

2 PROJECT DESCRIPTION

2.1 INTRODUCTION

This Chapter of the EIAR provides a description of all elements of the Carrigeen Renewable Energy Development (the Project). This forms the basis of the assessments presented within **Chapters 4 to 21**. This Chapter provides a description of the various elements of the Project, a description of the site location and surrounding environs, in addition to details of the construction, commissioning, operational and decommissioning phases.

This Chapter includes an overview of the Project followed by a detailed description of the main components and their method of construction. Measures that have been built into the design of the Project to reduce effects, also known as 'Embedded Mitigation' measures, are set out throughout the EIAR. In addition to these Embedded Mitigation measures, construction mitigation and enhancement measures where specifically relevant to their assessment topic are also set out.

This Chapter of the EIAR is supported by Figures in **Volume III** and the following Appendix documents provided in **Volume IV**:

- **Appendix 2.1:** Construction Environmental Management Plan (CEMP)
- **Appendix 2.2:** Harvest Management Plan (HMP)
- **Appendix 2.3:** Grid Connection Geophysical Investigation Report
- **Appendix 2.4:** List of Projects for Cumulative Assessment

Common acronyms used throughout this EIAR can be found in **Appendix 1.4**.

2.2 PROJECT DESCRIPTION

Permission is being sought by the Applicant for the construction of 11 No. Wind Turbines, Turbine Foundations, Turbine Hardstands, Site Access Roads, a Permanent Met Mast, Onsite Substation, Internal Cabling, Temporary Construction Compounds, Borrow Pit, Permanent Spoil Storage, Grid Connection and all ancillary and associated works.

The Project will consist of the provision of the following:

- 11 no. Wind Turbines with an overall turbine tip height of 185m, turbine hub height of 103.5m, and rotor blade diameter of 163m, a meteorological mast with a height of 30 metres, and associated foundations and hardstanding areas, and subsequent decommissioning of the wind turbines and meteorological mast, following a thirty five year operational life from the date of full commissioning of the wind turbines;

- A 110kV substation compound (Including control buildings (591 Sq. m) with welfare facilities, all associated electrical plant and apparatus, security fencing, underground cabling, storage containers, underground wastewater holding tank, site drainage and all ancillary works);
- Underground electrical (110kV) and communications cabling from the proposed 110kV Onsite Substation to the existing Flagford 220kV substation in the townland of Flagford (including joint bays, communication chambers, earth sheath links, and ancillary works along the underground electrical cabling route). This cabling route is primarily located within the public road corridor;
- Underground electrical (33kV) and communications cabling connecting the Wind Turbines and meteorological mast to the proposed 110kV Onsite Substation;
- 6 no. Temporary Construction Compounds (including site offices and welfare facilities (with a floor area of 405 Sq. m)).
- Junction accommodation works to facilitate turbine delivery and construction access to the Wind Farm Site, including the upgrade of an existing site entrances off the N5 national road, and the construction of new site access roads off the L-1217 and L-56421 local roads;
- Upgrade of existing Site Access Roads and provision of new Site Access Roads, junctions and hardstand areas (including upgrade of 3.6km of the L-1217, 660m of the L-56402, 360m of the L-5642, 480m of the L-56421, 210m of the L-56492 and 85m of the L-56491 local roads);
- 2 no. Borrow Pits;
- Peat & Spoil Management;
- Site Drainage;
- Tree felling and vegetation removal;
- Operational stage site signage;
- Biodiversity Enhancement measures and;
- All ancillary works and apparatus.

A 10-year planning permission and 35-year operational life from the date of commissioning of the entire Project is being sought. The Onsite Substation and Grid Connection will be under the ownership of ESB Networks and will form a permanent part of the national grid infrastructure, which will not be decommissioned with the wind farm at the end of its operational life.

2.3 PROJECT LOCATION AND ENVIRONS

2.3.1 Introduction / Existing Land Use

The Wind Farm Site, as shown in **Figure 1.1** and **Figure 1.2**, is located within an agricultural, peatland and commercial forested landscape, between Frenchpark and Elphin, in Co. Roscommon. The nearest centre of population to the site is the small village of Frenchpark, which is located along the R361 regional road and is c.2.1km to the north of the closest turbine (T2). The small village settlement of Ballinagare is located c.2.2km to the south-west of T5, and Ballinameen c.3.4km to the north-east of T8. The Wind Farm Site is located c.12km north-east of Castlerea and c.16km south-west of Carrick-on-Shannon

Temporary works will be required to accommodate the delivery of the Wind Turbine components. These temporary works are included as part of this application and details can be viewed in **Appendix 17.3: Turbine Delivery Route (TDR)**.

The EIAR Boundary covers an area of c.1,040ha. The principal land use in the general area consists of agricultural pasture grazing land, peat harvesting and commercial forestry.

There are 196 houses within 2km of the proposed Wind Turbines. This excludes 1 No. house, H1 a derelict house located 230m from T10. In the event that planning consent is achieved, this building will be in control of the Developer and will not be inhabited for the operational period of the Project. This building is uninhabited and the landowner is in agreement with the above terms. All houses located within 2km of the proposed Wind Turbines are shown on **Figure 1.3**.

2.3.2 Removal of Commercial Forestry and Replant Lands

The Wind Farm Site contains c.233 ha of commercial forestry. Wind Turbines T2, T4, T5, T6, T7, T10, and T11, are located within commercial forestry. Subsequently, tree felling will be required as part of the Project. To facilitate the construction of the Project it is estimated that c.43.7 ha of commercial coniferous forestry will need to be felled. The felling area proposed is the minimum necessary to construct the Project and to comply with any environmental mitigation (bats in particular).

The proposed harvesting and extraction procedures are set out in **Appendix 2.2: HMP** and will be updated as part of the felling licence application.

To ensure a tree clearance method that reduces the potential for sediment and nutrient runoff, the construction methodology will follow the specifications set out in the Forest

Service Forestry and Water Quality Guidelines (2000) and Forest Harvesting and Environmental Guidelines (2000).

The use of existing commercial forestry infrastructure will be maximised to lessen disturbance from machines used for felling.

In this regard, before any felling works commence on site all personnel, particularly machine operators, will be made aware of the following and will have copies of relevant documentation, including:

- The felling plan, surface water management, construction management, emergency plans and any contingency plans;
- Environmental issues relating to the site;
- The outer perimeter of all buffer and exclusion zones;
- All health & safety issues relating to the site.

All construction of tracks, including the creation of buffer zones and roadside drainage, will take into consideration the appropriate edition of the following specifications, which have been developed by the Forest Service:

- 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

2.3.3 Wind Farms in the Area (Cumulative)

There are 7 wind farms within 20km of the Wind Farm Site as detailed in **Table 2.1**.

Figure 2.3 shows the location of proposed, permitted and operational wind farms within a 20km radius of the proposed Wind Turbines. The nearest operational wind farm is Roosky wind farm which is located 13.6km to the north-west of the Wind Farm Site. The nearest permitted but not yet constructed wind farm is Leam wind farm 6.8km to the north, north-east.

Table 2.1: Wind farms within 20km of the Wind Farm Site

Wind Farm	Status	No. of Turbines	Distance to the Site Boundary	Direction from the Wind Farm
Riverstown Single Turbine	Permitted	1	19.2km	North-west
Leam Wind Farm	Permitted	2	6.8km	North, North-east
Largan Hill Wind Farm	Operational	13	15.1km	North-west
Islandmore Wind Farm	Proposed	10	15.3km	North-west
Sliabh Bawn Wind Farm	Operational	20	19.4km	South-east
Roosky Wind Farm	Operational	2	13.6km	North-west
Ballyfeeny Green Energy	Proposed	6	19.4km	South-east

2.3.4 Other Developments (Cumulative)

All other proposed, permitted or approved developments with potential for cumulative effects that are located within 10km can be seen in **Appendix 2.4: List of Projects for Cumulative Assessment**. The 10km radius distance search area selected for other development, other than wind farms, is considered to be reasonable for cumulative impact assessment for EIAR and consistent with the EPA “Guidelines on the information to be contained in environmental impact assessment reports” (2022) and best practice.

2.3.5 Land Ownership

The majority of the Wind Farm Site is located on lands under the ownership of private landowners who have consented to the Application and the Project. All necessary letters of consent accompany this application.

2.4 WIND RESOURCE

Due to the location, in the west-central part of Ireland, the Wind Farm Site experiences good annual wind speeds. The Irish Wind Atlas produced by Sustainable Energy Ireland shows average wind speeds for the country and it shows that wind speeds on the Wind Farm Site are sufficient for a wind farm development (7.6ms^{-1} at 75m, 8.1ms^{-1} at 100m and 8.9ms^{-1} at 150m).

2.5 PROJECT INFRASTRUCTURE

2.5.1 Proposed Layout Design

The layout of the Project has been designed to minimise the potential environmental effects of the Project while utilising the maximum energy yield from the Wind Farm Site’s wind resource. The layout design was informed by the following constraints and buffers selected in accordance with best practice and guidance:

- Distance to major watercourses of at least 50m, where possible (excluding crossings).

- Distance to minor watercourses of at least 10m, where possible (excluding crossings).
- Distance to recorded archaeological monuments and structures of at least 20m from the outer edges of all known and potential archaeological sites within the Wind Farm Site (professional judgement based on experience).
- Minimum 740m setback from third party sensitive receptors and a minimum 500m setback from sensitive receptors involved in the Project (achieving the Guidelines recommended setback of 500m and 4 x tip height separation distance from third party sensitive receptors in line with the draft Guidelines).
- Avoidance of more sensitive habitats, e.g., hedgerows and watercourses.
- Consideration of the mapped flood event extents on Wind Farm Site
- Maximise use of existing Site Access Roads to reduce land take.
- Minimisation of the overall length of Site Access Roads.
- Design of the Site Access Roads to follow natural contours as far as possible, in order to avoid unnecessary amounts of excavation and reduce adverse hydrological impacts.
- Avoidance of steep slope areas to minimise earthworks.
- Incorporation of measures to improve the visual appearance of the Wind Farm Site layout, including reinstatement of some elements of temporary infrastructure following the construction period, such as reinstatement of road widening areas.

The overall layout of the Wind Farm Site is shown in **Figure 1.2**. This figure shows the proposed locations of the Wind Turbines and associated Turbine Hardstands, Site Access Roads, Onsite Substation, Permanent Met Mast, Temporary Construction Compounds, Borrow Pits, Permanent Spoil Storage areas, and the site entrances. The coordinates (in Irish Transverse Mercator (ITM) and Irish National Grid (ING)) of the 11 proposed Wind Turbines are listed in **Table 2.2**.

Table 2.2: Turbine ITM Coordinates

Turbine No.	ITM Easting (m)	ITM Northing (m)	ING Easting (m)	ING Northing (m)	Top of Foundation Level (m OD)
T1	575477	790430	175520	290415	68.15
T2	574977	789898	175020	289882	68.00
T3	575779	789896	175822	289880	69.15
T4	576135	789684	176178	289668	67.15

Turbine No.	ITM Easting (m)	ITM Northing (m)	ING Easting (m)	ING Northing (m)	Top of Foundation Level (m OD)
T5	576298	789215	176341	289199	68.15
T6	576648	789007	176691	288991	70.15
T7	577096	788988	177140	288972	68.15
T8	579819	790661	179863	290646	74.15
T9	580296	790613	180340	290598	74.15
T10	580937	790353	180981	290338	70.15
T11	580433	790105	180477	290090	70.15

2.5.2 Wind Turbines

The proposed Wind Turbines will be of modern design and will be a three-bladed, rotor upwind of the tower, variable speed, pitched blade regulated machine. Wind Turbine appearance will be a matt non-reflective finish in a white, off-white or grey colour. Each of the 11 proposed Wind Turbines shall have a foundation-to-tip height of 185m.

The proposed Wind Turbines will have a circular based tower, sitting on reinforced concrete foundations. The Wind Turbine tower will support the nacelle, rotor hub, and rotor blades. Commercial wind turbine towers are made of steel or a hybrid of steel and concrete. The components within the nacelle are mainly metal (steel, copper, aluminium, etc.) with a metal/plastic/glass-reinforced plastic (GRP) body. The blades can be made of a matrix of glass-fibre reinforced polyester or wood-epoxy or similar composite materials.

Each Wind Turbine will have a generator with a capacity of c.5.7MW. The Wind Turbines may be direct drive machines or may contain a gearbox. The final Wind Turbine will be chosen in a competitive tendering process as part of the Project financing process, after all necessary consents have been secured.

A schematic drawing of the candidate turbine is shown on **Drawing No. 6575-JOD-CGWF-XX-DR-C-0503**.

The Wind Turbine parameters can be seen in **Table 2.3**.

Table 2.3: Wind Turbine Parameters

Wind Turbine Parameter	Assessment Envelope
Blade Tip Height	185m
Rotor Diameter	163m
Hub Height	103.5m

2.5.3 Turbine Hardstands and Turbine Foundations

The Turbine Hardstand is designed to accommodate the delivery, laydown, and assembly of turbine components (in particular, rotor assembly) prior to turbine lifting and assembly and is shown in **Drawing No 6575-JOD-CGWF-XX-DR-C-0501** and **Drawing No 6575-JOD-CGWF-XX-DR-C-0502**. The Turbine Hardstands are needed to support the cranes during turbine construction, operational and maintenance and for decommissioning. The Turbine Hardstands will be constructed and used to facilitate Turbine Foundation construction, such as steel reinforcement delivery and pouring of concrete.

The total Turbine Hardstands area will be c.45,435m² and includes the main crane hardstand, the component set down area, the assist crane hardstands and vehicle parking. These areas will consist of hardcore material topped with crushed stone.

Construction of the Turbine Hardstand and met mast hardstand will require the excavation of soils, the laying of a geotextile material on the formation surface and placing engineered stone and a top dressing.

The Turbine Foundations will be made of steel reinforced concrete, c.27.2m in diameter and have a depth of c 3.5m. The final Turbine Foundation design will depend on the turbine type and will be decided by the structural engineers at detailed design stage. The central part of the foundation (plinth) as seen on **Drawing No. 6575-JOD-CGWF-XX-DR-C-0501**, will be c.6m in diameter and will be raised from the main Turbine Foundation below ground level.

The area around and above the Turbine Foundation will be backfilled with compacted stone or crushed rock to a minimum specific density as this acts as additional ballast on top of the finished wind Turbine Foundation.

Confirmatory site investigations will be undertaken post consent to confirm that conditions do not vary from those encountered when initial investigations took place. This will confirm that the mitigation measures to be implemented remain accurate in protecting the environment. All proposed Wind Turbines, with the exception of T1 and T3, are expected to be traditional gravity foundations. These are concrete structures that depend on their own weight to achieve sufficient stability against overturning and sliding.

Turbine Foundations will need to be taken down to a level where the underlying soil or rock can bear the weight of a structure without shifting or compressing. This will be completed by excavating through the peat / soil, subsoil and rock where necessary (depending on the various geological locations).

The proposed Wind Turbines T1 and T3 will likely require piled foundations, comprising rotary bored piles into bedrock supporting the concrete base slab with a central upstand to support the tower. A typical piled foundation for Wind Turbines such as that proposed use 16 No. approximately 10m long piles bored at least 3m into intact limestone bedrock. Piled foundation bases will be approximately 21m in diameter with detailed foundation design being dictated by the local ground conditions. The construction methodology for the Turbine Foundations is detailed **Appendix 2.1 – CEMP** and the arrangement is shown on Drawing No. **6575-JOD-CGWF-XX-DR-C-502**. The foundations for each individual Wind Turbine will be designed by the appointed designer.

After the foundation level of each Wind Turbine has been formed, the bottom section of the turbine tower or cage reinforcing steel is then built up around and through the foundation insert or bolt cage and the outside of the foundation is shuttered with demountable formwork to allow the pouring of concrete.

The method of construction for a gravity Turbine Foundation is described as follows:

- Set out Turbine Foundations and required finish levels etc.
- Construct formation and/or supporting structures.
- Construct drainage as required.
- Provide a minimum of 100mm concrete blinding.
- Place bottom mat of steel reinforcing.
- Place Turbine Foundation base insert or bolt cage.
- Fix cable ducting and foundation earthing.
- Complete reinforcing steel.
- Fix shuttering to base sidewalls.

- Fix ducts and earthing wires between insert and walls of base.
- Carry out any corrective works as directed by Engineer.
- Check weather conditions and schedule concrete deliveries.
- Place concrete and take quality control slumps and cubes.
- Concrete surface finishing.
- Apply curing and protection of concrete.
- Strip formwork.
- Placing of any earthing wires around and over the base.
- Backfill base sides and place overburden.
- Confirm that cube results are satisfactory¹.
- Grout the top flange.

The method of construction specific for the piled foundation is described as follows:

- Excavate approximately 300mm to 500mm of topsoil and install approximately 500mm of crushed stone, compacted in two layers to form a stable platform used to support the piling rig during drilling.
- Set out pile locations.
- Construct piles by drilling vertical holes of approximately 900 mm in diameter to a minimum depth of 3 m into bedrock and installing steel reinforced cage and structural concrete.
- Excavate the footprint of the Turbine Foundation including working width for formwork and duct installation to formation level.
- Construct 100 mm thick concrete blinding layer.
- Prepare top of piles for connection to foundation reinforcement
- Once formation level, pile preparation and concrete binding is in place, the methodology will be the same construction methodology as outlined for gravity Turbine Foundations above.

2.5.4 Access to the Wind Farm Site

There are 5 proposed site entrances. The site entrances are shown on **Figure 2.2**.

Site entrance 1 on the existing N5 and site entrance 1a on the L56402 will be constructed to facilitate the delivery of the Wind Turbine components to Wind Turbines T1 and T2. The site entrances will allow abnormal load vehicles to leave the N5 at site entrance 1 and join the L56402 at site entrance 1a to access Wind Turbines T1 and T2 and avoid the existing

¹ Concrete cubes made during the pouring of the base are crushed to confirm that the required concrete strength has been reached.

N5 / L56402 junction which is not suitable for abnormal load vehicles. The existing N5 is a 6.0m wide Type 3 single carriageway with hard strips and grass verges. The N5 runs between Longford and Westport and currently has a 100km/h speed limit classification at the proposed site entrance 1. Existing traffic volumes on the N5 were obtained from the TII traffic counter on the N5 located to the east of Frenchpark near site entrance 1. The results from the automatic traffic counter show that in 2025 the N5 had an annual average daily traffic (AADT) of 6,471 vehicles with 10.6% HGV traffic. The realignment of the N5 between Ballaghaderreen to Scramoge is due to open in 2026 and the section of the N5 at site entrance 1 will become a regional / local road with reduced traffic volumes and reduced speed limit. Site entrance 1 on the N5 will be used by abnormal load vehicles during Wind Turbine delivery, general construction traffic will use the existing N5 / L56402 junction to access the Wind Farm Site. The L56402 is typically a 3.0m wide single carriageway with grass verges and has a 60km/h speed limit classification. Existing traffic volumes on the L56402 are calculated from the classified traffic counts carried out by JOD on 12th December 2025 at the N5 / L56402 junction. Using the methodology from TII publication PE-PAG-02039 to calculate the AADT from short period traffic counts, the resulting AADT on the L56402 is calculated from the recorded traffic counts. The L56402 local road has an AADT of 57 vehicles at its junction with the N5 which equates to a two-way traffic flow of approximately 4 vehicles during peak hour traffic periods with 0% HGV traffic recorded during the survey period. The L56402 is currently used for forestry operations and will be used by HGV's for haulage of construction materials and components to the Wind Farm Site.

The Road Safety Audit (**Appendix 16.4**) for site entrance 1 recommended that the design team should ensure this Site Access Road and junction is removed upon completion of the wind farm. The design team response is that the short section of proposed Site Access Road has been redesigned and will be used exclusively for Wind Turbine deliveries by abnormal load vehicles. All general construction and operational traffic will continue to access the site via the existing N5/L56402 junction. The dedicated Site Access Road has been designed to bypass the existing N5/L56402 junction solely for abnormal load turbine deliveries. Following completion of Wind Turbine deliveries, the boundary treatments along the N5 and L56402 at site entrances 1 and 1a will be reinstated to prevent ongoing access. This section of Site Access Road will remain in place for the duration of the Project and will only be reopened to facilitate the transport of any replacement Wind Turbine components that may be required in the future and to facilitate Decommissioning.

The Road Safety Audit for site entrance 1a onto the L56402 recommended that the design team should ensure suitable junction visibility is achieved and maintained. The design team have accepted the recommendation and realigned the site entrance to provide unrestricted visibility splays at the junction.

Site entrances 2, 3 and 5 will be constructed on the L1217 local road. Site entrance 2 will be a new entrance and site entrances 3 and 5 will be constructed at existing forestry entrances which will be upgraded for construction and Wind Turbine delivery traffic. The L1217 runs between the R361 regional road at Frenchpark to the L1216. The L1217 is typically a 3.0m wide single carriageways with grass verges and has a 60km/h speed limit classification. The L1217 local road will be used by wind farm construction, operations and Decommissioning traffic to access the Project. Existing traffic volumes on the L1217 are calculated from the classified traffic counts carried out by JOD on 12th December 2025 at the L1216 / L5601 junction. Using the methodology from TII publication PE-PAG-02039 to calculate the AADT from short period traffic counts, the resulting AADT on the L1217 is calculated from the recorded traffic counts. The L1217 local road has an AADT of 128 vehicles at its junction with the L5601 which equates to a two-way traffic flow of approximately 9 vehicles during peak hour traffic periods with 0% HGV traffic recorded during the survey period. The L1217 is currently used for forestry operations and will be used by HGV's for haulage of construction materials and components to the Wind Farm Site.

The Road Safety Audit did not include specific issues for site entrances 2, 3 and 5. The design team have accepted the general recommendation of the audit relating to drainage, access road gradients, turbine delivery over-run areas, fencing and gates.

Site entrance 4 on the L56421 will be a new entrance constructed to access Wind Turbines T3 to T11 of the Project. Access to site entrance 4 will be from the new N5 / L5642 priority junction using the L5642 and L56421 local roads. The L5642 and L56421 local roads are typically 3.0m wide single carriageways with grass verges and have a 60km/h speed limit classification. The L5642 and L56421 local roads will be used by wind farm construction, operations and Decommissioning traffic to access the Project.

Further details of site entrances are set out in **Chapter 16: Traffic and Transportation**.

2.5.4.1 Turbine Delivery Route

This EIAR assesses the preferred TDR (refer to **Appendix 16.3**) from Galway Port to the Wind Farm Site for blades and turbine components.

The Wind Turbine components for the Project will be shipped to the Port of Galway. The Wind Turbine components will be transported on the public road network using abnormal load vehicles between the Port of Galway and the Project site entrances on the existing N5 (site entrance 1) and on the L56421 via the realigned N5 (site entrance 4). The proposed TDRs are shown on **Figure 16.5**. Delivery vehicles will use the following road network to access the Wind Farm Site from the Port of Galway,

A trial run will be undertaken prior to delivery of the Wind Turbine components, this will include assessment of vertical alignment of the road network. If the vertical alignment is not sufficient for the length of the blade delivery vehicles, a dolly type vehicle can be utilised.

The Turbine Delivery Route for the transportation of the Wind Turbine components between the Port of Galway and the Project has been assessed by Jennings O'Donovan & Partners Limited (JOD) using AutoTRACK software to determine the swept path of abnormal load vehicles delivering the Wind Turbine components. The assessment has shown that enabling works such as road widening, alterations to junctions, removal and trimming of vegetation, alterations to signs, lighting, traffic signals and street furniture will be required along the haul route between the Port of Galway and the Project, a summary of the assessment is listed in **Table 2.4**. Full details of the works locations on the TDR between the Port of Galway are shown in **Appendix 16.3** of this EIAR.

Table 2.4: Enabling Works for Galway Port Turbine Delivery Route

Location	ITM (Easting)	ITM (Northing)	Works Required
R339 / R338 Junction	531128	726314	1. Bollards to be temporarily removed from central island.
R339 / L5034 Junction	531745	726697	1. Traffic lights to be temporarily relocated 2. Lighting Column to be temporarily relocated 3. Lighting Column to be temporarily relocated 4. Vegetation to be trimmed 5. Lighting Column and pole to be temporarily relocated

Location	ITM (Easting)	ITM (Northing)	Works Required
R336 / L5034 Junction	531798	727007	1. Lighting column on inside of bend to be temporarily relocated 2. Loadbearing area to be constructed 3. Vegetation to be trimmed for load oversail
N17 / N83 Junction, Tuam	541634	751131	1. Lighting column to be temporarily removed 2. Sign to be temporarily removed 3. Signs to be temporarily removed from splitter island 4. Vegetation to be trimmed
N17 / N83 Junction, Tuam (West)	543806	754103	1. Lighting column to be temporarily removed 2. Road sign to be temporarily removed on central island 3. Road sign on splitter island to be temporarily removed at two locations 4. Sign in verge to be temporarily removed
N17 Milltown	540584 540073	762895 763383	1. Signs and bollards to be temporarily removed from central island at two locations.
N17 Ballindine	536890 536742	769010 769299	1. Signs and bollards to be temporarily removed from central island at four locations. 2. Bollards to be temporarily removed from central islands at two locations
N17 / N5 Roundabout, Charlestown	547918	800434	1. Road widening in verge 2. Road widening / Footpath strengthening 3. 2 no. Lighting columns to be temporarily removed 4. Signs to be temporarily removed from islands at two locations 5. Vegetation to be trimmed
N5 Junction, Charlestown	548388	800815	1. Flexible bollards to be temporarily removed from slip road 2. Flexible bollards to be temporarily removed from N5 3. Lighting column to be temporarily removed 4. Sign to be temporarily removed from splitter island 5. Sign to be temporarily removed from verge 6. Vegetation to be removed 7. Oversail in third party lands

Location	ITM (Easting)	ITM (Northing)	Works Required
Realigned N5 to Existing N5, Frenchpark	569070	793015	1. Temporary access road to be constructed between realigned N5 and existing N5
Site Entrance 1, N5	574150	789496	1. Site Entrance 1 - New site entrance on the existing N5 constructed to accommodate the swept path of abnormal vehicles
Realigned N5 / L5642 Junction	577210	787922	1. Road widening at junction for abnormal load vehicles
L5642 & L56421 Local Roads	577220	788280	1. Road widening in third party lands
Site Entrance 3, L56421	576818	790119	1. Site Entrance to be Constructed on L56421 2. Vegetation to be trimmed for load oversail
Site Entrance 4, L1217	576938	788599	1. Site Entrance to be Constructed on L1217 with overrun area for abnormal load vehicles 2. Vegetation to be removed for oversail
Site Entrance 5, L1217	580207	789375	1. Site Entrance to be Constructed on L1217 with overrun area for abnormal load vehicles 2. Vegetation to be removed for oversail

The delivery of the Wind Turbines will require co-ordination with the Council's Roads Department, An Garda Síochána, TII and Motorway Operators. Efforts will be made to avoid peak times such as school drop off times, church services, peak traffic times where it is considered this may lead to unnecessary disruption, and abnormal loads may travel at night and outside the normal construction times as may be required by An Garda Síochána. The process has been set out in the TMP contained in **Appendix 16.2** which will be implemented in full and will be further developed prior to the commencement of construction by the Contractor.

2.5.4.2 Construction Haul Routes

All HGV traffic associated with the construction of the Project will use the site entrances and road network shown in **Appendix 16.2, Figure 13**. Workers employed on the Wind Farm Site will follow the road network shown in **Appendix 16.2, Figure 13** to access the works. General HGV deliveries to Wind Turbines T1 and T2 will use the existing N5/L56402

junction as shown in **Appendix 16.2, Figure 6**. The haul routes will be signposted with directional signs at all major junctions.

2.5.4.3 Machinery Access for Felling

For the proposed commercial forestry felling activities, it is intended that much of the existing commercial forest track infrastructure will be utilised. The Wind Turbine layout seeks to maximise use of the commercial forestry access tracks already present. Where there is already a track there will be less intrusion and disturbance to the soil and surrounding trees. Some widening and building up of the existing track network will be required which will minimise impacts on habitats compared to the construction of new forest tracks. These upgraded tracks will also be used for access for removal of the felled timber.

2.5.5 Site Access Roads

Site Access Roads refers to the internal road structure to facilitate the construction, operation and decommissioning of the Project. The Site Access Roads layout follows the existing commercial forestry access tracks into the Wind Farm Site as far as possible and avoids environmental constraints. Every effort has been made to minimise the length of track necessary.

Site Access Roads will be upgraded and constructed to provide a running width of 5m but may be wider at bends. The proposed Site Access Roads construction detail is shown on **Drawing No. 6575-JOD-CGWF-XX-DR-C-0401** and **Drawing No. 6575-JOD-CGWF-XX-DR-C-0402**. The proposed Site Access Road layout is shown on **Figure 1.2**.

The Site Access Roads within the floodplain will be finished at existing ground level during the construction phase and track edges will be marked out using snow poles. During the operational phase, the roads will be set to the 1 in 20-year flood level. In the event of a flood event, the maximum flooded depth along Site Access Roads will be between 200 and 400mm. Site Access Roads will be marked with snow poles to allow for emergency vehicular access. A length of c.6,382m of existing Site Access Roads will be upgraded for the Project to minimize land take.

There will also be c.5,325m of new Site Access Roads required for the Project. These will be constructed to provide a running width of 5m. These Site Access Roads will be excavated to firm bearing strata and constructed using rock from the Turbine Foundations excavations, the onsite Borrow Pits, and from imported quarry stone. Site Access Roads are shown on **Figure 1.2**. Site Access Roads across peat greater than 1m deep will be floated using layers

of geosynthetic materials and aggregates. Site Access Roads on peat less than 1m deep will generally be constructed using traditional cut and fill methodology.

There are 7 proposed crossings of rivers and natural streams along the internal Site Access Roads. 6 no crossings of which are required for the internal Site Access Roads and one proposed crossing is along the L1217 local road, where the Internal Cabling runs from the western portion to join up with the Onsite Substation on the eastern portion, shown on Drawing No. **6575-JOD-CGWF-XX-DR-C-0307**. All major watercourse crossings are clear span bridges and minor watercourse crossings will be culverts. The bridges will be constructed with reinforced concrete and will join to the gravel Site Access Roads. The bridges will range from 600mm to 2000mm in width. Further to consultation with Inland Fisheries Ireland (IFI), the proposed crossings have been designed in accordance with Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters, 2016 and Office of Public Works (OPW) Section 50 Guidelines, as set out in **Management Plan 2: Water Quality Management Plan** of the CEMP (**Appendix 2.1**). Details of the Site Access Road crossings are included in Drawings No. **6575-JOD-CGWF-XX-DR-C-0304** and **6575-JOD-CGWF-XX-DR-C-0305**.

The surface of the Site Access Roads will be maintained during the construction phase. All imported stone to the Wind Farm Site will have undergone appropriate quality testing to Transport Infrastructure Ireland (TII) specifications.

Mitigation measures outlined in **Chapter 11: Hydrology and Hydrogeology - Section 11.8.1** and the **CEMP Appendix 2.1** will be implemented on site to prevent sediment and hydrocarbon release to the environment and potentially impacting water quality.

2.5.6 Permanent Met Mast

EirGrid's grid code² requires an independent assessment of wind farm performance. One such requirement is that all wind farms with an installed capacity of greater than 10MW are required to supply continuous, real-time weather data for the wind farm location. The data required is the wind speed and wind direction, air temperature and air pressure. The data required for the Project will be provided by a dedicated Permanent Met Mast measuring 30m in height (location as detailed in **Figure 1.2**).

The Permanent Met Mast will be located in the western portion of the Wind Farm Site as detailed in **Figure 1.2**. It will be a free-standing lattice type structure as shown in **Drawing**

² EirGrid (15 December 2021). EirGrid Grid Code Version 10

No. 6575-JOD-CGWF-XX-DR-C-0701. The Permanent Met Mast foundation will be 4.5m by 4.5m, with a depth of approximately 2.25m. It will be designed and constructed similarly to the Turbine Foundations. It will encompass a cast-in insert or bolts to connect to the bottom of the Permanent Met Mast and reinforced bar structural elements. The area around and above the Turbine Foundation will be backfilled with compacted crushed rock. The Permanent Met Mast will be linked to the Onsite Substation via buried Internal Cabling for power and communication. It will be required for the full operational duration of the Project.

2.5.7 Onsite Substation

It is proposed to construct a 110kV electricity Onsite Substation within the Wind Farm Site, as shown on **Figure 1.2**. The Onsite Substation will connect to the national grid at the existing Flagford 220kV substation via c.17.5km of 110kV underground electricity cabling. Electricity transmitted between the Wind Turbines and the Onsite Substation on the Wind Farm Site will be at a voltage of 33kV. Voltage will be stepped up to 110kV within the Onsite Substation for onward transmission via the Grid Connection. The layout of the Onsite Substation and compound is further detailed in **Drawing No. 6575-JOD-CGWF-XX-DR-C-0602**.

The Onsite Substation will serve two main functions:

- 1) provide housing for switchgear, control equipment, monitoring equipment, and storage space necessary for the proper functioning of the wind farm
- 2) allow for metering and for switchgear to connect to the National grid

The construction and electrical components of the Onsite Substation will be to EirGrid specifications. The substation compound area will measure c.8,527m² and will be constructed from engineered stone material using similar construction techniques (as detailed in **Appendix 2.1**) as for the Turbine Hardstands. The overall compound will be enclosed by a 2.6m high palisade fence and will contain 2 no. control buildings, ancillary equipment, including the transformers, switch gear, fault protection, metering, car parking and other ancillary elements necessary for the operation of the Project.

The control buildings will contain an ESB room, control room, switchgear room, small store, an office and toilet. The control components will include metering equipment, switchgear, the central computer system and electrical control panels. A spare parts store and workshop will also be located in the control building. The control building will be a single story pitched roof structure with traditional rendered finishes. Details of the control building are shown on **Drawing No. 6575-JOD-CGWF-XX-DR-C-0605** and **Drawing No. 6575-**

JOD-CGWF-XX-DR-C-0606. The appearance and finish of the control building will be similar to an agricultural building with a slated roof and nap plaster finish. It will have a suitably sized footpath around it and an adjacent parking area. The final finish of the control building will be an off-white or grey colour.

2.5.8 Internal Cabling

Each Wind Turbine will be connected to the Onsite Substation via underground Medium Voltage (MV) 33kV cables. Fibre-optic cables will also connect each Wind Turbine to the Wind Turbine control system located within control building in the Onsite Substation. The electrical and fibre-optic cables running from the Wind Turbines to the Onsite Substation will be laid in cable ducts approximately 1.2m below the ground surface within the Site Access Roads and/or their verges.

2.5.9 Grid Connection

Connection will be sought from the grid system operator by application to EirGrid. It is proposed that the Onsite Substation will connect to the existing Flagford 220kV substation via 110kV underground electricity cabling. The cables will connect into existing infrastructure within the confines of the existing Flagford 220kV substation and its compound. The proposed Grid Connection will be constructed to the requirements and specifications (CDS-GFS-00-001-R1³) of EirGrid.

2.5.9.1 The Connection Route

The proposed route of this Grid Connection is provided in **Figure 2.4**. The overall length of the Grid Connection between the Onsite Substation and the existing Flagford 220kV AIS substation is c.17.5km which is located primarily within the public road corridor.

It is proposed that the Grid Connection route will exit the Onsite Substation east onto the local road L1217 travelling for approximately 3.7km before turning north onto the L5650. While travelling along the L5650 the route crosses the N61, the route then continues in a north-easterly direction along the L5650, L6019, L600, R368 and L1034 for 11.5km before reaching Flagford 220kV Substation.

APEX Geophysics Ltd carried out a Ground Penetrating Radar (GPR) survey along approximately 11.5 km of the proposed Grid Connection route to determine pavement construction details and identify the presence and thickness of peat, with supplementary Russian sampling and soft-ground probing confirming peat depths ranging from 0.58 m to

³ <https://www.eirgridgroup.com/site-files/library/EirGrid/110kV-Underground-Cable-Functional-Specification-General-Requirements.pdf>

4.83 m below ground level. Please refer to **Appendix 2.3: Grid Connection Geophysical Investigation Report** for additional details.

2.5.9.2 Cable Ducts

The electricity will be transmitted as a three-phase power supply meaning there will be three individual conductors. The three conductors will be laid in separate ducts. The width of a 110kV cable trench with a trefoil formation will be 600mm. The depth of the trench for 110kV cables is approximately 1.3m. Separate ducts will be provided within the trench for fibre optic communications.

The following is a summary of the typical main activities for the installation of ducts:

- Confirmatory drawings for all existing services will be obtained from ESB Networks, Gas Networks Ireland, Eir, Local Authorities, Irish Water and other utility operators.
- Preparation of necessary Risk Assessment Method Statement (RAMS).
- Immediately prior to construction taking place, the area where excavation is planned will be surveyed by CAT or GPR scan (sub-surface survey technique to locate any below-ground utilities) and all existing services will be verified. Temporary warning signs will be erected.
- 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.
- Where necessary, a silt fencing filtration system will be installed on all existing drainage channels before and for the duration of the cable construction to prevent contamination of any watercourse.
- A 13-tonne rubber tracked 360-degree excavators will be used to excavate the trench to the dimensions of 600mm wide by 1.3m deep.
- Once the trench is excavated, a 65mm depth base layer of sand (in road trench) or concrete (off road trench) will be installed and compacted. All concrete will be offloaded directly from the concrete truck into the trench.
- uPVC ducts will be installed on top of the compacted base layer material in the trench.
- Once the ducts are installed, couplers (a device used for joining pipes) will be fitted and capped to prevent any dirt entering the unjointed open end of the duct.
- 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.

- When ducts have been installed in the correct position on the trench base layer, sand (in road trench) or concrete (off road trench) will be carefully installed in the trench around the ducts so as not to displace the duct and compacted.
- Timber spacer templates will be used during installation so that the correct cover of duct surround material is achieved above, below and at the sides of the duct in the trench.
- A red cable protection strip will be installed above the layer of material surrounding the duct and for the full length of the cable route.
- A layer of concrete (in road) or excavated material (off road) will be installed on top of the duct as a surround material to a level 300mm below the finished surface level.
- Yellow marker warning tape will be installed for the full width of the trench, and for the full length of the cable route, 300mm from the finished surface level.
- The finished surface of the road will then be reinstated and finished with a bituminous layer. For off-road sections of the Grid Connection Route, the trenches will be reinstated with the related excavated material.
- Precast concrete cable joint bays (joint bays see Section 2.5.9.1 below) will be installed within the excavated trench at set intervals.
- The joint bays will be backfilled and the surface above will be finished with a bituminous layer. The cable joint bays will be opened a second time during cable pulling and jointing, after which the finished surface above the joint bays will be reinstated again to its original condition.
- When trenching and ducting is complete, the installation of the Grid Connection cable will commence between the Onsite Substation and the existing 220kV substation at Flagford.
- The underground cabling will be pulled through the installed ducts from a cable drum set up at one joint bay and using a winch system which is set up at the next joint bay.
- The cables will be jointed together within the precast concrete Joint Bay.
- The surface above each cable joint bay will be finished with a bituminous layer to the satisfaction of the Local Authority / TII as appropriate and as good as the pre-existing condition.

2.5.9.3 Joint Bays

Joint Bays are pre-cast concrete chambers along the Grid Connection route where individual lengths of cables will be joined to form one continuous cable. A joint bay is constructed in a pit. Each joint bay typically will be 6m long x 2.5m x 2.3m deep. A reinforced concreted slab will be constructed on top of the bay.

The joint bay locations have been dictated by suitable terrain and access to facilitate the operation of cable pulling equipment at any phase of the development and future operation of the installation in accordance with the EirGrid specifications (CDS-GFS-00-001-R1). Final joint bay locations will be determined by the electrical designer.

Communication chambers, which are similar to small manholes, will be installed at the joint bay locations to facilitate connection of fibre-optic communication cables which run parallel to the electricity ducts.

2.5.9.4 Horizontal Directional Drilling Works

There are 8 no. watercourse crossings along the Grid Connection route, 3 of which will be HDD crossings. Grid Connection watercourse crossing details can be seen on Drawing No. **6575-JOD-CGWF-XX-DR-C-0308** to Drawing No. **6575-JOD-CGWF-XX-DR-C-0315**. Directional drilling is the practice of drilling holes in a non-vertical direction for the laying of ducts which contain cables beneath features such as watercourse and this is what is proposed to traverse watercourse crossings. The directional drilling commences at the launch pit which is the entry point for pipes and ducts to be placed. Pipes and ducts are brought through the drilled hole to a receiving pit on the opposite side of the hole to the launch pit. The crossings will comprise 4 x 110 mm High Performance Polyethylene (HPPE) pipes/ducts each directionally drilled. Two separate excavations will be made to a depth of 2 metres to accommodate the directional drilling launch and reception pits in the road on either side of the crossing (no third-party lands either side of the road are anticipated to be required). Spoil arisings will be loaded onto trucks for disposal off-site as soil is excavated. The excavation launch and reception pits will be reinstated using compacted layers of crushed stone on completion of drilling and jointing operations.

The Drill head will be placed in the open excavation (launch pit) and it will be guided in by the operator for the first 1-2 metres. A series of drill rods will be connected to the head as it travels further along the shaft.

The drill position is always known to the operator and the drill can be manoeuvred in 3 planes / axis. A surveyor will monitor drilling works to ensure that the modelled stresses and collapse pressures are not exceeded. A drilling lubricant will be required, and this will be delivered directly to the drill head by hydraulics. The lubricant will be chemically inert bentonite slurry mixture which lubricates the drill head and remove the drilled earth and stone. Once the conduit is completed, the drill head is exposed at the reception pit and removed. 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. The drill rods are connected to the duct pipe and the drill is reversed pulling the pipe back through the conduit.

A spoil volume of 5 m³ will be excavated for each 100 m run of 4 pipes. This spoil will be largely subsoil material. This material will exit the launch pit within the bentonite slurry mixture. A mobile bunded tank will be located next to the launch pit into which the material/slurry mixture will be pumped.

Mitigation measures are set out in the CEMP (**Appendix 2.1**) and in EIAR **Chapters 10: Soils and Geology** and **11: Hydrology and Hydrogeology**.

2.5.10 Borrow Pits

Two Borrow Pits will be constructed as part of the Project, as per **Figure 1.2**. The Borrow Pits will be located in the western portion of the Wind Farm Site. It is estimated that the Borrow Pits will provide 240,000m³ excavated material to provide fill for the Site Access Roads, Turbine Hardstands, upfill to Turbine Foundations and the Temporary Construction Compounds. The Borrow Pits will be excavated only as required. Where rock and fill material is available from the excavation of Turbine Foundations this material will be used first. The use of the on-site Borrow Pits will reduce the need to transport material to the Wind Farm Site.

Site investigation borehole logs indicate that bedrock is relatively unweathered at each site investigation borehole location at the Wind Farm Site. Unconfined Compressive Strength results indicate the bedrock underlying the Wind Farm Site is considered weak. Details of the site investigations that were carried out and the stone type/suitability are provided in **Appendix 10.2: Borrow Pit Assessment Report**. Where rock is seen as unsuitable, rock will be imported from local quarries, as identified in **Chapter 16: Traffic and Transportation**. When the Borrow Pits are no longer required, they will be reinstated using any surplus inert material such as peat and subsoil from the Wind Farm Site, allowed to restore naturally and made secure using permanent stock proof fencing.

The rock will be extracted from the proposed Borrow Pits using two main methods, rock breaking and rock blasting. The primary method will be rock breaking.

2.5.10.1 Rock Breaking

Weaker rock will be extracted using a hydraulic excavator and a ripper. Where stronger rock is encountered and cannot be extracted using an excavator, then rock breaking equipment will be employed. This will typically involve the use of a 40-60 tonne 360-degree hydraulic excavator with a rock breaker. The rock breaker is supported by a smaller 30-40 tonne rock breaker which breaks the rock down further for feeding into the rock crusher machine. The larger rock breaker breaks out the rock in a progressive manner from the Borrow Pit and the smaller rock breaker breaks it down further.

The broken-down rock is loaded into mobile crusher using a wheeled loading shovel machine and crushed down into the correct grade for use in the construction of Site Access Roads, Turbine Hardstands, and Temporary Construction Compounds.

2.5.11 Onsite Drainage

The existing surface water runoff is contained within natural and artificial drainage channels that include stream and river waterbodies, drainage ditches, and other minor natural and artificial manmade drainage features.

Drainage measures will be provided to attenuate runoff, guard against soil erosion, soil compaction, and safeguard local water quality. A standard stilling pond can be seen on **Drawing No. 6575-JOD-CGWF-XX-DR-C-0303**. Details of the drainage system are shown on **Drawing No. 6575-JOD-CGWF-XX-DR-C-0301** and **Drawing No. 6575-JOD-CGWF-XX-DR-C-0302** and are outlined in detail in the **Surface Water Management Plan (Appendix 2.1- Management Plan 3)**. Full details of the proposed drainage are provided in **Chapter 11: Hydrology and Hydrogeology**.

A buffer zone of at least 50m will be in place for major watercourses. Where this is not possible for example, at the 5 major watercourse crossings where Site Access Roads will be constructed or at the 3 HDD sites along the Grid Connection route; construction methods incorporating mitigation measures from this EIAR are set out in **Appendix 2.1**.

Sustainable Drainage System (SuDS) principles namely separation of overland flow from construction areas, the mimicking of diverted overland flow around construction areas and treatment trains to treat water from construction areas, will all be employed as explained in **Chapter 11: Hydrology and Hydrogeology**. Associated controls are listed below:

Source controls for surface water:

- Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sandbags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems. Detailed plates and figures of these can be found in **Appendix 2.1**.
- Maintaining small working areas; covering stockpiles with geotextiles to protect against water erosion and runoff in rainy weather, and/or cessation of works in certain areas during wet and windy weather.

In-line controls for surface water:

- In line controls are controls which are directly applied to the surface water body including interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sandbags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps/attenuation lagoons, sediment traps, pumping systems, settlement ponds and/or temporary pumping chambers.

Treatment systems for surface water:

- Temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbusters.

When heavy rainfall is predicted works will be suspended or scaled back.

It is proposed that all drainage will be left in place upon completion of the construction phase. Full details on drainage management and mitigation can be found in **Chapter 11: Hydrology and Hydrogeology** and the **Surface Water Management Plan** attached as part of the CEMP in **Appendix 2.1**.

2.5.12 Temporary Construction Compounds and Temporary Works Area

Up to six Temporary Construction Compounds are proposed. These will be constructed and established upon commencement of the construction phase. The proposed location for the individual Temporary Construction Compounds are shown in **Figure 1.2** and the layout is shown on **Drawing No. 6575-JOD-CGWF-XX-DR-C-0801** to **Drawing No. 6575-JOD-CGWF-XX-DR-C-0806**. The compounds will be used as a secure storage area for construction materials and to contain temporary site accommodation units for staff welfare facilities. The compounds will contain cabins for offices space, meeting rooms, canteen area, a drying room, parking facilities, and similar personnel facilities.

An area within the compound will be used for the storage of fuel and oils and this will be suitably bunded and the bund will be lined with an impermeable membrane in order to prevent any contamination of the surrounding soils, vegetation and water table. Double protection containers / equipment will be used along with drip trays and details are included in the CEMP, included as **Appendix 2.1**.

During the construction phase, water will be supplied by water bowser. The maximum wastewater production is estimated to be the same as the maximum water consumption (2,000 litres per day)⁴. The Project will include an enclosed wastewater management system at the temporary compounds capable of handling the demand during the construction phase with 80-100 construction workers on site at peak. A holding tank is proposed for wastewater management. Wastewater will be removed off-site weekly, by a licensed wastewater disposal company and disposed at an appropriate licenced facility.

2.5.13 Spoil Management

Excavated material can be used onsite in several ways. Suitable excavation material can be used onsite for reprofiling and landscaping or it can be permanently repositied onsite.

Excavated material for reuse and for permanent repository onsite will be managed in accordance with the Spoil Management Plan contained as part of the CEMP in **Appendix 2.1**.

2.5.13.1 Spoil Quantities

The quantities of spoil likely to be generated at the Wind Farm Site have been calculated by Whiteford Geoservices Ltd. and checked by JOD. It is estimated that based on onsite surveys, the amount of spoil predicted to be generated during construction of the Project is approximately 352,314 m³. **Management Plan No. 4: Spoil Management Plan**, to the **CEMP Appendix 2.1**, contains the calculation of spoil volumes and how spoil will be managed onsite. Volumes are based on the site investigations undertaken to date, i.e. peat probing and trial pit excavations.

2.5.13.2 Landscape & Reinstatement

Topsoil and surface vegetation excavated during the construction works will be used to reinstate exposed areas around site infrastructure such as slopes or graded ground.

⁴ Table 3 of the EPA WW treatment Manual (Treatment systems for Small Communities, Business, Leisure Centres and Hotels), Environmental Protection Agency, 1999. Quarry (excluding canteen) best reflects a construction site. Available online: https://www.epa.ie/publications/compliance--enforcement/waste-water/EPA_water_treatment_manual_small-comm_business.pdf

Reinstatement and reprofiling of, and around, infrastructure will be carried out during the construction phase as outlined in the **Management Plan 4: Spoil Management Plan**, to the **CEMP, Appendix 2.1**. All areas subjected to Reinstatement will be fenced with stock-proof fencing to prevent livestock disturbance until vegetation has become established. A requirement as a minimum that any fencing posts are set in concrete and that the fencing is of a large animal stock proof material.

Approximately 352,314m³ of excavated material will be permanently repositied onsite. Excavated material for reuse onsite and for permanent repository onsite will be managed in accordance with **Management Plan 4: Spoil Management Plan**, to the **CEMP, Appendix 2.1**. Permanent Spoil Storage areas are shown in **Figure 1.2**.

Berms will generally consist of side cast topsoil, covered with peat, maintaining a distance of c. 5m from the Site Access Roads and site infrastructure. These berms will be 5m wide at base; 2m at top; 2m high. Berm storage and permanent spoil repository areas shall have side slopes battered back to a safe angle of repose not exceeding 60degrees to the horizontal. These areas will be compacted, further helping to reduce any potential for slippage. Spoil repository areas will be tapered to the existing ground level.

2.5.14 Table of Key Development Infrastructure Metrics

The Key Development Infrastructure Metrics are contained in **Table 2.5**. This table is provided for ease of access to these metrics for reference by the personnel writing the other EIAR Chapters.

Table 2.5: Key Development Infrastructure Metrics

Description	Length [m]	Width [m]	Depth (m)	No.	Area [m ²]	Volume of Excavation [m ³]
Upgraded Site Access Road (3.0m to 5m) Upgraded by 2m	6,382	5	0.65	-	12,764	8,295
New Site Access Road	5,030	5	0.50	-	25,150	12,575
Junction's	-	-	0.50	10	3,940	1,970
Turning Heads	-	-	0.50	4	1,675	838
Turbine Hardstands – Hardstand Areas	-	-	0.85	11	20,100	17,085
Turbine Hardstands – Aux Cranes	-	-	0.85	44	10,965	9,320
Turbine Hardstands – Main Cranes	-	-	0.85	11	2,950	2,510
Turbine Hardstands – Blade Fingers	-	-	1.00	22	2,970	2,970
Turbine Hardstands – Access Road in Hardstand	1,690	5	0.5	-	8,450	4,225
Turbine Foundations Gravity Based (27.2m diameter)	-	-	3.50	09	5,240	18,333
Turbine Foundations Gravity Based (21m diameter)	-	-	3.5	02	693	1,390
Met Mast foundation	4.5	4.5	2.25	1	21	46
Onsite Substation	166	63	0.85	1	10,458	8,890
Site Compound 02,03,04,05	55	35	0.5	1	1,925	963
Site Compound, 01	45	25	0.5	1	1,125	563

Description	Length [m]	Width [m]	Depth (m)	No.	Area [m ²]	Volume of Excavation [m ³]
Grid Connection cable length from Onsite Substation to out	17,470m	0.6	1	1	10,480	10,480
Tree Felling Areas	-	-	-		437,900	
Total					118,906	

2.6 CONSTRUCTION

The construction phase will begin with site preparation works and will be complete when the Wind Turbines are built and ready for commissioning, and when all wastes have been removed from the Wind Farm Site. For this Project, it is envisaged that the construction phase will last approximately 18-24 months.

It is envisaged that the following will be the sequence of construction for the Project:

1. Site Preparation including felling and drainage
2. Site Access Roads
3. Temporary Construction Compounds and welfare facilities
4. Turbine Hardstands
5. Turbine Foundations
6. Internal Cabling
7. Installation of the Grid Connection
8. Erection of Wind Turbines
9. Commissioning and Energisation

The Onsite Substation will be constructed in parallel with Turbine Hardstands, Turbine Foundations and Internal Cabling works.

The first step will be to prepare the Wind Farm Site for construction. This will include key-hole felling of some commercial forestry and implementing the designed drainage measures. The Site Access Roads will then be constructed and/or upgraded. The next step will be to construct the Temporary Construction Compounds and welfare facilities. The next step will be to prepare the areas of the Site where site infrastructure is to be located by marking out the construction works corridor, the relevant environmental buffer zones.

Following the site preparation, construction of the Turbine Hardstand areas for the 11 No. Wind Turbines will occur. The 11 No. Turbine Foundations will then be excavated and foundations constructed using reinforcing bar (rebar) and imported concrete. No concrete batching will take place on site.

Following the construction of the Turbine Foundations, internal cable ducting from the turbine locations to the Onsite Substation will be laid in trenches along the constructed Site Access Roads.

The Grid Connection will then be constructed. There will be c.17.5km of trenches for underground cabling (UGC) to Flagford 220kV substation. The ducts will be installed in an excavated trench which will be 650mm wide and 1.3m deep.

The last step will be to erect the 11 No. Wind Turbines on the foundations using two cranes. Commissioning and testing of the turbines can then proceed.

An indicative construction programme is set out at **Table 2.6**.

Table 2.6: Indicative Construction Programme

Activity	Month																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Site Establishment/Felling and Fencing	X	X	X																		
Site Access Roads Upgrade & Construction		X	X	X	X	X	X														
Onsite Substation & Temporary Compound Construction		X	X	X	X	X	X	X													
Onsite Substation Electrical Works									X	X	X	X	X	X	X	X	X				
Onsite Substation Commissioning																X	X				
Excavation &		X	X	X	X	X	X	X	X	X	X										

Activity	Month																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Construction of Turbine Foundations & Hardstands																					
Internal Cabling Installation										X	X	X	X	X	X	X					
Turbine Delivery and Erection												X	X	X	X	X					
Grid Connection						X	X	X	X	X	X	X	X	X	X	X	X				
Energisation																		X			
Turbine Commissioning																			X	X	X
Site Restoration																		X	X	X	X

2.6.1 Construction and Environmental Management Plan (CEMP)

A CEMP is appended to the EIAR in **Appendix 2.1**. The CEMP includes an Emergency Response Plan, Spoil Management Plan, Surface Water Management Plan, Water Quality Management Plan, Waste Management Plan, Decommissioning Plan and Traffic Management Plan. The CEMP includes all the mitigation measures proposed within the EIAR and the NIS related to the Construction Phase. A summary of all the mitigation measures of the EIAR is included in **Chapter 22: Schedule of Mitigation**.

The CEMP provides a commitment to mitigation and monitoring, and reduces the risk of pollution whilst improving the sustainable management of resources. The environmental commitments of the Project will be managed through the CEMP and will be secured in contract documentation and arrangements for construction and later phases, such that there will be a robust mechanism in place for their implementation. The CEMP addresses the construction phase, and will be continued through to the commissioning, operation and final decommissioning phases. An Environmental Manager / Ecological Clerk of Works (ECoW) with appropriate experience having completed a similar role will be appointed for the duration of the construction phase so that the CEMP is effectively implemented.

The following sections describe key activities which, if unmitigated against, may cause harm or nuisance to the public.

2.6.2 Refuelling

Vehicles will be refuelled off-site where possible. For vehicles that require refuelling on-site, refuelling will be carried out at designated refuelling areas at various locations throughout the Wind Farm Site. Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Wind Farm Site as required on a scheduled and organised basis. Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area on-site when not in use. All refuelling will be carried out outside designated watercourse buffer zones. Only designated trained and competent operatives will be authorised to refuel plant on-site. Mobile measures such as drip trays and fuel absorbent mats will be used during refuelling operations as required. All plant and machinery will be equipped with fuel absorbent material and pads to deal with any event of accidental spillage.

2.6.3 Concrete

There will be no concrete batching on the Wind Farm Site. Rather, it will be transported to the Wind Farm Site as it is required. Dedicated bunded areas will be created to cater for concrete wash-out and will be within the Temporary Construction Compounds. This will be for the wash-out of the chutes only after the pour. Concrete trucks will then exit the Wind Farm Site and return to the supply plant to wash out the mixer itself.

The main concrete pours at the Wind Turbine locations will be planned in advance and proposed mitigation measures are detailed in **Chapter 11: Hydrology and Hydrogeology** and are summarised as follows:

- Avoiding large concrete pours, for Turbine Foundations for example, on days when heavy or prolonged rainfall is forecast i.e., 25mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or rainfall depth greater than monthly average in seven days (prolonged heavy rainfall over a week).
- Ensuring that all concrete pour areas are dewatered prior to pouring concrete and while the concrete is curing.
- Making covers available so that areas can be covered if heavy rain arrives during the curing process which will prevent runoff of concrete.

2.6.4 Dust Suppression

During periods of dry and windy weather there is potential for dust to become friable and cause nuisance to nearby residences and users of the local road network. Damping down will be required in this instance to see that dust does not become friable. This is most likely to occur during periods of dry and/or windy weather. This requires wetting the material and ensuring water is supplied at the correct levels for the duration of the work activity.

To reduce mud and debris from getting onto the local road network, a wheel wash facility will be employed at exiting points on-site which will wash mud and debris from vehicles egressing the Site.

Where rock is sourced from off-site HGVs entering the Wind Farm Site carrying rock will be covered to prevent dust generation. A road sweeper will be available for use in case of any mud or debris making it onto the public road network.

2.6.5 Construction Hours

The Project will have approximately 80-100 construction workers during the peak of the construction phase. Working hours for construction will be from 07:00 to 19:00 Monday-Saturday. It should be noted that during the Wind Turbines erection phase, operations will need to take place outside those hours with concrete pours commencing at c.05:00hrs, to facilitate Turbine Foundation. Hours of working for Turbine Foundation construction will be agreed with the Council prior to the commencement of Turbine Foundation construction. **Chapter 16: Traffic and Transportation** refers to this in further detail. A detailed TMP (**Appendix 16.2**) will be implemented during the construction phase. This shall be agreed during the planning compliance stage with the Planning Authority so that strict controls described therein are in place with all suppliers coming to the Wind Farm Site.

2.6.6 Construction Turbine Assembly

Once on the Wind Farm Site, the Wind Turbine components will follow a detailed route and plan to minimise manoeuvring. Components will be placed on Turbine Hardstands prior to assembly, additional minor hardstand fingers will be provided to lay the turbine blades across once delivered. One large crane will be required for erecting the Wind Turbines, assisted by a smaller crane. The same number of cranes will also be required for maintenance during the operational phase.

The towers will be delivered in sections, and work on assembly will not start until a suitable weather window is available, e.g., wind gust speed threshold of less than 6ms^{-1} . The bottom

tower section will be bolted onto the concrete foundations. The lower-mid tower section will then be lifted into position and bolted to the bottom tower section. The upper-mid tower section is then bolted to the lower-mid section. Finally, the top tower section will be lifted into position and bolted to the upper-mid tower section. Three methods can be used to attach the blades:

1. The blades can be attached to the nacelle and hub on the ground. The hub and blades are then lifted as one. The nacelle of a wind turbine houses the drive train and other tower-top components. The hub of the Wind Turbine connects the blades to the main shaft and ultimately to the rest of the drive train.
2. The hub can be attached to the nacelle and the two blades attached to the hub while the nacelle is on the ground – the "bunny lift". The nacelle is then lifted into position and the third blade lifted into place separately. This requires manoeuvring of several components on the ground and usually the repositioning of cranes.
3. Lifting the nacelle and hub as one unit, as described above and then attaching the blades one at a time, rotating the hub between lifts. The blade lifting operations do not require repositioning of the crane.

The most appropriate method will be decided by the lifting contractor and the Wind Turbine manufacturer, prior to Wind Turbine erection.

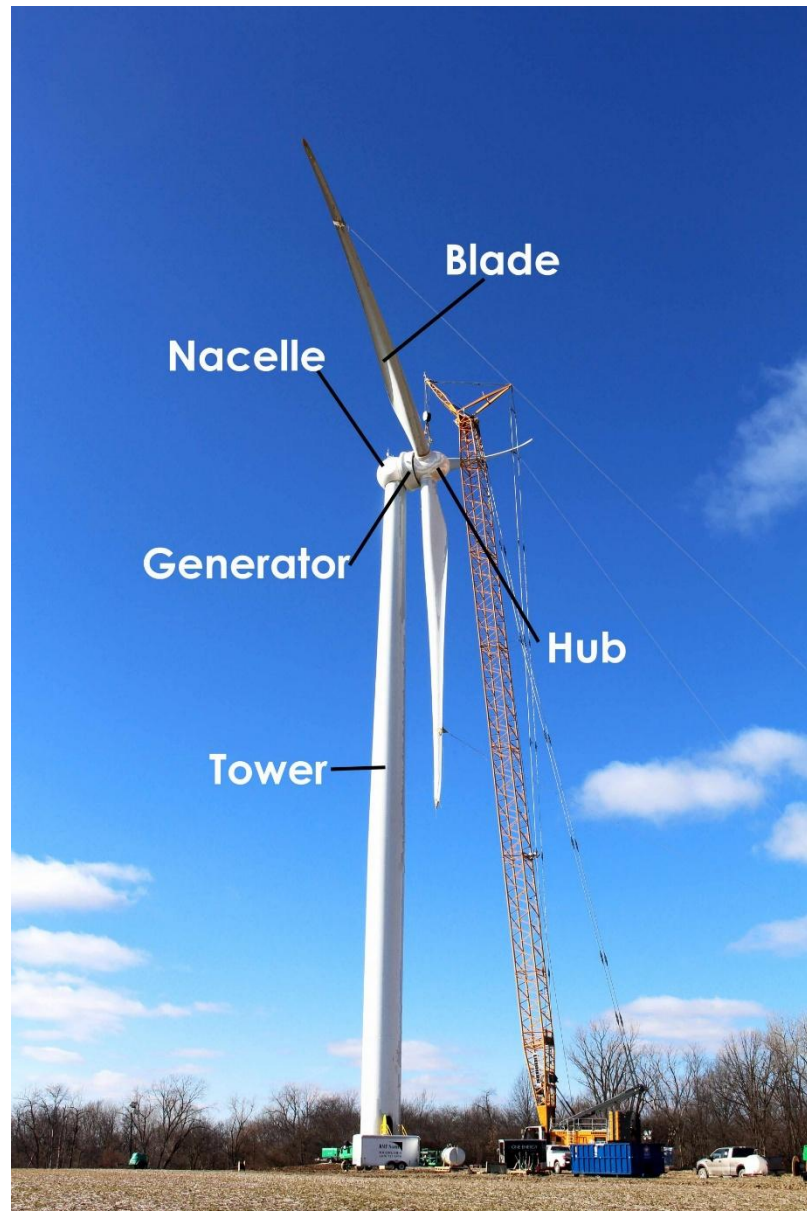


Plate 2.1: Turbine components

2.6.7 Construction Traffic

It is estimated in **Chapter 16: Traffic and Transport**, that during civil construction 8,983 fully loaded Heavy Goods Vehicle trips will be required for the Project. This breaks down to 499 loads per month or an average of 16 loads per day.

The first month of the Wind Farm Site construction period will involve deliveries of materials for site access works, Temporary Construction Compound, site offices and site security. This period will include deliveries of fencing materials for site boundaries and compounds, temporary fencing to protect trees, hedges and ecological buffer zones, road construction materials for Temporary Construction Compound and site entrance, and delivery of temporary site office units. It is anticipated that a maximum of 30 HGV vehicles (60 HGV

movements) will visit the Wind Farm Site on a daily basis during the first month of the contract.

Months 2 to 10 will involve deliveries of materials for Turbine Hardstands, Turbine Foundations, Site Access Roads, Onsite Substation and Control Building and Wind Farm Internal Cabling, this period will include deliveries of road construction materials for access tracks and Turbine Hardstands, ready mix concrete and steel reinforcement for Turbine Foundations. It is anticipated that a maximum of 164 HGV vehicles (328 HGV movements) will visit the Wind Farm Site on a daily basis during the period. The peak traffic will occur on 11 days during the 9 month period between months 2 to 10 when Turbine Foundations are poured. Concrete pours for individual Turbine Foundations will generate 120 HGV arrivals (240 HGV movements).

Months 10 to 18 will involve HGV movements for works associated with turbine delivery, turbine erection, turbine commissioning, electrical works, Grid Connection works, road reinstatement, road surfacing, site landscaping and the removal of temporary works materials such as offices and fencing from site. It is anticipated that a maximum of 42 HGV vehicles (82 HGV movements) will visit the Wind Farm Site on a daily basis during this period.

Based on the indicative timetable outlined above the peak times for HGV deliveries to the Wind Farm Site will be during months 2 to 10 (44 daily HGV deliveries + 120 additional deliveries during concrete pours which will take place on nine separate days during this period). Project traffic will be distributed throughout the day with morning, afternoon and evening peaks.

2.6.8 Reinstatement and Monitoring

Following completion of construction, all plant and machinery will be removed from the Wind Farm Site. The temporary works/assembly areas needed for the construction period will be reinstated using the original spoil material removed and stockpiled close to the location from where it was excavated as explained in **Chapter 10: Soils and Geology**. Stockpiles will be restricted to less than 2m in height and located outside of the surface water buffer zones. All stockpiling locations will be subject to approval by the Site Manager and ECoW.

The on-site installed drainage network will be left in place. This will be monitored on a quarterly basis to see that it is operating to its stated design purpose. Water monitoring on nearby natural watercourses will be undertaken during and post construction to determine

if any pollution has migrated off-site, and if so, implement measures to rectify the impact. Details of this can be found in **Chapter 11: Hydrology and Hydrogeology**.

2.6.9 Construction Supervision and Monitoring

The construction activities will be monitored by a Geotechnical Engineer, a qualified archaeologist and an ECoW. The Geotechnical Engineer will be contracted for the detailed design phase and their services retained throughout the construction and reinstatement phases. The Geotechnical Engineer will oversee all earthworks and excavation activities and monitor for issues such as ground stability, water ingress into excavations etc. Roles and responsibilities are further detailed in **Appendix 2.1**.

Daily monitoring of excavations by the Geotechnical Engineer will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken. Further details of what this will involve are detailed in **Chapter 10: Soils and Geology** and **Chapter 11: Hydrology and Hydrogeology**.

The ECoW will be employed prior to the commencement of the construction phase to monitor and review the pollution control measures and working practices during construction and have input into site remediation. The ECoW will have stop work authority if, for example, a sensitive habitat feature is encroached upon or there is the possibility of silt/pollution runoff to natural watercourses. Further details are detailed in **Chapter 6: Biodiversity**.

The archaeologist will have responsibility for ensuring that potential archaeological features are protected and will also have stop work authority should any be discovered during excavations. If any potential archaeological features are discovered, the archaeologist will inform the National Monuments Service (NMS). Further details are detailed in **Chapter 15: Cultural Heritage**.

A Water Quality Management Plan has been prepared as part of **Appendix 2.1** and will be implemented prior to commencement of construction. Regular inspections of the installed drainage system will be undertaken, especially after heavy rainfall events, to check blockages and see that there is no build-up of standing water in any part of the system where it is not designed to be.

Excess build-up of silt will be removed at check dams, attenuation/settlement ponds or any other drainage feature by scraper or excavator and under the supervision of the ECoW.

During the construction phase, field testing and laboratory analysis of a range of parameters with relevant regulatory limits and Environmental Quality Standards will be undertaken for each watercourse close to the site, and specifically following heavy rainfall events (i.e., weekly, monthly and event based). The locations and further detailed in **Chapter 11: Hydrology and Hydrogeology**.

The CEMP for the Project sets out the proposed site organisation, sequencing of works, methodologies, mitigation measures and monitoring measures.

The local road network near the Wind Farm Site, used to transport construction materials, will be monitored during construction, so that any damage caused by construction traffic associated with the Project can be identified and repaired. Any required monitoring programme will be agreed with the local authority, prior to the commencement of any construction works. Ready mix concrete and rock will be sourced from local quarries and monitoring may also be undertaken on the route as required. Further details are detailed in **Chapter 14: Material Assets**.

2.6.10 Construction Employment

It is estimated that up to 80-100 direct and indirect jobs could be created during the construction phase of the Project. It is not expected that all of these jobs will be based at the Wind Farm Site.

2.7 COMMISSIONING

Wind farm commissioning can take in the region of three months to complete from the erection of the final Wind Turbine to the commercial exportation of power to the National grid. It involves electrical and mechanical testing and control measures to check that the wind farm will perform and export power to the national grid, as designed and commissioning engineers working through an entire schedule of SCADA (Supervisory Control and Data Acquisition).

2.8 OPERATION AND MAINTENANCE

During the operation of the wind farm, the turbine manufacturer, the wind farm operator, or a service company will carry out regular maintenance of the Wind Turbines, Onsite Substation and all other site infrastructure. Monthly routine inspection and preventative maintenance visits will be necessary to provide for the smooth and efficient running of the

wind farm. This will occur over one day with one vehicle attending the Wind Farm Site. In addition, operation and monitoring activities will be carried out remotely with the aid of computers connected via a telephone broadband link.

2.9 DECOMMISSIONING

The Applicant is applying for a consent for a period of up to 35 years for the operation of the wind farm. The full description of the decommissioning is as follows:

- Removal of 11 No. Wind Turbines and above ground concrete plinths.
- Removal of all associated underground electrical and communications cabling connecting the Wind Turbines to the Onsite Substation (ducting is to remain *in-situ*).

All other elements of the Project will remain in-situ. The Site Access Roads and associated drainage systems will serve ongoing commercial forestry and agriculture activity in the area. All other hard surfaced areas will be allowed to revegetate naturally. Based on the experience of the project team monitoring operational wind farm sites throughout the country, the approach of allowing these areas to revegetate naturally has proven to be very successful.

Cranes of similar size to those used for construction will disassemble each turbine using the same Turbine Hardstands. The towers, blades and all above ground components will be removed from site and reused, recycled, or disposed of in a suitably licenced facility.

Wind Turbines will be cut on site so as to fit on articulated trucks, therefore allowing the use of the civil construction delivery routes for removal.

Potential impacts will be similar to that of the construction phase, albeit to a lesser extent and are described in each chapter of this EIAR.

A Decommissioning plan is included as part of the CEMP in **Appendix 2.1**. Prior to the Decommissioning works, a plan will be submitted to the planning authority for written agreement. The plan will take account of contemporary best practice.

2.10 COMMUNITY BENEFIT

In addition to helping Ireland reduce environmentally damaging fossil fuel emissions and helping avoid significant fines from the EU, the Project will also contribute positively to the national and regional economy.

A SEAI report indicated that in 2023 wind energy generated 33.7 % of all electricity, avoided 4.55 million tonnes of CO₂ emissions⁵. Additionally, a report published by Baringa in January 2025, analysing both wind and solar energy found that their cumulative deployment from 2000 to 2023 resulted in a net financial saving for Irish consumers of €840 million. This equates to an approximate per capita saving of €165 over that period⁶.

The Baringa report also highlighted significant environmental benefits from renewable (wind and solar) energy generation in Ireland between 2000 and 2023, including:

- Avoiding emissions of over 47 million tonnes of CO₂ from the power sector more than six times the sectors total 2023 emissions.
- Avoided consumption of fossil fuels valued at €7.4 billion displacing approximately 190 TWh of gas and TWh of coal

2.11 COMMUNITY BENEFIT FUND

The Renewable Electricity Support Scheme (RESS) is a Government of Ireland initiative that provides support to renewable electricity projects in Ireland. RESS is a pivotal component of the Programme for Government and the Climate Action Plan 2021 and 2023 and is a major step in achieving Ireland's target of at least 80% renewable electricity by 2030. One of the key objectives of RESS is to provide an Enabling Framework for Community Participation through the provision of pathways and supports for communities to participate in renewable energy projects.

The RESS Terms and Conditions, published by the Department of Communications, Climate Action and Environment make some high-level provisions for how this type of benefit fund will work. Any project which wants to export electricity to the national grid must abide by these broad principles.

Based on the current RESS guidelines it is expected that for each megawatt hour (MWh) of electricity produced by the wind farm, the Project will contribute €2 into a community fund for the first 15 years of operation. If this commitment is changed in upcoming Government Policy, the fund would be adjusted accordingly.

The Community Benefit Fund belongs to the local community. The premise of the fund is that it should be used to bring about significant, positive change in the local area. To make

⁵ SEAI (2024), Energy in Ireland 2024 Report, Available at: <https://www.seai.ie/sites/default/files/publications/energy-in-ireland-2024.pdf> [Accessed: 17th September 2025]

⁶ Baringa (2025), Good for your Pocket, Available at: <https://windenergyireland.com/images/files/20250114-finalbaringaweigoodforyourpocket-.pdf> [Accessed: 17th September 2025]

this happen, the first task will be to form a benefit fund development working group that clearly represents both the close neighbours to the Project as well as nearby communities. This group will then work on designing the governance and structure of a community entity that would administer the Community Benefit Fund.

The types of projects and initiatives that could be supported by such a Community Benefit Fund could include youth, sport and community facilities, schools, educational and training initiatives, and wider amenity, heritage, and environmental projects.

Should the Project be developed under the current RESS T&C's, it would attract a community contribution in the region of €406,000/year for the local community (estimated based on an average energy yield) over the first 15 years of operation of the Project. The value of this fund would be directly proportional to the electricity generated by the wind farm.

Should the Project be developed under RESS, the Applicant is committing that for each megawatt hour (MWh) of electricity produced by the wind farm, the Project will contribute €1 into a community fund for the entire operational life of the Proposed Project. This would equate to an estimated annual fund of €200,000 (using the same formula as above), which across the 35-year operational lifespan would result in funding in the order of €7 million to the local community which is a substantial contribution. The number and size of grant allocations will be decided by a Community Fund liaison committee with various groups and projects benefiting to varying degrees depending on their funding requirement. Please see **Appendix 1.2: Community Engagement Report** for details.