



Cush Wind Farm – Phase II

Environmental Impact Assessment Report

Chapter 3: Description of the Project

Cush Wind Limited

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3.1 INTRODUCTION

The purpose of this chapter is to provide a description of the project in sufficient detail to allow an independent reader, when taken together with the descriptions of the existing environment provided in each chapter of this EIAR, to understand the likely significant environmental effects arising from the project.

The description considers the location of the project together with its main physical characteristics including design, size, scale and land-use requirements during its construction, operation and decommissioning phases.

The description of the project also addresses relevant off-site elements of the project, including turbine delivery haul route accommodation works and the grid connection.

As set out in **Chapter 1**, certain off-site elements form part of the project for EIA purposes but do not form part of the development for which planning permission is sought. The reasonable alternatives considered during the development of the project, together with the principal reasons for selecting the proposed project, are described in **Chapter 2** of this EIAR.

This chapter should also be read in conjunction with the technical plans, drawings and other documentation submitted with the planning application. Further descriptions of specific elements of the project are also provided in individual chapters of this EIAR as they relate to particular environmental factors.

3.2 SITE LOCATION & CONTEXT

The project site is located in a rural area, approximately 4 km north of the town of Birr and c. 28 km south-west of Tullamore in the townlands of Galros East, Whigsborough, Ballycollin, and Eglish, Co. Offaly. The general location of the project site is illustrated at **Figure 3.1**.

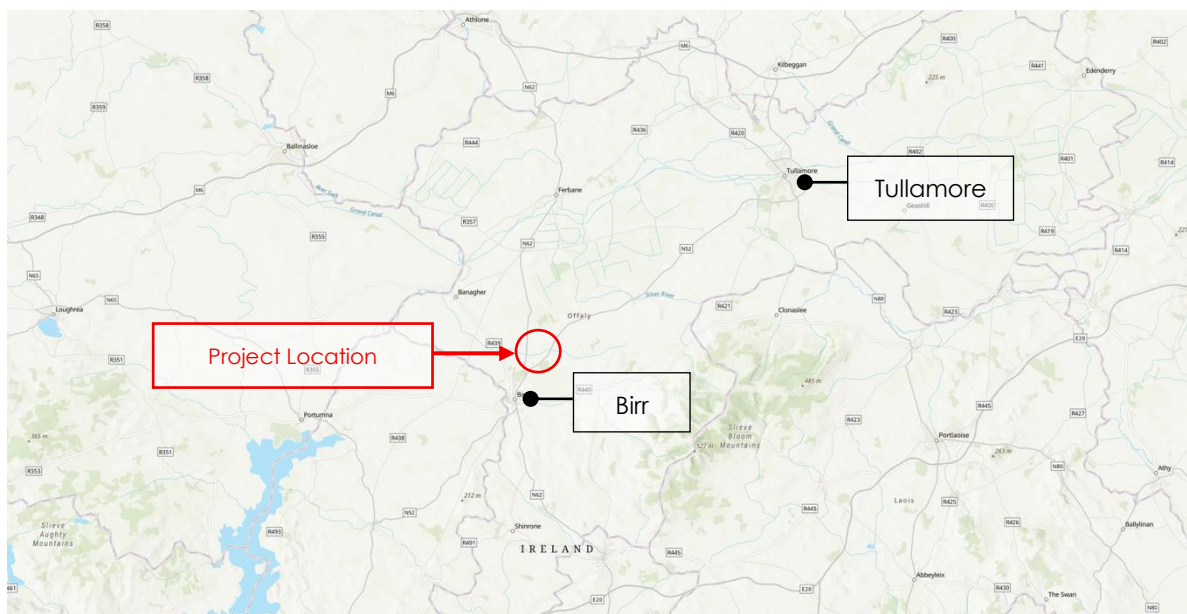


Figure 3.1: Project Site Location

For the purposes of describing the geographical and environmental setting of the project, two principal spatial components are referred to in this section (i) the proposed wind farm site and (ii) the underground electricity line route. These

components are used to assist in describing the location and characteristics of individual elements of the project and do not alter the overall definition of the project set out in **Chapter 1**.

The proposed wind farm site comprises a mixture of former industrial peatland and agricultural grassland. The three (3 no.) proposed turbine locations are situated on Galros Bog, which was formerly subject to industrial peat extraction and now predominantly characterised as cutaway bog. Much of the original raised bog surface has been removed and the bog is extensively drained by a generally north-south orientated network of open drains. A general view across the wind farm site is illustrated in **Figure 3.2**.



Figure 3.2: General View Across the Wind Farm Site

Galros Bog occupies a relatively low-lying and generally flat to gently sloping landscape. Ground elevations across the bog range from approximately 47 m OD in the south-west to 56 m OD in the north-east. The N62 national road extends along the western side of the bog, while esker ridges occur to the north, west and south-west. Areas of conifer plantation occur adjacent to the southern part of the bog.

The proposed electrical switch room is located within agricultural lands on the southern part of the proposed wind farm site. From the switch room, the c. 5 km underground electricity line extends through the townlands of Eglish, Ballynaguilsha, Shanacloon, Cloncarban, Clonbeale Beg Glebe and Mullanafawnia, Co. Offaly to facilitate connection of the proposed wind farm to the national electricity network.

The line extends predominantly through flat to gently undulating agricultural land, with ground elevations ranging from approximately 50m to 65m OD. The route crosses the N52 national road and the L7006 local road and runs adjacent to the Rapemills River

for approximately 2.5 km, crossing beneath the river at two locations.

The wider landscape surrounding the project is characteristic of this part of the Irish Midlands and comprises a mixture of former industrial peatland, agricultural grassland, hedgerows, drainage channels, commercial forestry plantations, local roads and dispersed rural residential development.

3.3 PROJECT DESCRIPTION

3.3.1 OVERVIEW

The project assessed in this EIAR comprises a 3 no. wind turbine extension to the permitted Cush Wind Farm Phase I, together with all associated and ancillary infrastructure and works. The on-site elements of the project comprise:-

- 3 no. wind turbines with the following dimensional ranges:
 - An overall turbine tip height of 199.1 m to 200 m;
 - A rotor diameter of 158 m to 175 m; and
 - A hub height of 111.6 m to 120.9 m.
- All associated turbine foundations and crane hardstanding areas;
- All associated internal underground electrical and communications cabling;
- Construction of approximately 1.7km of wind farm access tracks;
- Use of 1 no. permitted construction phase site vehicular entrance from the N62 national road and 1 no. permitted operation phase vehicular entrance from the L300321 local road;
- 1 no. proposed electrical switch room building, enclosed within a switch room compound and 1 no. new vehicular entrance onto the L300321 local road; and
- All associated and ancillary site development, excavation, construction, spoil deposition, landscaping and reinstatement works, including provision of site drainage infrastructure and environmental mitigation measures.

The off-site elements of the project comprise:

- Accommodation works along the Turbine Delivery Haul Route, and
- Approximately 5 km of 33 kV underground electricity line to connect the proposed wind farm to the proposed Mullanafawnia 110kV substation¹.

The definition of the project, including the relationship between the project and the development for which planning permission is sought from Offaly County Council, is described in Chapter 1.

The overall project location is provided at Annex 3.1, while the project layout is provided at Annex 3.2.

¹ The proposed Mullanafawnia 110kV substation is currently the subject of Strategic Infrastructure Development Pre-Application Consultation with An Coimisiún Pleanála (Reference: ACP-324608-26). The substation is being proposed by a separate developer and does not form part of the project assessed in this EIAR. However, it is assessed cumulatively, where relevant, in this EIAR.

3.3.2 ON-SITE WORKS

3.3.2.1 Wind Turbines

The project comprises 3 no. wind turbines (numbered T9, T10 and T11) together with associated foundations, crane hardstanding areas and electrical infrastructure. The Irish Transverse Mercator (ITM) coordinates and existing ground levels of each proposed wind turbine are set out in **Table 3.1** below.

Turbine ID	Easting	Northing	Approximate Ground Level (mAOD)
T9	608636	710729	50.5
T10	608275	711034	48.2
T11	608944	711100	50.2

Table 3.1: Wind Turbine Coordinates and Existing Ground Levels

The turbines will consist of a three-bladed rotor connected via a hub to a nacelle containing the electrical generation equipment. The blades will be constructed of glass-reinforced plastic. The nacelle will be supported on a steel tower of tubular construction. The colour of the proposed turbines and blades will be white, off-white or light grey, as determined by the Planning Authority.

The turbines will rotate in the same direction and will typically have a cut-in wind speed of 3 metres-per-second (m/s) and a cut-out speed of 25 m/s.

Each turbine will include its own transformer located inside the tower. Transformers will either be oil-filled and appropriately bunded or will be of a solid cast resin type which eliminates the requirement for bunding. The transformers will increase the electrical voltage and on-site electrical cables will connect the turbines to the proposed electrical switch room building.

The proposed wind turbines will have the dimensional ranges set out in **Table 3.2**.

Turbine Component	Dimension (m)	
	Minimum	Maximum
Hub Height	111.6	120.9
Rotor Diameter	158	175
Tip Height	199.1	200

Table 3.2: Wind Turbine Dimensional Ranges

Turbine elevation drawings illustrating the dimensional ranges are included at Annex 3.3. The final turbine model will be selected within the proposed dimensional range and will have a rated electrical output of approximately 6.1 MW to 7.2 MW per turbine, giving the project a total installed generating capacity of approximately 18.3MW to 21.6MW.

3.3.2.2 Turbine Foundations

Each turbine tower will be secured by means of a steel foundation ring to a reinforced concrete foundation. Initial geotechnical investigations carried out at each of the turbine locations demonstrate that the subsoil conditions are generally suitable for the construction of standard turbine gravity foundations (see **Chapter 6** and **Annex 6.1**).

In accordance with the approach set out in Section 5.3 of the Wind Energy Development Guidelines for Planning Authorities (2006), the final foundation design, including its detailed dimensions and reinforcement requirements, will be established

through post-consent detailed design and further geotechnical investigation prior to construction.

While initial geotechnical investigations indicate that gravity raft foundations are likely to be suitable at the proposed turbine locations, the final foundation type will be confirmed following further site-specific geotechnical investigation, with a piled foundation only used at a turbine location where required by the ground conditions.

Any associated micro-siting of the turbine locations will be undertaken within the parameters assessed in this EIAR and the scope of the planning permission.

3.3.2.3 Crane Hardstands

Crane hardstand areas will be established adjacent to each turbine to facilitate crane operations for turbine installation. The hardstand areas will typically measure approximately 100m by 45m and will consist of levelled and compacted (unsealed) hardcore placed on top of a geotextile membrane. The hardstands will generally be of a 'floated' construction type, thus avoiding significant excavations; however, localised excavations may be required to avoid excessive placement of granular fill.

The crane hardstands will be retained *in situ* during the operation phase of the project to accommodate crane activities in the event of a major turbine component replacement e.g. replacement of a turbine blade or generator.

Temporary set-down areas, also comprising levelled and compacted (unsealed) hardcore on a geotextile membrane, will be located immediately adjacent to each hardstand during the construction phase to accommodate the temporary storage of turbine components following their delivery to the project site, and crane components during crane assembly.

3.3.2.4 Site Entrances

Access to the wind farm site will be provided via three site entrances, including two entrances permitted as part of Cush Wind Farm Phase I. These comprise a construction phase entrance from the N62 national road (eastern side) which will be used to transport construction materials and turbine components (including abnormal-sized loads) to the site, and an operation phase entrance from the L300321 local road.

A third entrance from the L300321 local road will provide access to the proposed electrical switch room building.

Following the construction phase, the entrance from the N62 will be closed off and retained for occasional use in the event of a major turbine component replacement during the operation phase of the project (e.g. replacement of a turbine blade or generator).

3.3.2.5 Access Tracks

A total of c. 1.7km of new on-site access tracks will be required for construction purposes and for site access during the operation phase. The access tracks will connect with the access tracks permitted as part of Cush Wind Farm Phase I.

As is the case with the permitted access tracks, the proposed access tracks will be predominantly of a 'floating' construction type to minimise the need for excavation (see **Section 3.4.2.5**). This typically comprises the placement of a layer of geotextile or geogrid on the existing ground surface, followed by aggregate. Where shallow peat is present (<1 m), conventional 'excavate and replace' or 'cut and fill' ('founded')

access track construction methods will be used. Where required by ground conditions, a geotextile layer may also be installed within founded access tracks.

The access tracks will be similar to normal agricultural tracks with a typical running width of approximately 5m, with additional widening at bends to accommodate turbine delivery vehicles. Access tracks will be unsealed and constructed of crushed stone material to allow for permeability.

The access tracks will be constructed with horizontal and vertical alignments suitable to accommodate abnormal-sized loads and to provide adequate drainage. Passing bays and turning heads will be provided along the access tracks to accommodate vehicle turning and passing traffic, as required. Drainage and cable trenches will also be provided alongside the access tracks.

3.3.2.6 Cabling

On-site electrical and communications cables will connect the proposed turbines to the proposed electrical switch room building. All on-site electrical and communications cables will be placed underground and will be of a solid polymeric construction with either aluminium or copper conductors. The cables will follow the alignment of the on-site access tracks, insofar as practicable, and will be installed within new trenches.

3.3.2.7 Switch Room

The proposed electrical switch room building will be located on the southern side of the wind farm site. The switch room will be the location at which the underground electrical and communications cabling from each wind turbine will converge and will contain electrical apparatus to transfer electricity from the individual turbine circuits to a single circuit for onward transmission to the national electricity network via the underground electricity line.

The switch room will measure 13.12 m x 7.33 m (gross floor area of c. 96.2 m²) and will have an overall height of 6m to ridge height. The building will be constructed of blockwork and finished in sand cement nap render, with a blue/black cement fibre slate roof covering and galvanised steel doors. It will contain a control room, switchgear room, storeroom and welfare facilities for staff during the operation phase of the project.

The switch room will include a dedicated mains water connection for toilet facilities and hand washing. A water connection will be sought from the Eglish, Rath & Drumcullen Ltd Group Water Scheme², the closest point of which is located along the L300321 local road to the east of the switch room as illustrated at **Annex 3.6**. Wastewater from the switch room will be stored in a sealed foul holding tank and periodically removed for disposal off-site by an appropriately authorised waste collector.

The switch room will be located within a compound measuring 25.11m x 17.08m with a footprint of 429m². The compound will be surrounded by 2.6m high green palisade

² The scheme's groundwater source at Springfield, Rath is identified as 'Rath Group Water Scheme' in the GSI/Offaly County Council report, Rath Group Water Scheme Groundwater Source Protection Zones (July 2009). References to 'Rath Group Water Scheme' in **Chapter 7** and the Surface Water Management Plan (accompanying the planning-stage CEMP at **Annex 3.4**) retain this designation for consistency with the source-protection report and relate to the same scheme.

fence and associated gates for safety and security reasons. The switch room compound will be surfaced with free-draining crushed stone aggregate underlain by a geotextile layer to allow rainwater to percolate to ground.

A plan of the switch room compound is enclosed at Annex 3.6, with elevation and floor plan details provided at Annex 3.7.

3.3.2.8 Drainage

Natural surface water features in the vicinity of the proposed wind farm site include the West Galros Stream and other tributaries of the Rapemills River. No access track crossings of natural or EPA-designated watercourses are proposed.

Due to the permeable design of the access tracks, hardstands and switch room compound, the majority of surface water will percolate to ground. Stormwater drainage infrastructure will be installed around the switch room to capture runoff from roofed or paved areas which will pass through an oil interceptor before being discharged to an agricultural drain. Discharge rates will be designed to reflect greenfield runoff rates.

The proposed wind farm site is partly located on lands forming part of Galros Bog, which was historically subject to industrial peat extraction by Bord na Móna (BnM). The bog is drained by an existing network of artificial bog drainage ditches associated with historic industrial peat production. Industrial peat extraction has now ceased and BnM is required to rehabilitate the bog in accordance with the requirements of its Integrated Pollution Control (IPC) Licence (ref. P0500-01). The Galros Bog Draft Cutaway Bog Decommissioning and Rehabilitation Plan (2026) has been prepared by BnM for this purpose and is provided at **Annex 6.2**. The Rehabilitation Plan recognises the proposed wind farm as a potential future land-use constraint and provides for the integration of bog rehabilitation with the construction and operation of the wind farm.

The surface water drainage for the project has been designed to ensure compatibility with the proposed rehabilitation of the bog and to avoid compromising the rehabilitation objectives and associated drainage, water-level management, silt-control and monitoring measures. The proposed access tracks will cross or otherwise interact with a number of the existing artificial bog drainage ditches. Appropriately sized culverts or cross-drains will be installed at appropriate invert levels to accommodate anticipated flows, avoid ponding or flooding and maintain continuity of existing drainage pathways, comprising suitably sized pipework and/or drainage stone with perforated pipework, as appropriate.

Further details of the proposed surface water drainage measures are provided in **Chapters 6 and 7** and in the Surface Water Management Plan enclosed within the Planning-Stage CEMP at **Annex 3.4**.

3.3.3 OFF-SITE WORKS

3.3.3.1 Grid Connection

The proposed grid connection will comprise a c. 5 km 33 kV underground electricity line extending from the proposed electrical switch room building to the proposed Mullanafawnia 110kV substation. The line route will extend through the townlands of Eglish, Ballynaguilsha, Shanacloon, Cloncarban, Clonbeale Beg Glebe and Mullanafawnia, Co. Offaly.

The line will be located predominantly within private lands and will generally be

installed within ducting in an excavated trench typically c. 1.2 m deep and c. 1.0 m wide. The electricity cables will be pulled through the ducting in sections of up to c. 1,200 m, with individual sections connected at designated jointing plinths along the route. The jointing plinths will comprise concrete slabs of c. 2 m² installed within the trench to facilitate cable jointing. Traditional joint bay chambers will not be required.

Where the line crosses public roads, it will be installed beneath the carriageway using Horizontal Directional Drilling (HDD), thereby avoiding open trenching within the public road. Two such crossings are proposed, at the N52 national road and the L7006 local road at Clonbeale Beg Glebe. No jointing plinths will be located within the public road corridor.

The line will also cross the Rapemills River at two locations. HDD will be used at both crossings, with the cables installed beneath the river. Where the line passes through a hedgerow, c. 4–5m of hedgerow and/or trees will be removed to facilitate construction and subsequently replanted.

3.4 CONSTRUCTION PHASE

3.4.1 OVERVIEW

The construction of the project will generally comprise the following sequence of activities, with a number of activities occurring concurrently or progressively:

- Implementation of traffic management and surface water protection measures;
- Establishment of the site entrances;
- Use of the temporary construction compounds permitted as part of Cush Wind Farm Phase I, including bunded areas for the storage of oils, fuels and lubricants;
- Establishment of peat/spoil deposition areas;
- Construction of internal access tracks and turbine hardstands;
- Excavation and construction of turbine foundations.
- Temporary accommodation works along the turbine delivery haul route;
- Trenching for underground ducting and laying of cables;
- Construction of the switch room building and compound, and associated electrical apparatus;
- Construction of the underground electricity line between the wind farm switch room and the proposed Mullanafawnia 110kV substation;
- Erection of wind turbines.
- Testing and commissioning of the wind turbines, electrical apparatus and underground electricity line; and
- Progressive site reinstatement, restoration and landscaping, including re-profiling of spoil/peat deposition areas and removal of construction compounds.

A Planning-Stage Construction Environmental Management Plan (CEMP) has been prepared and is enclosed at Annex 3.4. The CEMP incorporates an Environmental and Emergency Response Plan, Waste Management Plan, Peat and Spoil Management

Plan, Surface Water Management Plan and Water Quality Monitoring Plan. It also establishes the framework and measures for the management of construction traffic. The Planning-Stage CEMP and its subsidiary plans will be updated prior to the commencement of construction to reflect the final project design, the terms and conditions of the planning permission and the relevant mitigation measures and commitments set out in this EIAR.

The traffic management measures identified in Chapter 14 and the CEMP will be implemented during the construction phase. Prior to the commencement of development, these measures will be incorporated into a detailed Traffic Management Plan, which will be finalised in consultation with, and submitted for the written agreement of, the Planning Authority. The Plan will include arrangements for abnormal-sized turbine component deliveries.

The construction phase is likely to last for approximately 15-18 months from commencement of enabling works through to the installation and commissioning of the turbines and ending with site reinstatement and landscaping. It is anticipated that the project will be constructed concurrently with the permitted Cush Wind Farm Phase I, with both developments forming part of the same overall construction programme.

It is estimated that the project will require an additional workforce of up to 40 no. people during the construction phase. The actual number present on site will vary throughout the construction programme depending on the activities being undertaken at any given time. Employment will be the responsibility of the appointed construction contractor, although it is likely that the workforce will include labour from the local area.

Construction activities will be carried out between 07:00 and 19:00 Monday to Friday, excluding public holidays, and between 07:00 and 13:00 on Saturdays. Works outside these hours will be required on occasion to make optimal use of suitable weather conditions or during critical stages of the construction programme. These works will include turbine installation activities requiring low-wind conditions, continuous concrete pours and the delivery of large turbine components along public roads. Where works are required outside the normal working hours, nearby residents and the Planning Authority will be notified in advance. Work on Sundays or public holidays will only be undertaken in exceptional circumstances and will be agreed in advance with the Planning Authority.

3.4.2 ON-SITE WORKS

3.4.2.1 Wind Turbines

Turbine components will be delivered to the wind farm site and temporarily stored within the designated set-down areas adjacent to each turbine location. Following completion of the turbine foundations and crane hardstands, the turbines will be assembled and erected using two cranes. The tower sections, nacelle, hub and blades will be lifted into position and assembled in accordance with the turbine manufacturer's installation requirements.

Turbine installation will generally be undertaken during suitable weather conditions, particularly periods of sufficiently low wind speeds to allow safe lifting operations. It is anticipated that the installation of each turbine will take approximately 1–2 weeks, subject to suitable weather conditions. Following installation, each turbine will be connected to the on-site electrical and communications cabling and will be tested and commissioned prior to operation.

3.4.2.2 Turbine Foundations

The depth of excavation required for each turbine foundation will vary depending on local ground conditions. For assessment purposes, a standard gravity raft foundation of approximately 28.9m diameter, with footing depths ranging from approximately 3m to 5m³, has been assumed. The final foundation type and dimensions will be confirmed through post-consent detailed design and further site-specific geotechnical investigation, as described at Section 3.3.2.2. If a piled foundation is required at any turbine location, the foundation will be constructed in accordance with the final site-specific geotechnical design and within the parameters assessed in this EIAR.

Excavations will be undertaken by conventional mechanical methods and no blasting will be required for turbine foundations. For the gravity raft foundation assessed, the total volume of excavated material at each foundation will be approximately 3,475m³, depending on local ground conditions. Excavated material will be managed in accordance with the measures described at **Section 3.4.4.2**.

Once the turbine foundation has been excavated and the base fill placed, the turbine foundation interface will be installed and steel reinforcement fixed before concrete is poured in accordance with the turbine manufacturer's specifications.

3.4.2.3 Crane Hardstands

The crane hardstands will generally be constructed as follows:

- Where excavation is required, topsoil and subsoil will be removed and stored separately in appropriate areas adjacent to the works;
- Rock/stone will be laid on a geotextile mat and compacted in layers to an appropriate depth. The sub-layers of the crane hardstands will be constructed of rock/stone, with the upper layer comprising suitable capping material. The hardstands will be permeable to limit surface water runoff;
- Where hardstands cross artificial drainage channels, appropriately sized culverts, cross-drains or other suitable drainage structures will be installed to maintain existing drainage pathways; and
- Temporary set-down areas used for turbine component storage and crane assembly will be reinstated following construction by removing aggregate material and geotextile, reinstating the underlying ground and allowing the areas to revegetate naturally. The crane hardstands will be retained during the operation phase to facilitate crane operations associated with major turbine component replacement.

3.4.2.4 Site Entrances

The N62 construction phase entrance will provide the principal access to the wind farm site, while the separate entrance from the L300321 local road will provide access to the switch room compound. The entrances will comprise compacted aggregate access surfaces with appropriate tie-ins to the existing road network and associated drainage, fencing and gates, as required. Temporary traffic management measures will be implemented as necessary during construction.

³ The 3–5m range refers to the constructed depth of the foundation itself.

Following completion of construction, the N62 construction phase entrance will be closed off but retained for occasional use to accommodate abnormal-sized loads should major turbine component replacement be required during the operation phase.

3.4.2.5 Access Tracks

The access tracks will generally be constructed as follows:

- The majority of access tracks will be constructed using a 'floating' construction method, comprising the placement of geotextile or geogrid directly on the existing ground surface followed by layers of compacted rock/stone and suitable capping material;
- Where shallow peat or other ground conditions require a founded track, topsoil, peat and/or subsoil will be excavated and stored separately, with the track constructed using compacted rock/stone and suitable capping material;
- The access tracks will be constructed with a permeable surface to limit surface water runoff; and
- Where access tracks cross artificial drainage channels, appropriately sized culverts, cross-drains or other suitable drainage structures will be installed to maintain existing drainage pathways.
- The access tracks, including associated passing bays and turning heads, will be retained during the operation phase to facilitate access to the turbines and other project infrastructure.

3.4.2.6 Cabling

Cable trenches will be excavated using a mechanical excavator and will typically be 1 m deep and 0.5 m wide. Excavated material from cable trenches will be appropriately stockpiled alongside the trench for subsequent reuse and reinstatement.

The cable ducts will be laid within the trench on suitable bedding material, with electrical and communications cables installed within the respective ducts. The ducts will be surrounded and covered with suitable material and appropriate warning or marker tape installed before the trench is backfilled and the ground surface reinstated.

No trenching works for or associated with internal electrical and communications cabling are proposed within the public road corridor.

3.4.2.7 Switch Room

The switch room is located in a relatively flat area of agricultural pasture and does not intersect any drains or watercourses. Minor modifications to ground levels will be necessary to achieve the required levels for the switch room building. Approximately 60 m³ of material will be excavated during its construction, with excavated material managed as described at Section 3.4.4.2

- Following site preparation, foundations will be excavated and constructed for the switch room building, after which the blockwork structure, roof, doors and internal finishes will be completed. Electrical switchgear, control equipment and associated services will then be installed within the building.

- The surrounding compound will be formed using compacted crushed stone aggregate placed over a geotextile layer and will remain free-draining. Palisade fencing and gates will be installed around the compound, together with the associated water supply, sealed foul holding tank and drainage infrastructure. The compound entrance will be constructed from the L300321 local road.

3.4.2.8 Drainage

Surface water drainage measures will be installed progressively during the construction phase to manage runoff from construction areas, excavations, stockpiles and spoil deposition areas. The measures will comprise, as appropriate, silt fences, silt traps/settlement ponds and other temporary drainage measures required to attenuate and treat surface water runoff prior to discharge. Further details of surface water management and associated mitigation measures are provided in **Chapters 6 and 7** and in the Surface Water Management Plan enclosed within the Planning-Stage CEMP at **Annex 3.4**.

Prior to the commencement of earthworks, temporary silt/sediment control measures will be placed in agricultural/peatland drains around the site until construction phase drainage measures are installed. The precise design, sizing and siting of construction phase drainage infrastructure will be confirmed as part of the post-consent detailed design process and will have regard to the Galros Bog Draft Cutaway Bog Decommissioning and Rehabilitation Plan (2026) to ensure compatibility with the proposed rehabilitation of the bog.

Along the route of the underground electricity line, similar temporary surface water control measures will be installed as construction progresses. Following completion of construction, temporary surface water treatment infrastructure will be decommissioned, where appropriate, and removed from the site.

3.4.2.9 Construction Compounds

The temporary construction compounds permitted as part of the Cush Wind Farm Phase I development will be utilised during the construction of the project, with both developments anticipated to form part of the same overall construction programme.

The compounds will comprise compacted aggregate laid on geotextile and will accommodate site offices, staff welfare facilities, parking, equipment storage and designated areas for the storage of waste, fuels and chemicals. Temporary security fencing will be erected around the compounds and storage areas to restrict access.

Oils, chemicals and fuels will be stored within appropriately bunded areas within the construction compounds. Spill kits and absorbent materials will be maintained at the compounds and at locations where fuels and chemicals are being used. Fuel required at works areas will be transported in a double-skinned fuel bowser by suitably trained personnel and will not be permitted at works locations within the 50m hydrological buffer. Additional location-specific controls will apply at watercourse crossings and within the Group Water Scheme source protection area, as set out in Chapter 7.

Construction waste will be segregated and stored in suitable receptacles within designated areas of the construction compounds. Materials will be reused or recycled where practicable, while waste requiring removal from site will be transported by appropriately permitted contractors to suitably authorised waste facilities. Records of waste removed from site will be maintained in accordance with applicable

requirements. Further details are provided in the Waste Management Plan in the planning-stage CEMP at Annex 3.4.

Following completion of the construction works, the compounds and storage areas will be reinstated through the removal of aggregate and underlying geotextile, replacement of excavated material and natural revegetation.

3.4.2 OFF-SITE WORKS

3.4.3.1 Grid Connection

Construction of the underground electricity line within private lands will be undertaken progressively, with only short sections of trench open at any one time. Excavated topsoil, subsoil and aggregates will be stored separately adjacent to the trench for subsequent reuse during reinstatement.

The typical sequence of construction will comprise:

- Identification of existing underground services;
- Excavation of the trench to the required dimensions;
- Placement of a sand blinding layer at the base of the trench;
- Installation and jointing of HDPE power ducts;
- Placement and compaction of sand around and above the ducts and installation of warning tape;
- Installation of high-density polyethylene (HDPE) communications ducts;
- Placement and compaction of backfill material; and
- Reinstatement of the trench, including replacement of topsoil and reseeding as appropriate.

At the N52 and L7006 road crossings and the two crossings of the Rapemills River, the line will be installed using HDD as described at **Section 3.3.3.1** above.

Approximately 5,946 m³ of material will be excavated during construction of the line. Excavated material will be reused insofar as practicable, while approximately 2,075 m³ of sand/backfill material will be imported. Further details of the reuse and management of excavated material and construction material requirements are provided in **Tables 3.4 and 3.5** and the Peat & Spoil Management Plan (enclosed within the CEMP at **Annex 3.4**).

3.4.3.2 Turbine Delivery Haul Route

The turbine component haul route assumes that turbine components will enter via the Port of Galway. From there, the turbine components will be transported by specialised HGVs along the N6, M6, N52 and N62 before accessing the project site via the construction phase site entrance. In order to facilitate the delivery of turbine components, accommodation works will be required at various locations along the route⁴.

⁴ As discussed in Chapter 2, it is not possible to precisely identify the port of entry for the turbine components at this time. Depending on the precise turbine manufacturer selected and logistical requirements at the time of delivery, a number of other ports may be used including, for example, Dublin Port, Port of Waterford and Shannon-Foyes Port. In the event that an alternative port is used, turbine components will be transported principally via the national and regional road network. The use of an alternative port and associated haul route would not materially alter the project or the likely significant environmental effects identified and assessed in this EIAR.

The haul route is the same as that assessed as part of the permitted Cush Wind Farm Phase I development. The turbine components will be delivered to the site as part of a coordinated construction programme for Cush Wind Farm Phases I and II. However, as the current project potentially incorporates slightly larger turbine dimensions than those previously permitted for Cush Wind Farm Phase I (see **Section 3.3.2.1**), an updated Route Access Survey was undertaken and provided at **Annex 3.5**. While the established haul route remains suitable, the revised assessment identifies some minor variations to the temporary accommodation works.

A total of 23 no. locations have been identified where accommodation works to the public road network will be required. The works principally comprise temporary road widening at identified roundabouts and junctions; the temporary removal and reinstatement of street furniture and fencing; and cutting back trees and hedgerows. The temporary accommodation works will be reinstated following the delivery of the turbine components. At the R339/Connolly Avenue junction in Galway City, a c. 6 m section of existing wall will be permanently removed and replaced with fencing.

A summary description of the principal accommodation works identified in the Route Access Survey is provided in **Table 3.3**. The full schedule of accommodation works at all 23 no. locations is provided in the Route Access Survey at **Annex 3.5**. Traffic management measures for turbine component deliveries will be agreed in advance with the relevant local authorities. These deliveries will comprise abnormal-sized loads but will not constitute abnormal-weight loads. The timing and management of deliveries will be agreed with the relevant local authorities and An Garda Síochána, as necessary, and all applicable notifications, licences and permits will be obtained in advance.

ID	Location	Accommodation Works
7.2.5	R339/Connolly Avenue Junction	Removal of c. 6 m section of existing wall and replacement with fencing. Temporary removal and reinstatement of existing fencing, traffic signals, street lighting and electric pole.
7.2.6	Connolly Avenue/R336 Junction	Temporary hardcore on offside of junction and temporary removal of street lighting.
7.2.7	R336/N6 Junction	Temporary removal of railings, tree, traffic signals and street lighting.
7.2.8	N6 Coolagh Roundabout	Temporary removal of road signs and street lighting.
7.3.1	M6/N52 Roundabout	Temporary hardcore at roundabout and exit slip and temporary modifications to street furniture. Temporary removal of road signs and street lighting.
7.3.2	N52/M6 Roundabout	Temporary hardcore and removal of road signs on central island of roundabout.
7.4.1	N52/R420 Ardan Roundabout	Temporary hardcore of roundabout central island.
7.4.2	N52/L2025 Roundabout	Temporary hardcore on splitter and central island of roundabout and temporary removal of road signs.
7.4.3	N52/R420 Roundabout	Temporary hardcore and road sign removal on central island of roundabout.
7.4.4	N52/R443 Roundabout	Temporary hardcore and road sign removal on central island/splitter at roundabout.
7.4.5	N52/Tullamore Distillery Roundabout	Temporary hardcore and road sign removal on central island of roundabout.
7.4.6	N52/R421 Roundabout (East)	Temporary hardcore and road sign removal on central island of roundabout.
7.4.7	N52/R421 Roundabout (West)	Temporary hardcore on central island of roundabout and temporary removal of road sign.
7.4.8	N52/L6009 Roundabout	Temporary hardcore and road sign removal on central island of roundabout.

7.5.1	Right hand bend in Kilcormac	Temporary removal and replacement of small streetscape trees.
7.5.3	N52/N62 Junction	Provision of temporary hardcore to east of junction to accommodate reverse manoeuvre onto N62. Temporary removal of fence, road signs and street lighting. Temporary removal and replacement of hedge and trees on eastern side of junction.

Table 3.3: Summary of Turbine Delivery Haul Route Accommodation Works

3.4.3.3 Construction Traffic

Vehicular traffic required for the construction phase is likely to include:-

- HGVs delivering construction materials, plant, turbine components, electrical equipment and other construction supplies;
- Tipper trucks and excavation plant involved in site development and excavation works;
- Cranes to erect the turbines; and
- Light vehicles associated with the construction workforce and site supervision.

Construction traffic will access the project site via the routes described in Chapter 14 and will be managed in accordance with the traffic management measures set out in that chapter and in the Planning-Stage CEMP at Annex 3.4. These measures will include appropriate signage and traffic control, management of vehicle movements at site entrances and works areas, and arrangements for abnormal-sized load deliveries. No road closures are proposed as part of the construction works.

Delivery of turbine components will be undertaken in accordance with the abnormal-sized load arrangements described in Chapter 14 and will generally be scheduled to avoid peak traffic periods. Escort vehicles will accompany abnormal-sized loads as required.

Further details of anticipated construction traffic volumes, haul routes, traffic management arrangements and the assessment of construction traffic effects are provided in Chapter 14.

3.4.3 CONSTRUCTION MATERIALS & EXCAVATED MATERIAL

3.4.4.1 Construction Materials

Preliminary site investigations have identified little rock within the project site suitable for use in the construction of access tracks and crane hardstands. Accordingly, rock/stone, sand, concrete and other construction materials will be imported to the project site.

Construction aggregates will be sourced from appropriately authorised commercial quarries operating within the scope of their respective planning permissions and other relevant authorisations.

Potential sources of construction aggregates are identified in **Annex 2.2**, together with the likely haul routes to the project site. Suppliers will be instructed to use the national and regional road networks to access the project site and to avoid local roads insofar as practicable, having regard to the haul routes identified in **Annex 2.2** and the construction traffic assessment presented in **Chapter 14**.

The estimated volumes of principal construction materials required for construction of

the project are set out in **Table 3.4**.

Project Element	On-Site Rock/Stone	Imported Rock/Stone	Concrete	Sand	Tarmacadam/Tar & Chips
Wind Farm	-	53,414	3,390	1,462	-
Switch Room	-	197	48	9	-
Underground Electricity Line	-	-	-	2,075	-
Delivery Haul Route Accommodation Works	-	1,600	-	-	10

Table 3.4: Estimated Construction Material Requirements (m³)

3.4.4.2 Excavated Material & Spoil Management

During the construction phase, excavated topsoil, peat, subsoil and rock will be stored separately for reuse in the reinstatement and landscaping of the project site or, in the case of rock and where suitable, in the construction of access tracks and turbine hardstands. It is estimated that c. 68,525 m³ of material will be excavated during the construction phase of the project as a whole.

Preliminary site investigations indicate that the ground profile across the proposed wind farm site is predominantly characterised by peat and peaty soils overlying marl and lacustrine clay deposits, with underlying glacial deposits. Very little rock or rock outcrop was identified during these preliminary investigations and, as such, significant volumes of rock are not expected to be available from on-site construction excavations.

Table 3.5 provides a breakdown of the estimated volumes of material to be excavated during construction and their proposed reuse, deposition or off-site disposal.

Project Element	Excavated	Site Reinstatement	Deposition areas	Off-Site Disposal
Wind Farm	62,509	15,364	47,145	-
Switch Room	60	60	-	-
Underground Electricity Line	5,946	5,946	-	-
Delivery Haul Route Accommodation Works	10	-	-	10

Table 3.5: Excavated Material Generation & Management (m³)

Material which cannot be reused, predominantly peat and peaty subsoils, will be permanently stored within dedicated spoil deposition areas. The project site includes a designated spoil deposition area immediately southeast of T11, together with a series of smaller deposition areas around the bases of the proposed turbines and along the access tracks.

The deposition areas have been selected having regard to the absence of notable environmental constraints, separation distances from watercourses and generally flat or gently sloping ground. The designated spoil deposition areas have been sized to accommodate the anticipated c. 48,000m³ of material requiring permanent deposition. Material will be placed in controlled shallow layers within the designated areas, in accordance with the Peat and Spoil Management Plan (enclosed within the CEMP at **Annex 3.4**), to ensure that stability is maintained. Appropriate drainage measures will be implemented to manage surface water and prevent waterlogging and erosion.

Following completion of construction, the deposition areas will be reinstated to reflect the adjoining ground profile and integrate with the surrounding landscape. Where

appropriate, topsoil stripped during initial site preparation will be placed on the surface to support natural revegetation.

Works at the spoil deposition areas will be monitored on a weekly basis during the construction phase and monthly for a 6-month period thereafter by an appropriately qualified geotechnical engineer.

In the event that material is generated which is unsuitable for the deposition areas (e.g. asphalt) or excess material arises which cannot be accommodated on-site, it will be removed from the site to an appropriately licensed waste facility.

A Peat & Spoil Management Plan, enclosed within Planning-Stage CEMP at Annex 3.4, has been prepared for the project and sets out measures for the appropriate management of excavated materials, including peat, arising during the construction phase. The Peat & Spoil Management Plan will be updated prior to the commencement of construction as part of the Planning-Stage CEMP update process described at Section 3.4.1. The updated Plan will address the reuse, reinstatement, storage and management of materials excavated during the construction phase, including detailed methods for the establishment and management of the spoil deposition areas.

3.5 OPERATION PHASE

The operation phase of the project will be 35 years following full commissioning. During this period, the wind turbines will be operational with activities generally limited to routine maintenance and monitoring. Existing agricultural activities will continue where compatible with the operation of the project, while the rehabilitation of Galros Bog will continue in accordance with the Galros Bog Draft Cutaway Bog Decommissioning and Rehabilitation Plan (2026).

On average, the project will be visited on 1-2 occasions per week by a light commercial vehicle for maintenance purposes. In exceptional circumstances major turbine component replacement may be required, involving more substantive works and associated vehicle movements.

3.6 DECOMMISSIONING PHASE

3.6.1 OVERVIEW

This EIAR assumes that the project will be decommissioned following the 35-year operation phase. Decommissioning will generally comprise the dismantling and removal of the wind turbines and other above-ground infrastructure for reuse, recycling or appropriate disposal. Access tracks may be retained where required for continued use by landowners.

Decommissioning and restoration works within Galros Bog will have regard to the rehabilitation status of the bog at that time and will be undertaken so as to avoid, insofar as practicable, compromising the objectives of the bog rehabilitation works.

A Decommissioning Plan will be prepared in advance of decommissioning works, having regard to the environmental requirements and regulatory framework applicable at that time, including the rehabilitation status and management requirements of Galros Bog.

Following completion of decommissioning and restoration works, the reinstated areas will be monitored for a period of two years to identify any requirement for additional restoration works. Any defects in reinstatement identified during this period will be

appropriately remediated.

3.6.2 ON-SITE WORKS

3.6.2.1 Wind Turbines

Wind turbines comprise the tower, nacelle and blades which are modular components that can be disassembled. Decommissioning will generally involve the reversal of the turbine installation process, with the turbines dismantled using cranes and removed from site.

Turbine components will be reused, recycled or recovered where practicable. Components which cannot be reused, recycled or recovered will be removed from site and managed at appropriately authorised waste facilities in accordance with the regulatory requirements and waste management practices applicable at the time of decommissioning.

3.6.2.2 Turbine Foundations

Turbine foundations will be removed to a depth of approximately 1 m below ground level using conventional excavation plant. Exposed reinforcement and holding-down bolts will be cut and removed from site for recycling or appropriate disposal.

Concrete removed from the foundations will be processed for reuse or recycling where practicable, with any residual material removed to an appropriately authorised waste facility. The resulting excavations will be backfilled with suitable material and reinstated to reflect the surrounding ground conditions.

3.6.2.3 Crane Hardstands

Crane hardstands will be removed, including the aggregate and underlying geotextile. As the hardstands will generally comprise floated construction, substantial excavation or earthworks are not expected to be required.

Following removal, the affected areas will be profiled to reflect the surrounding ground conditions and reinstated having regard to the rehabilitation status of Galros Bog at that time.

3.6.2.4 Site Entrances

Site entrances remaining in use at the time of decommissioning will be used, as required, to facilitate access for decommissioning works. Following completion of decommissioning, entrances which are not required for continued agricultural or other landowner use will be removed and the affected areas reinstated to reflect the surrounding ground conditions.

3.6.2.5 Access Tracks

Access tracks may be retained where required for continued agricultural or other landowner use. Where not retained, the aggregate and underlying geotextile will be removed. As the access tracks will generally comprise floated construction, substantial excavation or earthworks are not expected to be required.

Following removal, the affected areas will be profiled to reflect the surrounding ground conditions and reinstated having regard to the rehabilitation status of Galros Bog at that time.

3.6.2.6 Cabling

On-site electrical and communications cabling will be decommissioned having regard to the condition of the site, including the rehabilitation status of Galros Bog, and the environmental and regulatory requirements applicable at that time.

Where cables can be removed without giving rise to unnecessary environmental disturbance, they will be removed for reuse, recycling, recovery or appropriate disposal. Where removal would result in greater environmental disturbance, buried cabling may be left in situ. Any excavations required for cable removal will be backfilled with suitable material and the affected areas reinstated having regard to the surrounding ground conditions and, where relevant, the rehabilitation status of Galros Bog.

3.6.2.7 Switch Room

The switch room will be stripped of electrical equipment, fixtures and fittings prior to demolition. Electrical equipment and other materials will be removed from site for reuse, recycling, recovery or appropriate disposal.

The building will be demolished using conventional methods, with foundations and associated services removed to a depth of approximately 1 m below ground level. Demolition materials will be segregated and reused or recycled where practicable, with residual materials removed to appropriately authorised waste facilities. Excavations will be backfilled with suitable material and the affected area reinstated to reflect the surrounding ground conditions.

3.6.2.8 Drainage

During the decommissioning phase, temporary surface water drainage and treatment measures similar to those implemented during construction phase will be installed, as required, for the duration of the decommissioning works. Within Galros Bog, drainage measures will have regard to the rehabilitation status and hydrological conditions of the bog at that time.

3.6.3 OFF-SITE WORKS

3.6.3.1 Grid Connection

The underground electricity line will be decommissioned by removing the electrical cabling from the installed ducts. The recovered cables, including copper or aluminium conductors, will be removed from site for recycling or recovery.

The underground ducting will remain in situ to avoid the environmental disturbance associated with reopening the c. 5 km cable trench.