

Ballyfeeny Green Energy Project



Environmental Impact Assessment Report Volume III

Appendix 2.1 – Construction Environmental Management Plan

September 2025

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Construction & Environmental Management Plan

Project:

Ballyfeeny Green Energy Project

Applicant:

Ballyfeeny Green Energy Limited

Date of Report:

11th September 2025

Document Ref. No.:

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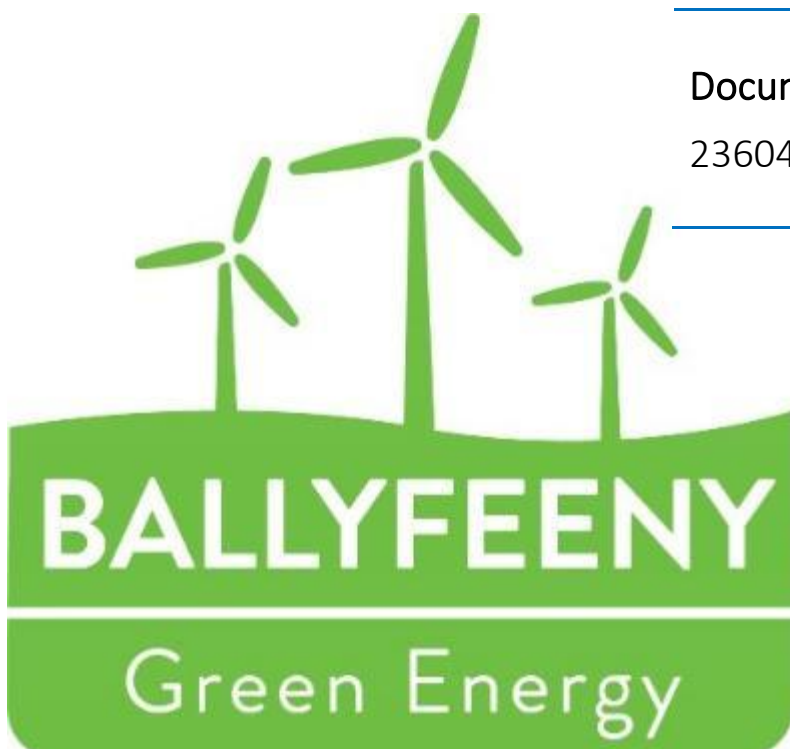


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Document Control

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1.0 Introduction

This Construction and Environmental Management Plan (**CEMP**) has been developed by Mable Consulting Engineers on behalf of Ballyfeeny Green Energy Limited (the Applicant), who intend to apply to Roscommon County Council for planning permission to construct the Ballyfeeny Green Energy Project (the Project).

This **CEMP** has been prepared in conjunction with the Environmental Impact Assessment Report (**EIAR**) which will accompany the planning application for the proposed Project.

This **CEMP** is to be read in conjunction with the following documents:-

- **EIAR, Volume III, Chapter 2.1.1; Surface Water Management Plan (SWMP);**
- **EIAR, Volume III, Chapter 2.1.2; Waste Management Plan (WMP);**
- **EIAR, Volume III, Chapter 2.1.3; Traffic Management Plan (TMP);**
- **EIAR, Volume III, Chapter 2.1.4; Decommissioning Management Plan (DMP);**
- **EIAR, Volume III, Chapter 2.1.5; Blasting Coordination and Cooperation Plan**
- **The Planning Drawings (Part-1 of the planning application).**

1.1 Project Description

The proposed Project comprises of the following key elements:-

- The Wind Farm Site;
- Turbine Delivery Route (TDR) Works;
- The Grid Connection Route (GCR).

A detailed description of the proposed Project is contained within the **EIAR, Volume II, Chapter 2 Project Description** and the **Planning Statement** that accompanies the planning application.

1.2 Scope

This **CEMP** details the construction and environmental management measures which will be implemented during the construction, operation and decommissioning phases of the Project.

The **CEMP** compiles the various mitigation measures identified in the **EIAR** and details work methodologies and systems to be put in place as part of the proposed mitigation measures.

1.3 Report Layout

The **CEMP** is structured as follows:-

- Section 1.0 Introduction
- Section 2.0 Overview of Existing Site
- Section 3.0 Proposed Project
- Section 4.0 N5 Ballaghaderreen to Scramoge Road Project
- Section 5.0 Construction Management
- Section 6.0 Safety, Health and Welfare at Work
- Section 7.0 Environmental Management
- Section 8.0 Summary
- Appendix A Environmental Method Plans (EMP)

1.4 Statement of Authority

This **CEMP** has been prepared by Mr. Barry McGinn and Mr. Eoin Roche of Mable Consulting Engineers Limited.

Mr. Barry McGinn is a Chartered Engineer with over 28 years' experience in the design, construction and project management of civil and structural engineering projects including; Wind Farms, Solar Farms, Battery Storage, Electrical Substations, Flood Alleviation, and multiple other development types. Barry is a member of Engineers Ireland and holds a BSc(Eng) in Structural Engineering, BEng (Ord) in Civil Engineering and Post Graduate Diplomas Planning and Environmental Law, Construction Law & Contract Administration and Project Management.

Mr. Eoin Roche is a Project Engineer with over 5 years of experience in the design and construction of civil and structural engineering works, as well as renewable energy infrastructure projects. His portfolio includes Wind Farms, Solar Farms, Battery Energy Storage Systems (BESS), Synchronous Compensators and Electrical Substations. Eoin holds a Bachelor of Engineering (Hons) in Structural Engineering and a Postgraduate Diploma (Distinction) in Sustainable Energy and the Environment.

1.5 CEMP Objectives

Key aims for the Project are:-

- To ensure the Project is undertaken in accordance with best construction and environmental practices, in accordance with the accompanying **EIAR** and associated planning documentation;
- To ensure the Project is constructed and commissioned in a safe and timely manner and within the Project budget;
- To ensure construction activities adhere to all relevant environmental regulations and standards
- To ensure that construction activities are carried out in accordance with any conditions of planning for the proposed Project;
- To ensure that construction activities have minimal impact/ disturbance to local landowners and the local community;
- To ensure that construction activities have minimal impact on the natural environment;
- To adopt a sustainable approach to construction; and
- To provide adequate training and awareness to all construction site personnel.

The key objectives of this **CEMP** are: -

- Appointment of a suitability qualified and experienced design and construction team to oversee the construction of the Project;
- Delegation of clear lines of responsibility within the design and construction team for monitoring construction and environmental compliance and adherence to this **CEMP**;
- Provide appropriate levels of training to ensure the design and construction team are up-to-date with construction and environmental best practice and legislative changes;
- Establishment of documented schedules and records for monitoring and inspections;
- Establishment of reporting procedures for incidents on site;
- Provide opportunities for community feedback and submission of complaints; and
- Adoption of a sustainable and socially responsible approach to construction.

1.6 Live Document

This **CEMP** is considered a 'live' document and as such will be reviewed and updated as required during the construction phase design and as required during the construction works.

Updates to the **CEMP** may be required due to changes in legislation or due to changes in construction and environmental best-practices. Updates may also be required to incorporate measures for compliance with any conditions of planning by the Local Authority.

Prior to commencement of construction works, this **CEMP** will be further developed by the construction contractor to the requirements of the Local Authority and other appropriate Stakeholders and incorporated into its construction management systems.

2.0 Overview of Existing Site

2.1 Site Location

The proposed wind farm Site is located at Ballyfeeny, Co. Roscommon, approximately 4.5 km northeast of Strokestown and 15 km northwest of Longford town. The Irish Transverse Mercator (ITM) coordinates for the approximate centre of the wind farm site are E598813 N782007 ITM.

The proposed grid connection is via underground cable duct laid in the wind farm and in the public road connecting to the existing Sliabh Bawn ESB 110kV Substation located at ITM coordinates E598813 N 782007.

The location of the site is detailed in red in **Figure 2-1**.

The Site has an area of approximately 49.774 hectares (ha) and comprises a number of private land parcels and public roads.

The proposed Project is serviced by the following public road network: the N5, R368, L1422, and L6062. The N5 National Road runs approximately 1.2 km to the southeast of the wind farm Site.

The local hydrology of the Site includes the Culliagh Stream which runs adjacent to the Projects eastern redline boundary. The Culliagh Stream flows south and turns east to join the Feorish River (EPA code 26F03) (also referred to as the Tammonbary) before joining the Shannon Upper River (EPA code 26S02).

The Ballymartin Stream is also located approximately 60m from the proposed Onsite Substation and Relay Tower. The Ballymartin stream flows west before turning north to flow into Kilgass Lough.

The proposed GCR travels past the Gortlustia Stream (EPA Code 26G29) to its west which flows west into the Scramoge River which flows into the Mountain West and finally into Kilgass Lough.

The proposed GCR also transects the Bellmount or Cloggernagh Steam further south prior to where the GCR route turns west to join the Sliabh Bawn 110kV Substation.

Further detail on the site location and existing hydrology on site is contained in **EIAR, Volume II, Chapter 2 - Project Description & Chapter 8 - Water, Hydrology (Flood Risk Assessment) & Hydrogeology**.

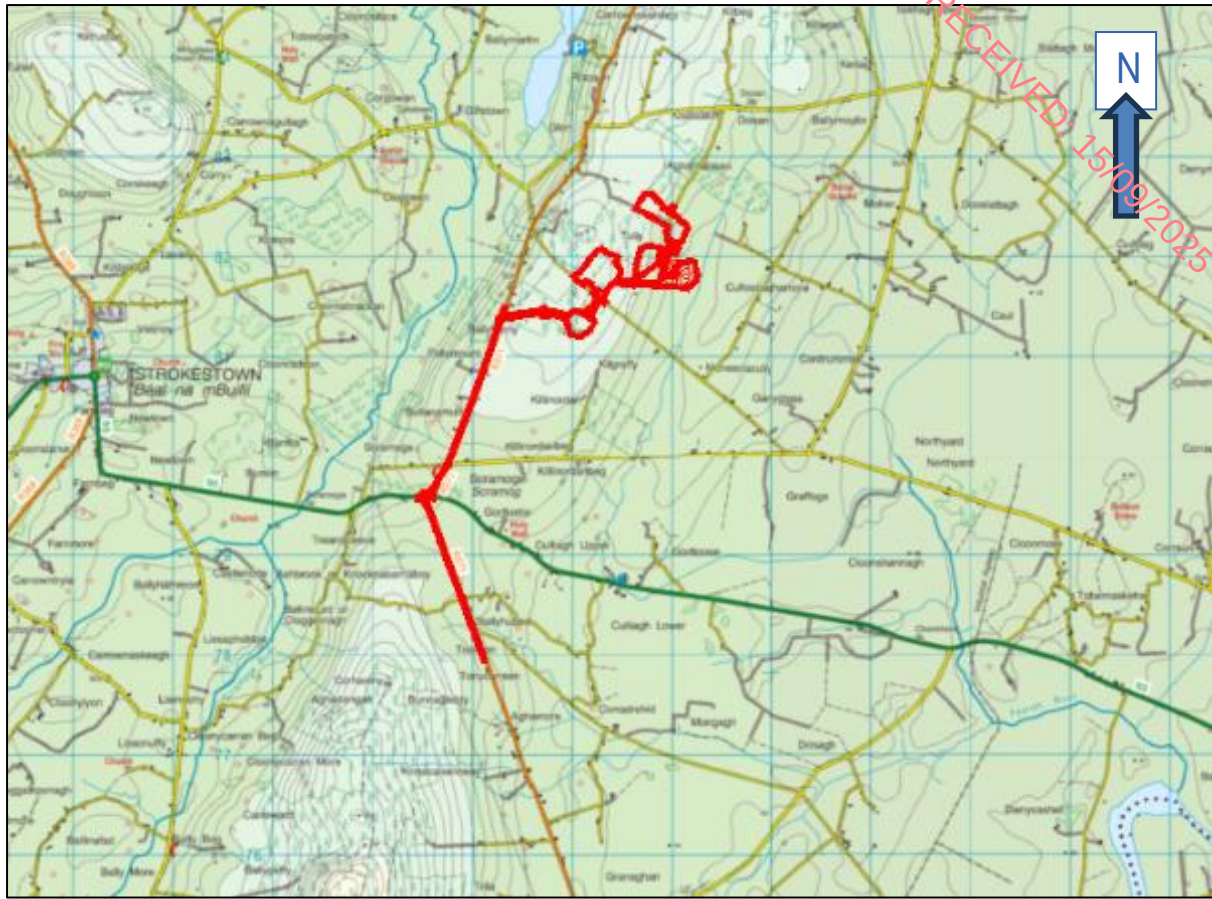


Figure 2-1 – Site Location – Site outlined in red

3.0 Proposed Project

3.1 Site Layout

The Project consists of two distinct sets of works, the proposed wind farm Project and the proposed Grid Connection Route connecting the Onsite Substation to the existing Sliabh Bawn 110kV Substation via the public road.

A detailed description of the proposed Project is contained within **EIAR, Volume II, Chapter 2; Project Description**.

3.1.1 Wind Farm

The proposed Project includes the following:-

The main components of the proposed Project will consist of:-

- The construction and operation of a wind farm consisting of six wind turbines;
- The turbine specification is unconfirmed but will fall within the parameter range outlined by Roscommon County Council and will be one of the following three Options;
 - Technology Option 1: tip height of 160m, rotor diameter of 136m and hub height of 92m; or
 - Technology Option 2: tip height of 156m, rotor diameter of 133m and hub height of 90m; or
 - Technology Option 3: tip height of 159m, rotor diameter of 138m and hub height of 90m;
- Construction of Turbine Hardstands (including crane and assembly areas) and Turbine Foundations;
- Construction of approximately 3.9km of new permanent internal Site Access Tracks and the upgrade of 0.5km of existing internal access tracks;
- Construction of a permanent 38kV Onsite Substation, including one single story substation building with welfare facilities, Lidar, diesel generator and fuel storage tank, all associated electrical plant and equipment, all associated underground cabling, rainwater harvesting and storage tank, wastewater holding tank, security fencing, gates, signage, and all ancillary structures and works;
- Installation of underground electrical and communications cabling connecting the wind turbines to the proposed 38kV Onsite Substation;
- Construction, of two Temporary Construction Compounds with associated site offices, welfare facilities, car parking, site fencing and lighting;
- Erection of a permanent 30m high Communications Relay Tower;
- Construction access via six site entrances (SE1 – SE6) to include:
 - SE1 on the R371, SE2 and SE3 on the L6018, and SE4, SE5 and SE6 on the L60498;
 - SE1 and SE6 are temporary and will be reinstated following construction. SE1 may be re-established if required for turbine component repair or replacement. SE2 – SE5 will be retained permanently for operational access;
- Tree felling to facilitate the construction and operation of the proposed Project;
- All associated site works, including site clearance, landscaping, site drainage, security gates, fencing, permanent and temporary signage and biodiversity mitigation and enhancements, including hedgerow and treeline planting.

A layout of the proposed Project is shown in Figure 3-1 detailed information is contained in the **EIAR** and the Planning Drawings (**Part 1** of the planning application).

A schedule of the proposed wind turbines and their corresponding ITM grid coordinates is set out in Table 3-1.

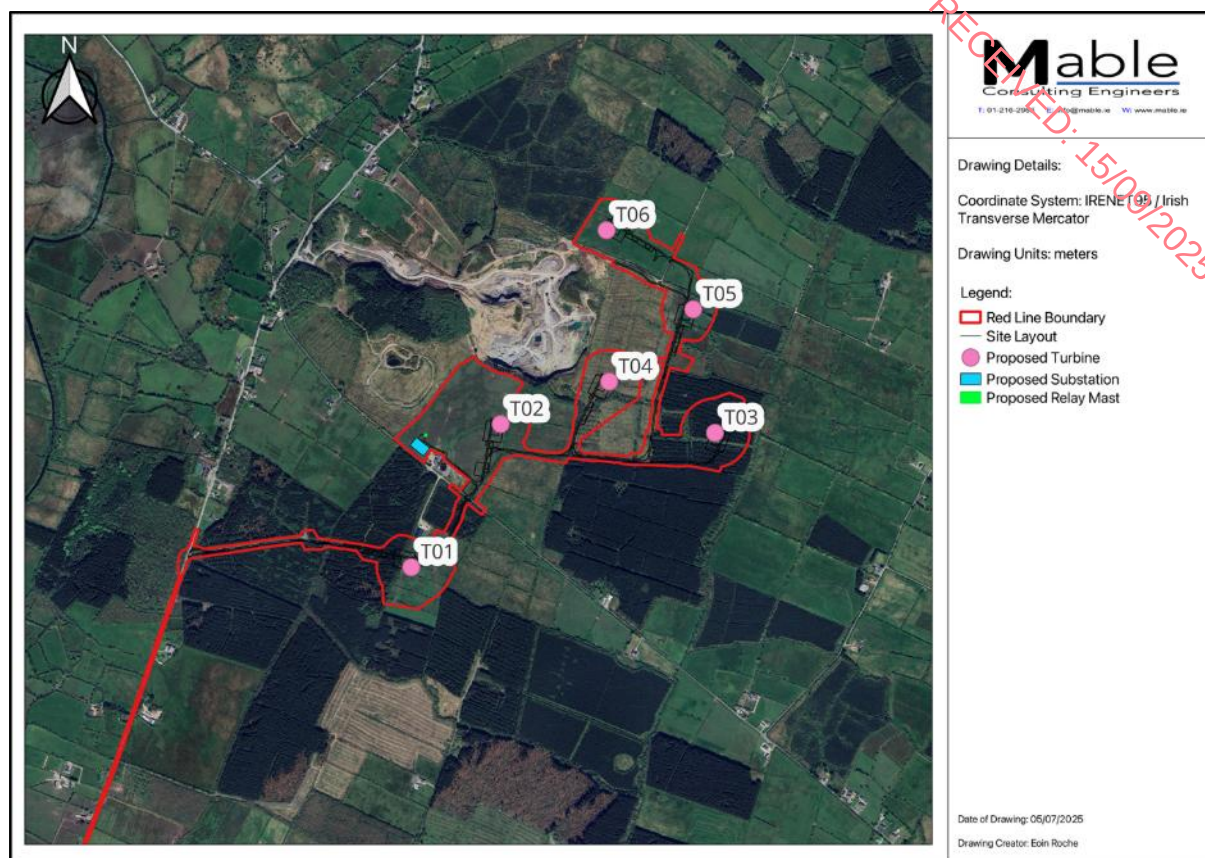


Figure 3-1 – Proposed Project Layout

Turbine ID	Grid Coordinates (ITM)		Ground Level at Turbine (meters above ordnance datum)
	Easting:	Northing:	
Turbine 1 (T01)	598032	781362	118
Turbine 2 (T02)	598343	781861	119
Turbine 3 (T03)	599091	781831	76
Turbine 4 (T04)	598722	782009	99
Turbine 5 (T05)	599015	782261	86
Turbine 6 (T06)	598713	782537	106

Table 3-1 – Proposed Wind Turbine Coordinates

3.2 Grid Connection

The proposed GCR development includes the following:

- 5.8km grid connection route to the existing Sliabh Bawn 110kV Substation;
- Construction of joint bays and communication chambers;
- Directional Drilling under existing services where required;
- Crossing of existing water courses, utility services, public roads and other structures using Open-Dig and Directional Drilling methods, as shown in **Planning Drawing 23604- 562 to 564 (Part 1)**;
- Relocation of existing services where required;
- Connection to Sliabh Bawn 110kV Substation; and
- All associated infrastructure for construction of the GCR.

The proposed GCR is detailed in **Figure 3-2**, detailed information is contained in the **EAIR** and the Planning Drawings.

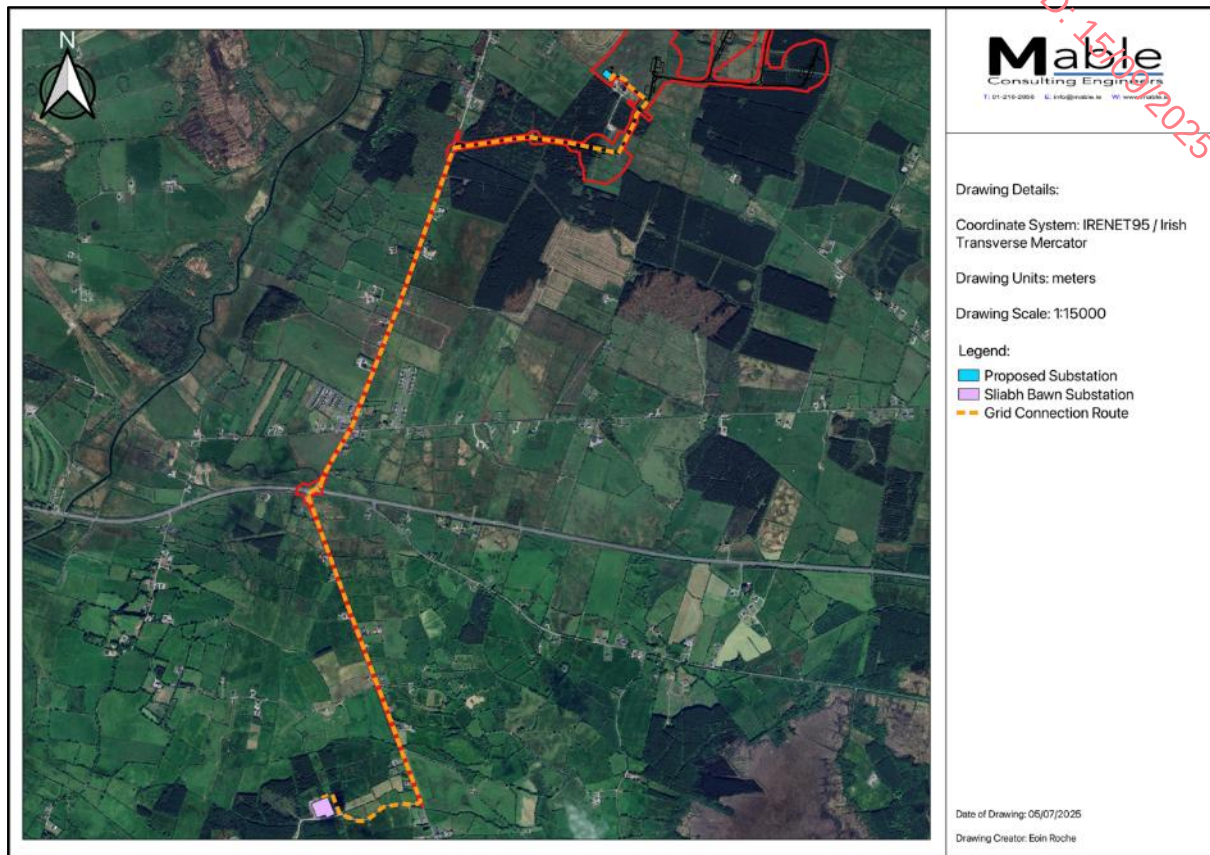


Figure 3-2 - Layout of GCR

Further detail on the GCR construction and crossings is given in Section 5.9

4.0 N5 Ballaghaderreen to Scramoge Road Project

Roscommon County Council and Transport Infrastructure Ireland are overseeing the construction of the N5 Ballaghaderreen to Scramoge Road Project, a new 34-kilometer stretch of National Road intended to modernize the connection between Ballaghaderreen and Scramoge in County Roscommon.

The new road section is designed as a Type 1 single carriageway that will bypass Frenchpark, Bellanagare, Tusk, and Strokestown.

The N5 Ballaghaderreen to Scramoge Road Project has moved into the construction phase, with contracts signed and construction having officially commenced in late 2023. The estimated timeline for completion is about four years, aiming for substantial completion by late 2027.

Figure 4-1 gives detail on the proposed new road in the vicinity of the proposed Project.

Prior to commencement of the works, the Traffic Management Plan will be reviewed and updated by the appointed contractor. In the unlikely event that the N5 realignment project has not been completed, the Applicant and Contractor will liaise with the Local Authority and TII in relation to the new road scheme and incorporate their requirements into the detailed plan.

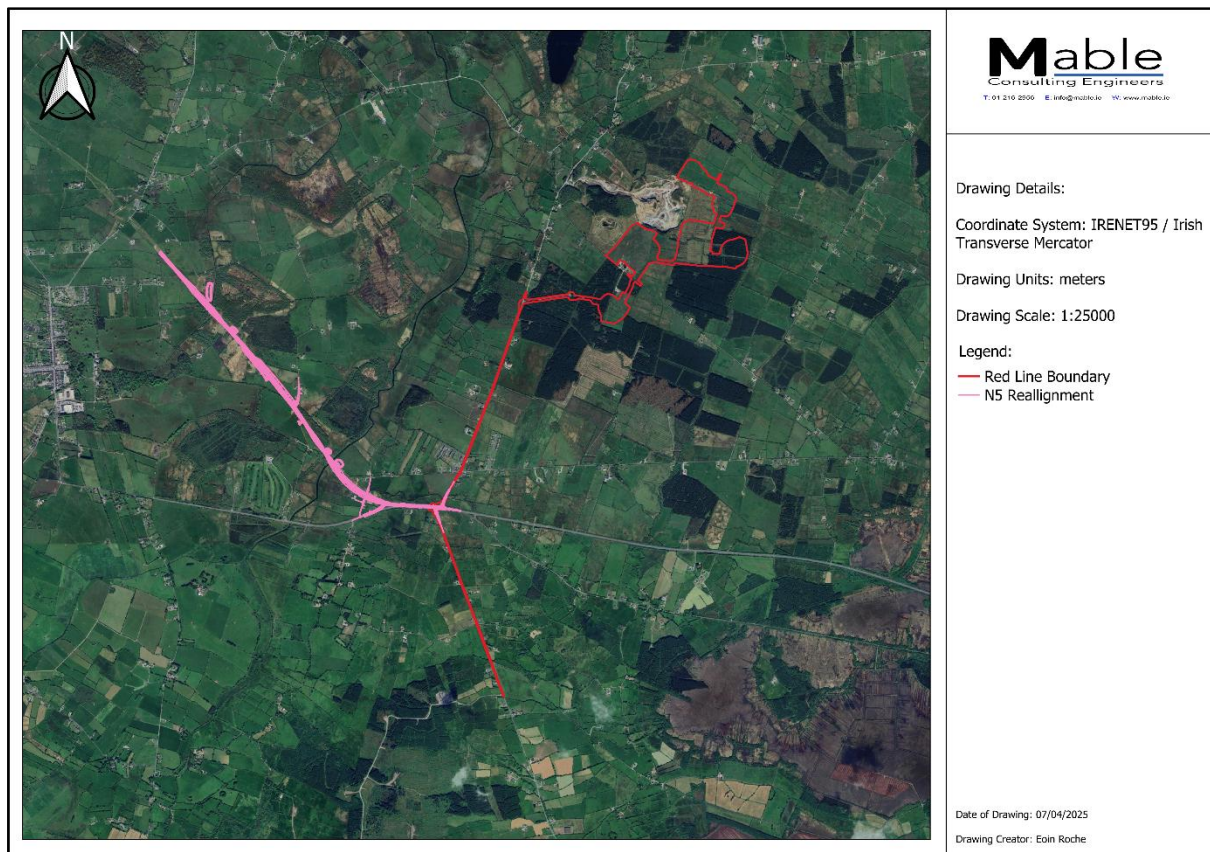


Figure 4-1 – Alignment of the N5 Ballaghaderreen to Scramoge Road shown in Magenta and proposed Project outlined in red

4.1.1 Proposed Project and N5 Realignment Interface

The following elements of the proposed Project interface with the N5 Ballaghaderreen to Scramoge Road Project:-

- Turbine Delivery Route (TDR);
- Grid Connection Route (GCR).

4.1.2 Turbine Delivery Route Interface

It is proposed to utilise the proposed new N5 Ballaghaderreen to Scramoge Road Project as part of the TDR for the proposed Project, see **Figure 4-2**, Option 1a. This route avoids bringing abnormal loads through the town of Strokestown.

In the unlikely event that the new N5 road scheme has not been completed by the time the proposed Project deliveries are due to commence, an alternative route through Strokestown will be utilised, see **Figure 4-2**, Option 1b.

Both route option have been assessed for required accommodation works and potential impacts within the **EIAR**.

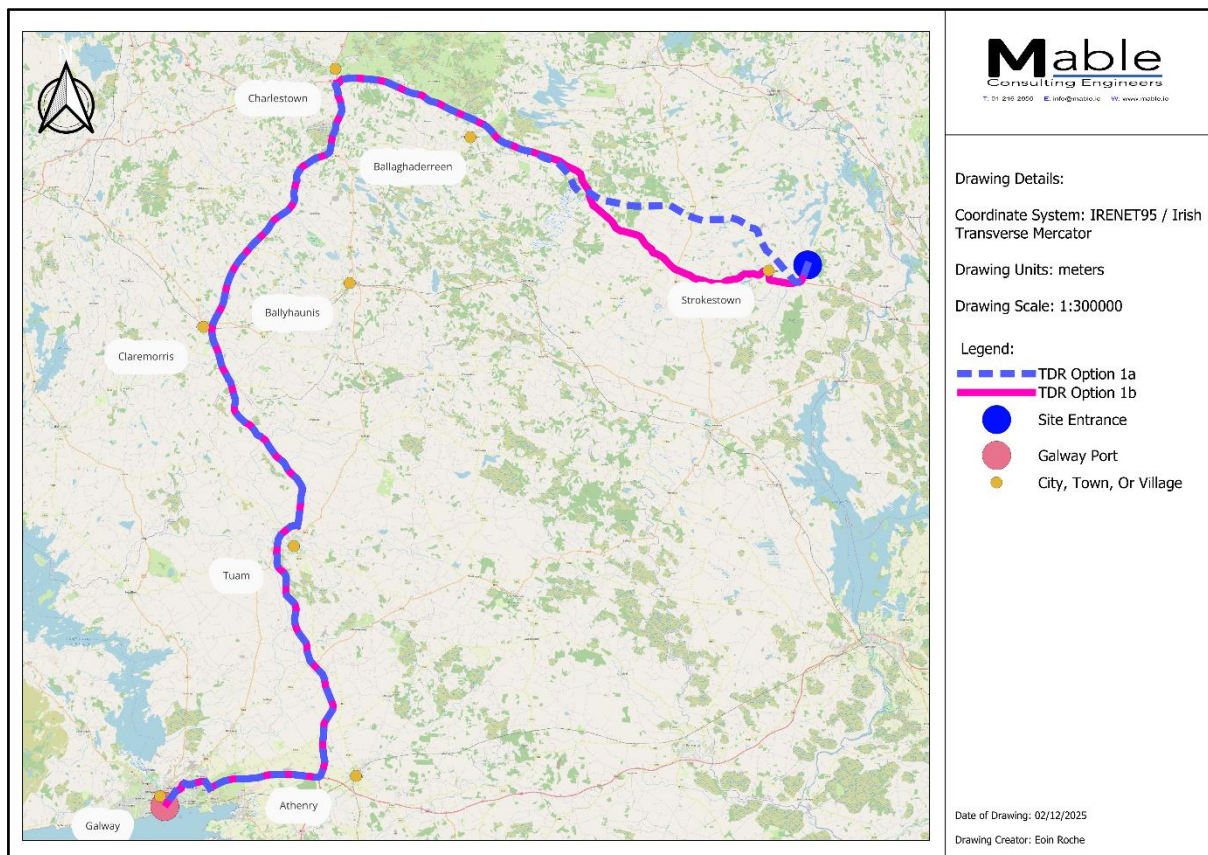


Figure 4-2 – TDR Options

Further detail on the TDR routes is set-out in the TMP (**EIAR, Volume III, Chapter 2.1.3; Traffic Management Plan**).

4.1.3 Grid Connection Route Interface

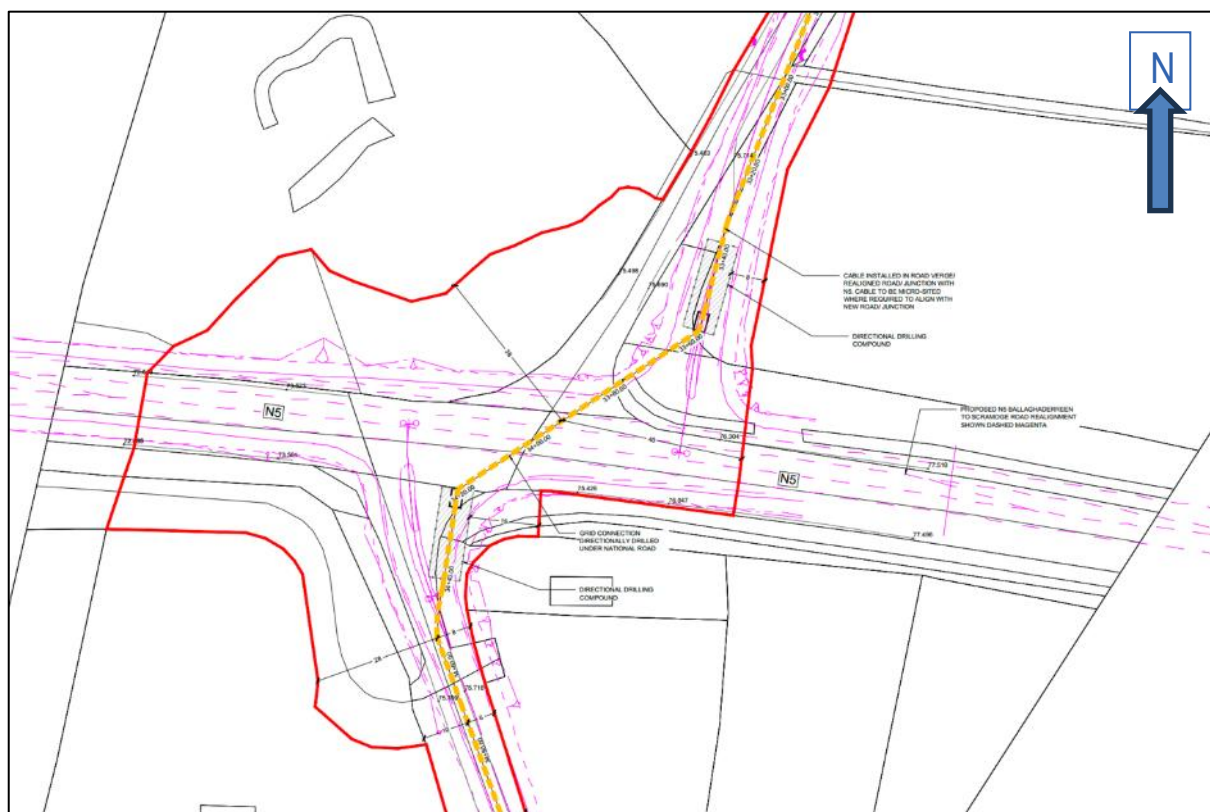
It is proposed to install the GCR within the public road network, a section of this route will cross the N5 National Road at the R371/N5 junction. It is envisaged that Directional Drilling will be utilised for this road crossing in accordance with Transport Infrastructure Ireland (TII) best practice guidelines provided during the scoping exercise for the proposed Project.

The N5 Ballaghaderreen to Scramoge Road Project ties back into the existing N5 road at this R31/N5 junction. The design of this tie-in has been reviewed as part of the design of the GCR.

The proposed GCR alignment has been coordinated with both the existing N5 road alignment and the proposed new N5 road alignment. The proposed layout has been selected to be compatible with both the existing arrangement and the proposed arrangement thus avoiding any conflict with the new road design or the timing of its construction.

Existing Road Alignment detailed in black, Proposed New Road Alignment detailed in Magenta.

Figure 4-3 give details on the GCR through the existing and proposed R371/N5 road junction. On this figure the existing road alignment is detailed in black and the proposed new road alignment detailed in magenta. Further details are contained on the Grid Route Site Layout Map, **Planning Drawing 23604-304**.



Existing Road Alignment detailed in black, Proposed New Road Alignment detailed in Magenta.

Figure 4-3 – GCR Crossing of N5

5.0 Construction Management

5.1 Duration and Phasing of the proposed Project

It is anticipated that the overall construction of the Project will take approximately 18 months from starting on-site to final commissioning of the wind turbines.

Table 5-1 details the works in a number of key phases, some of these phases will run in parallel.

Phase	Activity	Estimated Duration
1	Detailed Design Stage – For Construction - Detailed Civil, Structural and Electrical Design Works - Planning Compliance Works - Environmental Compliance Works - Pre-Construction Surveys	6 months over approximately a 15 month period
2	Civil Engineering Enabling Works - Setting out site boundaries - Tree felling and hedge cutting - Site entrance works to create access - Temporary Construction Compound - Advance drainage works and silt control measures	3 months
3	Civil Engineering Main Site Works - Upgrade and Widening of Public Road in Vicinity of Site - Access Track Construction - Crane Hardstand Construction - Drainage Works - Initial Reinstatement Works (Pre-Turbine Delivery) - Final Reinstatement Works (Post-Turbine Delivery)	8 months (Pre-Turbine Delivery) 2 months (Post-Turbine Delivery)
4	Structural Engineering Works - Wind Turbine Foundation Construction - Relay Tower Foundation Construction - Substation Construction	4 months
5	Wind Farm Internal Cabling	4 months
6	Turbine Delivery Route Enabling Works	3 months
7	Turbine Delivery, Erection and Commissioning	6 months
8	Site Electrical Works - Developer (IPP) Electrical Installations & Commissioning - ESB Networks Electrical Installations & Commissioning	6 months
9	Grid Connection Works - Ducting Works - Cable Installation Works - Final Connection Works in ESB Substation	5 months
10	Final Commissioning of the Development	1 month
Total Duration on Site (Some Phases will be carried out in parallel)		18 months

Table 5-1 – Proposed Project Construction Stage Duration and Phasing

All vegetation clearance that is required for the construction works will be carried outside the bird breeding season, which runs from the 1st of March to the 31st of August. To comply with this requirement a section of the initial Civil Engineering Works may be carried out as advance enabling works in the months from September to February.

A Gantt Chart Programme for the proposed works is given in **Figure 5-1**.

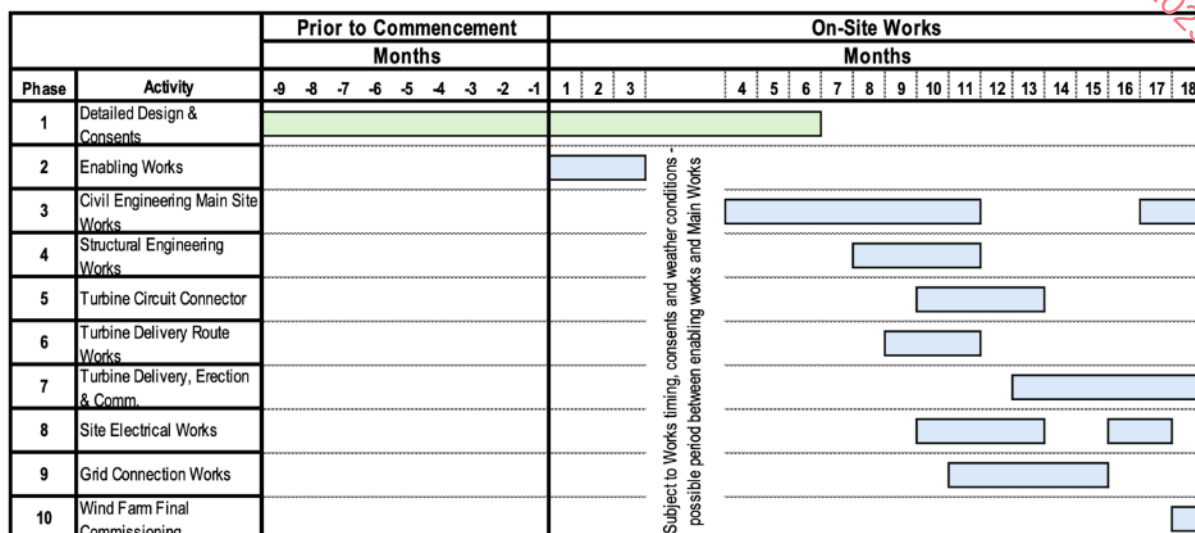


Figure 5-1 Gantt Chart Programme

5.2 Construction Hours

The hours of construction activity will be limited to avoid unsociable hours, where possible. Construction operations shall generally be restricted to between 07:00hrs and 19:00hrs on weekdays and between 07:00hrs and 14:00hrs on Saturdays.

However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e., concrete pours or to accommodate turbine erection and delivery of large turbine components along public routes), it may be necessary on occasion to work outside of these hours. Any such out of hours working will be agreed in advance with Roscommon County Council.

5.3 Employment

For the construction phase, a peak workforce of approximately 35 persons is anticipated on the wind farm Site and approximately 10 persons on the GCR. There will be peaks and troughs in the numbers, with a larger workforce during the general site works.

5.4 Roles and Responsibilities

The Organisational Structure for the construction phase of the Project is set out in

Figure 5-2. This structure will be developed further at pre-construction incorporating the requirements of Roscommon County Council and other stakeholders.

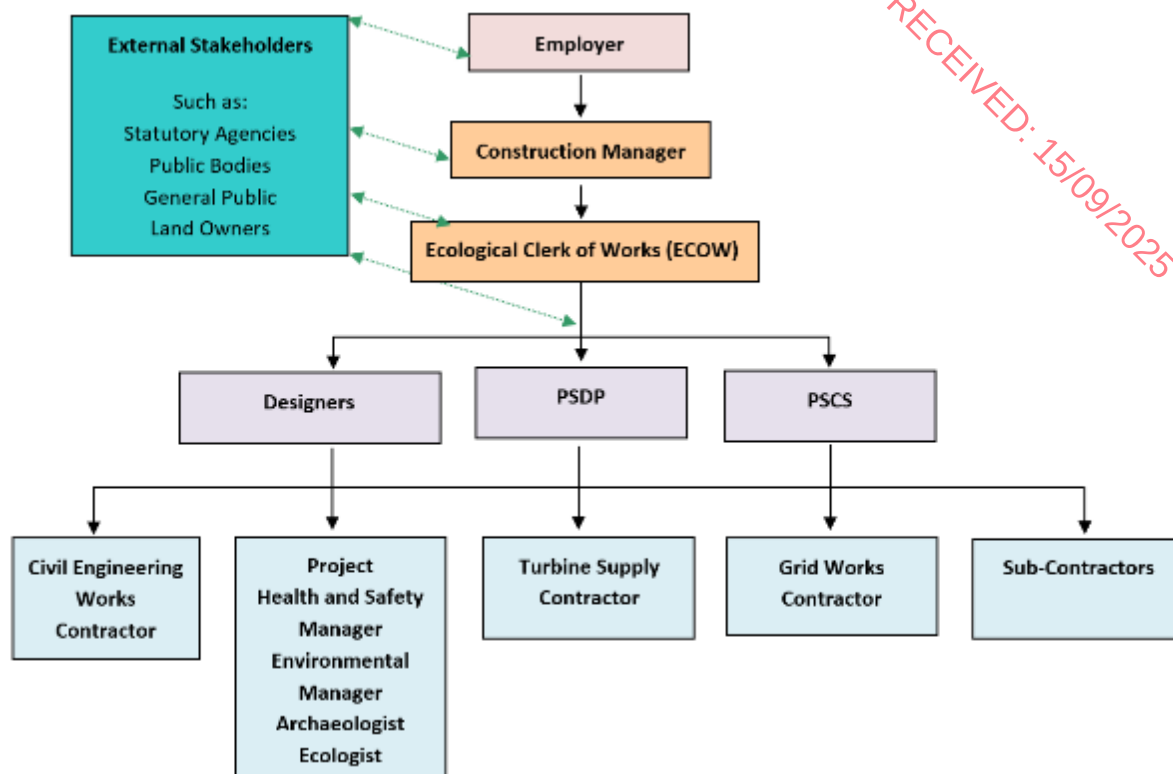


Figure 5-2 – Project Organisational Chart

The roles and responsibilities of each of the key members of the Organisational Structure is set out below.

5.4.1 Developer

The developer (the Developer) is the entity responsible for developing, operating and ultimately decommissioning the wind farm. The Developer is responsible for ensuring that competent parties are appointed to undertake the design and construction of the Project and to ensure sufficient resources are made available to facilitate the appropriate management of risks to the environment, safety and health and compliance with the Planning Permission, Building Regulations and other legislative requirements.

5.4.2 Construction Manager

A suitability qualified Construction Manager (CM) will be appointed by the Developer and will have overall responsibility for overseeing the construction of the proposed Project in accordance with regulatory and project environmental requirements.

The duties and responsibilities of the CM will include:-

- Assist the Developer with the appointment of suitably qualified Environmental Clerk of Works (ECOW), Project Supervisor Design Process (PSDP), Project Supervisor Construction Stage (PSCS), Designers, Project Archaeologist, Ecologist, Geotechnical Engineer, Turbine Supply Contractor, Civil Engineering Contractors and other contractors.
- Hold design team meetings, site meetings and other stakeholder meetings as required;
- Coordinate with the above roles and liaise with other project stakeholders;
- Ensure that all works are designed, planned and constructed safely and with minimal environmental risk;
- Update this **CEMP** to create a "Construction Stage" **CEMP**;
- Implement the **CEMP** on site, monitor the compliance through audits and site visits and take corrective action where necessary;

- Take advice from the ECoW on legislation, codes of practice, guidance notes and good environmental practice;
- Ensure timely notification of environmental incidents;
- Ensure that all waste and byproducts are managed and disposed in accordance with legislation and regulations current at the time as outlined in the WMP (**EIAR, Volume III, Chapter 2.12: Waste Management Plan**). Ensure that all contractors hired to remove waste and byproducts from the site have valid Waste Collection Permits and that the waste and byproduct is brought to an appropriately licenced waste facility as outlined in the WMP;
- Put communication protocols in place to ensure that all personnel on site are made aware that they are responsible for ensuring good construction and environmental practice and that they are encouraged to provide feedback and suggestions for improvements.

5.4.3 Environmental Clerk of Works

A suitably qualified Environmental Clerk of Works (ECoW) will be appointed by the Developer and will have overall responsibility for overseeing Environmental compliance on the Project and will report to the CM.

The ECoW will monitor the site works and ensure that methodologies and mitigation are followed throughout construction to avoid negatively impacting on the receiving environment. The ECoW will have authority to suspend works in an area where an Environmental issue has been observed.

The duties and responsibilities of the ECoW will include:-

- Preparation of the **CEMP** and supporting environmental documentation.
- Review and approval of contractor method statements and risk assessments;
- Monitor the implementation of the **CEMP**, carry out site inspections and audits to ensure the works are carried out in compliance with the **CEMP**;
- Keep site records to demonstrate compliance with the **CEMP**, the Planning Permission and other statutory requirements;
- Hold design team meetings, site meetings and other stakeholder meetings as required;
- Advise site management and contractors on items such as:-
 - Prevention of environmental pollution;
 - Planning conditions and other statutory requirements;
 - Suitability and use of plant, equipment and materials to prevent pollution;
 - Environmentally sound methods of working and systems to identify environmental hazards.
- Ensure mitigation measures are initiated and adhered to during the construction and subsequent phases;
- Liaise with Project Archaeologist, Ecologist, Hydrologist and Geotechnical Engineer and ensure their regular site visits and audits / inspections are completed;
- Ensure adequate emergency response procedures are put in place;
- Ensure that details of environmental incidents are communicated in a timely manner to the relevant regulatory authorities;
- Investigate incidents of significance and ensure corrective actions are carried out;
- Identify environmental training requirements and arrange relevant training for all levels of site based personnel.
- Put communication protocols in place to ensure that all personnel on site are made aware that they are responsible for ensuring good construction and environmental practice and that they are encouraged to provide feedback and suggestions for improvements.

5.4.4 Project Supervisor Design Process (PSDP)

In relation to safety and health; the design and construction of the wind farm is governed by the Safety, Health and Welfare at Work Act 2005 and also by S.I. No. 291 of 2013 the Safety, Health and Welfare at Work (Construction) Regulations 2013 (H&S Construction Regulations).

The scale and scope of this project requires that a PSDP and PSCS are appointed by the Developer (referred to as the client in the Construction Regulations).

The role of the PSDP is to ensure co-ordination of the work of designers throughout the project. This role has been performed by Rowan Consulting Engineers up to the end of the planning stage of the Project.

The Developer will appoint a PSDP for the construction phase of the project, the PSDP will report directly to the Developer. The duties of the PSDP will include:-

- Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project;
- Work with and coordinate designers to design out safety, health and environmental risks at source where possible so as to eliminate / reduce these risks during the construction stage and during the operation, maintenance and decommissioning;
- Prepare a written Safety and Health Plan for the project taking into account any particular risks;
- Communicate necessary control measures, design assumptions and residual risks to the PSCS so they can be dealt with in the Construction Stage Safety and Health Plan;
- Ensure that the work of designers is coordinated in terms of Health, Safety and the Environment;
 - Coordinate the designers involved in the project, including any temporary works designs during the construction stage;
- Organise co-operation between designers;
- Prepare a safety file for the completed development and give it to the Developer;
 - The safety file is to include relevant detail on the project's design, operation, maintenance and decommissioning; and
- Notify the Health and Safety Authority (HSA) and the Developer of non-compliance with any written directions issued.

5.4.5 Project Supervisor Construction Stage (PSCS)

The role of the PSCS is to manage and co-ordinate health and safety matters during the construction phase.

The Developer will appoint a PSCS for the construction phase of the Project, the PSCS will report directly to the Developer. The duties of the PSCS will include:-

- Development of the Safety and Health Plan for the construction phase and update as required as work progresses;
- Notify the HSA before work commences;
- Provide required safety file information to the PSDP;
- Report accidents / incidents to the HSA and the Developer;
- Coordinate the implementation of the H&S Construction Regulations, monitor compliance and take corrective action where necessary;
- Organise cooperation between contractors;
- Coordinate the checking of safe work procedures and monitor compliance with the H&S Construction Regulations;
- Review and approval of contractor method statements and risk assessments;

- Coordinate arrangements to ensure workers have Safe Pass and relevant Construction Skills Certification Scheme (CSCS) cards;
- Coordinate measures to restrict entry to site;
- Provide a site induction to all site personnel and carry out Toolbox Talks as necessary;
- Maintenance of the site Safety Files which are to include detail on personnel on site, their training details and induction date;
- Coordinate the appointment of a Safety Representative (when there are 20+ people on site); and
- Notify the HSA and the Developer of non-compliance with any written directions issued.

5.4.6 Designers

Designers will be appointed to carry out the construction phase detailed design of the Project and to monitor the on-site construction works. They will be appointed either directly by the Developer or by the contractors.

The duties and responsibilities of Designers will include:-

- Carry out designs that allows the project to be constructed, operated, and decommissioned safely and in compliance with the Planning Permission, **EIAR** and relevant legislation;
- Carry out Design Risk assessments.
 - Identify possible hazards that may present during construction and subsequent operation and decommissioning phases. Where possible, eliminate the hazards or reduce the risk;
- Communicate necessary control measures, design assumptions and residual risks to the CM, Environmental Manager, PSDP and PSCS;
- Co-operate and coordinate designs with other designers, the PSDP and the PSCS; and
- Carry out periodic site inspections during construction.

Key designers will be required to hold appropriated professional indemnity insurance and, upon successful completion of their design, will issue opinions on compliance with Planning Permissions and Building Regulations.

5.4.7 Project Archaeologist

The Project Archaeologist will report to the Environmental Manager and the National Monuments Service (NMS) and will be responsible for archaeological monitoring of the site during the construction phase. This will include monitoring of site investigations, excavation works, metal detection of excavated spoil and other tasks which may be required for compliance with any conditions of planning.

5.4.8 Project Ecologist / Ecological Clerk of Works

A suitably qualified Ecological Clerk of Works (EcoCoW) will be appointed by the Employer and will have overall responsibility for overseeing Environmental compliance on the Project and will report to the Construction Manager (CM) and liaise with the Environmental Clerk of Works (ECOW).

The EcoCoW will monitor the site works and ensure that ecological methodologies and mitigation are followed throughout construction to avoid negatively impacting on the receiving environment. The EcoCoW is responsible to ensure that all mitigation as identified in the NIS is implemented onsite.

The Project Ecologist will report to the ECoW and is responsible for the protection of sensitive habitats and species encountered during the construction phase of the Project. The Project Ecologist will carry out periodic site inspections during construction.

The responsibilities and duties of the EcoCOW will include the following:-

- Review and input into the preparation of the Construction Phase **CEMP** in respect of ecological matters;
- Carry out site visits to carry out environmental audits and reviews and report any issues noted to the ECoW;

- In liaison with ECoW, oversee and provide advice on all relevant ecology mitigation measures set out in the **EIAR** and as may be required for compliance with any conditions of planning and wildlife law; and
- Carry out ecological monitoring and survey work as may be required by and for compliance with any conditions of planning.

5.4.9 Project Hydrologist

The Project Hydrologist will report to the ECoW and is responsible for inspection and review of drainage and water quality aspects associated with construction of the Project. The Project Hydrologist will carry out periodic site inspections during the construction phase.

The responsibilities and duties of the Project Hydrologist will include the following:-

- Review and input into the preparation of the construction phase **CEMP** in respect of hydrological matters;
- Assist in compiling a detailed drainage design before construction commences and attend the site to set out and assist with micro siting of proposed drainage controls;
- Review and input to the preparation of the construction phase **CEMP** in respect of drainage and water quality management; and
- Carry out site visits and hydrological and water quality audits and report any issues noted.

5.4.10 Project Geotechnical Engineer

The Geotechnical Engineer or Project Geologist will report to the ECoW and is responsible for inspection and review of geotechnical aspects associated with construction of the Project. The Geotechnical Engineer will carry out periodic site inspections during construction.

The responsibilities and duties of the Geotechnical Engineer or Geologist will include the following:-

- Review and input into the preparation of the Construction Phase **CEMP** in respect of geotechnical matters;
- Liaise with designers and specify any construction stage site geotechnical investigation works;
- Inspect turbine foundation formation and confirm formation make-up;
- Carry out site visits to carry out geotechnical assessment work and monitoring;
- Ensuring that identified hazards are listed in the Geotechnical Risk Register and that these are subject to ongoing monitoring.

5.4.11 Community Liaison Manager

A liaison manager will be appointed by the applicant and will report to the Construction Manager, the ECoW and the Developer. The responsibilities and duties of the Community Liaison Manager will include:-

- Establish communication channels between Developer, Contractor, Roscommon County Council, local residents / neighbours.
- Briefing residents / neighbours on progress and issues as necessary;
- Liaison with Roscommon County Council, emergency services and other stakeholders; and
- Liaison with local Gardaí, particularly in relation to traffic movements and permits where necessary.

Contact details for the liaison manager will be posted on all construction site notice boards and on any other information or correspondence, which may be distributed from time to time.

5.4.12 Contractor

Suitably qualified and experienced contractors will be appointed to carry out the project construction works in accordance with the Planning Permission, Environmental and other regulatory requirements.

The construction contractors appointed will be responsible for the organisation, direction, and execution of construction related activities during the detailed design and construction of the Project. Contractors will report to the CM and the ECoW.

5.4.13 Site Manager

A Site Manager will be appointed by the contractor to oversee the day-to-day management of working areas within the site and ensure that effective, safe, planned construction activities are delivered on an ongoing basis to the highest standards.

The Site Manager will be a suitably qualified, competent, and experienced professional that will oversee site logistics, communicate regularly with construction staff, accommodate project-specific inductions for staff on site and ensure that all work is compliant with the relevant design standards and health and safety legislation.

The Site Manager will report to the CM and the ECoW.

The Site Manager will be responsible for:-

- Implementing the **CEMP** and other management plans on the site;
- Establishing, implementing, and maintaining the environmental management systems in line with ISO 14001;
- Conducting regular on-site inspections and audits and ensure that adequate site records on compliance are documented;
- Monitor the works to ensure they are carried out in accordance with the **CEMP** and relevant H&S and environmental requirements and when necessary, recommend corrective action;
- Hold site meetings and other stakeholder meetings as required;
- Ensuring appropriate Method Statements and Risk Assessments have been prepared for the works;
- Ensuring all personnel have undertaken adequate inductions, awareness briefings and training;
- Liaise with Stakeholders and dealing with enquires and complaints;
- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner.
- Put communication protocols in place to ensure that all personnel on site are made aware that they are responsible for ensuring good construction and environmental practice and that they are encouraged to provide feedback and suggestions for improvements.
- Appoint a Safety Representative to represent the safety interests of employees on the site. The Representative will act as a liaison between the workforce and management on health and safety matters.

5.4.14 Health, Safety, Environmental and Quality (HSEQ) Officer

A HSEQ Officer will be appointed by the contractor to ensure that the **CEMP** is effectively implemented, developed and managed. The HSEQ Officer will be a suitably qualified, competent and experienced professional that will review health, safety, environmental and quality on a day-to-day basis and consult with the members of the construction team and stakeholders as required.

The HSEQ Officer will work closely with, and report to, the Site Manager. The HSEQ will assist the Site Manager in meeting the above responsibilities and will also be required to keep up-to-date with relevant environmental best practice and legislative changes.

5.4.15 Traffic Management Coordinator

A competent Traffic Management Coordinator (TMC) will be appointed for the duration of the Project and this person will be the main point of contact for all matters relating to traffic management. The TMC will ensure the implementation of the Traffic Management Plan. The Traffic Management plan is contained in the **EIAR, Volume III, Chapter 2.1.3; Traffic Management Plan**.

The TMC will monitor works which have an impact on the public road and ensure that methodologies and mitigation are followed throughout construction to avoid negatively impacting road use and safety. The TMC will report to the CM.

5.5 Vehicles, Plant and Equipment

Vehicles, Plant and Equipment will be required to meet the following:-

- Only mechanically sound vehicles, plant and equipment will be permitted on site.
- To minimise emissions, noise and the risks of oil or fuel leaks; vehicles, plant and equipment use on site are to be properly serviced and maintained
- Noise emitting vehicles, plant and equipment are to be fitted with effective exhaust silencers.
- Vehicles, plant and equipment are to travel to work areas using the access tracks, there is to be no tracking of vehicle through watercourses and open land not part of the works.
- Refuelling of plant and vehicles will be carried out only in designated areas using the prescribed procedure.
- Refuelling and maintenance is not to be carried out within watercourse or drain buffer zones.
- Maintenance; in the event of a vehicle, plant or equipment requiring repairs, maintenance will be promptly carried out to minimise emissions arising from inefficient operation. This work will be carried out in the refuelling area or off site.
- Engine Idling; stationary onsite vehicles, plant and equipment will have engines turned off to reduce unnecessary idling emissions and noise.

5.6 Pre-Construction Surveys & Detailed Design

5.6.1 Pre-Construction Surveys

Prior to commencement of the construction works pre-construction surveys will be carried out to be used as part of the construction phase design and to meet the requirements of any conditions of planning.

These surveys will include: -

- Detailed Geotechnical Site Investigations;
- Road Condition Surveys;
- Environmental Surveys;
- Archaeological Surveys;
- Bird Surveys; and
- Telecommunications Surveys.

5.6.2 Construction Stage Detailed Design

Prior to the commencement of construction works, construction phase detailed design will be carried out and notified to Roscommon County Council. At construction phase these designers will be appointed to monitor the on-site construction works and to issue certificates of compliance with relevant codes on completion.

Key designers will be required to hold appropriated professional indemnity insurance and upon successful construction of their design will issue opinions on compliance with Planning Permissions, Building Regulations, Product and other Regulations.

Key designers will include:

- Civil Engineering Design Engineer;
- Structural Design Engineer;
- Electrical Design Engineer;
- Geotechnical Engineer;
- Hydrology Engineer;
- Turbine Designer;
- ESB Networks (ESBN) Grid Connection Design Engineer; and
- Telecommunications Designer.

5.7 Wind Farm Construction Works

5.7.1 Enabling Works

Prior to the main construction works commencing, advanced site enabling works will be carried out outside the bird breeding season, which runs from the 1st of March to the 31st of August.

These works will include topographical setting out to demarcate the site boundaries, tree and hedge cutting, site entrance works, Temporary Construction Compound and advance drainage works and silt control measures. Figure 5-3 shows a typical advance settlement pond under construction and later this pond in operation during the main construction works.

As part of habitat management, stockproof fencing will be erected to delineate the Project's redline boundary – this will be used to:-

- Minimise working areas to avoid unnecessary habitat removal or alteration.
- Restrict machinery and habitat removal to clearly marked construction footprints.
- Create tree protection barriers and ground protection in root zones.
- Protect existing hedgerows and trees.



Figure 5-3 - Settlement Pond Construction in advance of the Works, and later its operation

5.7.2 Tree Felling

Tree felling to facilitate the proposed Project will be carried out in a "Keyhole" manor in advance of the main construction works. In advance of tree felling, Tree Felling Licenses will be obtained from the Minister for Agriculture, Food and the Marine provides authority under the Forestry Act 2014 as amended.

Tree felling will be carried out in accordance with the requirements of the Tree Felling Licence and the following the Forest Service guidelines issued by the Department of Agriculture, Food and the Marine, 1st Published 7th March 2022, Updated 15th July 2025.

- Forest Protection Guidelines
- Forestry and Water Quality Guidelines
- Forest Harvesting and Environmental Guidelines
- Forestry and Freshwater Pearl Mussel Requirements - Site Assessment and Mitigation Measures
- Forest Biodiversity Guidelines
- Forestry and The Landscape Guidelines
- Forestry and Archaeology Guidelines

The following control measures will be put in place during felling operations: -

- The type of plant and equipment used (such as chainsaws and mechanical tree harvester) will be selected based on ground conditions at the time of felling, and which will minimise soil disturbance.
- The existing drainage features are to be retained and protected during felling works.
- Silt control measures will be established in advance of the felling works. See SWMP for details on silt control measures (**EIAR, Volume III, Chapter 2.1.1; Surface Water Management Plan**).
- Drains and silt control measures will be maintained during felling works to ensure they are clear of sediment build-up.
- Vehicles will use road infrastructure and existing watercourse crossing points, the is to be no tracking of vehicle through watercourses.
- Trees will be cut manually inside buffer zones and using machinery to extract whole trees only;
- Timber will be stacked in dry areas outside buffer zones for removal off site for use in other industry. Remaining branches and vegetation will be chipped / mulched / shredded and used for topsoil enrichment.
- Felling and extraction of timber will be undertaken in suitable weather conditions e.g., avoiding sustained rainfall (any foreseen rainfall event longer than 4-hour duration) and/or any yellow or greater rainfall warning (>25mm/hour) issued by Met Éireann.
- Felling and extraction of timber will only be permitted by experienced and fully trained operators.
- All Forest Service guidelines will be adhered to during all harvesting activities.

5.7.3 Site Drainage

See the SWMP for details on site drainage (**EIAR, Volume III, Chapter 2.1.1; Surface Water Management Plan**).

5.7.4 Site Entrances

There are 6 No. site entrances / exits proposed to service the proposed Project; 4 No. permanent entrances and 2 No. temporary entrances. Of the 4 No. permanent entrances, one of these is an upgrade of an existing field entrance. Of the 2 No. temporary entrances, one of these is a temporary upgrade to an existing forest track entrance. The site entrances are detailed in Figure 5-4.

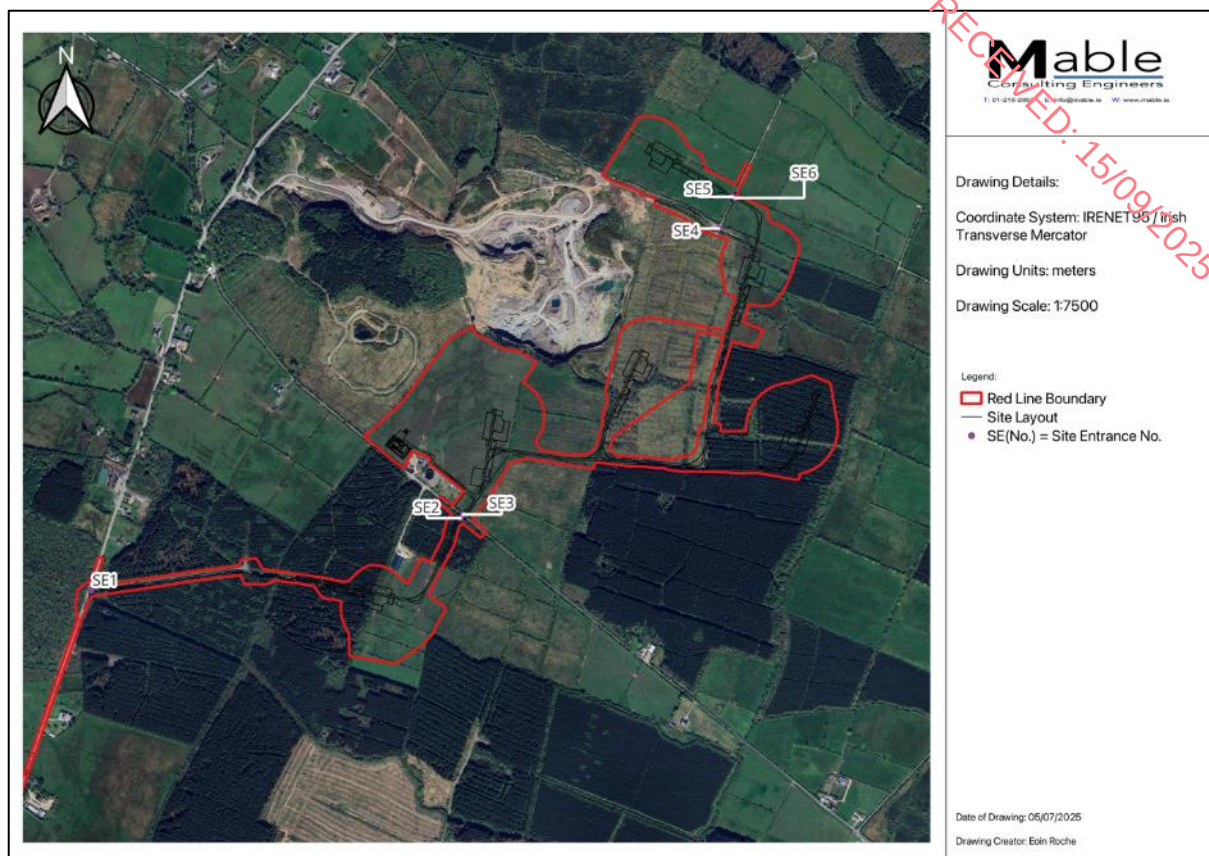


Figure 5-4 – Site Entrance Locations

5.7.4.1 Permanent Site Entrances

Details on the 4 No. permanent site entrances are given in Table 5-2.

Code	Name	Description
SE2	Site Entrance 2	Entrance off the L6018 servicing the proposed Turbine T01, This is a new site entrance onto the public road.
SE3	Site Entrance 3	Entrance off the L6018 servicing the substation, Relay Tower, and Turbines T02 to T05, this is a new site entrance onto the public road.
SE4	Site Entrance 4	Entrance off the L60498 servicing the proposed Turbine T05, This is an upgrade to an existing field entrance onto an unsealed public road.
SE5	Site Entrance 5	Entrance off the L60498 to proposed Turbine T06, This is a new site entrance onto an unsealed public road.

Table 5-2 – Permanent Site Entrance Details

5.7.4.2 Temporary Site Entrance

Details on the 2 No. temporary site entrances are given in Table 5-3:-

Code	Name	Description
SE1	Site Entrance 1	Entrance off the R371 servicing the proposed Turbine T01 during the construction phase. This is an upgrade to an existing Coillte forest track site entrance. This site entrance will accommodate abnormal load deliveries and construction traffic during the construction phase. SE1 will revert to its original layout and use on completion of the construction phase. During the operational phase this entrance may be re-established in the event that an abnormal load or loads are required as part of Turbine component repair or replacement.
SE6	Site Entrance	Entrance off the L60498 connecting the primary access track to SE5 to accommodate a straight run through with turbine component deliveries to T06. Except for abnormal loads, SE6 will not be used for construction traffic, a removable barrier will be constructed across the entrance to this road to prevent unauthorised use. This site entrance will be removed and the area reinstated on completion of abnormal load deliveries and the construction phase.

Table 5-3 – Temporary Site Entrance Details

5.7.4.3 Site Entrance Design

The proposed site entrances have been designed in accordance with TII Publication ‘Rural Road Link Design 2017’ (DN-GEO-03031), ‘Geometric Design of Junctions (Priority Junctions, Direct Accesses, Roundabouts, Grade Separated and Compact Grade Separated Junctions)’ (DN-GEO-03060) & The Roscommon County Development Plan 2022-2028.

The site entrances will be constructed to the requirements of Roscommon County Council. The requirement to ensure surface water from the Project does not flow onto the public road. This will be achieved by creating a localised ramp across the width of the entrance. This ramp will direct surface water flow at the entrance into the site drainage network.

5.7.5 Access Tracks

It is proposed to construct approximately 3.9km of new access track and 0.5km upgraded access track 5.5m wide. At construction phase there will be sections of track with temporary widened areas to accommodate abnormal load deliveries, these will be removed on completion of Turbine deliveries.

The tracks will take the form of an excavated track filled with Class 1C fill and finished with clause 6F2 crushed stone, a typical cross section is detailed on **Planning Drawing 23604-550**.

An existing Coillte forest track approximately 545m in length has been incorporated into the internal Access track layout, this will be upgraded to accommodate wind farm traffic loading and width requirements. An existing track upgrade cross section is detailed on **Planning Drawing 23604-550**.

Figure 5-5 shows typical excavated track construction at formation level with geotextile, geogrid and an edge drain.



Figure 5-5 - Excavated Access Track Formation, Geotextile, Geogrid and Edge Drain

Access tracks will be constructed as follows:-

1. The proposed access track will have an overall width of 5.5m.
2. The alignment of the new site access tracks will be set out based on the construction drawings and the centreline marked out using ranging rods or timber posts.
3. Topsoil will be excavated in the presence of the Archaeologist and removed to the temporary topsoil repository area for use in the permanent reinstatement works.
4. The subsoil will be excavated to firm formation as detailed on **Planning Drawing 23604-550**.
5. As per the above drawing, well graded granular fill will be spread and compacted in layers and capped with clause 804 crushed aggregate.
6. All new access tracks will be constructed with a fall to aid drainage of surface water. Access track will be graded to ensure that all runoff is channelled towards the dirty water drains.
7. Where access track are being constructed within a buffer zone, a Roadside Drainage Berm will be constructed to direct surface water runoff from the track into drainage measures outside the buffer zone. This Roadside Drainage Berm will consist of a small embankment built along the length of the roadside open drain (dirty water drain).

Figure 5-6 shows a completed and landscaped site access track.



Figure 5-6 - Completed Access Track

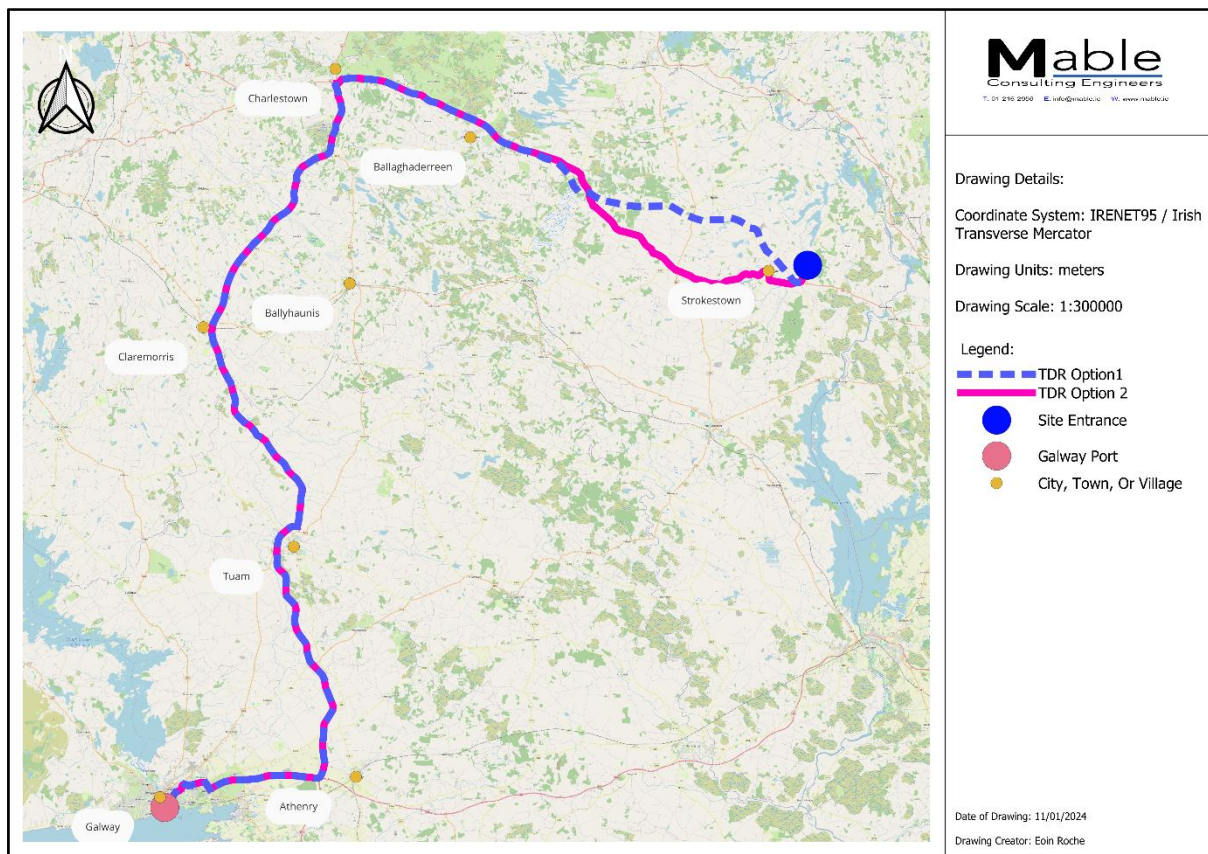


Figure 5-7 – Overview of TDR

Localised temporary widening and stoning of public road verges and roundabouts will be required on the TDR to facilitate abnormal load vehicle wheel over-run. Hedge and tree cutting will also be required as well as relocation of utility overhead lines, poles, lampposts, signage, and other street furniture.

Public Road Works for Turbine Delivery will include the following:-

1. Carry out construction stage SPA and identify:-
 - a. Areas to be cleared of obstructions to allow for Turbine Component oversail,
 - b. Areas to be stoned to facilitate delivery vehicle over-run,
 - c. Hedge and tree cutting,
 - d. Relocation of utility overhead lines, poles, lampposts, signage, and other street furniture.
2. Coordinate with Galway, Mayo, and Roscommon County Council's Roads Division, Utility Companies, Landowners and Local Residents on the proposed works;
3. Obtain a Road-Opening Licence from Galway, Mayo, and Roscommon County Council Road Divisions, as part of this, the following will be prepared and submitted to the council:-
 - a. Drawings of the proposed works,
 - b. Works method statement and Risk Assessment,
 - c. Traffic Management Plan,
 - d. Insurance for the Works,
 - e. Construction Programme,
4. On commencement of construction works; Implement Traffic Management Measures,
5. Tree and Hedge cutting carried out outside the bird breeding season, which runs from the 1st of March to the 31st of August.

At turbine component delivery stage, a transportation plan will be prepared by the wind turbine supplier. Permits for moving the abnormal loads on the public roads to the site will be obtained from An Garda Síochána and the applicable local authorities on the selected TDR.

5.7.6 Cement Based Products

Cement Based Products such as concrete, mortar and render will be used as part of the construction works. The following measures will be deployed to mitigate potential health and environmental impacts, these include:

- Wet mix concrete (ready-mix) and dry concrete (precast) will be used as part of the construction works. To reduce the extent of ready-mix concrete used on site, precast concrete will be used where possible.
 - Elements of the proposed Project where precast concrete will be used include substation hollow core concrete roof slabs, concrete cable trench cover slabs, cable joint bays, precast concrete manholes and precast concrete culverts.
 - Elements of the proposed Project where ready-mix concrete will be used include foundations for the Wind turbines, relay mast, substation building, substation plinths and palisade fencing. Ready-mix concrete will also be used for concrete encasement of underground ducting.
- Where wet-mix concrete is required this will be procured as ready-mix concrete from a specialist concrete supplier. There will be no batching of concrete on site;
- When working with ready-mix concrete appropriate PPE is to be worn by concreting personnel.
- Concrete trucks will wash concrete chutes in a designated concrete washout area located in the Temporary Construction Compound. Washout of concrete "bottles" will not be permitted on site.
- No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed.
- Use weather forecasting to plan dry days for pouring concrete;
- Ensure concrete pour site is free of standing water and plastic covers are available in case of sudden rainfall event;
- Where possible cement based products are to be used outside buffer zones to mitigate against accidental direct run-off to surface waters.

Further Detail is given in **EIAR, Volume III, Chapter 2.1.1; Surface Water Management Plan.**

5.7.7 38kV Substation

5.7.7.1 Substation Compound

It is proposed to construct an Onsite Substation as shown on **Planning Drawing No. 23604-520** and **521**. This substation will provide a connection to the national grid via an underground 38kV transmission cable connection to Sliabh Bawn 110kV Substation.

The Onsite Substation compound will have an area of approximately 1705m² and will include a block-built substation building, 38kV electrical transformer contained in a concrete bund connected to a duty and stand by oil sensitive pump, Lidar equipment, a diesel tank and generator, and associated electrical components that will be placed on concrete plinths and in concrete bunds. Palisade security fencing will be installed around the perimeter of the Onsite Substation compound and inside the compound to separate the Independent Power Providers outdoor electrical yard from the Electrical Supply Boards outdoor electrical yard.

The location of the substation compound is detailed in Figure 5-8

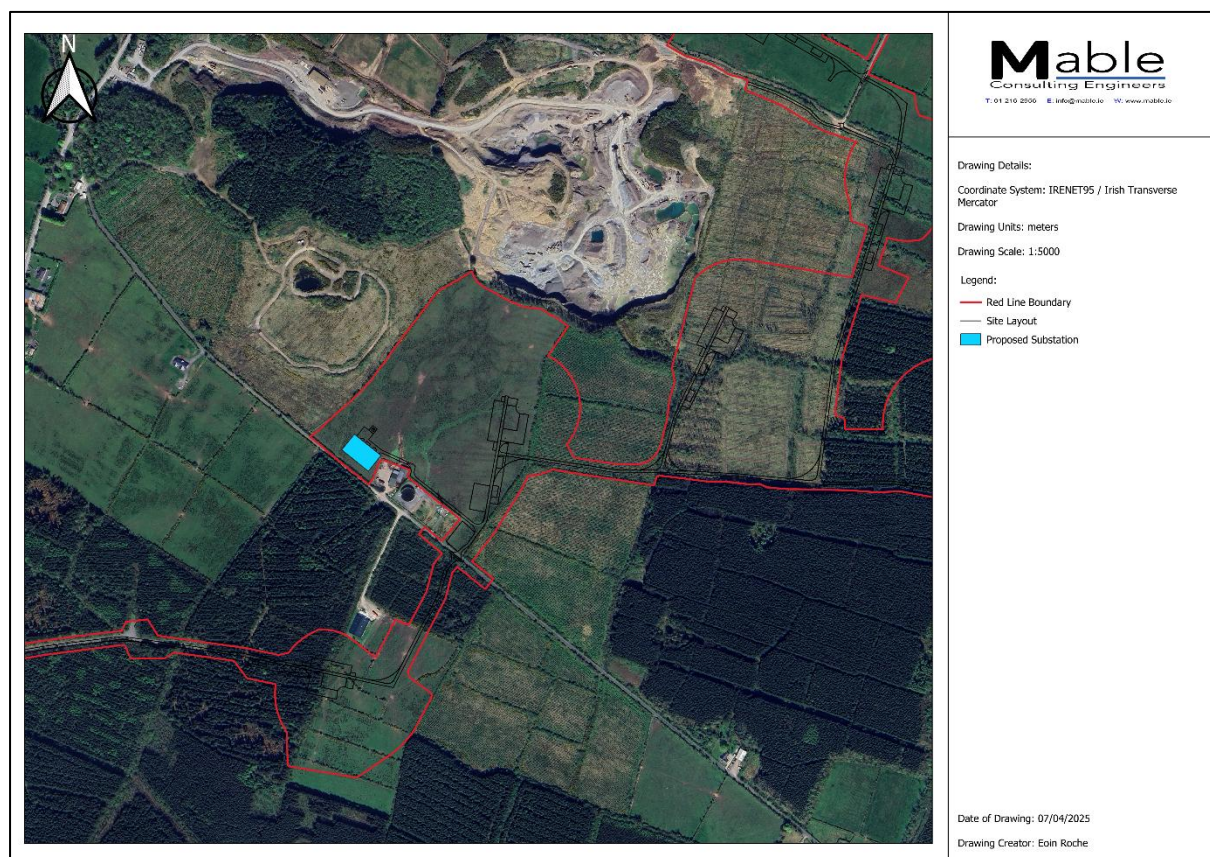


Figure 5-8 – Substation Compound Location

5.7.7.2 Substation Building

It is proposed to construct a 38kV electricity substation building within the Onsite Substation compound as shown on **Planning Drawing No. 23604-525**. The proposed 38kV substation building will consist of the following rooms:-

- MV Switchgear Room;
- IPP Control Room;
- ESB Control Room;
- Store Room;

- Office;
- Water Closet (WC).

5.7.7.3 Substation Compound and Building Construction

The construction will include the following:-

1. The Onsite Substation compound area will be outlined using ranging rods or wooden posts.
2. Perimeter drains will be installed or upgraded to collect surface water run-off from the Onsite Substation compound. This will involve the installation of check dams, silt traps and level spreaders to manage surface run-off effectively.
3. Topsoil will be stripped and carefully stockpiled for future landscaping use.
4. Subsoil will be excavated and retained on site by incorporated it into the perimeter of the compound area.
5. The Onsite Substation compound will be formed by constructing compacted layers of suitable hardcore;
6. The foundations for the substation building will be excavated down to the level indicated by the designer and concrete trench fill will be poured;
7. Steel reinforcement will be laid in place over the concrete trench fill and concrete foundations will be poured;
8. The blockwork walls for the building will be built up from the foundations to DPC level and the floor slab will be constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors;
9. Scaffold will be erected around the outside of the building;
10. The blockwork will then be raised to wall plate level and the gables & internal partition walls formed.
11. The concrete roof slabs will be lifted into position;
12. The construction and components of the substation buildings will be accordance with ESNB requirements; The timber roof trusses at the building will be lifted into position using a telescopic loader or mobile crane depending on site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather.
13. Installation of a domestic foul wastewater holding tank to hold effluent from the toilets within in the substation building;
14. Installation of a rainwater harvesting tank to collect rainwater from the roofs of the substation building for toilet flushing and hand washing;
15. Construction of foundations for CCTV security monitoring poles and palisade fencing will be commenced;
16. Construction of the transformer bund, equipment plinths etc. within the substation compound will be carried out;
17. Construction of underground cable ducts and trenches within the substation compound will be carried out;
18. Installation of electrical equipment within the substation compound and buildings including transformers, busbars, circuit breakers, cable supports, switchgear, panels etc. and all associated cabling.
19. CCTV Security Monitoring will be mounted on steel columns anchor-bolted to reinforced concrete foundations.
20. Perimeter security fencing and gates will be installed around the compound perimeter on completion of the installation of all electrical components within the compound including those described below.
21. On completion of the ground works areas to be returned to green filed will be re-topsoiled and landscaped.

5.7.8 Wind Farm Internal Cabling

Each wind turbine will be connected to the proposed Onsite Substation via underground Medium Voltage (MV) cables. Fibre-optic cables will also connect each wind turbine to a control system located within the control building module in the Onsite Substation.

The electrical and fibre-optic cables will be installed within underground cable ducts approximately 1 metre below ground level. The ducts will be located parallel to, but offset from, the site access tracks.

The cable duct construction work will include the following:-

1. A trench approximately 1.1m deep and 0.5m wide will be dug to accommodate the cable ducts.
2. The trench base will be graded, smoothened and trimmed when the required depth and width have been obtained.
3. Cable ducts will be installed within the trench, a typical cross section through the cable ducting and cable is contained in **Planning Drawing 23604-555**.
4. The typical fill over the cable ducting and bedding surround will consist of selected excavated backfill material.
5. Surplus spoil for the excavation and refilling works will be deposited in spoil repository areas.
6. Where cable ducting crosses the access track; the cable trench will be backfilled with lean-mix concrete in order to protect the ducting from heavy axle loads passing over.
7. Where cable ducting crosses an open drain or watercourse; the ducting will be installed at a lower level to allow it pass under the drain or watercourse.
8. Marker tape will be placed within the trench after part backfilling for identification and safety purposes in accordance with **Planning Drawing 23604-555**.
9. Cable marker posts will be installed at regular intervals and at change of directions along the line of the cable route. Cable marker posts will either be made of concrete, recycled plastic or timber material. Each marker post will contain appropriately worded warning signage highlighting to persons the presence of high voltage electricity cables underneath.

5.7.9 Wind Turbines

In accordance with the provisions set out by the Local Authority in Appendix 1-6. DFR-25-1 - Notification of Opinion by LA, the six wind turbines will have a total tip height of either 156m, 159m or 160m depending on which Technology Option is ultimately progressed. While the Applicant has sought flexibility for the turbine Technology Options assessed within this **EIAR**, flexibility is not sought for siting of the proposed turbine locations. Each of the three Technology Option are displayed in Table 5-4.

Turbine Parameter	Technology Option 1	Technology Option 2	Technology Option 3
Number of WTGs	6	6	6
Tip Height (m)	160	156	159
Rotor Diameter (m)	136	133	138
Hub Height (m)	92	90	90
MW Rating	4.5	4.8	4.26

Table 5-4 - Technology Options

Plan and elevation details with dimensions for these Wind turbines are contained in **Planning Drawings 23604-500 to 503**.

5.7.9.1 Wind Turbine Technology

The turbines installed on the site will be the conventional three-bladed, tubular tower model with horizontal axis. The rotor blades are bolted to the central rotor hub, which is connected to the nacelle. The nacelle contains the following turbine components:-

- Generator;
- Electrical Components;
- Aeronautical Lighting.

The entire nacelle and rotor are designed to rotate, or 'yaw', in order to face the prevailing wind. A wind vane located on the nacelle of the turbine controls the yaw mechanism. A control unit is typically located at the base of the turbine and an internal lift or ladder leads up to the nacelle where the shaft, generator and gearbox are located.

The turbine tower is a conical steel tube with multiple layer paint finish. Towers comprise a steel ring at the base of the tower which is assembled on top of the concrete foundations. The tower will be delivered to site in four sections. The base of the tower is approximately 5m in diameter, tapering to approximately 4m where it is attached to the nacelle. The tower is accessed by a galvanised steel hatch door, which will be kept locked except during maintenance. The nacelle is approximately 5m in width and 20m in length.

The blades of the turbines are typically made of fibreglass or carbon fibre reinforced polyester and are aerodynamically shaped to improve efficiency and lower noise production.

The turbines are multi-ply coated to protect against corrosion. It is proposed that the turbines will be of an off-white or light grey colour to blend into the sky background.

5.7.9.2 Turbine Hardstands

The Turbine Hardstands will be constructed to accommodate and support the wind turbine components, cranes and other plant during delivery and turbine erection. Turbine Hardstands will also be used for maintenance activities while the wind turbines are in operation.

The dimension of a single Hardstand is 42 metres in length and 25 metres in width. There will also be smaller ancillary temporary stoned areas constructed in the vicinity of the Turbine Hardstand to store the wind turbine parts and components prior to erection. These ancillary temporary stoned areas will be removed, and the areas reinstated on completion of the wind turbine erection.

The Turbine Hardstands and ancillary temporary stoned areas are detailed in **Planning Drawing 23604-504**. As discussed in **5.7.9**, the Applicant is in receipt of a design flexibility opinion from Roscommon County Council, in which three distinct turbine Technology Options have been assessed. A decision will be made as to which Technology Option is selected pre-construction phase. Although the wind turbines are similar in size, they differ slightly with regards to individual component sizes and their set-up on the Turbine Hardstand and ancillary temporary stoned areas.

To ensure that all wind turbine types are accommodated, the Turbine Hardstand **Planning Drawing 23604-504** has been prepared using the largest Turbine Hardstands and ancillary temporary stoned areas. Subject to which wind turbine type is selected, the Turbine Hardstands and ancillary temporary stoned areas may be micro-sited by up to 20m. This micro-siting allowance ensures that the least amount of earthworks and site stoning will be required on wind turbine selection and detailed design.

Turbine Hardstand construction will include the following:

1. The excavation process will involve hydraulic excavators moving excavated material to on-site repository areas using articulated dumper trucks or tractor and trailers.
2. Topsoil will be excavated in the presence of the Archaeologist and removed to the temporary topsoil repository area for use in the permanent reinstatement works.
3. The hardstand formation will be formed by excavating subsoil to the required suitable bearing stratum in accordance with the recommendations in the **EIAR, Volume II, Chapter 7 Land Soils and Geology**.

4. Subsoil will be temporarily stockpiled for reuse as part of landscaping around the hardstand, surplus material will be brought to a Permanent Spoil Repository.
5. The hardstand will be constructed using imported stone aggregate rolled in layers and tested in accordance with the requirements set-out on **Planning Drawing 23604-550**.
6. Temporary set down areas will be created at each Turbine Hardstand to store wind turbine components such as the rotor hub assembly, turbine blades, turbine towers, and nacelle. These areas will be made of compacted stone aggregate, these will be removed, and the areas reinstated on completion of the wind turbine deliveries.
7. Plate bearing tests will be conducted on the completed hardstand surface to verify the hardstand bearing strength.
8. The main crane outrigger areas are subjected to the highest levels of stress and as such strict minimum requirements are put in place to ensure safety during the works. This includes but is not limited to:-
 - a. Surface Evenness of equal or less than 0.25% slope.
 - b. Minimum Bearing Capacity of 220kN/m².

5.7.9.3 Turbine Foundations

As per the recommendations in the **EIAR, Volume II, Chapter 7 Land Soils and Geology**; the Turbine Foundations are to be Gravity Base Foundations, also known as a Ground Bearing Foundations. The Gravity Base Foundation will consist of a reinforced concrete foundation comprising a base slab bearing onto rock or other competent substrata with a central upstand to support the tower. See **Planning Drawing 23604-505** for foundation details.

Construction of the Turbine Foundation bases will require excavation down to suitable bearing strata and backfilling the trench with engineered fill up to the base of the foundation. Based on the results from the geotechnical site investigation report, submitted with this application, suitable bearing strata varies between turbine bases. The depth of suitable foundation bearing strata is set out in the **EIAR, Volume II, Chapter 7**, Table 7-11, these are summarised below in Table 5-5.

Turbine	Depth to Suitable Bearing Strata (m)
T01	3.5
T02	3.5
T03	5.5
T04	5.5
T05	5.5
T06	3.5

Table 5-5 – Depth Suitable Bearing Strata

The Turbine Foundation will be of circular shape on plan with an anticipated diameter of approximately 25.5m. The Wind Turbine foundation will require approximately 920m³ of poured concrete and 110 tonnes of steel reinforcement.

Figure 5-9 shows typical Turbine Gravity Base Foundation formation works, steel fixing and concrete pouring works.



Figure 5-9 - Turbine Foundation Formation, Steel Reinforcement and Concrete Pour

The construction will include the following:-

1. The excavation area will be clearly marked and will be adjusted to ensure a safe working environment with sloped sides.
2. The excavation process will involve hydraulic excavators moving excavated material to on-site repository areas using articulated dumper trucks or tractor and trailers.
3. Topsoil will be excavated in the presence of the Archaeologist and removed to the temporary topsoil repository area for use in the permanent reinstatement works.
4. The foundation formation will be formed by excavating subsoil to a suitable bearing stratum (set-out in **Table 5-5**). Engineered Stone fill will be installed on the excavated subsoil and rolled in layers and plate tested as set out in **Planning Drawing 23604-505**.
5. Subsoil will be temporarily stockpiled for reuse as part of landscaping around the foundation, surplus material will be brought to a Spoil Management Area. See **Planning Drawing 23604-250 to 258**.
6. A concrete blinding layer will be installed on the stone fill. This concrete blinding will be laid approximately 75mm thick directly on top of the stone fill, tamped and finished with a screed board to leave a flat level surface.
7. Temporary drainage measures will be installed to de-water the excavation. Water entering the excavation may have a relatively high concentration of suspended solids, the settlement ponds receiving this water will be designed to accommodate this flow.
8. Pumping water from Turbine Foundation excavations can lead to substantial flow rates into settlement ponds. Where possible drainage channels will be installed to de-water excavations via gravity flow. Where pumping is required to de-water deeper excavations, temporary storage will be provided within the excavations and dewatering will be carried out at a flow rate that matches the capacity of the settlement ponds.
9. Shutters and steel reinforcement will be installed on the concrete blinding, and the foundation of the wind turbine will be prepared for pouring of concrete.
10. Steel reinforcement will be installed as per the wind turbine foundation, **Planning Drawing 23604-505**. The foundation anchorage system will be set up, adjusted, and fastened to the steel reinforcement.
11. Ductwork will be installed as needed, and formwork will be erected around the steel cage and propped from the backside as necessary.
12. The foundation anchorage system will be inspected for level and alignment before pouring the concrete into the base. These checks will be submitted to the wind turbine supplier for their approval.
13. Ready-mix concrete will be delivered to the foundation by ready-mix concrete trucks via the site Access Tracks.
14. Concrete will be poured into each base using a concrete pump, and vibrating pokers will be utilised to ensure proper compaction around the reinforcement.
15. When concrete installation and finishing is complete, the foundation base will be covered and left to cure.
16. After the curing process, the formwork around the wind turbine base will be dismantled and taken away.
17. Earth wires will be installed around the base prior to backfilling around.

18. The base area will be backfilled and filled over to make up the, final levels using selected excavated material and crushed stone fill. As part of this, the crane Hardstand will be completed in the vicinity of the base.
19. To complete the area a stone access track will be created to the wind turbine door and around the wind turbine for maintenance purposes. The remaining area will be topsoiled and landscaped.

Figure 5-10 & Figure 5-11 provide details on typical Turbine Foundation finishing and backfilling works.



Figure 5-10 - Wind Turbine Shuttering, Finishing and Curing



Figure 5-11 - Wind Turbine Foundation Backfilling

5.7.9.4 Wind Turbine Erection

The erection of the wind turbines will occur in the last month of the construction phase. The erection process generally takes one week per turbine. The erection of wind turbines is a specialist process with specially designed large-scale cranes required to erect the turbine components. The cranes themselves will be constructed on site at the Turbine Hardstand location and will have to be dismantled before progressing to the next wind turbine base location.

The construction will include the following:-

1. Components are delivered and stored on Turbine Hardstands prior to assembly;
2. The first section is bolted to the steel base, which is cast into the Turbine Foundation;
3. The tower sections of the wind turbine are erected;
4. The nacelle is then installed on top of the top tower section;
5. Once the nacelle is installed the rotor hub is then installed in place;
6. The blades are then lifted one by one and connected to the rotor hub;
7. Once the wind turbine is installed, electrical commissioning and final energisation follows.

The wind turbine erection process is a carefully managed and precision operation and is heavily dependent on specialist plant and good weather windows.

Figure 5-12 outlines typical set up arrangements during wind turbine erection.



Figure 5-12 - Wind Turbine Erection

5.7.10 Telecommunications Relay Tower

A permanent Communications Relay Tower will be installed as part of the proposed Project. The tower will be equipped with telecommunications equipment at various heights and will be a slender, free-standing lattice structure 33m in height.

The tower will be constructed on a hardstanding area sufficiently sized to accommodate the crane that will be used for its erection. The tower will be located to the north of the proposed Onsite Substation as detailed in Figure 5--13.

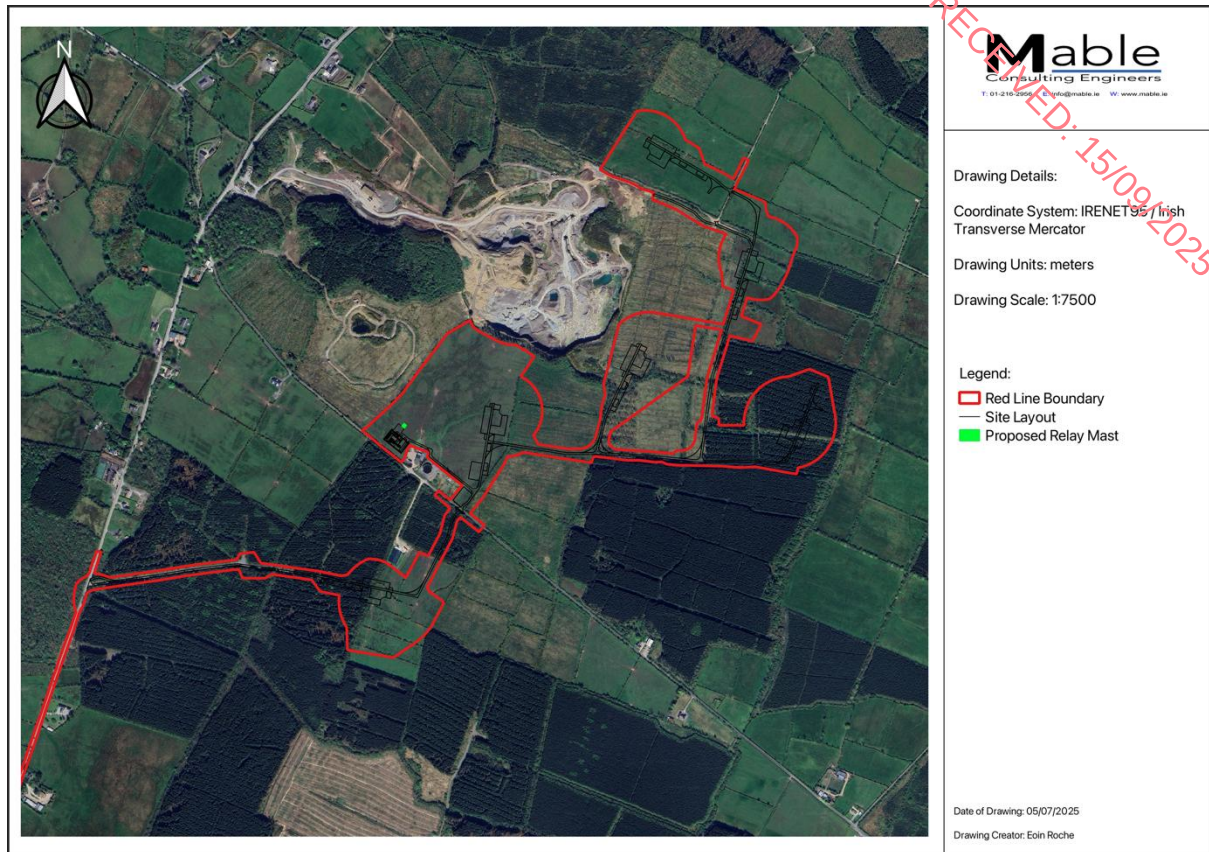


Figure 5-13 – Relay Tower Location

Figure 5-14 shows a typical Relay Tower base construction works. A detail of the proposed Relay Tower is shown on **Planning Drawing No. 23604-510**.



Figure 5-14 – Communications Relay Tower Base Construction

5.7.10.1 Relay Tower Structure

The Relay Tower will be a steel lattice tower structure, it will be prefabricated off site and delivered via 1 No. articulated lorry.

The construction will include the following:

1. The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter.
2. Topsoil will be stripped over the works area temporary stockpiles for reuse.
3. Subsoil will be excavated and temporarily stockpiled for reuse as part of landscaping around the finished Relay Tower, surplus material will be brought to a Permanent Spoil Repository.
4. All groundwater and surface water arising from the excavation of the foundation will be pumped to the dirty water system prior to discharge from the works area.
5. Topsoil excavation will be overseen by the Project Archaeologist in accordance with the scheme of archaeological monitoring.
6. The foundations for the Relay Tower will be excavated down to the level indicated by the Geotechnical Consultant and marked on **Planning Drawing 23604-510**.
7. The foundation excavation will be raised to formation level by compacted layers of well graded granular material will be spread and compacted to provide a hard area for the Relay Tower foundation.
8. The reinforced concrete foundation will be poured.
9. The Relay Tower prefabricated off site will then be erected.

5.7.11 Construction Material Volumes

As part of construction of the proposed Project, a significant number of materials will be delivered and removed from the construction site. The majority of materials delivered / removed will be made using ridged and articulated Heavy Goods Vehicles (HGV). Details on material delivery / removal is set out in the following tables:-

- Table 5-6 provides details on wind farm material delivered to site.
- Table 5-7 provides details on wind farm material removed from site.

The majority of materials delivered to the Project will be quarry based products such as crushed stone aggregate, ready-mix concrete, concrete blocks and other stone, sand and concrete based products. The supply of the wind turbine components themselves and other items such as steel reinforcement, switchgear, cables, cranes and other sundry deliveries will result in only minor localised increases in traffic movement in the area. Turbine component delivery is dealt with separately, see Section 5.8.

The peak period for quarry based product delivery will be the delivery of stone and aggregate fill for access track construction and also ready-mix concrete for turbine foundation construction.

During access track construction there will be up to 5 deliveries to Site per hour for a period of approximately 8 weeks. This peak period may not be continuous and could be divided into a number of sub-periods. Outside this period there will be up to 15 deliveries of stone aggregate to Site per day.

During turbine foundation construction there will be up to 9 deliveries to Site per hour for a 12-hour period for each Turbine Foundation.

Further detail on material deliveries is set-out in the TMP (EIAR, Volume III, Chapter 2.1.3; Traffic Management Plan).

Wind Farm Material Delivered to Site			
Item	Quantity	Unit	No. of Deliveries
Concrete - Consists of Concrete for Turbine, Substation, Battery & Inverter/Transformer Foundations/ Plinths.	7580	m ³	943
Steel Reinforcement - Consists of Reinforcement for Turbine, Substation, Battery & Inverter /Transformer Foundations/ Plinths.	512	Tonne	25
Stone Aggregates - Consists of aggregate for, engineered fill material, construction of Access tracks, temporary access tracks, road widening works, backfill material for cables.	39425	m ³	3943
Crane Deliveries to site, including ballast, booms etc - Cranes of 750 to 1,200 tonnes lifting capacity will be required to erect the turbines. Ballast is also normally employed for craneage. Smaller cranes of 150 to 200 tonnes lifting capacity will be required to assist with the removal of tower sections from delivery trailers and to operate as "tailing cranes".			60
Substation Deliveries - Blocks, Precast Concrete, Steel Work, Electrical Equipment, Doors, Roofing Materials, DPM Materials, Fencing			55
Internal Cabling - Consists of internal cables connecting turbines to 38kV Substation.	4333	m	15
Waste Skips (12 yard) - Timber, Metal, Concrete, Packaging			104
Miscellaneous Materials approximately 10% of overall loads - Consists of materials such as masonry blocks, fencing, geotextile, Storage containers, plant, etc			515
Turbine component delivery - dealt with separately, see Section 5.7			
Total			5664

Table 5-6 - Wind Farm Material Delivered to Site

Wind Farm Material Removed from Site			
Element	Quantity	Unit	No. of Removals
Excavated Material	6273	m ³	627
Waste Skips (12 yard) - Timber, Metal, Concrete, Packaging	1040	m ³	105
Hazardous Waste Fuels; Oil / Diesel / Grease	11	m ³	10
Wastewater from Welfare Facilities	540	m ³	135
Total			877

Table 5-7 - Wind Farm Material Removed from Site

5.7.11.1 Material Delivery / Removal

The TMP (**EIAR, Volume III, Chapter 2.1.3; Traffic Management Plan**) details the procedures to be implemented for material delivery to / removal from site, these include:-

- Designated Site Access Points
Construction deliveries to, and removals from the wind farm will use designated access routes and access points to avoid wind farm construction traffic passing the Ballyfeeney National School which is located off the R371 approximately 350m north of entrance SE1.
- Construction Delivery Routes
Quarry based products will be sourced relatively local to the development. Transport routes for 13 No. quarry facilities in the surrounding 40km likely to be used are set-out on **Planning Drawing 23604-900**.
- Delivery of Other Materials
Other materials to be delivered to the development will be sourced from a number of locations around the country and brought to site via a number of different routes. The volume and frequency of vehicles delivering other materials over the proposed 18-month construction period will be relatively small.

See the TMP and **Planning Drawing 23604-900** for further detail.

5.7.12 Excavation volumes

Excavation volumes have been calculated based on the findings of the Site Investigation Report contained within **EIAR, Volume II; Chapter 7**.

Table 5-8 outlines the estimated volumes of excavated topsoil and subsoil.

Spoil Volumes		
Item	Unit	Quantity
Total Excavation Volumes	m ³	62,731
Excavated Material Stored or Reused Onsite	m ³	56,458
Excavated Material Removed from Site	m ³	6,273*

* An allowance of 10% of total excavated spoil material has been made for removal off site.

Table 5-8 – Wind Farm Excavation Volumes

5.7.13 Spoil Management

It is envisaged that all excavated material generated during construction will be retained on site and, where appropriate, incorporated into the works. However, an allowance of 10% of total excavated spoil material has been made for removal off site.

An example of materials to be removed from site are excavated material from the public road which have bitumen mixed through. Depending on the constituents of the bituminous road make-up, this material may be inert or non-inert waste. This material will be transported off site by an appropriately authorised waste collector and disposed of at an appropriately licenced waste facility or recycled or reused as byproducts. Further detail on waste material removed from site is set-out in the WMP (**EIAR, Volume III, Chapter 2.1.2; Waste Management Plan**).

It should be noted that the field surveys undertaken for the proposed Project identified no evidence on site of Invasive Alien Plant Species listed under the third schedule of S.I. 477 or the first schedule of S.I. 347 EU Regulations, further detail is contained in **EIAR, Volume II, Chapter 6: Biodiversity**.

Initially excavated material will be stored in Temporary Spoil Storage Areas, and later, selected spoil will be incorporated into the works as they are completed. Temporary Spoil Storage Areas are identified on **Planning Drawings 23604-201 to 208**.

Spoil will be utilised in the construction of permanent track side bunds / low earthen mounds along the edge of the access tracks, to control and divert surface water, prevent erosion (See **EIAR, Volume II, Chapter 8 Water, Hydrology and Hydrogeology** and **Planning Drawings 23604-400 to 405**) and to provide a barrier to keep vehicles from leaving the Site access tracks. Spoil will be utilised to create low earthen mounds to support the enhancement / new planting of hedgerow and treelines.

Upon completion of the construction works, all remaining excavated material will be integrated into the final landscaping, blending seamlessly with the existing terrain to avoid leaving any mounds of spoil around the Site. See **Planning Drawing 23604-251 to 258** and **23604-551** for Spoil Management details.

Temporary construction areas such as the Temporary Construction Compounds, Turbine Hardstand assembly areas, blade fingers etc. will be reinstated utilising stored material from the Temporary Spoil Storage Areas.

5.7.14 Reinstatement

On completion of the ground works, the work areas will be reinstated with stored topsoil and re-vegetated, see Chapter 6 – Biodiversity contained in the **EIAR** for details on re-vegetation and planting.

Reinstatement works are detailed on **Planning Drawings 23604-251 to 258**. Figure 5-15 shows typical wind farm finishing works around a wind Turbine Foundation and Turbine Hardstand.



Figure 5-15 - Turbine Foundation and Hardstand Reinstatement

In consultation with the ECoW, Spoil Management areas will be finished with chipped / mulched / shredded vegetation from the tree and hedge removal to create flat surfaces to prevent rapid colonisation of new vegetation. These area will be finished with ryegrass.

5.7.15 Commissioning

The final stage of the Project's construction is the final commissioning of the wind turbines. This will involve testing of the wind turbines for compliance with standards and for compliance with the National Electricity Grid Code. Once the tests results are satisfactory, the wind farm will be authorised by ESBN / EirGrid to export electricity onto the national grid.

5.7.16 Decommissioning

A Decommissioning Plan (DMP) along with Decommissioning Reinstatement Drawings have been prepared, see **EIAR, Volume III, Chapter 2.1.4; Decommissioning Management Plan and Planning Drawings 23604-270 to 278.**

The design life of the proposed Project is 35 years after which time decommissioning will occur, unless planning permission is granted to extend the duration of operation. At the end of the design life of the Project, the Wind turbines and all their associated above ground components will be dismantled and removed from site using appropriate Decommissioning and Reinstatement practices in place at that time. The Substation & Relay Tower will be permanent as they will form part of the national grid and communication networks.

Prior to commencement of decommissioning works, the Decommissioning Management Plan will be reviewed with Roscommon County Council and updated as required as per their requirements.

During decommissioning, structures will be dismantled in the opposite order of their construction. Wind Turbine and other components located above ground will be dismantled and taken off-site for recycling. The Turbine Foundations, Turbine Hardstanding and other below ground works and will be left in place. Leaving below ground structures in place is seen as a more ecologically responsible choice since removing may cause environmental disturbances including noise, dust, and vibration. These will be reinstated with stored topsoil and re-vegetated, see **EIAR, Volume II, Chapter 6; Biodiversity** for details on re-ventilation and planting.

Some sections of the access tracks will serve functions beyond operation of the proposed Project, such as forest / agricultural access. Therefore, it is proposed to retain some sections of the access tracks for future use. Other sections of access tracks which are not to be retained will be grubbed-up and the area reinstated back to original ground levels. Grubbed-up crushed aggregate stone will be used to fill the area back to original ground levels. It is not proposed to remove grubbed material from site.

In terms of traffic effects, the decommissioning phase will generally mirror that of the constructions phase, although the effects will be significantly reduced as the volumes of materials removed from the site will be less than delivered. There will be no hazardous waste generated or the need for complex environmental remediation. For details on traffic management and waste management, see:-

- **EIAR, Volume III, Chapter 2.1.3; Traffic Management Plan**
- **EIAR, Volume III, Chapter 2.1.2; Waste Management Plan**

5.8 Turbine Delivery Route

The components for the wind turbines will be delivered by cargo ships to the Port of Galway. The components for each wind turbine will be delivered in separate loads, some of which are abnormal in terms of their width and length. The components will be transported from Galway Port to the site along the motorway, national, regional and local road network.

A Turbine Delivery Route Assessment has been prepared for the project and forms part of the TMP. This **CEMP** is to be read in conjunction with the TMP (**EIAR, Volume III, Chapter 2.1.3; Traffic Management Plan**).

5.8.1 Turbine Route Accommodation Works

Localised temporary widening and stoning of public road verges and roundabouts will be required on the TDR to facilitate abnormal load vehicle wheel over-run. Hedge and tree cutting will also be required as well as relocation of utility overhead lines, poles, lampposts, signage, and other street furniture.

On completion of delivery of wind turbine component abnormal loads, the temporary accommodating works will be reinstated to the requirements of TII and the Local Authority for the area. As part of this, hedges and trees will be re-planted and street furniture will be reinstated.

During the operational phase, the temporary accommodating works may be re-established to accommodate an abnormal load or loads for wind turbine component repair or replacement. As part of this, hedges and trees will be trimmed or removed and re-planted on completion of the delivery.

Public Road Works for Turbine Delivery will include the following:-

1. Carry out construction stage SPA and identify:-
 - a. Areas to be cleared of obstructions to allow for Turbine Component oversail,
 - b. Areas to be stoned to facilitate delivery vehicle over-run,
 - c. Hedge and tree cutting,
 - d. Relocation of utility overhead lines, poles, lampposts, signage, and other street furniture;
2. Coordinate with appropriate Stakeholders on the proposed works;
3. Obtain a Road-Opening Licence from Galway, Mayo, and Roscommon County Council Road Divisions, as part of this, the following will be prepared and submitted to the council:-
 - a. Drawings of the proposed works
 - b. Works method statement and Risk Assessment
 - c. Traffic Management Plan
 - d. Insurance for the Works
 - e. Construction Programme
4. On commencement of construction works; Implement Traffic Management Measures
5. Tree and Hedge cutting carried out outside the bird breeding season, which runs from the 1st of March to the 31st of August;

At Turbine Component Delivery stage, a transportation plan will be prepared by the Wind Turbine Supplier. Permits for moving the abnormal loads on the public roads to the site will be obtained from An Garda Síochána and the applicable local authorities on the selected TDR.

5.9 Grid Connection Works

The GCR will consist of 5.8km of underground cabling works, 1.5km will be installed within the boundaries of the wind farm access track, circa 3.7km will be installed within the boundaries of public road infrastructure and circa 0.6km will be installed within the boundaries of Sliabh Bawn Wind Farm and Sliabh Bawn 110kV Substation.

The GCR will be constructed in accordance with the requirements of ESB's 'Functional Specification For The Installation Of 38kV Underground Power Cables For Contestable Projects, Specification Number 18151, Revision 1, Dated March 2021 (the UG Cable Specification) and **Planning Drawings 23604-556 and 23604-560**.

The GCR will consist of 3 No. 110mm diameter HDPE power cable ducts and 1 No. 110mm diameter HDPE communications duct to be installed in an excavated trench, typically 600mm wide by 1,235mm deep, with

variations on this design to adapt to bridge crossings, service crossings and watercourse crossings, etc. The power cable ducts will accommodate 1 No. power cable per duct. The communications duct will accommodate a fibre cable to allow communications between the proposed Onsite Substation and the existing Sliabh Bawn 110kV substation.

This connection option involves crossing of the N5 National Road. It is proposed to directional drill this section of the grid route works to ensure minimal disruption to the road network – see Section 5.9.10 for details on directional drilling. The remaining sections will be installed in ducts which will be laid in excavated trenches.

Cable trenching along the public road will be carried out in the road carriageway or in the road verge where possible. This will depend on the space available in the verge and offset requirements from the existing services. Based on the review of the public roads which the GCR is to be installed, it is envisaged that in the main the GCR will be installed in the road carriageway. Details on cable trenching are contained in the **Planning Drawings 23604-556 and 23604-560 to 564**.

An overview of the GCR is given in **Figure 5 16**. Further details are contained in the **Planning Drawings 23604-300 to 308**.

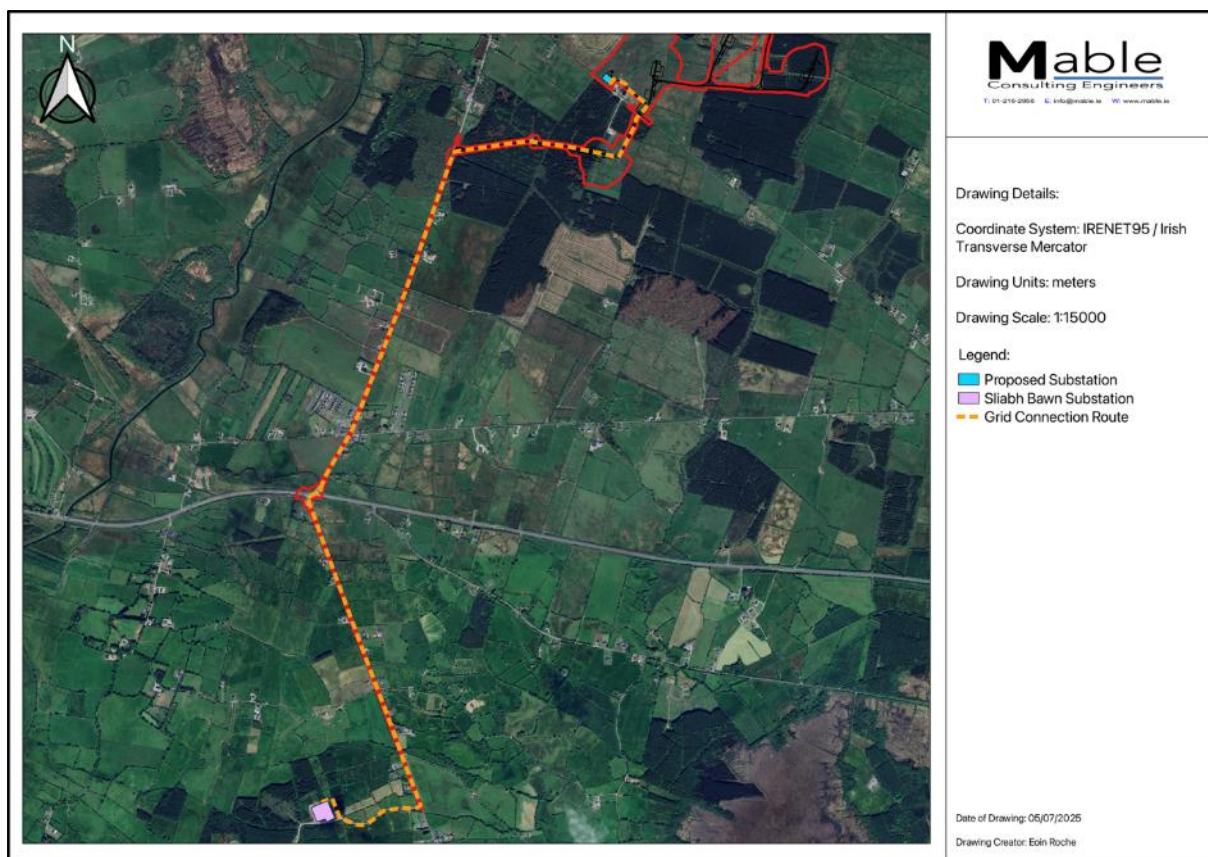


Figure 5-16 – Grid Connection Route

5.9.1 Grid Connection Route Assessment

An On-Site Assessment of the proposed GCR was carried out by Mable Consulting Engineers, and the following was noted:-

- A number of watercourses, surface water drains and services crossing the public road on the GCR were observed. These are marked on the GCR Site Layout, **Planning Drawing No. 23604-301 to 308**.
- The proposed GCR travels past the Gortlustia Stream (EPA Code 26G29) to its west.
- The GCR also transects the Bellmount or Cloggernagh Stream further south just before the grid connection route turns west into Sliabh Bawn Substation Road.

5.9.2 Cable Trenching Methodology

Cable ducts will be placed within a trench approximately 1.235m deep and 0.600m wide. The following list is a non-exhaustive list of items that will be adhered to during the construction of the GCR:

- All trenching works will be undertaken to ensure that only short sections of trench are open at any one time.
- At watercourse crossings, the contractor will be required to adhere to the environmental control measures set-out within the **EIAR**, the SWMP and best practice construction methodologies (**EIAR, Volume III, Chapter 2.1.1; Surface Water Management Plan**);
- Where the cable route intersects with a culvert or other service, the ducting will be installed either above or below the culvert or other service to provide minimum separation distances in accordance with the UG Cable Specification.

Typical trench layouts for a GCR within a roadway and within grassed areas are shown in Figure 5-17 and **Figure 5-18**. See **Planning Drawings 23604-560** for further details.

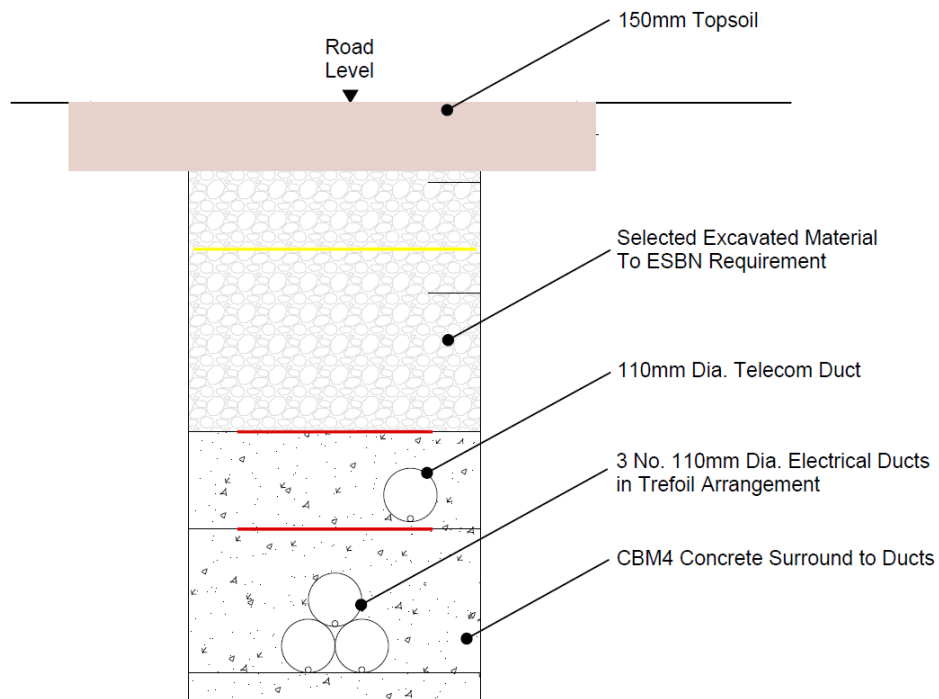


Figure 5-17 – Typical Cable Trench Layout in Green Field

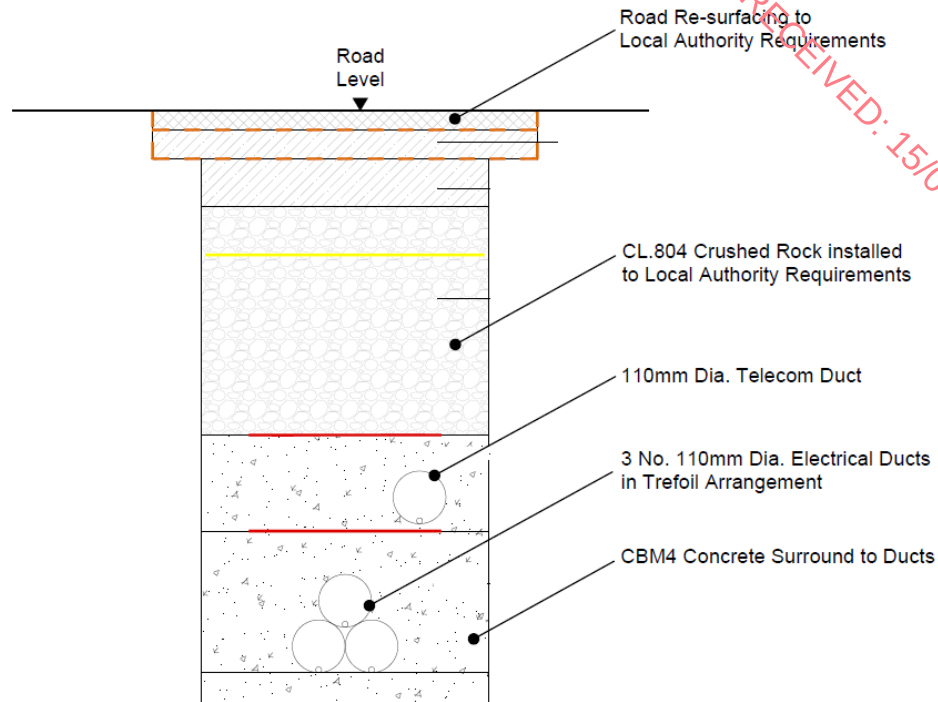


Figure 5-18 - Typical Cable Trench Layout in Public Road

The proposed sequence of works is as follows:

1. Prior to commencement, the proposed design for the GCR works including proposed traffic management will be reviewed with Roscommon County Council's Road Engineer.
2. The proposed works will also be reviewed with other stakeholders including; the IFI, TII, OPW, and ESN.
3. The contractor will carry out an on-site assessment of the works area and prepare a proposed works methodology for review with Roscommon County Council.
4. Road opening licence, road closure and partial lane closure permits will be obtained from Roscommon County Council.
5. Existing underground services along the GCR route will be surveyed.
6. Traffic control measures will be implemented.
7. Pollution control measures will be implemented in advance of any excavation works being undertaken.
8. The trench will be excavated to the required dimensions, approximately 600mm wide and 1,235mm deep.

5.9.3 Managing Excess Material from Trench

Excavated materials from grassed areas (topsoil, subsoil) will be stored separately for use during reinstatement. Stockpiles will be restricted to less than 2m in height.

Excavated material from the public road network will be recycled as appropriate. Excavated bitumen macadam will be placed in dumper trucks and transported to a temporary stockpile area for eventual recycling at a facility licensed for bitumen macadam recycling. Other excavated material will be transported off site by an appropriately authorised waste collector and disposed of at an appropriately licenced waste facility.

Further detail on waste material removed from site is set-out in the **EIAR, Volume III, Chapter 2.1.2.**

5.9.4 Storage of Plant and Equipment

All plant and equipment will be stored on site within the GCR works area or within the Temporary Construction Compounds located within the proposed wind farm site. Fuel, oils and chemicals will be stored in bunded areas within the Temporary Construction Compound.

5.9.5 Cable Ducting Methodology

The 38kV medium voltage underground cable duct construction is to be a 38kV XLPe cable duct in accordance with the UG Cable Specification and **Planning Drawings 23604-556 and 23604-560**.

The proposed sequence of works is as follows:

1. Grade, smooth and trim trench base when the required depth and width have been obtained.
2. Create a bedding layer using lean mix concrete CBM4. Depth of lean mix to be as per Error! Reference source not found..
3. Lay the bottom row of ducts in trefoil formation as detailed on drawings 23604-556 and 23604-560. Use spacers as appropriate to establish horizontal duct spacing.
4. Place red cable protection strips on compacted CBM4 directly over the ducts.
5. Surround the ducts with CBM4 lean mix concrete and lay the top duct onto the freshly compacted CBM4 including the cable protection strips above the bottom row of ducts.
6. Surround and cover the top duct with CBM4 material and thoroughly compact without damaging ducts.
7. Place red cable protection strip on top of compacted CBGM B over each set of ducts as shown on the drawings.
8. Place and thoroughly compact CBM4 material or Clause 804 backfill or soil backfill as specified and place warning tape at the depth shown on the drawings.
9. Reinstate existing surface;
 - a. For road sections, carry out full road width permanent reinstatement in accordance with the requirements of Roscommon County Council, TII and/or private landowners, whichever applies;
 - b. For unsurfaced/grass sections, backfill with suitable excavated material to ground level leaving at least 100mm topsoil or match existing level at the top to allow for seeding or replace turves to the requirements of Roscommon County Council and/or landowner, whichever applies;
10. Clean and test the ducts by pulling through a brush and mandrel. Install 12mm polypropylene draw rope in each duct and seal all ducts using robust duct end seals fitted with rope attachment eyes in preparation for cable installation at a later date.

5.9.6 Joint Bays

Joint bays will be provided to meet the requirements of standard cable drum lengths and/or as required to limit cable pulling forces. Joint bays will be no further than 1200m centre to centre apart. Joint bays will be constructed as per UG Cable Specification.

In association with joint bays, communication chambers are required at every joint bay location to facilitate communication links between Ballyfeeny Wind Farm substation and the existing Sliabh Bawn 110kV Substation.

Where possible joint bays will be located in the non-wheel bearing strip of roadways, however given the narrow profile of local roads this may not always be possible. During construction the joint bay locations will be fenced off once they have been constructed, they will be backfilled until cables are being installed. On installation of the cable, the cable will be jointed, and the joint pit will then be permanently backfilled with thermally suitable material together with protective tiles and hazard marking tape. On completion of the backfill work, the existing surface will be reinstated. Typical 38kV joint bay and communications chambers are detailed in **Figure 5-19 to Figure 5-22**, further details are provided in **Planning Drawing 23604-561**.

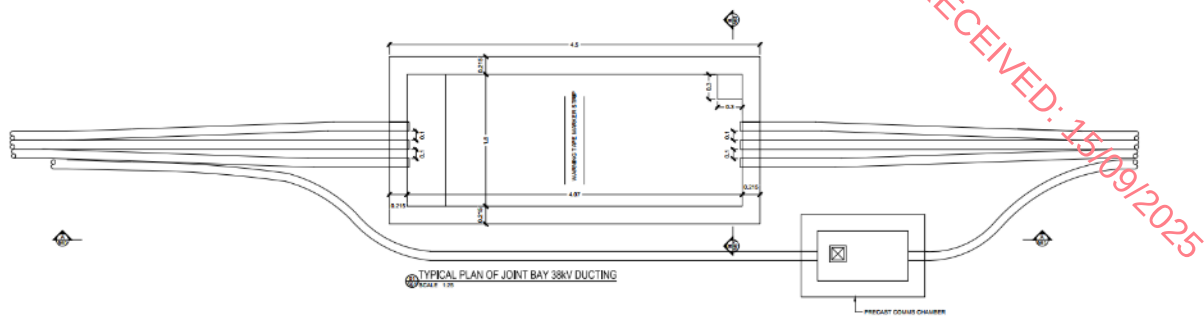


Figure 5-19 – Joint Bay Plan View

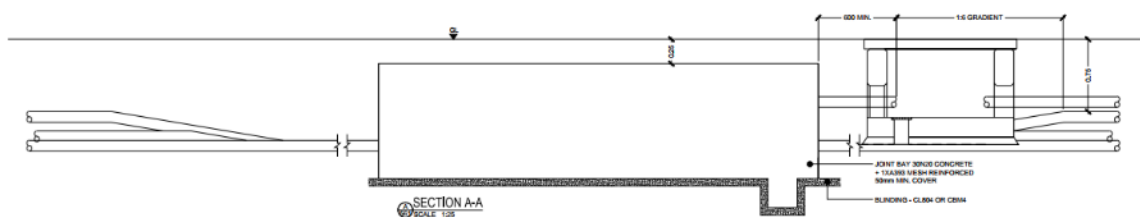


Figure 5-20 – Long Section through Joint Bay

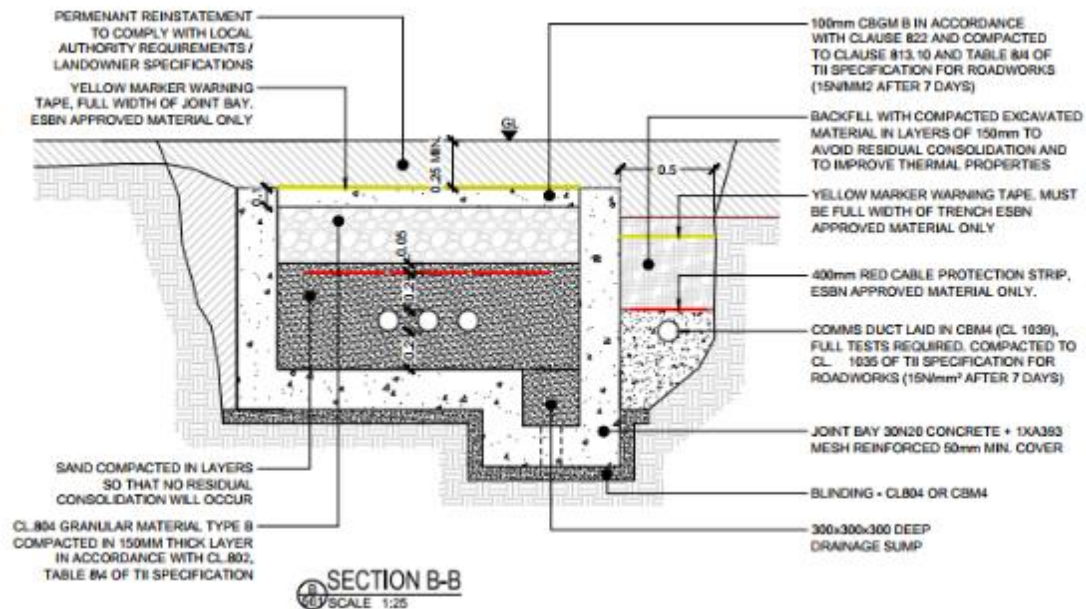


Figure 5-21 – Short Section through Joint Bay

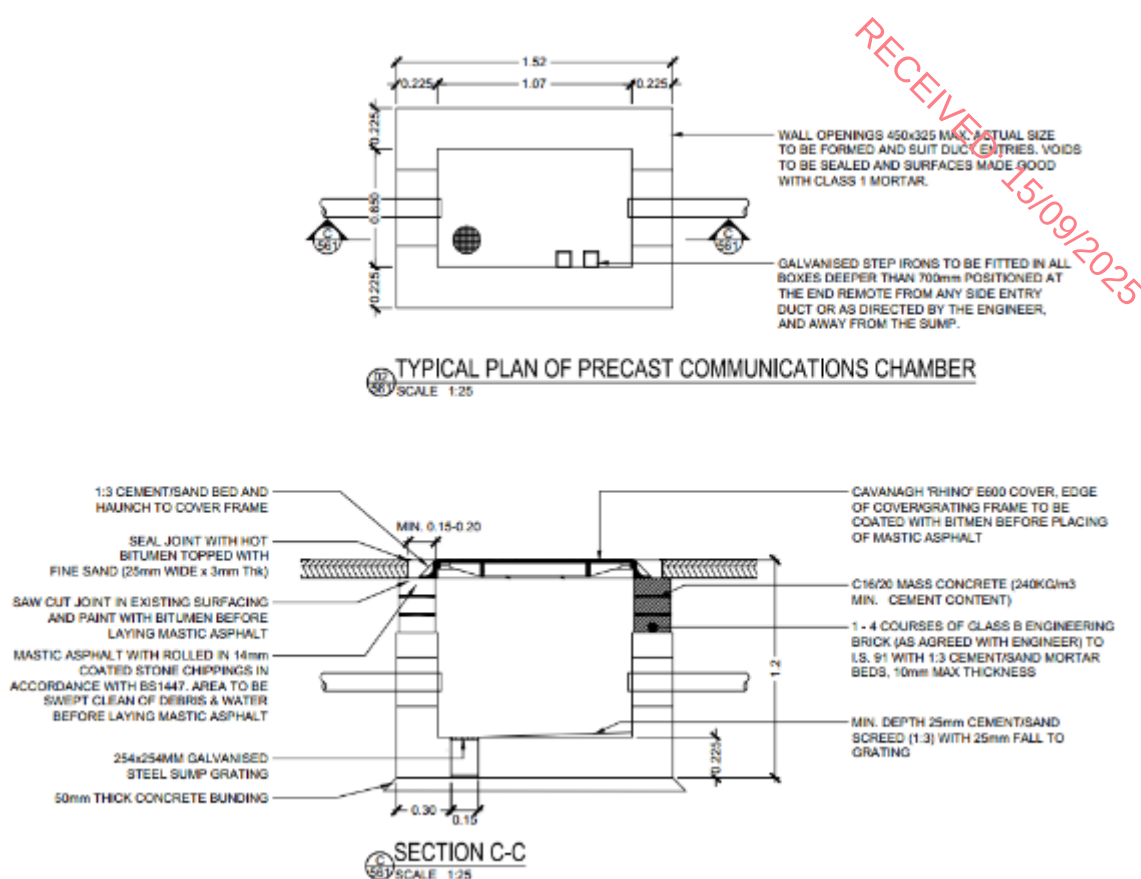


Figure 5-22 - Typical Communications Chamber Details

5.9.7 Public Road Reinstatement

On completion of the GCR works the full road width reinstatement is to be carried out to the requirements of Roscommon County Council.

As part of this, Falling Weight Deflectometer will be carried out on the reinstated road to the requirements of Roscommon County Council's Roads Division.

5.9.8 Surface Cable Markers and Marker Posts

Surface cable markers will be placed along the route where cable depth is unavoidably shallow, due to constraints such as existing services, to indicate the precise location of the underground cable. These markers will be metallic plates in accordance with ESNB standards.

Marker posts will be used on non-roadway routes to delineate the cable route and joint bay positions in accordance with the UG Cable Specification. Corrosion proof aluminium triangular danger sign, with 700mm base, and with centred lightning symbol, on engineering grade fluorescent yellow background will be installed in adequately sized concrete foundations. Marker posts will also be placed in the event that burial depth is not to standard.

5.9.9 Crossings

Details on cable trench crossings are contained in the **Planning Drawings 23604-556** and **23604-562** to **564**.

5.9.9.1 Existing Underground Services

In order to facilitate the installation of the GCR underground cable, it will be necessary to cross existing underground services such as drainage lines, water mains, telecom networks or existing cables. Crossing existing services will be carried out using open trenching with either an undercrossing or an overcrossing, depending on the depth of the service. Where this method is not suitable, the directional drilling method will be used.

The GCR has been designed to be installed without affecting existing services. Should an uncharted service be encountered where a clash is unavoidable, it may be necessary to relocate the service to accommodate the GCR. The design and construction of this service relocation will be carried out in consultation with the affected Utility Provider and Roscommon County Council.

5.9.9.2 Watercourses

Where the cable route intersects with existing watercourses, a detailed construction method statement will be prepared by the Contractor prior to the commencement of construction and submitted to Roscommon County Council, Inland Fisheries Ireland (IFI) and other relevant Stakeholders.

IFI have published guidelines relating to construction works along water bodies titled 'Guidelines on Protection Of Fisheries During Construction Works In And Adjacent To Waters (IFI, 2016)'. These guidelines will be adhered to during the construction of the Project.

Crossing existing watercourses services will be carried out using open trenching with either an undercrossing or an overcrossing, depending on the depth of the service. Where this method is not suitable, the directional drilling method will be used.

5.9.10 Horizontal Directional Drilling

Horizontal Directional Drilling (HDD) is a method of drilling under obstacles such as roadways, bridges, railways, water courses, utility services etc. in order to install cable ducts under the obstacle. This method is employed where installing the ducts using standard installation methods is not possible or impractical.

It is proposed to utilise HDD at one location – the N5/R371 road junction; to cross the N5 without open excavation of the road, see **Planning Drawing 23604-304** and **562**. The length of HDD at this location will be approximately 50m. The HDD works will take approximately 1.5 weeks to carry out.

HDD may also be utilised at other locations subject to the requirements of Roscommon County Council and / or the entity in charge of, or with responsibility for, the item to be crossed.

A Typical HDD Installation detail is given below in **Figure 5-23**.

The drilling methodology is as follows:

1. A works area of circa. 200m² will be fenced on both sides of the river/ railway crossing,
2. The drilling rig and fluid handling units will be located on one side of the bridge and will be stored on double bunded 0.5mm PVC bunds which will contain any fluid spills and storm water run-off.
3. Entry and exit pits (1m x 1m x 2m) will be excavated using an excavator, the excavated material will be temporarily stored within the works area and used for reinstatement or disposed of to a licensed facility.

4. A 1m x 1m x 2m steel box will be placed in each pit. This box will contain any drilling fluid returns from the borehole.
5. The drill bit will be set up by a surveyor, and the driller will push the drill string into the ground and will steer the bore path under the watercourse.
6. A surveyor will monitor drilling works to ensure that the modelled stresses and collapse pressures are not exceeded.
7. The drilled cuttings will be flushed back by drilling fluid to the steel box in the entry pit.
8. Once the first pilot hole has been completed a hole-opener or back reamer will be fitted in the exit pit and will pull a drill pipe back through the bore to the entry side.
9. Once all bore holes have been completed, a towing assembly will be set up on the drill and this will pull the ducting into the bore.
10. The steel boxes will be removed, with the drilling fluid disposed of to a licensed facility.
11. The ducts will be cleaned and proven, and their installed location surveyed.
12. The entry and exit pits will be reinstated to the requirements of ESNB and Roscommon County Council.
13. A transition coupler will be installed at either side of the HDD as per ESNB requirements, this will join the HDD ducts to the standard ducts.
14. The directional drilling details are contained in the Planning Drawing 23604-562.

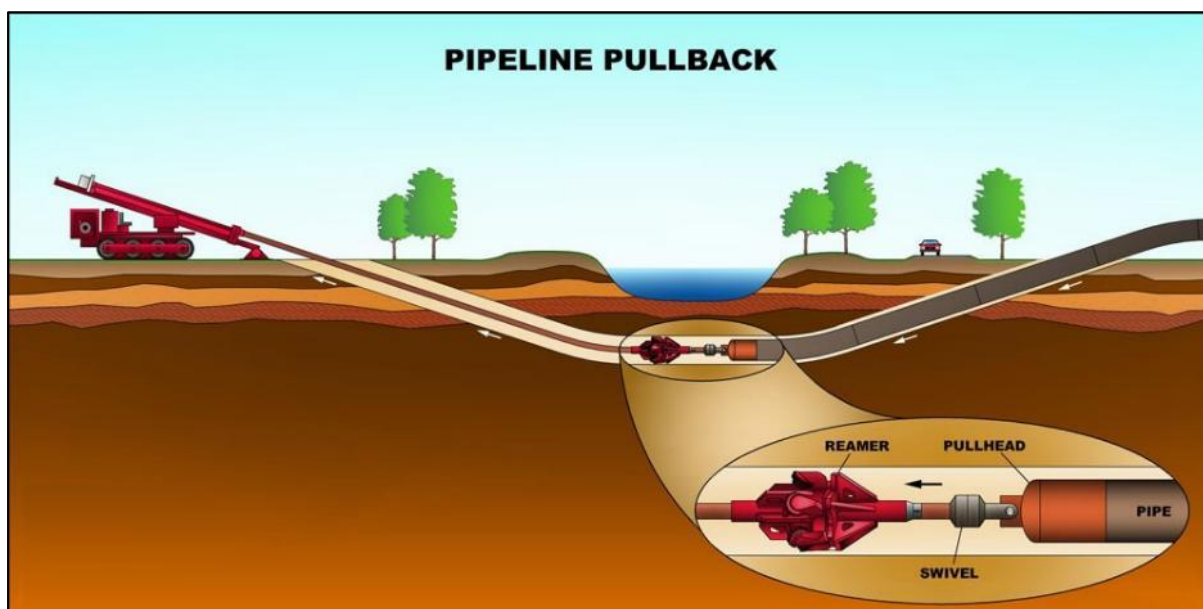


Figure 5-23 – Typical HDD Installation

5.9.10.1 Protection of Water Bodies during HDD

To reduce potential impacts from HDD works, the following mitigation measures will be implemented:-

- Drilling Fluid; bentonite, an inert drilling fluid, will be used throughout the works to minimise environmental impact.
- Drilling Rig and Fluid Storage; the drilling rig and fluid handling units will be stored on a double-banded minimum 0.5mm thick HDPE / uPVC storage container.
- Monitoring of Drilling; the drilling process will be continuously monitored for leaks, assessed through pumping rates, pressures, and visual observation for any bentonite plumes.
- Incident Response; in the event of drilling fluid escaping from the HDD via hydraulic fracturing (upward escape of bentonite to the riverbed), the Environmental Clerk of Works (ECOW) will be notified immediately, and corrective measures will be implemented in accordance with the **EIAR, Volume II, Chapter 6; Biodiversity**.

- Post-Construction Monitoring; monitoring will be undertaken to assess the natural re-vegetation rate vegetated areas following construction activities.

5.9.11 Material Volumes

As part of construction of the proposed GCR, a significant number of materials will be delivered and removed from the construction area. The majority of materials delivered / removed will be made using ridged and articulated Heavy Goods Vehicles (HGV). Details on material delivery estimates are set out in **Table 5-9**, details on material removal estimates are set out in **Table 5-10**.

GCR Material Delivery to Site			
Item	Quantity	Unit	No. of Deliveries
Concrete - Consists of Concrete for Encasing Ducts & Joint bays	1950	m ³	245
Stone Aggregates - Consists of aggregates to backfill cable trenches, Joint Bays and Comms Chambers	1655	m ³	166
Bituminous Trench Reinstatement	535	m ³	54
Bituminous Road Surfacing Material - Full width Road Reinstatement	1390	m ³	139
Precast Chambers - Consists of excavated road make up and subsoil			10
Cabling - Consists of cables connecting from site 38kV to Sliabh Bawn 110kV substation	5800	m	8
Ducting - Consists of 23.2km of ducting			15
Waste Skips (12 yard) - Timber, Metal, Concrete, Packaging and other miscellaneous waste			5
Miscellaneous Materials/ machinery approximately 10% of overall loads. - Consists of items such as, warning tape for cable trenches, temporary traffic management items and machinery such as directional drilling rigs.			61.6
Total Approximate Deliveries / Loads For GCR Works			678

Table 5-9 – Material Delivery Estimates for the Grid Connection Route

GCR Material Removal from Site			
Item	Quantity	Unit	No. of Deliveries
Excavated Material Removal - Consists of excavated road make up and subsoil	4430	m ³	443
Bituminous Trench Material with Subsoil	535	m ³	54
Bituminous Road Surfacing Material - Full width Road Reinstatement	1390	m ³	139
Waste Skips (12 yard) - Timber, Metal, Concrete, Packaging and other miscellaneous waste	50	m ³	5
Miscellaneous Materials/ machinery approximately 10% of overall loads. - Consists of items such as temporary traffic management items and machinery such as directional drilling rigs.			64
Total Approximate Deliveries / Loads For GCR Works			705

Table 5-10 – Material Removal Estimates for the Grid Connection Route

5.10 Consents

The key consents, licenses, notifications and permissions required for this Project are the following:

- Planning Permission and associated Planning Compliance;
- Commission for Energy Regulation (CER) Authorisation and Licence to Generate;
- ESB Grid Connection Offer;
- Tree Felling Licence;
- Building Control Commencement Notice;
- Building Control Fire Certificate;
- Office of Public Works (OPW) Section 50 Consent for watercourse crossings;
- Public Road Abnormal Load Permits;
- Public Road Opening Licenses;
- Public Road Closure and Partial Lane Closure Permits;
- Irish Aviation Authority Consent;
- Waste Collection Permits.

The consents, licenses, notifications and permissions list above is a non-exhaustive list and will be reviewed prior to construction and regularly thereafter to ensure that the programme is achieved, and new consent requirements are identified as early as possible.

To avoid delays to the project programme, all required construction stage consents is to be sought by the appointed designers and contractors in a timely manner.

5.11 Liaison with Roscommon County Council & New N5 Contractor

Mable Consulting Engineers' liaised with Roscommon County Council Roads and Transportation Department as part of the Pre-Planning meeting. Mable Consulting Engineers also liaised with the contractor currently constructing the N5 Ballaghaderreen to Scramoge Road Project.

5.11.1 Roscommon County Council

As part of the Project's design development, Mable Consulting Engineers' contacted Roscommon County Council Roads and Transportation Department and provided draft details in relation to:-

- Wind Farm Layout & Proposed Site Entrances;
- Turbine Delivery Route;
- Grid Connection Route.

Over the course of the Pre-Planning meeting we reviewed the details submitted.

5.11.2 N5 Ballaghaderreen to Scramoge Road Project

The N5 Ballaghaderreen to Scramoge Road Project is currently under construction. Mable Consulting Engineers liaised with Wills Bros Limited, the contractor carrying out the work, in relation to their construction programme and works in the vicinity of the R371/N5 road junction.

Wills Bros confirmed that their construction programme completion date is October 2027, and, based on current works, they anticipate a completion slightly ahead of this.

6.0 Safety, Health and Welfare at Work

As stated in section 3.3.4 Project Supervisor Design Process above, the design and construction of wind energy developments is governed by the Safety, Health and Welfare at Work Act 2005 and also by S.I. No. 291 of 2013 the Safety, Health and Welfare at Work (Construction) Regulations 2013 (H&S Construction Regulations).

Safety, Health and Welfare management for the proposed Project will include the following:-

1. During the detailed design stage of the Project a Preliminary H&S Plan will be prepared by the PSDP and circulated to designers, potential contractors and other stakeholders. This plan will identify potential safety hazards associated with the site and the works and assess the associated risks. Mitigation and control measures will be recommended to minimise the identified risks.
2. The Preliminary H&S Plan will then be developed further by the PSCS to create the construction phase H&S Plan for the works. This plan will address all safety and health aspects of the construction process and provide relevant contact details and emergency response procedures for the Project.
3. The construction phase H&S Plan will detail the site induction and training requirements for site personnel.
4. Evidence of completion of construction safety training, typically in the form of a Safepass Card, will be required from all construction personnel prior to commencing work on the site.
5. A record of Safepass Cards and personnel approved for entrance to site will be completed as part of a site induction process.
6. Where relevant, equipment operators or specialist works will require personnel to hold a valid Construction Skills Certification Scheme (CSCS) card.
7. All equipment and machinery used on site will be appropriately certified for its intended purposes.
8. The Employer via the CM will ensure that only competent contractors are appointed to carry out construction works on the site.

6.1 Temporary Construction Compound and Facilities

Two Temporary Construction Compounds will be established on Site, initially during the Enabling Works and completed at commencement of the main construction works. Each compound measure circa 1,260m² in total - as shown on the **Planning Drawings 23604-206**.

- Temporary Site Construction Compound 1 - will accommodate temporary containers for welfare facilities, site offices, meeting rooms, canteen area, a drying room and sanitary provisions.
- Temporary Site Construction Compound 2 - will be for storage of construction materials and plant.

The construction of the compound will be as follows:

1. The temporary compound's area will be outlined using ranging rods or wooden posts.
2. Perimeter drains will be installed or upgraded to collect surface water run-off from the temporary compound. This will involve the installation of check dams, silt traps and level spreaders to manage surface run-off effectively.
3. Topsoil will be stripped in the presence of an Archaeologist and carefully stockpiled for future landscaping use.
4. Subsoil will be excavated and retained on site for refilling into the compound area on completion of the construction works.
5. The temporary compound will be formed by constructing compacted layers of suitable hardcore.
6. Site offices and storage containers will be installed, and electric power will be provided by means of a temporary generator.
7. Parking areas and material storage areas will be provided within the Temporary Construction Compound.
8. For the storage of lubricants, oils, site generators, etc., a bunded refuelling area will be provided within the compound.

9. For sanitary provisions, self-contained toilets and wash areas with integrated foul wastewater holding tanks will be provided.
- Low-flush toilet cisterns will be used to reduce the volume of wastewater produced.
 - The foul wastewater holding tanks will be double lined.
 - These facilities will be managed and serviced regularly.
 - Foul water will be removed on a regular basis by pumping into a Foul Tanker Vehicle and disposing of to a designated sewage treatment plant by a suitably licensed foul waste collection contractor.
 - An automatic alert system will be used to monitor the holding tank to alert the operator if the tank is nearing full capacity.
 - The sanitary provisions, including the foul wastewater holding tank will be removed from site on completion of the construction works.
10. For water supply, water will be collected from roofs using a rainwater harvesting facility. Potable water will be brought onsite in bottles.
11. The compounds will be fenced and secured with locked gates.
12. On completion of the construction works the Temporary Construction Compound areas will be dismantled and the hardcore will be grubbed up. This hardcore will be incorporated into the final Reinstatement of the Project. The area will be backfilled with stockpiled subsoil and topsoil and re-seeded to the landowner's satisfaction.

6.2 Safety and Security

Members of the public will be prevented from accessing the Project site through implementation of adequate security measures. A contact information board will be erected at the site entrances. All those entering the site during the construction phase will be required to sign in at the Temporary Construction Compound on site. Security fences will be erected at the perimeter of active construction areas to prevent unauthorized entry. These fences will be regularly inspected and maintained.

Security measures will be in place at all times when construction activities are not taking place to safeguard site materials and equipment. This will include fencing, locked off areas, surveillance systems and security lighting.

Materials will be stored in the Temporary Construction Compound. Fuel, oils and chemicals will be stored in a bunded areas within the compound. The compound will be secured by means of a 2.4m high perimeter chain-link fencing with secure access gates.

6.3 Signage

Warning signs will be erected at the construction works areas to notify people of the construction site and of particular construction related risks in area. Signage will be regularly inspected by the site management team to ensure that they are securely fixed and in good condition.

6.3.1 Site Signage

A notice board will be erected at the site entrance and at the Temporary Construction Compound gates with information on the contact details for site management, PPE requirements for the site and any other information deemed necessary in accordance with the H&S Plan, see **Planning Drawing 23604-541**.

Within the site, maximum speed signage will be erected along the access tracks with a speed limit of 15km/hr. Health and safety signage will be erected where there are deep excavations, or other areas of increased risk. Signage will also be erected as a reminder to concrete delivery drivers that concrete truck wash-out is not permitted on-site and to direct concrete lorries to the chute wash down area.

6.3.2 Signage on the Public Road

Signage will be erected on the R371, L6018 and the L60498 Public Roads both sides of the site entrance locations to warn approaching vehicles, cyclists and pedestrians of the construction site entrance location and the potential presence of slow-moving vehicles.

Signage will also be erected along the public roads during the GCR works. Public road signage will be in accordance with Roscommon County Council's requirements and relevant planning conditions. Road signage on the public road will also be in accordance with the current Traffic Signs Manual Chapter 8 and associated best practice guidelines.

Signage in respect of traffic management is discussed in the TMP which forms part of this planning submission. This **CEMP** is to be read in conjunction with the TMP (**EIAR, Volume III, Chapter 2.1.3; Traffic Management Plan**).

6.4 Ballyfeeny Rock Quarry Blasting

Prior to commencement of construction works, the Liaison Manager will contact the neighbouring Ballyfeeny Rock Quarry in relation to any quarry blasting that may be planned during the construction works. When Ballyfeeny Rock gives notes of planned quarry blasting, then, the extent and proximity of the blasting to the proposed Project will be reviewed.

The site management team, in consultation with the PSCS, will review if additional safety precautions should be implemented on site during quarry blasting periods. As part of this the site management team will consider if a detailed Quarry Blasting Risk Assessment and Method Statement (RAMS) should be prepared and implemented on site.

When and if appropriate, additional safety precautions will be taken such as cordoning off a zone along the boundary of the proposed Project until the proposed blasting is complete.

A blasting coordination and cooperation plan has been produced and is contained in **EIAR, Volume III, Chapter 2.1.5**.

6.5 Pest Control

Effective prevention of infestation from pests or vermin including arrangements for regular disposal of food and material attractive to pests will be implemented. If infestation occurs the contractor will take appropriate action to eliminate and prevent further occurrence.

In the event of a pest outbreak pesticides that kill rodents (Rodenticides) will be deployed around the site. Incorrect use and management of rodenticide can indirectly have a negative impact on wildlife. Best practice use will include:-

- Pest control on site will be undertaken by a trained professional.
- Rodenticide baits will only be used for as long as is necessary to achieve satisfactory control.
- Good house-keeping and proper waste management practices will ensure there are no food sources available to vermin.
- A record of all bait points and the amount of bait laid will be maintained during the treatment. Activity will be noted at each bait point, including any missing or disturbed baits, as the treatment progresses.

- By carefully recording the sites of all bait points, responsible users of rodenticides will return to these sites at the end of the treatment and remove uneaten bait so that it does not become available to wildlife.
- The bodies of dead rodents may carry residues of rodenticides and, if eaten by predators or scavengers, may be a source of wildlife exposure to rodenticides.
- Regular searches for rodent bodies will be carried out, both during and after the treatment period. Bodies may be found for several days after rats have eaten the bait and rats may die up to 100 metres or more away from the baited site.
- Rodent bodies will be removed from site and disposed of safely as hazardous waste, adhering to EPA regulations for safe handling and disposal, including the use of gloves and proper packaging.
- Bait will be sufficiently protected to avoid accidentally poisoning other mammals and birds. Natural materials will be used where possible.
- Bait stations will be appropriate to the prevailing circumstances. They will provide access to the bait by rodents, while reducing the risks of non-target access and interference by unauthorised persons. They will protect the bait from contamination by dust or rain. Their design, construction and placement will be such that interference is minimised.
- On completion of the treatment, records will be updated to signify that the infestation is controlled and that, as far as reasonably practical, all steps have been taken to ensure that the site is now free of rodenticide bait.

7.0 Environmental Management

Construction and related Operation and Decommissioning mitigation measures in the **EIAR, Volume II, Chapter 18** are set out below.

7.1 Biodiversity

7.1.1 Timing of works

Measures will be implemented to avoid damage, destruction, and disturbance to sensitive species and their nesting habitats; these are achieved through careful timing of construction works throughout the breeding and nesting periods.

To minimise impacts on sensitive species, works with potential for harm or disturbance will be scheduled at the appropriate time of year; where this is not possible, works will be preceded or accompanied by suitable Environmental monitoring and / or supervision in accordance with best practice guidance.

7.1.2 Roles and Responsibilities

- Environmental Clerk of Works; A suitably qualified Environmental Clerk of Works (ECoW) will be appointed by the Developer and will have overall responsibility for overseeing Environmental compliance on the Project and will report to the Construction Manager (CM). The duties and responsibilities of the ECoW are set out in Section 5.4.3 above.
- Project Ecologist; The Project Ecologist will report to the ECoW and is responsible for the protection of sensitive habitats and species encountered during the construction phase of the development. The Project Ecologist will carry out periodic site inspections during construction. The responsibilities and duties of the Project Ecologist are set out in Section 5.4.8 above.

7.1.3 Habitat Management

The total maximum proposed habitat loss within the wind farm Site boundary, including GCR and TDR during construction is 19.13ha and 1,659m of linear habitat. Habitat Management Measures that will be implemented during the construction, operation and decommissioning phases of the Project include:-

- Minimise working areas to avoid unnecessary habitat removal or alteration.
- Restrict machinery and habitat removal to clearly marked construction footprints.
- Install tree protection barriers and ground protection in root zones.
- Protect existing hedgerows and trees in consultation with the ECoW.
- Store and dispose of all canteen waste (edible/putrescible) waste at licensed facilities.
- Compensate woodland loss with new broadleaf planting and shelter belts.

A Species and Habitat Management Plan (SHMP) has been prepared for the proposed Project, see **EIAR, Volume III, Appendix 6.10 - Species and Habitat Management Plan**. The SHMP details that 3km of hedgerow/treeline will be planted and 381m of existing hedgerow and treeline will be enhanced.

Further mitigation is provided within the SHMP which has been prepared to incorporate the above mitigation and will be followed during the construction and operation phases (Appendix 6.10).

7.1.4 Birds

7.1.4.1 Bird Habitat Loss and Fragmentation

Mitigation to limit Kestrel foraging activity around turbines will be implemented. This will include the following measures to reduce prey availability within the hardstand areas associated with each turbine:-

- Removal of timber/brush from felling and chipping of tree stumps to ground level;
- Piping/filling over of open field/forestry drains;
- Spread and compaction of chipped wood and spoil to create a flat surface to prevent rapid colonisation of new vegetation; and
- Ryegrass planting and the creation of uniformly short vegetation heights via infrequent mowing or trimming of vegetation around areas not proposed for other measures (e.g., replanting, enhancement).

7.1.4.2 Bird Disturbance & Displacement

Potential disturbance & displacement effects are likely to be greatest during the breeding season (March and August inclusive). Mitigation to limit effects are:- include:-

- Use properly maintained vehicles, plant and equipment to minimise the noise produced by on site operations.
- All vehicles, plant and equipment will be fitted with effective exhaust silencers.
- Timing of Works - Conduct habitat removal outside peak bird breeding season (mid-February to early September).
- Restrict activities in sensitive areas until the presence and status of nesting birds is confirmed.
- Carryout preconstruction and during construction bird surveys, including carrying out nesting bird checks within 48 hours prior to vegetation clearance during breeding season.
 - If an active nest is encountered, a disturbance buffer exclusion zone, in accordance with best practice guidelines is to be established within which works will not be carried out until the nest is no longer active.
 - The size of the exclusion zone would be dependent on the species affected, exclusion zones may range from 5m (e.g., for breeding passerines) to several hundred meters (e.g., for breeding raptors). As far as is practical the following exclusion zones sizes will be applied to the following species:-
 - Peregrine: 750m
 - Woodcock: 100–200m
 - Barn Owl: 150–175m

7.1.5 Bats

In order to offset the loss of bat habitat during construction of the proposed Project and to provide additional new opportunities for commuting and foraging bats, it is proposed to:-

- Compensate for loss of hedgerow/treeline habitat (1.011km/1.006km lost) by planting approximately 3km of new habitat. The areas for planting are shown in **EIAR, Volume III, Appendix 6.10 - Species and Habitat Management Plan**.
- Plant native species to maintain or improve commuting/foraging opportunities.

Overall, the proposed replanting will result in a net gain of approximately 1.807km in linear landscape features within the site from the existing baseline predicted to be lost as a result of the construction works.

7.1.6 Mammals and Other Fauna

A pre-construction mammal survey will be carried out immediately before the commencement of vegetation clearance to ensure that there is no new evidence of resting/breeding sites of protected mammal species in or directly adjacent to the construction corridor since the completion of the baseline surveys.

In the event that resting places of any protected mammal species become established in the interim period the ECoW will advise on the appropriate course of action, which will include:-

- Enforcement of onsite speed limits and in particular speed limits within 150m of water courses (15km/hr).
- Cover or provide egress for excavations to prevent entrapment of mammals, especially after work hours.
- To reduce disturbance to Otters, limit work hours to those proposed in Section 5.2 above.
- Apply best practice mitigation for pollutants (silt, nutrients, hydrocarbons, cement) to protect watercourses and aquatic species.

7.2 Land, Soil and Geology

Land, Soil and Geology (LS&G) mitigation measures are contained in the **EIAR, Chapter 7; Land, Soil and Geology**, these are set out below:-

7.2.1 LS&G Design

- Conduct design-stage risk assessments for all excavation, earthworks, and construction activities.
- Prepare detailed method statements for each construction element prior to works.
- Ensure qualified geotechnical personnel are on-site to supervise earthworks (the Project Geotechnical Engineer).
- Appoint an Environmental Manager, ECoW and Project Ecologist / Ecological Clerk of Works (EcoCoW) to oversee compliance.
- Ensure all waste soils are classified, tested, and disposed of according to EU Waste Codes and Waste Acceptance Criteria.
- Schedule earthworks to avoid severe weather or prolonged rainfall.

7.2.2 LS&G Management Plan and Good Practices

- Implement this **CEMP** and the WMP (**EIAR, Volume III, Chapter 2.1.2; Waste Management Plan**) throughout construction.
- Physically demarcate work areas by means of fencing prior to commencement construction activities

7.2.3 Storage and Stockpiles

Spoil types will be treated separately. Mineral soils and topsoil / organic soils will be segregated during excavation, with each type managed as follows:-

- Mineral Soils; Mineral soils will be deposited directly on other mineral soils. This will require the prior removal of topsoil or peat, where present, to facilitate placement.
- Topsoil / Organic Soils; These will be stored separately according to their classification, protected from environmental degradation to maintain integrity, and reused to reinstate mineral soil surfaces following construction. No topsoil will be disposed of as part of the Project.
- Deposition Locations; Mineral soil spoil deposition will occur at designated locations within the redline boundary, where low surface gradients coincide with minimal peat depth and sufficient distance from sensitive receptors.

- Minimisation of Movements; Spoil movements will be minimised by depositing material within, or immediately adjacent to, the construction footprint from which it originated.
- Site Preparation; Preparation of spoil deposition sites will involve stripping topsoil, which will be transferred to a designated location for stockpiling and subsequent reuse in restoration.
- Deposition Method; Spoil will be deposited in layers not exceeding 0.50 m, with a total thickness of no more than 2.00 m unless contained by suitably designed berms.
- Slope Constraints; Spoil will only be deposited on ground with slopes of less than 5° to the horizontal and more than 10 m from the top of any cutting.
- Monitoring; Spoil deposition sites will undergo regular weekly inspections by the Construction Manager or another suitably qualified individual to ensure stability and maintain good condition.
- Restoration; Upon completion of spoil deposition, sites will be re-vegetated using the upper vegetated layer removed at the commencement of works. During the decommissioning/restoration phase, guidance from a suitably qualified ecologist will be sought to develop an appropriate methodology and maintenance programme for the restored areas.

7.2.4 Vehicular Movements

- Restrict machinery to Site access tracks and permitted footprints.
- Minimise traffic by reusing excavated materials on-site and keeping cut / fill to a minimum.
- Deploy Best Practice work methodologies as described in the Irish Wind Energy Association (IWEA) (2012) "Best Practice Guidelines for the Irish Wind Energy Industry" and NatureScot (July 2024) "Good practice during wind farm construction", this will minimise double handling of excavated materials and help reduce site traffic.

7.2.5 Ground Stability & Landslide Prevention

The following procedures will be implemented to minimise the risk of soil instability during construction:-

- Spoil Management; Excavated spoil will not be placed on the downslope or upslope edges of adjacent topsoil. Instead, it will be deposited on the flanks of the excavation (where gradients are lowest) and spread to limit surcharge pressure on sensitive soils.
- Sensitive Soils; Excessive spoil will not be placed on topsoil, organic soils, or other sensitive sloping ground (slope gradients should not exceed 5°). Where necessary, topsoil and organic soils will be stripped in advance, stored appropriately, and later reused for landscaping.
- Excavation Stability; The cut face of excavations will be battered back to safe angles (c. 60° in clay soils and c. 30° in granular or organic soils) to minimise the potential for slope failure.
- Turbine Hardstandings; Hardstanding areas will be designed so that crane loadings are transferred directly onto competent strata. Limited excavations may be required to achieve this.
- Weather Precautions; Ground movements are more likely during or after severe rainstorms, particularly following prolonged dry periods. Extra vigilance will be maintained during these conditions.
- Monitoring; All slopes will be inspected regularly for tension cracks or other signs of movement. The potential for ground instability will also be monitored throughout construction by the ECoW through site visits and assessments.
- Excavation Practices; Excavations will not be undercut or left unsupported for more than 24 hours. Backfilling will take place as soon as practicable, with excavation and filling works coordinated to minimise open excavation time.
- Surface Water Management; Construction practices will ensure that surface water flows do not compromise the stability of granular or cohesive soils.

- Groundwater Control; Pore water pressure within excavations will be managed by draining sumps at regular intervals to prevent water ponding and potential hydraulic instability.
- Phasing of Works; Construction will commence in less sensitive areas first, allowing best practices to be established before progressing to more challenging locations. Where necessary, low ground-bearing pressure machinery will be used to transport materials in sensitive areas.
- Method Statements; All works will follow approved method statements. Any required modifications will be agreed in advance with the supervising engineer.

7.2.6 Soil Contamination - Hydrocarbons and Cementitious Materials

The probability of contamination from hydrocarbons and cementitious materials will be minimised through the application of good practice and strict adherence to this CEMP. The following measures will apply:-

7.2.6.1 Concrete Works

- Concrete pours will not take place during forecast heavy rainfall, and pour areas must be free of standing water.
- In the event of spills, dirty water drains will be temporarily blocked, pH levels in settlement ponds monitored and adjusted using CO₂ entrainment if required, and spillages cleared immediately to the chute wash-down area.
- Delivery trucks, tools, and equipment will be cleaned only at designated controlled areas. The concrete truck chute cleaning area will be lined with impermeable material to prevent groundwater pollution (see **Planning Drawing 23604-405**).

7.2.6.2 Fuel, Oils, and Chemicals

- All fuels, oils, and chemicals will be stored in bunded areas with 110% capacity, located at least 50 m from watercourses or drainage areas.
- Bunded areas will comply with Australian Standard AS 1940:2004; AS 1940:2004 is an Australian Standard that provides guidelines and requirements for the safe storage and handling of flammable and combustible liquids.
- Refuelling of plant and vehicles will be carried out only in designated areas using a prescribed procedure.
- Refuelling and maintenance will not occur near watercourses or drains.
- All refuelling and maintenance will be carried out on impervious surfaces or bunded trays to prevent ground contamination.
- Spill kits will be maintained on mobile fuel trucks and at multiple locations across the site.
- Only mechanically sound vehicles, plant, and machinery will be permitted on site.

7.2.6.3 Spill Response

In the event of a spill or leak:-

1. Stop the source and raise the alarm.
2. Eliminate ignition sources where applicable.
3. Contain the spill using spill control materials, track mats, or other methods.
4. Do not flush spills away; instead, bund or cover vulnerable areas such as drains, watercourses, or habitats.
5. Clean up as much as possible with spill control materials.
6. Contain used spill material and arrange disposal via a licensed waste contractor.
7. Notify the ECoW immediately, providing details of location, type, and extent of the spill.

8. The ECoW will inspect, oversee containment/clean-up, and notify the relevant authorities (e.g. Roscommon County Council, EPA) if required.
9. Records of all environmental incidents will be maintained by the ECoW and the Main Contractor.

7.2.6.4 Importation of Materials

- All imported materials (e.g. aggregates, construction materials) will be monitored, documented, certified, sampled, and tested in accordance with the WMP (**EIAR, Volume III, Chapter 2.1.2; Waste Management Plan**).
- Monitoring will ensure no contamination or invasive species are introduced to the site.
- Spoil materials removed from site will also be monitored to ensure compliance.

7.2.6.5 Wastewater Management

- The only source of wastewater will be welfare facilities within the Temporary Construction Compounds.
- To eliminate potential effects on soils and geology, foul effluent will be contained in a sealed, bunded storage tank.
- Effluent will be removed regularly and disposed of off-site at a suitably licensed facility, thereby preventing any pollution linkage to the wider environment.

7.2.7 General Waste

All materials used on site and wastes generated will be minimised through good site practices and adherence to the **CEMP** and WMP (**EIAR, Volume III, Chapter 2.1.2; Waste Management Plan**). A reduce–re-use–recycle policy will be applied throughout construction:-

- All waste will be segregated and either re-used on site where possible or removed for recycling.
- Non-recyclable and non-compostable wastes will be disposed of at a suitably licensed landfill facility.
- Excavated spoil will, wherever possible, be reused close to the point of excavation.
- Careful project design has minimised the volume of surplus soil and rock expected.

7.2.8 Emergency Response

An Emergency Response Plan is to be put in place for the construction phase, including detailed spill response and control procedures, see Appendix A, EMP 11.

7.3 Water, Hydrology & Hydrogeology

7.3.1 Site-Specific Surface Water Management

Site specific surface water management measures are set out in the SWMP (**EIAR, Volume III, Chapter 2.1.1; Surface Water Management Plan**). The SWMP addresses the following mitigation requirements:-

- Track Construction and Drainage Design; Site access tracks will be constructed by excavating to a stable layer and filling with selected materials. Since these tracks can create flow paths for surface water and are generally lower than surrounding ground, specific drainage designs will be implemented, these are detailed in the SWMP.
- Crane Hardstands and Perimeter Drainage; Maximum crossfall on crane hardstands will not exceed 1:100 to maintain stability. Perimeter drainage channels will collect runoff and direct it to suitably sized settlement ponds before discharge onto vegetated ground.
- Tree Felling Operations; Felling will be conducted in suitable weather conditions, paused during rainfall to minimise sediment mobilisation. Operations will be planned to minimise surface water flow rates and

volumes, with silt traps installed along felling routes as required to prevent sediment or debris from entering watercourses.

- Excavation Drainage; Excavations will be designed to minimise retained water volumes.
- Monitoring and Compliance; Surface water will be monitored during construction for pH, conductivity, chemical oxygen demand, suspended solids, and total dissolved solids. If thresholds in S.I. No. 77/2019 are exceeded, the Environmental Manager will review mitigation measures to protect surface water.

7.3.2 Site-Specific Fine Sediment Pollution Management

Mitigation measures for protecting surface water quality from runoff carrying fine sediments and other pollutants involve the implementation of silt control measures. These measures cover planning of works, site compound construction, storage management, and excavation practices.

Site specific fine sediment pollution management measures are set out in the SWMP (EIAR, Volume III, Chapter 2.1.1; **Surface Water Management Plan**). The SWMP addresses the following mitigation requirements:-

- Silt Control Measures; silt fencing, runoff control features, and other measures will be implemented to prevent contaminants from entering the stormwater system. Proper storage of hazardous materials and good waste management practices will be maintained at all times.
- Planning and Weather Considerations; works will be planned with reference to weather forecasts, avoiding heavy rain or storm events to minimise runoff exceeding the capacity of control measures. Where work during precipitation is unavoidable, runoff controls will be actively monitored to ensure effectiveness.
- Temporary and Permanent Control Features; silt traps, silt fences, check dams, swales, and sedimentation ponds will be implemented, alongside temporary settlement tanks in areas requiring water pumping.
- Trackside Swales; swales will be trapezoidal, at least 300 mm wide at the base and 450 mm deep, with check dams installed at prescribed intervals to reduce erosion and trap sediments.
- Emergency Response; an Emergency Response Plan will be in place to address mobilisation of soil particles or pollution, enabling rapid interception and treatment of runoff containing silt or contaminants.
- Vegetation Protection; existing vegetation along drains will not be stripped unless absolutely necessary, as it serves as a natural filter during runoff conveyance to watercourses, provided sufficient pre-treatment is applied.

7.3.3 Site-Specific Hydromorphology Mitigations

To reduce potential impacts from drilling works (HDD), the mitigation measures set out in Section 5.9.10.1 will be implemented.

7.3.4 Accidental Spills and Leaks

To avoid and manage accidental spills and leaks, a series of mitigation measures will be implemented; the Appointed Contractor will be responsible for ensuring compliance. Measures to prevent contamination from fuel, oil, chemicals, and cementitious materials are set out in Section 7.2.6

Monitoring records will be maintained by the Contractor and submitted to the ECoW at agreed regular intervals, see Section 7.9.4 for details on monitoring.

7.3.5 Groundwater Mitigation

- Excavation Dewatering; To prevent and manage fine sediment pollution and accidental spills from impacting the hydrogeological environment, dewatering of surface water from excavations will be directed to settlement ponds.
- Refuelling and Maintenance Controls; specific areas will be designated for refuelling and maintenance, located on impervious surfaces or bunded trays to prevent spills from seeping into the ground.
- Vegetation Management; the use of herbicides around turbines and Site access tracks will be avoided where possible. Where herbicides are necessary, environmentally friendly alternatives will be applied under strict guidelines to prevent infiltration into groundwater.
- Baseline and Monitoring; baseline groundwater quality testing will be conducted prior to construction and eventual wind farm operation to establish existing conditions; a regular groundwater monitoring program will then be implemented to detect any potential contamination early and enable immediate corrective action.
- Temporary Drainage and Dewatering; Water entering excavations may contain high concentrations of suspended solids; settlement ponds receiving this water will be designed to accommodate such flows. Where possible, gravity-fed drainage channels will be installed. If pumping is required for deeper excavations, temporary storage within the excavation will be provided, and dewatering will be carried out at a flow rate that matches the capacity of the settlement ponds.
- Integrated Mitigation; all mitigation measures outlined in the surface water, fine sediment, and accidental spill sections will also be implemented to prevent any likely significant adverse effects to groundwater.

7.4 Air Quality and Climate

7.4.1 Air Quality

The following management and control measures, based on IAQM guidance and best practice, will be implemented:-

- Site and Road Cleaning; Site access tracks and adjacent public roads will be regularly cleaned to remove mud, aggregate, and other materials.
- Track Maintenance; Site access tracks will be well maintained to minimise dust generation.
- Dampening of Tracks; water bowsers will be used during prolonged dry periods to suppress dust where necessary.
- Vehicle Controls;
 - Construction vehicles transporting potentially dusty materials will be enclosed, covered, or wetted at all times to restrict dust escape.
 - Vehicles will be inspected prior to entering the public road network to ensure no dust emission potential.
 - Vehicle speeds will be restricted on internal Site access tracks.
 - Vehicles will be routinely maintained to minimise emissions, switched off when not in use, and low-emission fuels will be used where possible.
- Material Handling;
 - Dusty materials, such as excavated soils, will be stored and handled appropriately (e.g., covered when necessary, and drop heights minimised).
 - Water misting or sprays will be applied during dry or windy periods to control dust from construction activities.
- Site Hoardings; where required suitable hoardings will be erected to prevent wind-blown materials.

- Construction Scheduling; timely completion of works will be ensured to minimise dust generation over prolonged periods.
- Transport Management;
 - Materials will be transported to and from the site only during normal working hours and along routes agreed with Roscommon County Council.
 - Local aggregate and concrete suppliers will be used wherever possible to reduce extended transport and potential dust emissions.
- Monitoring and Oversight; the appointed Contractor will undertake regular site inspections to ensure effective implementation of mitigation measures.
- Complaints Management; a complaints register will be maintained on site to record all telephone calls and letters regarding dust or air quality concerns, along with details of remedial actions taken.
- The appointed Contractor will review dust management measures at regular intervals during construction to confirm effectiveness.
- Personnel Training; construction site personnel will be briefed on dust management measures during Toolbox Talks and site meetings.
- Use of local suppliers to reduce the need for extended transport and therefore reduces potential effects on air quality.
- The Site has been determined as suitable for reuse of soils and subsoils within the Site boundary, thus preventing the requirement for significant transportation and risk of dust nuisance.

7.4.2 Climate

The following climate mitigation measures will be implemented during the construction phase of the Project, with the aim of reducing greenhouse gas emissions and supporting sustainable practices:

- Vehicle Management; management of vehicles including emissions and fuel usage.
- Maintenance; in the event of a vehicle requiring repairs, maintenance will be promptly carried out to minimise emissions arising from inefficient operation.
- Engine Idling; stationary onsite vehicles will have engines turned off to reduce unnecessary idling emissions; all plant and vehicles must be properly maintained to minimise emissions of engine-generated pollutants.
- Local Material Sourcing; the majority of aggregate materials and concrete for the construction of the Project will be obtained from local quarries, reducing emissions associated with vehicle movements.
- Use of Local Suppliers; local quarries, materials suppliers, and waste facilities will be utilised to minimise transport distances; and
- Groundworks Management; groundworks and excavation will be minimised to required development areas, with soils and subsoils reused onsite to reduce transport requirements.
- The appointed Contractor will brief construction site personnel on emission management measures during Toolbox Talks and site meetings.

7.5 Noise and Vibration Management

Construction related noise and vibration will be managed based on the recommendations in BS 5228-1:2009+A1:2014, Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise. Best management practices will be adopted during construction, these will include the following:-

7.5.1 Noise - Best Management Practices

- The day-to-day works programme will be planned in a manner to avoid simultaneous operation of the noisiest/vibratory plant.
- Establish communication channels between Contractor, Developer, Roscommon County Council, local residents and landowners – this will be led by the Community Liaison Manager.
- Appoint a Safety Representative responsible for noise and vibration matters – this appointment will be made by the Site Manager.
- Restrict construction hours to those proposed in Section 5.2 above.

7.5.2 Noise Control Measures

- Use properly maintained vehicles, plant and equipment to minimise the noise produced by on site operations.
- All vehicles, plant and equipment will be fitted with effective exhaust silencers.
- Select low-noise and low-vibration plant where possible.
- Position noisy or vibratory plant as far from sensitive receptors as site allows.
- Use attenuated compressors, sealed acoustic covers, and silencers on pneumatic tools.
- Shut down or throttle down machinery when not in use.
- Erect site hoarding and temporary screens around noisy equipment.
- Use acoustic enclosures or portable screens for plant operating outside standard hours.
- Maintain even Site access track surfaces to reduce vibration from vehicles.

7.5.3 Noise Monitoring:

- Undertake noise and vibration monitoring per BS 5228-1:2009 during construction and decommissioning works.
- Monitor when complaints are received or to verify compliance with noise criteria.

7.6 Traffic and Transport - Traffic Management Plan

A site-specific TMP has been prepared for the project and forms part of this planning submission. This **CEMP** is to be read in conjunction with the TMP. The TMP is contained in the **EIAR, Volume III, Chapter 2.1.3; Traffic Management Plan**.

7.7 Archaeology, Architectural and Cultural Heritage

Archaeology, Architectural and Cultural Heritage mitigation measures are contained in the **EIAR, Volume II, Chapter 13, Section 13.4**, these are set out below:-

7.7.1 Archaeological Testing Prior to Construction

- Undertake archaeological test excavations across suitable lands within the redline boundary prior to construction, under licence from the National Monuments Service (NMS) and in consultation with Roscommon County Council.
- The anomalies identified as part of the geophysical survey shall be assessed as part of any test excavation program.
- Areas within the redline boundary unsuitable for testing (e.g., commercial forestry) are to be subject to archaeological monitoring during construction, also under NMS licence.

7.7.2 Archaeological Monitoring

- All ground disturbance within the redline boundary are to be monitored archaeologically during construction carried out under licence from the NMS in consultation with Roscommon County Council.

- Areas which were not suitable for archaeological testing due to commercial forestry, are to be subject to close archaeological monitoring during the construction phase.

7.7.3 Archaeological Discovery Protocols

- Should previously unknown archaeological remains be discovered during the course of archaeological testing or monitoring, the Project Archaeologist will notify the NMS and Roscommon County Council to ensure that appropriate mitigation measures are put in place to protect and potentially preserve (preservation by record or preservation in-situ) any archaeological remains.

7.7.4 Archaeology & GCR and TDR

- GCR (5.8 km underground grid connection): No cultural assets within 50m; no mitigation required.

7.7.5 Archaeology & TDR

- Proposed works (street furniture removal) are required at Node No. 2040 to the west of Galway City. These works are located within the zone of Recorded Monument GA082-043002 (Fulacht Fiadh). Although the proposed minor works will not directly affect the Cultural Asset, the Project Archaeologist shall liaise with the NMS prior to the commencement of works to determine if archaeological mitigation measures are deemed necessary.

7.8 Material Assets

7.8.1 Waste Management Plan

A site-specific WMP has been prepared for the Project and forms part of this planning submission. This **CEMP** is to be read in conjunction with the WMP. The WMP is contained in **EIAR, Volume III, Chapter 2.1.2; Waste Management Plan (WMP)**.

7.8.2 Utilities

Best practice procedures will be followed to ensure the protection of the existing utilities and the health and safety of the site operatives. Such measures will include:-

- Confirmatory drawings for all existing services will be sought upon consultation with ESB Networks, Uisce Éireann and Eir/NBI;
- All construction workers to be trained on the Health and Safety Authorities (HAS) Code of Practice for Avoiding Danger from Underground Services;
- The Health and Safety Officer for the Project shall implement a safe system of work, including safe digging practices when working on or near existing utility services;
- Immediately prior to construction taking place, the area where excavation is planned will be surveyed by CAT scan (sub-surface survey technique to locate any below-ground utilities) and all existing services will be verified. Temporary warning signs will be erected;
- The as-built location of the installed ducts will be surveyed and recorded using a total station/GPS before the trench is backfilled to record the exact location of the ducts. The co-ordinates will be plotted on as-built record drawings for the Grid Connection cable operational phase and passed to the utility providers to include on the Dial before you Dig maps; and
- Clear and visible temporary safety signage will be erected all around the perimeter of the live work area to visibly warn members of the public of the hazards of ongoing construction works.

7.8.3 Telecommunications

The potential impact to Telecommunication Links is set out in the **EIAR, Volume III, Chapter 14.1; Telecommunications Impact Assessment**. During the detailed design and subsequent construction of the windfarm the following design and mitigation measures will be carried out:-

- Mitigate potential interference with Three Ireland and Vodafone links via existing telecom masts/relay towers or the proposed new Relay Tower.
- Construct a permanent Telecommunications Relay Tower for routing and rerouting telecoms links.
- Undertake confirmatory testing with Vodafone during construction; remediate any demonstrable interference before turbines become operational.

Telecommunications mitigation measures are fully detailed within Section 6 of **Appendix 14.1 – Telecommunications Impact Assessment**. The section, outlines the technically viable mitigation measures that are based on industry standard best practice. Mitigation Measures will be implemented to remediate any impacts of the proposed turbines on the Three Ireland and Vodafone Ireland networks. The proposed mitigations measures are based on previous experience of solutions and precedents that have been agreed with telecommunications operators on previous wind farm developments. A protocol agreement would be put in place between the Applicant and the telecoms operator prior to the construction of the proposed wind farm to agree terms such as estate management, operator access, electricity supply, dual redundant electricity supply etc.

A summary of mitigation for each impacted link is as follows:

Three Ireland Network

Three Ireland Link 1 - Relay the radio link via an existing Telecoms Mast:

The most technically viable mitigation measure option to offset the potential impact on the Three Ireland Link between Mullaghmacormick and Sliabh Bawn is to relay the radio link via an existing telecoms mast at Lissawaddy to relay the radio link. The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg (see **Appendix 14.1 – Telecommunications Impact Assessment**).

Vodafone Network Ireland

Vodafone Link 1 – Relay the radio link via an existing telecoms mast:

To mitigate the impact on the radio link between Mullaghmacormick and Sliabh Bawn the most technically viable mitigation measure option, is considered to be the use of an existing telecoms mast to relay that radio link. The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg (see Appendix 14.1 – Telecommunications Impact Assessment).

Vodafone Link 2 - Route the Vodafone service between Sliabh Bawn and Ballyfeeny via a new telecoms mast located within the wind farm site boundary:

The most technically feasible mitigation measure option to mitigate the potential impact on Vodafone Link 2 would be to route the radio service to/from Sliabh Bawn via a new telecoms relay mast installed within the proposed wind farm site boundary. The proposed Project is seeking planning consent as part of this planning application for the construction of a new 33m high, Relay Tower that would facilitate the diversion of this link.

The proposed mitigation solution is shown in **Planning Drawing 23604-510 (Part 1)**.

A 3D model of the proposed radio link was also generated to ensure that it would not be impacted by the turbine layout. The 3D model confirmed that a radio link from the proposed mast site location would not be impacted by the turbine layout. The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg (see **Appendix 14.1 Telecommunications Impact Assessment**).

Vodafone Link 4 - Route the Vodafone service between Ballyfeeny and Roosky via a new telecoms mast located within the wind farm site boundary:

The most technically feasible mitigation measure option to mitigate the potential impact on Vodafone Link 4 would be to route the radio service to/from Roosky via a new telecoms mast installed within the wind farm site boundary. The proposed Project is seeking planning consent as part of this planning application for the construction of a new 33m high, Relay Tower that would facilitate the diversion of this link. The proposed mitigation solution is shown in **Planning Drawing 23604-510 (Part 1)**.

A 3D model of the proposed radio link was also generated to ensure that it would not be impacted by the turbine layout. The 3D model confirmed that a radio link from the proposed mast site location would not be impacted by the turbine layout. The radio link path profile shows clear Line-of-Sight (LOS) and the link budget results would pass the radio availability criteria required by ComReg (see **Appendix 14.1 – Telecommunications Impact Assessment**).

The proposed measures will offset the potential impacts of the proposed turbines at Ballyfeeny on the existing telecommunications network infrastructure. The Applicant in this instance will be responsible for all costs associated with the mitigation measures set out. A protocol agreement will be put in place between the Applicant and the telecoms operator (Vodafone Ireland and Three Ireland), prior to the construction of the proposed wind farm to agree terms such as estate management, operator access, electricity supply etc.

7.8.4 Aviation Lighting

The Irish Aviation Authority (IAA), the Irish Air Corps (IAC) and / or the Department of Defence (DoD) may require one or more of the proposed wind turbines to be fitted with an Obstacle Warning Light System, see **EIAR, Volume II, Chapter 14; Section 14.5.3**.

At detailed design stage the Developer will liaise with the IAA and the IAC/DoD to:-

- Agree an aeronautical obstacle warning light scheme for the wind turbine development that is agreeable to both IAA and IAC/DoD;
- Will provide as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location to IAA and IAC/DoD; and
- Notify the IAA and IAC/DoD of intention to commence crane operations with at least 30 days prior notification of their erection

7.9 Environmental Control Procedures

7.9.1 Environmental Method Plans

A number of Environmental Method Plans (EMPs) have been prepared for the development to address the recommended mitigation measures contained in the **EIAR** and summarised in the Summary of Mitigation Measures table contained in Appendix A.

The EMP provide detail on the methodology to be deployed during construction activities as well as providing detail on mitigation monitoring requirements and the personnel responsible for implementing the EMPs.

The EMPs will be refined further at construction stage and adopted by contractors prior to commencement of construction activities. The EMPs will form part of the overall site induction, work risk assessments and method statements, and will also be reviewed on site during and Site Meetings and Toolbox Talks.

EMPs are listed in **Table 7-1**, the EMP are provided in Appendix A.

Reference	Procedure
EMP 1	Site Environmental Training and Awareness
EMP 2	Construction Noise and Vibration Management
EMP 3	Air Quality Management Plan
EMP 4	Fuel, Oil & Chemical Management Plan
EMP 5	Concrete Pour Management Plan
EMP 6	Biosecurity Management Plan
EMP 7	Groundwater Management Plan
EMP 8	Soils & Geology Management
EMP 9	Archaeological & Heritage Protection
EMP 10	Emergency Response Plan
EMP 11	Accidents & Incidents Plan
EMP 12	Complaints Management Plan

Table 7-1 Environmental Method Plans (EMP)

7.9.2 Site Meetings

Site Meetings between the site management team and site personnel will be held at regular intervals. The objectives of the Site Meetings are to discuss the coming weeks proposed activities and identify the relevant work method statements and sub plans that will be relevant to that week's activities. Additionally, any non-compliance identified during the previous week would also be discussed with the aim to reduce the potential of the same noncompliance reoccurring.

7.9.3 Toolbox Talks

A Toolbox Talk is a short presentation to site personnel on a single aspect of health and safety, environmental awareness and work methodologies on site. They are given to ensure that site personnel are aware of the standard of work practices that are expected and to make them aware of their responsibilities.

Toolbox Talks will be given on site by a member of the site management team. There will be generally 2 to 4 Toolbox Talks each week throughout the construction period.

The toolbox talks will include training and awareness on:-

- Ecological sensitive areas on site;
- Buffers zones on site – e.g. At watercourses, archaeological exclusion zone, ecological zone;
- Sediment and erosion control;
- Site housekeeping;
- On-site traffic routes and vehicle use;
- Site rules;
- Strictly adhering to the Project footprint;

- Fuel, oils and chemical storage on site;
- Fuel, oils and chemicals spill prevention and control;
- Materials and waste recycling procedures;
- Water pollution in relation to cement and concrete handling;
- Dust management.

7.9.4 Monitoring

The CM & ECoW will provide Audit Checklists to ensure regular checks of the site's control measures for the ongoing construction works and protection of the environment.

Checklists for daily, weekly or monthly site audits will be finalised by the CM & ECoW and the relevant personnel informed of their duties.

Checklists will include:-

- Confirmation that fuel is stored appropriately;
- Waste management rules are adhered to;
- All environmental buffers are maintained;
- Surface water and run-off control measures of the area in place and functioning;
- Concrete wash-out procedure is being followed

All environmental records, including completed checklists, will be retained at the site office, these will include:-

- Records of regular inspections of bunds, vehicles, and oil storage on site.
- Records of silt fencing conditions and placement.
- Records of water ingress and pumping during excavation activities.

7.9.5 Complaints

A provisional Complaints Management Plan (CMP) has been prepared for the project; EMP 14, this is included in Appendix A.

The CMP will be refined further at the construction phase by the ECoW and adopted by contractors prior to commencement of construction activities. The CMP will form part of the overall site induction and will be reviewed with site personnel regularly as part of Toolbox Talks and Site Meetings.

8.0 Summary

This Construction Environmental Management Plan (**CEMP**) presents a summary of the overall proposed Project works, the management of the site during the construction works and the mitigation measures required to ensure the proposed works do not have a significant effect on the environment.

This document has been prepared in accordance with Best Practice documents as set out above and in all relevant documents submitted with this Planning Application.

Key to the implementation of this **CEMP** is the delegation of responsibility for the **CEMP** to the CM, the ECoW and their Site Management team. The measures detailed in this **CEMP** ensures that each member of the construction team including site management and general site operatives will be aware of their responsibilities in terms implementing good construction and environmental practices.

Appendix A – Environmental Method Plans (EMP)

Reference	Procedure
EMP 1	Site Environmental Training and Awareness
EMP 2	Construction Noise and Vibration Management
EMP 3	Air Quality Management Plan
EMP 4	Fuel, Oil & Chemical Management Plan
EMP 5	Concrete Pour Management Plan
EMP 6	Biosecurity Management Plan
EMP 7	Groundwater Management Plan
EMP 8	Soils & Geology Management
EMP 9	Archaeological & Heritage Protection
EMP 10	Emergency Response Plan
EMP 11	Accidents & Incidents Plan
EMP 12	Complaints Management Plan

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EMP 1 - Site Environmental Training and Awareness

Aim:

To describe measures for the training of all site personnel in the protection of the environment and the relevant controls.

Methodology:

This EMP and its contents will be distributed to all site personnel, including management staff, operatives, and subcontractors, in order to ensure that environmental awareness and compliance are successfully communicated at the beginning and throughout the construction works. The main components of the CEMP will be covered in the site induction, which is required for all employees, contractors, and visitors.

Regular environmental Toolbox Talks will be given to all site personnel.

These will be targeted at particularly sensitive environmental issues such as:

- Safeguarding vital ecological receptors and delicate ecological environments;
- Controlling water pollution and silt; Water pollution in relation to processing cement and concrete;
- Spill control and prevention;
- Dust control; and
- Waste management.

Monitoring:

Monitoring will consist of:-

- Regular on-site inspections by the site management team;
- Review of on-site training at regular intervals and update as required;
- Review of requirements with site personnel during Toolbox Talks and Site Meetings.

Responsibility:

The Site Manager is responsible for ensuring that this EMP is communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this EMP lies with all site personnel but in particular:-

- Site Manager;
- ECoW;
- HSEQ Officer; and
- PSCS.

EMP 2 - Construction Noise & Vibration Management

Aim:

To describe measures for the management of impacts from construction noise and vibration.

Methodology:

The methodology will consist of:

- Use properly maintained vehicles, plant and equipment to minimise the noise produced by on site operations.
- All vehicles, plant and equipment will be fitted with effective exhaust silencers.
- Select low-noise and low-vibration plant where possible.
- Position noisy or vibratory plant as far from sensitive receptors as site allows.
- Use attenuated compressors, sealed acoustic covers, and silencers on pneumatic tools.
- Shut down or throttle down machinery when not in use.
- Erect site hoarding and temporary screens around noisy equipment.
- Use acoustic enclosures or portable screens for plant operating outside standard hours.
- Maintain even Site access track surfaces to reduce vibration from vehicles.

Best Management Practices

- The day-to-day works programme will be planned in a manner to avoid simultaneous operation of the noisiest/vibratory plant.
- Establish communication channels between Contractor, Developer, Roscommon County Council, local residents and landowners – this will be led by the Community Liaison Manager.
- Appoint a Safety Representative responsible for noise and vibration matters – this appointment will be made by the Site Manager.
- Restrict construction hours to those proposed in Section 5.2 above.

Monitoring:

Monitoring will consist of:

- Undertake noise and vibration monitoring per BS 5228-1:2009 during construction and decommissioning works.
- Monitor when complaints are received or to verify compliance with noise criteria
- Monitoring typical levels of noise and vibration during critical periods and at sensitive locations.
- Regular on-site inspections by the site management team.
- Review of the statement at regular intervals and update as required.
- Review of requirements with site personnel during Toolbox Talks and Site Meetings.

Responsibility:

The Site Manager is responsible for ensuring that this EMP is communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this EMP lies with all site personnel but in particular:-

- Site Manager;
- ECoW;
- HSEQ Officer; and
- PSCS.

EMP 3 - Air Quality & Climate

Aim:

To describe measures for the management of impacts on air quality.

Methodology:

The methodology will consist of:-

Air Quality

The following management and control measures, based on IAQM guidance and best practice, will be implemented:-

- Site and Road Cleaning; Site access tracks and adjacent public roads will be regularly cleaned to remove mud, aggregate, and other materials.
- Track Maintenance; Site access tracks will be well maintained to minimise dust generation.
- Dampening of Tracks; water bowsers will be used during prolonged dry periods to suppress dust where necessary.
- Vehicle Controls;
 - Construction vehicles transporting potentially dusty materials will be enclosed, covered, or wetted at all times to restrict dust escape.
 - Vehicles will be inspected prior to entering the public road network to ensure no dust emission potential.
 - Vehicle speeds will be restricted on internal Site access tracks.
 - Vehicles will be routinely maintained to minimise emissions, switched off when not in use, and low-emission fuels will be used where possible.
- Material Handling;
 - Dusty materials, such as excavated soils, will be stored and handled appropriately (e.g., covered when necessary, and drop heights minimised).
 - Water misting or sprays will be applied during dry or windy periods to control dust from construction activities.
- Site Hoardings; where required suitable hoardings will be erected to prevent wind-blown materials.
- Construction Scheduling; timely completion of works will be ensured to minimise dust generation over prolonged periods.
- Transport Management;
 - Materials will be transported to and from the site only during normal working hours and along routes agreed with Roscommon County Council.
 - Local aggregate and concrete suppliers will be used wherever possible to reduce extended transport and potential dust emissions.
- Monitoring and Oversight; the appointed Contractor will undertake regular site inspections to ensure effective implementation of mitigation measures.
- Complaints Management; a complaints register will be maintained on site to record all telephone calls and letters regarding dust or air quality concerns, along with details of remedial actions taken.
- The appointed Contractor will review dust management measures at regular intervals during construction to confirm effectiveness.
- Personnel Training; construction site personnel will be briefed on dust management measures during Toolbox Talks and site meetings.

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- Use of local suppliers to reduce the need for extended transport and therefore reduces potential effects on air quality.
- The Site has been determined as suitable for reuse of soils and subsoils within the Site boundary, thus preventing the requirement for significant transportation and risk of dust nuisance

Climate

The following climate mitigation measures will be implemented during the construction phase of the Project, with the aim of reducing greenhouse gas emissions and supporting sustainable practices:

- Vehicle Management; management of vehicles including emissions and fuel usage.
- Maintenance; in the event of a vehicle requiring repairs, maintenance will be promptly carried out to minimise emissions arising from inefficient operation.
- Engine Idling; stationary onsite vehicles will have engines turned off to reduce unnecessary idling emissions; all plant and vehicles must be properly maintained to minimise emissions of engine-generated pollutants.
- Local Material Sourcing; the majority of aggregate materials and concrete for the construction of the Project will be obtained from local quarries, reducing emissions associated with vehicle movements.
- Use of Local Suppliers; local quarries, materials suppliers, and waste facilities will be utilised to minimise transport distances; and
- Groundworks Management; groundworks and excavation will be minimised to required development areas, with soils and subsoils reused onsite to reduce transport requirements.
- The appointed Contractor will brief construction site personnel on emission management measures during Toolbox Talks and site meetings.

Monitoring:

Monitoring will consist of:-

- Regular on-site inspections by the site management team;
- Review of the statement at regular intervals and update as required; and
- Review of requirements with site personnel during Toolbox Talks and Site Meetings;

Responsibility:

The Site Manager is responsible for ensuring that this EMP is communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this EMP lies with all site personnel but in particular:-

- Site Manager;
- ECoW;
- HSEQ Officer; and
- PSCS.

EMP 4 - Fuel, Oil & Chemical Management

Aim:

To describe measures for the management of using and storing fuel, oil & other chemicals on site.

Methodology:

The methodology will consist of:-

- Using Bunded Refuelling/ Storage Areas:-
 - Ensuring all fuels, oils and chemicals are kept in a bunded area, 50 metres from watercourses and away from other environmentally sensitive areas;
 - Ensuring bunded areas to have 110% capacity of the total volume of store fuel/ oil/ chemicals;
 - Ensuring the refuelling of construction machinery and vehicles is carried out in designated refuelling areas using a prescribed re-fuelling procedure;
 - Refuelling of all plant and equipment will only be carried out at designated refuelling areas which will be located more than 50m from watercourses. Prior to commencement of construction, the location of designated refuelling areas will be agreed with IFI;
 - Construction of the bunded area are to be constructed in accordance with AS 1940:2004; and
 - Ensuring an appropriate spill kit is readily available and stocked. Spill kits will be maintained on the mobile fuel truck and at numerous locations on the Project site.
- Plant and Equipment
 - All plant and machinery will be serviced and inspected before being granted access to the site;
 - Plant and Equipment is to comply with the Guide to application of the Machinery Directive 2006/42/EC Edition 2.3 – April 2024 (Update of 2nd Edition)
 - Only suitably trained personnel are to operate plant or equipment.
 - Plant and equipment is to be checked daily by the suitably trained operator to ensure they are working properly (no oil/fuel leaks etc.).
- Refuelling
 - Fuel fill pipes will not extend beyond the bunded refuelling area.
 - Only trained personnel will handle refuelling and maintenance to reduce the likelihood of accidental spills;
 - Fuel tanks will be labelled with contents and capacity information; and
 - Where fuel is delivered through a pipe permanently attached to a tank or a bowser:-
 - The pipe will be fitted with a manually operated pump or valve at the delivery end which closes automatically when not in use;
 - The pump or valve will be fitted with a lock;
 - Tanks and bunds will be protected from vehicle impact damage;
 - All valves, pumps and trigger guns will be turned off and locked when not in use;
 - All caps on fill pipes will be locked when not in use, and be under the control of trained personnel.
- Reduction of leaks / spills:-
 - Ensuring only vehicles and machinery that are mechanically sound will be allowed onto the site;
 - Contractually requiring sub-contractors to provide/ use construction vehicles/ equipment which is in good working order.
- Spill Response:-

See also EMP 10 - Emergency Response Plan

 - Identifying the source of the spillage and cut off source, if possible, e.g. by closing valve, righting container etc.;

- Cessation of all work on site will and ensuring all operatives assist in placing spill mats on the affected area;
- Identifying where spillage may go. If spillage is near a watercourse (drainage/ditch/ river) diverting spillage away from the watercourse through the use of absorbent materials from the spill kit;
- Notifying the Site Manager; and
- The Site Manager will notify the Environmental Manger and the Construction Manager of the incident.

Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery.

Correct action in the event of a leak or spill will be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the ECoW at site induction.

Monitoring:

Monitoring will consist of:-

- Regular on-site inspections by the site management team;
- Review of the statement at regular intervals and update as required; and
- Review of requirements with site personnel during Toolbox Talks and Site Meetings;

Responsibility:

The Site Manager is responsible for ensuring that this EMP is communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this EMP lies with all site personnel but in particular:-

- Site Manager;
- ECoW;
- HSEQ Officer; and
- PSCS.

EMP 5 - Concrete Pour Management

Aim:

To describe measures for the management of concrete on site for the protection of watercourses from any spillages.

Methodology:

The methodology will consist of:

- Supervision of all concrete pours;
- Ensuring concrete pours do not take place during forecasted heavy rainfall;
- Ensuring the area in which the concrete pour is taking place is drained from any water;
- Not allowing the washout of concrete trucks with the exception of concrete chutes.
- Ensuring concrete chutes are washed in designated concrete washout area within the Temporary Construction Compound.
- Providing a washdown area with a capacity of 20m³, which will provide sufficient capacity to accommodate the chute washdown for two Wind Turbine base pours.
- Monitoring of the pH of the water in the chute wash down bund and dosing it with CO₂ or acidic water from the drains until the wash out water achieves neutrality before discharging.
- Concrete is to be procured from specialist ready-mix concrete supplier. There will be no batching of concrete on site.
- When working with ready-mix concrete appropriate PPE is to be worn by concreting personnel.
- Providing spill response consisting of:
 - temporarily blocking the dirty water drains in the immediate area and monitoring the pH levels of the water in the associated settlement ponds and if necessary, adjusting the pH levels using CO₂ entrainment. Any spillage will be cleared immediately and deposited in the Chute wash down area.

Monitoring:

Monitoring will consist of:-

- Monitoring of all concrete pours by suitably qualified personnel;
- Regular on-site inspections by the site management team;
- Review of method statements at regular intervals and update as required; and
- Review of requirements with site personnel during Toolbox Talks and Site Meetings.

Responsibility:

The Site Manager is responsible for ensuring that this EMP is communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this EMP lies with all site personnel but in particular:-

- Site Manager;
- ECoW;
- HSEQ Officer; and
- PSCS.

EMP 6 - Biosecurity Management Plan

Aim:

To describe measures for the management of Biosecurity on the site.

Methodology:

The methodology will consist of:-

- Biosecurity and the control of non-native species on site will be carried out in accordance with the requirements of the 'IFI Biosecurity Protocol for Field Survey Work' (IFI, 2010).
- Prior to commencement on site this Biosecurity Plan is to be further developed by the contractor and submitted and agreed with IFI and Roscommon County Council.
- As part of the site induction the ECoW will train personnel carrying out ground works on site to recognise and prevent the spread of disease and invasive alien species.
- All plant machinery will avoid unnecessary crossings to adjoining lands.
- A 'Check, Clean, Dry' protocol will be enforced on site for all plant. Equipment and PPE used for ground works.
- Prior to being brought onto site, all plant and equipment will be washed using a power washer to prevent the spread of disease and invasive alien species;
 - Any water-based equipment such as pumps and pipes are to be clean, drained and dried before entering the site.
- All footwear/waders and/or equipment that will be used within the aquatic environment will be treated to prevent foreign flora/fauna entering the water, and again after use, to prevent spread to other catchments.
- Prior to being brought onto site, all plant, equipment and PPE will be inspected to ensure they are clean and free of soil/mud/debris or any attached plant or animal material;
 - A designated inspection and wash station will be established to facilitate inspection and where required disinfection of equipment, PPE and personnel.
 - Disinfection is to be Virkon Aquatic, sodium hypochlorite, or another IFI-approved disinfectant.
 - Plant, equipment and PPE which do not pass the inspection are to be isolated and removed from site.
 - The inspection and wash station is to be located next to the site entrance and have sufficient space to facilitate isolation of plant, equipment and PPE should this be required.
- Prior to being brought to site, certification will be obtained from suppliers of materials to site such as soil, fill, sand, gravel and landscaping materials are free from disease and invasive alien species;
- To prevent disease and invasive alien species transmission, the movement of water or unwashed plant, equipment, PPE or personnel between different construction sites (and so possible different watercourses) will not be permitted.
- Water abstraction for the works from watercourses on site will not be permitted.

Monitoring:

Monitoring will consist of:-

- Regular on-site inspections by the ECoW and the site management team;
- Review of the statement at regular intervals and update as required; and
- Review of requirements with site personnel during Toolbox Talks and Site Meetings;

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Responsibility:

The ECoW is responsible for overseeing biosecurity implementation on site. As part of this he / she is to carry out regular audits and inspections to ensure compliance. Also as part of this incident response procedures are to be developed and put in place for any suspected introduction of invasive species.

The Site Manager is responsible for ensuring that this EMP is communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this EMP lies with all site personnel but in particular:-

- Site Manager;
- ECoW;
- HSEQ Officer; and
- PSCS.

EMP 7 – Groundwater Protection

Aim:

To propose measures to mitigate against impacts on the hydrology and hydrogeology.

Methodology:

Surface and Groundwater Contamination from Oil/Fuel Spills and Leaks

Mitigation will include the following:

- All plant and machinery will be serviced before being granted access to the site;
- Designate specific areas for refuelling and maintenance in a controlled manner, located on impervious surfaces/bunded trays to prevent spills from spilling / seeping into the ground;
- Regular daily inspections of bunded trays, pumps and other machinery, fuel lines and hoses are to be carried out by the site management team and record of the inspections logged in the site files.
- Only trained personnel will handle refuelling and maintenance to reduce the likelihood of accidental spills;
- A comprehensive spill response plan and procedures will be in place, that can be actioned in the event of an accident or emergency;
- Refuelling and equipment maintenance will be prohibited near watercourses or drainage areas to minimise contamination risks;
- Silt fencing should be in place to prevent contaminated runoff from reaching surface water;
- 20 m buffer zones should be in place around all watercourses where possible;
- All activities will be completed in line with the EMP; and
- Wastewater/greywater from the temporary construction compound will be transferred offsite by a suitably licensed wastewater facility for treatment and disposal.

Potential Impacts on Groundwater Quality

Mitigation will include the following:

- All plant and machinery will be serviced before being granted access to the site;
- Designate specific areas for refuelling and maintenance in a controlled manner, located on impervious surfaces/bunded trays to prevent spills from spilling / seeping into the ground;
- Only trained personnel will handle refuelling and maintenance to reduce the likelihood of accidental spills;
- A comprehensive spill response plan and procedures will be in place, that can be actioned in the event of an accident or emergency;
- Refuelling and equipment maintenance will be prohibited near watercourses or drainage areas to minimise contamination risks;
- Silt fencing should be in place to prevent contaminated runoff from reaching surface water;
- 20 m buffer zones should be in place around all watercourses where possible;
- Avoid use of herbicides for vegetation control around turbines and access roads. Where herbicides are necessary, use environmentally friendly alternatives and apply them following strict guidelines to prevent infiltration into groundwater;
- Conduct baseline groundwater quality testing before the wind farm becomes operational to establish existing conditions;

- Implement a regular groundwater monitoring program to detect any potential contamination early and take immediate corrective action; and
- All activities will be completed in line with the EMP.

Potential Effects on Surface and Groundwater WFD Status

- Strict mitigation measures regarding hydrocarbon use and the prevention of increased suspended solids during the construction phase will ensure the protection of the Surface and Groundwater Water Framework Directive (WFD) status. The proposed development will not result in any changes to the volume or chemical status of surface and groundwater, ensuring no alteration to their WFD status. Consequently, the development complies with the requirements of the WFD (2000/60/EC).
- At construction stage, there will be no direct discharge to streams or rivers. All runoff from work areas will pass through an in-line water treatment system before being released via buffered outfalls to vegetated natural surfaces.

Monitoring:

Monitoring will consist of:-

- Regular on-site inspections of ground water protection measures by the Contractor's site management team and the ECoW;
- Review of method statements at regular intervals and update as required; and
- Review of requirements with site personnel during Toolbox Talks and Site Meetings.

Responsibility:

The Site Manager is responsible for ensuring that this EMP is communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this EMP lies with all site personnel but in particular:-

- Site Manager;
- ECoW;
- HSEQ Officer;
- PSCS; and
- Project Hydrologist.

EMP 8 - Soils & Geology Management

Aim:

To provide information on the management of soils and geology on site.

Methodology:

LS&G Management Plan and Good Practices

- Implement this **CEMP** and the WMP (**EIAR, Volume III, Chapter 2.1.2; Waste Management Plan**) throughout construction.
- Physically demarcate work areas by means of fencing prior to commencement construction activities

Storage and Stockpiles

Spoil types will be treated separately. Mineral soils and topsoil / organic soils will be segregated during excavation, with each type managed as follows:-

- Mineral Soils; Mineral soils will be deposited directly on other mineral soils. This will require the prior removal of topsoil or peat, where present, to facilitate placement.
- Topsoil / Organic Soils; These will be stored separately according to their classification, protected from environmental degradation to maintain integrity, and reused to reinstate mineral soil surfaces following construction. No topsoil will be disposed of as part of the Project.
- Deposition Locations; Mineral soil spoil deposition will occur at designated locations within the redline boundary, where low surface gradients coincide with minimal peat depth and sufficient distance from sensitive receptors.
- Minimisation of Movements; Spoil movements will be minimised by depositing material within, or immediately adjacent to, the construction footprint from which it originated.
- Site Preparation; Preparation of spoil deposition sites will involve stripping topsoil, which will be transferred to a designated location for stockpiling and subsequent reuse in restoration.
- Deposition Method; Spoil will be deposited in layers not exceeding 0.50 m, with a total thickness of no more than 2.00 m unless contained by suitably designed berms.
- Slope Constraints; Spoil will only be deposited on ground with slopes of less than 5° to the horizontal and more than 10 m from the top of any cutting.
- Monitoring; Spoil deposition sites will undergo regular weekly inspections by the Construction Manager or another suitably qualified individual to ensure stability and maintain good condition.
- Restoration; Upon completion of spoil deposition, sites will be re-vegetated using the upper vegetated layer removed at the commencement of works. During the decommissioning/restoration phase, guidance from a suitably qualified ecologist will be sought to develop an appropriate methodology and maintenance programme for the restored areas.

Vehicular Movements

- Restrict machinery to Site access tracks and permitted footprints.
- Minimise traffic by reusing excavated materials on-site and keeping cut / fill to a minimum.
- Deploy Best Practice work methodologies as described in the Irish Wind Energy Association (IWEA) (2012) "Best Practice Guidelines for the Irish Wind Energy Industry" and NatureScot (July 2024) "Good practice during wind farm construction", this will minimise double handling of excavated materials and help reduce site traffic.

Ground Stability & Landslide Prevention

The following procedures will be implemented to minimise the risk of soil instability during construction:-

- Spoil Management; Excavated spoil will not be placed on the downslope or upslope edges of adjacent topsoil. Instead, it will be deposited on the flanks of the excavation (where gradients are lowest) and spread to limit surcharge pressure on sensitive soils.
- Sensitive Soils; Excessive spoil will not be placed on topsoil, organic soils, or other sensitive sloping ground (slope gradients should not exceed 5°). Where necessary, topsoil and organic soils will be stripped in advance, stored appropriately, and later reused for landscaping.
- Excavation Stability; The cut face of excavations will be battered back to safe angles (c. 60° in clay soils and c. 30° in granular or organic soils) to minimise the potential for slope failure.
- Turbine Hardstandings; Hardstanding areas will be designed so that crane loadings are transferred directly onto competent strata. Limited excavations may be required to achieve this.
- Weather Precautions; Ground movements are more likely during or after severe rainstorms, particularly following prolonged dry periods. Extra vigilance will be maintained during these conditions.
- Monitoring; All slopes will be inspected regularly for tension cracks or other signs of movement. The potential for ground instability will also be monitored throughout construction by the ECoW through site visits and assessments.
- Excavation Practices; Excavations will not be undercut or left unsupported for more than 24 hours. Backfilling will take place as soon as practicable, with excavation and filling works coordinated to minimise open excavation time.
- Surface Water Management; Construction practices will ensure that surface water flows do not compromise the stability of granular or cohesive soils.
- Groundwater Control; Pore water pressure within excavations will be managed by draining sumps at regular intervals to prevent water ponding and potential hydraulic instability.
- Phasing of Works; Construction will commence in less sensitive areas first, allowing best practices to be established before progressing to more challenging locations. Where necessary, low ground-bearing pressure machinery will be used to transport materials in sensitive areas.
- Method Statements; All works will follow approved method statements. Any required modifications will be agreed in advance with the supervising engineer.

Soil Contamination - Hydrocarbons and Cementitious Materials

The probability of contamination from hydrocarbons and cementitious materials will be minimised through the application of good practice and strict adherence to this **CEMP**. The following measures will apply:-

Monitoring:

Monitoring will consist of:-

- Regular on-site inspections of the ground works by the Contractor's site management team and the ECoW;
- Review of method statements at regular intervals and update as required; and
- Review of requirements with site personnel during Toolbox Talks and Site Meetings.

Responsibility:

The Site Manager is responsible for ensuring that this EMP is communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this EMP lies with all site personnel but in particular:-

- Site Manager;
- ECoW;
- HSEQ Officer;
- PSCS; and
- Project Hydrologist.

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EMP 9 - Archaeological & Heritage Protection

Aim:

To describe measures for the management and protection of archaeological and cultural heritage on the site.

Methodology:

Archaeological Testing on wind Farm Prior to Construction

- Undertake archaeological test excavations across suitable lands within the redline boundary prior to construction, under licence from the National Monuments Service (NMS) and in consultation with Roscommon County Council.
- The anomalies identified as part of the geophysical survey shall be assessed as part of any test excavation program.
- Areas within the redline boundary unsuitable for testing (e.g., commercial forestry) are to be subject to archaeological monitoring during construction, also under NMS licence.

Archaeology & GCR and TDR

- GCR (5.8 km underground grid connection): No cultural assets within 50 m; no mitigation required.

Archaeology & TDR

- Proposed works (street furniture removal) are required at Node No. 2040 to the west of Galway City. These works are located within the zone of Recorded Monument GA082-043002 (Fulacht Fiadh). Although the proposed minor works will not directly affect the Cultural Asset, the Project Archaeologist shall liaise with the NMS prior to the commencement of works to determine if archaeological mitigation measures are deemed necessary.

Archaeological Monitoring:

- All ground disturbance within the redline boundary are to be monitored archaeologically during construction carried out under licence from the NMS in consultation with Roscommon County Council.
- Areas which were not suitable for archaeological testing due to commercial forestry, are to be subject to close archaeological monitoring during the construction phase.

Archaeological Chance Finds and Discovery Protocols:

- Should previously unknown archaeological remains be discovered during the course of archaeological testing or monitoring, the Project Archaeologist will notify the NMS and Roscommon County Council to ensure that appropriate mitigation measures are put in place to protect and potentially preserve (preservation by record or preservation in-situ) any archaeological remains.

Responsibility:

The responsibility of the above lies with:

- Site Manager;
- ECoW;
- HSEQ Officer;
- PSCS; and
- Project Archaeologist

EMP 10 - Emergency Response Plan

Aim:

In the event of an environmental emergency, all personnel will react quickly and adhere to this procedure. All site personnel will be inducted in the provisions of the Emergency Response Plan (ERP).

The following non-exhaustive list outlines information regarding the types of emergencies which must be addressed in the ERP:

- Release of hazardous substance – Fuel and oil spill;
- Concrete spill or release of concrete or silt;
- Flood event – extreme rainfall event;
- Environmental buffers and exclusion zones breach;
- Housekeeping of materials and waste storage areas breach; and
- Stop works order due to environmental issue or concern (threat to archaeological or ecological feature).

The following procedure is to be carried out in the event of an emergency:

- Establish the scale of the emergency situation and identify the number of personnel, if any, that have been injured or are at risk of injury;
- Where necessary, sound the emergency siren/foghorn that activates an emergency evacuation on the site;
- The PSCS/Construction Manager must proceed to the assembly point if the emergency poses any significant threat to their welfare and if there are no injured personnel at the scene that require assistance;
- The PSCS/Construction Manager will be required to use their own discretion at that point. In the case of fire, the emergency evacuation of the site should proceed, without exception;
- Make safe the area if possible and ensure that there is no identifiable risk exists with regard to dealing with the situation e.g. if a machine has turned over, ensure that it is in a safe position so as not to endanger others before assisting the injured;
- Contact the required emergency services;
- Take any further steps that are deemed necessary to make safe or contain the emergency incident e.g. cordon off an area where an incident associated with electrical issues has occurred;
- Contact any regulatory body or service provider as required e.g. ESB Networks, the numbers for which as provided in the table below. Contact the next of kin of any injured personnel where appropriate; and
- The ECoW will notify the appropriate regulatory body such as the Local Authority, IFI, and the Environmental Protection Agency (EPA), if deemed necessary.

Spill Control Measures:

Every effort will be made to prevent an environmental incident during the construction and operational phase of the Project. However, in the event of a spill occurring the following steps will be followed:-

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident.
- Contain the spill using Spill Kit control materials, track mats or other material as required
- Do not spread or flush away the spill. If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.

- If possible, clean up as much as possible using the Spill Kit control materials.
- Contain any used Spill Kit material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the ECoW immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The ECoW will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The ECoW will notify the appropriate regulatory body such as the Local Authority, IFI, and the Environmental Protection Agency (EPA), if deemed necessary.
- A record of all environmental incidents will be kept on file by the ECoW and the Main Contractor.

Spill Kits

Spill Kit training will be provided to all plant operators and the site management team, this will be refreshed and updated on a monthly basis by means of on-site "Tool-Box Talks" and when new personnel commence on site.

The following Safety Training Companies Provide Spill Kit Training Courses for Groups, these training courses can be tailored to address the site specific condition and risks on this development.

- Nationwide Safety Training Network Ltd.; Chemical Safety & Chemical Spills Training
- Amber Safety Limited; Chemical Safety Awareness

Contacts:

As an Environmental Control Measure, the ECoW will append the relevant contact details to the Emergency Response Plan document. Examples of such contact details include:-

Contact	Telephone no.
Emergency Services – Ambulance, Fire, Gardai	999/112
Local Hospital Roscommon	090 662 6200
Midland Regional Hospital, Mullingar	0449340221
ESB Emergency Services	1850 372 999
Gas Networks Ireland Emergency	1850 20 50 50
Health and Safety Co-ordinator	TBC
Health and Safety Authority	1890 289 389
Inland Fisheries Ireland (IFI)	1890 347 424
Project Supervisor Construction Stage (PSCS):	TBC
Project Supervisor Design Stage (PSDS): Rowan Engineering Consultants	046 903 0102

Table EMP 11 Contact Details

Monitoring:

Monitoring will consist of:-

- Review of the ERP at regular intervals and update as required;
- Review of requirements with site personnel during Toolbox Talks and Site Meetings; and
- Hold simulated emergency event to assess performance of site personal, listen to feedback and provide additional training as necessary.

Responsibility:

The PSCS is responsible for developing a detailed ERP for the proposed works.

The Site Manager is responsible for ensuring that the ERP is put in place on site and communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this ERP lies with all site personnel but in particular:-

- Construction Manager;
- Site Manager;
- ECoW;
- HSEQ Officer; and
- PSCS.

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EMP 11 - Accidents & Incidents Plan

Aim:

To describe measures for the recording, investigating and close-out of any environmental accidents or incidents on the site.

Methodology:

Typically, the following methodology will be followed in the event of an incident:-

- Works will stop immediately where safe to do so.
- The ECoW will be notified immediately.
- The size of the incident will be assessed and determined if it can be controlled by site staff or if emergency services are required to attend.
- The appropriate enforcing authorities will be contacted.
- The ECoW will investigate after the incident.
- The findings will be sent to the appropriate authorities.
- An action plan will be prepared to set out any modifications to working practices required to prevent a recurrence.

Monitoring:

Monitoring will consist of:-

- Review of the statement at regular intervals and update as required;
- Review of requirements with site personnel during Toolbox Talks and Site Meetings; and
- Hold simulated incident event to assess performance of site personal, listen to feedback and provide additional training as necessary.

Responsibility:

The Site Manager is responsible for ensuring that this EMP is communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this EMP lies with all site personnel but in particular:-

- Site Manager;
- ECoW;
- HSEQ Officer; and
- PSCS.

EMP 12 - Complaints Management Plan

Aim:

To describe measures for the recording and resolving complaints by third parties, including local residents or members of the public.

Methodology:

Methodology / Measures are summarised in bullet point format below:

- Clearly display a 'contact board' at the site perimeter so that the public know whom to contact if they have a complaint or a comment to make.
- Personnel on site, including sub-contractors will perform their duties in accordance with the **CEMP** and in such a way as to minimise the risk of complaints from third parties.
- All complaints received from any source, regarding the construction, are recorded and categorised (e.g. Noise, Property Damage, Traffic, Dust etc.) within a central 'site complaints log'.

The Site Complaints Log will include the following key details:-

- Name, address and contact details of the complainant (*with the complainant's permission*).
- Brief outline of the complaint
- Date of Complaint
- Name of person receiving complaint details
- Agreed timeline for response to complaint

All complaints are to be communicated to the Community Liaison Manager, Engineer and Developer immediately following any complaint. All complaints are to be properly followed up and resolved in so far as is practicable.

The complainant, the Developer and other stakeholders will be kept informed of the progress in resolving complaints received.

Monitoring

Monitoring will consist of:-

- Review of the statement at regular intervals and update as required;
- Review of arrangements with site personnel during Toolbox Talks and Site Meetings.

Responsibility:

The Site Manager is responsible for ensuring that this EMP is communicated to all site personnel, including management staff and site operatives.

The responsibility for compliance with this EMP lies with all site personnel but in particular:-

- Site Manager;
- Community Liaison Manager;
- ECoW;
- HSEQ Officer; and
- PSCS.