting works in 50m sections, so that only 100m of trench is open per crew at any one time along the cable routes. A trenching crew will complete approximately 100 linear meters of trench per day depending on the site conditions.

A cable trench will be excavated to the required depth and width. In addition, at the road crossing on the cul-de-sac L58141 local road and along the cul-de-sac L18062 local public road, as standard best practice, before any excavation works begin, a surface check will be carried out for underground services with appropriate equipment. Service owners will also be contacted to confirm service locations. The road surface will be saw cut to the depth of existing asphalt/bitmac layers. Cabling works within the public road network will be carried out in co-ordination with Kilkenny County Council and in accordance with the “*Guidelines for Managing Openings in Public Roads*” (Department of Transport, Tourism & Sport, 2017).

Once excavated, the trench floor will be graded, smoothed and trimmed. The ducts, through which the electrical cables and fibre optic cables will be pulled, will be installed by hand, using profiles to attain the correct spacing between the ducts. The trench will be backfilled with material suitable for the location, and warning strips will be placed within the backfill layers over the cable ducts, with each backfill layer carefully compacted. The top of the trench will be reinstated according to the prevailing conditions: in agricultural lands the top of the trench will be reinstated with topsoil and reseeded with pasture grass species; under windfarm site roads the top of the trench will be reinstated with the same aggregate used for the site access road; and on the public road, the top of the trench will be reinstated with road surface dressing, in accordance with the conditions of the Road Opening Licence and the *Guidelines for Managing Openings in Public Roads* (Department of Transport, Tourism & Sport, 2017),

Contact with Local Residents and Landowners along the L58141 and L18062 cul-de-sac roads: Contact will be maintained with local residents and landowners on the day to day timing of the trenching works on the L58141 and L18062 local roads. A Community Liaison Officer (CLO) will be appointed as the point of contact between the Contractors and local residents and landowners. The CLO will keep active contact with local residents and landowners on the traffic arrangements around the works day to day.

Jointing Chambers

Every c.0.8km along the cable routes, the ground will be excavated to accommodate the installation of the underground jointing chambers. These jointing chambers will be pre-cast concrete, and the trench will be excavated to the required depth and width to fit the chambers. Once in place, any gaps between the jointing chambers and the walls of the excavation will be backfilled and the adjacent cable trench ducting will be fitted into the chambers. The cover will be placed back over the jointing chamber as a period of time will

elapse before there are further cable pulling and jointing works going on at the jointing chamber. Where the jointing chamber is located along the public road corridor – a temporary road surface will be laid over the jointing chamber.

Cable Pulling, Jointing, Testing and Commissioning

Once the majority of cable ducting and jointing chambers are installed, the cover over the jointing chambers is removed, and the ducts are proved using a test mandrel to confirm that there are no crushed sections and that there is no dirt or water blocking the ducts. Cable pulling follows, with the cables pulled through each line of ducting from one jointing chamber to the next, using heavy duty cable rollers and pulling machines. The chambers are covered for a period once again while cabling is pulled through the other jointing chambers along the route. The cables are then joined together in the jointing chambers – the cover is once again removed, and a temporary climate-controlled clean room is lifted into place over the jointing chamber. The cables prepared and connected, the joint is covered with an insulation sleeve and the cables are sealed. The cover is replaced, with only a manhole cover visible at ground level. The cabling will also be connected to the internal turbine cabling and to the electrical equipment in the Control Buildings. Once all cables have been connected, testing and then commissioning can be carried out.

4 General Traffic Management Measures

4.1 Surveying, Monitoring Measure and Mitigation Measures applicable to the TMP

WM09	<u>Confirmatory road condition surveys</u> involving pre-construction and post-construction inspections, high-definition video surveys and FWD surveys will be undertaken along road widening locations on the L18062, and L58141, and along the routes of concentrated construction traffic between the R639 / N77 and the windfarm Site Entrances – i.e. the L58141, L1803, L5818, L1804, L1806, L18062 and L1807.
WM10 GM10	<u>Confirmatory consultations with service operators</u> (i.e. Uisce Eireann, Eir, ESB Networks, and Gas Networks Ireland) and confirmatory ground surveys at service locations will be carried out ahead of, and throughout, excavation works or use of machinery in close proximity to existing overhead and underground services.
WM11 GM11	The <u>construction Method Statements</u> to be developed by the construction contractors will take full account of the EMP including the mitigation and monitoring measures and will be reviewed by the Project Engineer and the Environmental Manager prior to the commencement of construction works.
WM24 GM23	<u>Monitoring – Dust</u> : During working hours, the construction contractor will monitor dust control methods and weather forecasts for dry and windy conditions and will carry out weekly on-site and off-site inspections to monitor dust caused by the construction works. Public roads will be regularly inspected for cleanliness and regular dust soiling checks of surfaces along public roads and within 100m of site access points will also be carried out. The frequency of monitoring will be increased when construction activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
WM37	<u>No storage of excavated material on the public road</u> along road widening sections of the L58141 or L18062. All excavations from public roads will be removed to licensed waste facilities in accordance with the Waste Management Plan.
WM54	<u>Traffic speed limits</u> of 50km/h along the Local Roads L1807, L1806, L1804 and L5818; 30km/hr along the local roads L58141, and L18062 and 15km/hr along windfarm site roads.
WM71 GM60	<u>Public Road – cleanliness</u> : To ensure that local roads are kept clean, a road sweeper will be used daily at road works locations, and as required at site access points.
WM72	<u>Dust control</u>: Dust minimisation measures will be implemented during the construction works as follows: • The site roads will be regularly inspected and swept to remove build up of mud and aggregate materials from their surface, • Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and windy conditions. • Vehicles delivering material with dust potential will be enclosed or covered with tarpaulin to restrict the escape of dust. Public roads in the vicinity of the site will be regularly inspected for cleanliness, and cleaned as necessary
WM83 GM67	<u>'Goal Posts'</u> will be used to identify and highlight the height of nearby overhead lines.
WM85	<u>Roadside boundaries</u> will be maintained during the construction phase and following the

	removal of the boundary to provide a widened transport area or to provide sightlines, a post and mesh boundary fence will be erected immediately.
WM86	<u>Site Entrances - visibility</u> : Hedgerows and roadside vegetation within the visibility splays will be trimmed and maintained throughout the construction phase to ensure safe visibility at site entrances.
WM87 GM70	<u>Public Road Works</u> : Works along the public road network will be carried out in co-ordination with Kilkenny County Council and in accordance with "Guidelines for the Opening, Backfilling and Reinstatement of Openings in Public Roads (Department of Transport, Tourism & Sport, 2017).
WM88	<u>Public Road Repair</u> : Any damage to structures or road pavements along widening sections, cable routes or along concentrated construction haul routes, because of the construction works and deliveries to the works areas, will be repaired to at least as good a condition as pre-works.
WM89 GM72	<u>The Traffic Management Plan</u> will be a key construction contract document and will be implemented to safely coordinate and manage traffic during the construction works. The Traffic Management Plan will be developed in coordination with Kilkenny County Council.
WM90 GM73	<u>Flag-men</u> will be used on public roads at road works locations. These flagmen will control the movement of traffic on the public road, so that road users can continue to use the public road network in a in a safe and efficient manner.
WM91 GM74	<u>Local Communication</u> : Local residents likely to be affected by road works, will be kept up to date on works schedules by the Community Liaison Officer.
WM92	<u>Traffic Volumes</u> : The largest traffic volumes are associated with the concrete pours for the turbine foundations. No other deliveries to the Ballylehaun Area or Ballyring Area of the Gathabawn Windfarm will be scheduled to occur on the concrete pour days in that Area.
WM93	• <u>Local Traffic Flow</u>: Site entrance works and public road widening works on the L58141 and L18062 will be carried out prior to the main construction period at the Ballylehaun Area and at the Ballyring Area.
WM94	<u>A road safety and courtesy protocol</u> will be implemented for the duration of construction. All companies delivering to site will have to sign up to this protocol as part of their supply contract. Courtesy for other road users is fundamental to the protocol. Vehicles will slow down or stop, as appropriate, for other road users, in particular for pedestrians and cyclists along the construction haulage routes. Appropriate signage will be maintained for the duration of the project with clear signs at all junctions on the L1807, L1806 and L1804, L1803, L5818 and L58141 local roads.
GM09	<u>Confirmatory road condition surveys</u> involving pre-construction and post-construction inspections and high-definition video surveys will be undertaken along the routes of concentrated construction traffic and road works locations the affected sections of the N77, the R432, the L1807, L1811, L1808, L1806, L1804, L5818, L5821 and L5820, and along road works locations on the L5818, L5820, L5821, L1806, L18062, L1808, L1811, L1807, N77 and R432.
GM33	<u>No storage of excavated material on the public road</u> along the UGC routes, all excavations from public roads will be removed to licensed waste facilities in accordance with the Waste Management Plan.
GM52	<u>Road traffic speed limits</u> of 50km/h along the Local Roads L1807, L1806, L1804, and L5818; 30km/hr along the local roads L5821, L5820 and L18062; and 15km/hr along windfarm site roads.
GM61	<u>Dust Control</u> : Any loads of material which have the potential for dust emissions (such as

	aggregate) will be covered during transportation.
WM74 GM63	<u>A Community Liaison Officer (CLO)</u> will be appointed. The CLO will liaise with and keep the local community up-to-date with relevant construction work schedules, through the use of letter drops to or direct contact with nearest neighbours. The CLO will be the point of contact for local residents and local landowners for matters relating to noise, dust or traffic. The Environmental Clerk of Works will liaise with the CLO and will be the point of contact between the contractor/developer and the Local Authority regarding any matters relating to noise or vibration from the construction works.
GM68	<u>All excavation works and use of large plant</u> in close proximity to services will be supervised by a banksman; and a stock of repair materials for underground water mains will be kept at active works locations along the public road. Where Uisce Éireann assets are to be crossed by the UGC, the electrical cables will be installed under the Uisce Éireann asset in accordance with Eirgrid specifications and in accordance with Uisce Éireann's Standards Codes and Practices in relation to separation distances.
GM69	<u>Roadside boundaries</u> will be maintained during the construction phase.
GM71	<u>Public Road Repair</u> : Any damage to structures or road pavements along cable routes and along concentrated construction haul routes will be repaired to at least as good a condition as pre-works.
GM75	<u>Steel plating</u> will be available to cover the open trench to ensure access to property is maintained.
GM76	<u>Timing of Works</u> : UGC works which overlap, or whose associated HGV traffic is along, the L1807, L1806 the will not be carried out during concrete pour days for the Gathabawn turbines in the Ballyring Area.
GM77	<u>TII</u> : As requested by TII during preplanning consultation for the windfarm, all proposals relating to the N77 national road agreed and licensed between the Road Authority and the applicant will be shared with TII.
GM78	<u>Uisce Éireann</u> : As requested by Uisce Éireann during preplanning consultations, excavated materials from cable trenches and joint bays along the public road network will be sampled to ensure the material is inert.
GM79	<u>N77 Crossing</u> : the Parksgrove-Moatpark UGC will cross the N77 by horizontal directional drilling (HDD) rather than open-cut trenching, with no works within the N77 carriageway itself.
GM80	<u>Controlling Extent of Works</u> : Cable trenching along the Candidate Gathabawn Grid Connection route will be carried out in short, progressive sections, no longer than 100m in length, with each section reinstated before the next is opened.
WM95 GM81	<u>Scheduling Deliveries to avoid school drop-off/pick-up times</u> : HGV deliveries to works or compounds that pass through Lisdowney village or Gathabawn village, will be scheduled to avoid drop-off and pick-up times associated with Scoil Bhríde National School and Scoil na Críon Coille National Schools (approximately 8:30-9:00am, 1:30-1:50pm and 2:30-2:50pm). Any deliveries within the school pickup/drop-off times will be subject to a banksman/escort protocol. Construction drivers will additionally be briefed on the reduced-speed environment at the school frontage and on the likelihood of encountering slow moving agricultural vehicles and machinery on the local road haul routes, with the construction traffic schedule having regard, where practicable, to seasonal peaks in agricultural activity such as the silage season. Consultation with the Scoil Bhríde and Scoil na Críon Coille schools and with Kilkenny County Council Roads Section on this measure will be completed prior to finalisation of the

	Construction Traffic Management Plan.
GM82	<u>Grid Connection Coordination</u> : The Applicant will engage with other renewable energy developers proposing grid connections to the EirGrid Ballyragget Substation, with a view to sharing or optimising the use of grid connection assets, trenching corridors and associated infrastructure, and coordinating the timing and sequencing of construction works to minimise cumulative and repeated disruption to the same sections of public road.
WM103 GM92	<u>A Community Liaison Officer</u> will be appointed for the duration of the operational phase and will act as a point of contact for the local community.
WM125 GM100	<u>A Community Liaison Officer (CLO)</u> will be appointed for the duration of the decommissioning phase and will be the point of contact for local residents.

4.2 Signage

4.2.1 Signage for Construction Traffic

General construction traffic will be most concentrated in the vicinity of the windfarm Site Entrances, with peak periods expected during the road building phase and during turbine foundation concrete pours. In addition, construction traffic will occur on the roads subject to trenching and joint bay excavation works. Signage will be erected per;

- **Informational signage** will be erected to provide an overview of the construction traffic timetable and will include contact details for the Environmental Clerk of Works and the Community Liaison Officer. The signs will be provided at the entrances accessing the construction compounds - Site Entrance No. 2 and Site Entrance No. 5. Up to date information will also be provided on the project website.
- **Directional signage** will be installed along the construction materials haul route to the Site Entrances.
- **Advance Warning signage** will be erected on approaches to site entrances and on the approaches to road widening works locations and to cabling works on the public road. The placement of this signage will be designed based on the recorded 85th percentile traffic speeds, or the posted limit, whichever is the higher.

Signage will be according to the Chapter 8: Temporary Traffic Measures and Signs for Roadworks of the Department of Transport, Tourism and Sport Traffic Signs Manual, August 2019.

The signage layout will take the individual feature of the site into consideration. All signs will be manufactured using retro-reflective material and will be a minimum of 750mm X 750mm size. All cone will be 1m high and have reflector sleeves for additional visibility and sand bags will be used to weight down cones.

All temporary traffic signs will be placed such that they:

- Do not obstruct sight lines,
- Do not obstruct other signs, and
- Are themselves not obstructed by other signs.

Where signs could be obscured by hazards, hills or dips in the road, additional warning signs will be put in place.

4.3 Road Safety Protocol

It is noted that Lisdowney village includes a primary school, Lisdowney NS (Scoil Bhríde), which fronts directly onto the L1807, the road forming the construction haul route into the Ballyring Area. The general speed limit on this section of road is 50km/h, with a dedicated school warning sign and speed-reduction signage (indicating 30km/h) in place on the approach to the school; a continuous footpath with public lighting is provided along the school side of the road frontage. School doors open at 8:45am, with the school day finishing at 1:40pm for Junior and Senior Infants and at 2:40pm for 1st-6th classes; the school also operates its own set-down/collection management system at the school gate (a 'three car rule,' with parents asked to park facing Ballyragget and walk children to the school via the footpath), reflecting an established, actively-managed pattern of pedestrian and vehicle activity at this location during these periods.

Construction traffic accessing the Ballyring Area will therefore pass directly by the school on the L1807 prior to turning onto the L1806. It is also noted that a material proportion of vehicles recorded during turning-movement survey were agricultural/silage vehicles; construction traffic will therefore need to safely share this road network with slow-moving agricultural vehicles and machinery, in addition to general road users and school-related traffic.

Given the direct frontage of the school onto the haul route, the existing speed-reduction and warning signage at this location, the volume of agricultural traffic on the same local roads, and the school's documented drop-off and collection times, the Traffic Management Plan and Road Safety Protocol will make specific provision for construction traffic passing the school, including restricting or escorting HGV movements on the L1807 past the school during defined windows around 8:30-9:00am, 1:30-1:50pm and 2:30-2:50pm, driver briefings on sharing the road with agricultural traffic and using the passing bays provided on the L1807, and consultation with the school and Kilkenny County Council Roads Section, to be completed prior to finalisation of the Construction Traffic Management Plan

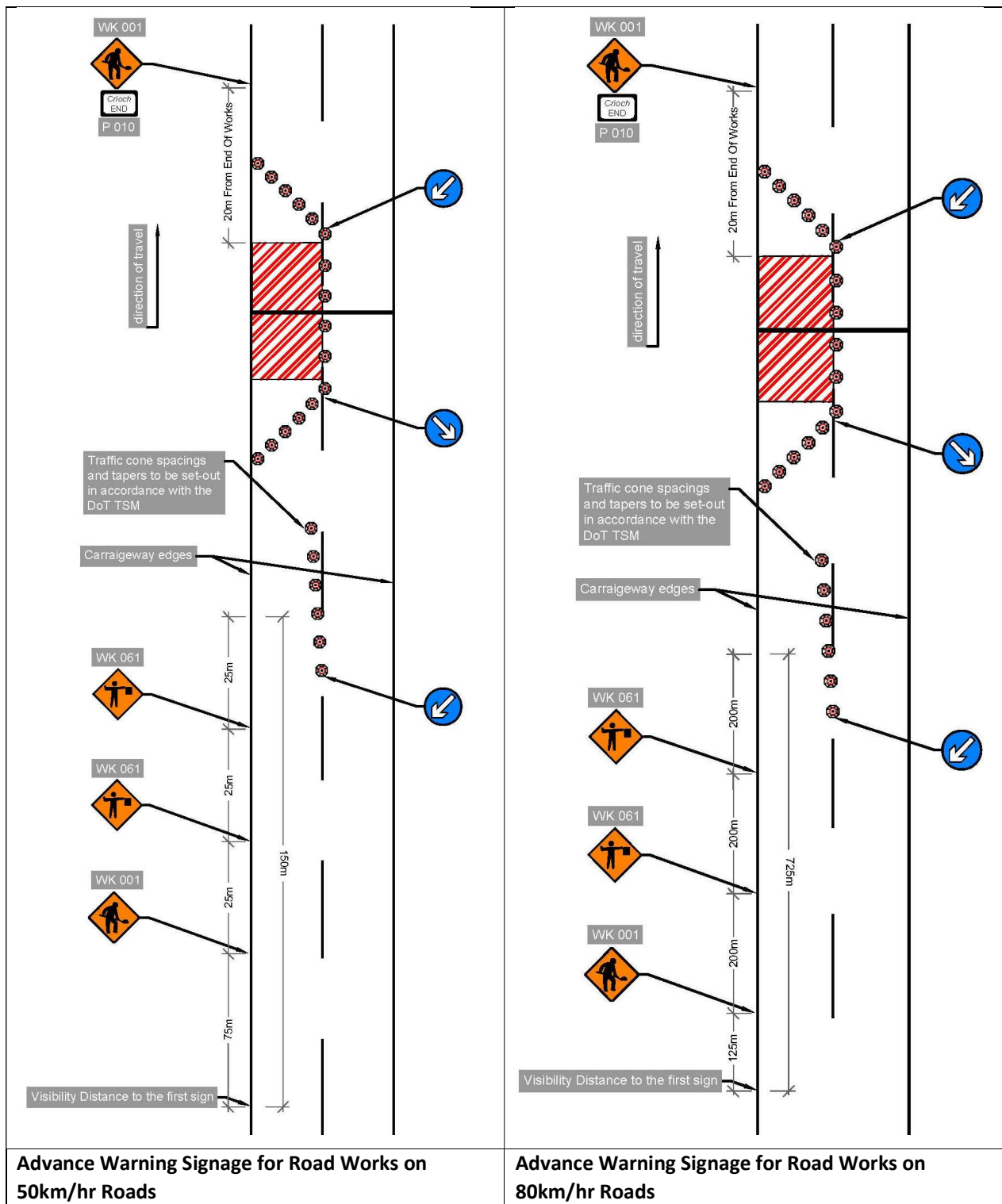
4.4 On-going communication with Kilkenny County Council Roads Section

The Project Manager for the construction of Gathabawn Windfarm will ensure that close communication with Kilkenny County Council Roads Section will be maintained throughout the construction stage. Such communication will include:

- Prior to commencement of construction the Project Manager and the Environmental Clerk of Works will meet with Kilkenny County Council Roads Section and agree any specific traffic requirements that they may have or that are subject to planning condition.
- Ongoing reporting relating to the condition of the road network and updates to construction programming will be provided to Kilkenny County Council.

4.4.1 Advance Warning Signage for Road Works

Advance warning signage will be erected on both approaches to road works locations. See below figures. The placement of this signage has been designed based on the recorded 85th percentile traffic speeds, or the posted limit, whichever is the higher.



4.5 Additional TMP Measures

4.5.1 Concealed Drain at Entrance

Permanent concealed drains will be installed at the Site Entrances at the public road to prevent water runoff from construction/site areas flowing onto the road.

4.5.2 Maintaining Access to Properties

Where works take place in the vicinity of a property entrance (house/farms/businesses/sports facilities), traffic flow will be maintained by placing a steel plate over trench or machinery moved to allow traffic to pass over.

5 Emergency Services

Emergency services vehicles will have priority over construction traffic vehicles at all times.

The telephone numbers for the Emergency Services are listed in the table below;

Emergency Contact Numbers

Emergency Service	Contact Number
Fire Brigade, Gardaí and Ambulance	Dial 112
Local hospital (St. Lukes Hospital Kilkenny)	Dial (056) 7785000
Utilities - ESB Networks	Dial 1850 372 999
Utilities – Eir	Dial 1850 245 424
PSCS appointed by the construction contractor for the windfarm	TBC

These numbers will be prominently posted at the site entrances and in the site offices.

If an incident occurs due to construction traffic, the PSCS (Project Supervisor Construction Stage) will provide all necessary assistance to the Gardaí, Ambulance and Fire Brigade services and local authority to deal with the emergency.

In the case of an emergency on the public road, the following incident management procedure will be followed:

- Emergency Services will be contacted immediately by dialling 112
- Exact details of the emergency / incident will be given by the caller to the emergency line operator to allow them to assess the situation and respond in an adequate manner
- The emergency will then be reported to the PSCS
- Flagmen will be deployed to warn and slow down any oncoming traffic
- The PCSC will notify all other construction traffic in the area of the incident, and
- The PCSC will ensure that personnel are available to guide the emergency services to the accident location.

All incidents will be recorded by the PSCS and remedial measures taken where appropriate. The incident management procedure will be part of the induction of all personnel coming onto the construction site including HGV drivers delivering to the site.

6 Figures and Mapping

Figure 5.1.1 - Whole Gathabawn Windfarm Project - Location on Discovery Mapping

Legend:

- Proposed Gathabawn Windfarm
- - - Candidate Gathabawn Grid Connection
- Parksgrove Substation
- Existing EirGrid Ballyragget Substation
- T6 Turbine Identification Number
- L1806 Public Road Identification Number
- Cullahill Towns/Villages

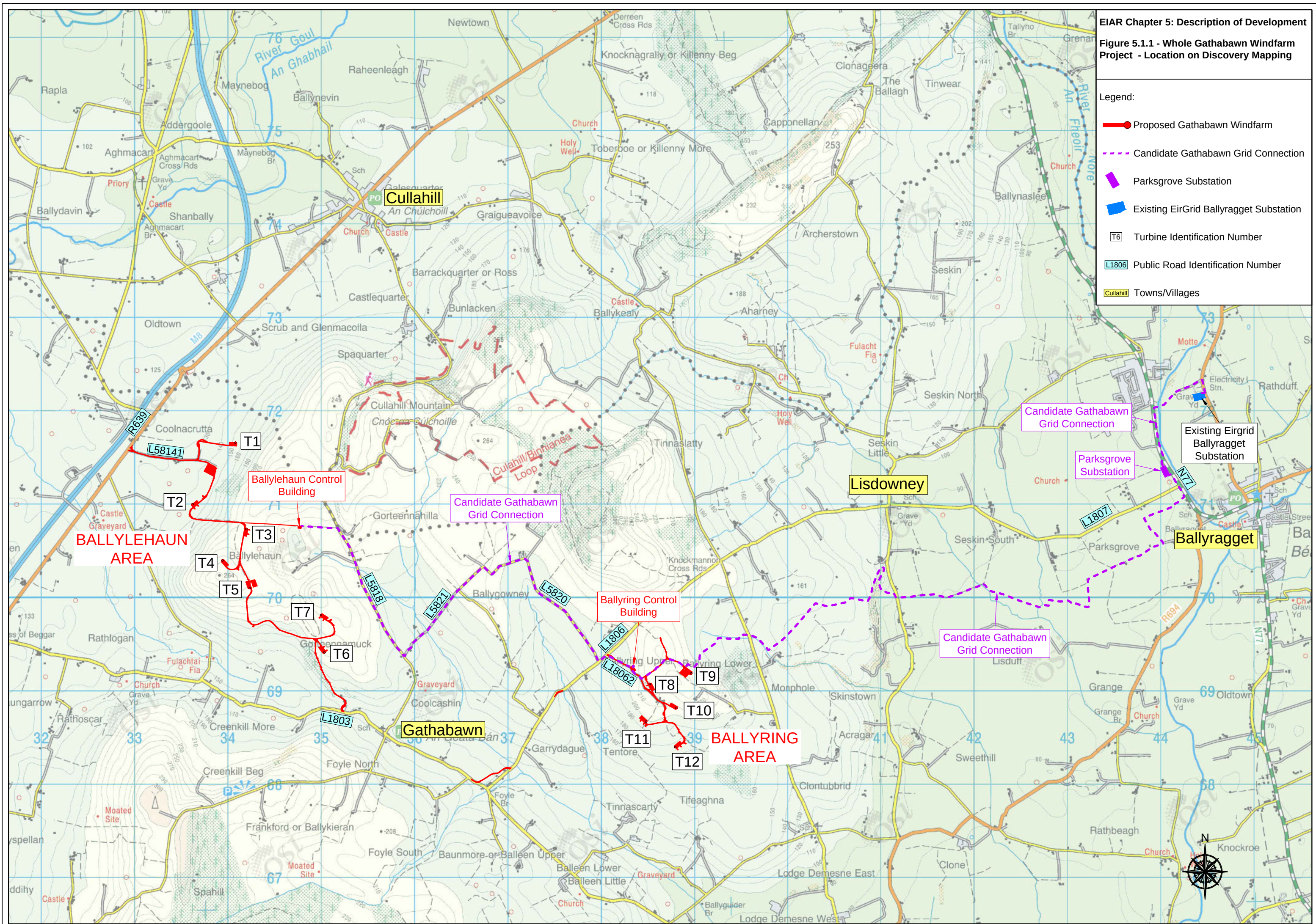


Figure 5.10 - Turbine Delivery Route

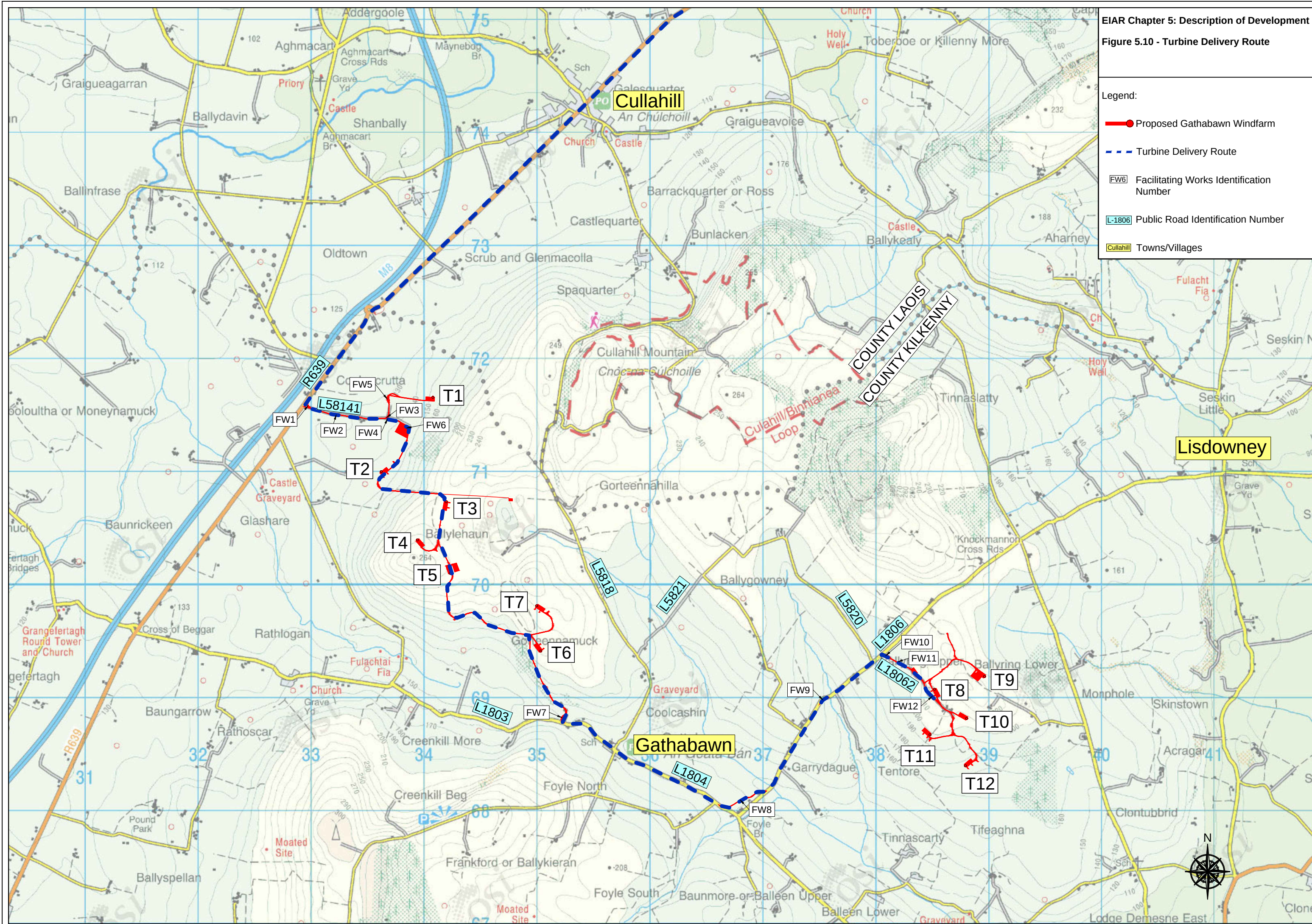
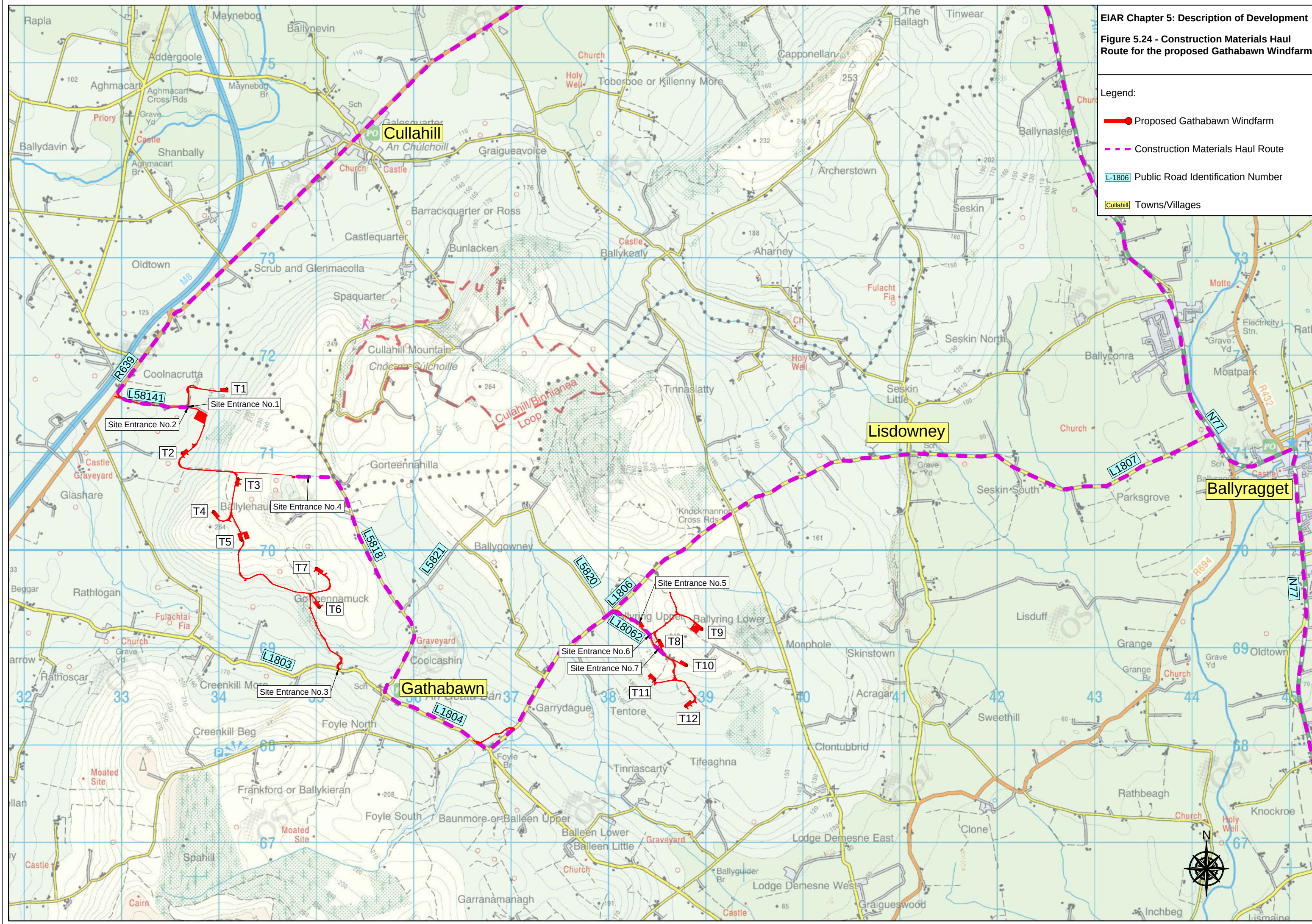


Figure 5.24 - Construction Materials Haul Route for the proposed Gathabawn Windfarm

Legend:

- Proposed Gathabawn Windfarm
- Construction Materials Haul Route
- Public Road Identification Number
- Towns/Villages

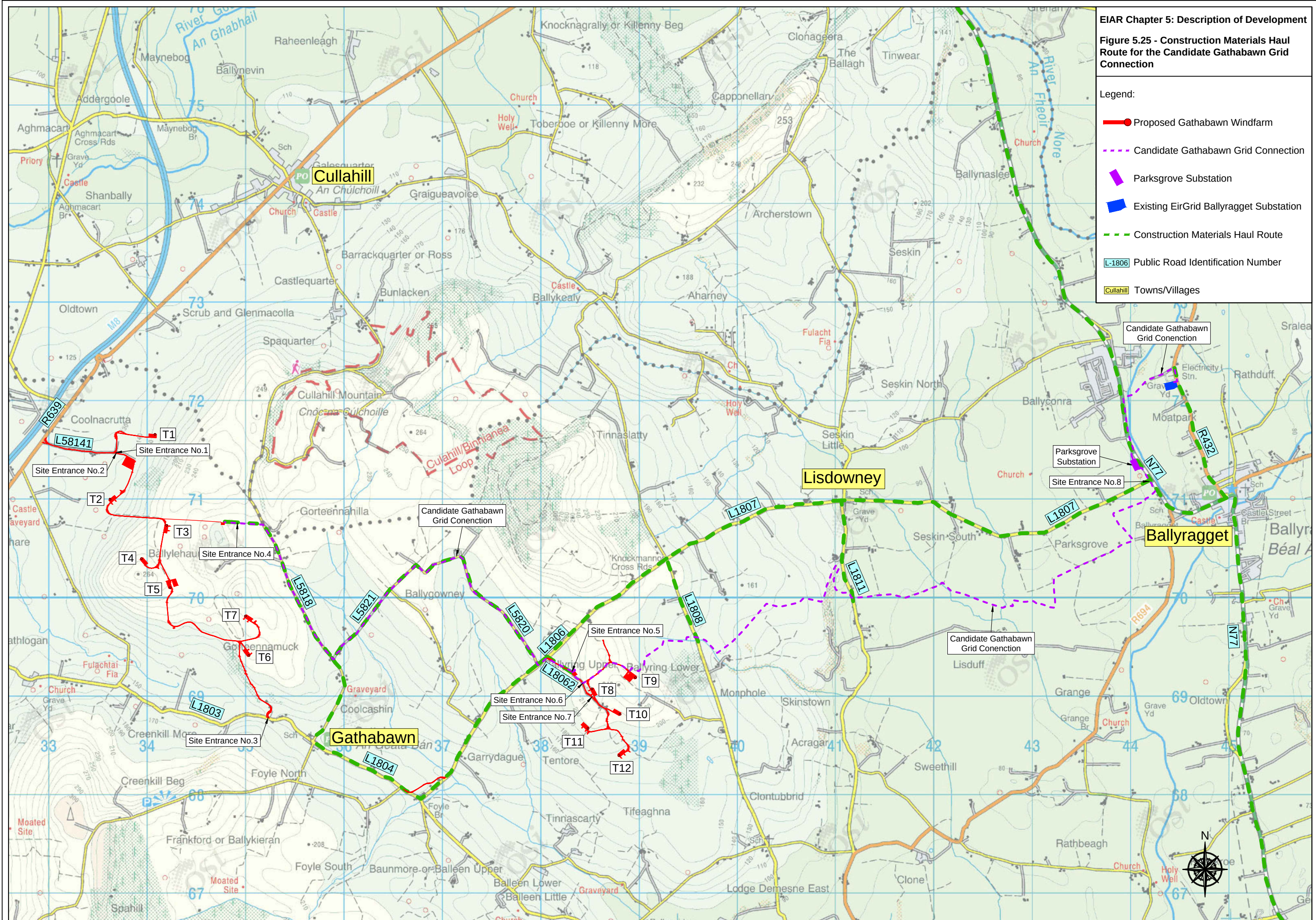


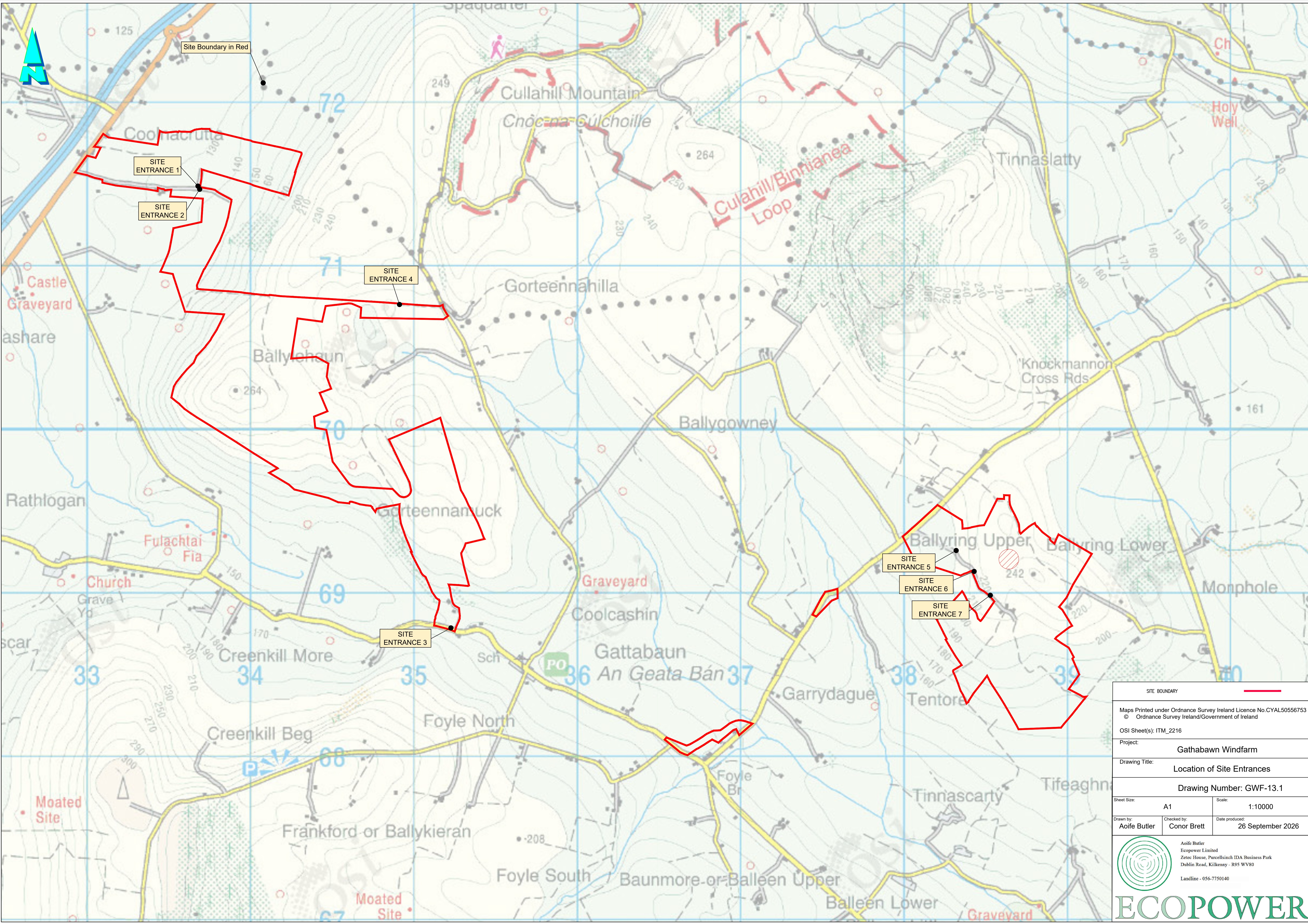
ElAR Chapter 5: Description of Development

Figure 5.25 - Construction Materials Haul Route for the Candidate Gathabawn Grid Connection

Legend:

- Proposed Gathabawn Windfarm
- Candidate Gathabawn Grid Connection
- Parksgrove Substation
- Existing EirGrid Ballyragget Substation
- Construction Materials Haul Route
- Public Road Identification Number
- Towns/Villages





SITE BOUNDARY

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OSI Sheet(s): ITM_2216

Project:

Gathabawn Windfarm

Drawing Title:

Location of Site Entrances

Drawing Number: GWF-13.1

Sheet Size:

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Scale:

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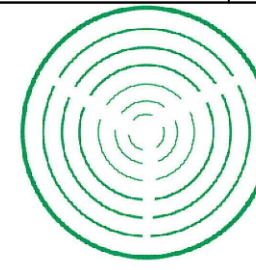
Aoife Butler

Checked by:

Conor Brett

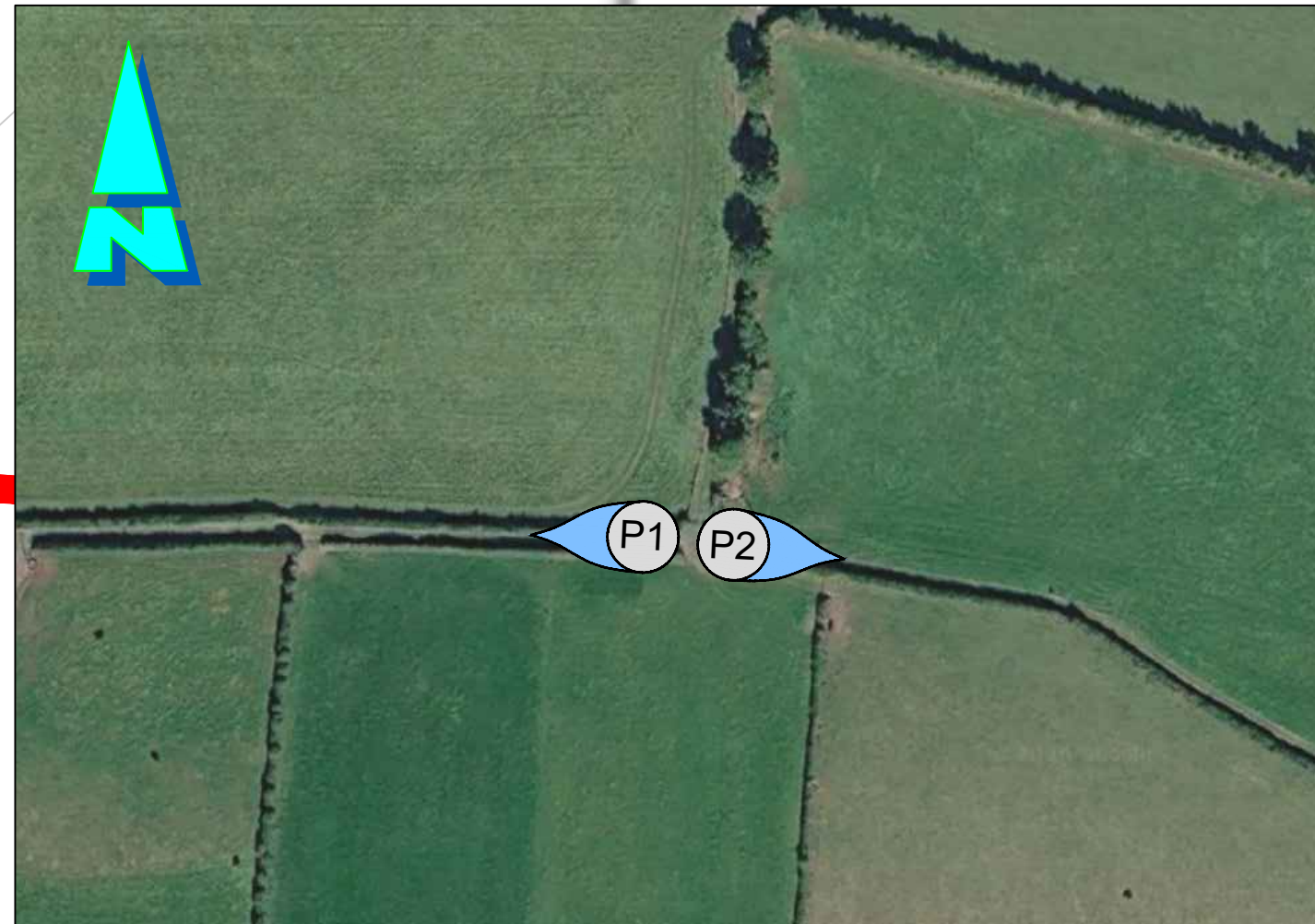
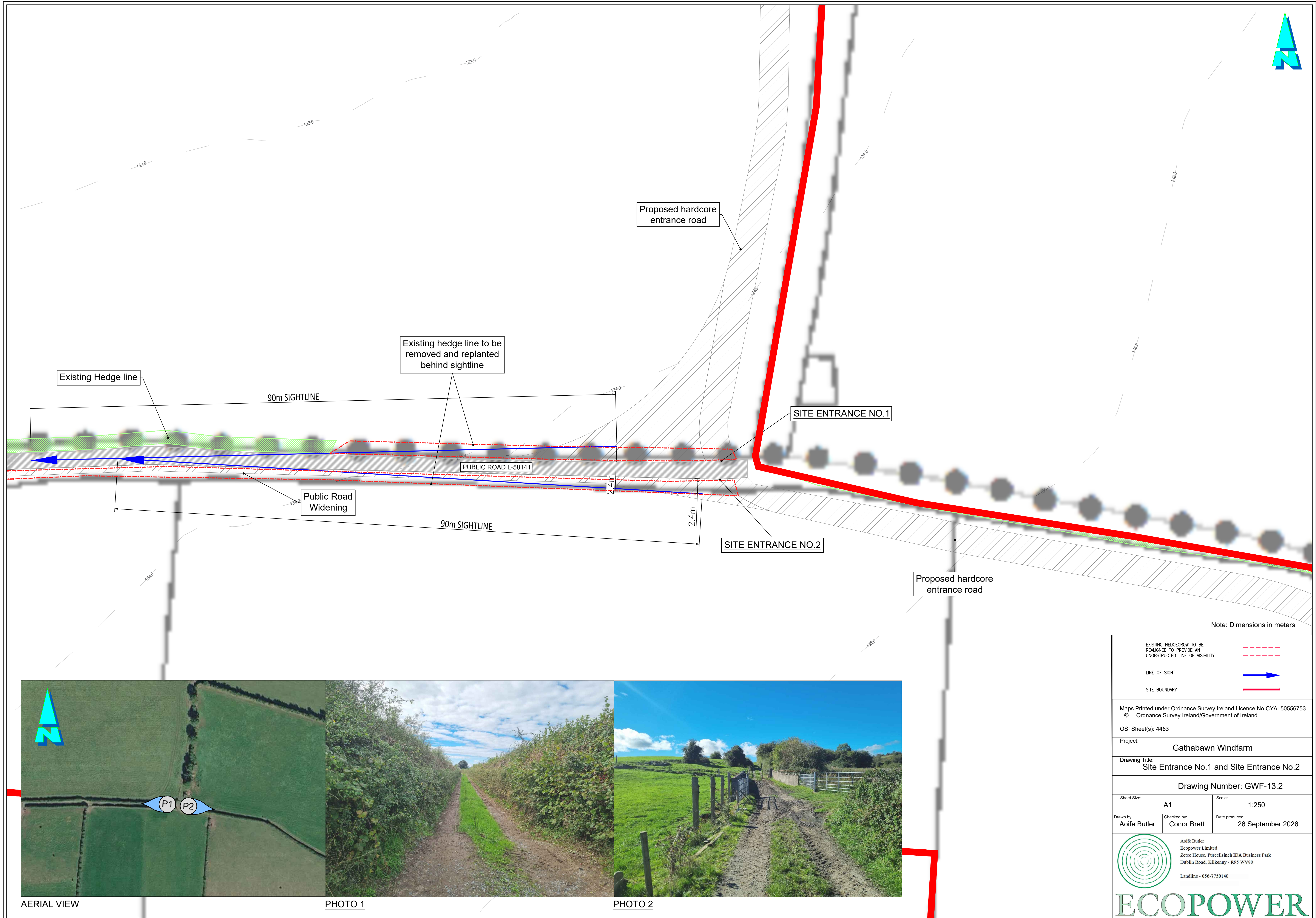
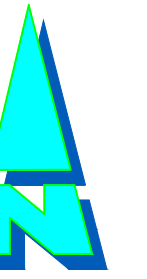
Date produced:

26 September 2026



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AERIAL VIEW



PHOTO 1

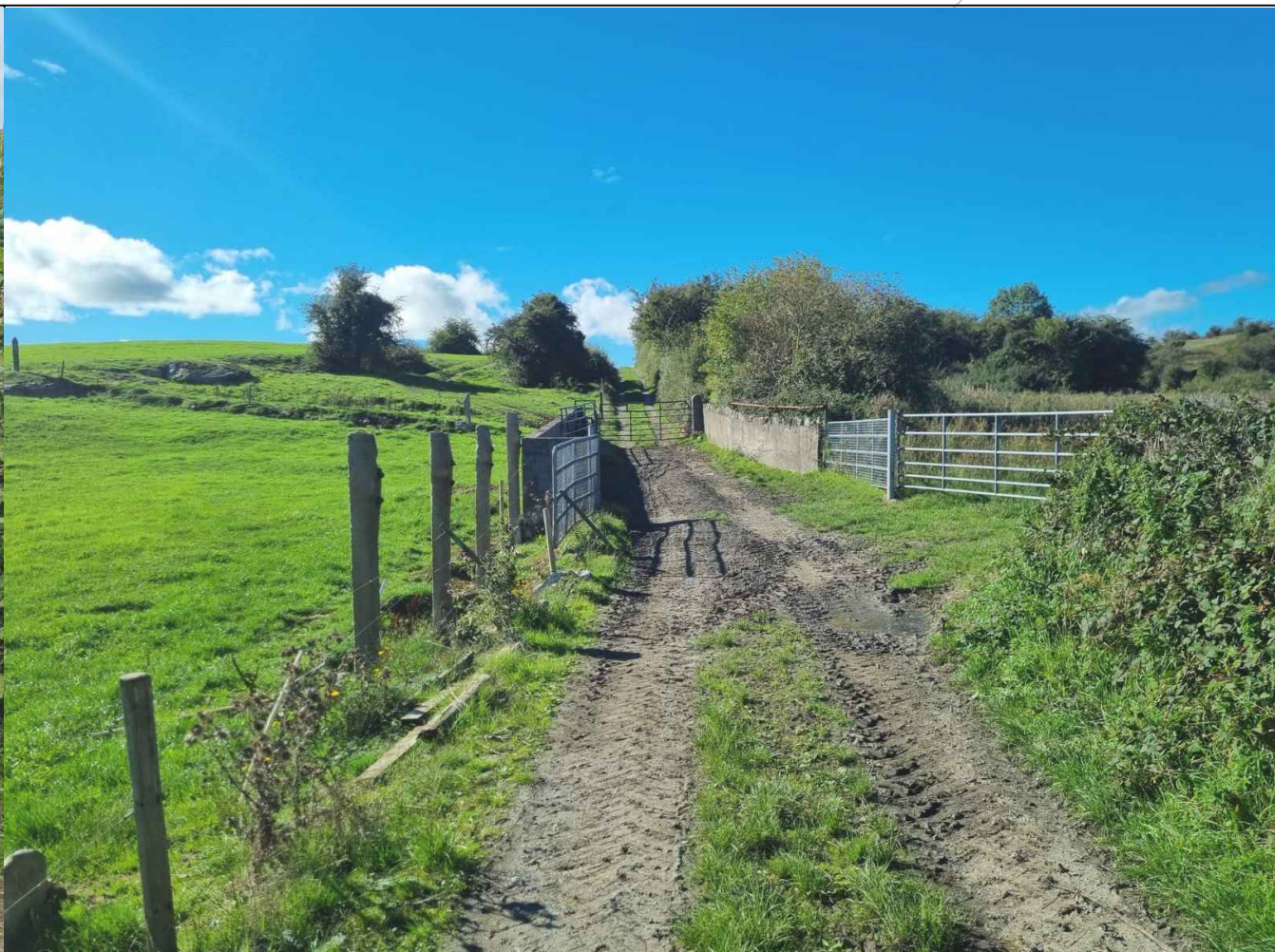


PHOTO 2

Note: Dimensions in meters

EXISTING HEDGE/ROW TO BE REALIGNED TO PROVIDE AN UNOBSTRUCTED LINE OF VISIBILITY	---
LINE OF SIGHT	---
SITE BOUNDARY	---

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OSI Sheet(s): 4463

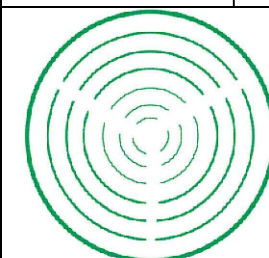
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Drawing Title: **Site Entrance No.1 and Site Entrance No.2**

Drawing Number: **GWF-13.2**

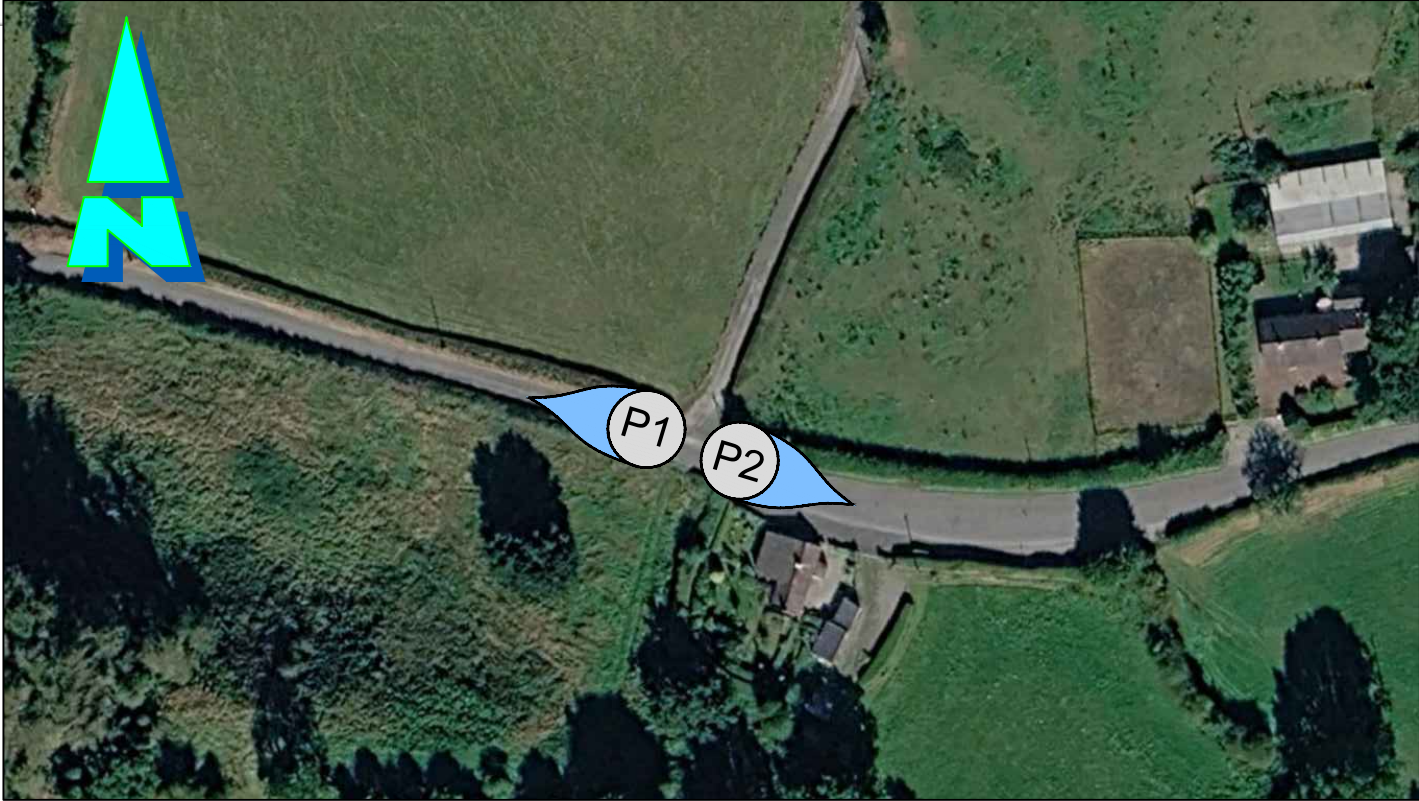
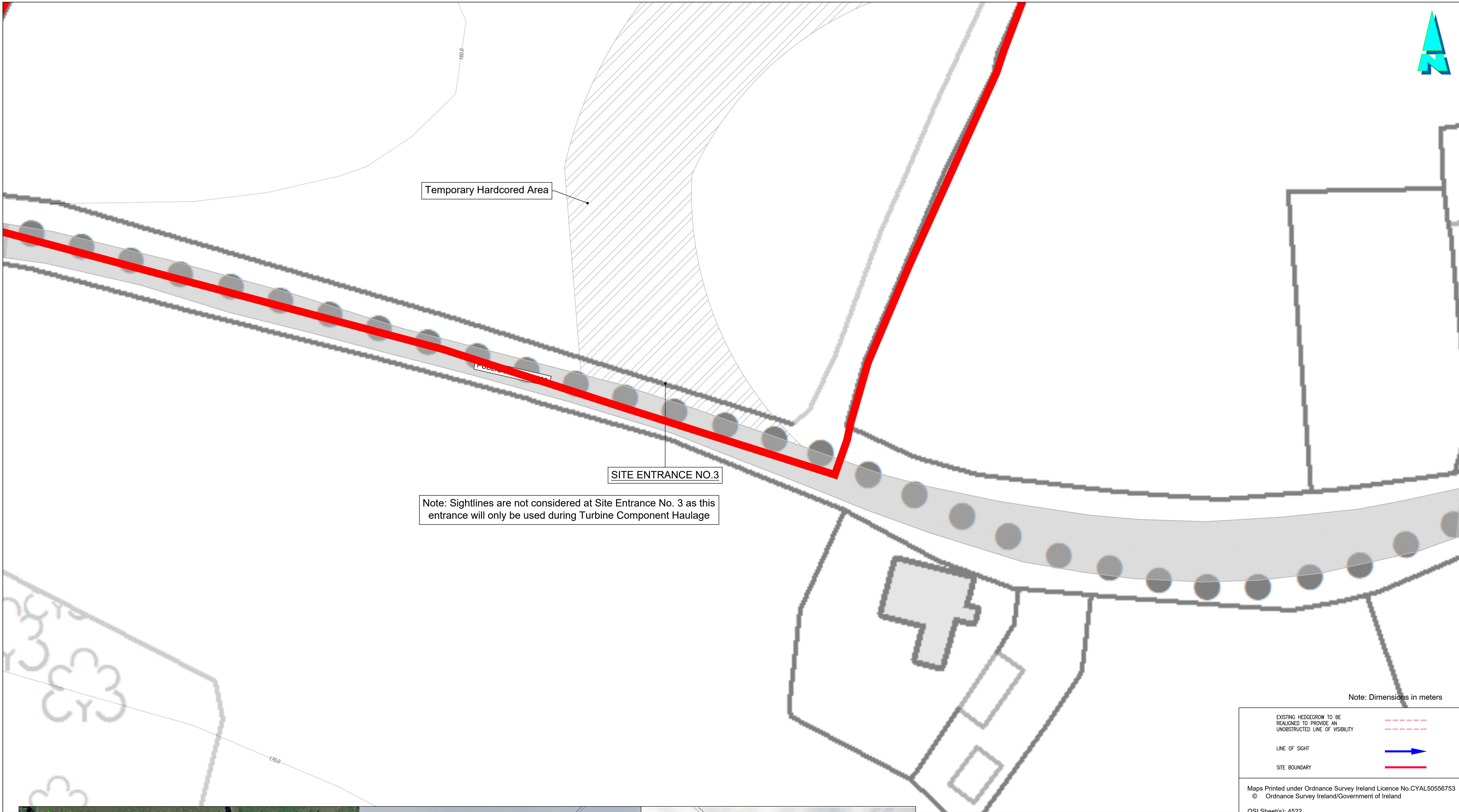
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AERIAL VIEW



PHOTO 1



PHOTO 2

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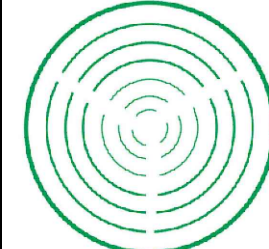
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Project: **Gathabawn Windfarm**

Drawing Title: **Site Entrance No.3**

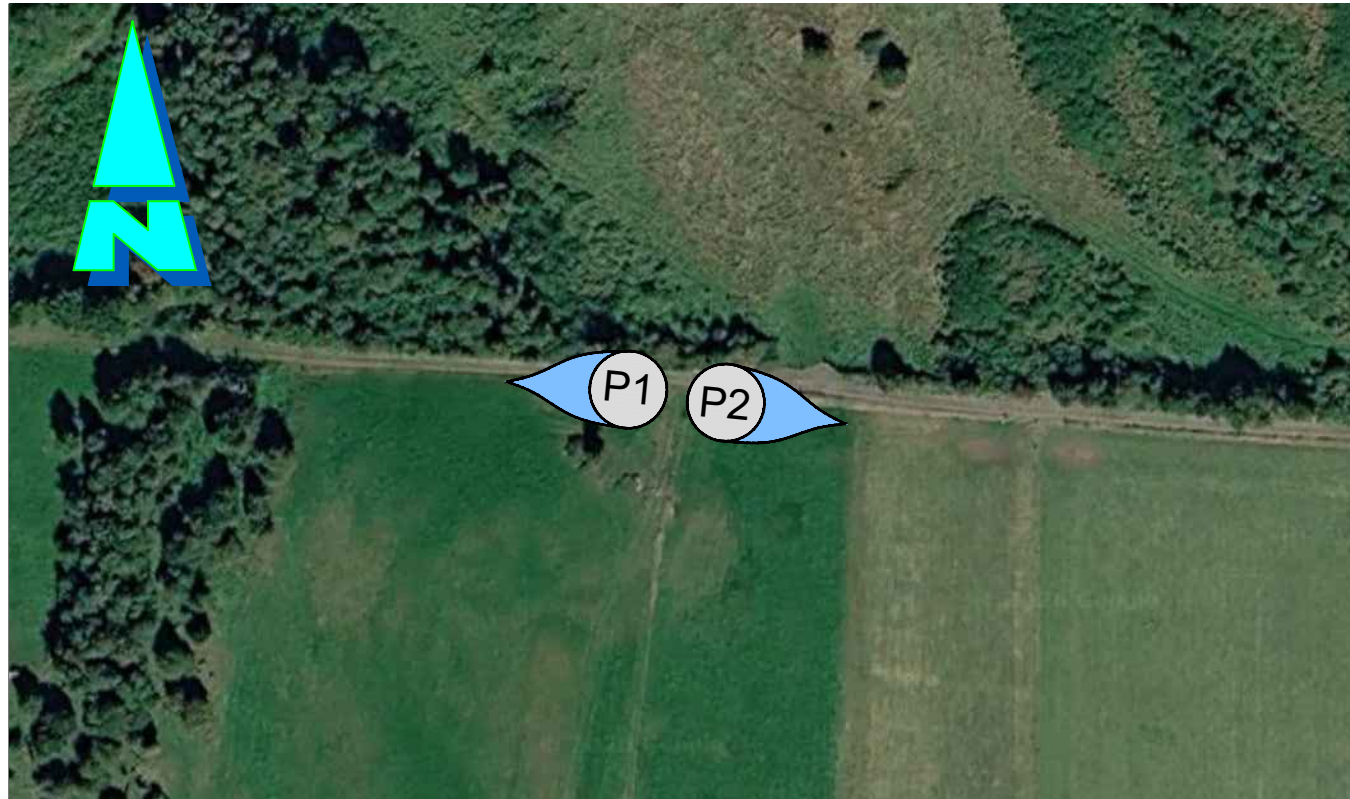
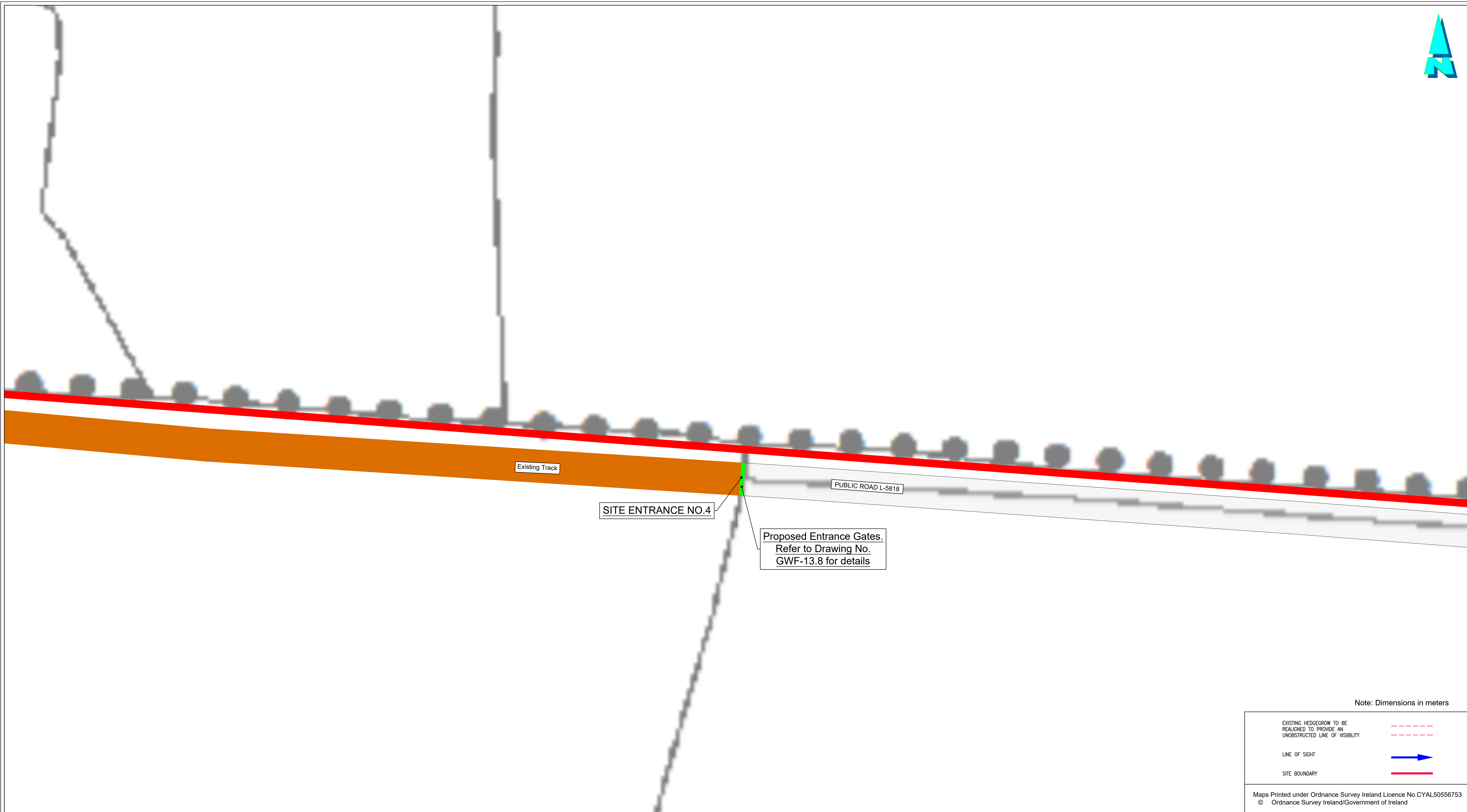
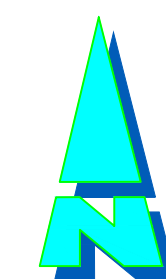
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		Date produced:	26 September 2026



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AERIAL VIEW

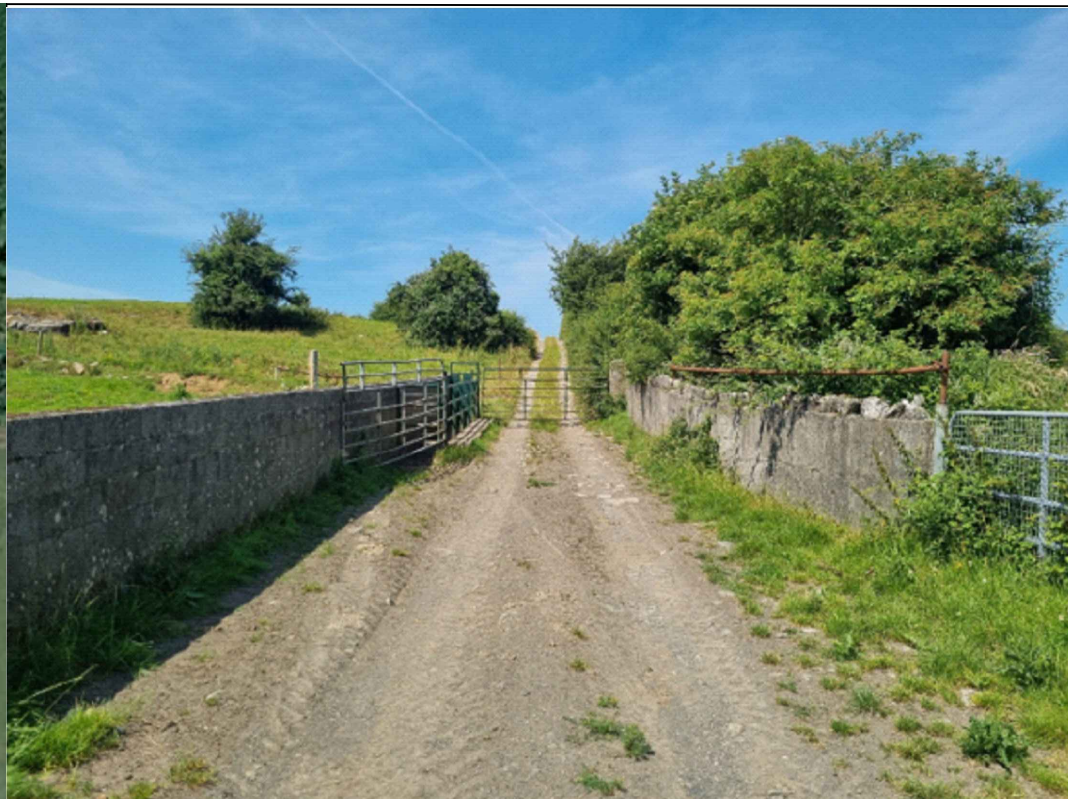


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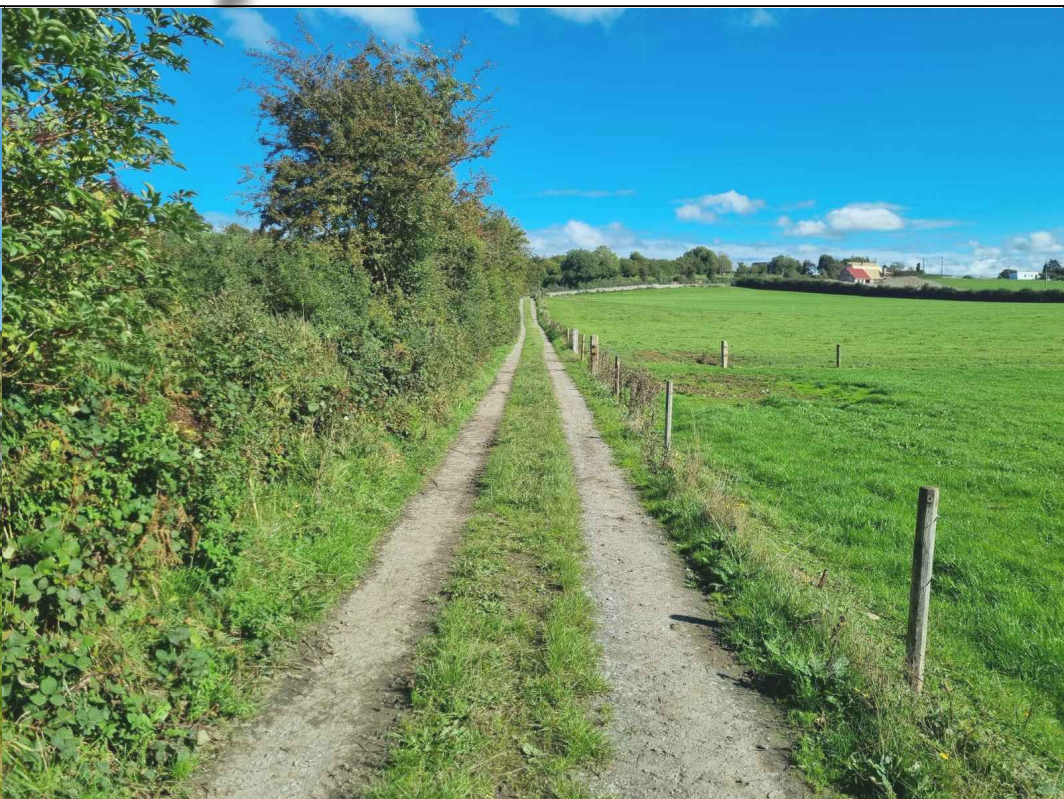


PHOTO 2

Note: Dimensions in meters

EXISTING HEDGE/CROW TO BE REALIGNED TO PROVIDE AN UNOBSTRUCTED LINE OF VISIBILITY	---
LINE OF SIGHT	→
SITE BOUNDARY	---

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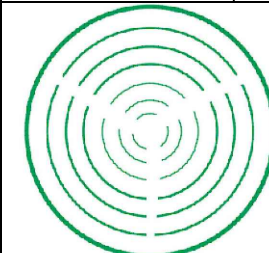
Project: Gathabawn Windfarm

Drawing Title: Site Entrance No.4

Drawing Number: GWF-13.4

Sheet Size:	A1	Scale:	1:250
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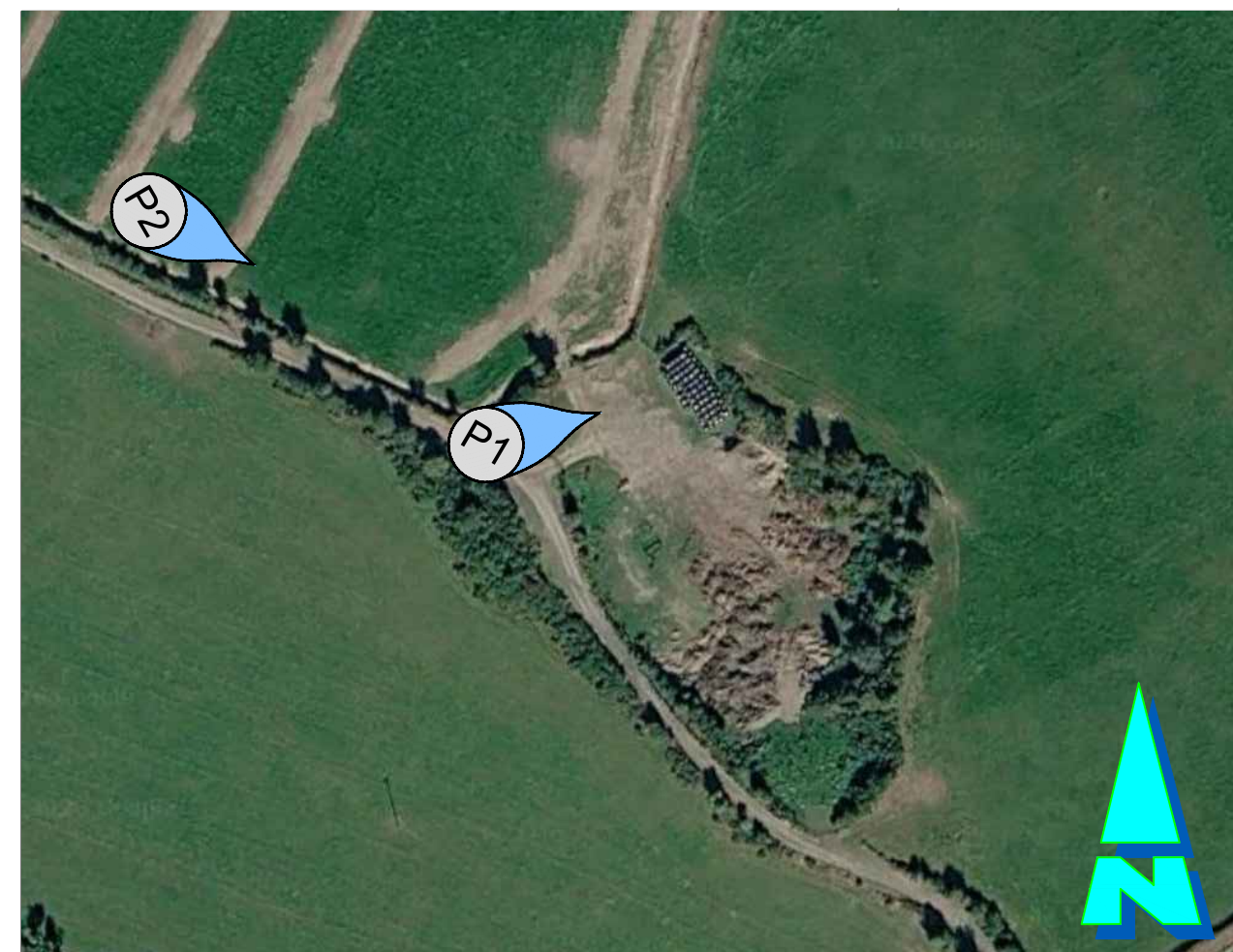
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PHOTO 2



PHOTO 1



AERIAL VIEW

Note: Dimensions in meters

EXISTING HEDGE/ROW TO BE REALIGNED TO PROVIDE AN UNOBSTRUCTED LINE OF VISIBILITY

LINE OF SIGHT

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OSI Sheet(s): 4464

Project: Gathabawn Windfarm

Drawing Title: Site Entrance No.5

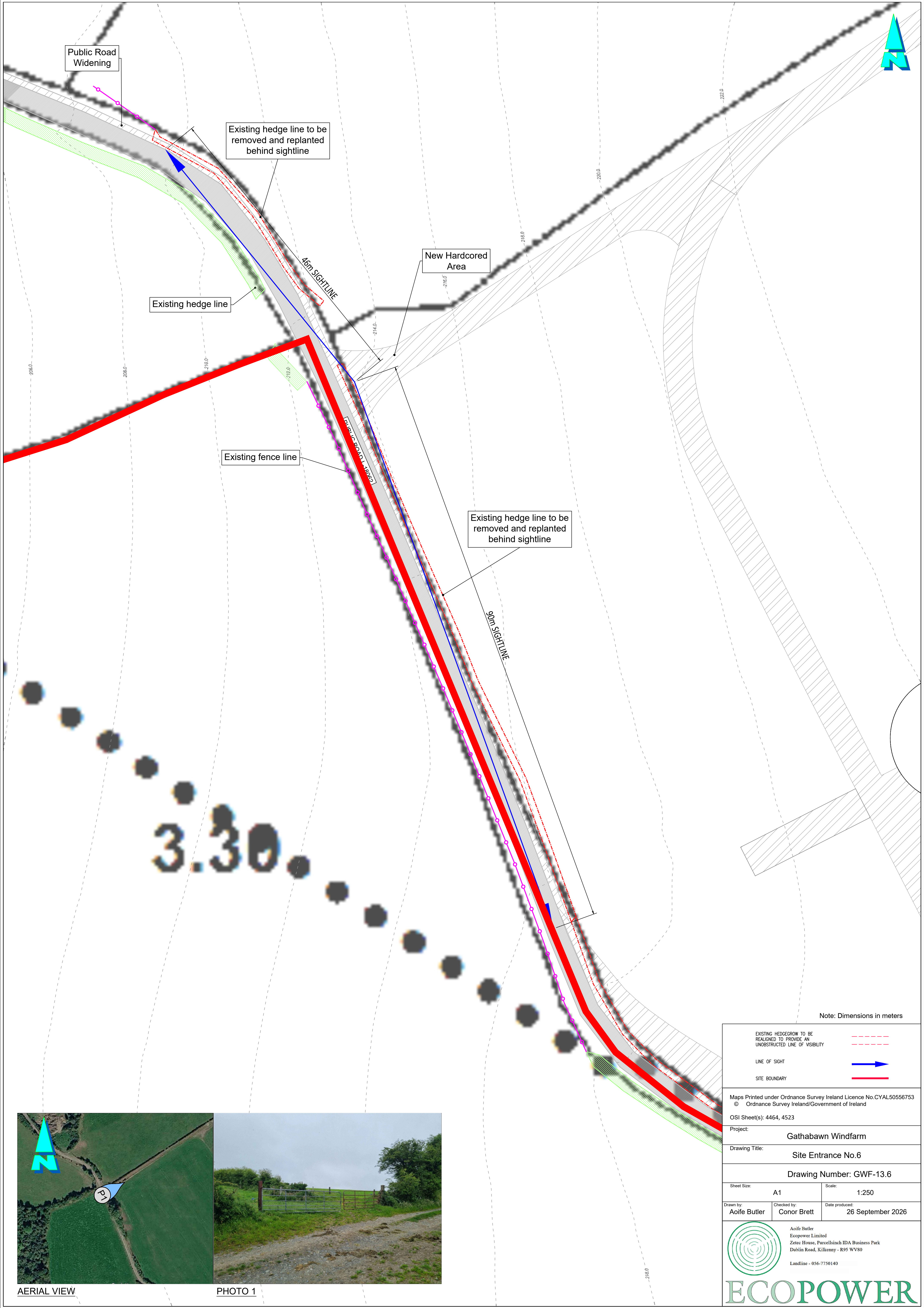
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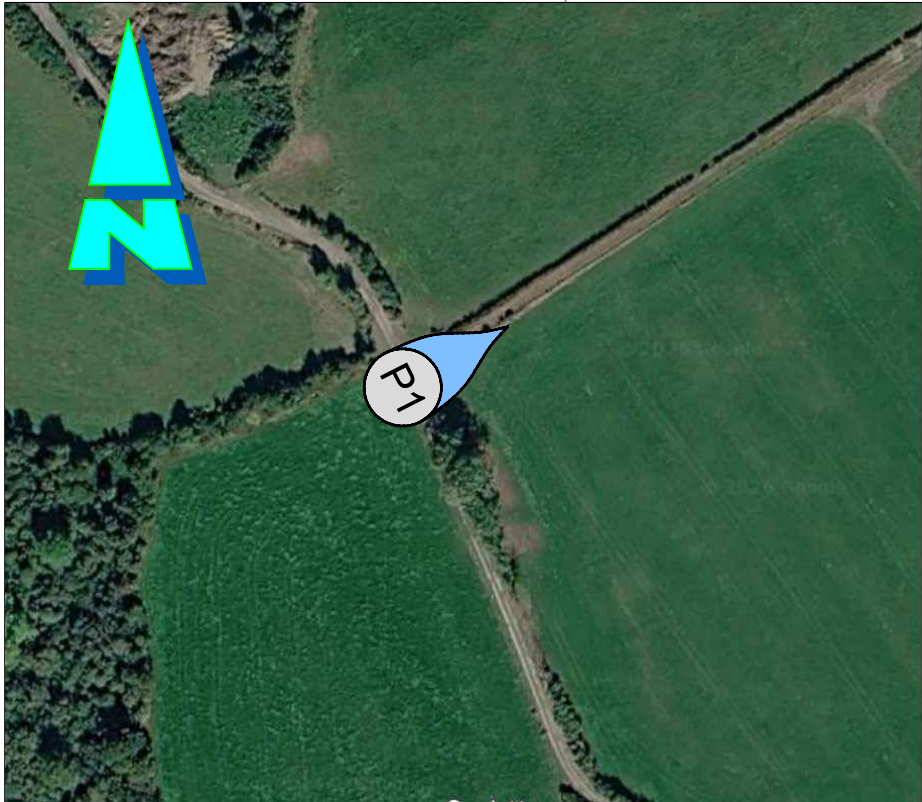
Drawn by: Aoife Butler Checked by: Conor Brett Date produced: 26 September 2026

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3.30



AERIAL VIEW



PHOTO 1

Note: Dimensions in meters

EXISTING HEDGE/ROW TO BE REALIGNED TO PROVIDE AN UNOBSTRUCTED LINE OF VISIBILITY	---
LINE OF SIGHT	→
SITE BOUNDARY	---

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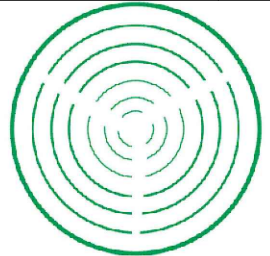
OSI Sheet(s): 4464, 4523

Project: Gathabawn Windfarm

Drawing Title: Site Entrance No.6

Drawing Number: GWF-13.6

Sheet Size: A1	Scale: 1:250
Drawn by: Aoife Butler	Checked by: Conor Brett
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T8

SITE ENTRANCE NO.7

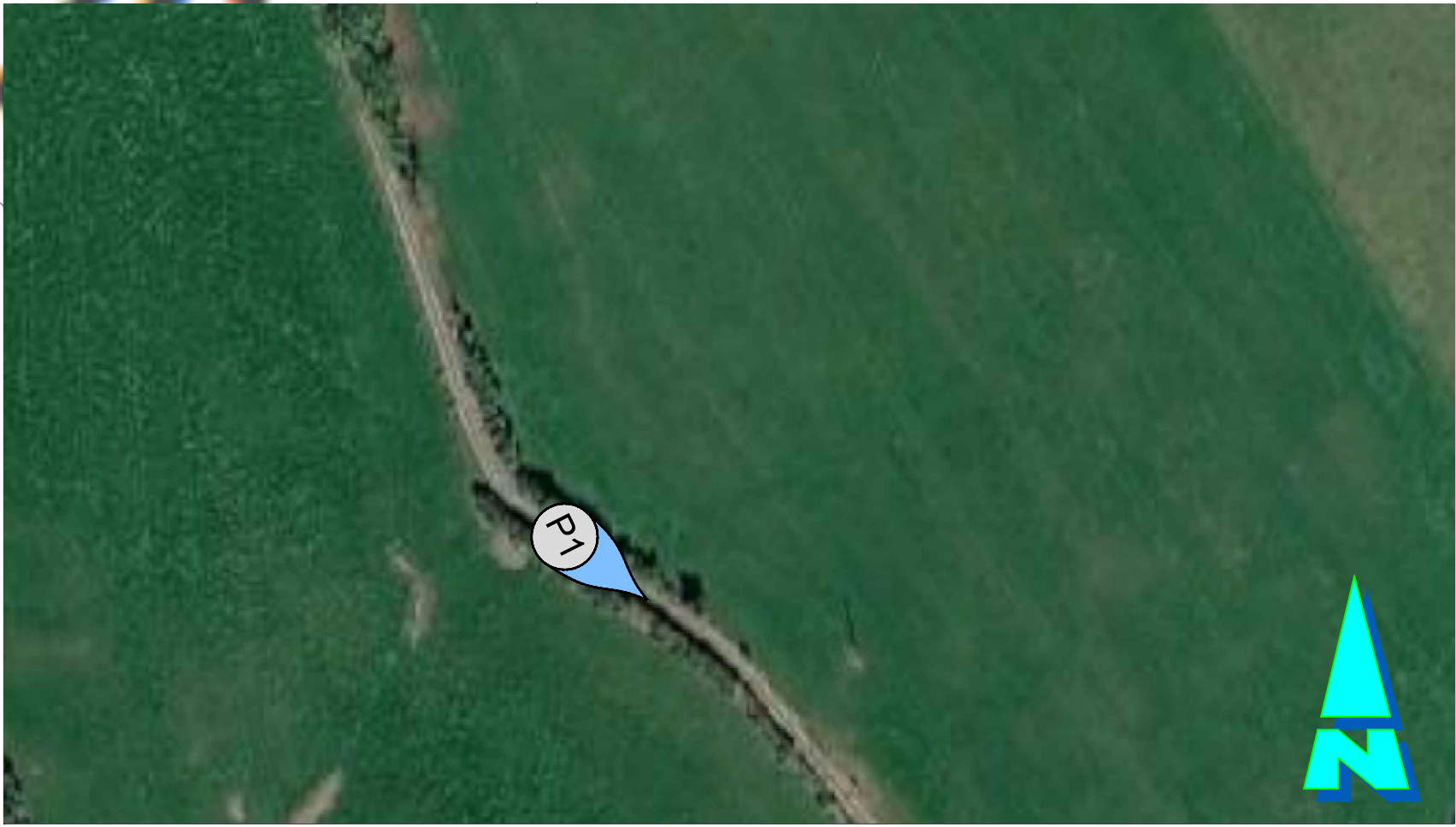
Proposed Entrance Gates.
Refer to Drawing No.
GWF-13.8 for details

Existing Track

PUBLIC ROAD L-18062



PHOTO 1



AERIAL VIEW

Note: Dimensions in meters

EXISTING HEDGE/CROW TO BE REALIGNED TO PROVIDE AN UNOBSTRUCTED LINE OF VISIBILITY	
LINE OF SIGHT	
SITE BOUNDARY	

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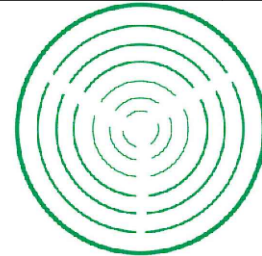
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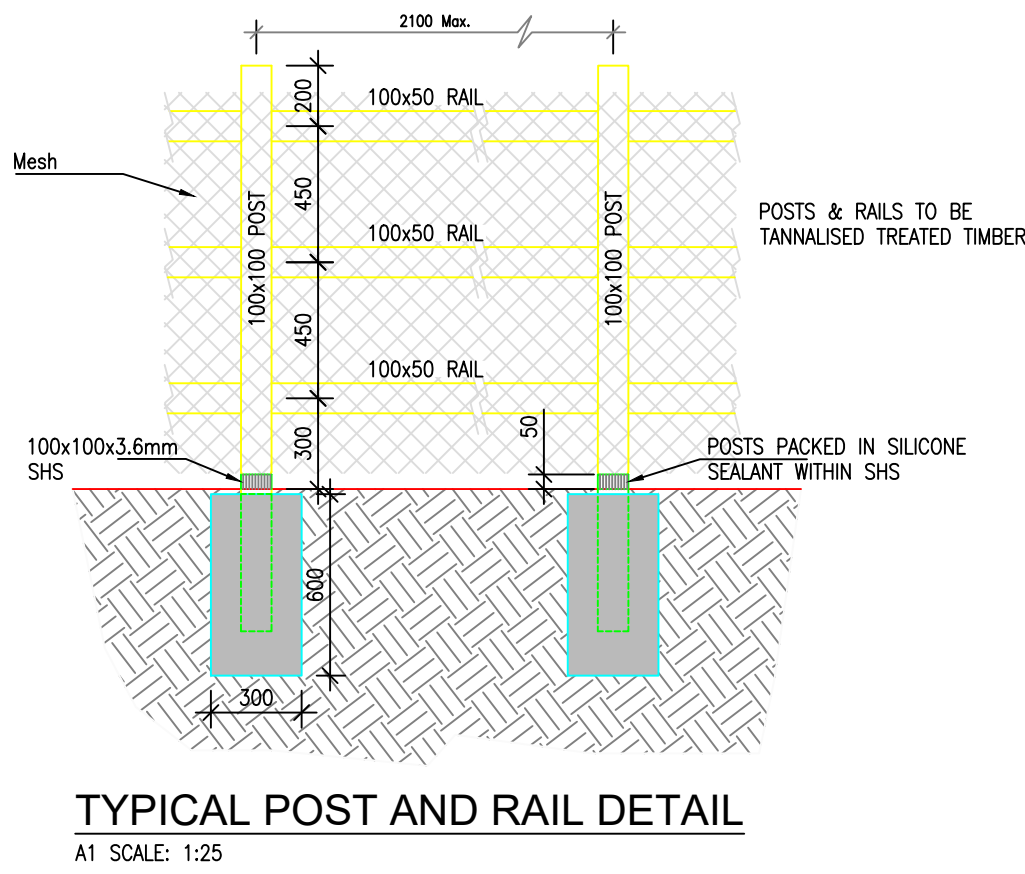
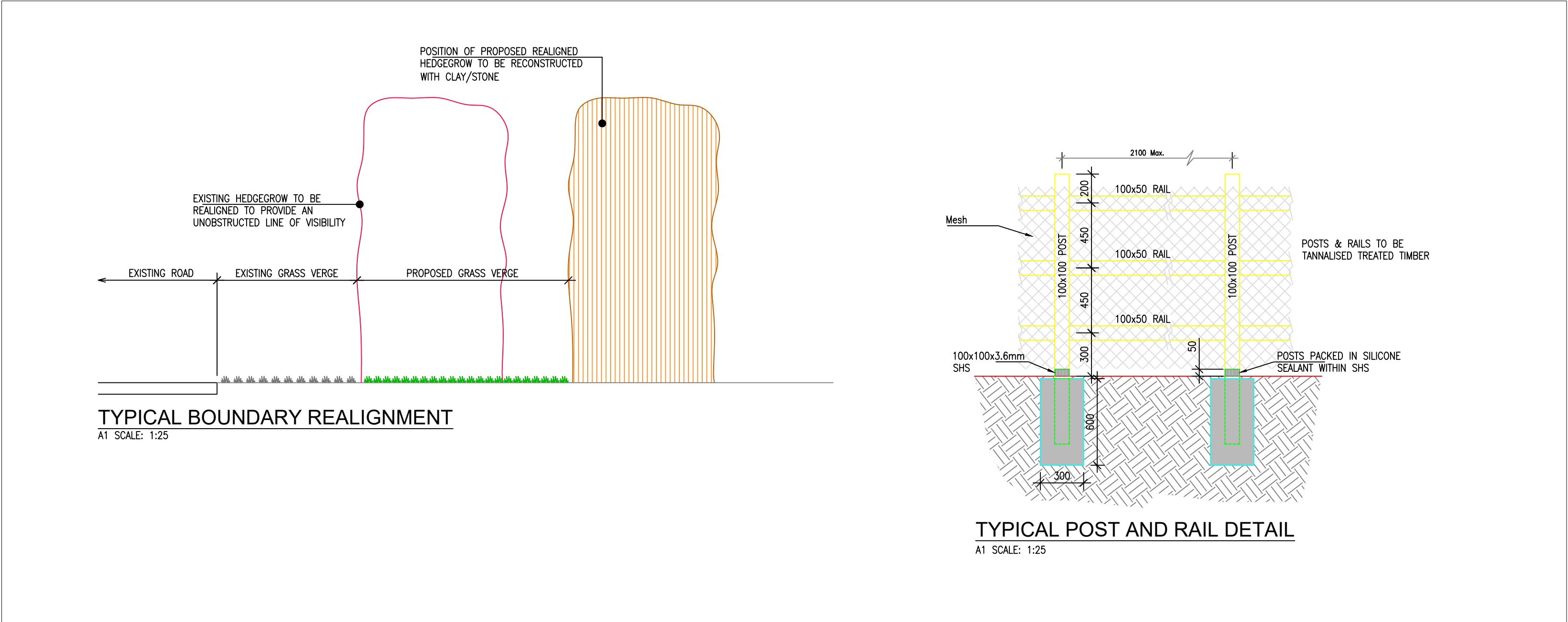
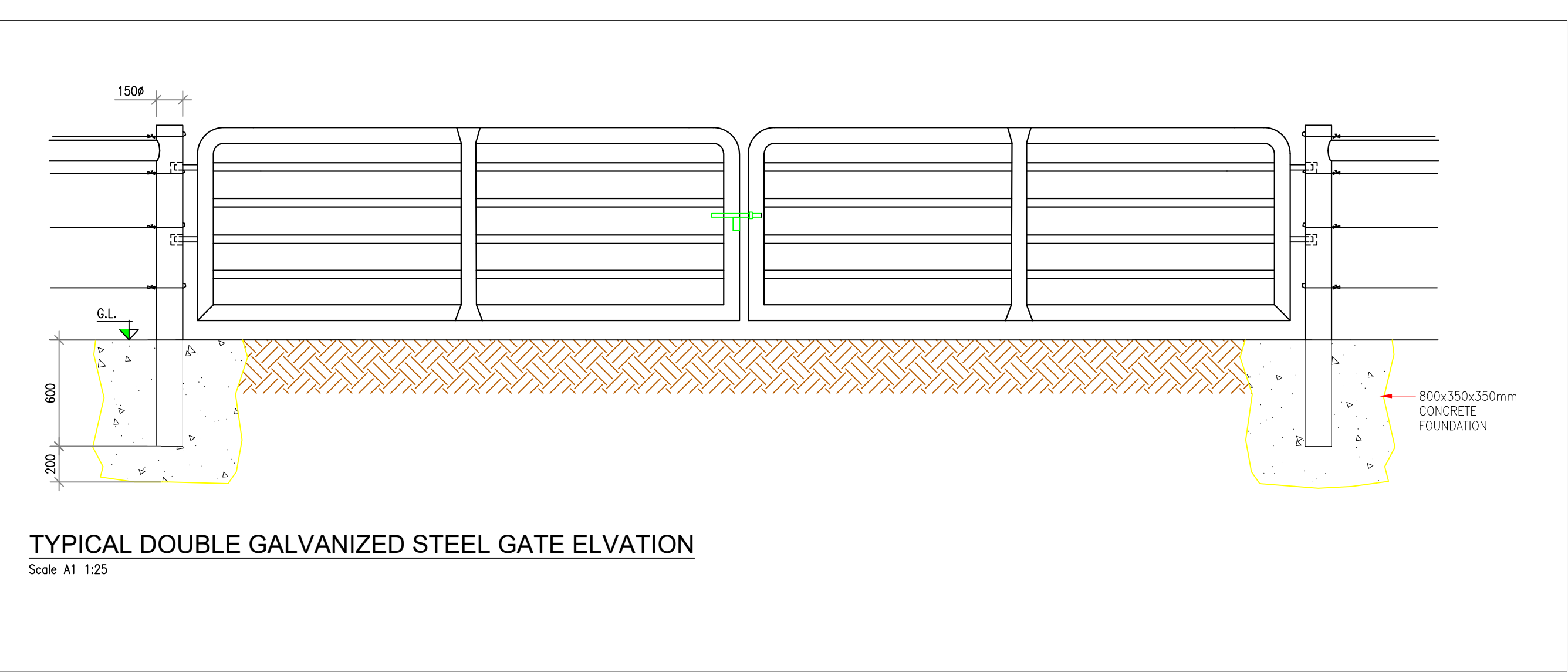
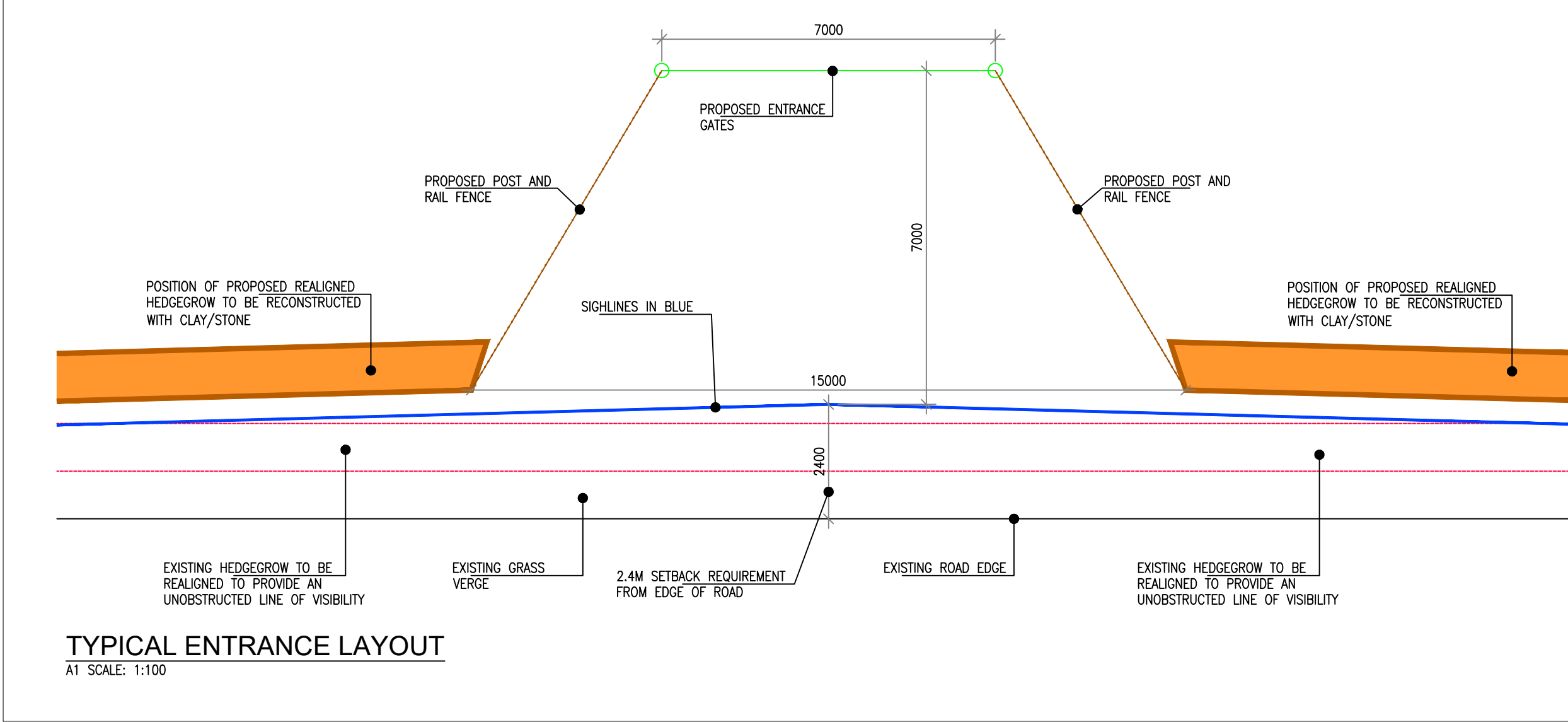
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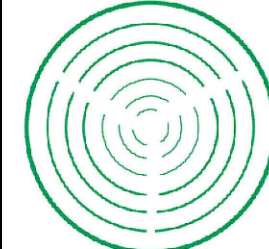


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Note: Dimensions in millimeters

Project:		Gathabawn Windfarm	
Drawing Title:		Typical Details for Site Entrance	
Drawing Number:		GWF-13.8	
Sheet Size:	A1	Scale:	As shown
Drawn by:	Aoife Butler	Checked by:	Conor Brett
Date produced:		26 September 2026	



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Tab 7

Waste Management Plan

Waste Management Plan

1 Introduction

This Waste Management Plan (WMP) will provide the basis for the preparation of a final WMP, which will include any relevant planning conditions. The appointed Contractor will draw up the final WMP and will be responsible for carrying out and managing the construction wastes in accordance with the WMP.

1.1 Objective of the Waste Management Plan

This Waste Management Plan (WMP) will be implemented to minimise waste, promote a practice of reduce, reuse and recycle where possible and ultimately to ensure the correct handling and disposal of construction waste streams in accordance with the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects, Department of the Environment, July 2006.

Construction wastes will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts and Southern Region Waste Management Plan.

1.2 Scope of WMP

This WMP **concentrates on the construction stage** of Gathabawn Windfarm which is the critical phase in the context of waste management.

1.3 Responsibilities

The responsibility of construction waste management will be placed with the Project Supervisor (Construction Stage) (PSCS) so that all reuse, recycling, wastage and necessary disposal can be monitored as close to the source as possible.

The PSCS will be assigned the authority to instruct all site personnel to comply with the specific provisions of this Plan. The PSCS will work closely with the Appointed Contractor to ensure that the Plan is implemented and updated when necessary in order to ensure that a waste management hierarchy of prevent, reduce, reuse, recycle and responsibility is implemented throughout the construction stage of the project.

An Environmental Clerk of Works will be employed by the Project Promoter to monitor the implementation of the WMP throughout the construction stage of the Gathabawn Windfarm.

All site personnel will have a responsibility to keep the construction works areas tidy, not to litter and to bring wastes back to the Gathabawn Windfarm Site Compounds on a daily basis for storage.

2 Construction Waste & Material Arising

The greatest potential for waste occurs during the Construction stage of the project.

In the course of the construction of Gathabawn Windfarm, the following construction wastes/ excavated materials will arise:

Table 1: Construction Wastes/Excavated Materials

Construction Waste Material	European Waste Code
Concrete	17 01 01
Wood pallets, timber shuttering, timber profiles (cables trench)	17 02 01
Component packaging - paper/plastic/timber profiles	17 02 01 / 17 02 03/ 20 01 01
Hazardous Materials – oil contaminated material, oily rags, construction vehicle fuel and oil	17 03 02
Steel foundation rebar	17 04 05
Canteen Waste – waste water from washing and toilet facilities	20 03 01
Excavated Materials arising - Soil & Stone Note: All excavated soil and rocks will be reused on site to form drainage bunds, for reinstatement of construction works areas and permanent storage berms, and as such <u>will not constitute waste</u> but rather 'material arising' on the Gathabawn Windfarm site.	17 05 04

3 Management of construction waste/materials

The waste materials will be moved off site by a specialist waste service contractor, who will possess the requisite authorisations for the collection and movement of waste, and who will bring the material to a facility which holds the requisite license for the specific waste.

All waste will be segregated and securely stored in skips and receptacles, which will be covered to protect the contents from the weather at Gathabawn Windfarm Site Compounds. The licensed operator, will collect and transfer the skips/receptacles of both recyclable and non-recyclable wastes as they are filled. The Gathabawn Windfarm Site Compounds will also accommodate the temporary site offices and WC facilities and this area will be secured by fencing and manned security 24/7 to prevent unauthorised access.

3.1 Waste water

Welfare facilities including self-contained toilets, with integrated waste water storage tanks, will be provided for construction workers, at the Temporary Construction Compounds. The wastewater storage tanks associated with the toilet facilities will be emptied on a regular basis, by a licence waste contractor, such as Enva, or other appropriately licenced operator for disposal at a licenced wastewater treatment facility.

3.2 General Waste

Materials such as pallets, packaging, and excess construction and building materials will be generated at windfarm and grid connection construction works areas. All individual waste streams will be identified at source, separated into recyclable and non-recyclable waste and stored in a designated and secure area at the Temporary Construction Compounds. This waste will be removed regularly, by a licence waste contractor for disposal at a licenced waste facility.

3.3 Chemical waste

Small quantities of chemical waste, such as solid waste oils and oily rags, will be generated during construction works. All chemical wastes will be stored in secure, banded and covered storage containers, in a designated part of the Temporary Construction Compounds. This waste will be removed regularly, by a licence waste contractor, such as Enva, or other appropriate licenced operator for disposal at the Enva licenced facility for hazardous and chemical waste in Portlaoise.

All concrete wash down at the site will be completed in a dedicated Roadside Concrete Washout (RCW) concrete wash unit (i.e. Silbuster or similar). This unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids will be disposed of off-site at an appropriate waste facility.

3.4 Arisings / Potentially Spoiled Soils

Construction phase: There will be c.2,400m of cabling and apparatus (i.e. for Internal Windfarm Cabling, Internal Cable Link, Gathabawn Grid Connection) laid under the public road. Arisings/Spoiled Soils from the cable trench will include bitumen bound surface dressing and potentially contaminated base layer aggregates comprising topsoil, subsoil and rock. The debris under the dry wheel washes at the site entrances will also be treated as potentially spoiled material. These arisings/potentially spoiled soils will be disposed of by a licensed waste operator to the Enva hazardous waste facility in Portlaoise.

3.5 Hazardous materials

Appropriate storage of all hazardous wastes on-site will be undertaken. There will be a secure, covered, bunded area in a designated part of the Gathabawn Windfarm Site Compounds. 1 for any waste oil, oily rags and contaminated materials. Storage of any hazardous wastes produced will be kept separate from other waste materials, in order to avoid further contamination.

3.6 Training & Communication

During Site Induction training, personnel will be informed of the objectives of the WMP and their responsibilities under the Plan.

Copies of the Waste Management Plan (WMP) will be made available to all relevant personnel on site. Posters will be designed to reinforce the key messages within the Plan and will be displayed prominently for the benefit of site staff.

4 Waste Auditing

The PSCS shall arrange for full details of all arisings, movements and treatment of construction waste discards to be recorded during the construction stage of the Project.

Each consignment of construction waste taken from the site and excavated materials arising on-site will be subject to documentation, which will conform to the table below. This will ensure full traceability of the material to its final destination.

Table 2: Waste Details to be Provided

Waste Details to be Provided	
Name of Project of Origin	Gathabawn Windfarm - Site Compounds
Material being Transported	e.g Canteen Waste
Quantity of Material	tonnes
Date of Material Movement	dd/mm/yyyy
Name of Carrier	e.g. Enva
Destination of Material	e.g. Portlaoise
Proposed Use	-

Details of the inputs of materials to the construction site and the outputs of wastage arising from the Project will be recorded by the PSCS in a Waste Audit, which will identify the amount, nature and composition of the waste generated on the site. The Waste Audit will examine the manner in which the waste is produced and will provide a commentary highlighting how management policies and practices may inherently contribute to the production of construction waste.

4.1 Waste Audit Report

The measured waste quantities will be used to quantify the costs of management and disposal in a Waste Audit Report, which will also record lessons learned from these experiences which can be applied to future projects. This report will be produced by the PSCS using inputs from the Waste Audit. The total cost of construction waste management will be measured and will take account of the purchase cost of materials, handling costs, storage costs, transportation costs, revenue from sales, disposal costs etc.

Costs will be calculated for the full range of construction waste materials, using the format shown in the table below:

Table 3: Measured waste quantities and costs

Material	Estimated Quantities & Costs
Purchase cost of general building materials i.e. import Costs	(€)
Materials Handling Costs	(€)
Material Storage Costs	(€)
Material Transportation Costs	(€)
Revenue from Material Sales	(€)
Material Disposal Costs	(€)

Material	Estimated Quantities & Costs
Material Treatment Costs	(€)
Total Waste General Building Materials Management Costs	(€)
Unit Waste General Building Materials Management Costs	(€)

(Sample relates to General Building Materials – separate record forms will be compiled in respect of each waste material and excavated soil & stone arising).

Final details of the quantities and types of construction waste arising from the Project will be forwarded to the Environment Section, Kilkenny County Council.

Tab 8

Contractors Method Statements

(to be added post consent)

Tab 9

Construction Programme

(to be added post consent)

Tab 10

Invasive Species Management Plan

1. Introduction

In this Plan, Invasive Species relates to any animal or plant introduced (deliberately or accidentally) by human activity to an area in which they do not naturally occur. Invasive Species, which are also referred to as 'invasive non-native species', or 'invasive alien species', are those non-native species that have the ability to spread rapidly and become dominant in an area or ecosystem, causing adverse ecological, environmental and economic impacts. Examples of the negative effects caused by invasive non-native species include economic cost, structural damage, environmental degradation, aesthetic degradation, biodiversity loss, loss of land function and access restrictions.

Invasive Species, such as Japanese knotweed, Himalayan knotweed, Rhododendron, and Giant Hogweed are regulated for control under legislation including under the requirements of the *European Communities (Birds and Natural Habitats) Regulations, 2011, S.I. No. 477*, which makes it an offence to *knowingly disperse or allow to escape* plant species listed in the Regulations.

A description of the biosecurity measures for Invasive Species which will be implemented during construction works are presented in this Plan. These measures are taken from the most relevant and current guidance in relation to the containment and management of non-native invasive plant species in construction projects. In addition to the above a list of general measures to be applied in respect of the prevention of spread of invasive species in the aquatic environment and the spread of invasive animal species in the terrestrial environment is provided.

2. Biosecurity Measures

All works or activities in close proximity to Invasive Plant Infestations will be carried out under the supervision of an invasive species specialist.

The prescriptions for the treatment of invasive species were derived with reference to the following literature:

- Managing Japanese knotweed on development sites - The Knotweed Code of Practice produced by the Environmental Agency (2013);
- NRA Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (2010);
- Managing Invasive Non-native Plants in or near Freshwater, Environment Agency (2010);
- Best Practice Management Guidelines Japanese knotweed *Fallopia japonica*, Invasive Species Ireland (2015);
- IFI Biosecurity Protocol for Field Survey Work, Inland Fisheries Ireland (2010).

2.1 Biosecurity Measures for works proximate to Invasive Plant Species Infestations

Pre-Construction Processes

Pre-Construction confirmatory surveys will be completed by an invasive species specialist, 3 – 4 weeks before construction begins. Mapping, showing the most up to date distribution and extent of each infestation, will be distributed to the Promoter, Owners Engineer and the Contractor;

A toolbox talk will be provided by the invasive species specialist with the Contractors construction site engineers and general operatives to explain about all invasive species identified at, or in close proximity to,

works areas and the restrictions that will apply for the full construction period. The toolbox talk will cover all pertinent topics including all relevant invasive species close to construction works and the biosecurity measures to be implemented while working. The invasive species toolbox talk will cover the full lifecycle of every construction activity including, but not limited to, all onsite construction activities, mechanical excavation, transportation and disposal of all material from excavations, through to the backfilling of excavations, and reinstatement of the construction works area;

Covering of knotweed infestations (adjacent the works) will be carried out 7 days ahead of works in close proximity to an infestation. The infestations will be covered so that their full extent plus 1 metre is covered entirely and no vegetation is visible;

The covering of vegetative knotweed infestations with high density polyethylene grass carpet terram at all identified locations prior to any works commencing on that section and the monitoring of construction works at that section when it happens. The polyethylene grass carpet terram covering will only be placed on and removed from the infestation under direct supervision from an invasive species specialist. When taking the terram off an infestation and moving to the next section the construction team will need to ensure that all adherent material has been removed and placed within the adjacent infestation i.e. it will be important not to spread the infestation;

No posts will be used to secure the coverings i.e. there will be no uncontrolled ground interference within 7 meters of any infestation during any of these operations;

Once each knotweed infestation has been covered, works can begin at that location, an invasive species specialist will be present to provide supervision of all works adjacent to infestations;

Rhododendron infestations and giant hogweed infestations will not be covered with high density polyethylene grass carpet terram, instead where works occur within 5m of Rhododendron infestations or giant hogweed infestation, an invasive species specialist will be present to ensure that construction machinery and operatives do not come into contact with these infestations;

The site Environmental Manager will ensure that the Contractor engages a suitable waste disposal company with the requisite license for handling any hazardous waste (i.e. invasive species material). The Contractor will maintain records of all wastes arising, and the documentation will include the waste contractor's local authority license and proof of appropriate haulage license per individual haulage vehicle.

Excavated material from works areas within 15m of an infestation, will be disposed as potentially contaminated material, by a licensed contractor to a suitably licensed waste facility.

Construction works adjacent to the infestation will be carried out under supervision of the invasive species specialist.

Construction Phase Processes for works locations proximate to Infestations

- Before construction begins at any location in close proximity to an infestation, all General Operatives will attend a toolbox talk on invasive species. No General Operative will be allowed to work on the project without completing the toolbox talk;
- Once this is completed construction can begin with onsite supervision of works in close proximity to locations where invasive species occur;
- The Environmental Manager will ensure that only licensed hauliers are collecting and disposing of material from any open excavation.

2.2 Biosecurity Measures to Prevent the Spread/Introduction of Aquatic Invasive Species

Inspection and Cleaning of Delivery Vehicles

- Prior to arrival on site, the contractor's vehicles and equipment will be thoroughly cleaned and then dried using high-pressure steam cleaning, with water hotter than 65 degrees Celsius, in addition to the removal of all vegetative material. Items difficult to soak/spray will be wiped down with a suitable disinfectant (e.g. Virkon Aquatic);
- Evidence that all machinery has been cleaned will be required to be on file for review by the statutory authorities.
- A dedicated member of the construction crew will be responsible for inspecting and cleaning delivery vehicles both entering and exiting the Gathabawn Windfarm site. These persons will receive training in the correct techniques; Following cleaning, all equipment and vehicles will be visually inspected to ensure that all adherent material and debris has been removed manually. A bin will be provided at each work locations/site entrance for adherent material to be placed in. This will be emptied on a daily basis into the hazardous waste container at the Site Compound for removal offsite by a licensed operator; Spot checks on the efficacy of cleaning strategies will be carried out by the Project Ecologist. Records of supplies and cleaning of delivery vehicles will be kept by the dedicated member of the construction crew, and will be regularly inspected by the Environmental Manager;
- Before works take place onsite the Contractor will have 150kg (15No. x 10kg buckets) of Virkon Aquatic available for the construction team – this will be stored in the COSSH store at the Site Compound.
- A Virkon footbath will be available at the site compounds, construction areas and at the site entrances;
- Each construction crew will be equipped with a 'disinfection box'. This will contain Virkon Aquatic, a spraying mechanism, cloths or sponges, a scrubbing brush and protective gloves. Protective gloves will be worn when using any disinfectant solution;
- Visual inspections will be carried out on all machinery and equipment (particularly for machinery and equipment exiting the site and which has come into contact with water or soils) for evidence of attached plant or animal material, or adherent mud or debris. Any attached or adherent material will be removed before entering or leaving the site of operation, securely stored away from traffic for removal to the waste storage area in the Site Compound at the end of the work day;
- No removed material or run-off will be allowed to enter a water body of any sort.

Measures for Works at/in/near Watercourses

- Residual water in any containers/vessels used in works near watercourses will be flushed with disinfectant (Virkon Aquatic) onto grass. A drying period of at least 24 hours will be adhered to;
- All footwear used, or to be used, in watercourses will be dipped in or scrubbed with a disinfectant solution (e.g. 1% solution of Virkon Aquatic or another proprietary disinfection product) and thoroughly dried afterwards.
- Any observations of mass mortality of Crayfish will be reported to the relevant authorities immediately upon evidence being found;

2.3 Biosecurity Measures to Prevent the Spread/Introduction of Invasive Animal Species

New hedgerows, trees and shrubs will be planted as part of the Gathabawn Windfarm Project. These trees/shrubs (the root balls, leaves and soil) can contain invasive animal species. 'Hitch-hiking' is a term used

to describe when a species is spread by the movement of other material. This can be, for example, on plants, soil, clothing or equipment.

Good practice Biosecurity Measures will be followed in order to avoid the unintentional introduction and spread of invasive animal species through newly imported plants or growing media.

Measures to be applied throughout the construction period will be as follows:

- Care will be taken in the use of trailers and the movement of plants onsite – inspections of all plants and shrub root balls will take place before they leave the nursery but also when they arrive onsite;
- All trailers will be checked before they leave the nursery but also when they arrive onsite;
- Staff will be appropriately trained in preventing the spread of invasive species (including training in relevant regulations).
- A toolbox talk will be provided by the invasive species specialist with the Contractors construction site engineers and general operatives to explain about all potential animal invasive species and the controls expected and that will apply for the full construction period. The toolbox talk will cover all pertinent topics including all relevant invasive species close to construction works and the biosecurity measures to be implemented.
- The invasive species toolbox talk will cover the full lifecycle of every plant delivery onsite including how to inspect deliveries and how to deal with any 'hitchhikers' if found;
- In all cases of an invasive species being found the relevant statutory authorities will be contacted immediately.

Example of 'hitchhiker'

Small mammals (e.g. White Toothed Shrew)

Hitchhike on: Trailers, larger root balls, and movement of large plants.

How to prevent it: Check plant consignments for signs of mammals. Signs would include droppings, chewed packaging materials and also seeing the animals. Avoid allowing any animals transported to your site to escape into the wild.

Insects (e.g. Red lily beetle, Harlequin ladybird)

Hitchhike on: Plants brought onto the site.

How to prevent it: Check consignments of the plants. Will require hand picking or in some cases use of pesticides. Do not release any handpicked animals into the wild.