2 DEVELOPMENT DESCRIPTION

2.1 INTRODUCTION

This chapter of the EIAR provides a description of all elements of the proposed Dyrick Hill Wind Farm (the Development) which includes all works within the redline boundary. This chapter also provides a description of the work required along the proposed grid connection route and turbine delivery route which are outside the redline boundary and which, together with the works within the redline boundary, are defined as the Project and form the basis of the assessments presented within chapters 5 to 15. This chapter provides details of the construction, operational and decommissioning phases.

This chapter includes an overview of the Project followed by a detailed description of the main components and their method of construction. Measures that have been built into the design of the Project to reduce environmental effects, also known as '*embedded mitigation measures'*, are set out in the various technical chapters and in this chapter. In addition to these embedded mitigation measures, Chapters 5 to 15 also present mitigation and enhancement measures where specifically relevant to their assessment topic.

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

- Construction Environmental Management Plan (CEMP) in **Appendix 2.1**
- Forestry Report in **Appendix 2.2**
- Deed of covenant for the farmhouse north of the public road (H106) **Appendix 2.3**
- TLI Technincal Notes in **Appendix 2.4**

Common acronyms used throughout this EIAR can be found in **Appendix 1.2**.

2.1.1 Statement of Authority

Jennings O'Donovan & Partners Ltd. (JOD) have extensive experience in all aspects of wind farm development, from design and planning stages through to construction. JOD have been active as engineering consultants in the wind energy market in Ireland since 1998 and have completed numerous wind farm projects, varying from single wind turbine installations to large-scale, multi-turbine developments with a total of over 2,000 MW generation capacity.

This section has been prepared by Mr. Ryan Mitchell and Mr. Justin Lohan of JOD. Mr. Mitchell has a Bachelors' Degree in Animal Conservation and Biodiversity, has a strong proven background in ecology with 5 years' of experience working in the sector. He is

experienced in report writing, EIAR chapter writing and project management working on EIA Reports (EIAR) for wind farm developments in Ireland.
Mr. Lohan has a Bachelors' degree in Environmental Science and Technology. He also has almost 20 years' experience working in the construction and environmental sectors. He is experienced in report writing, EIAR chapter writing and project management working on EIARs for wind farm developments in Ireland.

The chapter has been reviewed by Mr. David Kiely of JOD. Mr. Kiely has 35 years' experience in the civil engineering and environmental sector. He has obtained a bachelor's degree in Civil Engineering and a Master's in Environmental Protection, has overseen the construction of over 40 wind farms and has carried out numerous soils and geology assessments for EIARs. He has been responsible in the overall preparation of in excess of 20 EIARs.

2.2 PROJECT DESCRIPTION

Planning permission is being sought by the Developer for the construction of 12 wind turbines, a Permanent Met Mast, 110kV on-site substation and all ancillary works and the construction of an underground Grid Connection to Dungarvan 110kV Substation, Co. Waterford.

The Project will comprise of the following main components:

- Erection of 12 no. 6.0-7.2 MW wind turbines (Note* this is the current output available for turbines of this size. It is possible that with improvements in technology, the output may increase at the time of construction.) with an overall ground tip height of 185m. The candidate wind turbines will have a 162m rotor diameter and a hub height of 104m.
- Construction of Crane Hardstand areas and Turbine Foundations.
- Construction of new internal site Access Tracks and upgrade of existing site roads, to include passing bays and all associated drainage.
- Construction of a new wind farm site entrance with access onto the R671 regional road in the townlands of Lickoran.
- Improvement of existing site entrance with access onto local roads in the townlands of Broemountain.
- Improvements and temporary modifications to existing public road infrastructure to facilitate delivery of abnormal loads and turbine delivery.
- Construction of one Temporary Construction Compound with associated temporary site offices, parking area and security fencing.

- Development of on-site Borrow Pit.
- Installation of one Permanent Meteorological Mast with an overall height of 104m.
- Development of a site drainage network.
- Construction of one permanent 110 kV Substation.
- All associated Wind Farm Internal Cabling connecting the wind turbines to the wind farm substation.
- All works associated with the connection of the wind farm to the national electricity grid, which will be via 110 kV underground cable connection approximately 16km in length to the existing Dungarvan 110 kV Substation.
- Upgrade works on the Turbine Delivery Route from Waterford Port.
- Ancillary forestry felling to facilitate construction and operation of the Development.

A 15-year planning permission and 40-year operational life from the date of commissioning of the entire wind farm is being sought.

2.3 SITE LOCATION AND ENVIRONS

2.3.1 Introduction / Existing Land Use

The Site, as shown in **Figure 2.1**, is located within an area of farmland, forestry and upland heath, and is located within the townlands of Ballynaguilkee Upper, Broemountain, Corradoon, Dyrick, Lickoran, Lickoranmountain, Lisleagh, Lisleaghmountain, Lyrattin and Scartmountain. The Site is located 43km west of Waterford City, 55km northeast of Cork City, and 12.9km northwest of Dungarvan.

The proposed Grid Connection passes through the townlands of Broemountain, Lyrattin, Farnane Lower, Farnane Upper, Castlequarter, Mountaincastle South, Carrigaun (Mansfield), Langanoran, Sleadycastle, Knockaunnaglokee, Garryduff, Colligan More, Garryclone, Colliganwood, Ballymacmague North, Ballymacmague South and Killadangan.

Temporary works will be required to accommodate the delivery of the turbine components. These temporary works within the redline boundary on third party lands are included as part of this application and are assessed as part of this EIAR. These are located in the townlands of Lickoran, Lisleagh, Ballynaguilkee Lower, Kilcooney and Clooncogaile,

The Redline Boundary extends to 463ha, and comprises a mixture of farmland, forestry and upland heath. Much of the lands are in private, third-party ownership, while a portion of the site is shared land (commonage).

There are 112 Eircodes within 2km of the proposed turbines. A significant minimum separation distance from all occupied dwellings of 740m has been achieved with the Project design. With the exception of H92, which is in ownership of a financially involved third party and is located 710m from (T09). All houses located within 2km of the proposed turbines are shown on **Figure 1.3**. One building which, at the time of the application, is an occupied dwelling only has a separation distance of 320m. However, as this property will not be occupied from start of construction therefore it has not been assessed as part of this EIAR. Written confirmation from the landowner that the property will not be used as a residential dwelling from the start of construction of the Wind Farm has been included at **Appendix 2.3**.

2.3.2 Removal of Forestry

The Site contains approximately 66.7 ha of commercial forestry. Turbines T04, T05, T06, T08 and T09 are surrounded by forestry. Therefore, tree felling will be required as part of the project. To facilitate the Access Tracks, civil works and Turbine Hardstands. 8.1Ha of forestry will need to be clear-felled. The felling area proposed is the minimum necessary to construct the development and to comply with any environmental mitigation (bats in particular).

To ensure a tree clearance method that reduces the potential for sediment and nutrient runoff, the construction methodology will follow the specifications set out in the Forest Service Forestry and Water Quality Guidelines (2000) and Forest Harvesting and Environmental Guidelines (2000).

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

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

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

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

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

This forestry to be clear felled is mostly consisting of Sitka Spruce and additional broadleaves and is expected to take up to 3 months. This forestry will need to be replaced.

Detailed consideration of the approach to afforestation requirements associated with the Project is attached in **Appendix 2.2**. It should be noted that the clear-felling of trees in the State requires a felling licence. The associated afforestation of alternative lands equivalent in area to those lands being permanently clear-felled is also subject to licensing ('afforestation licensing'). The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing. The developer commits that a felling and afforestation licence(s) are put in place and therefore (as discussed above) this ensures the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority.

2.3.3 Wind Farms and Solar Installations in the Area

Figure 2.2 shows the location of proposed, pre-planning, permitted, and operational wind farm installations within a 20km radius of the proposed turbines and **Table 2.1** below provides further information on these developments. The nearest operational wind farm is Woodhouse Wind Farm which is located 10.8km to the south of the Site. Coumnagappul which is currently in pre-planning stage has been included within the EIAR study as the Developer is also the developer of this wind farm.

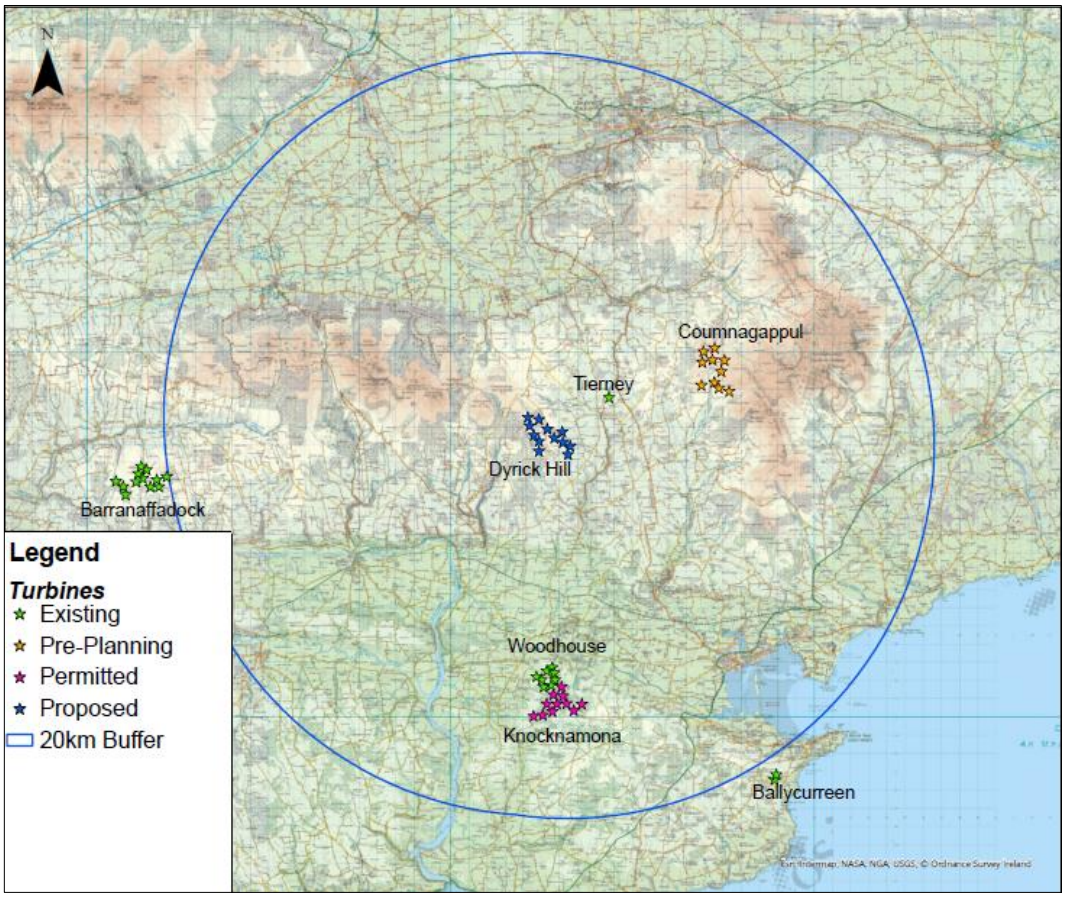

Figure 2.2: Location of proposed, pre-planning, permitted, and operational wind farm installations within a 20km radius.

Table 2.1: Wind Farms within 20km of the Proposed Dyrick Hill Wind Farm

Wind Farm Name	Number of Turbines	Distance and Direction from the Development Site Boundary	Status
Coumnagappul Wind Farm	11	7.1km east of site	Pre-planning
Tierney Single Turbine	1	3.5km northeast of site	Operational
Woodhouse Wind Farm	8	10.8km south of site	Operational
Knocknamona Wind Farm	8	11.6km south of site	Consented
Barranafaddock Wind Farm	9	19.3km west of site	Operational
Ballycurreen Wind Farm	2	20km southeast of site	Operational

2.3.4 Land Ownership

The majority of the Site is located on lands under the ownership of third-party private landowners who have consented to the application and the Development. A portion of the Site is shared land (commonage). All stakeholders party to the use of the commonage lands are contractually involved in the proposed Development.

2.4 WIND RESOURCE

The Site experiences high average annual wind speeds, primarily on account of its elevation. The Irish Wind Atlas produced by Sustainable Energy Ireland shows average wind speeds for the country and it shows that wind speed resource at the Site is consistent with a windfarm development (5.2m/sec at 30m, 6.6m/sec at 75m, 7.0m/sec at 100m and 7.9m/sec at 150m/s).

A Section 5 Declaration Exemption was sought in December 2021 to determine the exempted development planning status of installing an 80m high temporary meteorological mast at the Dyrick Hill Site. This exempted development status was confirmed by Waterford City and County Council on the 13th June 2022. A meteorological mast has been installed on the Site since December 2021.

2.5 SITE INFRASTRUCTURE AND CONSTRUCTION

2.5.1 Proposed Layout Design

The layout of the Development has been designed to minimise the potential environmental effects of the wind farm while utilising the maximum energy yield from the Site's wind resource. The layout design was informed by the following constraints and buffers (notification zones).

- Distance to watercourses of at least 20m.
- Distance to land drains of at least 10m.
- Distance to archaeological monuments and structures of at least 60m.
- Distance from turbines to inhabited houses of 740m (without consented permission).
- Distance from turbines to inhabited house of 710m (Consented permission).
- Distance of turbines to active bat roosts of 200m.
- Avoidance of ground slopes of greater than approximately 10 - 14%.
- Avoidance of existing telecommunications infrastructure.
- Avoidance of sensitive habitats.

The overall layout of the Site is shown in **Figure 2.1** in **Volume III**. This figure shows the proposed locations of the wind turbines and associated hardstanding areas, Electrical Substation, temporary construction compound, internal Access Tracks and the Site entrances. The ITM coordinates of the turbines are listed in **Table 2.2**.

Table 2.2: Turbine ITM Coordinates

Turbine No.	ITM Easting (m)	ITM Northing (m)
T01	616513.1	604875.6
T02	616391.4	604418.8
T03	616112.2	605075.7
T04	615637.9	605321
T05	616076.9	605659
T06	615263.4	605810.7
T08	614802.4	606340.6
T09	614799.7	604593.7
T10	614804.6	605146.2
T11	614522.2	605476.4
T12	614284	605998.4
T13	614188.3	606459.8

2.5.2 Wind Turbine Technology

The proposed turbines will be of typical modern design and will be a three-bladed, rotor up wind of the tower, variable speed, pitched blade regulated machine. Turbine appearance will be a matt non-reflective finish in a white, off-white or grey colour. The foundation-to-tip height will be 185m.

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

Each turbine will have an installed generator with a maximum capacity of 6.0- 7.2 MW. The turbines proposed contain a (two planetary stages) gearbox. The final turbine will be chosen in a competitive tendering process as part of the Project financing process, after all necessary consents have been secured.

The final choice of turbine model will be Vestas V162 6.0 – 7.2MW model wind turbine. This turbine model has been included for the purposes of EIA and planning approval. An indicative schematic drawing of the candidate turbines is shown on **Figure 2.3**.

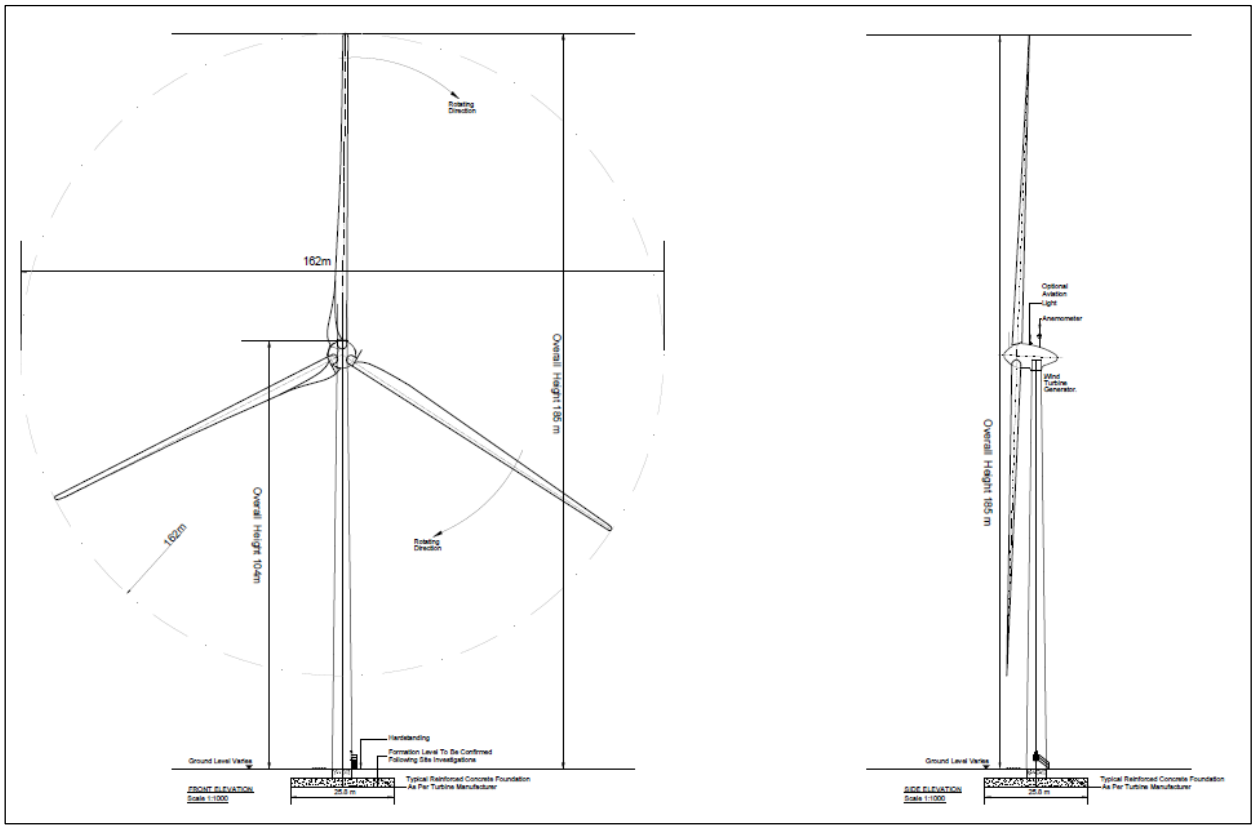

Figure 2.3: Vestas V162 6.0 – 7.2MW model turbine

For the purposes of the assessments, Vestas (Model: V162 6.0 – 7.2MW) has been selected based and is presented in **Table 2.3**.

Table 2.3: Turbine Specification Vesta (Model: V162-6.0 – 7.2MW)

Turbine Parameter	Dimensions (Maximum)
Turbine Blade Tip Height	185m
Rotor Diameter	162m
Hub Height	104m

2.5.3 Turbine Foundation and Turbine Hardstands

All turbine suppliers have a requirement for a turbine hardstand area to be constructed beside each turbine. The general layout of the turbine hardstand is designed to

accommodate the delivery, laydown, and assembly of turbine components (in particular rotor assembly) prior to turbine lifting and assembly and is shown in **Figure 2.4**. The turbine hardstands are needed to support the cranes during turbine construction, the operational and maintenance phase, and for decommissioning. The turbine hardstands will be constructed first and used to facilitate turbine foundation construction, such as steel reinforcement delivery and pouring of concrete.

Construction of the turbine and hardstands will require the excavation of overburden material to the noted area and depth, the laying of a geotextile material on the formation surface and placing of engineered stone and a top dressing. The main turbine hardstands will be 3,395m^2 in area and will be 2.25m in depth, depending on the local bedrock profile and the varying soil depth. In total, this represents a surface area of 40,740m^2 for 12 turbines and a material displacement volume requirement of approximately 12,222m^3.

The Turbine Foundations will be 25.5m in diameter and have a depth of approximately 2.5m. The central part of the foundation (plinth) as seen on **Drawing No. 6497-PL-702** will be 6m in diameter and will be raised from the main Turbine Foundation below ground level. It will encompass a cast-in insert or bolts to connect to the bottom of the turbine tower and reinforced bar structural elements.

The volume of concrete and steel required for each turbine foundation will be 814m^3 and 90 tonnes respectively. The area around and above the turbine foundation will be backfilled with compacted granular material and the only portion exposed in the long term will be the central foundation section.

Depending on the results of detailed site investigations (post consent), the possibility of installing rock anchors will be explored as a means of reducing the footprint and material volumes of the turbine foundations. The application of traditional gravity emplacement foundation design has been considered for EIA purposes. This represents a worst-case scenario, but it should be noted that the predicted environmental effects could be reduced where rock anchor foundations could be used for some of the turbine foundations.

Based on the results of peat probing and geotechnical assessments to date, mineral soil is not deep enough to require the piling of turbine hardstands. Therefore, the construction method for all of the turbine hardstands will be via an excavated soil overburden approach.

The construction methodology for each of the turbine foundations will depend on the strength and depth of the substrata specific to each location. Turbine foundations will need to be taken down to competent bearing strata by excavating through the subsoil, and rock where necessary.

A typical method of construction for turbine foundation is described as follows:

- Install temporary drainage around the perimeter of the excavation area.
- Excavate soil and rock within the foundation design footprint area.
- Back fill the foundation with excavated rock.
- Form a level working area to build the foundation.
- Install formwork and reinforcement.
- Pour the concrete.
- Once the concrete has set and the earthing system is in place, backfill the foundation with suitable excavated material.
- Use the soil to build up the area around the turbine foundation.

2.5.4 Access to the Site

There are two proposed Site entrances associated with the Development; Site Entrance 1 is an existing site entrance located in the southeast of the Site located off R671 road and Site entrance 2 is an existing site entrance located in the southwest corner of the Site off the L1027 Local Road. The Turbine Delivery Route and the Construction Haul Routes will utilise Site Entrance 1. The site entrances are shown on **Figure 2.1**.

It is proposed that the turbine nacelles, tower hubs and rotor blades will be landed in Belview Port (Port of Waterford). From there, they will be transported to the Site via the N29, N25, N72, and R671 as shown on **Figure 2.4**.

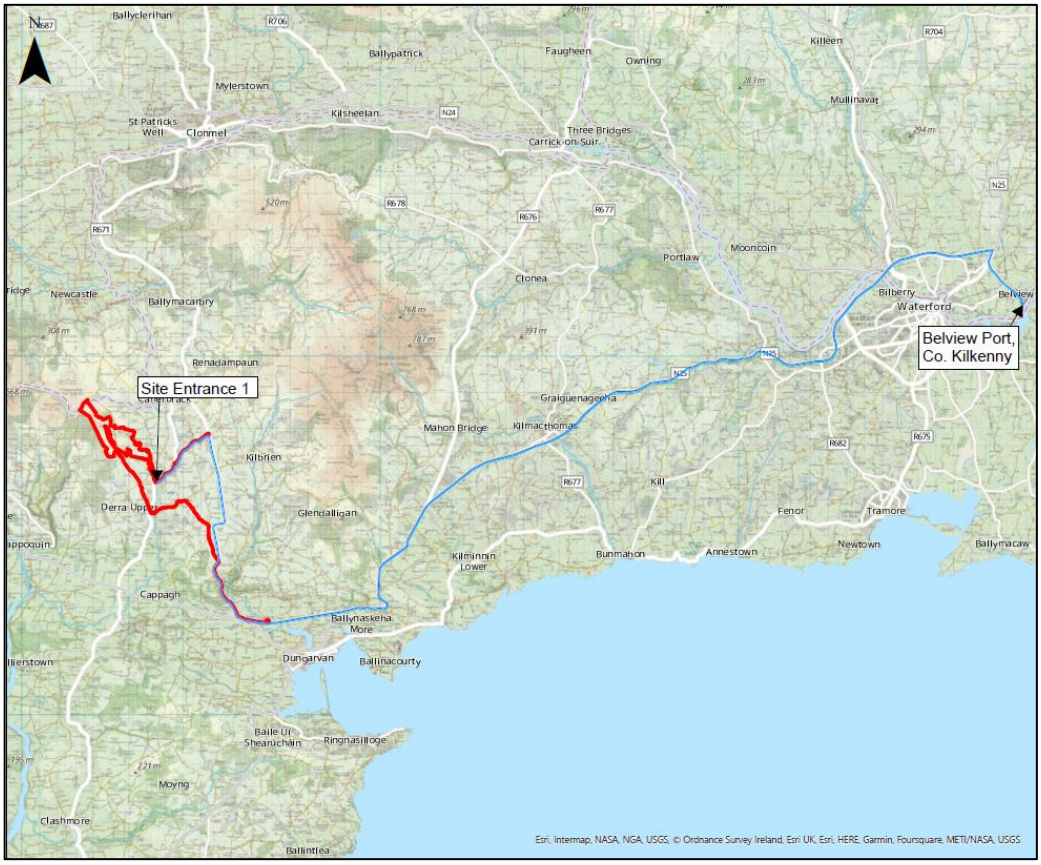

Figure 2.4: Dyrick Hill Turbine Delivery Route

The delivery of the turbines to the Site will require co-ordination with a number of statutory bodies including Transport Infrastructure Ireland (TII), Waterford City and County Council, and An Garda Síochána. All details will be set out in the Traffic Management Plan. This will be developed prior to construction.

There are 3 areas on the haul route that will require works in third party lands. These areas have been assessed and are shown on **Table 2.4**.

Table 2.4: Areas of Works on Haul Route in Third Party Lands

No.	Area	ITM (Easting)	ITM (Northing)	Description
1	R672 / L5071 Junction	620394	605624	A swept path assessment has been undertaken and indicates that loads will need to utilise an offline track in order to 'cut the corner'. A load bearing surface should be laid in **third party land** and a stone wall, trees and wire fence should be removed. Embankment to be reprofiled. Detailed design of the proposed track is required.

No.	Area	ITM (Easting)	ITM (Northing)	Description
				An indicative road edge has been provided from this point to the site entrance based on the available aerial mapping where the road is considered to be greater than 4.5m. An indicative 4.5m has been provided for the remaining section as this is the minimum required running width required by turbine manufacturers. All marking up is beyond this 4.5m road width. A clearance width of 5.5m is required. **Third party land** may be required to achieve the above mitigation.
2	L5071 North East of Clooncogaile	619481	605121	A swept path assessment has been undertaken and indicates that loads will oversail the verge on the inside of the left bend where the embankment will need to be reprofiled. **Third party land** required.
3/4	River Finisk Bridge / R671 Junction	618628	604027	A swept path assessment has been undertaken and indicates that loads will oversail into **third party land** on both sides of the road and trees / vegetation should be cleared throughout the section. A load bearing surface will be required in the eastern verge on approach to the bridge. Suspension settings should be raised to allow oversail of the bridge parapets by loads and care should be taken to ensure adequate clearance is still available to overhead utilities. Discussions with the council should be held to ensure that the bridge has suitable bearing capacity for the proposed loads. Loads will overrun the western verge following the bridge where the land will need to be reprofiled and a load bearing surface laid. A total of seven utility poles and two road signs will need to be removed through the section. Loads will turn right onto the unclassified road to the south of the bridge. This road will require full reconstruction and widening to meet the turbine manufacturer minimum 4.5m running width and 5.5m clearance width. Land reprofiling will be required on both sides of the road and a retaining structure may be required on the inside.

2.5.5 Site Access Tracks

The Site Access Tracks are necessary to allow access for cranes and delivery trucks during construction of the Development and also during servicing/repairs to the wind turbines. The existing Site Access Tracks will be used as far as possible to minimise additional land take.

These tracks will be upgraded as necessary so that the minimum width will be 5m. Site Access Tracks will be wider at bends and at passing bay locations where a width of 5.5m is provided. Gradients will, be limited to 1 in 7 (approximately 12%) and a stone layer provided, so as to provide a good grip during wet weather. Gradients of site Access Tracks will not exceed this value.

All Access tracks shall be free from overhead and side obstructions to provide a clear corridor. The larger components require 9.5m overhead minimum clearance for turbine delivery.

Approximately 1,780m of the existing Site Access Track length will be used for the Development. Site Access Tracks are shown on **Figure 1.2**. The upgraded Site Access Tracks will be approximately 8,900m^2 in surface area and will require approximately 2,937m^3 of stone material.

There will also be 10,684m of new Site Access Tracks required for the Development. These will be constructed to provide a width of 5m and will cover an area of 53,800m^2 and require c.3,526m^3 of rock. These roads will be excavated to firm bearing strata and constructed using rock from the turbine foundation excavations or imported to Site from a nearby quarry as outlined in **Table 2.5**.

The Site Access Track layout follows the existing access track into the Site as far as possible, avoids environmental constraints, and follows the natural contours of the land. Every effort has been made to minimise the length of track necessary.

Site Access Tracks will have to be maintained during the construction phase. When weathered, the stone should not contain any constituents which may be harmful to the environment; in particular, surface water and groundwater.

Turbine hardstand areas, in addition to turning areas, are required in the vicinity of each turbine location. Turbine hardstand areas must allow two cranes to work in the vicinity of a turbine.

2.5.6 Rural (Local) Electricity Supply

A rural/local supply will be required as a back-up power supply to the substation for light, heat and power purposes. The rural/local supply will be designed and constructed by ESB Networks. The rural/local supply will have an associated step-down transformer (i.e. MV to LV) and will enter the substation building by underground cable and terminate onto the control building distribution board.

2.5.7 Electrical Substation, Control Building and Associated Compound

It is proposed to construct one 110kV electricity substation within the Site, as shown on **Figure 2.1**. This will provide a connection point between the wind farm and the grid connection node point at the existing Dungarvan 110kV substation. Electricity transmitted between the turbines and the substation on the Site will be at 110kV.

The substation will serve two main functions:

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

The construction and electrical components of the substation will be to EirGrid specifications within the parameters assessed. The substation compound will be 7,749m^2 and will be 2m in depth and will be constructed from engineered stone material using similar construction techniques as for the crane hardstands. The overall compound will be enclosed by a 2.65m high fence and will contain a single building, ancillary equipment, including the transformers, switch gear, fault protection, metering, car parking and other ancillary elements necessary for the operation of the Development.

The substation building will contain control elements of the Development. The control components housed at the substation will include metering equipment, switchgear, the central computer system and electrical control panels. A spare parts store and workshop will also be located in the substation. The control building will be a single story pitched roof structure with traditional rendered finishes. Details of the substation building are shown on **Figure 2.5**. The appearance and finish of the substation building will be similar to an agricultural building with a slated roof and nap plaster finish proposed. It will have a suitably sized footpath around it and an adjacent parking area. The final finish of the control building will be an off-white or grey colour.

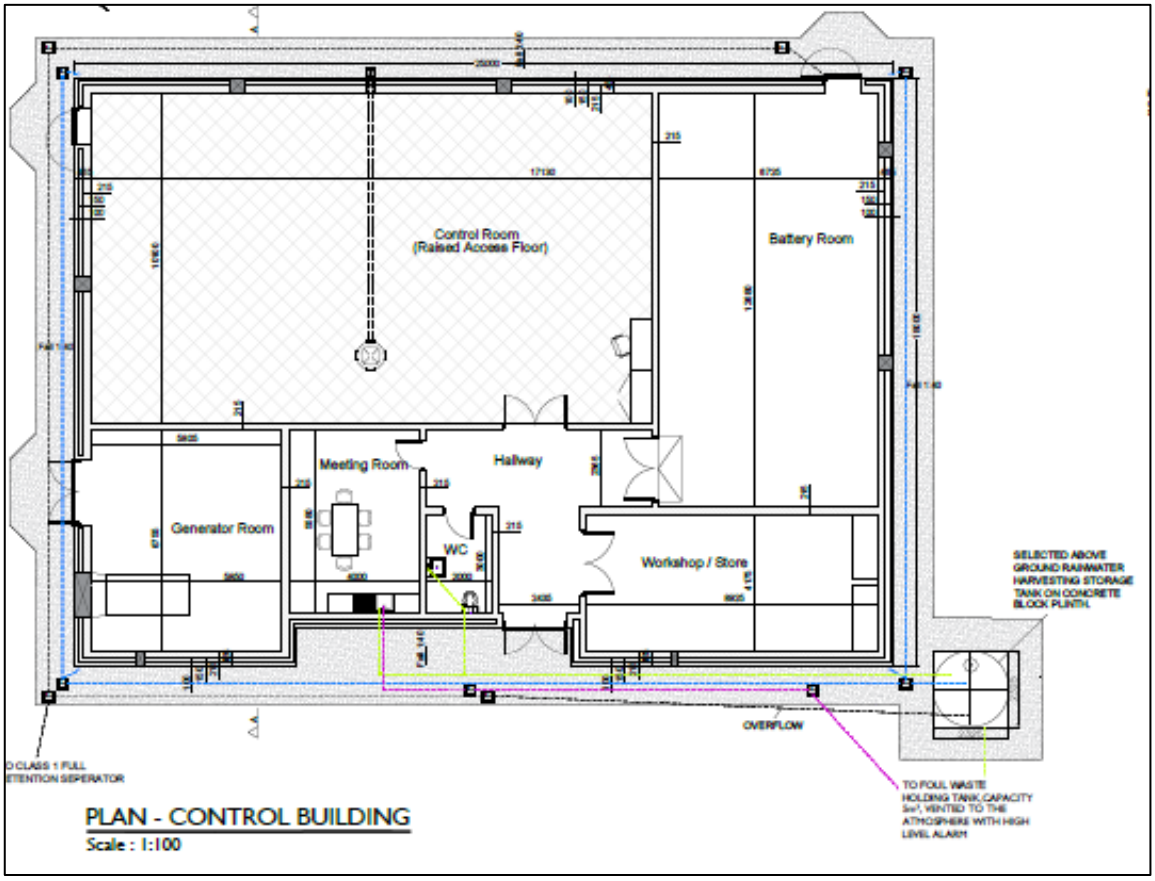

Figure 2.5: Details of the substation control building

The control building will contain an ESB room, control room, switchgear room, small store, an office and toilet. There will be four lightning monopole protection masts which will be up to approximately 18m in height and associated site works. Warning / health & safety signage will be displayed as is normal practice for such installations. Motion sensitive lighting only will be used. It is proposed to install a rainwater harvesting system as the source of water for toilet facilities, with potable water being brought on Site in bottles. Wastewater from the staff welfare facilities in the control building will be collected in a sealed storage tank, fitted with a high-level alarm. All wastewater will be tankered off-site by a licensed waste collector to a wastewater treatment plant. There will be no onsite treatment of wastewater.

A telecommunication antenna will be fixed externally to the substation control building for communication and control purposes (e.g. for the Supervisory Control and Data Acquisition (SCADA) System) for the Developer, turbine suppliers and ESB networks. There will be a small area outside the compound and adjacent to the Access Track that will be a hard-surfaced area for operational and maintenance for 4 parking spaces.

2.5.8 Transformers and Internal Cabling

Each turbine will be connected to the substation on Site via underground MV cables. There will be approximately 10,997m of internal cabling. 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 substation compound will be run in cable ducts 1m below the ground surface within the Site Access Tracks and/or their verges.

2.5.9 Grid Connection

A Grid Connection will be sought from the grid system operators by application to EirGrid. The substation will connect via underground 110kV cable. The route of this underground Grid Connection is provided in **Figure 2.6.** The overall length of the Grid Connection between the substation and the existing Dungarvan 110kV substation is 16.013km, of which, 268m is within the site of the Development, and 15,630m is located along the public road corridor. The 115m is located at Dungarvan substation.

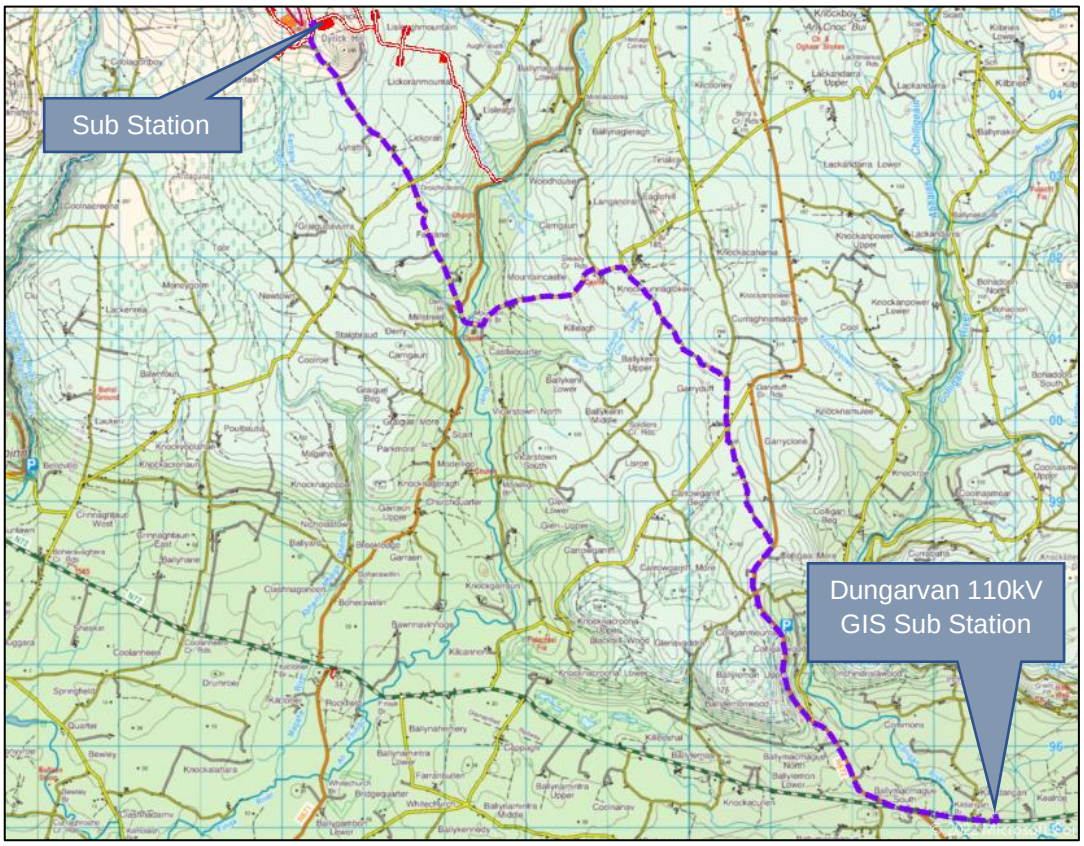

Figure 2.6: The route of this underground Grid Connection

The Grid Connection will be constructed to the requirements and specifications of EirGrid. The electricity will be transmitted as a three-phase power supply meaning there will be three

individual conductors in each cable circuit. The three conductors will be laid in separate ducts which will be laid in accordance with EirGrid functional specifications for 110kV underground cables. The width of a 110kV cable trench with a trefoil formation will be 600mm. The depth of the trench for 110kV cables is 1.335m. A separate duct will be provided within the trench for fibre optic communications.

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

- All relevant bodies i.e. EirGrid, Gas Networks Ireland, Eir, Local Authorities, Irish Water etc. will be contacted and up to date drawings for all existing services will be sought.
- Immediately prior to construction taking place, the area where excavation is planned will be surveyed using a Cable Avoidance Tool (CAT) and all existing services will be verified. Temporary warning signs will be erected.
- Clear and visible temporary safety signage will be erected all around the perimeter of the live work area to visibly warn members of the public of the hazards of ongoing construction works.
- A 13-tonne rubber tracked 360-degree excavator will be used to excavate the trench to the dimensions of 600mm wide by 1.335m deep.
- A silt fencing filtration system will be installed on all existing drainage channels for the duration of the cable construction to prevent contamination of any watercourse.
- Once the trench is excavated, a 50mm deep base layer of sand (in road trench) or 15 Newton CGBM B concrete (off road trench) will be installed and compacted. All concrete will be offloaded directly from the concrete truck into the trench.
- uPVC ducts will be installed on top of the compacted base layer material in the trench.
- Once the ducts are installed, couplers will be fitted and capped to prevent any dirt entering the unjointed open end of the duct.
- The as-built location of the installed ducts will be surveyed and recorded using a total station/GPS before the trench is backfilled to record the exact location of the ducts.
- The co-ordinates will be plotted on as-built record drawings for the grid connection cable operational phase.
- When ducts have been installed in the correct position on the trench base layer, sand (in road trench) or Lean-mix CBM4 (CL1093) (off road trench) will be carefully installed in the trench around the ducts, so as not to displace the duct, and compacted.
- Spacer templates will be used during installation so that the correct cover of duct surround material is achieved above, below and at the sides of the duct in the trench.
- A red cable protection strip will be installed above duct surround layer of material and for the full length of the cable route.

- A layer of Lean-mix CBM4 (CL1093) (in road) or excavated material (off road) will be installed on top of the duct surround material to a level 300mm below the finished surface level.
- Yellow marker warning tape will be installed for the full width of the trench, and for the full length of the cable route, 300mm from the finished surface level.
- The finished surface of the road will then be reinstated to its original condition.
- Precast concrete cable joint bays (junction boxes) will be installed within the excavated trench.
- The junction boxes will be backfilled and the finished surface above the junction box reinstated as per its original condition. The cable junction boxes will be re-excavated a second time during cable pulling and jointing, after which the finished surface above the joint bays will be reinstated again to its original condition.
- When trenching and ducting is complete, the installation of the Grid Connection cable will commence between the substation and the existing 110kV substation at Dungarvan.
- The underground cable will be pulled through the installed ducts from a cable drum set up at one joint bay and, using a winch system which is set up at the next joint bay, the cable will be pulled through.
- The cables will be jointed within the precast concrete cable junction box. (Joint Bay)
- The finished surface above each cable joint bay is reinstated to its original condition.

2.5.9.1 Joint Bays

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

The joint bay locations have been dictated by suitable terrain and access to facilitate the operation of cable pulling equipment at any phase of the development and future operation of the installation in accordance with the EirGrid specifications.

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

2.5.9.2 Trench Layout

The trench layout will be as per the appropriate EirGrid drawings. The specification of Waterford City and County Council will be followed for the excavation and reinstatement of

the ducted cable trenches. When the trench has been excavated to the required depth and all loose material and protruding stones have been removed, a bedding layer of sand will be laid and compacted to a minimum thickness of 65mm.

2.5.9.3 Joining Ducts

All joining ducts shall be laid in straight lines to even gradients. Once the ducts have been installed and backfilled with lean-mix concrete and with Clause 804 stone the duct run will be thoroughly cleaned by pulling the appropriate size of EirGrid approved duct brush through the duct.

Details of the construction methodology are summarised below:

- Preparatory Works
  - Preparatory Trial Pit Survey along the cable route
  - Access to the start point and setting out
  - Access to joint bays
  - Silt Attenuation Features and watercourse set back buffer
  - Joint Bay Excavation
- Trenching Works
  - Storage of Materials
  - Trench Operations
  - Managing excess material from trench works

2.5.9.4 Directional Drilling Works

There are total of 3 HHD which are required along the Grid Connection route, these include 2 no. water crossings and a HHD is required for a cattle underpass. All crossings will be constructed by means of directional drilling technology. The crossings will comprise 4 x 110mm HPPE pipes/ducts each directionally drilled. Two separate excavations will be made to a depth of 2 metres to accommodate the directional drilling launch and reception pits. Spoil arisings will be stored adjacent to the pit locations for reinstatement, at a minimum 25 metre buffer distance from the watercourse. These temporary spoil mounds will have side slopes battered back to 1:1. Silt fencing will to be erected around the base of each temporary mound. The excavation launch and reception pits will be reinstated on completion of drilling and jointing operations.

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

The drill position is always known to the operator and the drill can be manoeuvred in 3 planes / axis. A drilling lubricant will be required. This will be delivered directly to the drill head. This will be ultrabore non-toxic bentonite slurry mixture. Once the conduit is completed, the drill head is exposed at the reception pit and removed. The drill rods are connected to the duct pipe and the drill is reversed, pulling the pipe back through the conduit.

A spoil volume of 4m^3 will be excavated for each 100m run of 4 pipes. This spoil will be largely subsoil material. The 100m arisings will exit the launch pit within the bentonite slurry mixture. A mobile bunded tank will be located next to the launch pit into which the arisings will be pumped. This will be stored outside of the 25m watercourse buffer zone.

The following measures will be implemented during the directional drilling works:

- No in-stream works will be permitted.
- Works shall not take place at periods of high rainfall and shall be scaled back or suspended if heavy rain is forecast.
- A floating hydrocarbon boom and spill kit will be employed.
- Plant will travel slowly across bare ground at a maximum of 5km/hr. If truck rutting is observed, then bog mats or rolling road will be employed.
- Silt fencing will be erected at a setback distance of 5m during excavation.
- Any excess construction material shall be removed from the works areas and disposed of in a fully licensed landfill.
- No re-fuelling of machinery will take place on site or within 50 metres of any watercourse.
- All construction workers will be given a toolbox talk addressing the environmental topics concerning the drilling prior to commencement of construction.

2.5.10 Borrow Pit

One borrow pit will be constructed as part of the Development. The borrow pit will be located on the commonage land and will provide excavated material to provide fill for the Site Access Tracks, Turbine Hardstands, Turbine Foundations and temporary compound area. The borrow pit will be excavated as required. Where rock and fill material is available from the excavation of Turbine Foundations, this material will be used first. The use of the on-site borrow pit will reduce the environmental effect of other aspects of the Development such as by reducing the need to transport material to the Site. The location of the borrow pit can be seen on **Figure 2.1**.

Details of the site investigations that were carried out and the stone type/suitability are provided in **Chapter 8: Soils & Geology**. When the borrow pit is no longer required, it will be reinstated using any surplus inert material from the Site and made secure using permanent stock proof fencing.

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

2.5.10.1 Rock Breaking

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

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

2.5.10.2 Rock Blasting

If blasting is required, then this is generally carried out using a mobile drilling rig which is used to drill vertical holes into the rock area that requires blasting. It typically takes the drilling rig 3 or 4 days to drill the number of holes required for a single blast. A specialist engineer will be employed to determine the locations and depths of blasting required. The specialist blasting engineer will arrange for the correct amount of explosives to be delivered to the Site for each blast. The management of explosives delivery and storage on-Site will be agreed with An Garda Síochána in advance. The blast engineer will set the explosives and manage the blast. The rock generated from the blast will usually be the correct size to be loaded directly into the mobile crusher. The effects of blasting on noise are assessed in **Chapter 10: Noise and Vibration.**

2.5.11 Onsite Drainage

The surface water runoff contained within natural and artificial drainage channels includes stream and river waterbodies, drainage ditches, and other minor natural and manmade drainage features. Drainage measures will be provided to attenuate runoff, guard against

soil erosion and/or soil compaction, and safeguard local water quality. Details of the drainage system are shown on **Planning Drawings 6497-PL-301 - 6497-PL-304** and outlined in detail in the **Surface Water Management Plan**, part of the CEMP attached as **Appendix 2.1** and full details are provided in **Chapter 9: Hydrology and Hydrogeology.**

There are a number of natural streams on the Site. A buffer zone of at least 20m will be in place for natural streams and buffer zones of 10m will be in place for field / land drainage ditches, where possible. Sustainable Urban Drainage System (SuDS) principles will be employed as follows:

Source controls for surface water

- Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sandbags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems.
- Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas or other similar/equivalent or appropriate measures.

In-line controls for surface water

- Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sandbags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps/attenuation lagoons, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriates systems.

Treatment systems for surface water:

- Temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbusters and/or other similar/equivalent or appropriate systems.

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

Further details on drainage management and mitigation can be found in **Chapter 9: Hydrology and Hydrogeology** and the **Surface Water Management Plan** attached as **Appendix 2.1.**

2.5.12 Table of Key Development Infrastructure Metrics

The Key Development Infrastructure Metrics are contained in **Table 2.5**. This table is provided for ease of access by the public who maybe reviewing the EIAR Chapters.

Table 2.5: Key Development Infrastructure Metrics

Description	Length [m]	Width [m]	Depth [m]	No.	Area [m^2]	Volume of Excavation [m^3]
Upgraded Site Access Track	1,780	5	0.3	1	8,900	2,670
New Site Access Track	10,760	5	0.3	1	53,800	16,140
Internal Cabling (power & communications)	10,997	0.6	1	4	6,598	6,598
Turbine Hardstands - cranes	97	35	0.3	12	40,740	12,222
Turbine Foundations (25.5m diameter)	25.5	25.5	2.5	12	6,128.4	15,321
Electrical Substation	123	63	2	1	7,749	15,498
Site Compound	25	35	2	1	875	1,750
Cut & Fill Areas & Junctions	X	X	X	1	X	337,075
110kV Cable Trench	16,013	0.825	1.265	1	13,211	16,712
Joint Pits	6	2.5	2.3	21	315	724
Borrow Pit	127	127	2	1	13,211	31,894
Total					**151,527**	**456,604**

2.6 CONSTRUCTION

The first phase of the Development will comprise the construction phase. This phase will begin with Site preparation works and will be complete when the turbines are built and ready for commissioning, and when all wastes have been removed from the Site. For this Development, it is envisaged that the construction phase will last approximately 20 months. An indicated construction programme is set out at **Table 2.6**.

Table 2.6: Indicative Construction Programme

Activity	Month																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Site Establishment/ Fencing.	X	X	X																	
Internal Access Track Upgrade & Construction		X	X	X	X	X	X													
Substation & Compound Construction		X	X	X	X	X	X	X												
Substation Electrical Works									X	X	X	X	X	X	X	X	X			
Substation Commissioning																X	X			
Excavation & Construction of Turbine Foundations & Hardstands		X	X	X	X	X	X	X	X	X	X									
Internal Cabling Installation										X	X	X	X	X	X	X				
Turbine Delivery and Erection												X	X	X	X	X				
Grid Connection						X	X	X	X	X	X	X	X	X	X	X	X			
Energisation																		X		
Turbine Commissioning																			X	X
Site Restoration																		X	X	X

2.6.1 Micrositing

The Development infrastructure is designed around considerations of technical, economic, and environmental constraints. While the Site layout was optimised as far as practicable and EIA standard environmental investigations have taken place, adverse geotechnical ground conditions may require the minor micrositing of Development infrastructure. As per Section 5.3 Ground Conditions/Geology of the current 2006 Wind Energy Development Guidelines ("the 2006 WEDG"):

"Provision must be made for carrying out site-specific geo-technical investigations in order to identify the optimum location for each turbine. These investigations may suggest minor adjustments to turbine location. In order to accommodate this practice there should be a degree of flexibility built into the planning permission and EIS. The extent of flexibility will be site specific but should not generally extend beyond 20 metres. Any further changes in location beyond the agreed limits would require planning permission."

Any such movement will only be implemented if necessary and the above noted requirements of the 2006 WEDG will be followed. Such variations in ground conditions will only become apparent following excavation of the turbine foundation area during the construction phase. A movement of the turbine will require the associated turbine hardstand and site access track to 'follow' the turbine foundation move.

2.6.2 Construction and Environmental Management Plan (CEMP)

A CEMP is appended to the EIAR in **Appendix 2.1**. The CEMP includes an emergency response plan, spoil management plan, surface water management plan, surface water quality and inspection management plan and a waste management plan. The CEMP includes all the mitigation measures recommended within the EIAR and the NIS. A summary of the mitigation measures is included in **Appendix 17.1** and the **CEMP Appendix 2.1**.

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

2.6.3 Refuelling

Vehicles will be refuelled off-site where possible. For vehicles that require refuelling on-site, fuels will be stored in the temporary construction compound and bunded to at least 110% of the capacity of the largest tank within the bund or 25% of the total tank capacity, whichever is greater. Refuelling will take place via a mobile double skinned fuel bowser. The bowser will be a double axel refuelling trailer which will be towed to the refuelling locations by a 4x4 vehicle. The 4x4 will carry a drip tray, spill kit and absorbent mats in case of any accidental spillages. Only designated competent personnel will refuel plant and machinery on the Site.

2.6.4 Concrete

There will be no concrete batching on the Site. Rather, it will be transported to the Site as it is required. A dedicated, bunded area will be created to cater for concrete wash-out and this will be within the temporary construction compound. This will be for the wash-out of the chutes only after the pour. Concrete trucks will then exit the Site and return to the supply plant to wash out the mixer itself.

The main concrete pours at the turbine locations will be planned in advance and mitigation measures will be as follows:

- Avoiding large concrete pours, for turbine foundations for example, on days when heavy or prolonged rainfall is forecast.
- Providing that all concrete pour areas are dewatered prior to pouring concrete and while the concrete is curing.
- Making covers available so that areas can be covered if heavy rain arrives during the curing process which will prevent runoff of concrete which has a high pH.

2.6.5 Dust Suppression

During periods of dry and windy weather, there is potential for dust to become friable and cause nuisance to nearby residences and users of the local road network. Damping down may be required to see that dust does not become friable. A wheel wash facility will be employed on-site which will wash mud and debris from vehicles egressing the Site and reduce mud and debris from getting onto the local road network where it could dry out and become friable and potentially causing a nuisance. Where stone is sourced off-Site, HGVs entering the Site carrying stone will be covered to prevent dust generation. A road sweeper will be made available for use in case of any mud or debris making it onto the public road network.

2.6.6 Construction Hours

The Development will have 123 to 147 construction workers during the construction phase. Working hours for construction will be from 07:00 to 19:00 throughout the week, with reduced working hours at weekends. It should be noted that, during the turbine erection phase, operations will need to take place outside those hours to facilitate Turbine Foundation construction and so that lifting operations are completed safely. Hours of working for turbine foundation construction will be agreed with Waterford City and County Council prior to the commencement of Turbine Foundation construction. A detailed Traffic Management Plan ("TMP") will be put in place for the construction phase, which shall be agreed during the planning compliance stage with the Planning Authority so that strict controls are in place with all suppliers coming to the Site.

2.6.7 Construction Compound and Temporary Works Area

The temporary construction compound will be set up upon commencement of the construction phase. The proposed location for the temporary construction compound is southwest of T04 as shown in **Figure 2.1** and the layout is shown in **Planning Drawing 6497-pl-901**. The compound will be 25m by 35m and approximately 2m in depth 875m² / 1,750m³. The compound will be used as a secure storage area for construction materials and to contain temporary site accommodation units for sealed type staff welfare facilities. The compound will contain cabins for offices space, meeting rooms, canteen area, a drying room, parking facilities, and similar personnel facilities.

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

During the construction phase, water will be supplied by water bowser. The maximum wastewater production is estimated to be the same as the maximum water consumption (4,920- 5,880 litres per day). The project will include an enclosed wastewater management system at the temporary compound capable of handling the demand during the construction phase with 123 to 147 construction workers on site at peak. A holding tank is proposed for wastewater management. Wastewater will be removed off-site and disposed at an appropriate licenced facility.

2.6.8 Construction of Crane Hardstands and Foundations

The construction method for all the Turbine Hardstands will be via excavated approach. Each crane hardstand will be 97m by 35m. Turbine Foundations will be taken down to competent bearing strata by excavating through the soil, subsoil, and rock if necessary.

The method of construction for turbine foundation is also described below:

- Install temporary drainage around perimeter of excavation area;
- Excavate soil and rock;
- Form a level working area to build foundation;
- Install formwork and reinforcement;
- Pour concrete;
- Cure concrete;
- Once the concrete has set and the earthing system is in place, backfill the foundation with stone and excavated soil deposits;
- Use retained excavated soil deposits to build up the area around the turbine base.

2.6.9 Turbine Assembly

Once on Site, the wind turbine components will be routed according to a specific detailed route plan to minimise manoeuvring. Components will be placed on Turbine Hardstands prior to assembly. A *'just in time'* delivery strategy will be in place for turbine blades to reduce the need for temporary set down areas. One large crane will be required for erecting the turbines, assisted by smaller cranes. Similar cranes will also be required for maintenance during the operational phase. As with all other vehicles, refuelling of cranes will be carried out in accordance with site procedures to minimise the risk of spillage or pollution.

The towers will be delivered in sections, and work on assembly will not start until a suitable weather window is available. Three methods can be used to attach the blades:

1. The blades can be attached to the nacelle and hub on the ground. The hub and blades are then lifted as one;

2. The hub can be attached to the nacelle and the two blades attached to the hub while the nacelle is on the ground – the "*bunny lift*". The nacelle is then lifted into position and the third blade lifted into place separately. This requires manoeuvring of several components on the ground and usually the repositioning of cranes;

3. Lifting the nacelle and hub as one unit, as described above and then attaching the blades one at a time, rotating the hub between lifts. The blade lifting operations do not require repositioning of the crane.

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

2.6.10 Construction Traffic

It is estimated that during civil construction, approximately 5,944 loads will be delivered to Site. This breaks down to approximately 297 loads per month or an average of 83 per day raging between 3 to 141 loads (per day) excluding Sundays and bank holidays. The peak number of deliveries per day will occur during the concrete pour for Turbine Foundation construction. An estimated 102, depending on the capacity of the concrete truck (6 or 7m^3), concrete truck deliveries will be required per turbine foundation. Some other materials will also be delivered on such days, so a realistic estimation of peak deliveries is approximately 141 deliveries per day (for at least 20 separate days in the construction programme when the Turbine Foundations will be poured).

2.6.11 Reinstatement and Monitoring

Following completion of construction, all plant and machinery will be removed from the Site. The temporary works areas needed for the construction period such as blade laydown areas, will be reinstated using the original spoil material removed and stockpiled close to the location from where it was excavated. The Grid Connection route will be reinstated to its original condition.

The on-Site installed drainage network will be left in place were considered beneficial to do so. This will be periodically monitored to see that it is operating to its stated design purpose. Water monitoring on nearby natural watercourses will be undertaken during and post construction to determine if any pollution has migrated off-site, and if so, implement measures to rectify the impact.

2.6.12 Construction Supervision and Monitoring

The construction activities will be monitored by a geotechnical engineer, a qualified archaeologist and an ecological clerk of works (ECoW). The geotechnical engineer will be contracted for the detailed design phase and their services retained throughout the construction and reinstatement phases. The geotechnical engineer will oversee all earthworks and excavation activities and monitor for issues such as ground stability, water ingress into excavations etc.

The ECoW will be employed prior to the commencement of the construction phase and will monitor the working corridor and review the pollution control measures and working practices during construction and have input into site remediation. The ECoW will have stop work authority if, for example, there is potential for sensitive habitat features to be encroached upon or there is the possibility of silt/pollution runoff to natural watercourses. The archaeologist will have responsibility for ensuring that potential archaeological features are protected and will also have stop work authority should any be discovered during excavations. If any potential archaeological features are discovered, the archaeologist will inform the National Monuments Service (NMS).

An inspection and maintenance plan will be developed for the planned Site drainage prior to commencement of construction. Regular inspections of the installed drainage system will be undertaken, especially after heavy rainfall events, to check blockages and see that there is no build-up of standing water in any part of the system where is it not designed to be.

Excess build-up of silt at check dams, attenuation/settlement ponds or any other drainage feature will be removed.

During the construction phase, field testing and laboratory analysis of a range of parameters with relevant regulatory limits and Environmental Quality Standards (EQSs) should be undertaken for each primary watercourse close to the Site, and specifically following heavy rainfall events (i.e. weekly, monthly and event based).

The CEMP for the Development will set out the proposed site organisation, sequencing of works, methodologies, mitigation measures (including those outlined above) and monitoring measures.

Daily monitoring of excavations by the geotechnical engineer will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken.

The local road network near the Site, used to transport construction materials, will be monitored during construction, so that any damage caused by construction traffic associated with the project can be identified and repaired. Any required monitoring programme will be agreed with the local authority, prior to the commencement of any construction works. Ready mix concrete and rock will be sourced from local quarries and monitoring may also be undertaken on the route as required.

2.6.13 Construction Sequencing

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

1. Contractor compound and welfare facilities
2. Site preparation
3. Site Access Tracks
4. Crane hardstandings
5. Turbine Foundations
6. Internal cable ducting
7. Installation of the Grid Connection
8. Erection of wind turbines
9. Commissioning and energisation

The 110 kV substation will be constructed in parallel with Turbine Hardstands, Turbine Foundations and ducting. The first step will be to construct the Temporary Construction Compound and Welfare Facilities. Access to the area will be Site Entrance 1. The next step will be to prepare the areas of the site where Site infrastructure is to be located by marking out the construction works corridor and the relevant environmental buffer zones as needed.

Following the Site preparation, the Site Access Tracks will be constructed according to the specifications of the chosen turbine manufacturer. The next step will involve construction of the crane hard-standing areas for the 12 no. turbines according to the specifications of the chosen turbine manufacturer. The 12 no. Turbine Foundations can then be excavated, and foundations constructed using rebar and imported concrete. Following the construction of the Turbine Foundations, internal cable ducting from the turbine locations to the on-site 110 kV substation will be laid in trenches along the constructed Access Roads.

The Grid Connection will be installed in trenches within the national road network infrastructure from the Site to the 110kV substation located in Dungarvan.

The last step will be to erect the 12 no. wind turbines on the previously constructed foundations using two cranes. Commissioning and testing of the turbines can then proceed.

2.6.14 Construction Employment

It is estimated that 123 to 147 construction workers will be employed on-Site during the peak period of Turbine Foundation construction.

2.7 COMMISSIONING

Wind farm commissioning can take in the region of 2 months to complete from the erection of the final turbine to the commercial exportation of power to the national grid. It involves commissioning engineers working through an entire schedule of SCADA (Supervisory Control and Data Acquisition) and electrical and mechanical testing and control measures to check that the wind farm will perform and export power to the national grid, as designed.

2.8 OPERATION AND MAINTENANCE

During the operation of the wind farm, the turbine manufacturer, the Transmission System Operator (TSO) (EirGrid), the operator, or a service company will carry out regular maintenance of the turbines. In addition, operation and monitoring activities will be carried out remotely with the aid of computers connected via a telephone broadband link. Routine inspection and preventative maintenance visits will be necessary to provide for the smooth and efficient running of the wind farm.

2.9 DECOMMISSIONING

The Applicant is applying for a consent for a period of 40 years. Cranes of similar size to those used for construction will disassemble each turbine using the same crane hardstands. The towers, blades and all components will then be removed from site and reused, recycled, or disposed of in a suitably licenced facility. The turbine transformers will also be removed from site. There is potential to reuse some turbine components, while others can be recycled.

Underground cables will be removed while the ducting will be left in-situ. The Turbine Foundations will remain in-situ.

Turbine Hardstand areas will be remediated to match the existing landscape as closely as possible. Access Tracks will be left for use by the relevant landowner(s).

Any structural materials suitable for recycling will be disposed of in an appropriate manner. The financial costs of decommissioning, at current material values, will be more than met by the recycling value of the turbine components.

Prior to wind turbine removal, due consideration will be given to any potential impacts arising from these operations. Some of the potential issues could include:

- Potential disturbance by the presence of cranes, HGVs, and personnel on-Site.
- On-Site temporary compound would need to be located appropriately.

- Time of year and timescale (to be outside sensitive periods).

Prior to the decommissioning work, a comprehensive plan will be drawn up that takes account of the findings of this EIAR and the contemporary legislative requirements and best practice at that time, to manage and control the component removal and ground reinstatement.

2.10 COMMUNITY BENEFIT

The Project has the potential to bring significant positive benefits to local communities. It will support sustainable local employment; it will contribute annual rates to Waterford City and County Council and it will provide opportunity for local community investment in the Project in line with current and incoming Renewable Energy Support Schemes (RESS). A community benefit fund will be put in place for the lifetime of the Project to provide direct funding to those areas surrounding the Project.

Two important areas of Government policy are in development which will have a bearing on the possible extent of future community benefit funds. These are the publishing of the Wind Energy Development Guidelines (which are still only published in draft form)and the successor to the current Renewable Energy Support Scheme (RESS-3)[1]. It is envisaged these will guide requirements on future community benefit funds for renewable energy projects.

A significant annual Community Benefit Fund 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.

2.10.1 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, the first step 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.

[1] https://www.gov.ie/en/press-release/01513-minister-ryan-announces-launch-of-third-onshore-renewable-electricity-support-scheme-ress-3/ [Accessed 13th April 2023]

2.10.2 Community Investment

Under the current Renewable Energy Support Scheme (RESS)[2] renewable energy project proposals must enable local communities in a meaningful way by means of direct capital investment for communities in close proximity to renewable energy projects, each year for the duration of the support scheme. The Developer is committed to working with external agencies to develop workable models of Community Investment under any incoming renewable energy support schemes that succeeded the existing scheme.

https://www.gov.ie/pdf/?file=https://assets.gov.ie/251854/86c32a4e-c3a1-4bda-9140-853e89a0f000.pdf#page=null [Accessed 13th April 2023]