4. DESCRIPTION OF THE PROPOSED DEVELOPMENT

4.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) describes the Proposed Development and all its component parts. The planning application for the Proposed Development will be made to Cork County Council. Construction methodologies for the main infrastructural components of the Proposed Development are also included in this chapter (or its associated appendices) of the EIAR.

The development description for the current planning application as appears in the public notices is as follows:

I. 3 no. wind turbines with an overall turbine tip height of 156.5 metres; a rotor blade diameter of 133 metres; and hub height of 90 metres, and associated foundations, hard-standing and assembly areas;
II. Continued use of the existing onsite 38kV substation and associated 38kV underground cabling (built under Cork County Council Ref. No. 00/6590 / An Coimisiún Pleanála Ref. No. 04.127297);
III. A meteorological mast with a height of 30 metres above ground and associated foundation and hard-standing area;
IV. All associated underground electrical and communications cabling connecting the wind turbines and meteorological mast to the existing onsite 38kV substation;
V. A temporary construction compound (including 2 no. site offices and staff facilities (with a combined floor area of 60 sq.m));
VI. A borrow pit;
VII. Peat and spoil management;
VIII. Upgrade of existing site tracks/ roads and provision of new site access roads, junctions and hardstand areas;
IX. Temporary improvements and modifications to the existing site access junction off the R584 to facilitate delivery of turbine components;
X. Upgrade of an existing access track off the R584, including temporary improvements and modifications to facilitate a turbine component turning area;
XI. Tree Felling and Vegetation Removal;
XII. Biodiversity Enhancement measures (Kerry Slug habitat enhancement, peatland habitat enhancement, and riparian planting of native broadleaf trees);
XIII. Site Drainage;
XIV. Operational stage site signage; and
XV. All associated site development works, ancillary works and apparatus.

A 35-year operational life from the date of the full commissioning of the wind turbines and subsequent decommissioning of the development is being sought.

As detailed in Section 1.1.1 in Chapter 1 (Introduction), for the purposes of this EIAR, the various project components are described and assessed using the following references: ‘Proposed Development’, ‘proposed turbines’, the ‘Site’, the ' 2020 Application' and the 'Kealkill Wind Farm'. Please see Section 1.1.1 of this EIAR for further details. A detailed description of the Proposed Development is provided in Chapter 4 (Description of the Proposed Development) of this EIAR.

4.2 Site Location

The Proposed Development is located within a rural, agricultural setting in southwest Cork, approximately 6.8km northeast of Kealkill Village and 3.8km southwest of the village of Ballingeary. The Site which historically hosted an operational wind farm that had its turbines removed, is centred approximately at E508999, N562646 (ITM). The Site is facilitated with the existing wind farm infrastructure, such as the existing wind farm roads, the existing on-site 38kV substation and existing 38kV overhead line. The Site covers an area of approximately 270 hectares in total, the majority of which is planted with mixed forestry and existing wind farm infrastructure. The Site ranges in elevation from 111 metres above ordnance datum (m OD), in the turbine component turning area of the Site, to 347m OD in the north of the Site. The Site location context is shown on Figure 1-1. The EIAR Site boundary is presented in Figure 4-1.

The Site is located, almost in its entirety, within Type 15a: Ridged and Peaked Upland (Mullaghanish to Millstreet) Landscape Character Type (LCT) as per the Cork County Development Plan 2022-2028, which typically comprises of a ridged, peaked and forested upland landscape, with rugged and rolling mountainous topography.

The Site falls within the townlands of, Derreendonee, Curraglass, Cappaboy Beg and Inchi More is situated on the south-westerly slopes of Doughill Mountain of the Shehy Mountains. The Site is accessed by an existing site entrance, via forestry roads to the northeast that adjoins the R548 Regional Road, entering the Site at its eastern boundary in the townland of Derreendonee. The section of Site that covers the turbine component turning area for turbine delivery, is located in low lying lands along the R584 at the bottom of the northern slopes of the Doughill Mountain. This pocket of the Site contains an existing private gravel track, with a mix of agricultural grasslands on either side of the track, and the boundary with the R548 Regional Road includes gorse willow hedgerow.

The current available Environmental Protection Agency (EPA) Corine land cover maps describe the 270 ha of the Site, as primarily consisting of *mixed forestry,* with portions of *coniferous forestry* and *peat bogs* in the northwest and northeast of the section.

Current land-use on the Site comprises of commercial forestry, agricultural land and unutilised existing wind farm infrastructure. As noted, there was an operational wind farm at the Site, that has had the turbines removed. Wind energy is also a significant land use within the surrounding area and includes the operating Shehy More, Grousemount and Cleanrath wind farms. In addition to forestry and wind energy, other land-uses in the surrounding area include agriculture, and residential/commercial activities.

The Site location is described in detail in Chapters 1-16 of the EIAR.

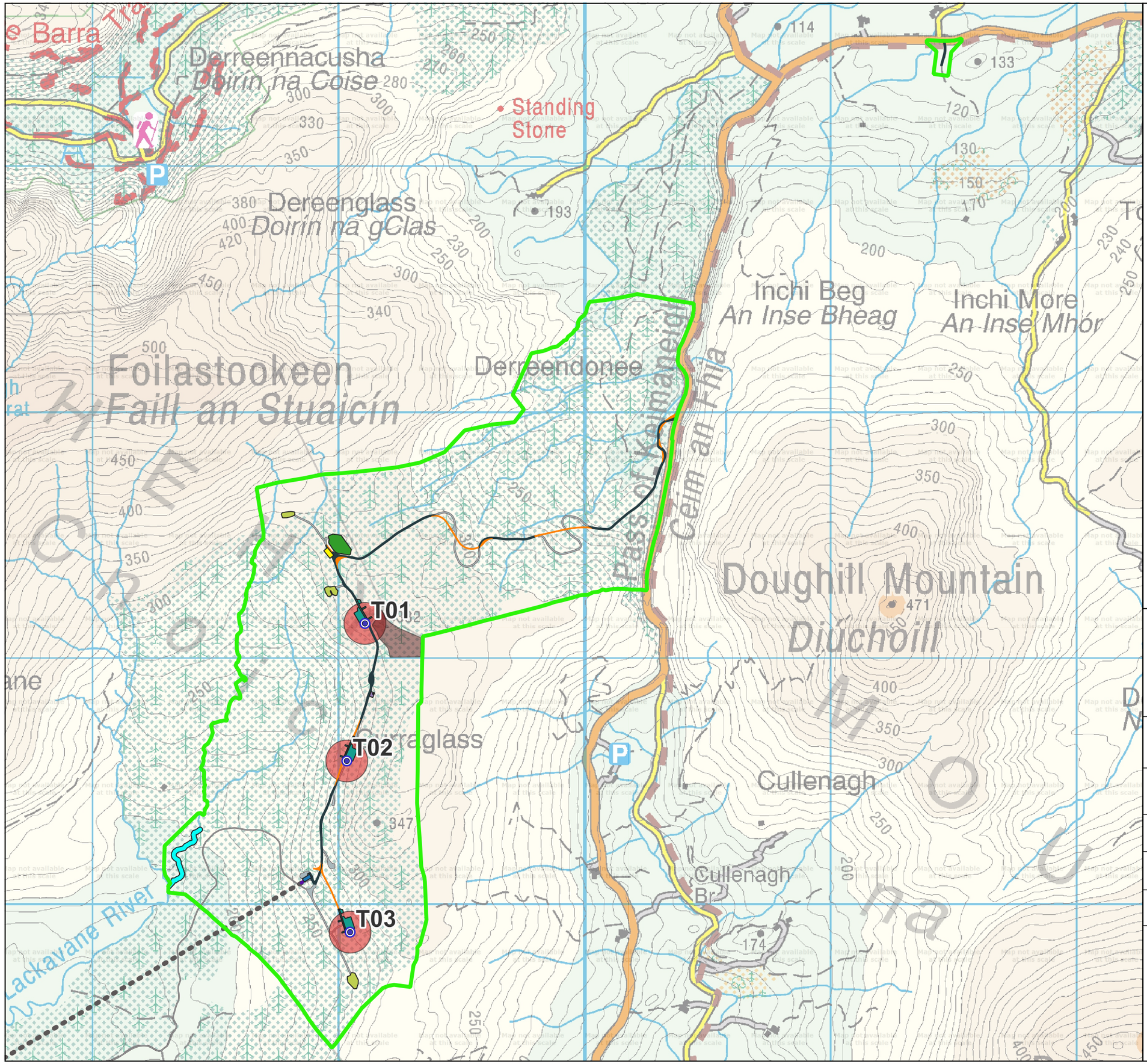
4.3 Proposed Development Layout

The overall layout of the Proposed Development is shown on Figure 4-1.

The Proposed Development layout has been designed to minimise potential environmental effects, and to reflect cognizance of the refusal reasons outlined in the previous 2020 Application.The current layout acknowledges that the Site was previously occupied by the previously operational Kealkill Wind Farm, aiming to build upon the established planning history of the location. While the Site offers a strong wind resource, existing wind farm infrastructure, and the existing 38kV overhead line, the design of the Proposed Development does not seek to maximise the Site's full wind generation potential. Instead, the layout and capacity have been deliberately scaled back to reduce the overall visual and environmental footprint of the development. This has been done in recognition of feedback received during the previous planning application referenced above, the current planning process, and the sensitivities associated with the surrounding landscape.

It is intended to connect the proposed turbines to the national grid via the existing onsite 38kV substation located within the Site. The existing onsite 38kV substation connects to an existing 38kV overhead line.

A constraints study, as described in Section 3.2.5 of this EIAR, has been carried out to ensure that turbines and ancillary infrastructure are located in the most appropriate areas of the Site and makes use of the existing access tracks, existing hardstands, existing onsite 38kV substation, and existing 38kV overhead line where appropriate. Detailed site layout drawings of the Proposed Development are included in Appendix 4-1 to this EIAR.



Map Legend

- EIAR Site Boundary
- Proposed Turbines
- Proposed Hardstands
- Proposed Met Mast
- Proposed Met Mast Hardstand
- Proposed Borrow Pit
- Existing Roads to Upgrade
- Proposed New Roads
- Existing Wind Farm Infrastructure
- Temporary Construction Compound
- Proposed Peat & Spoil Management Areas
- Eco Enhacement - Peatland Habitat Enhancement
- Eco Enhancement - Kerry Slug Habitat Enhancement
- Eco Enhancement - Riparian Planting
- Existing 38kV Onsite Substation
- Existing 38kV Underground Cabling
- Existing 38kV Overhead Line

Drawing Title
Proposed Development Layout

Project Title
Curraglass Wind Farm, Co. Cork

Drawn By	Checked By
EM	EC
Project No. 240614	Drawing No. Figure 4-1
Scale 1:15,000	Date 2025-09-12

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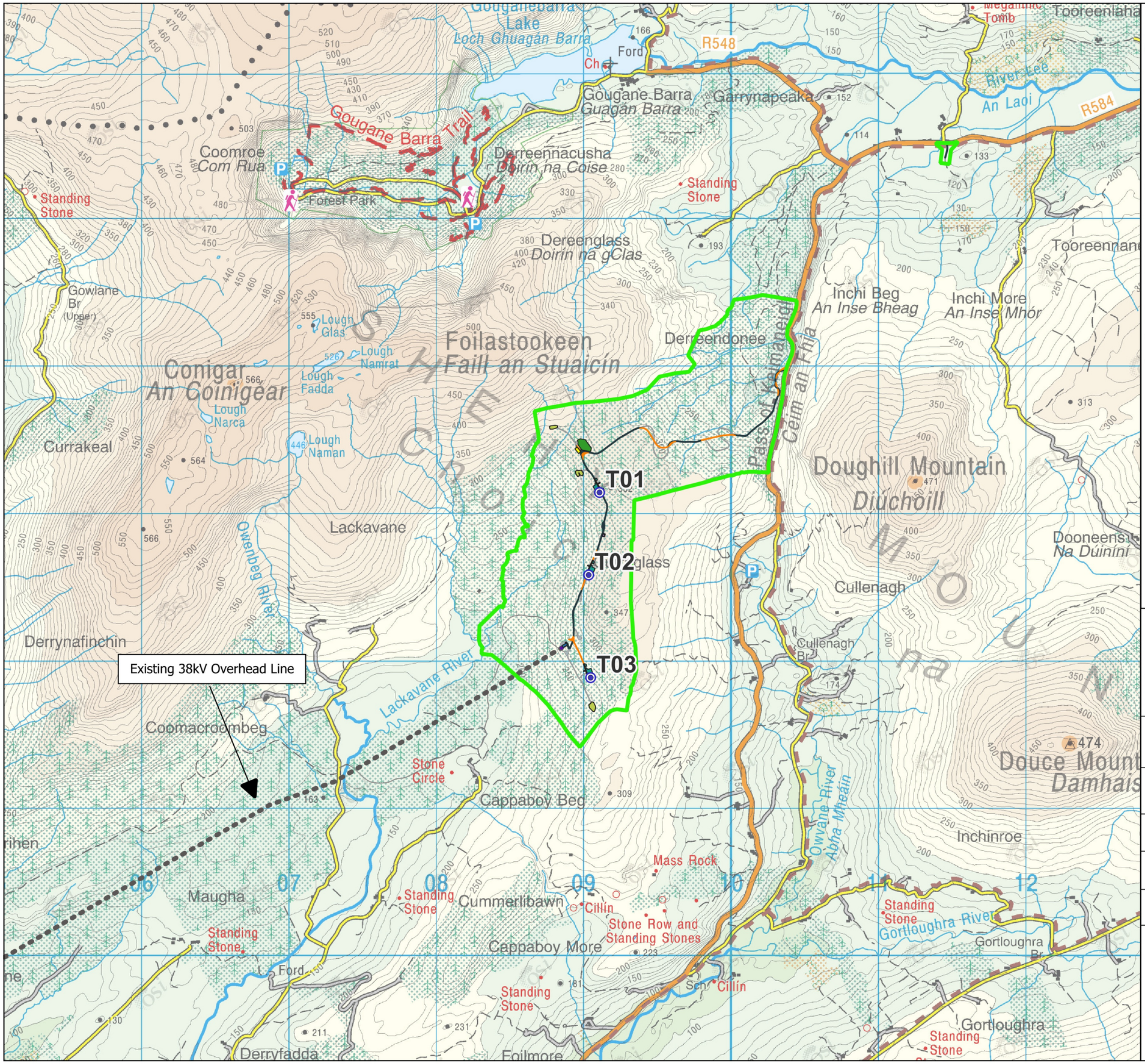

Map Legend

- EIAR Site Boundary
- Proposed Turbines
- Proposed Hardstands
- Proposed Met Mast
- Propsoed Met Mast Hardstand
- Proposed Borrow Pit
- Proposed New Road
- Existing Roads to Upgrade
- Existing Infrastructure
- Temporary Construction Compound
- Proposed Peat & Spoil Management Areas
- Existing Onsite 38kV Substation
- Existing Underground 38kV Cabling
- Exisiting 38kV Overhead Line

Drawing Title
Existing 38kV Overhead Line

Project Title
Curraglass Wind Farm, Co. Cork

Drawn By	Checked By
EM	EC
Project No. 240614	Drawing No. Figure 4-2
Scale 1:25,000	Date 2025-09-03

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4.4 Proposed Development Components

This section of the EIAR describes the components of the Proposed Development. Further details regarding Access and Transportation (Section 4.5), Site Drainage (Section 4.6), Construction Management (Section 4.7) and Construction Methodologies (Section 4.8) are provided subsequently in this chapter.

4.4.1 Proposed Development

4.4.1.1 Wind Turbines

4.4.1.1.1 *Proposed turbine Locations*

The proposed turbine layout has been optimised using wind farm design software (WindPro) to maximise the energy yield from the Proposed Development, while maintaining sufficient distances between the proposed turbines to ensure turbulence and wake effects do not compromise turbine performance. Every effort was made to utilise the existing on-site infrastructure where possible. The ITM Grid Reference coordinates of the proposed turbines are listed in Table 4-1 below. The final finished top of foundation level of the turbine foundations will be determined by the actual ground conditions at each proposed turbine location and may differ slightly from those levels listed in Table 4-1.

Table 4-1 Proposed turbine locations and top of foundation level

Turbine	ITM Coordinates		Top of Foundation Elevation (m OD)
	Easting	Northing	
1	509077	563204	325
2	509002	562644	291
3	509016	561949	268

4.4.1.1.2 *Turbine Locations and Site Investigation*

As the Site previously accommodated an operational wind farm, its overall suitability for wind energy development had already been established. As part of the design process for the Proposed Development, numerous intrusive site investigations were undertaken across the Site, to verify and update existing ground condition data. The reconfirmed data provided detail and clarity on the nature and extent of subsoils and bedrock as a means of characterising the Site. These investigations focused on reconfirming the suitability for turbine locations and associated infrastructure remain appropriate and feasible, based on current site conditions.

Geotechnical ground investigations (i.e. trial pitting and borehole drilling) were undertaken by Irish Drilling Limited (IDL) on the 28th of January 2025, under the supervision of Fehily Timoney & Company Ltd. (FTC). Further trial pitting investigations (1 no.) were carried out at proposed borrow pit locations on 19th March 2025 under the supervision of Fehily Timoney. Hydro-Environmental Services (HES) completed ground truthing site walkovers on the 13th of November 2024 and completed surface water sampling on 20th of February and again on the 24th of March. The combined geological and hydrological dataset collected from the geotechnical ground investigations and from ground truthing site walkovers completed by IDL, FTC and HES has been used in the preparation of this EIAR Chapter.

The objectives of the intrusive site investigations included mapping the subsoil lithology for all proposed turbines and other key locations (i.e. internal access tracks) and assessing the underlying bedrock. This data was used to inform the final layout of the Proposed Development.

In summary, a total of 7 no. trial pits, supervised by FTC, were carried out at all proposed turbine locations and at other key locations (i.e. internal access roads, borrow pit and met mast location) to investigate the underlying mineral soil lithology and subsoil/bedrock interface. Full detail of the 7 no. trial pits conducted on site can be viewed in Appendix 8-1.

The complete geotechnical ground investigations were carried out in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Ground Investigations with precedence given to IS EN 1997-2 where applicable

4.4.1.1.3 *Turbine Type*

Wind turbines use the energy from the wind to generate electricity. A wind turbine, as shown in Plate 4-1 below, consists of four main components:

- Foundation unit
- Tower
- Nacelle (turbine housing)
- Rotor

Plate 4-1 Wind Turbine Components

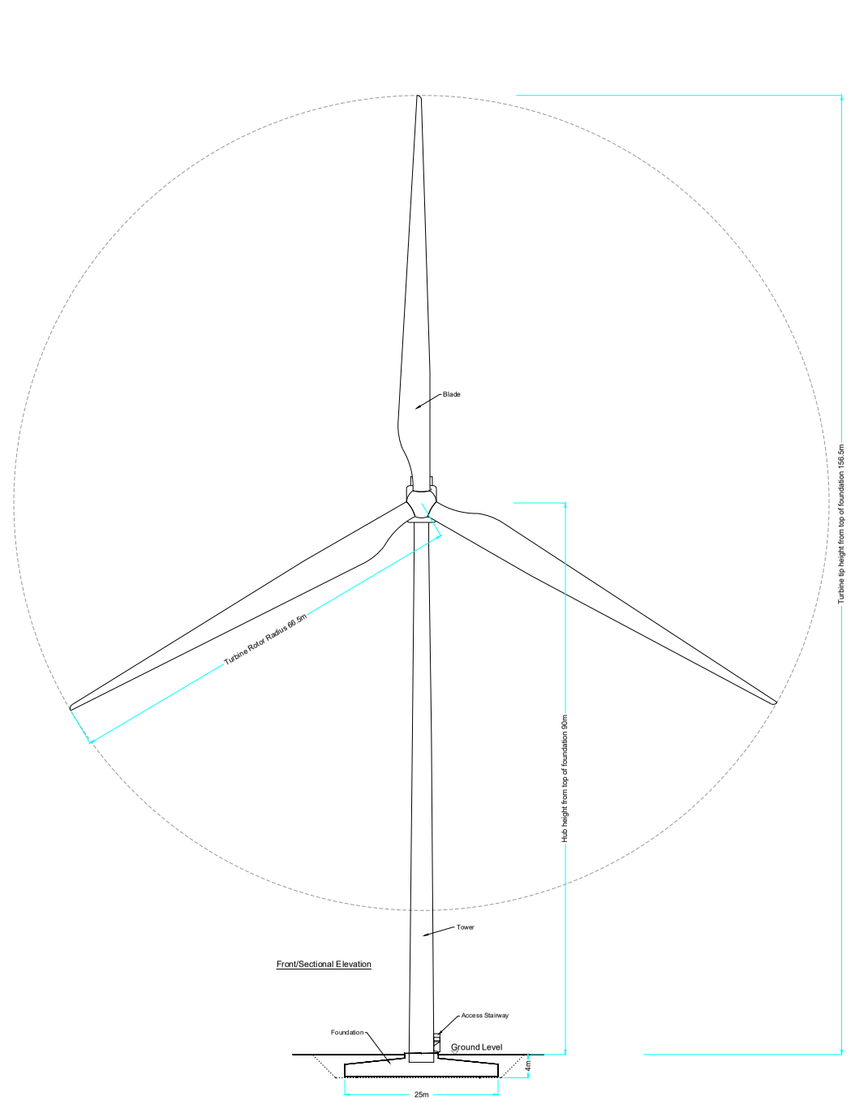
The proposed turbines to be installed on the Proposed Development will have the following dimensions:

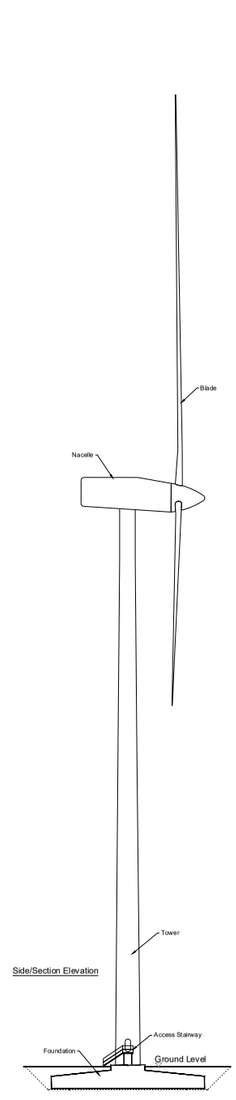
- Turbine Tip Height – 156.5 metres
- Hub Height – 90 metres
- Blade Rotor Diameter: – 133 metres

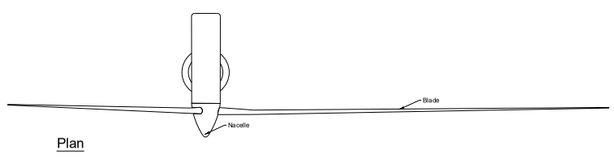
Modern wind turbines from the main turbine manufacturers have evolved to share a common appearance and other major characteristics, with only minor cosmetic differences differentiating one from another. The wind turbines that will be installed on the Proposed Development will be conventional three-blade turbines, that will be geared to ensure the rotors of all turbines rotate in the same direction at all times.

The turbines will be multi-ply coated to protect against corrosion. It is proposed that the turbines would be of a light grey colour to blend into the sky background to minimise visual impact as recommended in the Guidelines and '*The Influence of Colour on the Aesthetics of Wind Turbine Generators*' (ETSU, 1999).

A drawing of the proposed turbines is shown in Figure 4-3. Figure 4-3 also shows the turbine base layout, including turbine foundation, hardstanding area, assembly area, access road and surrounding works area. The individual components of a geared wind turbine nacelle and hub are shown in Figure 4-4 below.







Drawing Notes

1. Proposed wind turbines to have a maximum ground to blade tip height of 156.5m, blade length of 66.5m and hub height of 90m
2. Ground level represents the top of turbine foundation.

DRAWING TITLE:
Wind Turbine Hardstanding Elevations & Plan

PROJECT TITLE: Curraglass Wind Farm, Co. Cork	
DRAWING BY: JOB	CHECKED BY: AC
PROJECT No.: 240614	DRAWING No.: Fig 4-3
SCALE: 1:500 @A1	DATE: 11.09.2025

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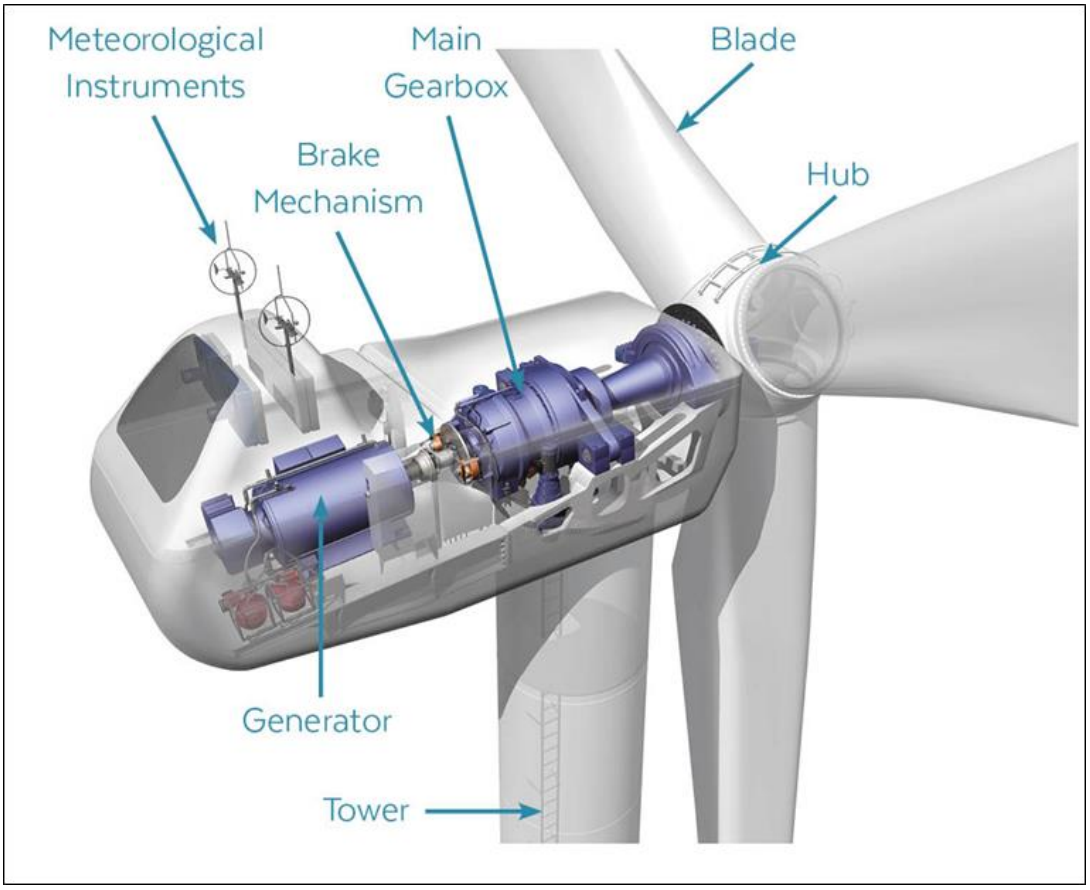
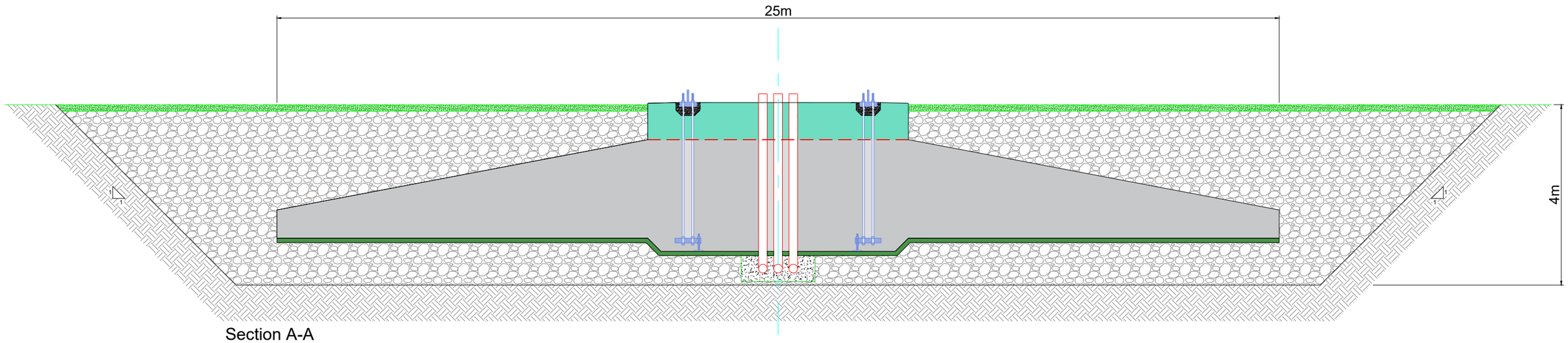


Figure 4-4 Turbine nacelle and hub components

4.4.1.1.4 Turbine Foundations

Each wind turbine is secured to a reinforced concrete foundation that is installed below the finished ground level. The size of the foundation will be dictated by the turbine manufacturer, and the final turbine selection will be the subject of a competitive tender process. Different turbine manufacturers use different shaped turbines foundations, ranging from circular to hexagonal and square, depending on the requirements of the final turbine supplier. The turbine foundation transmits any load on the wind turbine into the ground. The horizontal and vertical extent of the turbine foundation will be 25m and 3.5to 4.5m respectively, which has been assessed in this EIAR and is shown in Figure 4-5.

After the foundation level of each turbine has been formed on competent stratum (i.e bedrock or subsoil of sufficient load bearing capacity), the “Anchor Cage” is levelled and reinforcing steel is then built up around and through the anchor cage. The outside of the foundation is shuttered with demountable formwork to allow the pouring of concrete and is backfilled accordingly with appropriate granular fill to finished surface level (Plate 4-2 and Plate 4-3 below).



Section A-A

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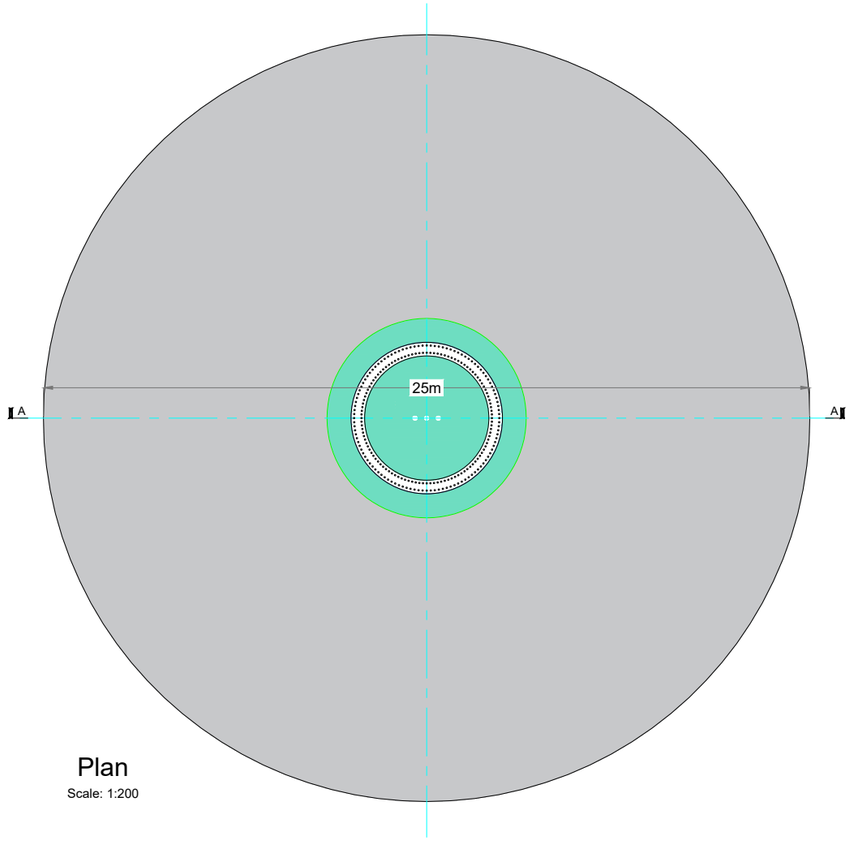

Plan

Scale: 1:200

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DRAWING TITLE: **Gravity Foundations Details**			
PROJECT No.: **240614**		DRAWING No.: **Fig 4-5**	SCALE: **As Shown @ A3**
DRAWN BY: **JOB**	CHECKED BY: **AC**	DATE: **10.09.2025**	REVISION.: D01

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Plate 4-2 Turbine Foundation Anchor Cage surrounded by reinforcing steel.

Plate 4-3 Finished Turbine Foundations

4.4.1.1.5 Hard Standing Areas

Hard standing areas consisting of levelled and compacted hardcore are required around each turbine base to facilitate access, turbine assembly and turbine erection. The hard-standing areas are used to accommodate cranes used in the assembly and erection of the turbine, offloading and storage of turbine components, and provide a safe, level working area around each turbine position. The hard-standing areas are extended to cover the turbine foundations once the turbine foundation is in place. All crane hardstand areas 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 and will measure approximately 35m x 50m. The precise sizes, arrangement and positioning of hard standing areas are informed by the turbine manufacturers. The proposed hard standing areas are illustrated in the detailed drawings included in Appendix 4-1 of this EIAR. The extent of the required areas at each turbine location may be optimised on-site depending on topography, position of the Proposed Development access road, the proposed turbine position and the turbine supplier's exact requirements. A detailed drawing of the hardstanding area has been included as Figure 4-3.

4.4.1.1.6 Assembly Area

Levelled assembly areas will be located within or on either side of the hard-standing area as shown on Figure 4-3. These assembly areas are required for offloading turbine blades, tower sections and hub from trucks until such time as they are ready to be lifted into position by cranes and to assist the main crane during turbine assembly. The extent of the area required for the assembly areas is shown on Figure 4-3 and the detailed drawing in Appendix 4-1.

4.4.1.1.7 Generating Capacity

Modern wind turbine generators currently have a typical generating capacity in the 4 to 7 MW range, with the generating capacity continuing to evolve upwards as technology improvements are achieved by the turbine manufacturers. Turbines of the exact same make, model and dimensions can have different generating potential depending on the capacity of the electrical generator installed in the turbine nacelle. The exact generating capacity of the installed turbine will be designed to match the wind regime on the Site and will be determined by the selected manufacturer.

For the purposes of this EIAR, a rated output of 4.8 MW has been chosen to calculate the potential generating capacity of the proposed 3-turbine renewable energy development, which would result in an estimated installed capacity of 14.4MW.

Assuming an installed capacity of 14.4 MW, the Proposed Development therefore has the potential to produce up to 44,150.4 MWh (megawatt hours) of electricity per year, based on the following calculation:

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

where: A = ... The number of hours in a year: 8,760 hours

B = ... The capacity factor, which takes into account the intermittent nature of the wind, the availability of wind turbines and array losses etc. A capacity factor of 35%[1] is applied here

C = ... Rated output of the wind farm: 14.4 MW

The 44,150.4 MWh of electricity produced by the Proposed Development would be sufficient to supply approximately 10,512 Irish households with electricity per year, based on the average Irish household using 4.2 MWh of electricity[2] (this latest figure is available from the March 2017 CER Review of Typical Consumption Figures Decision Paper).

The 2022 Census of Ireland recorded a total of 127,971 occupied households in Co. Cork. Per annum, based on a capacity factor of 35%, the Proposed Development would therefore produce sufficient electricity for the equivalent of 8% of all households in Co. Cork.

[1] https://www.eirgridgroup.com/site-files/library/EirGrid/ECP-2-2-Solar-and-Wind-Constraints-Report-Area-I-v1.0.pdf
[2] *March 2017 CER (CRU) Review of Typical Consumption Figures Decision Paper*
https://www.cru.ie/document_group/review-of-typical-consumption-figures-decision-paper/

4.4.1.2 Site Roads

4.4.1.2.1 *Road Construction Types*

To provide access within the Site and to connect the proposed turbines and associated infrastructure, existing roads and tracks will need to be upgraded, and new access roads will need to be constructed. FTC were appointed to assess the existing ground conditions and specify the type of road required to access all locations onsite. The road construction preliminary design has taken into account the following key factors:

1. Buildability considerations;
2. Making use of existing infrastructure where possible;
3. Minimising excavation arisings;
4. Serviceability requirements for construction and wind turbine delivery and maintenance vehicles;

Whilst the above key factors are used to determine the road design, the actual construction technique employed for a particular length of road will be determined on the prevailing ground conditions encountered along that length of road.

The Proposed Development makes use of the existing road network insofar as possible. It is proposed to upgrade approximately 2.6km of existing roads and tracks, and to construct approximately 1.5km of new access road. The proposed access road network has been designed to utilise the existing widened road sections to allow construction traffic to safely pass each other while travelling in opposite directions, as seen in Appendix 4-1. Areas such as wide junctions and proposed hardstands will also be used as passing bays throughout the construction phase of the Proposed Development.

The road construction techniques to be considered are as follows:

- Upgrade of Existing Access Roads or Tracks
- Upgrade to Existing Floating Roads
- Construction of New Excavated Roads

Upgrade of Existing Access Roads or Tracks

As noted above, approximately 2.6km of existing roads and access tracks will be upgraded as part of the Proposed Development construction phase. The general construction methodology for upgrading of existing sections of access roads or tracks, as presented in FTC's *Peat & Spoil Management Plan* in Appendix 4-2 of this EIAR, is summarised below in section 4.8.1.2.2.

A cross section of Existing Road for Upgrade is shown in Figure 4-6.

Upgrade to Existing Floating Road

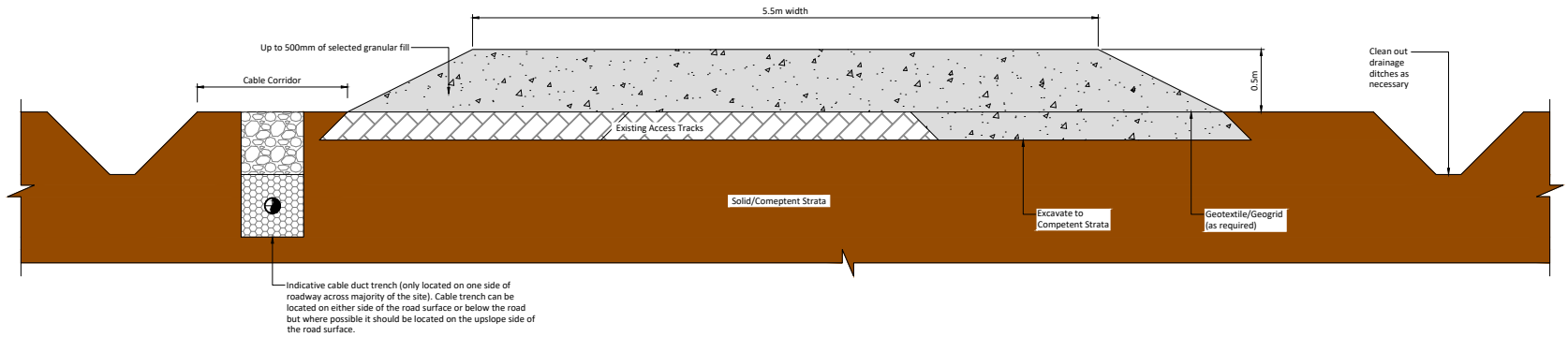
Approximately 200m of existing floating road will be upgraded to facilitate the Proposed Development. The general construction methodology for the upgrade of floating access roads or tracks, as presented in FTC's *Peat & Spoil Management Plan* in Appendix 4-2 of this EIAR.

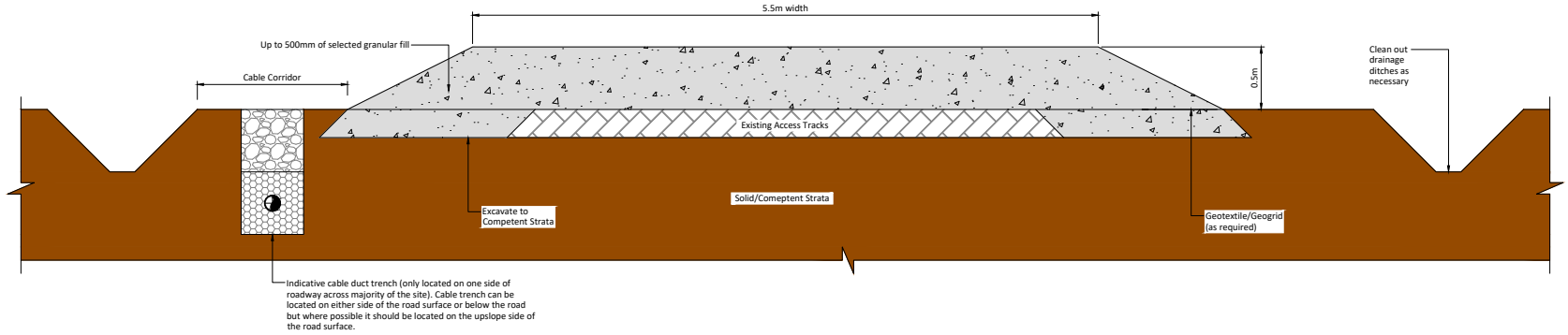
The section of floating road to be upgraded is shown in Figure 4-7. below. The general construction methodology for upgrading of existing sections of floating road, as presented in FTC's *Peat & Spoil Management Plan* in Appendix 4-2 of this EIAR, is summarised below in section 4.8.1.2.3;

Construction of New Excavated Roads

As noted above, approximately 1.5km of new roads will be constructed to facilitate the Proposed Development. Due to the ground conditions, specific sections of new access tracks proposed on site are proposed to be founded and located on competent stratum. The typical make-up of the founded access tracks is a minimum stone thickness of c. 500mm. A section of a new excavated road is also shown in Figure 4-8.

The general construction methodology for construction of new excavated roads is summarised below in Section 4.7.1.2.1:





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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	01.05.25
P02	FOR INFORMATION	BDH	02.07.25
P03	FOR INFORMATION	BDH	23.07.25

PROJECT: CURRAGLASS WIND FARM

CLIENT: MKO

SHEET: TYPE A – UPGRADE OF EXISTING FOUNDED ACCESS ROAD

Date: 23.07.25
Drawn by: POR
Checked by: IH

Project number: P24-263
Scale (@ A1): 1:20
Drawing Number: Figure 4-6
Rev: P03

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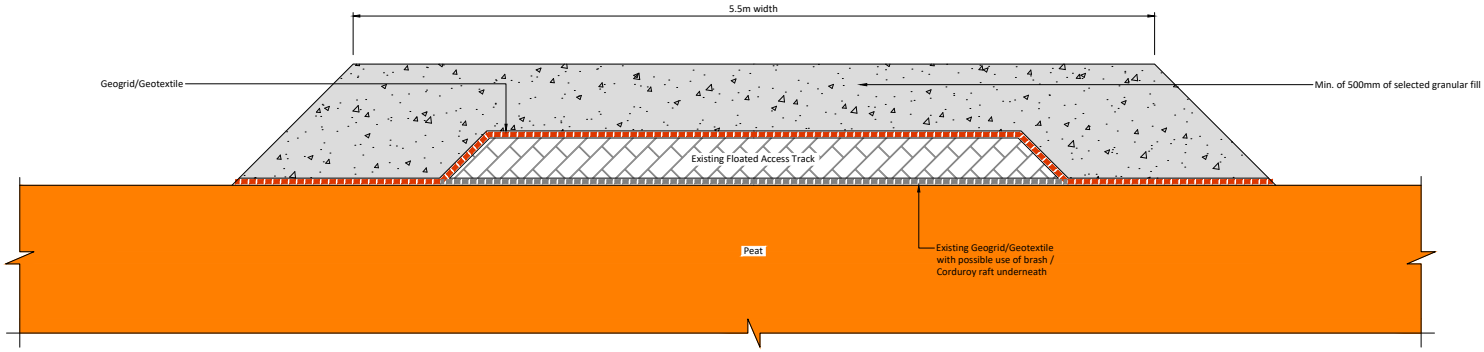
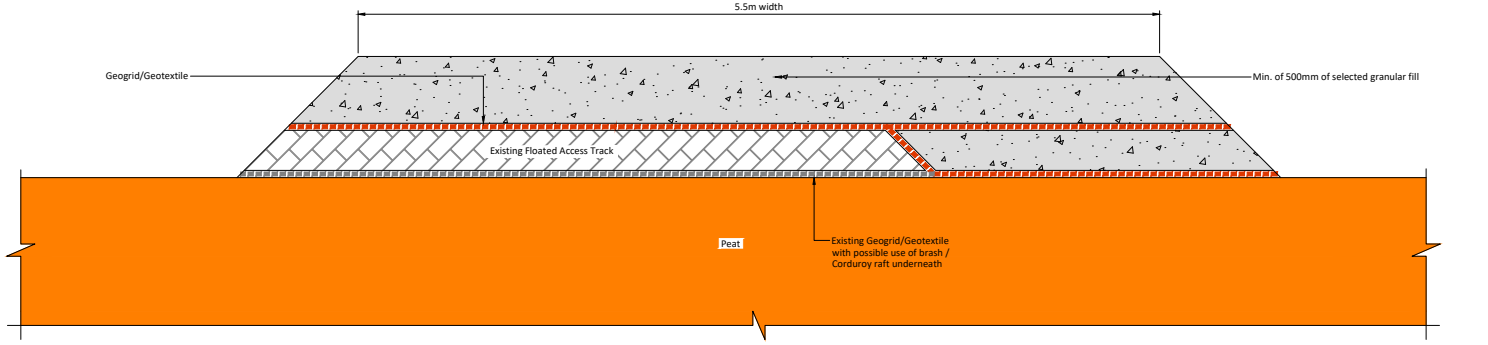
23 July 2025





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P01	FOR INFORMATION	BDH	01.05.25
P02	FOR INFORMATION	BDH	02.07.25
P03	FOR INFORMATION	BDH	23.07.25
P04	FOR INFORMATION	BDH	05.09.25

PROJECT: CURRAGLASS WIND FARM

CLIENT: MKO

SHEET: TYPE B – UPGRADE OF EXISTING FLOATING ACCESS ROAD

Date: 05.09.25

Drawn by: POR

Checked by: IH

Project number: P24-263

Scale (@ A1): 1:20

Drawing Number: Figure 4-7

(Sheet set to Sheet 0600)

Rev: P04

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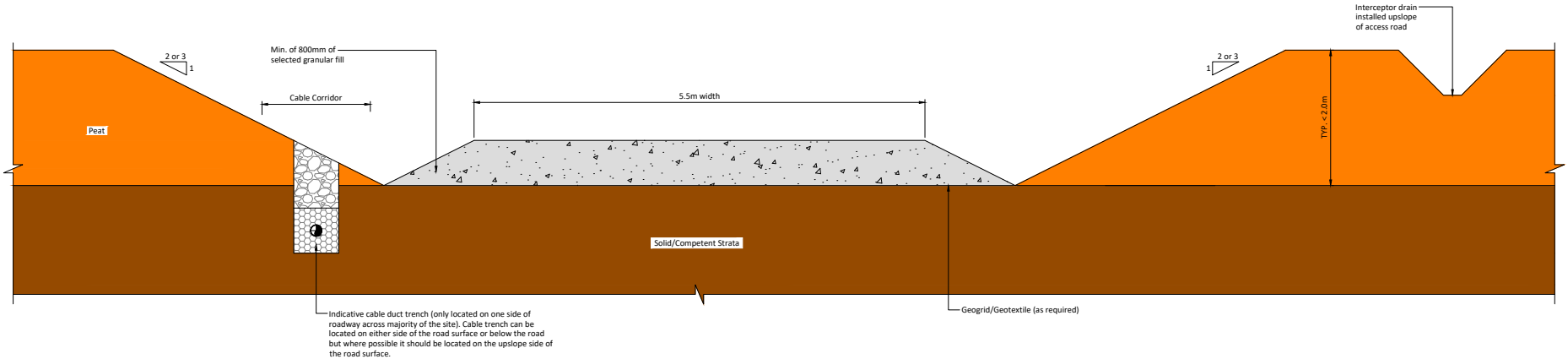
5 September 2025



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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	01.05.25
P02	FOR INFORMATION	BDH	02.07.25
P03	FOR INFORMATION	BDH	23.07.25

PROJECT: CURRAGLASS WIND FARM

CLIENT: MKO

SHEET: TYPE C – NEW EXCAVATE AND REPLACE ACCESS ROAD

Date: 23.07.25

Project number: P24-263

Scale (@ A1): 1:25

Drawn by: POR

Checked by: IH

Drawing Number: Figure 4-8

(Sheet set to short (A3))

Rev: P03

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23 July 2025

4.4.1.3 Watercourse / Culvert Crossings

The majority of the southern portion of the Site drains to the Owenbeg River (including the majority of the Proposed Development infrastructure) via the Lackavane River which flows along the western boundary of the Site.

Several headwater streams rise along the western facing slopes of the Site and these streams flow south westerly towards the Lackavane River. These streams intercept some of the existing forestry roads and Proposed Development access roads as described below.

Several headwater streams of the Owvane River flow off the steep rocky eastern facing slopes of the Site. There is no Proposed Development infrastructure in the south-eastern section of the Site. A similar hydrology exists on the northern section of the Site, where several small headwater streams of the River Lee emerge.

There are 2 no. existing stream crossings along existing roads that are proposed for upgrade. There are also 5 no. existing watercourse crossings along forestry roads that will be used by the Proposed Development but will not require upgrading.

4.4.1.3.1 *Culvert Crossing*

All proposed culvert upgrades crossings required for the Proposed Development will be suitably sized for the expected peak flows in the relevant drain.

Some culverts may be installed to manage drainage waters from works areas of the Proposed Development, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base. In all cases, culverts will be oversized to allow mammals to pass through the culvert. Culverts will be constructed as per the methodology detailed in Section 4.8.1.4. All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Please see Figure 4-9 for the location of these crossings and Figure 4-25 below for design details.

4.4.1.4 Borrow Pit

It is estimated that approx. 37,180m^3 of stone material will be required to construct the Proposed Development. It is intended to obtain the majority of materials for the construction of the Proposed Development from the proposed onsite borrow pit (engineer's specified material may be imported onto the Site should sufficient volumes of suitable material not be encountered during the excavation phase of the proposed infrastructure. These volumes will be sourced from local licenced quarries). Please see Figure 4-10 for details of the proposed borrow pit. The proposed onsite borrow pit is located approximately 281m north of T1 and measures approximately 5184 m^2 with an estimated rock volume of is 30,000m^3.

Access to the borrow pit will be via proposed Site roads. Please see Figure 4-1 for details.

The extraction of material from the borrow pit is a construction phase activity only of the Proposed Development which will be a temporary and occur over a short period of time. Hardcore materials will be extracted from the borrow pit (and some turbine locations, if necessary), principally by means of rock breaking. Depending on the hardcore volume, blasting may also be used as a more effective rock extraction method, capable of producing significant volumes of rock in a matter of milliseconds. Blasting will only be carried out after notifying any potentially sensitive receptors. Both rock extraction methods are discussed below. The processing and crushing of boulders may be required to achieve the grading requirements for use in construction. The potential noise and vibration impact on sensitive

receptors associated with the rock extraction measures, detailed below, are assessed in Chapter 12 of this EIAR (Noise & Vibration).

Post-construction, any unsafe areas around the borrow pit area will be permanently secured, and a stock-proof fence will be erected around the borrow pit area to prevent access to this area. The borrow pit will be backfilled with excavated spoil and then reseeded or left to vegetate naturally. Appropriate health and safety signage will also be erected on this fencing and at locations around the fenced area.

The extraction of rock from the borrow pit will be a temporary operation during the construction phase. The topsoil and subsoil will be stripped back and temporarily stockpiled using standard tracked excavators. Two extraction methods have been assessed for breaking out the useful rock: rock breaking and blasting.

4.4.1.4.1 *Rock Extraction*

The estimated volume to be extracted from the borrow pit for the construction of the Proposed Development is 37,180m^3. The volumes to be removed from the borrow pit will be confirmed at the time of construction and following detailed pre-construction site investigation works.

The borrow pit will be excavated and backfilled as follows:

1. *The area to be used for the borrow pit will be marked out at the corners using ranging rods or timber posts. Drainage runs, and associated settlement ponds will be installed in accordance with the Project Hydrologist's design;*
2. *The initial borrow pit excavation will involve removal of soil to the top of bedrock. These materials will be stored temporarily in selected spoil management areas, see Figure 4-10 for details;*
3. *All drainage measures prescribed in the detailed drainage design for the Proposed Development will be implemented around the works area;*
4. *The bedrock material will be extracted by breaking and blasting from the borrow pit and stockpiled or used as required;*
5. *The use of material won from the borrow pit will be sequential with new road construction or turbine foundation formations;*
6. *Temporary stockpiling of aggregates will be required to accommodate the cut and fill operations within the borrow pit, and the progression of access roads and turbine excavations;*
7. *As the borrow pit excavation progress and due to the local topography and confirmed competent bedrock along with the prevailing hydrogeology of the Site, the potential for groundwater level drawdown impacts is considered negligible.;*
8. *When extraction ceases within the borrow pit, the borrow pit will be backfilled with excavated spoil and its associated drainage measures will be removed; and,*
9. *The extraction area of the borrow pit will have to be permanently secured and a stock-proof fence will be erected around the borrow pit to prevent access to these areas as well as the installation of appropriate health and safety signage.*

Two extraction methods have been assessed for breaking out the useful rock below: rock breaking and blasting.

4.4.1.4.2 *Rock Breaking*

Weathered or brittle rock can be extracted by means of a hydraulic excavator and a ripper attachment. This is a common extraction methodology where fragmented rock is encountered as it can be carefully excavated in layers. In areas where stronger rock is encountered and cannot be removed by means of excavating then a rock breaking methodology may be used. Rock breaking equipment comprises a large hydraulic 360-degree excavator with a rock breaker attachment. Given the power required to break out tight and compact stone at depth, the machines are generally large and in the 40-60 tonne

size range. Even where rock might appear weathered or brittle at the surface, the extent of weathering can quickly diminish with depth resulting in strong rock requiring significant force to extract it at depths of only a few metres.

A large rock breaking excavator progressively breaks out the solid rock from the ground in the borrow pit area. A smaller rock breaker, in the 30-40 tonne size range, then breaks the rocks down to a size that can then be fed into a crusher.

The extracted, broken rock is loaded into a mobile crusher using a wheeled loading shovel and crushed down to the necessary size of graded stone required for the on-site civil works. The same wheeled loader takes the stone from the crusher conveyor stockpile and stockpiles it elsewhere within the borrow pit, away from the immediate area of the crusher, until it is required elsewhere within the Site.

4.4.1.4.3 Rock Blasting

Where blasting is used as an extraction method, a mobile drilling rig is used to drill vertical boreholes into the area of rock that is to be blasted.-A drilling rig will drill the necessary number of boreholes required for a single blast in approximately 3 to 4 days. The locations, depth and number of boreholes are determined by the blast engineer. This is a specialist role fulfilled by the blasting contractor.

The blast engineer will arrange for the necessary quantity of explosive to be brought to site to undertake a single blast. The management of explosives on-site and the actual blasting operation will be agreed in advance with and supervised by An Gardaí Siochána. The blast engineer sets the explosives in place in the boreholes, sets the charges, and fires the blast.

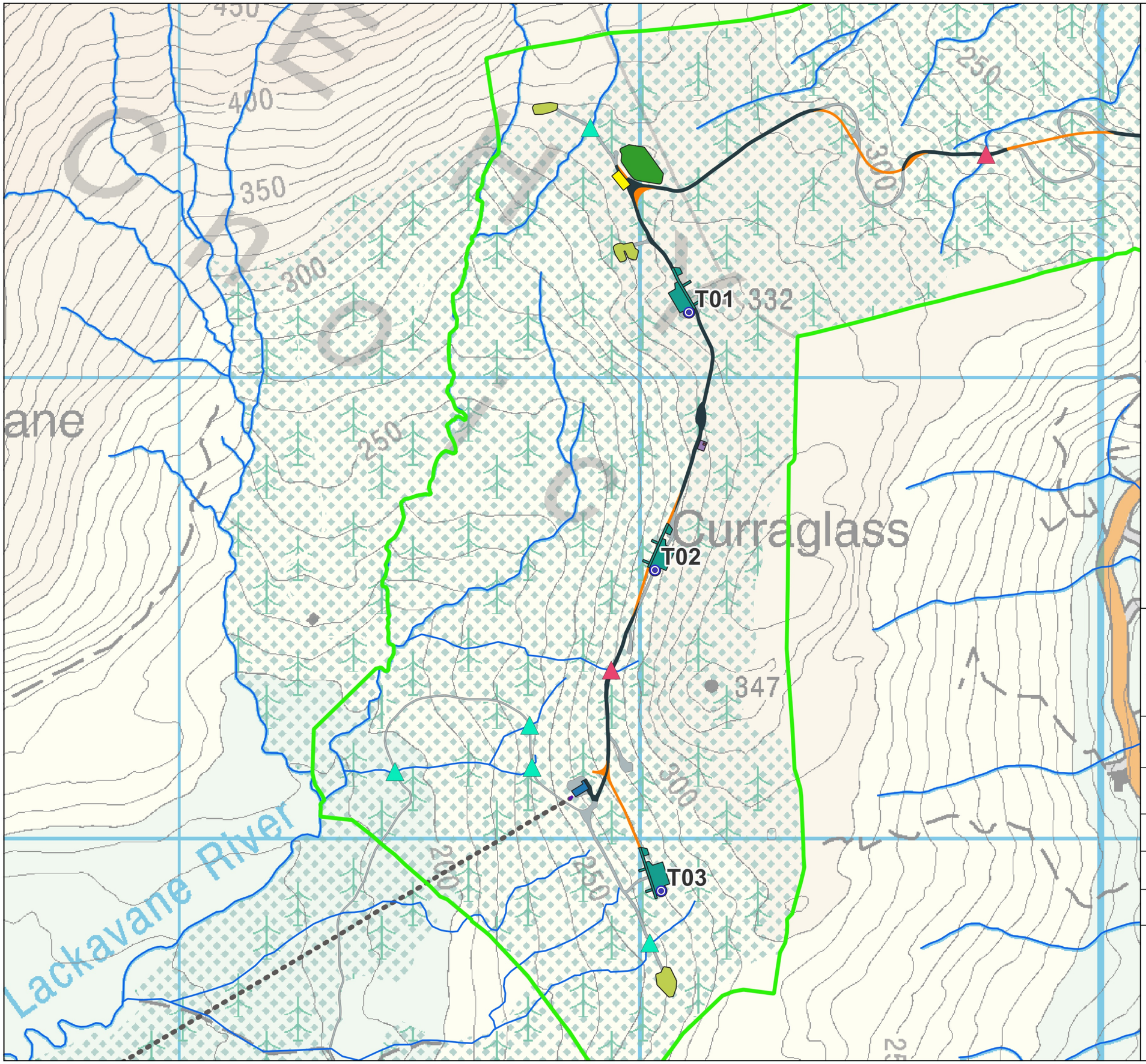
A properly designed blast should generate rock of a size that can be loaded directly into a mobile crusher, using the same wheeled loader outlined above. The same method is used for processing the rock generated from a blast, as would be used to process rock generated by rock breaking. Generally, the drilling rig will recommence drilling blast holes for the next blast as soon one blast finished. The potential impacts and control measures associated with noise and vibration from this extraction method are assessed in Chapter 12 (Noise and Vibration). Any blasting will be carried out in accordance with the *Guidance on the Safe Use of Explosives in Quarries* (Safety and Health Commission for the Mining and Other Extractive Industries, 2002)[3] and the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*[4].

4.4.1.4.4 Rock Processing

The blasted rock face will generate various sized rocks, including large boulders. These large boulders will require breaking to enable them to undergo further processing and grading. Rock breaking typically occurs for 2-4 days post blasting, utilising an excavator with a hydraulic breaker. Rock breaking occurs in close proximity to the Site face to maximise the attenuation offered by the Site face to transmission of the sound. The rock is collected by either a front-end loader or dumper and transported to the semi-mobile crushing/screening unit or loaded directly to the semi mobile crushing/screening unit which follows the operational face within the void. This will break the rock into pre-selected sizes / grades, generating aggregate stockpiles of the graded rock. This will then be transported to other designated stockpile areas of the Site for further screening/processing by articulated dumper or storage until they are required for construction.

Crushed and processed aggregates are stored in graded stockpiles on various parts of the Site and/or used directly in the formation of roads and hardstands.

[3] https://www.hsa.ie/eng/Publications_and_Forms/Publications/Mines_and_Quarries/Guidance%20on%20the%20Safe%20Use%20of%20Explosives%20in%20Quarries.pdf
[4] https://www.thenbs.com/PublicationIndex/documents/details?Pub=BSI&DocID=305965



Map Legend

- EIAR Site Boundary
- Proposed Turbines
- Proposed Hardstands
- Proposed Met Mast
- Proposed Met Mast Hardstand
- Proposed Borrow Pit
- Existing Roads to Upgrade
- Proposed New Roads
- Existing Infrastructure
- Temporary Construction Compound
- Proposed Peat & Spoil Management Areas
- Existing Onsite 38kV Substation
- Existing 38kV Underground Cabling
- Existing 38kV Overhead Line
- Watercourses

Watercourse crossings

- Existing Watercourse Crossings to Upgrade
- Existing Watercourse Crossings

Drawing Title
Watercourse Crossings

Project Title
Curraglass Wind Farm, Co. Cork

Drawn By	Checked By
EM	EC
Project No. 240614	Drawing No. Figure 4-9
Scale 1:8,000	Date 2025-09-11

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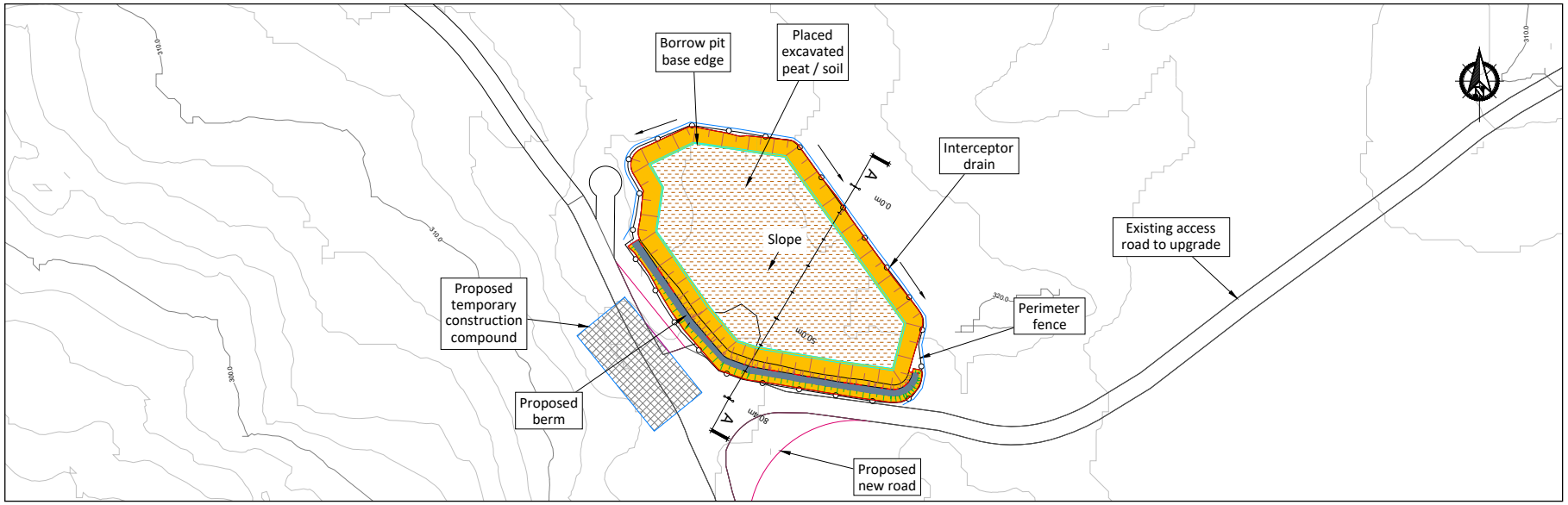


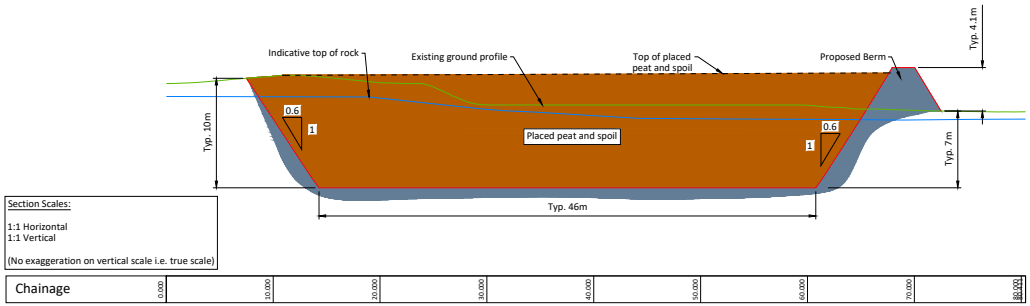
Legend:

PLAN

Scale 1:750

0m 7m 15m 22m 30m 37m 45m 52m 60m 67m 75m

Scale 1:750



Section Scales:

1:1 Horizontal
1:1 Vertical

(No exaggeration on vertical scale i.e. true scale)

Chainage 0.000 10.000 20.000 30.000 40.000 50.000 60.000 70.000 80.000

SECTION A - A

Scale 1:250

Borrow Pit Construction Notes:

(1) It is proposed to construct the borrow pit so that the base of the borrow pit is below the level of the adjacent section of access road.

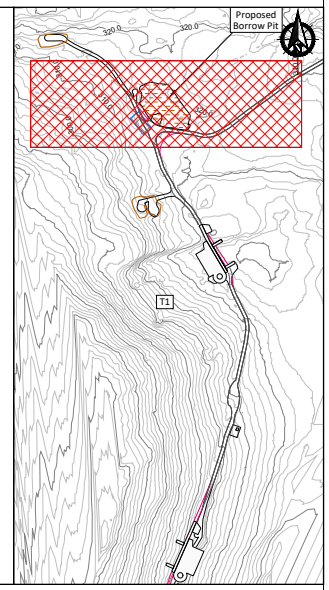
(2) Slopes within the excavated rock formed around the perimeter of the borrow pit will be formed at stable inclinations to suit local in-situ rock conditions.

(3) Infilling of the peat & spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress.

(4) The surface of the placed peat & spoil will be shaped to allow efficient run-off of surface water from the placed arising's.

(5) Control of groundwater within the borrow pit may be required and measures will be determined as part of the ground investigation programme.

(6) All the above-mentioned general guidelines and requirements will be confirmed by the designer prior to construction.



KEYPLAN

Scale 1:5000

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Rev.	Description	App By	Date
P02	FOR INFORMATION	BDH	28.04.25
P03	FOR INFORMATION	BDH	01.05.25
P04	FOR INFORMATION	BDH	23.07.25
P05	FOR INFORMATION	BDH	22.08.25
P06	FOR INFORMATION	BDH	27.08.25
P07	FOR INFORMATION	BDH	05.09.25

PROJECT: **CURRAGLASS WIND FARM**

CLIENT: **MKO**

SHEET: **BORROW PIT DETAILS**

Date: 05.09.25

Project number: P24-263

Scale (@ A1): As Shown

Drawn by: POR

Checked by: IH

Drawing Number: **Figure 4-10**

Rev: **P07**

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9 September 2025

4.4.1.5 Temporary Construction Compound

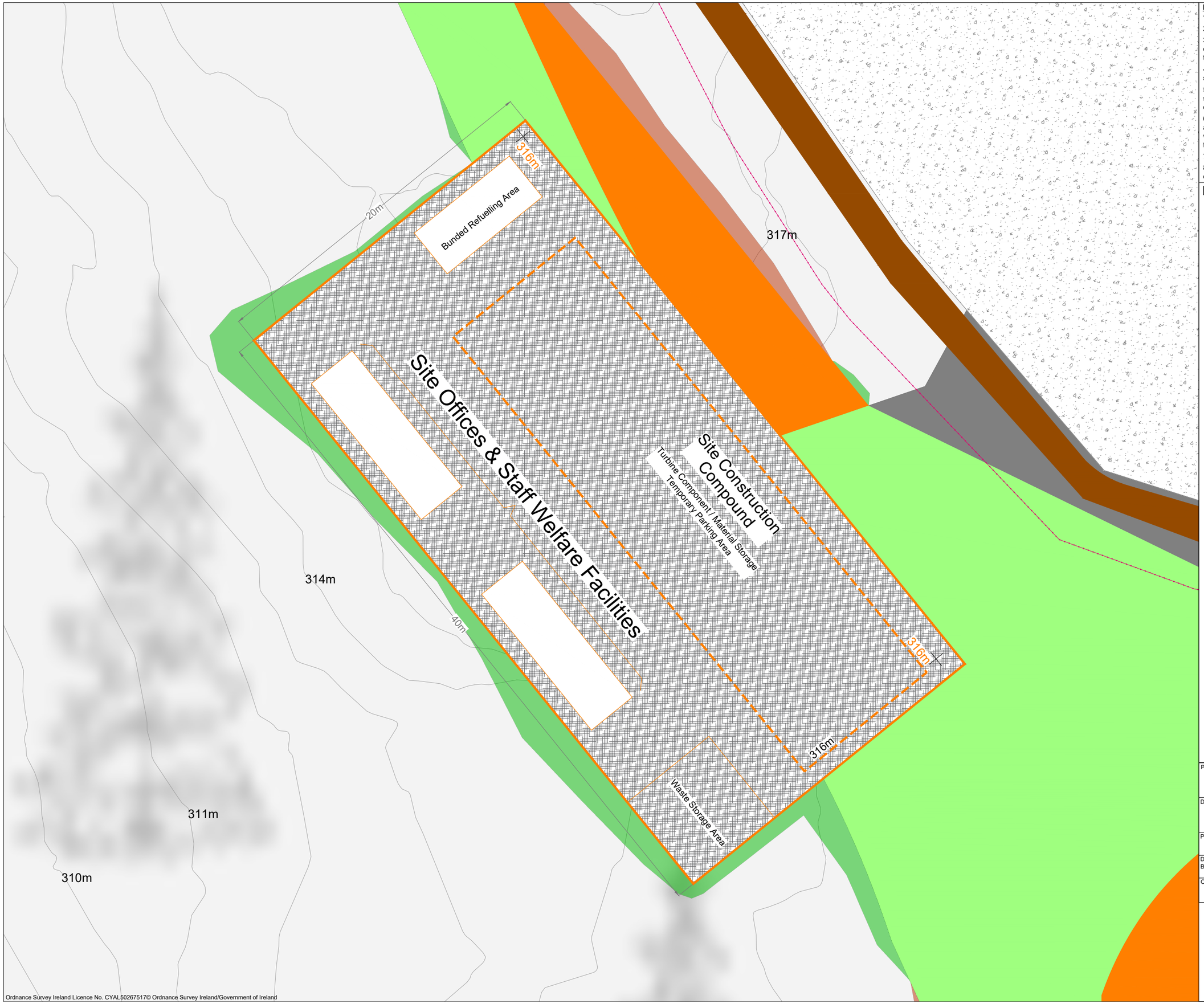
A temporary construction compound measuring approximately 800 square metres in area will be located in the northern section of the Site, along the road north of T1. the location of the proposed construction compound is shown on the Site layout drawing in Figure 4-1. The layout of this construction compound is shown on Figure 4-11.

The construction compound will consist of a bunded refuelling and containment area for the storage of lubricants, oils and site generators etc, and full retention oil interceptor, waste storage area, temporary site offices, staff facilities and car-parking areas for staff and visitors. Temporary port-a-loo toilets and toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewaters being tankered off site by permitted waste collector to wastewater treatment plants. There will also be a water supply on site for hygiene purposes, by way of a temporary storage tank.

Construction materials and turbine components will be brought directly to the proposed use and turbine locations following their delivery to the Site.

4.4.1.6 Meteorological Mast

One meteorological (met) mast is proposed as part of the Proposed Development. The met mast will be equipped with wind monitoring equipment at various heights. The proposed met mast will be located at E509109, N562918 (ITM) as shown on the Site layout drawing in Figure 4-1 above and the detailed site layout drawings included as Appendix 4-1. The met mast will be a free-standing slender lattice structure 30m in height. It will be constructed on a hard-standing area sufficiently large to accommodate the equipment that will be used to erect the mast. A standard detail of a meteorological mast is shown in Figure 4-12.



Project Design Drawing Notes

1. Drawings issued are for planning application purposes only.
2. Drawings not to be used for construction/contract conditions.
3. Copyright, all rights reserved. No part herewith may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
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5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
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7. Final levels may vary depending on local ground conditions.
8. Layout plans show turbine rotor diameter as per turbine drawing.

Drawing Legend

- Existing Road to be Upgraded
- Proposed New Road
- Existing Wind Farm Infrastructure
- Electrical Cabling Trench
- Borrow Pit
- Borrow Pit Fence
- Berm
- Cut
- Fill

N

PROJECT TITLE:
Curraglass Wind Farm, Co. Cork

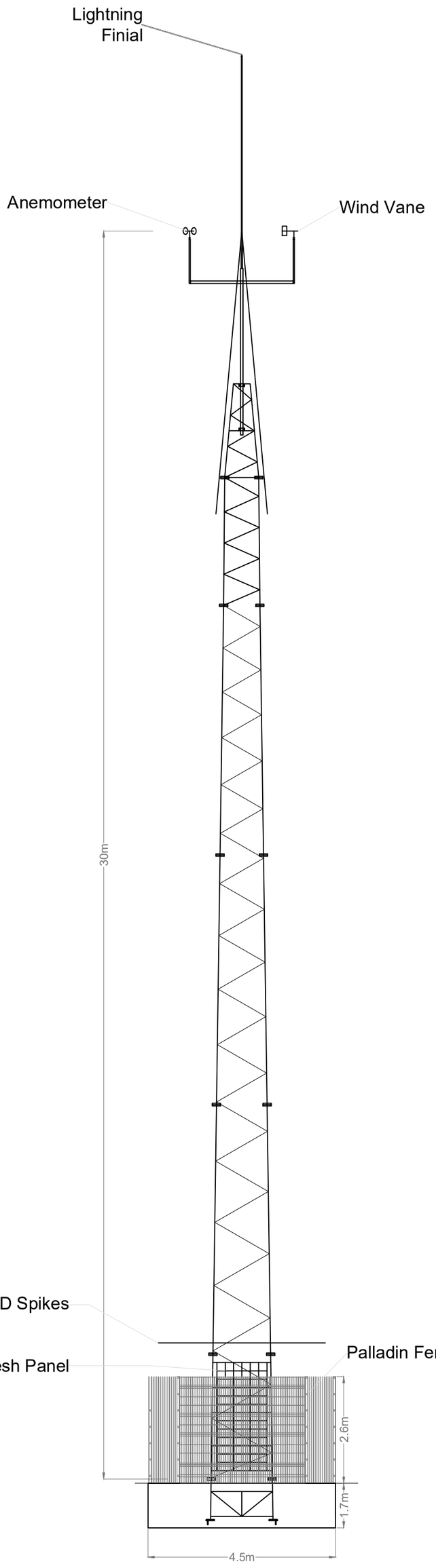
DRAWING TITLE:
Temporary Construction Compound

PROJECT No.:	DRAWING No.:	SCALE:
240614	Fig 4-11	1:200 @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	10.09.2025	P01

OS SHEET No.: 6454, 6455, 6493, 6494, 6531, 6532

Email: info@www.mkoireland.ie /Website: www.mkoireland.ie



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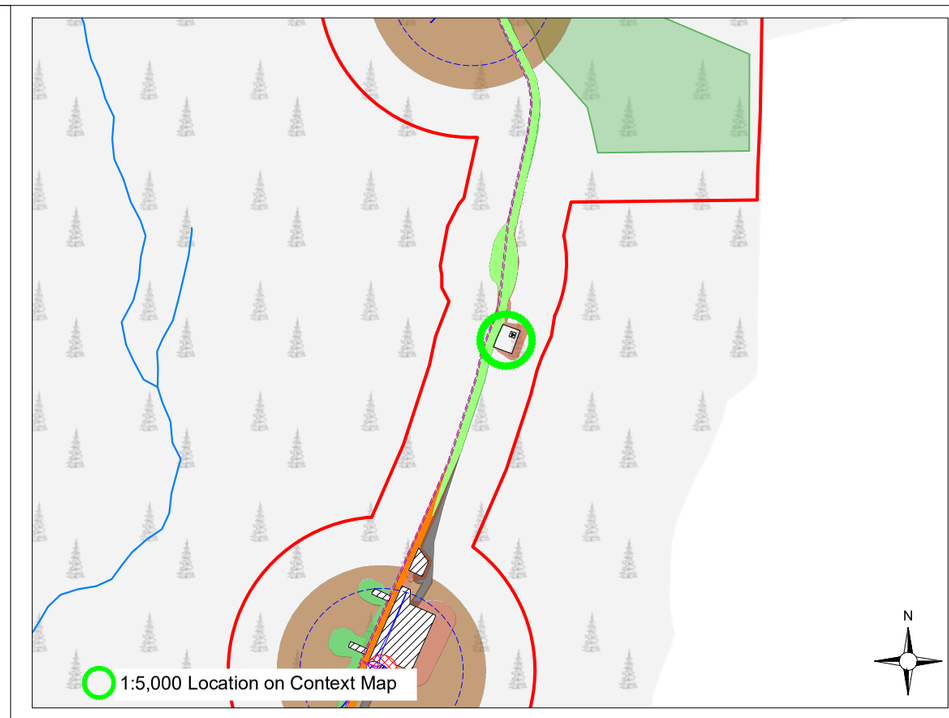

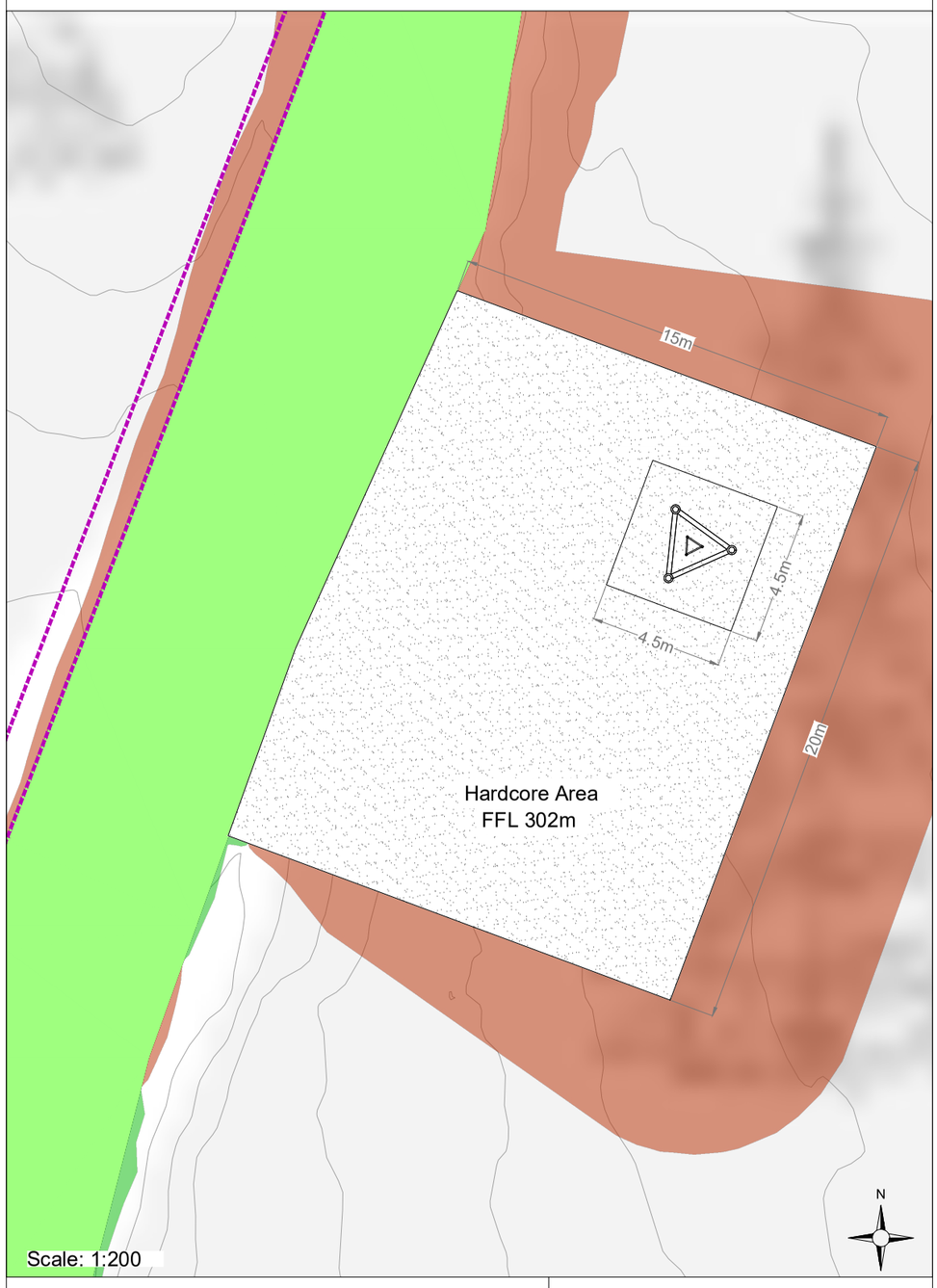

Note:

1. Met Mast exact detail may differ depending on the selected manufacturer.
2. Finished level of the mast to match ground conditions.
3. Mast/foundation orientation to be confirmed with met mast supplier.
4. Earthing and ducting requirements to be confirmed with met mast supplier and forwarded to foundation designer

PROJECT TITLE:
Curraglass Wind Farm, Co. Cork

DRAWING TITLE:
Proposed Metrological Mast

PROJECT No.:	DRAWING No.:	SCALE:
240614	Fig 4-12	As shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	10.09.2025	P01

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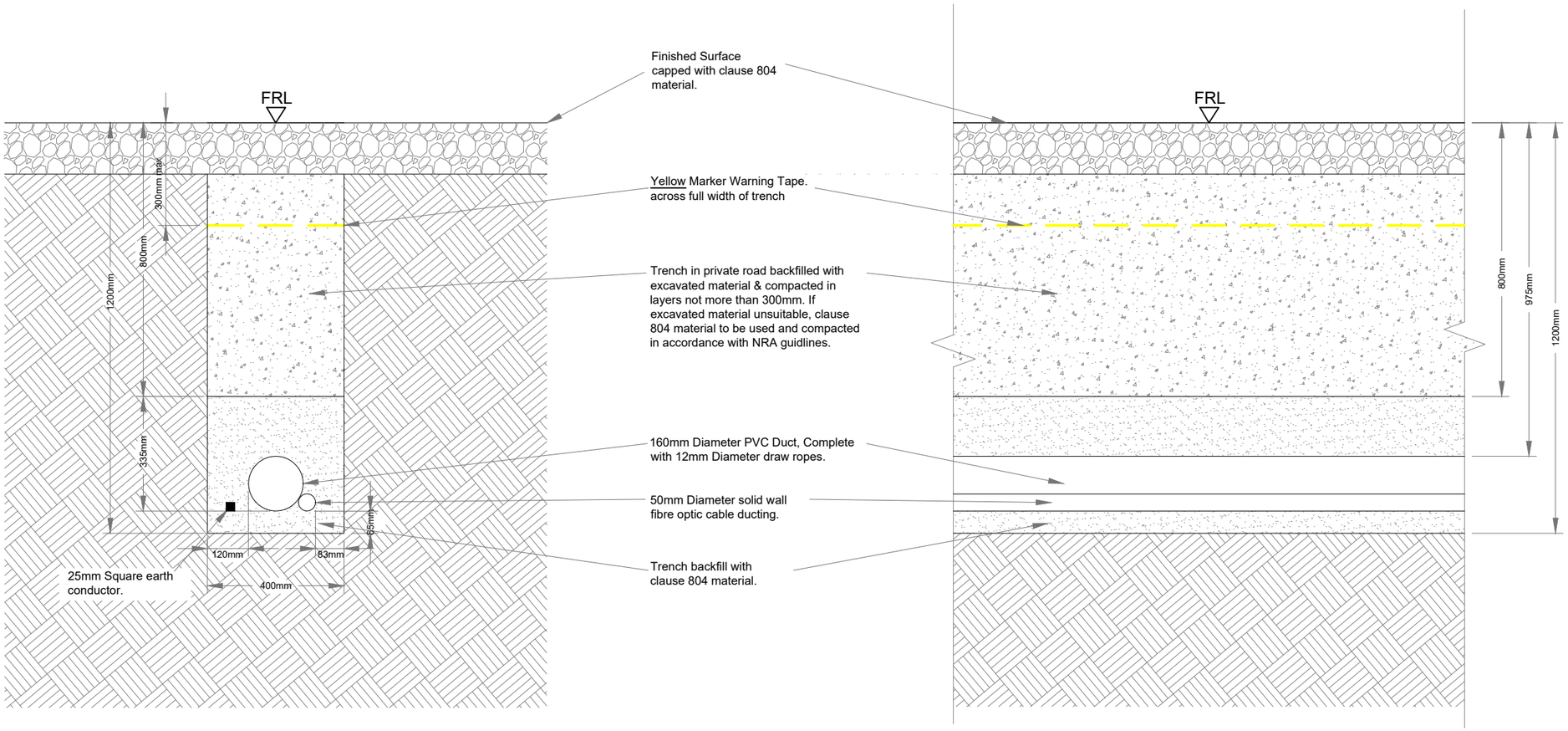
4.4.1.7 Underground Electrical (20/33kV) and Communications Cabling

Each turbine will be connected to the existing on-site 38kV substation via underground 20 or 33 kV (kilovolt) electricity cabling. Fibre-optic cables will also connect each wind turbine and the meteorological (met) mast to the existing onsite 38kV substation. The electricity and fibre-optic cabling connecting to the existing onsite 38kV substation compound will be run in cable ducts approximately 1.2 metres beneath ground level, along the sides of roadways and/or under the roadways. The route of the cable ducts will follow the access track to each turbine location and are illustrated on the Site layout drawings included as Appendix 4-1, the exact number and configuration of cable ducting may vary within the cabling trench. Figure 4-13 below shows two variations of a standard cable trench, one for off-road trenches and one for on-road trenches. The cabling may be placed on either side of the roads, on both sides of the road and/or within the road. The exact configuration of the underground cabling will be set by the requirements of the electrical designers at detailed design stage. Any existing services will be avoided.

Clay plugs (water flow barrier) will be installed at regular intervals of no greater than 50 metres along the length of the trenches where required to prevent the trenches becoming conduits for runoff water. Backfill material will be compacted in layers with approved engineer's specified material, which may be imported onto the Site should sufficient volumes of suitable material not be encountered during the excavation phase of the proposed infrastructure.

Where any underground services are encountered along the internal wind farm IPP cabling route, they will be traversed using the methods outlined in Section 4.8.1.5.1.



33kV IPP Wind Farm Road Trench Section - Single Circuit
SCALE 1:15

33kV IPP Wind Farm Road Trench Elevation - Single Circuit
SCALE 1:15

PROJECT TITLE: **Curraglass Wind Farm, Co. Cork**			
DRAWING TITLE: **Road Trench Details Through 33kV - Single Circuit**			
PROJECT No.: **240614**		DRAWING No.: **Fig 4-13**	SCALE: **1:15 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **AC**	DATE: **10.09.2025**	REVISION.: P01

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4.4.1.8 Biodiversity Management and Plan

4.4.1.8.1 *Enhancement Areas*

A Biodiversity Management and Enhancement Plan (BMEP) has been prepared for the Proposed Development and is included as Appendix 6-4 of this EIAR. This plan has been developed to offset the loss of habitats identified within the Site and further enhance the biodiversity of the Site and its environs. These enhancement measures have also been considered in the landscape & visual assessment which is included at Chapter 13 (Landscape & Visual), of this EIAR. Similarly, the enhancement proposals have been considered in relation to the existing drainage on the Site and in the drainage design for the Proposed Development, which has been prepared by Hydro Environmental Services Ltd. (HES) and is included in Appendix 4-4 of this EIAR.

High value peatland habitats were identified during initial habitat surveys of the Proposed Development site and include Annex 1 blanket bogs, European dry heaths, Northern Atlantic wet heaths with Erica tetralix and Alpine and Boreal heaths. Protected fauna species were recorded within the Proposed Development site and include Kerry slug, and bats. The Proposed Development has been designed to avoid these areas and where they are located adjacent to proposed works areas, fencing will be implemented with appropriate signage prohibiting entrance to the areas.

A total of five areas have been selected for the inclusion of biodiversity measures to mitigate the loss of habitat associated with the Proposed Development and to enhance the Site for species known to occur within the Site.

- **Kerry slug enhancement areas**
  The necessary bat feeling buffers for the Proposed Development will be managed to enhance Kerry slug habitat, as this species is known to occur within the Site. Enhancement will include the felling of existing conifer plantations within the 3 no. felling buffers and leaving the stumps in place, as these provide refuge for this species. Rock outcrops, boulders and stonewalls will be retained where possible or, if removal can't be avoided, they will be replaced to enhance the value of the habitat surrounding the wind farm infrastructure. This area will then be fenced off to reduce grazing pressure from deer which are known to be present in the area. These areas combined amount to approx. 4.34 ha, accounting for the below overlap with the peatland enhancement area.

- **Peatland enhancement/creation**
  An area of forestry within the Proposed Development will be felled and managed into heath habitats. This will be created using spoil peat from the construction of the Proposed Development and spread in the felled area to create heath habitat. Where existing heath habitat is proposed to be lost within the Site, the vegetation layer along with the top 50cm of peat will be removed and kept intact. This will then be placed vegetation layer up within the peat enhancement area, covering the tree stumps. Translocation to the enhancement areas will be done so within the same day as removal, to ensure the turves do not dry out. Where further excavations are required outside of existing heath habitat to be removed, the top 50cm of peat will be used to cover the remaining stumps within the enhancement area, ensuring a minimum of 20-50cm of peat cover. This will ensure a seed bank of local provenance will be used in the enhancement area and the target area has sufficient peat dept to facilitate heath habitats. This area will then be fenced off to reduce grazing pressure from deer which are known to be present in the area. The creation of this heath habitat will have an added benefit of creating more suitable habitat for Kerry slug. This enhancement area amounts to approx. 2 ha.

- **Riparian woodland planting and linear connectivity**

In anticipation of forestry felling within the Proposed Development, it is proposed to plant of a strip of riparian woodland either side of a mapped watercourse. This section of the watercourse is approx. 350m long. Planting will occur 10m either side of the watercourse, in an area of wet grassland and gorse scrub. Planting will occur at 2m spacings between trees. Shelterbelt planting may be applied by planting up two lines of trees as a staggered row. Newly planted trees will be protected from poaching by livestock and deer, through the erection of deer proof fencing. This measure will ensure a linear feature for commuting and foraging fauna, including bats, badger and other protected fauna within the Site. Total length of this proposed linear feature is approx. 700m or 0.7 ha in area.

A site-specific monitoring and evaluation programme is necessary to ensure that the success of the proposed measures remains long-term. It will also assist in situations where the habitat establishment may not have been successful by providing evidence of shortcomings, allowing a revised management plan to be formulated. Monitoring results will be reported by the Project Ecologist within an Annual Environmental Report. Reports detailing the monitoring works carried out, the results obtained and a review of their success, along with any suggestions for amendments to the plan will be prepared. The enhancement plan will be updated and amended where required to improve the efficacy of the enhancement work.

4.4.1.8.2 *Summary*

This BMEP sets out the measures to be implemented to ensure that the Proposed Development will result in a net gain in biodiversity. Specifically, proposed peatland restoration will result in a net gain of approximately 1 ha of wet heath habitat, as well as a net gain of 0.7 ha of new riparian woodland. Furthermore, given the known presence of Kerry slug within the Site, it has been proposed to enhance 5.75 ha of suitable habitat for this species. This Plan has set out measures to be implemented during establishment and management phases to ensure that the measures are successful, as well as regularly monitoring by an ecologist to ensure the success of the measures outlined in the BMEP. The BMEP areas can be seen in Figure 4-14 below

4.4.1.9 Continued use of the Existing Onsite 38kV Substation

It is proposed to continue the use of the existing onsite 38kV substation within the Proposed Development, as shown in Figure 4-1 and Figure 4-2. The operation of the existing onsite 38kV substation is proposed to be continued up to the decommissioning of the proposed turbines. The existing onsite 38kV substation is located just west of T3 and will be accessed via the existing access road.

It includes all the existing onsite 38kV substation components necessary to consolidate the electrical energy generated by each wind turbine, and export that electricity from the existing onsite 38kV substation to the national grid. This includes the short section of underground 38kV cabling that connects the existing onsite 38kV substation to the existing 38kV overhead line. New underground electrical 33/20kV and communication cables will be routed into the existing onsite 38kV substation. These works are essential to facilitate the integration of new wind farm infrastructure. The underground electrical 20/33kV and internal communications cabling will be constructed to allow connection into the existing onsite 38kV substation in the same extent outlined in Sectioned 4.4.1.7 above. The laid underground cabling will be drawn into the existing onsite 38kV substation by entry works into the substation building, including core drilling of opening of access point required. Internal cables will be pulled and terminated within the existing onsite 38kV substation in accordance with the relevant electrical ESBN standards.

4.4.2 Tree Felling and Replanting

4.4.2.1 Tree Felling

Tree felling will be required as part of the Proposed Development.

Approximately 8.8 hectares of conifer plantation forestry will be felled to accommodate the proposed turbines and its associated infrastructure. Figure 4-15 shows the extent of the commercial forestry to be permanently felled as part of the Proposed Development.

The forestry felling activities required as part of the Proposed Development will be the subject of a Limited Felling Licence (LFL) application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments. The policy requires that a copy of the planning permission for the Proposed Development be submitted with the felling licence application; therefore, the felling licence cannot be applied for until such time as planning permission is obtained for the Proposed Development.

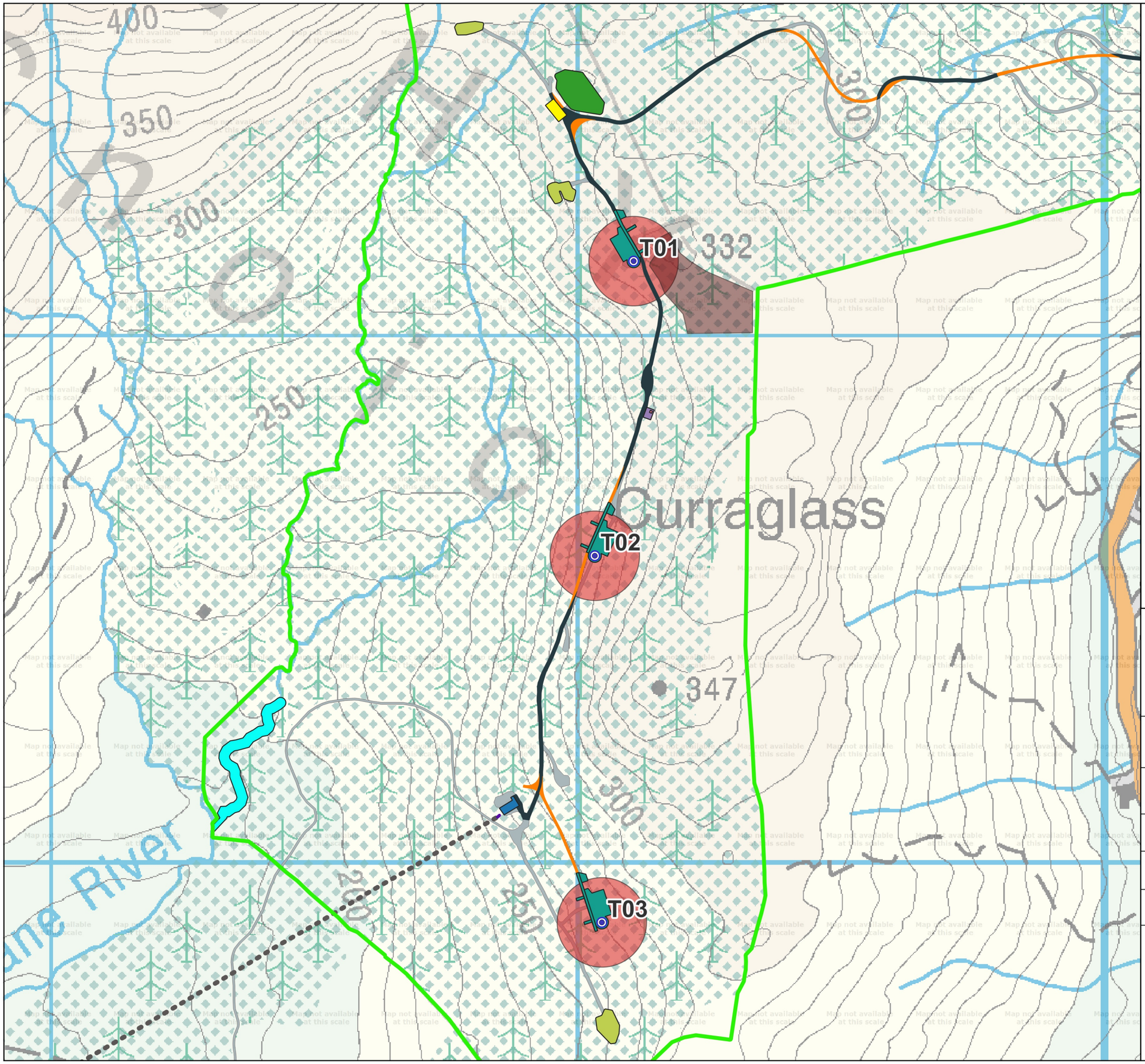
4.4.2.2 Forestry Replanting

In line with the Forest Service's published policy on granting felling licences for wind farm developments, areas cleared of forestry for access roads, and any other wind farm-related uses will have to be replaced by replanting at an alternative site or sites. The Forest Service policy requires replacement or replanting on a hectare for hectare basis for the felling carried out as part of the Proposed Development.

The identified 8.8 hectares of conifer plantation that will be permanently felled for the Proposed Development will be replaced or replanted on a hectare for hectare basis as a condition of any felling licence that will be issued in respect of the Proposed Development felling. Replanting is a requirement of the Forestry Act and is primarily a matter for the statutory licensing processes that are under the control of the Forest service. Felling carried out for the purposes of Biodiversity Enhancement Measures may be eligible for a re-planting derogation, subject to Forest service approval, and if granted would reduce the overall re-planting obligation outlined in this assessment. The replacement of the felled forestry on the Proposed Development may occur on any lands outside of the catchment of the Proposed Development, within the State benefitting from Forest Service Technical Approval[5] for afforestation, should the application receive planning consent. Under the Forestry Regulations 2017, all applications for licences for afforestation require the prior written approval (technical approval) of the Minister for Agriculture, Food and the Marine. Before the Minister can grant approval, he/she must first determine if the project is likely to have significant effects on the environment (for EIA purposes) and assess if the development, individually or in combination with other plans or projects is likely to have a significant effect on a European site (for Appropriate Assessment purposes).

The applicant commits to replanting the 8.8 hectares of conifer forestry, outside the hydrological catchments within which the Site is located. On this basis, it is reasonable to conclude that there will be no cumulative effects associated with the replanting of 8.8 hectares of forestry. Therefore, the forestry replanting is not considered further in the impact assessment chapters of this EIAR. In addition, the Applicant commits to not commencing the Proposed Development until both a felling and afforestation licence(s) is in place and, therefore, this ensures the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority.

[5] *All proposed forestry developments where the area involved is greater than 0.1 hectare must receive the prior written approval of the Forest Service. The application for approval is known as Pre-Planting Approval – Form 1.*



Map Legend

- EIAR Site Boundary
- Proposed Turbines
- Proposed Hardstands
- Proposed Met Mast
- Proposed Met Mast Hardstand
- Proposed Borrow Pit
- Existing Roads to Upgrade
- Proposed New Roads
- Existing Infrastructure
- Temporary Construction Compound
- Proposed Peat & Spoil Management Areas
- Existing Onsite 38kV Substation
- Existing 38kV Underground Cabling
- Existing 38kV Overhead Line
- Eco Enhancement - Riparian Planting
- Eco Enhacement - Peatland Habitat Enhancement
- Eco Enhancement - Kerry Slug Habitat Enhancement

Drawing Title: Proposed Biodiversity Enhancement Areas

Project Title: Curraglass Wind Farm, Co. Cork

Drawn By	Checked By
EM	EC
Project No. 240614	Drawing No. Figure 4-14
Scale 1:7,000	Date 2025-09-12

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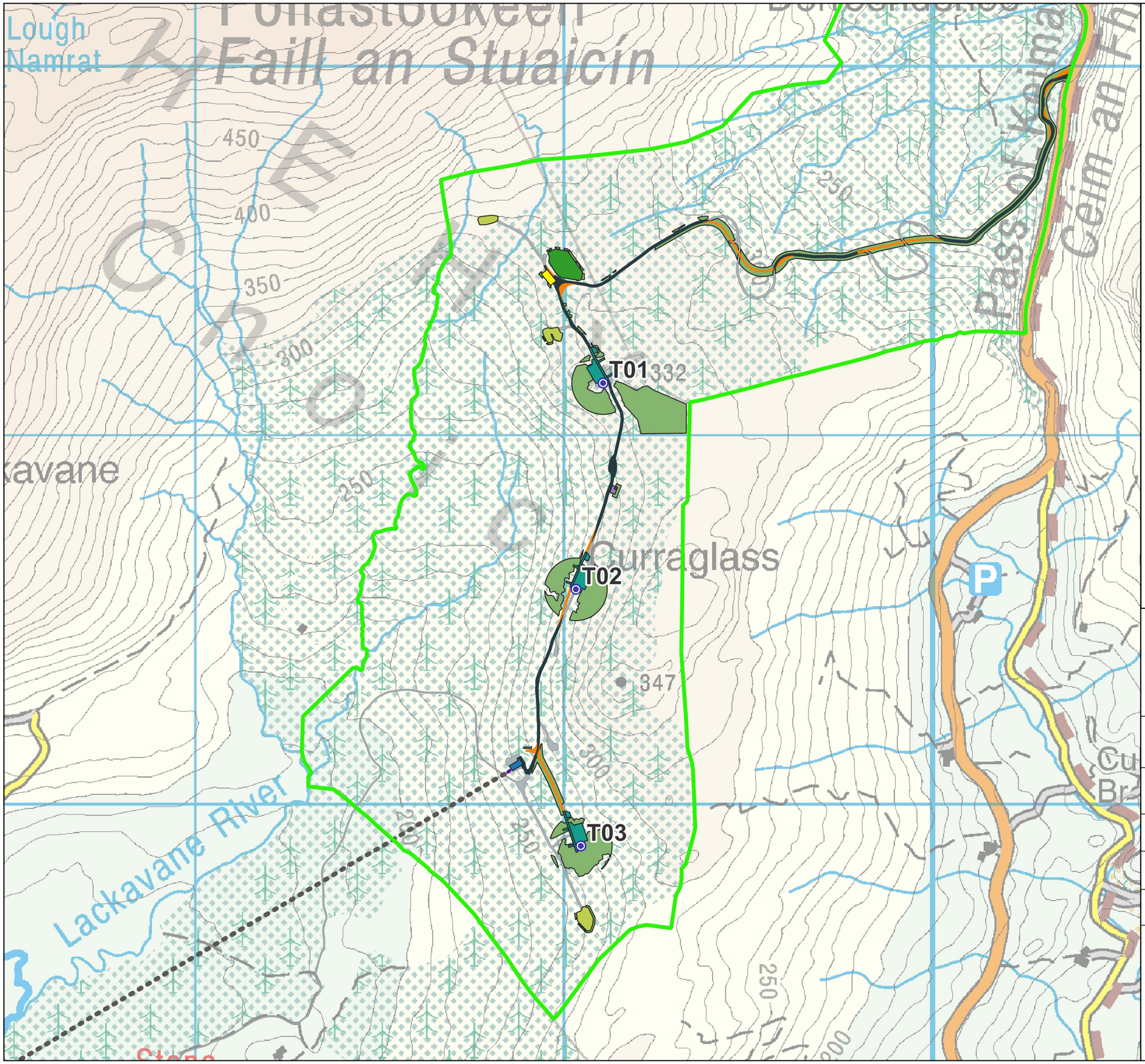

Map Legend

- EIAR Site Boundary
- Proposed Turbines
- Proposed Hardstands
- Proposed Met Mast
- Proposed Met Mast Hardstand
- Proposed Borrow Pit
- Existing Roads to Upgrade
- Proposed New Roads
- Existing Infrastructure
- Temporary Construction Compound
- Proposed Peat & Spoil Management Areas
- Existing Onsite 38kV Substation
- Existing 38kV Underground Cabling
- Existing 38kV Overhead Line
- Proposed Forestry Felling

Drawing Title
Proposed Forestry Felling

Project Title
Curraglass Wind Farm, Co. Cork

Drawn By	Checked By
EM	EC
Project No. 240614	Drawing No. Figure 4-15
Scale 1:10,000	Date 2025-09-11

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4.4.3 Peat and Spoil Management

The predicted peat and spoil burden generated during construction phase of the Proposed Development have been calculated and are outlined in Table 4-2 below, along with the crushed stone requirement for the Proposed Development.

4.4.3.1 Quantities

The quantity of peat and spoil generated and requiring management on the Site of the Proposed Development has been calculated, as presented in Table 4-2 below. In addition, the volume of stone required to build the Proposed Development infrastructure is noted below.

Table 4-2 Peat and Spoil and Stone Volumes

Development Component	Peat Volume (m3) (approx..)	Spoil Volume(m3) (approx.)	Crushed Stone Requirement (m3) (approx.)
Proposed Development			
3 no. Turbines and Hardstanding Areas (including foundations)	3,000	25,000	14,000
Access Roads (including internal cabling)	4,000	16,500	20,000
Temporary Construction Compound	500	0	1,400
Met Mast	150	1000	280
Borrow Pit	3,000	4,000	1,500
Total	**10,650**	**46,500**	**37,180**
Total Peat and Spoil Volume	**57,150**		

Note: A contingency factor of 10% has been applied and is included to the excavated peat and spoil volumes above to allow for expected increase in volume upon excavation and to allow for a variation in ground conditions across the Site.

It is considered that any peat and spoil generated by the proposed cabling trench will be backfilled or accommodated within the Peat and Spoil Management Areas within the Site. Any road material containing tar will be managed separately. Further detail on this can be found in Chapter 15 (Material Assests).

There will be a requirement to remove some sections of linear vegetation i.e. treelines and hedgerows to facilitate the Proposed Development infrastructure, however, this will not involve the excavation of tree stumps and as such does not affect the excavation volumes.

The surplus peat and spoil material generated will all be managed locally within the Site, as outlined below in Section 4.8.1.6.

4.4.3.2 Peat and Spoil Usage in Restoration of Borrow Pit

Once the required volume of rock has been extracted from the borrow pit areas, it is intended to reinstate these areas with any surplus peat and overburden excavated from the works areas of the Proposed Development.

The following particular recommendations/best practice guidelines for the placement of peat & in borrow pits as presented in FTC's *Peat & Spoil Management Plan* in Appendix 4-2 of this EIAR, is summarised below:

1. *Peat and overburden will be removed and temporarily stored in localised areas adjacent to the borrow pit locations before being placed into the permanent peat storage areas within the borrow pits. Data from the available ground investigation undertaken to date indicates that the rock can be removed by breaking. It is unlikely that blasting will be required to remove the bedrock.*
2. *It is proposed to construct the borrow pit so that the base of the borrow pit is below the level of the adjacent section of access road. As excavation progresses into the back edge of the borrow pits, localised deepening of the borrow pit floors may be required depending on extraction operations.*
3. *Slopes within the excavated rock formed around the perimeter of the borrow pits will be formed at stable inclinations to suit local in-situ rock conditions. Exposed sections of the rock slopes will be left with irregular faces and declivities to promote re-vegetation and provide a naturalistic appearance.*
4. *The stability of the rock faces within the borrow pit will be inspected by the Project Geotechnical Engineer upon excavation to ensure stability during construction works and in the long term. This inspection will allow unfavourable rock conditions to be identified and suitable mitigation measures to be applied such as removal of loose rock, in line with best practice guidelines.*
5. *Infilling of the peat and spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/perimeter rock berm. The contractor excavating the rock will be required to develop the borrow pits in a way which will allow the excavated peat and spoil to be reinstated safely.*
6. *In order to maximise the storage capacity, a perimeter berm will be required along the western and southern boundaries. The rock buttress will be constructed of rock fill from the borrow pit excavation, placed and compacted in layers. The founding stratum for the perimeter berm will be intact bedrock and will be inspected and approved by the Project Geotechnical Engineer.*
7. *The height of the stone berm constructed will be greater than the height of the stored peat and spoil to prevent any surface run-off. The height of the stone berm will be a minimum of 0.5m above the height of the placed peat and spoil.*
8. *The location of the rock berm shown on Drawing P24-263-0600-0009 in Appendix 4-2 for the borrow pit is indicative*
9. *only and may change subject to local conditions encountered on site during construction and as a result of the confirmatory ground investigation. The rock berm will be wide enough (up to 4m) to allow construction traffic access for tipping and grading during the placement of the excavated peat and spoil. The permanent external side slopes of the rock berm will be constructed at 45 degrees.*
10. *In order to prevent water retention occurring behind the berm, the berm will be constructed of coarse boulder fill with a high permeability. The berm will be constructed of well graded granular rock fill of about 100mm up to typically 500mm in size. In addition, drains will be placed through the*

11. *buttresses to allow surface water to drain from the surface of the placed peat. These drains will be 150mm diameter flexible plastic drainage pipe or equivalent.*
12. *The use of temporary access ramps and long reach excavators during the placement of the excavated peat and spoil will be required.*
13. *The surface of the placed peat and spoil will be shaped following backfill using excavators to allow efficient run-off of surface water from the placed arisings towards the perimeter of the borrow pit. The surface of the placed spoil will have a maximum grade of 5o.*
14. *An interceptor drain will also be installed around the perimeter of the borrow pit. This drain will divert any surface water away from the borrow pit and hence prevent water from ponding and lodging during construction and also when reinstated.*
15. *Temporary control of groundwater within the borrow pit will be required and measures will be determined as part of the ground investigation programme. A temporary pump and suitable outfall location will be required during construction.*
16. *Settlement ponds will be constructed at the lower side/outfall location of the borrow pit and are shown on the drainage drawings.*
17. *The acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the peat and spoil within the borrow pit.*
18. *Supervision by the Project Geotechnical Engineer is required for the development of the borrow pit.*
19. *All the above-mentioned requirements will be implemented by the Contractor during construction.*

4.4.3.2.1 Peat and Spoil Management Areas and Placement of Spoil Alongside Access Roads

It is proposed to manage any excess overburden generated through construction activities locally within the Site, in identified peat and spoil management areas, as shown in Figure 4-1, and in linear berms along access roads and turbine hardstand areas where appropriate.

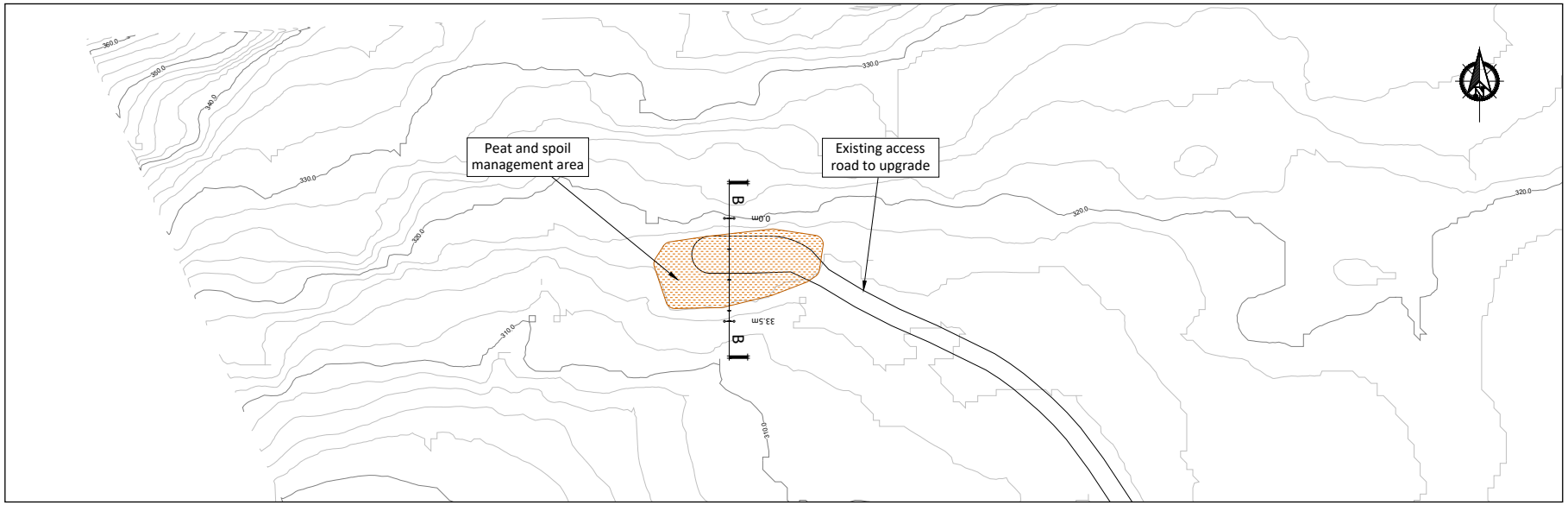
The following recommendations and best practice guidelines for the placement of peat and spoil in identified peat and spoil management areas and in linear berms will be adhered to during the construction of the Proposed Development:

The total estimated volume of peat and spoil to be managed following excavations during the construction phase of the Proposed Development is approximately 57,150m^3. It is proposed to manage any excess overburden generated through construction activities locally within the Site, by use of roadside berms where appropriate and grading the remaining spoil across identified spoil management areas, as shown in Figure 4-16 in Chapter 4. The total capacity of the identified spoil management areas within the Site is approx. 57,150 m^3 and therefore, in conjunction with roadside berms, there is more than enough capacity to manage the total volume of spoil requiring management for the Proposed Development as detailed in Table 4-3 in Chapter 4 of the EIAR. The spoil management areas have been selected based on the locations of spoil generation, areas suitable for spoil management and avoiding environmentally constrained areas.

1. Excavated peat and spoil will be placed/spread across the existing hardstand areas at 5 no. locations. These locations are shown in Drawing P24-264-0600-0005, with a detail shown on drawing P24-264- 0600-0010 of Appendix 4.4.
2. The peat and spoil placed within the areas shown on Drawing P24-264-0600-0005 will be restricted to a maximum height of 1.0m for peat, and 1.5m for spoil. Any weak/liquified peat (if any is encountered) will be placed within the proposed borrow pit and not stored within these areas.

3. The surface of the placed peat and spoil will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat and spoil will be carried out as placement of peat within the peat placement area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat.
4. Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h), and no greater than 1 (v):2 (h) in the placed spoil. This slope inclination will be reviewed during construction, as appropriate.
5. The acrotelm will be placed on the finished surface with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the placed peat and spoil within the deposition areas.
6. Supervision by the Project Geotechnical Engineer will be undertaken during the works.
7. An interceptor drain will be installed upslope of the designated deposition areas to divert any surface water away from these areas. This will help ensure stability of the placed peat/spoil and reduce the likelihood of debris run-off.
8. All the above-mentioned general guidelines and requirements will be undertaken by the Contractor during construction.

All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Engineer prior to construction.



PLAN

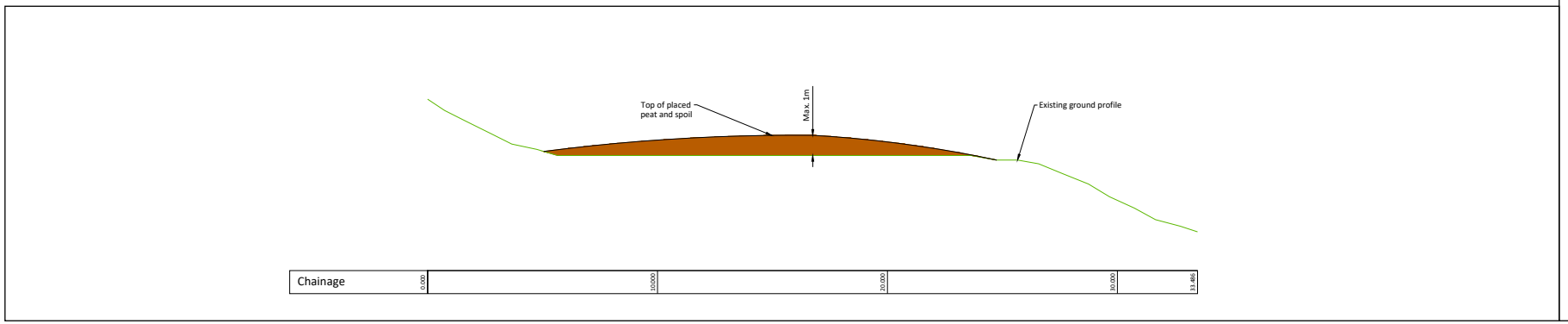
Scale 1:750

Legend:

- EIAR Study Boundary
- Proposed Turbine & Hardstanding
- Proposed New Road
- Existing Access Road to Upgrade
- Proposed Temporary Construction Compound
- Existing Onsite 38kV Substation
- Proposed Peat / Spoil Deposition Area
- Proposed Borrow Pit
- Existing 38kV Overhead Line
- Existing Ground Contour - Major
- Existing Ground Contour - Minor

0m 8m 15m 23m 30m 38m 45m 53m 60m 68m 75m

Scale 1:750



SECTION A - A

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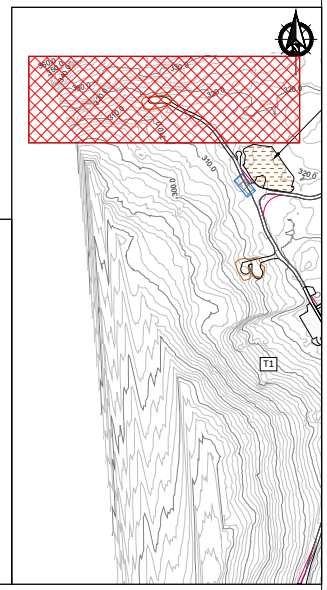

KEYPLAN

Scale 1:5000

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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	01.05.25
P02	FOR INFORMATION	BDH	23.07.25
P03	FOR INFORMATION	BDH	22.08.25
P04	FOR INFORMATION	BDH	27.08.25
P05	FOR INFORMATION	BDH	05.09.25

PROJECT: **CURRAGLASS WIND FARM**

CLIENT: **MKO**

SHEET: **DESIGNATED PEAT AND SPOIL MANAGEMENT AREAS**

Date: 05.09.25

Drawn by: POR

Checked by: IH

Project number: P24-263

Scale (@ A1): 1:750

Drawing Number: **Figure 4-16**

Rev: **P05**

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9 September 2025

4.4.4 Site Activities

4.4.4.1 Environmental Management

All proposed activities on the Site will be provided for in an environmental management plan. A Construction and Environmental Management Plan (CEMP) has been prepared for the Proposed Development and is included in Appendix 4-3 of this EIAR.

The CEMP sets out the key environmental considerations to be managed by the contractor during construction of the Proposed Development. The CEMP includes details of drainage, spoil management and waste management, and outlines clearly the mitigation measures and monitoring proposals that are required to be adhered to in order to comply with the environmental commitments outlined in the EIAR. In the event planning permission is granted for all elements of the Proposed Development, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for approval.

4.4.4.2 Refuelling

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

4.4.4.3 Concrete Deliveries

Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching.

Before leaving the Site, washing of the delivery truck will be minimised and restricted to designated wash out areas. Wash out will be restricted to the concrete lorry's chute only. Concrete lorries will be washed out fully at the off-site batching plant, where facilities are already in place.

The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent. This type of Siltbuster (or similar) unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility. Where temporary lined impermeable containment areas are used, such containment areas are typically built using straw bales and lined with an impermeable membrane. Two examples are shown in Figure 4-17 below.

Figure 4-17 Concrete Washout Area

Alternatively, a Siltbuster-type concrete wash unit or equivalent[6] may be used. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids can be disposed of off-site at an appropriate waste facility.

The risks of pollution arising from concrete deliveries will be further reduced by the following:

- Concrete trucks will not be washed out on the Site but will be directed back to their batching plant for washout.
- Site roads will initially be constructed with a subgrade and compacted with the use of a roller to allow concrete delivery trucks access all areas where the concrete will be needed. The final wearing course for the roads will not be provided until all turbine foundations have been poured. No concrete will be transported around the Site in open trailers or dumpers so as to avoid spillage while in transport. All concrete used in the construction of turbine foundations will be pumped directly into the shuttered formwork from the delivery truck. If this is not practical, the concrete will be pumped from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which will transfer the concrete to the location where it is needed.
- The arrangements for concrete deliveries to the Site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout and discussing emergency procedures.
- Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the Site.

4.4.4.4 Concrete Pouring

The main concrete pours for turbine foundations will be planned approximately one week in advance.

Specific procedures will be adopted in advance of and during all concrete pours to minimise the risk of pollution. These will include:

- Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast.
- Restricting concrete pumps and machine buckets from slewing over watercourses while placing concrete.
- Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets.
- Ensuring that covers are available for freshly placed concrete to avoid the surface washing away in heavy rain.
- The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a

[6] (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/)

Siltbuster-type concrete wash unit (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/) or equivalent.

4.4.4.5 Dust Suppression

In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling/settlement ponds in the Proposed Development drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and temporary construction compounds to prevent the generation of dust. Silty or oily water will not be used for dust suppression, because this would transfer the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water may lead to increased runoff.

4.4.4.6 Vehicle Washing

Wheels or vehicle underbodies are often washed before leaving sites to prevent the build-up of mud on public (and site) roads. It is not anticipated that vehicle or wheel washing facilities will be required as part of the construction phase of the Proposed Development as site roads will be formed before road-going trucks begin to make regular or frequent deliveries to the Site (e.g. with steel or concrete). However, to ensure a wheel wash facility is available should this be required, a wheel wash has been included in the design of the Proposed Development. The Proposed Development access roads will be well finished with 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 requires cleaning due to construction traffic associated with the Proposed Development.

4.4.4.7 Waste Management

The CEMP, Appendix 4-3 of this EIAR, provides a waste management plan (WMP) which outlines the best practice procedures during the construction phase of the project. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Development. Disposal of waste will be a last resort. The WMP has been produced in line with the following guidance 'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects' (EPA, 2021). The WMP has been prepared to outline the main objectives that are to be adhered to for the preparation of a more detailed WMP to be completed prior to the construction phase of the Proposed Development. The WMP will be in place throughout the construction and decommissioning phase of the Proposed Development and will be in line with all relevant legislation detailed in Section 3.8.1 in Appendix 4-3

The Waste Management Act 1996 and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity must have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the Site to ensure that all contractors hired to remove waste from the Site have valid Waste Collection Permits to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

Prior to the commencement of the development, a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be in charge of the implementation of the objectives of the plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient

authority so that they can ensure everyone working on the development adheres to the management plan.

The WMP will provide systems that will enable all arisings, movements and treatments of construction waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being generated. Estimates of the quantities to be produced will be inserted into a detailed waste management spreadsheet and the data will be updated as the work progresses, and information is available and performance against the estimates will be monitored. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The WMP can then be adapted with changes that are seen through record keeping.

4.5 Site Access and Transportation

4.5.1 Site Entrance

The location of the construction phase and operational phase Site access point is shown in Figure 4-18. In the event planning consent is granted for the Proposed Development, a Traffic Management Plan will be completed to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned.

Construction and Operational Site Entrance

The proposed site entrance for the Proposed Development will consist of the existing access point off the R584 regional route along the northeastern boundary of the Site in the townland of Derreendonee Co. Cork. This entrance will be used during both the construction and operational phase of the Proposed Development.

The existing entrance will be upgraded to facilitate the delivery of the construction materials, oversized loads, and turbine delivery. The Site entrance was subject to Autotrack assessment to identify the area required to access the Site. The proposed junction is shown in in Figure 4-18 and is detailed Section 14.1 of the Traffic and Transport Assessment. Works will involve removal of trees north of the entrance and placement of hardcore. On completion of the construction phase, this entrance will be reduced in size and gated for security and will be used as an operational phase entrance.

During the operational phase this entrance will be used to facilitate maintenance and monitoring activities on the Site and will also be used for the delivery of abnormal loads (i.e., turbine component replacement) if required.

Based on these Autotrack assessments a dedicated turbine component turning area is proposed to the northeast of the Site, approximately 2.2km from the Site entrance, to allow turbine delivery vehicles to access the Site. This area is essential for accommodating the swept path of the turbine load and to allow for the turbine delivery vehicles to manoeuvre into the Site entrance at the appropriate angle. The turbine component turning area will be formed using engineered fill and compacted hardcore, designed to withstand heavy vehicle loading. Further detail of this turbine component turning area is assessed in Section 15.1.8 of the Traffic and Transport Assessment. On completion of the construction phase, the roadside boundary removed for the accommodation works will be reinstated, and the upgraded private access track will remain in place.

4.5.2 Construction Materials Transport Route

Construction materials will be delivered to the Site via selected haul routes that will be determined based on the source of the construction material. In order to facilitate the construction of the Proposed Development, all hardcore materials, steel, and ready-mix concrete that will be required during the construction phase will be sourced from local, appropriately authorised concrete quarrying plants. For

the purposes of assessment within the EIAR, quarries within a 20km range of the Site that could potentially provide concrete have been assessed. Traffic movements generated by the Proposed Development are discussed in Section 15.1.4 of Chapter 15 (Material Assets). All construction vehicles entering the Site will enter from the East, via the existing site entrance as indicated on Figure 4-18.

It is also envisaged that general construction traffic (including materials and staff) will travel to the Site via the public road network to the proposed site entrance. The construction traffic that will be generated during the construction phase of the Proposed Development is outlined as part of the traffic and transport assessment in Chapter 15 of this EIAR.

4.5.3 Turbine Component Transport Route

It is proposed that large wind turbine components will be delivered to the Site, from the Port of Cork. For the purposes of assessment, the turbine components and other abnormal loads will be transported, from Ringaskiddy Port, west on the N22, before turning southwest along the R585 Regional Road via Crookstown to the junction with the R584 Regional Road at the village of Kealkill. From Kealkill, the turbine delivery route will continue along the R584 to Ballylickey, where a reversing manoeuvre occurs at Ballylickey bridge. Once the manoeuvre is complete, the turbines will travel northeast back along the R584, through Kealkill towards Ballingeary. The turbines will travel past the Site entrance, performing a reversing manoeuvre at an existing private access road further along the R584, before travelling back south along the same road and accessing the Site from the north via the existing entrance. This is the preferred route for turbine delivery. The Turbine Delivery Route is shown in Figure 4-19

The proposed turbine component turning area along the R584, with the reversing manoeuvre shown on Figure 4-20, will require removal of fencing and vegetation and the temporary placement of hardcore, so the area can be used during the delivery of large turbine components. Once the turbines have been delivered, the roadside boundary removed for the accommodation works will be reinstated, and the upgraded private access track will remain in place.

4.5.3.1 Turbine Delivery Route Accommodation Works

Works such as road widening are sometimes required along proposed turbine transport routes to accommodate the large turbine components and associated vehicles seeking to access wind farm sites. The proposed transport route for the Proposed Development has been the subject of a route assessment to determine if any works are required along its length. Full details of the assessment are included as part of the traffic impact assessment set out in Section 15-1.8 of this EIAR and summarised below. There are sections on the route where potential pinch points may require specialist transport vehicles. These sections will be further considered by the appointed transport company following turbine procurement process. Accommodation works will be required at various locations on the national and regional road network between the port of arrival in Cork and the Site. These are further detailed within Chapter 15 (Material Assets) of this EIAR.

Drawing Legend

- Existing Road Edge
- Proposed Road Widening
- Existing Track
- Sight Line
- Run Over Areas

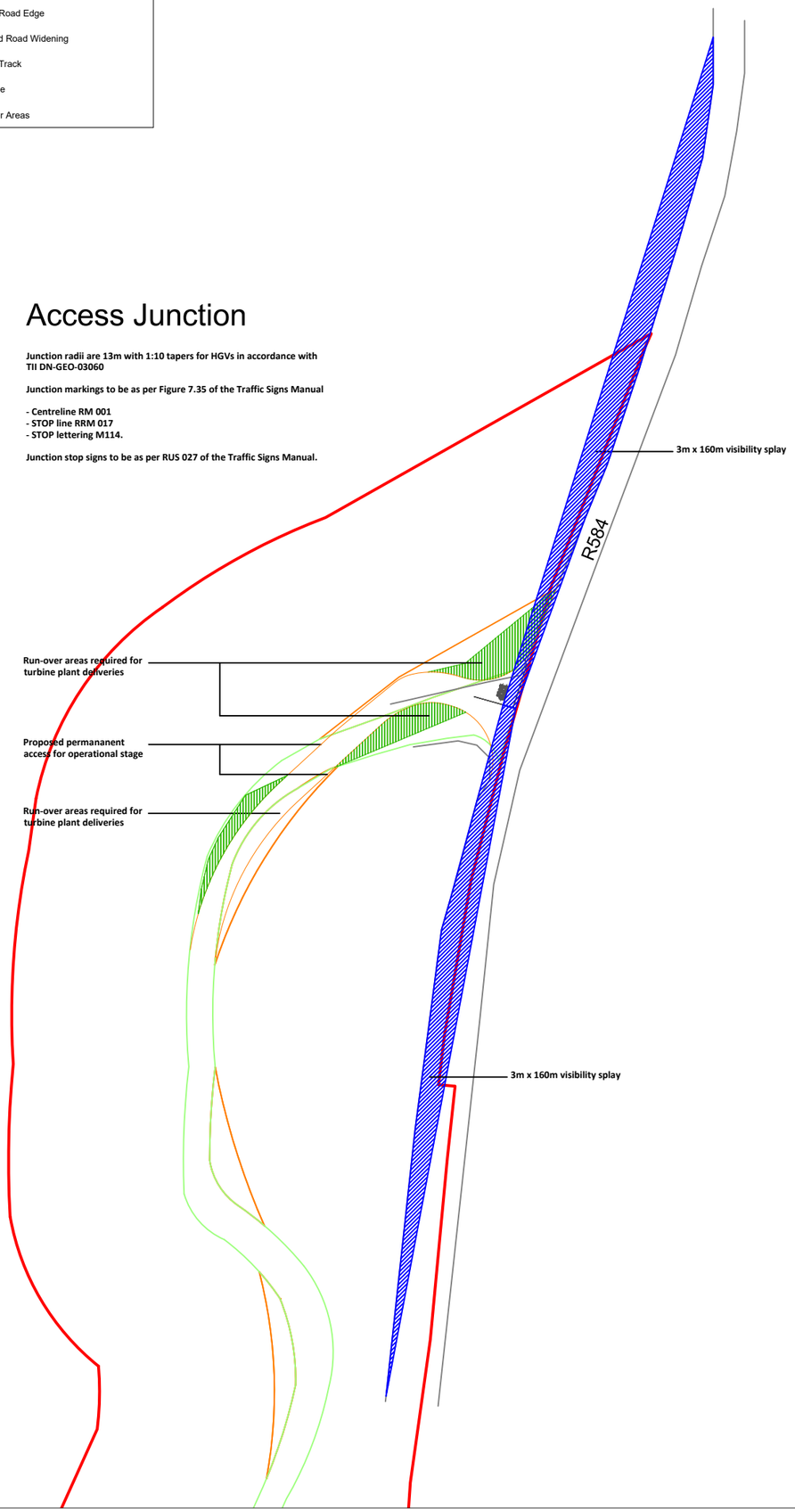
Access Junction

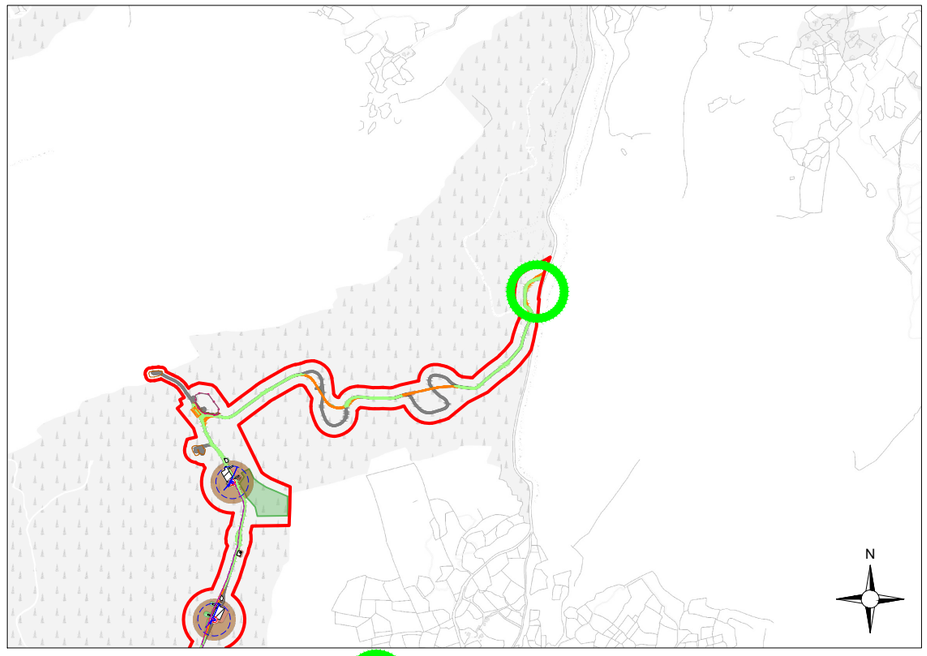
Junction radii are 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060

Junction markings to be as per Figure 7.35 of the Traffic Signs Manual

- Centreline RM 001
- STOP line RRM 017
- STOP lettering M114.

Junction stop signs to be as per RUS 027 of the Traffic Signs Manual.





1:25,000 Location on Context Map

PROJECT TITLE: **Curraglass Wind Farm, Co. Cork**			
DRAWING TITLE: **Upgrade of Existing Access Junction**			
PROJECT No.: **240614**		DRAWING No.: **Fig 4-18**	SCALE: **1:1,250 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **AC**	DATE: **10.09.2025**	REVISION.: P01

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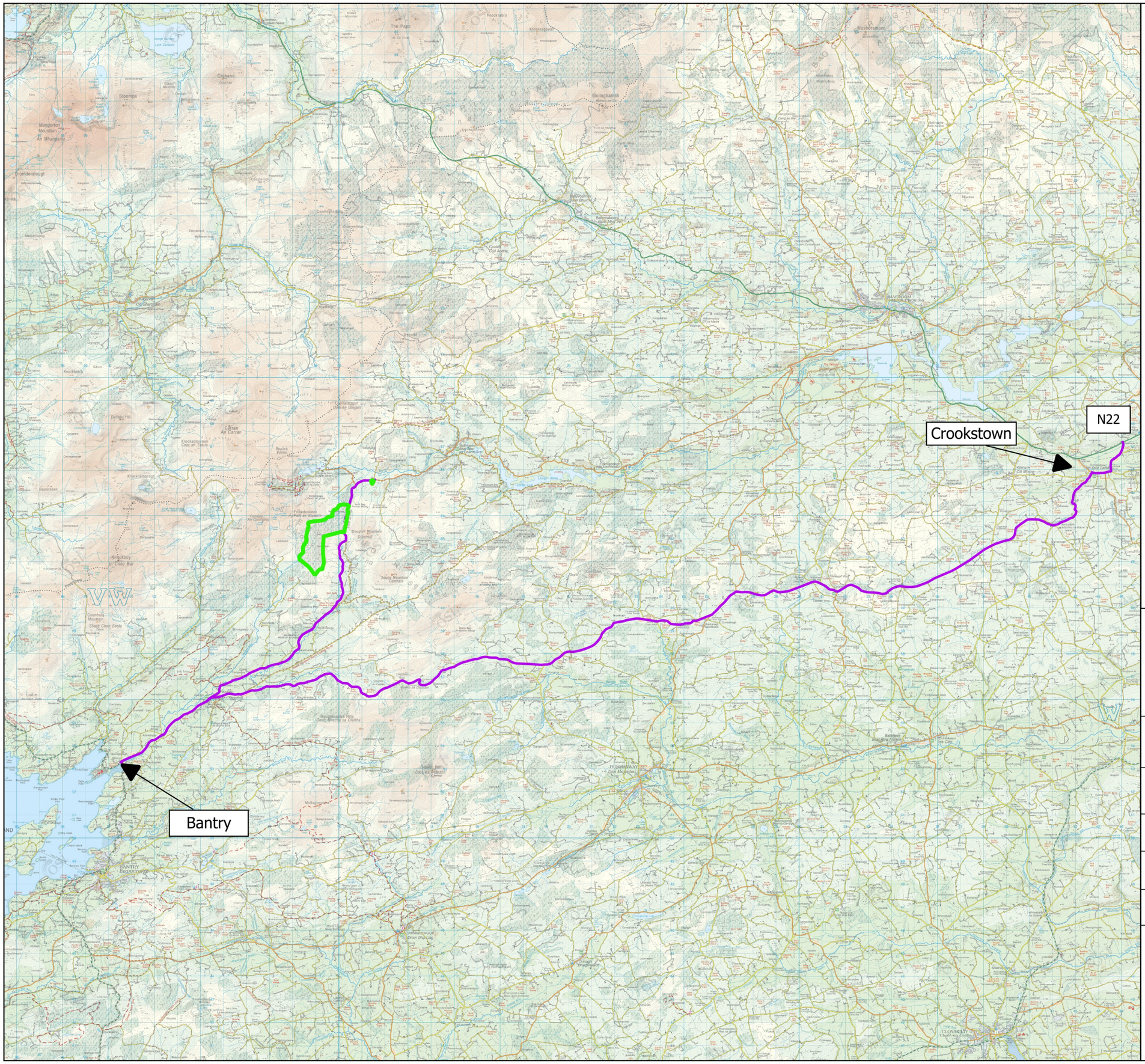

Map Legend

- EIAR Site Boundary
- Proposed Turbine Delivery Route

Drawing Title
Proposed Turbine Delivery Route

Project Title
Curraglass Wind Farm, Co. Cork

Drawn By	Checked By
EM	EC
Project No.	Drawing No.
240614	Figure 4-19
Scale	Date
1:160,000	2025-09-11

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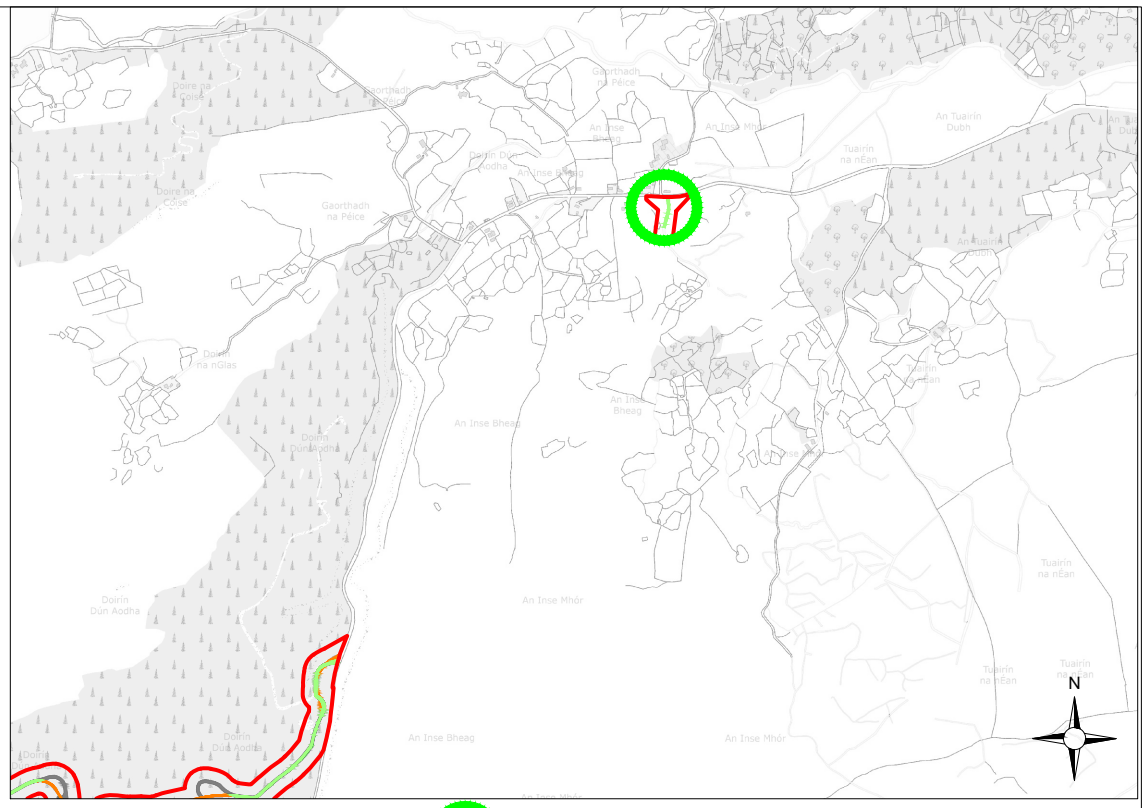
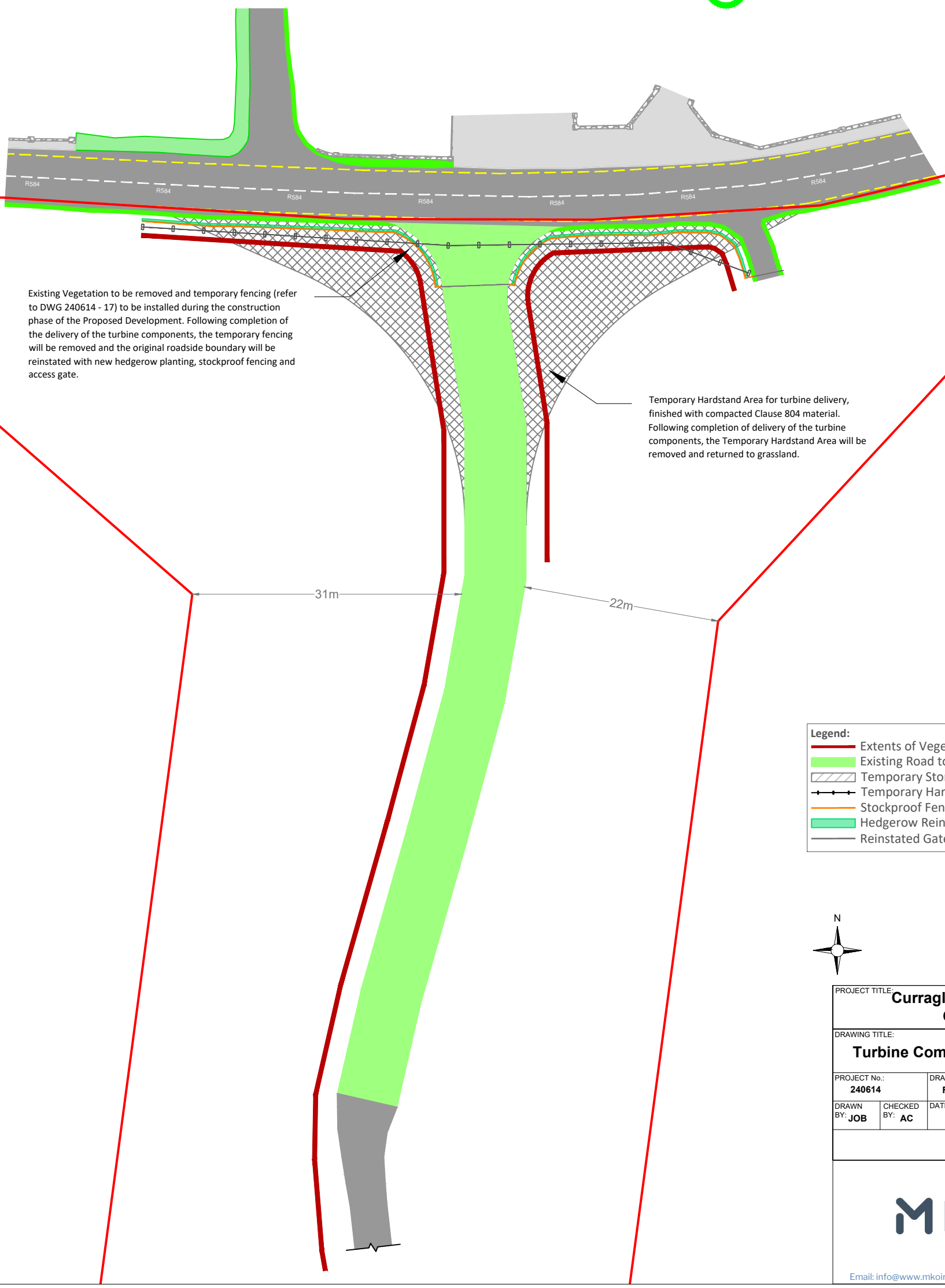


1:25,000 Location on Context Map



Legend:

- Extents of Vegetation to be Removed
- Existing Road to be Upgraded
- Temporary Stoned Area
- Temporary Harris Fencing
- Stockproof Fencing
- Hedgerow Reinstatement
- Reinstated Gate

N

PROJECT TITLE:
Curraglass Wind Farm, Co. Cork

DRAWING TITLE:
Turbine Component Turning Area

PROJECT No.:	DRAWING No.:	SCALE:
240614	Fig 4-20	1:500 @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	10.09.2025	P01

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4.6 Site Drainage

4.6.1 Introduction

The drainage design for the Proposed Development has been prepared by Hydro Environmental Services Ltd. (HES). The drainage design has been prepared based on experience of the project team of other wind farm sites, and the number of best practice guidance documents referred to in the Bibliography section of the EIAR.

The protection of groundwater and surface water within and surrounding the Site, and downstream catchments that they feed has been of utmost importance in considering the most appropriate drainage proposals for the Site of the Proposed Development.

The Proposed Development drainage design has therefore been proposed specifically and ensures minimal impact with regards the existing flow regime across the Site, in particular having no negative impact on the water quality of the Site and consequently no impact on downstream catchments and ecological ecosystems.

4.6.2 Drainage Design Principles

The key principles of drainage design that will be implemented and adhered to as part of the Proposed Development are as follows:

- Keep clean water clean by intercepting it where possible, upgradient of works areas, and divert it around the works areas for discharge/recharge to ground.
- Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line treatment and discharge to ground via infiltration drains and infiltration areas.
- There is no direct hydraulic connectivity from proposed construction areas to natural watercourses or drains connecting to downstream watercourses.
- Maintain the existing hydrology/hydrogeology of the Site.
- Re-routing existing local drainage pathways as required.
- Daily inspection and recording of surface water management system by on-site clerk of works and immediate remedial measures to be carried out as required and works temporarily ceased if a retained stormwater/sediment load is identified to have the potential to migrate from the Site.

Drainage water from any works areas of the Site will not be directed to any natural watercourses within the Site. Two distinct methods will be employed to manage drainage water within the Site. The first method involves keeping clean water clean by avoiding disturbance to natural drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations and construction areas. The second method involves collecting any drainage waters from works areas within the Site that might carry silt or sediment, to allow attenuation and settlement prior to controlled diffuse release via recharge.

The drainage design is intended to maximise erosion control, which is more effective than having to control sediment during high rainfall. Such a system also requires less maintenance. The area of exposed ground will be minimised. The drainage measures will prevent runoff from entering the works areas of the Site from adjacent ground, to minimise the volume of sediment-laden water that has to be managed. Discoloured run-off from any construction area will be isolated from natural clean run-off.

A schematic line drawing of the proposed drainage design is presented in Figure 4-21 below.

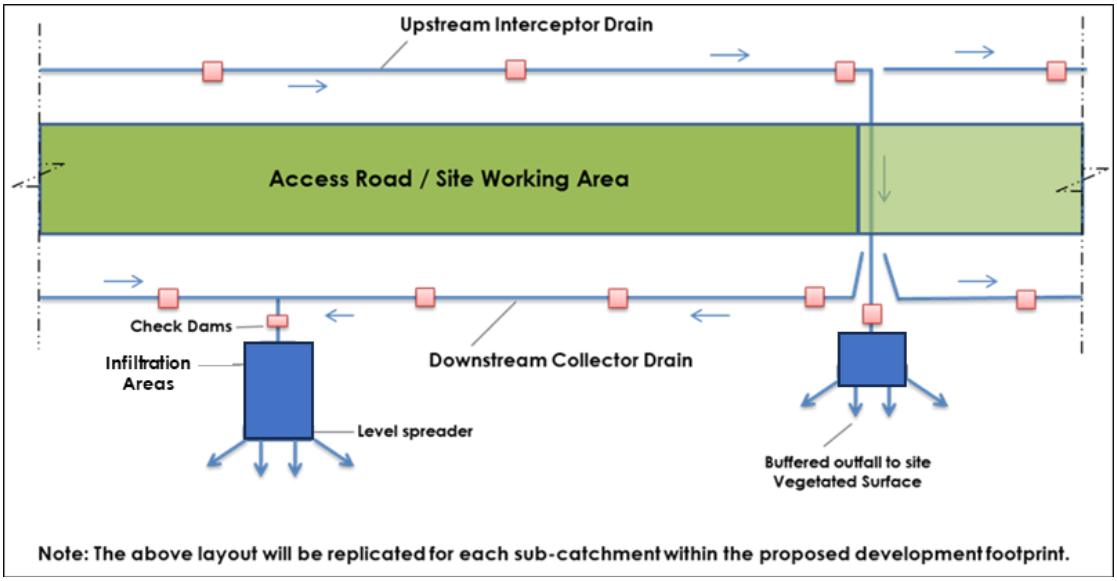


Figure 4-21 Proposed Development Drainage Process Flow

4.6.3 Drainage Design

A drainage design for the Proposed Development, incorporating all principles and measures outlined in this drainage design description, has been prepared, and is included in Appendix 4-4 to this EIAR. The drainage design employs the various measures further described below and is cognisant of the following guidance documents:

- Environmental Protection Agency (2022): Guidelines on the Information to be Contained in Environmental Impact Assessment Reports[7];
- European Commission (2017): Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report[8];
- Institute of Geologists Ireland (2013): Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements[9];
- National Roads Authority (2008): Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;[10]
- Forestry Commission (2004): Forests and Water Guidelines, Fourth Edition. Publ. Forestry Commission, Edinburgh;[11]
- Coillte (2009): Forest Operations & Water Protection Guidelines;[12]
- Forest Services (Draft 2018) Plan for Forests & Freshwater Pearl Mussel in Ireland;[13]

[7] *Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Dublin: EPA* https://www.epa.ie/publications/monitoring–assessment/assessment/strategic-environmental-assessment/guidelines-on-information-to-be-contained-in-environmental-impact-statements-eis.php

[8] *European Commission (2017) Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report. Luxembourg: Publications Office of the EU.* https://op.europa.eu/en/publication-detail/-/publication/2b399830-cb4b-11e7-a5d5-01aa75ed71a1

[9] *Institute of Geologists of Ireland (2013) Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements* https://igi.ie/assets/files/Codes%20and%20Guidelines/IGI%20Enviro%20Impact%202013.pdf

[10] *National Roads Authority (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.* https://www.tii.ie/media/llvnszei/guidelines-on-procedures-for-assessment-and-treatment-of-geology-hydrology-and-hydrogeology-for-national-road-schemes.pdf

[11] *Forestry Commission (2004) Forests and Water Guidelines (4th edn). Edinburgh: Forestry Commission* https://cdn.forestresearch.gov.uk/2006/03/ukfs_water_fcgl007.pdf

[12] Coillte 2009: Forest Operations & Water Protection Guidelines

[13] *Forest Services (Draft 2018) Plan for Forests & Freshwater Pearl Mussel in Ireland* https://irishriverproject.com/wp-content/uploads/2022/01/forest-report.pdf

- Department of Agriculture, Food and the Marine (2018) Forests and Water, Johnstown Castle Estate, Co. Wexford[14]
- Department of Agriculture, Food and the Marine (2024), Forestry Standards Manual, Johnstown Castle Estate, Co. Wexford.[15]
- COFORD (2004): Forest Road Manual – Guidelines for the Design, Construction and Management of Forest Roads;[16]

4.6.3.1 Interceptor Drains

Interceptor drains will be installed upgradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the Site where it might otherwise have come into contact with exposed surfaces and picked up silt and sediment. The drains will be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. This will minimise the volume of potentially silty runoff to be managed within the construction area.

The interceptor drains will be installed in advance of any main construction works commencing. The material excavated to make the drain will be compacted on the downslope edge of the drain to form a diversion dike. On completion of the construction phase works, it is envisaged that the majority of the interceptor drains could be removed. At that stage, there will be no open excavations or large areas of exposed ground that are likely to give rise to large volumes of potentially silt-laden run off. Any areas in which works were carried out to construct roads, turbines or hardstands, will have been built up with large grade hardcore, which even when compacted in place, will retain sufficient void space to allow water to infiltrate the subsurface of these constructed areas. It is not anticipated that roadways or other installed Site infrastructure will intercept ground-conveyed surface water runoff to any significant extent that would result in scouring or over-topping or spill over. Where the drains are to be removed, they will be backfilled with the material from the diversion dike. Interceptor drains may have to be retained in certain locations, for example where roadways are to be installed on slopes, to prevent the roadways acting as conduits for water that might infiltrate the roadway sub-base. In these cases, interceptor drains would be maintained in localised areas along the roadway with culverts under the roadway, which would allow the intercepted water to be discharged to vegetation filters downgradient of the roadway. Similarly, in localised hollows where water is likely to be funnelled at greater concentrations than on broader slopes, interceptor drains and culverts may be left in situ following construction. Figure 4-22 below shows an illustrative drawing of an interceptor drain.

The velocity of flow in the interceptor will be controlled by check dams (see Section 4.6.3.3 below), which will be installed at regular intervals along the drains to ensure flow in the channel is non-erosive. On steeper sections where erosion risks are greater, a geotextile membrane will be added to the channel. Interceptor drains will be installed horizontally across slopes to run in parallel with the natural contour line of the slope. Intercepted water will travel along the interceptor drains to areas downgradient of works areas, where the drain will terminate at a level spreader (see Section 4-6.3.4 below). Across the entire length of the interceptor drains, the design elevation of the water surface along the route of the drains will not be lower than the design elevation of the water surface in the outlet at the level spreader.

[14] *Department of Agriculture, Food and the Marine (2018) Forests and Water, Johnstown Castle Estate, Co. Wexford*
[15] *Department of Agriculture, Food and the Marine (2024), Forestry Standards Manual, Johnstown Castle Estate, Co. Wexford*
[16] *COFORD (2004): Forest Road Manual – Guidelines for the Design, Construction and Management of Forest Roads* https://windenergyireland.com/images/files/cofordforestroadmanual.pdf

4.6.3.2 Swales

Drainage swales are shallow drains that will be used to intercept and collect run off from construction areas of the Site during the construction phase. Drainage swales will remain in place to collect runoff from roads and hardstanding areas of the Proposed Development during the operational phase. A swale is an excavated drainage channel located along the downgradient perimeter of construction areas, used to collect and carry any sediment-laden runoff to a sediment-trapping facility and stabilised outlet. Swales are proven to be most effective when a dike is installed on the downhill side. They are similar in design to interceptor drains and collector drains described above. Figure 4-22 below, shows an illustrative example of a drainage swale.

Drainage swales will be installed downgradient of any works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and picked up silt and sediment. Swales will intercept the potentially silt-laden water from the excavations and construction areas of the Site and prevent it reaching natural watercourses.

Drainage swales will be installed in advance of any main construction works commencing. The material excavated to make the swale will be compacted on the downslope edge of the drain to form a diversion dike.

4.6.3.3 Check Dams

The velocity of flow in the interceptor drains and drainage swales, particularly on sloped sections of the channel, will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the swale is non-erosive.

Check dams will restrict flow velocity, minimise channel erosion and promote sedimentation behind the dam. The check dams will be installed as the interceptor drains are being excavated. Check dams may also be installed in some of the existing artificial drainage channels on the Site, downstream of where drainage swales connect in.

The proposed check dams will be made up of straw bales or stone, or a combination of both depending on the size of the drainage swale it is being installed in. Where straw bales are to be used, they will be secured to the bottom of the drainage swale with stakes. Clean 4–6-inch stone will be built up on either side and over the straw bale to a maximum height of 600mm over the bottom of the interceptor drain. In smaller channels, a stone check dam will be installed and pressed down into place in the bottom of the drainage swale with the bucket of an excavator. Figure 4-22 shows illustrative examples of check dams.

The check dams will be installed at regular intervals along the interceptor drains to ensure the bottom elevation of the upper check dam is at the same level as the top elevation of the next down-gradient check dam in the drain. The centre of the check dam will be approximately 150mm lower than the edges to allow excess water to overtop the dam in flood conditions rather than cause upstream flooding or scouring around the dams.

Check dams will not be used in any natural watercourses, only artificial drainage channels and interceptor drains. The check dams will be left in place at the end of the construction phase to limit erosive linear flow in the drainage swales during extreme rainfall events.

Check dams are designed to reduce velocity and control erosion and are not specifically designed or intended to trap sediment, although sediment is likely to build up. If necessary, any excess sediment build up behind the dams will be removed. For this reason, check dams will be inspected and maintained regularly to insure adequate performance. Maintenance checks will also ensure the centre elevation of the dam remains lower than the sides of the dam.

4.6.3.4 Level Spreaders

A level spreader will be constructed at the end of each interceptor drain to convert concentrated flows in the drain, into diffuse sheet flow on areas of vegetated ground. The levels spreaders will be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the Site.

The water carried in interceptor drains will not have come in contact with works areas of the Site and therefore should be free of silt and sediment. The level spreaders will distribute clean drainage water onto vegetated areas where the water will not be reconcentrated into a flow channel immediately below the point of discharge. The discharge point will be on level or only very gently sloping ground rather than on a steep slope so as to prevent erosion. Figure 4-22 below shows an illustrative example of a level spreader.

The slope in the channel leading into the spreader will be less than or equal to 1%. The slope downgradient of the spreader onto which the water will dissipate will have a grade of less than 6%. The availability of slopes with a grade of 6% or less will determine the locations of level spreaders. If a slope grade of less than 6% is not available in the immediate area downgradient of a works area at the end of a diversion drain, a piped slope drain (see Section 4.6.3.5 below) will be used to transfer the water to a suitable location.

The spreader lip over which the water will spill will be made of a concrete kerb, wooden board, pipe, or other similar piece of material that can create a level edge similar in effect to a weir. The spreader will be level across the top and bottom to prevent channelised flow leaving the spreader or ponding occurring behind the spreader. The top of the spreader lip will be 150mm above the ground behind it. The length of the spreader will be a minimum of 4m and a maximum length of 25m, with the actual length of each spreader to be determined by the size of the contributing catchment, slope and ground conditions.

Clean four-inch stone can be placed on the outside of the spreader lip and pressed into the ground mechanically to further dissipate the flow leaving the level spreader over a larger area.

4.6.3.5 Piped Slope Drains

Piped slope drains will be used to convey surface runoff from diversion drains safely down slopes to flat areas without causing erosion. Once the runoff reaches the flat areas it will be reconverted to diffuse sheet flow. Level spreaders will only be established on slopes of less than 6% in grade. Piped slope drains will be used to transfer water away from areas where slopes are too steep to use level spreaders.

The piped slope drains will be semi-rigid corrugated pipes with a stabilised entrance and a rock apron at the outlet to trap sediment and dissipate the energy of the water. The base of drains leading into the top of the piped slope drain will be compacted and concavely formed to channel the water into the corrugated pipe. The entrance at the top of the pipe will be stabilised with sandbags if necessary. The pipe will be anchored in place by staking at approximately 3-4 metre intervals or by weighing down with compacted soil. The bottom of the pipe will be placed on a slope with a grade of less than 1% for a length of 1.5m, before outflowing onto a rock apron.

The rock apron at the outlet will consist of 6-inch stone to a depth equal to the diameter of the pipe, a length six times the diameter of the pipe. The width of the rock apron will be three times the diameter of the pipe where the pipe opens onto the apron and will fan out to six times the diameter of the pipe over its length. Figure 4-22 below shows a diagrammatic example of a piped slope drain and rock apron.

Piped slope drains will only remain in place for the duration of the construction phase of the Proposed Development. On completion of the works, the pipes and rock aprons will be removed, and all channels backfilled with the material that was originally excavated from them.

Piped slope drains will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and blockages. Stake anchors or fill over the pipe will be checked for settlement, cracking, and stability. Any seepage holes where pipe emerges from the drain at the top of the pipe will be repaired promptly.

4.6.3.6 Vegetation Filters

Vegetation filters are the existing vegetated areas of land that will be used to accept surface water runoff from upgradient areas. The selection of suitable areas to use as vegetation filters will be determined by the size of the contributing catchment, slope and ground conditions.

Vegetation filters will carry outflow from the level spreaders as overland sheet flow, removing any suspended solids and discharging to the groundwater system by diffuse infiltration.

Vegetation filters will not be used in isolation for waters that are likely to have higher silt loadings. In such cases, silt-bearing water will already have passed through stilling ponds prior to diffuse discharge to the vegetation filters via a level spreader.

4.6.3.7 Stilling Ponds (Settlement Ponds)

Stilling ponds will be used to attenuate runoff from works areas of the Proposed Development during the construction phase and will remain in place to handle runoff from roads and hardstanding areas of the Proposed Development during the operational phase. The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing runoff velocity will allow larger particles to settle out in the stilling ponds, before the run-off water is redistributed as diffuse sheet flow in filter strips downgradient of any works areas.

Stilling ponds will be excavated/constructed at each required location as two separate ponds in sequence, a primary pond and a secondary pond. The points at which water enters and exits the stilling ponds will be stabilised with rock aprons, which will trap sediment, dissipate the energy of the water flowing through the stilling pond system, and prevent erosion. The primary stilling pond will reduce the velocity of flows to less than 0.5 metres per second to allow settlement of silt to occur. Water will then pass from the primary pond to the secondary pond via another rock apron. The secondary stilling pond will reduce the velocity of flows to less than 0.3 metres per second. Water will flow out of the secondary stilling pond through a stone dam, partially wrapped in geo-textile membrane, which will control flow velocities and trap any sediment that has not settled out. Figure 4-22 below shows an illustrative example of a stilling pond system.

Water will flow by gravity through the stilling pond system. The stilling ponds will be sized according to the size of the area they will be receiving water from but will be sufficiently large to accommodate peak flows storm events. The stilling ponds will be dimensioned so that the length to width ratio will be greater than 2:1, where the length is the distance between the inlet and the outlet. Where ground conditions allow, stilling ponds will be constructed in a wedge shape, with the inlet located at the narrow end of the wedge. Each stilling pond will be a minimum of 1-1.5 metres in depth. Deeper ponds will be used to minimise the excavation area needed for the required volume.

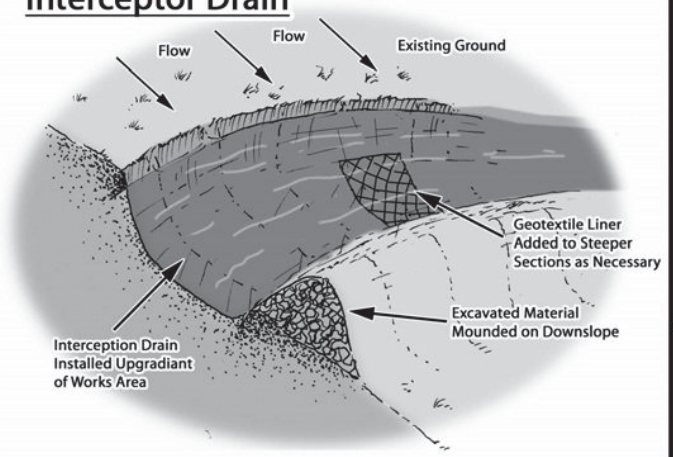
The embankment that forms the sloped sides of the stilling ponds will be stabilised with vegetated turves, which will have been removed during the excavation of the stilling ponds area. All material excavated during pond construction will be used locally for landscaping and berm construction around these ponds.

Stilling ponds will be located towards the end of swales, close to where the water will be reconverted to diffuse sheet flow. Upon exiting the stilling pond system, water will be immediately reconverted to diffuse flow via a fan-shaped rock apron if there is adequate space and ground conditions allow. Otherwise, a swale will be used to carry water exiting the stilling pond system to a level spreader to reconvert the flow to diffuse sheet flow.

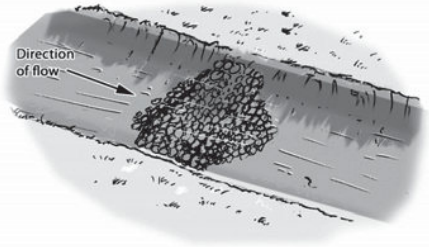
Stilling ponds will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and anything else that might interfere with flows.

Drainage Design Measures

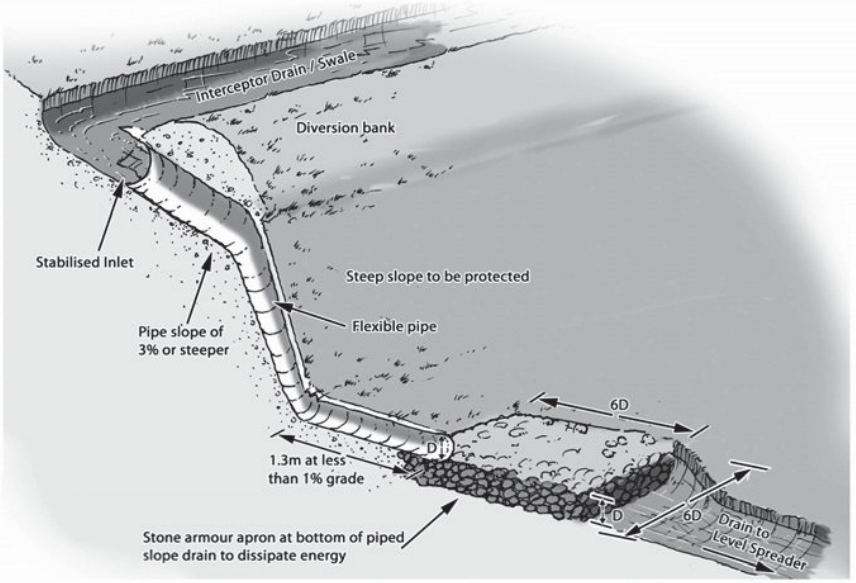
Interceptor Drain



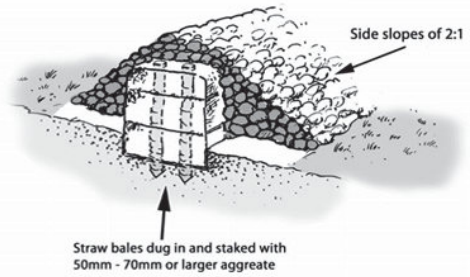
Check Dam (Stone Dam in Drain)



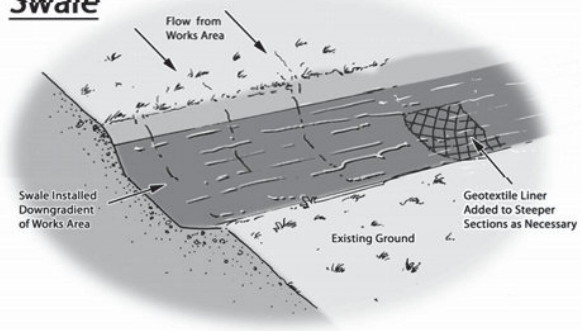
Slope Pipe Drain



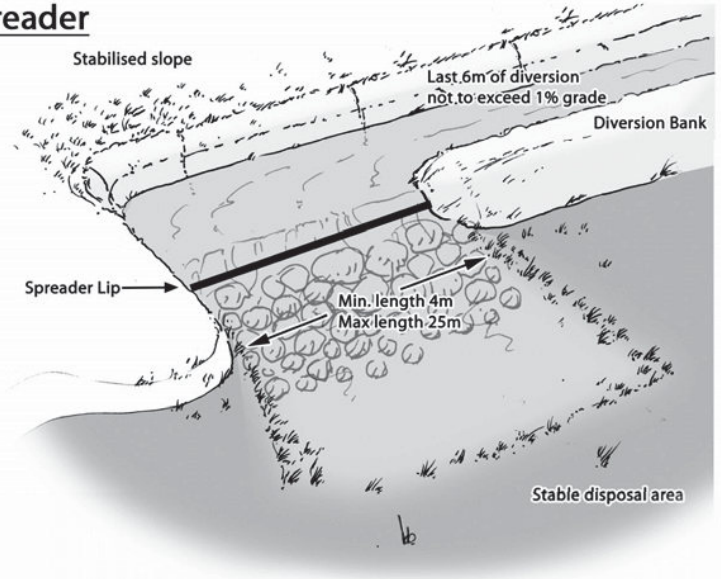
Check Dam
(Straw Bale & Stone Dam - Cross Section)



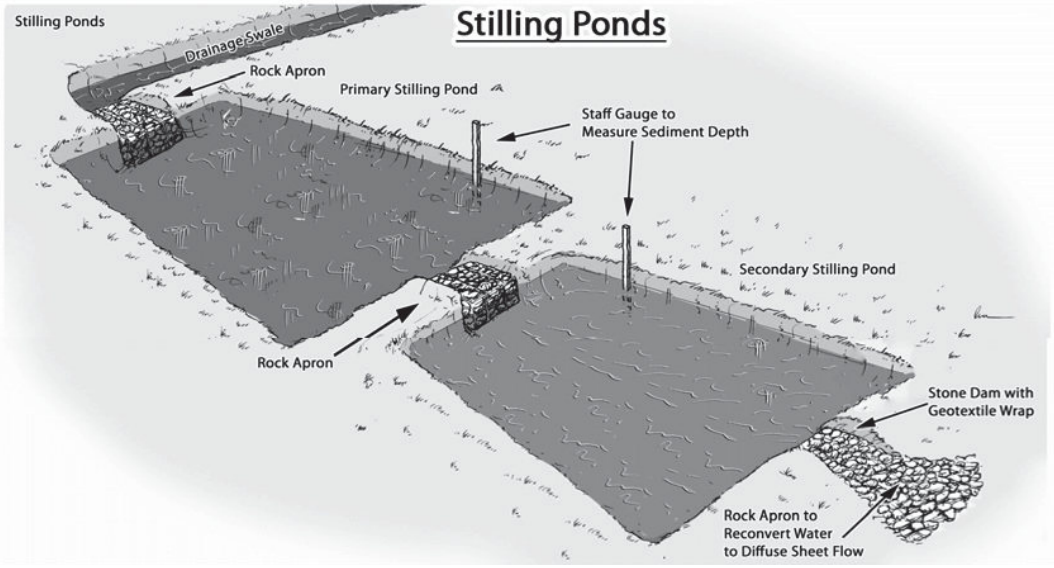
Swale



Level Spreader



Stilling Ponds



Drawing Title: Drainage Design Measures	Drawing No.: Figure 4-22	Scale: NTS
Project Title: Curraglass Wind Farm, Co.Corkt		Date: 27.08.2025
Drawn By: CF	Checked By: SC	Project No.: 240614

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4.6.3.8 Siltbuster

A "siltbuster" or similar equivalent piece of equipment will be available to filter any water pumped out of excavation areas, if necessary, prior to its discharge to stilling ponds or swales.

Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction sites.

The unit stills the incoming water/solids mix and routes it upwards between a set of inclined plates for separation. Fine particles settle onto the plates and slide down to the base for collection, whilst treated water flows to an outlet weir after passing below a scum board to retain any floating material. The inclined plates dramatically increase the effective settling area of the unit giving it a very small footprint onsite and making it highly mobile. Figure 4-23 shows an illustrative diagram of the Siltbuster.

The Siltbuster units are now considered best practice for the management of dirty water pumped from construction sites. The UK Environment Agency and the Scottish Environmental Protection Agency have all recommended/specified the use of Siltbuster units on construction projects.

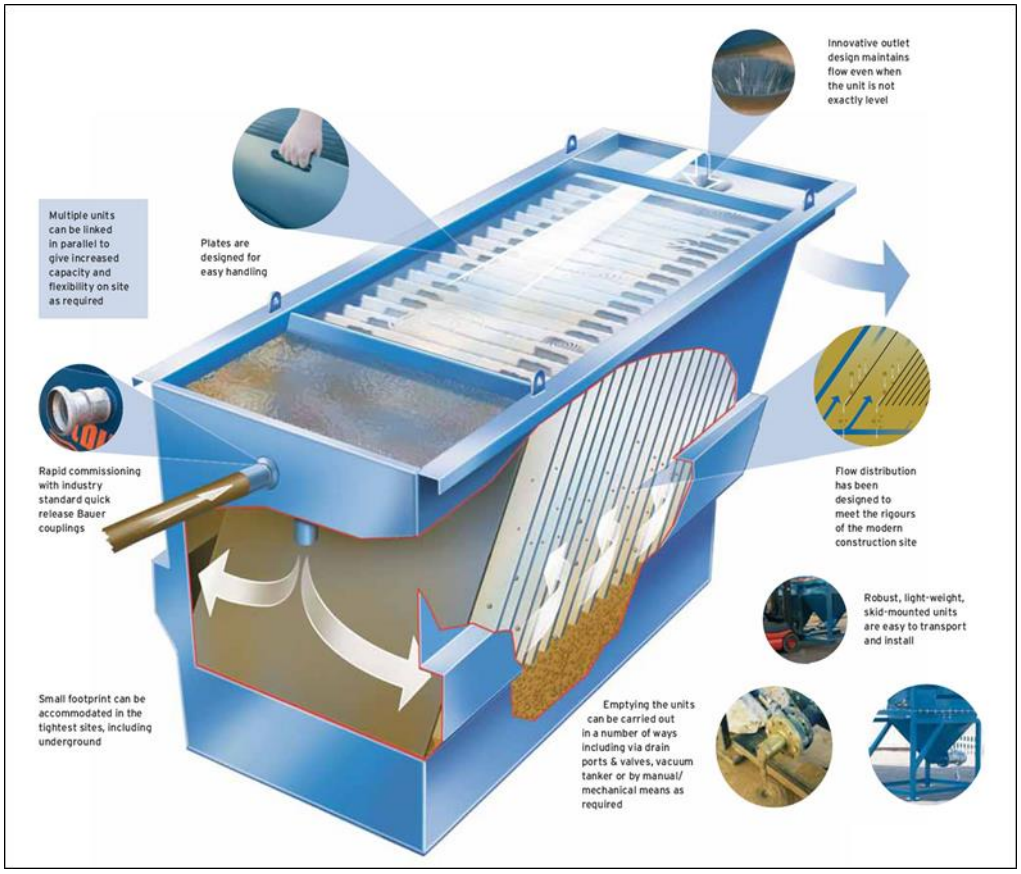

Figure 4-23 Siltbuster (Source: https://www.siltbuster.co.uk/sb_prod/siltbuster-fb50-settlement-unit/)

4.6.3.9 Silt Bags

Dewatering silt bags allow the flow of water through them while trapping any silt or sediment suspended in the water. The silt bags provide a passive non-mechanical method of removing any remaining silt contained in the potentially silt-laden water collected from works areas within the Site.

Dewatering silt bags are an additional drainage measure that can be used downgradient of the stilling ponds at the end of the drainage swale channels and will be located, wherever it is deemed appropriate, throughout the

Site. The water will flow, via a pipe, from the stilling ponds into the silt bag. The silt bag will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water after it has gone through the previous drainage measures. The dewatering silt bags will ensure that there will be no loss of silt into the stream.

The dewatering silt bag that will be used will be approximately 3 metres in width by 4.5 metres (see Plate 4-4 and Plate 4-5 below) in length and will be capable of trapping approximately four tonnes of silt. The dewatering silt bag, when full, will be removed from Site by a waste contractor with the necessary waste collection permit, who will then transport the silt bag to an appropriate, fully licensed waste facility.

Plate 4-4 Silt Bag under inspection

Plate 4-5 Silt Bag with water being pumped through

4.6.3.10 Sedimats

Sediment entrapment mats, consisting of coir or jute matting, will be placed at the outlet of the silt bag to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.

4.6.3.11 Culverts

All new proposed culverts and proposed culvert upgrades will be suitably sized for the expected peak flows in the watercourse.

Some culverts may be installed to manage drainage waters from works areas of the Proposed Development, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base. In all cases, culverts will be oversized to allow mammals to pass through the culvert.

Culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the road at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary.

All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.

4.6.3.12 Silt Fences

Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50m buffer zone of a stream, which is inevitable where existing roads in proximity to watercourses are to be upgraded as part of the Proposed Development. These areas include around existing culverts, around the headwaters of watercourses, and the proposed locations are indicated on the drainage design drawings included in Appendix 4-4.

Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading. The silt fence designs follow the technical guidance document '*Control of Water Pollution from Linear Construction Projects'* published by Construction Industry Research and Information Association (CIRIA, No. C648, 1996). Up to three silt fences may be deployed in series.

All silt fencing will be formed using Terrastop Premium or equivalent silt fence product.

Silt fences will be inspected regularly to ensure water is continuing to flow through the fabric, and the fence is not coming under strain from water backing up behind it.

4.6.3.13 Hydrocarbon Interceptor

A hydrocarbon (or petrol) interceptor is a trap used to filter out hydrocarbons from surface water runoff. A suitably sized hydrocarbon interceptor will be installed wherever it is intended to store hydrocarbons and oils or where it is proposed to park vehicles during the construction and operational phases of the Proposed Development (i.e., construction compound).

4.6.3.14 Tree Felling Drainage

Tree felling will be required within and around Proposed Development footprint to allow for the construction of the proposed turbines, access roads, underground cabling, and the other ancillary infrastructure. The felling will not be undertaken simultaneously with construction groundworks. Keyhole felling to facilitate construction works will take place prior to groundworks commencing. A Harvest Management Plan is included as Appendix 4-5.

During tree felling there is a potential to generate silts and sediments in surface water runoff due to tracking of machinery and disturbance of the ground surface etc, however mitigation is provided in Chapter 9 (Hydrology & Hydrogeology) with regard surface water quality protection for this activity which is summarised below. Also, prior to the commencement of tree felling for subsequent road construction the following key temporary drainage measures will be installed:

- All existing dry forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps;
- Clean water diversion drains will be installed upgradient of the works areas;
- Check dams/silt fence arrangements (silt traps) will be placed in all existing forestry drains that have surface water flows and also along existing forestry roadside drains; and,

- A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.

Before the commencement of any felling works, an Environmental Clerk of Works (ECoW) shall be appointed to oversee the keyhole and extraction works. The ECoW shall be experienced and competent, and shall have the following functions and operate their record using a Schedule of Works Operation Record (SOWOR), as proposed in the planning application:

- Attend the Site for the setup period when drainage protection works are being installed and be present onsite during the remainder of the forestry keyhole felling works.
- Prior to the commencement of works, review and agreement of the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing (see below), water crossings and onsite storage facilities for fuel, oil and chemicals (see further below).
- Be responsible for preparing and delivering the Environmental Tool Box Talk (TBT) to all relevant parties involved in site operations, prior to the commencement of the works.
- Conduct daily and weekly inspections of all water protection measures and visually assess their integrity and effectiveness in accordance with Section 3.4 (Monitoring and Recording) and Appendix 3 (Site Monitoring Form (Visual Inspections)) of the Forestry & Freshwater Pearl Mussel Requirements.
- Take representative photographs showing the progress of operation onsite, and the integrity and effectiveness of the water protection measures.
- Collect water samples for analysis by a 3rd party accredited laboratory, adhering to the following requirements:
- Surface water samples shall be collected upstream and downstream of the keyhole felling at suitable sampling locations.
- Sampling shall be taken from the stream / riverbank, with no in-stream access permitted.
- The following minimum analytical suite shall be used: pH, EC, TSS, BOD, Total P, Ortho-P, Total N, and Ammonia.
- Review of operator's records for plant inspections, evidence of contamination and leaks, and drainage checks made after extreme weather conditions.
- Prepare and maintain a contingency plan.
- Suspend work where potential risk to water from siltation and pollution is identified, or where operational methods and mitigation measures are not specified or agreed.
- Prepare and maintain a Water Protection Measure Register. This document is to be updated weekly by the ECoW.

To protect watercourses, the following measures will be adhered to during all keyhole/tree felling activities.

- All relevant measures, best practice methods and requirements set out in Chapter 9 (Hydrology & Hydrogeology), of the EIAR will be adhered to including Forestry & Water Quality Guidelines, Forest Harvesting & the Environment Guidelines and the Forest Protection Guidelines.
- The extent of all necessary tree felling will be identified and demarcated with markings on the ground in advance of any felling commencing.
- All roads and culverts will be inspected prior to any machinery being brought on Site to commence the felling operation. No tracking of vehicles through watercourses will occur. Vehicles will only use existing road infrastructure and established watercourse crossings.
- Existing drains that drain an area to be felled towards surface watercourses will be blocked, and temporary silt traps will be constructed to ensure collection of all silt within felling areas. These temporary silt traps will be cleaned out and backfilled once felling works are complete. This ensures there is no residual collected silt remaining in blocked drains after felling works are completed. No direct discharge of such drains to watercourses will occur from within felling areas.
- New collector drains and sediment traps will be installed during ground preparation to intercept water upgradient of felling areas and divert it away. Collector drains will be excavated at an acute angle to the contour (0.3% - 3% gradient), to minimise flow velocities.

- All silt traps will be sited outside of buffer zones and have no direct outflow into the aquatic zone. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of away from all aquatic zones.
- All new collector drains will taper out before entering the aquatic buffer zone to ensures the discharging water gently fans out over the buffer zone before entering the aquatic zone.
- Machine combinations, such as mechanical harvesters or chainsaw felling will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance.
- Mechanised operations will be suspended during and immediately after heavy rainfall.
- Where brash is required to form brash mats, it is to be laid out at harvesting stage to prevent soil disturbance by machine movement.
- Brash which has not been pushed into the soil may be moved within the Site to facilitate the creation of mats in more demanding locations.
- Felling of trees will be pointed directionally away from watercourses.
- Felling will be planned to minimise the number of machine passes in any one area.
- Extraction routes, and hence brash mats, will be aligned parallel to the ground contours where possible.
- Harvested timber will be stacked in dry areas, and outside any 50m watercourse buffer zone. Straw bales and check dams to be emplaced on the down gradient side of timber storage sites.
- Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but removing of natural debris deflectors will be avoided.

Summarised mitigation stated as part of the Harvest Management Plan;

- Harvesting and extraction will be completed in dry weather to reduce spoil compaction and rutting of tracks All harvesting activities will be suspended during periods of prolonged rainfall or high rainfall.
- Proposed machinery will comprise a harvester and a low-ground pressure forwarder with a 14-tonne bunk capacity.
- Before commencement of felling all operators will be fully briefed of the harvest plan including potential hazards and environmental sensitivities and corresponding protective measures on site.
- Advance notice and safety signage will be erected prior to harvesting, and harvest boundaries will be clearly marked before operations begin.
- Brash mats will be used along all extraction routes, with corduroy rafts deployed to reinforce short sections of soft ground subject to high traffic usage. The extraction directions are marked with red arrows on the Harvest Plan Map.
- Particular attention will be paid to minimizing disturbance to ground surfaces, drains /streams, and biodiversity features.
- Brash, logs or debris will not be allowed enter the aquatic zones and relevant watercourses.
- Felled trees to be stacked in a responsible manner at suitable locations to prevent contamination of watercourses with organic rich leachate exuding from cuttings.
- Sediment traps will be installed within relevant watercourses before harvesting commences, at strategic locations identified on the ground. Sediment traps will be monitored and maintained (i.e., cleaned out and/or added to, as appropriate) throughout felling, extraction, and periodically thereafter, until the site stabilises.
- There will be a 20m buffer around aquatic zones (10m either side) and 10m buffer around relevant watercourses (5m either side) identified in maps.

- The existing network of forestry drains will be integrated into the proposed drainage system for the renewable energy development and upgraded where required.
- Onsite supervision will be present during operations to ensure that felling and extraction are carried out appropriately and that water protection measures are adequate and remain effective throughout, and to trigger contingency measures, if necessary (e.g., to cease operations if rainfall creates a risk of sediment mobilisation and runoff).

- All staff must always wear high visibility jacket and hard hat. All personnel on site must have appropriate Health and Safety training. All felling/harvesting operations to comply with the Forest Harvesting and the Environment Guidelines and Forestry and Water Quality Guidelines.

4.6.3.15 Cable Trench Drainage

Cable trenches are typically constructed in short, controlled sections, thereby minimising the amount of ground disturbed at any one time and minimising the potential for drainage runoff to pick up silt or suspended solids. Each short section of trench is excavated, ducting installed and bedded, and backfilled with the appropriate materials, before work on the next section commences.

To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the up-gradient side of the trench and is temporarily sealed/smoothed over, using the back of the excavator bucket. Should any rainfall cause runoff from the excavated material, the material is therefore collected and contained in the downgradient cable trench. Excess subsoil is removed from the cable trench works area immediately upon excavation, and in the case of the Proposed Development, would be transported to one of the on-site designated spoil management areas or used for landscaping and reinstatement of other areas elsewhere on-site.

On steeper slopes, silt fences, as detailed in Section 4.6.3.12, above, will be installed temporarily downgradient of the cable trench works area, or on the downhill slope below where excavated material is being temporarily stored to control run-off.

4.6.3.16 Transverse Drains (Grips)

On sections of access road, transverse drains ('grips') are constructed within the surface layer to divert runoff into swales or roadside drains. These drains can run perpendicularly from edge to edge of the road and are most commonly used on steeper gradients to prevent surface water from flowing down the centreline, thereby reducing the risk of erosion and protecting the road structure.

4.7 Construction Management

4.7.1 Construction Timing

It is estimated that the construction phase of the Proposed Development will take approximately 9-12 months from commencement of civil works to the full commissioning of the wind turbines. The commencement of works where the removal of vegetation is required, or where works take place in sensitive breeding habitats will be scheduled to occur outside the bird breeding season (1st March to 31st August) to avoid any potentially significant effects on nesting birds. Construction may commence from September to March so that construction activities are ongoing by the time the next bird breeding season comes around and can continue throughout the bird breeding season.

Construction activities will be carried out during normal daytime working hours (i.e., 0700 – 1900hrs Monday to Saturday). However, to ensure that optimal use is made of good weather period or at critical periods within the programme (i.e., concrete pours) or to accommodate delivery of large turbine components along public routes it could be necessary on occasion to work outside of these hours. Any such out of hours working will be notified in advance to the Local Authority.

4.7.2 Construction Sequencing

The construction phase can be broken down into 3 main phases, which overlap partially and will take approximately 9-12 months to complete: 1) civil engineering works - 5 months, 2) electrical works - 3 months, and 3) turbine erection and commissioning - 4 months. The main task items under each of the three phases are outlined below.

Civil Engineering Works:

- Erect all necessary safety signage.
- Upgrade and hardcore existing entrances (where required).
- Clear and hardcore area for temporary site offices and construction compound. Install same.
- Construct bunded area for oil storage.
- Construct new site roads and hard-standings and crane pads.
- Construct drainage ditches, culverts etc. integral to road construction.
- Excavate for turbine bases where required. Place blinding concrete to turbine bases. Fix reinforcing steel and anchorage system for tower section. Construct shuttering. Fix any ducts etc. to be cast in. Pour concrete bases. Cure concrete. Remove shutters after 3-5 days.
- Backfill tower foundations and cover with previously stored granular material.
- Excavate trenches for site cables, lay cables and backfill. Provide ducts at road crossings.
- Complete site works, reinstate site.
- Remove temporary site offices. Provide any gates, landscaping, signs etc. which may be required.

Electrical Works:

- Establish the temporary construction compound.
- Install internal collector network and communication cabling.
- Excavate trench for ducting & place ducting, backfill with graded granular fill material, reinstate temporary surface.
- Install cable, including jointing.
- Establish connection into existing onsite 38kV substation

Turbine and Met Mast Erection and Commissioning:

- Set up erection crane(s) and deliver components to hardstands.
- Erect towers, nacelles and blades.
- Complete electrical installation.
- Install meteorological mast.
- Commission and test turbines.
- Complete site works and reinstate site.
- Provide any gates, landscaping, signs etc. which may be required.
- Remove temporary site offices.

All relevant Site Health & Safety procedures, in accordance with the relevant Health and Safety Legislation and guidance (listed in Section 5.2.2 of this EIAR), including the preparation of the Health & Safety Plan, erection of the relevant and appropriate signage on site, inductions and toolbox talks will take place prior to and throughout the construction phase of the Proposed Development. Further details of on-site health, safety and welfare are included in Chapter 5 (Population & Human Health), of this EIAR.

The phasing and scheduling of the main construction task items are outlined in Figure 4-24 below, where 1st January has been selected as an arbitrary start date for construction activities.

			Year 1			
ID	Task Name	Task Description	Q1	Q2	Q3	Q4
1	Site Health and Safety					
2	Site Compounds	Site Compounds, site access, fencing, gates				
3	Site Roads	Construction/upgrade of roads, construct underpasses install drainage measures, install water protection measures				
4	Electrical Works	Underground cabling between turbines				
5	Turbine Hardstands	Excavate/pile for turbine bases where required				
6	Turbine Foundations	Fix reinforcing steel and anchorage system, erect shuttering, concrete pour				
	Backfilling and Landscaping					
7	Turbine Delivery and Erection					
8	Substation Commissioning					
9	Turbine Commissioning					

Figure 4-24 Indicative Construction Schedule

4.7.3 Construction Phase Monitoring and Oversight

The requirement for a CEMP to be prepared in advance of any construction works commencing on any wind farm development site and submitted for agreement to the Planning Authority is now well-established. The procedures for the implementation of the mitigation measures outlined in the CEMP and their completion is audited by way of a CEMP Audit Report.

The CEMP Audit Report will list all mitigation measures prescribed in any of the planning documentation and all conditions attached to the grant of planning permission and allows them to be audited on a systematic and regular basis. The first assessment is a simply Yes/No question, has the mitigation measure been employed on-site or not? Following confirmation that the mitigation measure has been implemented, the adherence to mitigation measures must be the subject of regular review and audit during the full construction stage of the project. If remedial actions are needed to improve the effectiveness of the mitigation measure, then these are notified to the Site staff immediately during the audit site visit, and in writing by way of the circulation of the audit report. Depending on the importance and urgency of rectifying the issue, the construction site manager is given a timeframe by when the remedial works need to be completed.

A CEMP has been prepared for the Proposed Development and is included in Appendix 4-3 of this EIAR. The CEMP includes details of drainage, overburden management, waste management etc, and describes how the above-mentioned Audit Report will function and be presented. In the event planning permission is granted for the Proposed Development, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for written approval.

The on-site construction staff will be responsible for implementing the mitigation measures specified in the EIAR and the CEMP and compiled in the Audit Report. Their implementation will be overseen by the ECoW or supervising hydrogeologists, environmental scientists, ecologists or geotechnical engineers, depending on who is best placed to advise on the implementation. The system of auditing referred to above ensures that the

mitigation measures are maintained for the duration of the construction phase, and into the operational phase where necessary.

4.8 Construction Methodologies

This section of the chapter outlines the construction methodologies to be used for the various elements of the Proposed Development. Further details in relation to construction methodologies is included in Section 2.3 of the CEMP, included as Appendix 4-3 of this EIAR.

4.8.1 Proposed Development

4.8.1.1 Turbine Foundations

Each of the proposed turbines to be erected on site will have a reinforced concrete base. As detailed above in Section 4.4.1.1.2, intrusive site investigations were undertaken across the Site, to provide detail and clarity on the nature and extent of subsoils and bedrock as a means of characterising the Site. This assisted in providing additional information on the most suitable location for turbines and associated infrastructure. Full details and results from the Site investigation works are detailed in Appendix 4-2 of this EIAR.

Where the foundation of the turbine is founded on competent strata, overburden will be stripped off the foundation area to a suitable formation using a 360º excavator and will be placed across the Site as close to the excavation as practical. A two-metre-wide working area will be required around each turbine base, with the sides of the excavated areas sloped sufficiently to ensure that slippage does not occur. Material excavated to create the working area will be stored locally for later reuse in backfilling the working area around the turbine foundation. The excavated material will be sealed using the back of the excavator bucket and surrounded by silt fences to ensure sediment-laden run-off does not occur.

The formation material will have to be approved by an engineer as meeting the turbine manufacturer's requirements. If the formation level is reached at a depth greater than the depth of the foundation, the ground level will be raised with Clause 6F2 or similar hardcore material, compacted in 250 millimetres (mm) layers, with sufficient compacted effort (i.e. compacted with seven passes using 12 tonne roller). Drainage measures will be installed to protect the formation by forming an interceptor drain around the perimeter of the base which will be pumped to an adjacent settlement pond.

A berm approximately 500 mm high will be constructed around the perimeter of each turbine base and a fence will be erected to prevent construction traffic from driving into the excavation and to demarcate the working area. All necessary health and safety signage will be erected to warn of deep excavations etc. Access to and from excavated bases will be formed by excavating a pedestrian walkway to 1:12 grade.

There will be a minimum of 100 mm of blinding concrete laid on the formation material positioned using concrete skip and 360º excavator to protect ground formation and to give a safe working platform.

The anchor cage is delivered to site in 2 or more parts depending on the turbine type. A 360º excavator or crane with suitable approved lifting equipment will be used to unload sections of the anchor cage and reinforcing steel. The anchor cage is positioned in the middle of the turbine base and is assembled accordingly. When the anchor cage is in final position it is checked and levelled by using an appropriate instrument. The anchor cage is positioned 250mm – 300mm from formation level by use of adjustable legs. Reinforcement bars are then placed around the anchor cage, first radial bars, then concentric bars, shear bars and finally the superior group of bars. Earthing material is attached during the steel foundation build up. The level of the anchor cage will be checked again prior to the concrete pour and during the concrete pour.

Formwork to concrete bases will be propped/supported sufficiently so as to prevent failure. Concrete for bases will be poured using a concrete pump. Each base will be poured in three stages. Stage 1 will see the concrete being poured and vibrated in the centre of the anchor cage to bring the concrete up to the required level inside

the cage. Stage 2 will see the centre of the steel foundation being poured and vibrated to the required level. Stage 3 will see the remaining concrete being poured around the steel foundation to bring it up to the required finished level. After a period of time when the concrete has set sufficiently the top surface of the concrete surface is to be finished with a power float.

Once the base has sufficient curing time it will be filled with suitable fill up to existing ground level. The working area around the perimeter of the foundation will be backfilled with granular fill.

4.8.1.2 Site Roads and Hardstand Areas

4.8.1.2.1 *New Site Access Roads*

The construction methodology for the proposed new access roads and turbine hardstands is outlined as follows:

- *Prior to commencing the construction of the excavated roads, movements posts will be installed in areas where the peat depth is greater than 2.0m and in areas identified within the peat stability report (appendix 8-1) as requiring monitoring.*
- *Interceptor drains will be installed upslope of the access road alignment to divert any surface water away from the construction area.*
- *Excavation of roads will be to the line and level given in the design requirements. Excavation will take place to a competent stratum beneath the peat.*
- *Road construction will be carried out in sections of approximately 10m lengths i.e. no more than 10m of access road will be excavated without replacement with stone fill.*
- *Excavation of materials with respect to control of peat stability:*
    - *Acrotelm (to about 0.3 to 0.4m of peat) will be required for landscaping and will be stripped and temporarily stockpiled for re-use as required. Acrotelm stripping will be undertaken prior to main excavations.*
    - *Where possible, the acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation.*
    - *All catotelm peat (peat below about 0.3 to 0.4m depth, where present) will be transported immediately on excavation to the designated peat and spoil management areas or the borrow pit.*
- *Excavation side slopes in peat will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Should areas of weaker peat be encountered then slacker slopes will be required. Battering of the side slopes of the excavations will be carried out as the excavation progresses.*
- *End-tipping of stone onto the road during the construction/upgrading of the access road will be carefully monitored to ensure that excessive impact loading, which may adversely affect the adjacent peat, is limited.*
- *The excavated access road will be constructed with a minimum of 750mm of selected granular fill. Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works.*
- *Access roads will be finished with a layer of capping across the full width of the road.*
- *A layer of geogrid/geotextile may be required at the surface of the competent stratum, where this stratum is cohesive in nature.*
- *Where slopes of greater than 5 degrees are encountered along with relatively deep peat (i.e. greater than 1.5m) and where it is proposed to construct the access road perpendicular to the slope contours it is best practice to start construction at the bottom of the slope and work towards the top, where possible. This method avoids any unnecessary loading to the adjacent peat and greatly reduces any risk of peat instability.*
- *Where the above is not possible, a specific Risk Assessment Method Statement (RAMS) from the contractor will be produced, detailing how the downslope works will be undertaken, including that all plant would operate from the already constructed section of track, with no loading of the peat on the downslope slope and limiting the length of ground to be stripped/excavated at any one time. Movement monitoring posts (as described in the Peat &*

Spoil Management Plan, Appendix 4-2) will also be installed downslope of the works area to allow for ongoing monitoring during the construction works

- *A final surface layer will be placed over the excavated road and graded to accommodate wind turbine construction and delivery traffic.*

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4.8.1.2.2 Upgrading of Existing Site Access Road

Approximately 2.6km of the existing roads will require upgrading which will comprise widening of the roadway to a total running width of approximately five metres, with wider sections at corners and the laying of a new surface dressing on the existing section of roadway where necessary. A detailed drawing of this is included within the Site layout drawings associated with this EIAR and Planning Application. The road widening will be undertaken as follows:

1. *Access road construction will be to the line and level requirements as per design/planning conditions.*
2. *For upgrading of all existing access roads (Type A – Drawing P24-263-0600-0006) the following will apply:*
3. *Excavation of the access road will take place to a competent stratum beneath the peat, removing all peat and soft clay and backfilled with suitable granular fill.*
4. *Benching of the excavation will be required between the existing section of access road and the widened section of access road where the depth of excavation exceeds 500mm.*
5. *For a founded access road, the surface of the existing access road will be overlaid with up to 250mm of selected granular fill.*
6. *Access roads will be finished with a layer of capping across the full width of the road.*
7. *A layer of geogrid/geotextile may be required at the surface of the existing access road where the existing tracks shows signs of rutting, etc.*
8. *For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability.*

4.8.1.2.3 Upgrade to Existing Floating Road

The Section of floating road to be upgraded is shown in Figure 4-7 above. The general construction methodology for upgrading of existing sections of floating road, as presented in FTC's *Peat & Spoil Management Plan* in Appendix 4-2 of this EIAR, is summarised below;

1. *For upgrading of existing access tracks constructed using a floated construction technique (Type B – Drawing P24-263-0600-0007) the following will apply:*
2. *Prior to commencing floating road construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m.*
3. *Construction of road will be in accordance with appropriate design from the designer.*
4. *The surface of the existing access track should be graded/tidied up prior to the placement any geogrid/geotextile, where necessary (to prevent damaging the geogrid/geotextile).*
5. *Where granular fill has been used in the existing access track make-up, a layer of geogrid should be placed on top of the existing access track, extending to the full width of the proposed road.*
6. *The geogrid may be overlaid with up to 1000mm of selected granular fill on the widened sections of the access road.*
7. *Additional geogrid and granular fill may be required in certain sections of the works, such as where excessive rutting is noted in the existing track (to be confirmed by the designer).*
8. *Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will not be carried out.*

9. *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating road will be tipped over at least a 10m length of constructed floating road.*
10. *Following the detailed design of the floated access roads it may be deemed necessary to include pressure berms either side of the access road in some of the deeper peat areas. The inclusion of a 2 to 5m wide pressure berm (typically 0.5m in height) either side of the access road will reduce the likelihood of potential bearing failures beneath the access road.*
11. *Following end-tipping a suitable bulldozer will be employed to spread and place the tipped stone over the base geogrid along the line of the road.*
12. *At transitions between existing floating and existing excavated roads a length of about 10m shall have all peat excavated and replaced with suitable fill, with the geogrid extended into this fill. The surface of this fill shall be graded to accommodate wind turbine construction and delivery traffic.*
13. *The finished road width will have a minimum running width of 5m.*
14. *On side long sloping ground any road widening works required will be done on the upslope side of the existing access road.*
15. *A final surface layer shall be placed over the existing access track, as per design requirements, to provide a road profile and graded to accommodate wind turbine construction and delivery traffic.*
16. *The construction of access roads in areas of deep peat (greater than 2m) will be inspected on a routine basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/following trafficking by heavy vehicular loads.*

4.8.1.3 Temporary Construction Compound

The temporary construction compound will be constructed as follows:

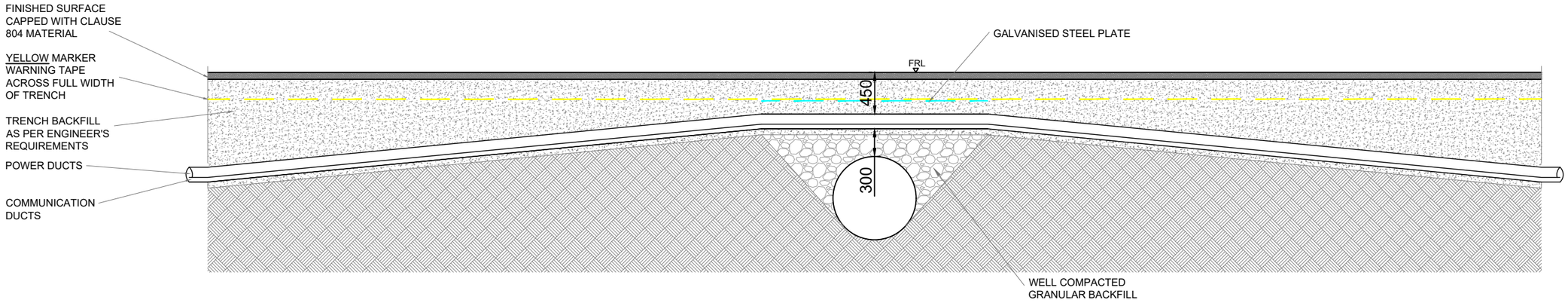
- The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter;
- The compound platform will be marked out using ranging rods or wooden posts and the soil and overburden stripped and temporarily stockpiled for later use in landscaping. Any excess material will be sent to one of the designated peat and spoil management areas.
- A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well graded granular material will be spread and lightly compacted to provide a hard area for Site offices and storage containers;
- Areas within the compound will be constructed as site roads and used as vehicle hardstanding's during deliveries and for parking;
- A bunded containment area will be provided within the compound for the storage of lubricants, oils and site generators etc;
- A waste storage area will be provided within the compound;
- The compound will be fenced and secured with locked gates if necessary; and,
- Upon completion of the construction phase of the Proposed Development, the temporary construction compound will be decommissioned and allowed to vegetate naturally.

4.8.1.4 Culvert Crossing

All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Proposed Development will be suitably sized for the expected peak flows in the watercourse. Some culverts may be installed to manage drainage waters from works areas of the Proposed Development, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base but will have a minimum 900m diameter. In all cases, culverts will be oversized to allow mammals to pass through the culvert.

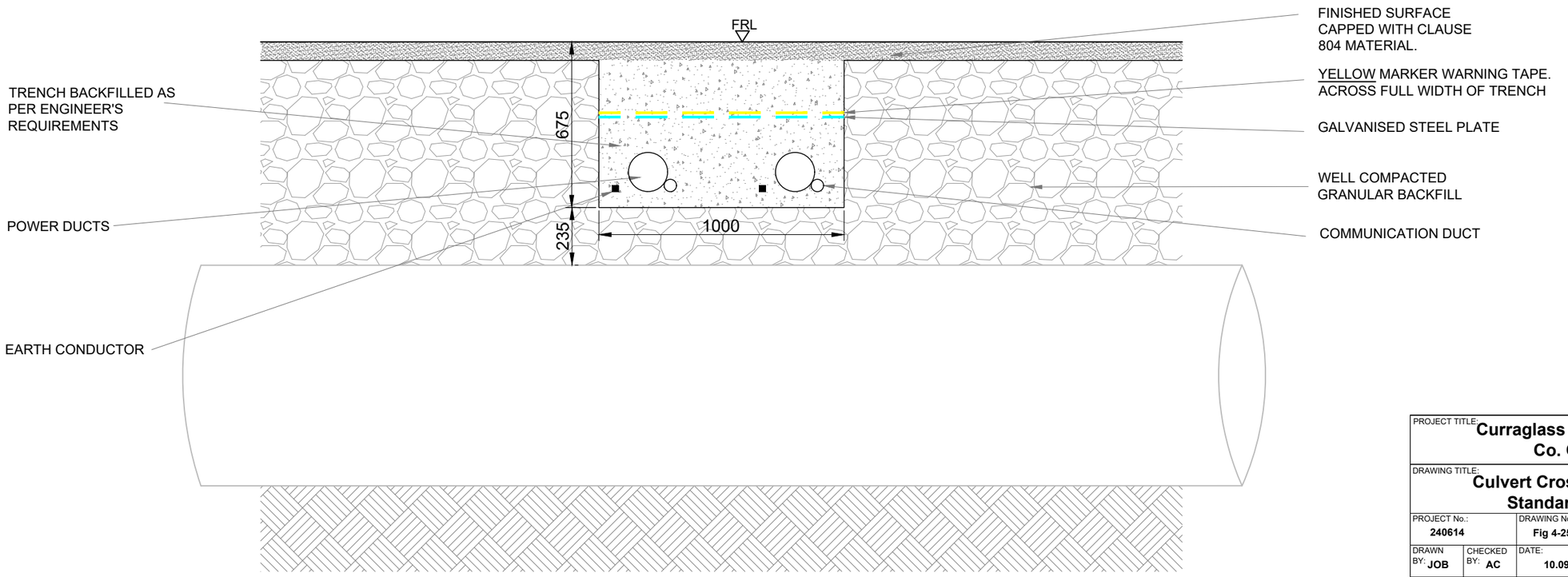
Culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the road at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary.

All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Please see Figure 4-25 for details.



Culvert Crossing - 33kV - Longitudinal Section

SCALE 1:50



Culvert Crossing - 33kV - Cross Section

SCALE 1:20

PROJECT TITLE: **Curraglass Wind Farm, Co. Cork**

DRAWING TITLE: **Culvert Crossing - 33kV Standard Detail**

PROJECT No.:	DRAWING No.:	SCALE:
240614	Fig 4-25	As Shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	10.09.2025	P01

Email: info@www.mkoireland.ie /Website: www.mkoireland.ie

4.8.1.5 Underground Electrical (20/33kV) and Communication Cabling

The transformer in each turbine is connected to the existing onsite 38kV substation through a network of buried electrical cables. The ground is trenched typically using a mechanical excavator. The top layer of soil is removed and saved so that it is replaced on completion. The cables are bedded with suitable material unless the ground conditions are such that no bedding is required. The cables will be laid at a depth that meets relevant national and international requirements and will generally be approximately 1.2m below ground level; a suitable marking tape is installed between the cables and the surface (see Plate 4-6 below). On completion, the ground will be reinstated as previously described above in Section 4.4.1.2. The route of the cable ducts will follow the access track to each turbine location and are shown on the Site layout drawings included as Appendix 4-1 of the EIAR. The cabling may be located on either side of the road and/or within the road footprint.

Plate 4-2 Typical Cable Trench View

Where any underground services are encountered along the internal wind farm IPP cabling route, they will be traversed using one of the methods outlined in Section 4.8.1.5.1

4.8.1.5.1 *Existing Underground Services*

Where feasible, new cabling routes will be aligned to avoid direct conflict with the existing underground services, thereby minimising the need for removal or disturbance. Prior to commencement of trenching works any underground services encountered along the cable routes will be surveyed for cable level and the new ducting will pass over the service, provided that adequate cover is available. A minimum clearance of 300 mm will be required between the bottom of the ducts and the service in question. If a horizontal clearance cannot be achieved, the ducting will pass under the service and again 300 mm clearance between the top of the communications duct and bottom of the service will be achieved. In deeper excavations an additional layer of marker tape will be installed between the communications duct and top-level yellow marker tape.

4.8.1.6 Peat and Spoil Management Areas

The following recommendations and best practice guidelines for the placement of peat and spoil in identified peat and spoil management areas will be adhered to during the construction of the Proposed Development:

- Excavated peat and spoil will be placed/spread across the existing hardstand areas at 3 no. locations. These locations are shown in Drawing P24-264-0600-0005, with a detail shown on drawing P24-264- 0600-0010.
- The peat and spoil placed within the areas shown on Drawing P24-264-0600-0005 will be restricted to a maximum height of 1.0m for peat, and 1.5m for spoil. Any weak/liquified peat (if any is encountered) will be placed within the proposed borrow pit and not stored within these areas.
- The surface of the placed peat and spoil will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat and spoil will be carried out as placement of peat within the designated peat and spoil management areas progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat.
- Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h), and no greater than 1 (v):2 (h) in the placed spoil. This slope inclination will be reviewed during construction, as appropriate.
- The acrotelm will be placed on the finished surface with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the placed peat and spoil within the designated peat and spoil management areas.
- Supervision by the Project Geotechnical Engineer will be undertaken during the works.
- An interceptor drain will be installed upslope of the designated peat and spoil management areas to divert any surface water away from these areas. This will help ensure stability of the placed peat/spoil and reduce the likelihood of debris run-off.
- All the above-mentioned general guidelines and requirements will be undertaken by the Contractor during construction.

All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Engineer prior to construction.

4.9 Community Gain Proposal

4.9.1 Background

The Proposed Development has the potential to have significant benefits for the local economy, by means of job creation, landowner payments and commercial rate payments. An important part of a renewable energy development, which Wingleaf Ltd. has been at the forefront of developing is its Community Benefit Fund. The concept of directing benefits from wind farms to the local community is promoted by the National Economic and Social Council (NESC) and the Wind Energy Ireland (WEI) among others. While it may be simpler and easier to put a total fund aside for a wider community area, Wingleaf Ltd. is endeavouring to develop new ways to direct increased gain towards the local community with particular focus on those living closest to the Proposed Development.

The applicant company has given careful consideration to the issue of community gain arising from the Proposed Development, if permitted and constructed. Community gain from significant development proposals, including wind farms, whilst a relatively recent approach, is now a common consideration for developers and, indeed, planning authorities. This approach recognises that, with any significant wind farm proposal, the locality in which the Proposed Development is situated is making a significant contribution towards helping achieve national renewable energy and climate change targets, and the local community should derive some benefit from accommodating such a development in their locality.

Community gain proposals can take a number of forms, generally depending on the nature and location of the Proposed Development and the nature and make-up of the local community. The nature of the community gain proposal will be subject to discussions with and input from the local community. In some instances, funds are paid by the developer, either annually or as a one-off payment, to a community fund that is administered as agreed by the community. These funds may then be used for a variety of projects, such as environmental improvements, local amenities and facilities, voluntary and sporting groups and clubs, educational projects, energy efficiency improvement works and direct payments to nearby households.

A Community Report is included as Appendix 2-1 to this EIAR, which sets out further detail on the proposals for the Community Benefit Fund.

4.9.2 Renewable Energy Support Scheme

The Renewable Electricity Support Scheme (RESS) is a Government of Ireland initiative that provides support to renewable electricity projects in Ireland. RESS is a pivotal component of the Programme for Government and the Climate Action Plan 2021, 2023, 2024 and 2025 and is a major step in achieving Ireland's target of at least 80% renewable electricity by 2030. RESS 1, the inaugural Renewable Electricity Support Scheme concluded in 2020. RESS 2 followed in 2022, with successful projects from this auction expected to increase Ireland's renewable electricity generation capacity by nearly 20% between 2023 and 2025. In preparation for RESS 3, a public consultation was held in 2022 to refine the Terms and Conditions based on the outcomes of RESS 2, closing in December of that year. RESS 3 was conducted in 2023 and concluded in September. RESS 4 took place in 2024, closing in August, with 27 out of 43 submitted projects deemed successful in the auction. RESS 5 commenced in May 2025. The auction submission date is September 2025 and the final auction results are expected on the 15 October 2025. One of the key objectives of RESS is to provide an Enabling Framework for Community Participation through the provision of pathways and supports for communities to participate in renewable energy projects.

The Renewable Energy Support Scheme (RESS) Terms and Conditions, published by the Department of Communications, Climate Action and Environment on in February 2020, make some high-level provisions for how this type of benefit fund will work. Any project which wants to avail of RESS must abide by these broad principles. These include the following:

1. *A minimum of €1,000 shall be paid to each household located within a distance of a 1-kilometre radius from the Project;*
2. *In respect of Onshore Wind RESS 2 Projects, a minimum of €1,000 shall be paid to each household located within a distance of a 1-kilometre radius from the Onshore Wind RESS3 Project. The 1-kilometre distance specified is measured from the base of the nearest turbine of the RESS 3 Project to the nearest part of the structure of the household, the location of which is identified in the An Post's GeoDirectory;*
3. *A minimum of 40% of the funds shall be paid to not-for-profit community enterprises whose primary focus or aim is the promotion of initiatives towards the delivery of the UN Sustainable Development Goals, in particular Goals 4, 7, 11 and 13, including education, energy efficiency, sustainable energy and climate action initiatives;*
4. *A maximum of 10% of the funds may be spent on administration. This is to ensure successful outcomes and good governance of the Community Benefit Fund.*
5. *The balance of the funds shall be spent on: (i) initiatives successful in the annual application process, as proposed by clubs and societies and similar not-for-profit entities; and (ii) in respect of Onshore Wind RESS 3 Projects, on "near neighbour payments" for households located outside a distance of 1 kilometre from the RESS 3 Project but within a distance of 2 kilometres from such RESS 3 Project. The distance specified is from the base of the nearest turbine to the nearest part of the structure of the occupied residence, the location of which is identified in the An Post's GeoDirectory.*

4.9.3 Community Benefit Fund

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

The Community Benefit Fund belongs to the local community. The premise of the fund is that it should be used to bring about significant, positive change in the local area. To make this happen, the first task will be to form a benefit fund development working group that clearly represents both the close neighbours to the project as well as nearby communities. This group will then work on designing the governance and structure of a community entity that would administer the Community Benefit Fund.

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

Should the Proposed Development be developed under the current RESS T&C's, it would attract a community contribution in the region of €88,000/year for the local community (estimated based on an average energy yield) over the first 15 years of operation of the Proposed Development. The value of this fund would be directly proportional to the electricity generated by the wind farm. Under the current RESS T&Cs, the following is the recommended breakdown of the fund:

- **Direct payments** – to those living closest to the Proposed Development. A minimum €1,000 payment per annum for houses within 1km of the Proposed Development.
- **Energy Efficiency** – A minimum of 40% per year would be available for local groups, clubs and not for profit organisations that provide services in the local area. This would include services for the elderly, local community buildings, and the development of sporting facilities such as all-weather playing pitches etc.
- **Administration costs** – a maximum of 10% per year will be made available for the administration and governance costs of the fund.
- **Support for Local Groups** – The remaining balance of this community benefit fund would be available for the development of energy initiatives to benefit people living in the local area. This is to be provided to not-for-profit community enterprises each year.-

Should the Proposed Development not be developed under RESS, the Applicant is committing that for each megawatt hour (MWh) of electricity produced by the wind farm, the project will contribute €1 into a community fund for the entire operational life of the Proposed Development. This would equate to an estimated annual fund of €44,000 (using the same formula as above), which across the 35-year operational lifespan would result in funding in the order of €1,540,000 to the local community which is a substantial contribution. The number and size of grant allocations will be decided by a Community Fund liaison committee with various groups and projects benefiting to varying degrees depending on their funding requirement. Please see Appendix 2-1 Curraglass Wind Farm Community Engagement Report for details.

4.10 Operation

The Proposed Development is expected to have a lifespan of approximately 35 years. As part of the Proposed Development planning application, permission is being sought for a 35-year operation period commencing from the date of full operational commissioning of the Proposed Development. During the operational period, on a day-to-day basis the wind turbines will operate automatically, responding by means of meteorological equipment and control systems to changes in wind speed and direction.

The wind turbines will be connected together and data relayed from the wind turbines to a central control unit at the existing onsite 38kV substation which will facilitate off-site remote monitoring of the wind farm. Each turbine will be monitored off-site by the appointed Operations and Maintenance contractor (typically the wind

turbine manufacturer) and also a wind farm operations management company. The monitoring of turbine output, performance, wind speeds, and responses to any key alarms will be monitored off-site by both parties 24-hours per day. Regular on-site visual inspections will also be carried out by the wind farm operations management company.

4.10.1 Maintenance

Each turbine will be subject to a routine maintenance programme involving several checks and changing of consumables, including oil changes. In addition, there is often a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes requiring a crane. Typically, maintenance traffic will consist of four-wheel drive vehicles or vans. The Site roads will also require periodic maintenance.

The existing onsite 38kV substation and site tracks will also require periodic maintenance. The existing onsite 38kV substation would be operational 24 hours per day, 7 days a week throughout the year. Substations can be operated remotely and manually. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link. The following maintenance procedures will also be adhered.

1. Periodic service and maintenance work which include some vehicle movement.
2. For operational and inspection purposes, substation access is required.
3. Servicing of the substation equipment will be carried out in accordance with the manufacturer's specifications, which would be expected to entail the following:
    - Six-month service – three-week visit
    - Annual service – six-week visit
    - Weekly visits as required.

Occasional technical problems may require maintenance visits by technical staff. During the six-month and annual service visits, some waste (lubricating and cooling oils, packaging from spare parts or equipment, unused paint, etc.) will arise. This will be recorded and removed from the Site and reused, recycled or disposed of in accordance with the relevant legislation in an authorised facility.

It is estimated that 1-2 daily visits will be made to the Site for authorised persons and vehicles to undertake minor routine maintenance and inspection, if and when required. Although the level of activity required for the maintenance of the Proposed Development is minimal, the impacts associated with traffic volumes for this period are assessed in Chapter 15 (Material Assets).

4.10.2 Monitoring

Section 8 of the CEMP sets out a programme of monitoring required for the operational phase of the project. The CEMP should be consulted for detailed information on the monitoring requirements during the operational phase, however a brief summary of the key information is provided below:

- Monthly water sampling and laboratory analysis will be undertaken for the first six months during the operational phase.
- The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored.
- Post-construction bird monitoring will be carried out in accordance with the Bird Monitoring Plan provided in Appendix 7-7.
- Post-construction bat monitoring will be carried out in accordance with the Bat Report recommendations in Appendix 6-1.
- Post-construction biodiversity enhancement management will be carried out in accordance with the Biodiversity Management Enhancement Plan in Appendix 6-5.
- Post turbine commissioning noise monitoring will be commenced within 6 months of commissioning the wind farm.

4.11 Decommissioning

The proposed turbines are expected to have a lifespan of approximately 35 years. Following the end of their useful life, the equipment may be replaced with a new technology, subject to planning permission being obtained, or the Proposed Development may be decommissioned fully.

Upon decommissioning of the Proposed Development, the wind turbines and met mast will be disassembled in reverse order to how they were erected. All above ground turbine and mast components would be separated and removed off-site for recycling. Turbine and mast foundations would remain underground and would be covered with earth and allowed to revegetate Leaving the foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in unnecessary environment emissions such as noise, dust and/or vibration.

The onsite 38kV substation will be disconnected from the grid prior to decommissioning. All above ground components and electrical plant will be dismantled. The underground cabling associated with the substation will be cut at either end and pulled from the underground ducting onto a cable drum. All materials will then be segregated and transported off-site to an appropriate facility and will be reconditioned and reused or recycled where possible. The substation will be demolished and the footprint will be covered with earth and reseeded with an appropriate seed mix.

The underground electrical cabling connecting the turbines and met mast to the existing onsite 38kV substation will be removed from the cable ducts. The cabling will be pulled from the cable ducts using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at the original cable jointing pits which will be excavated using a mechanical excavator and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The cable materials will be transferred to a suitable recycling or recovery facility.

Site roadways are in use for purposes other than the operation of the Proposed Development, and therefore it is considered more appropriate to leave the Site roads in situ for future use. It is envisaged that the roads will serve as agricultural/ forestry roads for local landowners.

The existing 38kV overhead line will remain in place as it is an existing grid operator asset.

A Decommissioning Plan has been prepared (Appendix 4-6) the detail of which will be agreed with the local authority prior to any decommissioning. The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will be agreed with the competent authority at that time. The potential for effects during the decommissioning phase of the Proposed Development has been fully assessed in the EIAR.

As noted in the Scottish Natural Heritage report (SNH) *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013) reinstatement proposals for a wind farm are made approximately 30 years in advance, so within the lifespan of the Proposed Development, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is therefore:

> *"best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm".*