FEHILY TIMONEY

DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

Appendix 2.1

Construction and Environmental Management Plan (CEMP)

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A SUSTAINABLE FUTURE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED SHANCLOON WIND FARM, CO. GALWAY

Construction and Environmental Management Plan (CEMP)

Prepared for:

RWE Renewables Ireland Ltd.

RWE

Date: **August 2025**

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1. INTRODUCTION

1.1 General Introduction and Purpose

This document is the Construction and Environmental Management Plan (CEMP) for the Proposed Development and has been prepared by Fehily Timoney and Company (FT) on behalf of RWE Renewables Ireland Ltd.

The CEMP will be a key construction contract document and the appointed contractor will be obliged to implement it in full. It will be updated by the contractor prior to construction to take account of any relevant conditions attached to the planning permission and will be implemented for the duration of the construction phase of the Proposed Development. The CEMP also includes measures for the operational and decommissioning phase of the Proposed Development. General guidance for the decommissioning of the Proposed Development is contained in Section 4.3.1 of this CEMP.

The CEMP will be a live document and will be subject to ongoing review through regular environmental auditing and site inspections. The measures in the CEMP will be implemented in full and further measures may be added as may be identified from the auditing and site inspections.

This CEMP sets out the key construction and environmental management issues associated with the construction of the Proposed Development, to ensure that the environment is protected and impacts on the environment are minimised.

The CEMP should be read in conjunction with the EIAR and NIS, Planning Documents and Drawings, and planning consent documentation. In the case of any ambiguity or contradiction between this CEMP and the EIAR, the EIAR shall take precedence.

This CEMP should be read in conjunction with the following EIAR Appendices:

- Appendix 2.3 Grid Connection Construction Methodology
- Appendix 2.5 Bridge inspection report
- Appendix 9.1 Biodiversity Enhancement and Management Plan (BEMP)
- Appendix 11.1 Geotechnical & Peat Stability Assessment
- Appendix 11.2 Karst Assessment Report
- Appendix 11.3 Review of Stabilising techniques for floating road on peat
- Appendix 11.4 Peat and spoil Management plan
- Appendix 12.1 Hydrology field observations
- Appendix 12.2 Surface Water Management Plan
- Appendix 14.1 Pell F. Turbine Delivery Route Assessment
- Appendix 14.2 Traffic Management Plan

1.2 Document Layout

The document is divided into six sections:

Section 1: *Introduction* provides an overview of the existing site and the Proposed Development.

Section 2: *Existing Site Environmental Conditions* provides details of the main existing geotechnical, hydrological, ecological and archaeological conditions onsite. These conditions will be considered by the contractor in the construction, operation and decommissioning of this Proposed Development.

Section 3: *Overview of Construction Works,* this section provides an overview of the construction works proposed, including drainage and sediment controls to be installed.

Section 4: *Environmental Management Plan (EMP*), this section outlines the main requirements of the EMP and outlines operational controls for the protection of the environment including soil management, habitat and species, site drainage control, archaeology, construction traffic, site reinstatement and decommissioning, waste management.

Section 5: *Safety & Health Management Plan*, this section defines the work practices, procedures and management responsibilities relating to the management of safety and health during the design, construction and operation of the Proposed Development.

Section 6: *Emergency Response Plan* contains predetermined requirements and procedures to ensure the safety, health and welfare of everybody involved in the project and to protect the environment during the construction phase of the Proposed Development.

1.3 Overview of the Proposed Development

The key components of the Proposed Development include: the wind farm site (referred to in this CEMP as the '**Site'** which includes the grid infrastructure); and the turbine delivery route (referred to in this CEMP as the **'TDR'**).

A detailed description of the Proposed Development is contained in Chapter 2 of the EIAR.

An overview of the Proposed Development is shown in Planning Drawings submitted with the application and in EIA Figures included in Volume IV of the EIAR documentation.

The Proposed Development for which consent is being sought as part of this planning application will consist of the following:

- Construction of 11 no. wind turbines with a ground to blade tip height range of 178 m to 180 m. The wind turbines will have a rotor diameter ranging from 149.1 m to 155 m and a hub height ranging from 102.5m to 105m.
- Construction of permanent turbine foundations and crane pad hardstanding areas and associated drainage;

- Construction of 13,725 m of internal access tracks and associated drainage infrastructure (of which 1,770 m will be floated road);
- Upgrading of 3,565 m of existing tracks and road and associated drainage infrastructure;
- Construction of 1,180 m of temporary access track to facilitate HDD cable crossing of the Togher River;
- Creation of 1 no. new construction and operation access to the wind farm Site from the L-2234 local road and one road crossing of the L-2220-21 local road;
- All associated drainage and sediment control including interceptor drains, cross drains, settlement ponds and swales;
- Installation of new watercourse crossings including 1 no. 18.5 m single span bridge crossing and 14 new piped culverts;
- All associated excavation, earthworks and spoil management;
- 3 no. temporary construction compounds and associated ancillary infrastructure including parking;
- Construction of 1 no. permanent onsite 110kV electrical substation, associated new access road off of the L-6100 local road, and associated construction compound including:
    - Welfare facilities;
    - Electrical infrastructure;
    - Parking;
    - Wastewater holding tank;
    - Rainwater harvesting tank;
    - Security fencing;
- Works associated with the connection of the wind farm to the national electricity grid, which will be via a loop-in 110 kV underground cable connection 650 m in length to the existing Cashla-Dalton 110 kV overhead line in the townland of Tonacooleen, with two new 16m high steel loop-in lattice tower end masts for loop-in connection at the connection point.
- Installation of 33 kV medium voltage electrical and communication cabling underground between the proposed turbines and the proposed on-site substation and associated ancillary works including Control Building;
- Erection of 1 no. permanent meteorological mast to a height of 110 m above ground level with a 4m lightning pole on top.
- Turbine Delivery Accommodation works:
    - R332 / L6483 Junction - temporary load bearing surface will be laid and the drainage ditch temporarily culverted. Vegetation will be cleared. One utility pole will be temporarily removed.
    - On the L6483, temporary load bearing surface will be laid to provide a minimum 4.5 m running width and a 5.5 m clearance width for turbine delivery.
    - L6483 – temporary load bearing surface will be laid and vegetation will be cleared. Two road signs will be temporarily removed.
- Felling of 0.54 ha of conifer plantation forestry;
- 2,032 m Treeline/hedgerow removal;
- 9.7 ha of Biodiversity Enhancement lands plus 2,457.50 m of hedgerow/treeline planting;

Certain temporary accommodation works associated with the Turbine Delivery are assessed within this EIAR but for which planning consent is not being sought within the current application (Refer to Table 2.6). These works to facilitate the delivery of turbine components and haulage to Site include hedge or tree cutting, relocation of powerlines/poles, lampposts, signage and local road widening. For these locations, works associated with road infrastructure have been identified and assessed in the EIAR, however, permission for these works will be sought separately as necessary.

2. EXISTING SITE CONDITIONS

The proposed wind farm is wholly located in the jurisdiction of Galway County Council, in proximity to the Mayo border. At its closest point, the turbine array is located approximately 4km north-east of Shrule, County Mayo (which is the closest settlement to the Proposed Development) and 8.5km north-west of Tuam, County Galway.

The key components of the Proposed Development include: the wind farm site (referred to in this CEMP as the '**Site'** which includes the grid infrastructure); and the turbine delivery route (referred to in this CEMP as the **'TDR'**).

The Site is located within the townlands of Beagh More, Cloonbar, Cloonnaglasha, Corillaun, Derrymore, Shancloon, Toberroe and Tonacooleen, County Galway. Of these, the on-site substation is located within Corillaun and loop-in connection within neighbouring Tonacooleen.

The development application area (i.e. the red line boundary depicting the land to which the application relates) encompasses a land area of 154 ha (1.54km^2). Existing land use within the Site comprises agriculture and historic peat extraction, with smaller pockets of commercial forestry also present along the periphery. The Site sits within the BLACK (SHRULE)_010 waterbody subbasin, hosting the Black and Togher Rivers.

The lands adjacent to the proposed loop in connection to the Cashla-Dalton overhead line host historical records for a ringfort (GA028-046----), children's burial ground (GA028-046001-) and hut site (GA028-046002-). Otherwise, there are no known archaeological records within the Site or TDR accommodation works. The nearest known archaeological feature to the turbine array is a ringfort (GA028-040----) located ca. 90m south of T3.

Tailte Éireann land cover mapping identifies the following land cover types within the Site: bare peat and cutover bog, wet grassland, improved (agricultural) grassland, broadleaf forest, artificial surfaces (tracks), rivers and streams, scrub, transitional forest, raised bog, hedgerows and treelines. Agricultural grassland and wet grassland dominate the Site.

Ground investigation (GI) at the Site confirms that the underlying geology comprises is Dinantian Pure Bedded Limestones (Ardnasillagh Formation) with varying depths of overburden comprising topsoil / peat (with depths varying between 1.3m to 5.5m below ground level (BGL), typically underlain by sandy/gravelly clay and granular gravel deposits. The depth to rock varies within the Site, with GI indicating rockhead at between 5.20m BGL to 17.00m BGL.

Surface karst features (collapse dolines) are present throughout the Site. These features are believed to form along unmapped fault lines that create zones of weakened and fractured rock beneath the overlying Quaternary deposits (predominantly Glacial Till).

3. OVERVIEW OF CONSTRUCTION WORKS

3.1 Construction Period

It is expected that the construction phase, including civil, electrical and grid works, and turbine assembly will take approximately 24 months.

3.2 Overview of the Construction Sequence

The construction of a wind farm project is a major infrastructural project. The construction of this project will involve many inter-related, inter-dependent and overlapping elements of a complex nature.

The following section outlines the construction methodology for the project. Upon mobilisation for the construction of the development, peat excavation (where required), upgrading of existing site tracks, felling and the provision of new site tracks will precede all other activities.

Construction stage drainage infrastructure will be constructed in parallel with the site clearance and track construction, elements of which will be adopted into and will accord with the Sites operational drainage as set out in the Planning Drawings. This will be followed by the construction of the turbine foundations and the provision of the hardstanding areas. In parallel with these works the on-site electrical works; sub-station and internal cable network will be constructed.

The proposed construction programme is presented in below:

Activity	Month																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mobilisation and site setup	X	X																						
Site clearance and felling	X	X																						
Internal access tracks	X	X	X	X	X	X	X	X	X	X	X	X												
Turbine hard standings			X	X	X	X	X	X	X	X	X	X	X	X										
Turbine foundations								X	X	X	X	X	X	X	X									
TDR accommodation works											X													
Turbine Installation														X	X	X	X	X	X	X	X			
Met Mast																			X	X				
Onsite substation													X	X	X	X	X	X						
Cable Works (On-Site)															X	X	X	x	X	X	X			
Cable Works (In Public Road)															X	X	X	X	X	X	X			
Testing and Commissioning																					X	X	X	X
Landscaping, reinstatement, demobilisation																							X	X

3.3 Construction Working Hours

The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations will generally be restricted to between 07:00 - 19:00 hours Monday to Friday and 07:00 - 1300 on Saturday.

It should be noted that it will be necessary to commence turbine base concrete pours earlier due to time constraints incurred by the concrete curing process. Foundation pours will likely extend beyond normal working hours also. Turbine component deliveries will be caried out at night in accordance with abnormal licenses and permits from An Garda Síochána and the local authority as appropriate. Consultation will be carried out with the local community in advance of out of hours working. Work on Sundays or public holidays will only be conducted in exceptional circumstances and subject to prior consultation and notification insofar as possible with the local authority.

3.4 Overview of the Construction Methodology

Method statements are presented below for the key elements of the construction process. The contractor for the main construction works will, following appointment, take ownership, expand upon and generally develop these method statements appropriately for the construction stage, in accordance with this CEMP.

The proposed construction methodology is summarised under the following headings:

- Site Entrances;
- Temporary Site Compounds;
- Forestry Felling and site clearance;
- Peat and Spoil Management;
- Concrete Washout and Wheel Washing;
- Wind Farm Internal Access Tracks
- Upgrade of Existing Internal Access Tracks;
- Turbine Hardstands;
- Turbine Foundations;
- Permanent Meteorological Mast
- Surface Water Management, Drainage and Watercourse Crossings;
- Substation Compound;
- Electrical Works;
- Internal Wind Farm Cable Works;
- Horizontal Directional Drilling
- Turbine Installation;
- Fencing and Site Security
- TDR Temporary Accommodation Works.

3.4.1 Site Entrances

The site access to the Shancloon wind farm will be from the L-2234 local road and will be used for construction, operation and decommissioning. A new access will be constructed to facilitate the delivery of turbine components and construction materials. All loads including turbine towers, turbine blades and trucks with materials will enter the Site via this new access from the L-2234. This access point will also be used for construction and operation vehicles and will be used by both HGV's and LGV's.

The layout of the Proposed Development includes for a new crossing of the L-2220 and L-22202 local roads. Construction, operational and decommissioning stage movement of vehicles at this new junction will be managed in accordance with the Traffic Management Plan.

The 110 kV substation will be accessed via a new entrance constructed off the L-6100.

The locations of the Site entrance and accesses are shown on Figure 2.2, Volume IV and on Planning Drawings P20-306-0101-0001 to P20-306-0101-0003. The general local road speed limit applies of 60kph. The minimum sight distance for an 60kph road is 120m in line with Transport Infrastructure Ireland (TII) standards (TII Publication DN-GEO-03060). It is proposed to construct a sweeping bell mouth and clear vegetation within the 120m visibility splays in both directions to facilitate the over-sized turbine delivery vehicles entering the site at this point and achieve minimum sight line distances. The detail is shown drawing P20-306-0101-0001 included with the planning application. Visual obstructions 1.05m above ground level will be removed to achieve target 'Y' visibility distances in both directions of 120m in accordance with TII design specifications.

The accesses have been selected with consideration for safety of public road users and construction staff and to ensure that it can be constructed to comply with the requirements of both Galway City and County Council and TII design requirements for direct accesses.

3.4.2 Temporary Site Compounds

During the construction phase, it will be necessary to provide temporary facilities for construction personnel (see planning drawings P20-306-0300-0013 and P20-306-0300-0014). There will be three temporary compounds: Compound 1 near the main entrance, Compound 2 near turbines 2 and 3, and Compound 3 at the substation. These will include temporary self-contained welfare facilities (e.g. ecopod type) and offices. The location of the temporary site compounds is shown in the Planning Drawings accompanying the application. A wheel wash facility will be provided within the main site entrance near the Compound 1.

The construction compounds will be established by removing topsoil down to a firm substrate, laying down geotextile material and then constructing a working surface of stone sourced from within the Site, and surrounded by security fencing. The topsoil will be removed and stored in accordance with Annendix 11.4 of the EIAR – the Peat and Spoil Management Plan.

Temporary facilities will be removed, and the lands reinstated on completion of the construction phase.

Facilities to be provided in the temporary site compounds will include the following:

- site offices, of Portacabin type construction
- Portaloos
- bottled water for potable supply
- a water tanker to supply water used for other purposes
- canteen facilities
- material/non-fuel storage areas;
- employee parking
- specially constructed bunded fuel / oil storage to ensure that fuel spillages are fully contained (such bunds shall be roofed to exclude rainwater)
- contractor lock-up facility
- diesel generator (within bunded area)
- waste management areas

3.4.3 Felling and Site Clearance

Felling of 0.43 ha of coniferous forestry is required at the turn off onto the L-6483 from the R332 road in order to accommodate turbine delivery. An additional 0.35 ha of coniferous forestry will be clear-felled to accommodate the construction of the on-site electrical caballing between the wind farm and 110 kV substation.

The clear-felling of trees in the State requires a felling licence. The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing which is governed by the Forestry Act 2014 as amended and the Forestry Regulations 2017 (S.I. No. 191 of 2017). In the event of grant of SID consent, a felling licence will be applied for. Felling licences include the provision of relevant replant lands (afforestation area) to be planted in lieu of the proposed tree felling on the Site (i.e. equivalent in area size to the permanently clear felled lands). The associated afforestation of alternative lands equivalent in area to those lands being permanently clear-felled is also subject to licensing ('afforestation licensing'). The scope of the licence can only be determined at the time of licence application, as such the location of the replant lands are not determined at this time.

The forestry within the Site was originally planted as a commercial crop and will be felled and replanted in the coming years should the Proposed Development not proceed.

The area of trees to be felled will be the minimum required to accommodate the Proposed Development. However, for the purpose of the EIAR the area for felling has been identified as the maximum area that could conceivably be required to construct the Proposed Development.

The contractor will not commence tree removal on site until both felling and afforestation licences are in place

Tree felling, trimming and site clearance will not be carried out during the bird breeding season which commences on March 1st and finishes on August 31st.

All site clearance / enabling works will be preceded by survey and inspection by an Ecological Clerk of Works for the presence of any species or habitats protected by Law in accordance with the TII's "Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes". The following confirmatory surveys will be undertaken by the Ecological Clerk of Works (who will be suitably qualified and competent to undertake such surveys) in accordance with the methodologies set out in the EIAR, prior to the commencement of Construction, in order for the Contractor to ensure the most relevant mitigation measures are included in the Design and Construction:

a) An otter survey 200m upstream and downstream of the footprint of all watercourse crossings to identify holt / couch locations and need for mammal passage/mitigation;
b) A bat survey of trees to be felled in accordance with the NRA Guidelines for the Treatment of Bats Prior To the Construction of National Road Schemes (a visual inspection of the tree during daylight hours followed by a night time detector survey);
c) A badger survey within 150m of all works areas;
d) A common frog surveys along all drain crossings (and spawn survey) during the breeding season of common frog (approximately January – midsummer). Spawn translocation may be required under licence where active breeding drains are within the development footprint during the construction phase.
e) An invasive plant species survey of all watercourses and lands within the footprint of the Works.

If any such species or habitats are found, as a result of such survey and inspection, the Contractor will undertake the following:

- Record and report the ecological data in accordance with the requirements of the National Biodiversity Data Centre (NBDC);
- If mitigation measures for such species or habitats have not been identified in the EIAR for that area of the Site, the Contractor will, consult with the National Parks and Wildlife Services and the Inland Fisheries Ireland as appropriate to determine and implement appropriate mitigation for the species / habitat.

3.4.4 Peat and Spoil Management

Appendix 11.4, Volume III of the EIAR sets out the Peat and Spoil Management Plan for the Site and should be read in conjunction with this CEMP. Peat and spoil storage areas are identified in planning drawings P20-306-0100-0011 to P20-306-0100-0072.

3.4.5 Concrete Washout Area and Wheel Washing

Detailed measures to control concrete runoff during the Construction stage of the Proposed Development are included in Chapter 12 - Hydrology and Water Quality of the EIAR and will be implemented as part of the Works. A summary is provided hereunder.

All concrete will be delivered to site via ready-mix trucks from a local supplier.

Concrete trucks will not be washed out on Site. Where chutes, hoppers/skips and equipment (e.g. vibrating wands) associated with concrete works need to be washed down this will be done into a sealed mortar bin / skip with the appropriate capacity and which has been examined in advance for any defects. The location of wash down areas will be set back as far as practically possible from any drain or watercourse, and a minimum of 50m. The residual liquids and solids will be disposed of off-site at an appropriate licenced waste facility.

A vehicle or wheel wash facility will be provided at the Proposed Development and will be used by vehicles entering and exiting the Site (see planning drawing P20-306-0300-0017). The site roads will be well finished with non-friable, compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt. A road sweeper will be available if any section of the public roads were to be dirtied by trucks associated with the Proposed Development.

3.4.6 Wind Farm Internal Access Tracks

The internal access tracks serving the wind farm will incorporate existing roads and tracks (which will be upgraded) and new access roads (which will be constructed). The proposed internal site track layout will permit access for vehicles during the construction phase, for maintenance during the operational phase and for vehicles to decommission the turbines at the end of the life of the Proposed Development. The internal road layout has taken into account the following key factors:

- Buildability having regard to existing ground conditions and land drainage;
- Minimise watercourse crossings;
- Sustainability by avoiding habitats of higher value and making use of existing tracks and roads.
- Optimising cut/fill balance.

Access tracks will have a running width of 5 m along straight sections and wider junctions and turning areas as required in accordance with wind turbine manufacturer requirements for the wind turbines of this size. The proposed new roadways will include passing bays to facilitate traffic passing around the Site. The site access tracks will be battered to safe permanent side slopes of 1V:2H. All site access tracks will comply with the turbine supplier's requirements.

3.4.6.1 New Access Tracks

The proposed new internal access tracks will be founded on suitable substrate and as such will include both floating road and excavated road. The 100-series planning drawings show the locations of excavated and floated road. The cross-sectional detail of an excavated track design and a floating track design is provided on planning application drawings ref. P20-306-0300-0016. All tracks will have an engineered crossfall to shed surface water into adjacent site drainage.

Traditional Founded Track

Access tracks on the site will be constructed using traditional founded track construction and best practice construction methods from suitable load bearing strata. This system will consist of either one or two layers of stone depending on the load bearing capacity of the base layer. Where the underlying layer is mineral subsoil, two layers of stone are used; a stone capping layer and running layer. Construction details are outlined in the planning drawings. Drainage runs and associated settlement ponds will be installed.

Track construction details will be implemented as follows:

- Establish alignment of the new site tracks from the construction drawings and mark out the centrelines with ranging rods or timber posts.
- The access tracks will be of single-track design with an overall width of 5m. There will be some local widening on the bends as shown on the design drawings, junctions and around Turbine Foundations for the safe passage of large vehicles. All bends have been designed to suit the requirements of the delivery vehicles.
- All machinery shall work within the consented areas as identified on planning and contract drawings.
- All access for construction vehicles within the site will follow the proposed internal access tracks as shown in planning drawings.
- Topsoil/subsoil will be stripped back to required levels and managed in accordance with the Peat and Spoil management Plan..
- The soil will be excavated down to a suitable formation layer.
- The formation will be prepared to receive the geotextile membrane.
- Well-graded granular fill will be spread and compacted in layers to provide a homogeneous running surface. The thickness of layers and amount of compaction required will be decided by the Site Manager based on the characteristics of the material and the compaction plant to be used.
- Batters will have a slope of between 1:1 and 1:5 (depending on depth and type of material) and will be left as cut to re-vegetate naturally with local species.

Floated Roads

Floating type construction of access tracks is proposed where peat depths are deeper than 1.0m. the internal wind farm infrastructure will comprise 1,770 m of floated road. The floating construction design leaves the peat deposit in place and utilises a construction of layered geo-grid, geo-textiles and aggregate fill, which is placed over the peat deposits. This system forms a 'floating' platform to spread the construction loads over the peat. This layer comprises approximately 800 mm of crushed stone laid on geotextile to form the track. This produces a stone batter with the edges of the site track raised above the surface. Floating road design will be in accordance with the following:

- Floating Roads on Peat. A report into Good Practice in Design, Construction and Use of Floating Roads on Peat with particular reference to Wind Farm Developments in Scotland (Scottish Natural Heritage, 2010);
- Good Practice During Wind Farm Construction (Scottish Natural Heritage, 2019).

This sequence of construction is as follows:

- Mark out the alignment of the road;
- Install advance drainage ahead of construction;
- Clear the road alignment of major protrusions such as rocks, trees, down to ground level leaving any residual stumps and roots in place, leaving the local surface vegetation and soils in place;
- Fill local hollows or depressions along the route alignment with lightweight fill e.g. a brash mat;
- Place geo-grids along the alignment of the road in accordance with the relevant manufacturer's specification.

- Place aggregate material onto the geo-grid. The final specification of the aggregate grading shall be dictated by the chosen geo-grid mesh size. The degree of compaction required will be dictated by the local ground conditions determined at detailed design.

Excavated road design will consist of a minimum 500mm hardcore on geo-textile membrane. The proposed construction methodology for newly constructed tracks is as follows:

- Mark out the alignment of the road;
- Install advance drainage ahead of construction;
- Excavate to formation level;
- The upper soil/peat horizon, together with any vegetation, will be placed to one side for later reinstatement as part of the Biodiversity Enhancement and Management Plan (see Appendix 9.1) as appropriate.
- The formation will be prepared to receive the geotextile membrane.
- A well graded aggregate stone will be placed and compacted in layers to minimum 500mm depth.
- A layer of compacted Cl 804 material will be placed on top to provide a suitable running surface.
- Surplus excavated material will be placed along the side of sections of the tracks in suitable locations as identified in the Peat and Soil Management Plan.

The stone required for the construction of the internal access roads will be sourced from licenced quarries in the vicinity of the Proposed Development. The location of licensed quarries and haulage routes are identified in Chapter 14: Traffic and Transportation and in Figure 14.3, Volume IV.

Internal access track drawings are presented in 100-Series planning application drawings.

Floated Road within Cloonbar Bog

The floated road within Cloonbar Bog will be supported by a double row of sheet piles in order to ensure suitable ground stability and bearing capacity given that the road will be constructed parallel to the Black (Shrule) River (OPW arterial drainage channel reference CH4/13/7). Road construction at this location will be as follows:

- Install a floating road platform for the press in pile rig / hydraulic vibrating pile rig and road construction machinery;
- The first row of sheet piles will be installed on the stream side to the appropriate predetermined depth (as informed by detailed site investigation carried out post consent) using vibratory piling rigs or press-in piling rigs.
- Floating road shall be constructed behind the sheet pile wall with two layers of geogrids and as per the floated road design and construction sequence set out int eh preceding section;
- The second row of sheet piles will be installed parallel to the first row on the opposite side of the floated road.
- Excavations shall be made at intervals as determined by the design engineers to 0.5m depth below the ground level for the installation of reinforced tie bars which will connect the two rows of sheet piles, thereby restricting the lateral movement of the sheet piles.
- Back fill the excavation with excavated material to the ground level
- Finish laying the floating road.

Road Crossing of Gas Main

The internal access track crosses an existing **High Pressure Gas Transmission Main** at the point at which the track parallels the L-22204 local road (see 100-Series planning application drawings). This is the Gas Networks Ireland (GNI) Mayo - Galway natural gas distribution main which is connected to the nearby Beaghmore Transmission Above Ground Installation (AGI). Consultation with GNI has confirmed that the gas main comprises a heavy walled pipe at this location (up to ITM X: 532528.770 ITM: Y 753639.059 Meters) and as such GNI has confirmed that no additional protection measures e.g. slabbing, are required for this crossing. GNI has confirmed the turbine array is sufficiently set back from their infrastructure noting that they require a distance of 2 times hub height of wind turbine set back.

Temporary Road

Construction of 1,180 m of temporary access track will be carried out to facilitate HDD cable crossing of the Togher River.

3.4.6.2 Upgrade of Existing Internal Access Tracks

The internal access track serving the Site will include the upgrading of 3,565 m of existing tracks and road and associated drainage infrastructure. Access tracks will be widened to 5 m wide along straight sections and wider at bends as required as shown on design drawings. The tracks will be finished with a well graded aggregate. The drainage system will be installed adjacent to the internal access tracks. Existing drainage infrastructure will be maintained and upgraded where necessary.

Access track formation will consist of a proposed 500mm hardcore on geo-textile membrane.

Existing track upgrades shall follow the same outline methodology as for new access tracks.

3.4.7 Turbine Hardstands

Each wind turbine will have an associated turbine hardstand area and temporary laydown area adjacent to the foundation to accommodate the delivery and temporary storage of the turbine components prior to their erection and to support the cranes during erection (see Planning Drawing P20-306-0300-0001 to P20-306-0300-0011).

Once the turbine components arrive on site they will be placed on the hardstand and lay down areas prior to assembly. The towers will be delivered in sections and each blade will be delivered in a separate delivery. Once there is a suitable weather window the turbine will be assembled.

A turbine hardstanding area consists of a main crane pad hardstanding with a number of additional smaller hardstandings that act as set down and assembly areas, located as shown on the accompanying planning drawings. This area will accommodate a main crane and an assist crane during the assembly of the turbine, as well as during occasional maintenance periods during operation. It will also facilitate parking for operation and maintenance staff.

All crane pads will be designed taking account of the loadings provided by the turbine manufacturer and will consist of a compacted stone structure. The crane hardstands will be constructed in a similar manner to the excavated site roads. Where an excavated crane hardstand cannot be used due to the depth of peat, the hardstand will be supported by using reinforced concrete piles as per the methodology outlined for piled foundations discussed above.

Hard standing formation will consist of a minimum 500 mm hardcore on geo-textile membrane. The construction methodology for hard standings will be as follows:

- The formation will be prepared to receive the geotextile membrane.
- Stone (sourced locally from licensed quarries) will be placed and compacted in layers to minimum 500 mm depth.
- Drainage ditches will be formed, within the excavated width and along the sides of the hard standing.
- Surplus topsoil will be placed along the side of the hard standing (avoiding any existing land drains) and dressed to blend in with surrounding landscaping.

3.4.8 Turbine Foundations

Extensive site investigation has been carried out at the Site, the purpose of which was to determine the ground conditions across the Site. This information has been used to identify the most likely foundation solution for the structures on the site including roads, hardstandings, turbine foundations and buildings.

Given the depth of peat across the Site, the high static water level and the poor strength quality of most of the shallow subsoils and the presence of dolines, piled foundations will be used across the Site. Gravity foundations will be used where confirmatory investigations show that suitable founding strata are located at shallow depths above the water table (or where ground water can be comfortably controlled by conventional pumping).

Turbine foundations will be designed to Eurocode Standards. Foundation loads will be provided by the wind turbine supplier, and factors of safety will be applied to these in accordance with European design standards:

- EN 1992-1-1: Eurocode 2: Design of concrete structures.
- BS EN 61400-1:2005: Wind Turbines Design Requirements.

The Site is entirely underlain by mid-Carboniferous Limestone, predominantly of the Ardnasillagh Formation and results from combined desktop study, site reconnaissance and ground investigations suggest that karst is confined to the Quaternary deposits overlying the limestone. A geotechnical engineer or engineering geologist with experience in identifying surface karst features will be appointed to oversee the construction.

Any surface depressions or suspected doline features within the footprint of the hardstands, construction compounds, met mast foundations, substation site or access roads will be removed by excavation of the existing soils and replacement with engineered fill.

3.4.8.1 Gravity Foundation

Gravity foundation will comprise a reinforced concrete base designed to distribute the loads to the ground directly. Foundation bases will consist of circular concrete base which will be 20m – 25m m in diameter and 5 m in depth with a central circular raised plinth which will be used to anchor the turbine tower at its base. Gravity foundation will be constructed as follows

- The extent of the excavation will be marked out.
- Around the perimeter of the foundation formation a shallow interceptor drain will be formed and settlement pond / swale constructed.

- The base of the foundations will be excavated to competent bearing strata. This will typically be within the upper 5 m but will be confirmed on-site by the Site Engineer.
- Excavated soil will be managed in accordance with the Soil Management Plan Appendix 11.4.
- Where necessary, temporary pumps and sumps may be required to maintain a dry, clean formation. Pumped water will be directed to the settlement ponds prior to entering the drainage system.
- A layer of concrete blinding (lean mix) will be laid 75 mm thick directly on top of the newly exposed formation to provide a level platform.
- Formwork and reinforcement will be fixed.
- Ductwork will be installed as required for cables, and formwork erected around the steel cage.
- Concrete will be placed using a concrete pump in accordance with the requirements of the Structural Engineer and compacted using vibrating pokers.
- Concrete (nominally 800 m3 per foundation) would typically be in two pours, the first pour being the main base, which is approximately 90% of the foundation; the second and remaining 10% forming the plinth section which sits on the top of the main base.
- Upon completion of the concreting works the foundation base will be covered against precipitation.
- Steel shutters will be used to pour the upper plinth section.
- Once the concrete is set the earthing system is put in place and the foundation is backfilled with suitable material to tie in with the required level of the hardstanding.
- The foundation will be backfilled with a cohesive material, where possible using the material arising during the excavation.

3.4.8.2 Piled Foundations

The piled turbine foundations will be constructed using standard reinforced concrete construction techniques. Detailed construction methodologies for turbine foundations are provided in the CEMP in Appendix 2.1 of Volume III.

While load bearing resistances may be achievable in the subsoils, the piles will be extended into the bedrock in order to provide certainty on stability given the occurrence of dolines[1] in the area. For the piled foundations it will be necessary to embed the piles directly into the bedrock using rock sockets. The pile toe level will depend on the depth to bedrock (see Appendix 11.1 – Geotechnical and Peat Stability Report for founding depths). These will be further established by detailed ground investigations prior to the construction of the Proposed Development. The piles to be constructed will be large diameter reinforced concrete piles and will range in the order of 600mm to 1200mm diameter. Between 14 and 16 piles will be used at each piled turbine foundation. Concrete volumes required for piled foundations averages as 733 m^3 per foundation, which has been rounded up to 800 m^3 for the purpose of this impact assessment (assuming 900mm diameter piles and 16no. per turbine foundation and based on indicative founding depths of piles at each turbine as listed in Table 9-1 of the Peat Stability Assessment Report, Volume III).

[1] A doline, also known as “Dropout” or “Cover Collapse” is a subsidence features limited to overburden deposits (soils) overlying the bedrock. ”. Based on the Site’s geology it is thought that fractures in the bedrock caused by regional scale faulting have allowed for overburden material to migrate downward thereby causing voiding and subsequent collapse of the overlying superficial deposits.

It is intended also that the crane pads are provided a piled foundation at locations where gravity foundation is determined not to be feasible by the Engineer following detailed design. Similar concrete volumes will be required for either a gravity or piled solution at crane pad locations.

Preparatory work for piling will include the following:

- Site clearance and setting out of the works area followed by soil stripping (which will be managed in accordance with the Soil Management Plan) in order to reach a suitable formation level for the piling platform.

- Around the perimeter of the foundation formation a shallow interceptor drain will be formed and settlement pond / swale constructed.

- Construction of a piling platform (also referred to as pling matt) which is a work platform used for piling rigs providing a stable base from which they can operate, and typically comprise gravels or crushed rock compacted in layers. The piling platform will be designed based on the rig size and specific ground conditions at each turbine location, which will be determined during the detailed design stage. The piling platform will be incorporated into the hardstand as part of construction.

Rock socket piles will be used to embed the piles into solid rock. This is a best practice technique in karst environments which involves drilling into the rock layer to create a socket which is slightly larger than the pile. This creates a void around the outer edge of the pile which is filled with grout / cement. This 'socket' in the rock provides the pile with stability by providing resistance against lateral loads and uplift forces. The method requires that piles are bored using a continuous auger until such point as rock-head is met. The auger drill head is then changed to penetrate into the intact rock head. This is followed by rotary piles: an auger core which is followed by a temporary outer steel casing / sleeve to maintain support in the bored excavation. As the casing is inserted, an auger / core-barrel is used to excavate and 'muck-out' inside the casing. When the predetermined pile toe level has been achieved, a prefabricated reinforced steel cage is introduced into the bore, and concrete is poured by means of a tremie-pipe (such that concrete is filled from the bottom of the bore upwards). The temporary casing is then removed. Where the appointed geotechnical engineer or engineering geologist for the works deems that, due to the karst environment, there is a risk of concrete wash out into the environment during piling, the bored pile will be cast within a permanent casing or geotextile sock/bag to prevent the loss of concrete or drilling fluids such as bentonite and vinyl-polymer.

Note that for piled foundations the water level within the pile shaft will be maintained at or above the surrounding ground water level to ensure that there is no differential head encouraging piping/boiling[2] of the soil at the base of the excavation.

[2] Piping/boiling of the soil is a seepage failure due to groundwater flow

Once all the piling for base has been completed the piles are checked to ensure that their cut off level is appropriate for the required base of the foundation. If this is not the case some pile head cutting may be required. When all piles are to the required level the area is lean-mixed and the foundation base rebar is tied and concrete is poured for the foundation whereby the foundation comprises a reinforced concrete base designed to distribute the loads across the piles. The foundation base will consist of circular concrete base which will be 20 m - 25 m in diameter and 4 m in depth with a central circular raised plinth which will be used to anchor the turbine tower at its base. Concrete will be placed using a concrete pump in accordance with the requirements of the Structural Engineer and compacted using vibrating pokers. Steel shutters will be used to pour the upper plinth section. Ductwork will be installed for cables. Upon completion of the concreting works the foundation base will be covered against precipitation. Once the concrete is cured the earthing system is put in place and the foundation is backfilled with suitable material to tie in with the required level of the hardstanding. The foundation will be backfilled with a cohesive material, where possible using the material arising during the excavation.

3.4.9 Permanent Meteorological Mast

The met mast design is shown on Planning Drawing P20-306-0300-0012. Installation works will be carried out by a small crew as follows:

- An access track will be extended towards the mast location from the wind farm internal access road. The access track will be 3.5m in width. Associated drainage infrastructure will be extended also.
- A small stone crane pad will be constructed in front of the proposed mast location.
- General construction methods for the access track and crane pad hard standing will match those described for wind farm access tracks and hard standings.
- The foundation will be excavated followed by shuttering, steel fixing and finally concrete pouring by ready mix truck.

3.4.10 Turbine Transformers

- The turbine transformers will be placed directly onto the turbine foundation upon delivery to site, prior to the installation of the turbine towers.
- The transformers will be of the sealed type and will be inspected for any damage prior to offloading. It is proposed that the units will be installed using a small mobile all-terrain crane and will be tested, commissioned and energised by suitably trained and authorised persons.
- The accessible sections of the transformer will be protected within an enclosure which will be locked at all times and displaying appropriate warning signs.
- Transformers and ancillary plinth-mounted equipment required in the substation compound will be delivered to site and unloaded directly in place by HIAB crane or similar.
- Suitable task specific RAMS and lifting plans will be in place prior to the commencement of all works.

3.4.11 Surface Water Management, Drainage and Watercourse Crossings

A Surface Water Management plan has been prepared and is presented in Appendix 12.2 of Volume III of the EIAR. It contains methodology for drainage, water quality management and silt control. The measures contained within the plan will be applied by the Contractor.

Drainage design and watercourse crossing details can be found on the 100 series planning drawings.

Watercourse crossings can be classified as follows:

- Existing structures (bridges or culverts) that need to be crossed by infrastructure (access tracks or cables) associated with the Proposed Development, without a need to modify the existing structure;
- Installation of new structures to facilitate the crossing of existing watercourses by infrastructure associated with the Proposed Development;
- Crossing of existing open streams or drains.

The water quality protection measures for in-stream works are set out in Chapter12- Hydrology and Water Quality of the EIAR and will be adhered to for Construction.

All in-stream works will be carried out under dry works conditions i.e. the works area will be isolated from the river/stream/drain flow by means of temporarily overpumping or fluming the flow in accordance with IFI (2016) ' Guidelines on protection of fisheries during construction works in and adjacent to waters'.

Instream works will only take place during the period July to September (as required by IFI for instream works).

Operation of machinery in-stream will be kept to an absolute minimum. All construction machinery operating in-stream or bank-side will be mechanically sound to avoid leaks of oils, hydraulic fluid, etc. Machinery will be checked prior to commencement of in-stream works.

Before contact with water is made, any equipment or machinery that will be used in the water, including Personal Protective Equipment (e.g. footwear, gloves), will undergo the Clean-Check-Dry biosecurity protocol: https://www.fisheriesireland.ie/Biosecurity/biosecurity.html. This will similarly be carried out upon completion of the work or moving the equipment or machinery from the water.

The proposed Construction Methodologies for the Watercourse Crossings are set out in Chapter 2 - Development Description of the EIAR, Chapter 9- Biodiversity and Chapter 12- Hydrology and Water Quality.

3.4.11.1 Stream Crossing Structures

3.4.11.1.1 *Clear Span Bridge Details and Construction Methodology*

The bridge will be installed on-line (i.e. on the existing channel without the need for waterbody diversion) and the works will be carried out under dry conditions in accordance with IFI (2016) '*Guidelines on protection of fisheries during construction works in and adjacent to waters*'. The watercourse flow will be flumed in order to facilitate construction in dry conditions. The flume installation will take place in low flow conditions. Mitigation for the protection of sensitive biological receptors when fluming / overpumping are presented in Chapter 9 – Biodiversity.

Foundations: The bridge will be constructed using three bridge abutments (one on the northern side and two on the southern side of the river). Abutments will be pre-cast concrete sections. The abutments for the bridge will be founded on reinforced concrete pad footings. An excavator will be used to reach the subgrade on which the concrete pads will be founded. The excavations will be set back a minimum of 2.5m from the banks of the BLACK (SHRULE)_010 River. Dewatering of the excavations as per the Surface Water Management Plan will likely be required through sump pump or alternative means until completion of the footings. A layer of Class 6N2 fill will be laid as a regulating layer on top of the subgrade. A 75mm thick blinding concrete will be placed over the full extent of the rectangular foundation to produce a clean flat surface for the wet structural foundation concrete. The reinforcement cage for the pad footing will be fixed and tied with bars protruding vertically for subsequent concrete pours. Formwork will be placed around the perimeter of the footing ensuring sufficient concrete cover to the reinforcement. It is calculated that 18m^3 of concrete will be required for each abutment bank seat pad and will be delivered to site by ready mix trucks. The concrete will be placed in the formwork using a hopper or concrete pump and vibratory poker used to remove air bubbles.

Abutments: Once the pad footing has achieved sufficient strength, the reinforcement for the abutment upstands will be cut, tied and fixed into position. A vertical formwork will be placed around the perimeter of the abutment wall. Each abutment upstand will require approximately 13m^3 of concrete which will be placed using a hopper or concrete pump. A vibratory poker will be used to remove any air pockets. Once the formwork has been removed and the concrete has cured, a waterproofing membrane will be applied to the concrete. At the top of the upstands, seatings for the precast deck beams will be prepared at the correct levels.

Deck: The bridge deck will be set above the 1% AEP flood height (100-year event plus climate change). The modelled peak 1% AEP + CC water level at the upstream face of the proposed bridge is 28.4m OD. Therefore, in compliance with the OPW Section 50 minimum freeboard requirements, the soffit level the bridge will be constructed to a minimum level of 28.7m OD. The bridge will be made up of precast concrete beams with a span of 18.5 m (see Planning Drawing P20-306-0300-0015). The beams will be precast off site and delivered to site on a flatbed truck. A crane will be used to lift the beams into position onto the seatings formed on top of the abutment upstands. When in place, cable ducts will be placed in the voids between each of the beam webs and mesh reinforcement placed above them. Cement Bound Granular Mixtures B (Cl 822) will surround the ducts and be compacted in accordance with Cl813.10 and Table 8/4 of TII Specification of Roadworks. Side forms for the edge parapet beams will be secured and reinforcement for the deck slab and parapet edge beams will be cut, tied and fixed into position with bars protruding vertically from the edge beams for subsequent concrete pours for the concrete parapets. The bridge deck slab and edge beams will be concreted to the finished level. Once the deck slab has reached sufficient strength the abutment walls will be backfilled with a granular fill to road formation level.

Parapets and Deck Topping: The bridge deck parapets will be constructed from reinforced concrete. Reinforcement for the parapets will be fixed to lap with the starter bars from the edge beams. Vertical formwork will be erected and secured in place. An in-situ pour will be carried out to cast the parapets to the design height and vibratory poker used. Once the parapets have reached sufficient strength the formwork will be stripped. The deck surfacing is to be formed using an ST1 concrete mix. This will be placed on top of the deck slab with a minimum thickness of 100mm and with a crossfall from the centre of the deck to the parapet to allow water to drain.

Construction of the water crossing will be scheduled to align with fisheries seasonal restrictions.

The access road on the approach to the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of the watercourse crossing.

All drainage measures, including check-dams and /or silt traps, along the proposed road will be installed in advance of the works along with the first layer of road construction.

All earthworks adjacent to the crossing locations will be carried out so as to prevent soil entering the watercourse and will be in accordance with the Spoil Management Plan and mitigation measures set out in Chapter 12 – Hydrology and Water Quality.

Safe pedestrian access over the stream for this installation will be via a steel walkway & handrail which will span the stream.

Further details on hydrology and drainage are contained in Chapter 12 - Hydrology and Water Quality, the Surface Water Management Plan (SWMP) and on accompanying planning application drawings.

3.4.11.1.2 Culvert Construction Methodology

Culverts will be made of precast units which will be sized specific to the hydraulic capacity required relative to the characteristics of the watercourse to be crossed. The crossing angle for the culverts will be set out in relation to road alignment and the existing watercourse channel. The project engineer will determine the required gradient of the culvert. Standard details for piped culverts are provided in Planning Drawing P20-306-0501-0002.

The access road on the approach to the channel will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of the culvert crossings.

The culverts will be installed on-line (i.e. within the existing channel) and the works will be carried out under dry conditions in accordance with IFI (2016) '*Guidelines on protection of fisheries during construction works in and adjacent to waters*'. The watercourse flow will be diverted by overpumping or by fluming the flow as appropriate in order to facilitate construction of the culvert in dry conditions. The installation of the culvert will take place in low flow conditions. Mitigation for the protection of sensitive biological receptors when fluming / overpumping are presented in Chapter 9 – Biodiversity.

The bed of the watercourse will be taken down to the desired levels to create a suitable platform for laying the culvert. The pipe culvert will be lifted into place with an excavator with a lifting mechanism / crane and will have an invert level 500 mm below the existing watercourse bed level. The embedded section will be allowed to fill naturally unless otherwise specified in Chapter 9 – Biodiversity.

The culverts will be such that it will not prevent fish, eel or lamprey passage.

3.4.11.1.3 Minor Stream / Drain Crossing Construction Methodology

All other minor streams or drains within the Site (which are not identified as Rivers by the EPA in their reporting under the Water Framework Directive) which are crossed by the wind farm infrastructure will be collected by interceptor drains and carried under the road by cross drains. Further details on the locations of such cross drains are provided in the Surface Water Management Plan and in the Drainage Drawings presented in 0100-Series planning application drawings. The cross drains will be an appropriately sized pipe buried in the sub-base of the road at the necessary invert level to ensure ponding or pooling doesn't occur above or below the cross drain and water can continue to flow as necessary.

For a minor stream/drain crossing the following will be employed:

All environmental mitigation measures, described in detail in Chapter 12 - Hydrology and Water Quality and Chapter 9 - Biodiversity, will be implemented locally in advance of the works, in accordance with the measures outlined in the Surface Water Management Plan (SWMP).

The pipe is laid in one lift or in sections using a lifting mechanism attached to an excavator.

Rock armour headwalls will be constructed where necessary to protect pipe ends and the base of slope embankments on either side of the track.

3.4.12 Substation Compound

The substation compound will measure 123 m X 62.8 m as shown in planning application drawings. The compound will include a substation control building and electrical components necessary to export the electricity generated from the wind farm to the national grid. The substation compound will be surrounded by a ca. 2.5-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 buildings.

The control building located within the substation compound will measure 25 m by 18 m and 8.38 m in height. The Independent Power Production (IPP) building will include grid operator control rooms, an office space and welfare facilities for staff during the operational phase of the wind farm and will measure 10.7m by 20.1m and 6.9m in height.

Due to the nature of the Proposed Development, there will be a small water requirement for occasional toilet flushing/hand washing with a rainwater harvesting tank adjacent to the control building. 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. The wastewater holding tank will be a sealed storage tank with all wastewater 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. Potable water will be delivered to site and stored in a holding tank in the substation control building.

The substation compound will also contain external electrical and ancillary infrastructure in the form of the following:

- Cable sealing ends;
- Surge arrestors;
- Cable disconnectors;
- Post insulators;
- Circuit breakers;
- Current and voltage transformers;
- Steel gantry's and cable chairs;
- Power transformers;
- Power quality compensation equipment;
- Concrete plinths and bunds;
- External lighting;
- Lightening protection masts;
- Telecommunications masts;
- Security cameras;
- Palisade fencing and gates.

Lightning protection (at 18m height) and telecommunications masts (at 20m height) will represent the tallest structures in the compound.

The proposed substation compound is presented in accompanying planning application drawings.

The building's main function is to provide housing for switchgear, control equipment and monitoring equipment necessary for the proper functioning of the substation and wind farm. The building will be constructed by the following methodology:

- The area of the control buildings and compound will be marked out using ranging rods or wooden posts and the vegetable soil stripped and removed to the nearby storage area for later use in landscaping. No material will be removed from site and storage areas will be stripped of vegetation prior to stockpiling in line with best working practises.
- Drainage runs and associated settlement ponds will be installed.
- The dimensions of the Building and Compound area will be set to meet the requirements of EirGrid and the necessary equipment to safely and efficiently operate the wind farm.
- The foundations will be excavated down to the level indicated by the designer and concreted.
- The blockwork walls will be built up from the footings to DPC level and the floor slab constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors.
- The blockwork will then be raised to wall plate level and the gables & internal partition walls formed. Scaffold will be erected around the outside of the building for this operation.
- The concrete roof slabs will be lifted into position using an adequately sized mobile crane.
- The wooden roof trusses will then be lifted into position using a telescopic load all or mobile crane depending on site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather.

The remainder of the substation compound will be brought up to the agreed formation and approved stone imported and graded to the correct level as per the detail design.

Equipment plinths will be marked out, excavated and constructed using in-situ reinforced concrete or pre-cast concrete. Provision will be made in each plinth for earth connection.

Following the construction of the equipment plinths an earth mat will be installed throughout the compound. This will be connected to each plinth and the buildings as per the electrical earth protection design.

3.4.12.1 Drainage of Substation

The substation will be drained via an underground piped surface water drainage network. The network will also utilise linear drainage channels and filter drains.

The network will discharge overland via a Class 1 Full Retention Oil Separator at a restricted greenfield rate. Attenuation for flows exceeding this rate will be provided within an underground tank.

In accordance with SuDS best practice, a rainwater harvesting tank will be included. Rainwater will be filtered and stored within the underground tank for reuse.

There will also be no discharge of foul flows from welfare units within the substation, with water stored in tanks and removed from site by a contractor.

3.4.12.2 Substation Fit Out and Switchgear Installation

The substation will have a domestic electrical system including lights, sockets, fire alarm and intruder alarm. The high voltage switchgear for the wind farm will be installed through the following method.

- The switchboard units will be delivered to site on a truck and unloaded using a forklift, front end loader or HIAB crane.
- Suitable task specific RAMS and lifting plans will be in place prior to the commencement of all works.
- The switchgear will be unloaded on to a concrete plinth directly outside the substation building.
- The units will be moved inside the substation building using a hand driven forklift and positioned over the internal trench supports, prepared previously.
- The switchgear will then secured as per manufacturer's instructions, typically by bolting directly to steel support bars over the trench.
- The building is fitted out with small light and power and ancillary wind farm control equipment such as SCADA computer, remote telemetry units, metering etc.
- All equipment and fittings are then connected, wired tested and commissioned in accordance with the Electrical Contractor's commissioning plan.

3.4.13 Internal Wind Farm Cabling Works

The construction methodology for the 110kV electrical infrastructure is contained in Appendix 2.3: Grid Connection Construction Methodology of Volume III of the EIAR and shown on planning drawings 051021-DR-101 to 051021-DR-121.

The specification for the 33kV cable trenches is based on cable voltage, location and existing land use. The proposed cable trench construction details are presented in planning application drawings 051021-DR-113 to 051021-DR-315.

All electrical and fibre-optic cabling on site between the wind turbines and the substation building will be buried in trenches approximately 0.6m wide by 1m deep located within or directly adjacent to the internal tracks.

The following describes the construction methodology for cable installation works inside the Site. Some cables will be buried directly, and some will be ducted. Direct buried cables will be used in non-load bearing areas and ducts will be used in load bearing areas.

For direct buried cables, the following outline methodology will be implemented:

- All environmental mitigation measures will be implemented locally in advance of the works, in accordance with environmental management plan outlined in Section 4 of this CEMP.
- The line of the cable trench will run beside the site access tracks until it exits to the public road.
- The ground will be excavated using a mechanical digger. The top layer of soil will be removed and placed to one side. It will be used for landscaping the top of the backfilled cable trench following the laying of the cables. The remaining subsoil, excavated to the required depth, will be placed separately and used as backfill for the trench.
- Safe ladder access/egress to trenches will be provided into the trench.
- The cables will be laid directly onto a bed of suitable material, free from sharp stones and debris*.
- A suitable material will be placed over the top of the cables to protect them during backfilling*.

- Warning tape and plates will be installed by hand in accordance with the trench design and ESBN specifications and the engineer's design.
- On completion, the ground will be reinstated, and marker posts will be positioned at agreed centres to the side of the trench highlighting the presence of cables below.
- Trenches will vary in width depending on the number of cables in the circuit. Where there is more than one set of cables they will be separated as per cable manufacturers and ESB/ EirGrid requirements.

Where ducting is required within the Site (i.e., for areas where cables will be laid under access tracks or other loaded surfaces), suitable ducting will be required to protect the cables. In this scenario, tasks marked by an asterisk (*) in the above methodology will be replaced by the following steps:

- Ducts will be placed into the trench manually, having been delivered to road side embankment/verge by tractor and pipe trailer and then offloaded by hand.
- Approved bedding material will be used to surround the ducts. It will be delivered straight from a concrete truck or by skid steer along the route.
- Approved fill material will be compacted above and below the power cable ducting as per the engineer's design.
- Exposed duct ends will be capped.
- A 12mm Draw rope will be blown through the ducting at later date.
- Small jointing pits will be located along the route of the trench which will be left open until jointing takes place. A protective handrail/ barrier will be placed around each pit for health and safety reasons.
- Once the cables are joined and sealed the jointing container will be removed and the cables at the joint-bay locations will be back-filled in the same manner as the rest of the cable trench.
- The cables will connect the turbines to the substation. Ducts will be cast into each turbine foundation to provide access for the cables Likewise, at the substation, ducts will be cast through the building foundation to provide access for the cables.
- There are no existing buried services expected within the site however the appointed contractor will be responsible for carrying out pre-construction confirmation surveys ahead of construction.
- Prior to commencement of the works, up to date records of services such as watermains, sewers, gas mains and other power cables will be obtained from the relevant service providers. Cable detection tools, ground penetrating radar and slit trenches will be used, as appropriate, to find the exact locations of existing services. The final locations of the cable trenches will be selected to minimise conflicts with other services.
- Trenches where ducts are laid will be back filled every evening. During excavation works signage will be erected at each location warning of the dangers.

Any temporary reinstatement of road excavations associated with the grid infrastructure will be as follows, with permanent reinstatement as per TII / Local Authority Requirements:

- Hot works permit to be issued for the area of works for the area to be reinstated.
- A grader (if required), Roller and mini-patch planer will be delivered to site by low-loader. A 2 - in - 1 Tar - and Chipper or patch sprayer will be driven to site.
- A mini patch planer will be attached to a skid steer and will plane a fresh cut line along the verge of the trench.
- The trench fill material will be graded to shape the trench to match the existing camber of the carriageway and compacted using a drum roller.
- The Tar - and - Chipper will make first pass of one metre wide.
- Once the bitumen emulsion and chips have been dispensed from the 2- in 1 Tar and chipper and the drivers cab is clear of the area, the roller will follow and compact the chips into the emulsion.
- If the 2 - in - 1 - Tar - and - Chipper is not being used, a towable emulsion sprayer will be used. This involves the towable sprayer being towed by a pickup truck, and an operative spraying the trench area by means of a lance from the unit.
- The emulsion is heated up to 70°C.The operator will wear protective overalls, heat resistant gloves and eye protection.
- The emulsion is sprayed out to cover the existing trench fill where a follow up crew will spread surface dressing chips over the sprayed area at a safe distance of 5m from the lance.
- Compaction will then take place by a drum roller.
- Both the 2 - in - 1 - Tar - and - Chipper and towable sprayer will have internal diesel burners, with no exposed naked flame.
- Delay set macadam may also be used, 75mm of delay set macadam shall be placed within the trench at the end of each working day, by means of skid steer and trench reinstatement bucket and compacted.

Image 3-1: Towable Sprayer for Temporary Reinstatement

3.4.14 Horizontal Directional Drilling

A launch and reception area is required for directional drilling: 180m2 for the HDD entry side, and circa 550m2 on the HDD exit side. Entry and exit pits (approximately 2m (width) x 3m (length) x 1m depth) will be excavated using an excavator. Two ducts will be required at each crossing location. A specialised directional drill machine will be anchored to the ground and will drill at a suitable shallow angle to allow it to achieve the required depth for the bore. If ground conditions are unfavourable, the drilling process will need to be repeated using progressively larger drill heads until the required size is achieved.

The drilling process involves pumping a drilling fluid through the drill head. The fluid is inert, natural and biodegradable. This fills voids locally around the drill head and enables the drill to progress without the hole collapsing. The duct will be positioned, and the launch and reception pits will be refilled.

Further details of this crossing method are provided in EIAR Appendix 2.3 and planning drawing 051021-DR-308.

3.4.15 Turbine Installation

Each wind turbine will have an associated turbine hardstand area and temporary laydown area adjacent to the foundation to accommodate the delivery and temporary storage of the turbine components prior to their erection and to support the cranes during erection.

Once the turbine components arrive on site they will be placed on the hardstand and lay down areas prior to assembly. The towers will be delivered in sections and each blade will be delivered in a separate load within the convoys. Once there is a suitable weather window the turbine will be assembled.

It is anticipated that the turbine installation works will take place over the course of 6 months. This is based on a total of 7 no. loads per turbine to deliver blades, tower sections and nacelles, with each convoy consisting of components for two turbines at a time.

3.4.16 Fencing and Site Security

Temporary Heras fencing will be erected surrounding the construction compounds. Access will be gated to prevent unauthorised access. CCTV will be in operation.

Permanent palisade fencing will be constructed around the on-site substation. Fence details are shown on planning drawing 051021-DR-110.

3.4.17 TDR Temporary Accommodation Works

Temporary accommodation works (see Table 3-1) will be required along the TDR to facilitate the delivery of large components to the Site. No permanent road widening or junction accommodation works are required along the turbine delivery route. Some temporary hardcore surfacing will be required at roundabouts and areas of oversail. All temporary accommodation works associated with the TDR will be fully reinstated following the construction stage. Refer to Appendix 14.1 of the EIAR and EIAR figure 2.3 for further details.

Table 3-1: Accommodation Works on Delivery Route

POI Ref.	Location	Description of Works
1	Exit from Galway Harbour	Loads will need to travel through the car park where parking should be suspended and the fences removed. All street furniture should be removed. Loads will over-sail the right-hand verge of Lough Atalia Road where one lighting column should be removed.
2	Lough Atalia Road Railway Overbridge	Loads will straddle the centre line of the road. The bridge clearance is 5.46m and loads should be set on a lower suspension to provide additional clearances to the structure. Recent studies have been completed by the port authority which confirmed that a blade of similar dimensions is able to exit the port via this route.
3	Lough Atalia Road / College Road Junction	Loads will merge onto the R339 northbound by undertaking a contraflow manoeuvre. Loads will over-sail both verges through the section. One traffic signal head should be removed from the right-hand verge and one traffic signal head, one road sign, and two bollards should be removed from the left-hand verge.
4	R339 / R338 Junction	Blade tip will over-sail the left-hand verge on entry where one traffic signal should be removed. Loads will over-sail the exit splitter island where one traffic signal, one crossing signal and pedestrian guardrails should be removed.

POI Ref.	Location	Description of Works
5	R339 / Connolly Avenue Junction	Loads will turn left to join Connolly Avenue northbound. Blade tip will oversail the south eastern verge. Loads will overrun and oversail the footway on the inside of the left bend where a load bearing surface will be laid and one traffic signal and two lighting columns will be removed. Loads will overrun and oversail the eastern footway of the exit road where a load bearing surface should be laid and one traffic signal will be removed.
6	Connolly Avenue / R336 Junction	Loads will turn right at the junction to join the R336 eastbound. The blade will oversail the lefthand verge on the entry arm of the junction. Loads will over-run and over-sail the inside verge of the right turn where a load bearing surface should be laid and two lighting columns will be removed.
7	R336 / N6 Junction	Loads will turn right at the junction to join the N6 eastbound, undertaking a contraflow manoeuvre. The blade will over-sail the left-hand verge on entry where one road sign will be removed and vegetation trimmed. Loads will oversail the inside verge of the right turn where one traffic signal, one lighting column and the pedestrian guardrail will be removed.
8	N6 / R865 Junction	Loads will continue through the junction to remain on the N6 eastbound. No works required
9	N6 / R339 Junction	Loads will continue through the junction to remain on the N6 eastbound. Loads will oversail the central reservation on the exit arm where one bollard should be removed.
10	N6 Coolagh Roundabout	Loads will take the first exit at the roundabout via the slip road to remain on the N6 eastbound.

POI Ref.	Location	Description of Works
		Blade will oversail the outside verge of the bend where four road signs should be removed. Loads will oversail the inside verge where four lighting columns and two road signs should be removed.
11	M6 Junction 18 Slip Road	Loads would leave the M6 and join the slip road for the M17. Escorts to ensure that the convoy can safely complete the manoeuvre.
12	M17 / N83 Roundabout	Loads will continue straight over the M17 roundabout. Loads will overrun and oversail through the centre of the roundabout island where a load bearing surface should be laid. Loads will oversail the western verge on approach to the roundabout.
13	N17 / R332 Junction	Loads will turn left from the N17 onto the R332. Loads will oversail the junction entry splitter island where one chevron sign and one road sign should be removed. Bollards will be oversailed. Two lighting columns and three road signs should be removed from the western verge on entry. Loads will overrun the entry splitter island at the roundabout and the central island where load bearing surfaces should be laid. Five road signs should be removed. Loads will oversail the exit splitter island at the roundabout where one bollard and one road sign should be removed.
14	R332 Kilconly Left Bend	Loads will continue through the left bend. Loads will oversail the verge on the inside of the bend where one road sign should be removed and vegetation should be trimmed.
15	R332 Right Bend Castlegrove	Loads will continue through the right bend. Loads will oversail both verges where trees and vegetation should be trimmed through the inside verge. One utility pole should be removed.

POI Ref.	Location	Description of Works
16	R332 / L6483 Junction	Loads will turn left onto the L6483 at the junction. Loads will oversail and overrun into third party land on the inside of the left bend where a load bearing surface should be laid and the drainage ditch culverted. Trees and vegetation will be cleared and one utility pole removed.
17	L6483	Loads will continue west on the L6483. The road along this section will need to be widened to provide a minimum 4.5m running width and a 5.5m clearance width. Widening will be within local authority lands.
18		Loads will turn left onto the L6483 towards the proposed site entrance. Loads will oversail and overrun into third party land on the inside of the left bend where a load bearing surface should be laid. Two road signs should be removed. Trees and vegetation should be cleared.

4. ENVIRONMENTAL MANAGEMENT PLAN

4.1 Introduction

This Environmental Management Plan (EMP) defines the work practices, environmental management procedures and management responsibilities relating to the construction of the Proposed Development. This plan should be read in conjunction with the EIAR.

This EMP describes how the Contractor for the main construction works will implement a site Environmental Management System (EMS) on this project to meet the specified contractual, regulatory and statutory requirements and identified mitigation measures. This plan will be further developed and expanded following the grant of planning permission and appointment of the Contractor for the main construction works (in accordance with the parameters and measures set out in this EMP). Please note that some items in this plan can only be finalised with appropriate input from the Contractor who will carry out the main construction works and once the planning conditions are known. It is the Contractor's responsibility to implement an effective EMS to ensure that environmental requirements for the construction of this Proposed Development are met.

All site personnel will be required to be familiar with the EMP's requirements as related to their role on site. The plan describes the project organisation, sets out the environmental procedures that will be adopted on site and outlines the key performance indicators for the site.

- The EMP is a controlled document and will be reviewed and revised as necessary (to comply with planning conditions or other local authority requirements).
- A copy of the EMP will be located on the site H&S notice board.
- All employees, suppliers and contractors whose work activities cause/could cause impacts on the environment will be made aware of and understand the EMP and its contents.

This section includes the mitigation measures which will be implemented by the contractor and client during the construction, operation and decommissioning of the Proposed Development as per the EIAR and NIS.

4.2 Project Obligations

In the construction of the Proposed Development there are a number of environmental management obligations on the developer and the contractor. As well as statutory obligations, there are several specific obligations set out in the EIAR and NIS. This CEMP will be updated by the main contractor following appointment and will only be revised as set out above. The contractor and all of its sub-contractors will be fully aware of and in compliance with these environmental obligations.

4.2.1 EIAR/NIS Obligations

The EIAR and NIS identified mitigation measures that will be put in place to mitigate the potential environmental impacts arising from construction of the Proposed Development. Measures identified in the EIAR and NIS are detailed in this CEMP and listed in the Schedule of Commitments which accompany the EIAR. It should be noted that this Schedule of Commitments also includes operational phase and decommissioning phase commitments which are not relevant to the construction phase. The CEMP will be read in conjunction with the EIAR and NIS. In the case of any ambiguity or contradiction between this CEMP and the EIAR and NIS, the EIAR and NIS shall take precedence.

4.2.2 Planning Permission Obligations

All planning conditions attached to the Proposed Development's planning permission will be adhered to. All pre-commencement planning conditions will be discharged fully by the project owner prior to commencement of construction.

4.2.3 Other Obligations

The Developer and/or Contractor for the main construction works will liaise directly with relevant Bodies in relation to securing any necessary permits to allow the works to take place including for example (non-exhaustive list):

- Commencement notice;
- Special Permits in relation to oversized vehicles on public roads;
- Temporary Road Closures (if required);
- Road Opening Licence;
- Building control approval;
- Trade effluent discharge licence / Tankered wastewater agreement;
- Section 50 consent for the construction of bridges or culverts on any drain or watercourse;
- Abstraction licence – registration with EPA;
- licence, permit or certificate of registration required by the waste producer, haulier and waste facility;
- Tree Felling Licence;
- Licence from national Monuments Service;
- Protected Species licence (noting that the need for same has not been identified at planning stage);

The Developer will also liaise closely with the local residents, especially homeowners and landowners along the local access routes in relation to works and all reasonable steps will be taken to minimise the impact of the development on such persons.

A Traffic Management Plan is included in Appendix 14.2 of the EIAR.

4.3 Environmental Management Plan

This section outlines the EMP associated with the Proposed Development. Table 4-1 below describes the Management Plans that have been prepared as part of the EIAR. The Management Plans should be read in conjunction with the EIAR and CEMP. The contents of the management plans will be updated for the construction phase in line with any planning conditions that may apply.

Table 4-1: Management Plans

Management Plan	Location	Description
Traffic Management Plan	Appendix 14.2 of Volume III of the EIAR To be read in conjunction with Appendix 14.1 - Turbine Delivery Route Assessment Report	The traffic management plan outlines the procedures to be implemented during the construction stage for traffic management at the Proposed Development. In the traffic management plan the proposed haul routes to the site, used for engineering material, equipment deliveries and the turbine delivery route (TDR) (to be used for the delivery of oversized components required for the construction of the turbines) are assessed. The objective of the TMP is to maintain the strategic capacity of the national routes at all times, cognisant of the National Development Plan, 2021 – 2030, and to maintain all roads to a robust and safe standard for users. The Developer will adopt and further develop the Traffic Management Plan for agreement with the Galway City and County Council in advance of construction. The Traffic management does not consider the decommissioning phase of the Proposed Development. A separate plan will be prepared by the Developer in this regard closer to the point of decommissioning.
Peat and Spoil Management Plan	Appendix 11.4 of Volume III of the EIAR	The purpose of this is to provide a peat and spoil management plan for the construction phase of the Proposed Development. The intention of the report is to describe how peat and spoil which will be excavated from infrastructure locations such as turbine bases and roads and will be handled and placed/reinstated on site in an appropriate manner. The peat and spoil management plan contains drainage guidelines for construction works and for management of peat on site. It should be noted that the control of water quality and drainage measures for site is outlined in detail in Chapter 12 of the Environmental Impact Assessment Report (EIAR).
Surface Water Management Plan	Appendix 12.2 of Volume III of the EIAR, to be read in conjunction with Appendix 12.3: Flood Risk Assessment	The Surface Water Management Plan contains methodology for drainage, water quality management and silt control. The measures contained within the plan will be applied when working near water.

Management Plan	Location	Description
Biodiversity Enhancement and Management Plan	Appendix 9.1 of Volume III of the EIAR. The BEMP should be read in conjunction with Chapter 9 – Biodiversity, Chapter 10 – Ornithology and Chapter 12 – Hydrology and Water Quality.	provides guidance for the creation, maintenance and management of habitat and species enhancement features which will form part of the Proposed Development. The BEMP has been prepared having regard to *'Planning for development: What to consider and include in Habitat Management Plans*' (Nature Scot, 2016). In addition, mitigation measures prescribed in the Natura Impact Statement (NIS) carried out for the Proposed Development will be implemented in full. For mitigation measures associated with the NIS please refer to the EIAR Schedule of Commitments.

4.3.1 Decommissioning Plan

The decommissioning phase works will be completed to approved standards, which include specified materials, standards, specifications and codes of practice (at the time decommissioning takes place).

An experienced main contractor will be appointed to undertake the of the decommissioning of the wind farm development. The main contractor will comply with the Construction and Environmental Management Plan (CEMP) prepared for the construction phase and the Operation and Environmental Management Plan (OEMP) implemented during operation and any revisions made to those documents throughout the phases in which they were adopted. The contractor will produce a detailed an site specific Decommissioning Plan prior to commencement of decommissioning.

The key site targets are as follows;

- Ensure decommissioning works and activities are completed in accordance with mitigation and best practice approach presented in the accompanying Environmental Impact Assessment Report (EIAR) and associated planning documentation;
- Ensure decommissioning works and activities have minimal impact/disturbance to local landowners and the local community;
- Ensure decommissioning works and activities have minimal impact on the natural environment;
- Adopt a sustainable approach to decommissioning;
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows;

- Using recycled materials if possible, e.g. soil and overburden material for backfilling and reinstatement;
- Ensure sustainable sources for materials supply where possible;
- Avoidance of any pollution incident or near miss as a result of working around or close to existing watercourses and having emergency measures in place;
- Avoidance of vandalism;
- Keeping all watercourses free from obstruction and debris;

- Correct implementation of the sustainable drainage system (SuDS) drainage design principles;
- Keep impact of decommissioning works to a minimum on the local environment, watercourses, and wildlife;
- Correct fuel storage and refuelling procedures to be followed;
- Good waste management and house-keeping to be implemented;
- Air and noise pollution prevention to be implemented;
- Monitoring of the works and any adverse effects that it may have on the environment. Decommissioning methods will be altered where it is found there is the potential to have an adverse effect on the environment;

An overview of the anticipated decommissioning methodologies is provided below.

Wind Turbines

Prior to any works being undertaken on wind turbines, they will be disconnected from the grid by the site operator in conjunction with ESB Networks and EirGrid. The dismantling and removal of wind turbines of this scale is a specialist operation which will be undertaken by the turbine supplier that completed the installation where possible. Turbine dismantling will be undertaken in reverse order to methodology employed during their construction. A number of large-scale cranes will be brought back to site utilising the existing hard stand areas. The dismantling of turbines will be bound by the same safety considerations as was the case during construction in terms of weather conditions where works will not be undertaken during adverse weather conditions and in particular not during high winds.

The turbines will most likely be removed from site in a similar manner to how they were transported to the site originally in extended articulated trucks. The destination of the turbines post decommissioning is unclear at this time as a re-use option may be sourced if early decommissioning occurs. Therefore the removal of turbines from site is considered in terms of all turbine components being removed intact and as they transported to site.

The transport of disassembled turbines from the site will be undertaken in accordance with a Decommissioning Transport Management Plan which will be issued to and agreed with the competent authority at that time as part of a permit application for the delivery of abnormal loads using the local roads under the Road Traffic (Special Permits for Particular Vehicles) Regulations 2007. The Transport Management 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 temporary accommodation works along the TDR will not be required for the decommissioning phase as turbine components can be dismantled on site and removed using standard HGVs.

Turbine Foundations

On the dismantling of turbines, it is not intended to remove the concrete foundation from the ground. The foundation pedestals will be covered over and allowed to re-vegetate naturally. Leaving the turbine foundations in situ is considered a more environmentally sensible option as to remove the reinforced concrete associated with each turbine would result in environmental nuisances such as noise and vibration and dust.

Therefore, the turbine foundations will be backfilled and covered with soil material which will comprise the usable soil or overburden material on the site after construction. The soil will be spread and graded over the foundation using a tracked excavator and revegetation allowed to occur naturally.

It is proposed that all the internal site access tracks and turbine hard standings will be left in place. These will continue to be used for agriculture. Turbine foundation pedestals and hardstandings will be covered over with topsoil previously stripped and used for landscaping purposes during the construction stage and left to revegetate naturally.

Underground Cabling

The 33kV electrical and fibre optic cabling will be removed from the cable ducting. The cabling will be pulled from the cable duct using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at each of the joint bays/pull pits along the cable. The road will be excavated using a mechanical excavator at each cable pulling pit location and will be fully re-instated once the cables are removed. A decommissioning phase Traffic Management Plan will be prepared for these works. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and

Grid connection infrastructure including the on-site substation and ancillary electrical equipment will form part of the national grid and will be left in situ.

The mast will be decommissioned using a similar methodology as the construction except in reverse.

It is expected that the decommissioning phase will take no longer than 6 months to complete.

4.3.2 Dust Management Plan

This Dust Management Plan (DMP) outlines the sources of dust during the works, identifies measures to minimise dust during the works and the complaints procedure for dust.

Construction stage mitigation measures to minimise dust and emissions will be implemented as follows:

- Construction vehicles and machinery will be serviced and in good working order;
- Receptors which receive dusting and soiling on the haul routes, entering the site; and dwellings directly adjacent to the grid connection route that experience dust soiling, where appropriate, and with the agreement of the landowner, will have the facades of their dwelling cleaned if required should soiling have taken place;
- Ensure all vehicles switch off engines when stationary – no idling vehicles; and
- Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be minimised through regular servicing of machinery.

4.3.2.1 Dust Generation and Control

The principal sources of potential air emissions during the construction will be from dust arising from earthworks, tree felling activities, trench excavation along cable routes, construction of the new access tracks, the temporary storage of excavated materials, the construction of the proposed substation, the movement of construction vehicles, loading and unloading of aggregates/materials and the movement of material around the site.

The Site Manager will adopt a range of dust control and mitigation measures aimed at minimising fugitive emissions during the project construction phase. The Site Manager shall ensure that all works are carried out in compliance with 'Guidance on Monitoring in the Vicinity of Demolition and Construction Site[3], published by the Institute of Air Quality Management (IAQM).

Construction dust can be substantially mitigated through the implementation of good onsite practice and the adoption of commonly used techniques to prevent dust being generated and emitted.

Management measures are set out below and have been adapted from best practice guidance from the IAQM. Different mitigation measures have therefore been recommended for different construction activities. The following management measures will be implemented:

Preparing and maintaining the site.

- The internal access roads will be constructed prior to the commencement of other major construction activities. These roads will be finished with high quality graded aggregate.
- The access and egress of construction vehicles will be controlled to designated locations, along defined routes, with all vehicles required to comply with onsite speed limits, which shall be reduced in periods of dry, windy weather.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles;
- Remove materials that have a potential to produce dust from site as soon as possible unless being re-used on site; if they are being reused on site cover;
- Cover or fence stockpiles to prevent wind whipping.

Operating vehicles/ machinery and sustainable travel:

- Ensure all vehicles switch off engines when stationary – no idling vehicles;
- Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable;
- Delivery of materials to site should be to a designated unloading area equipped with dust control screens and vehicles delivering / removing material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- Impose and signpost a maximum-speed limit of 15mph on surfaced and 10mph on unpaved surface haul roads and work areas.

[3] Institute of Air Quality Management (2018). 'Guidance on Monitoring in the Vicinity of Demolition and Construction Site'

Operations:

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction;
- Ensure an adequate water supply on the site for effective dust/ particulate matter suppression/ mitigation using non- potable water where possible and appropriate; and,
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors loading shovels hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever available;
- During periods of very high winds (gales), construction activities likely to generate significant dust emissions should be postponed until the gale has subsided;
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Measures specific to trackout:

- Use water-assisted dust sweepers on the access and local roads, to remove as necessary any material tracked out of site;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; and,
- Record all inspections of haul routes;
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable) at the main construction traffic exit. All trucks leaving the site must pass through the wheel wash. The wheel wash will be located a minimum of 20m but sufficiently far from the exit to allow trucks to ‘drip off’ prior to exit.
- public roads are kept free of debris.;
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit and layout permits;
- regularly damp down internal roads with mobile sprinkler system or mobile water bowsers and regularly clean;
- Avoid dry sweeping of large areas; and,

Measures specific to construction:

- Avoid scabbling (roughening of concrete surfaces) if possible:
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos where suitable emission control systems to prevent escape of material and overfilling during delivery: and,
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures specific to earthworks:

- Re-vegetate earthworks and exposed areas/ soil stockpiles to stabilise surfaces as soon as practicable;
- Use hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil as soon as practicable; and,
- Only remove the cover in small areas during work and not all at once.

Site Management:

- Record all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner and record the measures taken: and
- Record any exceptional incidents that cause dust and or air emissions, either on or off site, and the action taken to resolve the situation in the log book.

Monitoring:

- Carry out regular site inspections to monitor compliance with the CEMP and record inspection results.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out during prolonged dry or windy conditions.

Mobile Dust Suppression Infrastructure

Mobile dust suppression infrastructure (bowser and dribble bars) will be used throughout construction as required. Dust control infrastructure will be available at excavations faces and on temporary and permanent roads. It is proposed that dust suppression will be limited to the use of dribble bars. Dribble bars utilise lower volumes of water (vs. spray bars) therefore mitigate the risk of leachate production or run off. It is noted that dust suppression is typically necessary during extended dry periods where evaporation of water from dust suppression will likely be significant.

Figure 4-1: Mobile Dust Control: Bowser and Dribble Bar[4]

The EHS advisor will advise on dust monitoring requirements during the works. The following provisional dust monitoring will be carried out but may be amended (reduced / increased) depending on monitoring data:

- Dust gauge (DG) and Particulate meter (PM) with anemometer and wind vane at the following approximate monitoring locations (ITM co-ordinates):
  - ITM: 135808.02, 255350.03
  - ITM 132788.408, 253701.508
  - ITM 129717.142, 252387.419

These equipment will be calibrated as per manufacturers requirements.

Bergerhoff dust measurements are long term ambient dust measurements usually carried out over a 30 day period and positioned at a height of between 1.5 and 2 meters above ground level. They provide long term ambient dust data and are usually measured at the perimeter of the site.

The particulate meter will measure PM2.5, PM10 & TPM in µg/m3 and will report and alert in real-time via email and SMS to the Site Manager and EHS Adviser.

Typical examples of the above equipment are shown in the photographs below.

[4] https://www.trailerengineering.co.uk/products/dust-suppression-bowser/dust-suppression-highway-site/

Bergerhoff Dust Gauge and Pot (DG)

Particulate Meter (PM)

Complaints Procedure

At the main site entrance, the contact details for the site will be available so that local residents are encouraged to contact the Contractor in the event of an off-site dust impact.

The contractor on site will need to be immediately informed of the incident so that fugitive dust complaints can be substantiated.

In all instances, a complaint will be logged by the environmental manager and each complaint will be assigned a discrete complaint number in the Environmental Log.

The environmental manager will maintain the complaints register and any complaints received will be investigated and the dust suppression methods employed will be reviewed. Suitable remedial action will be undertaken as necessary.

4.3.3 Noise and Vibration Management

The predicted noise levels from on-site activity from the Proposed Development is below the noise limits in BS 5228-1:2009+A1:2014. Nonetheless, several mitigation measures will be employed to minimise any potential impacts from the Proposed Development.

The noise impact for construction works traffic will be mitigated by generally restricting movements along access routes to the standard working hours and exclude Sundays and public holidays, unless specifically agreed otherwise. For example, during turbine erection, an extension to the working day may be required but this would be necessary only on a relatively small number of occasions. The hours of construction activity will be as described in Section 3.5.

It will be ensured that vehicles on local roads do not wait outside residential properties with their engines idling during turbine deliveries. Local residents and the local authority will be consulted in advance of any activities likely to occur outside of normal working hours. The transport of large transport loads generates low levels of noise and vibration as trucks performing such tasks move at very low speeds. Construction activity is temporary and unlikely to generate noise issues at any receptor. Construction noise including ground vibration, and air overpressure impacts are predicted as insignificant.

Consultation with the local community is important in minimising the impacts and therefore construction will be undertaken in consultation with the local authority as well as the residents being informed of construction activities through the Community Liaison Officer.

The construction works on site will be carried out in accordance with the guidance set out in BS 5228:2009+A1:2014. Proper maintenance of plant will be employed to minimise the noise produced by any site operations.

The on-site construction noise levels will be below the relevant noise limit of 65 dB $L_{Aeq,1hr}$ for operations exceeding one month, and therefore construction noise impacts are not considered to be significant. However, there is potential for temporary elevated noise levels due to the grid connection works. However, the impact of these works at any particular receptor will be for a short duration (i.e. typically less than 3 days). Where the where the grid route is within 20m to a receptor, then mitigation measures will be put in place. Mitigation could include the erection of a 2m high barrier between source and receptor. Maximum levels from grid connection will pertain for no more than one day at any location. The noise impact will also be minimised by limiting the number of plant items operating simultaneously where reasonably practicable.

The operation of plant and machinery, including site vehicles, is a source of potential impact that will require mitigation at all locations within the site. Proposed measures, which are the same as those proposed for the construction phase, to control noise include:

- Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts.
- Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All plant and equipment to be used on-site will be modern equipment and will comply with the S.I. No. 359/1996 - European Communities (Construction Plant and Equipment) (Permissible Noise Levels) (Amendment) Regulations.
- Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works.
- Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machines, which are used intermittently, will be shut down during those periods when they are not in use.
- Training will be provided by the Site Manager to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation.
- Local areas of the haul route will be condition monitored and maintained, if necessary.

4.3.4 Archaeological Management Plan

Mitigation Measures and Monitoring

A suitably qualified archaeologist will be employed to oversee the construction phase of the Proposed Development and will advise on and establish appropriate Exclusion Zones around the external most elements of Heritage Assets. Exclusion zones shall be fenced off or demarcated for the duration of construction works in the vicinity of the monuments and will be agreed in advance with the National Monuments Service. No groundworks of any kind (including but not limited to advance geotechnical site investigations) and no machinery, storage of any materials or any other activity related to construction will be permitted within Exclusion Zones.

A systematic advance programme of archaeological field-walking surveys will be undertaken within all construction areas to confirm whether there are any surface traces of any potential unrecorded archaeological or architectural heritage sites exist within areas inaccessible due to the presence of thick tree cover. Archaeological monitoring of ground excavation works during the construction phase will then be carried out within all areas of the Site under licence by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage. The Archaeologist will advise on the need for geophysical survey in advance of ground excavation. In the event that any archaeological sites are identified during monitoring, ground works will halt at the location and the archaeological remains will be recorded and cordoned off. The NMS will then be consulted to determine further appropriate mitigation measures, which may include preservation in situ by avoidance or preservation by record through systematic archaeological excavations licensed by the NMS.

4.3.5 Waste Management Plan

It will be the objective of the Developer in conjunction with appointed contractor to prevent, reduce, reuse and recover as much of the waste generated on site as practicable and to ensure the appropriate transport and disposal of residual waste off site. This is in line with the relevant National Waste Management Guidelines and the European Waste Management Hierarchy, as enshrined in the Waste Management Act 1996, as amended.

Any waste generated during the development construction phase will be collected, source separated and stored in dedicated receptacles at the temporary compound during construction pending removal to an appropriately licensed waste facility.

A Construction Waste Management Plan has been prepared for the Proposed Development in line with the “Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects” (2021) as published by the Department of the Environment, Community and Local Government.

The Waste Management Plan will be finalised in accordance with this plan following the appointment of the contractor for the main construction works. This plan should be read in conjunction with the EIAR. The Construction Waste Management Plan will comply with the Statutory requirements of the National Waste Management Plan for a Circular Economy.

Assignment of Responsible Personnel

It will be the responsibility of the contractor for the main construction works (when appointed) to nominate a suitable site representative such as a Project Manager, Site Manager or Site Engineer as Waste Manager who will have overall responsibility for the management of waste. The waste manager will have overall responsibility to instruct all site personnel including sub-contractors to comply with on-site requirements. They will ensure that at an operational level each crew foreman is assigned direct responsibility.

Waste Generated

It is envisaged that the following categories of waste will be generated during the construction of the Proposed Development:

- municipal solid waste (MSW) from the office and canteen;
- construction waste including concrete;
- waste oil/hydrocarbons;
- paper/cardboard;
- timber;
- steel.

A fully authorised waste management contractor will be appointed prior to construction works commencing. This contractor will provide appropriate receptacles for the collection of the various waste streams and will ensure the regular emptying/and or collection of these receptacles.

Waste Minimisation/Reduction

All efforts will be made by site management to minimise the creation of waste throughout the construction of the Proposed Development.

This will be done by:

- nominate a manager who will take responsibility for materials management on site
- develop a Materials Management Plan for each section of site
- material ordering will be optimised to ensure only the necessary quantities of materials are delivered to site
- material storage areas will be of a suitable design and construction to adequately protect all sorted materials to ensure no unnecessary spoilage of materials occurs which would generate additional waste
- all plant will be serviced before arriving on site. This will reduce the risk of breakdown and the possible generation of waste oil/hydrocarbons on site
- all operators will be instructed in measures to cut back on the amount of wastage for trimming of materials etc. for example cutting of plywood, built into the amount ordered
- educating foremen and others to cut/use materials such as ply wisely for shutters etc.
- prefabrication of design elements will be used where suitable to eliminate waste generation on site
- where materials such as concrete are being ordered, great care will be practiced in the calculation of quantities to reduce wastage.

Waste Reuse

When possible, materials shall be re used onsite for other suitable purposes e.g.

- value engineering will be used to minimise the extent of materials needed and to optimise earthworks balance within the site
- re-use of shuttering etc. where it is safe to do so;
- re-use of rebar cut-offs where suitable;

Waste Recycling & Recovery

In accordance with national waste policy, source separation of recyclable material will take place. Receptacles will be clearly labelled, signposted and stored in dedicated areas in the construction compound.

The following sourced segregated materials container will be made available on site in the construction compound:

- timber;
- ferrous metals;
- aluminium;
- dry mixed recyclables;
- packaging waste;
- food waste.

Typical waste quantities generated during construction of similar-sized developments are included hereunder with typical recovery / reuse that can be achieved.

		Reuse		Recycle/Recovery		Disposal	
Waste Type	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	1200	10	120	80	960	10	120
Timber/Wood	1000	40	400	55	550	5	50
Plasterboard	360	30	108	60	216	10	36
Metals	300	85	255	10	30	5	15
Concrete	200	20	40	65	130	15	30
Other	540	20	108	60	324	20	108
Total	3600		1031		2210		359

The materials will be transported off-site by a licensed contractor to a licensed recovery centre and these materials will be processed through various recovery operations. A list of nearby licensed waste management facilities is shown in Table 4-2.

Table 4-2: Nearby Waste Management Facilities

Licensed Waste Facility Location	Type of Waste
T/A Walsh Complete Waste Management, Deerpark Industrial Estate, Oranmore, Co. Galway (WFP-G-19-0002-01)	Paper and cardboard packaging, mixed packaging, wooden packaging, concrete, bricks, wood, plastic, mixed construction and demolition wastes, plastics, mixed metals, soil and stones, bituminous mixtures, cables, glass, textiles, rubber, combustible waste, bulky waste, mixed municipal waste, solid wastes from soil remediation.
Frank Mortimer Ltd. Cartron, Belclare, Tuam, Co. Galway. (WFP-G-21-0007-02)	Soil and stone, concrete, glass, bituminous mixtures, mixed construction and demolition waste.
Tuam Recycling Centre, Athenry Road, Tuam, Co. Galway (COR-G-13-001-CA)	Mixed recyclables.

The Contractor will be obliged to aim for an overall recycling rate of 70% of construction and demolition waste, in accordance with EU targets under the Waste Framework Directive (2008/98/EC). Waste management targets for anticipated waste arisings regarding reuse / recycling / recovery and disposal rates are presented in **Table** 4-3.

Table 4-3: Waste Management Targets

Waste Type	Reuse/Recovery %	Recycling %	Disposal %
Concrete	85	-	15
Soils	100	-	-
Nominally Empty Containers containing residues of or contaminated by dangerous substances	100	-	-
Waste Diesel and Oil	80	20	-
Waste Fuels (Miscellaneous)	80	20	-
Scrap Metal	85	10	5
Bitumen / Tarmacadum	20	50	30
Surplus Bitumen / Tarmacadum	20	50	30
Surplus Cabling	-	-	100
Plastic Pipe Cut-offs	-	85	15
Plastic Packaging	-	85	15
Paper and Cardboard Packaging	15	85	-

Waste Disposal

Residual waste generated on-site will require disposal. This waste will be deposited in dedicated receptacles and collected by the licensed waste management contractor and transported to an appropriate facility. All waste movements will be recorded, which records will be held by the waste manager on-site.

Waste generated during the construction phase will be segregated into various waste streams (and separate skips/waste receptacles). The main waste streams will be segregated as follows:

- Soil and stone
- Concrete
- Cardboard and paper
- Plastics
- Food waste
- Scrap metal
- Timber
- Hazardous waste drums
- Mixed residual waste

All waste will be stored in an appropriate manner so as to minimise any potentially contaminated run-off as well as nuisances such as odour or vermin.

To maximise recycling and recovery rates at the works site, dedicated receptacles such as skips, drums or wheelie bins will be supplied for each waste stream. These receptacles will be clearly labelled so as to minimise cross contamination.

Under Schedule 1 of the Waste Management (Food Waste) Regulations 2009, canteens on construction sites will be required to separate food waste for treatment either on site or off site and must pass via an authorised treatment process to one of five options: use as a fertiliser, use as a soil improver, pet food manufacture, use as fuel (but not incineration) or to another treatment process approved by the Environmental Protection Agency (EPA).

Only small quantities of hazardous wastes in the form of waste oils/hydrocarbons, paints, contaminated textiles, lubricants, etc. will be generated at the works site. These wastes will be stored separately in dedicated sealed drums within a bunded area or raised COSSH storage areas.

The following plan for the segregation and storage of waste shall be implemented on site:

- Waste will be transported from the works to the site of recovery/disposal only in a manner which will not adversely affect the environment. Such transportation shall be in accordance with the appropriate National and European legislation and protocols
- The loading and unloading of materials will be carried out in designated areas protected against spillage and leachate run-off
- Waste will be stored in designated areas, protected as may be appropriate against spillage and leachate run-off. The waste will be clearly labelled and appropriately segregated
- Skips will be covered to prevent rainwater accumulation and contamination and to prevent dust and litter being blown out. Skips will be regularly inspected and replaced when full. Drums and Intermediate Bulk Containers (IBCs) containing waste materials must be securely sealed to prevent water ingress. Waste receptacles will be checked regularly for signs of leakage/spillage. Hydrocarbon, including used oil, will be stored in bunded areas; containers will be sealed and clearly labelled
- All drainage from bunded areas will be treated as hazardous waste unless it can be demonstrated to be otherwise. All drainage from bunded areas will be diverted for collection and safe disposal.

- The road network in the vicinity of worksites will be kept free from debris caused by vehicles entering and leaving the site. Any debris or deposited materials will be removed as soon as practicable.
- No spoil removed will be deposited in wildlife sensitive areas.

Contaminated Material

Any contaminated soils will be handled, removed and disposed of in accordance with statutory requirements for the handling, transportation and disposal of waste. In particular, the following measures will be implemented:

- Contaminated material will be left in-situ and covered, where possible until such time as WAC (Waste Acceptance Criteria) testing is undertaken in accordance with recommended standards and in-line with the acceptance criteria at a suitably licenced landfill or treatment facility. This will determine firstly the nature of the contamination and secondly the materials classification i.e. inert, non-hazardous or hazardous,
- If the material is deemed to be contaminated, consultation will take place with the respective local authority and/or EPA on the most appropriate measures. Such materials will be excavated, transported by a contractor with a valid waste collection permit and recovered/disposed of at an appropriate facility.

Waste Management Training

Copies of the construction waste management plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the Waste Management Plan and informed of the responsibilities that fall upon them as a consequence of its provisions.

It will be the responsibility of the contractors appointed Waste Manager to ensure that all personnel are made aware of their responsibilities under the plan via a toolbox talk or otherwise.

4.4 Environmental Management Team - Structure and Responsibility

A preliminary organisation chart is included hereunder.

The Contractor's Project Manager will be responsible for the delivery of all elements of the Environmental Management Plan.

The Contractor's Project Manager will retain all responsibility for issuing, changing and monitoring the Environmental Management Plan throughout.

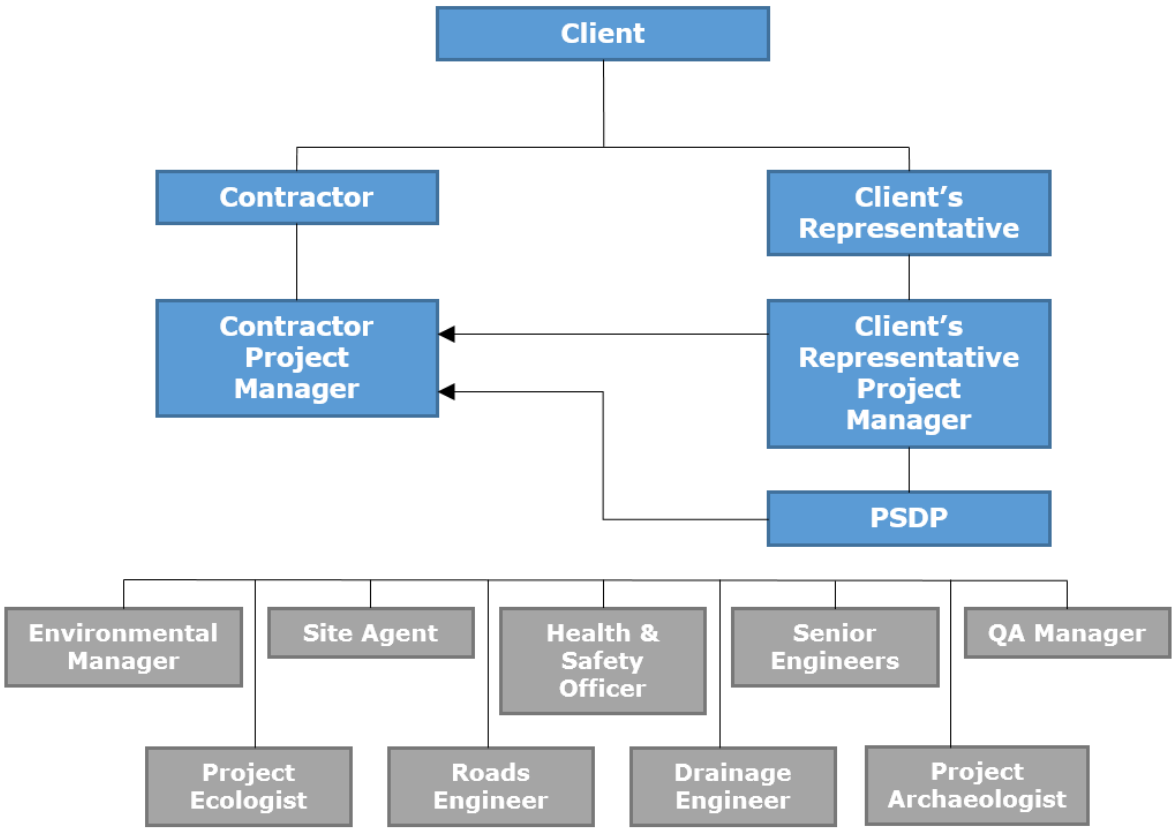

Image 4-1: Project Management Team Organogram

4.5 Training, Awareness and Competence

All site personnel will receive environmental awareness information as part of their initial site briefing. The detail of the information will be tailored to the scope of their work on site.

The contractor for the main construction works will conduct the environmental awareness training at the same time as Health and Safety Training (often referred to as Site Inductions).

This will ensure that personnel are familiar with the environmental aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures.

The CEMP will be available in the main site compound during the construction of the Proposed Development. The environmental performance at the site is on the agenda of the monthly project management meetings for the Proposed Development.

Elements of the CEMP will be discussed at these meetings including objectives and targets, the effectiveness of environmental procedures etc. Two-way communication will be encouraged by inviting all personnel to offer their comments on environmental performance at the site.

4.6 Environmental Policy

The contractor is responsible for preparing and maintaining an Environmental Policy for the site. The policy will be appropriate to the Proposed Development, commit to continuous improvement and compliance with legal requirements and provide a framework for objectives and targets. This will be communicated to all site personnel and will be available on site notice boards.

4.7 Register of Environmental Aspects

The contractor is responsible for preparing and maintaining a Register of Environmental Aspects pertaining to the site. This register will identify the environmental aspects associated with activities onsite and determine which aspects have or can have a significant impact on the environment. This will be adopted from the Schedule of Environmental Commitments in Appendix E of this CEMP,

4.8 Register of Legislation

The contractor is responsible for preparing and maintaining a register of key environmental legislation pertaining to the site. This register will reference all current environmental legislation and will be inspected, reviewed and updated regularly to ensure compliance.

4.9 Objectives and Targets

Objectives and targets will be set to ensure that the Proposed Development can be constructed and operated in full accordance with the EIAR, planning conditions and legislative requirements, with minimal impact on the environment.

Environmental objectives are the broad goals that the contractor must set in order to improve environmental performance. Environmental targets are set performance measurements (key performance indicators or KPI's) that must be met in order to realise a given objective.

4.10 Non-Conformance, Corrective and Preventative Action

Non-Conformance Notices will be issued where there is a situation where limits associated with activities on the Proposed Development are exceeded, or there is an internal/external complaint associated with environmental performance.

Non-Conformance is the situation where essential components of the EMS are absent or dysfunctional, or where there is insufficient control of the activities and processes to the extent that the functionality of the EMS is compromised, in terms of the policy, objectives and management programmes. A Non-Conformance register will be controlled by the contractor.

The EMS and all its components will be required to conform to the EMP. In the event of non-conformance with any of the above, the following must be undertaken:

- Assess cause of the non-compliance;
- Develop a plan for correction of the non-compliance;
- Determine preventive measures and ensure they are effective;
- Verify the effectiveness of the correction of the non-compliance;
- Ensure that any procedures affected by the corrective action taken are revised accordingly.

Responsibility will be designated for the investigation, correction, mitigation and prevention of non-conformance.

4.11 EMS Documentation

The Contractor is required to keep the following documentation in relation to the environmental management of the construction of the Proposed Development (as a minimum):

- Construction Environmental Management Plan;
- Register of Environmental Impacts;
- Register of Planning Conditions;
- Monitoring Records;
- Minutes of Meetings;
- Training Records;
- Audit and Review Records.

All these documents and records will be available for inspection in the site office. The documentation will be kept up to date and will be reviewed on a regular basis with revisions controlled in accordance with the site quality plan.

4.12 Control of Documents

The Contractor will establish, implement and maintain a procedure to control CEMP documents and records so they are clearly identifiable, organised, current, easily located and revised when necessary.

5. SAFETY & HEALTH MANAGEMENT PLAN

5.1 Introduction

This Safety and Health Management Plan (SHMP) defines the work practices, procedures and management responsibilities relating to the management of health and safety during the design, construction and operation of the Proposed Development and will be read in conjunction with the Preliminary Safety & Health Plan prepared for the Proposed Development by the Project Supervisor for the Design Process. The Safety and Health Management Plan for the construction stage will be finalised in accordance with this plan following the appointment of the contractor for the main construction works.

This SHMP describes how the contractor for the main construction works will implement a site safety management system (SMS) on this project to meet the specified contractual, regulatory and statutory requirements, environmental impact assessment report and natura impact statement mitigation measures and planning conditions The contractor will be required to implement an effective safety management system and will be required to appoint a health and safety officer to ensure that the developer's safety requirements for the construction of this Proposed Development are met.

All site personnel will be required to be familiar with the requirements of the safety management plan as related to their role on site. The plan describes the project organisation and sets out the health and safety procedures that will be adopted on site.

- The Safety and Health Plan is a controlled document and will be reviewed and revised as necessary.
- A copy of the Safety and Health Plan will be located on/near the site H&S notice board.
- All employees, suppliers and contractors whose work activities cause/could cause impacts on the environment will be made aware of the SHMP and its contents.

5.2 Project Obligations

The construction of the Proposed Development will impose numerous safety management obligations on the developer, designer and contractor. As well as statutory obligations, there are several specific obligations set out in the EIAR for the Proposed Development. These obligations are set out below. The contractor for the main construction works and all its sub-contractors are to ensure that they are fully aware of and in compliance with these safety obligations.

5.2.1 Planning Permission Obligations

Planning permission obligations will be fully outlined in this CEMP once it is updated if planning permission is granted.

5.2.2 Statutory Obligations

The Safety, Health and Welfare at Work Act 2005 (as amended) and the Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended) place a responsibility on the Developer as the "Client", the Designer, the Project Supervisors and the Contractor.

The Client will:

- Appoint a competent and adequately resourced Project Supervisor for the Design Phase (PSDP);
- Appoint a competent and adequately resourced Supervisor for the Construction Stage (PSCS);
- Be satisfied that each designer and contractor appointed has adequate training, knowledge, experience and resources for the work to be performed;
- Co-operate with the project supervisor and supply necessary information;
- Keep and make available the safety file for the completed structure;
- Provide a copy of the safety and health plan prepared by the PSDP to every person tendering for the project;
- Notify the Authority of the appointment of the PSDP.

Designers must:

- Identify any hazards that their design may present during construction and subsequent maintenance;
- Eliminate the hazards or reduce the risk;
- Communicate necessary control measures, design assumptions or remaining risks to the PSDP so they can be dealt with in the safety and health plan;
- Co-operate with other designers and the PSDP or PSCP;
- Take account of any existing safety and health plan or safety file
- Comply with directions issued by the PSDP or PSCS.

The PSDP must:

- Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the Proposed Development;
- Where possible, eliminate the hazards or reduce the risks;
- Communicate necessary control measure, design assumptions or remaining risks to the PSCS so they can be dealt with in the safety and health plan;
- Ensure that the work of designers is coordinated to ensure safety;
- Organise co-operation between designers;
- Prepare a written safety and health plan for the Proposed Development and deliver it to the client prior to tender;
- Prepare a safety file for the completed structure and give it to the client.

The PSCS must:

- Co-ordinate the identification of hazards, the elimination of the hazards or the reduction of risks during construction;
- Develop the Safety and Health Plan initially prepared by the PSDP before construction commences;
- Co-ordinate the implementation of the construction regulations by contractors;
- Organise cooperation between contractors and the provision of information;
- Co-ordinate the reporting of accidents to the Authority;
- Notify the Authority before construction commences;
- Provide information to the site safety representative;
- Co-ordinate the checking of safe working procedures;
- Co-ordinate measures to restrict entry on to the site;
- Co-ordinate the provision and maintenance of welfare facilities;
- Co-ordinate arrangements to ensure that craft, general construction workers and security workers have a Safety Awareness card, e.g. Safe Pass and a Construction Skills card where required;
- Co-ordinate the appointment of a site safety representative where there are more than 20 persons on site;
- Appoint a safety adviser where there are more than 100 on site;
- Provide all necessary safety file information to the PSDP;
- Monitor the compliance of contractors and others and take corrective action where necessary;
- Notify the Authority and the client of non-compliance with any written directions issued.

The Contractor must:

- Co-operate with the PSCS;
- Promptly provide the PSCS with information required for the safety file;
- Comply with directions of the project supervisors;
- Report accidents to the Authority and to the PSCS where an employee cannot perform their normal work for more than 3 days;
- Comply with site rules and the safety and health plan and ensure that your employees comply;
- Identify hazards, eliminate the hazards or reduce risks during construction;
- Facilitate the site safety representative;
- Ensure that relevant workers have a safety awareness card and a construction skills card where required;
- Provide workers with site specific induction;
- Appoint a safety officer where there are more than 20 on site or 30 employed;
- Consult workers with site specific induction;
- Monitor compliance and take corrective action.

Consequently, at all stages of construction of the Proposed Development there are statutory requirements for the management of safety, health and welfare of all involved in or affected by the development. This CEMP and specifically the Safety and Health Management Plan address key construction management issues associated with the construction of the Proposed Development. This plan will be developed further at the construction stage, on the appointment of the Contractor for the main construction works.

5.2.3 The Preliminary Safety and Health Plan

In accordance with the requirements of the Safety, Health & Welfare at Work (Construction) Regulations 2013 (as amended) a Preliminary Safety & Health Plan will be required as part of the design process. This plan will be further developed by the PSCS on appointment and maintained as a live document during construction and commissioning of the Proposed Development.

The safety and health plan will include the following information:

- a general description of the Proposed Development;
- details of other work activities taking place on site;
- works involving particular risks;
- the timescale for the construction phase and the basis on which the time frame was established;
- conclusions drawn by designers and the PSDP having taken into account the General Principles of Prevention and any relevant Safety and Health Plan or Safety File;
- the location of electricity water and sewage connections so as to facilitate early establishment of welfare facilities.

In accordance with the PSDP's procedures the Preliminary Safety & Health Plan for the Proposed Development will include the following sections and subsections to ensure the PSCS is aware of the health and safety issues at tender stage and enable them to price accordingly:

Preamble:

1 General Project Information:
- 1.1 Title;
- 1.2 Description of the Proposed Development;
- 1.3 Employer;
- 1.4 Designers / Other Consultants;
- 1.5 Project Supervisor Design Process;
- 1.6 Drawings, Specifications and Other Documents;
- 1.7 Intended Contract Commencement Date;
- 1.8 Intended Contract Completion Date;
- 1.9 Basis for Contract Duration;
- 1.10 Restrictions on Working Hours;
- 1.11 Notification of Project;
- 1.12 Termination of the PSCS Appointment.

2 The Existing Environment:
- 2.1 Site Location;
- 2.2 Relevant Adjoining Land Uses;
- 2.3 Site Restrictions;
- 2.4 Restrictions on Access;
- 2.5 Hazardous Area Classification;
- 2.6 Existing Services;
- 2.7 Ground Conditions;
- 2.8 Existing Hazards;
- 2.9 Liaison with Statutory Bodies.

3 Other Work Activities:
- 3.1 Other Contracts Which May Affect Work;
- 3.2 Occupation of Site;
- 3.3 Building Activities;
- 3.4 Other Work Activities;
- 3.5 Emergency Procedures in Place on Site.

4 Particular and Residual Risks:
- 4.1 Works Which Put Persons at Work at risk;
- 4.2 Work Which Puts Persons at Risk from Chemical or Biological Substances;
- 4.3 Work with Ionising Radiation;
- 4.4 Work near High Voltage Power Lines;
- 4.5 Work Exposing Persons at Work to the Risk of Drowning;
- 4.6 Work on Wells, Underground Earthworks and Tunnels;
- 4.7 Work Carried Out by Divers at Work Having a System of Air Supply;
- 4.8 Work Carried Out by Divers at Work Having a System of Air Supply;
- 4.8 Work Carried Out in a Caisson with a Compressed Air Atmosphere;
- 4.10 Work Involving the Assembly or Dismantling of Heavy Prefabricated Components;
- 4.11 Work Involving Hazardous Material;
- 4.12 Residual Risks.

5 Additional Information:
- 5.1 Existing Documents;
- 5.2 Site Possession;
- 5.3 Site Rules;
- 5.4 Site Specific Safety Objectives;
- 5.5 Phasing of Works;
- 5.6 Permits / Authorisation Required;
- 5.7 Maintenance;
- 5.8 Continuing Liaison;
- 5.9 Specific Recommendations.

6 Information Required for Safety File:
- 6.1 Information Required for Safety File from PSCS.

5.2.4 The Management of Health and Safety during the Construction Phase

The selection criteria for the Contractor for the works will be based on the ability to construct the works in a manner that will not endanger the safety, health and welfare of any parties and competence to fulfil the role of PSCS.

The contract will be awarded on the basis of assessment of the candidates against relevant health and safety criteria including experience of similar projects, knowledge of the construction processes involved and training of their management and staff who will be involved in carrying out the works.

5.2.5 The Construction Stage Safety and Health Plan

In accordance with the requirements of the Safety, Health & Welfare at Work (Construction) Regulations 2013 (as amended) the preliminary Safety & Health Plan prepared by the PSDP will be further developed by the PSCS before the commencement of the construction work and updated on a regular basis during the construction phase of the project.

The document will include the following sections and subsections to ensure the management of health and safety during the construction phase of the project:

1. Description of Project:
   - project description and programme details;
   - details of client, PSDP and PSCS, designers;
   - main contractor and other consultants;
   - extent and location of existing records and plans;
   - arrangements for communicating with Contractors, PSDP and others as appropriate.

2. Communication and Management of the Work:
   - management structure and responsibilities;
   - safety and health goals for the construction phase and arrangements for monitoring and review of safety and health performance.
   - arrangements for:
     - regular liaison between parties on site;
     - consultation with the workforce;
     - the exchange of design information between the Client, Designers, Project Supervisor for the Design Process, Project Supervisor Construction Stage and Contractors on site;
     - handling design changes during the construction phase;
     - the selection and control of contractors;
     - the exchange of safety and health information between contractors;
     - security, site induction, and on-site training;
     - welfare facilities and first aid;
     - the production and approval of risk assessments and method statements;
     - the reporting and investigation of accidents and other incidents (including near misses);

- site rules;
- fire and emergency procedures.

3. Arrangements for Controlling Significant Site Risks:

- safety risks:
    - services, including temporary electrical installations;
    - preventing falls;
    - work with or near fragile materials;
    - control of lifting operations;
    - dealing with services (water, electricity and gas);
    - the maintenance of plant and equipment;
    - poor ground conditions;
    - traffic routes and segregation of vehicles and pedestrians;
    - storage of hazardous materials;
    - dealing with existing unstable structures;
    - accommodating adjacent land use;
    - other significant safety risks.

- Health risks:
    - removal of asbestos;
    - dealing with contaminated land;
    - manual handling;
    - use of hazardous substances;
    - reducing noise and vibration;
    - other significant health risks.

The construction stage safety and health plan will be maintained on site by the PSCS and will be communicated to all relevant parties on an ongoing basis through inductions, site safety meetings and toolbox talks etc. as required.

6. EMERGENCY RESPONSE PLAN

6.1 Introduction

This chapter of the CEMP presents an Emergency Response Plan (ERP) for the proposed project. The Emergency Response Plan shall be finalised in accordance with this plan following the appointment of the contractor for the main construction works and following detailed design development.

This ERP contains predetermined guidelines and procedures to ensure the safety, health and welfare of everybody involved in the Proposed Development and to protect the environment during the construction phase of the Proposed Development. This outlines the immediate response to an emergency situation and will be developed by the main construction works contractor and PSCS as part of their construction stage Safety and Health Plan.

An emergency is any disruptive or harmful event that endangers people, environment, property or assets. Emergencies can be small, as in a fire contained by employees using firefighting equipment or large, as in damage resulting from a storm.

In the context of the Proposed Development, examples of Emergency Response Plan emergency events are:

- medical emergency;
- explosion;
- overheated equipment;
- chemical and fuel spill;
- fire;
- loss of power;
- vehicle incidents;
- land slippage.

Example sources of emergency or disaster events are:

- unstable/inappropriate stockpiles on site;
- faulty or incorrect use of equipment;
- falls from height;
- storm/adverse weather;
- power failure;
- fuel spill;
- road failure;
- serious vehicle collisions or overturning.

The emergency response plan deals with the immediate physical effects of a disaster and outlines the initial response.

6.2 Emergency Response Liaison

The contractor/PSCS will designate an individual to serve as the Emergency Response Liaison for this Proposed Development. The emergency response liaison will coordinate the emergency response for the duration of any emergency at or nearby the Site.

The local authority, An Garda Síochána and the HSE Ambulance Co-ordinator will be provided with the construction programme and the onsite contact information from the Emergency Response Liaison prior to construction.

The Emergency Response Liaison will be immediately reachable at all times during Proposed Development construction. The Liaison will coordinate with the above agencies to establish emergency procedures for access to and within the site in the event of an emergency.

6.3 Reporting Emergencies

In the event of fire, storm, flood, serious injury or other emergency, contact:

ALL ON SITE EMERGENCIES DIAL 112

6.4 Designated Responder

A map depicting turbine tower locations with the emergency meeting point will be furnished to the local authority, Fire Department and HSE ambulance co-ordinators.

Upon arrival on the scene, the senior EMS Officer will set up the incident command structure. The Emergency Response Liaison and all contractor's personnel will cooperate with directions of the incident commander and assist as directed.

The nearest emergency services, ambulance and Accident & Emergency (A&E) facilities are:

Service:	Contact Details:	
Accident & Emergency (A&E)	University Hospital Galway	091 544 544
Ambulance Service	Dial 112	
Fire Services	Dial 112	
Garda Station		
District HQ:	Shrule Garda Station Tuam Garda Station	+3539331292 +3539370840
Divisional HQ:	Castlebar Divisional HQ North-Western Region HQ, Galway	+353 94 9038211 +353 91 337212

Each member of the contractor's site team who are First-Aid and Cardiopulmonary Resuscitation (CPR) trained personnel will be identifiable with a hard hat sticker indicating their training.

6.5 Emergency Alarm

The emergency alarm will be raised on site as soon as an emergency situation is detected, the alarm will be identified (contractor to check those that apply):

	Air Horn		Radio		Voice		Hand Signals		Siren

6.6 Emergency Reporting

In the event of an emergency the nearest supervisor with radio equipment/mobile phone will be notified. The degree of emergency will be reported to the Emergency Response Liaison who will contact the Emergency Services and request the appropriate emergency service.

6.7 Medical Protocol

In the event of a major medical emergency, the emergency centre (999) will be notified, and an ambulance and emergency medical team will respond to the scene. All major medical cases require professional (ambulance) transportation. In the event of a minor medical case, the affected employee can be transported via company vehicle in the escort of a foreman or site engineer (with first aid training).

6.8 Emergency Response

Upon notification, the Emergency Response Liaison will respond to the emergency scene and manage emergency operations:

1. Assess hazards and make the area safe – If you cannot enter the area without risking your safety, don't do it, call the Emergency Services immediately and wait for them. If you think you can safely enter the area, look around the emergency scene for anything that can be dangerous or hazardous to you, the casualty, or anyone else at the scene. Bystanders can help with making the area safe. First aid kits will be available on site. Operators that have been first aid/CPR/AED trained will be listed on site and easily identifiable by a hard hat sticker.

2. Take charge of the situation – if you are the first-aid provider on the scene act fast. If someone is already in charge, briefly introduce yourself and see if that person needs any help. If there is any chance the casualty could have a head or spinal injury, tell them not to move.

3. Get Consent – always identify yourself as a first-aid provider and offer to help. Always ask for consent before touching a conscious adult casualty. Remember to protect yourself first by wearing gloves and eye protection.

4. Assess Responsiveness – is the casualty conscious or unconscious? Note their response while you are asking them for their consent. If they respond, continue with the primary survey, and if they don't respond, be aware that an unconscious casualty is or has the potential of being a breathing emergency.

5. Call out for help – this will attract bystanders. Help is always useful in an emergency situation. Someone can be called over to phone for medical help. Others can bring blankets if needed, get water, etc. a bystander can help with any of the following:

- Make the area safe.
- Find all the casualties.
- Find the first aid kit, or any useful medical supplies.
- Control the crowd.
- Call for medical help.
- Help give first aid, under your direction.
- Gather and protect the casualty's belongings.
- Take notes, gather information, be a witness.
- Reassure the casualty's relatives.
- Lead the ambulance attendants to the scene of the emergency.
- Notify Emergency Services as soon as you can. Either send a bystander or call yourself.

In the event of a major medical emergency the Emergency Response Liaison, as the person-in-charge of the emergency scene, will dispatch someone to the site access point nearest the emergency scene to direct and lead arriving outside responders to the emergency scene. The designated meeting point will be agreed prior to the commencement of construction. Emergency personnel will be met at this meeting point communicated by management during the 112 call. The emergency personnel escort will use the hazard lights on their vehicle, so they are easily identified.

6.9 Escape and Evacuation Procedure

Dependent upon the degree of the emergency and if safe to do so, employees will evacuate to the designated assembly area where the designated wardens shall account for all employees and determine if anyone still remains within the emergency scene.

Should a wild land fire or peat slippage occur, and the designated assembly area is compromised other locations will be designated as secondary assembly areas.

Wind turbines shall be fitted with fire suppression systems and will have emergency escape procedures in place for staff in the event of fire in a wind turbine.

6.10 Turbine Tower rescue Procedure

In the event personnel are trapped or injured in an elevated turbine tower position the following protocol will be initiated:

1. The Emergency protocol will be initiated.
2. Emergency Response Liaison will be notified.
3. Tower Rescue Team will be activated and respond to the scene.
4. Outside medical and Rescue Teams will be notified and respond to the scene.

Tower Rescue Procedure:

1. Upon learning of an emergency, the on-scene foreman shall assess the emergency and ascertain its degree, location and the extent of any injuries.
2. Upon confirming that an emergency exists the on-scene foreman notifies the Emergency Response Liaison and the project Office.
3. Upon notification of the emergency the Emergency Response Liaison shall notify senior project supervision and the local emergency centre (999) of the emergency.
4. The Emergency Response Liaison shall inform the dispatcher of the location, tower number, the degree of the emergency and the extent of injuries.

6.11 Prevention of Illness/Injury Due to Weather/Elements

1. All employees will have access to shelter and heat in the event of inclement weather.
2. Employees will have access to at least a litre of water at all times.
3. High wind warnings and weather forecast will be discussed every morning with the crews. Weather conditions and forecast will be monitored regularly by management.
4. No Employee will work alone. A buddy system will be used so employees can contact a supervisor in case of an emergency.

6.12 Flood Response

accordance with the 'Planning System and Flood Risk Management Guidelines' (DOEHLG, 2009) and Departmental Circular PL2/2014 and is provided in Appendix 12.3, Volume III of the EIAR.

The assessment and analysis undertaken has determined that the location of the proposed substation and the grid connection route and loop-in do not fall within a delineated predictive fluvial Flood Vulnerable Zones Flood Zone 'A' or Flood Zone 'B'. The location of the proposed sub-station and grid connection route therefore fall within Flood Zone 'C'.

The location of proposed turbines T01, T02, T03, T04, T05, T06, T08, T09, T10 and T11 do not fall within a delineated predictive fluvial Flood Zone 'A' or Flood Zone 'B'. The location of these proposed turbines therefore fall within Flood Zone 'C'.

The location of proposed turbine T07 falls within a delineated predictive fluvial Flood Zone 'A' and Flood Zone 'B'.

The following measures have been built in to the design of the wind farm in order to manage against flood risk and to ensure a robust and sustainable development:

- The finished floor level of the proposed substation will be constructed to a minimum level of 0.5m above the predictive peak 0.1% AEP flood level at cross sectional location C13 – i.e. 26.94m OD + 0.5m = 27.44m OD.
- Any vulnerable elements of Proposed Turbine T01 shall be constructed to a minimum level of 0.3m above the peak 0.1% AEP (1 in 1000 year) flood level at cross section C5 - i.e. 28.15m OD + 0.3m = 28.45m OD.

- Any vulnerable elements of Proposed Turbine T05 shall be constructed to a minimum level of 0.3m above the peak 0.1% AEP (1 in 1000 year) flood level at cross section C1 - i.e. 28.55m OD + 0.3m = 28.85m OD.
- The base of proposed turbine T07 will be sealed to prevent water ingress. No vulnerable components of the turbine will be located at ground level and will be constructed to a minimum level of 31.3m OD, which is 0.3m above the 0.1% AEP (1 in 1000 Year) fluvial flood level at this location (31.0m OD + 0.3m = 31.3m OD).

The drainage infrastructure will be designed to minimise concentration of flows. This will be achieved by:

- Use of cut-off drains to divert runoff around necessary 'hard' infrastructure and hardstanding areas, including construction compound and laydown areas;

- Use of regular cross-drains underneath any access tracks. These will be installed in line with the natural terrain, making use of natural low points where runoff will naturally be focused; and

- Use of a slight gradient on installed 'hard' infrastructure to encourage drainage into a filter drains, for infiltration into vegetated areas and as shallow through-flow.

Long-term drainage will be installed ahead of related construction works or excavations taking place, to ensure that site drainage can be controlled appropriately. Mitigation relevant to hydrology and flood risk has been embedded into the proposed development design.

Any areas which must be left unvegetated during the construction phase, may have temporary settlement ponds or similar put in place to attenuate flow until vegetation can be re-established at the end of the construction period.

The Met Eireann is responsible for issuing weather warnings, which warn of impacts caused by severe weather. The warnings are designed to let people, businesses, emergency responders and governments know what weather is in store and what the impacts of that weather may be. Warnings are provided up to seven days ahead for rain, thunderstorms, wind, snow, lightning, ice and fog, although in relation to this plan the warnings for rain and thunderstorms are the ones of direct relevance.

In the unlikely event of flooding occurring the Site Manager is responsible for the timely evacuation of the site(s). It is thought most likely that this could be anticipated and communicated without endangering the operatives working on site. Where this cannot be anticipated, the Site Manager should ensure the site is left in a safe manner, minimising the risk of environmental contamination if possible as well as ensuring the safety of any affected operatives.

A Flood Coordinator will be appointed, to ensure that all construction personnel are aware of the potential flood risk and of how to respond in the event of a flooding emergency. All training completed will be documented and recorded. Staff will also be made aware of any updates to the Procedure through appropriate internal staff briefings or toolbox talks.

The Flood Warning and Evacuation Procedure will be subject to update / review:

- Whenever there are changes to any of the contact numbers, names or roles held within the Procedure.

- All updates / reviews shall be documented and recorded.

- The Site Manager will ensure an up-to-date version of the Procedure is always available during the construction phase.

In the event of any work sites flooding - through adverse weather or drainage – the primary response of the Site Manager and EHS Advisor is to ensure the safety of all operatives affected by the flood as well as to prevent any environmental incident through contamination. General actions to be carried out in the event of a flood are set out in Table 6-1.

Table 6-1: Flood Response Actions

All Staff	Assess the situation. Contact Site Management using emergency channel for help and provide them with the turbine number or the nearest turbine, service or county road at which flooding has occurred at which flooding has occurred. In the event that evacuation is needed, site personnel should leave the site and go to safe location (higher ground) at the pre-designated assembly points. If personnel are incapacitated, call emergency services and only attempt to rescue persons in the turbine/area if safe to do so. Secure the incident scene / do not disturb accident / incident area.
Site Manager / EHS Officer	Coordinate with the local community's emergency response plan / emergency responders, and assistance site personnel who need transportation. Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. If outside medical help is needed contact emergency services and determine the meeting location if not the turbine. When everybody is out of the flood area stop the affected turbine if it is operational. Contact Project Manager once the situation is under control. Excavations that have been subject to flooding are extremely unstable. Prior to resuming work in an excavation the soil should be retested by a suitably competent Engineer and damaged benching/slopes or shoring systems inspected and repaired. Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.

6.13 Underground Services

Prior to work being undertaken, any excavations will have been surveyed and the ground clearly indicated with the findings and consultation will have taken place with service providers.

NOTE: Gas Networks Ireland must be engaged to supervise all works in proximity to the gas mains crossing.

Where underground services have been located, the control measures outlined in the relevant RAMS will ensure the services are safely exposed by hand digging or use of other safe digging techniques e.g. air lance and supported where necessary to prevent damage.

Should an underground service be damaged during its exposure or found in a damaged state, the initial response is to secure the area and to prevent unauthorised entry, contact the service provider as soon as is reasonably practical to do so, as well as trying to contain any leak using the emergency spill kits to hand. The Management Team should be informed as soon as possible and will be responsible for ensuring adequate communication has taken place.

Should the damage to underground services result in injury or a significant flood the emergency services should be informed at the time of the incident. The priority response is to casualty care followed by protection of property and equipment.

6.14 Environmental Emergency Procedure - Pollution Control

Despite pro-active measures, including the availability of specific environmental procedures, environmental method statements and risk assessments and the provision of training and supervision, environmental incidents may still occur.

An emergency preparedness and response procedure is required to prevent environmental pollution incidents. A major environmental incident is considered as: An event which is a breach in legislation (including a breach of permit, consent or permission) that is causing serious environmental harm and is reportable to the regulator, for example:

- A major spillage of hazardous substance, resulting in an uncontrolled discharge entering waters, a sewer or into permeable ground, resulting in serious damage to the environment.
- Serious breach of an environmental permit.
- Serious breach of planning permission.
- Significant air emissions.
- Damage to habitat of a protected species, or the disturbance or causing the death of a protected species.
- Spread of invasive or injurious weed.
- Transferring waste offsite without a valid waste transfer note or consignment note.

Emergency Silt Control and Spillage Response Procedures are included in Section 4.5 of the Surface Water Management Plan which is included in Appendix 12.2 of the EIAR.

Oil spill containment kits will be available on the site and key operatives trained in their use. Larger oil spill kits will be located at areas of higher risk as required, with these identified on site layout drawings, to be displayed on site. Smaller oil spill kits (grab packs) will be made available in all plant, for immediate use in the event of a leak or spillage. Oil spill kit absorbents will be replaced or replenished after use and any used spill materials will be disposed of to the on-site waste management facilities, in accordance with Hazardous Waste Regulations

In the event of pollution or potential risk of pollution the Local Authority will be informed immediately. In the case of water pollution in addition to the Local Authority, Inland Fisheries Ireland and the Environmental Protection Agency will also be informed immediately. All environmental events, including Near Misses and Environmental Incidents, shall be reported immediately, and without delay.

In the event of an oil or chemical spill (environmental incident) the following information will be required:

- Exact location of the incident.
- Incident type – including type and amount of material involved.
- Material details (Product Name/Code/Hazard Class./Action Code).
- Whether any emergency / other services are in attendance (e.g. Fire, Garda, Environment Protection Agency (EPA).

The Environmental Emergency Procedure will be tested by the Contractor at random on the site, but as a minimum, annually.

6.14.1 Emergency Pollution Event Actions

In the event that pollution occurs the following action must be taken on site:

- **LOCATE** the source of the pollution.
- If safe to do so, **STOP** the source of the pollution for example by turning off faulty equipment. Do not expose yourself to any pollutant without the appropriate PPE.
- **STOP** any works which are in the vicinity of the pollution event and make sure all site staff are diverted away from the pollution event.
- **SUPPRESS** pollution with appropriate spill kit to control the runoff to any drains or watercourses or to ground or to air.
- **MONITOR** the effectiveness of protection measures and re-plan as necessary.
- **MAINTAIN** the pollution control measure regularly so they do not make problems worse.
- **REMOVE** the spillage. Small spills can be removed using spill mats and/or granules; larger spills may require a pump from a specialist contractor.
- **DISPOSE** of the waste material. Used spill kit should be placed in a designated bin separate from all other types of waste. Do not put used spill kit material in any of the skips. Material which has been pumped may be stored in empty oil drums or other suitable container prior to removal by a registered special waste contractor.
- **REPORT** the incident to the works manager and site engineer who will then determine if the event is serious enough to require notification to the Local Authority / EPA etc. Report the incident to the Employer.
- **REVIEW** the cause of the pollution event to determine any actions required to prevent the incident from recurring. Review the effectiveness of the response plan and make any changes necessary.

6.14.2 Injured Animal

All species identified as being protected or endangered in the pre-construction phase work will have had mitigation measures to prevent impact or harm identified in EIAR and it will be the responsibility of the Site Manager to constantly review these measures as the work changes locations through the differing phases of the project.

In the event that an animal is injured on site the following steps will be taken on site:

- **DO NOT APPROACH** the injured animal. It may be aggressive or be harboring disease.
- **STOP** works in the immediate vicinity of the injured animal.
- **CONTACT** the ISPCA and NPWS (as appropriate) and follow their advice.
- The incident should be recorded and reported to the Employer.

6.15 Emergency Response Plan - Haul Routes

Emergency Response Procedure relating to transportation of plant, equipment and materials to site will be developed by the main contractor during the construction phase of the Proposed Development.

6.16 Emergency Response Plan - Fire

A site evacuation/fire drill procedure will be in place for carrying out the immediate evacuation of all site personnel in the event of an emergency with might include fire on site or within adjacent lands. The following steps will be taken:

- Notification of the emergency situation. Provision of a siren to notify all personnel of an emergency situation.
- An assembly point will be designated in the construction compound area and will be marked with a sign. All site personnel will assemble at this point.
- A roll call will be carried out by the Site Security Officer to account for all personnel on site.
- The Site Security Officer will inform the Site Supervisor/Construction Manager when all personnel have been accounted for. The Site Supervisor/Construction Manager will decide the next course of action, which be determined by the situation that exists at that time and will advise all personnel accordingly.
- All personnel will be made aware of the evacuation procedure during site induction. The Fire Services Acts of 1981 and 2003 require the holding of fire safety evacuation drills at specified intervals and the keeping of records of such drills.

Fire Safety awareness will be provided as part of general safety induction to the Site. Specific fire training provided to all relevant fire wardens/ officers /representatives. Fire officers will ensure that used or partially used Fire Extinguishers are immediately refilled or replaced.

Smoking will be restricted on site to designated areas within the construction compounds only.

Stockpiling of cleared vegetation / brash will not take place during periods of high fire risk.

Machinery will be parked in a manner that allows them to be moved in an emergency and will be parked a reasonable distance apart from each other to avoid the risk of a fire spreading to adjacent machines.

Areas must be left safe from the threat of fire following hot works. Hot work will only be undertaken by competent and trained personnel under a permit to work system and a fire risk assessment carried will be out for all hot works.

6.17 Emergency Events - Wind Turbine Damage/Failures

Each wind turbine, incorporating the tower, blades, gearbox and ancillary equipment in the tower and nacelle is a machine under the European Machinery Directive [2006/42/EC]. The duties of designers and manufacturers of machinery are set out in the Machinery Directive, which has been transposed into national law by the 2008 European Communities (Machinery) Regulations [S.I.No.407/2008] (as amended). All wind turbines will be CE marked, which is in effect, a mark of assurance that the wind turbine complies with the essential health and safety requirements (EHSRs) of EU supply law. In all cases, the manufacturer or the manufacturer's authorised representative will compile information in a technical file confirming how the machine complies with these requirements. The commissioning of turbines and ancillaries will only be carried out by competent, trained and qualified personnel. The system of work for commissioning must be planned, organised, maintained and revised to ensure safety of personnel.

Potential emergency events associated with wind turbines include:

- Blade loss;
- Fire;
- Wind turbine toppling (due to foundation or tower failure);
- Wind turbine rotational failure in extreme wind conditions (due to control system or rotor break failure).

The primary mitigation against an emergency catastrophic event that may endanger the health and safety of the public is implemented at design stage through adequate siting of wind turbines which provide sufficient set back distances from occupied buildings and other infrastructure to avoid the risk of impact in the event of wind turbine collapse.

Peat slippage contingency measures have been included in Section 6.18 below in the unlikely event of landslide scenario.

6.18 Land Slippage Contingency Measures

The Geotechnical and Peat Stability Assessment (Appendix 11.1 of the EIAR) determined that peat slippage risk at the Site is low. Notwithstanding contingency measures are set out hereunder in the event of land slippage. All earthworks within the Site will be in accordance with the Peat and Spoil Management Plan (Appendix 11.4 of the EIAR) and will be managed by the Geotechnical Engineer.

6.18.1 Excessive Movement

Where there is excessive movement or continuing peat movement recorded at a monitoring location or identified at any location within the site but no apparent signs of distress to the peat (e.g. cracking, surface rippling) then the following shall be carried out.

1. All activities (if any) shall cease within the affected area.
2. Increased monitoring at the location shall be carried out. The area will be monitored, as appropriate, until such time as movements have ceased.
3. Re-commencement of activities shall only start following a cessation of movement and a review by an experienced geotechnical engineer.

6.18.2 Onset of Peat Slide

In the unlikely event where there is the onset or actual detachment of peat (e.g. cracking, surface rippling) then the following will be carried out.

1. On alert of a peat slide incident, all activities (if any) in the area will cease and all available resources will be diverted to assist in the required mitigation procedures.
2. Action will be taken to prevent a peat slide reaching any watercourse. This will take the form of the construction of check barrages on land. Due to the terrain and the inability to predict locations it may not be possible to implement any on-land prevention measures, in this case a watercourse check barrage will be implemented.
3. All relevant authorities will be notified if a peat slide event occurs on site.
4. For localised peat slides that do not represent a risk to a watercourse and have essentially come to rest the area will be stabilised initially by rock infill, if required. The failed area and surrounding area will then be assessed by an experienced geotechnical engineer and stabilisation procedures implemented. The area will be monitored, as appropriate, until such time as movements have ceased.

7. SUSTAINABILITY

7.1 Energy and Carbon Management

While project design is such to limit carbon footprint, the Contractor will seek to continue to reduce the emissions of greenhouse gases from the construction element of its projects where possible. Sources of greenhouse gases include:

- Electricity and gas supply for heating, lighting and services to site accommodation
- Gas oil/Diesel typically used in site plant and site generators
- Petrol and diesel used for commuting and business travel, including transport of plant and materials to site
- SF_6 gas installation and handling and leaks from electrical equipment
- Water supply and wastewater treatment

Every effort is made to obtain grid supplied electricity, to reduce the necessity for the use of generators. Where this is not possible, an appropriately sized and efficient generator will be used to achieve optimum efficiency of power supply.

Ways in which energy use can be reduced or alternative energy sources utilised are listed in Table 7-1below:

Table 7-1: Energy reduction measures

Carbon Emission Sources	Measures to be adopted to reduce use
Electricity	The use of electricity on site is kept to a minimum. Heating in the office buildings will be turned off at least 1-2 hours before the building closes. Energy saving light bulbs will be used and with the exception of safety lighting, all other lighting will be turned off when not in use. Outdoor lights will be fitted with sensors and timers to reduce operating times. All site office equipment will be switched off when not in use e.g. laptops and monitors, printers etc. Electricity supply will be metered, and meters calibrated to ensure usage can be recorded accurately. The energy usage and energy saving actions on site will be regularly audited by the Site Manager and EHS Advisor and further action to reduce taken as feasible.
Gas oil for generator and plant/machinery	Ensure all vehicles switch off engines when stationary – no idling vehicles; and, Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable. Plant and equipment regularly maintained.
Waste	The Waste Management Plan provides for the segregation of all construction wastes to facilitate optimum levels of re-use, recovery, and recycling operations.
Petrol and diesel for commuting	Appropriate measures (e.g. promoting car sharing) will be encouraged by the contractor to reduce the number of vehicles arriving and departing the site at any one time and

Carbon Emission Sources	Measures to be adopted to reduce use
	subsequently reduce the amount of fuel used. Local transport information will also be displayed on staff notice boards to encourage use of public transport. Use of shuttle bus from transport hubs/park and ride will be adopted as appropriate.
Water supply	The water hierarchy will be considered: Eliminate wasted water > Improve efficiency > Reuse water > Recycle water. The importance of water saving will be promoted on site and potable mains water supply will be metered and meters calibrated as required to ensure usage can be recorded accurately. Meters will be read weekly to monitor usage. Where mains water is not available, tankered treated water will be supplied and the deliveries and usage recorded. Drinking water may have to be supplied where treated mains water is not available. Concrete washout to be avoided on site, with concrete mixers returning to their concrete plant to washout, reducing the volume of water and concrete slurry disposal on site. Rely on the concrete lorry's own onboard water supply to carry out washdown of chute, so removing any need for use of any site potable water.
Wastewater treatment	Wastewater and effluent will be kept collected separately from any surface water to reduce the volume of water required to be disposed of offsite to full aerobic treatment.

7.2 Resource Sustainability

Every attempt will be made to reduce the use of primary aggregates and unsustainable products and materials, wherever possible. Where practicable, commercially acceptable and in accordance with specification and regulatory requirements, use will be made of waste or recycled material, or products containing some recycled content.

Opportunities for the use of sustainable products and material have been identified in Table 7-2 below and will be pursued during procurement and the subsequent undertaking of the project works.

Table 7-2: Resource sustainability

Opportunities for the use of sustainable products and material	
Product	**Sustainable specification**
Timber	Timber used for shuttering will be 100% sustainable timber, FSC (or equivalent) certified. Re use of shuttering will be encouraged to reduce overall wastage
Cut and fill arising	Utilise site won material. Zero balanced cut and fill design to retain all arisings on site to minimise need for imported materials for backfill. Adopt DEFRA: Construction Code of Practice for the Sustainable Use of Soils on Construction Sites – minimize any movement offsite.
Concrete	Design specification to encourage use of cement replacements and lower carbon cements.
Design	Buildings or other structures fabricated off site to reduce off-cuts and wastage.

Opportunities for the use of sustainable products and material	
	Aim to design and provide structures and elements that will be fully recyclable on decommissioning.
Delivery of materials	Use local suppliers, when possible (i.e., local quarry & concrete supplier) to reduce carbon footprint and lower transport fuel usage and costs

7.3 Socioeconomic

Aim to provide economic benefit to the regions in which the project is located by engaging with local suppliers wherever possible. Local suppliers will provide expert local knowledge and the following economic benefits:

- Local employment and training
- Cost savings through reduced travel and transport
- Direct and indirect investment in the local economy
- Reduced carbon footprint

Examples of initiatives which could be utilised on the project include:

- Host supplier open days to introduce project needs to local SMEs and tradespeople
- Hire local labour for construction and assist local workers in developing skills in renewable energy
- Partner with local technical schools or colleges
- Prioritize employment and training for women, youth, and marginalized groups
- Prioritize local suppliers and contractors for construction materials, transportation, catering
- Provide capacity building workshops for small businesses to qualify for contracts

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