Environmental Impact Assessment Report (EIAR)

Proposed Cahermurphy West Wind Farm, Co. Clare

Chapter 4: Description of the Proposed Project

DOCUMENT DETAILS

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Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
F	Final	16.03.2026	MC	EMC

Table of Contents

TABLE OF TABLES

TABLE OF PLATES

TABLE OF FIGURES

4. DESCRIPTION OF THE PROPOSED PROJECT

4.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) describes the development and its component parts (the 'Proposed Project') including the works subject of two proposed applications for planning permission to An Coimisiún Pleanalá.

The Chapter is divided into six sections, as outlined below:

- Section 1 sets out the two proposed applications and the nature and extent of the overall project.
- Section 2 sets out the elements of the Proposed Wind Farm site which is subject to the Section 37E planning application including the construction methodologies.
- Section 3 sets out the elements of the Grid Connection which is subject to the Section 182A planning application including the construction methodologies.
- Section 4 sets out a programme for the timing of the works and the construction management proposals for the Wind Farm and Grid Connection.
- Section 5 provides a description of the operational phase for the Wind Farm and Grid Connection.
- Section 6 provides a description of the decommissioning phase for the Wind Farm and Grid Connection.

The full description of the Proposed Project, as per the public planning notices is as follows:

An Coimisiún Pleanalá – Planning Notice Project Description – Proposed Wind Farm

i. *Construction of 8 no. wind turbines with a blade tip height range from 180m to 185m inclusive, a hub height range from 98.5m to 110.5m inclusive and a rotor diameter range from 149m to 163m inclusive with associated foundations, hard-standing and assembly areas.*
ii. *Construction of 1 no. permanent 110 kV electrical substation including 2 no. control buildings lightening protection, welfare facilities, car parking, and all associated electrical plant and apparatus, security fencing, external lighting, underground cabling, wastewater holding tank and all associated infrastructure, apparatus and landscaping;*
iii. *Underground electrical cabling (33kV) and communications cabling connecting the wind turbines to the proposed on-site 110kV electrical substation and associated ancillary works;*
iv. *Erection of 1 no. Meteorological Mast of 100m metres above existing ground level for the measuring of meteorological conditions, including a lightning rod which will extend above the mast ;*
v. *Construction of new permanent access roads and upgrade of existing roads to provide access within the site and to connect the wind turbines and associated infrastructure;*
vi. *Upgrade of 1 no. new existing agricultural/forestry access to the site, off the L6254 local road, to serve as the sole entrance to the wind farm during its operational phase and to facilitate the delivery of the construction materials and turbine components to site during the construction and operational phases (including the installation of security fencing and gates);*
vii. *Development of 2 no. borrow pits;*

viii. *Construction of 2 no. temporary construction compounds and associated ancillary infrastructure including temporary site offices, staff facilities and car-parking areas, all to be removed at end of construction phase;*
ix. *Temporary works at 6 no. locations along the N68 national road, R484 regional road and L-2074, L-2082 and L-2048 local roads associated with the facilitation of turbine component and abnormal load delivery to site. These works will primarily include the trimming of vegetation and strengthening of road verges;*
x. *Permanent and temporary Site Drainage;*
xi. *Operational Stage Site Signage;*
xii. *Ancillary forestry felling to facilitate construction and operation of the proposed development;*
xiii. *Biodiversity enhancement measures including the permanent removal of commercial forestry (deforestation) over an area of 56.3ha and restoration of farmland habitat to good quality hen harrier foraging habitat through diversifying the range and extent of habitats over an area of 67.4ha, and;*
xiv. *All related site works and ancillary development including landscaping considered necessary to facilitate the proposed development*

This application seeks a 10-year planning permission and a 35-year operational life from the date of commissioning of the entire wind farm.

An Coimisiún Pleanalá – Planning Notice Project Description – Grid Connection

i. *The provision of c.25km of underground electrical cabling (110kV) from the proposed Cahermurphy West Wind Farm development to the existing Moneypoint 110kV electrical substation to facilitate the connection to the national grid;*
ii. *Provision of 36 no. joint bays, communication chambers and earth sheath links along the proposed underground electrical cabling route;*
iii. *Permanent and temporary Site Drainage;*
iv. *Reinstatement of land, road and track surface above the proposed cabling trench;*
v. *All related site works and ancillary development considered necessary to facilitate the proposed development.*

For the purposes of this EIAR:

- Where the 'Proposed Project' is referred to, this relates to all the project components described in detail in Chapter 4 of this EIAR i.e. Proposed Wind Farm and Proposed Grid Connection as detailed below.
- Where 'the Site' is referred to, this relates to the primary study area for the EIAR, as delineated by the EIAR Site Boundary in green as shown on Figure 1-1. Generally, the study area extends beyond the planning application site boundary depending on the requirements of individual assessments. Individual topics for assessment purposes, i.e., each chapter, will indicate the study area used for that topic. The planning application red line boundary occupies a smaller area within the primary EIAR Site Boundary. The EIAR Site Boundary represents the primary area of study and not necessarily areas where proposed works will occur as part of the Proposed Project. The EIAR Site Boundary encompasses an area of approximately 637 hectares (ha). Where the 'Application Site Boundary' is referred to, this refers to the planning application boundaries as shown in Figure 1-4 below and Appendices 4-1 and 4-2, of this EIAR. Two planning application boundaries are included for within the Proposed Project, which denote the 'Proposed Wind Farm' and 'Proposed Grid Connection' as outlined below. Both Application Site Boundaries are shown in Figure 1-4.
- Where the 'Proposed Wind Farm' is referred to, this refers to turbines and associated foundations and hard-standing areas, meteorological mast, site entrance, junction accommodation works, access roads, accommodation works along the turbine delivery route (TDR Works), temporary construction compounds, temporary

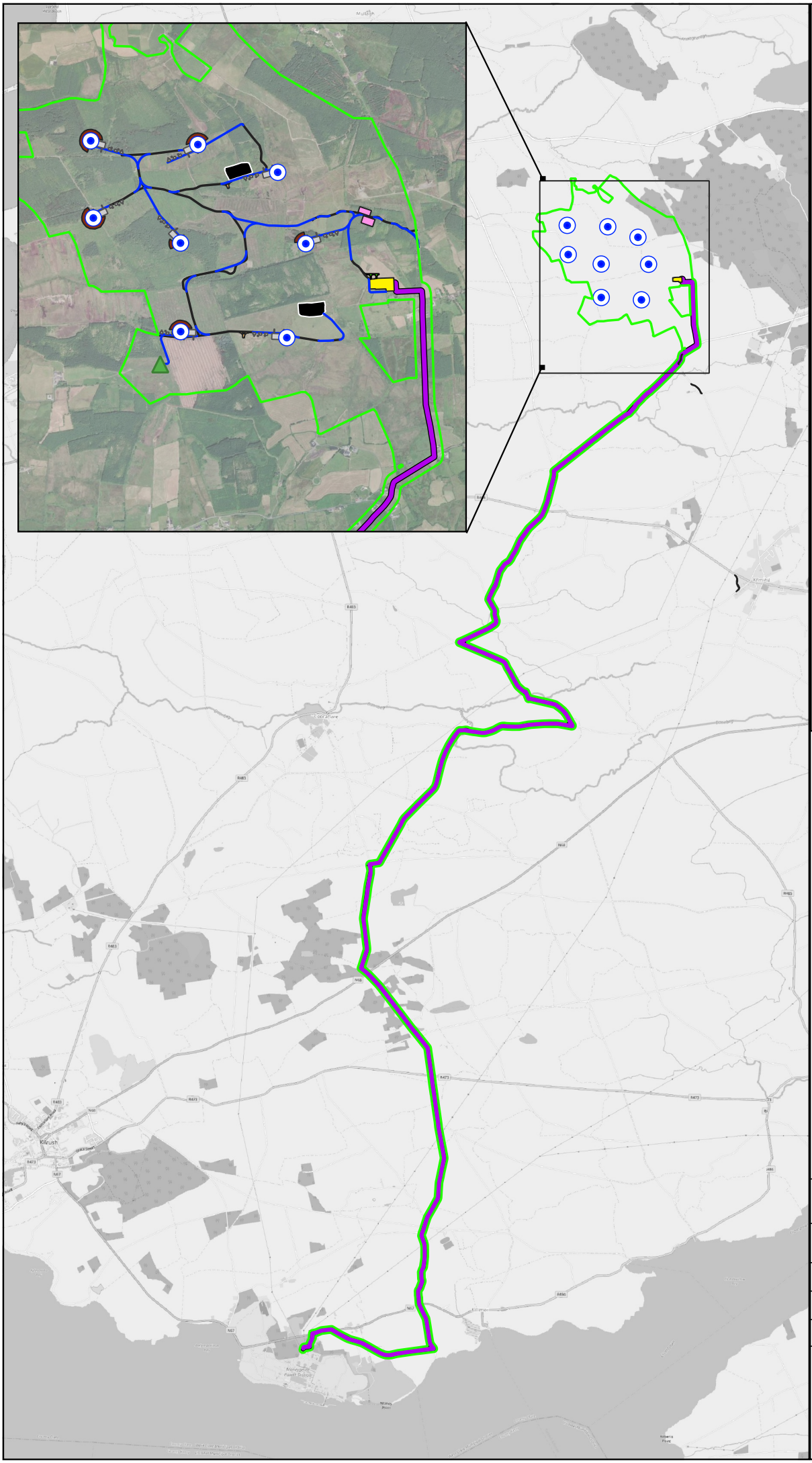
transition compound, 110kV electrical substation, underground cabling, borrow pits, site drainage, tree felling, biodiversity management and enhancement measures and all ancillary works. The Proposed Wind Farm site (EIAR Site Boundary without corridor that encompasses the Proposed Grid Connection) is shown in Figure 1-2. The Proposed Wind Farm site encompasses an area of approximately 375 hectares (ha). The permanent footprint of the Proposed Wind Farm measures approximately 15.55 ha, which represents approximately 4.1% of the Proposed Wind Farm site.

- Where 'Proposed Grid Connection' is referred to, this refers to the underground 110kV electrical cabling and all associated site development works connecting the Proposed Wind Farm to the existing Moneypoint 110kV electrical substation in the townlands of Carrowdotia South and Carrowdotia North, Co. Clare. The Proposed Grid Connection is shown in Figure 1-3.
- Where 'the Applicant' is referred to, this refers to Cahermurphy West Designated Activity Company (DAC), who are discussed further in Section 1.4 of this EIAR.

4.1.2 Project Layout

The layout of the Proposed Project has been designed to minimise the potential environmental effects of the wind farm, while at the same time maximising the energy yield of the wind resource passing over the Proposed Wind Farm site. A constraints study, as described in Section 3.6.1 of this EIAR, has been carried out to ensure that turbines and ancillary infrastructure are located in the most appropriate areas of the Proposed Wind Farm site. The Proposed Wind Farm site layout makes maximum use of the existing access road and tracks within the Site.

The overall layout of the Proposed Project is shown on Figure 4-1. The layout for the Proposed Wind Farm site application under Section 37E of the Planning and Development Act 2000, as amended, is shown in Figure 4-1a. This drawing shows the proposed locations of the wind turbines, electrical substation, borrow pits, temporary construction compounds, internal roads layout, temporary transition compound and the main site entrance. The layout for the Proposed Grid Connection Application under Section 182A of the Planning and Development Act 2000, as amended, is shown in Figure 4-1b. Detailed site layout drawings of the Proposed Project are included in Appendix 4-1 and Appendix 4-2 to this EIAR.



Drawing Title: Proposed Project Layout

Project Title: Cahermurphy West Wind Farm

Drawn By	Checked By
MC	EMC
Project No.	Drawing No.
230843	Figure 4-1
Scale	Date
1:80,000	08.01.2026

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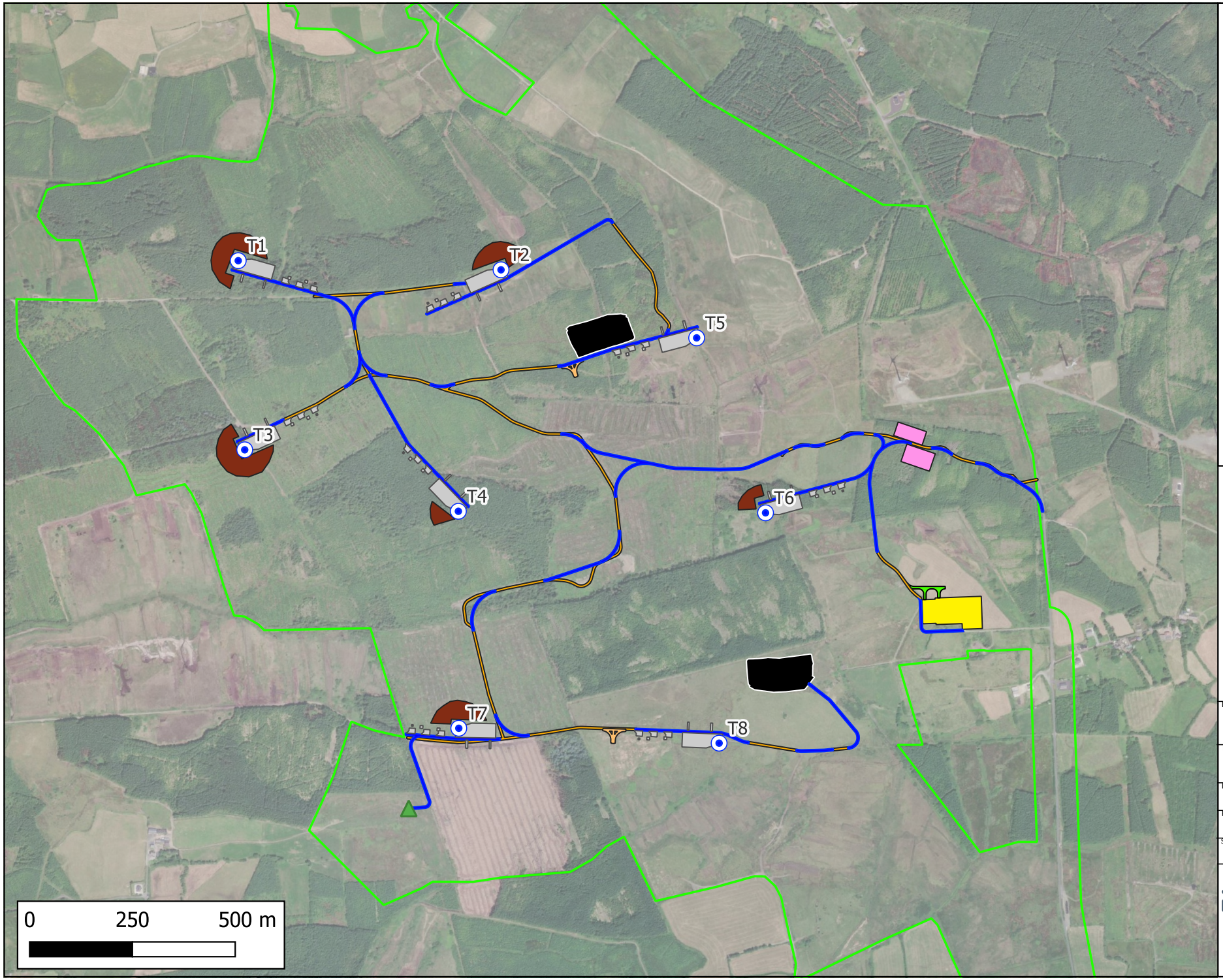

Map Legend

- EIAR Site Boundary
- Proposed Turbine Location
- Proposed Met Mast Location
- Proposed Hardstand
- Existing Roads to be Upgraded
- Proposed New Roads
- Temporary Transformer Delivery Road
- Proposed Turning Heads
- Proposed 110kV Substation
- Proposed Temporary Construction Compounds
- Peat Placement Areas
- Proposed Borrow Pit

Drawing Title

Proposed Wind Farm

Project Title: Cahermurphy West Wind Farm	
Drawn By: MC	Checked By: EMC
Project No.: 230843	Drawing No.: Figure4-1a
Scale: 1:12,000	Date: 08.01.2026

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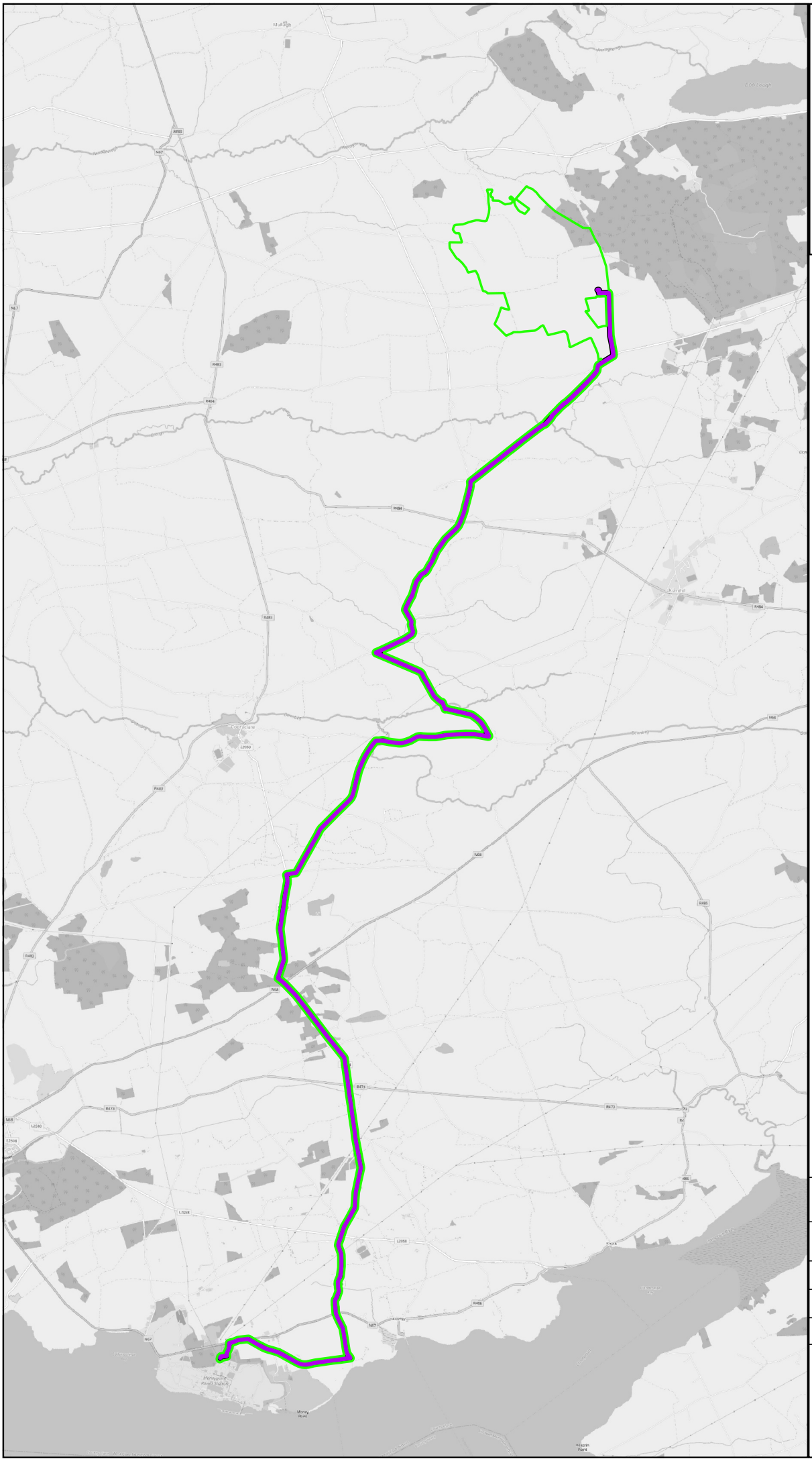

Map Legend

EIAR Site Boundary

Proposed Grid Connection

Drawing Title: Proposed Grid Connection

Project Title: Cahermurphy West Wind Farm

Drawn By	Checked By
MC	EMC
Project No.	Drawing No.
230843	Figure 4-1b
Scale	Date
1:80,000	12.12.2025

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4.2 Development Components of the Proposed Wind Farm site

The following sections will describe each of the development components within this planning application in further detail, in the following order:

1. *Wind Turbines*
2. *Access Roads*
3. *Onsite 110kV Electrical Substation and Control Building*
4. *Internal Site Cabling*
5. *Meteorological Mast*
6. *Proposed Wind Farm Site Entrance*
7. *Borrow Pits*
8. *Peat and Spoil Management Plan*
9. *Temporary Construction Compounds*
10. *Turbine Component and Abnormal Load Delivery Works*
11. *Ancillary Forestry Felling*
12. *Hen Harrier Enhancement Plan*
13. *Site Drainage Measures*

Detailed site layout drawings of the Proposed Project are included in Appendix 4-1 and Appendix 4-2 of this EIAR.

4.2.1 Wind Turbines

4.2.1.1 Turbine Locations

The proposed wind turbine layout has been optimised using industry standard wind farm design software to maximise the energy yield from the site, while maintaining sufficient distances between the proposed turbines to ensure turbulence and wake effects do not compromise turbine performance. The Grid Reference coordinates of the proposed turbine locations are listed in Table 4-1 below.

Table 4-1 Proposed Wind Turbine Locations and Elevations

Turbine No.	Irish Transverse Mercator Co-ordinates		Top of Foundation Elevation (m OD)
	Easting (m)	Northing (m)	
1	507772	669761	89.5m
2	508411	669739	100.5m
3	507788	669301	115m
4	508308	669151	112m
5	508887	669573	133m
6	509055	669148	122m
7	508309	668624	116.5m
8	508942	668587	113.5m

4.2.1.2 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

Figure 4-2: Wind Turbine Components

The Proposed Wind Farm planning application includes a design flexibility opinion from the Commission to allow for a limited range of turbine dimensions under Section 37CD(1) of the PDA (case reference ABP-323567-25). The details consist of the following:

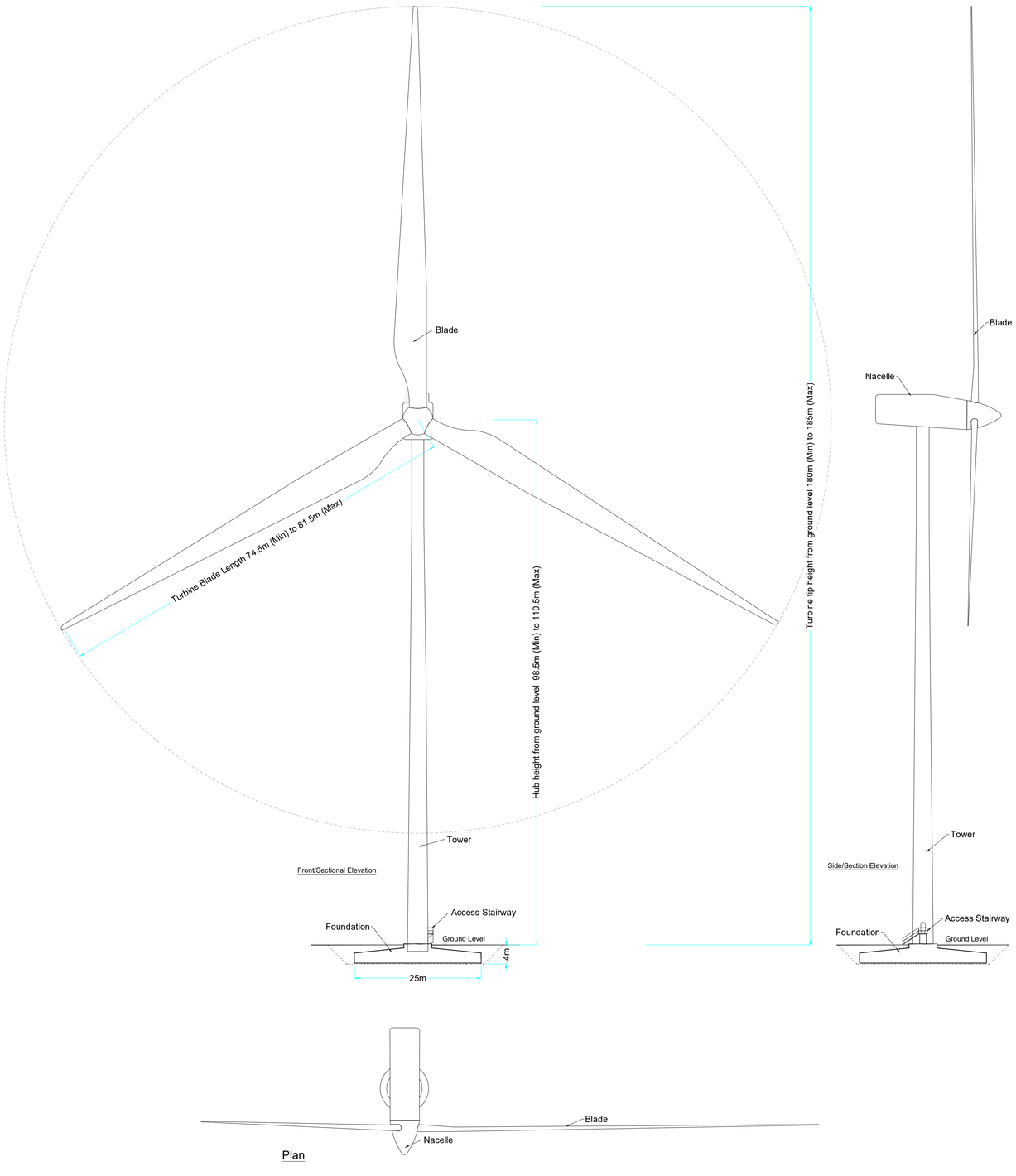
- Turbine Dimensions
  - Tip Height
  - Rotor Diameter
  - Hub Height

The proposed wind turbines to be installed on the Proposed Wind Farm site will have a ground-to-blade tip height, hub height and blade length within the following, limited, ranges:

- Tip Height – Maximum height 185 metres, Minimum height 180 metres
- Hub Height – Maximum height 110.5 metres, Minimum height 98.5 metres
- Blade Length: - Maximum length 81.5 metres, Minimum length 74.5 metres.

For the purposes of this EIAR, various types and sizes of wind turbines, within the proposed ranges outlined above, have been selected and considered in the relevant sections of the EIAR. This allows for a robust assessment of the proposed range of dimensions. Turbine design parameters have a bearing on the assessment of shadow flicker, noise, visual impact, traffic and transport and ecology (specifically birds), as addressed elsewhere in this EIAR.

It should also be noted that the assessment of the development footprint of the Proposed Project site, within this EIAR, is based on the potential footprint for all of the infrastructural elements. This precautionary approach is taken as the assessment of the maximum development footprint will, in the absence of mitigation measures, give rise to the greatest potential for significant effects. However, a range of turbine dimensions are assessed throughout where applicable.



Drawing Notes

1. Proposed wind turbines to have a maximum ground to blade tip height of 185m, blade length of 74.5m - 81.5m and hub height of 98.5m - 110.5m
2. Ground level represents the top of turbine foundation.

PROJECT TITLE: **Proposed Cahermurphy West Wind Farm, Co. Clare**

DRAWING TITLE: **Wind Turbine Elevation & Plan**

PROJECT No.:	DRAWING No.:	SCALE:
230843	Fig 4-3	1:500 @ A1

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	03.03.2026	D01

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A drawing of the proposed wind turbine range is shown in Figure 4-3. Figure 4-3 also shows the turbine base layout, including turbine foundation, hard standing 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.

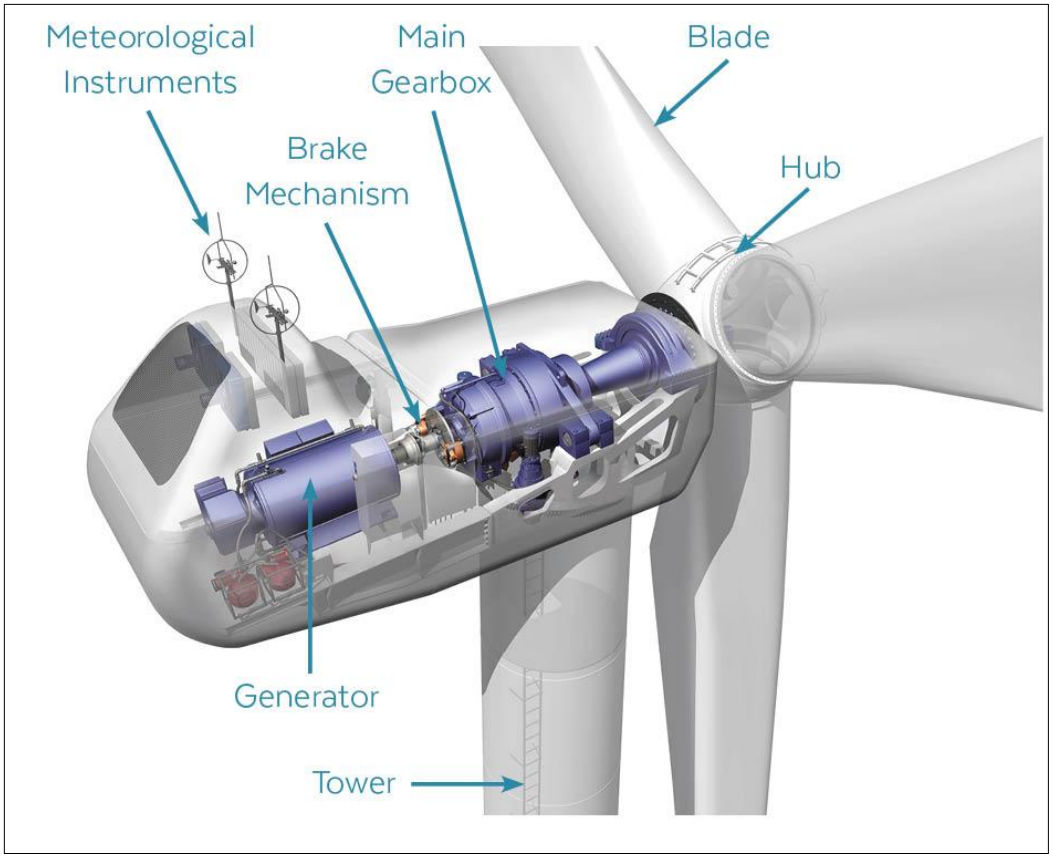


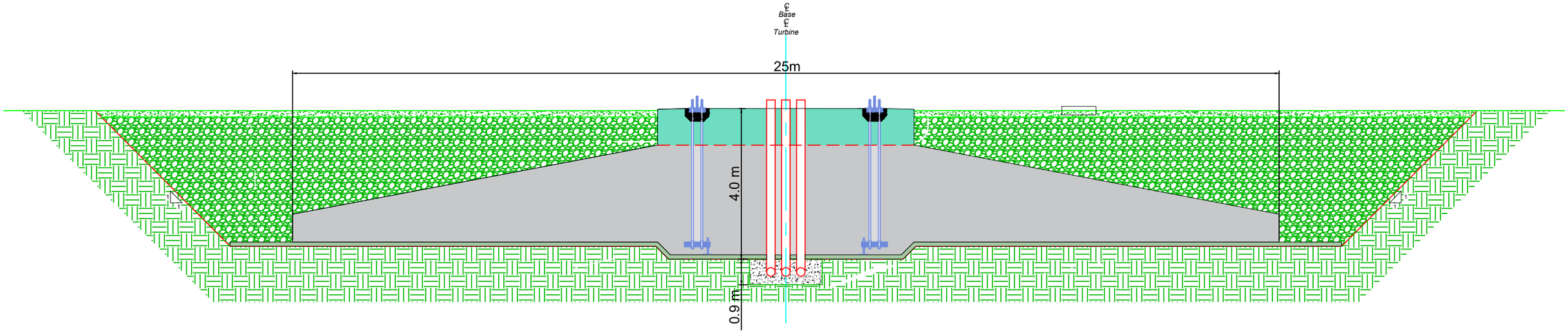
Figure 4-4 Turbine nacelle and hub components

4.2.1.3 Turbine Foundations

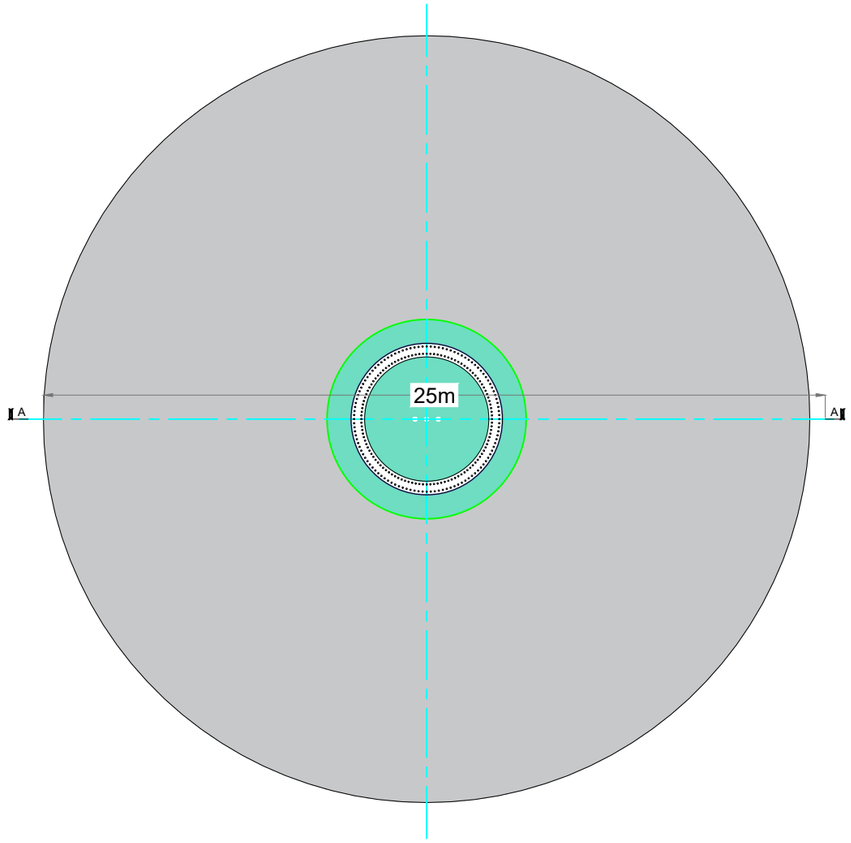
Each wind turbine is secured to a reinforced concrete foundation that is installed below the finished ground level. The turbine foundation transmits any load on the wind turbine into the ground. The horizontal and vertical extent of a turbine's foundation is shown in Figure 4-5. The foundation footprint, which measures 25m in diameter and 3.8m in depth at each proposed turbine location, is assessed in this EIAR.

After the foundation level of each turbine has been formed using piling methods or on competent strata, the bottom section of the turbine tower "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 below).

Section A-A
Scale 1:100



Plan
Scale: 1:200



PROJECT TITLE:
Proposed Cahermurphy
West Wind Farm, Co. Clare

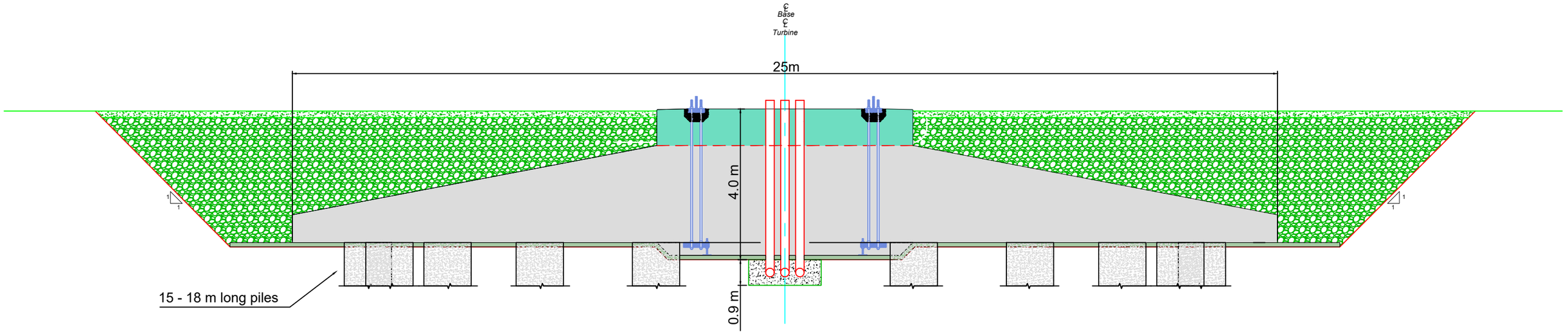
DRAWING TITLE:
Gravity Foundations Details

PROJECT No.:	DRAWING No.:	SCALE:
230843	Fig 4-5a	As Shown @ A3

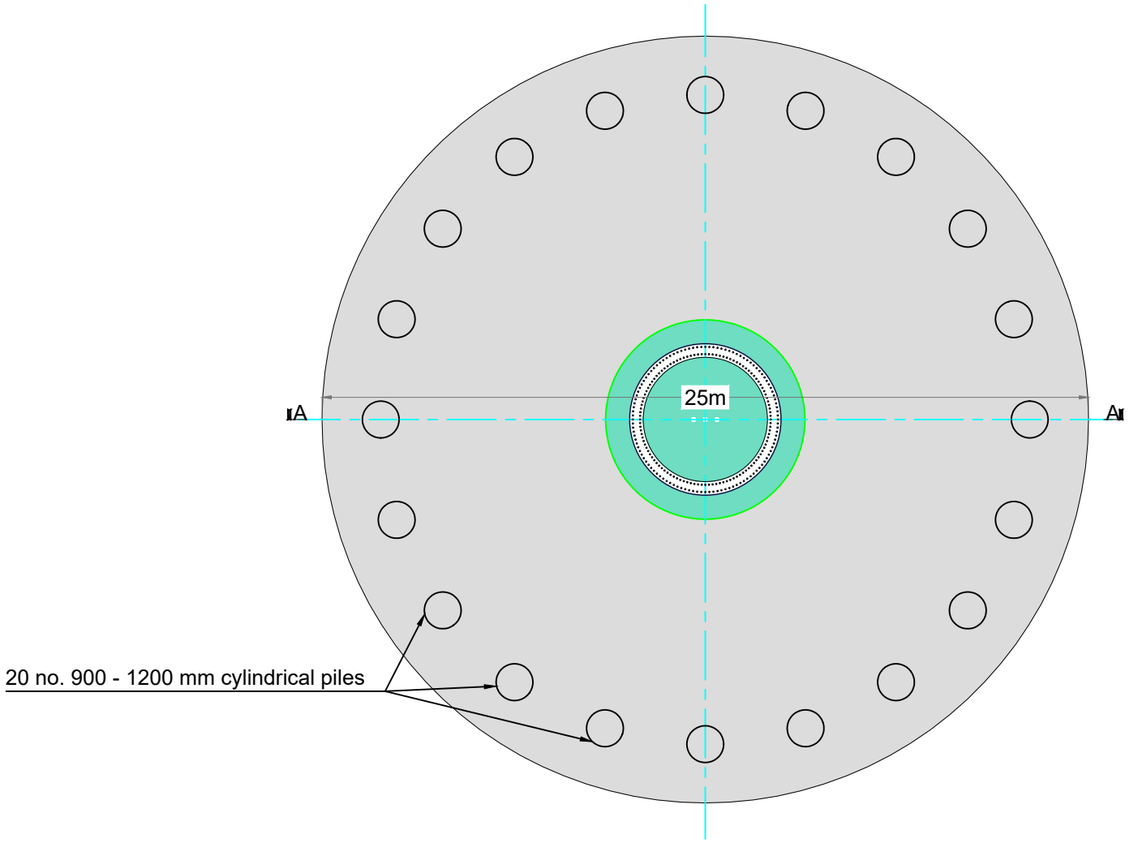
DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	03.03.2026	D01

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

Section A-A
Scale 1:100



Plan
Scale: 1:200



PROJECT TITLE:
Proposed Cahermurphy
West Wind Farm, Co. Clare

DRAWING TITLE:
Bored Pile Foundations Details

PROJECT No.:	DRAWING No.:	SCALE:
230843	Fig 4-5b	As Shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	03.03.2026	D01

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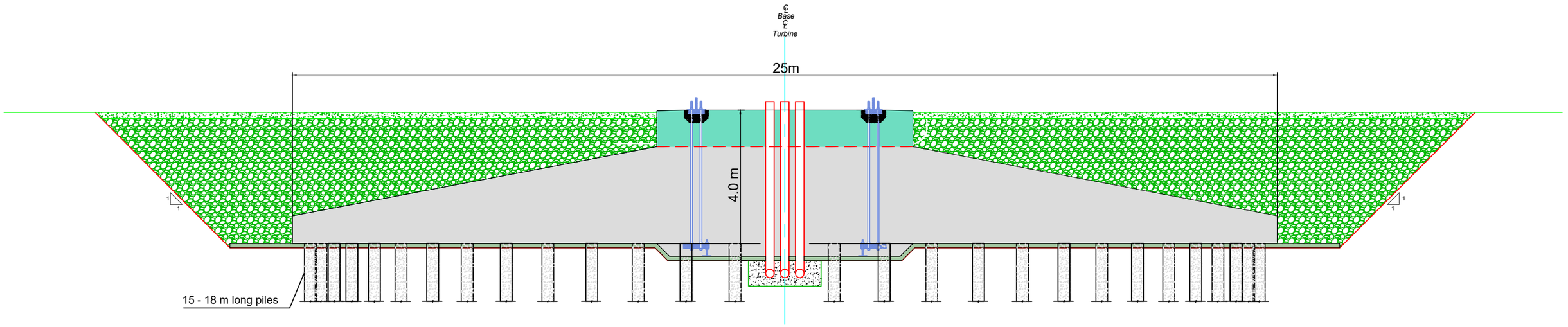
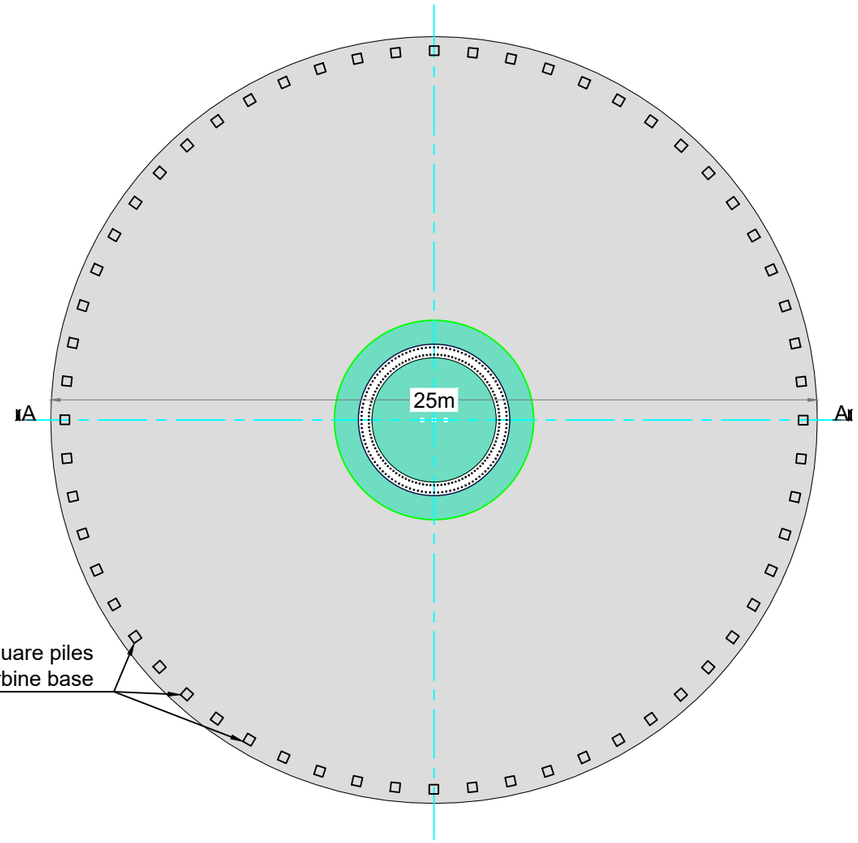
Section A-A
Scale 1:100



Plan
Scale: 1:200



50 - 70 no. 300 x 300 mm square piles
Spaced evenly around the perimeter of the turbine base

PROJECT TITLE:
Proposed Cahermurphy
West Wind Farm, Co. Clare

DRAWING TITLE:
Driven Pile Foundations Details

PROJECT No.:	DRAWING No.:	SCALE:
230843	Fig 4-5c	As Shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	03.03.2026	D01

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Plate 4-1 Turbine 'Anchor Cage' and finished turbine base

4.2.1.4 Hard Standing Areas

Hard standing areas consisting of levelled and compacted hardcore will be installed around each turbine base. These will 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. The hardstands also allow for the offloading and storage of turbine components, and generally provide a safe, level working area around each turbine position. The hard-standing areas are extended to cover the turbine foundations, once completed, by placing crushed stone over the foundation. The turbine hardstand assessed in this EIAR measure 35m x 98m. Figure 4-5 shows the turbine base layout, including turbine foundation, hard standing area, assembly area, access road and surrounding works area.

A two-metre wide working area will be required around each hard standing area, 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 at turbine hardstands for later reuse in backfilling the working area around the turbine foundation or transported immediately on excavation to one of the 2 no. borrow pits. The excavated material stored locally will be sealed using the back of the excavator bucket and surrounded by silt fences to ensure sediment-laden run-off does not occur. All peat placement areas will be upslope of founded roads/hardstands and will be inspected by the Project Geotechnical Engineer before material is temporarily stored in the area.

The proposed hard standing areas for each individual turbine are shown as part of the detailed layout drawings included in Appendix 4-1 and measure 35m x 98m.

4.2.1.5 Hardstanding Assembly Area

Levelled assembly areas comprising of bare soil surface will be located on either side of the hard-standing area as shown on Figure 4-5 above. 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. Refer to Appendix 4-1 for the planning application drawings assessed in this EIAR.

4.2.1.6 Power Output

It is anticipated the proposed wind turbine will have a rated electrical power output in the range of 6.3 to 7.2 megawatt (MW) depending on further wind data analysis and power output modelling. Therefore, the potential installed capacity of the proposed wind farm will range from a minimum of 50.4 MW up to a maximum 57.6 MW. Turbines of the exact same make, model and dimensions can also have different power outputs depending on the capacity of the electrical generator installed in the turbine nacelle.

Assuming a maximum installed capacity of 57.6 MW, the Proposed Project therefore has the potential to produce up to 176,602 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 36%[1] is applied here

C = ... Rated output of the wind farm: 57.6 MW

The 181,647 MWh of electricity produced by the Proposed Project would be sufficient to supply 43,249 Irish households with electricity per year, based on the average Irish household using 4.2 MWh[2] of electricity.

For context, the 2022 Census of Ireland recorded a total of 46,441 occupied households in Co. Clare. Therefore, per annum, based on a capacity factor of 36%, the Proposed Project would therefore produce sufficient electricity for approximately 93.1% of all households in Co. Clare.

If the installed capacity is the minimum proposed (50.4MW), the electricity produced by the Proposed Project would be sufficient to supply approximately 37,843 households

4.2.1.7 Construction Methodology - Turbine Foundations

Each of the turbines to be erected on the Proposed Wind Farm site will have a reinforced concrete base that is installed below the finished ground level. The turbine foundation will either be formed using piling methods or on competent strata (i.e., bedrock or subsoil of sufficient load bearing capacity). Where the ground conditions do not have a competent stratum of sufficient load bearing capacity, piling methods will be utilised. Overburden will be stripped off the foundation area to a suitable formation using a 360º excavator and will be stored locally for later reuse in backfilling around the turbine foundation or in borrow pit restoration. 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 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 804 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 outfall out at the lowest point level spreader or settlement pond.

An embankment approximately 600 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 excavated hole and to demarcate the working area. All necessary health and safety signage will be erected to warn of deep

[1] *EirGrid, 2022 Enduring Connection Policy 2.2 Constraints Report for Solar and Wind* ECP-2-2-Solar-and-Wind-Constraints-Report-Area-D-v1.0.pdf (eirgridgroup.com)
The Proposed Project is located within the D wind region for Ireland with an associated 2020 capacity factor of 36%.
2 March 2017 CER (CRU) Review of Typical Consumption Figures Decision https://www.cru.ie/document_group/review-of-typical-consumption-figures-decision-paper/

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 360^{o} excavator to protect ground formation and to give a safe working platform.

The anchor cage is delivered to the Proposed Project site in two or more parts depending on the turbine type. A 360° 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 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 the hard-standing areas will be extended to cover the turbine foundations, by placing crushed stone over the foundation.

4.2.1.8 Turbine Bases, Hardstanding and Infrastructure Foundations

The construction methodology for the site access follows the same methodology as the site roads, as outlined below in Section 4.2.2. However, the following procedures will be included during the construction of turbine bases, hardstandings and other infrastructure foundations to minimise any adverse impact on peat stability.

1. *All excavations within peat will be adequately supported or peat slopes are to be battered to a safe slope inclination typically of 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then side slopes will be supported with granular fill. A Peat and Spoil Management Plan detailing these procedures is provided in Appendix 4-3 of this EIAR.*
2. *Excavations will be kept reasonably free from water at all times. Water will be prevented from being impounded within excavations by either using drainage channels cut into the excavation face or by pumping. Please see Appendix 4-7 for further detail on drainage proposals.*
3. *Where water is channelled or pumped from an excavation then this water is to be fed into an established watercourse or drainage ditch following suitable treatment, as described in Chapter 4 of the EIAR.*

4.2.2 Access Roads

4.2.2.1 Road Construction Types

To provide access within the Proposed Wind Farm site and to connect the wind turbines and associated infrastructure existing tracks will need to be upgraded and new access roads will need to be constructed. The road construction design has taken into account the following key factors as stated in

the Fehily Timoney & Company's (FTC) *Peat and Spoil Management Plan* in Appendix 4-3 of this EIAR:

1. *Buildability considerations.*
2. *Serviceability requirements for construction and wind turbine delivery and maintenance vehicles.*
3. *Minimise excavation arisings.*
4. *Requirement to minimise disruption to peat hydrology.*

The access roads on site will be constructed as excavate and replace (founded) type construction, which, given the ground conditions and type of terrain present, this is deemed the most appropriate construction approach. Floating road construction will also be undertaken on the Proposed Project.

The Proposed Wind Farm site makes use of the existing Wind Farm site road network insofar as possible. It is proposed to upgrade 4.5 kilometres of existing roads and tracks, and to construct 5.4 kilometres of new access road on the Proposed Wind Farm site. Areas such as wide junctions and proposed hardstands will also be used as passing bays throughout the construction phase of the proposed Wind Farm.

See the Peat & Spoil Management Plan (Appendix 4-3) for the Proposed Project for further detail on how peat and spoil will be managed during road construction.

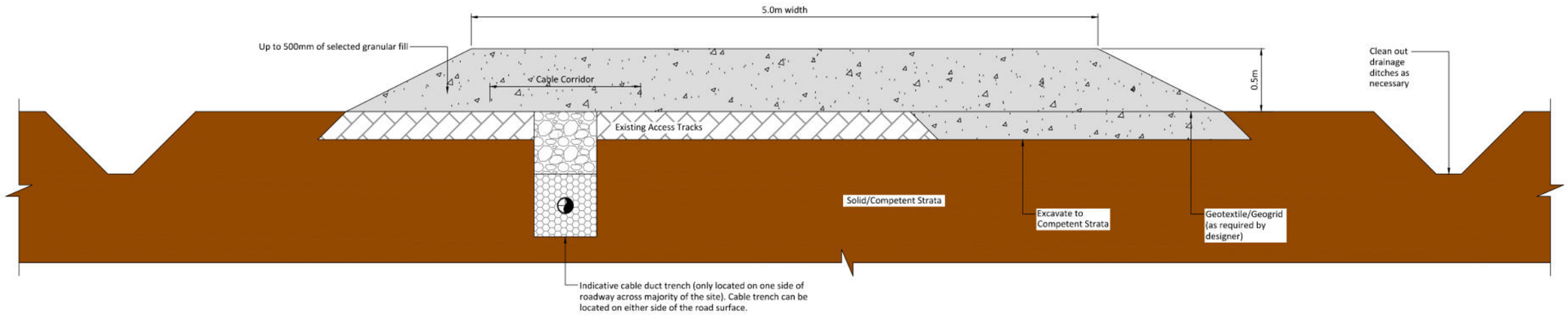
4.2.2.1.1 Upgrade to Existing Roads or Tracks

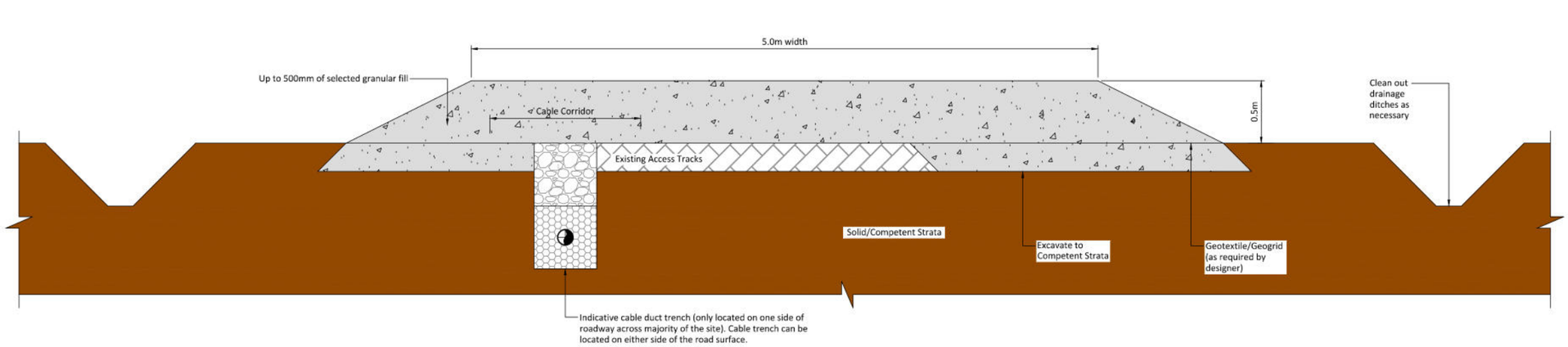
The construction methodology for upgrading of existing sections of excavated roads or tracks, as presented in FTC's *Peat & Spoil Management Plan* in Appendix 4-3 of this EIAR, is summarised below. This methodology includes procedures that are to be included in the construction to avoid any adverse impact on peat stability.

1. *Access road construction will be to the line and level requirements as per design/planning conditions.*
2. *For upgrading of existing access roads (Type A) the following guidelines will be implemented in full:*
    a. *Excavation of the access road will take place to a competent stratum beneath the peat (glacial deposits) and backfilling with suitable granular fill.*
    b. *Benching of the excavation will be used where required between the existing section of access road and the widened section of access road where the depth of excavation exceeds 500mm.*
    c. *The surface of the existing access track will be overlaid with up to 500mm of selected granular fill.*
    d. *Access roads will be finished with a layer of capping across the full width of the track.*
    e. *A layer of geogrid/geotextile may be required for strengthening of soil and drainage measures at the surface of the existing access road and at the base of the widened section of access road (to be confirmed by the designer).*
    f. *For excavations in peat, side slopes will not be 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 employed to ensure stability.*
3. *The finished road width will have a running width of 5m, with wider section on bends and corners.*
4. *On side long sloping ground any road widening works required will be done on the upslope side of the existing access road, where possible. Where 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, limiting the length of ground to be stripped/excavated at any one time.

A typical section of existing excavated road for upgrade is shown in Figure 4-6. Please refer to Appendix 4-7 for details on drainage proposals for road upgrades.





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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	08.01.26
P02	FOR INFORMATION	BDH	12.02.26

PROJECT: CAHERMURPHY WEST		CLIENT: MKO	
SHEET: TYPICAL UPGRADE OF EXISTING EXCAVATED ACCESS ROAD	Date: 12.02.26	Project number: P23-230	Scale (@ A1): Scale N/A
	Drawn by: POR	Drawing Number: Figure 4-6	Rev: P02
	Checked by: IH		

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4.2.2.1.2 Construction of New Excavated Roads

Excavate and replace type access roads are the conventional method for construction of access roads on peatland sites and the preferred construction technique in shallow peat provided sufficient placement/reinstatement capacity is available on site for the excavated peat, as is the case for the Proposed Wind Farm site (see FTC's *Peat & Spoil Management Plan* in Appendix 4-3 of this EIAR for how peat and spoil will be managed on site).

The construction methodology for the construction of excavated roads, as presented in FTC's *Peat & Spoil Management Plan* in Appendix 4-3 of this EIAR, is summarised below. This methodology includes procedures which will be implemented during the construction phase to avoid any adverse impact on peat stability.

1. *Prior to commencing the construction of the excavated roads, movement monitoring posts will be installed in areas where the peat depth is greater than 2.0m. It should be noted while this is included as a precautionary best practice procedure, peat depths greater than 2.0m were not recorded along the proposed road network.*
2. *Interceptor drains will be installed upslope of the access road alignment to divert any surface water away from the construction area.*
3. *Excavation of roads will be to the line and level given in the design requirements. Excavation will take place to a competent stratum (glacial deposits) beneath the peat.*
4. *The road sub-formation will be proof rolled following stripping of the peat. where soft spots are noted following the proof roll, these will be excavated and replaced with granular fill.*
5. *Road construction will be carried out in sections of up to 50m lengths i.e., no more than 50m of access road will be excavated without replacement with stone fill.*
6. *Once excavated, peat will be temporarily stored in localised areas adjacent to excavations for roads and hardstands before being placed into the permanent peat storage areas within the borrow pits. All temporary peat placement areas will be upslope of founded roads/hardstands and will be inspected by the Project Geotechnical Engineer before material is temporarily stored in the area.*
7. *Acrotelm (to about 0.3 to 0.4m of peat) is required for landscaping, it will be stripped and temporarily stockpiled for re-use as required. Acrotelm stripping will be undertaken prior to main excavations.*
8. *The acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation.*
9. *All catotelm peat (peat below about 0.3 to 0.4m depth) will be transported immediately on excavation to the designated placement areas.*
10. *Excavation side slopes in peat will not be greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction. Should areas of weaker peat be encountered then slacker slopes will be employed. Battering of the side slopes of the excavations will be carried out as the excavation progresses.*
11. *End-tipping of stone onto the road during the construction/upgrading of the access road will be carefully monitored to ensure the excessive impact loading, which may adversely affect the adjacent peat, is limited.*
12. *The excavated access road will be constructed with a minimum of 750mm of selected granular fill. Granular fill will be placed and compacted in layers in accordance with the TII Specification for Road Works*[3]*.*
13. *Access roads will be finished with a layer of capping across the full width of the road.*
14. *A layer of geogrid/geotextile will be used at the surface of the competent stratum, where cohesive material is present to prevent mixing of the underlying material with the granular fill.*

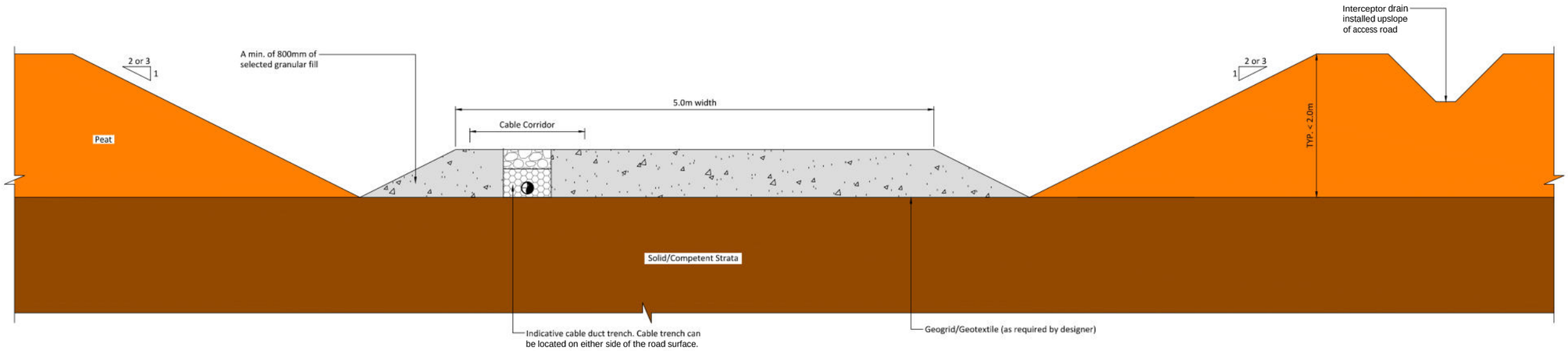
[3] *TII Specification for Road Works Series 600 – Earthworks (including Erratum No. 1), June 2013, CC-SPW-00600. Available at: https://www.tiipublications.ie/library/CC-SPW-00600-03.pdf*

15. *Where slopes of greater than 5 degrees are encountered along with relatively deep peat (i.e., greater than 2m) 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. It should be noted that while this is best practice, no roads are proposed in areas where peat depth exceeds 2.0m.*
16. *A final surface layer will be placed over the excavated road and graded to accommodate wind turbine construction and delivery traffic.*
17. *The construction and upgrading 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 tracking by heavy vehicular loads. It should be noted that the new access tracks have been designed to avoid areas of deep peat where possible, with an average peat depth of 0.55m recorded along these tracks.*

The following general construction guidelines will be implemented for the access roads on site:

1. *Where existing drainage crosses the road then it will be necessary to ensure that this drainage is not affected by settlement of the upgraded access road. Cross drains comprising flexible perforated pipes within a permeable stone fill surround will be used to maintain the existing drainage.*
2. *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 underlying peat, is limited.*
3. *The construction and upgrading of access roads in areas of deep peat (greater than 2m) will be inspected on a routine basis during the works, particularly before/following trafficking by heavy vehicular loads. It should be noted that while this is best practice, no roads are proposed in areas where peat depth exceeds 2.0m.*

A section of a new excavated road is shown in Figure 4-7.



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P01	FOR INFORMATION	BDH	08.01.26
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PROJECT	CAHERMURPHY WEST
CLIENT	MKO
SHEET	Figure 4-7: Typical Section of New Excavate and Replace Road
Date	12.02.26
Project number	P23-230
Scale (@ A1)	Scale N/A
Drawn by	POR
Checked by	IH
Drawing Number	P23-230-0600-0007
Rev	P02

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4.2.2.2 Construction Methodology - Access Roads

Site roads will be constructed to each turbine base and at each base a crane hard standing will be constructed to the turbine manufacturer's specifications.

The road excavations will follow a logical route working away from the borrow pit locations. Excavated material will be transported back to the borrow pits in haul trucks.

When the road formation layer has been reached, stone from the on-site borrow pit shall be placed to form the road foundation. In the event of large clay deposits being encountered in sections of road, a geotextile layer will be implemented at sub base level. The sub grade will be compacted with the use of a roller. The final surface course on the road will not be provided until all turbine bases have been poured. This prevents damage to the surface course due to stone and concrete trucks movements. The road will be upgraded prior to the arrival of the first turbine. All roads will be maintained for the duration of the operation of the Proposed Project.

4.2.3 Onsite 110kV Electrical Substation and Control Buildings

It is proposed to construct one 110 kV electrical substation within the Proposed Wind Farm site, as shown in Figure 4-1a. The proposed onsite 110kV electrical substation will have a control building, associated electrical plant and equipment, a wastewater holding tank and will be constructed in accordance with EirGrid substation specifications and requirements. The construction and electrical components of the electricity substation will be to EirGrid specifications[4]. Further details regarding the connection between the site substation itself and then on to the national electricity grid are provided in Section 4.3.1 below and can be seen in Drawing No. 05935-DR-212-P2 in Appendix 4-2 of this EIAR chapter.

The footprint of the proposed onsite electrical substation compound measures 16,571 square metres, and will include 2 no. wind farm control buildings and the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine, and export that electricity from the wind farm substation to the national grid. The onsite substation will be a permanent development under the ownership of the ESB/EirGrid. The layout and elevation of the onsite substation is shown on Drawings No. 05935-DR-220-P5 and 05935-DR-221-P1 in Appendix 4-1 of this EIAR.

The substation compound will be surrounded by an approximately 2.6-metre-high steel palisade fence, and internal fences will also segregate different areas within the main substation.

[4] *EirGrid Document XDS-GFS-00-001-R4 110/220/400kV Substation General Requirements (2019). Available at: https://cms.eirgrid.ie/sites/default/files/publications/6-110-220-400-kV-Substation-General-Requirements.pdf*

4.2.3.1 Wind Farm Control Buildings

Two wind farm control buildings will be located within the substation compound. The EirGrid Control Buildings will be located towards the south of the substation compound and will measure 25 metres by 18 metres and 8.38 metres in height. The Independent Power Provider (IPP) Control Building located at the eastern edge of the substation compound will measure 10.6 metres by 20.15 metres and 6.92 metres in height. Layout and elevation drawings of the control buildings are included in Drawings No. 05935-DR-223-P1 and 05935-DR-224-P1 in Appendix 4-1.

The wind farm control buildings will include welfare facilities for the staff that will work on the Proposed Project during the operational phase of the project. Toilet facilities will be installed with a low-flush cistern and low-flow wash basin. Due to the specific nature of the Proposed Project there will be a very small water requirement for occasional toilet flushing and hand washing and therefore the water requirement of the Proposed Project does not necessitate a potable source. It is proposed to harvest rainwater from the roofs of the buildings, and if necessary, bottled water will be supplied for drinking.

It is proposed to manage wastewater from the staff welfare facilities in the control building by means of a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. It is not proposed to treat wastewater on-site, and therefore the EPA's 2009 'Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. 10)' does not apply. Similarly, the EPA's 1999 manual on 'Treatment Systems for Small Communities, Business, Leisure Centres and Hotels' also does not apply, as it too deals with scenarios where it is proposed to treat wastewater on-site.

Such a proposal for managing the wastewater arising on site has become standard practice on wind farm sites, which are often proposed in areas where finding the necessary percolation requirements for on-site treatment would be challenging, and has been accepted by numerous Planning Authorities and An Coimisiún Pleanalá as an acceptable proposal.

The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. The wastewater storage tank alarm will be part of a continuous stream of data from the site's turbines, wind measurement devices and electrical substation that will be monitored remotely 24 hours a day, 7 days per week. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007(as amended), will be employed to transport wastewater away from the site.

4.2.3.2 Construction Methodology – Onsite 110kV Electrical Substation and Control Buildings

The proposed onsite electrical substation will be constructed by the following methodology:

- The area of the onsite substation will be marked out using ranging rods or wooden posts and the soil and overburden stripped and will be either temporarily stockpiled locally at the substation location, or transported immediately on excavation to one of the 2 no. borrow pits.
- The dimensions of the onsite substation area have been designed to meet the requirements of EirGrid and the necessary equipment to safely and efficiently operate the permitted wind farms;
- A generator will be temporarily located in the area of the onsite substation to provide a local electricity supply during construction;
- Two control buildings will also be built within the onsite substation compound;
- The foundations will be excavated down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it. An anti-bleeding admixture will be included in the concrete mix;

- The block work walls will be built up from the footings to damp proof course level and the floor slab constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors;
- The block work will then be raised to wall plate level and the gables & internal partition walls formed. Scaffold will be erected around the outside of the building for this operation;
- The concrete roof slabs will be lifted into position using an adequately sized mobile crane;
- The timber roof trusses will then be lifted into position using a telescopic load all or mobile crane depending on site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather.
- The electrical equipment will be installed and commissioned.
- Perimeter fencing will be erected.
- The construction and components of the substation have been designed to EirGrid specifications.

4.2.4 Internal Site Cabling

Each turbine will be connected to the on-site electrical substation via an underground 33 kV (kilovolt) electrical cable. Fibre-optic cables will also connect each wind turbine to the wind farm control building in the onsite 110kV electrical substation compound. The electrical and fibre-optic cables running from the turbines to the onsite substation compound will be run in cable ducts approximately 1.3 metres below the ground surface, in the roadways. The route of the cable ducts will follow the access track from each turbine location to the proposed onsite 110kV electrical substation, and are visible on the site layout drawings included as Appendix 4-1 to this report. Figure 4-8 below shows two variations of a cable trench, one for off-road trenches (to be installed on areas of soft ground that will not be trafficked) and one for on-road trenches (to be used where trenches run along or under a roadway).

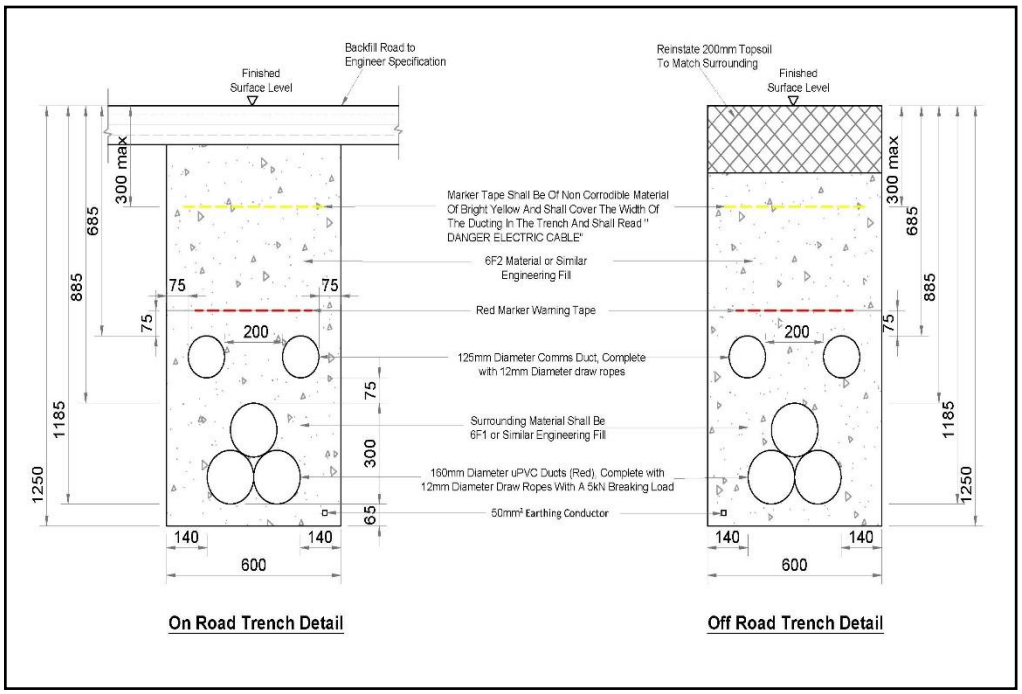


Figure 4-1: Typical Collector Cable trench cross-section detail

4.2.4.1 Construction Methodology – Internal Site Cabling

The transformer in each turbine is connected to the substation through a network of buried electrical cables. The ground is trenched 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 all national and international requirements, and will be approximately 1.3m below ground level; a suitable marking tape is installed between the cables and the surface. On completion, the ground will be reinstated as previously described above. The route of the cable ducts will follow the access track to each turbine location and are visible on the site layout drawings included as Appendix 4-1 of the EIAR.

Clay plugs will be installed at regular intervals of not greater than 50 metres along the length of the trenches to prevent the trenches becoming conduits for runoff water. While the majority of the cable trenches will be backfilled with native material, clay subsoils of low permeability will be used to prevent conduit flow in the backfilled trenches. This material will be imported onto the Proposed Wind Farm site should sufficient volumes not be encountered during the excavation phase of roadway and turbine foundation construction. Potential quarries that will be considered for the delivery of materials to the Site include;

- Darragh Quarry, Co. Clare
- Kilrush Quarry, Co. Clare
- Roadstone Ryans, Co. Clare
- Glenmore Quarry, Co. Clare

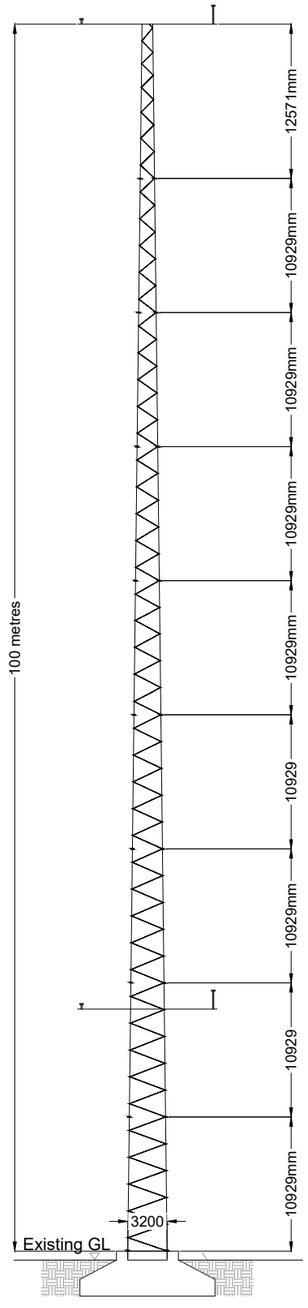
Further details of the Site Cabling Construction Methodology are outlined in Appendix 4-4.

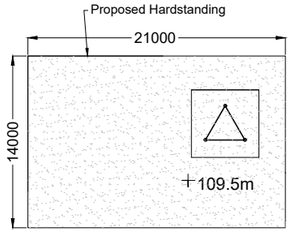
4.2.5 Meteorological Mast

One permanent meteorological mast is proposed as part of the Proposed Project. The meteorological mast will be equipped with wind monitoring equipment at various heights. The mast will be located at the southwest of the Proposed Wind Farm site (E508187 N668430) as shown on the site layout drawing in Figure 4-1a. The mast will be a self-supporting slender structure 100 metres in height with a lightning mast on top. The mast will be constructed on a hard standing area measuring 14m by 21m and accommodate the crane that will be used to erect the mast. The meteorological mast and hardstanding areas will be located alongside both existing and proposed new roads. The meteorological mast is shown in Figure 4-9.

4.2.5.1 Construction Methodology – Meteorological Mast

The meteorological mast foundation will comprise a gravity type foundation. Given the ground conditions present at the proposed meteorological mast, the foundation will be founded on glacial till, or weathered bedrock. The founding depth for the met mast foundation is envisaged to be 0.5 to 1.0m below ground level. At the underside of the met mast foundation, a layer of structural up-fill (class 6N) will be required. The meteorological mast will be supported by guyed lattices.





Met Mast Compound Plan

N

PROJECT TITLE:
Proposed Cahermurphy West Wind Farm, Co. Clare

DRAWING TITLE:
Met Mast - Free Standing Mast

PROJECT No.:	DRAWING No.:	SCALE:
230843	Fig 4-9	1:500 @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	03.03.2026	D01

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

4.2.6 Proposed Wind Farm Site Entrance

It is proposed to access the Proposed Wind Farm site via an upgrading of the existing site junction (including the installation of security fencing and gates) off the L-6254 local road to the east of the site. This entrance will be upgraded and widened to facilitate the delivery of the construction materials and turbine components. The site entrance was subject to Autotrack assessment to identify the turning area required, as described in Section 15.1 of Chapter 15: Material Assets of this EIAR. Appropriate sightlines will be established to the north and south of the proposed site entrance for the safe egress of traffic. The visibility splays at the main site entrance off the L-6254, as shown in Figure 15-14, will be provided and kept clear of obstruction during construction, operation and decommissioning phases. The proposed works will result in a permanent site access from the local road, which will also form the sole entrance to the Proposed Wind Farm site during the operational phase.

The location of the Proposed Wind Farm site entrance is shown on the site layout drawing in Figure 4-1a. A Traffic Management Plan is included in Appendix 15-2 of this EIAR.

In the event planning permission is granted for the Proposed Project, the final Traffic Management Plan will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned.

4.2.6.1 Construction Methodology – Proposed Wind Farm site Entrance

The construction methodology for the site access follows the same methodology as the site roads, as discussed above in Section 4.2.2.

4.2.7 Borrow Pits

4.2.7.1 Description

It is proposed to develop 2 No. on-site borrow pits as part of the Proposed Project. It is proposed to obtain a majority of all rock and hardcore material that will be required during the construction of the Proposed Project from the on-site borrow pits. Usable rock may also be won from other infrastructure construction including the substation and the turbine base excavations. Some aggregate material due to a requirement for specific grade, quality or quantity may be sourced from suitable licenced quarries around the Site.

Borrow pit No. 1 located approximately 155 metres to the northeast of Turbine No. 8, measures approximately 12,715m^2 in area and is intended to supply hardcore materials for the construction of the turbines and site roads in the south of the site.

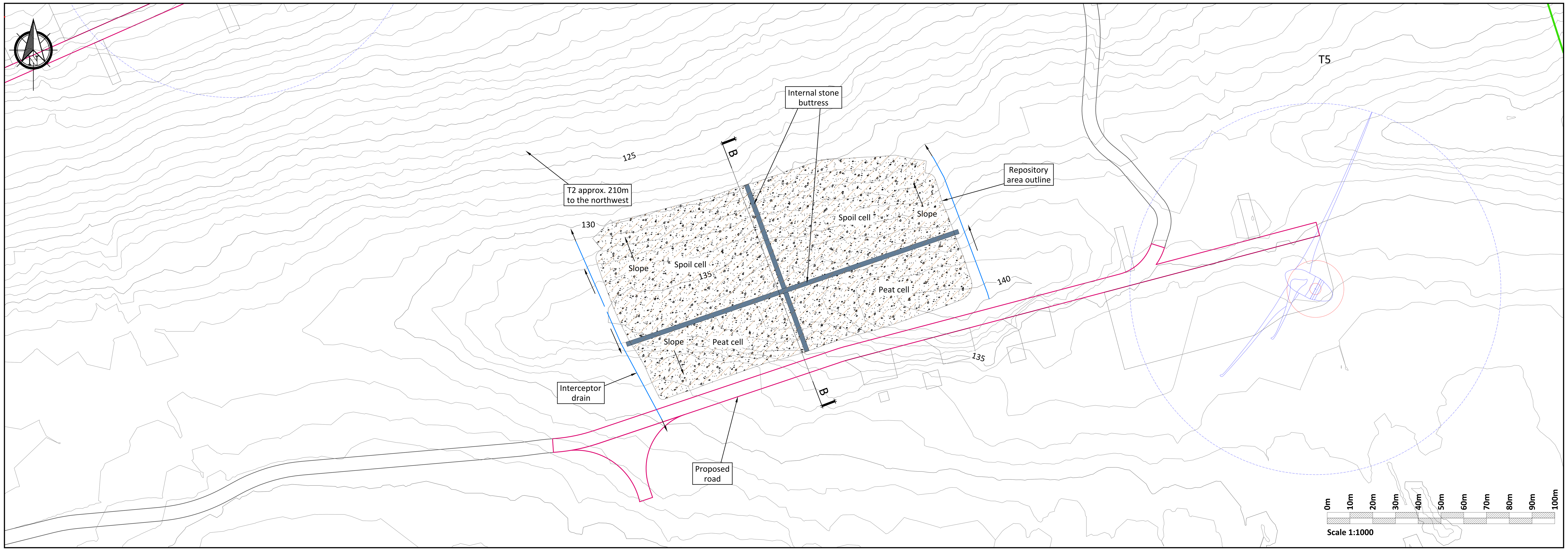
Borrow pit No. 2 located approximately 150 metres to the northwest of Turbine No. 5, measures approximately 11,450m^2 in area and is intended to supply hardcore materials for the construction of turbines in the north of the site and access roads thereto.

Both borrow pits are shown on Figure 4-1a and on the detailed site layout drawings included as Appendix 4-1 to this EIAR. Figures 10 and 11 below show detailed sections through the proposed borrow pits. The borrow pits will, on removal of all necessary and useful rock, will be reinstated with excavated peat and subsoils as described in Section 4.2.8 below.

At certain turbine foundation and hardstand locations, depending on local ground conditions, the extraction of rock may be required in order to obtain a level construction area. Any rock obtained from

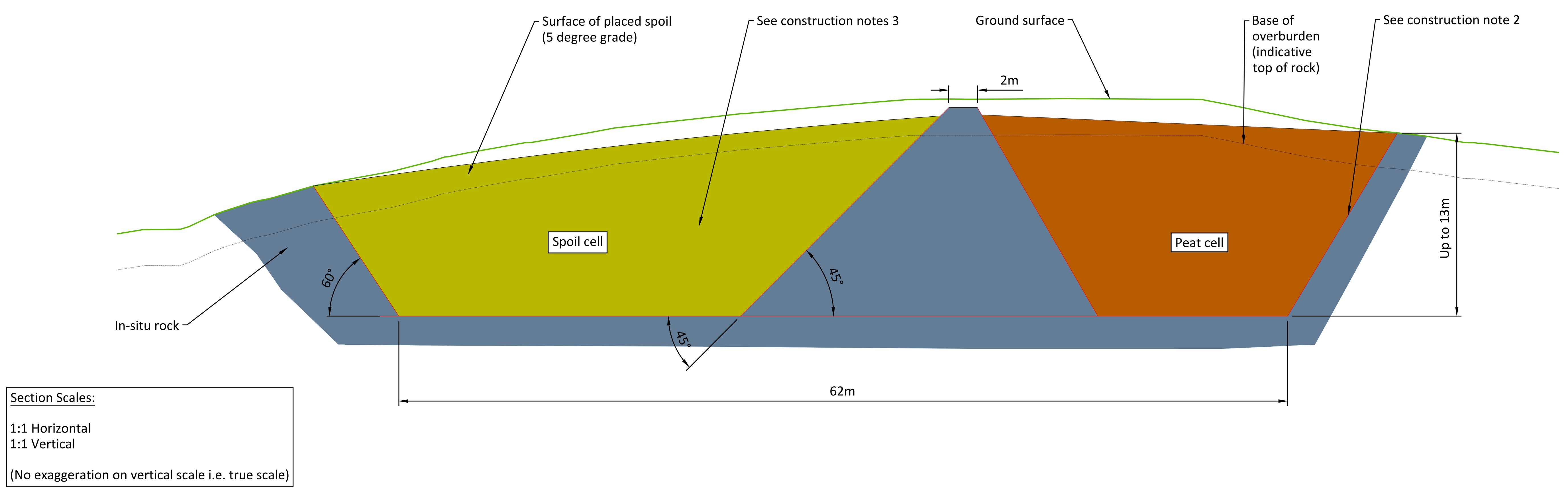
a turbine location will be used to supply the hardcore materials requirement for that turbine's hardstand and access road.

Post-construction, the borrow pit areas will be permanently secured and a stock-proof fence will be erected around the borrow pit areas to prevent access to these areas. Appropriate health and safety signage will also be erected on this fencing and at locations around the fenced area.



PLAN (NORTHERN BORROW)

Scale 1:1000



Section Scales:

1:1 Horizontal
1:1 Vertical

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

SECTION B - B

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. Excavation and infilling of the borrow pit will need to be sequenced and programmed.

(4) The contractor excavating the rock will sequence the borrow pit construction in a way which will allow the excavated peat & spoil to be reinstated safely.

(5) The borrow pit will be developed in cells, with two cells for storage of peat and two for spoil/overburden.

(6) The rock buttress will be founded on competent strata. The founding stratum for the rock buttress will be inspected and approved by the Project Geotechnical Engineer.

(7) In order to prevent water retention occurring behind the buttresses, the buttresses will be constructed of coarse boulder fill with a high permeability.

(8) The surface of the placed peat & spoil will be shaped to allow efficient run-off of surface water from the placed arising's. The finished surface of the spoil cells will have a maximum grade of 5 degrees.

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

(10) An interceptor drain will be installed around the upslope side of the borrow pit to capture surface water flow and divert it around the borrow pit.

(11) A perimeter drain will be installed around the individual cells, which will outfall to a settlement pond on the downslope side of the borrow pit (not shown on plan).

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

(13) Further guidelines on the construction of the borrow pit is included within Section 5.4 of the Peat & Spoil Management Plan.

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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	08.01.26
P02	FOR INFORMATION	BDH	12.02.26

PROJECT: CAHERMURPHY WEST	CLIENT: MKO		
SHEET: BORROW PIT 1 PLAN AND SECTION	Date: 12.02.26	Project number: P23-230	Scale (@ A1): As Shown
	Drawn by: POR	Drawing Number: Figure 4-10	Rev: P02
	Checked by: IH		

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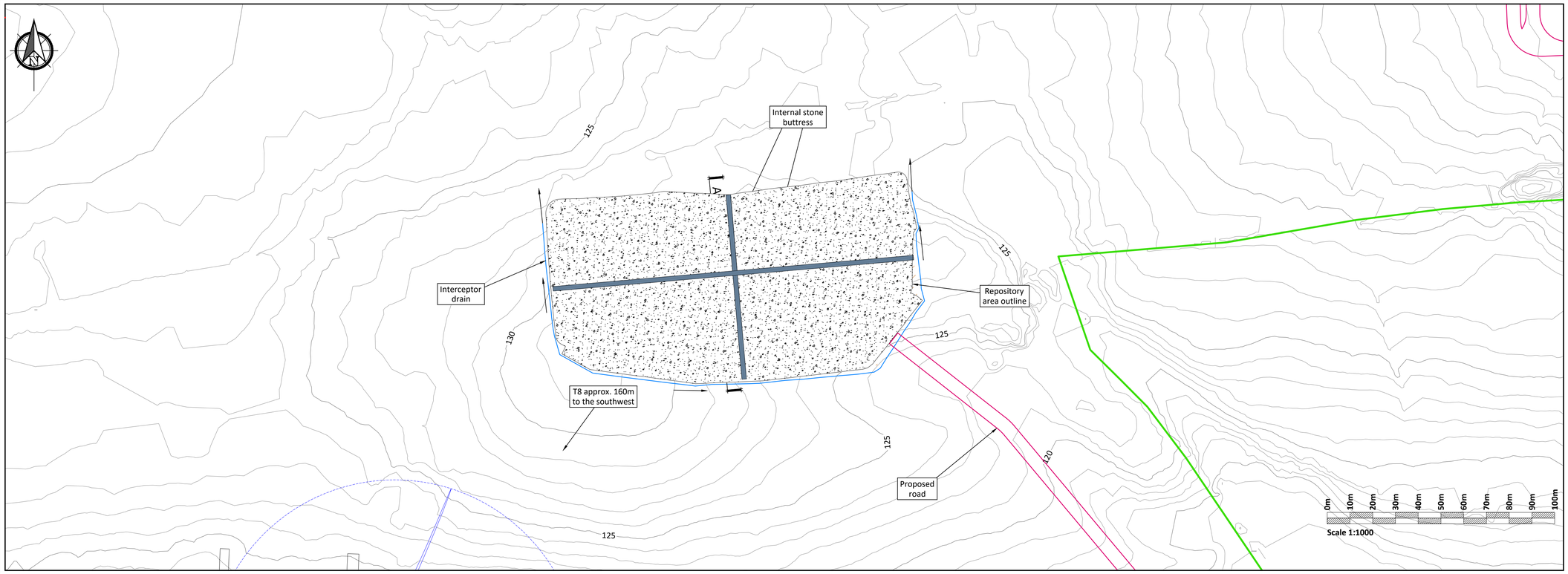
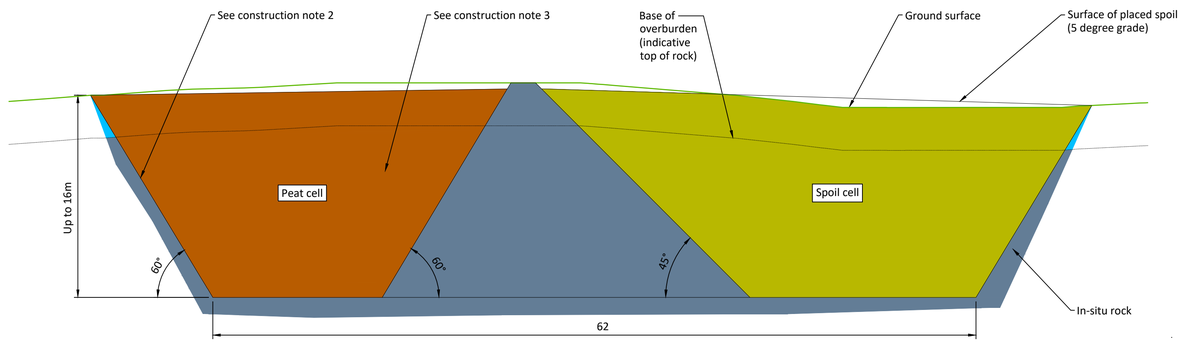


PLAN (SOUTHERN BORROW)

Scale 1:1000



Section Scales:

1:1 Horizontal
1:1 Vertical

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

SECTION A - A

Scale 1:250

Legend:

EIAR Site Boundary

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. Excavation and infilling of the borrow pit will need to be sequenced and programmed.

(4) The contractor excavating the rock will sequence the borrow pit construction in a way which will allow the excavated peat & spoil to be reinstated safely.

(5) The borrow pit will be developed in cells, with two cells for storage of peat and two for spoil/overburden.

(6) The rock buttress will be founded on competent strata. The founding stratum for the rock buttress will be inspected and approved by the Project Geotechnical Engineer.

(7) In order to prevent water retention occurring behind the buttresses, the buttresses will be constructed of coarse boulder fill with a high permeability.

(8) The surface of the placed peat & spoil will be shaped to allow efficient run-off of surface water from the placed arising's. The finished surface of the spoil cells will have a maximum grade of 5 degrees.

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

(10) An interceptor drain will be installed around the upslope side of the borrow pit to capture surface water flow and divert it around the borrow pit.

(11) A perimeter drain will be installed around the individual cells, which will outfall to a settlement pond on the downslope side of the borrow pit (not shown on plan).

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

(13) Further guidelines on the construction of the borrow pit is included within Section 5.4 of the Peat & Spoil Management Plan.

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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	08.01.26
P02	FOR INFORMATION	BDH	12.02.26

PROJECT	CAHERMURPHY WEST
CLIENT	MKO
SHEET	BORROW PIT 2 PLAN AND SECTION
Date	12.02.26
Drawn by	POR
Checked by	IH
Project number	P23-230
Scale (@ A1)	As Shown
Drawing Number	Figure 4-11
Rev	P02

O:\ACAD\2023\P23-230\P23-230-0600-0008

13 February 2026

Hardcore materials will be extracted from the borrow pits (and some turbine locations, if necessary), principally by means of rock breaking. Depending on the hardcore volume requirements, 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 local residents. However, data available from the ground investigations undertaken to date indicated that the rock can be removed by breaking. The potential noise and vibration effects on sensitive receptors associated with both methods of rock extraction are detailed below, and are further assessed in Chapter 12 of this EIAR.

The two proposed extraction methods are detailed below.

4.2.7.2 Rock Extraction Methods

Where present, overburden will be stripped back and stockpiled in dedicated safe locations (please see Appendix 4-3 Peat and Spoil Management Plan) using standard tracked excavators. Two extraction methods will be used and have been assessed for breaking out the useful rock below; rock breaking and blasting.

4.2.7.2.1 *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 by a competent operator. In areas where rock of a much higher strength is encountered and cannot be removed by means of excavating then a rock breaking methodology may be used. Where rock breaking is required, a large hydraulic 360-degree excavator with a rock breaker attachment is used. 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. The large rock breaker is supported by a smaller rock breaker which can often be in the 30-40 tonne size range, and works to break the rocks down to a size that they can 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 away from the immediate area of the crusher until it is required elsewhere on the Proposed Wind Farm site.

4.2.7.2.2 *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. The drilling rigs used are purpose built, self-propelled machines, designed specifically for drilling blast boreholes. A drilling rig working for 3-4 days would typically drill the necessary number of boreholes required for a single blast. The locations, depth and number of boreholes are determined by the blast engineer, a specialist role fulfilled by the blasting contractor that will be employed to undertake the duties.

The blast engineer will then 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 Garda Síochána. The blast engineer sets the explosives in place in the boreholes, sets the charges, and fires the blast. The blast takes only a matter of milliseconds, but may be perceived to take longer as blast noise echoes around the area.

A properly designed blast will generate rock of a size that can be loaded directly into a mobile crusher, using the same wheeled loader description outlined above. From that point on, the same method is used for processing the rock generated from a blast, as would be used to process rock generated by rock breaking. It would be likely that a drilling rig would recommence drilling blast holes for the next blast as soon one blast finished. Rock blasting will be undertaken in line with the Safety and Health Commission for the Mining and other Extractive Industries report on *Guidance on the Safe Use of Explosives in Quarries 2001* [5]to ensure the safe use of explosives on-site. Only authorised people will handle explosives for rock blasting at the site. Given the small quantities of explosives to be used on site, it is considered that there is negligible risk of a major accident occurring from the use of explosives on site (see Section 16.4 of Chapter 16: Vulnerability of the Proposed Project to Major Accidents and Natural Disasters of this EIAR). The potential impacts associated with noise are also assessed in Chapter 12 Noise and Vibration.

4.2.7.3 Construction Methodology – Borrow Pits

The Peat and Spoil Management Plan in Appendix 4-3 outlines the guidelines for the construction and reinstatement of borrow pits. The borrow pit locations were selected based on the shallow depth of peat and overburden and accessibility from the existing forestry tracks.

The borrow pits will be constructed as follows:

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. The rock within the proposed borrow pit footprints will be removed by excavation and breaking based on its excavatability, which was determined from a ground investigation carried out at the proposed borrow pits.
2. It is proposed to construct the borrow pits so that the base of the borrow pits are below the level of the adjacent section of access road.
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 pits 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.
5. It will be necessary to construct rock buttresses founded on in-situ rock within the borrow pits to create individual cells (up to 4 no. depending on the borrow pit). The cells will be opened in sequence and filled as needed. The rock buttresses will be constructed of rock fill from the borrow pit excavated, placed and compacted in layers. The founding stratum for each rock buttress will be inspected and approved by the Project Geotechnical Engineer.
6. The rock buttresses will be constructed in stages to allow infilling of peat and spoil within cells. The buttress will be constructed of selected rock fill and placed and compacted in suitable layers to form a buttress of sufficient stability to retain the placed peat and spoil.
7. Infilling of the peat and spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress, allowing the borrow pit to be developed and infilled in cells. Peat will be placed in two cells on the upslope side of the borrow pit with overburden spoil in the other two cells. 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.

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5 *https://www.hsa.ie/eng/publications_and_forms/publications/mines_and_quarries/guidance%20on%20the%20safe%20use%20of%20explosives%20in%20quarries.pdf*

8. A number of rock buttresses to form cells within the borrow pits will be required to ensure access for trucks and excavators can be achieved. See Drawings P23-230-0600-0008 and P23-230-0600-0009 of Appendix 4-3 for the location of the rock buttresses. The locations of the rock buttresses shown in the aforementioned drawings for the borrow pits are indicative only and may change subject to local conditions encountered on site during construction.
9. The rock buttresses 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 side slopes of the rock buttresses will be constructed at between 40 to 60 degrees.
10. The internal rock buttresses will be founded on bedrock i.e., competent strata. The founding stratum for the rock buttress will be inspected and approved by the Project Geotechnical Engineer.
11. In order to prevent water retention occurring behind the buttresses, the buttress will be constructed of coarse boulder fill with a high permeability. The buttress will be constructed of well graded granular rock fill of 100mm up to 500mm in size. In addition, drains will be placed through the buttresses to allow surface water to drain from the surface of the placed peat.
12. Temporary access ramps and long reach excavators will be used 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 5°. The surface of the spoil will also be higher than the surface of the peat in the adjacent upslope cell.
14. As the internal berms are slightly higher than the retained peat, drains will be provided at regular intervals through the berms, at the same level as the top of the peat surface, to prevent ponding of water within the repositories. These drains will be 150mm diameter flexible plastic drainage pipe or equivalent.
15. A layer of geogrid to strengthen the surface of the placed peat within the borrow pits will be required.
16. An interceptor drain will also be installed upslope 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. Please see Appendix 4-7 for detailed drainage design drawings.
17. Temporary control of groundwater within the borrow pits will be implemented. A temporary pump and suitable outfall locations will be used during construction.
18. Settlement ponds will be constructed at the lower side/outfall location of the borrow pits and locations are shown on the drainage drawings included in Appendix 4-7 of this EIAR.
19. 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 pits.
20. Supervision by the Project Geotechnical Engineer will be carried out for the development of the borrow pits.
21. All the above-mentioned general guidelines and requirements will be implemented by the Contractor during construction.

4.2.8 Peat and Spoil Management Plan

The purpose of the Peat and Spoil Management Plan (Appendix 4-3) is to provide a management plan, with particular reference to peat stability for the construction phase of the Proposed Project. The report describes how peat and spoil, which will be excavated from infrastructure locations such as turbine bases, hardstands, borrow pits and roads, will be handled and placed/reinstated onsite. The report also provides construction details for the types of roads which will be put in place at the site and proposed peat and spoil placement/reinstatement areas which will be developed at the site. The full Peat and Spoil Management Plan, as produced by Fehily Timoney and Company (FT) is available in Appendix 4-3.

4.2.8.1 Quantities

The quantity of peat and non-peat material (spoil), requiring management on the site of the Proposed Project has been calculated, as presented in Table 4-2 below. These quantities were calculated by FTC as part of the *Peat and Spoil Management Plan* in Appendix 4-3 of this EIAR. It should be noted that

Table 4-2 Peat and Spoil Volumes requiring management.

Infrastructure Element	Proposed Dimensions	Peat Volume (m^3)	Spoil (non-peat) Volume (m^3)
8 no. Turbines and Hardstands	28m diameter excavation footprint for turbine foundation with 100m x 35m hardstand area.	31,000	41,000
Access Roads	5m running surface with 6m wide development footprint.	34,000	16,000
2 no. Temporary Construction Compounds	Hardstanding area of 75m x 35m.	1,300	700
Substation	Hardstanding area of 130m x 65m.	2,000	6,800
Met Mast	Hardstanding area of 30m x 30m	150	450
2 no. Borrow Pits	2 no. borrow pits.	11,000	21,000
Grid Connection	25 km in length	-	16,000
Total		**79,450**	**101,950**
Total Peat & Spoil to be managed (m^3)		**181,400**	

Note a factor of 15% (bulking factor of 15%) has been applied and is included in 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 should also be noted that the excavated rock volume from the borrow pits is not included in the total volume quoted above in Table 4-2. The excavated rock volume will be re-used on site as part of the construction works for the development and hence will not require reinstatement on site.

The Proposed Wind Farm will be constructed in 4 phases, as detailed below. This will allow for the borrow pits to be developed and backfilled in stages. An outline of the Phasing is provided below:

Phase 1: Construction of site roads, Temporary Construction Compounds, Met Mast foundation and excavation of borrow pits (84,600m^3 of peat and spoil generated).

- All fill material will come from the on-site borrow pits
- All excavated material will be transferred to borrow pits once cells have been created

Phase 2: Construction of hardstands and foundation bases for turbines T01, T02, T05 and T06 (45,400m^3 of peat and spoil generated).

- Fill material to be taken from Northern and Southern Borrow Pits.
- Excavated peat to be placed in clearfell storage areas around T01, T02 and T06 and any excess to be placed in the Borrow Pits
- All excavated spoil to be placed within the borrow bits

Phase 3: Construction of hardstands and foundation bases for turbines T03, T04, T07 and T08 (26,600m^3 of peat and spoil generated).

- Fill material to be taken from BP1
- Excavated peat to be placed in clearfell storage areas around T03, T04 and T07 and any excess to be placed in the Borrow Pits.
- All excavated spoil to be placed within the Borrow Pit

Phase 4: Construction of on-site substation (8,800m^3 of peat and spoil generated).

- Fill material to be taken from borrow pits
- Excavated material to be transferred to Borrow Pits

The above phasing works are estimated to take 10-12 months in total. It is important to clarify that at any one time during the phasing of works, the entire volume of peat and spoil will not be stockpiled within the site. For example, at no point during the construction of the Phase 1 components will 84,600m^3 of peat or spoil be stockpiled or loose within the Site. Instead the volumes at any given time will relate to the element of the Proposed Project being constructed, and all peat and spoil will be promptly reinstated/stockpiled following construction of the infrastructure. Discussed below are strategies to manage peat and spoil volumes extracted for the purposes of the construction of the Proposed Project.

4.2.8.2 Peat and Spoil Usage in Restoration of Borrow Pits

Once the required volume of rock has been extracted from the borrow pit areas it is proposed to reinstate these areas with peat and overburden excavated from the works areas of the Proposed Project.

The construction methodology for the construction of the borrow pits, as presented in FTC's *Peat & Spoil Management Plan* in Appendix 4-3 of this EIAR, is summarised in Section 4.2.7 above. This methodology prescribes procedures that will be applied during the construction to avoid any adverse impact on peat stability.

Where possible, the acrotelm peat that has been excavated from across the site and not retained for reinstatement and landscaping works in those locations, will be stored with the vegetated side facing up so as to promote the growth of vegetation and placed across the surface of the stored peat within the borrow pit areas.

4.2.8.3 Designated Peat Placement Area Within Turbine Clearfell Areas

The following commitments for the placement of peat within permanent clearfell areas around 6 no. turbines will be implemented during construction. These areas have been selected based on a combination of the depth of peat, the recorded peat strength in the area and the slope angle. A check of peat stability in each area was also undertaken, allowing for the additional loading from 1m of stored peat, and these results are included on the Peat Stability Assessment Report (Appendix 8-1).

1. *Excavated peat will be placed/spread across the clearfell areas around 6 no. of the proposed turbines. These locations are shown in Drawing P23-230-0600-0005.*
2. *The peat placed within the areas shown on Drawing P23-230-0600-0005 will be restricted to a maximum height of 1.0m. Any weak/liquified peat (if encountered) will be placed within the proposed borrow pits and not stored within these areas.*
3. *The placement of peat and spoil within the placement areas will require the use of long reach excavators and low ground pressure machinery in particular for drainage works.*

4. *Where there is any doubt as to the stability of the peat surface then no material will be placed on to the peat surface. The risk of peat instability is reduced by not placing any loading onto the peat surface.*
5. *The surface of the placed peat will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat 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*
6. *Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h). This slope inclination will be reviewed during construction, as appropriate.*
7. *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 placement areas.*
8. *Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on site.*
9. *Supervision by the Project Geotechnical Engineer will be carried out for the works.*
10. *An interceptor drain will be installed upslope of the designated peat placement areas to divert any surface water away from these areas. This will help ensure stability of the placed peat and reduce the likelihood of debris run-off.*
11. *All the above mentioned general guidelines and requirements will be undertaken by the Contractor during construction*

4.2.9 Temporary Construction Compounds

2 no. temporary construction compounds are proposed for the Proposed Wind Farm site to allow for storage and refuelling of plant and machinery within the Site. Construction compound 1 is the largest compound and measures approximately 73 metres by 48 metres and 3,280 m^2 in area. The second compound measures approximately 73 metres by 32 metres and 2,330 m^2 in area. Both construction compound 1 and 2 are located approximately 350m and 365m northeast of Turbine 6 respectively.

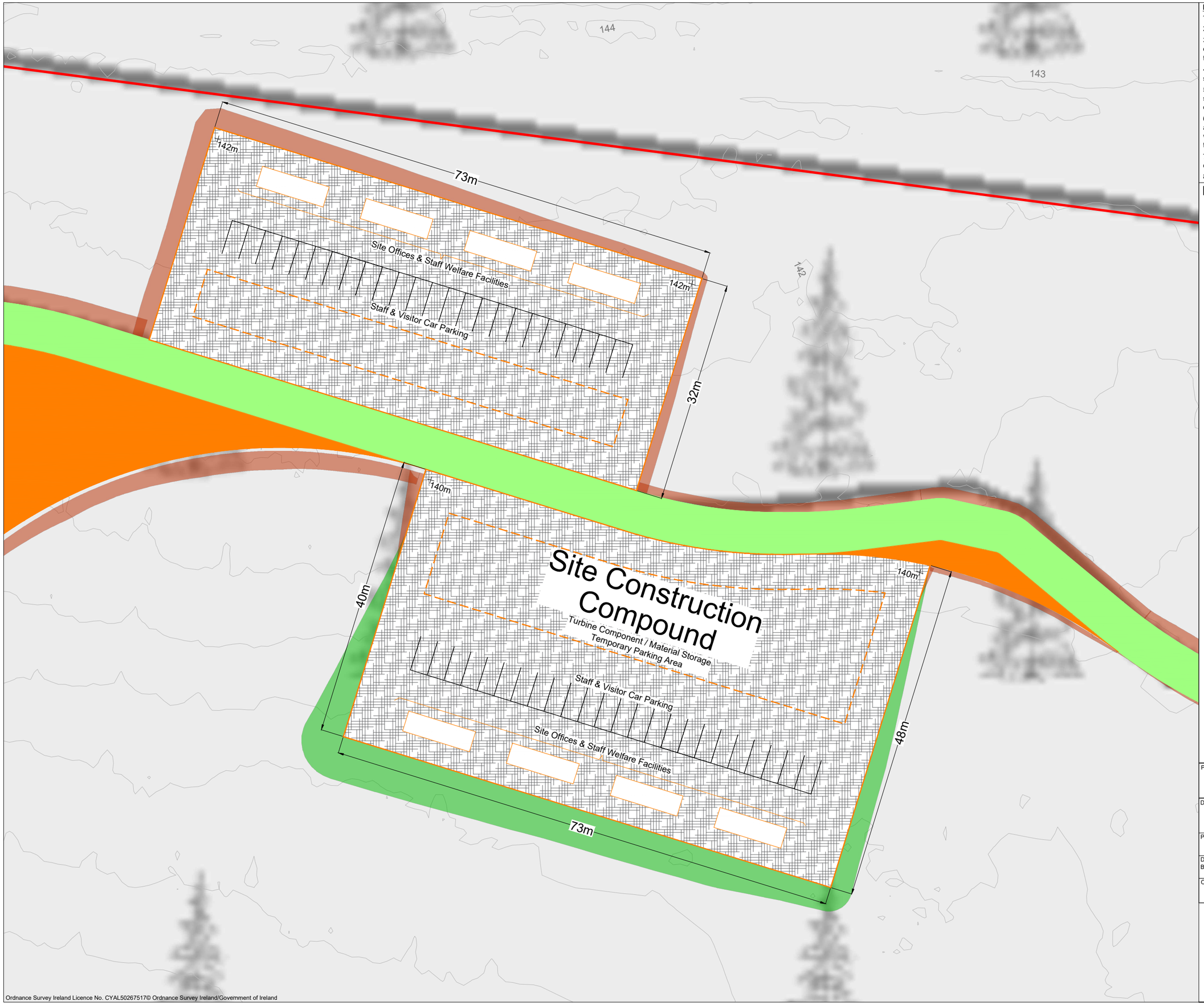
The construction compounds will consist of temporary site offices, staff facilities and car-parking areas for staff and visitors. The layout of these construction compounds is shown in Figure 4-12. Construction materials and turbine components will be brought directly to the proposed turbine locations following their delivery to the site. Temporary port-a-loo 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 wastewater being tankered off site by permitted waste collector to wastewater treatment plants. The nearest licenced primary wastewater treatment plant is located in Kilmihil, approximately 5.6km South of the Proposed Wind Farm site

4.2.9.1 Construction Methodology - Temporary Construction Compounds

The 2 no. temporary construction compounds will be constructed as follows:

- The area to be used for each 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 established using a similar technique as the construction of the substation platform as discussed in Section 4.2.3 above;
- 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;
- A limited amount of fuel will have to be stored on the Proposed Project site and for the Grid Connection in appropriately bunded containers and a bunded area for oil storage will be constructed within the compound.

- Areas within the compound will be constructed as site roads and used as vehicle hardstanding 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 compounds;
- The compounds will be fenced and secured with locked gates if necessary; and,
- Upon completion of the Proposed Project the temporary construction compounds will be decommissioned, granular material will be removed and the area will be allowed to vegetate naturally.



Project Design Drawing Notes

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6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.

Drawing Legend

- Planning Application Boundary
- Existing Road to be Upgraded
- Proposed Road
- Cut
- Fill

N

PROJECT TITLE: **Proposed Cahermurphy West Wind Farm, Co. Clare**

DRAWING TITLE: **Temporary Construction Compounds**

PROJECT No.:	DRAWING No.:	SCALE:
230843	Fig 4-12	1:500 @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	03.03.2026	D01

OS SHEET No. 4373, 4374, 4375, 4431, 4432, 4433, 4490, 4491, 4492, 4550, 4551, 4552, 4609, 4610, 4611

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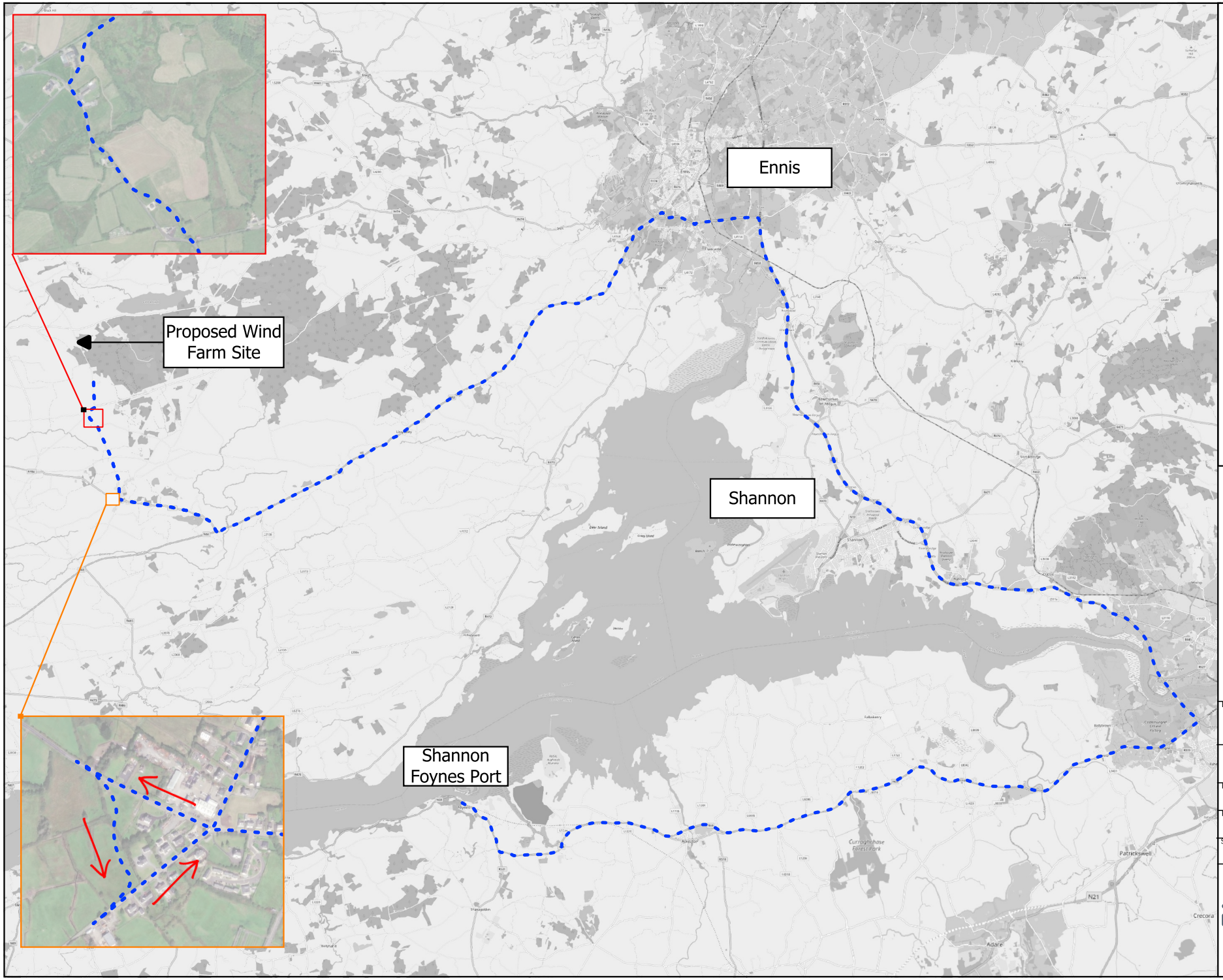
4.2.10 Turbine Component and Abnormal Load Delivery

It is proposed that large wind turbine components will be delivered to the Proposed Wind Farm site from Shannon Foynes Port, via the N69 National Secondary Road. A summary of the turbine delivery route (102km in length) is as follows:

- From the access road serving Shannon Foynes Port the route turns south onto the N69 National Secondary Road at the existing priority junction.
- From this point the route heads east on N69 for approximately 33.5km.
- The route then turns left at the Dock Road West Roundabout to head north onto the N18/M18 for approximately 30km.
- From here the route takes and exit off the M18 onto the N85 National Road and heads west for 3.8km towards the Rocky Road Roundabout where it then turns off onto the N68 heading northwest for approximately 260m, taking the first exit south on the Kilrush Roundabout .
- The route continues northeast on the N68 for approximately 23.1km passing through the village of Lissycasey before taking the right turn at the N68/R484 junction.
- From this point the route travels along the R484 for 4.7km into the village of Kilmihil, where the vehicle will perform a reverse manoeuvre through a temporary access road across two agricultural fields, into the townland of Kilmihil, onto the L-2074 local road.
- The route then heads north on the L-2074 through Kilmihil before merging onto the L-2082, travelling along the L-2082 for approximately 4km and passing through an agricultural field in the townland of Castlepark.
- The route then passes through an agricultural field north of Scoil Mhichíl in the townland of Cahermurphy, onto the L-2048, where it travels for approximately 290m before turning left onto the L-6254 for approximately 1.2km before reaching the site entrance.

The Turbine Delivery Route will run from Foynes Port to the Proposed Wind Farm site entrance off the L-6254. All deliveries of abnormally sized loads will be made using An Garda Síochána escorts and local transient traffic management measures put in place by the haulage company. The Turbine Delivery Route from Foynes Port is displayed in Figure 4-13 below.

The delivery route for general construction traffic including site staff and heavy goods vehicles (HGVs) delivering general construction materials to the site may vary depending on the location of the suppliers used for concrete and other materials required to construct the Proposed Project. Based on the location of suppliers in the vicinity of the Proposed Project (as described in Chapter 15 of the EIAR), it is intended that Construction traffic will utilise the Turbine Delivery Route insofar as possible (see Figure 4-13 below).



Map Legend

Proposed Turbine Delivery Route

Drawing Title: Proposed Turbine Delivery Route

Project Title: Cahermurphy West Wind Farm

Drawn By	Checked By
MC	EMC
Project No.	Drawing No.
230843	Figure 4-13
Scale	Date
1:200,000	26.02.2026

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4.2.10.1 Construction Materials

Concrete / Rock / Stone

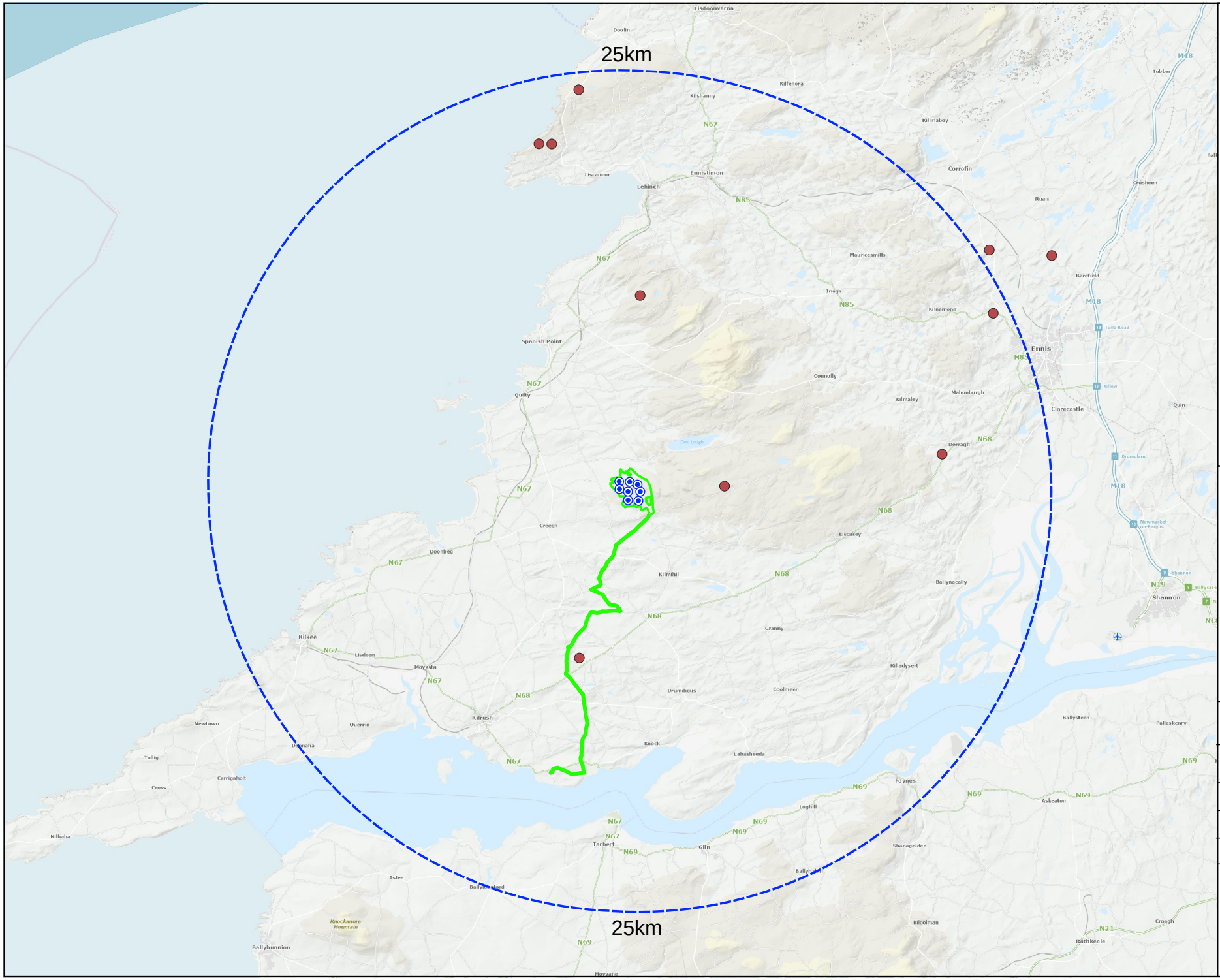
At this stage it is not confirmed where the concrete required for the turbine foundations or the finer crushed stone required during the construction phase will be transported from. The closest operational quarry (Darragh Quarry)is located 25.5km southwest of the Site via the public road network, with multiple quarries also located to the east and northeast of the site connected via national, regional and local roads that may be used to provide concrete, rock and stone. While it is proposed that quarries situated closest to the site will be used in order to minimise the traffic effects of the Proposed Project, in order to test a robust traffic scenario it is assumed that all concrete, rock and stone will be delivered along the Turbine Delivery Route (see Figure 4-13).

General construction materials, felled timber, other miscellaneous items and waste

- Similarly, it is not confirmed at this stage where general construction materials, felled timber, miscellaneous items and waste will be transported from or to. Again, in order to test a robust traffic scenario, it was assumed that all general construction traffic may be delivered from the same directions as described above (see Figure 4-13). Figure 4-14 below showcases quarries within 20km of the Proposed Wind Farm Project.

Other wind turbine component deliveries (components delivered using standard HGVs)

- All other wind turbine components delivered by standard HGVs will arrive at Shannon Foynes Port and will be delivered by via the same haul route as for the abnormally sized loads as set out above.



Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- Operational Quarry

Drawing Title
Operational Quarries within 25km of the Proposed Wind Farm site

Project Title
Cahermurphy West Wind Farm

Drawn By	Checked By
MC	EMC
Project No.	Drawing No.
230843	Figure 4-14
Scale	Date
1:300,000	26.02.2026

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4.2.10.2 Temporary Accommodation Works

Works such as road widening are sometimes required along proposed turbine transport routes to accommodate the large vehicles used to transport turbine components to wind farm sites. The proposed transport route for the Proposed Project has been the subject of a route assessment to determine if any widening works are required along its length.

It is proposed that temporary roads are established through agricultural fields at 2 no. locations and a permanent road is established at 1 no. location for the purposes of turbine components and abnormal load delivery. These field crossings will be excavate and replace type roads, given the ground condition and terrain type at these locations. It should be noted that there is no peat at any of these agricultural fields discussed in locations 2, 5 & 6 below, and no protected species/habitats were recorded during walkovers of these accommodation areas. The methodology used will be broadly similar to that outlined in Section 4.2.2.1.1, without measures directly relating to peat.

Full details of the locations described below are shown in Figures 15-6 to 15-12 in Chapter 15 and full details of the assessment are included as part of the traffic impact assessment set out in Section 15.1 of this EIAR and summarised below

Location 1: R484 Junction at the Crossroads Bar

Road widening including the temporary removal of a wall, street furniture and vegetation removal/trimming is proposed on the eastern side of the R484 regional road beside the Crossroads Bar. Any material removed will be reinstated.

Location 2: Reversing manoeuvre in the village of Kilmihil.

The Turbine Delivery vehicle will perform a reverse manoeuvre through 2 no. agricultural fields at the eastern boundary of Kilmihil. This manoeuvre begins on the R484 and finishes on the L-2074, where the vehicle will drive North through the village of Kilmihil. The temporary road will require some temporary removal of fencing (will be fully reinstated post construction) and vegetation clearance. A new track will be constructed using excavate and replace methodology in order to accommodate vehicles carrying abnormal loads. These tracks will remain within the field but will be left to grass over post construction.

Location 3: Slight bend on Church street, Kilmihil:

Temporary road widening works are necessary on Church street to the north of Kilmihil. Road widening and temporary vegetation removal is proposed along approximately 120m of the public road. Hedgerow temporarily removed will be fully reinstated post construction.

Location 4: Field Crossing, Castlepark:

Some minor temporary road widening and vegetation removal is proposed south of the beginning of the second agricultural field crossing. This hedgerow will be fully reinstated post construction. At this location, the turbine delivery vehicle will pass through agricultural fields, beginning at the L-6188/L-2082 junction and emerging back onto the L-2082 approximately 320m south of Scoil Mhichíl in the townland of Cahermurphy. Road construction methodology will follow that outlined in Section 4.2.2 above. No protected species/habitats were noted at this crossing and no potential roosting features were recorded. Temporary hedgerow loss (which will be fully reinstated post construction) will be required here to enter the field, with a new track constructed using excavate and replace methodology to accommodate vehicles carrying abnormal loads.

Location 5: Field crossing north of Scoil Mhichíl

The turbine delivery vehicle will cross through an agricultural field north of Scoil Mhichíl and emerge onto the L-2048. Temporary hedgerow loss (which will be fully reinstated post construction) is expected at this location. A new permanent track will be constructed through this field using excavate and replace methodology (as described in Section 4.2.2 above) to accommodate vehicles carrying abnormal loads. The Proposed Grid Connection route will traverse this field underneath the proposed new road.

Location 6: L-6254 Junction

Temporary expansion of an existing area of hardcore at an area previously used for the delivery of turbines to the existing Cahermurphy Wind Farm will be required. This will result in the temporary removal of 0.075ha of improved agricultural grassland which will be left to revegetate post construction.

4.2.10.3 Construction Methodology – Temporary Works Associated with Turbine Component and Abnormal Load Delivery

It is proposed that large wind turbine components will be delivered to the Proposed Wind Farm site from Shannon Foynes Port, via the N69 National Secondary Road. As discussed above and in Section 15.1 of this EIAR, road widening works are required along sections of the proposed turbine delivery route. The works include the trimming of vegetation and strengthening of road verges using the methodologies outlined above.

4.2.11 Ancillary Forestry Felling

4.2.11.1 Tree Felling

A proportion of the Proposed Wind Farm site is occupied by existing commercial forestry. As part of the Proposed Project, tree felling will be required within and around the development footprint to allow the construction of turbine bases, bat buffers, access roads, and the other ancillary infrastructure.

It should be noted that forestry on the Proposed Wind Farm site was originally planted as a commercial crop and will be felled in the future should the Proposed Project proceed or not.

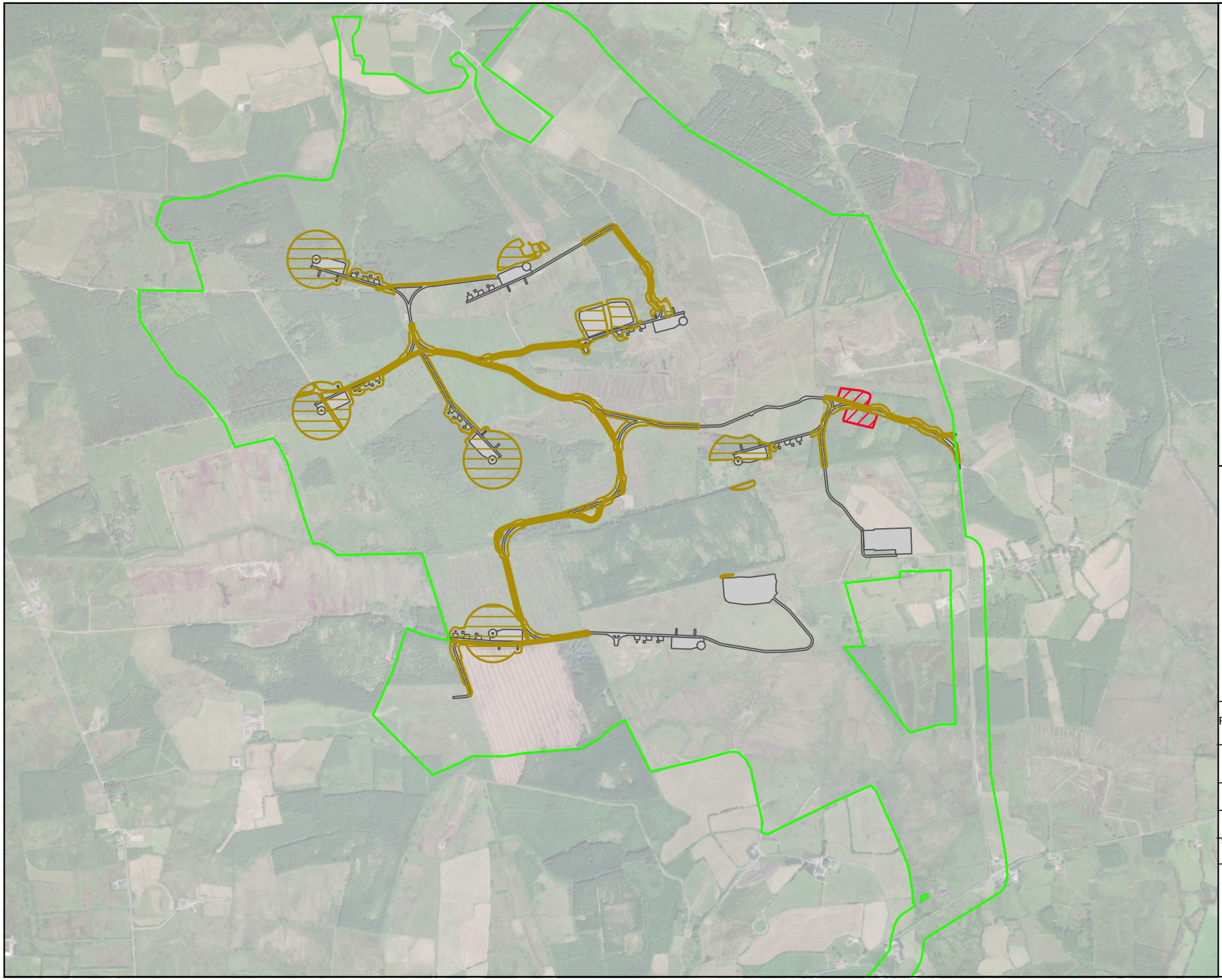
A total of 21 hectares of commercial forestry is to be permanently removed and approximately 0.79 hectares temporarily felled to facilitate the temporary construction compounds and subsequently replanted within the footprint of the Proposed Wind Farm site following the completion of the construction phase, and 56.3 hectares to be permanently felled as part of the Hen Harrier Enhancement Plan, as discussed in Appendix 7-8. Figure 4-15 shows the extent of the areas to be felled as part of the Proposed Project. Approximately 41.5 hectares of forestry will be replanted in accordance with Section 4.2.11.2 below and in line with the Forestry Act 2014, the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments.

The tree felling activities required as part of the Proposed Project will be the subject of a Felling Licence application to the Forest Service, in accordance with the Forestry Act 2014, 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 wind farm be submitted with the felling licence applications; therefore, the felling licenses cannot be applied for until such time as planning permission is obtained for the Proposed Project.

4.2.11.2 Replanting

Detailed consideration of the approach to afforestation requirements associated with the Proposed Project is attached in Appendix 2-3 of this EIAR. It should be noted that the clearfelling of trees in the

State requires a felling licence, as discussed above. The associated afforestation of alternative lands equivalent in area to those lands being permanently clearfelled is also subject to licensing ('afforestation licensing'). The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority and is responsible for all forest licensing. In light of the foregoing and for the purposes of this project, the developer commits that the location of any replanting (alternative afforestation) associated with the project will be greater than 10km from the Proposed Wind Farm site and outside any potential hydrological pathways of connectivity i.e., outside the catchment within which the Proposed Project is located. Areas of forestry proposed to be permanently clearfelled for this Wind Farm are located in upland, marginal land locations.


Map Legend
EIAR Site Boundary
Permanent Felling (c.21ha)
Temporary Felling (c.0.79ha)
Permanent Proposed Wind Farm Infrastructure Footprint
N
Microsoft product screen shots reprinted with permission from Microsoft Corporation
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Drawing Title
Proposed Forestry Felling Areas within the Proposed Wind Farm site
Project Title
Cahermurphy West Wind Farm
Drawn By
MC
Checked By
EMC
Project No.
230843
Drawing No.
Figure 4-15
Scale
1:15,000
Date
26.02.2026
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Some of these areas are of low forest productivity due to the nature of the environment and will be replaced by alternative afforestation which will be of higher forest productivity, corresponding to the latest afforestation guidelines, thus providing increased carbon sequestration.

On this basis, it is reasonable to conclude that there will be no more than imperceptible indirect, or in-combination effects associated with the replanting. In addition, the developer commits to not commencing the project until both felling and afforestation licences are in place and this ensures the afforested lands are identified, assessed and licensed appropriately by the relevant consenting authority.

4.2.11.3 Construction Methodology – Ancillary Forestry Felling

The proposed methodology for the ancillary forestry felling activities is as follows:

- The extent of all necessary forestry felling areas will be identified and demarcated with markings on the ground in advance of any felling commencing.
- All roads and culverts will be inspected by the ECoW and contractor prior to any machinery being brought on site to commence the felling operation.
- Existing drains that drain an area to be felled towards surface watercourses will be blocked, and temporary silt/sediment traps (i.e. check dam / silt fence) 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.
- 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.
- Sediment traps will be sited in drains downstream of felling areas. Machine access will be maintained to enable the accumulated sediment to be excavated.
- Sediment removed from traps will be carefully disposed of in the areas for peat and spoil management as identified in the Peat and Spoil Management Plan in Appendix 4-3.
- Machine combinations (i.e. hand-held or mechanical) will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance; however, the general proposed machine combination will comprise a harvester and a low-ground pressure harvester with a 14-tonne bunk capacity.
- Trees will be cut manually inside the 50m construction watercourse buffer and using machinery to extract whole trees only;
- Brash mats will be put in place to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur.
- Brash mat renewal will take place when they become heavily used and worn. Provision will be made for brash mats along all off-road routes, to protect the soil from compaction and rutting.
- No tracking of vehicles through watercourses will occur. Vehicles will only use existing road infrastructure and established watercourse crossings.
- Brash which has not been pushed into the soil will be moved to facilitate the creation of mats elsewhere within the site.
- 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 50-metre watercourse buffer zone prior to removal off site to authorised saw mills. Timber is likely to be diverted to different sawmill customers based on species and size.

4.2.12 Hen Harrier Enhancement Plan

4.2.12.1 Hen Harrier Enhancement Areas

Based on the precautionary assumption that hen harrier will avoid all areas within 250 metres of a turbine and having calculated the amount of foraging habitat available on an annual basis (taking into account standard forestry management practices for forested areas), the estimated quantum of habitat from which hen harrier will be displaced is c.62 hectares. It is proposed to mitigate the impact of the Proposed Project on foraging hen harrier through enhancement of the surrounding lands. A detailed description of the enhancement measures for hen harrier are outlined in the Hen Harrier Enhancement Plan in Appendix 7-8 of the EIAR. A total of 123.7ha of enhancement lands is being proposed for the benefit of hen harrier which will result in a net gain of suitable foraging and breeding habitat of c.60ha being provided by the Proposed Project. It is proposed to enhance habitats such as heath/bog, forestry, scrub and grassland through the permanent removal of non-native commercial forestry plantations planted on underlying peatland habitat, retention and reinstatement of beneficial landscape features (e.g. scrub and hedgerows), through rush management, and through the management of grazing timing and intensity. The presence of breeding and foraging hen harrier adjacent to these lands, as well as the habitats present within the enhancement and adjoining lands were factors which were used to identify these areas as habitats suitable for enhancement.

4.2.12.2 Management Methodology – Hen Harrier Enhancement Areas

Management prescriptions to be implemented by the Applicant at areas subject to forestry removal will include:

- Permanent forestry removal (c. 56.3ha)
- Erect livestock-proof fencing to prevent overgrazing.
- Approximately 26 No. plots of 0.2ha patches of scrub planted
- Self-seeded conifers hand-pulled/cut to ground level every five years.
- Eradication of invasive species within the enhancement lands.

Management prescriptions to be implemented by the Applicant at areas subject to farmland management will include:

- Implementation of a rotational grazing regime
- Establishing linear strips of wildlife cover via sowing/planting of wildlife seed crops
- Planting of scrub and hedgerow
- Rush management
- Cessation of fertiliser application

4.2.13 Site Drainage Measures

The drainage design for the Proposed Wind Farm site 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 in more peat-dominated environments than the Proposed Wind Farm site, and the number of best practice guidance documents referred to in Chapter 9 of the EIAR and included in the Bibliography of this EIAR.

The protection of the watercourses within and surrounding the site, and downstream catchments that they feed is of utmost importance in considering the most appropriate drainage proposals for the site of the Proposed Project. The Proposed Project's drainage design has therefore been proposed specifically with the intention of having no significant negative effect on the water quality of the site and its associated rivers and lakes, and consequently no significant effect on downstream catchments and ecological ecosystems.

No routes of any natural drainage features will be altered as part of the Proposed Project and turbine locations and associated new roadways were originally selected to avoid natural watercourses, and existing roads are to be used wherever possible. There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. The distance will vary between 5-20m depending on local slope, the nature of local soil deposits and also the type of vegetation present. Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Project.

4.2.13.1 Existing Drainage Features

The routes of any natural drainage features will not be altered as part of the Proposed Project. Turbine locations have been selected to avoid natural watercourses. It is proposed that 1 no. new stream crossings and 1 no. existing stream crossing upgrade will be required to facilitate the Proposed Wind Farm. There will be no direct discharges to natural watercourses. All discharges from the proposed works areas or from interceptor drains will be made over vegetated ground at an appropriate distance from natural watercourse and lakes.

Minimum buffer zones of 50m around the existing natural drainage features have informed the layout of the Proposed Wind Farm, and are indicated on the drainage design drawings. Where artificial drains are currently in place in the vicinity of proposed works areas, these drains may have to be diverted around the proposed works areas to minimise the amount of water in the vicinity of works areas. Where it may not be possible to divert artificial drains around proposed work areas, the drains will be blocked to ensure sediment laden water from the works areas has no direct route to other watercourses. Where drains have to be blocked, the blocking will only take place after an alternative drainage system to handle the same water has been put in place. Existing artificial drains in the vicinity of existing site roads will be maintained in their present location where possible. If it is expected that these artificial drains will receive drainage water from works areas, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. If road widening or improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain.

4.2.13.2 Construction Drainage Design

Drainage water from any works areas on the Proposed Wind Farm 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. Proposed Grid Connection drainage measures are discussed below.

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. Sediment laden 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 4-16 below.

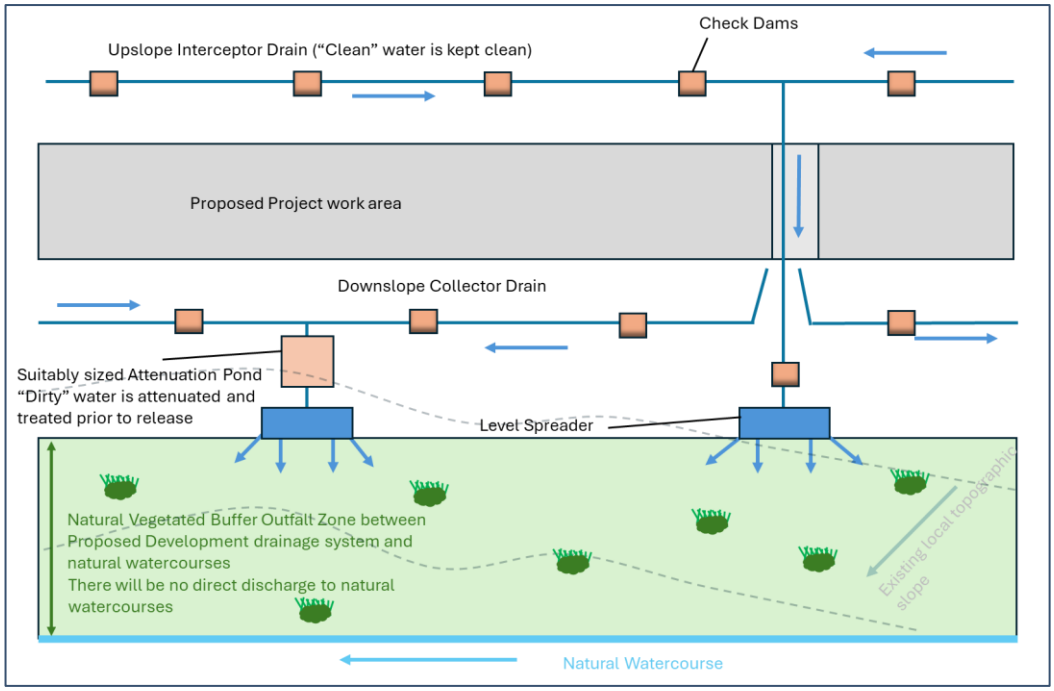


Figure 4-16: Proposed Wind Farm Drainage Process Flow

A detailed drainage design for the Proposed Project, incorporating all principles and measures outlined in this drainage design description, has been prepared, and is included as part of the Surface Water Management Plan (Appendix 4-7) to this EIAR. The drainage design employs the various measures further described in the sub-sections below and is cognisant of the relevant guidance documents as outlined in Chapter 9 of this EIAR.

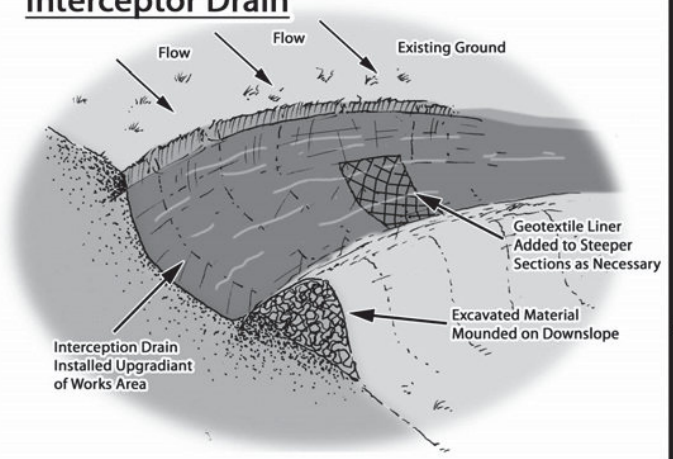
4.2.13.2.1 Interceptor Drains

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.

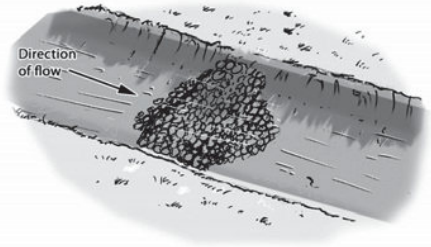
The interceptor drains will be installed in advance of any main construction works commencing. The material excavated to make the drain will be compacted on the downslope edge of the drain to form a diversion dike.

Drainage Design Measures

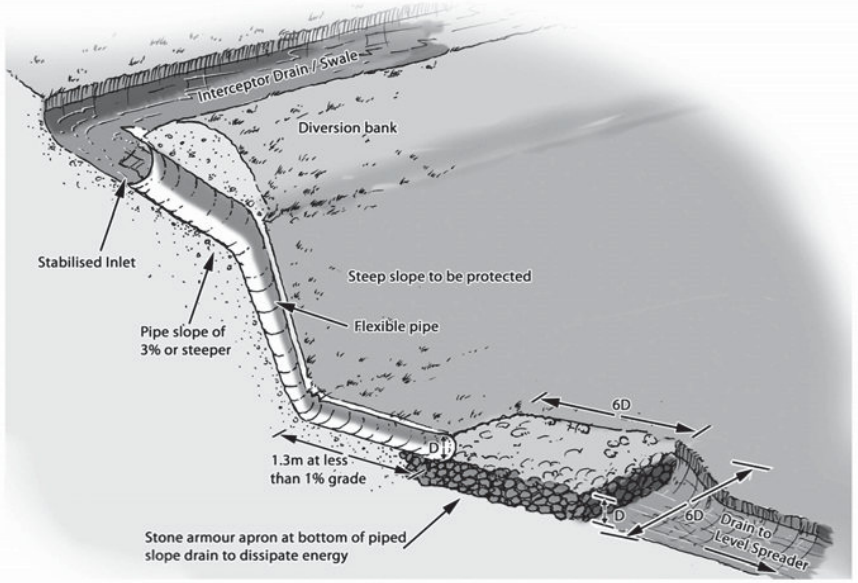
Interceptor Drain



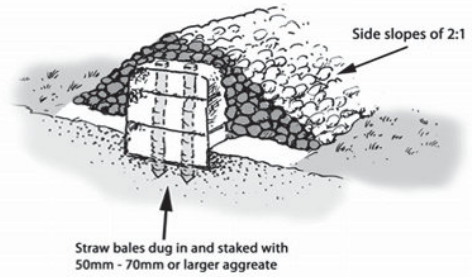
Check Dam (Stone Dam in Drain)



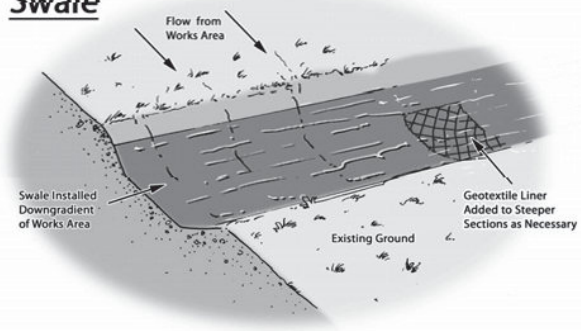
Slope Pipe Drain



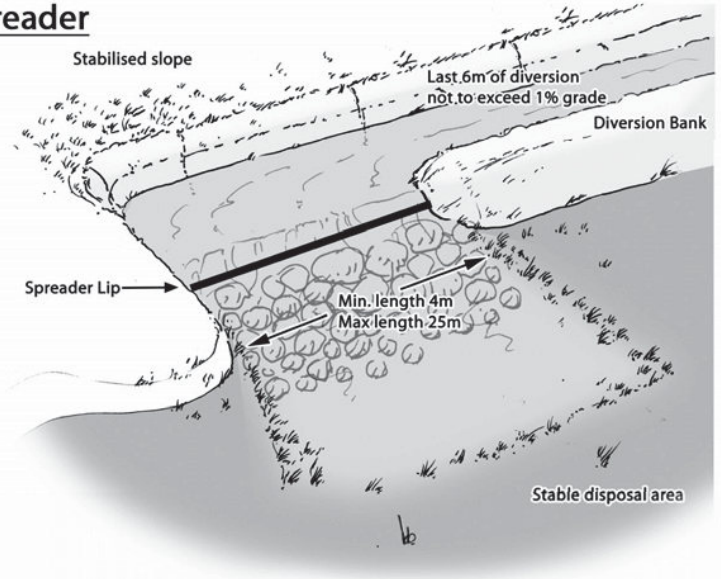
Check Dam
(Straw Bale & Stone Dam - Cross Section)



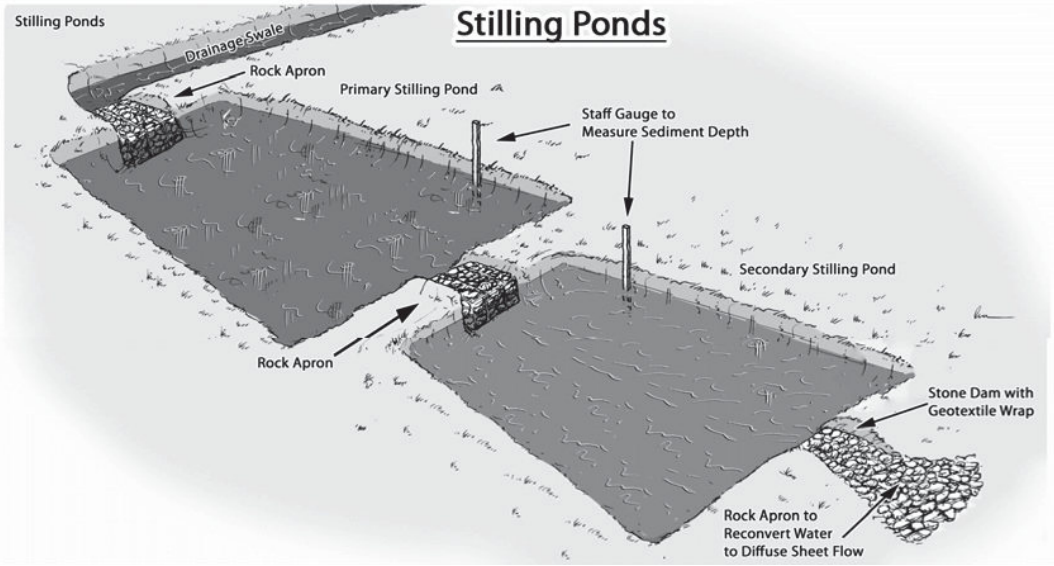
Swale



Level Spreader



Stilling Ponds



Drawing Title: Drainage Design Measures	Drawing No.: Figure 4-17	Scale: NTS
Project Title: Cahermurphy West Wind Farm		Date: 26.02.2026
Drawn By: Michéal Cahill	Checked By: Eoin McCarthy	Project No.: 230843

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The velocity of flow in the interceptor will be controlled by check dams (see Section 4.2.13.2.3 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 4.2.13.2.4 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. Figure 4-17 above shows an illustrative drawing of an interceptor drain.

4.2.13.2.2 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. 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 4-17 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.

4.2.13.2.3 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 4-17, above, 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 as this ensures the velocity of flow in the drain is controlled. 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 weekly to ensure adequate performance. Maintenance checks will also ensure the centre elevation of the dam remains lower than the sides of the dam.

4.2.13.2.4 Level Spreader

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 will not 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 will be free of silt and sediment. The level spreaders will distribute clean drainage water onto vegetated areas where the water will not be re-concentrated 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 4-17, above, 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 4.2.13.2.5 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 four metres and a maximum length of 25 metres, with the actual length of each spreader to be determined by the size of the contributing catchment, slope and ground conditions.

If necessary, 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.

4.2.13.2.5 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 1.5 metres, 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 4-17, above, shows a diagrammatic example of a piped slope drain and rock apron.

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 drain at the top of the pipe will be repaired promptly.

4.2.13.2.6 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.

4.2.13.2.7 Stilling Ponds

Stilling ponds will be used to attenuate runoff from works areas of the Proposed Wind Farm site during the construction 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 4-17, above, 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 and accounts for climate change. 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 between 1-1.5 metres in depth. Deeper ponds will be used to minimise the excavation area needed for the required volume. The proposed locations of the drainage measures that will be installed prior to wind farm construction commencing are identified on the drainage plans in Appendix 4-7.

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. Stilling ponds will feature perimeter fencing and signage to ensure that there are no health and safety risks to workers.

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 to 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.

A water level indicator such as a staff gauge will be installed in each stilling pond with marks to identify when sediment is at 10% of the stilling pond capacity. Sediment will be cleaned out of the still pond when it exceeds 10% of pond capacity. 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.

4.2.13.2.8 *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 on site and making it highly mobile. Figure 4-18 below 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.

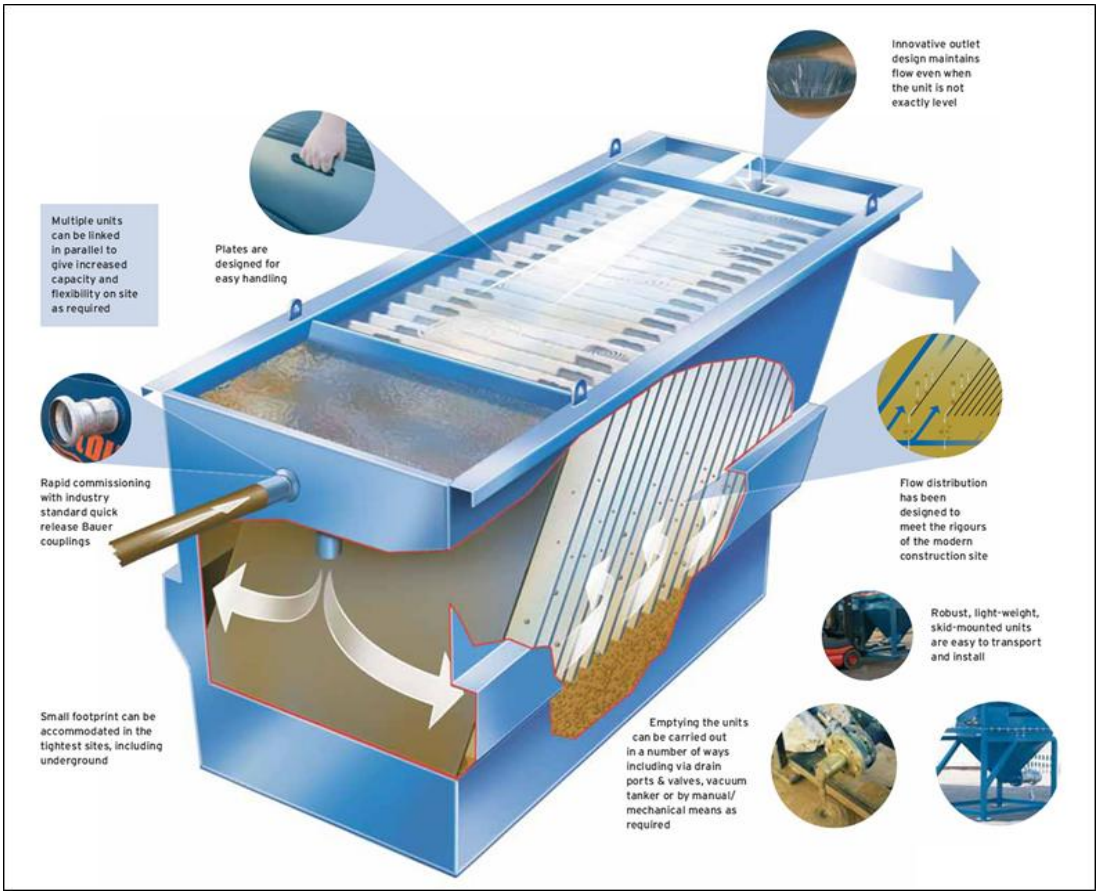

Figure 4-18: Siltbuster (Source: https://www.siltbuster.co.uk/sb_prod/siltbuster-fb50-settlement-unit/)

4.2.13.2.9 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 peaty 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 4-3 and Plate 4-4 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 4-3 Silt Bag with water being pumped through

Plate 4-4 Silt bag under inspection

4.2.13.2.10 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 as shown in Plate 4-5 below.

Plate 4-5 Typical Sedimat Details (Source: https://www.hy-tex.co.uk/)

4.2.13.2.11 Culverts

26 no. culverts will be installed to transport drainage waters from works areas of the Proposed Project (see Appendix 4-7 for locations), particularly where the waters have to be taken from one side of an existing roadway to the other for discharge and treatment. 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. Furthermore, all new proposed culverts and proposed culvert upgrades will be suitably sized for the 100-yr flood flow from the upstream catchment with an included factor (+20%) for climate change.

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 doesn't occur above or below the culvert and water can continue to flow as necessary.

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

4.2.13.2.12 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 50-metre buffer zone of a stream, which is inevitable where proposed new roads and existing roads in proximity to watercourses are to be upgraded as part of the Proposed Project. These areas include around existing culverts, around the headwaters of watercourses, and the proposed locations are indicated on the detailed drainage design drawings included in Appendix 4-7.

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.

Site fences will be inspected regularly, at least once a week, to ensure water is continuing to flow through the fabric, and the fence is not coming under strain from water backing up behind it. Standard silt fence details are shown below in Plate 4-6.

Plate 4-6 Silt Fence Details

4.2.13.3 Permanent Drainage Design

4.2.13.3.1 *Interceptor Drains and Associated Infrastructure*

On completion of the construction phase works, it is envisaged that the majority of the interceptor drains will 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, turbine bases 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 will 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 will be maintained in localised areas along the roadway with culverts under the roadway, which will 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 under the road will be left in situ following construction.

4.2.13.3.2 *Swales and Associated Infrastructure*

Drainage swales will remain in place to collect runoff from roads and hardstanding areas of the Proposed Project during the operational phase.

4.2.13.3.3 *Stilling Ponds and Associated Infrastructure*

Stilling ponds will remain in place to handle runoff from roads and hardstanding areas of the Proposed Wind Farm site during the operational phase.

4.2.13.4 Drainage Works for Ancillary Structures

The drainage works for ancillary infrastructure not covered in Section 4.2.13 above are summarised below.

4.2.13.5 Borrow Pit Drainage

While surface water will be contained in the borrow pits areas, the design proposal is to control the level of water in the borrow pit area by creating a single point outlet from the basin-like area that will ensure the water does not overtop the pit area. Run-off from the proposed borrow pit areas will be controlled via a single outlet that will be installed at the edge of the borrow pit. The single outfall point will be constructed to control runoff from the borrow pit and its immediate surrounds. Interceptor drains will already have been installed upgradient of the borrow pit area before any extraction begins.

During the construction phase of the project, it will be necessary to keep the borrow pit area free of standing water while rock is still being extracted. This will be achieved by using a mobile pump, which will pump water into the same series of drains, settlement ponds and level spreader, which will receive the water from the single outlet.

Please see Figure D101 and D103 of Appendix 4-7 of this EIAR for detailed drawings of the drainage measures proposed at the proposed borrow pit locations.

4.2.13.6 Wind Farm Internal Cable Trench Drainage

Cable trenches will be developed in short 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 upgradient side of the trench. Should any rainfall cause runoff from the excavated material, the material is 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 Project, will be transported to one of the on-site borrow pits or used for landscaping and reinstatements of other areas elsewhere on site or removed to an appropriately licenced waste/recovery facility.

On steeper slopes, silt fences, as detailed in Section 4.2.13.2.12, 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.

4.2.13.7 Forestry Felling Drainage Measures

Tree felling to facilitate the Proposed Project will not be undertaken simultaneously with construction groundworks at the same location. Felling to facilitate construction works will take place prior to groundworks commencing at that location. Some further felling may take place after all groundworks have been completed and while turbines are being commissioned.

Before the commencement of any felling works, an Environmental Clerk of Works (ECoW) will be appointed to oversee the felling and extraction works. The ECoW will have the following functions:

- Attend the site for the setup period when drainage protection works are being installed and be present on site during the remainder of the forestry felling works.
- Prior to the commencement of works, review and agree 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.
- 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 site at suitable sampling locations.
    - Sampling shall be taken from the stream / river bank, with no in-stream access permitted.
    - The following minimum analytical suite shall be used: pH, Electrical Conductivity, Total Suspended Solids, Biochemical Oxygen Demand, Total Phosphorus, Ortho-Phosphate, Total Nitrogen, 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.

All relevant measures set out in the most recent versions of the *Forestry & Freshwater Pearl Mussel Requirements, Forestry & Water Quality Guidelines, Forest Harvesting & the Environment Guidelines and the Forest Protection Guidelines* will apply. In particular, to protect watercourses, the following measures will be adhered to during all /tree felling activities.

- Works will be overseen by an ECoW as described above.
- 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 (which may include a combination of the drainage components outlined in Section 4.2.13) 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.
- Where felling is required inside the buffers, silt fences will be installed around existing watercourses. 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.
- All new collector drains will taper out before entering the aquatic buffer zone to ensure 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 will be laid out at harvesting stage to prevent soil disturbance by machine movement.
- Brash which has not been pushed into the soil will 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 50-metre watercourse buffer zone. Straw bales and check dams will 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.

4.2.13.8 Proposed Wind Farm Site and Drainage Management

Site drainage management methodology is discussed briefly below, however, it should also be noted that the Surface Water Management Plan (Appendix 4-7) discusses site drainage management in further detail.

4.2.13.8.1 *Preparative Site Drainage Management*

All materials and equipment necessary to implement the drainage measures outlined above, will be brought on-site in advance of any works commencing.

An adequate amount of straw bales, clean stone, terram, stakes, etc will be kept on site at all times to implement the drainage design measures as necessary. The drainage measures outlined in the above will be installed prior to, or at the same time as the works they are intended to drain.

4.2.13.8.2 *Pre-emptive Site Drainage Management*

The works programme for the groundworks part of the construction phase of the Proposed Project will also take account of weather forecasts, and predicted rainfall in particular. Large excavations, large movements of overburden or large-scale overburden or soil stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

4.2.13.8.3 *Reactive Site Drainage Management*

The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the ECoW or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained. This may require the installation of additional check dams, interceptor drains or swales as deemed necessary on-site. The drainage design may have to be modified on the ground as necessary, and the modifications will draw on the various features outlined above in whatever combinations are deemed to be most appropriate to the situation on the ground at a particular time.

Daily visual inspections of drains and outfalls will be performed during the construction period to ensure suspended solids are not entering streams and rivers on site, to identify any obstructions to channels and to allow appropriate maintenance of the drainage regime. In the event that works are giving rise to siltation of watercourses, the ECoW or supervising hydrologist will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.

4.2.13.9 Drainage Maintenance

Regular inspections (weekly and monthly) of all installed drainage features will be undertaken. Additional event based inspections will also be completed, i.e. after heavy rainfall in order to check for blockages and to ensure there is no build-up of standing water at parts of the drainage systems where it is not intended. The inspection of the drainage system will be the responsibility of the ECoW or the supervising hydrologist.

If necessary, any excess sediment build up behind check dams will be removed. For this reason, check dams will be inspected and maintained weekly during the construction phase of the project to ensure adequate performance. Maintenance checks will also ensure the centre elevation of the dam remains lower than the sides of the dam.

Check dams will also be inspected following rainfall events to ensure the structure of the dam is still effective in controlling flow. Any scouring around the edges of the check dams or overtopping of the dam in normal flow conditions will be rectified by reinforcement of the check dam.

Drainage swales will be regularly inspected for evidence of erosion along the length of the swale. If any evidence of erosion is detected, additional check dams will be installed to limit the velocity of flow in the channel and reduce the likelihood of erosion occurring in the future.

A water level indicator such as a staff gauge will be installed in each stilling pond with marks to identify when sediment is at 50% of the trap's capacity. Sediment will be cleaned out of the silt trap when it exceeds 50% of trap capacity. Silt traps will be inspected weekly during the construction phase of the Proposed Project and following rainfall events. Inlet and outlets will be checked for sediment accumulation and anything else that might interfere with flows.

The frequency of drainage system inspections will be reduced following completion of the construction phase of the Proposed Project. Weekly inspections during the construction phase will be reduced to monthly, bi-monthly and eventually quarterly inspections during the operational phase up until the site has revegetated and the natural silt controls regenerate. The frequency will be increased or decreased depending on the effectiveness of the measures in place and the amount of remedial action required in any given period.

4.3 Development Components of the Grid Connection

The planning application for the Proposed Project under Section 182A of the Planning and Development Act 2000, as amended, comprises the connection to the national electricity grid from the proposed onsite 110kV electrical substation at the eastern end of the Proposed Wind Farm site (as part of the Proposed Wind Farm site planning application under Section 37E of the Planning and Development Act 2000, as amended) to the existing Moneypoint 110kV substation via underground 110kV electrical cabling, measuring approximately 25 km in total, located within the public road corridor and agricultural land for the entirety of the route.

The following sections will describe each of the development components within this planning application in further detail, in the following order:

- Grid Connection Cabling
- Grid Connection Site Drainage

4.3.1 Grid Connection Cabling

A connection between the Proposed Wind Farm site and the national electricity grid will be necessary to export electricity from the proposed wind farm.

It is proposed to construct a 110kV substation at the eastern end of the Proposed Wind Farm site and to connect from here to the existing Moneypoint 110kV substation via underground 110kV electrical cabling, measuring approximately 25 km in total, utilising public local road networks and private agricultural lands. The Proposed Grid Connection route is briefly described in Section 4.3.1.1 below.

4.3.1.1 Proposed Grid Connection route

Please see Figure 4-1b for an illustration and Appendix 4-2 for detailed drawings of the Proposed Grid Connection route. Please also see Appendix 4-4 for a more detailed breakdown of the Proposed Grid Connection route, including technical detail and construction methodology. The underground cable route initially begins at Moneypoint 110 kV Substation in the townland of Carrowdotia South, Co. Clare. The route begins by exiting the existing ESB Moneypoint 110kV GIS substation along its northern boundary. The proposed cable will route north within consented private lands and converges onto the N67 national roadway travelling within the curtilage of this public road before it converges onto the L-6154. The Proposed Grid Connection takes a left turn before converging onto the L-2054 local roadway. It then travels in a northern direction. The route merges onto the L-2050 local roadway, before it takes a right turn onto the L-6132 and subsequently onto the L-6130. The route then takes a right turn traversing along the L-6118. The Proposed Grid Connection continues east within the L-6118 local roadway before it takes a left turn in a western direction traversing along the L-2044. The route continues northwest along the L-2044 before it takes a right turn along the L-2074. The route continues north along the L-6182 before meeting the R-484 regional road within the townland of Leitrim.

The Proposed Grid Connection routes across the R-484 Regional roadway onto the L-6194. The route carries right in a northeastern direction onto the L-6186 local roadway. From here the route continues northeast along the L-6186 before reaching the L-2082 local road within the townland of Cahermurphy. The proposed route crosses the L-2082 before entering the private lands. The route continues north before entering onto the L-2048. The route traverses this local roadway before taking a left turn in a northern direction onto the L-6254 local roadway. From there, the route travels north before taking a left turn in a western direction into the Site. The proposed 110kV UGC routes along an access track for approx. 215m before reaching Cahermurphy West Substation.

The Proposed Grid Connection Route will feature 36 no. Joint Bays, 6 no. Bridge Crossings and 18 no. Culvert Crossings. Horizontal Directional Drilling will be required at 12 locations. This underground Grid Connection route is illustrated in Figure 4-1b above. 24km of the Proposed Grid Connection will be located within public roads, 0.84km in private lands and 0.16km within roads located within the Proposed Wind Farm site.

4.3.1.2 Construction Methodology - Grid Connection Cable Trench from onsite substation to the National Grid

The proposed Grid Connection works will require a road opening licence from Clare County Council. A Traffic Management Plan (TMP) (Appendix 15-2 of this EIAR) will be agreed with the local authority prior to the commencement of the development. The TMP will outline the location of traffic management signage, together with the location of any necessary road closures and the routing of appropriate diversions. Where diversions are required, these will be agreed with the local authority in advance of the works commencing.

The underground 110kV grid connection ducting will consist of 1 No. trench, the trench will contain 3 No. 160mm diameter HDPE power ducts, 2 No. 125mm diameter HDPE communications ducts and 1 no. 125mm diameter earth continuity duct to be installed in an excavated trench, typically 825mm wide by 1315mm deep, with variations on this design to adapt to service crossings and watercourse crossings, etc. The communications duct will accommodate a fibre cable to allow communications between the Cahermurphy 110kV substation and Moneypoint 110kV GIS substation. The inclusion of 1 No. earth continuity conductor duct will also be required. The ducts will be installed, the trench reinstated in accordance with landowner/ Clare County Council specification. Once all are satisfied, then the electrical cabling/fibre cable is pulled through the installed ducts in approximately 750/850m sections. Construction method statements and templates will be implemented to ensure that the underground HV ducting is installed in accordance with the correct requirements, materials, and specifications of ESBN and EirGrid.

The Grid Connection route utilises public local road networks (24,068m), Wind Farm Site Roads (160m), and private lands (787m). The following methodology will be followed during the trenching works:

- The Contractor, and their appointed Site Manager, will prepare a targeted Method Statement concisely outlining the construction methodology and incorporating all mitigation and control measures included within the planning application and accompanying reports and as required by planning conditions where relevant;
- All existing underground services shall be identified on site prior to the commencement of construction works;
- At watercourse crossings, the contractor will be required to adhere to the environmental control measures detailed in the CEMP (see Appendix 4-5);
- Where the cable route intersects with culverts, the culvert will remain in place (where possible) and the ducting will be installed either above or below the culvert to provide minimum separation distances in accordance with ESB and Uisce Éireann specifications[6];

[6] *ESB Document PE424-F7001-R00-001-001 HV Cables – General Construction Methodology (2012). Available at: http://eirgridlaoiskilkenny.ie/media/pdf/21%20The%20Final%20Planning%20Application%20(Jan%202013)/Vol%203B%20Environmental%20Supplemantal%20Documents/Supplementary%20Environmental%20Documents/4%20Underground%20Cables%20Construction%20Methodology.pdf*
Uisce Éireann Document IW-CDS-5050-03 Code of Practice for Water Infrastructure (2020). Available at: https://www.water.ie/docs/connections/faqs/Water-Code-of-Practice.pdf
EirGrid Documents CDS-GFS-00-001-R1 110kV, 220kV and 400kV Underground Cable Functional Specification (2021). Available at: https://www.eirgrid.ie/site-files/library/EirGrid/110kV-Underground-Cable-Functional-Specification-General-Requirements.pdf

- Traffic management measures will be implemented as described in the Traffic Management chapter, and detailed Traffic Management Plan (see Appendix 15-2)
- Excavated material will be temporarily stockpiled onsite for re-use during reinstatement. Stockpiles will be restricted to less than 2m in height. Stockpiles will be located a minimum of 15m from surface water features and all stockpiling locations will be subject to approval by the Site Manager and Project Ecological Clerk of Works (ECoW);
- Excavated material will be employed to backfill the trench and any surplus material will be transported off site and disposed at a fully authorised soil recovery site;
- The excavated trench will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, dirty water will be fully and appropriately attenuated, through silt bags, before being discharged to vegetation or surface water drainage feature;
- Where required, grass will be reinstated by either seeding or by replacing with grass turves;
- No more than a 100m section of trench will be opened at any one time. The second 100m will only be excavated once the majority of reinstatement has been completed on the first;
- The excavation, installation and reinstatement process will take on average of 1 no. day to complete a 100m section;
- Where the ducting is being installed in a roadway, temporary reinstatement may be provided to allow larger sections of road to be permanently reinstated together.

For the trenching and ducting works, the following step by step methodology will apply:

- Grade, smooth and trim trench floor when the required 1315mm depth and 825mm width have been obtained.
- Place bedding layer of Cement Bound Granular Mixture B (CBGM B) material in accordance with the specification and compact it so that the compacted thickness is as per the drawings.
- Lay the bottom row of ducts in trefoil formation as detailed on the design drawings. Use spacers as appropriate to establish horizontal duct spacing. Fit a secure cap / bung to the end of each duct run to prevent the ingress of dirt or water.
- Carefully surround and cover ducts with CBGM B in accordance with the design drawings and specifications and thoroughly compact without damaging ducts.
- Place cable protection strips on compacted CBGM B directly over the ducts.
- Lay the top row of ducts onto the freshly compacted CBGM B including the cable protection strips above the bottom row of ducts. Place a secure cap at the end of each duct to prevent the ingress of dirt or water.
- Carefully surround and cover ducts with CBGM B material in accordance with the drawings and thoroughly compact without damaging ducts.
- Place red cable protection strip on top of compacted CBGM B over each set of ducts as shown on the drawings.
- Place and thoroughly compact CBGM B material or Clause 804 backfill or soil backfill as specified and place warning tape at the depth shown on the drawings.
- For concrete and asphalt/bitmac road sections, carry out immediate permanent reinstatement in accordance with the specification and to the approval of the local authority and/or private landowners, unless otherwise agreed with local authorities.
- Clean and test the ducts in accordance with the specification by pulling through a brush and mandrel. Install 12 mm polypropylene draw rope in each duct and seal all ducts using robust duct end seals fitted with rope attachment eyes in preparation for cable installation at a later date. All the works should be witnessed by ESBN Clerk of Works (ECoW) as required.

The proposed on-site 110kV electrical substation will be connected to the existing 110kV Moneypoint electrical substation via underground 110kV electrical cabling which will be constructed to EirGrid specifications[7], guided by the methodology outlined above.

Plate 4-7 Typical Cable Trench View

4.3.1.2.1 Existing Underground Services

Any underground services encountered along the grid cable routes will be surveyed for level and the ducting will pass over the service provided 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 the 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. If the required separation distances cannot be achieved then a number of alternative options are available such as using steel plates laid across the width of the trench and using 35N concrete surrounding the ESB ducts where adjacent services are within 600mm, with marker tape on the side of the trench. Back fill around any utility services will be with dead sand/pea shingle.

4.3.1.2.2 Marker Posts

Surface cable markers will be placed along the route where cable depth is unavoidably shallow, due to constraints such as existing services, to indicate the precise location of the UGC. These markers will be metallic plates in accordance with ESBN and EirGrid standards.

Marker posts will be used on non-roadway routes to delineate the cable route and joint bay positions. Corrosion proof aluminium triangular danger sign, with 700mm base, and with centred lightning symbol, on engineering grade fluorescent yellow background shall be installed in adequately sized concrete foundations. Marker post shall also be placed in the event that burial depth is not to standard. Siting of marker posts to be dictated by ESBN as part of the detailed design process.

4.3.1.2.3 Joint Bays

[7] *https://www.eirgrid.ie/site-files/library/EirGrid/110kV-Underground-Cable-Functional-Specification-General-Requirements.pdf*

Joints Bays are to be installed approximately every 650m - 850m along the UGC route to facilitate the jointing of 2 No. lengths of 110kV UGC. Joint Bays are 6m x 2.5m x 2.05m pre-cast concrete structures installed below finished ground level. Joint Bays will be located in the non-wheel bearing strip of roadways, however given the narrow profile of local roads this may not always be possible. Please refer to Appendices 4-2 and 4-4 for further details on joint bay construction and cable installation.

Where possible, joint bays will be located in areas where there is a natural widening/wide grass margin on the road in order to accommodate easier construction, cable installation and create less traffic congestion. During construction the joint bay locations will be completely fenced off, and once they have been constructed, they will be backfilled until cables are being installed.

In association with joint bays, Communication Chambers will be installed at every joint slab location to facilitate communication links. Earth Sheath Link Chambers are also be installed at every joint bay along the cable route. Earth Sheath Links are used for earthing and bonding cable sheaths of underground power cables, so that the circulating currents and induced voltages are eliminated or reduced. Earth Sheath Link Chambers and Communication Chambers are located in close proximity to joint bays. Earth Sheath Link Chambers and Communication Chambers will be pre-cast concrete structures with an access cover at finished surface level.

4.3.1.2.4 *Major Watercourse Crossings*

The cable route will involve 6 No. bridge crossings, of which 5 no. will be horizontal directional drilling (HDD) crossings and will not interact with the existing bridge structure. As there is insufficient cover and depth in the bridge to cross with the bridge deck at these 5 locations, HDD will be required. Drawings of the bridge crossings and further details on culvert crossing methodology are included in Appendices 4-2 and 4-4 of this EIAR.

The underground cable will encounter 18 no. water culverts along the route, of which 2 no. Culverts are proposed to be replaced with an adequately sized HDPE Twin Wall pipe. Existing culverts will be crossed using open trenching with either an undercrossing or overcrossing. A confirmatory site survey of all culverts has been completed as part of this phase of the project prior to planning to confirm the crossing methods. The locations of the bridges and culverts are shown on the site layout drawings included in Appendix 4-2.

Inland Fisheries Ireland have published guidelines relating to construction works along water bodies entitled "*Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites (Eastern Regional Fisheries Board, 2004)*", and these guidelines will be adhered to during the construction of the Proposed Project.

4.3.2 Grid Connection Site Drainage

Please refer to Section 4.2.13 above for details on trenching and drainage methodology.

4.4 Wind Farm and Grid Connection – Construction and Monitoring

4.4.1 Construction Phasing and Timing

It is estimated that the construction phase of the Proposed Project (i.e. Wind Farm as set out in Section 4.2 and Grid Connection as set out in Section 4.3) will take 18 to 24 months from starting on site to the commissioning of the electrical system. In the interest of breeding birds, construction will not commence during the breeding bird season from April to July inclusive. Construction may commence at any stage from August onwards to the end of March, so that construction activities are ongoing by

the time the next breeding bird season comes around, and can continue throughout the next breeding season.

4.4.1.1 Construction Sequencing

The construction phase can be broken down into three main, overlapping phases: 1) civil engineering works - 12 months, 2) electrical works including grid connection works – 12 months, and 3) turbine erection and commissioning - 8 months. The main task items under each of the three phases are outlined below.

Civil Engineering Works

- Create new entrance.
- Felling of forestry (as outlined in Section 4.2.11)
- Construct new site roads (permanent), drainage ditches and culverts.
- Clear and hardcore area for construction compound incorporating temporary site offices.
- Construct remaining new site roads and hard-standings and crane pads.
- Construct the substation, control building and groundworks for the substation compound.
- Excavate/pile for turbine bases where required. Excavate borrow pits. Store soil/peat locally for backfilling and re-use. 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 1-2 days.

Electrical Works

- Construct bases/plinths for transformer in the sub-station.
- Excavate trenches for site cables, lay cables and backfill. Provide ducts at road crossings.
- Install external electrical equipment at substations
- Install transformer at compound.
- Erect stock proof and palisade fencing around substation area.
- Install internal collector network and communication cabling.
- Construct grid connection.

Turbine Erection and Commissioning

- Backfill tower foundations and cover with suitable material.
- Erect towers, nacelles and blades.
- Complete electrical installation.
- Install anemometry masts and decommission and remove existing mast.
- Commission and test turbines.
- Complete site works reinstate site.
- Remove temporary site offices. Provide any gates, landscaping, signs etc. which may be required.

All relevant Site Health & Safety procedures, in accordance with the relevant Health and Safety Legislation and guidance (listed in Section 5.11.2.2 of Chapter 5: Population and Human Health 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 Project. Further details of on-site health, safety and welfare are included in Chapter 5 of this EIAR.

The phasing and scheduling of the main construction task items are outlined in Figure 4-19 below, where 1st January has been selected as an arbitrary start date for construction activities.

			Year 1				Year 2			
ID	Task Description	Duration (months)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Mobilisation	1								
2	Set-up Construction Compound	1								
3	Construct Roads	6								
4	Turbine Foundations	4								
5	Site Ducting	4								
6	Site Cabling	4								
7	Turbine Delivery	2								
8	Turbine Erection	3								
9	Turbine Commissioning	3								
10	Site Substation Civils	4								
11	Grid Connection Cable Civils	3								
12	Substation electrical fit-out	4								
13	Grid Connection cable and jointing	3								
14	Substation Commissioning	3								
15	Power on	1								
16	Commissioning	3								
17	Operational	0								

Figure 4-19: Indicative Construction Schedule

4.4.1.2 Construction Phase Monitoring and Oversight

A CEMP has been prepared for the Proposed Project and is included in Appendix 4-5 of this EIAR. The CEMP includes details sets out details of the environmental controls to be implemented on site, site drainage measures, peat stability monitoring measures and a waste management plan. The CEMP also outlines the Emergency Response Procedure to be adopted in the event of an emergency in terms of site health and safety and environmental protection. In the event planning permission is granted for the Proposed Project, 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 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 will be maintained for the duration of the construction phase, and into the operational phase where necessary.

4.4.2 Construction Management

4.4.2.1 Environmental Management

All proposed activities on the site of the Proposed Project will be provided for in an environmental management plan. This EIAR Chapter should be read in conjunction with the CEMP, which includes more detailed information on the environmental management framework to be adhered to during the pre-commencement and construction phases. A brief summary of the key information is presented in the following sections.

4.4.2.2 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 within the temporary construction compounds. 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. 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.

4.4.2.3 Concrete Deliveries

Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. The closest concrete batching plant to the Proposed Project is located in the townland of Ballybrody, Co. Clare located approximately 25.2km to the northeast of the Site. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. When concrete is delivered to site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the site. Chute cleaning water will be isolated in temporary lined wash-out pits located near the Proposed Wind Farm site entrance. These temporary lined wash-out pits will be removed from the Proposed Wind Farm site at the end of the construction phase. Concrete trucks will be washed out fully at the 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 (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/) or equivalent. 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 will be disposed of off-site at an appropriate waste facility. Where temporary lined impermeable containment areas are used, such containment areas will be built using straw bales and lined with an impermeable membrane. Two examples are shown in Plate 4-8 and Plate 4-9 below.

Plate 4-1 Concrete washout area


Plate 4-2 Concrete washout area

The areas are covered when not in use to prevent rainwater collecting. In periods of dry weather, the areas will be uncovered to allow much of the water to be lost to evaporation. At the end of the concrete pours, any of the remaining liquid contents will be tankered off-site. Any solid contents that will have been cleaned down from the chute will have solidified and will be broken up and disposed of along with other construction waste.

Due to the volume of concrete required for each turbine foundation, and the requirement for the concrete pours to be continuous, deliveries will be carried out outside normal working hours in order to limit the traffic impact on other road users, particularly peak period school and work commuter traffic. Such activities are limited to the day of turbine foundation concrete pours, which are normally

complete in a single day per turbine. Notice will be provided to local residents and the local authority in advance of any out of hours operations.

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 be constructed to a high standard to allow transport of the turbine components around the site, and hence, concrete delivery trucks will be able to access all areas where the concrete will be needed. 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 bases 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, confirming 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.

4.4.2.4 Concrete Pouring

Because of the scale of the main concrete pours that will be required to construct the Proposed Wind Farm, the main pours will be planned days or weeks in advance. Special 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 Siltbuster-type concrete wash unit (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/) or equivalent (see Section 4.2.13.2.8 above).
- Disposing of surplus concrete after completion of a pour in suitable off-site locations away from any watercourse or sensitive habitats.

4.4.2.5 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 ponds in the site's drainage system, and will be pumped into a bowser or water spreader to dampen down haul roads and site 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.

4.4.2.6 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 will be required as part of the construction phase of the Proposed Project because site roads will be already formed using on-site materials before other road-going trucks begin to make regular or frequent deliveries to the site (e.g. with steel or concrete). The site 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 were to be dirtied by trucks associated with the Proposed Project.

4.4.2.7 Waste Management

The CEMP, Appendix 4-5 of this EIAR, provides a waste management plan (WMP) which outlines the best practice procedures during the excavation and construction phases 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 Project. Disposal of waste will be seen as a last resort.

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 has to have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the site of the development to ensure that all contractors hired to remove waste from the site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is delivered to a licensed or permitted waste facility. The nearest licensed waste facility to the Proposed Project is Clean (Ireland) Refuse & Recycling Co. Ltd. near Creegh, Co. Clare, which is located approximately 5.2km to the southwest of the Proposed Wind Farm site. 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 Waste Manager will be appointed by the Contractor. The 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 will 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. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets.

4.4.2.8 Traffic Management

A turbine with a blade length of 81.5 metres has been used in assessing the traffic impact of the Proposed Project. This length was used to model for the longest blade length during transport. Resultantly, all blade lengths within the proposed range will fit within the modelled oversail areas. The blade transporter for such a turbine blade would have a total vehicle length of 87 metres, including the blade which overhangs the back of the vehicle. A clamp & dolly style vehicle has been used for these assessments. All other vehicles requiring access to the site of the Proposed Wind Farm site will be smaller than the design test vehicles. The largest turbine delivery vehicles have been modelled

accurately in the Autotrack assessments for the site access junctions, as detailed in Section 15.1 of this EIAR.

The need to transport turbine components on the public roads is not an everyday occurrence in the vicinity of the site of the Proposed Project. However, the procedures for transporting abnormal size loads on the country's roads are well established. While every operation to transport abnormal loads is different and requires careful consideration and planning, escort vehicles, traffic management plans, drive tests, road marshals and convoy escorts from the Garda Traffic Corps are all measures that are regularly employed to gets unusual loads from origin to destination. With just under 400 wind farms already built and operating in Ireland (Republic and Northern Ireland combined, as per latest available figures, accessed in January 2026, on www.windenergyireland.com), transport challenges are something the wind energy industry and specialist transport sector has become particularly adept in finding solutions to.

A Traffic Management Plan has been prepared as set out in Appendix 15-2 of the EIAR. In the event planning permission is granted for the Proposed Project, the final Traffic Management Plan will address the requirements of any relevant planning conditions, including any additional mitigation measures, should they be conditioned.

Traffic management measures included the following:

- Identification of a delivery schedule,
- Details of the alterations required to the infrastructure identified in Section 15.1.9 of this EIAR, and any other minor alteration identified,
- A dry run of the route using vehicles with similar dimensions.

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

It is not anticipated that any section of the public road network will be closed during transport of turbines, although there will be some delays to local traffic at pinch points. During these periods it may be necessary to operate local diversions for through traffic. All deliveries comprising abnormally large loads where required will be made outside the normal peak traffic periods, at night, to avoid disruption to work and school-related traffic.

A full dry run of the transport operation along the proposed route will be completed using vehicles with attachments to simulate the dimensions of the wind turbine transportation vehicles. This dry run will inform the Traffic Management Plan submitted for agreement with Limerick and Clare County Councils. All turbine deliveries will be provided for in the Transport Management Plan which will be finalised in advance of the construction stage, when the exact transport arrangements are known, delivery dates confirmed and escort proposals in place. The finalised Transport Management Plan will be submitted to the Planning Authority for agreement in advance of any abnormal loads using the local roads, and will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls.

4.5 Operation

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

The wind turbines will be connected together and data relayed from the wind turbines to an off-site control centre. Each turbine will also be monitored off-site by the wind turbine supplier. The monitoring of turbine output, performance, wind speeds, and responses to any key alarms will be monitored at an off-site control centre 24-hours per day.

Each turbine will be subject to a routine maintenance programme involving a number of checks and changing of consumables, including oil changes. In addition, there will be a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes requiring a crane. Maintenance traffic will consist of four-wheel drive vehicles or vans. In the event that a single replacement turbine blade is required to be delivered to the Proposed Wind Farm site, a blade lifter vehicle will be used to transport the turbine blade from the port of delivery to the Proposed Wind Farm site and hence the temporary measures for turbine delivery proposed during construction, including a set down area, are not anticipated during operation. The electricity substation and site tracks will also require periodic maintenance.

4.5.1.1 Renewable Energy Support Scheme

The Renewable Energy Support Scheme (RESS) Terms and Conditions, published by the Department of Communications, Climate Action and Environment in August 2023, make some high-level provisions for how this type of community benefit fund will work. Any project which wants to export electricity to the national grid 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. The 1-kilometre distance specified is measured from the base of the nearest turbine of the Project to the nearest part of the structure of the household, the location of which is identified in the An Post's GeoDirectory;*
2. *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;*
3. *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. The Generator may supplement this spend on administration from its own fund should it be deemed necessary to do so; and*
4. *The balance of the funds shall be spent on*
    a. *initiatives successful in the annual application process, as proposed by clubs and societies and similar not-for-profit entities; and*
    b. *in respect of Onshore Wind RESS 3 Projects, on "near neighbour payments" for households located outside a distance of 1 kilometre from the Project but within a distance of 2 kilometres from such Project. The distance specified is measured from the base of the nearest turbine of the Project to the nearest part of the structure of the household, the location of which is identified in the An Post's GeoDirectory.*

4.5.1.2 Community Benefit Fund

Cahermurphy Renewables Designated Activity Company (DAC) expects that for each megawatt hour (MWh) of electricity produced by the wind farm, the project will contribute €2 into a community fund

for the RESS period i.e. first 15 years of operation and €1 per MWh for the remaining lifetime of the wind farm. If this commitment is improved upon in upcoming Government Policy, we will adjust accordingly.

If this project is constructed as currently proposed, we estimate that a total of approximately €9,000,000 will be available in the local area for community funding over the lifetime of the project. The above figure is indicative only and will be dependent on the generation capacity of the wind farm which is influenced by a number of factors including:

1. *Number of wind turbines.*
2. *Capacity and availability of energy production of those turbines.*
3. *Quantity of wind*

4.6 Decommissioning

The wind turbines proposed as part of the Proposed Project are expected to have a lifespan of 35 years. Following the end of their useful life, the wind turbines may be replaced with a new set of turbines, subject to planning permission being obtained, or the Proposed Project will be decommissioned fully. The onsite 110kV electrical substation and 110kV electrical cabling will remain in place as it will be under the ownership of the ESB and will form a permanent part of the national electricity grid.

Upon decommissioning of the Proposed Project, the wind turbines will be disassembled in reverse order to how they were erected. All above ground turbine components will be separated and removed off-site for recycling.

Turbine hardstands and foundations will remain in place underground and will be left to revegetate naturally. Leaving the turbine hardstands and foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environment nuisances such as noise, dust and/or vibration.

Site roadways will be left in situ, as appropriate to facilitate on-going forestry operations. Underground cables, including grid connection, will be removed and the ducting left in place.

A decommissioning plan will be agreed with the local authorities three months prior to decommissioning the Proposed Project. The principles that will inform the final decommissioning plan are contained in the Decommissioning Plan in Appendix 4-6. The likely effects associated with the decommissioning of the Proposed Project is assessed throughout each chapter of this EIAR and NIS.