2. DESCRIPTION OF THE PROPOSED PROJECT

2.1 INTRODUCTION

This section of the EIAR describes the works and the main components of the proposed project and provides details on the construction, operation and decommissioning of the wind farm and associated infrastructure.

The proposed project includes the construction of 13 no. wind turbines and ancillary works, installation of an on-site control building and a 33 kV private grid connection cable (circa 8.7 km in length) from the on-site control building to the proposed 110 kV substation. The proposed 110 kV substation (with associated works) in the townland of Killamanagh Co. Galway will connect to the adjacent overhead line (OHL) via underground cables and two steel lattice end masts in the townlands of Killamanagh and Bunnasillagh.

There will be minor temporary accommodation works on the Turbine Delivery Route (TDR) with strengthening of hard surfacing required at one location and temporary demounting of signage and vegetation trimming at various locations.

A summary of the proposed project which this EIAR assesses is as follows:

- 13 no. wind turbines with a blade tip height of 150 m, a rotor diameter of 136 m, a hub height of 82 m, and all associated foundations and hard-standing areas in respect of each turbine;
- Creation of two new permanent site entrances onto the R334 Regional Road;
- Two temporary construction compounds with associated temporary site offices, parking areas and security fencing;
- One borrow pit. All works associated with the opening, aggregate and spoil extraction, and decommissioning of the borrow pit;
- New internal site access tracks, to include passing bays and all associated drainage;
- A temporary new access track to connect to the boundary of an adjacent operating quarry;
- Construction of drainage and sediment control systems;
- New on-site control building
- Construction of one permanent loop-in 110 kV electrical substation compound including
    - Two control buildings containing worker welfare facilities;
    - Electrical infrastructure and grid ancillary services equipment
    - Parking
    - Lighting
    - Fencing
    - Wastewater holding tank
    - Rainwater harvesting equipment
    - Communications equipment and storage
    - Associated electrical plant

    - All associated infrastructure, services, and site works including landscaping
- All works associated with the connection of the proposed wind farm to the proposed 110 kV loop-in substation, which will be via a 33 kV underground cable connection (circa 8.7 km in length), including 4 no. watercourse crossings, and the onward connection from the substation to the existing overhead line via 110 kV cables and steel lattice interface masts;
- All associated infrastructure and services including site works, signage and permanent underground electrical and communications cabling connecting the wind turbines to the proposed wind farm control building;
- A lidar unit, and associated foundation and hard-standing area;
- All related site works and ancillary development including site drainage, security gates, fencing, permanent and temporary signage, berms, landscaping, soil excavation and biodiversity mitigation and enhancements, including habitat, hedgerow and treeline removal, creation and management.
- Temporary additional works required within the public road corridor to accommodate delivery of oversize turbine components.

A 10-year planning permission and 35-year operational life from the date of commissioning of the entire wind farm and 33 kV grid connection infrastructure is being sought. The proposed 110 kV substation and grid infrastructure will be permanent. The entire proposed project has been considered and assessed as part of this EIAR however consent is not being sought as part of the current planning application for any temporary TDR accommodation works,. The elements of the proposed project for which planning permission is being sought (i.e. all items listed above with the exception of the TDR temporary works) is referred to as the proposed development.

The proposed wind farm site is located within the townlands of Cloghmoyne, Carrowoughteragh, Toorard, Rooaunalaghta, Brodullagh South and Kinlough, County Mayo. The proposed underground 33 kV GCR associated with the grid connection traverses the townlands of Brodullagh South, Kinlough, Cloonbanaun, County Mayo, and the townlands of Largan, Joyce's Park, Shrulegrove, Carrowmore, Tonacooleen, Ralusk, Abbeytown, Ballinvoher, Killamanagh and Bunnasillagh, County Galway.

The proposed 110 kV substation and associated 110 kV cables and end masts to connect to the existing overhead line are located in the townlands of Killamanagh and Bunnasillagh, County Galway (the proposed 110 kV substation itself is within the former townland).

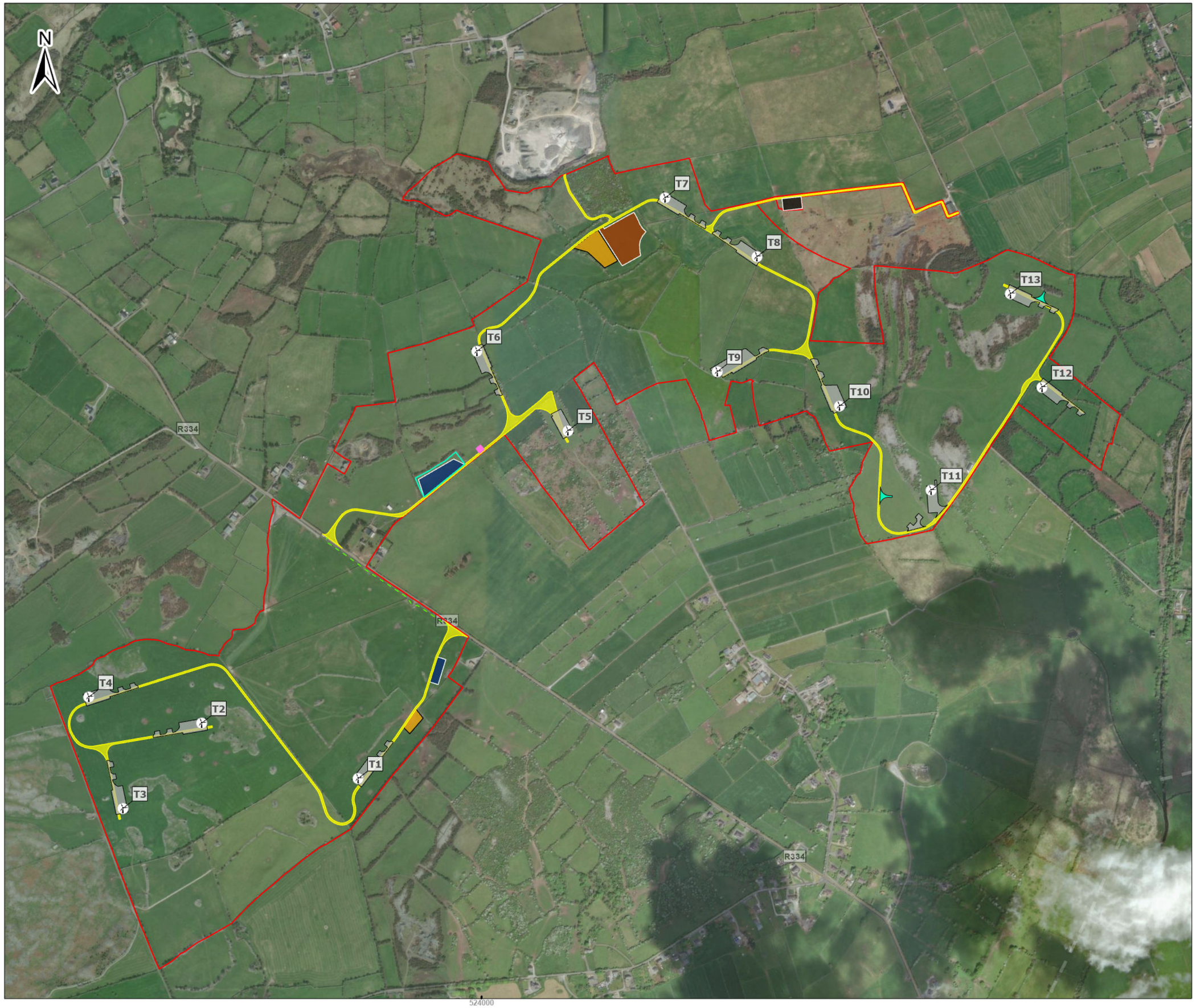
There is one location which requires small scale temporary additional works to accommodate oversize/abnormal load delivery to site (for turbine components) from Galway Harbour. This involves modifying a small area of footpath to support the turbine delivery vehicle in the townlands of Ballybaan Beg, within Galway City. Hedgerow/vegetation trimming and temporary demounting of signage will also be required at various locations along the route prior to delivery. All temporary works associated with road infrastructure have been identified and assessed in the EIAR. All of the temporary accommodation works required are contained within the extents of the road infrastructure and verge.

2.1.1 Landownership

The proposed wind farm site is located on lands under the ownership and control of local landowners. The third-party private landowners have consented to the making of the current planning application.

The GCR predominantly follows the public road network, however, it does cross private third-party lands in places, with the 110 kV grid elements (proposed 110 kV substation and grid connection) all being on private lands. All landowners involved have consented to the planning application.

A copy of all consent letters can be found in Appendix 2-1.





Legend

- Proposed wind farm site boundary
- Turbine Locations

Site Layout

- Borrow Pit
- Temporary Construction Compounds
- Temporary Spoil Deposition Area
- Site Access Track
- Turbine Hardstands
- Proposed Lidar Unit
- Onsite Control Building
- Turning Head
- Alternative Constuction Compound
- Internal Underground Cabling

0 200 400
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

Copyrights:
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community.

Rev	Date	Description	By	Chkd.
A	27/10/2026	First issue	K.K	J.S

Client: ROOAUNALAGHTA Green Energy

Project:

Rooaunalaghta Green Energy Project

Title:

Figure 2-1:
Proposed Wind Farm Site Layout

Scale @ A3: 1:10,000

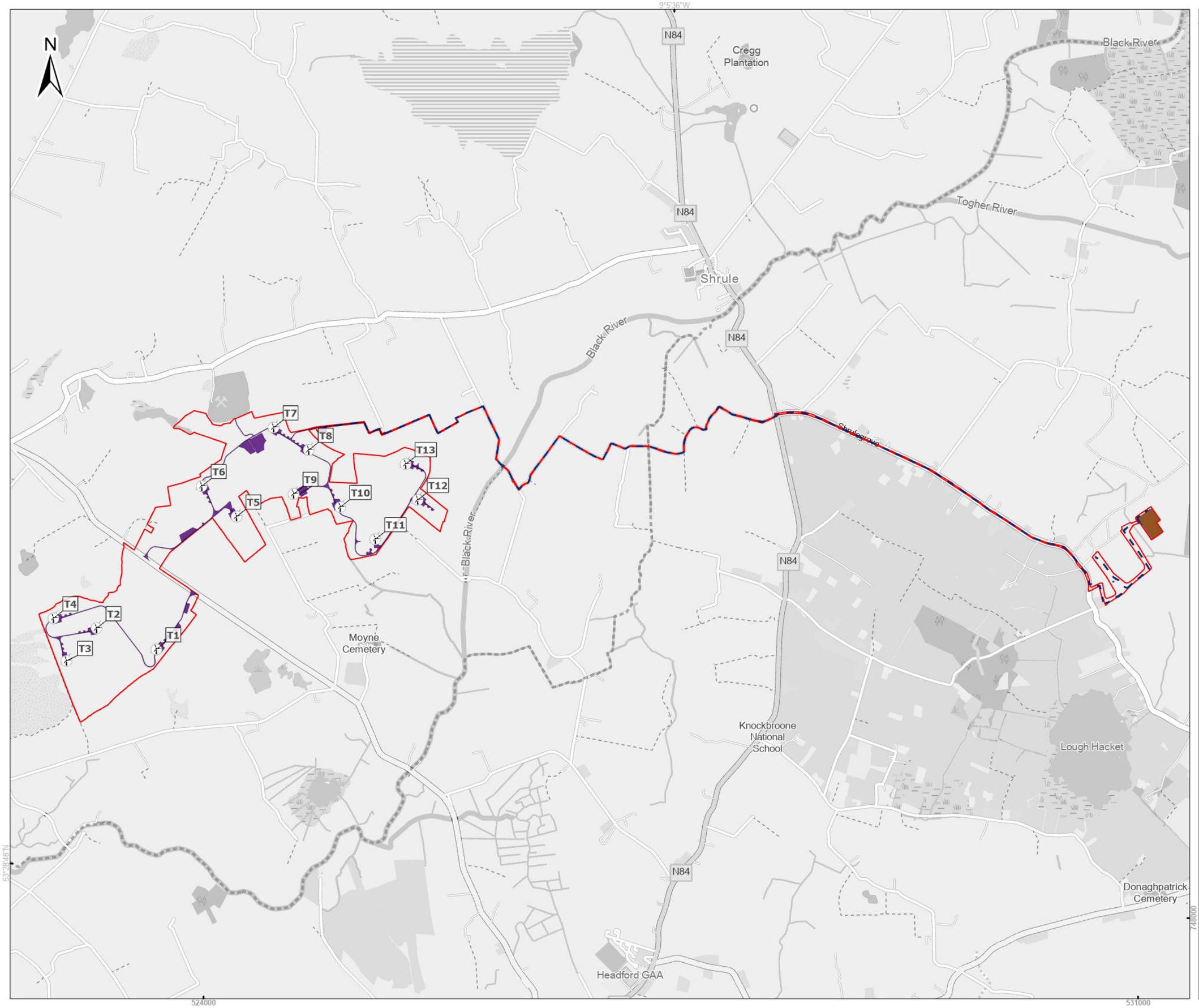
Prepared by:	Checked by:	Date:
K.Kale	J.Staunton	October 2026

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Map Ref: 11981-002-S.LAY-S.BO-TOB-A

Draft: A





Legend

- Proposed wind farm site
- Turbine Locations
- Site Layout
- Proposed Grid Connection Route

0 500 1,000
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

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A	27/10/2026	First issue	S.P	J.S

Client: ROOAUNALAGHTA Green Energy

Project:

Rooaunalaghta Green Energy Project

Title:

Figure 2-2:
Grid Connection Route

Scale @ A3:	1:26,000	
Prepared by:	Checked by:	Date:
S.Pezzetta	J.Staunton	October 2026

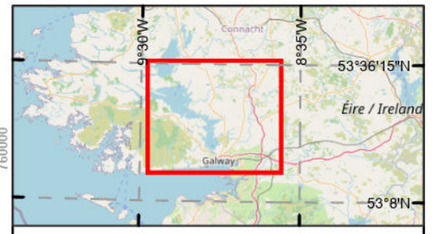
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Map Ref: 11981-003-GCR-S.BO-TOB-A

Draft: A





Legend

- Proposed wind farm site
- Proposed Turbine Delivery Route
- Proposed TDR Nodes

0 2 4
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Rev	Date	Description	By	Chkd.
A	27/10/2026	First issue	KK	JS

Client: ROOAUNALAGHTA Green Energy

Project:
Rooaunalaghta Green Energy Project

Title:
Figure 2-3:
Turbine Delivery Route

Scale @ A3: 1:150,000

Prepared by:	Checked by:	Date:
K.Kale	J.Staunton	October 2026

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Map Ref: 11981-004-TDR-S.BO-TOB-A

Draft: A

2.2 The Proposed Wind Farm Site

The proposed wind farm site is located approximately 2.5 km southwest of Shrule, Co. Mayo and approximately 3.5 km northwest of Headford, Co. Galway. The lands of the wind farm site are primarily comprised of agricultural fields bounded by stone walls, hedgerows and treelines with pockets of scrub and woodland in the eastern half of the site. The proposed wind farm site is located on either side of the R334 Regional Road, which runs in a northwest-southeast direction connecting Headford and Ballinrobe. The area surrounding the proposed wind farm site can be described as rural with a mostly dispersed settlement type (though some clustering at Moyne). The nearest settlements are Moyne village to the southeast of the proposed wind farm site and Glencorrib to the northwest, both along the R334.

The site of the proposed wind farm (Figure 1-2 of this EIAR) has an area of approximately 222 ha and comprises an irregularly shaped contiguous land parcel approximately 1.2 km wide in the northwest/southeast direction and is approximately 3.2 km in length in a northeast/southwest direction. The topography ranges in elevation from approximately 25 to 60 m AOD. Access to the proposed wind farm site is directly from two new entrances on the R334 Regional Road, which connects with the N84 National Secondary Road at Headford, Co. Galway. Photos of the proposed wind farm site are provided in Figures 2-4 and 2-5.

For the turbine delivery route, notable temporary accommodation works are only required at one location within Galway city in the townland of Ballybaan Beg. This involves modifying a small section of a footpath to allow it to accommodate the delivery vehicle. This is located within the city environs and as it is located on a footpath there will be no disturbance to 'new' ground. Minor works such as hedgerow/vegetation trimming and temporary demounting of signage will also be required along the route prior to delivery at various locations.



Figure 2-4 View across the northern part of the proposed wind farm site



Figure 2-5 View across the southern part of the proposed wind farm site

The proposed project will connect to the national grid via an electrical grid connection. There will be a proposed control building at the northeastern edge the proposed wind farm site (near T8) which gathers all the power from the individual turbines and feeds it into the proposed grid connection (See Section 2.1). This includes a triple circuit 33 kV GCR with a length of approximately 8.7 km which will connect to a proposed 110 kV substation in the townland of Killamanagh, County Galway.

2.3 PROPOSED PROJECT LAYOUT

The layout of the proposed wind farm provides for 13 no. wind turbines and has been designed to minimise the potential environmental effects of the wind farm, while at the same time maximising the energy yield of the wind resource. A comprehensive constraint identification exercise, as described in Chapter 3, has been carried out to ensure that turbines and ancillary infrastructure are sited in the most appropriate areas of the proposed wind farm site.

Available wind speed is a key factor in determining the economic viability of potential wind energy locations. In 2003, the Sustainable Energy Authority of Ireland (SEAI) produced a Wind Atlas with information on wind speed modelled at 50 m, 75 m and 100 m height above the ground. With turbine technology innovation, turbine models can now capture more of the wind current and have bigger rotors that radically change the economic viability of wind power. This has been reflected in the updated SEAI 2013 Wind Atlas which re-modelled wind speed data for a much wider range of 20-150 m height above ground level. The 2013 SEAI Wind Speed Atlas

identifies the site as having a wind speed of between approximately 7.5 m/s and 7.9 m/s at 100 m above ground level. This indicates that the proposed wind farm site has a suitable wind resource for a commercial wind energy development.

Each turbine will have a top of foundation to blade tip height of 150 m. The blade rotor diameter will be 136 m with a corresponding hub height of 82 m.

The overall layout of the proposed wind farm is shown in Figure 2-1. This figure shows the proposed locations of the wind turbines and associated hardstanding areas, passing bays, control building, borrow pit, temporary construction compounds, operational phase lidar, internal site access tracks layout and the main site entrances.

Detailed site layout drawings are included in Planning Drawings 11981-2012 – 11981-2017, as part of this application.

2.4 Power Output

The proposed wind turbines will have an assumed rated electrical power output of 4.5 MW. For the purposes of this EIAR, a 136 m rotor diameter turbine with a rated output of 4.5 MW has been used to calculate the power output of the proposed project, which will result in an estimated installed capacity of 58.5 MW.

Based on the above, the proposed wind farm has the potential to produce approximately 150,000 Megawatt (MWh) hours of electricity per year, based on the following calculation:

A x B x C = Megawatt Hours of electricity produced per year where:

- A is the number of hours in a year: 8,760 hours
- B is the capacity factor, which takes into account the intermittent nature of the wind, the availability of wind turbines and array losses etc: 29.2%[1]
- C is the rated output of the wind farm: 58.5 MW

The capacity factor of a wind farm takes into account the intermittency of the wind and is based on average wind speeds.

150,000 Megawatt (MWh) hours of electricity produced by the proposed wind farm would be sufficient to supply the equivalent of 34,125 Irish households with electricity per year. This is based on the Sustainable Energy Authority of Ireland "Energy in Ireland 2025 Report" from December 2025, which details domestic consumption values for electricity customers in 2024. This report details the average annual dwelling electricity consumption figure as 4,385 kWh per annum.

2.5 Community Benefit Fund

Community Benefit Proposal

The proposed project has the potential to bring significant positive benefit to the local community. The project will contribute annual rates to the local authority, and it will provide opportunity for local community investment in the project in line with the Renewable Energy Support Scheme (RESS) estimated at over €4 million over the first 15 years of the project.

[1] energy-in-ireland-2024.pdf (accessed 27/02/2026)

The RESS Terms and Conditions were published in February 2020 and provide details on the Government requirements for community benefit funds for renewable energy projects that participate in the scheme. A significant annual community benefit fund estimated at approximately €300,000 per year for the first 15 years of the project will be established in line with Government policy which will include funding for both wider community initiatives and a Near Neighbour scheme focused on houses in close proximity to the project.

Fund Usage and Administration

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 this happen, our first task will be to form a benefit fund development working group that clearly represents both the closest 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 will administer the Community Benefit Fund. The fund will be operated in accordance with the Government of Ireland's Good Practice Principles Handbook for Community Benefit Funds, which will mean that the Fund will deliver initiatives that are in alignment with the UN Sustainable Development Goals.

Community Investment

The proposed RESS sets out that future renewable energy project proposals enable the possibility for local communities to invest in projects in a meaningful way as a means to directly gain from the financial dividends that a project can provide should it be consented, built and operated. In response to this, the Applicant has been working hard with external agencies to develop workable models of Community Investment. This element was not included in the existing RESS scheme, but it is expected to form part of later RESS schemes which may apply to this proposed project.

2.6 PROPOSED PROJECT COMPONENTS

This section of the EIAR describes the components of the proposed project, while Section 2.7 describes the construction methods to be used for each component and Section 2.8 describes the construction management, including timing and sequencing.

2.6.1 Wind Turbines

2.6.1.1 Wind Turbine Locations

The location of individual turbines is influenced by a range of design constraints, which are established in advance of the modelling of the turbine layout. Refer to Chapter 3 which references how the iterative layout was developed.

The ITM Grid Reference co-ordinates of the proposed turbine locations are listed in Table 2.1.

Table 2-1 Proposed Wind Turbine Locations (ITM Co-ordinates)

Turbine ID	Easting's (ITM X)	Northing's (ITM Y)
T01	523647	750010
T02	523199	750168
T03	522973	749924
T04	522876	750243
T05	524247	751004
T06	523987	751232
T07	524525	751670
T08	524788	751502
T09	524675	751173
T10	525024	751075
T11	525287	750834
T12	525604	751129
T13	525514	751396

2.6.1.2 Wind Turbine Types

Design flexibility has not been sought after for the proposed project. The proposed turbines will have an overall blade tip height of 150 m, a rotor diameter of 136 m, a hub height of 82 m. Detailed drawings, which accompany the planning application, show the parameters of the turbine that will be used for the proposed project.

A drawing of the proposed wind turbine is shown in the detailed drawings 11981-2023 which accompany this application.

Modern wind turbines from the main turbine manufacturers have evolved to share a common appearance and other major characteristics with only minor cosmetic details differentiating one from another.

The wind turbines that will be installed on site will be conventional three-blade turbines, geared to ensure that the rotors of all turbines rotate in the same direction at all times.

The Wind Energy Development Guidelines (2006) are currently in force. The current design has had cognisance of the Draft Revised 2019 Guidelines, in particular in relation to:

- Shadow flicker –proposed to have near zero shadow flicker (Chapter 10);

- Electrical grid connection – grid connection cables are proposed to be underground (with the exception of the proposed end masts for the 110 kV loop-in connection) (Chapter 2); and
- Proximity to sensitive receptors – a minimum turbine set-back of 4 times the tip height (150 m x 4 = 600 m) is provided (Chapter 2 and 12).

By providing a minimum separation distance of 600 m between the proposed turbines and the sensitive receptors, the proposed project is in compliance with the setback requirements in the 2006 and the Draft Revised 2019 Guidelines. One involved residential dwellings, Receptor ID 377 (532 m), has consented to the proposed wind turbines being placed within the recommended 600 m setback distance as provided for in the Draft 2019 Guidelines. The closest receptor not involved in the proposed project is Receptor ID 381 (600 m) south-east from the nearest turbine location (T12).

2.6.1.3 Wind Turbine Blades and Nacelle

The turbines will be of the generic three bladed, tubular tower model with horizontal axis. The rotor blades are bolted to the central hub, which is connected to the nacelle (see Figure 2-6).

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

The entire nacelle (shown in Figure 2-6) and rotor are designed to rotate, or 'yaw', in order to face the prevailing wind. A wind vane located on the nacelle of the turbine controls the yaw mechanism. Rotors of all the proposed turbines will rotate in the same direction. A control unit is located at the base of the turbine, and an internal ladder or lift leads up to the nacelle where the shaft, gearbox and generator are located.

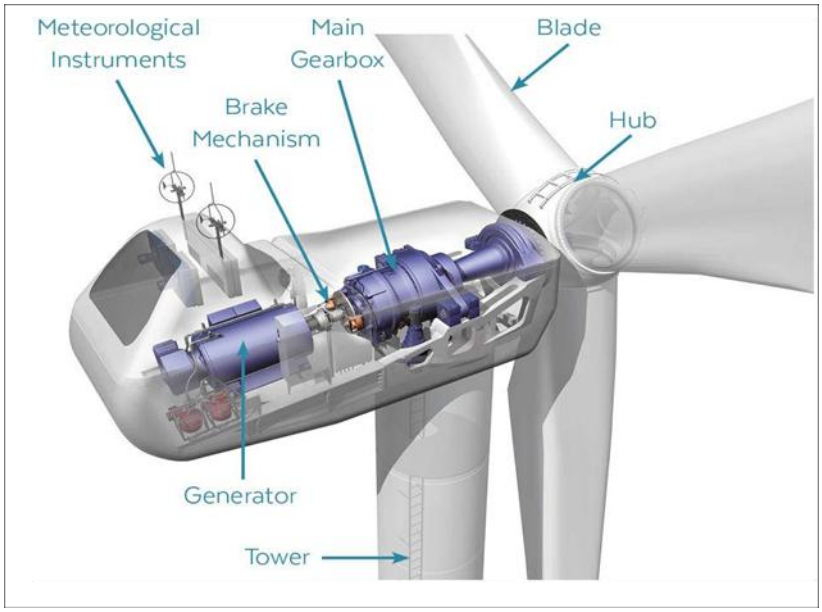


Figure 2-6 Turbine Nacelle and Hub Components

2.6.1.4 Wind Turbine Towers

The turbine tower is a conical steel tube with multiple-layer paint finish. The tower is delivered to site in three to six sections. The first section is bolted to an anchor cage, which is cast into the concrete foundation. The base of the tower is approximately 4.3 m in diameter, tapering to approximately 2-3 m where it is attached to the nacelle (Figure 2-6). The tower is accessed by a galvanised steel hatch door, which will be kept locked except during maintenance.

2.6.1.5 Wind Turbine Transformer

When operating, the rotational energy of the blades is utilised to drive the wind turbine generator. The generated power is in the form of low voltage (approximately 660 volts) and connected via low voltage cables to the wind turbine transformer located within the tower or in the turbine nacelle. This transformer steps up the generated low voltage to medium voltage (typically 33 kV) which supports a reduction of electrical losses when transmitting power over large distances. The medium voltage from the wind turbine transformers connects to the proposed 110 kV substation which again will be stepped up to high voltage for connection to the transmission system.

2.6.1.6 Wind Turbine Colour

The turbines are multi-ply coated to protect against corrosion. It is proposed that the turbines will be of an off-white or light grey colour to blend into the sky background. This minimises visual impact as recommended by the following guidelines on wind energy development:

- Wind Farm Development – Guidelines for Planning Authorities (2006);
- Draft Revised Wind Energy Development Guidelines (2019);
- "The Influence of Colour on the Aesthetics of Wind Turbine Generators" – ETSU W/14/005333/00/2000.
- Planning Advice Note 45, Annex 2: Spatial Frameworks and Supplementary Planning Guidance for Wind Farms (2008). The Scottish Office Environment Department
- Planning Policy Guidance Note 22: Renewable Energy Annex on wind energy. (1993) PPG22, Department of the Environment, Welsh Office.
- Technical Advise Note (TAN) 8: Renewable Energy (2005) Welsh Assembly Government

2.6.1.7 Wind Turbine Foundations

The design assessed includes gravity foundations at all locations, however piled foundations may be required at T2, T6, T7 and T9 if confirmed by detailed pre-construction investigations. They have also been assessed in this EIAR. Construction of the turbine bases will require excavation of the surrounding soil from the foundation and crane hardstanding area to founding level with access being provided from adjacent roads at or near the surrounding ground level. The soil will be replaced with granular fill where required. Some rock may also need to be

removed at each location to construct the foundations. Where this is required, a rock breaking excavator will be used to break the rock down to the required level.

Each wind turbine will require a reinforced concrete (RC) foundation comprising a base slab bearing onto rock or other competent substrata with a central upstand to support the tower. The foundation for each turbine will be designed by the appointed Civil Designer. It is anticipated to be 25 m in diameter with thickness of 4 m at the centre tapering towards the edge and require a volume of approximately 700 m^3 of concrete per turbine foundation.

The turbine foundation transmits any load on the wind turbine into the ground. After the foundation level of each turbine has been formed on competent strata, an anchor cage is installed and levelled. Reinforcing steel is then built up around and through the anchor cage, and the outside of the foundation is shuttered with demountable formwork to allow the pouring of concrete.

For the piled turbine foundations, micropiles are proposed (see Planning Drawing 11981-2030 which accompanies this application).

Micropiles are small-diameter piles, ranging from 100 mm to 200 mm diameter, drilled, reinforced with bars or pipes, and filled with grout. In the event of open voids or in areas of variable rockhead levels being encountered, Mini-piles or micropiles will be utilised. A number of micropiles (i.e. small piles) will be designed using rock sockets to transfer loads via skin friction, as these are preferred in karst landscapes (Rutty & Jennings, 2012, Traylor et al., 2002), rather than a smaller number of large piles relying on end bearing. It is recommended that piles are designed on the basis of transferring loads via skin friction to a rock socket.

The advantage of this approach lies in the load transfer mechanism. Micropiles transfer load primarily by skin friction along the rock socket, which means that the presence of a defined thickness of competent rock guarantees a corresponding pile capacity.

From a construction perspective, micropiles offer significant adaptability in karst conditions. Their installation methods can accommodate variations in rockhead elevation and the presence of cavities within the rock mass, with drilling techniques such as the ODEX system used to advance through overburden and weak rock into competent limestone. Permanent steel casing is employed to prevent grout loss, while pilot holes drilled below the planned founding level can verify the absence of cavities beneath the pile. These measures, combined with tremie grouting from the bottom upward to ensure proper socket contact, provide a robust foundation solution that is well suited to ground conditions characteristic of karstified limestone.

2.6.1.8 Hard Standing Area

Hardstand areas consisting of levelled and compacted hardcore are required around each turbine base to facilitate access, turbine assembly and turbine erection. The hard-standing areas are used to accommodate large cranes used in the assembly and erection of the turbine, offloading and storage of turbine components, and generally to provide a safe, level working area around each turbine position. The hard-standing areas are extended to cover the turbine foundations once the turbine foundation is in place. The size, arrangement and positioning of hard-standing areas are dictated by turbine suppliers. For this planning application, individual bespoke hardstands have been designed to cover the parameters of the proposed turbine at each location. The turbine hard-standing areas are shown on Planning drawings 11981-2022 (For T1 - T4, T6 - T8 & T12 - T13), 11981-2031 (For T5), 11981-2032

(For T9 & T10) and 11981-2033 (For T11) which accompany this application. The hard-standing area is intended to safely accommodate a large crane during turbine assembly and erection.

2.6.1.9 Assembly Area

Unbound, levelled assembly areas will be located on either side of each hard-standing area, as shown on Drawings 11981-2022 which accompany this application. These assembly areas are required for offloading turbine blades, tower sections and hubs from trucks until such time as they are ready to be lifted into position by cranes. They will be surfaced with clause 804 material or similar.

2.6.2 Site Access

The proposed wind farm site will be accessed via two new site access locations off the R334 Regional Road and will facilitate both materials delivery (stone, steel and concrete) as well as large oversize/abnormal components such as turbine blades, tower sections and substation components. For further information see Chapter 17 and the Traffic Management Plan (TMP)(Appendix 17-1).

The site accesses/entrances will remain in place during the operation and decommissioning phases as they will facilitate access for operation and maintenance vehicles. The proposed site entrance will have adequate visibility also as discussed in Chapter 17.

Aggregate materials will either be sourced from the adjacent operational quarry and/or alternative operational quarries in the vicinity of the site. Both options have been fully assessed in the EIAR.A temporary site access track for the construction phase to connect to the adjacent operational quarry is proposed to allow for the direct movement of material from source (separately permitted quarry) into the proposed wind farm site. If this option is available for the construction phase of the proposed project, it will minimise the traffic that will utilise the local road network. This would be removed at the end of the construction phase.

The proposed 110 kV substation will be accessed via a proposed new site entrance onto the L2104 in Co. Galway.

2.6.3 Internal Site Access Tracks

Site tracks will be constructed to each turbine location, and to all proposed site infrastructure as shown in Figure 2-1 and the site layout drawings 11981-2012 to 2017, with a proposed running width of 5 m. Passing bays will be included along roads strategically, as indicated in the same layout planning drawings which accompanies this application.

The road construction methodology to be used at the proposed wind farm site is an excavated new track and upgrades to existing farm tracks where proposed internal tracks follow the existing farm tracks. This is described in further detail within the following sections. Proposed new access tracks are shown on planning drawings 11981-2012 to 2017 which accompanies this application. Where required, the track widths will be increased to a maximum of 9.5 m to form the indicated passing bays, as shown in planning drawings 11981-2012 to 2017. It is proposed to construct approximately 6.8 km of new internal site access tracks, with an upgrade of approximately 1.5 km additional existing internal site access tracks to meet the same standard.

As described in Section 2.6.2 there may be an access track (approximately 340 m length) that will be temporary to connect the proposed wind farm site to an adjacent operating/permitted

quarry. It will be reinstated back to grassland at the end of the construction phase. The EIAR considers both a scenario where this is built and a scenario where it is not built and instead materials are sourced from other local quarries in the various assessments.

2.6.3.1 Construction of Internal Site Access Tracks

Tracked excavators will carry out excavation for new tracks with appropriate equipment attached. Any surplus excavated material will be dealt with as set out in the CEMP (Appendix 2-2), within the spoil management section. As the proposed project footprint is located on predominantly well drained mineral soil, this material can be either side-cast, profiled and bermed as close to the excavation areas as practical, temporarily stored in the spoil storage area, or it can be directly used to reinstate the borrow pit.

Stone from the on-site borrow pit shall be placed to form the track foundation. A geotextile layer will be placed under this on the existing ground surface. The final top layer of unbound material will be provided on top of this and will be regularly checked and dressed as necessary during the construction phase, particularly after turbine bases have been poured. This top surface may be required to be sourced from local quarries (see section 2.6.15 and Table 2-2). All site tracks will be maintained for the duration of the proposed project.

All on-site tracks will be maintained for the duration of the construction and operational phases of the project (with the exception of the short proposed temporary access track connecting to the adjacent quarry). They will also be left in-situ upon decommissioning of the proposed project and will be used for access around the farmland, as they are inert and digging them up would be considered more environmentally damaging.

2.6.4 Temporary Construction Compounds

At the commencement of the construction phase, two temporary compound areas will be constructed (one on each side of the regional road, as shown in planning drawing 11981-2012 and 2013 which accompanies this application) to provide office space, welfare facilities, car parking and hardstands for storing materials. The compounds will cover approximately 1,870 m^2 and 5,350 m^2 on the southern and northern side of the regional road respectively, as shown on the site layout drawings. At the end of the construction phase, the temporary compounds will be reinstated back to agricultural pasture.

2.6.5 Operational Phase Lidar

An operational phase Lidar unit is proposed as part of the proposed project. This will allow for wind monitoring at various heights. The unit will be located adjacent to the wind farm access track, east of T5, between the temporary construction compound and the access track junction towards T5, as shown in planning drawing 11981-2013 which accompanies this application.

The unit will be placed on a small concrete pad (measuring 4 m^2) within a hardstanding area of approximately 25 m^2 and will be surrounded by a security fence with an access gate.

2.6.6 Borrow Pit

It is proposed that one borrow pit will be constructed as part of the proposed project, in order to provide a source for the majority of stone material requirements within the site itself. This will be located within the northern part of the proposed wind farm site, covering an area of approximately 1.1 ha. The location of this borrow pit can be seen on the site layout drawings

11981-2013. Having a borrow pit on-site will minimise material transport to the proposed wind farm site and will minimise the associated impacts to traffic and local residents.

Further details of the site investigations that were carried out and the stone type/suitability of the borrow pit are provided in Chapter 8.

Once the required stone material has been extracted from the borrow pit, it will be reinstated using any surplus inert material from the proposed wind farm site and any unsafe areas will be made secure using permanent stock proof fencing. Once the borrow pit is fully reinstated at the end of the construction phase, this fence will be removed. Stone extraction methodologies are described in section 2.7.

Stone and fill material may need to be extracted from a number of proposed turbine foundation locations as part of the required excavations. This material will be used, where possible, to replace the material requirements from the borrow pit, meaning extraction from the borrow pit will be reduced. It is proposed that the on-site borrow pit will be backfilled with any excess spoil which is excavated around the proposed wind farm site and is not required for landscaping. Once all the required stone has been extracted from the borrow pit, it will be reinstated using excess spoil from the proposed wind farm site. As it will be excavated into the ground, spoil stability risks associated with storage will be mitigated.

Using the average borrow pit depth of 5 m bgl, the available volume of potential useable material is approximately 30,000 m^3 (accounting for overburden, an entrance and based on the area of the proposed borrow pit being approximately 1.1 ha).

2.6.7 Stone Requirements

As part of construction of the proposed project, a significant amount of stone and aggregate fill material will be required. This will be used under and around key infrastructure including the turbines, control room, substation, site tracks, hardstands and the temporary construction compounds. By sourcing the majority of the required stone volume from the on-site borrow pit as described above, the volume of traffic that will occur on public roads in the area will be significantly reduced, see Chapter 17 of this EIAR for more information. However, construction grade granular fill and higher quality, final surfacing fill (including sand) will be required for the construction of the proposed wind farm site.

Table 2-2 outlines the estimated volumes of material required, both the construction grade (borrow pit) and surfacing granular fill (imported) material, for some of the key infrastructure items.

Table 2-2 Granular fill Volumes Required

Construction Component	Surface Area (m2)	Required Stone Material (m^3)	Borrow Pit Material (m^3)	Import Material (m^3)
Internal site access tracks & Passing bays	39680	15871	11903	3968
On-site Control Building/ Lidar Unit	1870	855	641	214

Temporary Construction Compounds/ Temporary Quarry Track	8921	3713	2785	928
Turbine Hardstands	31200	16380	11466	4914
Grid connection and internal cabling		11114	0	11114
Proposed 110 kV substation	8800	5544	0	5544
Total Stone		53477	26795	26682

Presently the estimated volumes of compacted aggregate material required for construction is 53,477 m^3. Stone materials proposed to be imported from local licensed quarries include construction grade granular stone fill directly below the turbine foundation and for the proposed 110 kV substation, the high quality final surface layer on the running surface of the proposed site tracks and hardstands (and other temporary areas) and sand for backfill around ducts. An estimation of 26,682 m^3 imported stone volume will be required.

Hardstands and site tracks will be constructed to be above the existing ground level. The lower layer of this will be lower grade stone, with the top layer being high-quality compacted gravel (imported). Internal cable trenches which connect each turbine to the proposed control room will be approximately 1220 mm deep, with the first 600 mm being backfilled with sand. The excavated material will be used to complete the backfilling to the surface.

2.6.8 Temporary Spoil Storage Area

Over the course of the construction phase there will be a requirement to stockpile some spoil, including topsoil, subsoil and stone that might be unsuitable for construction purposes. It is proposed to do this in a designated area immediately adjacent to the proposed borrow pit. This will facilitate efficient material handling and site reinstatement. This area, currently characterised by improved grassland, will be stripped of turves and topsoil, which will be stockpiled separately. Excavated material will be stored within the area in managed mounds that utilise safe slopes and heights, to be determined at pre-construction stage and to be monitored through the construction phase by a geotechnical engineer to ensure safety. A double silt fence and a temporary drainage channel will be installed around the perimeter of this area. Following the extraction phase, the stored material will be backfilled into the borrow pit to reinstate it. The area will then be top-soiled using the same material that was removed originally and reseeded with a grass mixture to ensure the land successfully reverts to its baseline grassland state. For further information, see the spoil management plan in the CEMP (in Appendix 2-2).

2.6.9 Wind Farm Control Building

It is proposed to construct a wind farm control building within the proposed wind farm site at the location shown in Figure 2-1. The wind farm control building will include the Independent Power Producer (IPP) control room, as well as an office space and welfare facilities for staff during the operational phase. Toilet facilities will be installed with a low-flush cistern and low-flow wash basin. Due to the specific nature of the proposed project there will be a very small water requirement for occasional toilet flushing and hand washing. It is proposed to install

a rainwater harvesting system as the source of water for this, with all potable water being brought on site in bottles. A wastewater holding tank will be provided beside the building. All wastewater will be tankered off site as required by an authorised waste collector to a wastewater treatment plant. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007, will be employed to transport wastewater away from the site. The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying.

2.6.10 Internal and private cables

2.6.10.1 Internal Underground Cabling from Turbines to On-Site Control Building

Each turbine will be connected to the proposed on-site control building via underground Medium Voltage (MV) cables. Fibre-optic cables will also connect each wind turbine to the wind turbine control system located within the control building. The electrical and fibre-optic cables running from the turbines to the building will be run in cable ducts approximately 1.2 m below the ground surface within the proposed internal tracks and/or their verges or through grassland and crossing perpendicularly under the R334 to connect the southwestern parcel of the proposed wind farm site to the proposed control building. The electrical cables will proceed on from here via the proposed 33 kV grid connection to the proposed 110 kV substation.

2.6.10.2 Proposed 33 kV Grid Connection

After converging at the proposed on-site control building, the 33 kV cables will proceed in a triple circuit form along the proposed GCR via an approximately 8.7 km long route to a proposed 110 kV substation in the townland of Killamanagh, Co. Galway.

This route will follow off road sections through private lands, in addition to sections within the public road corridor. The cable will remain in the ownership of, and will be operated by, the owner of the proposed project.

Further details are provided in Figure 2-2.

2.6.10.2.1 Watercourse, Bridge & Culvert Crossings

The proposed cable route will require four culvert crossings, one bridge crossing and one open drain crossing as detailed in Table 2-3 and the planning drawings accompanying this application.

Table 2-3 Watercourse Crossings on the GCR (33 kV and 110 kV)

Crossing no.	Location (approx. chainage)	Crossing type	Crossing methodology	110 kv and/or 33 kV
1	Near proposed 110 kV Substation on private land (200 m)	Open Drain (existing poor culvert)	Culvert with cable undercrossing	110 kV and 33 kV
2	On L16157 at county boundary (5275 m)	Culvert	Undercrossing	33 kV
3	On L16157 (5860 m)	Stone culvert	Replacement of culvert with cable undercrossing	33 kV

4	On L16152. River Black crossing (6780 m)	Bridge	HDD	33 kV

2.6.10.2.2 33kV Joint Slabs and Associated Chambers

Joints Slabs are to be installed approximately every 900 m along the 33kV GCR. Joint slabs are typically 2.2 m x 1.8 m x 0.1 m concrete slabs installed below finished ground level. Joint slabs will be located in the non-wheel bearing strip of roadways/access tracks. In association with joint slabs, communication chambers will be required at selected joint slab location to facilitate communication links. Earth sheath link chambers are also required at selected joint bay along the cable route. Earth sheath link chambers and communication chambers will typically be pre-cast concrete structures with an access cover at finished surface level. Marker posts will be used on non-roadway routes to delineate the duct route and joint bay positions.

2.6.11 Proposed 110 kV Substation and Grid Connection

For the proposed grid connection, a 110 kV substation compound will be constructed in the townland of Killamanagh, Co. Galway, at the location shown on Planning Drawing 11981-2017. The design for this project will include a 110 kV substation at this location with an associated underground loop in connection (circa 1.1 km in length) to the existing adjacent overhead line via two steel lattice end masts.

Further details are provided in Figure 2-2 and the following sections.

2.6.11.1 Proposed 110 kV substation

The layout of the proposed 110 kV substation is shown on Planning Drawing 300101121-U-DR-160. The footprint of the proposed 110 kV substation compound is approximately 95 m in length by 89 m, with an adjoining Independent Power Producer (IPP) compound measuring 81 m by 35 m. The substation footprint will include one control building and electrical components necessary to export generated power from the wind farm to the transmission system. Refer to the 110 kV substation planning drawings which accompany this application for the substation elevations.

2.6.11.2 Underground 110 kV loop-in Grid Connection

Connection will be sought from the grid system operators by application to EirGrid. It is intended that the proposed 110 kV substation will connect to the existing adjacent 110 kV overhead line via an underground connection. Two new overhead steel lattice end masts will be required at the interface points on the existing overhead line, to allow the connection to be made. One existing wooden poleset (Planning Drawing 300101121-U-DR-107) will be removed as part of the 110 kV grid connection works. The overall length of the grid connection between the proposed 110 kV substation and the existing overhead line is approximately 1 km (two circuits, each measuring 0.9 km and 1.1 km), all of which are within private lands, with no use of public roads. The proposed 110 kV double-circuit underground cable (UGC) leaves the proposed 110 kV substation on its southwest side and follows the proposed access track for approximately 750 m. It then diverges to the north, undercrossing the three 33 kV UGC circuits to each of the steel line cable end masts. The first end mast will be located between the existing pole sets 146 and 147, with the second being between pole sets 147 and 148 respectively. Joints

Bays are to be installed approximately every 850 m along the 110 kV GCR to facilitate the jointing of two lengths of 110 kV UGC.

Further detail on the grid connection construction methodologies is provided in Section 2.7.6 and Appendix 2-3.

2.6.11.2.1 Watercourse, Bridge & Culvert Crossings

The proposed 110 kV cable route will require one open drain crossing (which needs an upgrade to an existing culvert) as detailed in Table 2-3 and the planning drawings accompanying this application.

2.6.11.2.2 Joint Bays and Associated Chambers

Joints bays are to be installed approximately every 850 m along the 110 kV GCR to facilitate the jointing of two lengths of 110 kV cable. Joint bays are typically 6 m x 2.5 m x 2.05 m pre-cast concrete structures installed below finished ground level. Joint bays will be located in the non-wheel bearing strip of roadways. In association with Joint bays, Communication Chambers will be required at every joint slab location to facilitate communication links. Earth sheath link chambers are also required at every joint bay along the cable route. Earth sheath links are used for earthing and bonding cable sheaths of underground power cables, so that the circulating currents and induced voltages are eliminated or reduced. Earth sheath link chambers and communication chambers are located in close proximity to joint bays and will typically be pre-cast concrete structures with an access cover at finished surface level. The precise siting of all joint bays and communication chambers is subject to approval by ESBN. Marker posts will be used on non-roadway routes to delineate the duct route and joint bay positions.

2.6.11.3 Proposed 110 kV substation Security

The substation compound will be surrounded by a 2.6-metre-high steel palisade fence and internal fences will also be provided to segregate different areas within the main substation compound. Lighting will be required on site, and this will be provided by lighting poles located around the substation and exterior wall mounted lights on the control building.

2.6.11.4Substation Control Building (within the proposed 110 kV Substation Compound)

The substation control building will include the IPP and EirGrid control room, as well as an office space and welfare facilities for staff during the operational phase. Toilet facilities will be installed with a low-flush cistern and low-flow wash basin. Due to the specific nature of the proposed project there will be a very small water requirement for occasional toilet flushing and hand washing. It is proposed to install a rainwater harvesting system as the source of water for this, with all potable water being brought on site in bottles. A wastewater holding tank will be provided outside the substation compound fence line so that it can be maintained where required without requiring access to the substation compound. All wastewater will be tankered off site as required by an authorised waste collector to a wastewater treatment plant. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007, will be employed to transport wastewater away from the site. The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying.

2.6.12 Local Electricity Supply

As part of the proposed project, a local electricity supply will be required as a power supply to the proposed on-site control room and the proposed 110 kV substation for light, heat and power purposes. The local supply will be designed and constructed by ESB Networks. A diesel generator will provide a backup power source for these in the event that the local power fails.

Currently there is an electricity supply running to the northeast of the proposed on-site control building (approximately 430 m from its location) and to the west of the proposed 110 kV substation compound (approximately 400 m from its location). No significant works are anticipated for this (placement of local poles with cable from a nearby power line), as it will be similar to what normally occurs for new house connections. Should permission be granted for the project, the details (regarding the exact location of each pole) of the connection route and works will need to be determined by ESB Networks prior to construction. As it will be a local electrical connection, the works will be minimal in nature, similar to a new house connection.

2.6.13 Wind Turbine Delivery Route

It is proposed that the turbine components will be delivered to the proposed wind farm site via Galway Harbour in Galway City as shown in Figure 2-3. The TDR has been identified from a detailed traffic and transport assessment.

The detailed Swept Path Analysis (SPA) using both a non-segmented 67 metres turbine blade in length carried on a standard transporter and a tower clamp vehicle for the turbine towers was carried out from port to the proposed wind farm site entrance as seen in Figure 2-3 above. Appendix 2-4 (Turbine Delivery Route Report) provide greater detail of the Abnormal Indivisible Load (AIL) route assessment. All accommodation works along the TDR route are detailed above in Section 2.6.14.

The deliveries of turbine components to the proposed wind farm site will be made in convoys of three to five vehicles and mostly at night when roads are quietest. Convoys will be accompanied by escorts at the front and rear operating a “stop and go” system. Although the turbine delivery vehicles are large, they will not prevent other road users or emergency vehicles passing, should the need arise. The delivery escort vehicles will ensure the turbine transport is carried out in a safe and efficient manner with minimal delay or inconvenience for other road users.

There will be some delays to local traffic at pinch points. During these periods, it may be necessary to operate local diversions for through traffic.

Prior to delivery of abnormal loads i.e. turbine components, the Applicant or their representatives, will consult with An Garda Síochána, Transport Infrastructure Ireland (TII), Public Private Partnership (PPP) operators and all relevant Local Authorities to obtain all necessary abnormal load permits and discuss the requirement for a Garda escort. The Applicant will also outline the intended timescale for deliveries and 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. Local residents at sensitive locations along the affected route will be notified of the timescale for AIL deliveries.

Before delivery of abnormal loads, a test run of the proposed transport operation along the proposed route will be completed using vehicles with attachments to simulate the dimensions of the turbine components. Following this test run, the Traffic Management Plan will be

reviewed and updated with the haulage company when the final transport arrangements are known, delivery dates confirmed and escort proposals in place. The plan will then be submitted to the relevant County Councils for agreement in writing in advance of any abnormal loads using the local roads. The plan will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls.

The route out of Galway city has been used for multiple wind farms with similar sized components. The street furniture has already been made demountable for these previous projects and as such there are minimal disruptions anticipated within the city. The road from Galway city to the proposed wind farm site is generally quite straight, utilising National and regional road networks, reducing the potential for pinch points.

The current planning application does not include the proposed temporary works required for turbine delivery, but they are fully assessed as part of this EIAR. A further consenting process will be used to obtain permission for the works as required. These works include:

- Temporary strengthening / modification works to a small area of the footpath in the townland of Ballybaan Beg, in Galway city.
- Vegetation/hedgerow trimming at various locations along the route, in particular on the N84 and R334 in the townlands of Ballindooley and Cordarragh Co. Galway and Moyne, Co. Mayo.
- Temporary signage demounting on the route, in particular on the R334 in the townland of Moyne, Co. Mayo.

2.6.14 Temporary Accommodation works along the TDR

There is one location along the TDR requiring temporary accommodation groundworks in order to facilitate the delivery of turbine components to the proposed wind farm site, which is referred to as a Node. Some vegetation trimming and temporary signage demounting is required at other locations along the route. Details of this are provided in the Turbine Delivery Route Report presented in Appendix 2 -4, which includes Swept Path Analysis (SPA).

This involves modifying a small area of footpath to allow it to support the turbine transport vehicle weight in the townlands of Ballybaan Beg, within Galway City. Hedgerow/vegetation trimming and temporary demounting of signage will also be required at various locations along the route prior to delivery, but no other significant works or hardstanding areas are required.

All of the accommodation works required are contained within the extents of the road infrastructure and verge.

2.6.15 Construction Material Haul Route

Construction materials (including aggregate, concrete, steel, ducting, machines and other equipment/material) will be delivered to the proposed wind farm via selected haul routes that will be determined based on the source of the construction material. In order to facilitate the construction of the proposed project, all crushed stone, hardcore materials and ready-mix concrete that will be required during the construction phase will be suitably sourced from local, appropriately authorised quarries. Quarry selection will be based on a range of technical, environmental and logistical considerations, including material quality, engineering suitability,

hydrochemical compatibility where relevant, production capacity, haulage distance and regulatory compliance. For the purposes of assessment within the EIAR, quarries within a 25 km range of the proposed wind farm site that could potentially provide stone and concrete have been assessed including:

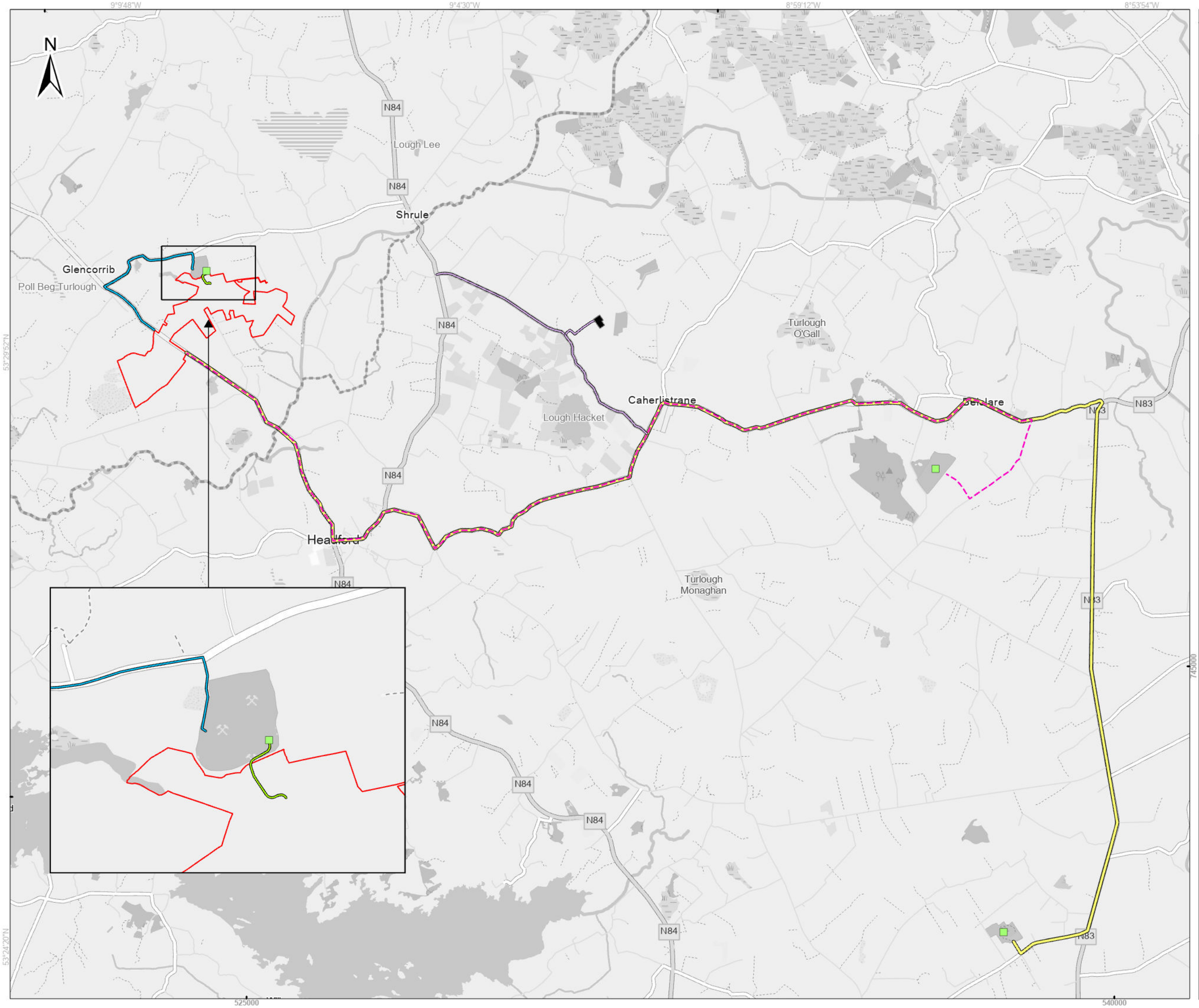
- P&D Lydon, Carrowoughteragh, Co. Mayo (3.9 km to quarry via public road but adjacent to the site with an option for a direct link temporary access track)
- Harringtons Concrete and Quarries, Claregalway, Co. Galway (22.4 km)
- Mortimer Quarries, Belclare, Co. Galway (20.1 km)

It is proposed to construct a temporary access track to directly connect the proposed wind farm site and the adjacent operating quarry (P&D Lydon). In the event that the quarry is still operational with a suitable source of material at the time of construction, this will allow all of the aggregate material to arrive to site without any additional traffic on the surrounding road network, with the exception of crossing the R334. This EIAR assesses the possibility that this proposed connecting temporary access track will be utilised as well as the possibility that it is not used. The construction traffic will otherwise utilise the R334 Regional Road to get to the proposed wind farm site and will not need to travel on small or narrow local roads.

For the proposed works along the GCR, the material will be brought via the local road network, however the volume of material required for this will be small, and the works will be transient in nature, thereby reducing the potential for impacting any one particular area.

Material deliveries to the proposed 110 kV substation will only utilise a short section of local road (L2104) up to the site entrance itself, but this is linked to either the R333 or the N84 within a short distance (2.8 km and 2 km respectively) from the entrance.

Chapter 17 of this EIAR includes an assessment of the potential effects that the proposed project will have on the road network in the area. Material delivery haul routes are shown in Figure 2-8.





Legend

- Proposed wind farm site
- Quarries
- Proposed 110kV substation

Material Haul routes

- Harringtons Concrete and Quarries
- Mortimer Quarries
- Substation Material Haul Route
- P&D Lydon - Public road route
- P&D Lydon - proposed direct access track

0 1 2
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Rev	Date	Description	By	Chkd.
A	20/08/2026	First issue	K.K	J.S

Client: ROOAUNALAGHTA Green Energy

Project:

Rooaunalaghta Green Energy Project

Title:

Figure 2.6:
Material Haul Routes

Scale @ A3: 1:60,000

Prepared by:	Checked by:	Date:
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Map Ref: 11981-036-Hauls.-P.App.BO-TOB-A

Draft: A

2.7 CONSTRUCTION METHODOLOGIES

2.7.1 Turbine Foundations

The geotechnical investigations to date indicate that the foundations at the proposed wind farm site will utilise excavated gravity foundations with the potential requirement for piled foundation at 4 of the 13 no. turbine locations (Turbines 2, 6, 7 and 9). Both methods are assessed in this EIAR for these turbines with the exact method being confirmed following detailed pre-construction site investigations. Piling is not anticipated to be required elsewhere.

Each of the turbines to be erected on-site will have a reinforced concrete base. Overburden will be stripped from the foundation area to a suitable formation using a 360º excavator and will be stored as detailed in the CEMP (Appendix 2-2), within the Spoil Management section. The sides of the excavated areas will be sloped sufficiently (2:1 or as determined by a suitably qualified site engineer) to ensure that slippage does not occur. Ground investigations in the form of trial pitting, boreholes, geophysical survey and the use of augers have been carried out around the site, including at the proposed turbine and hardstanding locations to inform the proposed design and excavation / upfill requirements (See Site Investigation Report in Appendix 2-5).

Material excavated to create the working area will be stored locally for later reuse in backfilling the working area around the turbine foundation, or for reinstatement elsewhere on-site (such as the borrow pit). The excavated material will be smoothed with the back of an excavator bucket and surrounded by silt fences to minimise the potential for sediment-laden run-off occurrence. Where there are large volumes of material to be stored, the material will be brought to the proposed temporary spoil storage area as seen on the proposed site layout in Figure 2-1.

Where rock may need to be removed at each location to construct the foundations, a rock breaking excavator will be used. A hydraulic rock breaking attachment is fitted to the arm of a large tracked excavator, and this breaks large pieces of rock from the ground. These large rocks are broken down into smaller pieces using these hydraulic rock breaking attachments and fed into a mobile rock crusher, where they are crushed, graded into various sizes and reused on site.

A summary of the proposed turbine foundations is provided in Table 2.4.

Table 2-4 Proposed Wind Turbine Foundation Types

Turbine ID	Foundation Type
T01	Gravity
T02	Gravity (with a potential requirement for micropiling)
T03	Gravity
T04	Gravity
T05	Gravity
T06	Gravity (with a potential requirement for micropiling)
T07	Gravity (with a potential requirement for micropiling)

T08	Gravity
T09	Gravity
T10	Gravity (with a potential requirement for micropiling)
T11	Gravity
T12	Gravity
T13	Gravity

In the case of gravity foundations, if the formation level is reached at a depth lower than the depth of the foundation, the formation layer will have to be raised with hardcore material and/or lean mix concrete, compacted in layers as required, with sufficient compaction effort. Site investigations have shown the site to have shallow soils, generally <3 metres. Drainage measures will be installed to protect the formation by forming an interceptor drain around the perimeter of the base which will outfall out at the lowest point level with the spreader or settlement pond.

In cases where micropile foundations are required, micropiles will be installed using a small rotary/percussive drilling rig. The pile location will be set out and a borehole drilled through the overburden and into competent bedrock. In areas of unstable ground, cavities, or variable rockhead levels, temporary or permanent steel casing may be advanced concurrently with drilling using systems such as ODEX drilling to maintain borehole stability and prevent collapse. Upon reaching the design founding level, the borehole will be extended to form a rock socket of the required length within competent limestone. Where necessary, pilot probing may be undertaken below the socket to confirm the absence of significant voids beneath the pile founding level. Reinforcement, typically in the form of a steel bar or steel tube, will then be installed within the borehole. The micropile will subsequently be grouted from the base of the borehole upwards using a tremie pipe to ensure complete filling of the borehole and intimate contact between the grout and surrounding rock. The grout will be allowed to cure before the pile head is trimmed and connected to the foundation structure. Drilling spoil, wash water and surplus grout will be contained and managed and will not be discharged to surface waters, groundwater, swallow holes, sinkholes or other karst features. Grout volumes will be monitored during installation to identify any abnormal losses that may indicate the presence of subsurface voids or highly fractured ground. In the event of significant grout losses, drilling difficulties, or the interception of previously unidentified cavities, works will cease in the affected location and it will be reported to the Environmental Clerk of Works (ECoW) and Project Geotechnical Engineer who will determine the correct course of action.

An embankment approximately 600 mm high and a fence or berm will be constructed around the perimeter of each turbine base to prevent construction traffic from driving into the excavated hole and to demarcate the working area. All necessary health and safety signage will be erected to warn of deep excavations etc. Access to and from excavated bases will be formed by excavating a gangway to a standard 1:12 grade, thereby allowing safe passage into/out of the foundation area.

Formwork to concrete bases will be propped/supported sufficiently to prevent failure. Concrete for bases will be poured using a concrete pump. After a period of time when the concrete has set sufficiently, the top surface of the concrete surface is to be finished with a power float.

Once the base has sufficient curing time it will be filled with suitable fill (i.e. hardcore) up to existing ground level. The working area around the perimeter of the foundation will be backfilled with suitable material (hardcore). These hardstand areas around the turbines will be levelled, compacted and finished with a suitable surface material for traffic (clause 804 or similar) as per the site access tracks and remainder of the hardstand areas.

2.7.2 Traffic Management

As outlined in Chapter 17of this EIAR, mitigation measures will be put in place before and during the construction and operational phase of the proposed project in order to minimise the effects of the additional traffic generated by the proposed project. A Traffic Management Plan proposed for the project is included as Appendix 17-1, which details the measures to be implemented.

2.7.3 Site Entrance

The proposed wind farm site will be accessed via two new site accesses off the R334 Regional Road and will facilitate both materials delivery (stone, steel and concrete) as well as large oversize/abnormal components such as turbine blades, tower sections and substation components. There will also be an entrance to the proposed 110 kV substation required on the L2104. For further information see Chapter 17 and the Traffic Management Plan (TMP)(Appendix 17-1).

The site accesses/entrances will remain in place during the operation and decommissioning phases as they will facilitate access for operation and maintenance vehicles as well as the delivery of any wind turbine or substation components that may require replacement/upgrade. The proposed site entrances will have adequate visibility as also discussed in Chapter 17. Secure gates will be installed at gates to ensure site security during all phases of the proposed project, with sufficient space outside the gates to allow trucks to pull safely off the road and stop to open/close the gates.

2.7.4 Internal Site Access Tracks

Excavation will take place to a competent stratum beneath the topsoil (as agreed with the site designer). When the formation layer has been reached, stone from the on-site borrow pit and/or local quarries shall be placed to form the track foundation. The sub-grade will be compacted with the use of a roller or other approved compaction method. The final top layer of unbound material will be provided on top of this and will be regularly checked and dressed as necessary during the construction phase, particularly after turbine bases have been poured. All site tracks will be maintained for the duration of the proposed project with the exception of the proposed temporary access track to the adjacent quarry which will be removed at the end of the construction phase.

Internal cables connecting the wind turbines to the on-site control building will be laid within or immediately adjacent to the on-site access roads. All cables will be laid in underground ducts. Ducts will be installed by open trenching.

2.7.5 Underground Private 33 kV Cable from On-Site Control Building to proposed 110 kV substation

A 33 kV private connection will be required to connect to the proposed 110 kV substation. After converging at the proposed on-site control building, the 33 kV cables will proceed in a triple circuit along an approximately 8.7 km long route to the proposed 110 kV substation in the townland of Killamanagh, Co. Galway

Construction methodology for this 33 kV cable is provided in Appendix 2-3.

2.7.6 Proposed 110 kV Substation

It is proposed to construct a 110 kV substation compound in the townland of Killamanagh, Co. Galway.

The proposed 110 kV substation has been designed and constructed to meet all the required EirGrid/ESB standards. An area will be levelled and built to the required level with stone fill material, capped by high-quality compacted stone. One on-site control building will be constructed using traditional techniques for constructing small buildings (i.e. concrete block walls, timber and slate tile roof). Foundations will be built for all of the proposed electrical infrastructure. All the electrical equipment will be installed to EirGrid/ESB requirements. Perimeter fencing will be constructed around the substation compound for security and safety purposes. Further information and drawings of the proposed 110 kV substation and electrical infrastructure are provided in planning drawings which accompanies this application, while the associated construction methodologies provided in Appendix 2-3.

A local electricity supply will be made from the nearest suitable power lines at the time of construction in the same way that residential houses are connected. Standard overhead electricity poles and cables will be installed using a minimal footprint. See Section 2.6.12 for further information.

2.7.7 110 kV Grid Connection Route

It is proposed to construct a 110 kV grid connection from the proposed 110 kV substation compound in the townland of Killamanagh, Co. Galway.

2.7.7.1 Underground 110 kV loop-in Grid Connection

Connection will be sought from the grid system operators by application to EirGrid. It is intended that the proposed 110 kV substation will connect to the existing adjacent 110 kV overhead line via an underground connection and two interface masts.

Construction methodologies for this route are provided in Appendix 2-3.

2.7.8 Operational Phase Lidar

The operational phase lidar installation works will be carried out by a small crew at the final stage of the construction phase and are described as follows, as illustrated on Drawing 11981-2026 which accompanies this application.

General construction methods for the operational phase lidar hard standing match those described for wind farm access tracks, hard standings and the temporary construction compounds. The stone hard standing area will measure approximately 5 m x 5 m.

The slab foundation will be excavated followed by shuttering, steel fixing and finally concrete pouring by a ready-mix truck. Excavation and concrete operations will be carried out in accordance with the CEMP (Appendix 2-2). The foundation will be 2 m x 2 m x 0.3 m in size.

Following this, the lidar unit will be delivered and unloaded by truck. It will be connected to a power source from either the on-site control building or the closest wind turbine.

The unit will be decommissioned after 35 years using a similar methodology as the construction except in reverse.

2.7.9 Borrow Pit

The construction of the borrow pit will follow a standard sequence as follows;

- Prior to work commencing, an extensive Ground Penetrating Radar (GPR) scan for hidden services will be carried out and services will be relocated if required.
- The working area will be cordoned using temporary fencing.
- Extraction plant and vehicles on low loaders will be mobilised to site.
- An interceptor drain will be installed upslope of the borrow pit, where necessary. This drain will divert any surface water away from the borrow pit and hence prevent water from ponding and lodging during construction and when reinstated.
- Overburden will be stripped using a 360° excavator and stored as detailed in the CEMP (Appendix 2-2), within the Spoil Management section.
- Material will be extracted using a combination of blasting and excavators.
    - A large rock breaking excavator will progressively break out the solid rock from the ground in the borrow pit area. Where the rock is difficult to break, blasting will be employed to fracture the rock into loose pieces.
    - A smaller rock breaker, in the 30-40 tonne size range, will then break the rocks down to a size that can then be fed into a crusher
    - Other extracted materials deemed unsuitable for re-use, will be reinstated within the borrow pit.
- Material will be processed by using a mobile crusher and screener. The extracted, broken rock is loaded into a mobile crusher using a wheeled loading shovel and crushed down to the necessary size of graded stone required for the on-site civil works.
- The processed material will be stockpiled in designated areas within the borrow pit.
- A site access track to the borrow pit will be constructed to tie in with the internal site access track infrastructure.
- Processed material will be loaded into lorries or articulated dumpers and transported to areas within the site for the construction of internal tracks, hardstand, compound and other infrastructure which require stone fill.
- Temporary excavation side slopes will be designed by a geotechnical engineer.

- Temporary control of groundwater within the borrow pit may be required and measures will be determined as part of the ground investigation programme. A temporary pump and suitable outfall locations will be required during construction.
- Temporary construction settlement ponds have been designed at the lower side/outfall location of the borrow pit.
- Upon completion, all faces of excavation will be constructed to safe permanent side slopes to be designed by a geotechnical engineer as part of the detailed design on approval of the application.
- Infilling of the spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance.
- Once full, the area will be finished with soil and reseeded to revert to agricultural use.
- Extraction plant and vehicles on low loaders will be demobilised via internal site tracks and the main site entrance.

2.7.9.1 Stone Extraction Methods

The rock will be extracted from the proposed borrow pit, and any proposed turbine foundation locations requiring extraction. It is proposed that the primary method will be rock breaking due to good fracture spacing and rock characteristics, however some blasting is likely to be required at the proposed borrow pit.

Rock breaking can be used to extract rock in many situations and is particularly suitable for any brittle rock and rock near the surface. A hydraulic rock breaking attachment is fitted to the arm of a large tracked excavator, and this breaks large pieces of rock from the ground. These large rocks are broken down into smaller pieces using these hydraulic rock breaking attachments, until they are small enough for use or to fit into a rock crusher. At that point, a large loader feeds them into a mobile rock crusher, where they are crushed, graded into various sizes, and removed by the loader for use on site. The potential noise and vibration effects of rock breaking have been assessed in Chapter 12.

Rock blasting is an effective way to produce a large volume of broken stone in a very short time, as the blasts only last a number of milliseconds. All parts of the blasting process from drilling to explosives handling to execution of the blast itself will be designed and carried out/overseen by a specialist engineer. In order to carry out a blast, a number of holes are drilled into the rock over several days. Once these are prepared, the required amount of explosives will be brought to the site and installed in the holes. The explosive material will not be stored on site, and the transport and handling of the material, as well as the carrying out of the blast will be carried out with agreement and supervision of An Garda Siochána. The charges will be set, the area will be cleared and the blast carried out by a specialist engineer.

After a blast, the rock will be able to be loaded into a crusher with a loader and processed for use on site. In the event when blasting is required, local residents and noise sensitive locations will be notified of the upcoming blast. The potential noise and vibration effects of blasting have been assessed in Chapter 12. Blasting is currently carried out at the adjacent quarry regularly (typically four times per year) (Mayo planning ref: 22970).

2.7.10 Spoil Management

The use of the borrow pit shall be phased. This will then allow materials to be placed in one end of the borrow pit while the other end is still being extracted, thereby minimizing the volume of soils requiring temporary storage. In order to further reduce temporary storage requirements, reinstatement of soils and turves around infrastructure, and in restoration and landscaping works on areas of excavated/disturbed ground, will be carried out during the construction phase or as soon as is practical after the completion of the works in any one area of the site.

Topsoil and sub-soil are to be stockpiled separately. There will be a designated temporary spoil storage area for the duration of the construction phase which will be clearly demarcated at the start of the works. Any large volumes of material which cannot be sidecast or used in site landscaping will be temporarily stored here until they can be used for borrow pit reinstatement. Turves will be stored grass side up and will not be allowed to dry out. Stockpiles are to be isolated from any surface drains and a minimum of 50 m away from watercourses (see the CEMP – Appendix 2-2 for further detail). Measures such as interceptor ditches around the bases of these areas, sediment traps and seeding of the bunds shall be incorporated to prevent runoff of suspended solids laden surface water and soil erosion. No permanent spoil or stockpiles will be left on site.

The method for restoration of excavated or disturbed areas is to encourage stabilisation and early establishment of vegetation cover, where available, and vegetative sods/turves or other topsoil in keeping with the surrounding vegetation type will be used to provide a dressing for the final surface.

To prevent erosion and run-off and to facilitate vegetation reinstatement, any sloped embankment will be graded such that the slope angle is not too steep and that embankments match the surrounding ground profile.

It is not anticipated that there will be any peat excavated on site as part of the proposed project as there were no peat deposits encountered during the ground investigations completed across the proposed wind farm site, as detailed in Chapter 8 and Appendix 2-5.

A thin layer of peaty topsoils (up to 0.4 m thick), observed at TP-14, at the proposed 110 kV substation (see Appendix 2-5 - Site Investigation Report). The land at the proposed 110 kV substation site is flat, drained and in intensive agricultural production. Additional peat probing in July 2026 at the substation building encountered 0.3m of peaty topsoil. Generally, the soils encountered during the site investigation works were as expected for this region, and predominantly consisted of topsoil overlying glacial tills, overlying bedrock. It is envisaged that the majority of the excavated topsoil (including the peaty topsoil) will be used for landscaping and reinstatement on site. Any excess material that cannot be used for landscaping here will be disposed of in a suitably licenced facility. It will not be used for borrow pit reinstatement due to the distance to the proposed wind farm site.

2.7.11 Temporary Construction Compound

At the commencement of the construction phase, a temporary compound area will be constructed close to each proposed site entrance to the proposed wind farm site. The compounds will cover approximately 1,870 m^2 and 5,350 m^2 on the southern and northern side of the regional road respectively, as shown on the site layout drawings. The topsoil will be stripped where development of the temporary compound is proposed. The compound shall be

constructed to heights of up to approximately 0.3 m above existing ground level using granular fill from the on-site borrow pit.

At the end of the construction phase, the temporary compound will be restored to agricultural grassland. The stone will be removed and used to reinstate the borrow pit and soil will be spread over the area before it is reseeded.

2.8 Construction Management

2.8.1 Construction Timing

Approximately 60 persons will be employed on site during the peak construction period, and it is estimated that the construction phase will take approximately 24 months from starting on-site to completion of turbine commissioning. A reduction in construction staff on site is expected when the construction activities are more technical and less labour intensive, i.e. May 2030 as per the below indicative construction schedule.

Vegetation clearance will be kept to a minimum, where possible. Any necessary removal of trees or scrub will be implemented outside of the bird breeding season in line with the Wildlife Act as amended. Where the construction programme does not allow this time restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. The ecologist will have the authority to halt work for as long as required where such breeding birds are found.

The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 08:00hrs and 20:00hrs weekdays and between 08:00hrs and 13:00hrs on Saturdays. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e. concrete pours) or to accommodate delivery of large turbine component along public routes it may be necessary on occasion to work outside of these hours. Any such out of hours working will be agreed in advance with the local authority.

Due to the volume of concrete required for each turbine foundation, and the requirement for the concrete pours to be continuous, deliveries are often carried out outside normal working hours. Such activities are limited to the day of turbine foundation concrete pours, which are completed in a single day per turbine (can take >12 hours). Because of the scale of the main concrete pours that will be required to construct the proposed wind farm, the main pours will be planned weeks in advance and refined in the days leading up to the pour. Concrete pours are required for 13 no. wind turbines so they will require 13 days of longer working hours. A similar number of days with longer working hours will be needed for installation of the turbines during a period of calm weather (this is mostly limited to on-site activity).

2.8.2 Construction Sequencing

The construction phase of 24 months can be broken down into five main phases as follows (there will be overlap between these):

- 14 months – Civils (including site tracks, hardstands, turbine foundations, vegetation clearance, drainage, borrow pit extraction)
- 12 months – Electrical grid connection/substation installation and commissioning
- 12 months – Site electrical (installing between turbines and substation, pulling cables)

- 7 months – Turbine deliveries and erection
- 2 months – Commissioning

The phasing and scheduling of the main construction task items are outlined in Table 2-55 below, where November 2028 has been selected as an arbitrary start date for construction activities. Where there is overlap between phases, this reflects the anticipated progression of work through the proposed wind farm site, with different areas within the site at different stages of completeness.

Table 2-5 Indicative Construction Schedule

Ref	Task Name	Task Description	Nov -28	Dec – 28	Jan - 29	Feb - 29	Mar – 29	Apr - 29	May - 29	Jun – 29	Jul – 29	Aug – 29	Sep – 29	Oct – 29	Nov – 29	Dec – 29	Jan – 30	Feb – 30	Mar – 30	Apr – 30	May – 30	Jun – 30	Jul – 30	Aug – 30	Sep – 30	Oct - 30
1	Site Health & Safety																									
2	Site Compounds (civils)	Site compound, site access, fencing, gates																								
3	Site Access Tracks (civils)	Construct access tracks, install drainage measures, create borrow pit and temporary spoil storage area																								
4	Turbine Hardstands (civils)	Excavate base, construct hardstand areas																								
5	Turbine Foundations (civils)	Fix steel, erect shuttering, concrete pouring																								
6	Substation & GCR Construction & Electrical Works (civils and electrical)	Construct substation, underground cabling between turbines, cabling to substation																								
7	Backfilling & Landscape (civils)	Backfill and reinstate excavated material, landscaping																								
8	Turbine Delivery & Erection	Turbine component deliveries, assemble and erection of turbines																								
9	Substation Commissioning (electrical)																									
10	Turbine Commissioning (electrical)																									

2.8.3 Surface Water Management

Limited surface water features occur on the proposed wind farm site. A wet drainage ditch is located 50 m southwest of turbine T10 and T11. The proposed surface water management will require control of sediment with infiltration to ground. There are no EPA streams within the footprint of the proposed 110 kV substation, though the proposed access track to it does cross one (River Black). On the substation site a dry drainage ditch will be rerouted to accommodate the substation.

The management of surface water will be carried out in accordance with the proposed design (see Appendix 2-2 (CEMP) as well as Drawings 11981-2025 and 11981-2040 to 2043 that accompany this planning application) and associated management features such as settlement ponds which will be installed during the construction phase and will be maintained through the operational phase. The drainage design will ensure that any surface water arising from the proposed project during operation will be contained and treated to ensure it can be dispersed out from the proposed wind farm site.

The layout of the proposed wind farm site has been designed to collect surface water runoff from access tracks, the borrow pit, hardstanding areas etc. and discharge to settlement/infiltration ponds within the proposed wind farm site boundary. Once the water has been filtered by the flow control device it then outfalls to an area of intact vegetation, which acts as a secondary filter. The outflow control from the settlement device is designed such that in an extreme event the device can overflow into adjacent vegetated areas. A drawing of the proposed surface water details and drainage design are shown in Drawings 11981-2025 and 11981-2040 to 2043 that accompany this planning application and further described in Appendix 2-6 (Surface Water Management Plan (SWMP)).

The drainage layout will be retained for the decommissioning phase of the project. The decommissioning phase will require maintenance of the drainage network by the owner/occupier of the site.

The protection of water quality and prevention of pollution events requires a sustained and concentrated input from the Contractor with regard to the provision and maintenance of sediment control structures. Construction will be carried out in accordance with a SWMP that has been prepared and is included as Appendix 2-6.

2.8.4 Preliminary Drainage Design

The proposed surface water drainage system utilises sustainable drainage devices and methods. Surface water management on wind farm construction sites utilises well-established and well-understood techniques. Although these management methods are designed based on the site specific requirements, they are recognised and proven in the industry, and they have a long-term record of a high level of efficacy. Wind farm construction has been ongoing in Ireland for over 30 years, and where the mitigation and methods are correctly implemented, water quality is generally not a significant issue over that period. The measures outlined in this project have been developed based on the CIRIA (Construction Industry Research and Information Association) C648 (Control of water pollution from linear construction projects) guidance, and that guidance has itself been developed based on site experience in Ireland and the UK over recent decades.

The purpose of the SWMP (Appendix 2-6) plan is to ensure that all site works are conducted in an environmentally responsible manner so as to minimise any potential adverse impacts from the proposed project on surface water quality. The plan incorporates the following specific objectives:

- Provide overall surface water management principles and guidelines for the construction phase of the proposed project;
- Address erosion, sedimentation and water quality issues; and
- Present measures and management practices for the prevention and/or mitigation of potential downstream impacts.

Construction Phase

During the construction phase, all run-off from construction areas will be controlled and treated to reduce suspended solids concentration prior to being discharged into the existing drainage network or overland.

Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. These flows will discharge diffusely overland, within the buffer zone before entering any watercourse. Regular cross flow and energy dissipation devices will be installed to divert overland flows and prevent these flows from entering the borrow pit/excavations. An overview of the surface water drainage system is provided in Figure 2-9.

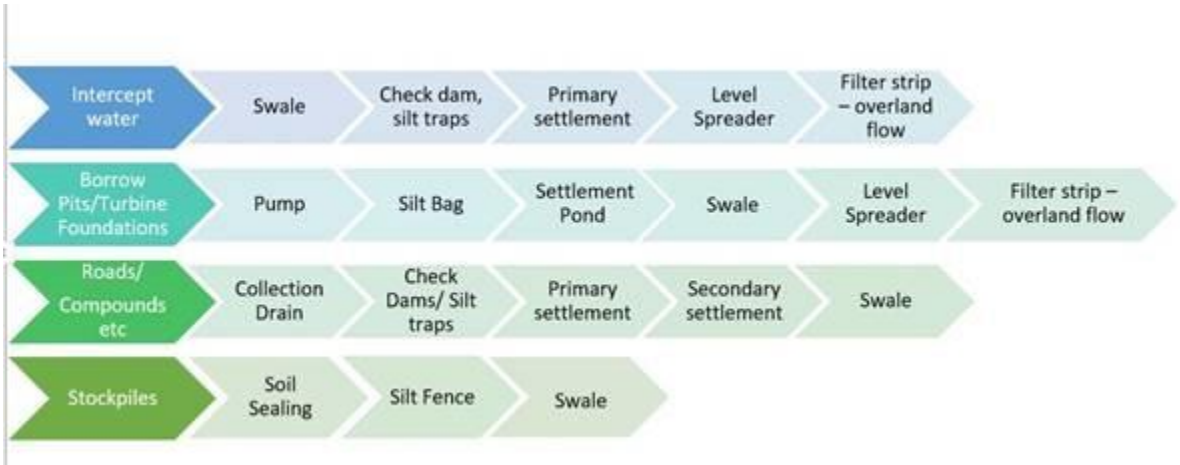


Figure 2-8 Treatment Train

A number of temporary settlement ponds will be established during the construction phase along access tracks and in areas of high construction activity (adjacent to turbine foundations, borrow pit, the temporary construction compounds etc.) to minimise the potential risk of silt laden run-off entering the drainage network. The settlement ponds will be designed to provide sufficient retention time and a low velocity environment to allow suspended solids to fall out of suspension prior to allowing the water to outfall to the receiving environment. Further information on the runoff calculations and site drainage is provided in Chapter 9. The proposed locations of the temporary settlement ponds, and details of same are shown on site layout drawings 11981-2040 to 2043 , which accompany this application.

Surface water runoff from hardstanding areas will be collected and discharged to associated settlement ponds adjacent to the proposed infrastructure. It will then be managed by gravity

flow at greenfield runoff rates (i.e. the runoff of the site at natural rates without development). Level spreaders/diffusers will then be used where overland discharge of water is carried out. The level spreader will prevent soil erosion at these locations by spreading out and slowing down the water, see Figure 2-10.

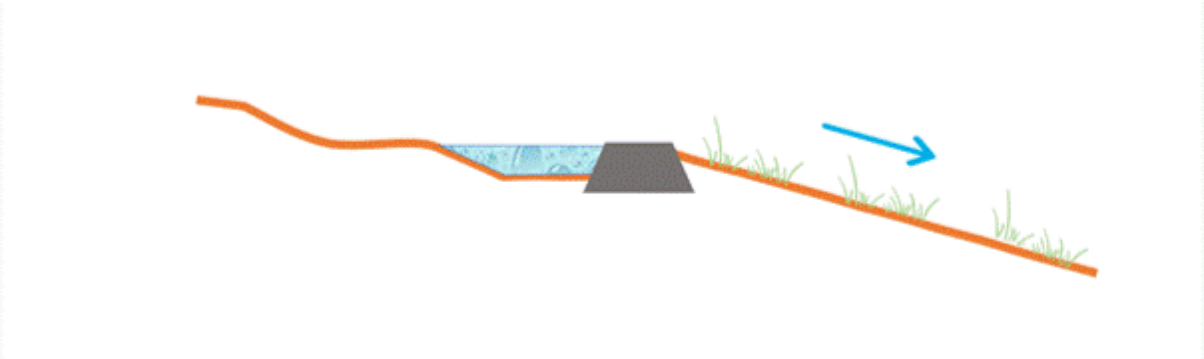


Figure 2-9 Conceptual Level Spreader and Filter Strip

Operational Phase

The drainage layout for the operational stage of the proposed project has been designed to collect surface water run-off from tracks, crane pads and hardstanding areas for treatment and to maintain the existing site discharge rates. Run-off arising from the proposed project will discharge into settlement ponds specifically constructed for managing surface water from the wind farm. Temporary settlement ponds for the construction phase (i.e. borrow pit, temporary construction compounds) will be removed at the end of the construction phase upon reinstatement of those features. Details and locations of the proposed operational phase settlement ponds are shown on the drawings 11981-2025 and 11981-2040 to 2043 accompanying this application.

Once treated in the settlement pond the treated surface water will then be allowed to spread across the adjacent vegetated lands via a level spreader/diffuser which will minimise any risk of soil erosion and allow further filtration of any remaining sediment particles. Level spreaders and existing vegetation will help slow and distribute runoff evenly. This treated water will ultimately percolate to ground or travel over-ground through vegetation and be assimilated into a drain or stream on site at appropriate greenfield run-off rates (i.e. the runoff of the site at natural rates without development). There will be no direct discharges from the wind farm. The measures outlined for this project are based on the CIRIA C648 (Control of water pollution from linear construction projects) guidance, and that guidance has itself been developed based on site experience in Ireland and the UK over recent decades.

Decommissioning Phase

The decommissioning phase will not require any significant works that will impact on the drainage network, as the drainage system will remain in place to serve the access tracks.

For each phase of development, the protection of water quality and prevention of pollution events requires a sustained and concentrated input from the appointed Contractor with regard to the provision and maintenance of sediment control structures. The drainage system is described in further detail in Chapter 9 of this EIAR and the SWMP (Appendix 2-6).

2.8.4.1 Silt Control

Silt control measures e.g. silt traps and silt bags, will be implemented as required during the construction process. Dewatering silt bags allow the flow of water through them while trapping any silt or sediment suspended in the water. The silt bags provide a passive non-mechanical method of removing silt from silt-laden water collected from works areas within a construction site. Silt bags are easily disposed of by a licensed waste contractor.

In specific locations, silt fences will be installed as an additional water protection measure around existing watercourses, particularly where works are proposed within the 50-metre buffer zone of a stream.

If required (if there is particularly wet weather and a high potential for silt runoff), a mobile silt-buster can be employed at the site (most likely at the borrow pit and potentially at the turbines), which uses advanced filtration technology to remove suspended particles from the water. This is very effective, with a small footprint, and is also very mobile with the potential to be moved around the proposed wind farm site. These units are recommended by the Scottish Environmental Protection Agency (SEPA) and the English Environment Agency (EA) for use on construction sites for the treatment of pumped dirty water.

Check dams (also known as silt traps) will be used as required throughout the proposed site drainage system to minimise sediment transport. These will slow down the movement of water in site drains, and thereby reduce the amount of sediment transported by the water. Stones are used at each dam to reduce soil erosion, to stabilise the dam and aid in filtration.

2.8.4.2 Culverts

Culverts will be required where site access tracks, crane pads and other proposed infrastructure might intersect the proposed site drainage network or existing small field drains. Indicative locations of the culverts are shown on the drawings 11981-2040 to 2043 , and are typically located near settlement ponds or at the lowest topographical points, which will be determined precisely at the detailed design stage. The proposed culverts would be plastic or concrete and approximately 400 mm in diameter (exact dimension subject to detailed design), a typical detail of which is shown in the planning drawings.

2.9 HEALTH & SAFETY

The proposed project will be constructed, operated and decommissioned in accordance with all relevant Health and Safety Legislation as described in the CEMP (Appendix 2-2).

Aspects of the proposed project that will present health and safety issues include:

- Health and safety aspects of construction activities;
- General construction site safety (e.g. slip/trip, moving vehicles etc);
- On site traffic safety (during construction, operational and decommissioning phases) associated with localised high road embankments;
- Traffic safety during the transport of Abnormal Indivisible Loads (AIL) such as turbine components to the site;
- Lifting of heavy loads overhead using cranes;
- Working at heights; and

- Working with electricity during commissioning.

The scale and scope of the project requires that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Safety, Health and Welfare at Work (Construction) Regulations. The PSDP role has been performed by TOBIN Consulting Engineers up to the end of the planning stage of the project.

The PSDP and PSCS appointed for the proposed project will be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations as described in the CEMP (Appendix 2-2).

None of the construction, operational or decommissioning phases of the proposed project are anticipated to cause a significant negative impact to safe practice of agricultural, forestry and commercial activities outside the development footprint.

It is not anticipated that the operation of the wind farm will present a danger to the public and livestock. Rigorous safety checks are conducted on the turbines during design, construction, commissioning and operation to ensure the risks posed to staff, landowners and general public are negligible.

Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits.

Signs will be erected at suitable locations across the site as required for the ease and safety of operation of the wind farm. Further details are provided in the CEMP (Appendix 2-2).

The components of a wind turbine are anticipated to have a useful lifespan of 35 years or more and are equipped with a number of safety devices to ensure safe operation during their lifetime. During the operation of the wind farm regular maintenance of the turbines will be carried out by the turbine manufacturer or appointed service company. A project or task specific Health and Safety Plan will be developed for these works in accordance with the site's health and safety requirements.

2.10 Wind Farm Operation

The proposed project is expected to have a lifespan of 35 years. This is the anticipated useful lifespan of wind turbines which are being produced for the market today. The lifespan of wind turbines has been increasing steadily in recent years and allowing this duration will improve the overall carbon balance of the development, therefore maximising the amount of fossil fuel usage that will be offset by the wind farm. Leaving the wind turbines in-situ until the end of their useful lifespan would make the most sense from an environmental viewpoint, particularly in relation to carbon savings. During this operational period the wind turbines will generally operate automatically, responding by means of anemometry equipment and control systems to changes in wind speed and direction.

The wind turbines will be connected together, and data relayed from the wind turbines to a control centre off-site. Each turbine will also be monitored off-site by the wind turbine supplier or Operations and Maintenance (O&M) service provider. The monitoring of turbine output, performance, wind speeds, and responses to any key alarms will be monitored at a control centre 24-hours per day.

Each turbine will be subject to a routine maintenance programme involving a number of checks and changing of consumables, including oil changes. In addition, there will be a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes requiring a crane. Typically, maintenance traffic will consist of four-wheel drive vehicles or vans. The electricity substation components and site tracks and drainage will also require periodic maintenance in accordance with appropriate operation maintenance plans, procedures and health and safety plans.

Once operational, it is estimated that the wind farm will support 2-3 full-time long term, high-quality technical jobs on site in operation and maintenance as well as a more significant number of jobs in ancillary functions (estimated to be a total of 21 jobs between direct and indirect employment based on research). See Chapter 5 for further information.

2.11 Wind Farm Decommissioning

As stated previously the wind turbines are expected to have a lifespan of 35 years. Following the end of their useful life, the wind turbines may be replaced with a new set of machines, subject to planning permission being obtained, or the project will be decommissioned fully, with the exception of the 110 kV substation (and associated 110 kV connection), turbine foundations, the proposed site access tracks and drainage.

Upon decommissioning of the proposed project, the wind turbines will be disassembled in reverse order to how they were erected. All above ground turbine components will be separated, cut up to allow them to fit on a standard articulated lorry and removed off-site for recycling.

Turbine foundations will remain in place underground, and hardstands will be covered in topsoil and reseeded, the plinth will be removed, and the foundation will be reinstated to grassland. Leaving the turbine foundations and hardstands in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete and stone from the ground could result in potentially needless environment nuisances such as noise, dust and/or vibration. There would be no real environmental benefit from removing the underground element of the foundations, as the majority of the concrete is underground, stable and inert if untouched. The site tracks will be in use for additional purposes to the operation of the wind farm (e.g. for agricultural access) by the time the decommissioning of the project is to commence, and therefore it is more appropriate to leave the site tracks in situ for future use.

The lidar unit will be disassembled in reverse order to how it was installed. It will be removed from site for reuse or recycling. The hardstand area and concrete foundation will remain in situ and (as per turbine hardstands) will be covered in topsoil and reseeded. The proposed on-site control building will also be removed and reinstated to agricultural lands in the same way, while the underground 33 kV private cable will be left in the ground for the same reasons as the turbine foundations mentioned above.

The proposed 110 kV substation and all the associated transmission infrastructure i.e. underground 110 kV cables and overhead line interface masts will not be removed at the end of the useful life of the proposed wind farm infrastructure as it will form part of the national electricity network and will be managed by EirGrid/ESB. Therefore, the substation will be retained as a permanent structure and will not be decommissioned.

A detailed decommissioning plan will be agreed in advance of works taking place with the local planning authority. A decommissioning plan is contained within the CEMP (Appendix 2-2).