4. DESCRIPTION OF THE PROPOSED PROJECT

4.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) describes the proposed the Proposed Project and all of its component parts. Consultation with An Coimisiún Pleanála confirmed that the Proposed Project will be subject to a single consenting process, with development relating to the Proposed Wind Farm and the Proposed Grid Connection being made to An Coimisiún Pleanála under Section 37E of the Planning and Development Act, 2000, as amended.

Section 1.1.1 of Ch. 1: Introduction of this EIAR provides a definition of the various project references used throughout the document. The 'Proposed Project', which encompasses the 'Proposed Wind Farm' and the 'Proposed Grid Connection' has been assessed within this EIAR. The Proposed Project is located within the EIAR site boundary or the 'Site'. The Site measures approximately 1,175 hectares (ha). The 'Proposed Wind Farm site' refers to the portion of the Site surrounding the Proposed Wind Farm but excluding the portion of the site surrounding the Proposed Grid Connection. The 'proposed turbines' refers to the 14 no. turbines associated with the Proposed Wind Farm. The 'Proposed Grid Connection' refers to the part of the Site containing the 110kV underground cabling connection from the proposed 110kV onsite substation to the existing Dunmanway 110kV substation. The Proposed Project layout is illustrated on Figure 4-1.

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

The Proposed Project will consist of the provision of the following:

i. *14 no. wind turbines with an overall turbine tip height of 169 metres, a rotor blade diameter of 133 metres, and turbine hub height of 102.5 metres, a meteorological mast with a height of 30 metres, and associated foundations and hardstanding areas, and subsequent decommissioning of the wind turbines and meteorological mast, following a thirty five-year operational life from the date of full commissioning of the wind turbines;*
ii. *A 110kV substation compound (Including control buildings (645Sq.m) with welfare facilities, all associated electrical plant and apparatus, security fencing, underground cabling, lightening protection poles, underground wastewater holding tank, site drainage and all ancillary works);*
iii. *Underground electrical (110kV) and communications cabling from the proposed 110kV on-site substation to the existing Dunmanway 110kV substation in the townland of Ballyhalwick (including joint bays, communication chambers, earth sheath links, and ancillary works along the underground electrical cabling route). This cabling route is primarily located within the public road corridor;*
iv. *Underground electrical (33kV) and communications cabling connecting the wind turbines and meteorological mast to the proposed 110kV on-site substation;*
v. *3 no. temporary construction compounds (including site offices and welfare facilities (with a combined floor area of 585 Sq.m)).*
vi. *2 no. temporary security cabins (with a combined floor area of 28.8 Sq.m);*
vii. *Junction accommodation works to facilitate turbine delivery and construction access to the site, including the upgrade of an existing site entrance off the R585 regional road, and the construction of a new access road off the R585 regional road, crossing the L8777 Local Road; including new permanent gated site entrances located off the R585 and the L8777;*
viii. *Upgrade of existing site tracks/ roads and provision of new site access roads, junctions and hardstand areas (including upgrade of a short section of the L8777 local road);*

ix. *4 no. borrow pits;*
x. *Peat and Spoil Management Areas;*
xi. *Site Drainage;*
xii. *Tree felling and vegetation removal;*
xiii. *Operational stage site signage;*
xiv. *Biodiversity Enhancement measures (peatland enhancement, Kerry slug habitat enhancement, and native woodland planting) and;*
xv. *All associated site development works, ancillary works and apparatus.*

All elements of the Proposed Project provided in the list above, and described in this chapter, have been assessed as part of this EIAR.

4.2 Proposed Project Location

The Proposed Wind Farm site is located within a rural setting in west Co. Cork, approximately 2.3km east of the village of Kealkill, 9.5km northeast of the town of Bantry, and 12.2km west of Dunmanway.The nearest Natura 2000 site to the Proposed Wind Farm site, i.e., Special Area of Conservation (SAC) or Special Protection Area (SPA), is the Derryclogher (Knockboy) Bog SAC which is located approximately 7km northwest of the nearest proposed turbine (T13). Elevations within the Proposed Wind Farm site range from ~428mOD (metres above Ordnance Datum) to ~132mOD.

The Proposed Grid Connection consists of c.20.5km of 110kV underground electrical cabling from the proposed 110kV onsite substation, in the townland of Maughanaclea, Co. Cork to the existing Dunmanway 110kV substation in the townland of Ballyhalwick, Co. Cork to facilitate the connection of the Proposed Wind Farm to the national electricity grid. The Proposed Grid Connection is primarily located along the public road corridor, with a short section located across private land/tracks. The Proposed Grid Connection follows the R585, L4909, L4609, L4615, R587, R586, and the R586 to the existing Dunmanway 110kV substation. The townlands that the Proposed Grid Connection will pass through are detailed in Table 1-1 of Chapter 1: Introduction. The nearest Natura 2000 site to the Proposed Grid Connection is the Bandon River SAC. A section of the Proposed Grid Connection overlaps with the Bandon River SAC. Please see Section 4.4.2 for further details on the Proposed Grid Connection.

Current land-use on the Proposed Wind Farm site is predominantly commercial forestry, with agricultural pastures and rough grazing also present. Current land-use along the Proposed Grid Connection comprises of the public road corridor, public open space, pastures, and private land principally used by agriculture. Land-use on the wider landscape comprises a mix of pastoral agriculture, low-density residential, and small-scale commercial properties.

The existing uses of the site for agriculture and forestry will continue in conjunction with the Proposed Project.

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

4.3 Proposed Project Layout

The overall layout of the Proposed Project is shown on Figure 4-1, which includes the Proposed Wind Farm and the Proposed Grid Connection.

The Proposed Project has been designed to minimise potential environmental effects, while at the same time maximising the energy yield from the Proposed Wind Farm. A constraints study, as described in Section 3.2.5 of this EIAR, has been carried out to ensure that turbines and ancillary infrastructure are located in the most appropriate areas of the Site, making use of existing access tracks where appropriate and thereby minimising the extent of proposed new roads required. Similarly, as described in Section 3.2.5.9 of this EIAR, a route selection constraints study was undertaken to ensure that the most

appropriate route for the Proposed Grid Connection was selected. The Proposed Wind Farm layout is shown in Figure 4-2. The Proposed Grid Connection layout is shown in Figure 4-3.

The overall layout of the Proposed Project is shown on Figure 4-1. This drawing shows the proposed locations of the wind turbines, proposed 110kV onsite substation, meterological (met) mast, the underground electrical cabling route to the Dunmanway 110kV Substation, peat and spoil management areas, borrow pits, temporary construction compounds, internal access roads and hardstand areas, biodiversity management and enhancement areas, and the site entrances, which include proposed turbine delivery temporary accommodation works. Detailed site layout drawings of the Proposed Project are included in Appendix 4-1 of this EIAR.

505000 510000 515000 520000 525000 530000 535000

575000 570000 565000 560000 555000 550000

T01 T02 T03 T04 T05 T06 T07 T08 T09 T10 T11 T12 T13 T14

Kealkill

Dunmanway

0 5 10 km

Microsoft Vantor

Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- Existing Dunmanway 110kV Substation
- Proposed Grid Connection
- Proposed Internal 33kV Cabling
- Proposed Turbine Foundations
- Proposed Met Mast Location
- Proposed New Roads
- Exisitng Roads to be Upgraded
- Proposed Peat and Spoil Management Areas
- Proposed Borrow Pits
- Proposed 110kV Onsite Substation
- Proposed Hardstands
- Proposed Tempoary Construction Compounds
- Proposed Security Compounds

BMEP Enhancement Areas

- Kerry Slug Enhancement Area
- Habitat Restoration Area
- Native Woodland Planting

SITE LOCATION - NOT TO SCALE

Drawing Title: Proposed Project Layout

Project Title: Maughanaclea Renewable Energy Development

Project No.	Drawing No.	Scale
240225	Figure 4-1	1:100,000
Drawn By	Checked By	Date
SOR	RK	27/03/2026

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

508000

510000

512000

558000

556000

T01
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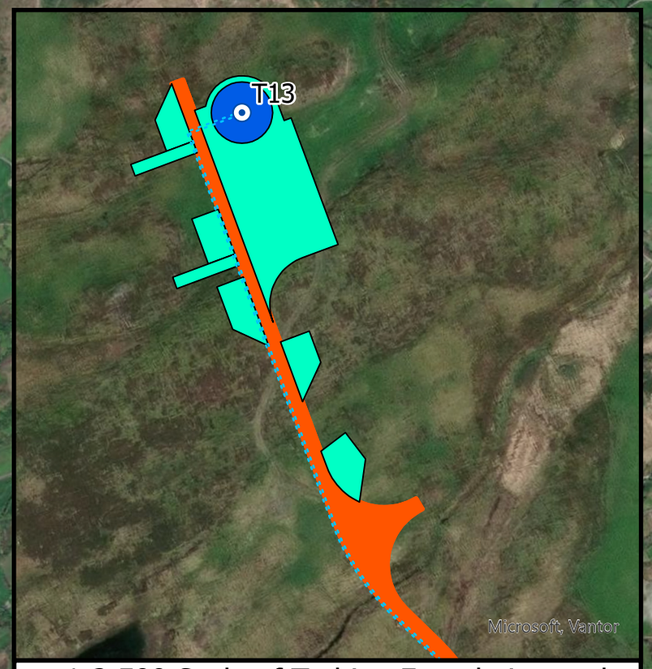
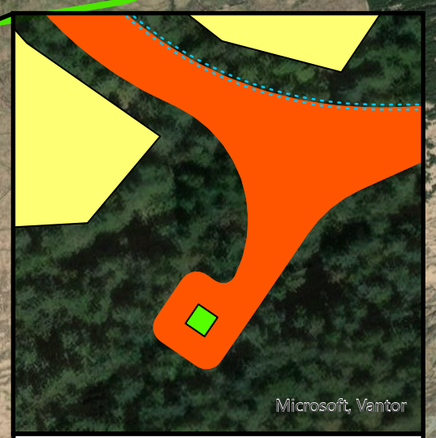


1:2,500 Scale of Turbine Foundation and Hardstand



1:1,200 Scale of Proposed Met Mast Location

0 0.9 1.8 km

Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- Proposed Grid Connection
- Proposed Internal 33kV Cabling Route
- Proposed Turbine Foundations
- Proposed Met Mast Location
- Proposed Hardstands
- Proposed 110kV Onsite Substation
- Proposed New Roads
- Exisitng Roads/Tracks to be Upgraded
- Proposed Peat and Spoil Management Areas
- Proposed Borrow Pits
- Proposed Security Cabins
- Proposed Tempoary Construction Compounds

BMEP Enhancement Areas

- Kerry Slug Enhancement Area
- Peatland Restoration Area
- Native Woodland Planting

SITE LOCATION - NOT TO SCALE

Drawing Title

Proposed Wind Farm Layout

Project Title

Maughanaclea Renewable Energy Development

Project No.	Drawing No.	Scale
240225	Figure 4-2	1:18,000
Drawn By	Checked By	Date
SOR	RK	24/03/2026

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

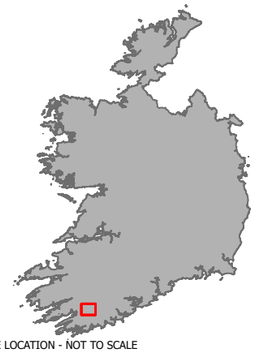
510000 515000 520000 525000

560000 555000 550000

0 2.5 5 km

Map Legend

- EIAR Site Boundary
- Proposed Grid Connection
- Existing Dunmanway 110kV Substation



SITE LOCATION - NOT TO SCALE

Drawing Title

Proposed Grid Connection Layout

Project Title

Maughanaclea Renewable Energy Development

Project No.	Drawing No.	Scale
240225	Figure 4-3	1:55,000
Drawn By	Checked By	Date
SOR	RK	24/03/2026

MKO

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4.4 Proposed Project Components

This section of the EIAR describes the components of the Proposed Project. Further details regarding Site Activities (Section 4.5), Access and Transportation (Section 4.6), Site Drainage (Section 4.7), Construction Management (Section 4.8) and Construction Methodologies (Section 4.9) are provided subsequently in this chapter.

4.4.1 Proposed Wind Farm

4.4.1.1 Wind Turbines

4.4.1.1.1 *Turbine Locations*

The proposed wind turbine layout has been optimised using wind farm design software (WindPro) to maximise the energy yield from the Proposed Wind Farm, 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. The final finished level of the top of turbine foundations will be determined by the actual ground conditions at each proposed turbine location and may differ slightly from those levels listed in Table 4-1.

Table 4-1 Proposed Wind Turbine Locations and top of foundation level

Turbine	ITM Coordinates		Top of Foundation Elevation (mOD)
	Easting	Northing	
T1	512234	559029	308
T2	511718	558777	290
T3	511969	558466	258
T4	510753	558366	212
T5	511153	558170	276
T6	511548	557969	220
T7	510300	555783	348
T8	509807	555268	376
T9	509359	555344	316
T10	508872	555280	300
T11	508449	555395	290
T12	508113	555660	246
T13	507799	555873	232
T14	507383	555284	224

4.4.1.1.2 Site Investigations

As part of the design process for the Proposed Project, numerous intrusive site investigations were undertaken across the Proposed Wind Farm site, to provide detail and clarity on the nature and extent of subsoils and bedrock as a means of characterising the Proposed Wind Farm site, and provide information on the sandstone/mudstone (primarily Ardaturrish Member, Old Head Sandstone Formation, and Reenagough member) bedrock. This assisted in providing additional information on the most suitable location for turbines and associated infrastructure.

A total of 640 no. peat depth probes were carried out on the Site during various site visits undertaken by MKO, Fehily Timoney & Company Ltd. (FTC), Hydro-Environmental Services (HES), and the Applicant. Peat depths recorded across the Proposed Wind Farm site ranged from 0.0m to 4.5m, with an average depth of 0.65m. Approximately 95% of peat depth probes recorded depths of less than 2.0m, and approximately 78% of the peat dept probes recorded a depth of less than 1.0m. In addition, GSI mapping indicated that there is one short section along the Proposed Grid Connection where the cable passes through peat lands. Peat depth probing at this location, recorded by HES on 8th April 2025, indicated the presence of shallow peaty topsoil, 0.15m - 0.20m deep. There are two other sections along the Proposed Grid Connection where the cable passes alongside peat lands. Peat depth probes carried out by HES on 8th April 2025 at these locations did not record the presence of any peat.

Geotechnical ground investigations were carried out for the site and included the following:

- 16 no. trial pits excavated to depths ranging from 0.20m to 3.50m below ground level;
- 3 no. boreholes at depths ranging from 6.00m to 10.40m below ground level;
- In-situ shear vane testing at turbine and other selected locations across the Site to provide representative coverage of indicative peat strengths;
- Installation of standpipes at 2 no. rotary coring locations to allow for monitoring of groundwater levels; and,
- Laboratory testing of rotary core and trial pit samples.

The ground investigation was carried out at the Proposed Wind Farm site by Irish Drilling Limited (IDL) under the supervision of FTC between January and March of 2025. Ground investigation in the form of trial pits were carried out on the 29th and 30th of January and the 4th and 5th of February 2025, and rotary coring at the proposed borrow pit locations was undertaken from the 19th to 26th of March 2025. The combined geological and hydrological dataset collected from the geotechnical ground investigations and from ground truthing site walkovers completed by IDL, FTC, HES and MKO have been used in the preparation of this EIAR Chapter.

The 16 no. trial pits were carried out at various locations across the Proposed Wind Farm site in order to provide information on the ground conditions and underlying bedrock at turbine locations, along internal access tracks, and to investigate the potential to develop borrow pits within the Site. The 3 no. rotary core boreholes were carried out to establish overburden conditions and rockhead and to establish the nature and integrity of the underlying bedrock at the proposed borrow pit locations. Subsequent laboratory testing included the classification testing for overburden material and determination of dry density/moisture content relationship. In-situ shear vane testing was undertaken at turbine and other selected locations across the Proposed Wind Farm site to provide representative coverage of indicative peat strengths. The data obtained from the ground investigations and laboratory testing was used to inform the final layout of the Proposed Project. Further details on the ground investigations, including detailed results of the surveys, are provided in Appendix 8-1: Geotechnical and Peat Stability Assessment Report.

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

4.4.1.1.3 *Turbine Type*

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

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

Plate 4-1 Wind turbine components

The turbine model to be installed at the Proposed Wind Farm site will have the following dimensions:

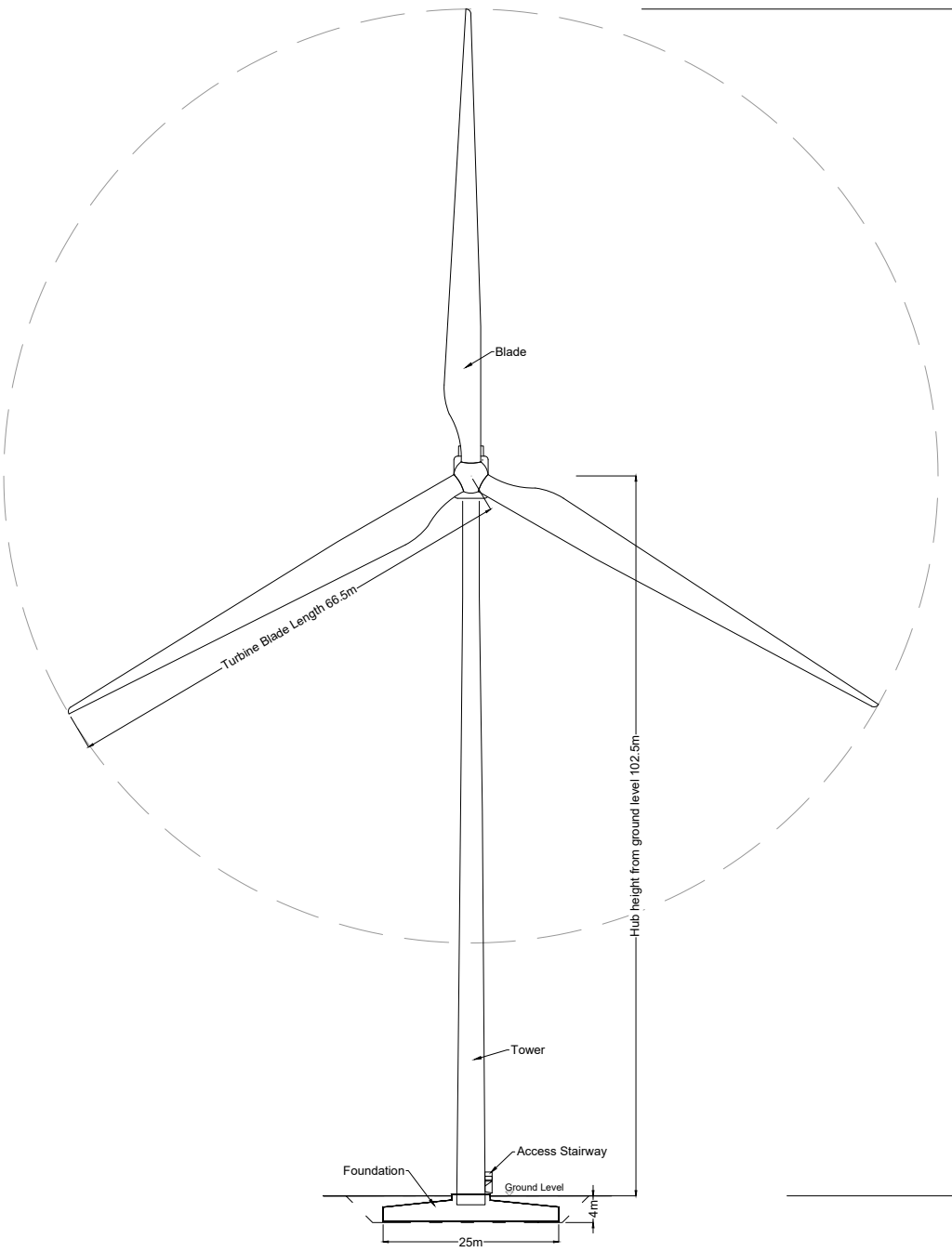
- Turbine tip height of 169 metres;
- Blade rotor diameter of 133 metres; and,
- Hub height of 102.5metres.

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

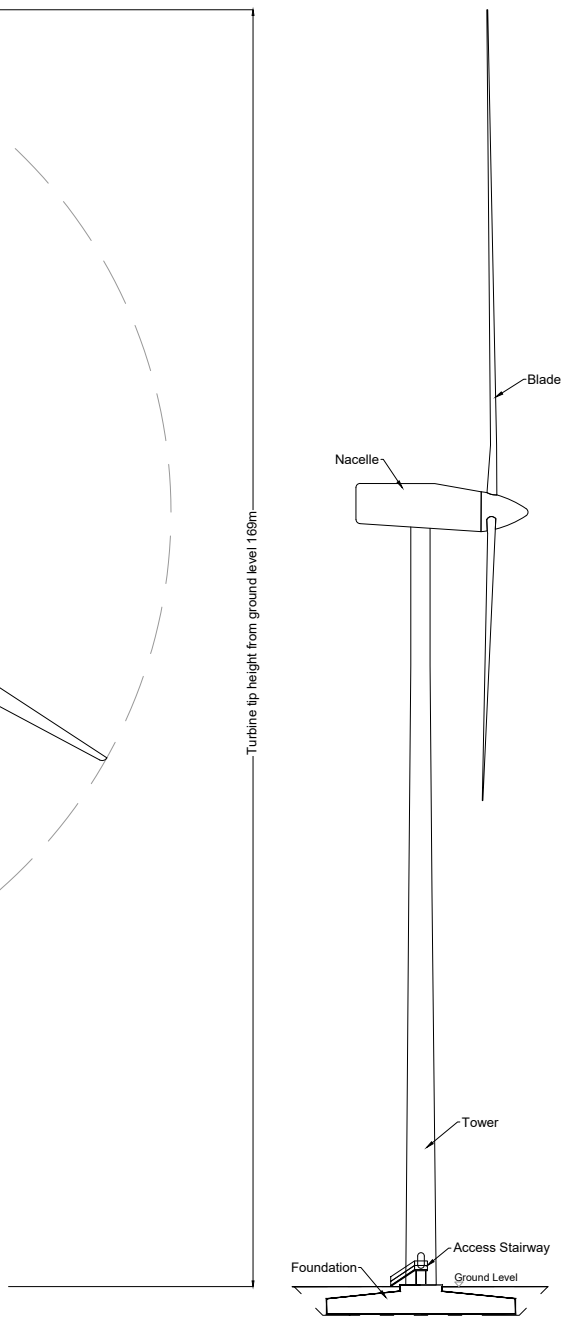
For the purposes of this EIAR, the above turbine dimensions have been selected and considered in the relevant sections of the EIAR. Turbine design parameters have a bearing on the assessment of shadow flicker, noise, visual impact, traffic and transport and ecology (specifically birds), as addressed elsewhere in this EIAR.

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

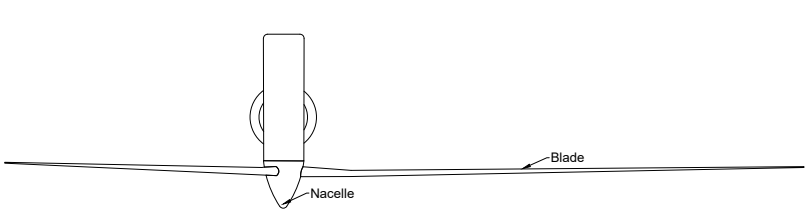
A drawing of the proposed wind turbine is shown in Figure 4-4. The individual components of a geared wind turbine nacelle and hub are shown in Figure 4-5 below.



Front/Sectional Elevation



Side/Section Elevation



Plan

Drawing Notes

1. Proposed wind turbines to have a ground to blade tip height of 169m, blade length of 66.5m and hub height of 102.5m
2. Ground level represents the top of turbine foundation.

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Wind Turbine Elevations and Plan

PROJECT No.:		DRAWING No.:	SCALE:
240225		**Figure 4-4**	**1:500 @ A1**
DRAWN BY: **KD**	CHECKED BY: **AC**	DATE: **25.03.2026**	REVISION.: P01

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

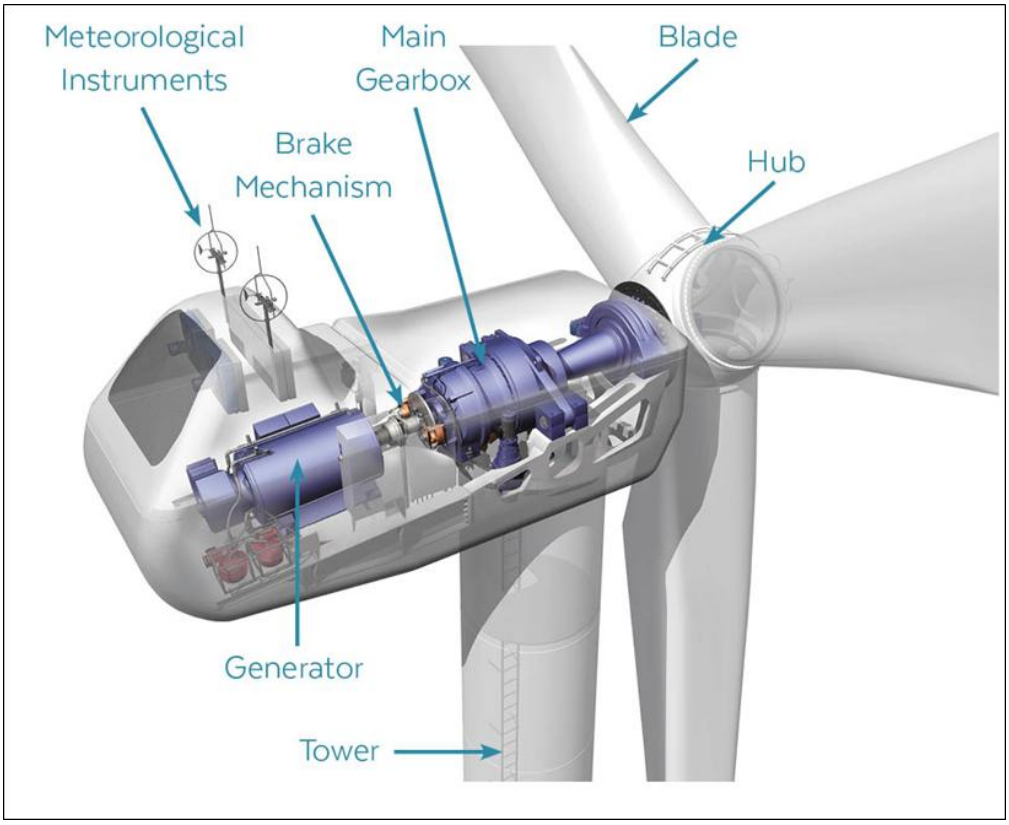


Figure 4-5 Turbine nacelle and hub components.

4.4.1.1.4 Turbine Foundations

Each wind turbine is secured to a reinforced concrete foundation that is installed below the finished ground level. The size of the foundation will be dictated by the turbine manufacturer, and the final turbine selection will be the subject of a competitive tender process. Different turbine manufacturers use different shaped turbine foundations with some variation, depending on the requirements of the final turbine supplier, however, a foundation area large enough to accommodate modern turbine models has been assessed in this EIAR, adopting a precautionary approach. The turbine foundation transmits any load on the wind turbine into the ground. The maximum horizontal and vertical extent of the turbine foundation will be 25m and 3.5m respectively. The gravity foundations to be constructed at the Proposed Wind Farm site are shown on Figure 4-6 below.

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

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

Plate 4-3 Finished Turbine Foundation

4.4.1.1.5 Hard Standing Areas

Hard standing areas consisting of levelled and compacted hardcore are required around each turbine base to facilitate access, turbine assembly and turbine erection. The hard-standing areas are used to accommodate cranes used in the assembly and erection of the turbine, offloading and storage of turbine components, and provide a safe, level working area around each turbine position. The hard-standing areas are extended to cover the turbine foundations once the turbine foundation is in place. All crane hardstand areas will be designed taking account of the loadings provided by the turbine manufacturer and will consist of a compacted stone structure. The main body of the crane hardstands (i.e. not including the blade fingers and turbine foundation) will be constructed in a similar manner to the excavated site roads. The main body of the crane hardstand area will measure approximately 35m x 55m.

The precise sizes, arrangement and positioning of hard standing areas are informed by the turbine manufacturers. The proposed hard standing areas are illustrated in the detailed drawings included in Appendix 4-1 of this report. The extent of the required areas at each turbine location may be optimised on-site depending on topography, position of the Proposed Wind Farm access roads, the proposed turbine position and the turbine supplier's exact requirements.

Figure 4-6 shows a turbine base layout (Turbine No. 1), including turbine foundation, hard standing area, blade lay-down area, access road and surrounding works 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 using the precautionary principle, represent the maximum sizes required.

A temporary works area has been identified around each of the proposed turbines hardstand areas; these areas will be utilised during the construction phase to facilitate all works with the construction of the proposed turbines and associated infrastructure. These temporary works areas are shown within the planning drawings included as Appendix 4-1 to this EIAR.

4.4.1.1.6 Generating Capacity

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

Please note, the MW output of the Proposed Wind Farm is considered to be a consequence of turbine design and not a physical attribute on which it is possible to measure or assess the impact of. For the purposes of this EIAR, a rated output of 4.8 MW has been chosen to calculate the potential generating capacity of the proposed 14-turbine renewable energy development, which would result in an estimated installed capacity of 67.2MW.

Assuming an installed capacity of 67.2 MW, the Proposed Wind Farm therefore has the potential to produce approximately 217,800 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 37%[1] is applied here

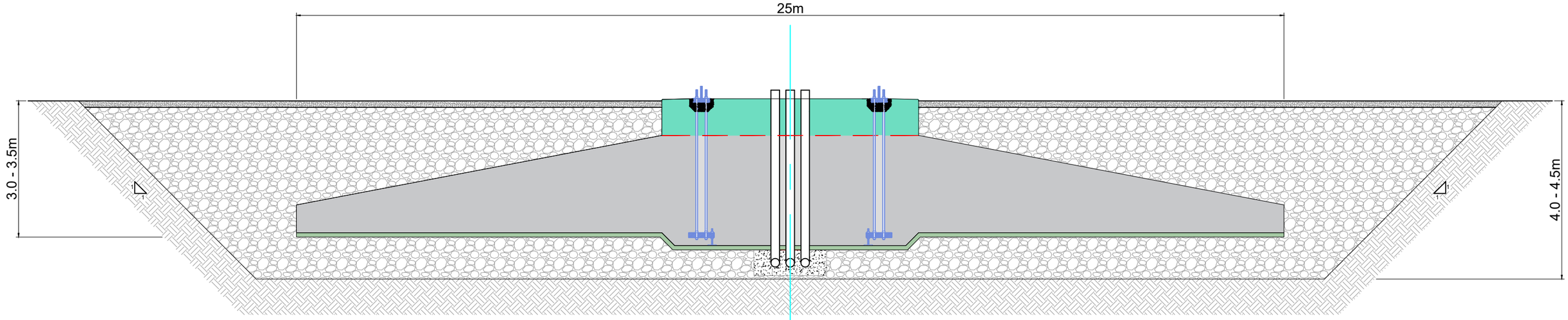
C = ... Rated output of the Proposed Wind Farm: 67.2 MW

The 217,800 MWh of electricity produced by the Proposed Wind Farm would be sufficient to supply over 51,800 Irish households with electricity per year, based on the average Irish household using 4.2 MWh of electricity[2] (this latest figure is available from the March 2017 CER Review of Typical Consumption Figures Decision Paper).

The 2022 Census of Ireland recorded a total of 127,971 occupied households in Co. Cork. Per annum, based on a capacity factor of 37%, the Proposed Project would therefore produce sufficient electricity for the equivalent of approximately 40% of all households in Co. Cork.

[1] *Enduring Connection Policy 2.3 Solar and Wind Constraints Report: Assumptions and Methodology* <https://cms.eirgrid.ie/sites/default/files/publications/ECP-2.3-Solar-and-Wind-Constraints-Report-Assumptions-and-Methodology-v1.1.pdf> *The Proposed Project is located within the F wind region for Ireland with an associated capacity factor of 37%.*

[2] *March 2017 CER (CRU) Review of Typical Consumption Figures Decision Paper* https://www.cru.ie/document_group/review-of-typical-consumption-figures-decision-paper/



Section A-A

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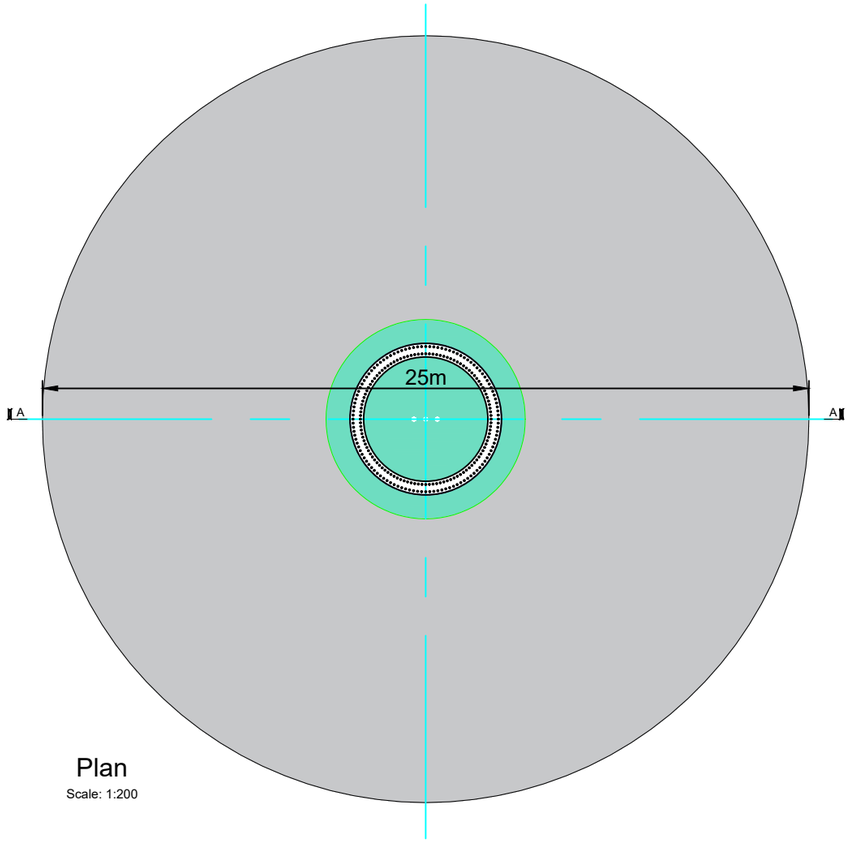

Plan

Scale: 1:200

PROJECT TITLE: **Maughanaclea Renewable Energy Development Co.Cork**			
DRAWING TITLE: **Gravity Foundation Details**			
PROJECT No.: **240225**	DRAWING No.: **Figure 4-6**		SCALE: **As shown @ A3**
DRAWN BY: **KD**	CHECKED BY: **AC**	DATE: **25.03.2026**	REVISION.: P01

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4.4.1.2 Site Roads

4.4.1.2.1 *Road Construction Types*

To provide access within the Proposed Wind Farm and to connect the wind turbines and associated infrastructure, existing roads and tracks will need to be upgraded, and new access roads will need to be constructed. FTC were appointed to assess the existing ground conditions and specify the type of road required to access all locations onsite. The road construction preliminary design has taken into account the following key factors, as outlined in the *Peat and Spoil Management Plan* in Appendix 4-2:

1. Buildability considerations
2. Maximising use of existing infrastructure
3. Minimising excavation arisings
4. Serviceability requirements for construction and wind turbine delivery and maintenance vehicles
5. Requirement to minimise disruption to peat hydrology

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

The Proposed Wind Farm makes use of the existing road network insofar as possible. It is proposed to upgrade approximately 2.1km of existing roads and tracks, and to construct approximately 12.1km 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.

The road construction techniques to be considered are as follows:

- Upgrade of existing access roads or tracks
- Construction of new excavated roads through peat
- Construction of new section of floating road

Upgrade of Existing Access Roads or Tracks

As noted above, approximately 2.1km of existing roads and access tracks will be upgraded as part of the Proposed Wind Farm construction phase. This includes an approximate 0.3km section of local road L8777 which will require minor upgrade works to facilitate the 33kV internal wind farm cabling. The general construction methodology for upgrading of existing sections of access roads or tracks, as presented in FTC's *Peat & Spoil Management Plan* in Appendix 4-2 of this EIAR, is summarised in Section 4.9.1.2.1 below. Sections of road undergoing upgrades are shown in Figure 4-7 below.

Construction of New Wind Farm Access Roads

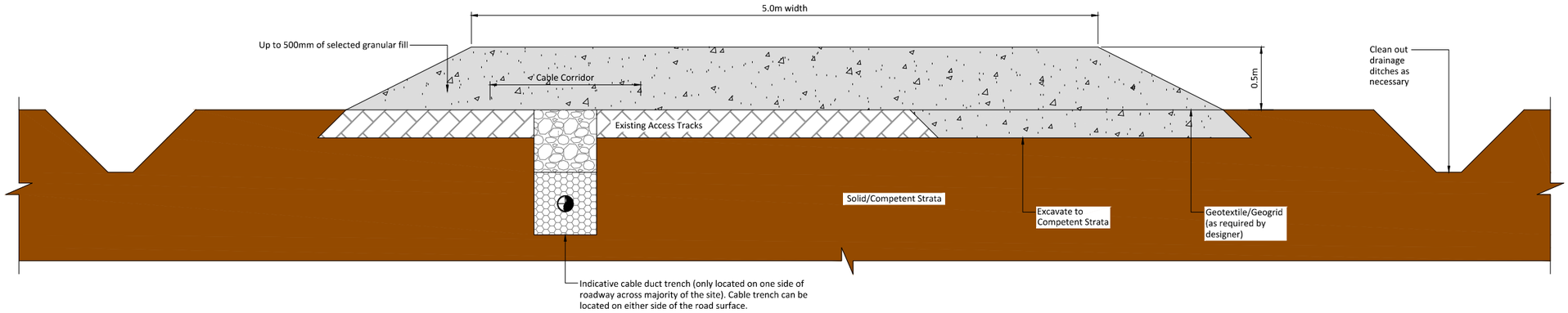
As noted above, approximately 12.1km of new roads will be constructed in order to facilitate the Proposed Wind Farm. Due to the ground conditions, new access roads proposed onsite are generally proposed to be founded and located on competent stratum. The excavated access tracks typically consist of an average of 750 mm of selected granular fill. A section of a new excavated road is also shown in Figure 4-8.

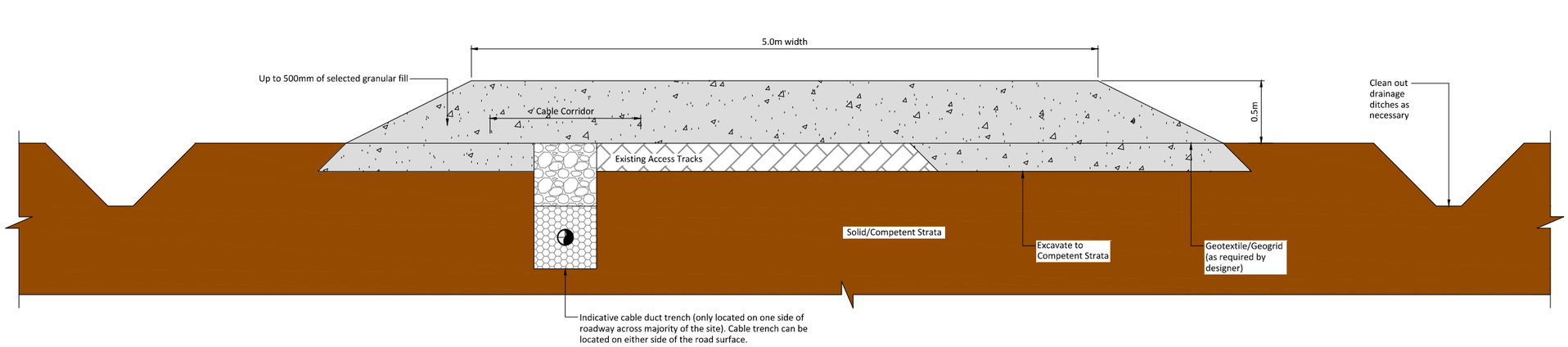
Construction of New Section of Floating Road

A new floating road, approximately 85 metres in length, will be constructed in a single area on the Proposed Wind Farm site (to the east of T14) where the peat depth is in excess of 3m and the slope

angle is less than a 5 degree slope. The single section of floating road will consist of an up to 1,000 mm of selected granular fill. A section of the new floated access road is shown in Figure 4-9.

The general construction methodologies for the construction of new excavated roads, and the single section of floating road, are summarised below in Section 4.9.1.2 and in FTC's *Peat & Spoil Management Plan* in Appendix 4-2.





Scale 1:20

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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	07.07.25

PROJECT
MAUGHANACLEA RENEWABLE ENERGY DEVELOPMENT

CLIENT
MKO

SHEET
TYPE A UPGRADE OF EXISTING EXCAVATED ACCESS ROAD

Date 16.02.26	Project number P24-118	Scale (@ A1) Scale N/A	
Drawn by POR	Drawing Number **Figure 4-7**		Rev **P01**
Checked by IH			

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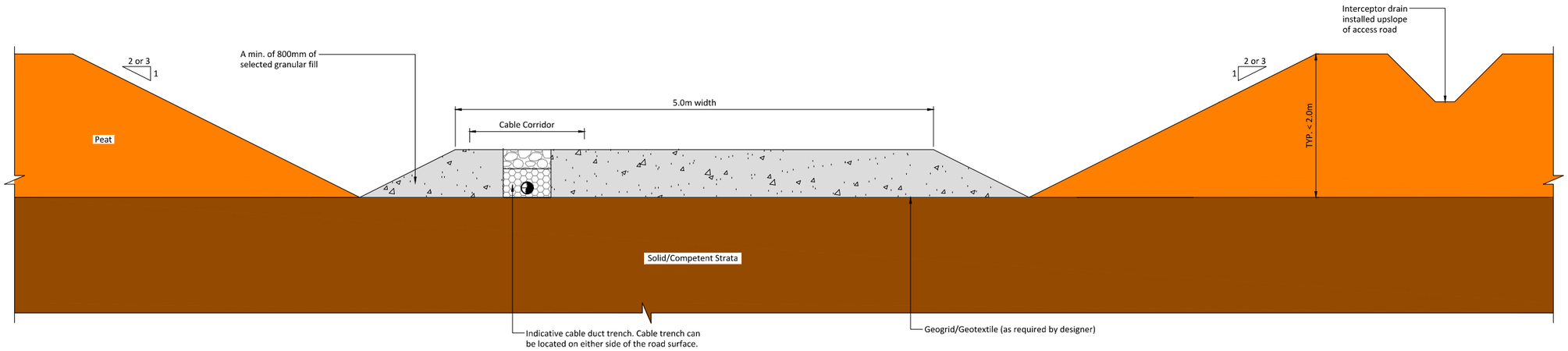
25 February 2026



Scale 1:25

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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	07.07.25

PROJECT
MAUGHANACLEA RENEWABLE ENERGY DEVELOPMENT

CLIENT
MKO

SHEET
TYPE B NEW EXCAVATE AND REPLACE ACCESS TRACK

Date 16.02.26	Project number P24-118	Scale (@ A1) As Shown
Drawn by POR	Drawing Number Figure 4-8	Rev P01
Checked by IH		

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25 February 2026

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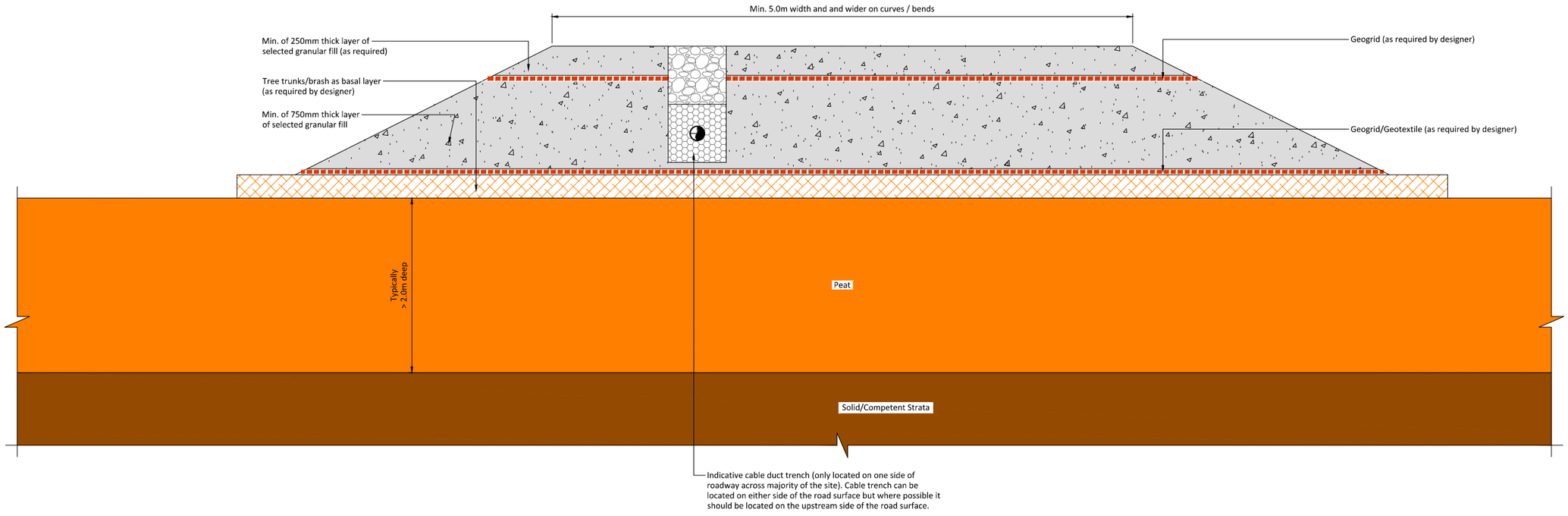

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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	16.02.26

PROJECT
MAUGHANACLEA RENEWABLE ENERGY DEVELOPMENT

CLIENT
MKO

SHEET
TYPE C NEW FLOATED ACCESS ROAD

Date 16.02.26	Project number P24-118	Scale (@ A1) 1:20
Drawn by POR	Drawing Number Figure 4-9 (Sheet set subset (SSD))	Rev P01
Checked by IH		

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25 February 2026

4.4.1.3 Watercourse / Culvert Crossings

The Proposed Wind Farm site is extensively drained by a network of natural watercourses and manmade land drains. The majority of watercourses and manmade drains at the Proposed Wind Farm drain into the Owngar River, which flows in an east to west direction between the northern and southern turbine clusters. In addition, several headwater streams rise within the Site and streams flow towards Owngar River, Mealagh River and Gortloughra River.

To facilitate the construction of the Proposed Wind Farm roads, there are a total of 5 no. new watercourse crossing locations over natural watercourses (rivers and streams). The crossing locations are outlined below:

- A new crossing is proposed over the Owngar River along the proposed access road to the northern turbine cluster;
- A new crossing on the proposed access road to turbine T4;
- A new crossing on the proposed access road between turbines T11 and T12;
- A new crossing on the proposed access road to turbine T13; and,
- A new crossing on the proposed access road between the proposed 110kV onsite substation and turbine T10.

The above watercourse crossings will all be achieved via new clear span crossings.

In addition to the 5 no. new watercourse crossings to facilitate the construction of the Proposed Wind Farm access roads outlined above, there is 1 no. existing watercourse crossing proposed along the R585 regional road between the northern turbine cluster and the southern turbine cluster to facilitate the construction of the 33kV internal wind farm cabling. Further details of this crossing are provided in Section 4.9.1.6.1 below.

Within the Proposed Wind Farm site, there are a total of 3 no. existing watercourse crossings that will require upgrading to facilitate the construction of site roads. The crossing locations are as follows:

- 3 no. existing culverts along the forestry road between the proposed 110kV onsite substation and proposed turbine location T10.

In addition to the natural watercourses, there are manmade agricultural, peat and forestry drains within the Proposed Wind Farm site, which will rerouted around the Proposed Wind Farm infrastructure and/or integrated into the proposed drainage design as required.

Please see section 4.9.1.3 and 4.9.1.4 below for further details on the watercourse crossings to be used at the Proposed Wind Farm, and the associated construction methodologies.

4.4.1.3.1 *Clear Span Crossing*

The watercourse crossings within the Proposed Wind Farm site will comprise clear span watercourse crossings. The construction methodology for these crossings has been designed to eliminate the requirement for in-stream works at these locations. The watercourse crossings will be constructed to the specifications of the Office of Public Work (OPW) bridge design guidelines *'Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945'*, and in consultation with Inland Fisheries Ireland (IFI).

Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material. Confirmatory inspections of the proposed new watercourse crossing locations will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing. Please see Appendix 4-1 for the location of the proposed clear span crossings, Figure 4-28 for the design details, and Section 4.9.1.3 for the construction methodology.

4.4.1.3.2 *Culvert Crossing*

All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Proposed Wind Farm will be suitably sized for the expected peak flows in the relevant drain.

Some culverts may be installed to manage drainage waters from works areas of the Proposed Wind Farm, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base. In all cases, culverts will be oversized to allow mammals to pass through the culvert. Culverts will be constructed as per the methodology detailed in Section 4.9.1.4. All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Please see Figure 4-29 below for design details.

4.4.1.4 Underground Electrical (33kV) and Communications Cabling

Each turbine will be connected to the proposed 110kV onsite substation via underground 33 kV (kilovolt) electricity cabling. Fibre-optic cables will also connect each wind turbine and the meteorological (met) mast to the proposed 110kV onsite substation. The electricity and fibre-optic cabling connecting to the proposed 110kV onsite substation compound will be run in cable ducts approximately 1.2 metres beneath ground level, along the sides of roadways and/or under the roadways. The route of the cable ducts will follow the access track to each turbine location and are illustrated on the site layout drawings included as Appendix 4-1. The exact number and configuration of cable ducting may vary within the cabling trench. Figure 4-10 below shows two variations of a standard cable trench, one for off-road trenches and one for on-road trenches. The cabling may be placed on either side of the roads, on both sides of the road and/or within the road. The exact configuration of the underground cabling will be set by the requirements of the electrical designers at detailed design stage. Any existing services will be avoided.

Clay plugs (water flow barrier) will be installed at regular intervals of not greater than 50 metres along the length of the trenches where required to prevent the trenches becoming conduits for runoff water. Backfill material will be compacted in layers with approved engineer's specified material, which may be imported onto the Proposed Wind Farm site should sufficient volumes of suitable material not be encountered during the excavation phase of the proposed infrastructure.

4.4.1.5 Meteorological Mast

One metrological (met) mast is proposed as part of the Proposed Wind Farm. The met mast will be equipped with wind monitoring equipment at various heights. The proposed met mast will be located at E 509109, N 555194 (ITM) as shown on the Proposed Wind Farm site layout drawing in Figure 4-2 and the detailed site layout drawings included as Appendix 4-1. The mast will be a free-standing slender lattice structure 30 metres in height. The mast will be constructed on a hard standing area sufficient to accommodate the equipment that will be used to erect the mast. The proposed meteorological mast is shown in Figure 4-11.

4.4.1.6 Temporary Construction Compounds

There are 3 no. temporary construction compounds proposed as part of the Proposed Wind Farm. A temporary construction compound measuring approximately 2,400m^2 in area will be located in the northern cluster at the approximate coordinates E 510358, N 557722 (ITM). A second temporary construction compound measuring approximately 4,800m^2 in area will be located in the southern cluster at the approximate coordinates E 509024, N 555342 (ITM). There is also a temporary construction compound located adjacent to the eastern boundary of the proposed 110kV onsite substation, measuring approximately 2,108m^2.

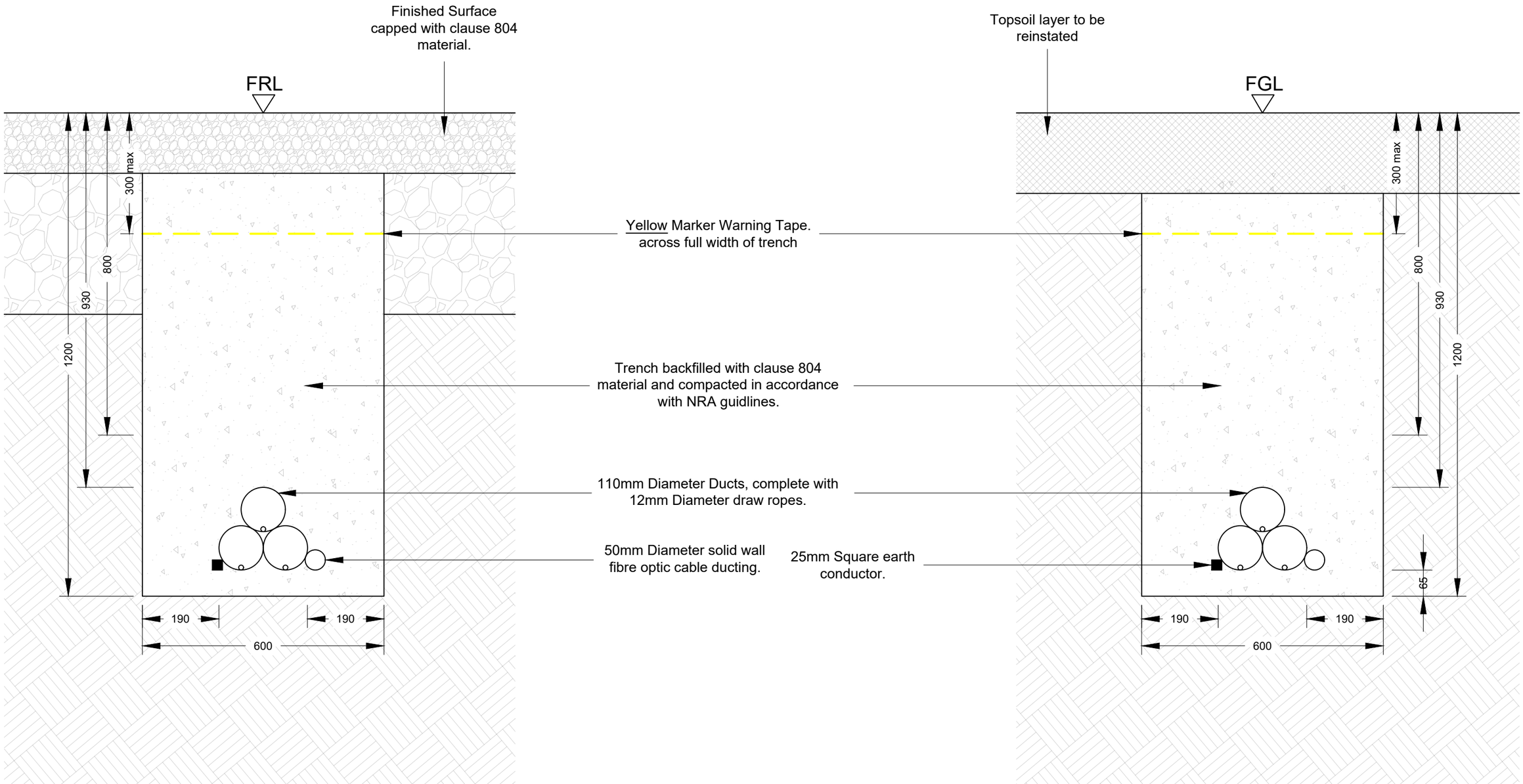
The location of the proposed construction compounds is shown on the Proposed Wind Farm site layout drawing in Figure 4-2. The layout of the temporary construction compound in the northern turbine cluster of the Proposed Wind Farm is shown on Figure 4-12 below. The layout of the 2 no. temporary construction compounds in the southern turbine cluster of the Proposed Wind Farm are included in Appendix 4-1 of this EIAR.

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

All temporary construction compounds will be removed as part of the post-construction reinstatement works of the Proposed Wind Farm. The concrete foundation of these compounds will be left in situ and will be left to revegetate naturally.

4.4.1.7 Temporary Security Cabins

There will be 2 no. temporary security cabins within the Proposed Wind Farm site, one of which will be located in the Proposed Wind Farm's northern turbine cluster along the proposed site access road, just before the L-8777 Local Road. In the southern cluster, a temporary security cabin will be located just inside the existing site entrance off the R585.



33kV Cable - On Road Trench Detail - Cross Section

33kV Cable - Off Road Trench Detail - Cross Section

PROJECT TITLE: Maughanaclea Renewable Energy Development Co.Cork			
DRAWING TITLE: 33kV Cable Trench Sections			
PROJECT No.: 240225		DRAWING No.: Figure 4-10	SCALE: 1: 10 @ A3
DRAWN BY: KD	CHECKED BY: AC	DATE: 25.03.2026	REVISION.: P01

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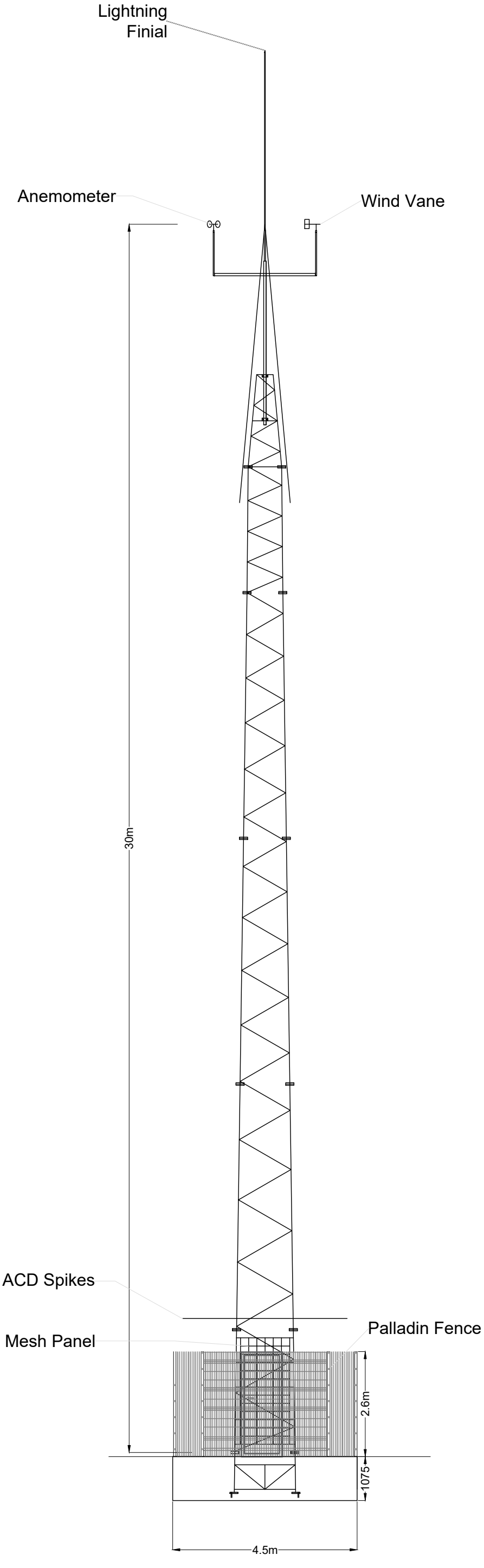
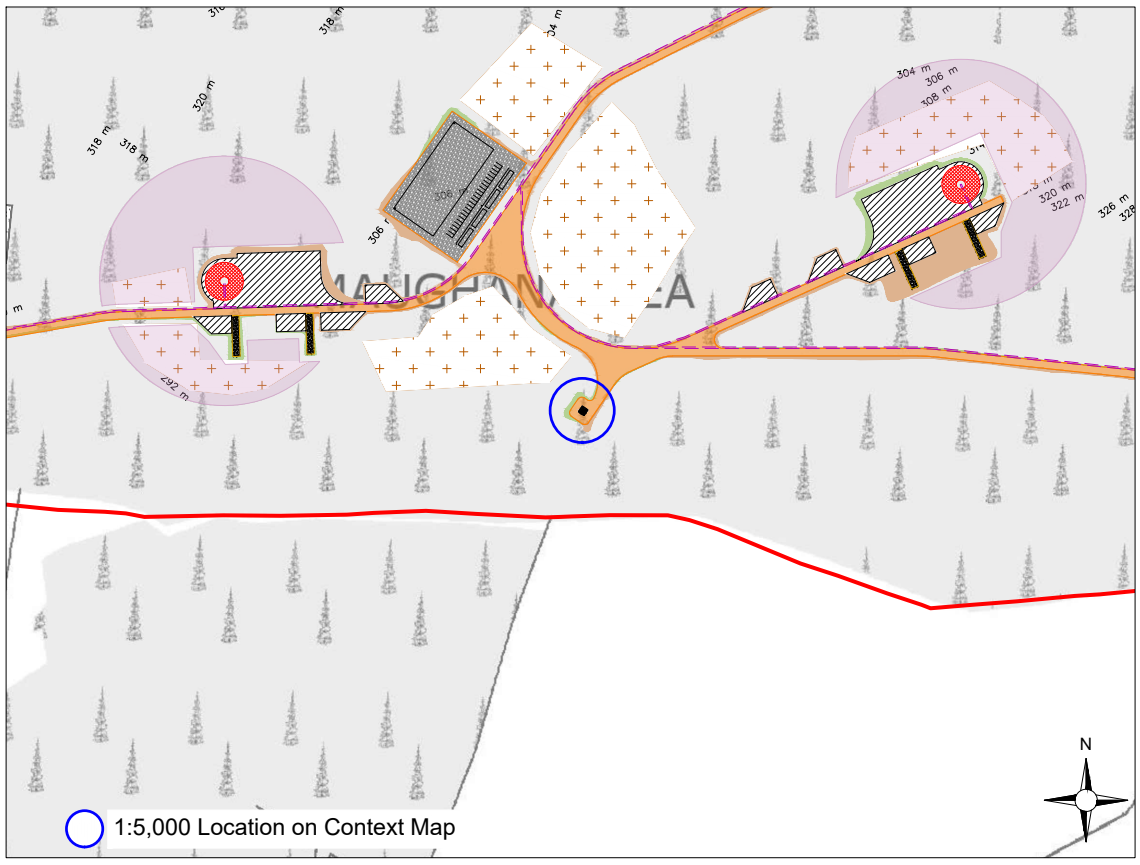


Mast Elevation
Scale: 1:100



Note:

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

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Metrological Mast

PROJECT No.:	DRAWING No.:	SCALE:
240225	Figure 4-11	As shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
KD	AC	25.03.2026	P01

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Project Design Drawing Notes

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2. Drawings not to be used for construction/contract conditions.
3. Copyright, all rights reserved. No part herewith may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
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

- Proposed New Roads
- Cut
- Fill

N

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Temporary Construction Compound 1

PROJECT No.:	DRAWING No.:	SCALE:
240225	Figure 4-12	1:250 @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
KD	AC	25.03.2026	P01

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4.4.1.8 Proposed 110kV Onsite Substation

It is proposed to construct a 110 kV onsite substation within the Proposed Wind Farm site, as shown in Figure 4-1 and Figure 4-2. The proposed 110kV onsite substation is located within commercial forestry land and will be accessed via the existing access road to the southern turbine cluster.

The footprint of the proposed 110kV onsite substation compound measures approximately 9,543m^2 in area and will include 2 no. control buildings and the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine, and export that electricity from the proposed 110kV onsite substation to the national grid. The layout and elevations of the proposed 110kV onsite substation are shown on Figure 4-13 and 4-14 below. The construction and exact layout of electrical equipment in the proposed 110kV onsite substation will be to EirGrid / ESB Networks specifications. The proposed 110kV onsite substation compound will include steel palisade fencing (approximately 2.6 metres high or as otherwise required by ESB), and internal fences will also segregate different areas within the main substation. Construction methodologies for the proposed 110kV onsite substation are outlined in Section 4.9.1.7.

Further details regarding the underground cabling connection between the proposed 110kV onsite substation and the national electricity grid are provided in Section 4.4.2 below. Construction methodologies for the Proposed Grid Connection (including the underground electrical and communication cabling and joint bays) are outlined below in Section 4.9.2.

The proposed 110kV onsite substation and 110kV underground electrical cabling will remain in place after the operational phase of the Proposed Project as they will be under the ownership and control of the ESB Networks and will form a permanent part of the national electricity grid.

4.4.1.8.1 *Wind Farm Control Buildings*

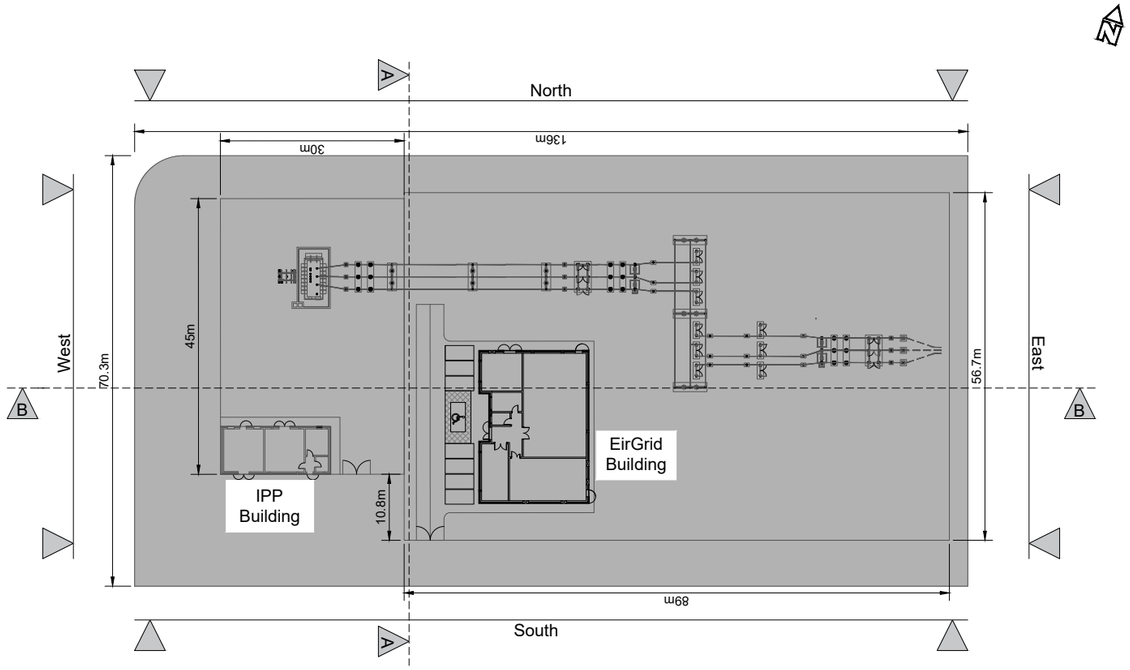
Two wind farm control buildings will be located within the proposed 110kV onsite substation compound. The Independent Power Producer (IPP) Control Building will measure approximately 18 metres by 7.8 metres and 6 metres in height. It will be located at the western edge of the proposed 110kV onsite substation compound. The EirGrid Control Building will be located towards the centre of the proposed 110kV onsite substation compound and will measure approximately 25 metres by 18 metre and 7 metres in height. Layout and elevation drawings of the control buildings are included in Figures 4-15 and Figure 4-16 below.

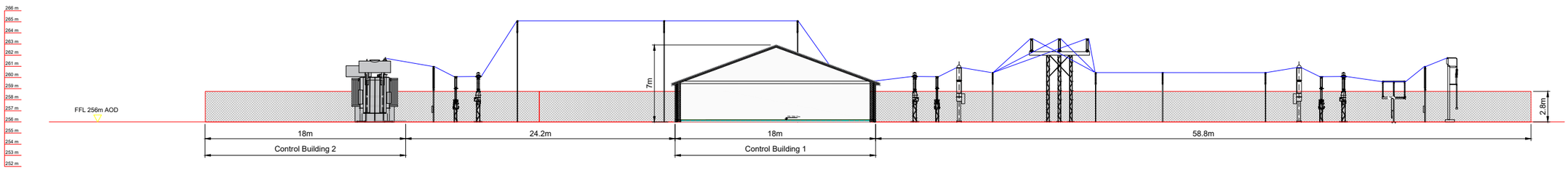
The wind farm control buildings will include staff welfare facilities for the operational phase of the Proposed Project. Toilet facilities will be installed with a low-flush cistern and low-flow wash basin. Due to the specific nature of the proposed 110kV onsite substation, there will be a very small water requirement for occasional toilet flushing and hand washing, and therefore a potable water source is not required. It is proposed to either harvest rainwater from the roofs of the buildings or, alternatively, install a groundwater well adjacent to the proposed 110kV onsite substation in accordance with the Institute of Geologists Ireland, *Guide for Drilling Wells for Private Water Supplies* (IGI, 2007). The well will be flush to the ground and covered with a standard manhole. A pump house is not required as an in-well pump will direct water to a water tank within the roof space of the control building. Bottled water will be supplied for drinking, if required.

It is not proposed to treat wastewater on site. Wastewater from the staff welfare facilities in the control buildings will be managed by means of a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to a licenced wastewater treatment plant.

Such a proposal for managing the wastewater arising on site has become almost 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 Pleanála 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. Full details of the proposed tank alarm system can be submitted to the Planning Authority in advance of any works commencing on-site. The wastewater storage tank alarm will be part of a continuous stream of data from the Proposed Wind Farm turbines, wind measurement devices and proposed 110kV onsite 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 proposed 110kV onsite substation underground storage tank.





Section B-B

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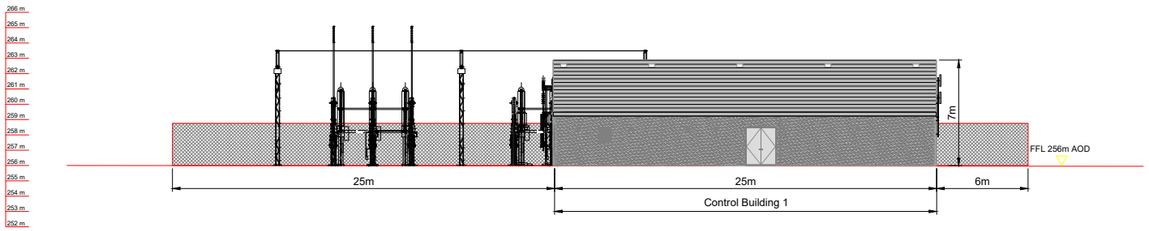

Section A-A

Scale 1:200 at A1

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Substation Compound Plan & Sections

PROJECT No.:	DRAWING No.:	SCALE:
240225	**Figure 4-13**	**As Shown @ A1**

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KD	**AC**	**25.03.2026**	P01

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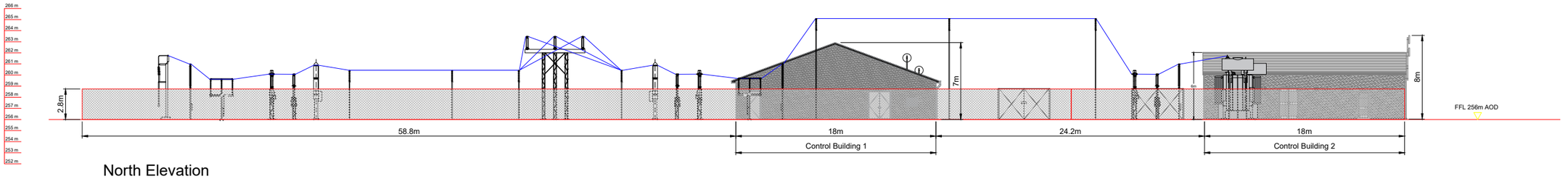

North Elevation

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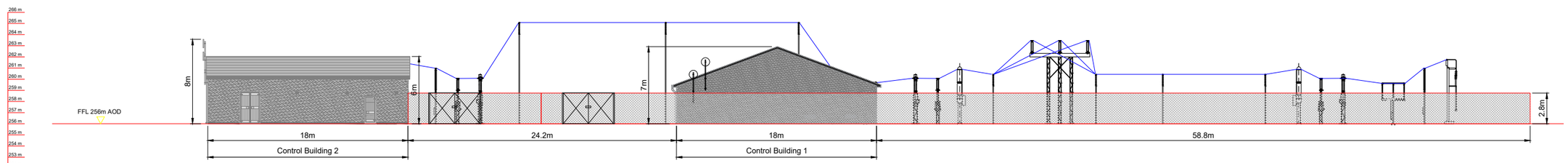

South Elevation

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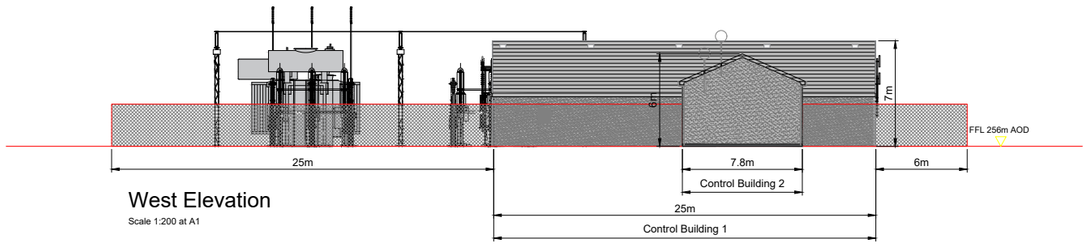

West Elevation

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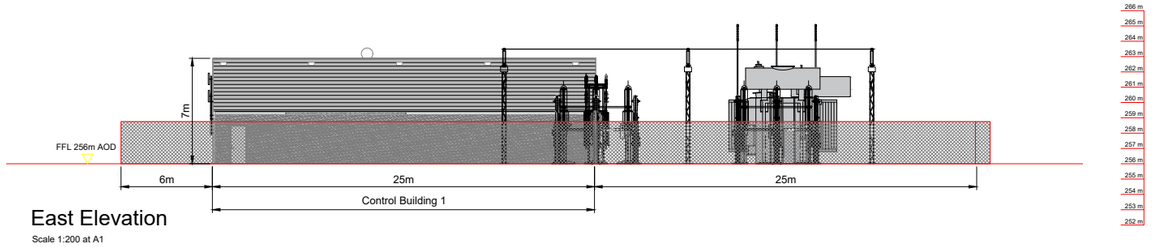

East Elevation

Scale 1:200 at A1

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Substation Compound Elevations

PROJECT No.:		DRAWING No.:	SCALE:
240225		**Figure 4-14**	**As Shown @ A1**
DRAWN BY: **KD**	CHECKED BY: **AC**	DATE: **25.03.2026**	REVISION.: P01

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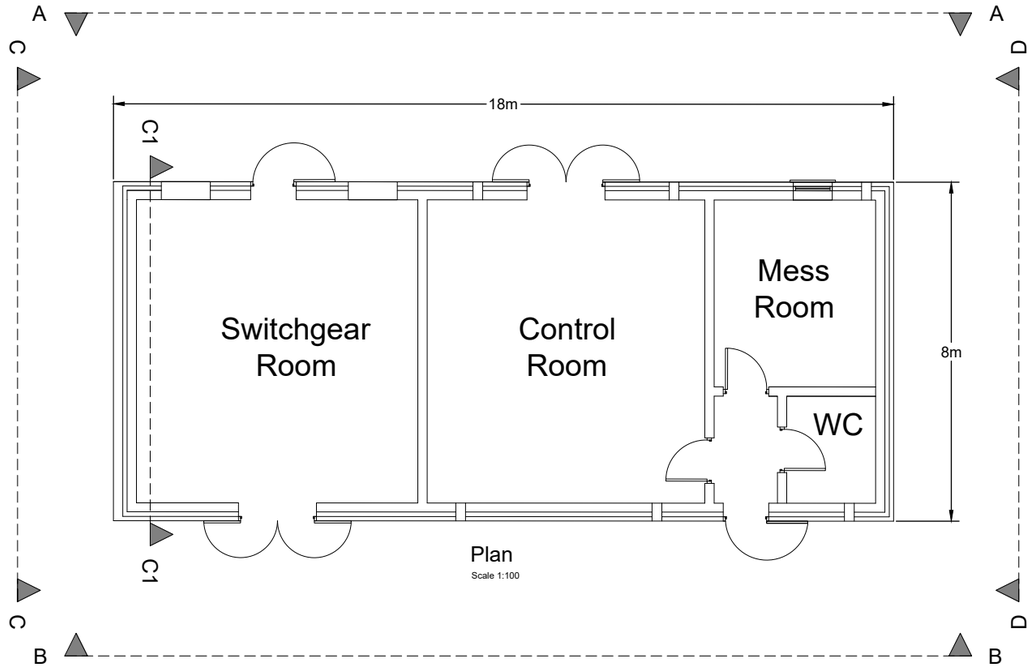

Plan

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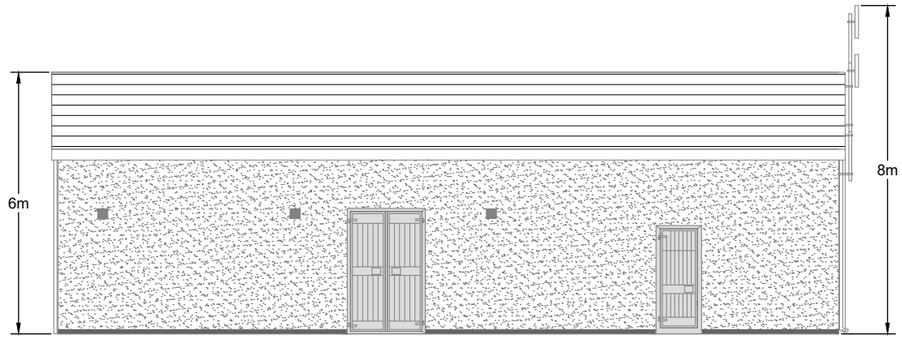

Section A-A

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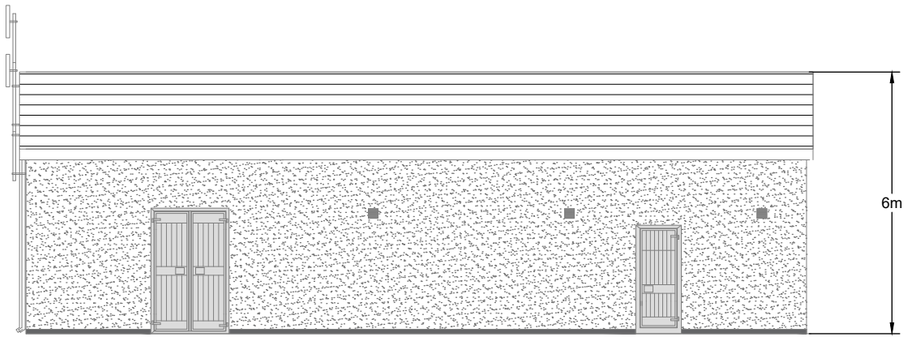

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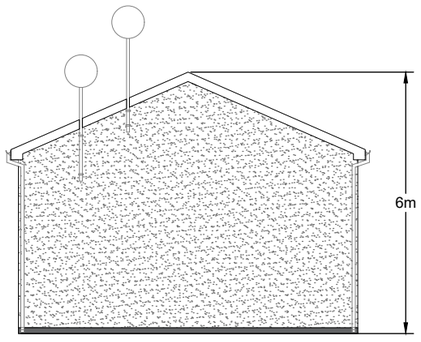

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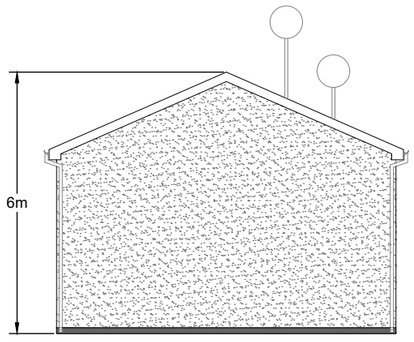

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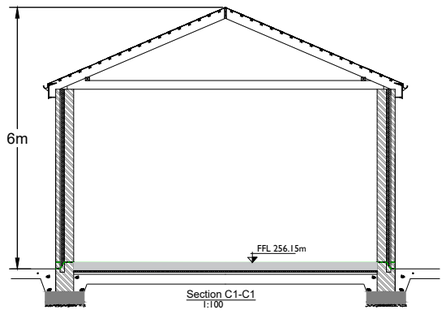

Section C1-C1

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PROJECT TITLE:

Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:

IPP Building - Plans, Section & Elvations

PROJECT No.:	DRAWING No.:	SCALE:
240225	**Figure 4-15**	**As Shown @ A2**

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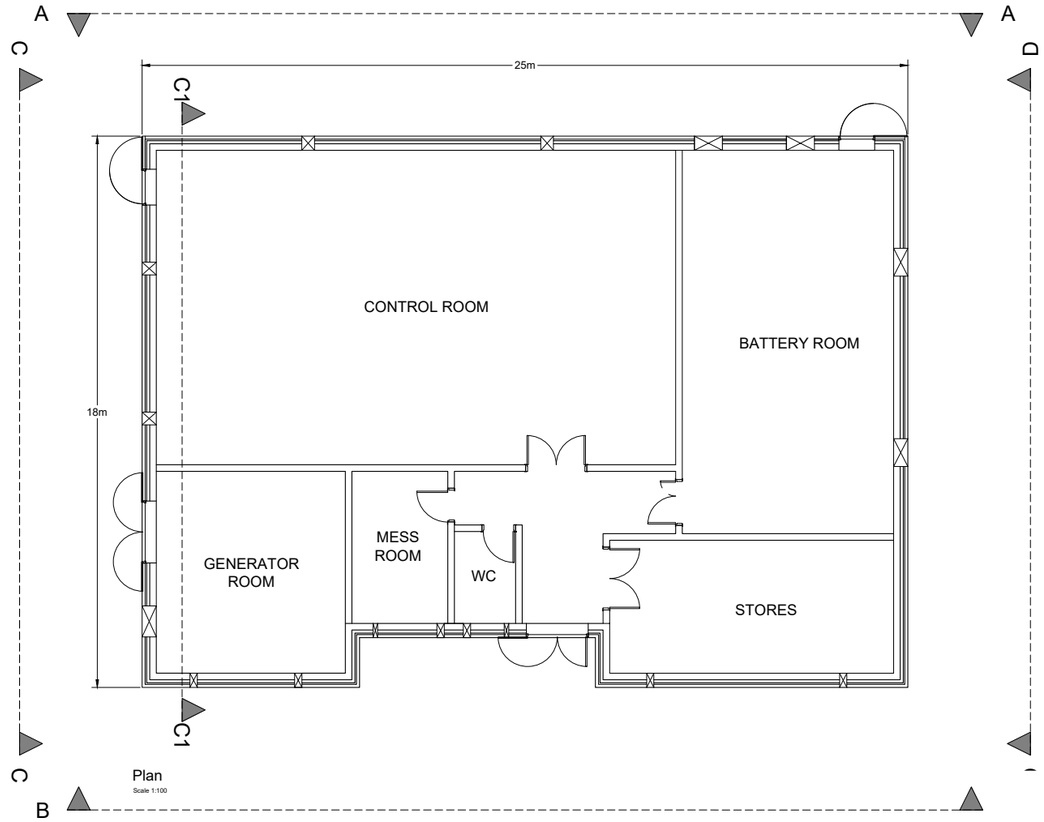

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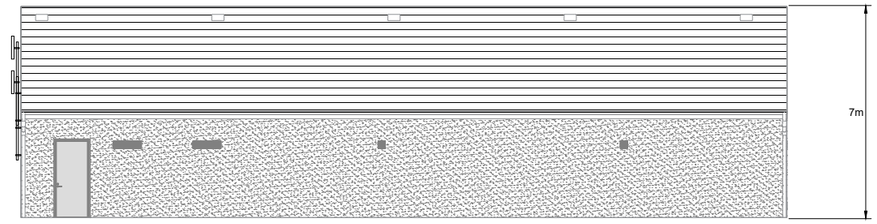

Section A-A
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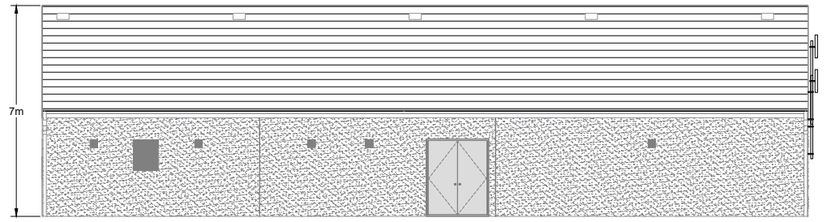

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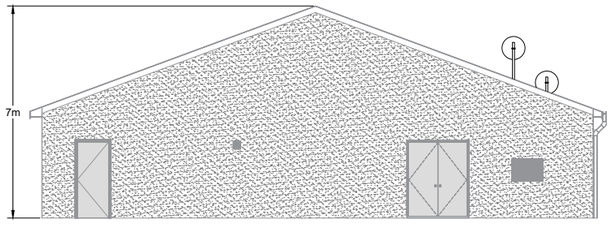

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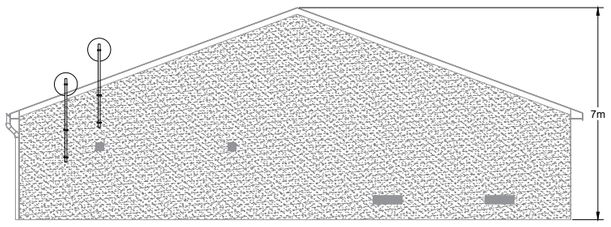

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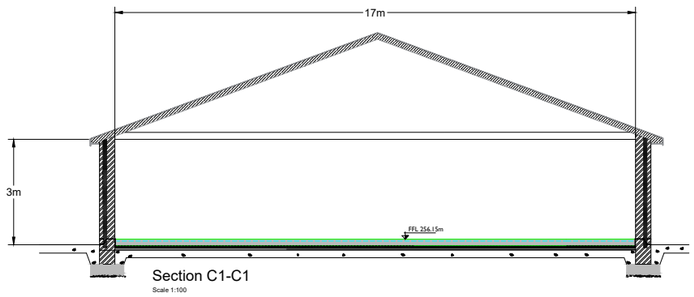

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PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
EirGrid Building - Plans, Section & Elevations

PROJECT No.:		DRAWING No.:	SCALE:
240225		**Figure 4-16**	**As Shown @ A1**
DRAWN BY: **KD**	CHECKED BY: **AC**	DATE: **25.03.2026**	REVISION.: P01

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

4.4.1.9 Biodiversity Management and Enhancement Plan

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

High value habitats were identified during initial habitat surveys of the Proposed Wind Farm site and include Annex I areas of dry siliceous heath, wet heath, and upland blanket bog. High-quality, intact heath and bog habitats within the Proposed Wind Farm site have been deliberately avoided where possible in the design of the Proposed Project. Additionally, hand searches confirmed the presence of Kerry slug at one location within the Proposed Wind Farm site, within an area of recently felled woodland (WS5) within the southern turbine cluster of the Proposed Wind Farm site. Full details on the current ecological baseline of the Site are provided in Section 6.3 of Ch. 6: Biodiversity of the EIAR.

4.4.1.9.1 *Enhancement Measures*

Three different types of enhancement areas within the Proposed Wind Farm site have been selected for biodiversity enhancement measures as part of the Proposed Project and to enhance the Proposed Wind Farm site for species and habitats known to occur within the Proposed Wind Farm site

Kerry slug enhancement areas

The necessary bat felling buffers for the Proposed Project, as shown in Figure 4-18 below, will be managed as peat and spoil management areas and to enhance Kerry slug habitat, as this species is known to occur within the Proposed Wind Farm site. Enhancement will include the felling of existing conifer plantations within 3 no. felling buffers and leaving the stumps in place and to protrude from the additional peat and spoil deposits, as these provide refuge for this species. These areas combined amount to approx. 3.9 ha. Monitoring of Kerry Slug in the areas adjacent to the Proposed Wind Farm site works will be undertaken to provide a before and after impact assessment. This will ensure that populations remain stable post-construction. The areas to be managed to enhance Kerry slug habitat are shown on Figure 4-17 below.

Native woodland planting

As shown in Figure 4-17, 0.54ha of coniferous forestry within the Proposed Wind Farm site will be felled and planted with native woodland. Trees will be of native origin and will be of advanced nursery stock where possible. This habitat will connect to a parcel of previously established native woodland and will be located at the boundary of a larger area of conifer plantation. Planting will follow recommendations to establish an oak woodland. Trees will be of native origin and will be of advanced nursery stock where possible.

Peatland Restoration

As part of the BMEP, it is proposed to restore 5.3 ha of peat habitat. The location of the proposed peatland enhancement area encompasses an area of recently afforested conifer plantation and degraded wet heath habitat, and is shown in Figure 4-17. The selected area for enhancement was recently planted with Sitka spruce. Peat in this area is shallow (<0.5 m), and the understory between the young trees is dominated by Molinia caerulea with stands of Pteridium aquilinum being locally dominant.

Summary

The BMEP sets out the measures to manage and enhance the biodiversity in the locality of the Proposed Project. Specifically, proposed peatland restoration will result in enhancement of wet heath habitat on the Proposed Wind Farm site, while also offsetting the losses of degraded wet heath to facilitate the Proposed Wind Farm. The establishment of native woodland will enhance the woodland habitat within the Proposed Wind Farm site. Finally, establishment of both wet heath and woodland within the Proposed Wind Fam site, along with enhancement measures within the proposed bat felling buffers, will result in habitats of higher suitability for Kerry Slug within the Proposed Wind Farm site.

This BMEP has set out measures to be implemented during establishment and management phases to ensure that the targets of this BMEP are successful. It also provides for monitoring of the target habitats by an ecologist to ensure the success of the measures outlined in the BMEP.

Full details of the enhancement measures outlined above, including monitoring and management measures and measures to control the growth of invasive species, are outlined in Appendix 6-4: Biodiversity Management and Enhancement Plan of this EIAR.

4.4.1.10 Tree Felling and Vegetation Removal

Tree felling will be required within and around the Proposed Wind Farm infrastructure footprint to allow for the construction of the proposed turbines, access roads underground cabling, proposed 110kV onsite substation, and the other ancillary infrastructure.

Approximately 44 hectares of forestry (conifer plantation (WD4)) will be felled to accommodate the Proposed Wind Farm infrastructure and bat buffers inclusive of proposed turbines T01, T02, T03, T05, T06, T07, T08, T09, T10, T11 and associated infrastructure, and as part of the BMEP as identified in Section 4.4.1.9 above. Figure 4-18 shows the extent of the commercial forestry to be permanently felled as part of the Proposed Wind Farm.

The Proposed Wind Farm will also require the removal of a small section (23m) of hedgerow (WL1) and 0.6ha of scrub (WS1) to facilitate the construction of an access road. The loss of hedgerow and scrub for the Proposed Project will be offset through the planting of native woodland as part of the BMEP included in Appendix 6-4 of this EIAR.

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

4.4.1.10.1 *Tree and Vegetation Replanting*

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

The identified 44 hectares of conifer plantation that will be permanently felled for the Proposed Wind Farm will be replaced or replanted on a hectare for hectare basis as a condition of any felling licence that will be issued in respect of the Proposed Wind Farm felling. Replanting is a requirement of the Forestry Act and is primarily a matter for the statutory licensing processes that are under the control of the Forest service. The replacement of the felled forestry as part of the Proposed Wind Farm may occur

on any lands, within the State benefitting from Forest Service Technical Approval[3] for afforestation, should the Proposed Wind Farm receive planning permission. Under the Forestry Regulations 2017, all applications for licences for afforestation require the prior written approval (technical approval) of the Minister for Agriculture, Food and the Marine. Before the Minister can grant approval, he/she must first determine if the project is likely to have significant effects on the environment (for EIA purposes) and assess if the development, individually or in combination with other plans or projects is likely to have a significant effect on a European site (for Appropriate Assessment purposes).

It is proposed to plant approximately 0.54 hectares of natural woodland within the Proposed Wind Farm site as shown in Figure 4-17. Please see Ch. 6: Biodiversity and Appendix 6-4 Biodiversity Management and Enhancement Plan for details.

For the balance of the replanting obligation, the applicant commits to replanting the 43.5 hectares of conifer forestry, outside the hydrological catchment within which the Proposed Wind Farm is located. On this basis, it is concluded that there will be no cumulative effects associated with the replanting of 43.5 hectares of conifer forestry. Therefore, the conifer forestry replanting is not considered further in the impact assessment chapters of this EIAR. In addition, the applicant commits to not commencing the Proposed Project until both a felling and afforestation licence(s) is in place and, therefore, this ensures the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority.

As identified in Section 4.4.1.10 above, the Proposed Wind Farm will also require the removal of a small section of hedgerow (23m) for the construction of an access road. The loss of hedgerow for the Proposed Wind Farm will be offset through the planting of native woodland as part of the BMEP included in Appendix 6-4 of this EIAR.

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

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Map Legend

- EIAR Site Boundary
- Proposed Wind Farm Permanant Footprint

BMEP Enhancement Areas

- Kerry Slug Enhancement Area
- Peatland Restoration Area
- Native Woodland Planting

SITE LOCATION - NOT TO SCALE

Drawing Title

Proposed BMEP areas

Project Title

Maughanaclea Renewable Energy Development

Project No.	Drawing No.	Scale
240225	4-17	1:20,000
Drawn By	Checked By	Date
SOR	RK	24/03/2026

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

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555000

Map Legend

- EIAR Site Boundary
- Proposed Forestry Felling
- Proposed Wind Farm Permanant Footprint

SITE LOCATION - NOT TO SCALE

Drawing Title

Proposed Forestry Felling

Project Title

Maughanaclea Renewable Energy Development

Project No.	Drawing No.	Scale
240225	Figure 4-18	1:20,000

Drawn By	Checked By	Date
SOR	RK	20/03/2026

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

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4.4.1.11 Borrow Pits

The estimated volume of stone material to be extracted from the borrow pits for the construction of the Proposed Wind Farm is approximately 170,000m^3, this figure presented is the anticipated volume; however, the actual volumes will be confirmed at the time of construction and following detailed pre-construction site investigation works. It is intended to obtain the majority of materials for the construction of the Proposed Wind Farm from the 4 no. proposed onsite borrow pits (engineer's specified material may be imported onto the Site should sufficient volumes of suitable material not be encountered during the excavation phase of the proposed infrastructure, to come from local licenced quarries). The borrow pit locations were selected based on the relatively shallow depth to bedrock. Bedrock (sandstone and siltstone) will be excavated and reused across the Proposed Wind Farm site as granular fill for roads and hardstands. The locations of the proposed onsite borrow pits are shown on Figure 4-19 below. Detailed plans and sections through the proposed borrow pits are provided in Appendix 4-1 and Appendix 4-2: Peat and Spoil Management Plan.

The borrow pits are located adjacent to the proposed new access roads and existing access roads (to be upgraded) and access to the borrow pits will be via these roads. Upon removal of the rock from the borrow pits, it is proposed to reinstate the borrow pits using excavated peat and spoil and then reseed or leave to revegetate naturally. Post-construction, the borrow pit area will be permanently secured. 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 the fencing and at locations around the fenced area.

Material extraction from the borrow pits will take place during the construction phase of the Proposed Project only, and will be a temporary operation conducted over a short period. The topsoil and subsoil will be stripped back and temporarily stockpiled using standard tracked excavators. 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 turbine locations will be used to supply the hardcore materials required for the turbine's hardstand and access road. Hardcore materials will be extracted from the borrow pit (and some turbine locations, if necessary), principally by means of rock breaking. Depending on the hardcore volume, blasting may also be used as a more effective rock extraction method, capable of producing significant volumes of rock in a matter of milliseconds. Blasting will only be carried out after notifying any potentially sensitive receptors. The processing and crushing of boulders may be required to achieve the grading requirements for use in construction. The potential noise and vibration impact on sensitive receptors associated with the rock extraction measures, detailed below, are assessed in Ch. 12: Noise and Vibration of this EIAR.

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

Please see Section 4.9.1.8 below for the borrow pit construction methods. The two proposed borrow pit extraction methods (rock breaking and blasting) are detailed below.

4.4.1.11.1 *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. In areas where stronger rock is encountered and cannot be removed by means of excavating then a rock breaking methodology may be used. Rock breaking equipment comprises a large hydraulic 360-degree excavator with a rock breaker attachment. Given the power required to break out tight and compact stone at depth, the machines are generally large and in the 40-60 tonne size range. Even where rock might appear weathered or brittle at the surface, the extent of weathering

can quickly diminish with depth resulting in strong rock requiring significant force to extract it at depths of only a few metres.

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

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

4.4.1.11.2 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. A drilling rig will drill the necessary number of boreholes required for a single blast in approximately 3 to 4 days. The locations, depth and number of boreholes are determined by the blast engineer. This is a specialist role fulfilled by the blasting contractor.

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

A properly designed blast should generate rock of a size that can be loaded directly into a mobile crusher, using the same wheeled loader outlined above. The same method is used for processing the rock generated from a blast, as would be used to process rock generated by rock breaking. Generally, the drilling rig will recommence drilling blast holes for the next blast as soon as the previous one has finished. The potential impacts and control measures associated with noise and vibration from this extraction method are assessed in Ch. 12: Noise and Vibration. Any blasting will be carried out in accordance with the *Guidance on the Safe Use of Explosives in Quarries* (Safety and Health Commission for the Mining and Other Extractive Industries, 2002)[4] and the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*[5].

4.4.1.11.3 Rock Processing

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

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

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

Map Legend

- EIAR Site Boundary
- Proposed Borrow Pits
- Proposed Wind Farm Permanant Footprint

SITE LOCATION - NOT TO SCALE

Drawing Title

Proposed Borrow Pit Locations

Project Title

Maughanaclea Renewable Energy Development

Project No.	Drawing No.	Scale
240225	4-19	1:20,000
Drawn By	Checked By	Date
SOR	RK	20/03/2026

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

4.4.2 Proposed Grid Connection

4.4.2.1 Underground Electrical Cabling Route

It is proposed to connect the proposed 110 kV onsite substation within the Proposed Wind Farm site to the existing Dunmanway 110kV substation near Dunmanway, Co Cork via 110 kV underground electrical cabling, as illustrated in Figure 4-3. The Proposed Grid Connection is approximately 20.5km in length and is located primarily within the public road corridor. A short section of the route (approximately 940m) is located within the southern turbine cluster of the Proposed Wind Farm site, mostly within an existing access road.

The Proposed Grid Connection underground electrical cabling route will originate at the proposed 110kV onsite substation, and from there will run southeast for approximately 130m through an existing conifer plantation within the Proposed Wind Farm site. The Proposed Grid Connection will then travel east for approximately 810m through an existing access road within the Proposed Wind Farm site, towards the R585. The Proposed Grid Connection then exists the Proposed Wind Farm's southern turbine cluster site entrance to the east, and travels along the R585 for approximately 7km. The Proposed Grid Connection then turns right and follows the L4909 and L4609 for approximately 3km in a generally southeast direction. The Proposed Grid Connection then turns left and is routed along the L4615 in an easterly direction for approximately 5.7km. The underground cabling route then turns right onto the R587 and runs south towards Dunmanway for approximately 3km, before turning left and travelling east on the R586. After 825m the Proposed Grid Connection exits the R586 to the south and enters the existing Dunmanway 110kV substation in the townland of Ballyhalwick.

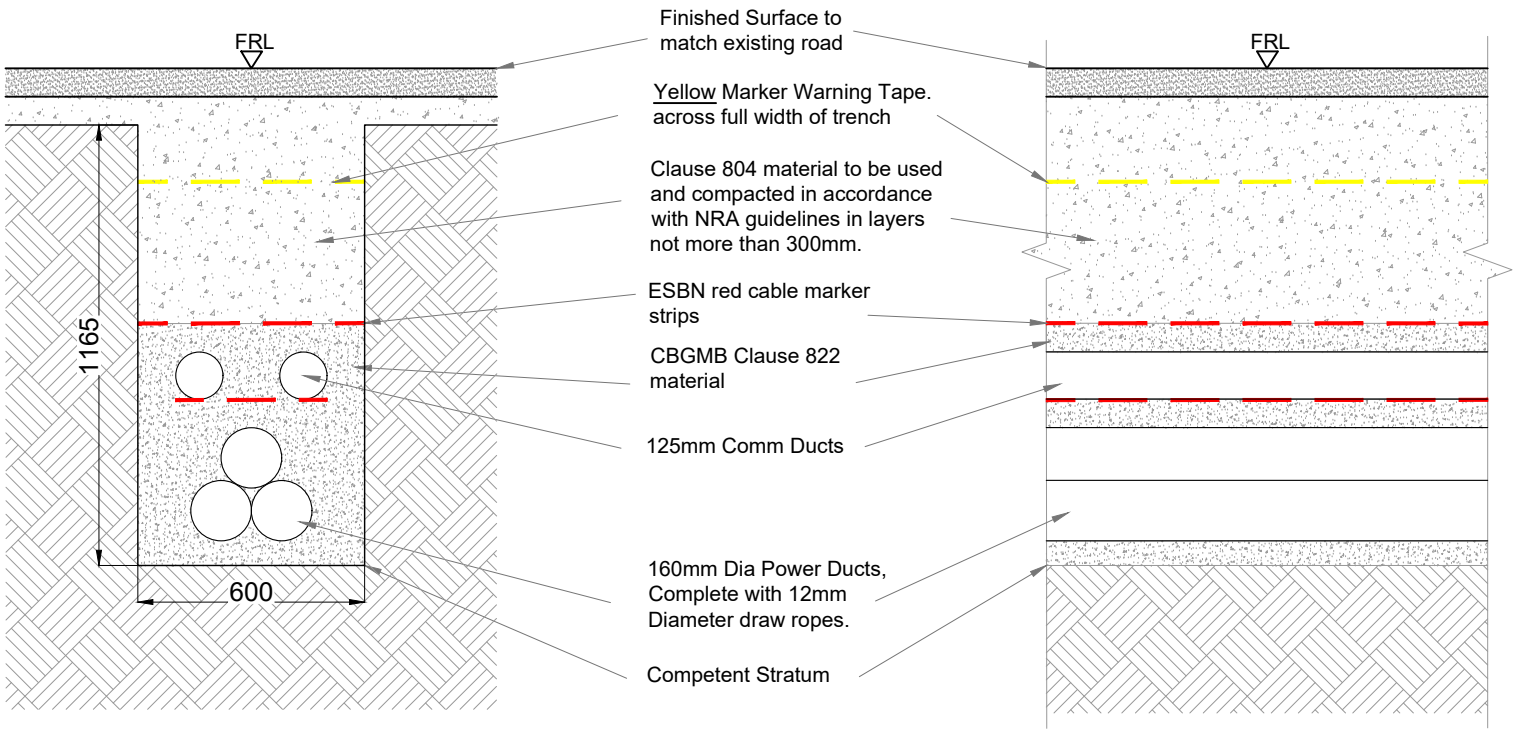
The methodology for the construction of the Proposed Grid Connection underground electrical cabling route is presented in Section 4.9.2 below. The Proposed Grid Connection is illustrated in Figure 4-3. The cross section of the 110kV underground cabling trench is shown in Figure 4-20.

4.4.2.2 Joint Bays

There are 27 no. joint bays proposed along the Proposed Grid Connection, generally between 700 to 800 apart or as otherwise required by ESB/EirGrid and electrical requirements. These are:

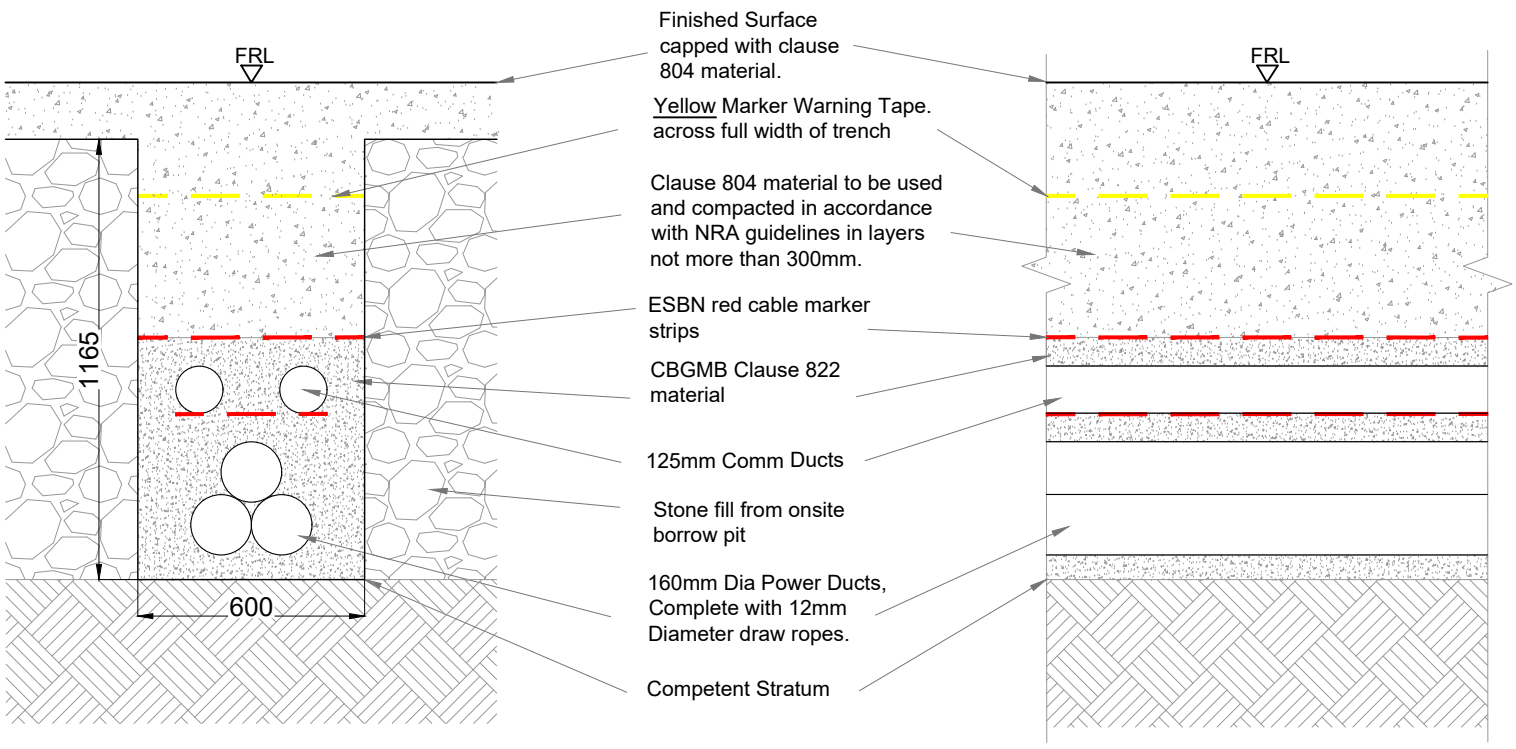
- 1 no. joint bay proposed within the Proposed Wind Farm access roads,
- 9 no. joint bays are proposed along the existing R585,
- 3 no. joint bays are proposed along the L4909 Local Road,
- 1 no. joint bays are proposed along the L4609 Local Road,
- 8 no. joint bays are proposed within the L4615 Local Road,
- 4 no. joint bays are proposed within the R587; and,
- 1 no. joint bay is proposed within the R586.

Please see Figure 4-21 for details and Section 4.9.2.5 for joint bay construction methodologies.



Option A - Standard Cross Section - 110kV

SCALE 1:20



Option A - Standard Cross Section - 110kV

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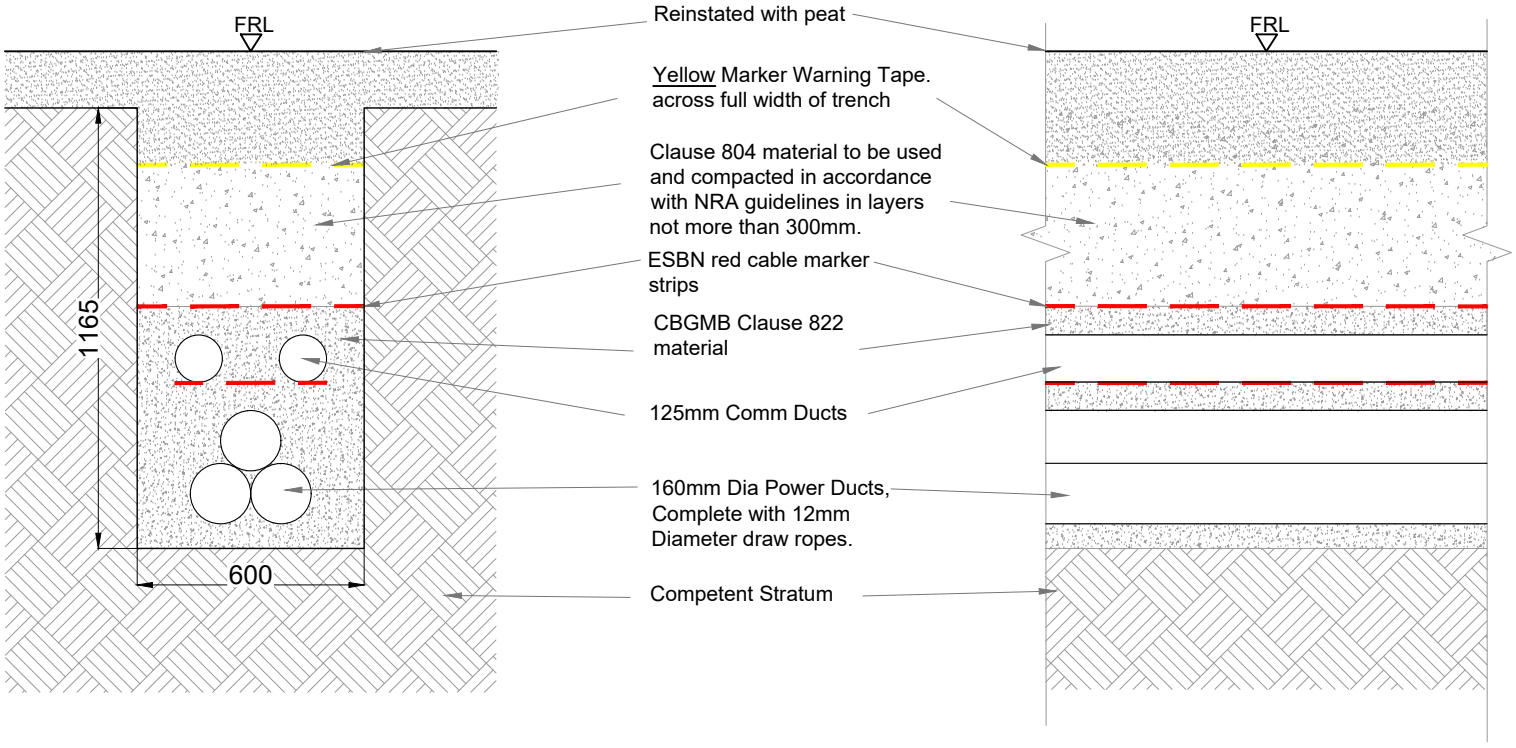

Option A - Standard Cross Section - 110kV

SCALE 1:20

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Option A - Standard 110kV Trench Detail In Road

PROJECT No.:	DRAWING No.:	SCALE:
240225	Figure 4-20	As Shown @ A3

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KD	AC	25.03.2026	P01

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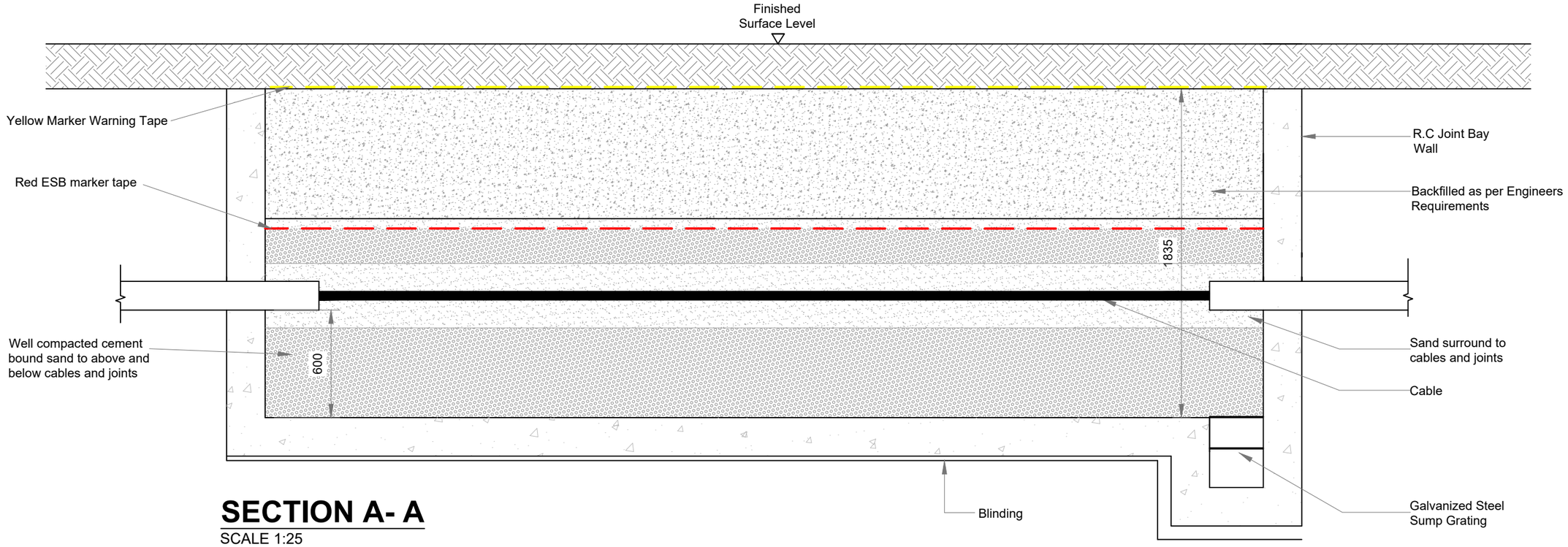

SECTION A- A

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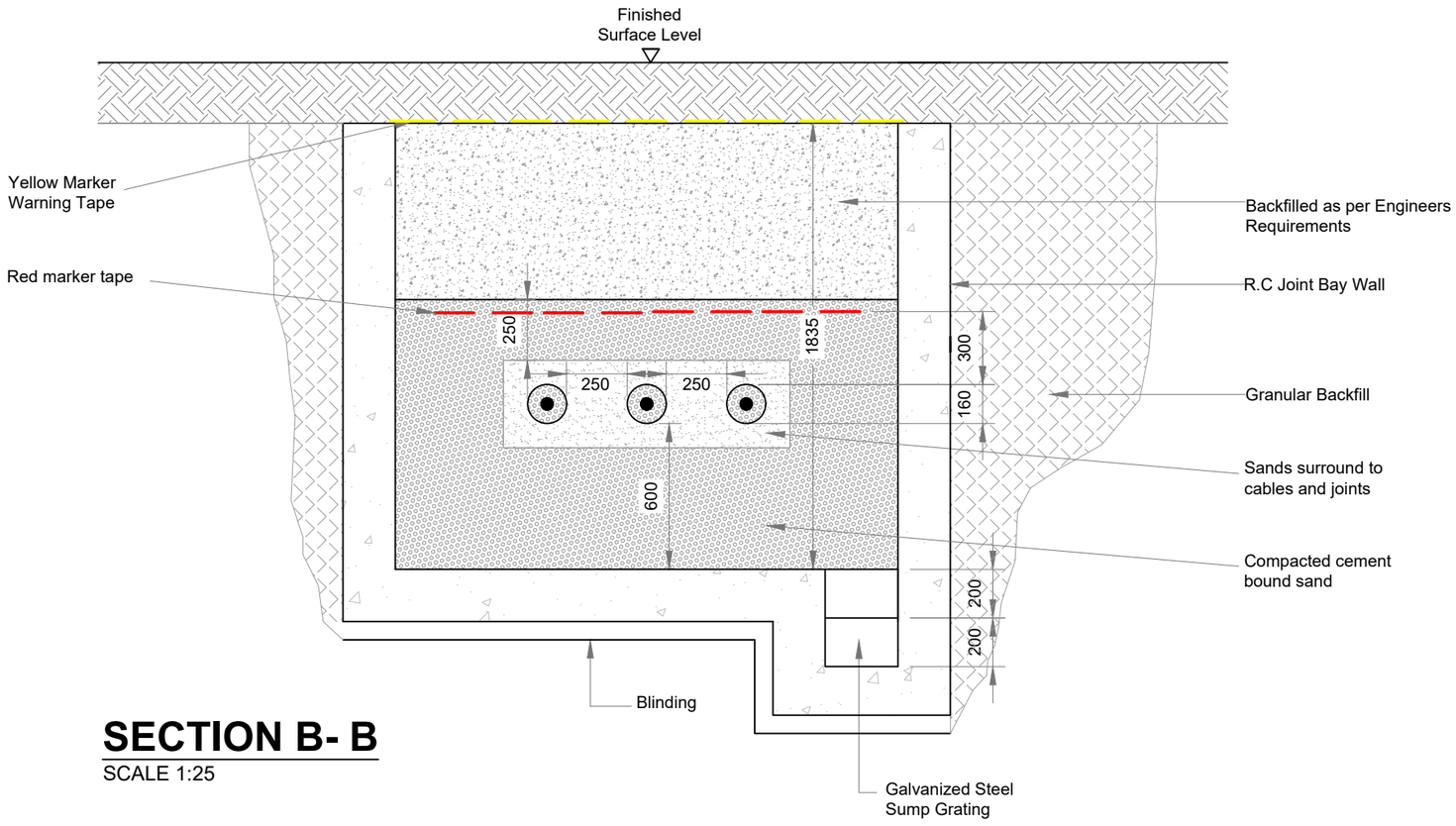

SECTION B- B

SCALE 1:25

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Standard Joint Bay Detail

PROJECT No.:		DRAWING No.:	SCALE:
240225		Figure 4-21	As Shown @ A3
DRAWN BY: KD	CHECKED BY: AC	DATE: 25.03.2026	REVISION.: P01

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4.4.2.3 Watercourse and Service Crossings

There are 11 no. identified watercourse crossings along the Proposed Grid Connection. All 11 no. watercourse crossings are referenced on EPA/OSI mapping. An additional watercourse crossing of an EPA mapped watercourse is required within the Proposed Wind Farm site along the R585 to facilitate the 33kV internal wind farm cabling. The construction methodology for the 11 no. EPA/OSI mapped crossings has been designed to eliminate the requirement for in-stream works at these locations. The various crossing methodologies to be employed along the Proposed Grid Connection include the following:

- Type A: Crossing using standard trefoil formation (Figure 4- 32)
- Type B: Flatbed formation under (Figure 4-33)
- Type C: Flatbed Formation over (Figure 4- 34)
- Type D: Horizontal Directional Drilling (Figure 4-31)

A general description of the construction methods employed at watercourse crossings are described in Section 4.9.2.6 below. An illustration of the proposed crossing methodology at the 11 no. EPA/OSI mapped crossing locations is included within the detailed site layout drawings in Appendix 4-1.

4.4.3 Quantities of Peat, Spoil and Crushed Stone

4.4.3.1 Peat and Spoil Management Plan

The construction of the Proposed Project will require the excavation of peat and spoil. The quantities of peat and spoil, requiring management on the Proposed Wind Farm site has been calculated, as presented in Table 4-3 below. In addition, the volume of stone required to build the Proposed Project infrastructure is noted below. The quantities were calculated by FTC as part of the *Peat and Spoil Management Plan* included as Appendix 4-2 of this EIAR.

Table 4-2 Spoil and Stone Volumes

Development Component	Peat Volume (m^3) (approx..)*	Spoil Volume(m^3) (approx.)*, **
Proposed Wind Farm		
14 no. Turbines and Hardstanding Areas (including foundations)	52,200	85,800
Access Roads	76,500	23,300
Temporary Construction Compounds (not including substation compound)	10,300	800
Proposed 110kV onsite substation (including temporary construction compound)	18,000	15,000
Borrow Pits	16,100	32,200
Met Mast	320	100
Total (Proposed Wind Farm)	**173,420**	**157,200**
Proposed Grid Connection		
Cabling Trench	n/a	10,200
Total Peat and Spoil Volume (Proposed Project)	**173,420**	**167,400**
	340,820 m^3	

*Notes: *A factor of 10% (bulking factor of 10%) has been applied to the excavated peat and spoil volumes to allow for expected increase in volume upon excavation and to allow for a variation in ground conditions across the site.*

***It should be noted that rock is expected to be encountered at a number of the hardstand locations. It is assumed that this 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.*

It is considered that any spoil generated by the proposed cabling trench will be removed and either accommodated within the peat and spoil management areas within the Proposed Wind Farm site or

transported to a Materials Recovery Facility (MRF) where necessary. Any road material containing tar will be managed separately. Further details on this can be found in Ch. 15: Material Assets.

Tree felling is proposed at various locations across the Proposed Wind Farm site; however, this will not involve the excavation of tree stumps, outside of the Proposed Wind Farm infrastructure footprint, and as such does not affect the excavation volumes.

The surplus peat and spoil material generated will all be managed locally within the Proposed Wind Farm site in dedicated peat and spoil management areas, as shown on Figure 4-22. Further details are provided below in Section 4.4.3.3.

4.4.3.2 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 intended to reinstate these areas with any surplus peat and overburden excavated from the works areas of the Proposed Wind Farm.

Further details on construction methodologies, including recommendations and best practice guidelines for the placement of peat and spoil in borrow pits, are detailed in Section 4.9.1.8 below, and in FTC's *Peat & Spoil Management Plan* in Appendix 4-2 of this EIAR.

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

In addition to the reinstatement of the onsite borrow pits, it is proposed to manage any excess overburden generated through construction activities locally within the Site. As identified in Table 4-3 above, the total estimated volume of peat and spoil to be managed following excavations during the construction phase of the Proposed Project is approximately 340,820m^3. This comprises 173,420m^3 of peat and 167,400m^3 of spoil. It is proposed to manage any excess overburden generated through construction activities locally within the Proposed Wind Farm site by grading the peat and spoil across identified peat and spoil management areas. Excavated peat will be also placed/spread on the upslope side of sections of the Proposed Wind Farm access roads. Linear berms will be placed along access roads and turbine hardstand areas where appropriate.

Some material arising from the construction of the Proposed Grid Connection will be sent to an appropriate licenced facility. The total capacity of the identified peat and spoil management areas within the Site, including the proposed onsite borrow pits, is approximately 368,400m^3 and therefore, there is sufficient capacity to manage the total volume of peat and spoil requiring management for the Proposed Project as detailed in Table 4-3. The peat and spoil management areas have been selected based on the locations of peat and spoil generation, areas suitable for peat and spoil management, and avoiding environmentally constrained areas. The locations of the peat and spoil management areas are outlined in Figure 4-22 below (please note other linear areas for peat and spoil management will follow the development footprint under the supervision of the Geotechnical Engineer). Cross sections of the peat and spoil management areas are shown in the Site Layout Drawings in Appendix 4-1 and in Appendix 4-2: Peat and Spoil Management Plan.

Further details on construction methodologies, including recommendations and best practice guidelines for the placement of peat and spoil in identified peat and spoil management areas and borrow pits, are provided in Section 4.9.1.8 and 4.9.1.9 below, and in FTC's *Peat & Spoil Management Plan* in Appendix 4-2 of this EIAR.

4.4.3.2 Crushed Stone

The quantity of crushed stone required for the construction of the Proposed Project has been calculated, as presented in Table 4-4 below.

Table 4-4 Crushed Stone Requirement

Development Component	Crushed Stone Requirement (m^3) (approx.)*	Comment
Proposed Wind Farm		
14 no. Turbines and Hardstanding Areas (including foundations)	72,200	Hardstanding area and foundation footprint. Allowance included for mini-crane pads and blade finger hardstands associated with the main hardstand, plus allowance for side slopes in areas of fill
Access Roads Allowance includes for widening on bends, at junctions, laybys, and tie-ins to hardstands.	87,000	Allowance includes for widening on bends, at junctions, laybys, and tie-ins to hardstands.
Temporary Construction Compounds (not including substation compound)	7,300	
Proposed 110kV onsite substation (including temporary construction compound)	22,400	
Borrow Pits	8,000	
Met Mast	340	
Total (Proposed Wind Farm)	197,240	
Proposed Grid Connection	7,400	
Total (Proposed Project)	**204,640**	

*Note: *A contingency factor of 10% has been applied to the volumes to allow for expected bulking upon excavation and to allow for a variation in ground conditions across the site.*

507000 510000 513000

558000 555000

Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- Proposed Wind Farm Permanant Footprint
- Proposed Peat and Spoil Management Areas

T01 T02 T03 T04 T05 T06 T07 T08 T09 T10 T11 T12 T13 T14

Derryfadda
Foilmore
Cappabo Br
Kilnaknappoge
Gortloughra
Maulavanig
Meall an Mhanaigh
Cahermuckee
Coomclogh
Beara Gougane Barra Cycling Route
Ballynamought
Owngal River
Stone Row
Standing Stone
Stone Circle
Burial Ground
Cousane Gap
Cousane
An Cuasan
Maughanaclea
Machá na Cléibhe
Cairn
Standing Stones
Lough Nahirree
Maughanaclea Hills
Choic Mhacha na Cléibhe
Ardrah
Gortnacowly
Coomleagh West
Coomleagh East
Sheep's Head

0 1 2 km

SITE LOCATION - NOT TO SCALE

Drawing Title: Peat and Spoil management Area Locations

Project Title: Maughanaclea Renewable Energy Development

Project No.	Drawing No.	Scale
240225	Figure 4-22	1:20,000
Drawn By	Checked By	Date
SOR	RK	18/03/2026

MKO

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4.5 Site Activities

4.5.1 Environmental Management

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

The CEMP sets out the key environmental considerations to be considered by the contractor during construction of the Proposed Project. The CEMP includes details of drainage, peat and spoil management, waste management, and details the mitigation and monitoring measures to be implemented in order to comply with the environmental commitments outlined in the EIAR and NIS. The contractor will be contractually obliged to comply with all such measures. 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 approval.

4.5.2 Refuelling

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

4.5.3 Concrete Deliveries

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

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

The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent. This type of Siltbuster (or similar) unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility. Where temporary lined impermeable containment areas are used, such containment areas are typically built using straw bales and lined with an impermeable membrane. Two examples are shown in Plates 4-4 and 4-5 below.

Plate 4-4 Concrete washout area

Plate 4-5 Concrete Wash Out Area

The areas are covered when not in use to prevent rainwater collecting. In periods of dry weather, the areas can 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 to an appropriately authorised facility as necessary. Any residual solid contents that will have been cleaned down from the chute will have solidified and can be broken up and disposed of along with other construction waste, as noted above, by an appropriately authorised waste collector for disposal at an authorised waste facility.

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

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

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

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

4.5.4 Concrete Pouring

Due to the volume of concrete required for each turbine foundation, and the requirement for the concrete pours to be continuous, deliveries may be carried out outside normal working hours 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 completed in a single day per turbine. The main concrete pours for turbine foundations will be planned approximately one week in advance.

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

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

4.5.5 Dust Suppression

In periods of extended dry weather, dust suppression may be required within the Proposed Wind Farm site, along haul roads, public road corridors, proposed new roads on private agricultural land, and proposed upgrades to existing private tracks associated with the Proposed Grid Connection, to prevent dust from becoming a nuisance. If necessary, water will be taken from stilling/settlement ponds in the Proposed Wind Farm site's drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and temporary construction compounds to prevent the generation of dust. Silty or oily water will not be used for dust suppression, because this would transfer the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water may lead to increased runoff.

4.5.6 Vehicle Washing

Wheels or vehicle underbodies are often washed before leaving sites to prevent the build-up of mud on public (and site) roads. It is not anticipated that vehicle or wheel washing facilities will be required as part of the construction phase of the Proposed Project because site roads will be formed before road-going trucks begin to make regular or frequent deliveries to the Site (e.g. with steel or concrete). However, to ensure that wheel wash facilities are available should this be required, 3 no. wheel wash facilities have been included at the site entrances to the Proposed Wind Farm. The Proposed Wind Farm 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 mud or dirt may be picked up.

A road sweeper will be available if any section of the public roads requires cleaning due to construction traffic associated with the Proposed Project.

4.5.7 Waste Management

The CEMP, Appendix 4-3 of this EIAR, provides a waste management plan (WMP) which outlines the best practice procedures during the construction 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 WMP has been produced in line with the following guidance *'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects'* (EPA, 2021)[7]. The WMP has been prepared to outline the main objectives that are to be adhered to for the preparation of a more detailed WMP to be completed prior to the construction phase of the Proposed Project. The WMP will be in place throughout the construction and decommissioning phase of the Proposed Project and will be in line with all relevant legislation detailed in Section 3.8 of Appendix 4-3.

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

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

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

The WMP will provide systems that will enable all arisings, movements and treatments of construction waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being generated. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The WMP can then be adapted with changes that are seen through record keeping.

[7] *EPA 2021 Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects. Available at: https://www.epa.ie/publications/circular economy/resources/CDWasteGuidelines.pdf*

4.6 Site Access and Transportation

4.6.1 Site Entrances

It is proposed to access southern turbine cluster of the Proposed Wind Farm utilising the existing commercial forestry road off the R585. It is proposed to access the northern turbine cluster of the Proposed Wind Farm via a new proposed entrance road that will travel northbound off the R585, with a short section crossing the existing L8777 Local Road. All construction traffic will enter via the two aforementioned site entrances off the R585. The access arrangements will include the upgrade of approximately 350m of the L8777. The Proposed Wind Farm site access off the R585 was subject to Autotrack assessments to identify the turning areas required, as described in Section 15.1.10 of the Traffic and Transport Assessment in Ch. 15: Material Assets of this EIAR. Appropriate sightlines will be established to the Proposed Wind Farm site access for the safe egress of traffic.

It is proposed to access the proposed 110 kV onsite substation via the same existing commercial forestry entrance to the Proposed Wind Farm's southern turbine cluster.

The locations of the Proposed Wind Farm site access are shown in Figure 4-23, which also illustrates the sections of the site entrances that will be used for turbine delivery and for construction traffic, and other sections that will be used for operational phase traffic entering the site.

A Traffic Management Plan is included in Appendix 15-2 of this EIAR and the CEMP in Appendix 4-3 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 that are conditioned.

4.6.2 Turbine Component Transport Route

It is proposed that large wind turbine components will be delivered to the Proposed Wind Farm site from Ringaskiddy Port. For the purposes of assessment, the turbine components and other abnormal loads will be transported from Ringaskiddy Port. The proposed Turbine Delivery Route (TDR) leaves Ringaskiddy on Ringaskiddy Rd (N28), following the N28 right onto Carr's Hill, merging onto the Cork south Ring Rd (N40), continuing on the N22 until turning southwest onto the R585 Regional Road. The TDR continues on the R585 before reaching the site in the townland of Maughanaclea where it will turn left up the existing commercial forestry track to reach the southern cluster, or turn right up the new proposed site entrance to reach the northern cluster.

The existing commercial forestry entrance will be upgraded to facilitate the delivery of the construction materials and oversized loads. Both site entrances were subject to an Autotrack assessment to identify the areas required to access the site. The proposed junctions are shown below in Figure 4-23, and further detailed in Section 15.1 of Ch. 15: Material Assets.

It is also envisaged that general construction traffic (including materials and staff) will travel to the Site via the public road network. Further details are provided in Section 15.1 of Chapter 15: Material Assets. All construction vehicles entering the Proposed Wind Farm site will do so via the proposed site entrances as indicated on Figure 4-23. The construction traffic that will be generated during the construction phase of the Proposed Project is outlined as part of the traffic and transport assessment in Ch. 15: Material Assets of this EIAR.

All deliveries of turbine components and other construction materials to the Site will only be via the proposed transport (haul) routes outlined in Chapter 15: Material Assets (please refer to Figure 15-1A). The TDR is shown on Figure 4-24 below. No other public road routes will be used as part of the construction phase of the Proposed Wind Farm site for the transport of materials. There are no

significant turbine delivery route accommodation works required to facilitate the delivery of components to the Site.

Due to the nature of the Proposed Grid Connection, the proposed works will be transient in nature along the public road network in which the underground cabling route is proposed. As such, deliveries of construction materials will utilise the surrounding road network along the underground cabling route as it moves along the public road network in which it is proposed.

The construction traffic that will be generated during the construction phase of the Proposed Project is outlined as part of the traffic and transport assessment in Section 15.1 of this EIAR.

4.6.2.1 Turbine Delivery Route Accommodation Works

Works such as road widening are sometimes required along proposed turbine transport routes to accommodate the large turbine components and associated vehicles seeking to access wind farm sites. The proposed transport route for the Proposed Project, as shown on Figure 4-24, has been the subject of a route assessment to determine if any works are required along its length. Full details of the assessment are included as part of the traffic impact assessment set out in Section 15.1 of Chapter 15: Material Assets of this EIAR. There are sections on the route where potential pinch points may require specialist transport vehicles. These sections will be further considered by the appointed transport company following turbine procurement process. The main pinch points along the TDR are outlined below:

Location 1 – N22 / R585 junction

The swept path analysis undertaken for this location indicates that the large turbine vehicles will be able to negotiate this junction.

Location 2 – Right turn R585 in Crookstown

The swept path analysis undertaken for this location shows that the blade tail will need to over-sail the field to the northeast of the junction in order for the blade transporter to negotiate the bend.

Location 3 – Left turn at R585 / R590 junction at Crookstown

The figures show that temporary accommodation works on the south-eastern corner of the junction will be required for overhang of the blade for the blade transport vehicle to make this turn. An over-sail of the blade tip on the northern side of the road will also be required.

Location 4 – Bend on R585

The preliminary swept path analysis indicates that the wind farm turbine vehicles will be able to negotiate this bend.

Location 5 – Series of bends on R585

It is noted that local road works and tree felling along the verge had been undertaken for the purpose of the delivery of similar sized turbine component for a wind farm previously constructed.

Location 6 – R585 through Bealnablath

The figures show that over-sail of the blade will be required into the field on the southern side of the R585.

Location 7 – Bend on R585 at Gloun Cross

The figures show that over-sail of the blade will be required into the field on the northern side of the R585.

Location 8 – Bend on R585 at Shanlaragh

The figures show that over-sail of the blade will be required into the field on the northern side of the R585 and overhang of the body of the blade will be required on the southern side of the road.

Location 9 – Bends on R585 at Cousane Gap

The analysis shown in these figures indicates that significant oversail of the blade tip and overhang of the body of the blade will be required at this location.

Please refer to the traffic and transport assessment in Chapter 15 and the detailed autotrack assessment drawings in Appendix 15-3 of this EIAR for further details on the TDR and the pinch points outlined above.

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510000

558000

555000

R585

Site Entrances

T01

T02

T03

T04

T05

T06

T07

T08

T09

T10

T11

T12

T13

T14

Microsoft, Vantor

Microsoft, Vantor

0

0.9

1.8 km

Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- Proposed New Roads
- Exisitng Roads to be Upgraded

SITE LOCATION - NOT TO SCALE

Drawing Title
Proposed Wind Farm Site Entrance

Project Title
Maughanaclea Renewable Energy Development

Project No.	Drawing No.	Scale
240225	Figure 4-23	1:18,000
Drawn By	**Checked By**	**Date**
SOR	RK	27/03/2026

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

520000
540000
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540000
520000
540000
560000

Cork City
R585
N22
Site Entrances
Ringaskiddy Port
0
10
20 km

Map Legend
EIAR Site Boundary
Turbine Delivery Route

SITE LOCATION - NOT TO SCALE

Drawing Title
Turbine Delivery Route

Project Title
Maughanaclea Renewable Energy Development

Project No.	Drawing No.	Scale
240225	Figure 4-24	1:210,000
Drawn By	Checked By	Date
SOR	RK	10/02/2026

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

4.6.3 Traffic Management

A turbine with a blade length of 64.4 metres has been used in assessing the traffic impact of the Proposed Project. The blade transporter for such a turbine blade would have a total vehicle length of 69.4 metres, including the blade which overhangs the back of the vehicle. The total length of the tower transporter is 47.73 metres with the axles located at the front and rear of the load with no overhang.

The vehicles used to transport the nacelles will be similar to the tower transporter. All other vehicles requiring access to the site of the Proposed Project will be smaller than the design test vehicles. The turbine delivery vehicles have been modelled accurately in the Autotrack assessments for the Proposed Wind Farm 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 deliver oversized loads from origin to destination. With just under 400 no. wind farms already built and operating in Ireland (Republic and Northern Ireland combined, as per latest available figures on http://www.windenergyireland.com), transport challenges are something the wind energy industry and specialist transport sector has become particularly adept in finding solutions to.

As an alternative solution for transport of turbine blades, alternative delivery systems are available. For example, delivery vehicles fitted with blade adapters may be used in order to navigate the existing roads along the turbine delivery route. Blade adaptors allow the turbine blade to be transported at a suitable angle in order to navigate tight bends or obstacles along the delivery route. Plate 4-6 below shows an example of a blade adapter.

Plate 4-6 Blade adaptor transport system

A detailed Traffic Management Plan (TMP) will be provided specifying details relating to traffic management and included in the Construction Environmental Management Plan (CEMP) prior to the commencement of the construction phase of the Proposed Project. The TMP will be agreed with the local authority and An Garda Síochána prior to construction works commencing on-site. The TMP will include:

- A delivery schedule.
- Details of works or any other minor alteration identified.
- A dry run of the route using vehicles with similar dimensions.

The deliveries of turbine components to the Proposed Wind Farm site may be made in convoys of three to four 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, usually at night, to avoid disruption to work and school-related traffic.

Prior to the Traffic Management Plan being finalised, a full dry run of the transport operation along the potential routes 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 for agreement with the relevant Authorities. All turbine deliveries will be provided for in a Traffic Management Plan which will be finalised in advance of oversized load deliveries, when the exact transport arrangements are known, delivery dates confirmed and escort proposals in place. Such a traffic management plan is typically submitted to the relevant Authorities 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.

4.7 Site Drainage

4.7.1 Introduction

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

The protection of groundwater and surface water within and surrounding the Proposed Project site, and downstream catchments that they feed has been of utmost importance in considering the most appropriate drainage proposals for the site of the Proposed Project. The drainage design for the Proposed Project has been planned with the intention of having no significant negative impact on the water quality of the Site and its associated rivers, and consequently no impact on downstream catchments and ecological ecosystems. The assessment of potential impacts on hydrology and hydrogeology due to the construction, operation and decommissioning of the Proposed Project is included in Ch. 9: Hydrology and Hydrogeology. No routes of any natural drainage features will be altered as part of the Proposed Project. Turbine locations and associated new roadways were designed to avoid natural watercourses with existing roads to be used wherever possible. There will be no direct discharges to any natural watercourses or land drains, 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 and drains. Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Project.

During the construction phase, the Proposed Grid Connection comprises a temporary narrow trench excavated and backfilled along existing roadways The scale and scope of the drainage measures imposed along the Proposed Grid Connection will be reduced in comparison to the Proposed Wind Farm site drainage. Nonetheless, the mitigation measures incorporated along the Proposed Grid Connection, such as silt fences and the covering of stockpiles during rainfall events, will ensure that there are no effects on downstream surface water quality as a result of the Proposed Grid Connection.

4.7.2 Existing Drainage Features

The general design approach to wind farm layouts is to utilise and integrate with the existing drainage infrastructure where possible whether it be existing access roads or the existing forestry / peat / agricultural drainage network. Utilising the existing infrastructure means that there will be less of a requirement for new construction/excavations which have the potential to impact on downstream watercourses in terms of suspended solid input in runoff (unless managed appropriately). The existing forestry and agricultural drains have no major ecological or hydrological value and can be readily integrated into the Proposed Wind Farm drainage scheme.

There will be no discharge of untreated or unattenuated water to natural watercourses or drains. All discharges from the proposed works areas or from interceptor drains will be made over vegetated ground at an appropriate distance from watercourses. Buffer zones around the existing natural drainage features have informed the layout of the Proposed Project 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 Proposed Wind Farm 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 post treatment, 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.

4.7.3 Drainage Design Principles

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

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

Drainage water from any works areas of the Site will not be directed to any natural watercourses within the Site. Two distinct methods will be employed to manage drainage water within the Site. The first method involves keeping clean water clean by avoiding disturbance to natural drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations and construction areas. The second method involves collecting any drainage waters

from works areas within the Site that might carry silt or sediment, to allow attenuation and settlement prior to controlled diffuse release via recharge.

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

A schematic line drawing of the proposed drainage design is presented in Figure 4-25 below.

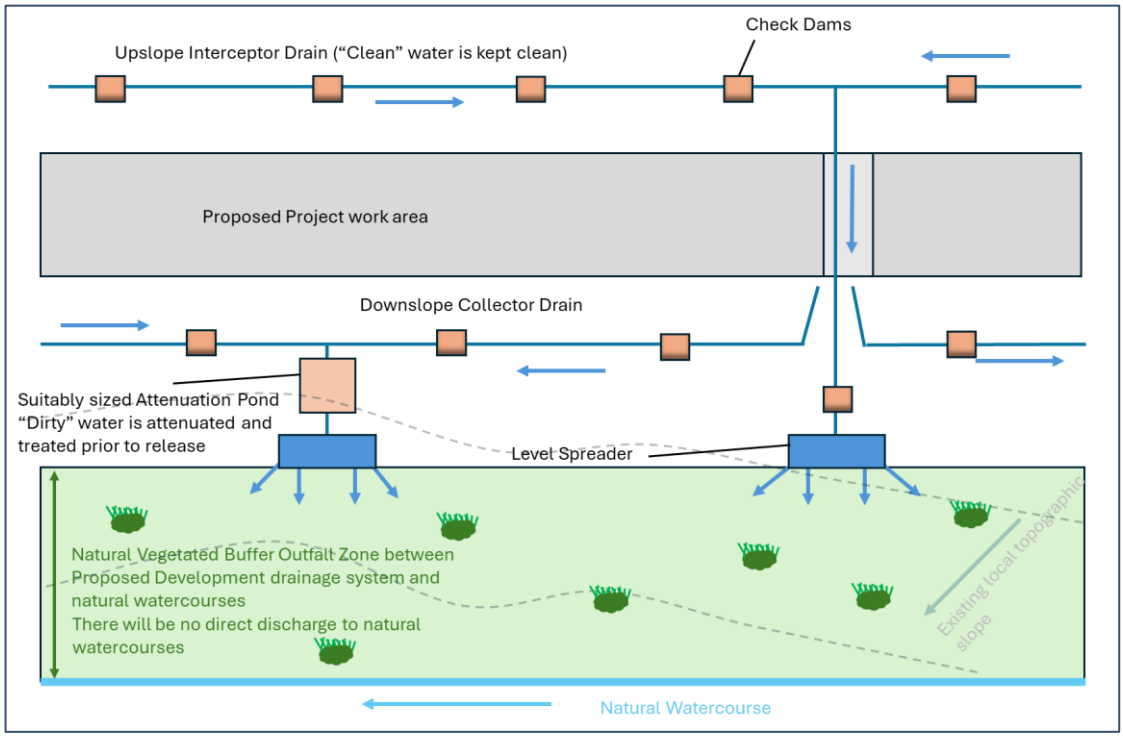


Figure 4-25 Schematic of Proposed Site Drainage Management

4.7.4 Drainage Design

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

- Circular Letter PL 1/2017: Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive);
- Environmental Protection Agency (2022): Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Institute of Geologists Ireland (2013) Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements;
- DoE/NIEA (2015): Wind farms and groundwater impacts - A guide to EIA and Planning considerations";
- OPW (2009) The Planning System and Flood Risk Management;
- National Roads Authority (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- Wind Energy Development Guidelines for Planning Authorities, 2006 (the Guidelines);

- Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Watercourses;
- Good Practice During Wind Farm Construction (Scottish Natural Heritage, 2010);
- GPP5 – Works or Maintenance Near Water (UK Guidance Note);
- CIRIA (Construction Industry Research and Information Association) Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006);
- Wind Farms and Groundwater Impacts: A guide to EIA and Planning considerations (DoE/NIEA, April 2015);
- Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2001;
- Land Types for Afforestation (Forest Service, 2016b);
- Forest Protection Guidelines (Forest Service, 2002);
- Forest Operations and Water Protection Guidelines (Coillte, 2013);
- Forestry and Water Quality Guidelines (Forest Service, 2000b); and,
- Forests and Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 (DAFM, 2018).

4.7.4.1 Interceptor Drains

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

The interceptor drains will be installed in advance of any main construction works commencing. The material excavated to make the drain will be compacted on the downslope edge of the drain to form a diversion dike. On completion of the construction phase works, it is envisaged that the majority of the interceptor drains could be removed. At that stage, there will be no open excavations or large areas of exposed ground that are likely to give rise to large volumes of potentially silt-laden run off. Any areas in which works were carried out to construct roads, turbines or hardstands, will have been built up with large grade hardcore, which even when compacted in place, will retain sufficient void space to allow water to infiltrate the subsurface of these constructed areas. It is not anticipated that roadways or other installed Site infrastructure will intercept ground-conveyed surface water runoff to any significant extent that would result in scouring or over-topping or spill over. Where the drains are to be removed, they will be backfilled with the material from the diversion dike. Interceptor drains may have to be retained in certain locations, for example where roadways are to be installed on slopes, to prevent the roadways acting as conduits for water that might infiltrate the roadway sub-base. In these cases, interceptor drains would be maintained in localised areas along the roadway with culverts under the roadway, which would allow the intercepted water to be discharged to vegetation filters downgradient of the roadway. Similarly, in localised hollows where water is likely to be funnelled at greater concentrations than on broader slopes, interceptor drains and culverts may be left in situ following construction. Figure 4-26 below shows an illustrative drawing of an interceptor drain.

The velocity of flow in the interceptor will be controlled by check dams (see Section 4.7.4.3 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 4.7.4.4 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

4.7.4.2 Swales

Drainage swales are shallow drains that will be used to intercept and collect run off from construction areas of the Site during the construction phase. Drainage swales will remain in place to collect runoff from roads and hardstanding areas of the Proposed Wind Farm site during the operational phase. A swale is an excavated drainage channel located along the downgradient perimeter of construction areas, used to collect and carry any sediment-laden runoff to a sediment-trapping facility and stabilised outlet. Swales are proven to be most effective when a dike is installed on the downhill side. They are similar in design to interceptor drains and collector drains described above. Figure 4-26 below, shows an illustrative example of a drainage swale.

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

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

4.7.4.3 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 4-26 shows illustrative examples of check dams.

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

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

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

4.7.4.4 Level Spreaders

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

The water carried in interceptor drains will not have come in contact with works areas of the Site, and therefore should be free of silt and sediment. The level spreaders will distribute clean drainage water onto vegetated areas where the water will not be reconcentrated into a flow channel immediately below the point of discharge. The discharge point will be on level or only very gently sloping ground rather than on a steep slope in order to prevent erosion. Figure 4-26 below shows an illustrative example of a level spreader.

The slope in the channel leading into the spreader will be less than or equal to 1%. The slope downgradient of the spreader onto which the water will dissipate will have a grade of less than 6%. The availability of slopes with a grade of 6% or less will determine the locations of level spreaders. If a slope grade of less than 6% is not available in the immediate area downgradient of a works area at the end of a diversion drain, a piped slope drain (see Section 4.7.4.5 below) will be used to transfer the water to a suitable location.

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

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

4.7.4.5 Piped Slope Drains

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

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

The rock apron at the outlet will consist of 6-inch stone to a depth equal to the diameter of the pipe, a length six times the diameter of the pipe. The width of the rock apron will be three times the diameter of the pipe where the pipe opens onto the apron and will fan out to six times the diameter of the pipe over its length. Figure 4-26 below shows a diagrammatic example of a piped slope drain and rock apron.

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

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

4.7.4.6 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.

4.7.4.7 Stilling Ponds (Settlement Ponds)

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

Stilling ponds will be excavated/constructed at each required location as two separate ponds in sequence, a primary pond and a secondary pond. The points at which water enters and exits the stilling ponds will be stabilised with rock aprons, which will trap sediment, dissipate the energy of the water flowing through the stilling pond system, and prevent erosion. The primary stilling pond will reduce the velocity of flows to less than 0.5 metres per second to allow settlement of silt to occur. Water will then pass from the primary pond to the secondary pond via another rock apron. The secondary stilling pond will reduce the velocity of flows to less than 0.3 metres per second. Water will flow out of the secondary stilling pond through a stone dam, partially wrapped in geo-textile membrane, which will control flow velocities and trap any sediment that has not settled out. Figure 4-26 below shows an illustrative example of a stilling pond system.

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

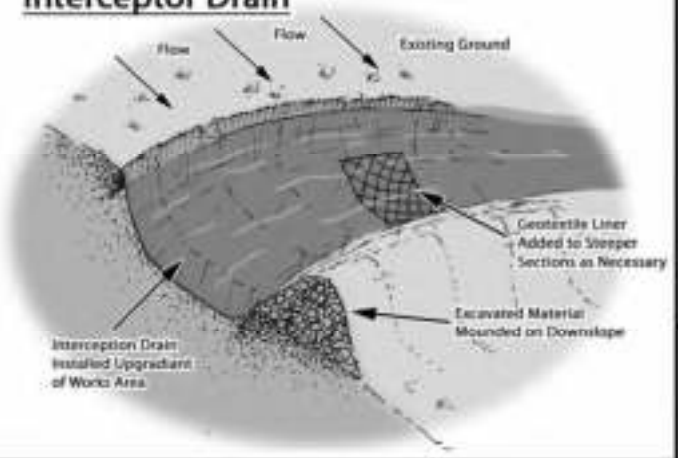
The embankment that forms the sloped sides of the stilling ponds will be stabilised with vegetated turves, which will have been removed during the excavation of the stilling ponds area. All material excavated during pond construction will be used locally for landscaping and berm construction around these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

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

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

Drainage Design Measures

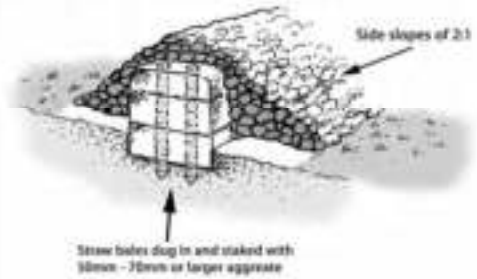
Interceptor Drain



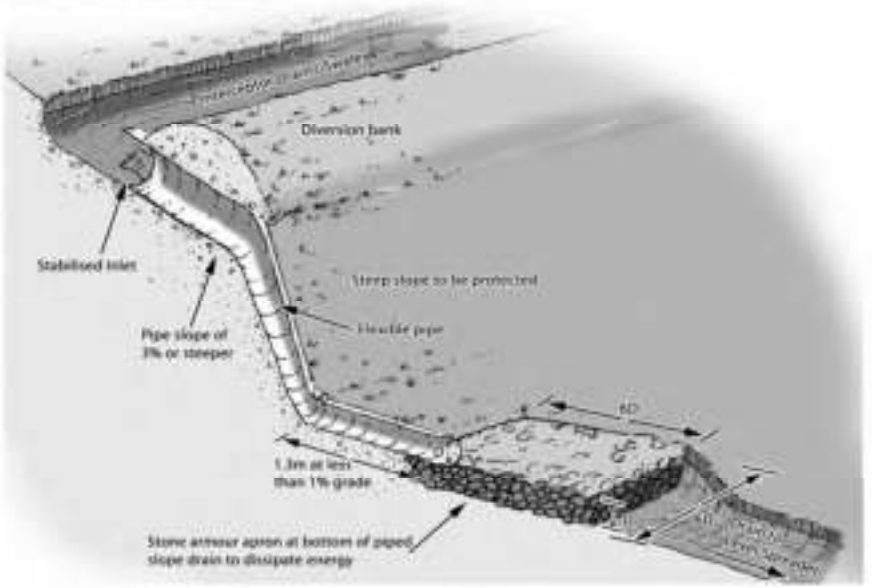
Check Dam (Stone Dam in Drain)

Check Dam

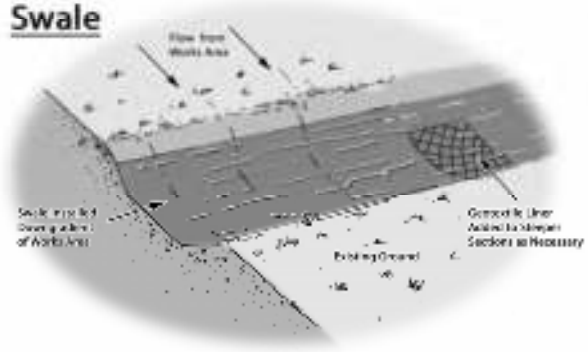
(Straw Bale & Stone Dam - Cross Section)



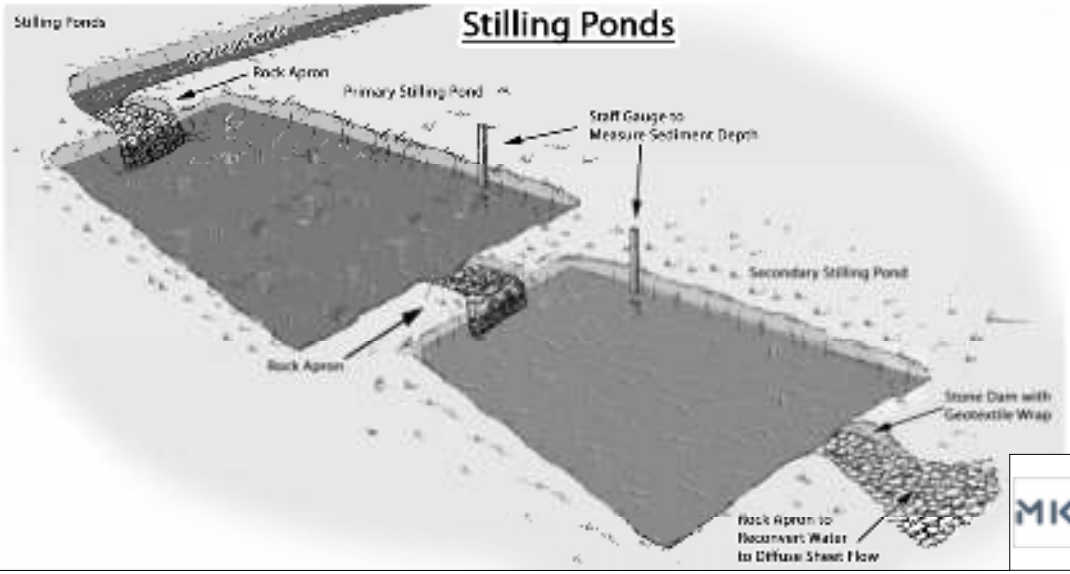
Slope Pipe Drain



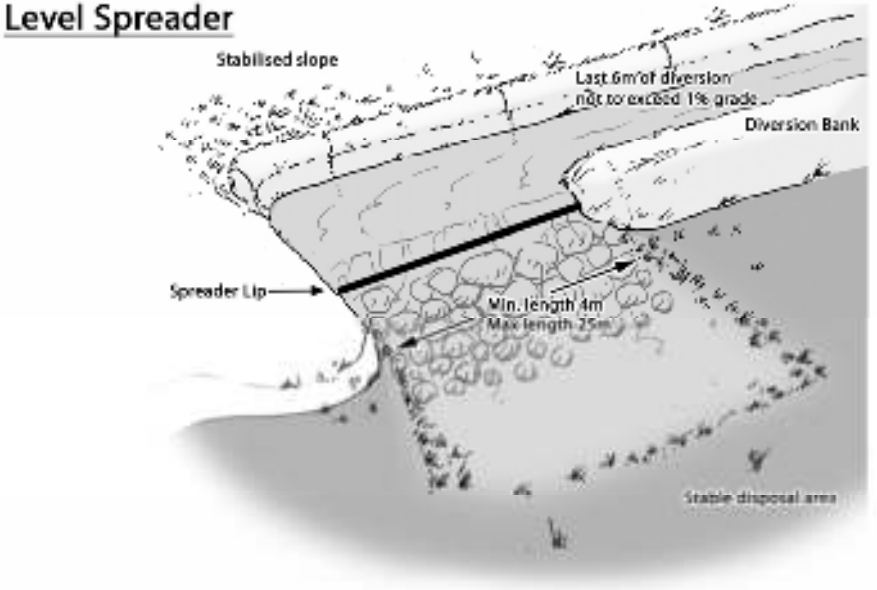
Swale



Stilling Ponds



Level Spreader



MAP TITLE: **Drainage Design Illustrations**		MAP NO.: **Figure 4-26**	SCALE: **NTS**
PROJECT TITLE: **Maughanaclea Renewable Energy Development, Co. Cork**			DATE: **26.03.2026**
DRAWING BY: **Ciaran Fitzgerald**	CHECKED BY: **Robert Kennedy**	ISSUE NO.: **240225 - 2026.03.26 - F**	

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4.7.4.8 Siltbuster

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

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

The unit stills the incoming water/solids mix and routes it upwards between a set of inclined plates for separation. Fine particles settle onto the plates and slide down to the base for collection, whilst treated water flows to an outlet weir after passing below a scum board to retain any floating material. The inclined plates dramatically increase the effective settling area of the unit giving it a very small footprint onsite and making it highly mobile. Figure 4-27 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.

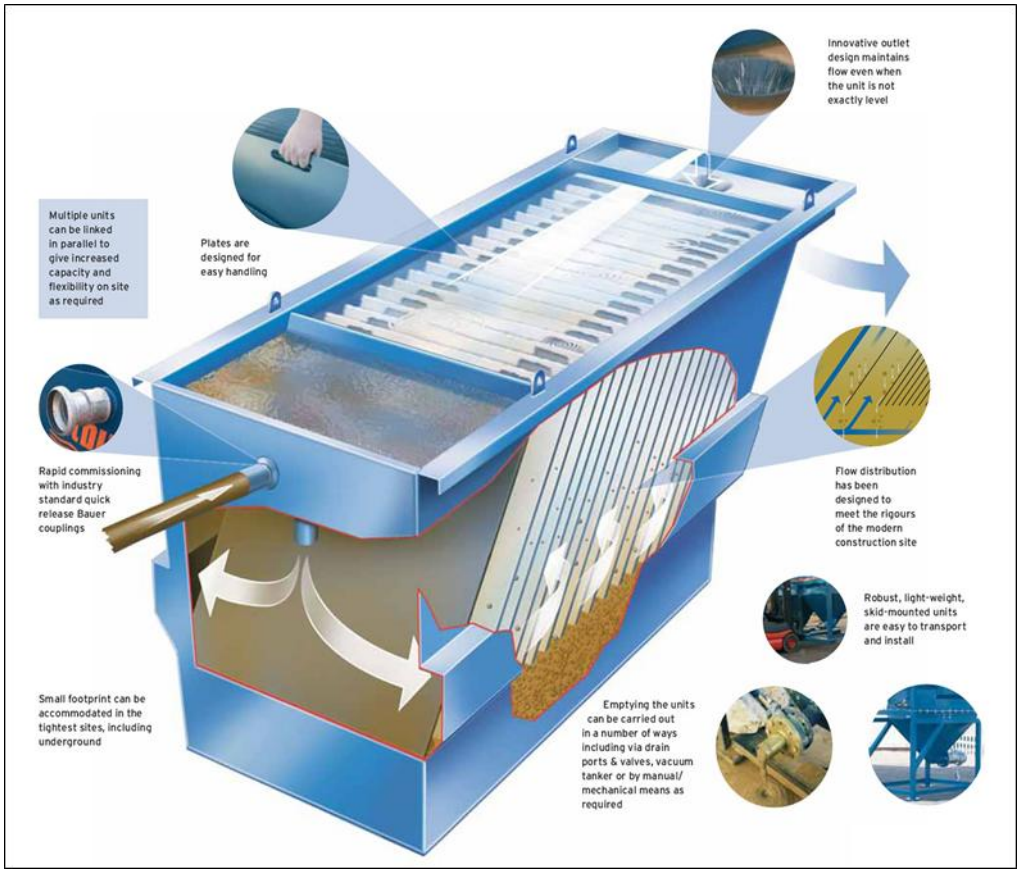


Figure 4-27 Siltbuster (Source: https://www.siltbuster.co.uk/sb_prod/siltbuster-fb50-settlement-unit/)

4.7.4.9 Silt Bags

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

Dewatering silt bags are an additional drainage measure that can be used downgradient of the stilling ponds at the end of the drainage swale channels and will be located, wherever it is deemed appropriate, throughout the Site. The water will flow, via a pipe, from the stilling ponds into the silt bag. The silt bag will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water after it has gone through the previous drainage measures. The dewatering silt bags will ensure that there will be no loss of silt into the stream.

The dewatering silt bag that will be used will be approximately 3 metres in width by 4.5 metres (see Plate 4-7 and Plate 4-8 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 4-6 Silt Bag under inspection

Plate 4-7 Silt Bag with water being pumped through

4.7.4.10 Sediments

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

4.7.4.11 Culverts

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

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

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

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

4.7.4.12 Silt Fences

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

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

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

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

4.7.4.13 Hydrocarbon Interceptor

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

4.7.4.14 Tree Felling Drainage

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

During tree felling there is a potential to generate silts and sediments in surface water runoff due to tracking of machinery and disturbance of the ground surface etc, however mitigation is provided in Ch. 9: Hydrology and Hydrogeology with regard surface water quality protection for this activity which is

summarised below. Also, prior to the commencement of tree felling for subsequent road construction the following key temporary drainage measures will be installed:

- All existing dry forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps;
- Clean water diversion drains will be installed upgradient of the works areas;
- Check dams/silt fence arrangements (silt traps) will be placed in all existing forestry drains that have surface water flows and also along existing forestry roadside drains; and,
- A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.

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

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

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

- All relevant measures, best practice methods and requirements set out in Ch. 9: Hydrology and Hydrogeology of the EIAR will be adhered to including Forestry & Water Quality Guidelines, Forest Harvesting & the Environment Guidelines and the Forest Protection Guidelines.

- The extent of all necessary tree felling will be identified and demarcated with markings on the ground in advance of any felling commencing.
- All roads and culverts will be inspected prior to any machinery being brought on Site to commence the felling operation. No tracking of vehicles through watercourses will occur. Vehicles will only use existing road infrastructure and established watercourse crossings.
- Existing drains that drain an area to be felled towards surface watercourses will be blocked, and temporary silt traps will be constructed to ensure collection of all silt within felling areas. These temporary silt traps will be cleaned out and backfilled once felling works are complete. This ensures there is no residual collected silt remaining in blocked drains after felling works are completed. No direct discharge of such drains to watercourses will occur from within felling areas.
- New collector drains and sediment traps will be installed during ground preparation to intercept water upgradient of felling areas and divert it away. Collector drains will be excavated at an acute angle to the contour (0.3% - 3% gradient), to minimise flow velocities.
- All silt traps will be sited outside of buffer zones and have no direct outflow into the aquatic zone. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of away from all aquatic zones.
- All new collector drains will taper out before entering the aquatic buffer zone to ensures the discharging water gently fans out over the buffer zone before entering the aquatic zone.
- Machine combinations, such as mechanical harvesters or chainsaw felling will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance.
- Mechanised operations will be suspended during and immediately after heavy rainfall.
- Where brash is required to form brash mats, it is to be laid out at harvesting stage to prevent soil disturbance by machine movement.
- Brash which has not been pushed into the soil may be moved within the Site to facilitate the creation of mats in more demanding locations.
- Felling of trees will be pointed directionally away from watercourses.
- Felling will be planned to minimise the number of machine passes in any one area.
- Extraction routes, and hence brash mats, will be aligned parallel to the ground contours where possible.
- Harvested timber will be stacked in dry areas, and outside any 50m watercourse buffer zone. Straw bales and check dams to be emplaced on the down gradient side of timber storage sites.
- Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but removing of natural debris deflectors will be avoided.

4.7.4.15 Transverse Drains (Grips)

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

4.7.5 Cable Trench Drainage

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

To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the up-gradient side of the trench and is temporarily sealed/smoothed over, using the back of the excavator bucket. Should any rainfall cause runoff from the excavated material, the material is therefore collected and contained in the downgradient cable trench. Excess subsoil is removed from the cable trench works area immediately upon excavation, and in the case of the Proposed Project, would be transported to one of the on-site designated spoil management areas or used for landscaping and reinstatement of other areas elsewhere on-site. Along sections of the Proposed Grid Connection that are further removed from the Proposed Wind Farm site, it may be more practical to transport excess excavated material to a nearby licenced facility.

On steeper slopes, silt fences, as detailed in Section 4.7.4.12, 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.

4.7.6 Site Drainage Management

4.7.6.1 Preparative Site Drainage Management

All materials and equipment necessary to implement the drainage measures detailed above, will be brought on-site in phases as they are required during the construction phase. A sufficient number of straw bales, clean drainage stone, terram, stakes, etc. will be kept on-site at all times to implement the drainage design measures as necessary. The drainage measures detailed in the above will be installed prior to, or at the same time as the works they are intended to drain.

4.7.6.2 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. 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.

4.7.6.3 Reactive Site Drainage Management

The final drainage design prepared for the Proposed Project prior to commencement of construction will provide for reactive management of drainage measures. 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 in so far as is possible. 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 situation on the ground as a particular time.

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.

4.7.7 Drainage Maintenance

An inspection and maintenance plan for the drainage system on-site will be prepared in advance of commencement of any works on the Proposed Project. Regular inspections of all installed drainage

features will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water at parts of the systems where it is not intended. The inspection of the drainage system will be the responsibility of the ECoW or the Project Hydrologist. The drainage inspection and maintenance plan are included in the CEMP in Appendix 4-3 of this EIAR.

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 Proposed Project to insure 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 weekly during the construction phase of the Proposed Project and 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.

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. The Project Hydrologist will inspect and review the drainage system after construction has been completed to provide guidance on the requirements of an operational phase drainage system.

4.8 Construction Management

4.8.1 Construction Timing

It is estimated that the construction phase of the Proposed Project will take approximately 18-24 months from commencement of civil works to the full commissioning of the wind turbines. The commencement of works where the removal of vegetation is required, or where works take place in sensitive breeding habitats will be scheduled to occur outside the bird breeding season (1st March to 31st August) to avoid any potentially significant effects on nesting birds. Construction may commence from September to March so that construction activities are ongoing by the time the next bird breeding season comes around and can continue throughout the bird breeding season.

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

4.8.2 Construction Sequencing

The construction phase can be broken down into four main phases, which overlap partially and will take approximately 18-24 months to complete: 1) civil engineering works - 18 months, 2) electrical works including grid connection works - 12-18 months, and 3) turbine erection and commissioning - 9 months. The main task items under each of the three phases are outlined below.

Civil Engineering Works:

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

Electrical Works:

- Construct the substation compound hardcore footprint, including ancillary temporary construction compound.
- Establish the temporary construction compound.
- Construct bases/plinths for substation building.
- Install external electrical equipment at substation.
- Install transformer at compound.
- Erect stock proof and palisade fencing around substation area.
- Install internal collector network and communication cabling.

- Establish traffic management.
- Excavate and install pre-cast concrete joint bays.
- Excavate trench for ducting & place ducting, backfill with graded granular fill material, reinstate temporary surface.
- Install cable, including jointing.
- Test installation and carry out permanent reinstatement of carriageway.
- Commission the substation.

Turbine and Met Mast Erection and Commissioning:

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

All relevant Site Health & Safety procedures, in accordance with the relevant Health and Safety Legislation and guidance (listed in Ch. 5: Population and Human Health: Section 5.1.2 of this EIAR), including the preparation of the Health & Safety Plan, erection of the relevant and appropriate signage on site, inductions and toolbox talks will take place prior to and throughout the construction phase of the Proposed Project. Further details of on-site health, safety and welfare are included in Ch. 5: Population and Human Health of this EIAR.

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

Table 4-3 Indicative Construction Schedule

		Year 1				Year 2			
ID	Task Name	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Site Health and Safety								
2	Grid Connection								
3	Site Compounds								
4	Site Roads								
5	Substation and Electrical Works								
6	Turbine Hardstands								
7	Turbine Foundations								
8	Backfilling and Landscaping								
9	Turbine Delivery and Erection								
10	Substation Commissioning								
11	Turbine Commissioning								

4.8.3 Construction Phase Monitoring and Oversight

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

The CEMP Audit Report (Section 10.2 of the CEMP) will list all mitigation measures prescribed in any of the planning documentation and all conditions attached to the grant of planning permission and allows them to be audited on a systematic and regular basis. The first assessment is a simply Yes/No question; *has the mitigation measure been employed on-site or not?* Following confirmation that the mitigation measure has been implemented, the adherence to mitigation measures must be the subject of regular review and audit during the full construction stage of the project. If remedial actions are needed to improve the effectiveness of the mitigation measure, then these are notified to the Site staff immediately during the audit site visit, and in writing by way of the circulation of the audit report. Depending on the importance and urgency of rectifying the issue, the construction site manager is given a timeframe by when the remedial works need to be completed.

A CEMP has been prepared for the Proposed Project and is included in Appendix 4-3 of this EIAR. The CEMP includes details of drainage, overburden management, waste management etc, and describes how the above-mentioned Audit Report will function and be presented. In the event planning permission is granted for the Proposed 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 the CEMP and compiled in the Audit Report. Their implementation will be overseen by the ECoW or supervising hydrogeologists, environmental scientists, ecologists or geotechnical engineers, depending on who is best placed to advise on the implementation. The system of auditing referred to above ensures that the mitigation measures are maintained for the duration of the construction phase, and into the operational phase where necessary.

4.9 Construction Methodologies

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

4.9.1 Proposed Wind Farm

4.9.1.1 Turbine and Met Mast Foundations

Each of the turbines to be erected at the Proposed Wind Farm site will have reinforced concrete foundations that are installed below the finished ground level. It is anticipated that the turbine foundations will be formed on competent stata (i.e bedrock or subsoil of sufficient load bearing capacity). As detailed above in Section 4.4.1.1.2, numerous intrusive site investigations were undertaken across the Proposed Wind Farm site, to provide detail and clarity on the nature and extent of subsoils and bedrock as a means of characterising the site. This assisted in providing additional information on the most suitable location for turbines and associated infrastructure. A methodology for reinforced concrete foundations is included in Section 2.3.3.1 of the CEMP, Appendix 4-3 of this EIAR.

Where the foundation of the turbine is founded on competent strata, overburden will be stripped off the foundation area to a suitable formation using a 360° excavator and will be placed across the Site as

close to the excavation as practical. A two-metre-wide working area will be required around each turbine base, with the sides of the excavated areas sloped sufficiently to ensure that slippage does not occur. Material excavated to create the working area will be stored locally for later reuse in backfilling the working area around the turbine foundation. The excavated material will be sealed using the back of the excavator bucket and surrounded by silt fences to ensure sediment-laden run-off does not occur.

The formation material will have to be approved by an engineer as meeting the turbine manufacturer's requirements. If the formation level is reached at a depth greater than the depth of the foundation, the ground level will be raised with Clause 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 be pumped to an adjacent settlement pond.

A berm approximately 600mm 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 excavations etc. Access to and from excavated bases will be formed by excavating a pedestrian walkway to 1:12 grade.

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

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

Formwork to concrete bases will be propped/supported sufficiently to prevent failure. Concrete for foundations will be poured using a concrete pump. Each base will be poured in three stages. Stage 1 will see the concrete being poured and vibrated in the centre of the anchor cage to bring the concrete up to the required level inside the cage. Stage 2 will see the centre of the steel foundation being poured and vibrated to the required level. Stage 3 will see the remaining concrete being poured around the steel foundation to bring it up to the required finished level. After a period of time when the concrete has set sufficiently, the top surface of the concrete surface is to be finished with a steel float.

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

4.9.1.2 Site Roads and Hardstand Areas

4.9.1.2.1 *New Site Access Roads*

Approximately 12.1km of new road will be constructed which will comprise a roadway with a final running width of approximately five metres, with wider sections at corners and the laying of appropriate surface dressing on the new roadway where necessary. Approximately 12km of proposed new roads will be excavated founded roads, and approximately 85 metres of proposed new road will be floating road.

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

i. *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, and in areas identified within the peat stability risk assessment (see Geotechnical & Peat Stability Assessment, FT, 2025, Appendix 8-1) as requiring monitoring.*
ii. *Interceptor drains will be installed upslope of the access road alignment to divert any surface water away from the construction area.*
iii. *Excavation of roads will be to the line and level given in the design requirements. Excavation will take place to a competent stratum beneath the peat.*
iv. *Road construction will be carried out in sections of approximately 20m lengths i.e. no more than 20m of access road will be excavated without replacement with stone fill. This length will be reduced to 5m in areas identified within the peat stability risk assessments.*
v. *Excavation of materials with respect to control of peat stability:*
    a. *Acrotelm (to about 0.3 to 0.4m of peat) will be required for landscaping and will be stripped and temporarily stockpiled for re-use as required. Acrotelm stripping will be undertaken prior to main excavations.*
    b. *Where possible, the acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation.*
    c. *All catotelm peat (peat below about 0.3 to 0.4m depth) will be transported immediately on excavation to the designated peat and spoil management areas or the borrow pit.*
vi. *Once excavated, non-catotelm peat will be temporarily stored in localised areas adjacent to excavations for roads and hardstands before being placed into the permanent storage areas within the borrow pits, in the designated peat and spoil management areas, or reused for landscaping purposes. All peat placement areas will be inspected by the Project Geotechnical Engineer before material is stored in the area. No material is to be sidecast on the downslope side of the access roads.*
vii. *Excavation side slopes in peat will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Should areas of weaker peat be encountered then slacker slopes will be required. Battering of the side slopes of the excavations will be carried out as the excavation progresses.*
viii. *End-tipping of stone onto the road during the construction/upgrading of the access road will be carefully monitored to ensure that excessive impact loading, which may adversely affect the adjacent peat, is limited.*
ix. *The excavated access road will be constructed with an average of 750mm of selected granular fill. Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works.*
x. *Access roads will be finished with a layer of capping across the full width of the road.*
xi. *A layer of geogrid/geotextile may be required at the surface of the competent stratum, where this stratum is cohesive in nature.*
xii. *Where slopes of greater than 5 degrees are encountered along with relatively deep peat (i.e. greater than 1.5m) and where it is proposed to construct the access road perpendicular to the slope contours it is best practice to start construction at the bottom of the slope and work towards the top, where possible. This method avoids any unnecessary loading to the adjacent peat and greatly reduces any risk of peat instability.*
xiii. *Where the above is not possible, a specific Risk Assessment Method Statement (RAMS) from the contractor will be produced, detailing how the downslope works will be undertaken, including that all plant would operate from the already constructed section of road, with no loading of the peat on the downslope slope and limiting the length of ground to be stripped/excavated at any one time. Movement monitoring posts (as described in the Peat & Spoil Management Plan, Section 9.1, Appendix 4-2) will also be installed downslope of the works area to allow for ongoing monitoring during the construction works.*
xiv. *A final surface layer will be placed over the excavated road and graded to accommodate wind turbine construction and delivery traffic.*

The construction methodology for the proposed new floating roads is outlined as follows:

i. *Prior to commencing floating road construction, movement monitoring posts will be installed upslope and downslope of the floating road and will be monitored daily as the road is constructed. Monitoring posts will be located along the road at 10m intervals in areas of deep peat (greater than 2m). These survey points will be surveyed on a weekly basis, and more frequently when construction activities are ongoing in the area.*
ii. *Base geogrid will be laid directly onto the existing peat surface along the line of the road in accordance with geogrid provider's requirements.*
iii. *Tracking of machinery on the open peatland will be restricted to the machinery required to construct this section of floating road.*
iv. *The typical make-up of the new floated access road will be up to 1,000mm of selected granular fill with 2 no. layers of geogrid with possibly the inclusion of a geotextile separator.*
v. *Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works, Series 600 (2024).*
vi. *Following the detailed design of the floated access roads it may be deemed necessary to include pressure berms either side of the access road in some of the deeper peat areas. The inclusion of a 2 to 5m wide pressure berm (typically 0.5m in height) either side of the access road will reduce the likelihood of potential bearing failures beneath the access road.*
vii. *The finished road width will be approximately 5m, with wider sections on bends and corners.*
viii. *Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will not be carried out.*
ix. *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating road will be tipped over at least a 10m length of constructed floating road.*
x. *Where it is not possible to end-tip over a 10m length of constructed floating road then dumpers delivering stone to the floating road will carry a reduced stone load (not greater than half full) until such time as end-tipping can be carried out over a 10m length of constructed floating road.*
xi. *Following end-tipping suitable machinery will be employed to spread and place the tipped stone over the base geogrid along the line of the road.*
xii. *A final surface layer will be placed over the full width of the floating road, as per design requirements, to provide a road profile and graded to accommodate wind turbine construction and delivery traffic.*
xiii. *No excavations (e.g., drainage, peat cuttings) will be carried out within 5m distance of a completed floated access road edge, or at a distance determined following site inspection. The presence of excavations can destabilise the road. Temporary excavations will be excavated in short lengths and backfilled as soon as practicable.*
xiv. *No materials will be sidecast or stored on the peat on either side of the floating road during construction.*
xv. *Settlement of a floated access road is expected and will likely be in the order of several 100mm in the deeper peat areas; as such it will be necessary to re-level the road at convenient intervals during the works. The magnitude and extent of settlement is likely to be greater in areas of deeper peat with the rate of settlement reducing over time. Prior to completion of the works, the road will be re-levelled using crushed stone.*
xvi. *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.*

4.9.1.2.2 Upgrading of Existing Site Access Road

Approximately 2.1km of the existing roads will require upgrading which will comprise widening of the roadway to a total running width of approximately five metres, with wider sections at corners and the laying of a new surface dressing on the existing section of roadway where necessary. The construction methodology for the proposed upgrading of the access roads is outlined as follows:

i. *Access road construction will be to the line and level requirements as per design drawings.*
ii. *For upgrading of all existing access roads, the following guidelines apply:*

a. *Excavation of the access road will take place to a competent stratum beneath the peat, removing all peat and soft clay and backfilled with suitable granular fill.*
b. *Benching of the excavation will be required between the existing section of access road and the widened section of access road where the depth of excavation exceeds 500mm.*
c. *For a founded access road, the surface of the existing access road 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 road.*
e. *A layer of geogrid/geotextile may be required at the surface of the existing access road where the existing roads shows signs of rutting, etc.*
f. *For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability.*

iii. *The finished road width will have a minimum running width of 5m, with wider sections on bends and corners.*
iv. *On side long sloping ground any road widening works required will be done on the upslope side of the existing access road, where possible.*

4.9.1.3 Proposed Clear-Span Watercourse Crossing

It is proposed to construct a clear-span watercourse crossing at the 5 no. locations where new watercourse crossings are required within the Proposed Wind Farm site. The locations of these crossings are shown on the layout drawings included in Appendix 4-1. The clear-span watercourse crossing methodology presented below will ensure that no instream works are necessary. The standard construction methodology for the installation of a clear-span watercourse crossing is as follows:

- The access road on the approach either side of the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of each watercourse crossing.
- All drainage measures along the proposed road will be installed in advance of the works.
- A foundation base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along a 1m setback from the stream bank with no instream works required.
- Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete or metal bridge across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse.
- Once the foundation base has been completed, the pre-cast concrete box culvert will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse.
- Where the bottomless box culvert is installed in sections, the joints will be sealed to prevent granular material entering the watercourse,
- Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations.
- Underground cabling ducting will be contained within the road make-up of the proposed crossing.

A standard design drawing of a pre-cast concrete, clear span crossing is shown in Figure 4-28.

The watercourse crossing will be constructed to the specifications of the OPW bridge design guidelines '*Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945*', and in consultation with Inland Fisheries Ireland. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material.

Confirmatory inspections of the proposed new watercourse crossing locations will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.

4.9.1.4 Existing Watercourse Crossings

Within the Proposed Wind Farm site, there are a total of 3 no. existing watercourse culvert crossing location that will require upgrading. All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Proposed Wind Farm will be suitably sized for the expected peak flows in the watercourse. Some culverts may be installed to manage drainage waters from works areas of the Proposed Wind Farm, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base but will have a minimum 900m diameter. In all cases, culverts will be oversized to allow mammals to pass through the culvert.

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

All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Please see Figure 4-29 for details.

4.9.1.5 Temporary Construction Compounds

The 3 no. temporary construction compounds within the Proposed Wind Farm site will be constructed as follows:

- The area to be used as the compounds will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeters of the temporary construction compounds;
- The compound platforms will be established using a similar technique as the construction of the substation platform as discussed in Section 4.9.1.7 below;
- A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well graded granular material will be spread and lightly compacted to provide a hard area for Site offices and storage containers;
- Areas within the compounds will be constructed as site roads and used as vehicle hardstandings 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 construction phase of the Proposed Project, the temporary construction compounds will be decommissioned and allowed to vegetate naturally.

4.9.1.6 Underground Electrical (33kV) and Communication Cabling

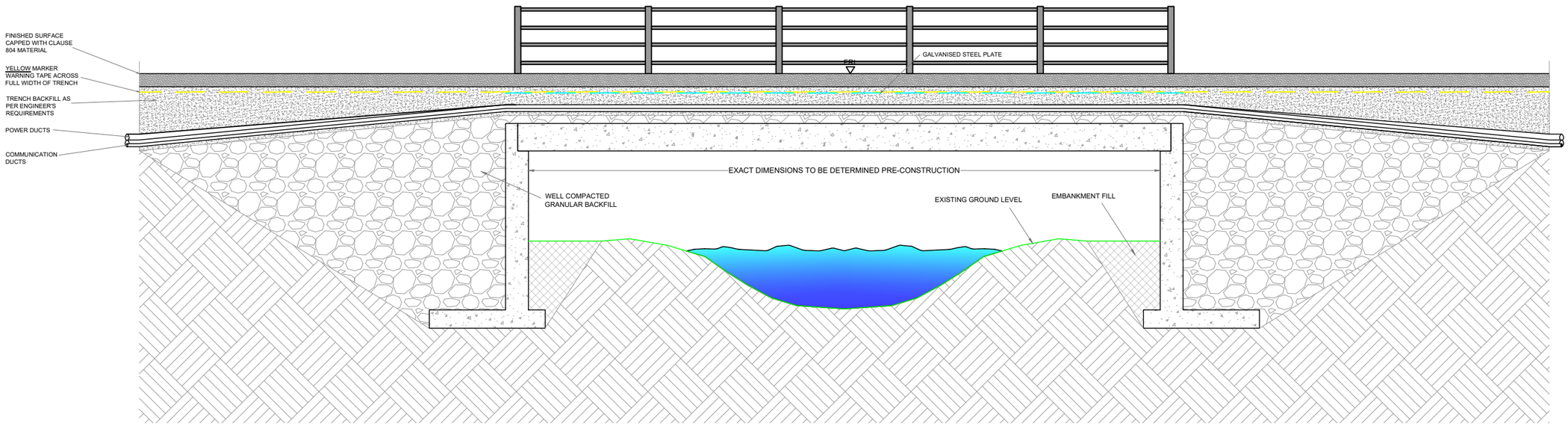
The transformer in each turbine is connected to the proposed 110kV onsite substation through a network of underground electrical and communication cabling. The ground is trenched using a mechanical excavator. The top layer of soil (or road surface) is removed and saved so that it is replaced on completion. The cables ducting will be bedded with suitable material unless the ground conditions are such that no bedding is required. cabling will be laid at a depth of approximately 1.2m below ground level; a suitable marker tape is installed between the cabling and the surface (see Plate 4-9

below illustrating an example of a single 33kV cable trench and Plate 4-10 below illustrates an example of a trefoil 33kV cable trench). On completion, the ground will be reinstated. The route of the underground electrical and communication cabling will follow the access tracks as illustrated on the Proposed Wind Farm layout drawings included as Appendix 4-1 of the EIAR. The cabling may be placed on either side of the road footprint, on both sides of the road and/or within the road. The exact configuration of the underground cabling will be set by the requirements of the electrical designers at detailed design stage.

Plate 4-9 Typical Single Cable Trench View

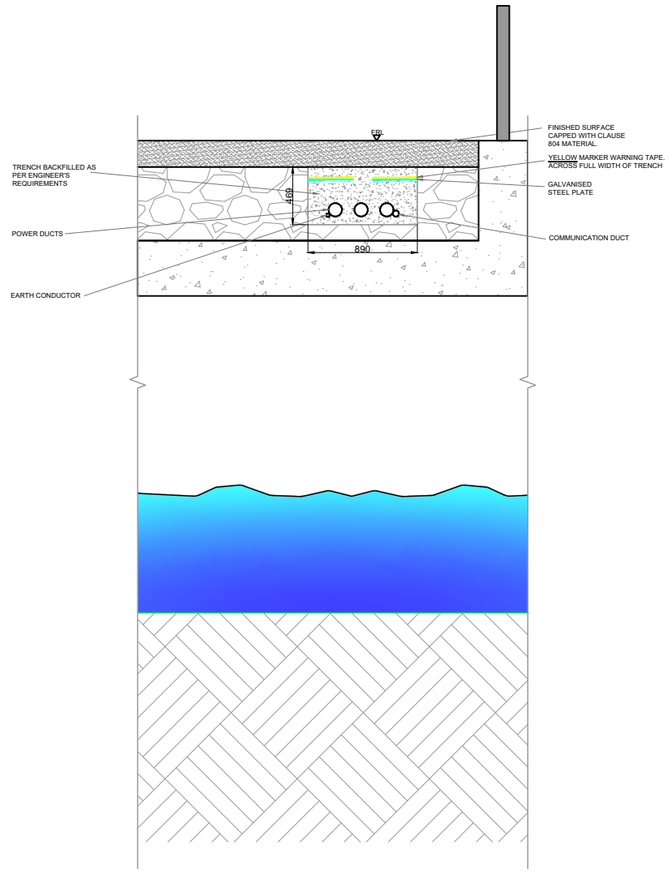
Plate 4-10 Typical Trefoil Cable Trench View

Where any underground services are encountered along the internal wind farm IPP cabling route, they will be traversed using one of the methods outlined in Section 4.9.2.2.



Clear Span Watercourse Crossing - Longitudinal Section

SCALE: 1:75



Clear Span Watercourse Crossing - Cross Section

SCALE: 1:50

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Standard 33kV Clear Span Watercourse Crossing

PROJECT No.:		DRAWING No.:	SCALE:
240225		**Figure 4-28**	**As Shown @ A3**
DRAWN BY: **KD**	CHECKED BY: **AC**	DATE: **25.03.2026**	REVISION.: P01

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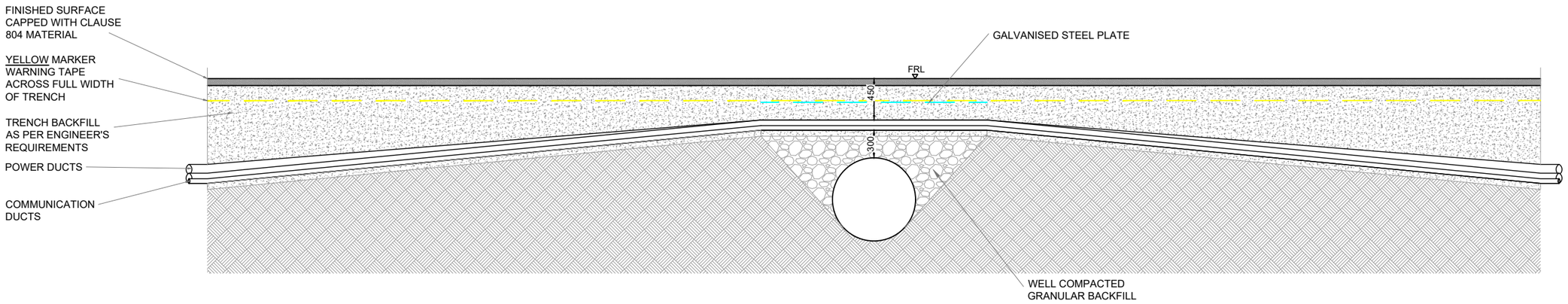
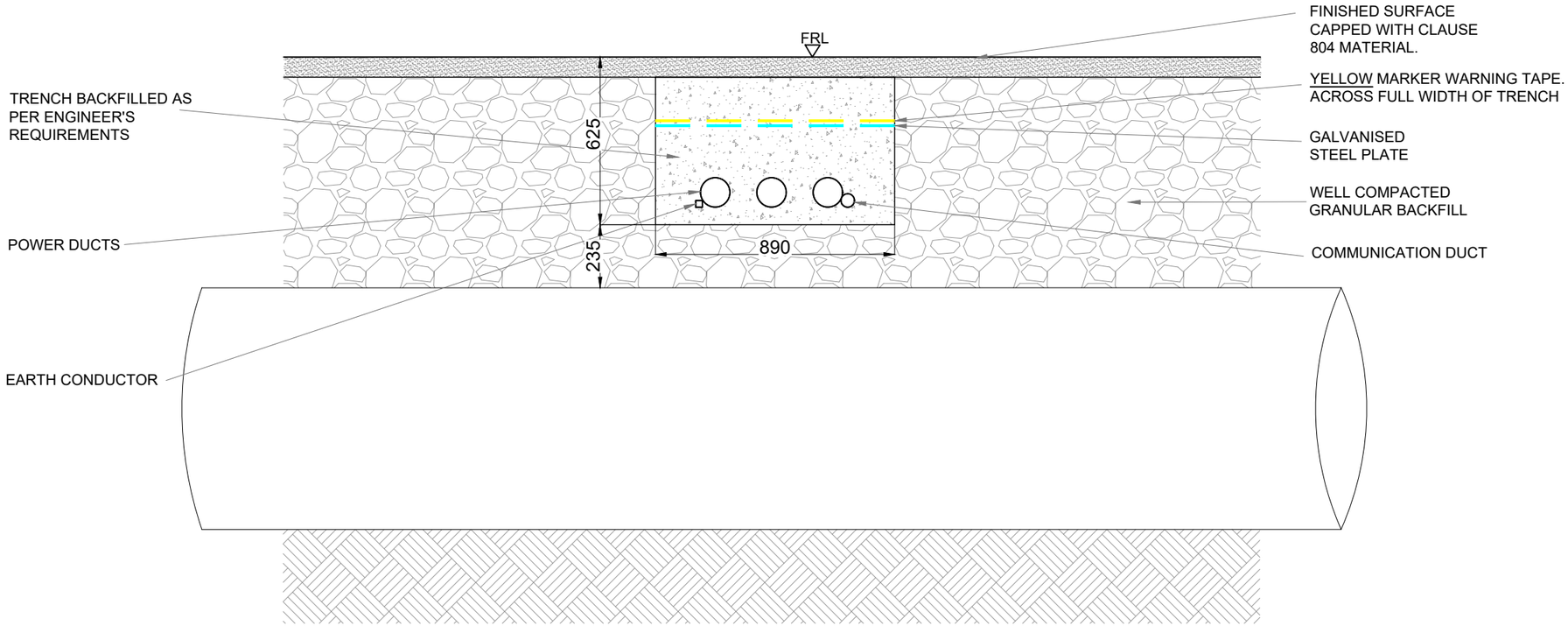


Culvert Crossing - Longitudinal Section

SCALE 1:50



Culvert Crossing - Cross Section

SCALE 1:20

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Standard 33kV Culvert Crossing

PROJECT No.:	DRAWING No.:	SCALE:
240225	Figure 4-29	As Shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
KD	AC	25.03.2026	P01

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4.9.1.6.1 33kV IPP Cabling Watercourse Crossing

1 no. existing watercourse crossings along the R585 will be traversed to cater for the internal wind farm 33kV IPP cabling. This crossing comprises an existing stone arch bridge. The approximate coordinates for this crossing are E 510541, N 556626 (ITM), with the location of the watercourse crossing and a drawing of the crossing methodology at this location also shown on the detailed layout drawings in Appendix 4-1.

Instream works are not required at any watercourse crossing along the proposed IPP cabling route or Proposed Grid Connection.

The crossing of this watercourse will be achieved via the Standard Trefoil Formation Over – Option A, with a drawing of the methodology provides in Appendix 4-1 of this EIAR. Please refer to Section 4.9.2.6.1 for further details on the standard trefoil formation methodology. Should an alternative methodology option be required for individual crossings during the construction process, this will be agreed with the relevant authorities including Cork County Council prior to works commencing.

4.9.1.7 Proposed 110kV Onsite Substation and Control Buildings

A detailed drawing of the proposed 110kV onsite substation is shown in Appendix 4-1. The proposed 110kV onsite substation will be constructed using the following methodology:

- The area of the proposed 110kV onsite substation will be marked out using ranging rods or wooden posts and the soil and overburden stripped and removed to a nearby spoil management area for later use in landscaping. Any excess material will be sent to one of the on-site peat and spoil management areas.
- 2 no. control buildings will be built within the proposed110kV onsite substation compound;
- The building 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 DPC 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 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 transformer and electrical equipment plinths 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 electrical equipment will be installed and commissioned.
- Perimeter fencing will be erected.
- The construction and components of the proposed 110kV onsite substation will be built to EirGrid specifications.

4.9.1.8 Borrow Pits

The estimated volume of stone material to be extracted from the borrow pit for the construction of the Proposed Wind Farm is up to 170,000m^3 This figure presented is the anticipated maximum volume;

however, the actual volumes to be removed from the borrow pits will be confirmed at the time of construction and following detailed pre-construction site investigation works. It is intended to obtain the majority of materials for the construction of the Proposed Wind Farm from the 4 no. proposed onsite borrow pits (engineer's specified material may be imported onto the Site should sufficient volumes of suitable material not be encountered during the excavation phase of the proposed infrastructure, to be sourced from local, licenced quarries).

The onsite borrow pits will be excavated and backfilled as follows:

i. *Peat and overburden will be removed and temporarily stored in localised areas adjacent to the borrow pit locations before being placed in the permanent peat and spoil management areas within the borrow pits. Data from the available ground investigation undertaken to date indicates that the rock in the area should be suitable, but testing will be undertaken to ensure the bedrock, although this would be a suitable method for removal of the rock.*
ii. *It is proposed to construct the borrow pits so that the base of the borrow pit is below the level of the adjacent section of access road. An excavation progression into the back edge of the borrow pits, localised deepening of the borrow pit floors may be required depending on extraction operations.*
iii. *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.*
iv. *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, in line with best practice guidelines.*
v. *Infilling of the peat and spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/front face. The contractor executing the work will be required to develop the borrow pit in a way which will allow the excavated peat and spoil to be reinstated safely.*
vi. *In order to maximise the storage capacity, a perimeter berm will be required along the lower edge of the borrow pits. The berm will be constructed of rock fill from the borrow pit excavation, placed and compacted in layers. The founding stratum for the perimeter berm will be intact bedrock and will be inspected and approved by the Project Geotechnical Engineer.*
vii. *The height of the perimeter berm will be greater than the height of the stored peat and spoil to prevent any surface run-off. The crest of the stone berm will be a minimum of 0.5 m above the height of the placed peat and spoil.*
viii. *It will be necessary to construct internal rock buttresses founded on in-situ rock within borrow pit 3 and 4 to create individual cells (either 1 or 2 no.). The cells will be opened in sequence and filled as needed. The rock buttresses will be constructed of rock fill from the borrow pit excavation, placed and compacted in layers. The founding stratum for each rock buttress will be intact bedrock and will be inspected and approved by the Project Geotechnical Engineer.*
ix. *The rock buttresses will be constructed in stages to allow infilling of peat and spoil within cells. The buttresses will be constructed of selected rock fill and placed and compacted in suitable layers to form rock buttresses sufficient stability to retain the placed peat and spoil.*
x. *Rock buttresses to form cells within borrow pits 3 and 4 will be required to ensure access for trucks and excavators can be achieved. The locations of the rock buttresses shown in the Peat and Spoil Management Plan (Appendix 4-2) for the borrow pits are indicative only and may change subject to final conditions encountered on site during construction and as a result of the confirmatory ground investigation.*
xi. *The internal rock buttresses will be wide enough (up to 4 m at the crest) to allow construction traffic access for tipping and grading during the placement of the excavated peat and spoil. The perimeter side slopes of the rock buttress will be constructed between 35° (based slope) to 60° (inside slope) degrees.*

xii. *In order to prevent water retention occurring behind the buttresses, the buttresses will be constructed of coarse boulder fill with a high permeability. The buttress will be constructed of well graded granular rock fill of about 100 mm up to typically 500 mm in size. In addition, drains will be placed through the buttresses to allow surface water to drain from the surface of the placed peat.*
xiii. *The use of temporary access ramps and long reach excavators during the placement of the excavated peat and spoil will be required.*
xiv. *The surface of the placed peat and spoil will be shaped to allow efficient run-off of surface water from the placed arising towards the perimeter of the borrow pit.*
xv. *As the internal buttresses 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 around the edges of the repositories. These drains will be 150 mm diameter flexible plastic drainage pipe or equivalent.*
xvi. *A layer of geogrid to strengthen the surface of the placed peat and spoil within the borrow pits will be required.*
xvii. *An interceptor drain will also be installed around the perimeter of the borrow pit. This drain will divert any surface water away from the borrow pit and hence prevent water from ponding and lodging during construction and also when reinstated.*
xviii. *Temporary control of groundwater within the borrow pits will be required and measures will be determined as part of the ground investigation programme. A temporary pump and suitable outfall locations will be required during construction.*
xix. *Settlement ponds have been designed at the lower side/outfall location of the borrow pits.*
xx. *The acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the peat and spoil within the borrow pit.*
xxi. *Supervision by the Project Geotechnical Engineer is required for the development of the borrow pits.*

All the above-mentioned requirements will be implemented by the Contractor during construction.

4.9.1.9 Peat and Spoil Management Areas

The peat and spoil management areas within the Proposed Wind Farm site have been selected based on the depth of peat and the slope angle. The following recommendations and best practice guidelines for the placement of peat and spoil within designated peat and spoil management areas, within turbine clearfell areas and as landscaping around turbines will be implemented during construction of the Proposed Project:

i. *The designated peat management locations and details are shown on the drawings contained within the Peat and Spoil Management Plan (Appendix 4-2).*
ii. *The peat placed within the peat and spoil management areas will be restricted to a maximum height of 1.5m. Weak/liquified peat must be placed within the proposed borrow pits and not stored within these areas.*
iii. *The placement of excavated peat will be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the placement areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works.*
iv. *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.*
v. *It will be ensured that the surface of the placed peat is 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 management area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability in the placed peat.*
vi. *Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate.*

vii. *On the downslope side of the storage areas at T08 a stone berm is shown to provide stability to the placed peat. The berm is 1.5m in height and will be constructed of free draining crushed rock. The berm will be founded on competent ground below the in-situ peat.*
viii. *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 within the management areas.*
ix. *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.*
x. *Supervision by the Project Geotechnical Engineer is required for the works.*
xi. *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.*
xii. *A collector drain will be installed on the downslope side of the peat management areas to capture any surface runoff from the storage areas.*

All the above-mentioned commitments will be undertaken by the Contractor during construction.

4.9.2 Proposed Grid Connection

4.9.2.1 Underground Cabling (110kV)

The underground cabling works will consist of the installation of ducts in an excavated trench to accommodate electrical and fibre communications cabling and facilitate the connection between the proposed 110kV onsite substation and the existing Dunmanway 110kV substation. Further details are included in Appendix 4-1.

The underground cabling will be laid beneath the surface of the Proposed Wind Farm and the public road using the following methodology:

- Before works commence, updated surveying will take place along the proposed cable route, with all existing culverts identified. All relevant bodies i.e. ESB, Cork County Council, etc. will be contacted and all up to date drawings for all existing services sought.
- When the cable is located on public roads, a traffic management plan will be prepared prior to any works commencing. A road opening licence will be obtained where required and all plant operators and general operatives will be inducted and informed as to the location of any services.
- A tracked 360-degree excavator will then proceed to dig out the proposed trench, typically to a depth of c.1300mm, within which the ducts will be laid.
- The cable ducts will be concrete surrounded where they pass under the public road and under drains or culverts.
- Trench supports will be installed, or the trench sides will be benched or battered back where appropriate and any ingress of ground water will be removed from the trench using submersible pumps, fitted with appropriate silt filtration systems, to prevent contamination of any watercourse.
- Once the trench has been excavated, a base-layer will be laid and compacted, comprising Clause 804, or 15 Newton CBM4 concrete as required.
- The ducting will be installed as per specification, with couplers fitted and capped to prevent any dirt etc. entering the duct. In poor ground conditions, the ends of the ducts will be shimmed up off of the bed of the trench, to prevent any possible ingress of water dirt. The shims will be removed again once the next length has been connected. Extreme care will be taken to ensure that all duct collars (both ends) are clean and in good condition prior to ducts being joined.

- As the works progress, the as-built location of the ducting will be recorded using a total station or GPS.
- As per the associated base-layer (Clause 804 material or 15 Newton CBM4 concrete) will be installed and compacted as per approved detail, with care not to displace the ducting.
- Spacers will be used to ensure that the correct cover is achieved at both sides of the ducting.
- The remainder of the trench will be backfilled in two compacted layers with approved engineer's specified material.
- Yellow marker warning tape will be installed across the width of the trench, at 300mm depth,
- The finished surface is to be reinstated, as per original specification. Off-road cabling may be finished with granular fill to facilitate access to the trench for any potential maintenance that is required during the operational phase of the Proposed Project.
- Marker posts will then be placed at regular intervals (generally at joint bays and any change in direction) to denote the location of the underground power cables.

4.9.2.2 Existing Underground Services

Any underground services encountered along the underground cabling route 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 Proposed Grid Connection ducting 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 proposed ducting, with marker tape on the side of the trench. Back fill around any utility services will be with dead sand/pea shingle where appropriate.

4.9.2.3 Site Preparations

Prior to beginning construction work the contractor will scan the proposed route with a Cable Avoidance Tool (CAT), carry out visual inspection of the area and may carryout out further below ground surveys if deemed necessary. If any previously unidentified services are discovered the site engineer will inform the design of the issues and possibly recommend a solution that works with the new constraints.

In some instances, it may be necessary to relocate existing underground services such as water mains or existing cables. In advance of any construction activity, the contractor will undertake additional surveys of the proposed route to confirm the presence or otherwise of any services. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works.

If existing low voltage underground cables are found to be present, a trench will be excavated, and new ducting and cabling will be installed along the new alignment and connected to the network on either end. The trench will be backfilled with suitable material to the required specification. Warning strip and marking tape will be laid at various depths over the cables as required. Marker posts and plates will be installed at surface level to identify the new alignment of the underground cable, the underground cables will then be re-energised.

In the event that water mains are encountered the water supply will be turned off by the utility so work can commence on diverting the service. The section of existing pipe will be removed and will be replaced with a new pipe along the new alignment of the service. The works will be carried out in accordance with the utility standards.

4.9.2.4 Trenching and Ducting

The proposed cable will be installed in a series of ducts in an excavated trench. Trenching will be achieved using a mechanical excavator. The top layer of soil or road surfacing will be removed and stockpiled separately for reuse. Material stockpiles shall be stored at least 15m back from drains and watercourses on level ground with a silt fence inserted at the base to prevent runoff.

The trench base will be graded and smoothed once the required depth and width is achieved. A layer of bedding material will be placed and compacted to the required specification on the trench floor prior to laying the ducts in trefoil formation.

The ducting surrounds will be carefully backfilled and compacted in accordance with the required specification. Cable protection strips will be placed on compacted material directly above the ducting. A secure cap will be placed at the end of each duct to prevent the ingress of dirt or water.

Ground water and surface water accumulating in the base of trenches will not be pumped directly to roadside drains or watercourses unless it is clean and free from solids. Contaminated water will be either treated onsite prior to discharge or tankered offsite to a suitably licensed disposal facility.

For concrete and asphalt/bitumen road sections, surfaces will be permanently reinstatement in accordance with the specification and to the approval of the local authority and/or private landowners, unless otherwise agreed with local authorities. All trench works carried out in public roadways will be carried out in accordance with *'Guidelines for Opening, Backfilling and Reinstatement of trenches in Public Roads'* and any other conditions imposed by the relevant road authority.

For unsurfaced/grass sections, trenches will be backfilled with suitable excavated material to ground level leaving at least 100 mm topsoil or match existing level at the top to allow for seeding or replace turves as per the specification of the local authority or landowner.

Ducting will be cleaned and tested in accordance with the specification by pulling through a brush and mandrel. A draw rope will be installed in each duct in preparation for cable installation at a later date.

4.9.2.5 Joint Bays

Joint bays are typically pre-cast concrete chambers where lengths of cable will be joined to form one continuous cable. They will be located at various points along the ducting route generally between 700 to 800 metres intervals or as otherwise required by ESB/EirGrid and electrical requirements. Joint Bays are typically 2.5m x 6m x 1.75m pre-cast concrete structures installed below finished ground level.

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. 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. During construction the joint bay locations will be completely fenced off once they have been constructed, they will be backfilled until cables are being installed. Once the cabling is installed, the joint bays will be permanently backfilled with the existing surface re-instated and there will be no discernible evidence of the joint bay on the ground.

In association with Joint Bays, Communication Chambers are required at every joint bay location to facilitate communication links between the proposed 110kV onsite substation and the existing Dunmanway 110kV substation. Earth Sheath Link Chambers are also required approximately every second joint bay along the cable route. Earth Sheath Links are used for earthing and bonding cable sheaths of underground power cables, installed in a flat formation, 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. The locations of the joint bays and chambers are shown on the Proposed Grid Connection Infrastructure drawings in Appendix 4-1. Please see Figure 4-21 above for a standard joint bay.

The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers within the planning corridor assessed is subject to approval by ESBN and EirGrid.

The installation of cabling normally involves pulling three individual conductors into three separate ducts. The cable pulling winch must be set at a predetermined cut off pulling tension as specified by the designer. The cable will be connected to the winch rope using approved suitably sized and rated cable pulling stocking and swivel or the pulling head fitted by the cable manufacturer. Once the "two sections" of cable are pulled into the joint bay, a jointing container will be positioned over the joint bay and the cable jointing procedure carried out in this controlled environment.

Following the completion of jointing and duct sealing works in the joint bay, place and thoroughly compact cement-bound sand in approximately 200 mm layers to 100mm above the top of the cable joint base to provide vertical support. A cable protection strip will be installed at this depth and the joint bay backfilled with cement-bound sand and reinstated to match surrounding areas.

4.9.2.6 Underground Cabling Installation and Watercourse/Service Crossings

A total of 11 no. existing watercourse crossings will be traversed to cater for the Proposed Grid Connection to the existing Dunmanway 110kV substation. The locations of the watercourse crossings are shown on the detailed layout drawings in Appendix 4-1 and in Figure 4-30 below. The watercourse crossing methodologies for the provision of the Proposed Grid Connection at these locations is set out in Table 4-5 below, with proposed crossing methodology illustrated on Figure 4-31 to Figure 4-34. The most appropriate methodology has been selected for each crossing location. Instream works are not required at any watercourse crossing along the route of the Proposed Grid Connection.

Should an alternative methodology option listed below be required for individual crossings during the construction process, this will be agreed with the relevant authorities including Cork County Council prior to works commencing.

4.9.2.6.1 *Crossing Using Standard Trefoil Formation Over – Option A*

Watercourses will not be directly impacted upon since no instream works or bridge/culvert alterations are proposed. Where adequate cover exists above a bridge/culvert, the standard ESB approved trefoil arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert, watercourse, or existing underground service. The cable trench will pass over the culvert in a standard trench.

Please see Figure 4-32 below for further details.

4.9.2.6.2 *Flatbed Formation Under – Option B*

Where cable ducts are to be installed under an existing watercourse or service crossing where sufficient cover cannot be achieved by installing the ducts in a trefoil arrangement, the ducts will be laid in a deeper trench, the depth of which will be determined by the location of the top of the obstacle or the depth of excavatable material over it. The ducts will be laid in this trench in a flatbed formation under the existing watercourse/service and will be encased in 6mm thick steel galvanized plate with a 35N concrete surround as per ESB Networks specification.

Any addition of a new pavement will be tied back into the existing road pavement at grade. After the crossing under the culvert/service has been achieved, the ducts will resume to the trefoil arrangement within a standard trench.

Please see Figure 4-33 below for further details.

4.9.2.6.3 *Flatbed Formation Over – Option C*

Where cable ducts are to be installed over an existing watercourse or service crossing where sufficient cover cannot be achieved by installing the ducts in a standard trefoil arrangement, the ducts will be laid in a much shallower trench, the depth of which will be determined by the location of the top of the obstacle or the depth of excavatable material. The ducts will be laid in this trench in a flatbed formation over the watercourse/service and will be encased in 6mm thick steel galvanized plate with a 35N concrete surround as per ESB Networks specification.

Where a bridge/culvert or service has insufficient cover depth to fully accommodate the required trench, the ducts can be laid in a flatbed formation partially within the existing road surface. Where this option is to be employed, the ducts will also be encased in steel with a concrete surround as per EirGrid and/or ESB Networks specifications. In order to achieve cover over these ducts and restore the carriageway of the road, it may be necessary to raise the pavement level locally to fully cover the ducts. The increased road level will be achieved by overlaying the existing pavement with a new wearing course as required. Any addition of a new pavement will be tied back into the existing road pavement at grade. After the crossing over the culvert has been achieved, the ducts will resume to the trefoil arrangement within a standard trench.

Please see Figure 4-34 below for further details.

4.9.2.6.4 *Horizontal Directional Drilling – Option D*

The horizontal directional drilling method of duct installation is carried out using Vermeer D36 x 50 Directional Drill (approximately 22 tonnes), or similar plant. The launch and reception pits will be approximately 2.5mm wide, 2.5m long and 2.0m deep. The pits will be excavated with a suitably sized excavator. The drilling rig will be securely anchored to the ground by means of anchor pins which will be attached to the front of the machine. The drill head will then be secured to the first drill rod and the operator will commence to drill into the launch pit to a suitable angle which will enable him to obtain the depths and pitch required to the line and level of the required profile. Drilling of the pilot bore will continue with the addition of 3.0m long drill rods, mechanically loaded and connected into position.

During the drilling process, a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water is pumped through the centre of the drill rods to the reamer head and is forced in to void and enables the annulus which has been created to support the surrounding subsoil and thus prevent collapse of the reamed length. Depending on the prevalent ground conditions, it may be necessary to repeat the drilling process by incrementally increasing the size of the reamers. When the reamer enters the launch pit, it is removed from the drill rods which are then passed back up the bore to the reception pit and the next size reamer is attached to the drill rods and the process is repeated until the required bore with the allowable tolerance is achieved.

The use of a natural, inert and biodegradable drilling fluid such as Clear Bore™ is intended to negate any adverse impacts arising from the use of other, traditional polymer-based drilling fluids and will be used sparingly as part of the drilling operations. It will be appropriately stored prior to use and deployed in the required amounts to avoid surplus. Should any excess drilling fluid accumulate in the reception or drilling pits, it will be contained and removed from the site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility.

Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring, as listed below, will be put in place

during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exits.

- The area around the Clear Bore™ batching, pumping and recycling plants shall be bunded using terram and sandbags in order to contain any spillages;
- One or more lines of silt fences shall be placed between the works area and adjacent rivers and streams on both banks;
- Accidental spillage of fluids shall be cleaned up immediately and transported off site for disposal at a licensed facility; and,
- Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush.

Please see an illustration of the HDD methodology on Figure 4-31 below.

Figure 4-31 Horizontal Directional Drilling Methodology

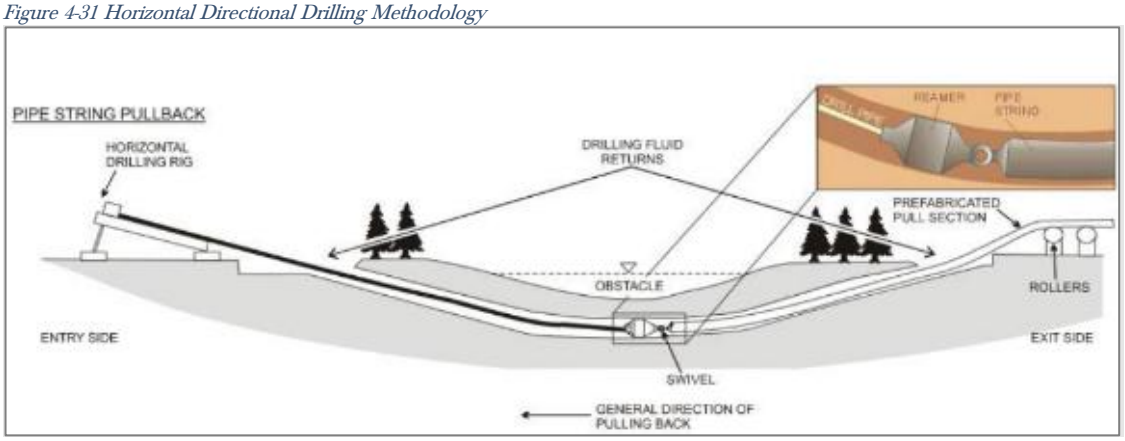


Table 4-5 Watercourse Crossing Types

Crossing No.	Watercourse Type	Width of Channel (m)	Cover from Road Level to Top of Bridge/ Culvert (m)	Crossing Type Description	Watercourse Crossing Type
WC 1 (EPA Mapped WC)	Stone Arch Bridge	2.7	4.5	Standard Trefoil Formation	Type A
WC 2 (EPA Mapped WC)	Stone Arch Bridge	3.5	2.0	Standard Trefoil Formation	Type A
WC 3 (EPA Mapped WC)*	Stone Arch Bridge	3.9	0.8	HDD	Type D
WC 4 (EPA Mapped WC)	Plastic Pipe	0.6	2.0	Standard Trefoil Formation	Type A
WC 5 (EPA Mapped WC)	Stone Arch Bridge	25.5	0.5	HDD	Type D

Crossing No.	Watercourse Type	Width of Channel (m)	Cover from Road Level to Top of Bridge/ Culvert (m)	Crossing Type Description	Watercourse Crossing Type
WC 6 (EPA Mapped WC)	Concrete Clear-span Bridge	5.4	0.7	HDD	Type D
WC 7 (EPA Mapped WC)	Two-span Stone Culvert	1.85	0.45	HDD	Type D
WC 8 (EPA Mapped WC)	Stone Culvert	0.75	0.9	Flatbed Formation Over	Type C
WC 9 (EPA Mapped WC)	Concrete Clear-span Bridge	2.75	0.55	HDD	Type D
WC 10 (EPA Mapped WC)*	Stone Arch Bridge	65.9	1.15	HDD	Type D
WC 11 (A) (EPA Mapped WC)**	Stone Arch Bridge	3.8	1.5	Flatbed Formation Over	Type C
WC 11 (B) (EPA Mapped WC)**	Stone Arch Bridge	33.8	0.7	HDD	Type D

*Please note, WC 3 and WC 10 were both originally constructed as stone arch bridges and are indicated as such in the above table. Both were subsequently widened by adding additional concrete crossings immediately adjacent to the original structures.

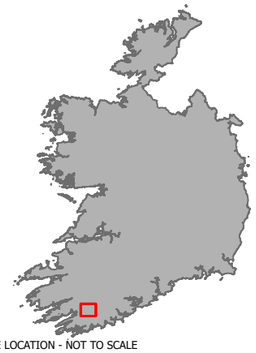
**Please note, WC 11(A) and WC 11(B) relate to the same watercourse crossing. WC 11(A) represents the overflow section of this crossing, which is in place to accommodate floodwater flows.

510000
515000
520000
525000
560000
555000
550000

WC01
WC02
WC03
WC04
WC05
WC06
WC07
WC08
WC09
WC10
WC11

Map Legend

- EIAR Site Boundary
- Proposed Grid Connection
- EPA Mapped Watercourses
- Proposed Watercourse Crossing



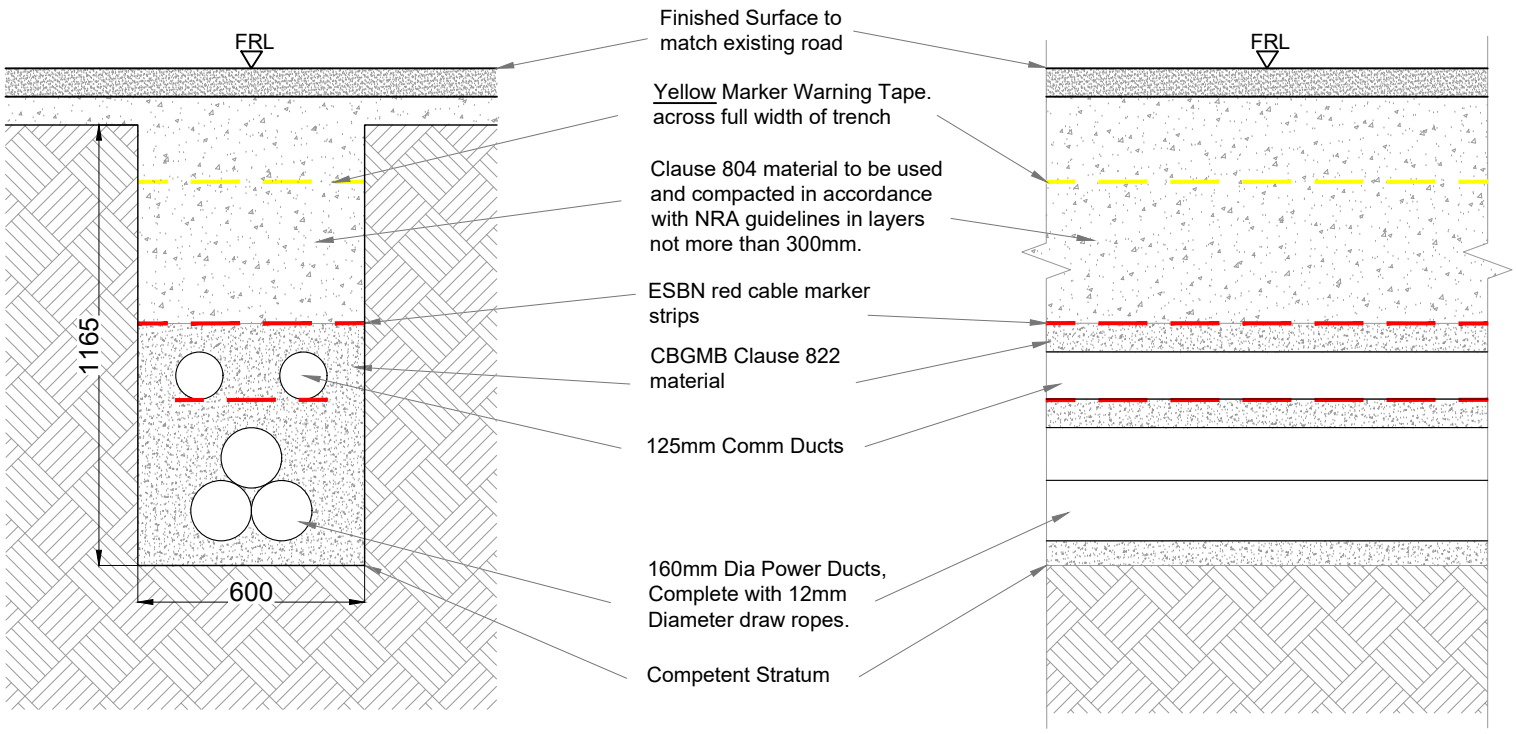
SITE LOCATION - NOT TO SCALE

Drawing Title
Proposed watercourse crossings

Project Title
Maughanaclea Renewable Energy Development

Project No.	Drawing No.	Scale
240225	4-30	1:60,000
Drawn By	Checked By	Date
SOR	RK	25/03/2026

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

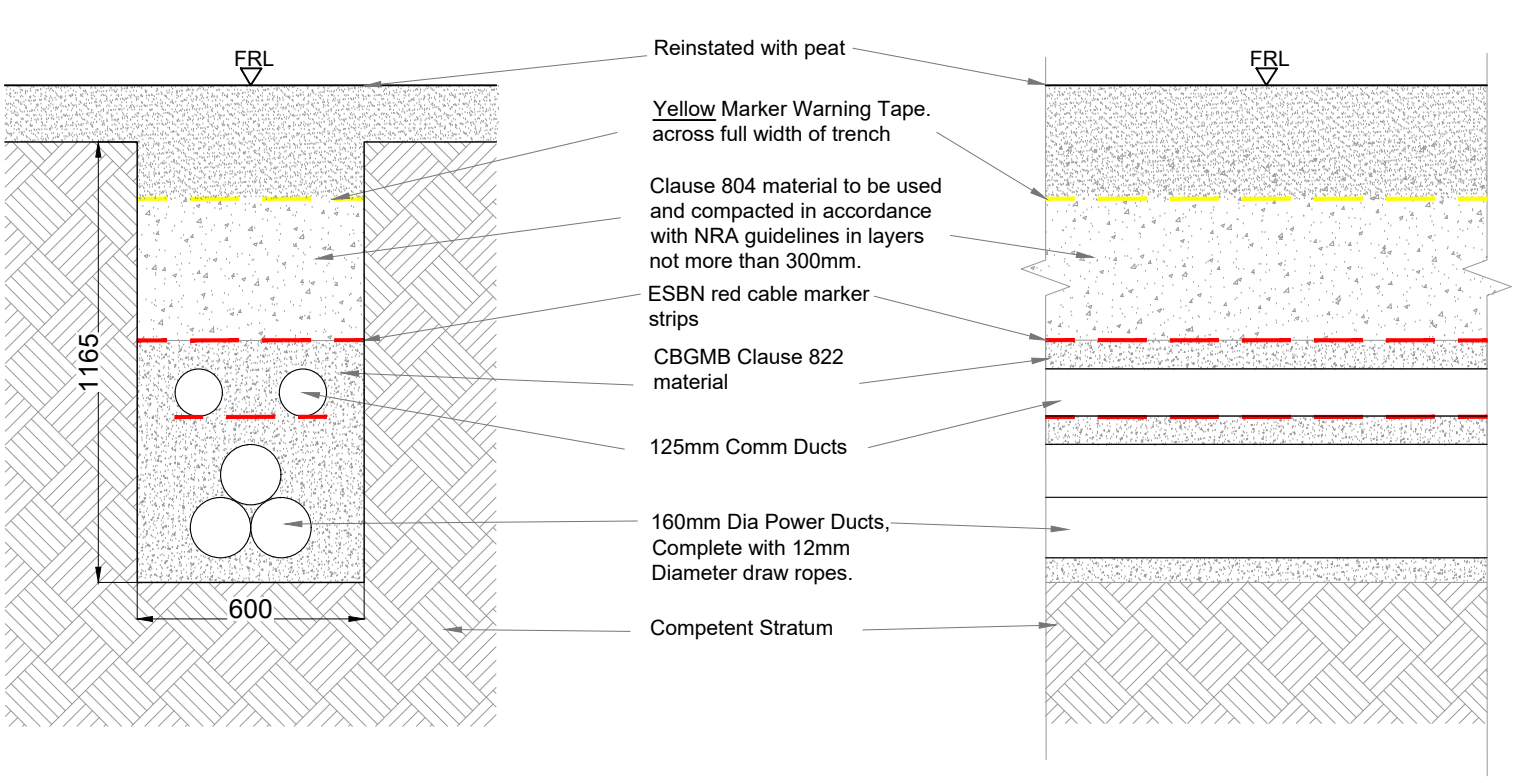


Option A - Standard Cross Section - 110kV

SCALE 1:20

Option A - Standard Cross Section - 110kV

SCALE 1:20



Option A - Standard Cross Section - 110kV

SCALE 1:20

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Option A - Standard 110kV Trench Detail In Road

PROJECT No.:	DRAWING No.:	SCALE:
240225	Figure 4-32	As Shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
KD	AC	25.03.2026	P01

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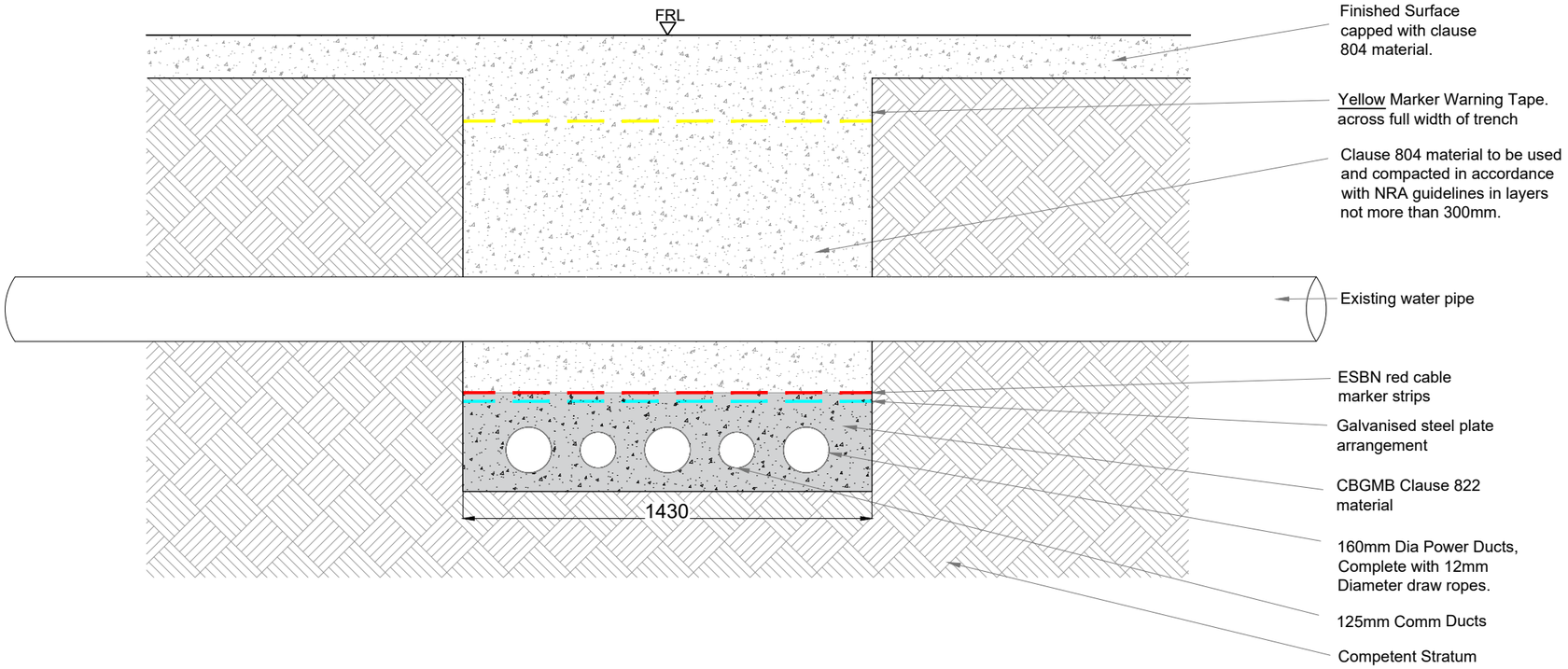
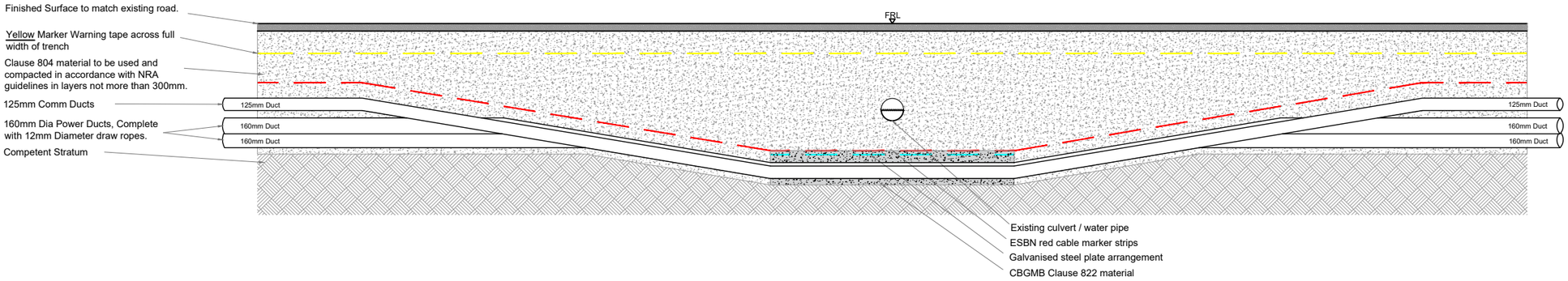


Option B - Flat Bed Under Existing Pipe - 110kV

SCALE 1:20



Option B - Flat Bed Under Existing Pipe - 110kV

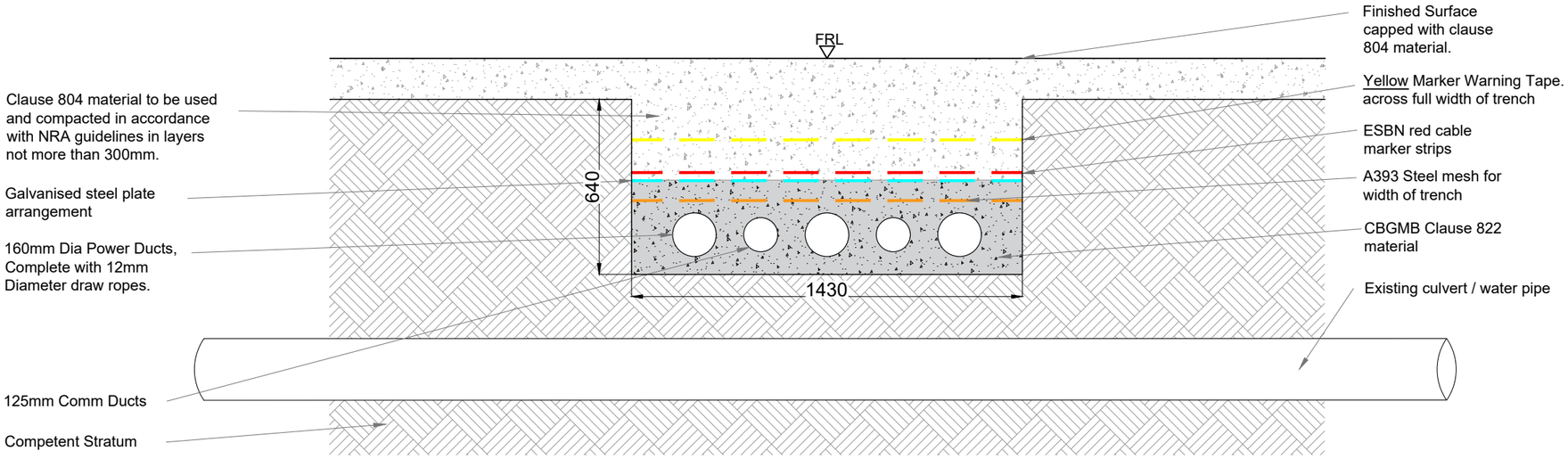
SCALE 1:50

PROJECT TITLE:
Maughanaclea Renewable Energy Development Co.Cork

DRAWING TITLE:
Option B - Flat bed under existing pipe - 110kV

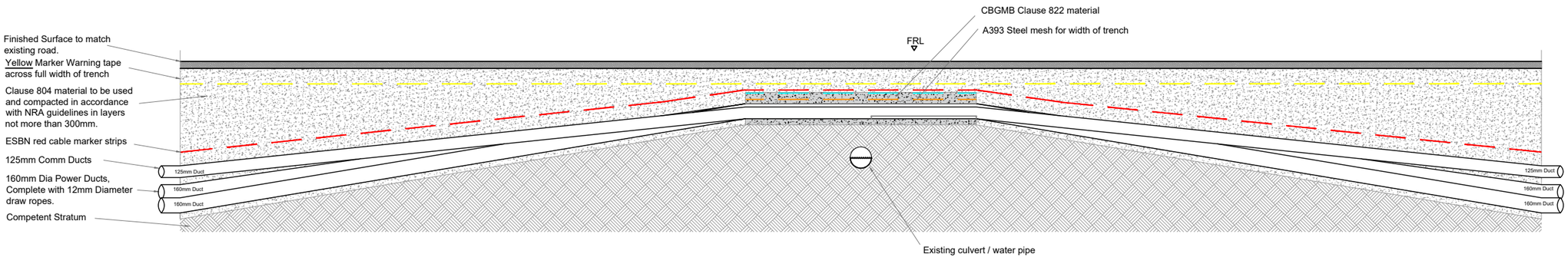
PROJECT No.:		DRAWING No.:	SCALE:
240225		Figure 4-33	As Shown @ A3
DRAWN BY: KD	CHECKED BY: AC	DATE: 25.03.2026	REVISION.: P01

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



Option C - Flat Bed Over Existing Pipe - 110kV

SCALE 1:20



Option C - Flat Bed Over Existing Pipe - 110kV

SCALE 1:50

PROJECT TITLE: Maughanaclea Renewable Energy Development Co.Cork			
DRAWING TITLE: Option C - Flat bed over existing pipe - 110kV			
PROJECT No.: 240225		DRAWING No.: Figure 4-34	SCALE: As Shown @ A3
DRAWN BY: KD	CHECKED BY: AC	DATE: 25.03.2026	REVISION.: P01

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

4.10 Community Gain Proposal

4.10.1 Background

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

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

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

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

4.10.2 Renewable Energy Support Scheme

The Renewable Electricity Support Scheme (RESS) is a Government of Ireland initiative that provides support to renewable electricity projects in Ireland. RESS is a pivotal component of the Programme for Government and the Climate Action Plans 2021, 2023, 2024, and 2025 and is a major step in achieving Ireland's target of at least 80% renewable electricity by 2030. One of the key objectives of RESS is to provide an Enabling Framework for Community Participation through the provision of pathways and supports for communities to participate in renewable energy projects.

The current RESS 5 Terms and Conditions[8], published by the Department of Climate, Energy and Environment in February 2026, make some high-level provisions for how this type of benefit fund will work. Any project which wants to avail of RESS must abide by these broad principles. These include the following:

1. *A minimum of €1,000 shall be paid to each household located within a distance of a 1-kilometre radius from the Project;*
2. *In respect of Onshore Wind RESS 2 Projects, a minimum of €1,000 shall be paid to each household located within a distance of a 1-kilometre radius from the Onshore Wind*

[8] https://assets.gov.ie/static/documents/RESS_5_Terms_and_Conditions.pdf

RESS3 Project. The 1-kilometre distance specified is measured from the base of the nearest turbine of the RESS 3 Project to the nearest part of the structure of the household, the location of which is identified in the An Post's GeoDirectory;

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

4.10.3 Community Benefit Fund

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

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

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

Should the Proposed Project be developed under the current RESS T&C's, it would attract a community contribution in the region of €4300,000/year for the local community (estimated based on an average energy yield) over the first 15 years of operation of the Proposed Project. The value of this fund would be directly proportional to the electricity generated by the wind farm. Under the current RESS T&Cs, the following is the recommended breakdown of the fund:

- **Direct Payments** - to those living closest to the wind farm. A minimum €1,000 payment per annum for houses within 1km of the Proposed Project. Further payments to those living within 1-2km of the Proposed Project will be made using the remaining fund with Direct Payments capped at 50%.
- **Energy Efficiency** - A minimum of 40% of the fund would be available for the development of energy initiatives to benefit people living in the local area. This is to be provided to not-for profit community enterprises.
- **Administration Costs** - A maximum of 10% of this fund to be made available for the administration and governance costs of the fund.
- **Support for Local Groups** – The remainder of the fund would be available for local groups, clubs and not-for-profit organisations that provide services in the local area. This would include services for the elderly, local community buildings, and the development of sporting facilities such as all-weather playing pitches etc.

Should the Proposed Project not be developed under RESS, the Applicant is committing that for each megawatt hour (MWh) of electricity produced by the wind farm, the project will contribute €1 into a community fund for the entire operational life of the Proposed Project. This would equate to an estimated annual fund of €205,000 (using the same formula as above), which across the 35-year operational lifespan would result in funding in the order of €7,175,000 to the local community, a substantial contribution. The number and size of grant allocations will be decided by a Community Fund liaison committee with various groups and projects benefiting to varying degrees depending on their funding requirement. Please see Appendix 2-1: Community Report for details.

4.11 Operation

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

The wind turbines will be connected together and data relayed from the wind turbines to a central control unit at the proposed 110kV onsite substation which will facilitate off-site remote monitoring of the wind farm. Each turbine will be monitored off-site by the appointed Operations and Maintenance contractor (typically the wind turbine manufacturer) and also a wind farm operations management company. The monitoring of turbine output, performance, wind speeds, and responses to any key alarms will be monitored off-site by both parties 24-hours per day. Regular on-site visual inspections will also be carried out by the wind farm operations management company.

4.11.1 Maintenance

Each turbine will be subject to a routine maintenance programme involving several checks and changing of consumables, including oil changes. In addition, there is often a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes requiring a crane. Typically, maintenance traffic will consist of four-wheel drive vehicles or vans. The site roads and drainage system will require periodic maintenance. Maintenance of the site roads will involve filling potholes and maintaining road edge markers. Drainage maintenance will typically involve cleaning of drainage ditches when required to prevent water backing up.

The proposed 110kV onsite substation will also require periodic maintenance. The substation would be operational 24 hours per day, 7 days a week throughout the year. Substations can be operated remotely and manually. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link. The following maintenance procedures will also be adhered.

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

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

It is estimated that 1-2 daily visits will be made to the Site for authorised persons and vehicles to undertake minor routine maintenance and inspection, if and when required. Although the level of activity required for the maintenance of the both the Proposed Wind Farm and Proposed Grid Connection infrastructure is minimal, the impacts associated with traffic volumes for this period are assessed in Ch. 15: Material Assets: Traffic and Transport.

4.11.2 Monitoring

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

- Monthly water sampling and laboratory analysis will be undertaken for the first six months during the operational phase.
- The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored.
- Post-construction bird monitoring will be carried out in accordance with the Bird Monitoring Plan provided in Appendix 7-7.
- Post-construction bat monitoring will be carried out in accordance with the Bat Report recommendations in Appendix 6-2.
- Post-construction monitoring of the biodiversity management and enhancement areas in accordance with the BMEP in Appendix 6-4.
- Monitoring for shadow flicker at sensitive receptors where any exceedance of the shadow flicker limit has been predicted as outlined in Ch. 5: Population and Human Health.
- Post turbine commissioning noise monitoring will be commenced within 6 months of commissioning the wind farm.

4.12 Decommissioning

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

Upon decommissioning of the Proposed Wind Farm site, the wind turbines will be disassembled in reverse order to how they were erected. The turbines will be disassembled with a similar model of crane that was used for their erection. The turbine components will be separated and removed offsite. The turbine materials will be transferred to a suitable recycling or recovery facility. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in unnecessary environment emissions such as noise, dust and/or vibration.

The underground electrical cabling connecting the turbines to the proposed 110kV onsite substation will be removed from the cable ducts. The cabling will be pulled from the cable ducts using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at the original cable jointing pits which will be excavated using a mechanical excavator and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The cable materials will be transferred to a suitable recycling or recovery facility.

Site roadways could be in use for purposes other than the operation of the Proposed Project by the time the decommissioning of the Proposed Wind Farm site is to be considered, and therefore it may be

more appropriate to leave the Site roads in situ for future use. It is envisaged that the roads will serve as agricultural roads for local landowners.

The Proposed Grid Connection and proposed 110kV onsite substation will remain in place as it will be under the ownership and control of the ESB and EirGrid.

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

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

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