Planning and Environmental Consultants

Environmental Impact Assessment Report (EIAR)

Ballydermot Wind Farm, Co. Offaly & Co. Kildare

Chapter 4 – Description of the Proposed Project



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GLOSSARY OF TERMS

Terms	Definition
Anchor cage	The bottom section of the turbine (i.e. the foundation) which is backfilled with concrete
Borrow Pit	A pit resulting from the excavation of material used in construction of the Proposed Wind Farm
Clear-Span Watercourse Crossing	A bridge structure that spans a watercourse without any supports (piers) within the stream channel or on its banks, ensuring no interference with the waterway.
Culvert	A structure, typically a pipe or enclosed channel, that allows water to flow under roads, railroads, or embankments acting as a crucial drainage solution.
Hardstanding	Levelled assembly areas comprising of bare soil surface to support plant and machinery
Joint Bays	Typically, pre-cast concrete chambers where lengths of cable will be joined to form one continuous cable.
Nacelle	Housing component of the turbine generator.
Piling	Installation of heavy stakes (piles) to support the foundations of the turbine
Turbine delivery route	A highly specialized, engineered, and permitted route for transporting oversized components—blades, tower sections, and nacelles—from ports to wind farm sites.

GLOSSARY OF ACRONYMS

ACP	An Coimisiún Pleanála
BMP	Biodiversity Management Plan
BTO	British Trust for Ornithology
CAP	Climate Action Plan
CBGM B	Cement Bound Granular Mixture B
CEMP	Construction and Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
CoW	Clerk of Works
CSM	Conceptual Site Model
DECC	Department of Environment, Climate and Communications
ECoW	Ecological Clerk of Works
EIAR	Environmental Impact Assessment Report

EnvCoW	Environmental Clerk of Works
EPA	Environmental Protection Agency
ESBN	ESB Networks
FTC	Fehily Timoney & Company
GIS	Gas-Insulated Substation
GNI	Gas Networks Ireland
HDD	Horizontal Directional Drilling
HES	Hydro-Environmental Services
HGVs	Heavy Goods Vehicles
IFI	Inland Fisheries Ireland
IGI	Institute for Geologists Ireland
IPC	Integrated Pollution Control
IPP	Independent Power Producer
ITM	Irish Transverse Mercator
km	Kilometres
kV	Kilovolt
LFL	Limited Felling Licence
mOD	metres above Ordnance Datum
MW	Megawatt
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
OHL	Overhead Line
OPW	Office of Public Works
OTE	Over-the-edge
PCAS	Peatland Climate Action Scheme
pNHA	proposed Natural Heritage Area
RC	Reinforced Concrete

RESS	Renewable Energy Support Scheme
RWMP	Resource and Waste Management Plan
SAC	Special Area of Conservation
SCADA	Supervisory Control and Data Acquisition
SI	Site Investigations
SID	Strategic Infrastructure Development
SNH	Scottish Natural Heritage
SOWOR	Schedule of Works Operation System
SPA	Special Protection Area
SWMP	Surface Water Management Plan
TAO	Transmission Asset Owner
TMP	Traffic Management Plan
TSO	Transmission System Operator
WD4	Conifer Plantation
WN7	Bog woodland
WS1	Scrub

4. DESCRIPTION OF THE PROPOSED PROJECT

4.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) describes the Proposed Project and its component parts which is the subject of a proposed application for planning permission to An Coimisiún Pleanála (ACP) in accordance with Section 37E of the Planning and Development Act 2000, (as amended). Construction methodologies for the main infrastructural components of the development are also included in this chapter (or its associated appendices) of the EIAR.

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

i. 46 no. wind turbines and 2 no. meteorological masts with a height of 40m, and subsequent decommissioning of the wind turbines and meteorological masts, following a thirty five-year operational life from the date of full commissioning of the wind turbines. The 46 no. wind turbines (18 no. located in Co. Offaly, 28 no. located in Co. Kildare) comprise:
    a. 19 no. wind turbines with turbine tip height of 200m, hub height of 115m, and blade rotor diameter of 170m; and
    b. 27 no. wind turbines with turbine tip height of 220m, hub height of 135m, and blade rotor diameter of 170m.
ii. Turbine and meteorological mast foundations, hard-standing and assembly areas;
iii. Underground electrical and communications cabling connecting the proposed turbines and meteorological mast to the proposed 220kV onsite electrical substation;
iv. An onsite electrical substation compound (c. 25,615m^2) in the townland of Lullymore East, Co. Kildare, consisting of 1 no. 220kV Gas-Insulated Substation (GIS) building (75m x 22m, with a height of 24m), 1 no. 110kV GIS building (51m x 15.88m, with a height of 16.5m), 1 no. Independent Power Producer (IPP) control building (44.4m x 12.8m, with a height of 7.1m), all associated electrical and communications plant and equipment, access roads, security fencing and gates, lightning masts, signage, landscaping, drainage infrastructure and all other ancillary works;
v. An offsite electrical substation compound (c. 9,307m^2) in the townland of Killybegs, Co. Kildare consisting of 1 no. 220kV GIS building (75m x 22m, with a height of 24m), 2 no. new gantry structures and ancillary apparatus, access roads, security fencing and gates, lightning masts, signage, landscaping, drainage infrastructure and all other ancillary works;
vi. All works associated with the connection of the wind farm to the national electricity grid, including underground electrical (220kV) grid connection cabling, c. 18 no. joint bays, communication chambers and earth sheath links extending for c. 13.1 km primarily located in the public road corridor connecting the proposed onsite substation to the proposed offsite substation, and all associated site development and reinstatement works;
vii. A 220kV loop-in grid connection at the offsite substation consisting of c. 120m of new overhead line (OHL) and the decommissioning / removal of 65m of existing OHL, 2 no. new steel masts, temporary tower build areas and crane pads, and associated hard-standing areas to facilitate the connection into the existing 220kV Maynooth–Dunstown 220kV OHL in the townland of Killybegs, Co. Kildare;
viii. 2 no. telecommunications towers with a height of 36m and 1 no. relay telecommunication mast with a height of 60m and associated foundation and hard-standing areas;
ix. The upgrade of c.2.8km of existing internal site roads/tracks and the provision of c.60 km of new internal site access roads, passing bays, layby areas and set down areas;
x. The provision of c.14.4km of new tracks and c. 844m of boardwalk for the purposes of amenity, seating areas, and amenity signage;

xi. Upgrade to 4 no. existing site entrances (1 no. site entrance on R401 regional road, 1 no. site entrance on L3001 local road, 2 no. site entrances on R414 regional road)
xii. 8 no. new site entrances (3 no. site entrances on L3001 local road, 3 no. site entrances on L1001 local road, 1 no. site entrance on R414 regional road, 1 no. site entrance on L6002 local road);
xiii. Widening and upgrade of wind farm access roads within the existing Cloncreen Wind Farm to facilitate the delivery of turbine components and other abnormal loads;
xiv. Temporary works between the R420 regional road to R402 regional road at Ballina Co. Offaly and along the R402 at Ballingar, Co. Offaly to facilitate the delivery of turbine components and other abnormal loads;
xv. 10 no. temporary construction compounds with temporary offices, containers and staff facilities;
xvi. 4 no. permanent amenity car parks comprising 132 no. spaces for private vehicles, 12 no. spaces for accessible parking, parking for buses and bicycle rack facilities;
xvii. 10 no. temporary Security Cabins;
xviii. Watercourse crossings;
xix. Peat and Spoil Areas;
xx. Site Drainage;
xxi. Tree felling and vegetation removal;
xxii. Biodiversity mitigation and enhancement measures;
xxiii. Operational stage site signage; and
xxiv. All ancillary apparatus and site development works above and below ground, including hard and soft landscaping and drainage infrastructure.

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

The application meets the threshold for wind energy set out in the Seventh Schedule of the Planning and Development Acts 2000 to 2023, on foot of a notice issued by ACP on 12th October 2026 and is therefore being submitted directly to ACP as a Strategic Infrastructure Development (SID) in accordance with Section 37E of the Planning and Development Act 2000, as amended. The planning application will encompass all elements of the Proposed Project, including the grid connection infrastructure and associated works.

All elements of the Proposed Project have been assessed as part of this EIAR.

4.2 Proposed Project Location

The Proposed Wind Farm is located approximately 2.2km south-southeast of Edenderry Co. Offaly, 3.3km west of Allenwood Co. Kildare, 2km north of Rathangan Co. Kildare, and 1.7km east of Clonbullogue Village Co. Offaly. The Proposed Wind Farm, Proposed Onsite Substation, and Proposed Enhancement Areas will be located on part of the Allen Bog Group, comprising 14 no. bogs and is located on the border of County Offaly and County Kildare. The bogs include: Ticknevin, Glashabaun North, Glashabaun South, Codd 1, Codd 2, Ballydermot North, Ballydermot South, Blackriver, Lullymore, Lullybeg, Barnaran, Killina, Derrybrennan and Lodge. The Proposed Grid Connection will traverse through Allenwood, Co. Kildare and Prosperous, Co. Kildare, with infrastructure proposed in the townlands of Lullymore and Killybegs, Co Kildare and adjacent townlands. The Proposed Turbine Delivery Route will exit south off the M6 Motorway at Junction 5 Kilbeggan / Tullamore and travel via national, regional and local roads, as well as the internal site access roads of the existing Cloncreen Wind Farm, to access the Proposed Wind Farm. Refer to Section 4.5.2 below for further detail.

Current land use within the area encompassing the Proposed Wind Farm, Proposed Onsite Substation and Proposed Enhancement Ares (hereafter known as the Proposed Wind Farm site) comprises natural revegetation of cutaway and degraded bog, a small area of active turbary, and public road corridor.

Current land use on and along the Proposed Grid Connection (excluding the Proposed Onsite Substation) comprises primairly public road corridor, degraded raised bog, and land principally used for agriculture. Land-use associated with the Proposed Enhancement Areas include natural revegetation of cutaway and degraded bog and forestry. Land-use in the wider landscape of the Project Site comprises of BnM landholdings, forestry, agricultural land, cutover and cutaway peatland, peatland rehabilitation, one-off rural housing, small village settlements, and existing energy infrastructure, including power plants, solar farms, and wind energy developments. The nearest Natura 2000 site to the Project Site, i.e., Special Area of Conservation (SAC) or Special Protection Area (SPA), is the Ballynafagh Lake SAC which is crossed by the Proposed Grid Connection underground electrical cabling route; the entirety of the interaction with the Ballynafagh Lake SAC is within the public road corridor. The Long Derries SAC is adjacent the Proposed Wind Farm site.

Elevations within the Proposed Wind Farm site range from 82 metres above Ordnance Datum (mOD) at its highest point to approximately 68 mOD at its lowest point. The Project Site encompasses an area of approximately 5,157ha.

The Proposed Project location is described in detail in each technical Chapters 1-17 of this EIAR.

4.3 Proposed Project Layout

The Proposed Project consists of the Proposed Turbines, Proposed Onsite Substation, Proposed Offsite Substation, underground electrical cabling and overhead line (OHL) cabling, peat and spoil areas, meteorological masts, relay mast, internal site access roads and hardstand areas, temporary construction compounds, ecological and ornithological enhancement and offset areas, amenity track, car parks and all ancillary works and apparatus. Detailed site layout drawings of the Proposed Project are included in Appendix 4-1 to this EIAR. The overall layout of the Proposed Project is shown on Figure 4-1.

The layout of the Proposed Project has been designed to minimise the potential environmental effects, while at the same time maximising the energy yield from the wind resource passing over the Proposed Wind Farm. Constraint studies, as described in Section 3.2.5.3 of Chapter 3: Site Selection and Reasonable Alternatives of this EIAR, have been carried out to ensure that turbines and all ancillary infrastructure are located in the most appropriate areas. Similarly, as described in Section 3.2.5.4 of this EIAR, a route selection constraints study was undertaken to ensure that the most appropriate locations and 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.

640000
660000
680000
740000
720000
N
Ballinagar
Kilbeggan
Tullamore
Geashill
Edenderry
Clonaslee
Kildare
Newbridge
Naas
Clane
R414
0 4.25 8.5 17 25.5 34
Kilometers

Legend

- Project Site
- Proposed Turbine Layout
- 220
- 200
- Proposed Relay Mast
- Proposed Met Mast
- Proposed Telecommunications Tower
- Joint Bays
- Existing OHL
- Proposed Internal 33kV Cabling
- Proposed OHL
- Proposed Grid Connection Underground 220KV electrical cabling
- Proposed Construction Haul Routes
- Proposed Turbine Delivery Route
- Temporary Construction Compounds
- Proposed Offsite Substation Tower Build Area
- Proposed Offsite Substation Crane Pad
- Proposed Onsite 110kV GIS Substation
- Proposed Onsite 220kV GIS Substation
- Proposed Offsite 220kV GIS Substation
- Proposed Internal Access Track
- Upgrades to Existing Tracks
- Proposed Turning Bay
- Proposed Dedicated Amenity Track
- Proposed Dedicated Amenity Board Walk
- Proposed Dedicated Amenity Equestrian Track
- Proposed TDR Accommodation Area

Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

SITE LOCATION - NOT TO SCALE

Drawing Title
Proposed Project Layout

Project Title
Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	4-1	1:300,000
Drawn By	Checked By	Date
TI	CJ	01/10/2026

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

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672000

N

Killane

Drumcooly

Ticknevin

Killinagh Lower

Allenwood South

Church Road

Clonbullogue

Woodlands

R401

R414

R442

T01 T02 T03 T04 T05 T06 T07 T08 T09 T10 T11 T12 T13 T14 T15 T16 T17 T18 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T29 T30 T31 T32 T33 T34 T35 T36 T37 T38 T39 T40 T41 T42 T43 T44 T45 T46

0 1 2 4 6 8 Kilometers

Legend

- Project Site

Proposed Turbine Layout

- 220
- 200
- Proposed Relay Mast
- Proposed Met Mast
- Proposed Telecommunications Tower
- Proposed Internal 33kV Cabling
- Proposed Grid Connection Underground 220KV electrical cabling
- Temporary Construction Compounds
- Proposed Peat and Spoil Areas
- Proposed Security Hut
- Proposed Car parking
- Proposed Set Down Area
- Proposed Onsite 110kV GIS Substation
- Proposed Onsite 220kV GIS Substation
- Proposed Internal Access Road
- Upgrades to Existing Road
- Proposed Turning Bay
- Proposed Dedicated Amenity Track
- Proposed Dedicated Amenity Board Walk
- Proposed Dedicated Amenity Equestrian Track

Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

SITE LOCATION - NOT TO SCALE

Drawing Title

Proposed Wind Farm Layout

Project Title

Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	4-2	1:70,000
Drawn By	Checked By	Date
TI	CJ	20/10/2026

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672000

672000

684000

N

R414

Hodgestown (Clane By)

Coolearagh East

gh Lower

Curryhills

Blackwood (Clane By)

Allenwood North

Allenwood Middle

Allenwood South

R403

Downings North

Prosperous

R414

R409

Derrymullen

R415

Lowtown (Connell By)

Robertstown East

Grangeclare West

Newtown Dollore

Mylerstown (Connell By)

Ballyteige South

Kilmeage

0 0.75 1.5 3 4.5 6 Kilometers

Legend

- Project Site
- Proposed Telecommunications Tower
- Joint Bays
- Existing OHL
- Proposed Internal 33kV Cabling
- Proposed OHL
- Proposed Grid Connection Underground 220KV electrical cabling
- Temporary Construction Compounds
- Proposed Internal Access Track
- Proposed Offsite Substation Tower Build Area
- Proposed Offsite Substation Crane Pad
- Proposed Onsite 110kV GIS Substation
- Proposed Onsite 220kV GIS Substation
- Proposed Offsite 220kV GIS Substation
- Proposed Offsite 220kV Substation

Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

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SITE LOCATION - NOT TO SCALE

Drawing Title
Proposed Grid Connection Layout

Project Title
Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	4-3	1:60,000
Drawn By	Checked By	Date
TI	CJ	01/10/2026

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4.4 Proposed Project Components

This section of the EIAR describes the components of the Proposed Project. Further details regarding Access and Transportation (Section 4.5), Site Activities (Section 4.6), Site Drainage (Section 4.7), Construction Management (Section 4.8), Construction Methodologies (4.9), Community Benefit Proposals (Section 4.10), Operation (Section 4.11) and Decommissioning (Section 4.12) 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 Turbine layout has been optimised using wind farm design software (a combination of WAsP [wind resource assessment software]) and WindPro [Computational Fluid Dynamics and WindFarmer]) to maximise the energy yield from the Project Site, while maintaining sufficient distances between the Proposed Turbines to ensure turbulence and wake effects do not compromise turbine performance and to maintain the minimum setbacks from neighbouring properties as set out in the '*Wind Energy Development Guidelines for Planning Authorities'* (DoEHLG, 2006) (hereafter referred to as the 'WEDG 2006') and the Draft Wind Energy Development Guidelines (December 2019) (hereafter referred to as the 'Draft WEDG 2019'). The Irish Transverse Mercator (ITM) Grid Reference coordinates of the Proposed Turbine locations are listed in Table 4-1 below.

There are 19 no. Proposed Turbines with a tip height of 200m and 27 no. Proposed Turbines with a tip height of 220m. Table 4-1 identifies the tip height for each Proposed Turbine. The turbines are shown on Figure 4-1, with the 19 no. Proposed Turbines with a tip height of 200m delineated by a green point and 27 no. Proposed Turbines with a tip height of 220m delineated by a blue point.

The final Top of Foundation Level of the turbine foundations will be determined by the actual ground conditions at each Proposed Turbine location and may differ slightly from those levels listed in Table 4-1.

Table 4-1 Proposed Wind Turbine Locations and Elevations

Turbine	ITM X	ITM Y	Turbine Tip Height	Top of Foundation Levels (mOD)
1	669577	723417	200	73.2
2	667966	722318	200	75.0
3	668652	722904	200	74.7
4	667122	722389	200	74.4
5	666811	722918	220	69.1
6	667272	723632	220	70.4
7	666843	724155	220	68.3
8	666062	723362	220	68.7
9	665993	724419	220	70.1
10	665722	725145	220	69.6
11	665245	723070	220	68.7
12	665675	722587	200	71.0
13	664725	722393	200	69.6
14	665129	721837	200	68.2
15	664797	723510	220	70.1

16	664366	723995	220	70.1
17	664368	724900	220	68.7
18	665151	724290	220	70.2
19	663527	724680	200	75.4
20	663228	725279	200	70.5
21	664020	725419	220	69.7
22	663076	726129	200	69.5
23	665568	728222	200	68.6
24	664901	727516	220	72.2
25	664557	726842	220	70.3
26	663924	727245	200	71.8
27	666654	728789	200	73.8
28	667453	728387	200	73.8
29	667535	729311	200	72.4
30	667317	730151	200	75.3
31	666424	729892	200	74.2
32	665913	730395	200	74.1
33	668791	723754	220	73.1
34	668234	724133	220	72.5
35	667696	724705	220	71.7
36	667700	725703	220	72.1
37	668428	725406	220	71.9
38	666932	725059	220	69.0
39	666484	725794	220	69.3
40	667297	726306	220	71.9
41	666699	726708	220	71.4
42	667233	727483	220	71.8
43	668319	727108	220	74.9
44	668927	727701	220	75.1
45	668094	727874	220	74.6
46	669561	728266	200	75.4

Internal Wake Effect

The internal wake effect refers to the aerodynamic interaction between wind turbines within a wind farm, whereby turbines operating in the lee of upwind machines experience reduced wind speeds and increased turbulence as a result of energy extracted from the passing airflow. As detailed in Section 3.2.5.3 of Chapter 3, the Proposed Turbine layout has been an informed by wind data, the results of noise assessments, shadow flicker and the separation distance to be maintained between turbines and the nearest sensitive receptors, including inhabitable residential properties.

The Proposed Turbine layout has been designed in line with the wind take requirements as outlined in WEDG 2019, stating "*Conditions with regard to windtake could be included to ensure that wind turbines are located in a manner that respects the development potential of an adjoining site for a similar development. Where such conditions apply they should generally allow a distance from adjoining site boundaries of not less than two rotor blades having regard to the wind resource at the site.* Furthermore, the design of the Proposed Turbines is aligned with the requirements of the WEDG 2006 and Draft WEDG 2019'.

The configuration of the Proposed Turbines achieves a suitable balance between optimising energy production, minimising wake losses and ensuring compliance with required setback distances from sensitive receptors.

4.4.1.1.2 Site Investigation

As part of the design process for the Proposed Project, intrusive site investigations (SI) were undertaken within the Project Site and within the vicinity of the same, to detail and clarify the nature and extent of subsoils and bedrock as a means of characterising the Project Site. The site investigative works provided information relevant to the design and siting of turbines and associated infrastructure.

There were 5 no. rounds of intrusive SI carried out on the Project Site, as follows:

- The first round of SI consisting of 9 no. trial pits, was undertaken on the 25th of May 2021 by Fehily Timoney & Company Ltd. (FTC) with FTC further providing a supervisory role alongside Tobar Archaeological Services Ltd. (Tobar).
- The second round of SI, consisting of 53 no. trial pits and 1 no. rotary core borehole, commenced on the 8th of November 2021 and was completed on 7th of December 2021. Works were carried out by IDL under the supervision of FTC and Tobar.
- The third round of SI, consisting of 2 no. rotary-core boreholes, commenced on 21st of June 2022 and was completed on 23rd of June 2022. Works were carried out by IDL under the supervision of FTC.
- The fourth round of SI, consisting of 6 no. rotary-core boreholes, was completed by IDL over the time period 9th of September 2022 to 16th of September 2022 under the supervision FTC.
- The fifth and final round of SI was carried out between 30th November 2022 and 1st December 2022 and comprised 3 no. rotary-core boreholes. Works were carried out by IDL under the supervision of FTC. Refer to Section 1.8.2 of Chapter 1: Introduction for detailed biographies of all involved persons in the SI.

The combined geological and hydrological dataset collected from the intrusive SI and from ground-truthing site walkovers completed by FTC, Tobar, Hydro-Environmental Services (HES) and MKO have been used in the preparation of this EIAR Chapter, as well as Chapter 8: Land, Soils and Geology, Chapter 9: Water, and Chapter 14: Cultural Heritage.

The objectives of the intrusive SI included mapping the subsoil lithology for all Proposed Turbines and other key locations (i.e., internal access roads) and assessing the underlying bedrock. This data was used to inform the final layout of the Project Site. Refer to Section 3.2.5.3.2 of this EIAR for further information on the evolution of the Proposed Project design.

In summary, a total of 62 no. trial pits and 12 no. rotary core boreholes, supervised by FTC, Tobar, and/or MKO were carried out at all Proposed Turbine locations and at other key locations (i.e., internal access roads, Proposed Onsite Substation, met mast locations) to investigate the underlying mineral soil lithology and subsoil/bedrock interface.

The complete geotechnical ground investigation campaign was 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

There will be 19 no. Proposed Turbines with the following dimensions:

- Turbine Tip Height – 200 metres
- Hub Height – 115 metres
- Blade Rotor Diameter – 170 metres

There will be 27 no. Proposed Turbines with the following dimensions:

- Turbine Tip Height – 220 metres
- Hub Height – 135 metres
- Blade Rotor Diameter – 170 metres

Details on each of the Proposed Turbines, their associated location and tip height are provided in Table 4-1 above. The 19 no. Proposed Turbines with a tip height of 200m are located on the outer limits of the Proposed Wind Farm, with the 27 no. Proposed Turbines with a tip height of 220m located centrally within the Proposed Wind Farm. The Proposed Turbines are aligned with the required setback distances in the 'WEDGs 2006' and 'Draft WEDG 2019' and reduce the visual impact of the Proposed Turbines in the areas surrounding the Proposed Wind Farm. Further detail on design evolution of the Proposed Wind Farm is provided in Section 3.2.5 of Chapter 3, with a detailed visual assessment of the entirety of the Proposed Project provided in Chapter 14: Landscape and Visual.

Modern wind turbines from turbine manufacturers have evolved to share a common appearance and other design characteristics, with minor cosmetic differences differentiating one from another. The wind turbines that will be installed on the Proposed Wind Farm will be conventional three-blade turbines, with all rotors rotating in the same direction.

The Proposed Turbines will be multi-ply coated to protect against corrosion. It is proposed that the turbines would be of a white, off-white or light grey colour to blend into the sky background. This minimises visual impact as recommended by the following guidelines on wind energy development:

- Wind Farm Development – Guidelines for Planning Authorities, (DoEHLG, 2006) (WEDG 2006)
- Draft Revised Wind Energy Development Guidelines (DoEHLG, 2019) (Draft WEDG 2019)
- The Influence of Colour on the Aesthetics of Wind Turbine Generators (ETSU, 1999)

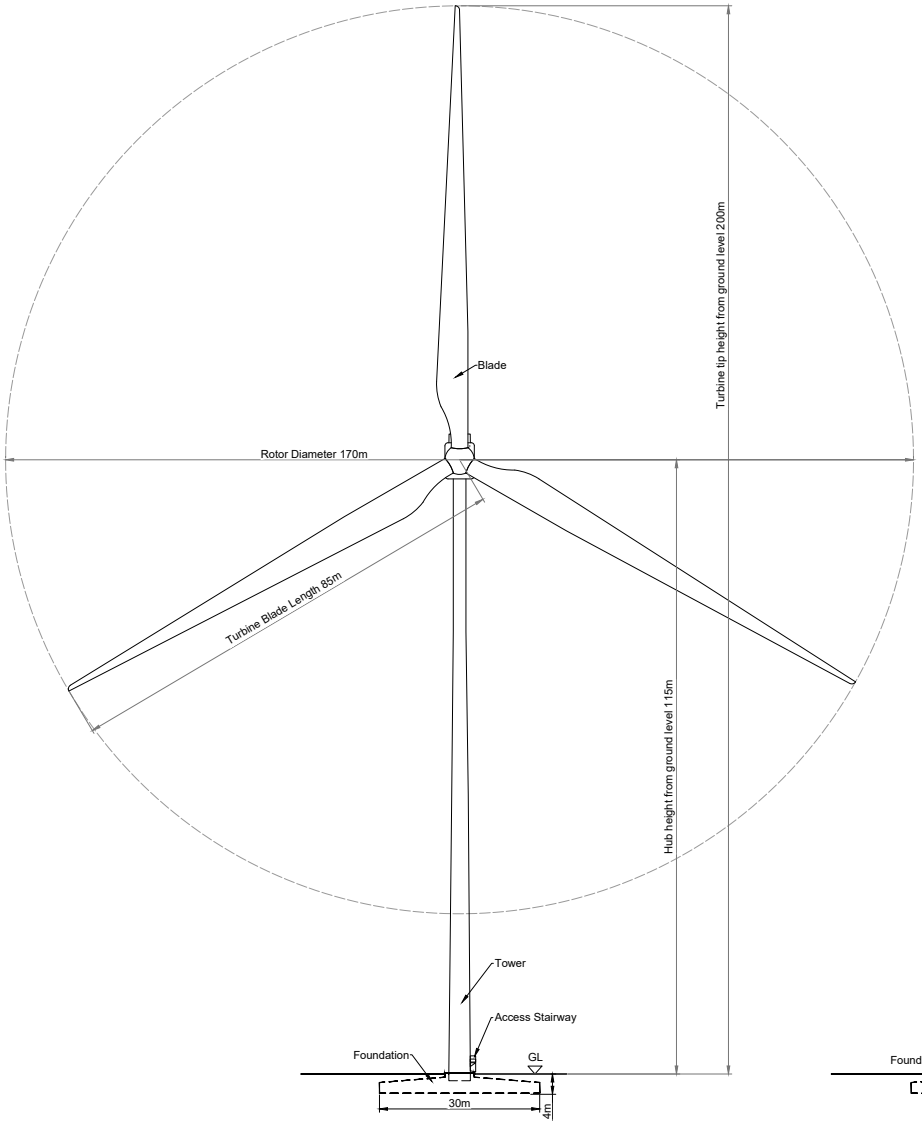
The WEDGs 2006 were the subject of a targeted review. The proposed changes to the assessment of impacts associated with onshore wind energy developments were outlined in the document Draft WEDGs 2019. The proposed changes presented in the Draft WEDGs 2019 give certain focus on shadow flicker and noise requirements relative to sensitive receptors. At time of writing, the Draft WEDGs 2019 have not yet been adopted, and the relevant guidelines for the purposes of Section 28 of the Planning and Development Act 2000, as amended, remain to be the WEDGs 2006. However, due to the timelines associated with the planning process for renewable energy projects and the commitment within the Climate Action Plan 2025 (CAP25) Annex of Actions to develop revised wind energy development guidelines for onshore wind in Q1 2025[1], it is possible that the Draft WEDGs 2019 may be adopted during the consideration period for the current planning application. Should the Draft WEDGs 2019 be adopted in advance of a planning decision being made on this application, the Proposed Turbines will be capable adhering to any revised noise and shadow flicker standards. While the final updated guidelines have not yet been published, the Noise and Shadow Flicker are controllable and are discussed further in Chapter 12: Noise and Vibration and Chapter 5: Population and Human Health, respectively.

The assessment of the development footprint of the Project Site, within this EIAR, is based on the maximum potential footprint for all the infrastructural elements; for clarity, there are no unconfirmed details associated with this planning application relating to turbine dimensions. This precautionary approach is taken as the assessment of the maximum Proposed Project infrastructure footprint will, in the absence of mitigation measures, give rise to the greatest potential for significant effects. Any reduction in the final development footprint would, by definition, reduce the magnitude of the assessed effects.

A drawing of the proposed wind turbine is shown in Figure 4-4A and Figure 4-4B along with the turbine base layout, including turbine foundation, hard standing area, assembly area, access road and surrounding works area.

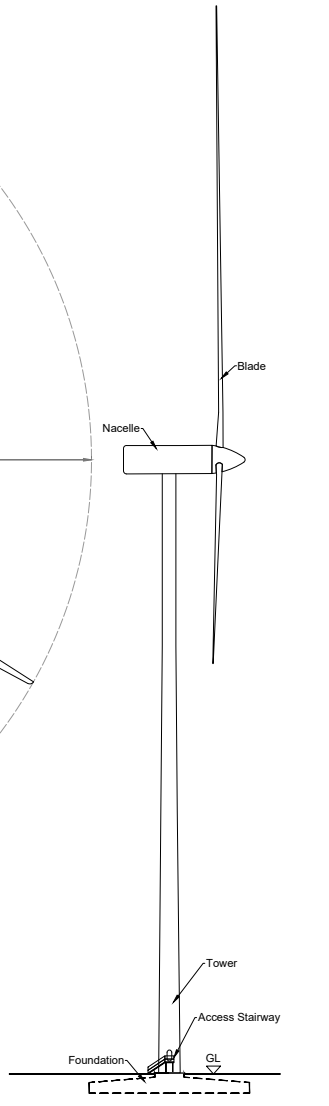
The individual components of a geared wind turbine nacelle and hub are shown in Figure 4-5 below.

[1] *Department of the Environment, Climate and Communications (April 2025) Climate Action Plan 2025 Annex of Actions (EL/24/5)*



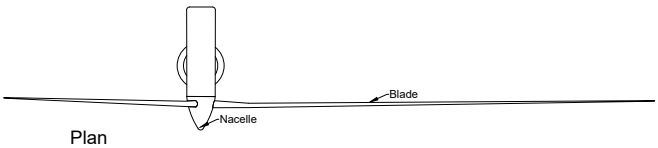
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Side/Section Elevation

Scale 1:500

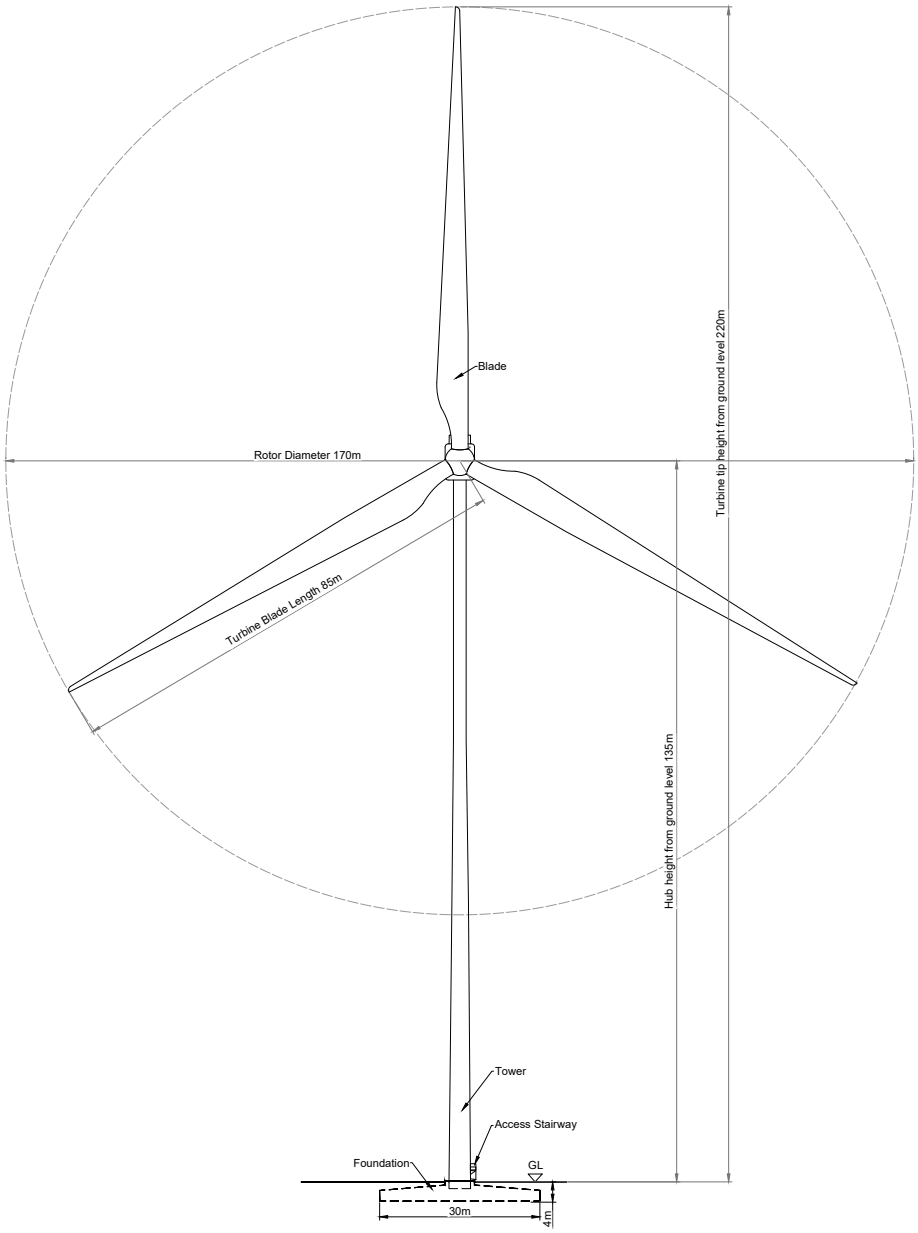


Plan

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PROJECT NO: 250708	DRAWING NO: Figure 4-4A
SCALE: As Shown	
DRAWN BY: GO	CHECKED BY: RD
DATE: 23.10.2026	REVISION: P03

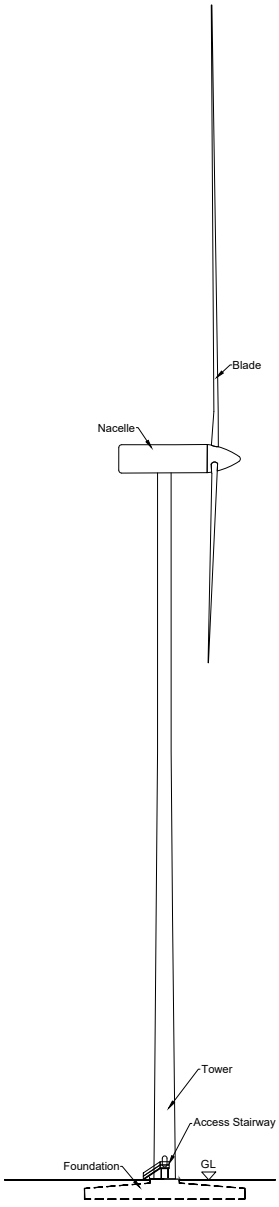
MKO

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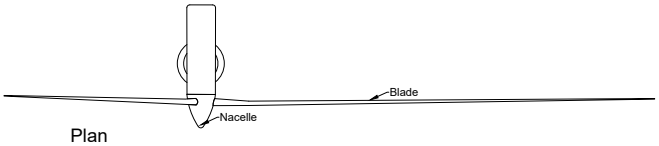
Front/Sectional Elevation

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Side/Section Elevation

Scale 1:500



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SCALE: As Shown	
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DATE: 23.10.2025	REVISION: P02

MKO

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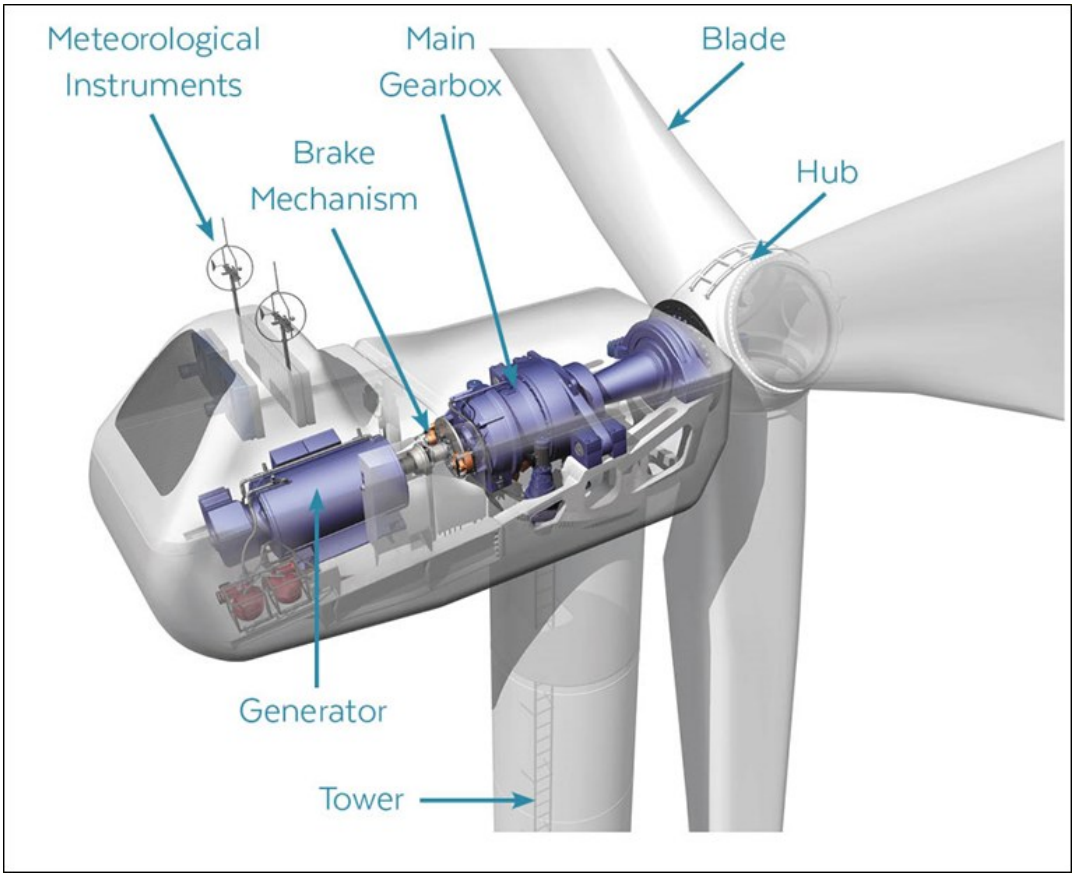


Figure 4-5 Turbine nacelle and hub components

4.4.1.1.4 Turbine Tower

The turbine tower will have a conical steel tube with triple paint finish. Modern tower design also provides for the use of concrete sections. Towers generally comprise a steel load distribution flange or plate at the base of the tower which is assembled on top of the concrete foundations using locally supplied concrete. The tower is delivered to the Project Site in three to six sections. The first tower section is bolted to the anchor cage, which is cast into the concrete foundation. The base of the tower will be approximately 4.8 m in diameter, tapering to approximately 4 m where it is attached to the nacelle. The tower is accessed by a galvanised steel hatch door, which will be kept locked during the operational phase except during maintenance.

4.4.1.1.5 Turbine Blade

Turbine blades are airfoil-shaped blades that harness wind energy and drive the rotor of a wind turbine. The airfoil-shaped-design (which provides lift in a fixed wing aircraft) is used to allow the blades to exert lift perpendicular to wind direction. The difference in air pressure across the two sides of the blade creates both lift and drag. The force of the lift is stronger than the drag and this causes the rotor to spin. The blades of modern turbines are generally made of fibreglass or carbon fibre reinforced polyester and are aerodynamically shaped to improve efficiency and lower noise production.

The Proposed Wind Farm has been designed to accommodate turbines with a blade length of 85 m. A traffic and transport assessment has been prepared as part of this EIAR (Chapter 15: Material Assets) with Swept Path Analysis modelling undertaken for an 85 m blade. See Appendix 15-3 completed Collett & Sons Limited.

4.4.1.1.6 Turbine Foundations

Turbine foundations are constructed by excavating peat and spoil to suitable sub-formation level. Imported structural fill and blinding is placed and compacted to formation level. A reinforced concrete base is cast in-situ. The turbine foundation transmits any load on the wind turbine into the ground.

Each wind turbine will require either piled foundation or a gravity foundation of reinforced concrete (RC) bearing onto rock or other competent substrata with a central upstand to support the tower. The size of the foundation will be designed by the appointed Civil Designer and dictated by the turbine manufacturer, with the final turbine selection being the subject of a competitive tender process. Adopting a precautionary approach, however, a circular in plan foundation area large enough to accommodate modern turbine models has been assessed in this EIAR. Piled and gravity foundation bases are generally ca. 30 m in diameter with the detailed foundation design being dictated by the local ground conditions. The vertical extent of the turbine foundation will be ca. 4 m. These turbine foundation parameters have been used as the purposes of this assessment and are shown in Figure 4-6, Figure 4-7 and Figure 4-8.

The top of the base is referred to as 'Top of Foundation Level', see Table 4-1 above for further detail on the Top of Foundation Level for the Proposed Turbines. Where ground conditions are unfavourable to excavate and replace, piles will be installed to a suitable bearing strata. After the piles are installed a working platform of leanmix concrete is established at the base to formation level of the foundation which is determined by its vertical extent. After the formation level has been established, 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 (Plate 4-2 below). The outside of the foundation is shuttered using either permanent lightweight formwork using corrugated sheeting or temporary demountable formwork to allow the pouring of concrete and is backfilled accordingly with appropriate granular fill to the finished surface level (Plate 4-2 below).

Figure 4-6 shows a piled turbine base layout, Figure 4-7 shows the bored turbine base layout and Figure 4-8 shows a gravity turbine base layout, including turbine foundation, hard standing area, assembly area, access road and surrounding works area.



Plate 4-2 Turbine 'Anchor Cage' and finished turbine base

4.4.1.1.7 Hard Standing Areas and Assembly Areas

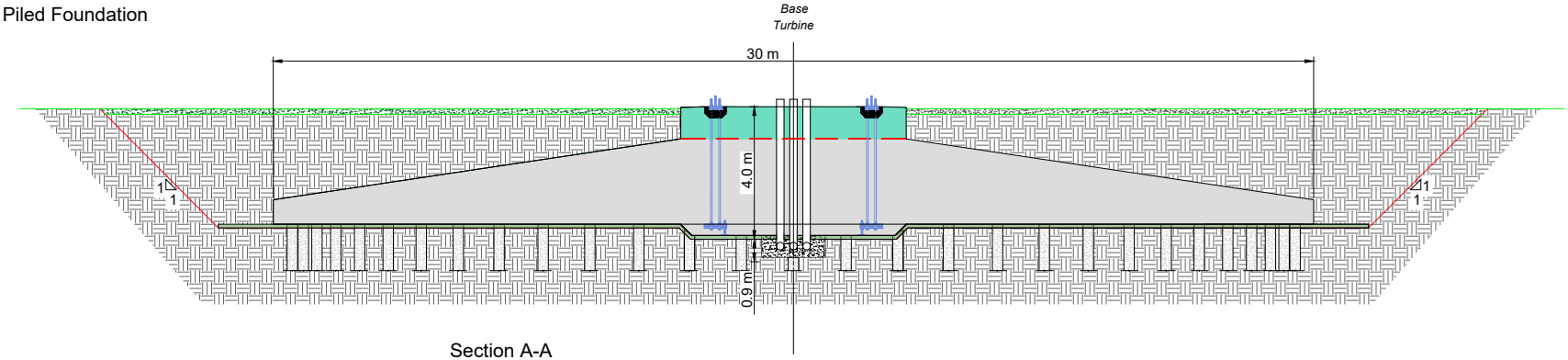
Hard standing areas consisting of levelled and compacted hardcore are required around each turbine base to facilitate access, turbine assembly and turbine erection. The hard-standing areas are used to accommodate cranes used in the assembly and erection of the turbine. The hardstands also allow for the offloading and storage of turbine components, and provide a safe, level working area around each turbine position. The hard-standing areas are extended to cover the turbine foundations once the turbine foundation is in place. All crane hardstand areas will be designed taking account of the loadings provided by the turbine manufacturer and will consist of a compacted stone structure. The crane hardstands will be constructed in a similar manner to the excavated site roads detailed in Section 4.9.1.2.2 below and will measure 51m by 108m, with ancillary crane pads measuring 15m by 13.1m, boom support pads of 7m by 7m and blade storage areas are 5.2m and 6m by 21m.

The precise size, arrangement and positioning of hard standing areas are informed by the turbine manufacturers. The extent of the required areas at each turbine location may be optimised on-site depending on topography, the position of the internal site access roads, the Proposed Turbine position and the turbine supplier's exact requirements.

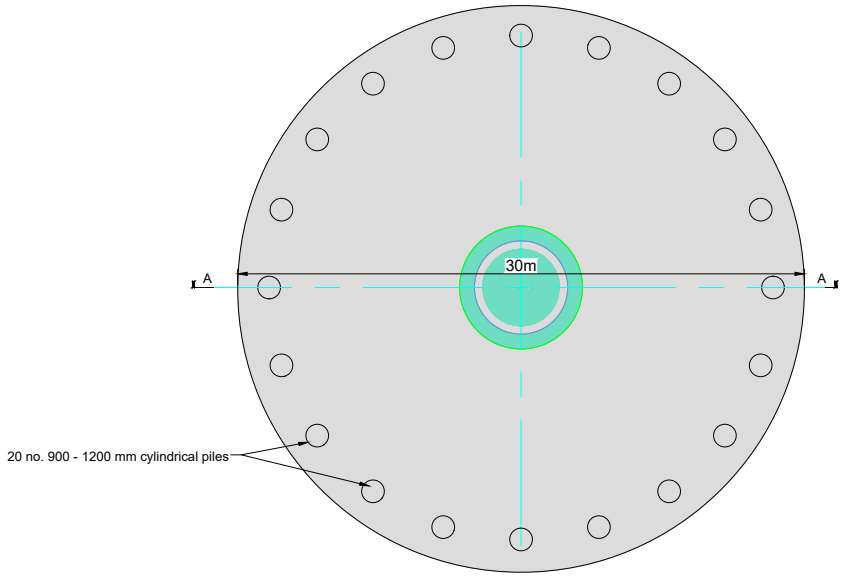
The proposed hard standing areas for each individual turbine are shown as part of the detailed layout drawings included in Appendix 4-1 and using the precautionary principle, represent the maximum sizes required. This EIAR utilises this maximum size when determining the quality, significance, extent and duration of potential effects.

The assembly areas will be located on the hard-standing area as shown in Figure 4-6, Figure 4-7 and Figure 4-8. These assembly areas are required for offloading turbine blades, tower sections and hub from trucks until such time as they are ready to be lifted into position by cranes and to assist the main crane during turbine assembly. The extent of the area required for the assembly areas is shown in Figure 4-6 Figure 4-7 and Figure 4-8 below and the detailed drawing in Appendix 4-1.

Piled Foundation



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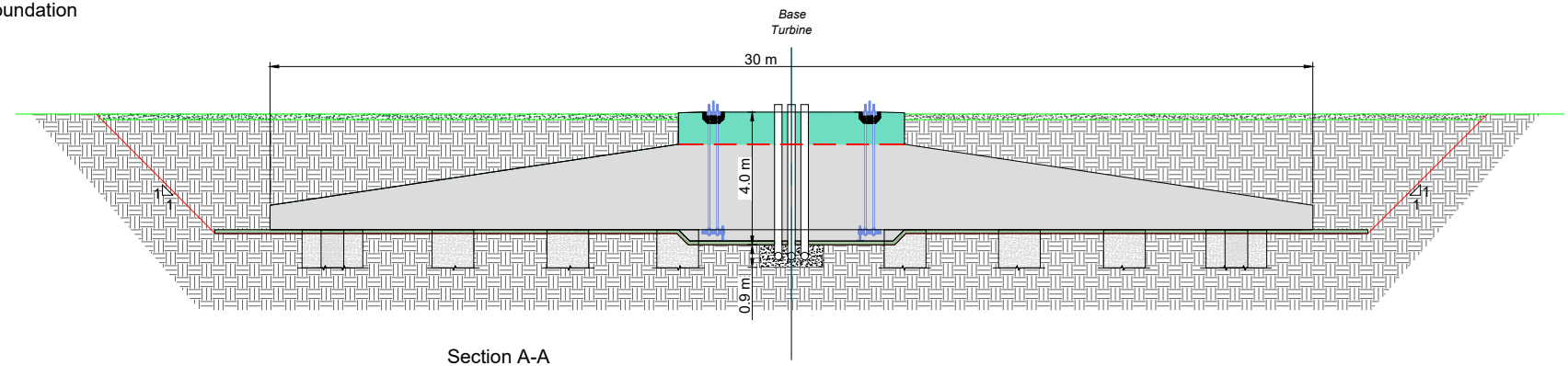


Plan
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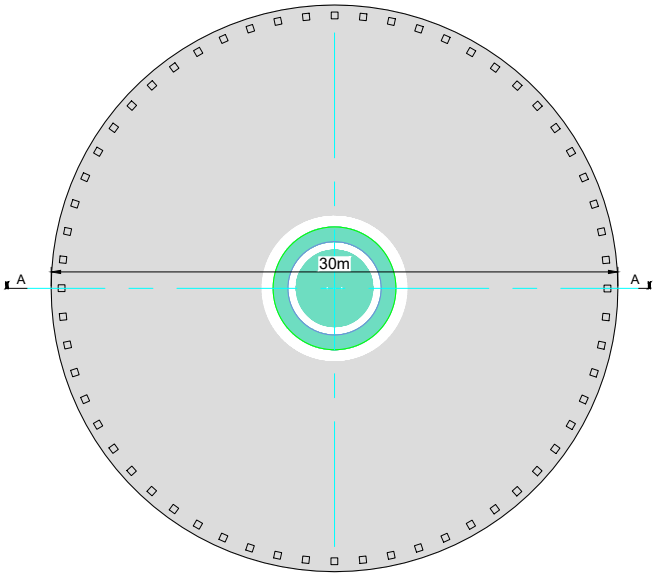
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PROJECT No.: 250708		DRAWING No.: Figure 4-6	SCALE: As Shown
DRAWN BY: GO	CHECKED BY: RD	DATE: 23.10.2026	REVISION: P03

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Bored Foundation



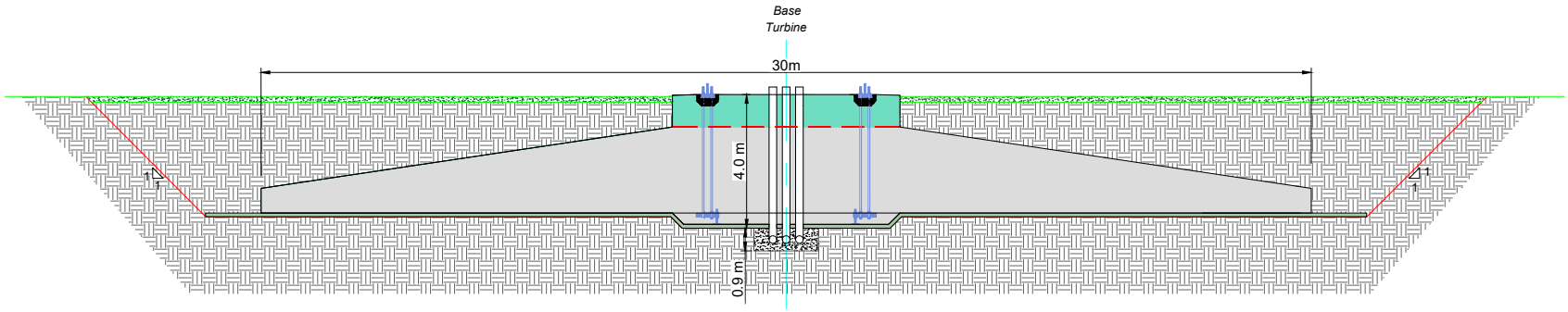
Section A-A
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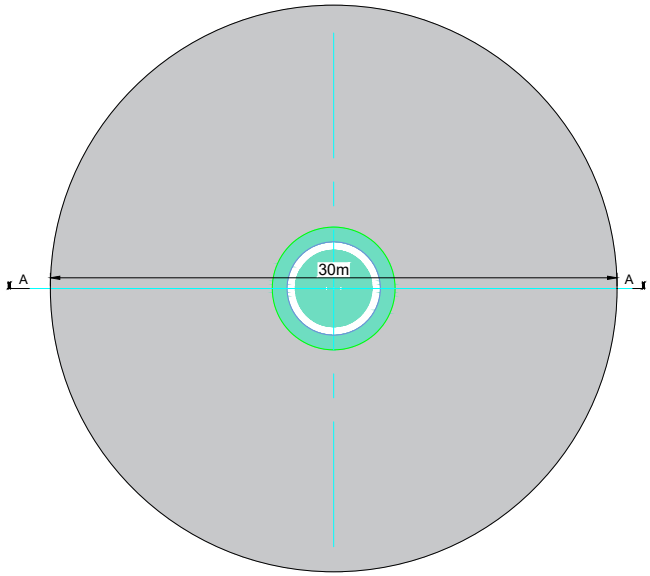
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DRAWN BY: GO	CHECKED BY: RD	DATE: 23.10.2026	REVISION: P03

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Section A-A
Scale 1:100



Plan
Scale: 1:200

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DRAWING TITLE:	Turbine Base Layout - Gravity

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-8	As Shown

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4.4.1.1.8 Power Output

Modern wind turbine generators have a typical generating capacity in the 6 to 7.2megawatt (MW) range, with the generating capacity continuing to evolve upwards as technology improvements are achieved by turbine manufacturers. Turbines of the exact same make, model and dimensions can have different power outputs depending on the capacity of the electrical generator installed in the turbine nacelle. The exact power rating of the installed turbine will be designed to match the wind regime on the Project Site and will be determined by the selected manufacturer.

The MW output of the Proposed Project 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 7MW has been chosen to calculate the power output of the proposed 46-turbine renewable energy development, which would result in an estimated installed capacity of 322 MW.

Assuming an installed capacity of 322 MW, the Proposed Project therefore has the potential to produce up to 823,650 MWh respectively 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 29.2%[2] is applied here.

C = Rated output of the wind farm: 322 MW

The 823,650MWh of electricity produced by the Proposed Project would be sufficient to supply approximately 257,390 Irish households with electricity per year, based on the average Irish household using 3.2 MWh of electricity[3] (this latest figure is available from the Central Statistics Office Metered Electricity Consumption 2025/2024).

The 2022 Census of Ireland Summary Results recorded a total of 28,923 occupied households in Co. Offaly and 82,793 occupied households in Co. Kildare[4]. Per annum, based on a capacity factor of 29.2%, the Proposed Project would therefore produce sufficient electricity for the equivalent of over 100% of all households in Co. Offaly and 100% of all houses in Co. Kildare.

4.4.1.2 Site Roads

4.4.1.2.1 Road Construction Types

To provide internal access within the Proposed Wind Farm and to connect the Proposed Turbines and associated infrastructure, existing roads and tracks will need to be upgraded, and new access roads will need to be constructed. The Proposed Project will have approximately 62.8 kilometres (km) of internal site access roads.

The Proposed Wind Farm makes use of the existing access track network insofar as possible. It is proposed to upgrade approximately 2.8 km of existing site tracks, and to construct approximately 60km of new internal site access road for the Proposed Project. Fehily Timoney & Company Ltd. (FTC) was

[2] *SEAI (2025) Energy In Ireland 2025 (https://www.seai.ie/sites/default/files/publications/Energy-in-Ireland-2025.pdf)*
[3] *Central Statistics Office (2026) Metered Electricity Consumption 2025/2024 https://www.cso.ie/en/releasesandpublications/ep/p-mec/meteredelectricityconsumption2025/*
[4] *Central Statistics Office (2022) https://data.cso.ie/table/F2005B*

appointed to assess the existing ground conditions and inform the type of road required to access all locations on site.

The road construction preliminary design has taken into account the following key factors as stated in the Peat and Spoil Management Plan in Appendix 4-3:

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

Whilst the above key factors are used to determine the road design at this stage, actual construction technique employed for a particular length of road will be determined on the prevailing ground conditions encountered along that length of road. It is proposed to construct 42 no. passing bays along the proposed road network. The proposed new internal site access roads will be approximately 6m in width; the designation of floated vs excavated roads is outlined in Section 4.4.1.7 below.

The road construction techniques to be considered are as follows:

- Construction of New Floating Roads over peat;
- Construction of New Excavated Roads through peat, and;
- Upgrades to Existing Track – Floated Road.

The construction techniques proposed to be used for roads across the Project Site are shown in the FTC Peat and Spoil Management Plan (Appendix 4-3) and are included in Section 4.4.1.7 and Section 4.4.2.8 below.

Construction of New Floating Roads

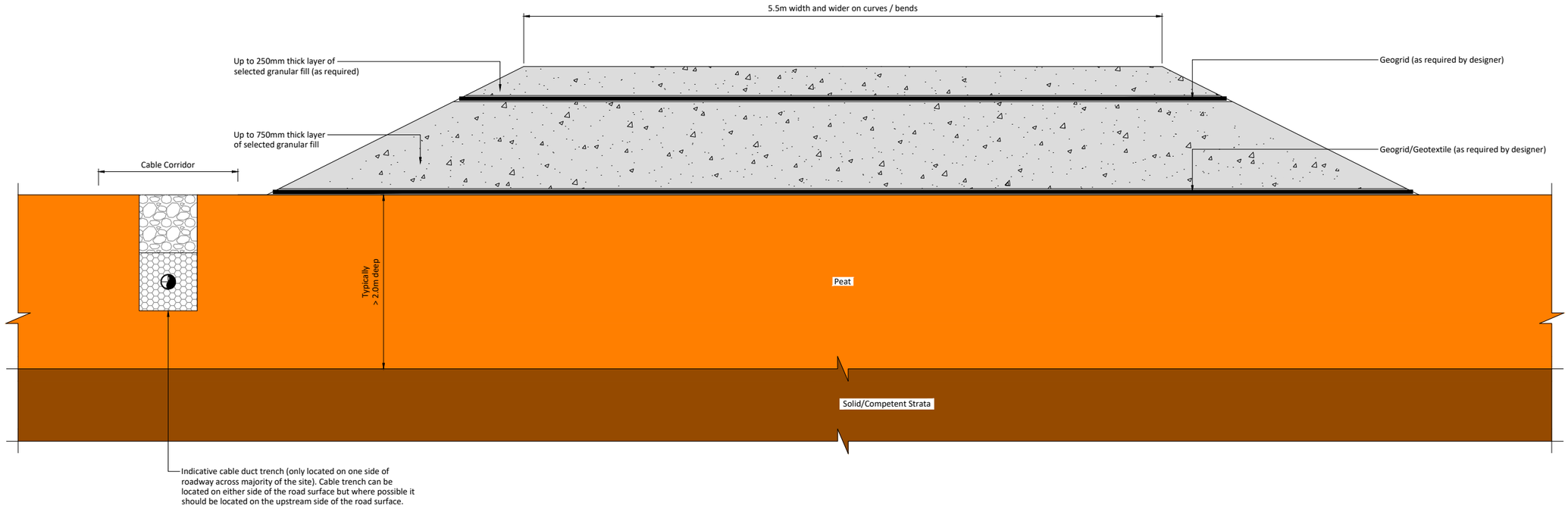
As noted above, approximately 60km of new roads will be constructed in order to facilitate the Proposed Wind Farm and Proposed Offsite Substation; approximately 58.5km being new floating roads. The general construction methodology for the construction of new floating access roads, as presented in FTC's Peat & Spoil Management Plan in Appendix 4-3 of this EIAR, is summarised in Section 4.4.1.7 and Section 4.4.2.8 below. Sections of New Floating Roads are shown in Figure 4-9 below.

Construction of New Excavated Roads

As noted above, approximately 60km of new roads will be constructed in order to facilitate the Proposed Project; approximately 1.5km being new excavated (founded) roads. The general construction methodology for the construction of new founded access roads, as presented in FTC's Peat & Spoil Management Plan in Appendix 4-3 of this EIAR, is summarised in Section 4.4.1.7 and Section 4.4.2.8 below. Sections of New Excavated Roads are shown in Figure 4-10 below.

Upgrades to Existing Tracks – Floated Road

As noted above, approximately 2.8 km of existing roads and access tracks will be upgraded as part of the Proposed Project construction phase; all existing roads within the Project Site are floated. 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 4-3 of this EIAR, is summarised in Section 4.4.1.7 and Section 4.4.2.8 below. Sections of Upgrades to Existing Road are shown in Figure 4-11 below.



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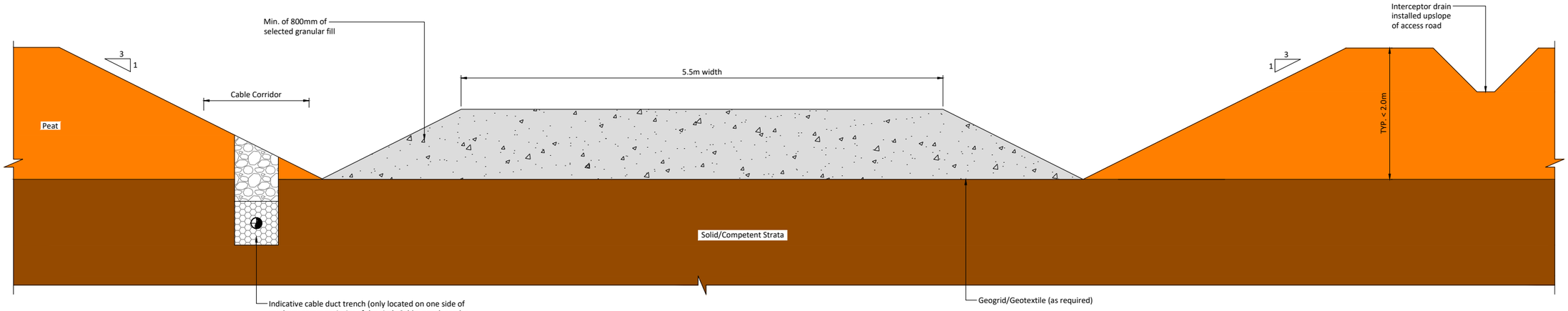
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Rev.	Description	App By	Date
A	FOR INFORMATION	BDH	11.02.26
B	FOR INFORMATION	BDH	22.10.26

PROJECT	BALLYDERMOT WIND FARM
CLIENT	MKO
SHEET	SECTION OF NEW FLOATED ACCESS ROAD
Date	22.10.26
Project number	P2319
As Shown	
Drawn by	POR
Drawing Number	Figure 4-9
Rev	B
Checked by	IH

O:\ACAD\2021\P2319\P2319-0600-0022

22 October 2026



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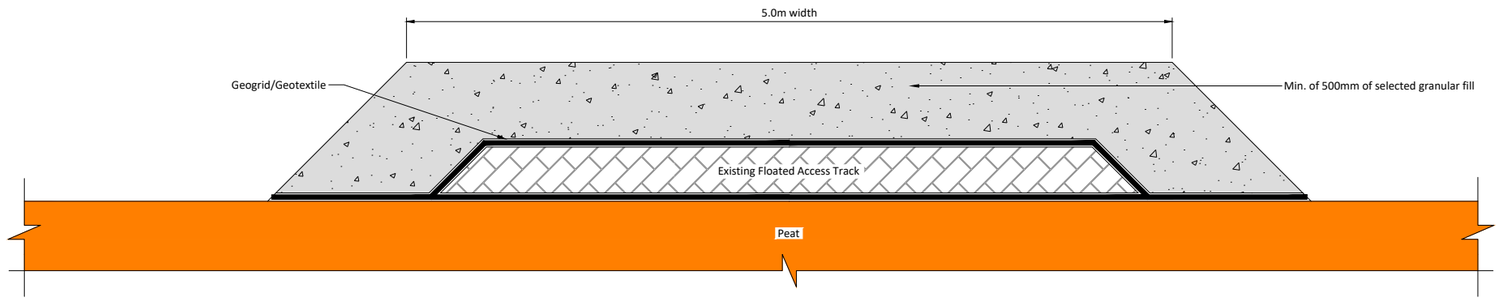
Rev.	Description	App By	Date
A	FOR INFORMATION	BDH	11.02.26
B	FOR INFORMATION	BDH	22.10.26

PROJECT: BALLYDERMOT WIND FARM		CLIENT: MKO	
SHEET: SECTION OF NEW **EXCAVATE**D **ROAD**	Date: 22.10.26	Project number: P2319	As Shown
	Drawn by: POR	Drawing Number: Figure 4-10	Rev: B
	Checked by: IH		

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22 October 2026

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Rev.	Description	App By	Date
A	FOR INFORMATION	BDH	02.10.26
B	FOR INFORMATION	BDH	22.10.26

PROJECT: BALLYDERMOT WIND FARM		CLIENT: MKO	
SHEET: SECTION OF **UPGRADE OF EXISTING** ROAD	Date: 22.10.26	Project number: P2319	As Shown
	Drawn by: POR	Drawing Number: Figure 4-11	Rev: B
	Checked by: IH		

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22 October 2026

4.4.1.3 Site Underground 33kV Electrical and Communications Cabling

Each turbine will be connected to the Proposed Onsite Substation via underground 33kV (kilovolt) electricity cabling. Fibre-optic cables will also connect each Proposed Turbine, the proposed meteorological masts (met mast) (Section 4.4.1.4 below), and the proposed relay mast (Section 4.4.1.10 below) to the Proposed Onsite Substation. The electricity and fibre-optic cabling connecting to the Proposed Onsite Substation will be run in cable ducts adjacent to the proposed internal site access roads and buried directly alongside the internal site access roads at depths of approximately 1m below ground level to the top of the duct. After the ducts are laid the excavated material will be reinstated over the ducts. The cables will follow the access roads to each Proposed Turbine location and are illustrated on the site layout drawings included as Appendix 4-1; the exact number and configuration of cable may vary within the cabling trench. Figure 4-12 below shows the proposed cable trench for 33kV cable trenches proposed within the Project Site. See Appendix 4-1 Planning Drawings for further detail on the location for the cable trench. The exact configuration and exact location of the underground cabling will be set by the requirements of the electrical designers at detailed design stage.

Backfill material will be compacted in layers with engineer-approved specified material, which may be imported onto the Project Site should sufficient volumes of suitable material not be encountered during the construction phase of the Proposed Project.

4.4.1.4 Meteorological Masts

There are 2 no. permanent met masts proposed as part of the Proposed Project. The met masts will be equipped with wind monitoring equipment at various heights. The met masts will be located within the Proposed Wind Farm ITM X 664363, Y723502 (Met Mast 1) and at ITM X667735, Y726740 (Met Mast 2), as shown on the site layout in Figure 4-1 and will be a slender structure of 40 metres in height. Each mast will be a free-standing structure and will be constructed with a reinforced concrete gravity foundation measuring 10m by 10m, designed to cater for the mast loadings. A hard-standing area measuring 40m by 20m to accommodate the installation crane will be constructed adjacent to an existing internal access road. The design of the proposed met masts is shown in Figure 4-13 and Figure 4-14.

4.4.1.5 Temporary Construction Compounds

There are 10 no. temporary construction compounds proposed as part of the Proposed Project, of which 9 no. will be located within the Proposed Wind Farm site and 1 no. within private land containing the Proposed Offsite Substation, listed in Table 4-2 below. The temporary construction compounds are strategically situated to facilitate works during the construction phase of the Proposed Project. The varying sizes of the temporary construction compounds are identified below in Table 4-2 and will be used over various durations during the Proposed Project construction phase.

The locations of the proposed 10 no. temporary construction compounds are shown on the Proposed Project layout drawing in Figure 4-1 to Figure 4-3 above, as well as in Appendix 4-1. The layouts of these construction compounds are shown in Figure 4-15 to Figure 4-24 below.

Table 4-2 Construction Compounds

Compound No.	Location	Scale	Total Area
1	Codd 1 Bog (northwest), Co. Offaly	70m x 182.9m	12,803m^2
2	Ballydermot North Bog (south), Co. Offaly	100m x 134.9m	13,365m^2
3	Ballydermot South Bog (southeast), Co. Kildare	68.5m x 56.9m x 41.2m x 60.4m	3,000m^2

4	Blackriver Bog (west), Co. Kildare	60m x 200m	12,000m^2
5	Barnaran Bog (west), Co. Kildare	118m x 64.9m	7,670m^2
6	Glashabaun South Bog (southwest), Co. Offaly	65m x 70m	4,550m^2
7	Glashabaun North Bog (west), Co. Offaly	60m x 100m	6,000m^2
8	Glashabaun North Bog (northeast), Co. Offaly	65.6m x 23.9m	792m^2
9	Lodge Bog (Proposed Onsite Substation), Co. Kildare	76.8m x 84.3m	6,468m^2
10	Killybegs (Proposed Offsite Substation), Co. Kildare	124.3m x 55m	6,765m^2

The proposed 10 no. temporary construction compounds will consist of bunded refuelling and containment area for the storage of lubricants, oils, and site generators, etc., temporary site offices, staff facilities, and car-parking areas for staff and visitors. Turbine components will be brought directly to the Proposed Turbine locations following their delivery to the Project Site.

Temporary toilets, located within staff portacabins, will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewaters tankered off site by an appropriately permitted waste collector to wastewater treatment plants.

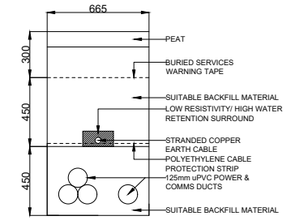
The 10 no. temporary construction compounds will be removed following construction and reinstated.

4.4.1.6 Temporary Security Cabins and Proposed Gates

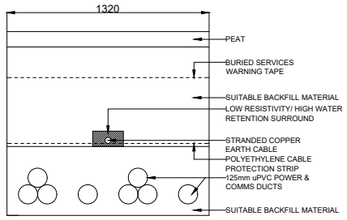
During the construction phase, 10 no. temporary security cabins will be installed within the Project Site for the duration of the construction phase (see Table 4-7 in Section 4.5.1 below for detail on each site entrance location and for the location of each security cabin). The security cabins will be located close to the proposed construction site entrances and at crossing points on local roads from one bog to another.

The security cabins will be prefabricated structures of varying dimensions, refer to Appendix 4-1 for details on all proposed security cabins. The security cabins will serve as the check in and check out point for staff and visitors during the construction phase. At the end of the construction phase, the temporary security cabins will be removed from the Project Site and reinstated, then either reseeded or allowed to naturally revegetate. The layout and sections of the proposed security cabins is shown in Figure 4-25, and the locations are shown in Figure 4-1 above.

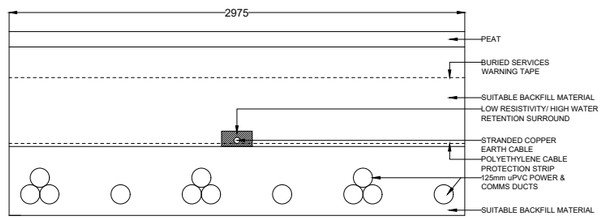
During the construction phase, each temporary security cabin will have gates installed which will be manned by security stationed within each temporary security compound. Upon completion of construction and commissioning, a permanent gate will be installed at all operational phase entrances. Each gate will be fitted with a locking mechanism and will be used in the operational phase for amenity, maintenance and monitoring activities (see Table 4-7 below).



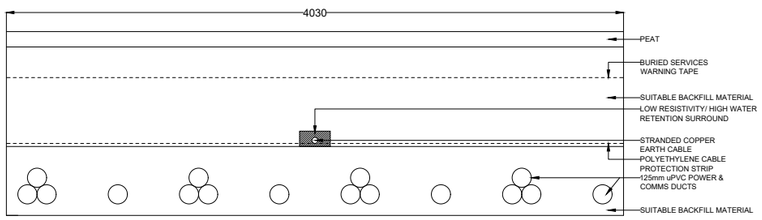
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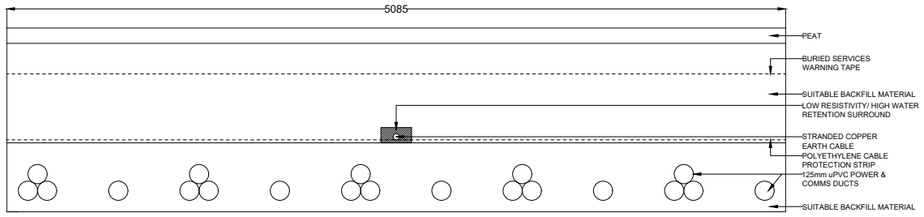
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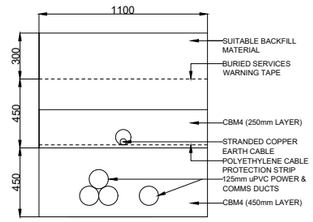
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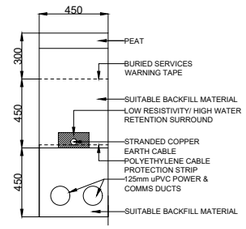
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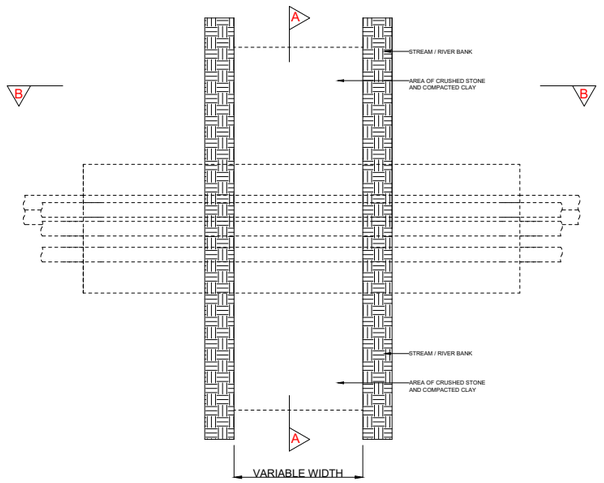
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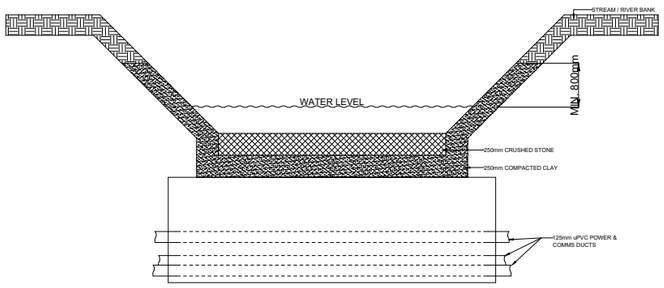
ROAD CROSSING TRENCH DETAIL



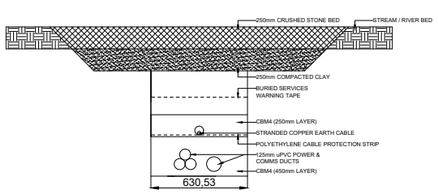
MET MAST TRENCH DETAIL



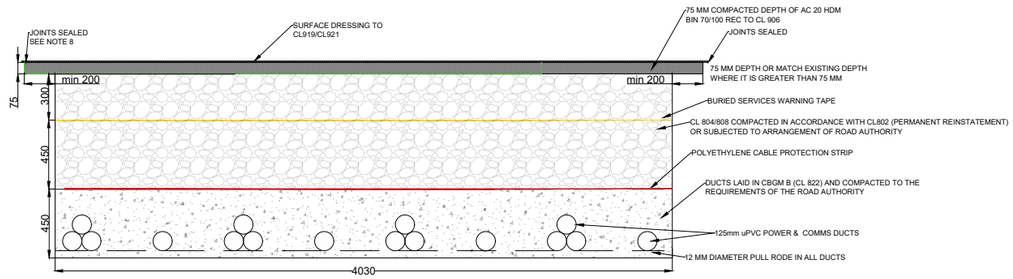
STREAM CROSSING TRENCH DETAIL
PLAN VIEW
NTS



STREAM CROSSING TRENCH DETAIL
SECTION VIEW B - B
NTS



STREAM CROSSING TRENCH DETAIL
SECTION VIEW A - A
NTS



REINSTATEMENT DETAILS BASED ON GUIDELINES
FOR MANAGING OPENINGS IN PUBLIC ROADS

NOTES:

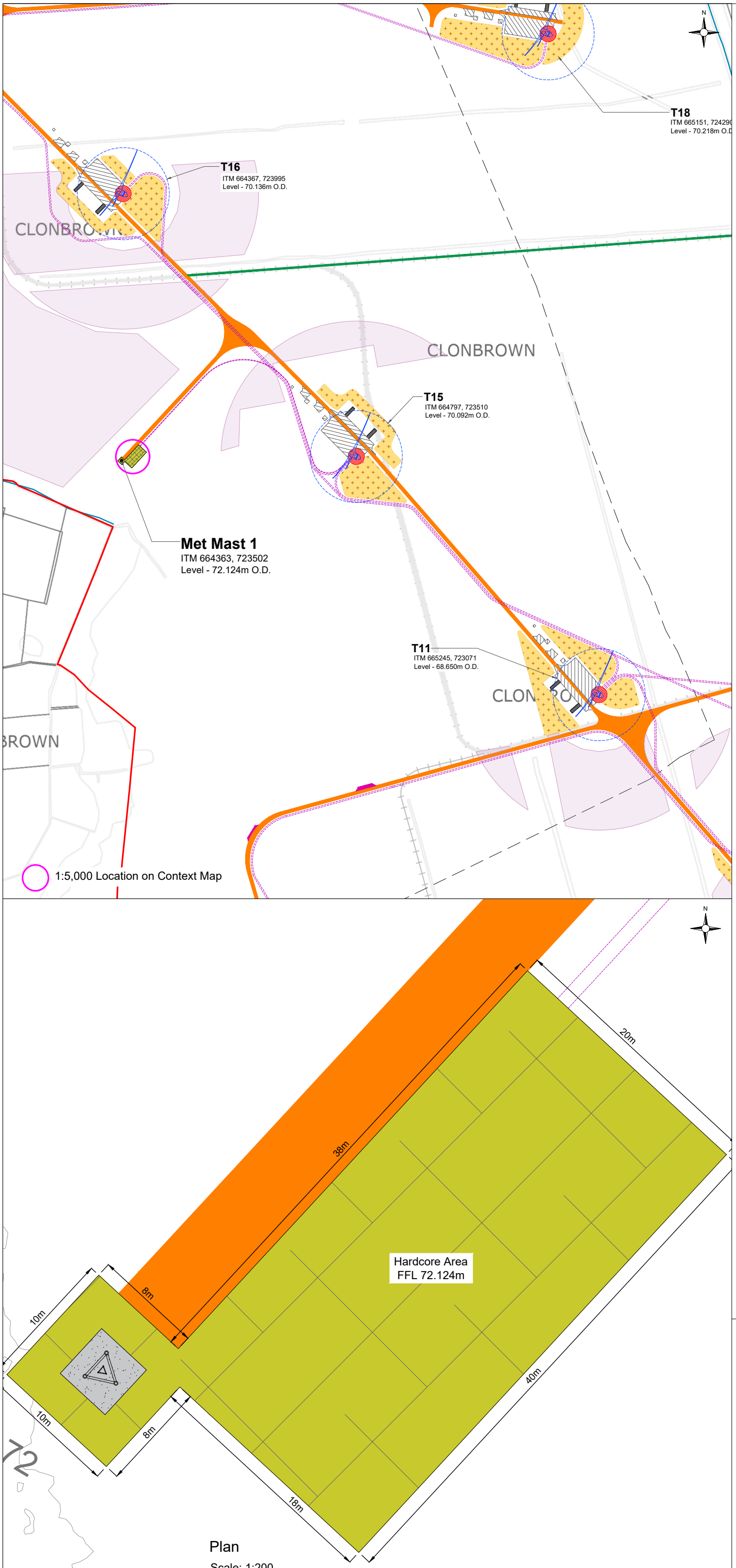
1. ALL DIMENSIONS NOTED ARE IN MM
2. DRAWING IS FOR PLANNING PURPOSES ONLY
3. COPPER STRANDED EARTH CABLE TO BE SIZED IN ACCORDANCE WITH EARTHING AND LIGHTNING STUDIES
4. SUITABLE BACKFILL MATERIAL IS SUBJECT TO THE APPROVAL OF THE RESIDENT ENGINEER
5. TRENCH WIDTHS ARE INDICATIVE AND ARE TO BE CONFIRMED DURING DETAILED DESIGN
6. DUCTING DESIGN SHOWN IS INDICATIVE AND DUCT TYPE/ LOCATION / SPACING IS TO BE CONFIRMED WITH THE ELECTRICAL CONTRACTOR/ DESIGNER PRIOR TO CONSTRUCTION WORKS COMMENCING
7. CABLE TRENCHING ROUTE IS TO AVOID TURBINE HARD STANDING AREA
8. JOINT SEALER SHALL BE A HOT 50 PEN BITUMEN BINDER OR COLD THIXTROPIC BITUMEN 50-70 PEN TO BE APPLIED TO ALL VERTICAL CUTS IN ACCORDANCE WITH B.S 594987 PRIOR TO APPLICATION OF BITUMINOUS MATERIAL

PROJECT TITLE:	**Ballydermot Wind Farm, Co. Offaly and Co. Kildare**
DRAWING TITLE:	**Cable Trench Cross Section**

PROJECT No.:	DRAWING No.:	SCALE:
250708	**Figure 4-12**	**As Shown**

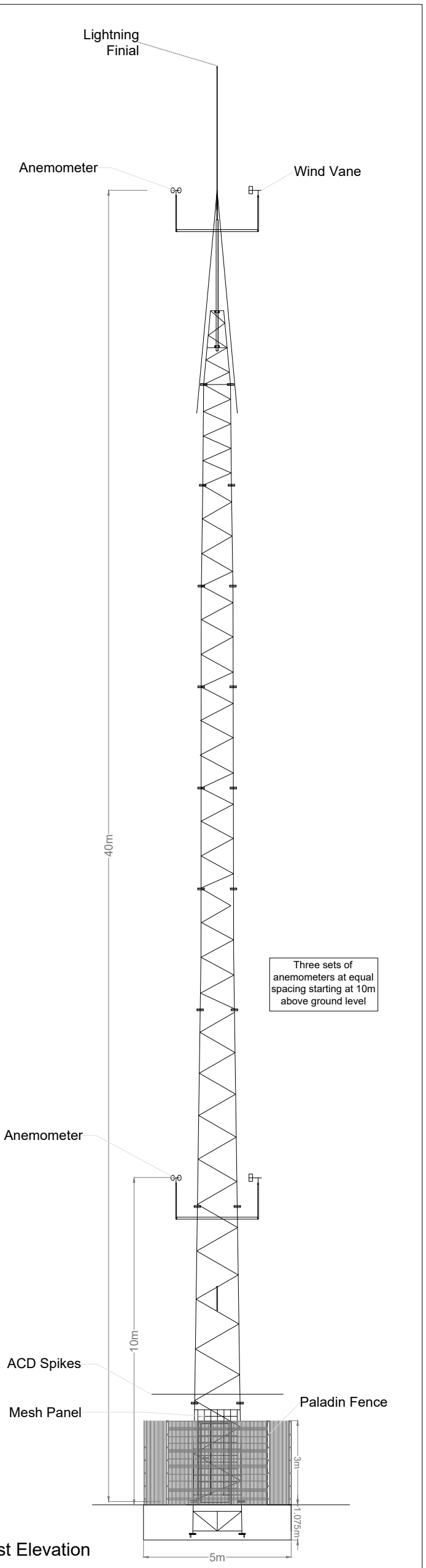
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Plan

Scale: 1:200



Mast Elevation

Scale: 1:100

NOTES:

1. Mast/foundation orientation to be confirmed with met mast supplier
2. Earthing and ducting requirements to be confirmed with met mast supplier and forwarded to foundation designer

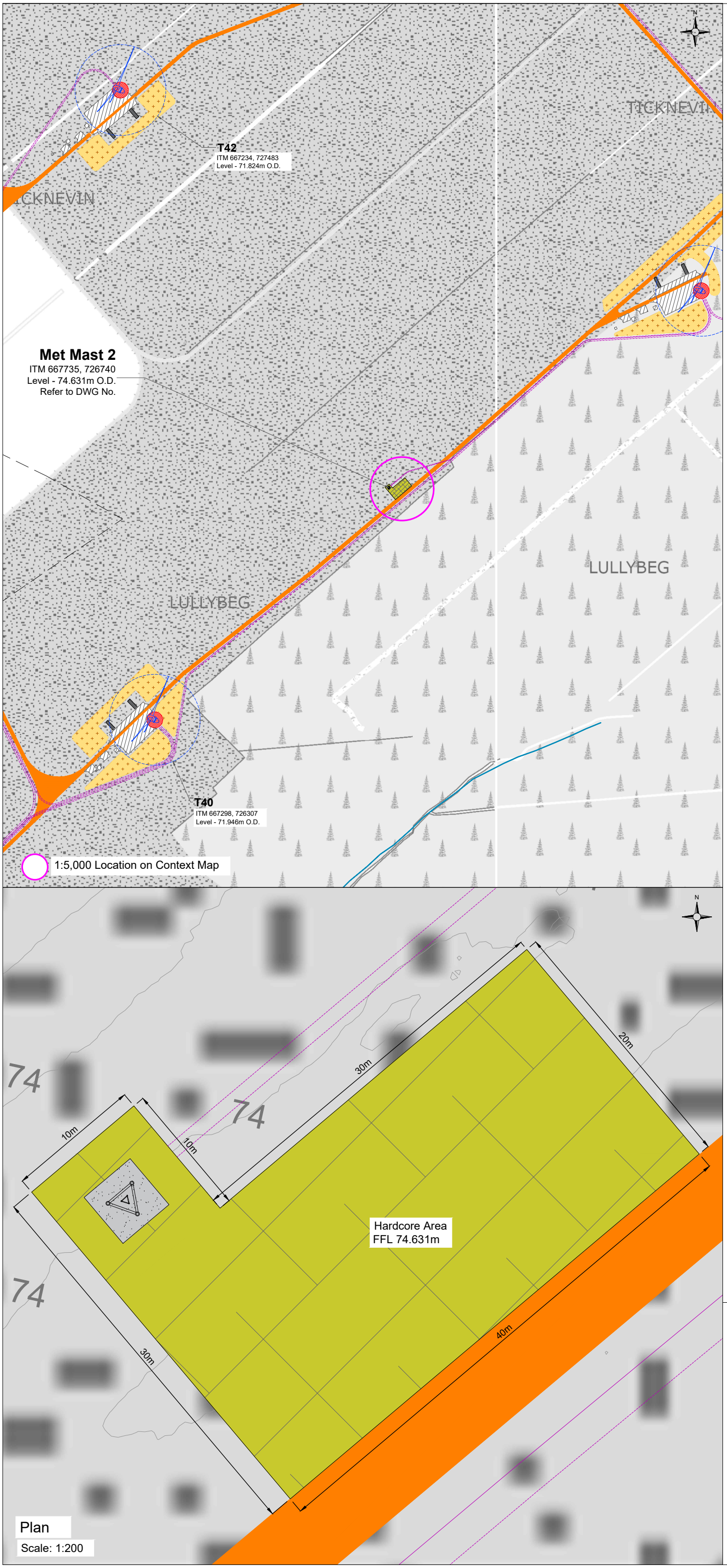
PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

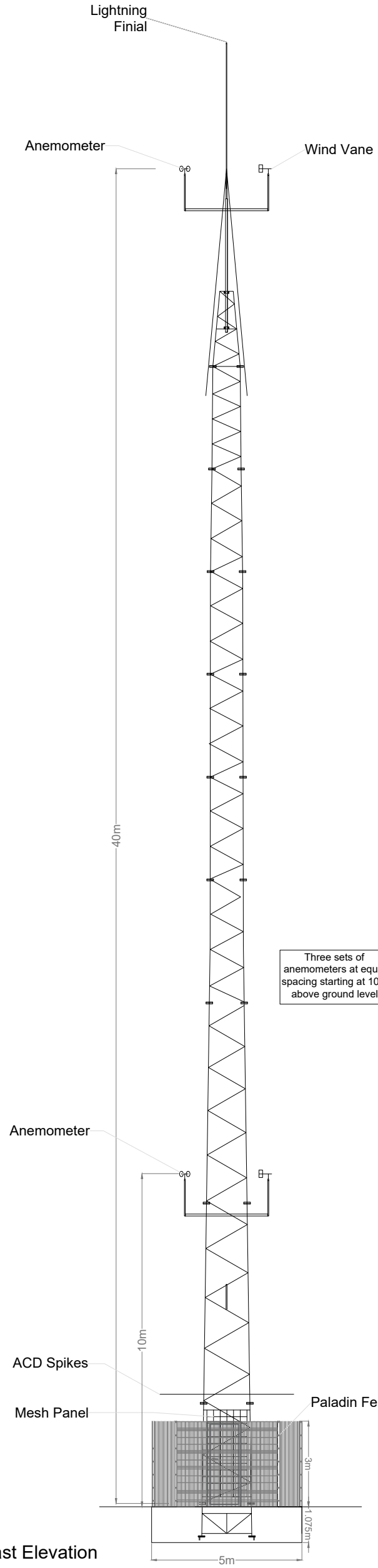
DRAWING TITLE:
Proposed Met Mast 1

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-13	As Shown

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GO	RD	12.10.2026	P03

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Mast Elevation

Scale: 1:100

NOTES:

1. Mast/foundation orientation to be confirmed with met mast supplier
2. Earthing and ducting requirements to be confirmed with met mast supplier and forwarded to foundation designer

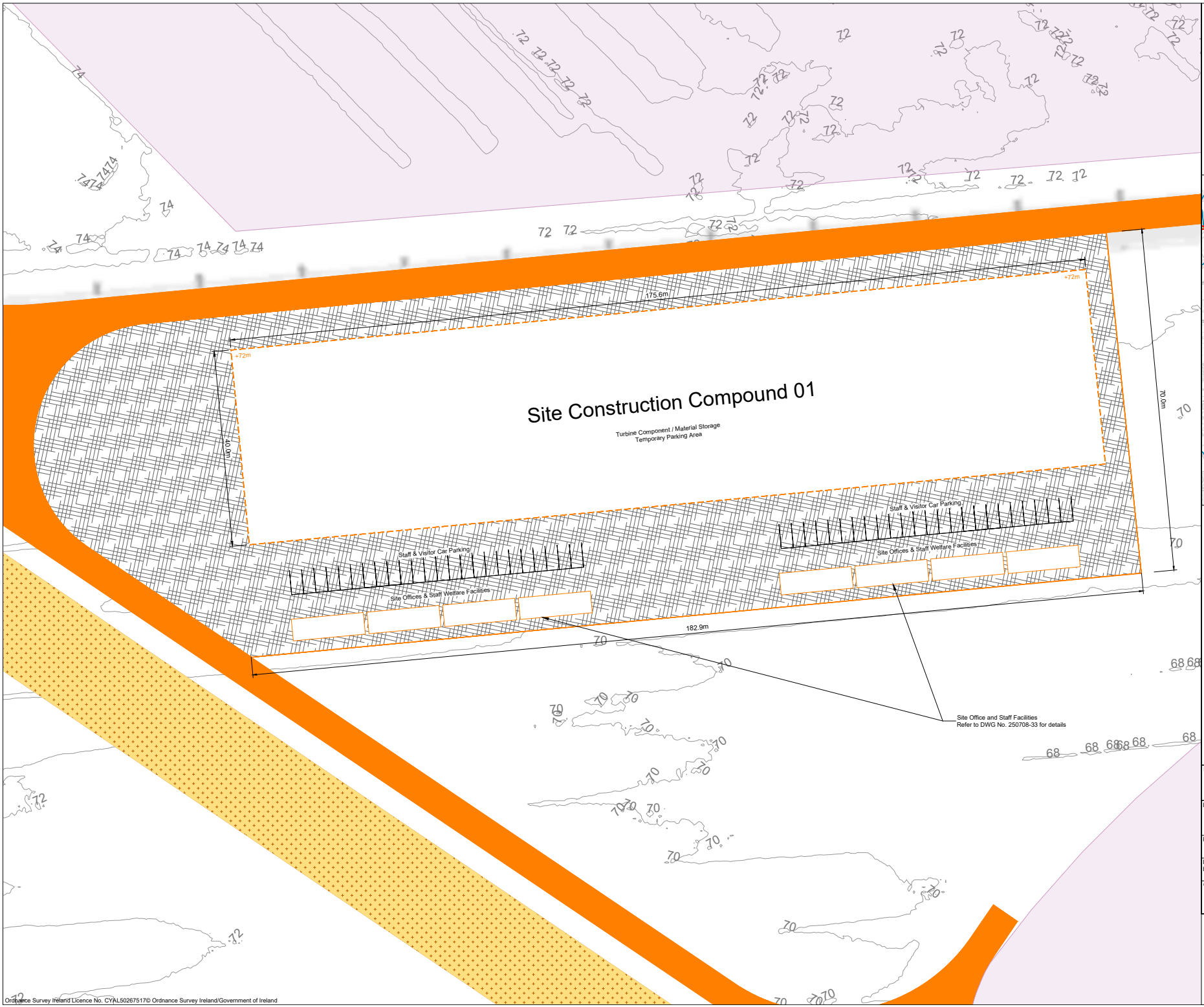
PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Proposed Met Mast 2

PROJECT No.:	DRAWING No.:	SCALE:
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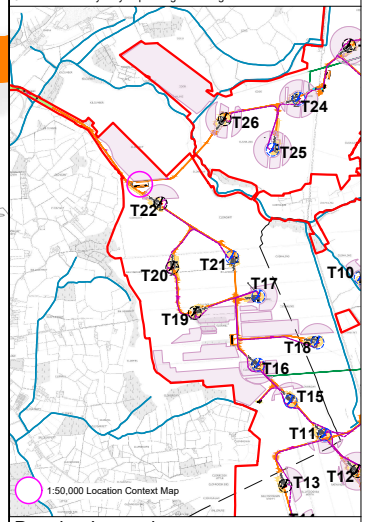
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Proposed Internal Access Road
- Existing Internal Access Road to be Upgraded
- Proposed Peat and Spoil Areas
- Proposed Enhancement Areas

N

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Proposed Temporary Construction Compound 01

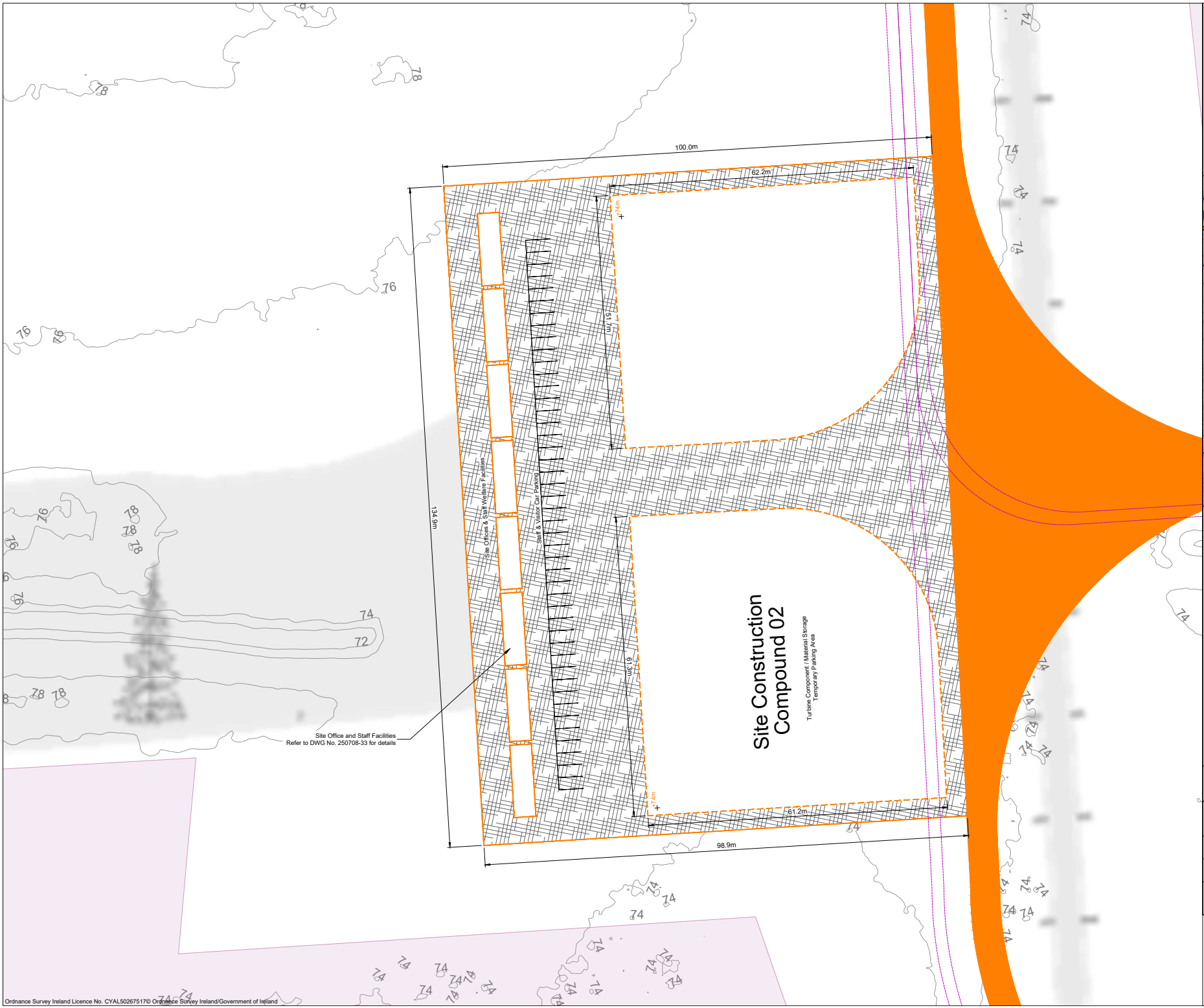
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250708	Figure 4-15	As Shown

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GO	RD	12.10.2026	P03

OS SHEET No.:
2974 to 2986, 3044 to 3056, 3112 to 3124, 3178 to 3190, 3244 to 3256, 3309 to 3321, 3372 to 3384, 3435 to 3447, 3496 to 3508, 3546 to 3558, 3595 to 3607, 3651 to 3663, 3709 to 3721, 3767 to 3779

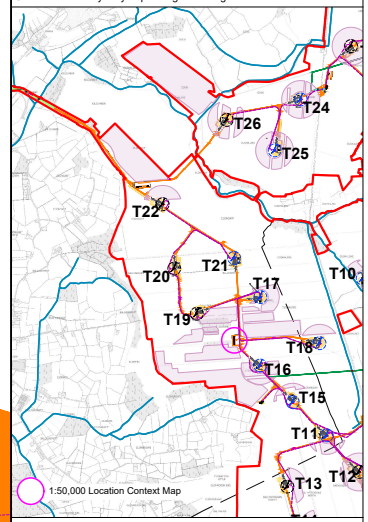
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Proposed Internal Access Road
- Proposed Enhancement Areas
- Proposed 33kV Underground Cable Route

N

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Proposed Temporary Construction Compound 02

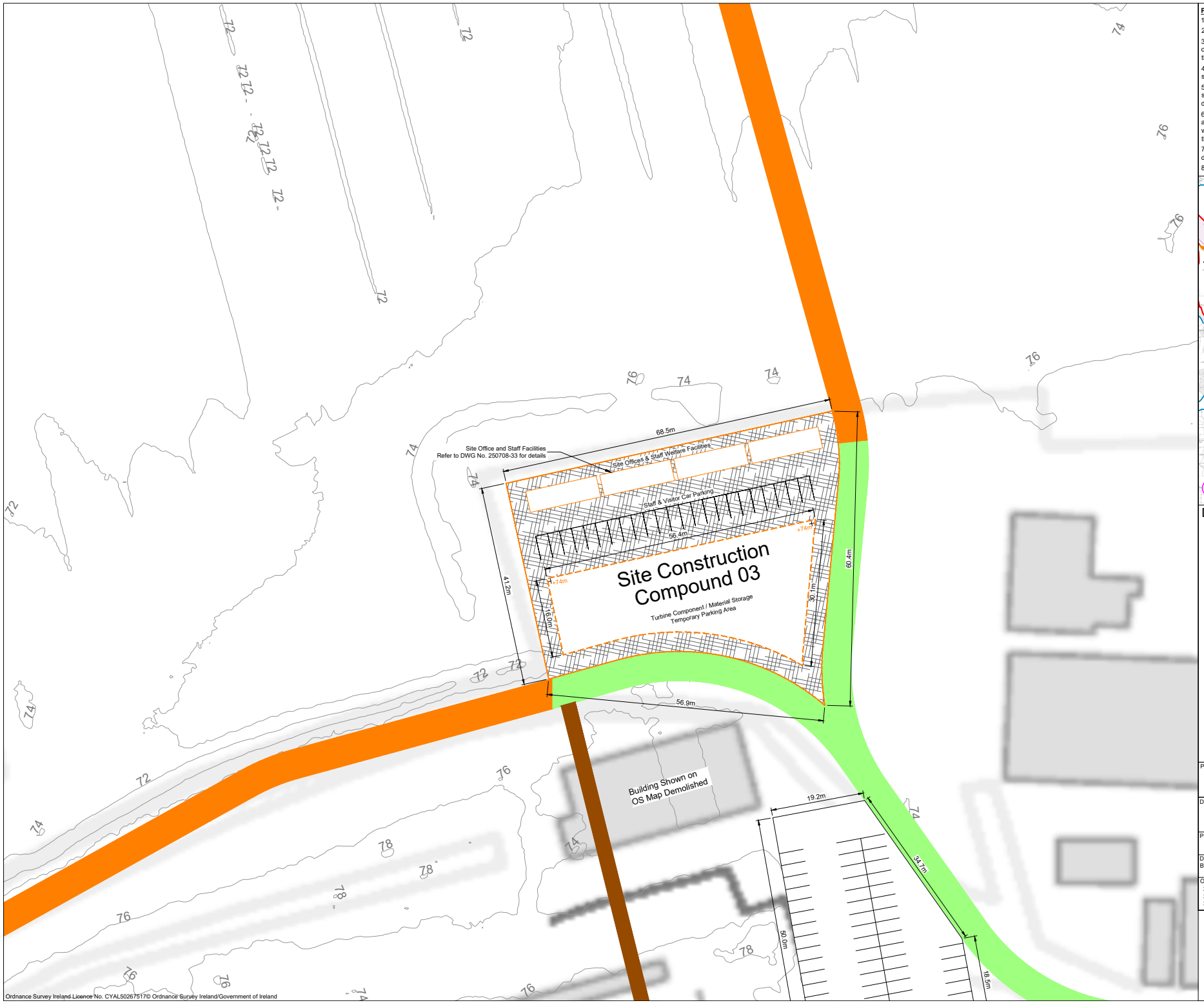
PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-16	As Shown

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GO	RD	12.10.2026	P03

OS SHEET No.:
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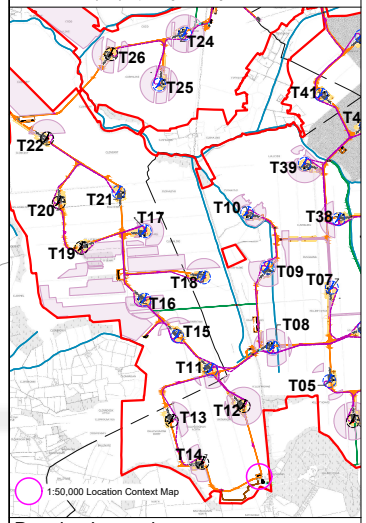
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Proposed Internal Access Road
- Existing Internal Access Road to be Upgraded
- Proposed Amenity Boardwalk

N

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

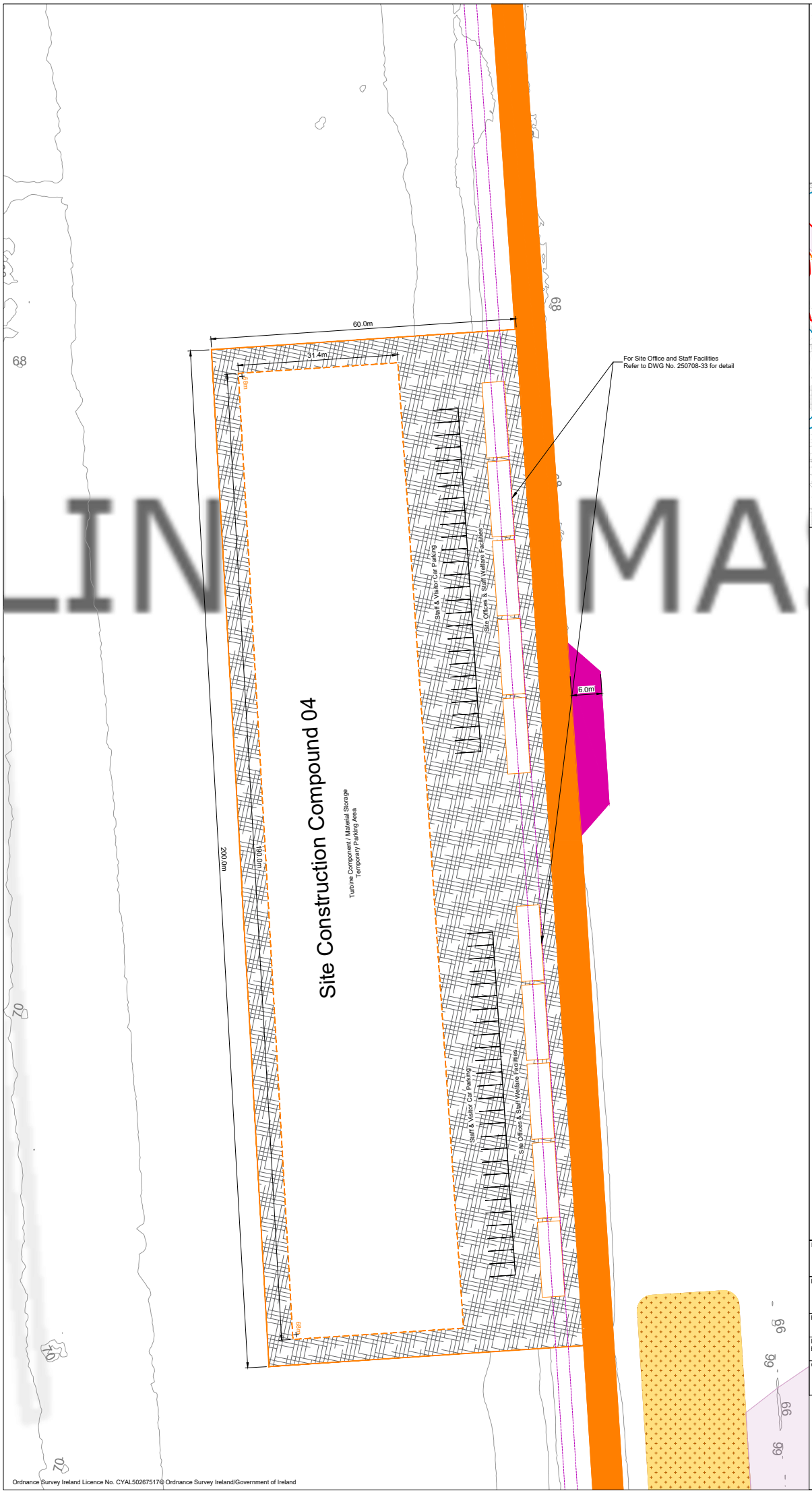
DRAWING TITLE:
Proposed Temporary Construction Compound 03

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-17	As Shown

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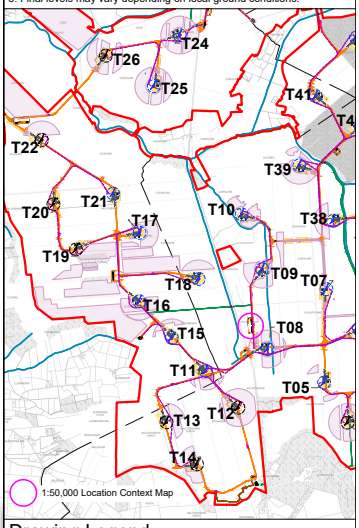
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Proposed Internal Access Road
- Proposed 33kV Underground Cable Route
- Proposed Peat and Spoil Areas
- Proposed Passing Bay
- Proposed Enhancement Areas

N

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Proposed Temporary Construction Compound 04

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-18	As Shown

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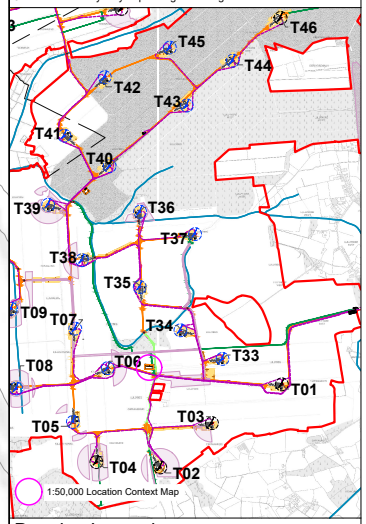
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Existing Internal Access Road to be Upgraded
- Proposed Amenity Track
- Proposed Internal Access Road
- Proposed 33kV Underground Cable Route
- Proposed Enhancement Areas

N

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

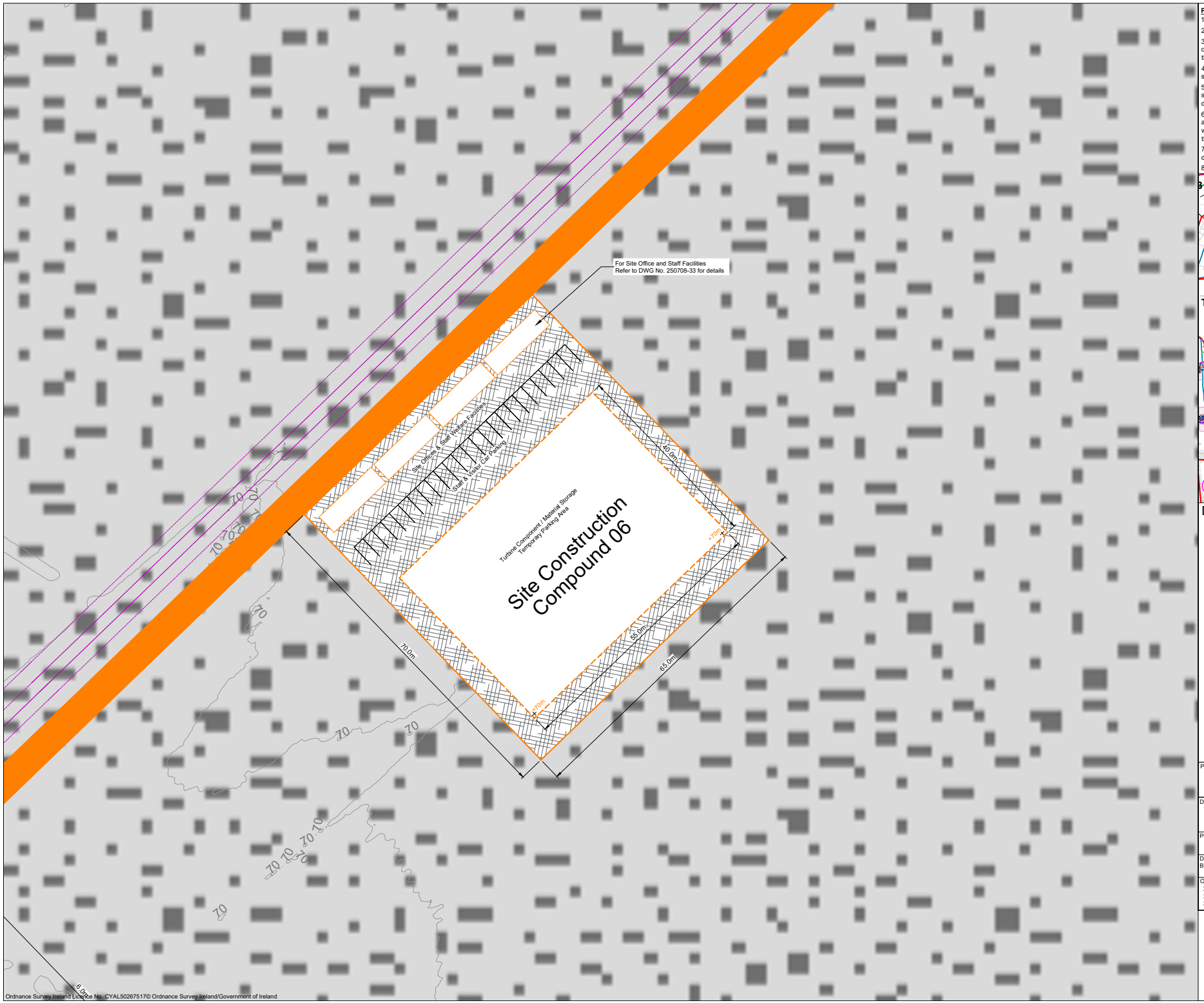
DRAWING TITLE:
Proposed Temporary Construction Compound 05

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-19	As Shown

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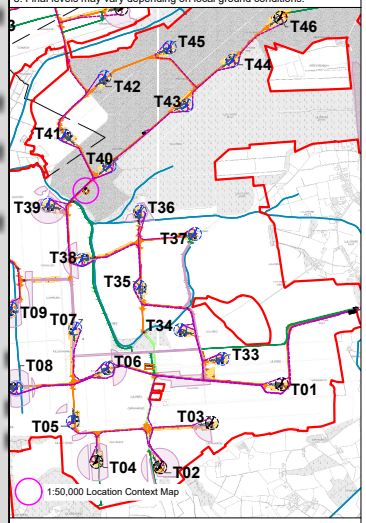
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Proposed Internal Access Road
- Proposed 33kV Underground Cable Route

N

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Proposed Temporary Construction Compound 06

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-20	As Shown

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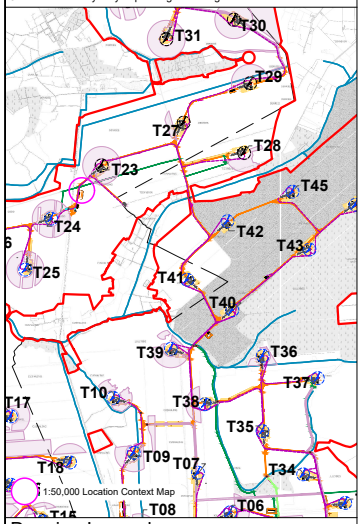
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Proposed Internal Access Road
- Proposed Amenity Track
- Proposed 33kV Underground Cable Route

N

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Proposed Temporary Construction Compound 07

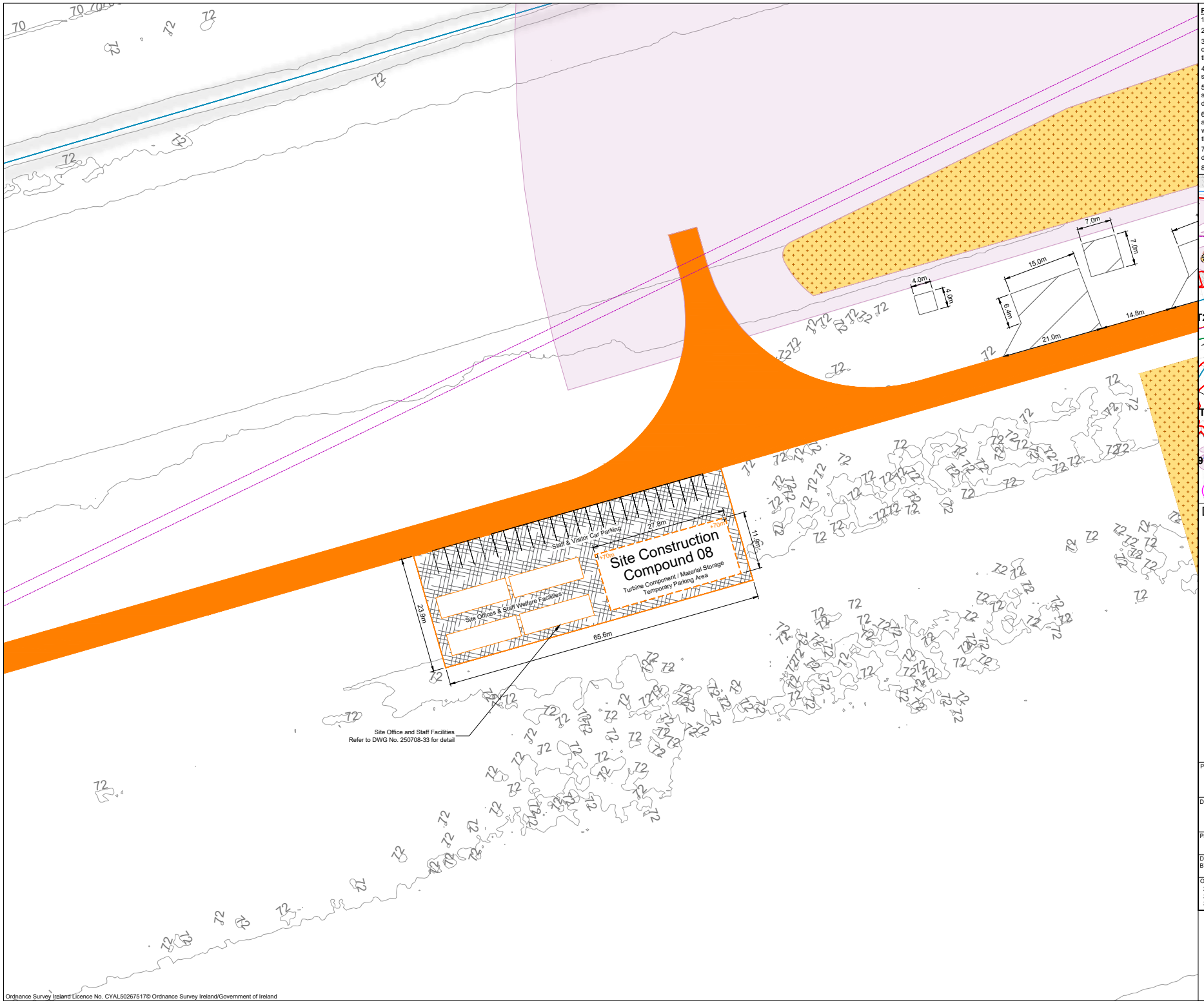
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250708	Figure 4-21	As Shown

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GO	RD	12.10.2026	P03

OS SHEET No.:
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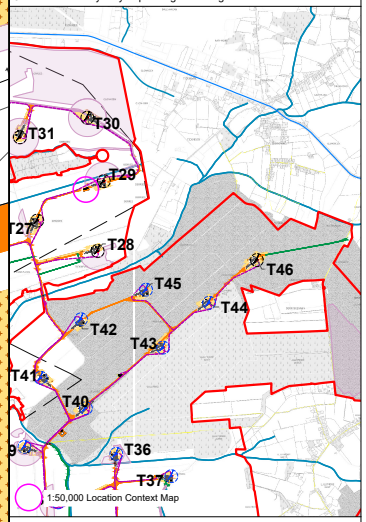
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Proposed Internal Access Road
- Proposed 33kV Underground Cable Route
- Proposed Hardstand
- Proposed Peat and Spoil Areas
- Proposed Enhancement Areas
- River/Stream

N

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Proposed Temporary Construction Compound 08

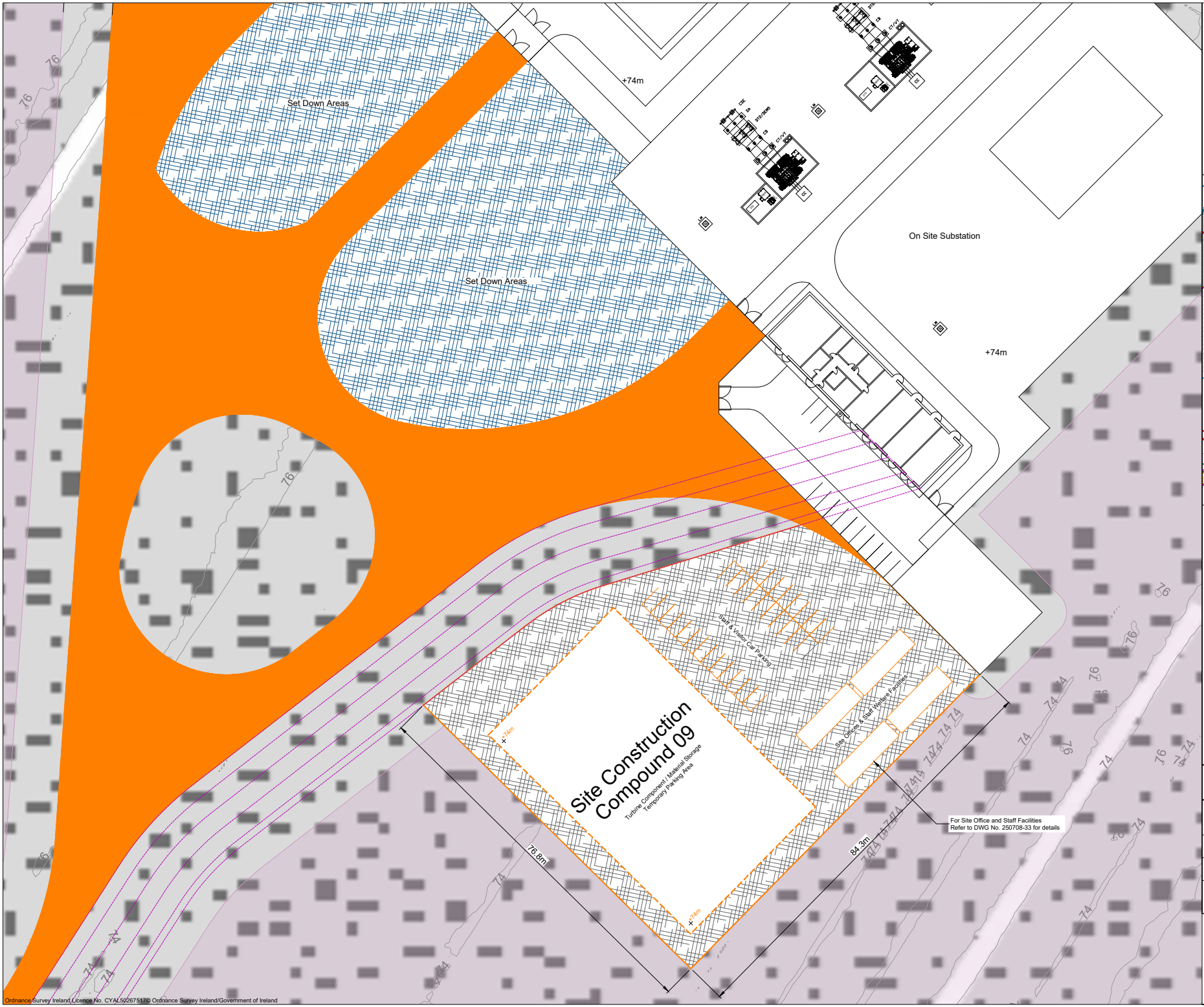
PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-22	As Shown

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GO	RD	12.10.2026	P03

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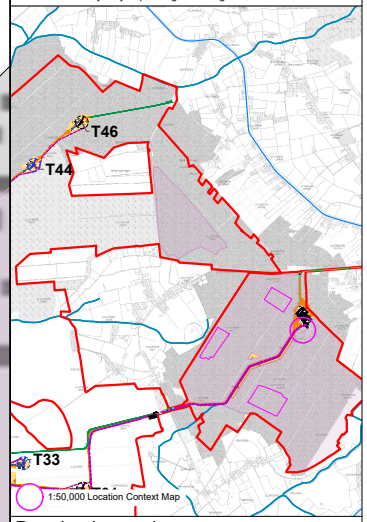
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Proposed Internal Access Road
- Proposed 33kV Underground Cable Route
- Proposed Enhancement Areas
- Set Down Area

N

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

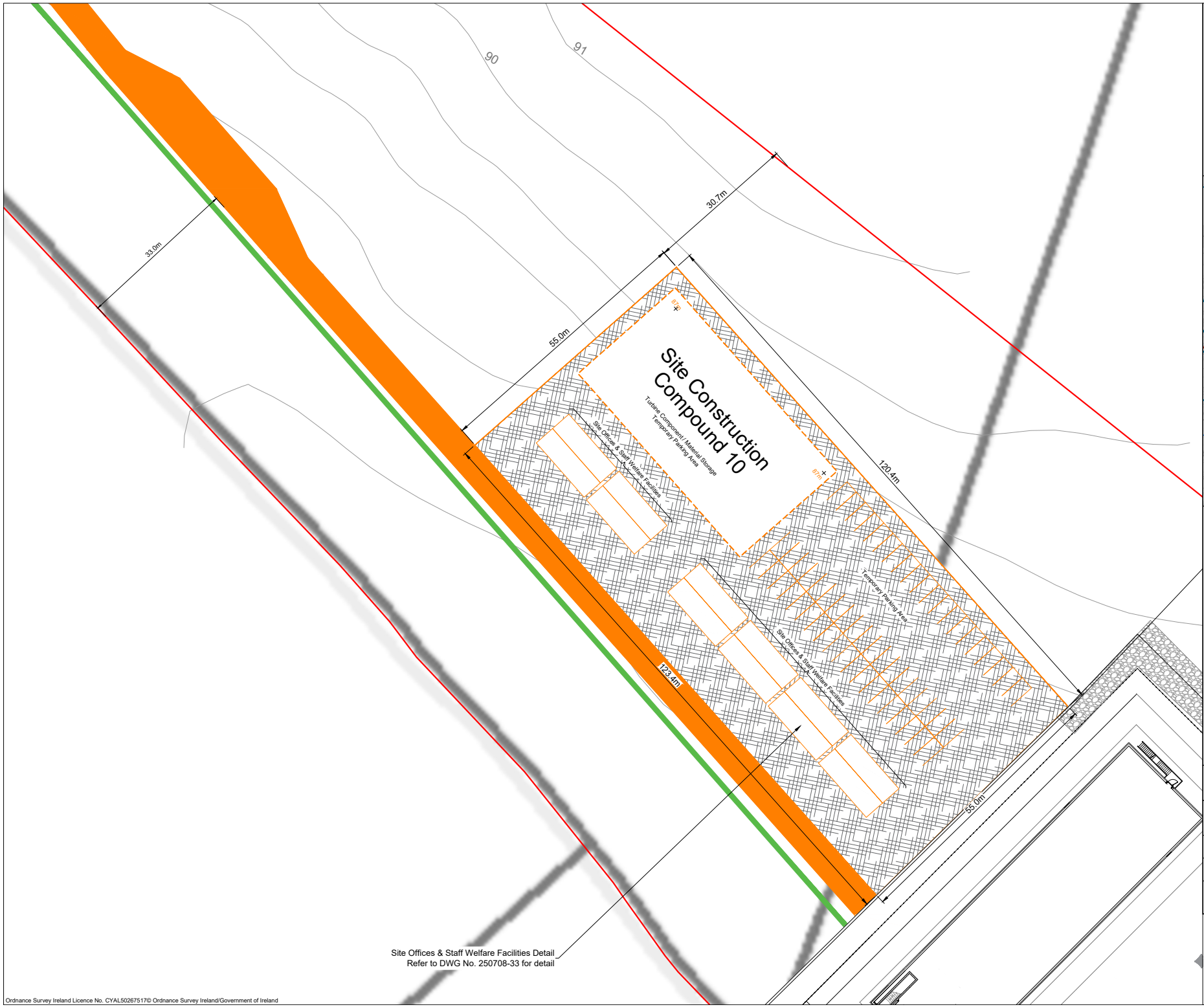
DRAWING TITLE:
Proposed Temporary Construction Compound 09

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-23	As Shown

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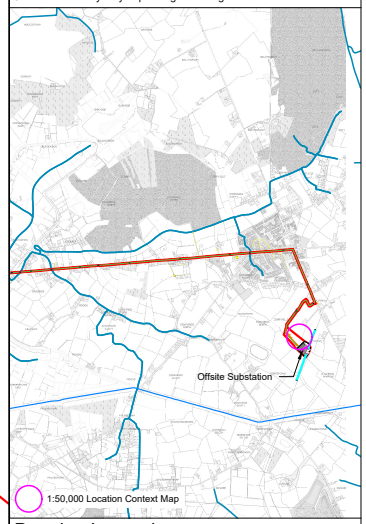
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Planning Application Boundary
- Proposed Internal Access Road
- Proposed 220kV Underground Cabling

N

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Proposed Temporary Construction Compound 10

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-24	As Shown

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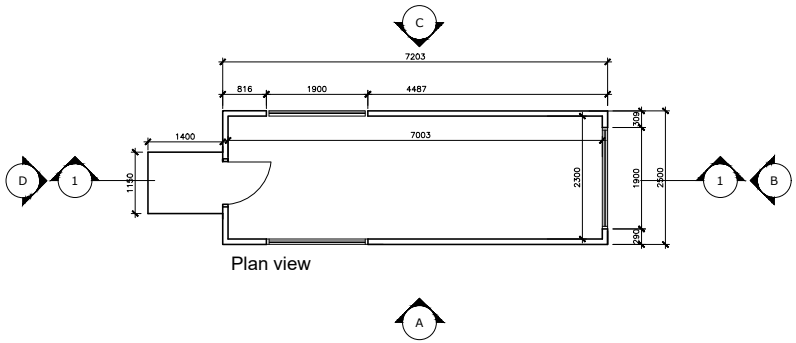
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Note:
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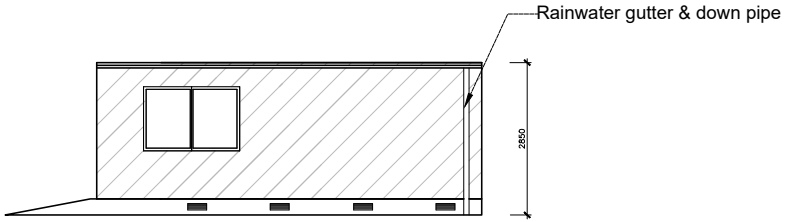
All dimensions to be checked on site and any discrepancy to be reported to the engineer.

Figured dimensions only to be used, drawings not to be scaled. If in doubt ask.

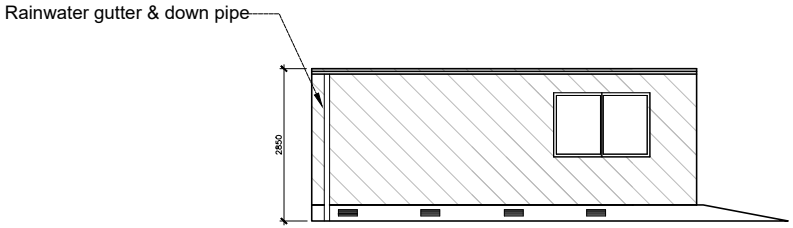
For illustration purposes only. Exact size and appearance of unit subject to manufacturer selection.



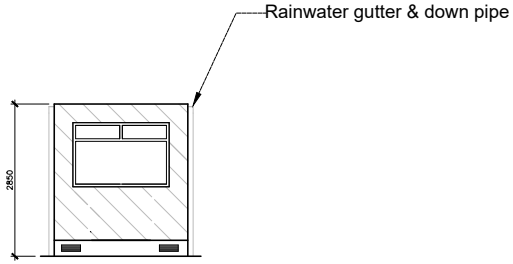
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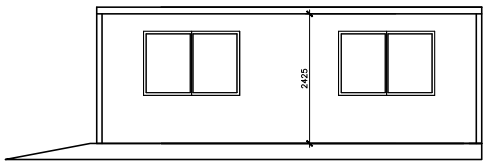
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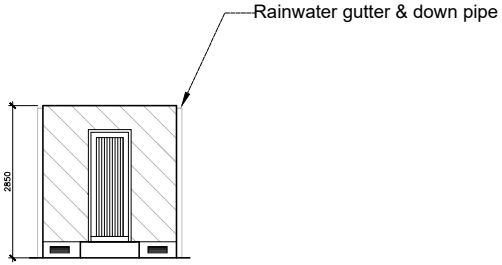
Elevation C



Elevation B



Section 1-1



Elevation D

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Security Hut Detail

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-25	As Shown

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4.4.1.7 Peat and Spoil Management Plan

4.4.1.7.1 *Quantities*

The approximate quantity of peat and non-peat material (spoil) requiring management on the Project Site has been calculated and is presented in Table 4-3 below. These quantities were calculated as part of the Peat and Spoil Management Plan in Appendix 4-3 of this EIAR.

Table 4-3 Approximate Peat and Spoil Volumes Requiring Management

Proposed Project	Peat Volume (m^3)	Spoil Volume (m^3)
46 no. Turbines and Hardstands	636,200	112,200
Access Roads (inc. turning heads and passing bays)	25,300	-
2 no. Meteorological Masts and 1 no. Relay Masts	1,900	600
10 no. Temporary Construction Compounds/ 10 no. Security Huts	-	-
Proposed Onsite Substation (and associated infrastructure)	67,900	12,000
Proposed Offsite Substation (and associated infrastructure)	1,500	13,300
Total	**732,800m^3**	**138,100m^3**
Total Peat and Spoil to be managed (m^3)		**870,900m^3**

Note, a factor of 20% (bulking factor of 15% and contingency factor of 5%) has been applied to the excavated peat and spoil volumes above to allow for expected increase in volume upon excavation and to allow for a variation in ground conditions across the Project Site.

4.4.1.7.2 *Peat and Spoil Areas*

Excess overburden will be generated through construction activities within the Project Site; this excess will be managed within peat and spoil areas, around hardstanding's, along access roads as shown in Figure 4-1. A detailed breakdown of the capacity of the Project Site to store peat and spoil is shown in Table 4-4 below and is further detailed in the Peat and Spoil Management Plan (Appendix 4-3).

Table 4-4 Project Site storage capacity

Location	Peat and Spoil Volume (m^3)	Comment
Peat placement adjacent to hardstand areas	864,000	Up to 1.5m in height and up to 50m wide corridor around all Proposed Turbine hardstands on the Proposed Wind Farm site. See drawings P2319-0600-0017 to 0020 for locations and extents.
Peat placement alongside designated access roads	135,500	Up to 1.5m in height and 20m wide corridor on both sides of proposed infrastructure elements

		onsite. See drawing P2319-0600-0024 for locations and extents.
Landscaping [1]	47,000	It is estimated that approximately 1,000m^3 of peat will be required for landscaping purposes at each of the 46 no. Proposed Turbine locations.
Total Volume	**1,046,500m^3**	

As identified in Table 4-4, the total volume of peat requiring management on site is estimated at 1,046,500m^3. Peat and spoil material will be excavated and deposited in the peat and spoil areas, with a total capacity volume of 864,000m^3. Peat and spoil material will also be placed within the dedicated peat and spoil areas, sidecast around hardstanding's and along access roads with gentle gradients. As such, there is enough capacity within the Project Site for the total volumes of peat and spoil requiring management for the Proposed Project as detailed in Table 4-4 above.

4.4.1.7.3 Stone Requirements

The volumes of stone required for the construction of the Proposed Project, outlined in Table 4-5 below, have been estimated based on the Proposed Project footprint, the anticipated excavation levels to suitable formation or suitable subgrade, and the proposed final levels for the infrastructure components. Construction grade granular fill and higher-quality, final surfacing fill will both be required for the construction of the Proposed Project.

Table 4-5 outlines the volumes of stone required for the construction of the Proposed Project.

Table 4-5 Granular Fill Volumes Required

Proposed Project	Stone Fill Required (m^3)
46 no. Turbines and Hardstands	637,200
Access Roads (including cabling)	454,000
Proposed Onsite Substation	163,900
Proposed Offsite Substation	55,250
2 no. Meteorological Masts and 1 no. Relay Masts	2,000
10 no. Temporary Construction Compounds/ 10 no. Security Huts	49,900
Car Parks	5,000
Totals (m^3) (including 10% contingency factor)	**1,367,250m^3**

Note: A contingency factor of 10% has been applied and is included in the crushed stone requirements volumes above to allow for a variation in ground conditions across the Project Site.

The locations of the peat and spoil areas are outlined in Figure 4-26 below. The cross sections of the peat and spoil areas is shown in the Site Layout Drawings in Appendix 4-1 and in Appendix 4-3 Peat and Spoil Management Plan.

As stated above it is anticipated that all construction material, including stone, will be sourced from local, authorised quarries. For the purposes of assessment within the EIAR, 9 no. existing, authorised

quarries, located within 20km of the Project Site have been selected and are shown in Figure 4-49. The proposed routes for heavy goods vehicles (HGVs) from each of the above identified quarries detailed in Section 4.5.2 below and in Section 15.1 of Chapter 15: Material Assets of this EIAR.

It is also envisaged that general construction traffic (including materials and staff) will travel to the Project Site via the public road network to the relevant site entrance, as detailed in Section 4.5.1 below.

666000

672000

726000

N

R441

Drumcooly

Ticknevin

80 m

110 m

86 m

R401

85 m

Killinagh
Lower

R414

Church Road

Church Road

82 m

85 m

72 m

80 m

dlawn Drive

Clonbullogue

R401

76 m

85 m

81 m

79 m

0 0.75 1.5 3 4.5 6

Kilometers

Legend

- Project Site
- Proposed Project Infrastructure Footprint
- Proposed Peat and Spoil Areas

Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

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SITE LOCATION - NOT TO SCALE

Drawing Title
Proposed Peat and Spoil Areas

Project Title
Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	4-26	1:65,000
Drawn By	Checked By	Date
TI	CJ	21/10/2026

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

4.4.1.8 Clear-Felled Forestry and Vegetation Removal with Associated Replanting

4.4.1.8.1 *Clear-Felled Forestry*

Clear-felled tree felling will be required within and around the Proposed Project footprint to accommodate the Proposed Enhancement Areas.

A total of 60.7ha of forestry (comprising conifer plantation (WD4)) will be permanently clear-felled within and around the Proposed Wind Farm site.

The felling activities required as part of the Proposed Project 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 Forest Service policy requires that planning permission for the Proposed Project is available prior to determination of the associated felling licence application. Where replacement afforestation is required by the Forest Service as part of the felling licence process, the replacement afforestation lands will also be subject to the applicable statutory forestry consent process.

The Forestry Service's Felling and Reforestation Policy provides for circumstances in which permanent forest removal may be permitted without a requirement for alternative afforestation, including where deforestation is justified by overriding environmental considerations and conversion to open habitat is necessary to benefit the habitat or species concerned. In the case of the Proposed Project, 60.7ha of permanent forestry removal will be felled to accommodate the ornithological offsetting and biodiversity enhancement (i.e., the Proposed Enhancement Areas) in Killina Bog. The applicability of this provision to the Proposed Project will ultimately be a matter for determination by the Forestry Service through the relevant felling licence process. Accordingly, the EIAR does not assume that an exemption will apply and, on a precautionary basis, assesses the position on the basis that replacement afforestation is required. Refer to Section 4.4.3 below and Chapter 6: Biodiversity and Appendix 6-5 for details.

Replacement Afforestation

In line with the Forest Service's published policy on felling 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 estimated 60.7ha that will be permanently clear-felled for the footprint of the Proposed Project will be replaced or replanted. 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 60.7ha hectares of forestry can occur anywhere in the State subject to licence. The replacement of forestry, felled as part of the Proposed Project, may occur on any lands, within the state, benefitting from Forest Service Technical Approval[5] for afforestation, should the Proposed Project 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 Habitats purposes).

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

The specific lands on which any such replacement afforestation would occur have not been identified at this stage. On a precautionary basis, the Applicant commits that, where replacement afforestation is required, the replacement afforestation lands will be located at least 10km from the Proposed Wind Farm and will not be located where there is a hydrological pathway through which the afforestation works could give rise to cumulative effects with the Proposed Project.

Further details in relation to clear-felled forestry replanting and cumulative assessment are included in Section 2.10.2.6 of Chapter 2: Background to the Proposed Project of this EIAR.

4.4.1.8.2 *Vegetation Removal*

As part of the Proposed Project, bog woodland (WN7) and scrub (WS1) will be required to be removed (hereafter referred to as vegetation removal) within and around the footprint of the Proposed Wind Farm and Proposed Onsite Substation and other ancillary infrastructure and Proposed Enhancement Areas.

The estimated 176ha of vegetation to be removed within and around the Proposed Project, along with existing treeline boundaries is not subject to a Felling Licence from the Forestry Service and will be replanted within the Proposed Wind Farm site as part of the Proposed Enhancement Areas. Please see Section 4.4.3 below and Chapter 6: Biodiversity and Appendix 6-5 for details.

4.4.1.9 Amenity Tracks and Carparks

The Proposed Project includes 55.2 km of amenity track. This includes:

- 13.4km of a new dedicated internal amenity access track
- 40km of proposed internal site access road
- 8.5km equestrian loop for equestrian users only – this loop will overlap with proposed internal site access road (40km) for approximately 7.5km
- 0.844km (844m) of amenity board walk

These amenity tracks will provide amenity access opportunities, facilitate a variety of walking loops, enhance connectivity with local roads and existing off-site amenities, and provide local access to the Proposed Wind Farm. The amenity track proposed will enable the Proposed Wind Farm to provide connectivity to the surrounding settlements and sites / areas of interest. These include the towns / villages of Edenderry, Allenwood, Lullymore, Rathangan and Clonbullogue.

The Amenity Plan for the Proposed Project includes several waymarked trails of different lengths along the proposed internal site access roads and proposed dedicated internal amenity track, ranging in distance, which will accommodate walkers and other amenity users (including equestrian users); a dedicated equestrian track will also be supplied as part of the Proposed Wind Farm. The amenity access tracks have been designed to be looped and tie in with the network of existing onsite tracks and proposed internal site access to minimise disturbance to wildlife and the peatland. The proposed amenity access tracks will include for 9 no. waymarked circular walking trails ranging from 1.3km to 21km and will enable connections to neighbouring sites of interest including Killinthomas Wood (to the south), the Grand Canal (to the North) and Cloncreen Wind Farm (to the west).

Approximately 55.2km of amenity access track in total (inclusive of dedicated amenity track, internal access road, equestrian amenity track, and boardwalk), for walking, cycling and equestrian use is proposed within the Proposed Wind Farm.

The 13.4km of new dedicated internal amenity access track and 1km of dedicated equestrian amenity track will have a gravel/crushed stone finish surface and will be approximately 3m in width and will be constructed using a similar methodology to the proposed new roads as outlined in Section 4.9.1.2 below. The 0.844km of amenity boardwalk will be supported on timber piles and be approximately 3m

in width; the construction methodology is outlined in Section 4.9.1.6 below. The Ballydermot Wind Farm Amenity Map is included as Appendix 4-2 and is shown in Figure 4-27 below.

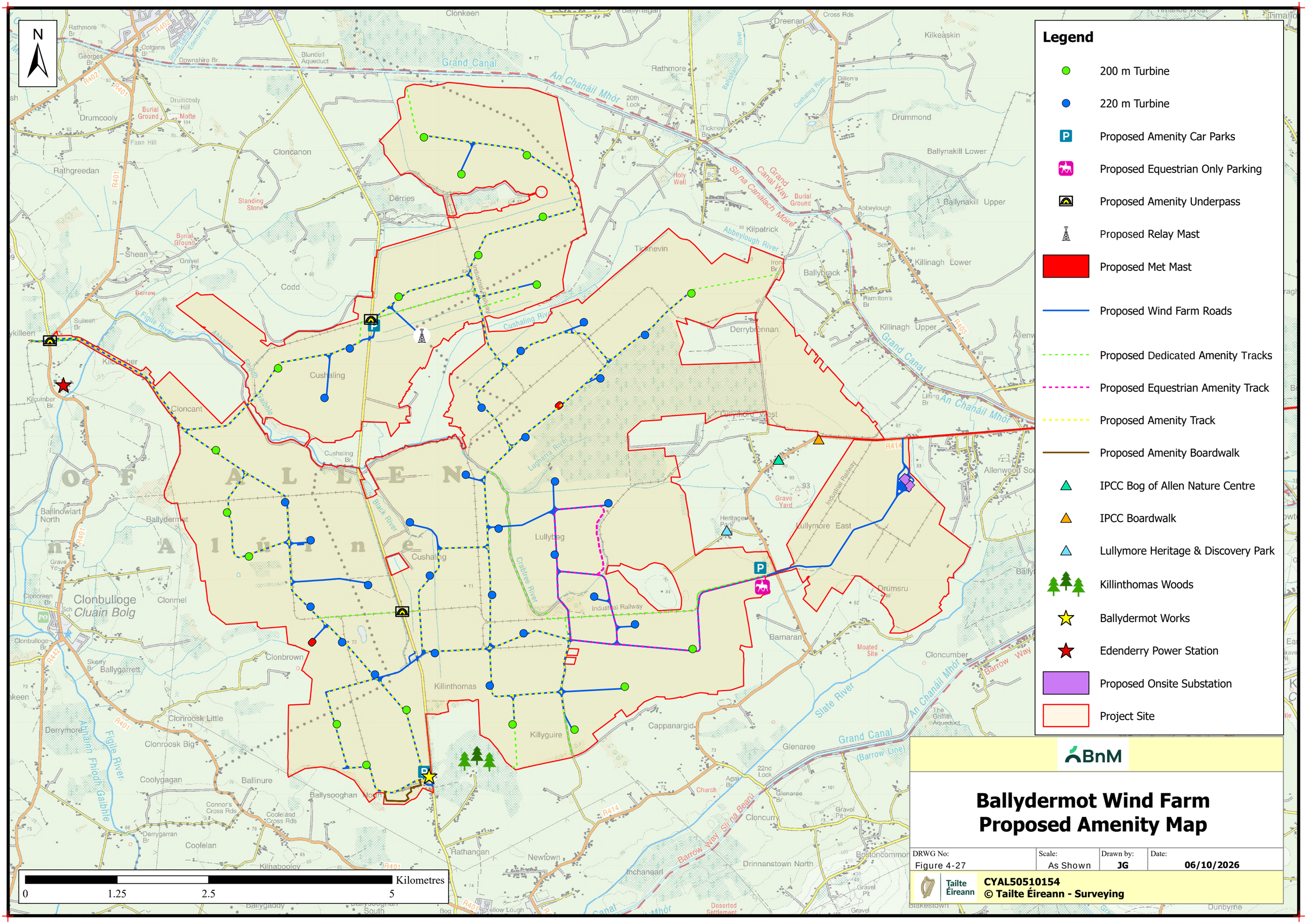
In addition to the new dedicated internal amenity access tracks, 4 no. new permanent amenity car parks will be provided. The proposed car parks will be accessible via the site access junctions which are detailed in Table 4-7 below). The location and configuration of the proposed car parks are shown in Appendix 4-1. Further detail on the amenity car parks is outlined in Table 4-6 below.

Table 4-6 Amenity Car Parks

Amenity Car Park	Location	Relevant Site Entrance*	Configuration
Amenity Car Park 1	East of the L1001 within the Glashabaun North Bog	Site Entrance 4G	› 15 no. spaces for private vehicles › 3 no. spaces for accessible parking › 1 no. parking spaces for buses.
Amenity Car Park 2	Barnaran Bog off the R414	Site Entrance 5I	› 44 no. spaces for private vehicles › 3 no. spaces for accessible parking, › 1 no parking spaces for buses
Amenity Car Park 3	Ballydermot works to the southeast of the Ballydermot South Bog	Site Entrance 2B	› 58 no. spaces for private vehicles › 3 no. spaces for accessible parking › 1 no parking spaces for buses
Amenity Car Park 4	Barnaran Bog off the R414	Site Entrance 5I	› 15 no. spaces for private vehicles & horse boxes › 3 no. spaces for accessible parking, › 1 no parking spaces for buses

**Refer to Table 4-7 below for all details relating to the Project Site access junctions and site entrances*

Each car park will also provide bicycle rack facilities for those who want to cycle to the area and then utilise the amenity track for walking.


N
Legend
200 m Turbine
220 m Turbine
Proposed Amenity Car Parks
Proposed Equestrian Only Parking
Proposed Amenity Underpass
Proposed Relay Mast
Proposed Met Mast
Proposed Wind Farm Roads
Proposed Dedicated Amenity Tracks
Proposed Equestrian Amenity Track
Proposed Amenity Track
Proposed Amenity Boardwalk
IPCC Bog of Allen Nature Centre
IPCC Boardwalk
Lullymore Heritage & Discovery Park
Killinthomas Woods
Ballydermot Works
Edenderry Power Station
Proposed Onsite Substation
Project Site
Kilometres
0
1.25
2.5
5
O F A L L E N
Grand Canal
An Chanáil Mhór
Grand Canal Way
Sli na Canalach Moire
Cushaling River
Abbeylough River
Slate River
Barrow Way
Industrial Railway
Clonkeen
Rathmore
Dreenan
Kilkeaskin
Drumcooly
Cloncanon
Rathgreedan
Derries
Shean
Codd
Cushaling
Cloncant
Tickincvin
Derrybrennan
Killinagh Upper
Killinagh Lower
Ballynakill Lower
Ballynakill Upper
Ballybrack
Drummond
Lullymore West
Lullymore East
Lullybeg
Killinthomas
Killyguire
Cappanargid
Barnaran
Glenaree
Cloncurry
Clonbulloge
Clonbrown
Clonroosk Little
Clonroosk Big
Derrymore
Coolygagan
Ballinure
Ballysooghan
Coolelan
Rathangan
Newtown
Inchanaarl
Drinnanstown North
Bostoncommon
Cloncumber
Ballydermot
Ballinowlart North
Clonmel
Skerry
Ballygarrett
Kilcumber
Suileen
Figile River
Black River
Crabtree River
Lugnera River
Ballyhagan
Dillon's Br
Hamilton's Br
Abbeylough Br
Ticknevin Br
Holy Well
Standing Stone
Burial Ground
Motte
Gravel Pit
Barrow
Grave Yard
Heritage Park
Moated Site
Church
Deserted Settlement
Yellow Lough
Bog
Ballygaddy
Ballysooghan South
Drumsru
Allenwood South
Dunbyrne
Blakestown
Gravel
Tailte Éireann
CYAL50510154
© Tailte Éireann - Surveying
BnM
Ballydermot Wind Farm
Proposed Amenity Map
DRWG No:
Figure 4-27
Scale:
As Shown
Drawn by:
JG
Date:
06/10/2026

4.4.1.10 Relay Mast

Chapter 15 of the EIAR provides a detailed impact assessment on traffic and transport, telecommunications, and other material assets. Section 15.2 in Chapter 15: Material Assets details the proposed telecommunication impacts associated with the Project Site. During detailed telecommunication scoping in July 2020 and again in March 2025, the latter consultation identified that there are 3 no. Virgin Media links traversing the Project Site, which have the potential to interact with the Proposed Turbine locations. Ai Bridges was commissioned to carry out a detailed telecommunications impact assessment (Appendix 15-8). A relay mast was proposed to mitigate any potential impacts caused by the Proposed Turbines on Virgin Media radio links. The relay mast will be 60m in height and will have appropriately 2 no. antennae. Figure 4-28 illustrates the location of the proposed relay mast in the northwest of the Proposed Wind Farm. The proposed relay mast will relay 3 no. impacted Virgin Media links (detailed below) from Dunmurry Hill onwards to each of the B-End sites (customer sites). The radio links from Dunmurry Hill to the following B-End sites would be impacted by the Proposed Turbines:

- VM_L2
- VM_L5
- VM_L6

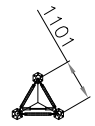
The path profiles and link budgets completed for each radio link indicates that a relay mast at the proposed location will be used to mitigate any impacts to the Virgin Media links.



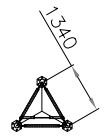
Figure 4-28 Location of the proposed relay mast which could be used to relay links VM_L2, VM_L5 and VM_L6 (Source: Appendix 15-8 Ballydermot Wind Farm Telecommunications Impact Assessment Report, Figure 22)

Refer Figure 4-29 below for further details on the proposed relay mast and Chapter 15, Section 15.2.7 for further detail on potential impacts of the Proposed Turbines on telecommunication links.

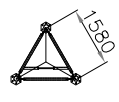
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BS EN 10219 S355J2H



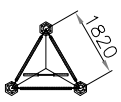
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LEG 139.7 O.D x 4 C.H.S.
BRACE: 48x3 CHS
BS EN 10219 S355J2H



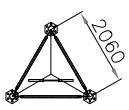
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BRACE: 48x3 CHS
BS EN 10219 S355J2H



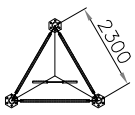
SECTION "D"
LEG 139.7 O.D x 6 C.H.S.
BRACE: 60.3x3 CHS
BS EN 10219 S355J2H



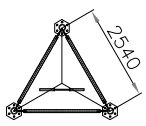
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BRACE: 60.3x4 CHS
BS EN 10219 S355J2H



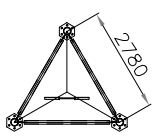
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BS EN 10219 S355J2H



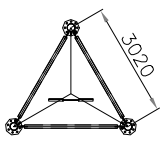
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BS EN 10219 S355J2H



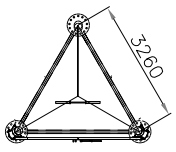
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BRACE: 76.1x5 CHS
BS EN 10219 S355J2H



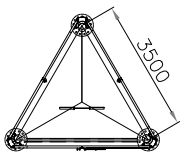
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BS EN 10219 S3552H

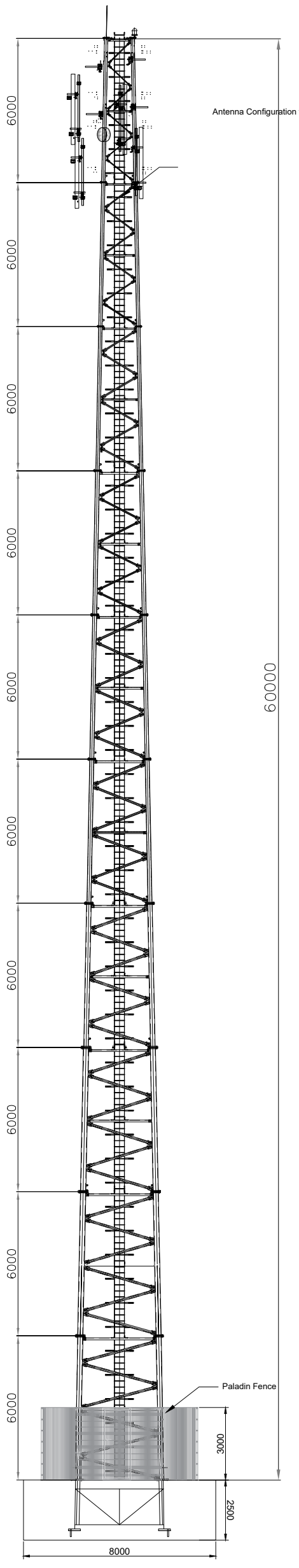


SECTION "-C"
LEG 193.7 O.D x 10 C.H.S.
BRACE: 88.9x4 CHS
BS EN 10219 S355J2H



SECTION "-D"
LEG 193.7 O.D x 12.5 C.H.S.
BRACE: 88.9x5 CHS
BS EN 10219 S355J2H





NOTES:

1. Mast /foundation orientation to be confirmed with relay mast supplier
2. Earthing and ducting requirements to be confirmed with relay mast supplier and forwarded to foundation designer

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare			
DRAWING TITLE: Proposed Relay Mast			
PROJECT No.: 250708		DRAWING No.: Figure 4-29	SCALE: As Shown
DRAWN BY: GO	CHECKED BY: RD	DATE: 23.10.2026	REVISION.: P03

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

4.4.1.11 Watercourse Crossings

4.4.1.11.1 *Bridge Crossings*

Within the Proposed Wind Farm, there are a total of 15 no. watercourse crossing locations over natural watercourses (rivers and streams).

There are 5 no. new crossing points and 10 no. crossing points which will be upgraded as part of the Proposed Wind Farm. Of the 10 no. crossing points for upgrade, 5 no. will be upgraded with clear span bridges, and 5 no. are culverts which will be upgraded via a box, bottomless or pipe culvert, see Section 4.9.1.7 below.

There are two proposed crossing locations over the Figile River, and both will be constructed as clear-span crossings. Existing bridges are currently in place at these locations; these will be dismantled and replaced as part of the Proposed Wind Farm.

All water crossing locations are outlined below:

- **Proposed Wind Farm Crossing 1** (X665801, Y723274): Existing crossing to be removed and a box culvert / bottomless culvert / pipe to be constructed
- **Proposed Wind Farm Crossing 2** (X665762, Y723344): Proposed new crossing via box culvert / bottomless culvert / pipe
- **Proposed Wind Farm Crossing 3** (X665579, Y723922): Existing crossing, no structural upgrade necessary to existing crossing to facilitate amenity track.
- **Proposed Wind Farm Crossing 4** (X663544, Y726783): Existing crossing to be demolished and replaced with a clear span bridge
- **Proposed Wind Farm Crossing 5** (X661271, Y727618): Existing crossing, no structural upgrade necessary to existing crossing facilitate proposed upgrades to access road
- **Proposed Wind Farm Crossing 6** (X661437, Y 727522): Existing crossing, no structural upgrade necessary to existing crossing facilitate proposed upgrades to access road
- **Proposed Wind Farm Crossing 7** (X666745, Y727788): Existing crossing to be demolished and replaced with a clear span bridge
- **Proposed Wind Farm Crossing 8** (X666820, Y 725833): Existing crossing, no structural upgrade necessary to existing crossing to facilitate amenity track.
- **Proposed Wind Farm Crossing 9** (X666785, Y725833): Proposed new crossing via clear span bridge / bottomless culvert
- **Proposed Wind Farm Crossing 10** (X667679, Y 725577): Proposed new crossing via clear span bridge / bottomless culvert
- **Proposed Wind Farm Crossing 11** (X667101, Y725097): Proposed new crossing via clear span bridge / bottomless culvert
- **Proposed Wind Farm Crossing 12** (X667755, Y724102): Existing culvert to be upgraded
- **Proposed Wind Farm Crossing 13** (X668331, Y724421): Existing culvert to be upgraded
- **Proposed Wind Farm Crossing 14** (X666087, Y724945): Existing culvert to be removed and a box culvert / bottomless culvert / pipe to be constructed
- **Proposed Wind Farm Crossing 15** (X666167, Y724791): Proposed new crossing via box culvert / bottomless culvert / pipe

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. Refer to Figure 4-1 for the location of the proposed clear-span crossings, Figure 4-57 to Figure 4-58C for the design details and Section 4.9.1.7 for the construction methodology.

4.4.1.11.2 *Culvert Crossing*

All new proposed culverts and proposed culvert upgrades at watercourse crossings and 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 must be taken from one side of an existing roadway to the other for discharge. The size of the 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 4.9.1.8 below. All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Refer to Figure 4-58a to Figure 4-58c below for design details.

4.4.2 Proposed Grid Connection

The Proposed Grid Connection will facilitate the connection of the Proposed Wind Farm to the national grid. The Proposed Grid Connection is comprised of the Proposed Onsite Substation, Proposed Offsite Substation, the 13.1km underground cabling connection from the Proposed Onsite Substation to the Proposed Offsite Substation, and overhead line (OHL) connecting to the existing Maynooth-Dunstown 220kV OHL, and all ancillary works and apparatus.

The Proposed Grid Connection underground 220kV electrical cabling route will exit the Proposed Onsite Substation via the proposed internal access track onto the R414, and will comprise then HDD at 1 no. location, i.e., beneath the Grand Canal west of the Shee Bridge, before and continuing along the R403 through Allenwood, and turn south along the L6002 at Prosperous to connect to the Proposed Offsite Substation in the townland of Killybegs, Co. Kildare.

4.4.2.1 Electricity Substation

4.4.2.1.1 *Proposed Onsite Substation*

It is proposed to construct a 220 kV electricity substation within the Proposed Wind Farm, as shown in Figure 4-1. The Proposed Onsite Substation is located in the eastern section of the Proposed Wind Farm, in the northeast of Lodge Bog, Co. Kildare, in the townland of Lullymore East.

The Proposed Onsite Substation will be permanently connected to the Transmission System Network and will become a permanent ESB Network Asset. The construction and detailed design of electrical equipment in the Proposed Onsite Substation will be to ESB/EirGrid network specifications and will be under the operation and ownership of the Transmission System Operator (TSO) / Transmission Asset Owner (TAO) EirGrid or ESB Networks (ESBN).

Access to the Proposed Onsite Substation will be via a new entrance off the R414 regional road, Site Entrance 6L as delineated in Table 4-7 below. Access to the R414 regional road is via the R403 and R415 which run along the eastern boundary of the Project Site. Refer to Section 4.5.1 below for detail on site entrances for the Proposed Project. This site entrance location will facilitate EirGrid/ESB access during the operational phase of the Proposed Project and beyond.

Upon decommissioning of the Proposed Wind Farm, the Proposed Grid Connection infrastructure, inclusive of the Proposed Onsite Substation, will form part of the national grid infrastructure and operate in perpetuity as part of Transmission System and ESBN assets and will remain insitu. The assets transferred to ESBN will not form part of the decommissioning works.

The footprint of the Proposed Onsite Substation compound measures approximately 25,615m^2. The Proposed Onsite Substation will include 1 no. 220kV Gas-Insulated Substation (GIS) building, 1 no. 110kV GIS building, one control building, a 36m telecom tower (Figure 4-40) and the electrical components necessary to consolidate the electrical energy generated by each Proposed Turbine and export that electricity from the Proposed Wind Farm to the national grid. The building will consist of a two-storey modular building housing the substation elements, and the whole compound will be enclosed within palisade fencing. The layouts, and elevations of the Proposed Onsite Substation are shown on Figure 4-30 to Figure 4-34. Further details regarding the connection of the Proposed Onsite Substation to the national electricity grid are provided in Section 4.9.2.1 below.

It is proposed to install 1 no. bored well adjacent to the Proposed 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 (subject to final design). See Section 4.9.2.2 for details on the construction methodology of the bored well.

The Proposed Onsite Substation compound will be surrounded by an approximately 2.6m high steel palisade fence as shown in Figure 4-39 (or as otherwise required by ESB/EirGrid). The construction and exact layout of electrical equipment in the onsite electricity substation will be to ESB/EirGrid networks specifications.

The Proposed Grid Connection underground electrical cabling will exit the Proposed Onsite Substation and connect into the Proposed Offsite Substation via 13.1km of underground cabling (220kV) primarily located within the public road corridor.

4.4.2.1.2 Proposed Offsite Substation

It is proposed to construct the Proposed Offsite Substation within the Project Site, as shown in Figure 4-1 and Figure 4-3. The Proposed Offsite Substation is located within an agricultural field east of the Proposed Wind Farm, in the townland of Killybegs, Co. Kildare.

The Proposed Offsite Substation will be permanently connected to the Transmission System Network and will become a permanent ESB Network Asset. The construction and detailed design of electrical equipment in the Proposed Offsite Substation will be to ESB/EirGrid network specifications and will be under the operation and ownership of the TSO/ TAO EirGrid or ESBN. Access to the Proposed Offsite Substation will be from a new entrance off the L6002 local road (Site Entrance 7M), please see Table 4-7 below for further detail. Access to the L6002 local road is via the R403 and R408 which run to the north of the Proposed Offsite Substation. Please see Section 4.5.1 below for detail on site entrances for the Proposed Project. This site entrance location will facilitate EirGrid/ESB access during the operational phase of the Proposed Project and beyond.

The footprint of the Proposed Offsite Substation compound measures approximately 9,307m^2. The Proposed Offsite Substation will include 1 no. 220kV GIS building, a 36m telecom tower (Figure 4-40), 2 no. steel masts, and 2 no. new gantry structures and all ancillary apparatus. The building will consist of a two-storey modular building housing the substation and the compound will be enclosed within palisade fencing.

The layouts, and elevations of the Proposed Offsite Substation are shown on Figure 4-35 to Figure 4-38. Further details regarding the connection of the Proposed Offsite Substation to the national electricity grid are provided in the following sections.

Upon decommissioning of the Proposed Wind Farm, the Proposed Grid Connection infrastructure, inclusive of the Proposed Offsite Substation, will form part of the national grid infrastructure and operate in perpetuity as part of Transmission System and ESBN assets and will remain insitu. The assets transferred to ESBN will not form part of the decommissioning works.

The Proposed Offsite Substation compound will be surrounded by an approximately 2.6m high steel palisade fence as shown in Figure 4-39 (or as otherwise required by ESB/EirGrid). The construction and exact layout of electrical equipment in the onsite electricity substation will be to ESB/EirGrid networks specifications.

As part of the works for the Proposed Offsite Substation, the existing Maynooth-Dunstown 220kV OHL will be broken between tower 46 and 47 and 2 no. loop-in towers will be built to turn the existing OHL into 2 no. new gantry structures within the footprint of the Proposed Offsite Substation. The existing Maynooth-Dunstown 220kV OHL is located approximately. 0.05km southeast of the Proposed Offsite Substation at its closest point.

It is proposed to install 1 no. bored well adjacent to the Proposed Offsite Substation in accordance with the IGI, 2007. Please see Section 4.9.2.2 for details on the construction methodology of the bored well.

4.4.2.1.3 *Wind Farm Control Building*

There are 2 no. wind farm control buildings, 1 no. is located within the Proposed Onsite Substation, and 1 no. is located within the Proposed Offsite Substation. The wind farm control buildings will include staff welfare facilities during the operational phase. Toilet facilities will be installed with a low-flush cistern and low-flow wash basin. Due to the specific nature of the Proposed Project, there will be a requirement for occasional toilet flushing and hand washing and therefore the water requirement of the Proposed Project is minimal and does not necessitate a potable source.

It is proposed to manage wastewater from the staff welfare facilities in the control buildings by means of a sealed storage tank, measuring 9m^2 in area, and approximately 2m in depth, with a holding capacity of 1,000 litres. All wastewater will be tankered off site by an appropriately licensed waste collector to wastewater treatment plants. It is not proposed to treat wastewater on site, and therefore the EPA's 2009 *'Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses'* (EPA, 2009) and the EPA's 1999 manual on *'Treatment Systems for Small Communities, Business, Leisure Centres and Hotels'* does not apply.

Such a proposal for managing the wastewater arising on site has become standard practice on wind farm sites, which are often proposed in areas where finding the necessary percolation requirements for on-site treatment would be challenging and has been accepted by numerous Planning Authorities and ACP 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 will 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 wind turbines, wind measurement devices and electricity substations that will be monitored remotely 24 hours per 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 Project Site. When the final destination of the materials is known following the appointment of a permitted contractor, this information can be submitted to the Planning Authority if necessary.

4.4.2.2 Underground 220kV Electrical Cabling

It is proposed to connect the Proposed Onsite Substation to the Proposed Offsite Substation in the townland of Killybegs, Co. Kildare via 220kV underground electrical cabling. The underground

electrical cabling route, illustrated in Figure 4-3, is approximately 13.1km in length and located primarily within the public road corridor, with two sections of the route (0.5km and 1km) located in private lands.

The underground electrical cabling route will originate at the Proposed Onsite Substation and travel approximately 0.5km north on internal site access roads to exit the Proposed Wind Farm site onto the R414. The underground electrical cabling route will travel east on the R414 for approximately 2.1km to approximately 0.2km west of the Shee Bridge. The Proposed Grid Connection underground electrical cabling route will utilise HDD to cross the Grand Canal and will not interact with the Shee Bridge. Following the HDD crossing of the Grand Canal, the route will merge onto the R403 and continue east for approximately 8.7km where the route will turn right onto the L6002 local road. The Proposed Grid Connection underground electrical cabling route will travel south on the L6002 for 0.8km before turning right into Site Entrance 7M and into private agricultural land. Approximately 1km of proposed new access road will enable the Proposed Grid Connection underground electrical cabling route to access the Proposed Offsite Substation in the townland of Killybegs, Co. Kildare.

The methodology for construction of the Proposed Grid Connection underground electrical cabling is presented in Section 4.9.2.3 below. The underground electrical cabling route is illustrated in Figure 4-1 and Figure 4-3. The cross section of the Proposed Grid Connection 220kV underground electrical cabling trench is shown in Plate 4-11 below.

The exact final detail and specifications of the Proposed Grid Connection underground electrical cabling route construction methodology for the Proposed Project will ultimately be decided by ESB/EirGrid.

4.4.2.3 Overhead Line 220kV Electrical Cabling Route

A 220kV connection between the Proposed Project and the national electricity grid will be necessary to export electricity from the Proposed Project. It is proposed to construct the Proposed Offsite Substation within the Project Site and to connect this to the existing Maynooth-Dunstown 220kV OHL via an OHL connection in the townland of Killybegs, Co. Kildare. The location of the Proposed Grid Connection OHL cabling is detailed in Figure 4-1 and Figure 4-3 above.

The Proposed Grid Connection will consist of approximately 0.12km of OHL (comprising 0.06km of OHL from the proposed 2 no. steel masts for the loop-in from the Proposed Offsite Substation to the existing OHL), consisting of 2 no. new steel masts, and 2 no. new gantry structures. The location of the 2 no. new proposed steel masts are shown on Plate 4-3 below.

The proposed design for the Proposed Grid Connection will require two new mast structures which will be constructed under the existing Maynooth-Dunstown 220kV OHL. The existing transmission line will be broken between two existing towers (Tower 46 and Tower 47) into 2 no. new steel masts which will connect to the 2 no. new gantry structures located within the Proposed Offsite Substation. Please see the locations of the 2 no. new steel masts and 2 no. new gantry structures on Plate 4-3 below.

Each new steel mast will have a footprint of approximately 20m^2 and an overall height of approximately 28.5m. They will be steel masts with cross-arms which can extend over the base footprint and internal bracing. The exact final detail and specifications, height and size of the Proposed Grid Connection will ultimately be decided by ESB or EirGrid. The indicative design of the proposed lattice masts to facilitate the Proposed Grid Connection is shown in Plate 4-4 below.

Each new gantry structure will have a footprint of approximately 20m^2 to be confirmed at detailed design stage to the acceptance of EirGrid/ESBN.

Please see Section 4.9.2 below for the indicative detail on the proposed construction methodology to facilitate the connection of the Proposed Wind Farm to the national grid via the existing Maynooth-Dunstown 220kV OHL.



Plate 4-3 Indicative position of the masts and gantries (for visual purposed only). Source: BnM

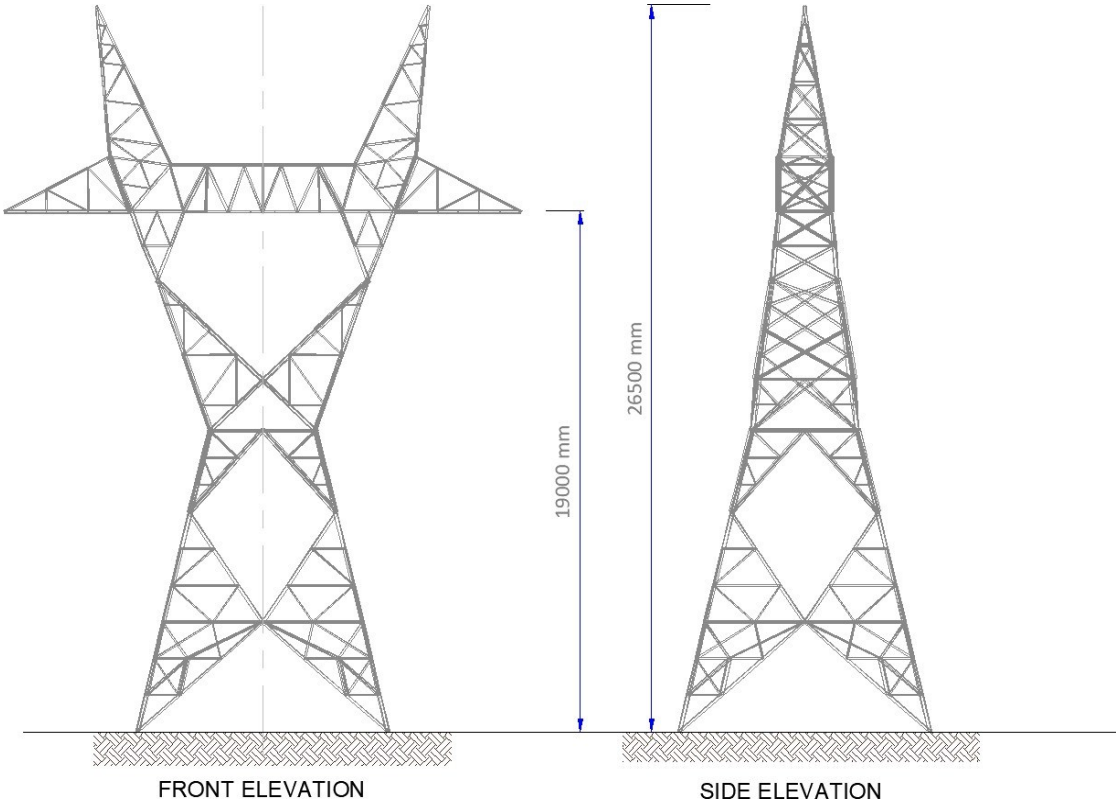


Plate 4-4 220kV Towers. Source: BnM

4.4.2.4 Joint Bays

There are approximately 18 no. joint bays proposed along the Proposed Grid Connection underground electrical cabling route, approximately 600 to 900 metres apart or as otherwise required by ESBN and electrical requirements, with the final number and type to be determined at detailed design stage.

The proposed joint bays and the associated location within the public road network are outlined below:

- 4 no. joint bays proposed within the R414 Regional Road;
- 13 no. joint bays proposed along the R403 Regional Road;
- 1 no. joint bay proposed along the L6002 Local Road.

Please see Section 4.9.2.5 below for joint bay construction methodology. Please see Figure 4-59 for details.

4.4.2.5 Rural (Local) Electricity Supply

A rural/local electricity supply will be required as a back-up power supply to the proposed substations for light, heat and power purposes. The rural/local supply will be designed and constructed by ESB Networks. The exact source of supply is to be confirmed by ESB Networks; however, the supply will enter the Project Sites by either MV overhead line or MV cable. The rural/local supply will have an associated step-down transformer (i.e., MV to LV) and will enter the substation building by underground cable and terminate onto the control buildings AC distribution boards.

4.4.2.6 Telecommunications Towers

As part of the Proposed Grid Connection, there will be 1 no. telecommunication towers proposed at both the Proposed Onsite Substation and at the Proposed Offsite Substation and the telecommunications towers serve to provide as a communication link during the operational stage and to relay data between the Proposed Project and external monitoring/management stations. The towers will be free-standing structure of 36m in height and will be constructed on a hard-standing area measuring approximately 13m by 13m to accommodate the crane that will be used to erect the mast, adjacent to proposed roads. The indicative design of the proposed telecommunications towers is shown in Figure 4-40 below.

4.4.2.7 Watercourse and Service Crossings

The Proposed Grid Connection underground cabling route includes a total of 11 no. watercourse crossings (7 no. crossings over EPA mapped watercourses, 1 no. crossing under the Grand Canal and an additional 3 no. crossings over non-EPA mapped watercourses). These crossings are detailed below in Section 4.9.2.7 and comprise predominantly of existing bridge/culvert crossings along the public road network. There is 1 no. new proposed crossing immediately west of Shee Bridge by HDD under the Grand Canal.

The construction methodology for all Proposed Grid Connection underground electrical cabling route watercourse crossings has been designed to eliminate the requirement for in-stream works.

The various crossing methodologies to be employed along the Proposed Grid Connection include the following:

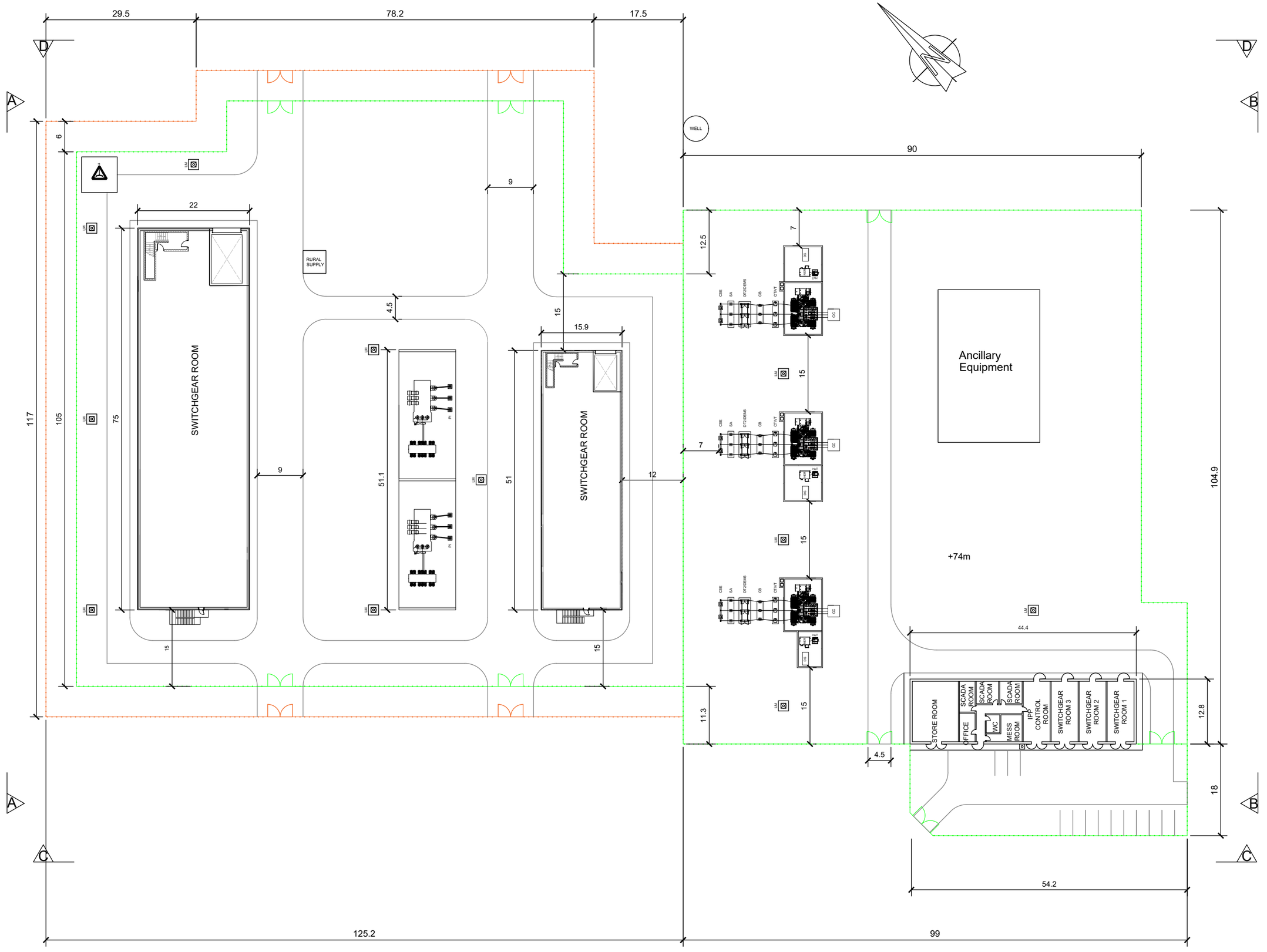
- Type A: Crossing using standard trefoil formation (Figure 4-61)
- Type B Flatbed formation under (Figure 4-61)
- Type C: Flatbed Formation over (Figure 4-61)
- Type D: Horizontal Directional Drilling (HDD) (Figure 4-62)

A general description of the construction methods employed at watercourse crossings and existing service crossings are described in Section 4.9.2.7 below. An illustration of the proposed crossing methodology at the 10 no. crossing locations with existing services is included within the detailed site layout drawings in Appendix 4-1. Please see Section 4.9.2.7 below for further detail on the proposed crossing methodologies of services along the Proposed Grid Connection.

4.4.2.8 Peat and Spoil Management Plan

The approximate quantity of peat and non-peat material (spoil) requiring management on the Project Site, inclusive of the Proposed Grid Connection, has been calculated and is presented in Table 4-3 above. These quantities were calculated as part of the Peat and Spoil Management Plan in Appendix 4-

3 of this EIAR. Please see Section 4.4.1.7 above for further detail on the Peat and Spoil Management Plan associated with the Proposed Grid Connection.



NOTES:

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4. POSITION OF AIS EQUIPMENT IS SUBJECT TO CHANGE DURING DETAILED DESIGN PHASE
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6. FINAL DETAIL OF BUILDING FINISHES TO BE AGREED WITH PLANNING AUTHORITY IN ADVANCE OF DEVELOPMENT COMMENCING
7. POSITION OF GROUND WATER BORED WELL INDICATIVE. FINAL NO. AND POSITION TO BE DETERMINED DURING DETAILED DESIGN PHASE.

LEGEND

- PALISADE FENCE
- STOCK PROOF FENCE
- CONCRETE ACCESS ROAD

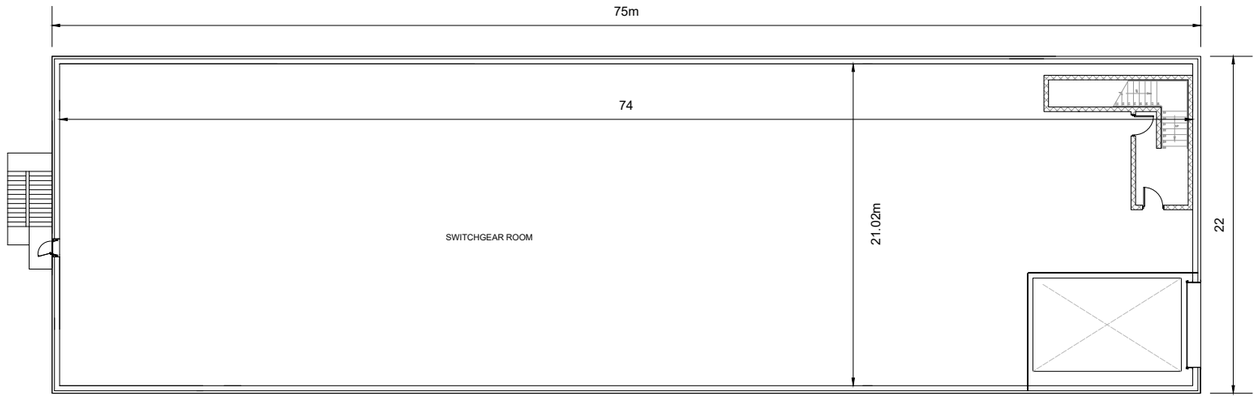
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DRAWING TITLE: **Proposed Onsite Substation Layout**

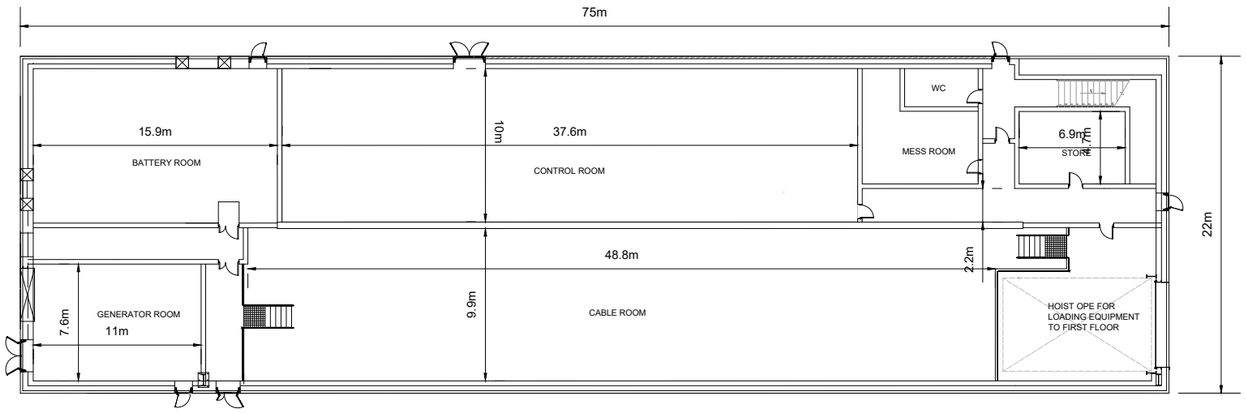
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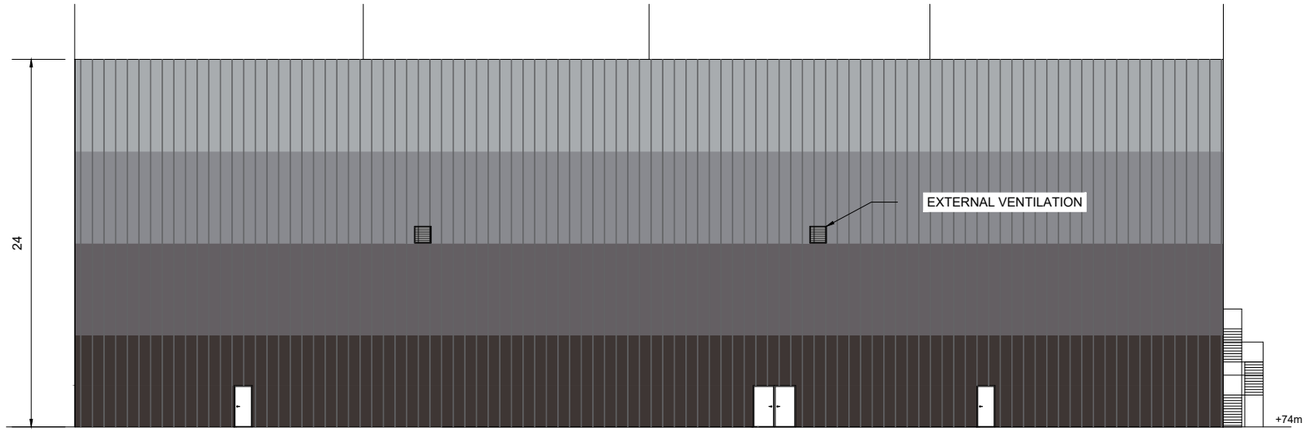
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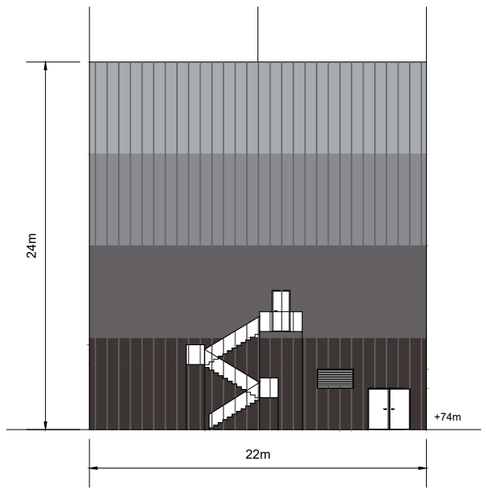
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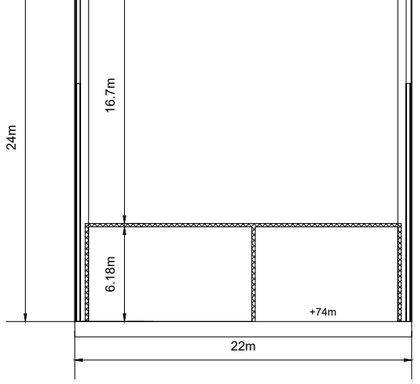
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4. FINAL DETAIL OF BUILDING FINISHES TO BE AGREED WITH PLANNING AUTHORITY IN ADVANCE OF DEVELOPMENT COMMENCING
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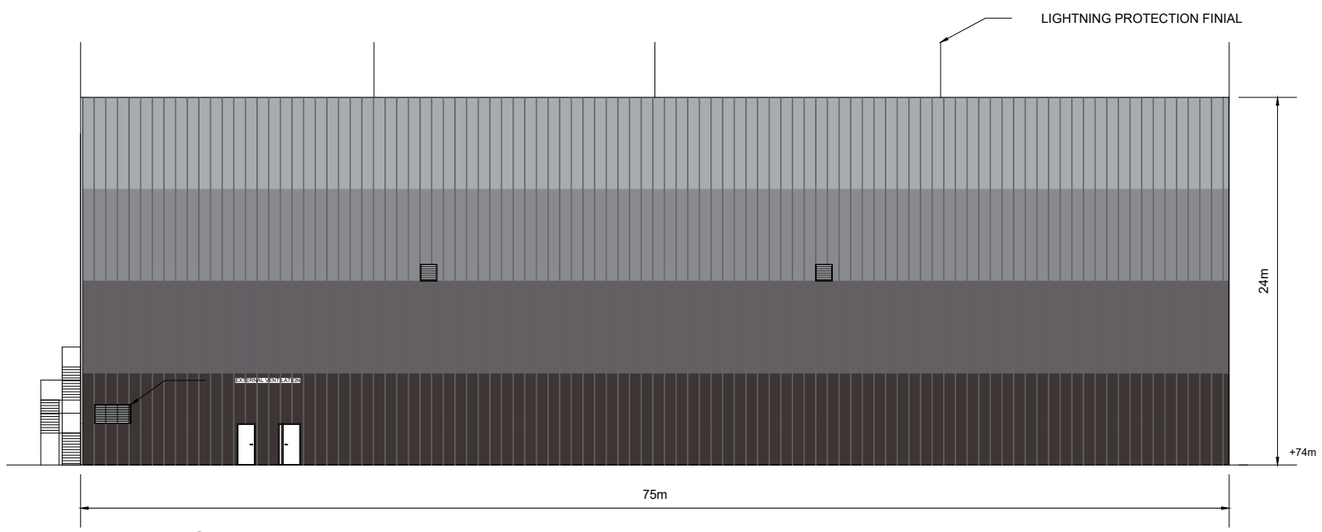
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ELEVATION A-A



SECTION A-A



ELEVATION D-D



ELEVATION B-B

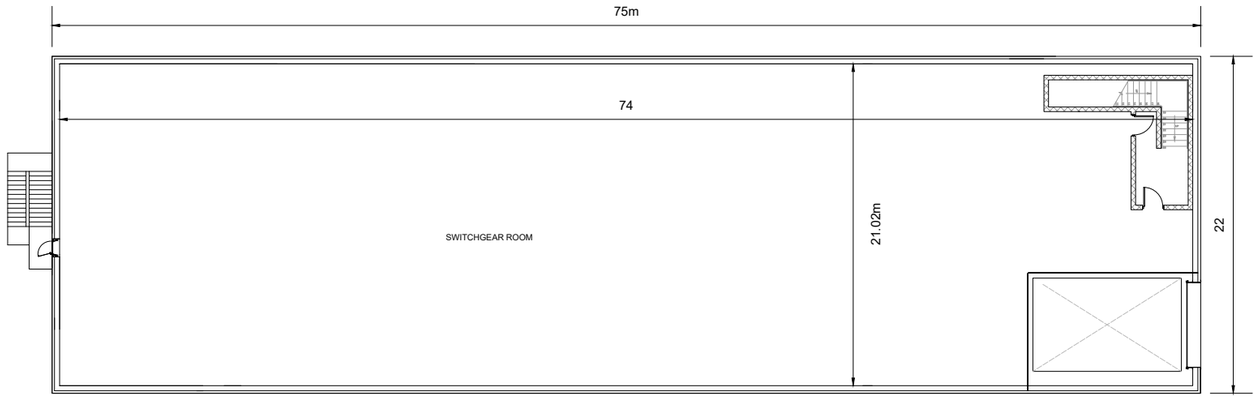
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DRAWING TITLE: **Proposed Onsite Substation Elevations and Sections**

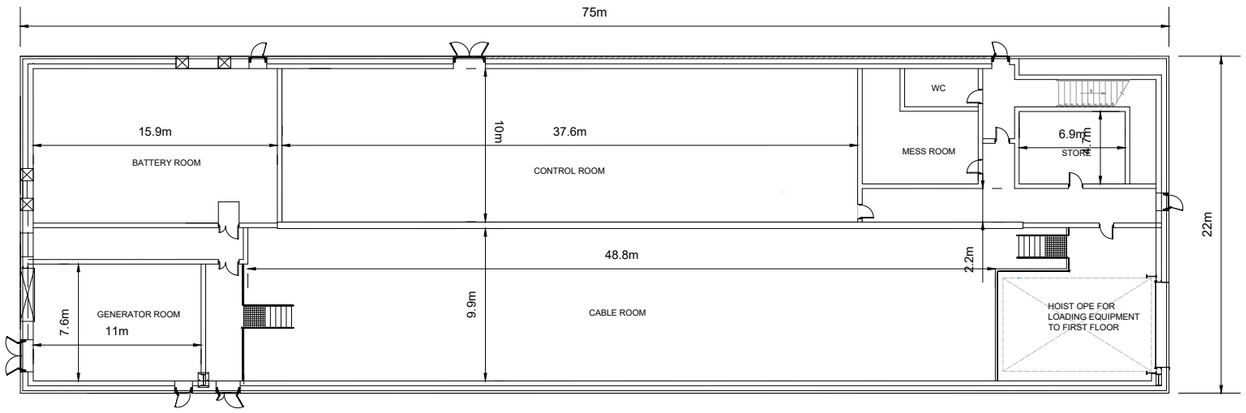
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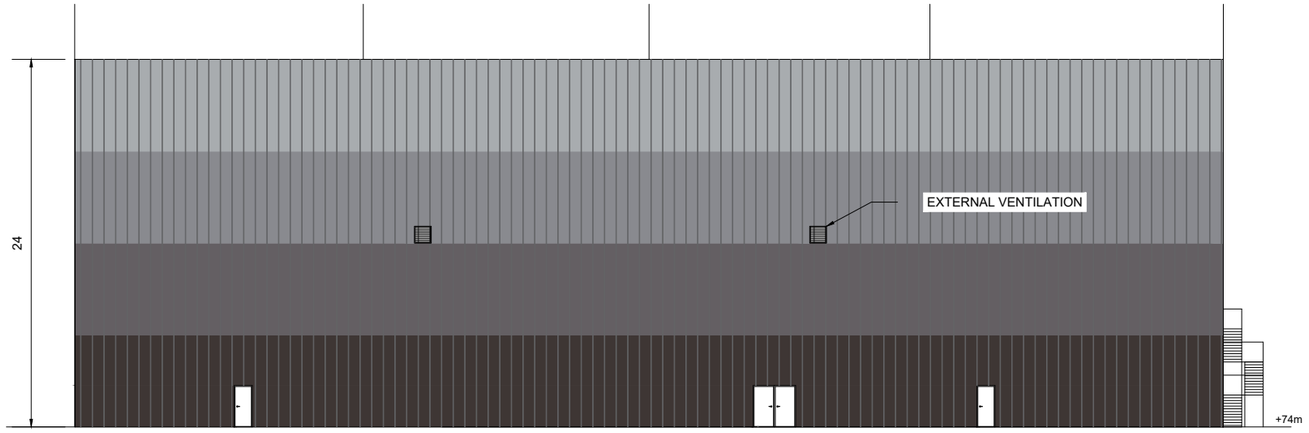
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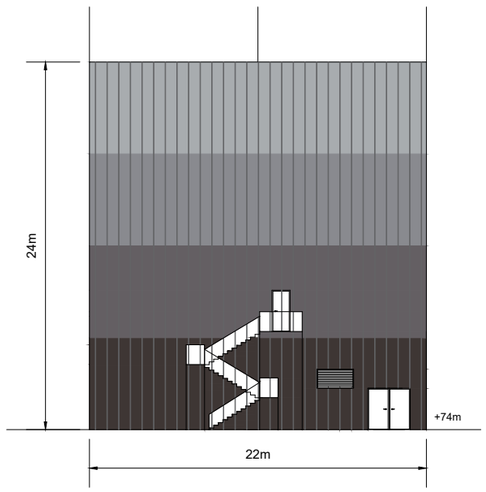
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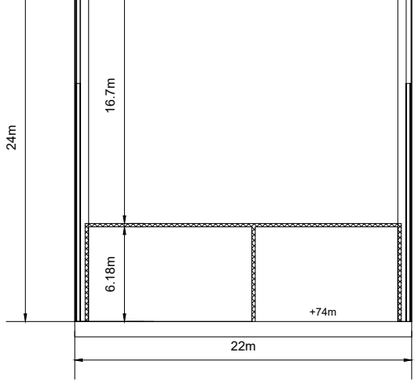
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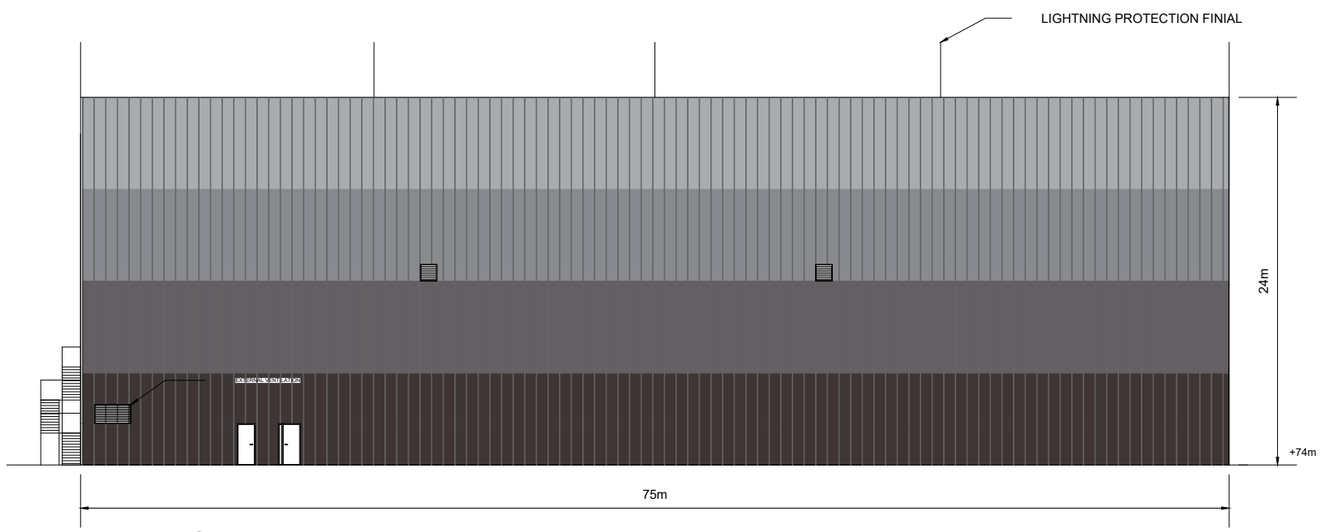
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ELEVATION A-A



SECTION A-A



ELEVATION D-D



ELEVATION B-B

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DRAWING TITLE: **Proposed Onsite Substation Elevations and Sections**

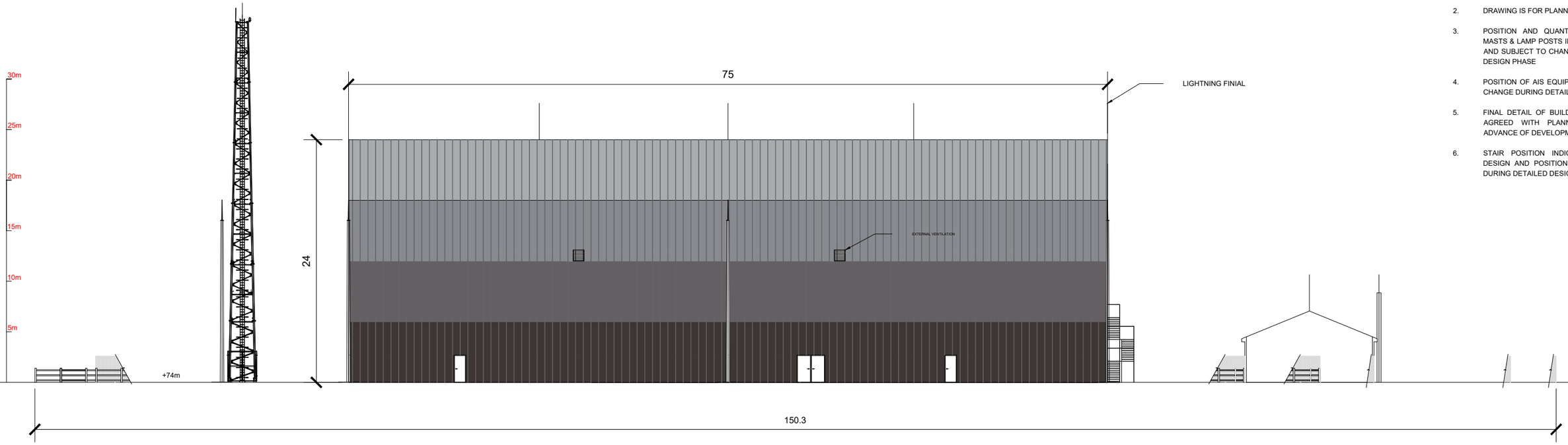
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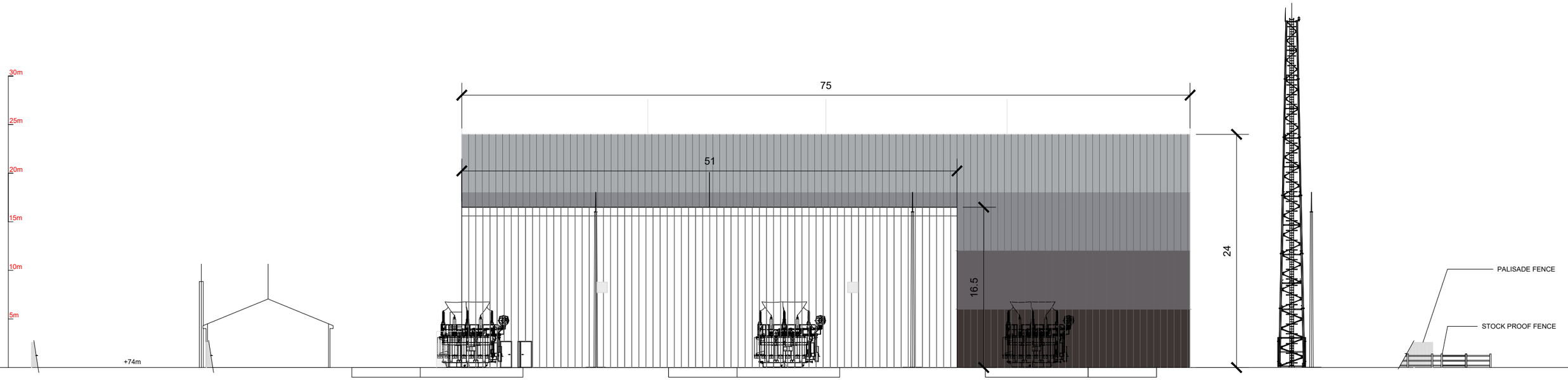
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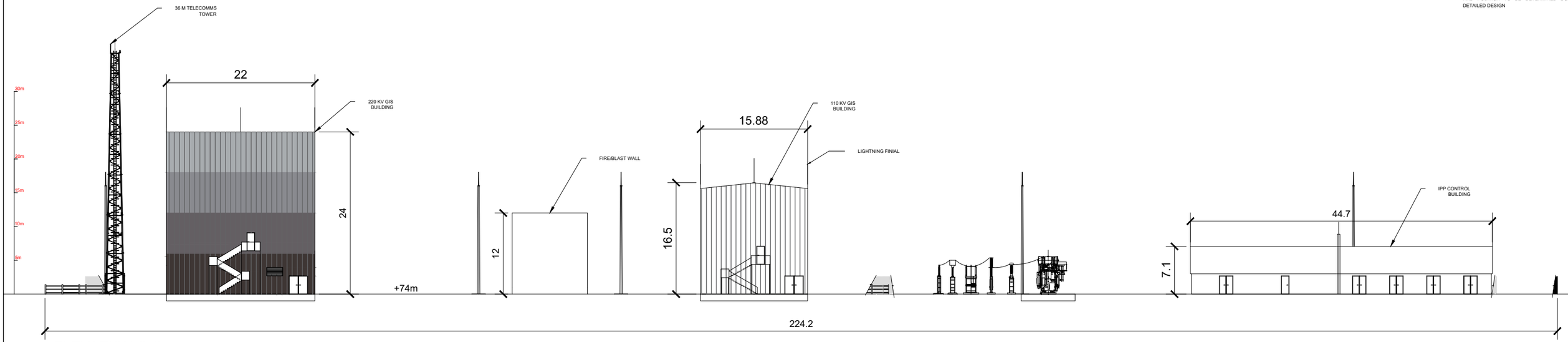
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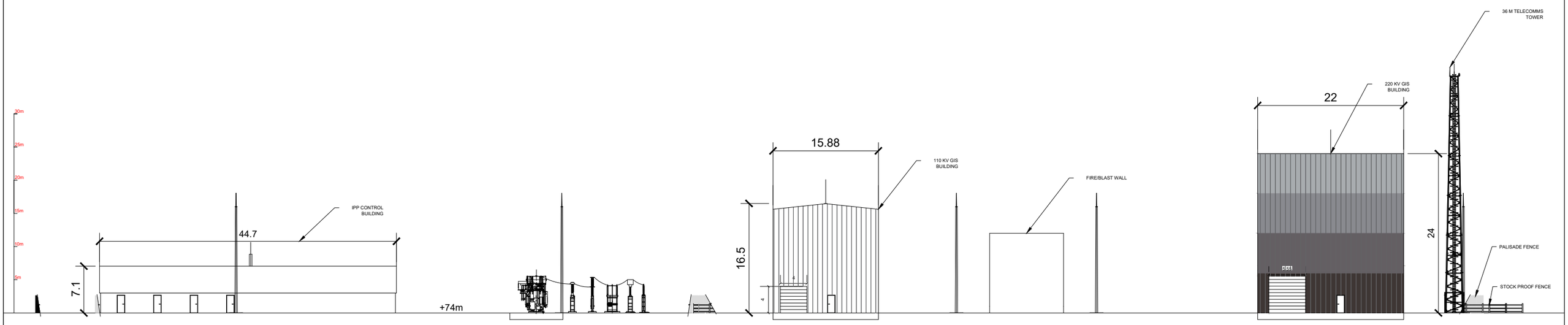
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ELEVATION C-C

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ELEVATION D-D

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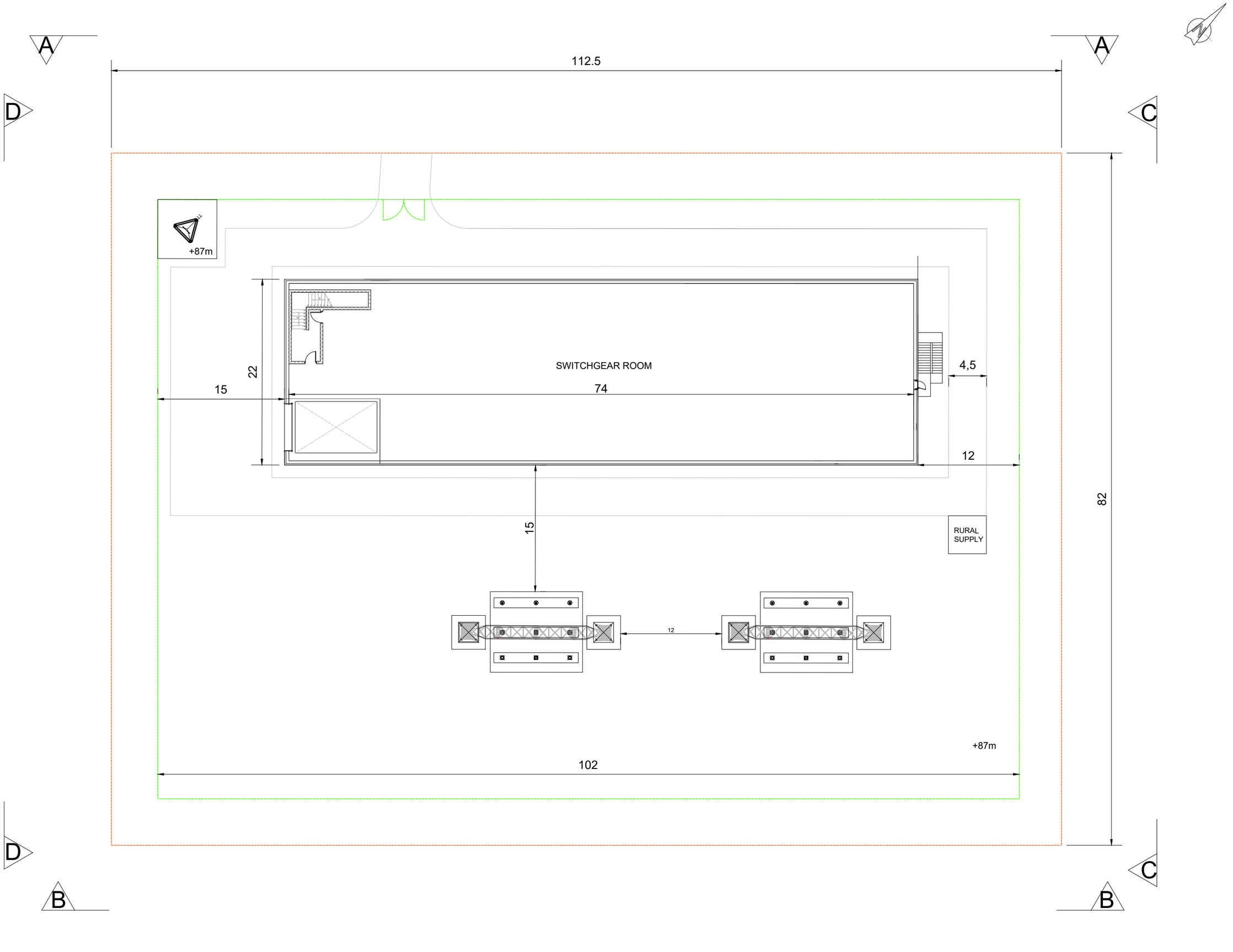
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		STATUS: PO3

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1. ALL DIMENSIONS NOTED ARE IN METRES
2. DRAWING IS FOR PLANNING PURPOSES ONLY
3. POSITION AND QUANTITIES OF LIGHTNING MASTS & LAMP POSTS IF ANY ARE INDICATIVE AND SUBJECT TO CHANGE DURING DETAILED DESIGN PHASE
4. POSITION OF 110 kV AIS EQUIPMENT IS SUBJECT TO CHANGE DURING DETAILED DESIGN PHASE
5. RURAL SUPPLY POSITION INDICATIVE. FINAL POSITIONING TO BE AGREED WITH ESB NETWORKS.
6. FINAL DETAIL OF BUILDING FINISHES TO BE AGREED WITH PLANNING AUTHORITY IN ADVANCE OF DEVELOPMENT COMMENCING

LEGEND

PALISADE FENCE

STOCK PROOF FENCE

CONCRETE ACCESS ROAD

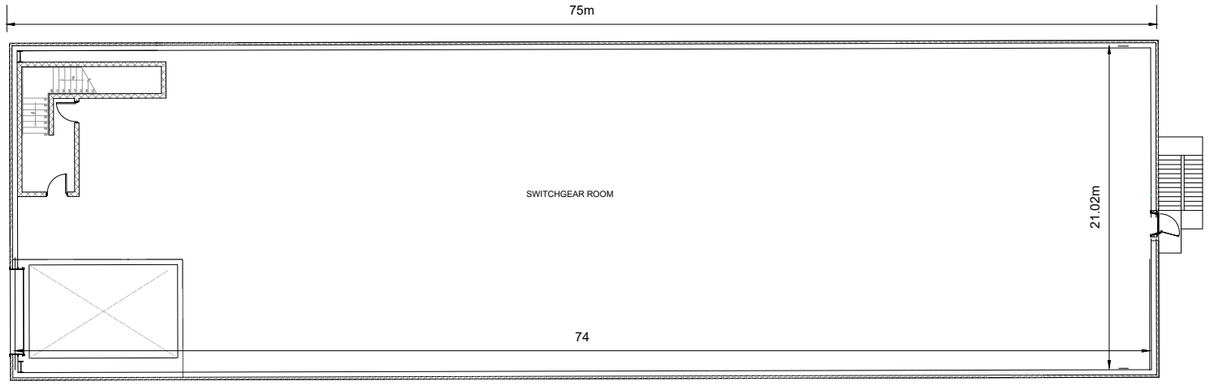
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DRAWING TITLE: **Proposed Offsite Substation Layout**

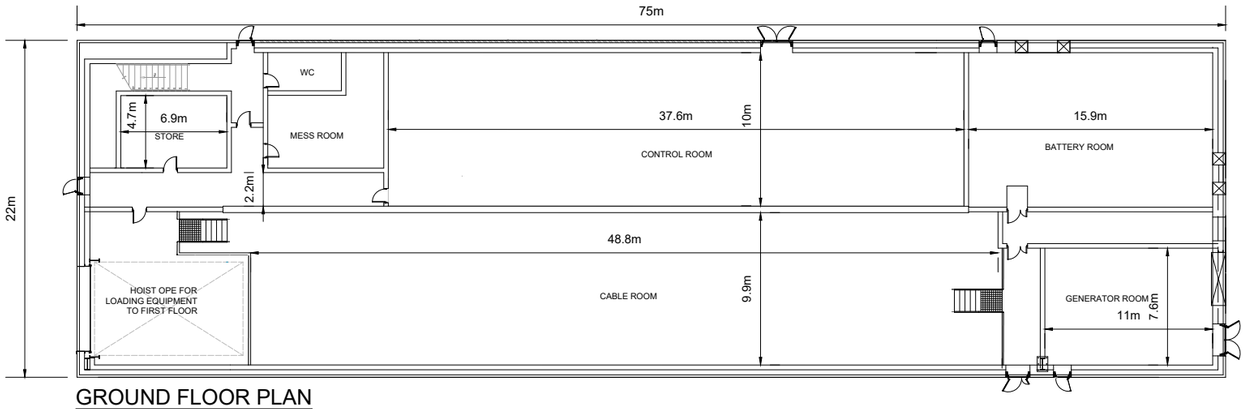
PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-35	As Shown

DRAWN BY:	CHECKED BY:	DATE:	REVISION:
GO	RD	12.10.2026	P03

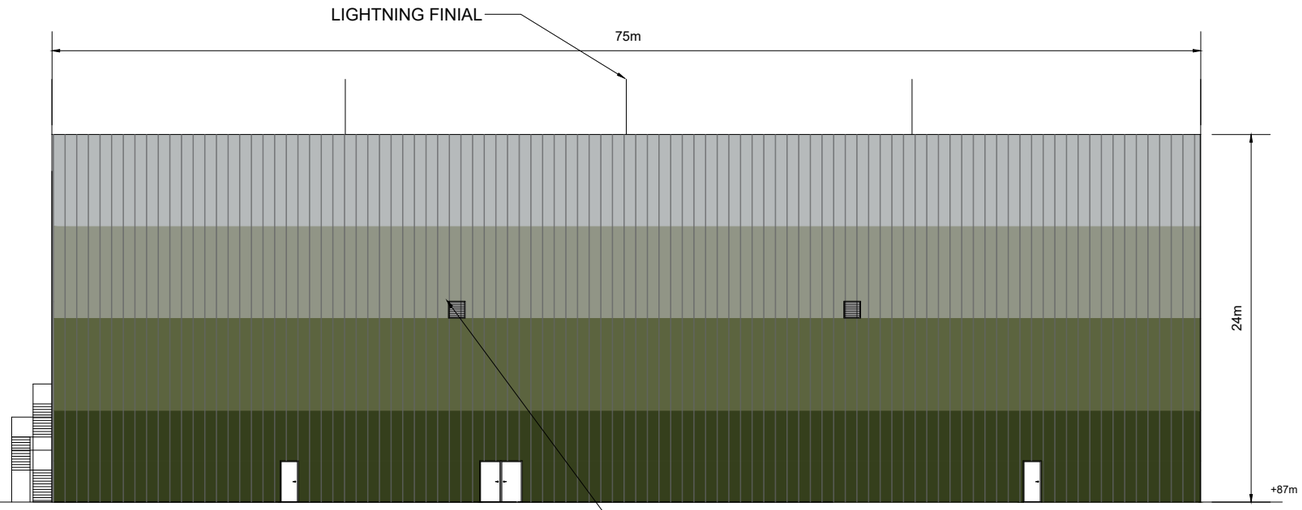
MKO
Email: info@www.mkoireland.ie/Website: www.mkoireland.ie



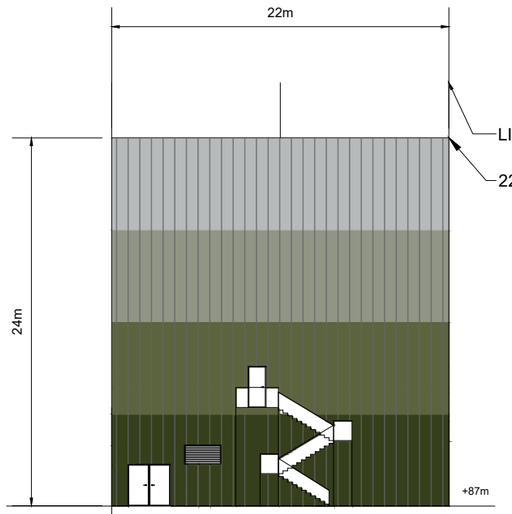
FIRST FLOOR PLAN
1:200



GROUND FLOOR PLAN
1:200



ELEVATION A-A
1:200



ELEVATION C-C
1:200

SECTION A-A

ELEVATION B-B
1:200

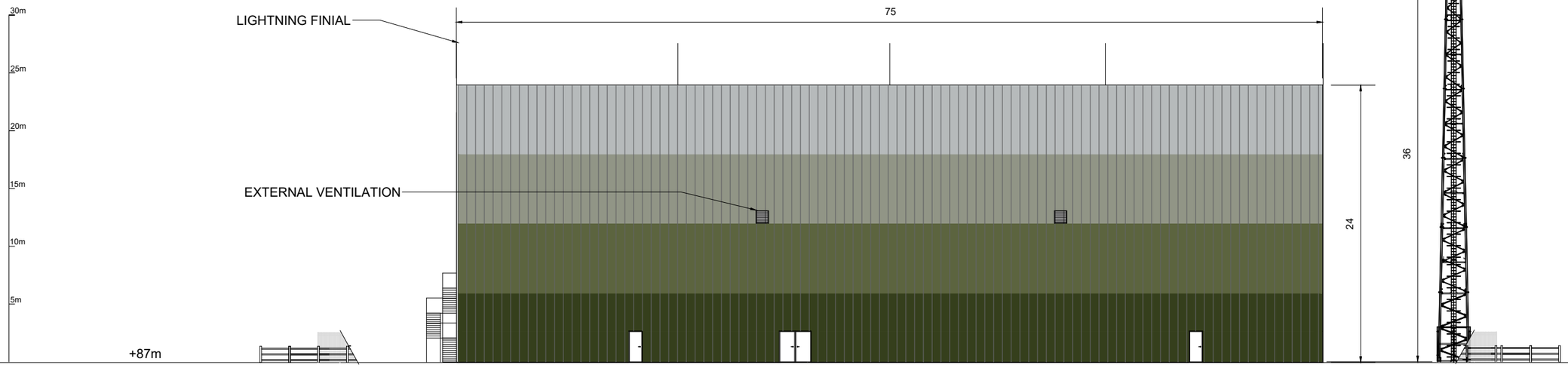
ELEVATION D-D
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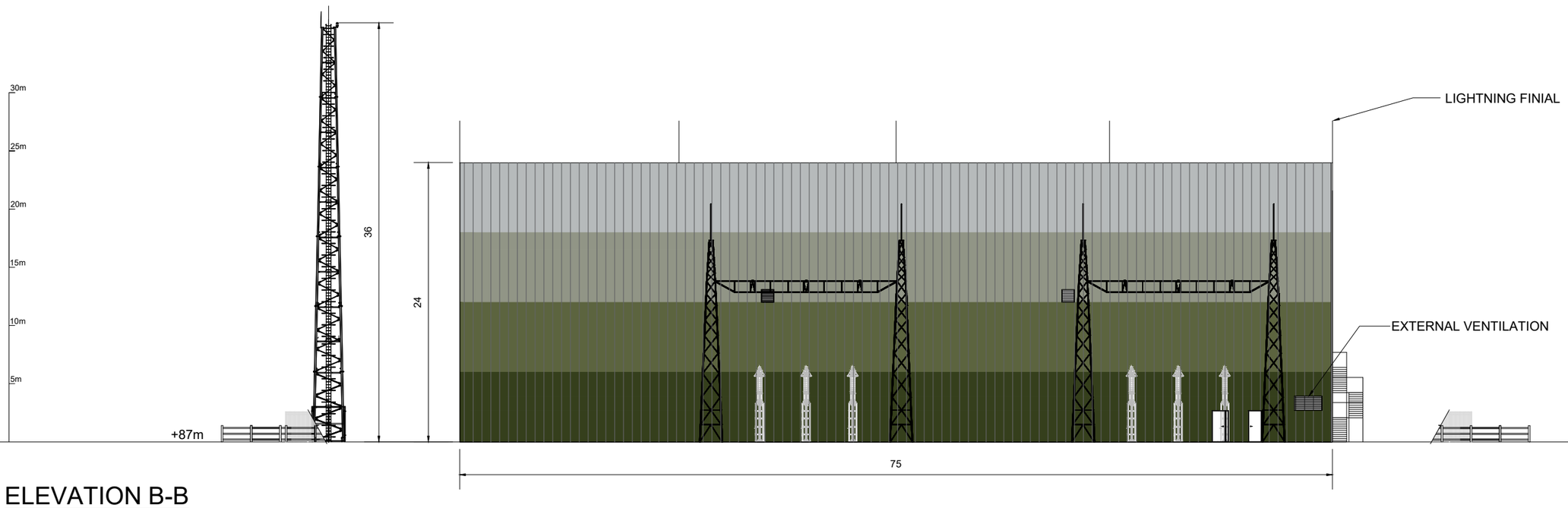
1. MEASUREMENTS SHOWN IN METRES UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. BUILDING COLOUR WILL RANGE WITHIN A MUTED MID-DARK GREEN SPECTRUM. REFER TO EIAR VOL. II APPENDIX 10A FOR INDICATIVE DETAIL
4. FINAL DETAIL OF BUILDING FINISHES TO BE AGREED WITH PLANNING AUTHORITY IN ADVANCE OF DEVELOPMENT COMMENCING
5. DOOR POSITION INDICATIVE. FINAL LOCATION TO BE DETERMINED DURING DETAILED DESIGN
6. STAIR POSITION INDICATIVE ONLY. FINAL DESIGN AND POSITION TO BE DETERMINED DURING DETAILED DESIGN

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare			
DRAWING TITLE: Proposed Offsite Substation Elevations and Sections			
PROJECT No.: 250708		DRAWING No.: Figure 4-36	SCALE: As Shown
DRAWN BY: GO	CHECKED BY: RD	DATE: 12.10.2026	REVISION: P03

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ELEVATION A-A
1:200



ELEVATION B-B
1:200

Notes:

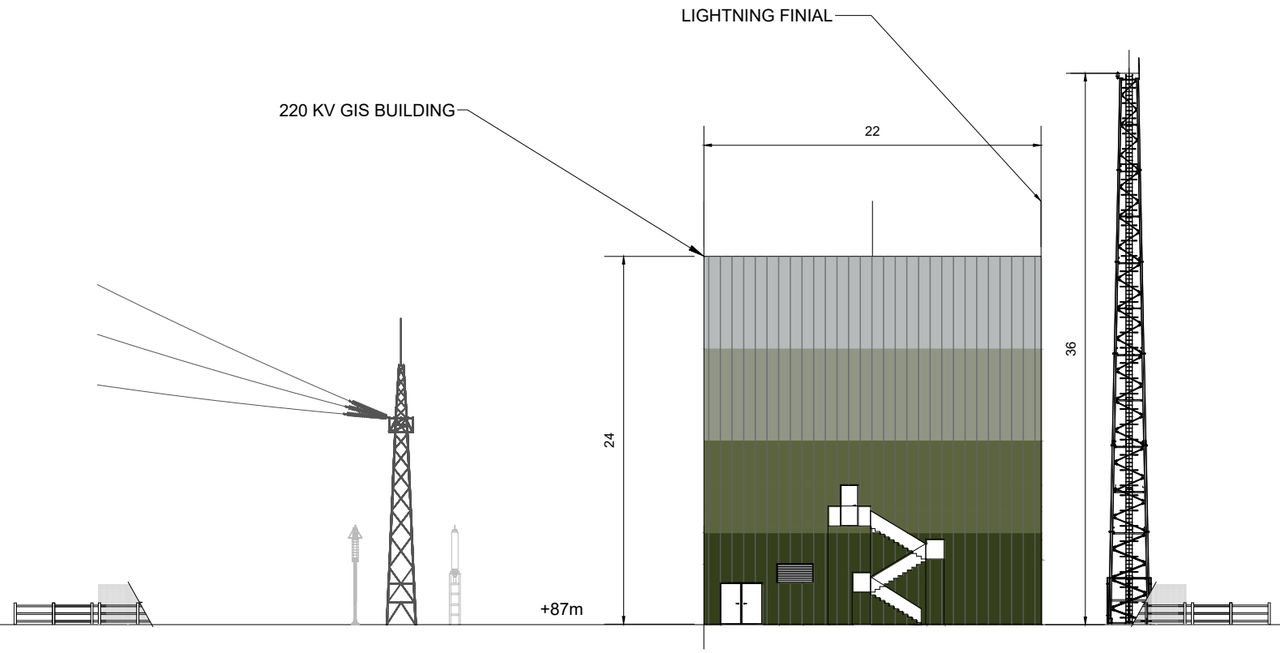
1. MEASUREMENTS SHOWN IN METRES UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. BUILDING COLOUR WILL RANGE WITHIN A MUTED MID-DARK GRAY AND GREEN SPECTRUM. REFER TO EIAR VOL. II APPENDIX 10A FOR INDICATIVE DETAIL
4. FINAL DETAIL OF BUILDING FINISHES TO BE AGREED WITH PLANNING AUTHORITY IN ADVANCE OF DEVELOPMENT COMMENCING
5. DOOR POSITION INDICATIVE. FINAL LOCATION TO BE DETERMINED DURING DETAILED DESIGN
6. STAIR POSITION INDICATIVE ONLY. FINAL DESIGN AND POSITION TO BE DETERMINED DURING DETAILED DESIGN

PROJECT TITLE: **Ballydermot Wind Farm, Co. Offaly and Co. Kildare**

DRAWING TITLE: **Proposed Offsite Substation Elevations**

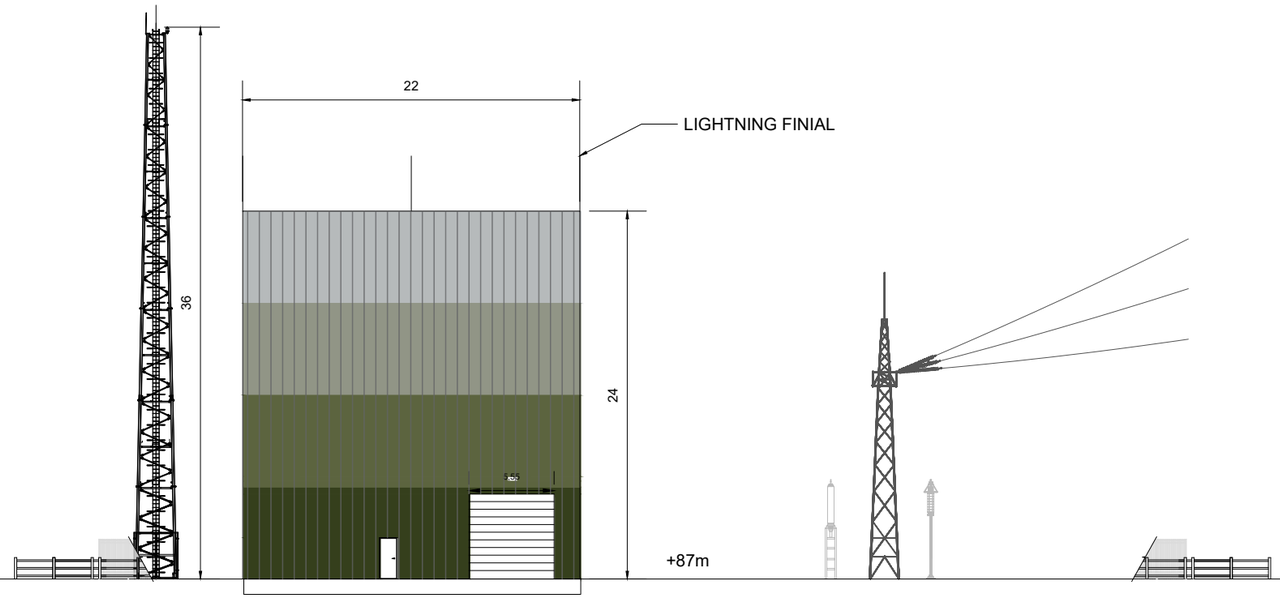
PROJECT No.	DRAWING No.	SCALE
250708	Figure 4-37	As Shown
DRAWN BY: GO / CHECKED BY: RD	DATE: 12.10.2026	REVISION: P03

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ELEVATION C-C

1:200



ELEVATION D-D

1:200

Notes:

1. MEASUREMENTS SHOWN IN METRES UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. BUILDING COLOUR WILL RANGE WITHIN A MUTED MID-DARK GRAY AND GREEN SPECTRUM. REFER TO EIAR VOL. II APPENDIX 10A FOR INDICATIVE DETAIL
4. FINAL DETAIL OF BUILDING FINISHES TO BE AGREED WITH PLANNING AUTHORITY IN ADVANCE OF DEVELOPMENT COMMENCING
5. DOOR POSITION INDICATIVE. FINAL LOCATION TO BE DETERMINED DURING DETAILED DESIGN
6. STAIR POSITION INDICATIVE ONLY. FINAL DESIGN AND POSITION TO BE DETERMINED DURING DETAILED DESIGN

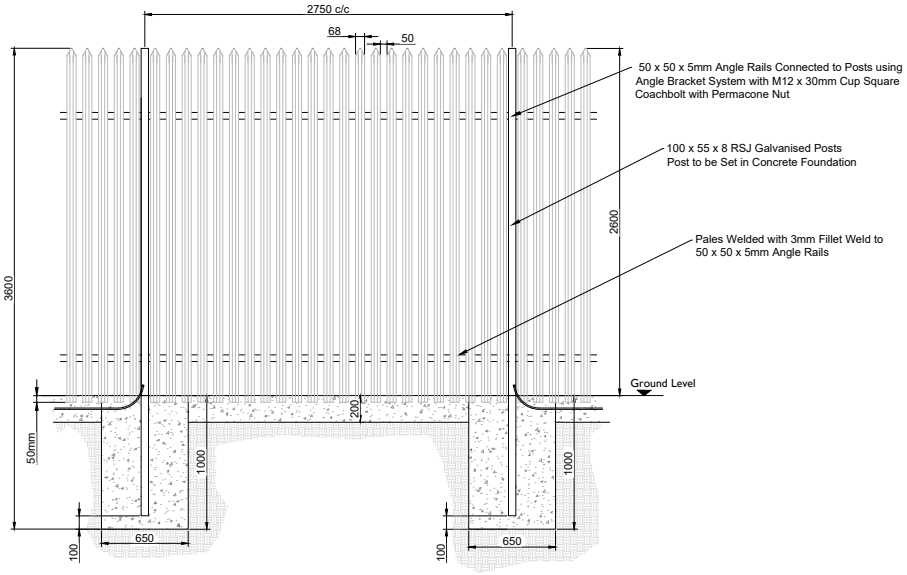
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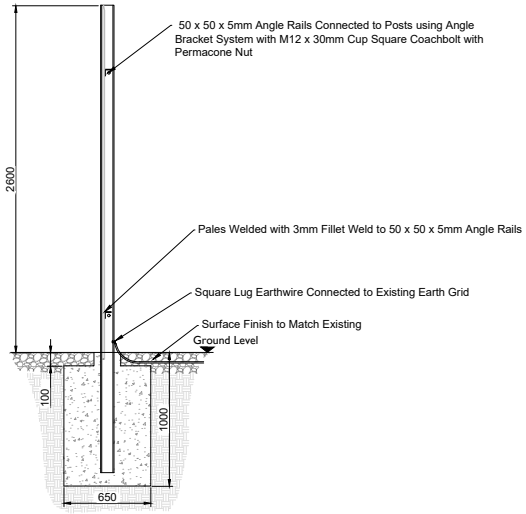
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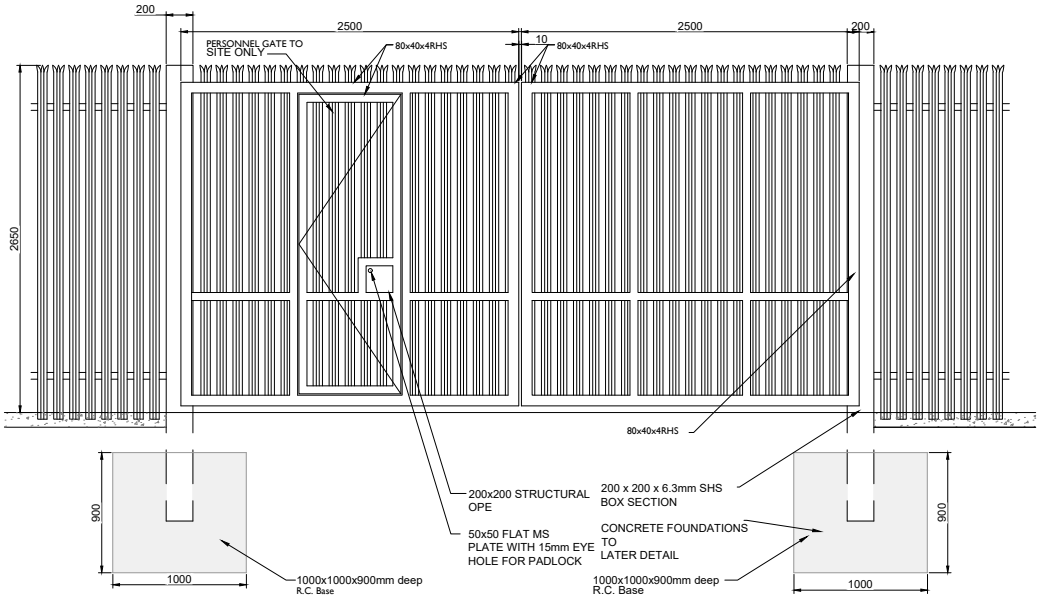
PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-38	As Shown

DRAWN BY:	CHECKED BY:	DATE:	REVISION:
GO	RD	12.10.2026	P03

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Notes:

1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY
4. GROUND LEVELS VARY

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE: Substation Palisade Fence and Gate Details

PROJECT NO.	DRAWING No.	SCALE
250705	Figure 4-39	As Shown

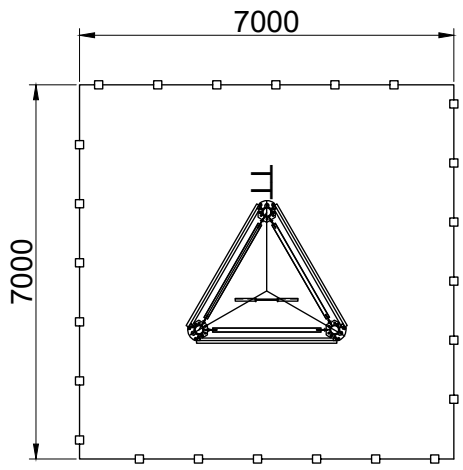
DRAWN BY	CHECKED BY	DATE	REVISION
GO	RD	23.10.2020	P03

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

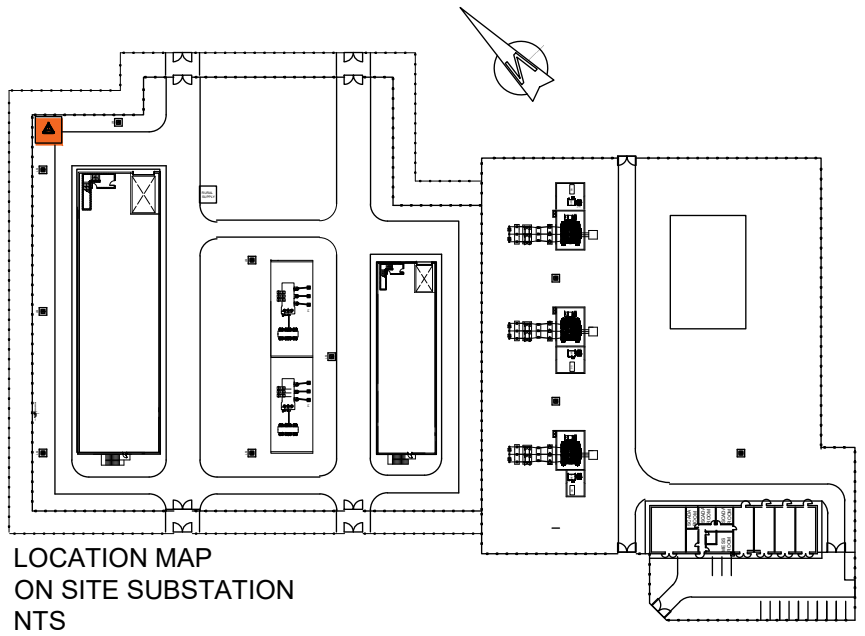
NOTES:

1. ALL DIMENSIONS NOTED ARE IN MM
2. DRAWING IS FOR PLANNING PURPOSES ONLY
3. EQUIPMENT/STRUCTURE DETAILS ARE INDICATIVE AND WILL BE FINALISED DURING DETAILED DESIGN
4. DETAILED DESIGN SHALL BE CARRIED OUT IN LINE WITH SYSTEM OPERATOR AND ASSET OWNER SPECIFICATIONS
5. LEVELS OF COMPOUND AT ON SITE SUBSTATION 74M & 87M AT OFF SITE SUBSTATION

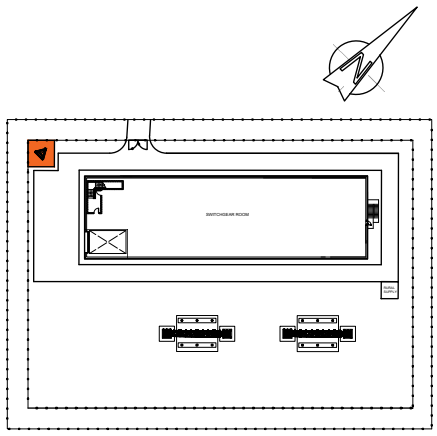
SEE NOTE 5 FOR COMPOUND LEVELS



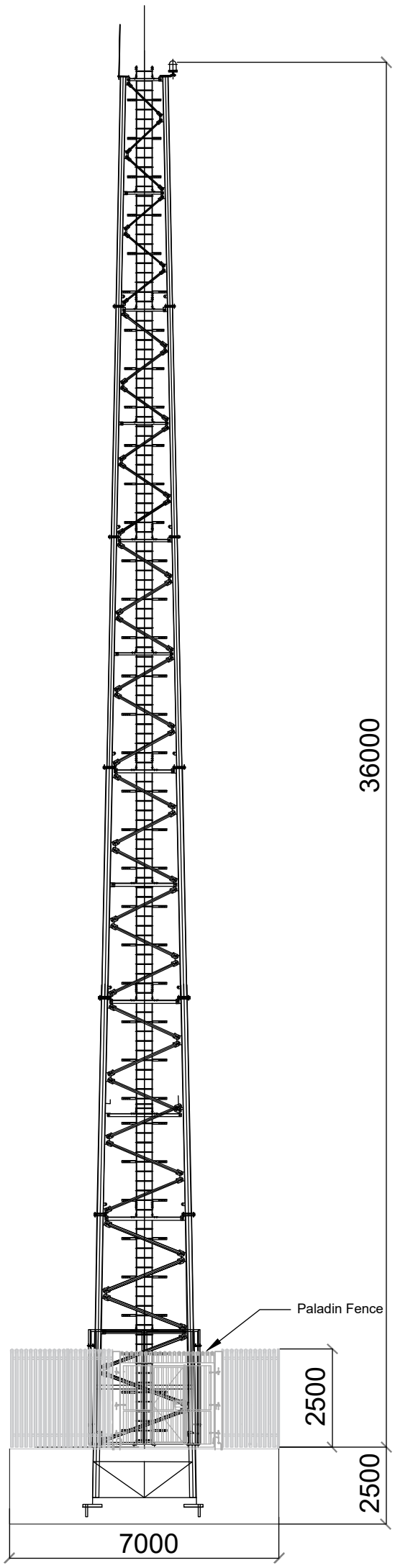
TELCOM TOWER COMPOUND
SCALE 1:100



LOCATION MAP
ON SITE SUBSTATION
NTS



LOCATION MAP
OFF SITE SUBSTATION
NTS



TELCOM TOWER STRUCTURE VIEW
SCALE 1:100

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare			
DRAWING TITLE: Telecommunication Tower - Substation Compound			
PROJECT No.: 250708		DRAWING No.: Figure 4-40	SCALE: As Shown
DRAWN BY: GO	CHECKED BY: RD	DATE: 23.10.2026	REVISION.: P03

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4.4.3 Proposed Enhancement Areas

4.4.3.1 Biodiversity Offsetting and Enhancement

A Biodiversity Management Plan (BMP) has been prepared for the Proposed Project and is included as Appendix 6-5 of this EIAR. This plan has been developed to offset the loss of habitats identified within the Project Site and further to enhance the biodiversity (flora and fauna, including birds) of the Project Site and its environs. These measures have also been considered in the ornithological impact assessment and landscape and visual impact assessment which is included in Chapter 7: Birds and Chapter 13: Landscape & Visual, of this EIAR. Similarly, the drainage design for the Proposed Project which has been prepared by HES and is included in Appendix 4-5 of this EIAR has also taken the BMP measures into consideration from a drainage perspective.

Irrespective of the consenting or construction of the Proposed Project, the measures outlined in the Draft Cutaway Bog Decommissioning and Rehabilitation Plan (Appendix 2-4) will be implemented by the Applicant in agreement with the EPA, per the Applicant's IPC Licence Obligations.

4.4.3.1.1 *Ornithological Offsetting and Enhancement*

Scrub Mosaic Creation Area

As outlined in Section 4.2 of Appendix 6-5, a scrub mosaic habitat of approximately 246.27ha will be created within 250m of the Proposed Turbines to make the areas unsuitable for golden plover. The aim of these management prescriptions is to create a mosaic habitat where open habitats of greater than 10ha does not exist as golden plover prefer open areas larger than 20ha and actively avoid areas which are smaller than 10ha[6]. The management prescriptions below aim to create a mosaic habitat where open areas of greater than 10ha exist. This will be achieved by planting or promoting scrub in smaller patches (1-5ha) within these larger open areas to fragment these open areas.

Management prescriptions to be implemented are detailed in Appendix 6-5 and summarised below:

- Where open areas are adjacent to mature scrub (i.e. in areas where a good seed bank is likely to exist within the peat already), granular lime (calcium carbonate) and slow-release fertilizer (granular rock phosphate) will be applied on a target basis to accelerate the germination and growth of scrub species (e.g. birch and willow spp.).
- In more open habitats (where peat production has most recently been ceased), the natural seed bank may be absent; it is therefore proposed to plant native scrub species (e.g. birch and willow spp.) on a targeted basis, at a density of one plant per square meter.
- Drain blocking may be required where dry cutover peat exists and conditions are not optimal for the germination or success of transplanting of scrub species (e.g. birch and willow spp.).
- Slow-release fertiliser will be applied to all targeted scrub areas to accelerate the establishment of the scrub.
- It is proposed to attract golden plover to alternative, lower risk areas through the creation of attractive habitat plus the use of golden plover lures/decoys, as outlined in Objective 2 and Objective 3 of Appendix 6-5.
- Monitoring for golden plover carcasses will be undertaken during the operational phase of the Proposed Project, as outlined in Section 5 of Appendix 6-5. Curtailment will be implemented if the number of golden plover carcasses found are above the threshold set, see Section 5.1.1.2.1 of Appendix 6-5 for further details

[6] *Leitão, D. & S. Peris. 2015. Annual variation in habitat use by Northern Lapwings Vanellus vanellus and Eurasian Golden Plovers Pluvialis apricaria wintering in Portugal. Wader Study 122(2): 115–127*

Lodge Bog Enhancement Area

The enhancement of Lodge Bog will be achieved through a number of separate measures, each of these measures is summarised below and described in detail within Appendix 6-5 to this EIAR.

Scrub Removal and Management

The key measure proposed at Lodge Bog is the permanent removal of scrub within the enhancement area and the management of the area to ensure scrub does not recolonise over the lifetime of the Proposed Project. Management prescriptions to be implemented are detailed in Appendix 6-5 and summarised below:

- All areas of scrub, trees and shrubs will be permanently removed. The timber and brash will be mulched to waste and left on-site. The heavier timber will be removed from site where mulching is not practical. The area will be allowed to revert to peatland habitat and therefore will create suitable habitat for golden plover and breeding waders. Felling/mulching of scrub will be undertaken before the first winter season of the construction phase of the project programme. This will ensure replacement habitat would be available in advance of the operational phase.
- Heavy machinery, e.g. specially adapted tracked excavators and mulching mowers, will be used to clear large areas of dense scrub.
- Scrub will be removed by hand from areas of suitable marsh fritillary habitat to minimize the damage to the underlying habitat. These areas will be identified during a preconstruction habitat survey.
- The vegetation sward will be maintained at the optimal height for waders, including golden plover and lapwing, of approximately 7-10cm. Golden plover tend to avoid areas where the sward height exceeds 10-20cm. Therefore, a sward height of between 7-10cm will be maintained in this area during the winter months. This will be achieved through summer and autumn grazing with livestock or through mechanical means using a flail or mulcher. A sward height of 7-10cm will be achieved by the end of August each year to ensure suitable conditions are available when golden plover return for the winter. If there is an extended growing season into September and October of any given year and the vegetation height exceeds 10cm in these months, further mechanical intervention or grazing may be required in October.
- Self-seeding conifers and scrub vegetation originating as windblown seedlings from adjacent and nearby commercial conifer plantations and nearby scrub and bog woodland, are a threat to the viability of the enhancement areas. They gradually take hold, and if unmanaged, would eventually make the area unsuitable for golden plover and breeding lapwing. Habitat maintenance of the area will involve the eradication of self-seeding trees and shrubs, and mulching to waste and left on-site. The frequency of this management intervention will be informed by monitoring. The monitoring outlined in Section 5 of Appendix 6-5 will monitor the level of encroachment by self-seeding trees and shrubs and will bring the scheduled removal forward as required.
- In the event of any invasive species being recorded within the Proposed Enhancement Area, an invasive species management plan will be put in place to eradicate any stands of such species.
- Herbicides will not be used for the eradication of native scrub or self-seeding trees. However, herbicides may be required for the eradication of invasive species such as Rhododendron or Japanese Knotweed, if required.
- Enhancement and maintenance works will be undertaken outside of the nesting season as per the Wildlife Acts 1976 – 2023 as amended. A suitably qualified ornithologist will be present at the removal of all woody vegetation, to ensure that identified breeding bird sites are avoided. If breeding activity of birds of high conservation concern is identified, no works shall be undertaken within a species-

specific buffer (as per Goodship and Furness, 2022) in line with best practice, until it can be demonstrated that the nest is no longer occupied.
- Measures will be implemented during the construction phase. This will ensure that the area is suitable for golden plover at the start of the operational phase.

Permanent Waterbodies for Whooper Swan

Two areas are proposed for whooper swan to replace the loss of roosting habitat to the Proposed Project. As detailed in Section 7.3.7.15 of Chapter 7, roosting was recorded across a total of seven areas within the Proposed Wind Farm site across the six winter seasons surveyed, with a maximum of five areas being used in any one season.

Two areas are proposed within Lodge Bog, which are 7.8ha and 5.6 ha, (please see Figure 6-5-3 of Appendix 6-5 for location details) in areas of wetland which has already undergone the following works under the PCAS scheme: intensive and targeted drain blocking, the creation of berms to control/retain water levels, peat field re-profiling, modifying outfalls and managing overflows, seeding and inoculation of Sphagnum. The measures proposed includes the controlled flooding of an area to a depth of approximately 1.5m. This will be achieved by creating an encircling embankment to contain the water. The controlled flooding will be such that water will be present during the winter months when whooper swan are present (October to March).

This will be achieved as follows:

- Wetland management: the proposed approximately 7.8ha and 5.6ha shallow water bodies (wetland) will be created with encircling embankments. The internal embankment height will be approximately 2m to ensure the target depth of 1.5m of water can be accommodated. The top width of the embankment should be a minimum of 5m with a slope of 3:1.
    - The embankment is formed using a bulldozer to push the peat into place, which is then shaped by an excavator. As the peat and subsoil is shaped by the excavator, it should be compacted to make the peat less permeable.
- The top of the embankment, above the target water level of 1.5m, will include overflow pipes to avoid high water levels eroding channels through the top of the embankment.
- Herbicides and pesticides are not permitted within the enhancement area.
- In the event of any invasive species being recorded within the area identified for enhancement measures, an invasive species management plan will be put in place to eradicate any stands of such species. A pre-commencement survey for invasive species will be undertaken as part of preparatory work and if any such species are recorded an invasive species management plan shall be prepared.
- Maintenance is expected to be low. Occasionally, drop boards from the sluice gate may need to be replaced if they are damaged.
- Measures will be implemented during the construction phase. This will ensure that the area is suitable for whooper swan at the start of the operational phase.

Breeding Wader Areas

Three enhancement areas for breeding waders are proposed, primarily for lapwing and snipe to replace the breeding habitat lost to the Proposed Project for breeding curlew which have historically nested in this area. As detailed in Section 7.3.7.21 of Chapter 7, lapwing breeding activity was identified within the Proposed Wind Farm site, with an estimated 23 pairs breeding within the Proposed Wind Farm site in the most recent breeding season surveyed (i.e. 2025).

The areas proposed within Lodge Bog are 12ha, 7ha and 6ha, which equates to a total proposed area of 25ha. There are two areas (12ha and 6ha) within areas of PCAS which have undergone more intense drain blocking, with outflows blocked and managed. The remaining area (7ha) is within an area

adjacent to wetlands where minimal work was required through the IPC Licence rehabilitation, however, there has historically been waders breeding within or adjacent to this proposed area (see Figure 6 - 5 - 6 of Appendix 6-5 for location details). These proposed areas will be managed by annual mowing to keep the land open for breeding waders and free of avian predator posts (e.g. through scrub encroachment). The annual mowing cycle will be implemented as lapwing (and other waders such as curlew and ringed plover (*Charadrius hiaticula*)) prefer a short open sward.

The objective is to create good quality breeding wader habitat that is defined as having a stable water table, an open aspect throughout, a short sward and reduced predation. This will be achieved as follows:

- The areas have already undergone PCAS rehabilitation, however there may be the requirement for some areas to be levelled (re-profiled) to stabilise the water table and facilitate the mowing necessary to maintain the required open aspect. A bulldozer will be used to level/remove any remaining camber from the former peat production fields and infill the drains which have not already undergone drain blocking through PCAS. Any remaining drains around the perimeter will be infilled first and as a priority, as the proposed predator-proof fencing would be made ineffectual if mammalian predators could travel under the fence via a drainage channel. If there is not sufficient peat to infill the remaining sections of the drains, the edges will be re-profiled with a tapered edge. This measure will facilitate easy egress for chicks should they fall into a drain. The newly created breeding wader areas should be at least the level of the surroundings peat to avoid large areas of pooling water.
- Using an excavator, wader scrapes will be excavated to a maximum depth of 30-45cm, with gentle sloping edges to provide foraging areas for breeding waders and their chicks. The scrapes will be evenly distributed throughout the breeding wader area, with one wader scrape proposed per hectare, and preferentially placed in locations of existing hollows.
- Slow-release fertiliser will be applied, and a grass nurse crop will be sown to accelerate the revegetation of the area in the first growing season. Reapplication as necessary in subsequent years until 60% of the area has revegetated. As revegetation may be uneven, fertiliser application may need to be targeted to the underperforming areas.
- Mowing will not be required until revegetation exceeds 60% of the lapwing breeding area to a height of 5cm in late winter (before March 1st) as per BTO recommendations[7] and/or when tree seedlings (e.g. birch seedlings) are recorded within the enhancement area. Once the requirement for mowing is triggered, it will be undertaken annually thereafter.
    - Mowing should be undertaken in late winter before March 1st, before earlier breeding birds arrive in March (Joys & Crick 2004). Mowing will be undertaken with low-pressure tracking machinery to avoid damaging the developing sward. The annual mowing is likely to produce permanent grassland, which is an important foraging resource for breeding lapwing (Galbraith, 1988).
- In areas where mowing is not possible, e.g. around wader scrapes, tree seedlings will be hand-pulled or cut to the ground by hand.
- Herbicides and pesticides are not permitted within the Proposed Enhancement Area.
- In the event of any invasive species being recorded within the area identified for enhancement measures, an invasive species management plan will be put in place to eradicate any stands of such species. A pre-commencement survey for invasive species will be undertaken as part of preparatory work and if any such species are recorded an invasive species management plan shall be prepared.

[7] https://www.bto.org/sites/default/files/lapwing-habitat-guide.pdf

- Measures will be implemented during the construction phase. This will ensure that the area is suitable for breeding waders at the start of the operational phase.

This area will also be suitable for wintering waders, such as golden plover.

Predator-proof Fencing

The fence specification has been chosen in order to successfully exclude ground predators potentially present in this area (e.g. Red Fox, Badger, Otter, American Mink, Irish Stoat and Pine Marten). The NPWS, as part of recent conservation measures within the Termoncarragh Lake and Annagh Marsh SPA, have provided detailed specifications for permanent predator exclusion fencing for this specific purpose. The proposed permanent predator exclusion fencing within Lodge Bog Enhancement area has therefore been designed based on these specifications, as detailed below. Images of example permanent predator exclusion fencing to a comparable specification are provided in Plate 6-5-1 and Plate 6-5-2 of Appendix 6-5.

Permanent Reedbeds for Hen Harrier

It is proposed to create areas of permanent reedbeds for hen harrier, primarily to replace roosting habitats which may be lost through displacement. As detailed in Section 7.3.7.7 of Chapter 7, hen harrier were recorded roosting irregularly throughout the Project Site at suitable roosting habitats, with seven roosting areas identified within the Project Site over the six winter seasons. No communal roosting or regularly used roost site was identified. Roosting was opportunistic; therefore, it is likely that the creation of new roosting habitat will be utilised.

It is proposed that a reedbed of Common Reed *(Phragmites australis),* Bulrush *(Typha)* and Saw Sedge *(Cladium mariscus)* will be planted adjacent to one of the permanent waterbodies proposed in Section 4.3.2.2 in Appendix 6-5, creating a wetland mosaic through simple rewetting or on the margins of PCAS areas which have undergone more intense drain blocking, with outflows blocked and managed. Where there are existing reedbeds, these will be maintained and natural expansion will be encouraged. Where reedbeds need to be planted, nursery-propagated and locally-sourced turves will be used and planted in patches which will naturally expand. Reedbeds will be planted on shallow gradients with standing vegetation which will be retained throughout winter. The reedbed will be established in shallow waters (5cm) and water levels will be raised gradually. Once established, this reedbed will remain uncut and intact for the winter, as this is more likely to support roosting. Hen harriers have been documented to use roost habitats in a wide range of sizes, from several hundred square metres to several kilometres' square metres. It is proposed that 5.6ha of reedbed mosaics be established, in line with the average size of contiguous habitats used for roosting within, and adjacent to, the Proposed Wind Farm site.

Killina Bog Offsetting Area

Approximately 60.7ha of forestry and woodland within this Killina Bog will be felled and all timber and brash will be removed from the Proposed Wind Farm site. The area will be reprofiled and managed as an open peatland/grassland habitat for the lifetime of the Proposed Project.

The measures to be implemented are detailed in Appendix 6-5 and summarised below:

- The identified area of existing forestry will be permanently removed. The timber, brash and stumps will be mulched to waste and left on-site. The heavier timber and larger stumps will be removed from site where mulching is not practical. The area will be allowed to revert to peatland habitat. This process will be aided by drain blocking as discussed below. This will create suitable habitat for golden plover. Pre-mature felling of forestry will be undertaken before the first winter season of the construction phase of the project programme. This will allow time for the clear-felled

site to revegetate in advance of the operational phase, thereby ensuring replacement habitat would be available should the predicted displacement effect occur.

- A tracked excavator machine with a shears/ harvester head will cut the trees and a second excavator will remove the timber from the site. Similarly, an excavator will be used to remove the stumps.
- The ground will be supported by brash in areas where machinery movements are required to facilitate deforestation.
- Felling will be carried out when ground conditions are dry. It is therefore anticipated that deforestation works will commence in September, in order to both avoid the bird nesting season (i.e. March – August) and coincide with suitable ground conditions. The works are anticipated to be undertaken over a period of one to two months.

- A hydrology/hydrogeology study will be undertaken to map the movement of ground and surface water to inform the requirement for drain blocking. Forestry drainage channels will be blocked where necessary, using peat dams, as appropriate. The area will be levelled (re-profiled) to stabilise the water table and facilitate the mowing necessary to maintain the required open aspect. A bulldozer is used to level/remove any remaining camber from the former peat production fields and/or infill the drains. In flat areas, drain blocks will be placed every 50 meters and more frequently when accounting for a slope. When drains are blocked this reinstates the waterlogged conditions which are crucial for the survival of peatland plants.
- Wader scraps will be created in suitable areas within the offsetting area.
- The vegetation sward within this area will be maintained at the optimal height for waders, including golden plover, of approximately 7-10cm. Golden plover tend to avoid areas where the sward height exceeds 10-20cm. Therefore, a sward height of between 7-10cm will be maintained in this area during the winter months. This will be achieved through summer and autumn grazing with livestock and/or through mechanical means using a flail or mulcher. A sward height of 7-10cm will be achieved by the end of August each year to ensure suitable conditions are available when golden plover return for the winter. If there is an extended growing season into September and October of any given year and the vegetation height exceeds 10cm in these months, further mechanical intervention or grazing may be required in October.
- Decoys of golden plover will be deployed within the offsetting area. The decoys should be positioned tightly together to mimic the natural flocking behaviour of the species, in an open aspect with good views in all directions. The majority of circling flights of golden plover are of birds searching for other flocks on the ground, indicating a safe place to roost. The decoys will encourage golden plover to land within this area and, in theory, attract them to this offsetting area instead of open areas between the Proposed Turbines.
- Self-seeding conifers and scrub vegetation originating as windblown seedlings from adjacent and nearby commercial conifer plantations and nearby scrub and bog woodland, are a threat to the viability of the enhancement areas. They gradually take hold, and if unmanaged, would eventually make the area unsuitable for golden plover. Habitat maintenance of the area will involve the eradication of self-seeding trees and shrubs and mulched to waste and left on-site. It is envisaged that the area will require maintenance every five years during the life of the Proposed Project where annual mowing is not undertaken (e.g. adjacent to drains, areas that are too wet for machinery). The monitoring outlined in Section 5 below will monitor the level of encroachment by self-seeding trees and shrubs and will bring the scheduled removal forward as required.
- In the event of any invasive species being recorded within the Proposed Enhancement Area, an invasive species management plan will be put in place to eradicate any stands of such species.
- Herbicides will not be used for the eradication of self-seeding trees or scrub.

- Enhancement and maintenance works will be undertaken outside of the nesting season as per the Wildlife Acts 1976 – 2023 as amended. A suitably qualified ornithologist will be present at the removal of all woody vegetation, to ensure that identified breeding bird sites are avoided. If breeding activity of birds of high conservation concern is identified, no works shall be undertaken within a species-specific buffer in line with best practice, until it can be demonstrated that the nest is no longer occupied.
- The requirement for any Felling License will be discussed and agreed with the Forest Service. The felling license, if required, will include management prescriptions for the felling of the forestry. Following felling, these enhancement lands will be managed for the benefit of golden plover.

The specific measures and timelines for the deforestation and restoration of these enhancement lands are outlined in Section 4.9 of Appendix 6-5

4.4.3.1.2 *Ecological Offsetting and Enhancement*

Marsh Fritillary Habitat Protection and Enhancement

The Proposed Project infrastructure footprint will result in the loss of approximately 0.67ha of habitat which was considered to be suitable for marsh fritillary.

In order to offset these losses it is proposed to enhance two areas containing fragmented areas of suitable but sub optimal marsh fritillary habitat on site hereafter referred to as Marsh Fritillary Enhancement Block A and Block B.

Habitat Protection

Both suitable and confirmed breeding habitat for marsh fritillary that occur adjacent to but outside proposed works areas will be fenced off in advance of construction of the Proposed Wind Farm. These areas were identified during initial ecological surveys of the Proposed Wind Farm site, and the Proposed Wind Farm was designed to avoid the vast majority of these areas. The fencing will contain signage strictly prohibiting entry to these areas. This will demarcate the area where strictly no machinery, storage of materials or entry of construction site personnel will be permitted. The protective fencing will be inspected and signed off by the supervising ECoW prior to commencement of the Proposed Project. Protective measures for marsh fritillary are detailed in Appendix 6-5 and summarised below:

- Pre-commencement surveys will be carried out by the appointed ECoW to confirm the extent of suitable breeding habitat for marsh fritillary in and within 20m of the Proposed Project construction footprint to determine whether any new areas of suitable habitat for marsh fritillary have been established between planning being granted (if approved) and the commencement of construction works.
- This will be followed by pre-commencement dedicated larval web surveys of areas of identified suitable habitat for marsh fritillary at the appropriate time of year, i.e. August and September in order to determine the extent of confirmed breeding habitat for marsh fritillary.
- Any areas where confirmed and/or suitable breeding habitat for marsh fritillary were identified during surveys to inform the EIAR for the Proposed Project will be temporarily fenced off (including a minimum buffer of 5 metres) prior to the commencement of construction works. Additionally, any new areas of suitable and/or confirmed breeding habitat for marsh fritillary identified during the pre-commencement surveys will also be fenced off. Fencing will be constructed along the margins of these areas.

- The fencing will contain signage strictly prohibiting entry to these areas. This will denote the area where strictly no machinery, storage of materials or entry of construction site personnel will be permitted. The fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the appointed ecologist on site.
- The appointed ECoW will supervise works in close proximity to confirmed and suitable breeding habitat for marsh fritillary.
- Where suitable marsh fritillary habitat occurs in close proximity to the proposed infrastructure, side casting of material will be to the opposite side of the proposed infrastructure to where the suitable habitat occurs. This will ensure that there is no potential for direct or indirect impacts on marsh fritillary habitat. This measure will also protect existing suitable habitat for other Lepidoptera/pollinator species of local importance.

Habitat Enhancement

It is also proposed to enhance areas of identified suitable but sub-optimal habitat for marsh fritillary near a proposed internal site access road northeast of T09 and a proposed internal site access road east of T06 to improve the quality of and connectivity of the habitat for marsh fritillary. This will be achieved through targeted scrub removal and plug-planting of devil's bit scabious.

Devils bit scabious is a slow-growing perennial and may take several years to reach maturity and flower. If grown from seed, it can take 5-6 years to germinate. Therefore, plug planting with plants from a certified native source will be the preferred method[8]. An off-site nursery will be used to grow and source the plugs. However, sewing with devil's-bit scabious seed will also be considered if sourcing plug plants is a limiting factor to the BMP.

The marsh fritillary enhancement measures are detailed in Appendix 6-5 and summarised below:

- Enhancement areas will be clearly marked/fenced off to prevent inadvertent encroachment by construction activities and to ensure management actions are confined to the defined areas.
- Planting will be undertaken to increase the abundance and distribution of devil's-bit scabious within the enhancement areas using an appropriate native source.
- Management will aim to maintain a heterogeneous sward structure, comprising a mosaic of shorter and taller vegetation, rather than a uniform sward. It will also maintain the abundance of devil's-bit scabious within the enhancement areas by preventing competitive exclusion by rank grasses or scrub.
- Where vegetation becomes overly rank or scrub encroachment occurs, targeted and localised management (e.g. selective cutting or clearance by hand) will be undertaken to retain open conditions.
- No fertilisers, slurry, herbicides or pesticides will be applied within the marsh fritillary enhancement areas.
- Field operations such as rush or scrub control should only be carried out November to February when caterpillars are in hibernation and less vulnerable to disturbance.
- In addition to this it is proposed to create additional 'stepping stone' habitat which is key for the survival of the meta populations of the species and to increase its distribution across the landscape. This will not only benefit marsh fritillary but a wide range of other pollinators. This is detailed in Section 4.7.2 in Appendix 6-5.

[8] https://www.plantlife.org.uk/learning-resource/managing-meadows/

Peatland Enhancement Area

There will be a loss of 31.75ha of cutover bog to facilitate the Proposed Project. To offset this loss four areas have been identified for enhancement through drain blocking and rewetting measures.

These include Blocks A, B, C and D as shown in Figure 6-5-8 of Appendix 6-5 which have a combined total area of 231.6ha. Block A is located in Ticknevin, north of T30 and T32, Block B is located in Codd 2 north west of T26, Block C is located in Codd1 northwest of T22 and Block D is located along the boundary of Ballydermot North and Ballydermot southwest of T16.

Draft Rehabilitation Plans has already been prepared for each of the 14 no. bogs within the Allen Bog Group comprising the Proposed Wind Farm site, to satisfy Condition 10 of its EPA licence P0503-01. The aim of the Draft Rehabilitation Plans is to stabilise and rehabilitate the peatland habitats within the Proposed Wind Farm site, and it is proposed that natural revegetation will form the basis for the environmental stabilisation of these areas. The BMP includes for additional peatland enhancement measures to those included within the Draft Rehabilitation Plans, including re-wetting through drain blocking, to aid in the enhancement of peatland habitat within the Proposed Wind Farm site and encourage cutover bog habitats to establish on areas of bare peat

Prescriptive measures are unique to the existing baseline habitats and comprise three no. broad categories, 1) measures associated with deep peat cutover bog 2) those associated with wetland cutaway and 3) those associated with dry cutaway.

The measures proposed are outlined in Appendix 6-5 and summarised below:

Bare peat areas

- Targeted fertiliser applications to accelerate vegetation establishment on areas of bare peat on headlands and high fields. Areas where vegetation has established do not need fertiliser application.
- Regular drain blocking at a minimum of (3/100) using peat dams along with the blocking of outfalls and management of water levels.
- Drain blocking undertaken by a bulldozer, raising water levels, re wetting and slowing water movements through the enhancement blocks.
- Assessment of inoculation of reeds and other target species including common reed, bulrush and saw sedge from other suitable areas within the Project Site, as needed.

Vegetated cutover bog

- Less intensive measures (targeted drain-blocking) will be used in areas where habitats have already established or where tree growth limits access.
- Berms comprising embankments of peat are proposed. These will be constructed with the aim of trapping rainwater and creating shallow pools of water. Berms will be constructed perpendicular to the field orientation to create large compartments.
- There are areas of deeper peat within all four peatland enhancement areas. These will be targeted for more intensive drain-blocking at a minimum of 3/100 m, with field reprofiling also where suitable. Deep Peat measures will also include modifying outfalls, and management of water levels with overflow pipes and blocking of internal outfalls.

Wetland Cutaway

- Measures proposed within areas of wetland cutaway include blocking outfalls, managing water levels with overflow pipes and targeted bunding.

Refer to Table 6-5-2 of Appendix 6-5 for further detail on the typers of measures proposed within the Peatland Enhancement Blocks.

Native Tree (Woodland and Scrub) Planting

The Proposed Project will result in the loss of approximately 44.3ha of woodland to facilitate the construction of the Proposed Wind Farm, to facilitate bat buffers around turbines to make the habitat less attractive to bats and to allow for creation/enhancement of suitable areas for golden plover within Lodge Bog and Killina Bog to offset potentially significant effects on this species as identified in the EIA

It is proposed to plant 45.3ha of native trees at five different areas (Woodland Planting Blocks A – E, as shown in Figure 6-5-3 of Appendix 6-5) to offset any losses of woodland identified. Over time this will establish into mature woodland habitat. Areas chosen for woodland planting are areas of dry cutaway and wetland cutaway.

Local variation in ground levels and hydrological conditions within the Native Tree (Woodland and Scrub) Planting Block will be taken into account during implementation. LiDAR topographic data and onsite observations will be used to inform species selection and planting layout, to ensure that planting is appropriate to local conditions. Where lower lying or wetter areas are identified, planting will be adapted accordingly, either through the use of appropriate wet woodland species or by allowing areas to remain as more open or transitional habitats. This approach will ensure that woodland enhancement is aligned with site conditions and allows for the gradual establishment of a structurally diverse woodland/wetland mosaic alongside ongoing peatland enhancement.

Implementation and Management

The felling of native woodland is not subject to a forestry felling licence and will be replanted within the Project Site as part of Proposed Enhancement Areas. Refer to Section 4.4.1.8 above for further detail on clear-felled forestry and the associated requirements for a felling licence.

Implementation and management measures are outlined in Appendix 6-5 and summarised below:

- All trees within Woodland Planting Block B will be felled using conventional forestry harvesting approaches/machinery and with specific reference to Macklin *et al.* 2017.
- Timber and brash will be gathered and removed from the Proposed Wind Farm site post felling.
- The machine operators used will be experienced at working on deep peat and made aware of the specific risks on the Proposed Wind Farm site.
- The Proposed Wind Farm site will be walked prior to commencement of works.
- The use of off-road vehicles on the Proposed Wind Farm site will be restricted to the proposed new site access track unless where specifically required to access the areas to be felled
- These works will also be preceded by a toolbox talk to the felling team by the ECoW to ensure all measures are implemented in full.
- Burning and dumping will not be permitted.

The native woodland planting measures proposed for all five blocks will be implemented as follows:

- Planting areas will be clearly marked prior to works to define the extent of planting.
- Thin stakes or sticks will be used to mark the rows or areas of trees to be planted.
- Trees will generally be planted at approximately 2 m spacing. Shelterbelt planting may be applied by planting up two lines of trees as a staggered row.
- Newly planted trees will be protected as required using appropriate tree guards to prevent browsing by wild animals such as deer.
- New tree planting will be kept weed and litter free until the new plants are established, particularly from ruderal weeds. Healthy growth will be maintained by

allowing the plant to occupy as much of the planting areas as possible to allow them to achieve as close their natural form as possible.

- During spring and autumn maintenance periods all trees and plants will be checked and adjusted as required, soil firmed, and any dead wood present removed back to healthy tissue. If there is significant failure, the need for replacement planting will be assessed. Where tree guards are no longer required these will be removed to avoid damage to the tree.
- During the first growing season, all standard trees/ semi-mature trees will be watered regularly during any prolonged dry periods during the growing season (i.e. in April, May, June, July and August). During the second growing season the trees will be kept well-watered as often as required, particularly during June, July and August.
- Trees will be inspected following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any trees are dead or damaged these will be replaced using the same species within the next planting season. Recommendations for ongoing or remedial management required will be specified within a Monitoring Report (see Section 5 of Appendix 6-5).

4.4.3.2 Best Practice Measures

A number of biodiversity enhancement measures are outlined in Section 4.8 of Appendix 6-5 and summarised below. These measures are not required to mitigate or offset identified significant effects.

Enhancement of Pollinator Foraging Habitat

No significant effects on supporting habitat for pollinating insects was identified within the EIAR. Nonetheless, there is an opportunity to create areas of high quality, flower rich grassland habitat along the verges of the proposed internal roads associated with the Proposed Project and to manage existing areas of cutover bog, wet grassland and dry meadows and grassy verge habitat along these proposed roads for increased floral diversity. This will benefit pollinators by providing flower rich foraging resources and improved habitat connectivity.

Two areas for habitat creation and enhancement have been identified. The first starts in Lullybeg just south of T37 continuing south along proposed internal roads past T34 into Barnaran, west along the old railway tracks entering Blackriver and then north along proposed internal site access roads past T07 (refer to Map 6-5-3 of Appendix 6-5). The second area starts in the north of the Proposed Wind Farm site in Ticknevin and continues along proposed roads joining T32 and T30, finally connecting to the Long Derries, Edenderry SAC.

Refer to Section 4.8.1 of Appendix 6-5 for further detail on implementation and management of these best practice measures.

Falcon Nest Boxes

As outlined in in Section 7.3.7.11 and 7.3.7.20 of the EIAR, peregrine and kestrel are resident at the Proposed Wind Farm site and breeding in the area. Although no significant impacts are anticipated for these species, both of these species can be limited by the lack of available suitable breeding locations in an Irish context. It is therefore proposed to bolster the population of these peregrine and kestrel by providing additional nesting sites in the form of nest boxes. For peregrine, it is proposed to install two nest boxes at suitable locations outside the buffer of disturbance for this species (750m). For kestrel, it is proposed to provide nest boxes at a ratio of 5:1 relative to the potential collision risk mortality, or 25 nest boxes and these will be placed within the Core Ornithological Survey Area, but at sufficient distances from the Proposed Turbines to avoid impacts. Peregrine and kestrel are known to readily

accept nest boxes. Nest boxes will be placed in the winter before the first breeding season of the construction phase.

Log and Brash Piles

Log and brash habitat piles will be created within areas following birch woodland felling and scrub removal. These areas will be located outside of any areas proposed for permanent infrastructure. Where suitable, woody material arising from necessary vegetation removal associated with the Proposed Project will be retained and reused for this purpose.

The habitat piles will comprise untreated logs, branches and brash of varying sizes, with bark retained where possible, to provide a range of microhabitats for invertebrates, small mammals, small birds, other fauna and fungi. The piles will be located away from routinely trafficked areas and will remain in situ throughout the operational phase of the Proposed Project.

Bat Boxes

As a range of bat species are known to utilise the Proposed Wind Farm site for commuting and foraging, artificial roosting features will be incorporated within the Proposed Wind Farm site to enhance roost availability and strengthen the ecological functionality of the landscape for bats. The enhancement measures will comprise a minimum of 15 no. bat boxes.

The precise location of all artificial roosting features will be agreed with a suitably qualified ecologist prior to installation. In accordance with national guidance, bat boxes will be installed in clusters on mature trees or dedicated poles within woodland, treelines and other sheltered linear features that form existing commuting corridors, and away from artificial lighting and other potential sources of disturbance. Boxes will be installed at a minimum height of 3m above ground level and on a range of aspects to provide a variety of microclimatic conditions. Boxes will include a mix of crevice-type and cavity-type design.

Amenity Development

The Proposed Project includes 55.2km of amenity track which is described in Chapter 4 of this EIAR. The potential for significant disturbance to wildlife as a result of the use of the proposed amenity track and boardwalk by the public during the operational phase of the Proposed Project was considered and assessed in Section 6.4.3.2 of Chapter 6.

The following measures will ensure that disturbance to wildlife and encroachment on to sensitive habitats is avoided or kept to a minimum:

- Dog control management (dogs on leads) will be included on all signage, as required.
- The amenity tracks have been designed to avoid areas identified as suitable for marsh fritillary and construction activities will be supervised by the ECoW, ensuring minor micro-siting as required.
- The amenity pathways will include educational signage with information on the habitats, species and general biodiversity of Ballydermot Bogs and the habitat enhancement work being undertaken by BnM on the Project Site.
- Proposed Amenity Tracks that are located nearby waterbird breeding or roosting locations will be screened. Visual screening fences will be installed at selected locations along the amenity roads and tracks, to prevent disturbance to breeding and non-breeding birds using the site during the operation phase (occasional movement of people, dogs). The screening fence will be approximately 1m high. A dense hedgerow comprising native species may be planted to enhance privacy and visual appeal also. Indicative areas of where screens will be implemented are presented in

Figure 6-5-9 in Appendix 6-5. The actual number and location of screening required will be assessed during the construction phase by the ECoW.

Pine Marten and Red Squirrel Boxes

Pine marten were recorded on trail camera footage in the woodland North of T28 in Glashabaun North Bog, south of T35 in Lullybeg Bog and north-west of T11 in Ballydermot South Bog. Red squirrel were observed in Ballydermot North Bog, Blackriver Bog, Killina Bog and in Lullymore Heritage Park. Other incidental records of these species occurring within and outside the Project Site were also noted in the Biodiversity chapter. No breeding sites for either species were recorded within the footprint of the Proposed Project by surveyors

However, the Proposed Project presents an opportunity to provide enhancement measures for these species in the form of artificial breeding sites. These den/nest boxes act to provide artificial breeding sites facilitating the raising of young during the spring and summer, in addition to providing shelter from environmental conditions and predators.

Proposed Nest/Den Box Installation

It is proposed to erect five pine marten den boxes within Glashabaun North, Glashabaun South, Ballydermot South and Barnaran and five red squirrel nest boxes in Killina and within the proposed Native Tree (Woodland and Scrub) Planting Blocks. These will be erected immediately post construction (to avoid disturbance to these species during construction). They will be erected along existing mature trees within these area and in suitable locations where future tree felling (associated with forestry) will not occur.

Tree Selection

Boxes will not be installed until after the Proposed Project has been constructed, this will allow an optimal location to be identified. Selection of a suitable tree will require the installer to seek out a tree that they deem to be fit for the purpose. Although these guidelines were provided in relation to pine marten den boxes the same would apply in relation to the installation of red squirrel nest boxes. Guidelines for installation are listed in Section 4.8.6.1.1 of Appendix 6-5.

Embankments for Solitary Bees and Pollinators

Safe places for bees to nest are crucial to the survival of each species. Adult solitary bees die in autumn, leaving the next generation behind as pupae in nests to emerge as adults the following spring. Mining solitary bees nest by making tiny burrows in bare earth. It is proposed to use excavated subsoil from the construction of the Proposed Project to construct short sections of embankments/berms at locations within the two pollinator foraging habitat areas that are proposed for enhancement. These berms will be allowed to become recolonised by vegetation naturally to ensure the local seedbank is preserved and provide additional foraging resources for pollinating insects. However, it is also proposed to maintain the south-facing embankment slopes free of vegetation to provide bare soil for nesting solitary bee species. An example of an embankment used by solitary bees is provided in Plate 6-5-6 in Appendix 6-5 with examples of pollinators present within the Project Site shown within Plate 6-5-7 and Plate 6-5-8 in Appendix 6-5. Management and implementation measures are detailed in Section 4.9.7 of Appendix 6-5.

4.5 Access and Transportation

4.5.1 Site Entrances

The Project Site is currently served by a number of existing tracks and access roads due to its previous use as a commercial bog. These site entrances will be used throughout the construction, operation, and decommissioning phases of the Proposed Project to enable delivery of materials and turbine components (construction phase), amenity access and maintenance and monitoring use (operational phase), and removal of Proposed Wind Farm infrastructure (decommissioning phase).

Due to the nature of the Proposed Project, all proposed works will be local to the Project Site and as such, the construction phase will utilise 7 no. access junctions. Of the 7 no. access junctions there are 10 no. associated site entrances proposed to be used during the construction phase. Of these site entrances, 4 no. are existing access junctions that will be upgraded, and 8 no. are proposed new site entrances. Refer to Table 4-7 below for further detail.

The operational phase will utilise 10 no. site entrances to facilitate maintenance and monitoring activity and 3 no. site entrances for amenity access. Refer to Table 4-7 below for further detail.

All proposed site entrances were subject to a swept path analysis assessment to identify the turning areas required, as described in Section 15.1 of Chapter 15: Material Assets. Appropriate sightlines will be established for the safe access and egress of traffic, see Section 15.1.3.1 of Chapter 15 for further information.

As stated above in Section 4.4.1.7, it is anticipated that engineering fill and high-quality surfacing granular fill and sand will be sourced from local, authorised quarries. Refer to Section 4.5.2 below for further details on the construction haul routes of these materials and the corresponding construction phase site entrance that would be utilised by HGVs from each relevant quarry for access to the Project Site. Refer to Figure 4-49 for all proposed construction haul routes for local, authorised quarries.

Refer to Table 4-7 below for details on the locations of these entrances and their proposed use.

Table 4-7 Proposed Construction and Operational Phase Site Entrances

Access Junction	Site Entrance	Description	Used for Turbine Delivery	Used during Construction Phase	Used During Operational Phase (maintenance and monitoring)	Used During Operational Phase (amenity)	Existing Entrance	New Entrance	Security Compound and Gate
1	A	Access on the east side on R401 (previously used for the existing Cushaling Wind Farm)	✓	✓	✓		✓		✓
2	B	Access junction off the west side of L3001 (at existing Ballydermot works)		✓	✓	✓	✓		✓
3	C	Access off the L3001 between T08 & T11 – Southwest		✓	✓			✓	✓
	D	Access off the L3001 between T08 & T11 – North	✓					✓	
	E	Access off the L3001 between T08 & T11 – Southeast	✓	✓	✓			✓	✓
4	F	Access off the L1001 Between T23 & T24 – West	✓	✓	✓			✓	✓
	G	Access off the L1001 Between T23 & T24 – South		✓	✓	✓		✓	✓
	H	Access off the L1001 Between T23 & T24 – East	✓					✓	
5	I	Access off the R414 - West		✓	✓	✓	✓		✓
	J	Access off the R414 – East		✓	✓		✓		✓

6	L	Access off the R414 to access the Proposed Onsite Substation		✓	✓			✓	✓
7	M	Access to the Proposed Offsite Substation-L6002 Road		✓	✓			✓	✓

660000
672000
684000
732000
720000

N

T32 T30 T31 T29 T27 T28 T23 T46 T45 T44 T24 T42 T26 T43 T41 T25 T40 T22 T39 T36 T37 T20 T21 T10 T38 T35 T17 T19 T18 T07 T34 T16 T06 T01 T08 T15 T05 T03 T33 T11 T04 T13 T12 T02 T14

A B C D E F G H I J L M

0 1 2 4 6 Kilometers

Legend

- Project Site
- Site Entrances

Site Design

- 220
- 200
- Security Hut
- Car parking
- Proposed Peat and Spoil Management Areas
- New Road
- Upgrades to Existing Roads

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SITE LOCATION - NOT TO SCALE

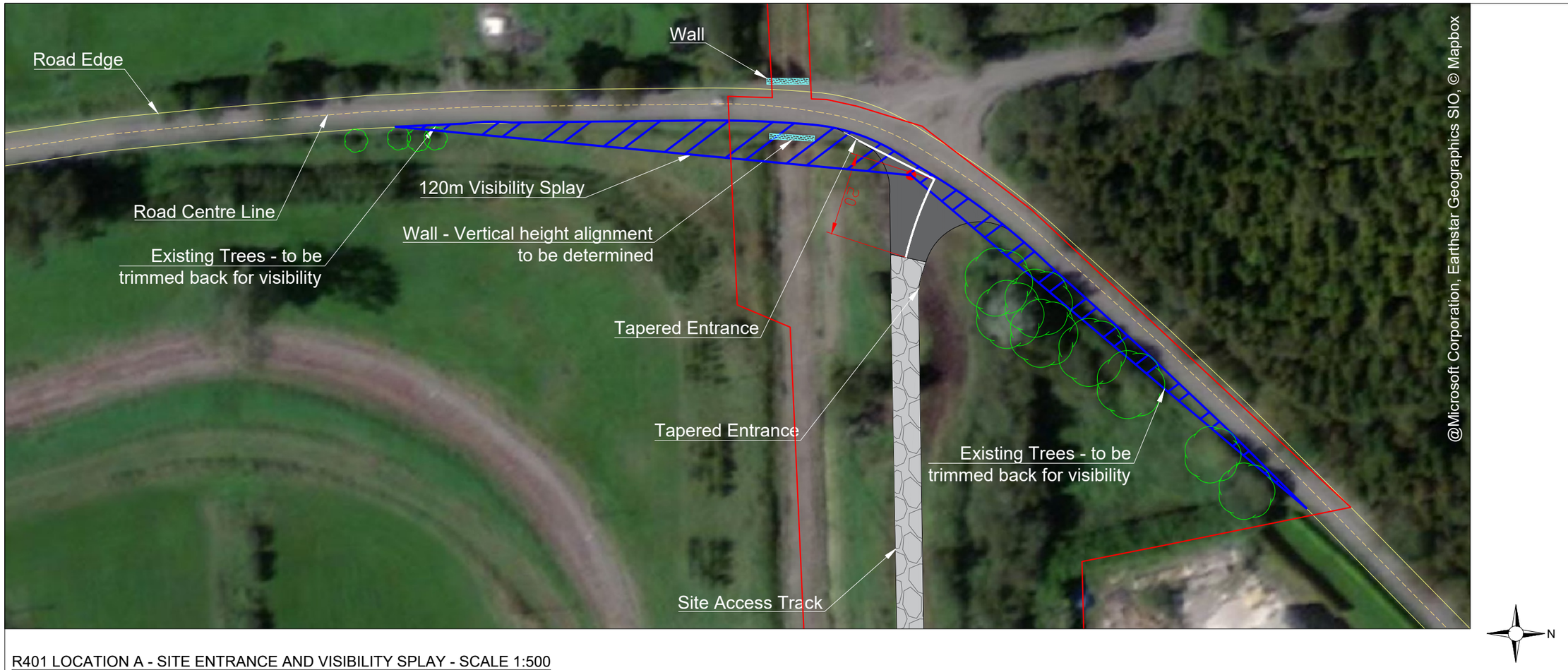
Spatial Reference
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Datum: IRENET95
Projection: Transverse Mercator

Drawing Title
Proposed Site Entrances

Project Title
Ballydermot Wind Farm
Co. Kildare & Co.Offaly

Project No.	Drawing No.	Scale
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Drawn By	Checked By	Date
CJ	EC	04/09/2026

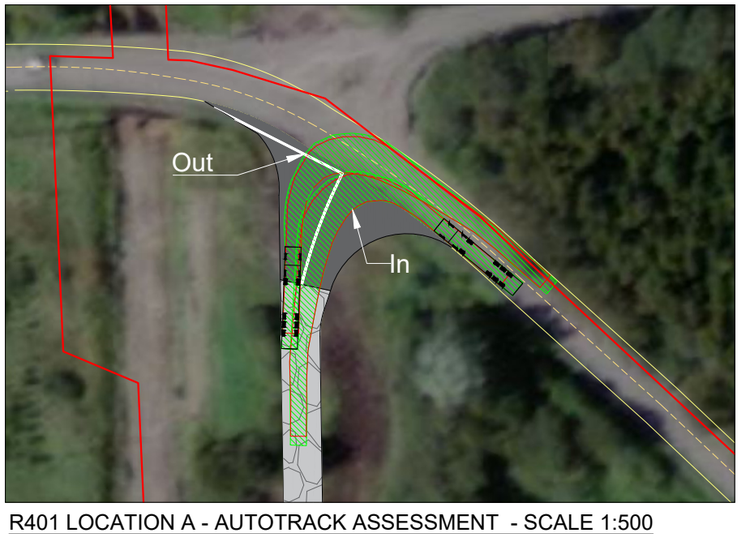
Email: info@mkoireland.ie/ Website: www.mkoireland.ie



R401 LOCATION A - SITE ENTRANCE AND VISIBILITY SPLAY - SCALE 1:500



R401 LOCATION A - RIGHT NORTH VIEW



R401 LOCATION A - AUTOTRACK ASSESSMENT - SCALE 1:500



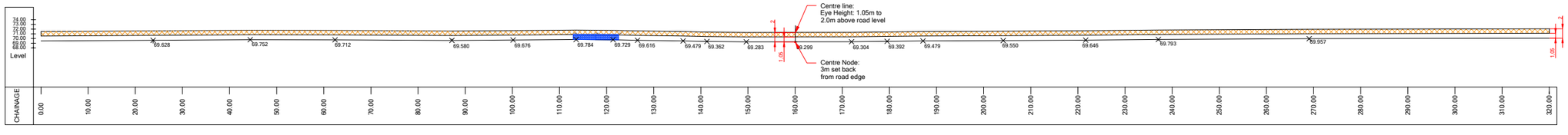
R401 LOCATION A - LEFT SOUTH VIEW

Site Entrance 1A
R401 Design Considerations:

Setback distance = 3.0 m.
Speed limit = 80km/h.
Design speed = 70 km/h.
Required Visibility = 120 m in both directions.
Recommended reduced visibility splays as observed speeds were:
NB = 61.1km/hr
SB = 63.9km/hr
Taper lengths in accordance with DN-GEO-03060

Existing vegetation to North East and South. Vegetation at entrance to be removed and trimmed back from road edge. Boundary walls at railway underpass to South noted.

Obstructions within sight triangles to be maintained below 1m.

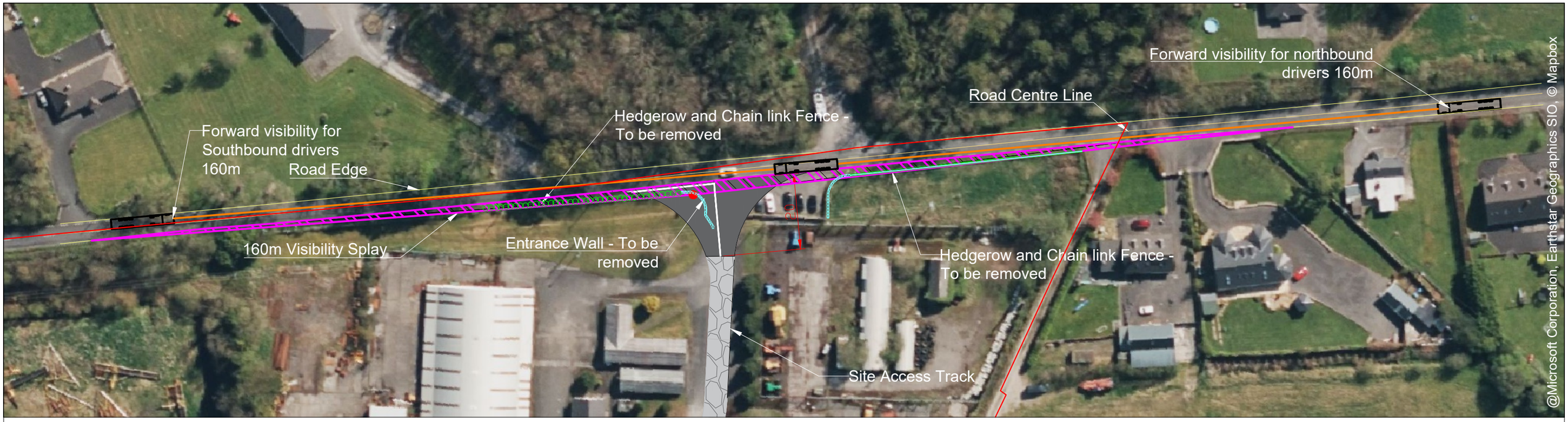


R401 LOCATION A - VERTICAL PROFILE ALONG VISIBILITY SPLAY - SCALE 1:500

Notes:
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare
DRAWING TITLE: Proposed Project Access Junction 1
PROJECT No.: 250708
DRAWING No.: Figure 4-42
SCALE: As Shown
DRAWN BY: FB
CHECKED BY: RD
DATE: 19.10.2026
REVISION: P03

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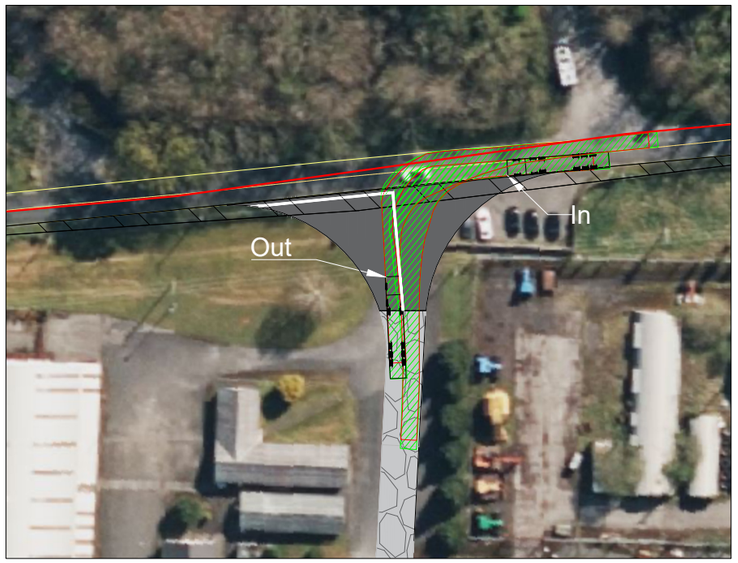


L3001 LOCATION B - SITE ENTRANCE AND VISIBILITY SPLAY - SCALE 1:500

N



L3001 Location B - RIGHT SOUTH VIEW



L3001 Location B - AUTOTRACK ASSESSMENT- SCALE 1:500



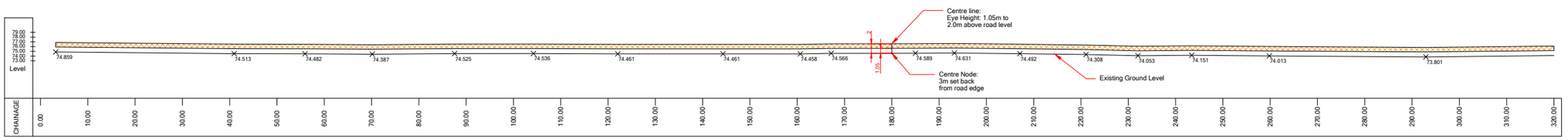
L3001 Location B - LEFT NORTH VIEW

Site Entrance B
L3001 Design Considerations:

Setback distance = 3.0 m.
Speed Limit 60 km/h
Design speed = 85 km/h.
Required Visibility = 160 m in both directions.
Recommended increased visibility splays as observed speeds were:
NB = 88.9km/hr
SB = 86.3km/hr
Taper lengths not included as radius is sufficient (25m).

Existing chain link fence with vegetation and wall to North and South. Wall North of entrance to be removed.

Obstructions within sight triangles to be maintained below 1m.



L3001 Location B - VERTICAL PROFILE ALONG VISIBILITY SPLAY - SCALE 1:500

Legend
- Planning Application Boundary
- 160m Sight Line
- 120m Sight Line
- Node
- Road Edge
- Road Centre
- Vegetation
- Wall
- Gate
- Site Entrance
- Site Access Track

Notes:
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY

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DRAWING TITLE: Proposed Project Access Junction 2

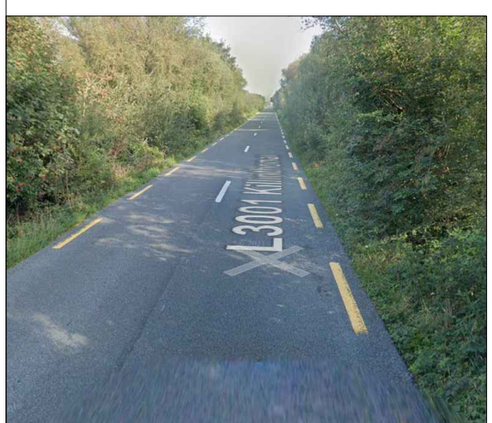
PROJECT No.	DRAWING No.	SCALE
250708	Figure 4-43	As Shown

DRAWN BY	CHECKED BY	DATE	REVISION
FB	RD	19.10.2026	P03

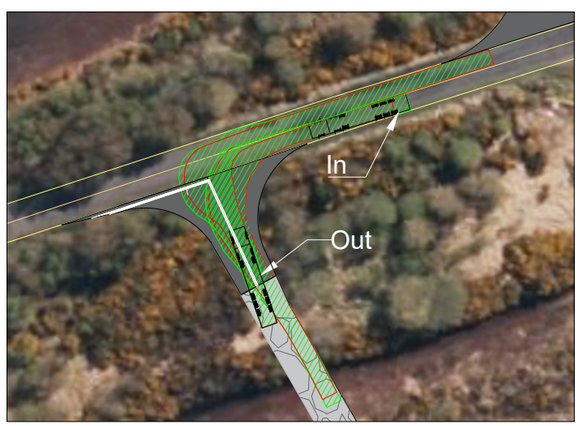
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L3001 LOCATION C - SITE ENTRANCE AND VISIBILITY SPLAY - SCALE 1:500



L3001 LOCATION C - LEFT NORTH VIEW



L3001 LOCATION C - AUTOTRACK ASSESSMENT SCALE 1:500



L3001 LOCATION C - RIGHT SOUTH VIEW

N

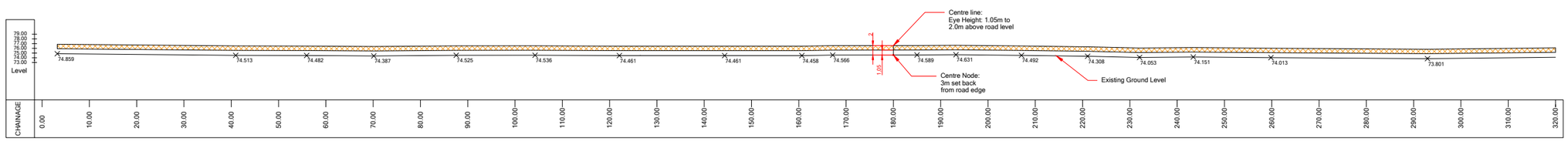
Legend
- Planning Application Boundary
- 160m Sight Line
- 120m Sight Line
- Node
- Road Edge
- Road Centre
- Vegetation
- Wall
- Gate
- Site Entrance
- Site Access Track

Site Entrance 3C
L3001 Design Considerations:

Setback distance = 3.0 m.
Speed Limit 60 km/h
Design speed = 85 km/h.
Required Visibility = 120 m in both directions.
Recommended increased visibility splays as observed speeds were:
NB = 94.9km/hr
SB = 94.1km/hr
Taper lengths in accordance with DN-GEO-03060

Existing vegetation to North and South of entrances. Vegetation to be removed from entrance and trimmed back from road edge.

Obstructions within sight triangles to be maintained below 1m.



L3001 LOCATION C - VERTICAL PROFILE ALONG VISIBILITY SPLAY SCALE 1:500

Notes:
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare
DRAWING TITLE: Proposed Project Access Junction 3
PROJECT No.: 250708
DRAWING No.: Figure 4-44A
SCALE: As Shown
DRAWN BY: FB
CHECKED BY: RD
DATE: 19.10.2026
REVISION: P03

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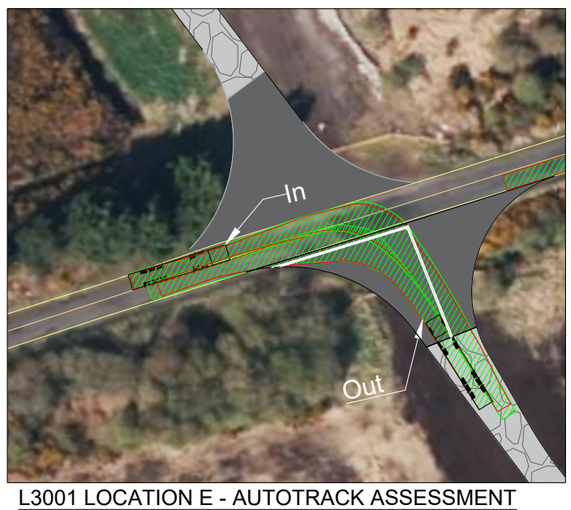


L3001 LOCATION E - SITE ENTRANCE AND VISIBILITY SPLAY - SCALE1:500

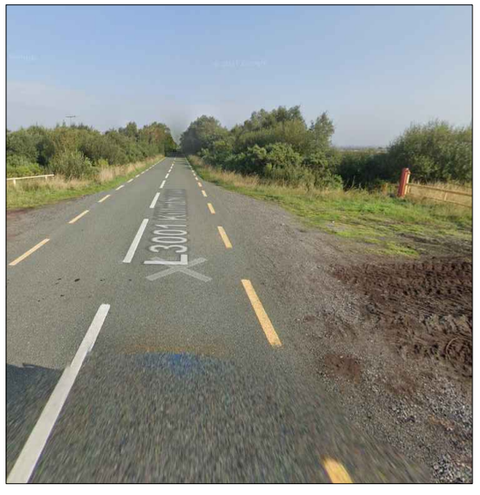
N



L3001 LOCATION E - LEFT SOUTH VIEW



L3001 LOCATION E - AUTOTRACK ASSESSMENT SCALE1:500



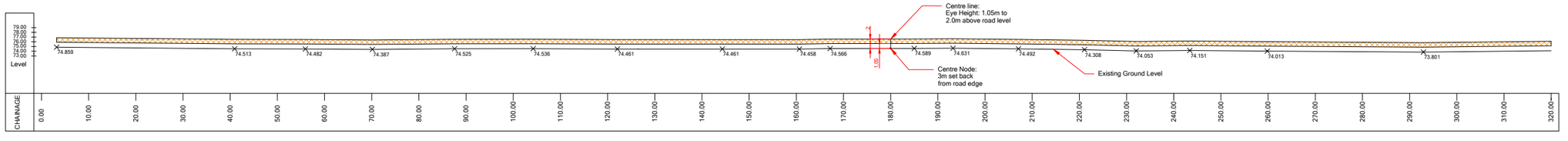
L3001 LOCATION E - RIGHT NORTH VIEW

Site Entrance 3D AND 3E
L3001 Design Considerations:

Setback distance = 3.0 m.
Speed Limit 60 km/h
Design speed = 85 km/h.
Required Visibility = 160 m in both directions.
Recommended increased visibility splays as observed speeds were:
NB = 94.9km/hr
SB = 94.1km/hr
Taper lengths not included as radius is sufficient (25m).

Existing vegetation to North and South of entrances. Vegetation to be removed from entrance and trimmed back from road edge.

Obstructions within sight triangles to be maintained below 1m.



L3001 LOCATION E - VERTICAL PROFILE ALONG VISIBILITY SPLAY SCALE1:500

Legend
- Planning Application Boundary
- 160m Sight Line
- 120m Sight Line
- Node
- Road Edge
- Road Centre
- Vegetation
- Wall
- Gate
- Site Entrance
- Site Access Track

Notes:
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare
DRAWING TITLE: Proposed Project Access Junction 3
PROJECT No.: 250708 | DRAWING No.: Figure 4-44B | SCALE: As Shown
DRAWN BY: FB | CHECKED BY: RD | DATE: 19.10.2026 | REVISION: P03

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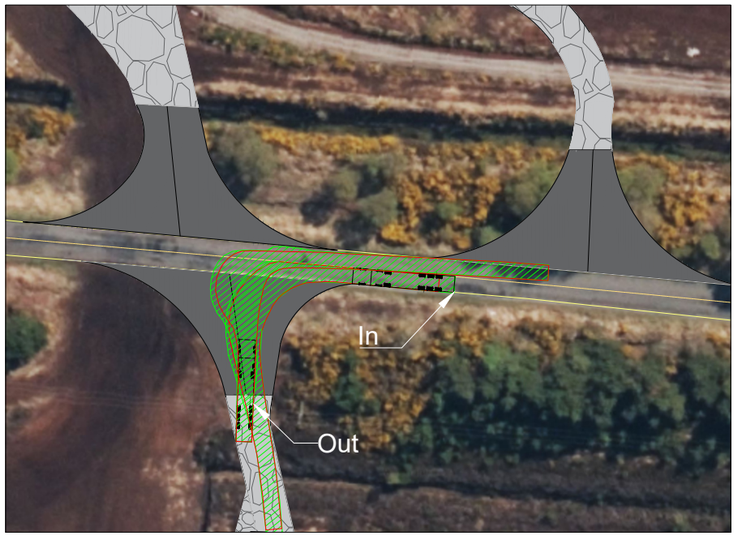


L1001 LOCATION F - SITE ENTRANCE AND VISIBILITY SPLAY - SCALE 1:500

N



L1001 LOCATION F - RIGHT SOUTH VIEW



L1001 LOCATION F - AUTOTRACK ASSESSMENT - SCALE 1:500



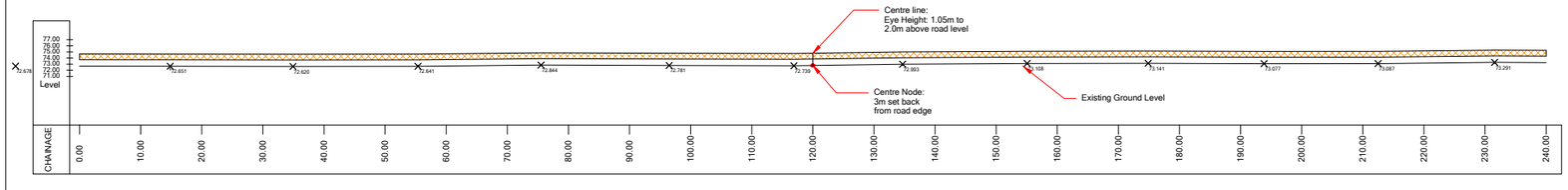
L1001 LOCATION F - LEFT NORTH VIEW

Site Entrance 4F
L1001 Design Considerations:

Setback distance = 3.0 m.
Speed Limit 60 km/h
Design speed = 85 km/h.
Required Visibility = 120 m in both directions.
Recommended increased visibility splays as observed speeds were:
NB = 76.1km/hr
SB = 78.5km/hr
Taper lengths in accordance with DN-GEO-03060

Existing vegetation to North and South of entrances. Any vegetation to be removed from entrance and trimmed back from road edge.

Obstructions within sight triangles to be maintained below 1m.



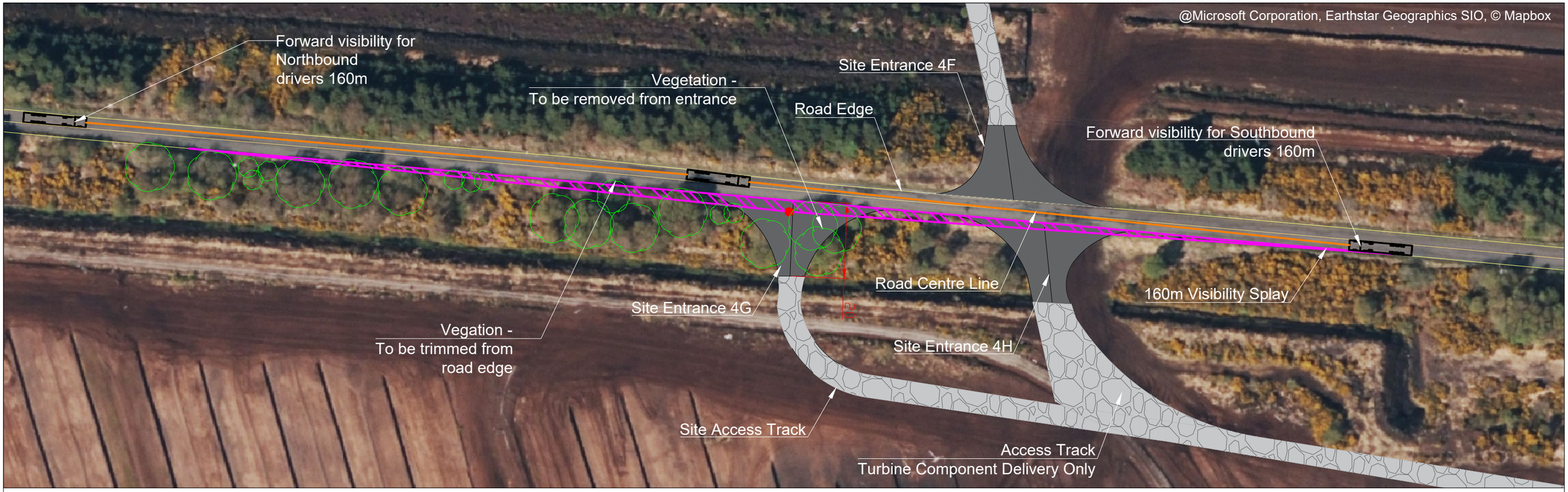
L1001 LOCATION F - VERTICAL PROFILE ALONG VISIBILITY SPLAY - SCALE 1:500

Legend
- Planning Application Boundary
- 160m Sight Line
- 120m Sight Line
- Node
- Road Edge
- Road Centre
- Vegetation
- Wall
- Gate
- Site Entrance
- Site Access Track

Notes:
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare
DRAWING TITLE: Proposed Project Access Junction 4
PROJECT No.: 250708
DRAWING No.: Figure 4-45A
SCALE: As Shown
DRAWN BY: FB
CHECKED BY: RD
DATE: 22.10.2026
REVISION: P03

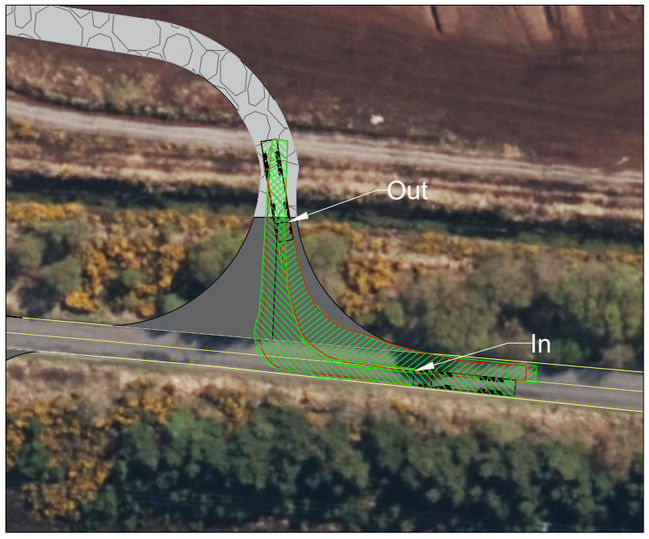
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L1001 LOCATION G - SITE ENTRANCE AND VISIBILITY SPLAY - SCALE 1:500



L1001 LOCATION G - LEFT NORTH VIEW



L1001 LOCATION G - AUTOTRACK ASSESSMENT- SCALE 1:500



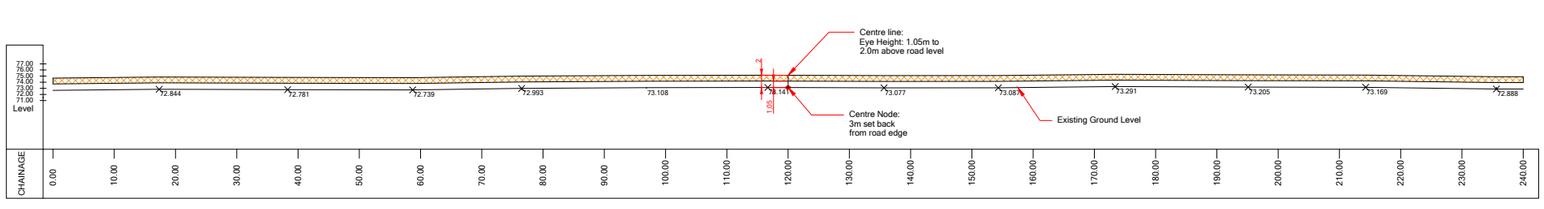
L1001 LOCATION G - RIGHT SOUTH VIEW

Site Entrance 4G and 4H
L1001 Design Considerations:

Setback distance = 3.0 m.
Speed Limit 60 km/h
Design speed = 85 km/h.
Required Visibility = 120 m in both directions.
Recommended increased visibility splays as observed speeds were:
NB = 76.1km/hr
SB = 78.5km/hr
Taper lengths not included as radius is sufficient (25m).

Existing vegetation to North and South of entrances. Vegetation to be removed from entrance and trimmed back from road edge.

Obstructions within sight triangles to be maintained below 1m.



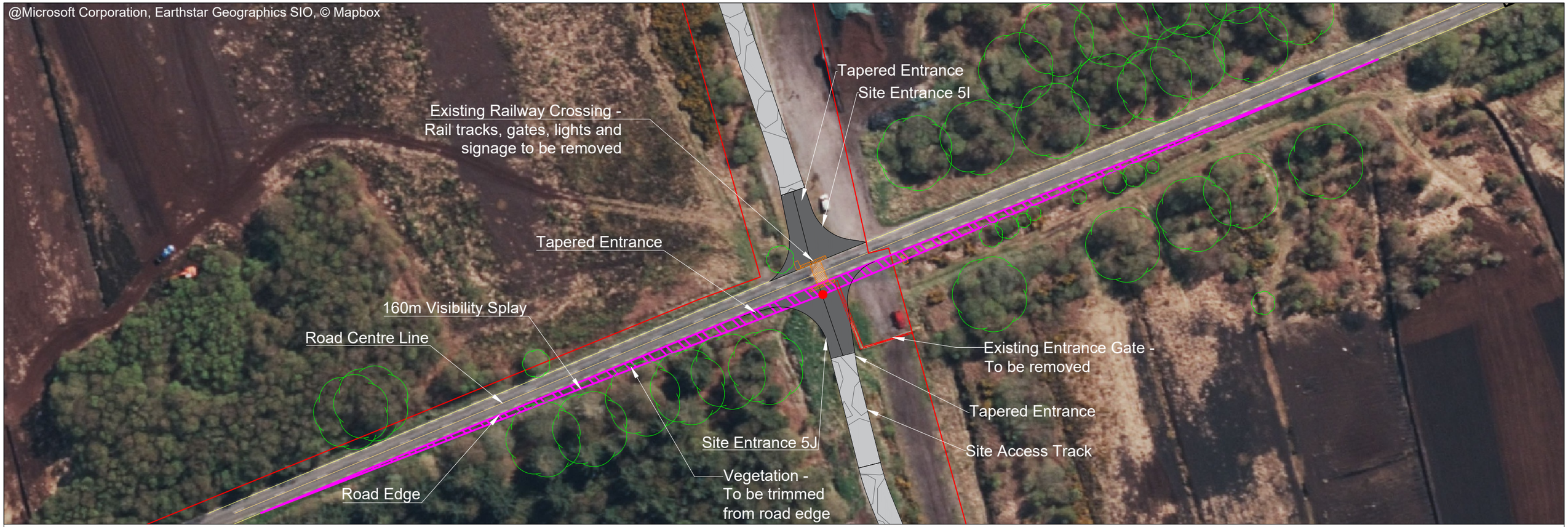
L1001 LOCATION G - VERTICAL PROFILE ALONG VISIBILITY SPLAY - SCALE 1:500

Legend
- Planning Application Boundary
- 160m Sight Line
- 120m Sight Line
- Node
- Road Edge
- Road Centre
- Vegetation
- Wall
- Gate
- Site Entrance
- Site Access Track

Notes:
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare
DRAWING TITLE: Proposed Project Access Junction 4
PROJECT No.: 250708
DRAWING No.: Figure 4-45B
SCALE: As Shown
DRAWN BY: FB
CHECKED BY: RD
DATE: 22.10.2026
REVISION: P03

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R414 LOCATION I - SITE ENTRANCE AND VISIBILITY SPLAY - SCALE 1:500

N



R414 LOCATION I - LEFT NORTH VIEW



R414 LOCATION I - RIGHT SOUTH VIEW

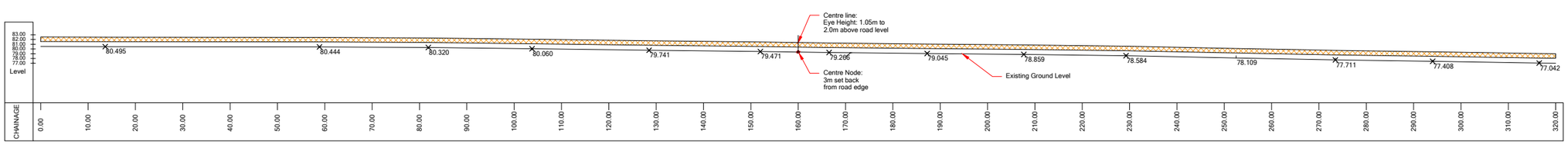
Legend
- Planning Application Boundary
- 160m Sight Line
- 120m Sight Line
- Node
- Road Edge
- Road Centre
- Vegetation
- Wall
- Gate
- Site Entrance
- Site Access Track

Site Entrance 5I and 5J
R414 West Design Considerations:

Setback distance = 3.0 m.
Speed Limit 60 km/h
Design speed = 85 km/h.
Required Visibility = 120 m in both directions.
Recommended increased visibility splays as observed speeds were:
NB = 83.3km/hr
SB = 83.8km/hr
Taper lengths in accordance with DN-GEO-03060

Existing vegetation to North and South to be removed from road edge and entrance. Rail crossing with signs and gate North of entrance to be removed
Obstructions within sight triangles to be maintained below 1m.

This entrance is provided solely to facilitate crossing from one side of the R414 to the other for radial cable installation. It is not intended for material delivery or general site access.



R414 LOCATION I - VERTICAL PROFILE ALONG VISIBILITY SPLAY - SCALE 1:500

Notes:
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare
DRAWING TITLE: Proposed Project Access Junction 5

PROJECT No.	DRAWING No.	SCALE
250708	Figure 4-46A	As Shown

DRAWN BY	CHECKED BY	DATE	REVISION
FB	RD	22.10.2026	P02

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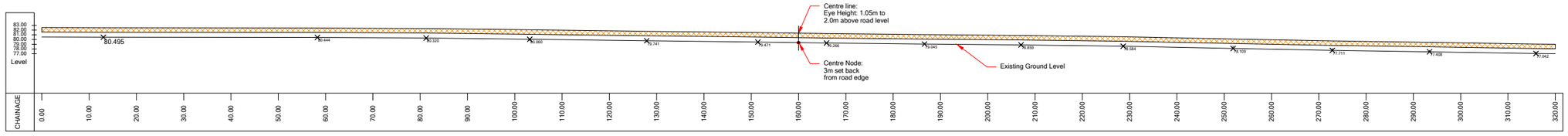
R414 LOCATION I - SITE ENTRANCE AND VISIBILITY SPLAY - SCALE 1:500



R414 LOCATION I - LEFT SOUTH VIEW



R414 LOCATION I - RIGHT NORTH VIEW



R414 LOCATION I - VERTICAL PROFILE ALONG VISIBILITY SPLAY- SCALE 1:500

N

Legend
- Planning Application Boundary
- 160m Sight Line
- 120m Sight Line
- Node
- Road Edge
- Road Centre
- Vegetation
- Wall
- Gate
- Site Entrance
- Site Access Track

Site Entrance 5I and 5J
R414 East Design Considerations:

Setback distance = 3.0 m.
Speed Limit 80 km/h
Design speed = 85 km/h.
Required Visibility = 160 m in both directions.
Recommended increased visibility splays as observed speeds were:
NB = 83.3km/hr
SB = 83.8km/hr
Taper lengths in accordance with DN-GEO-03060

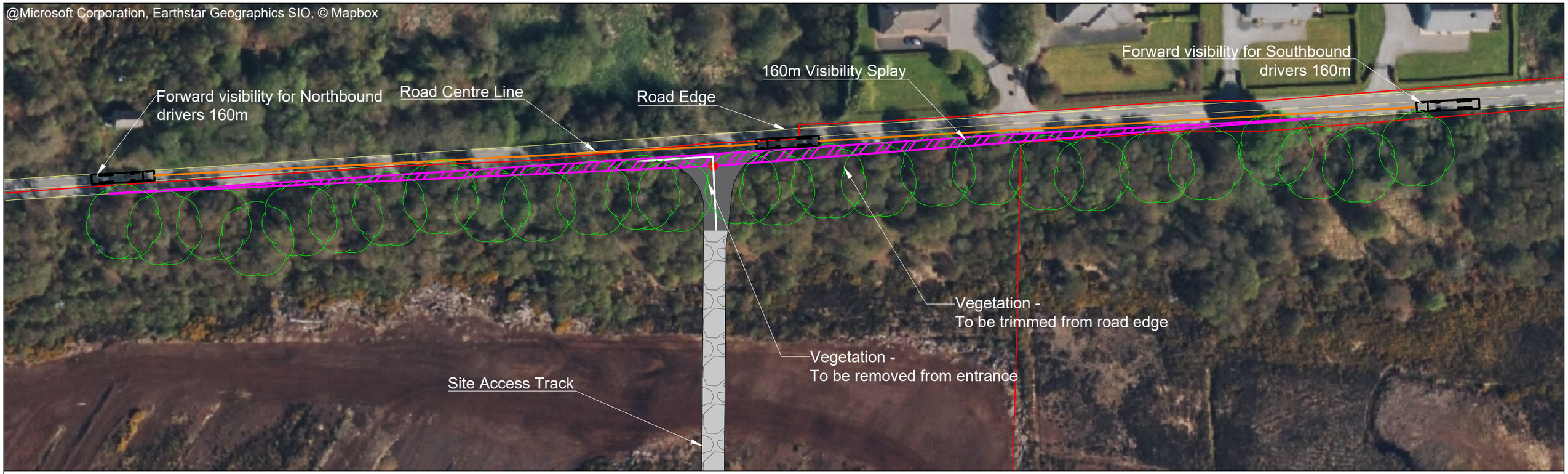
Existing vegetation to North and South to be removed from road edge and entrance. Rail crossing with signs and gate North of entrance to be removed
Obstructions within sight triangles to be maintained below 1m.

This entrance is provided solely to facilitate crossing from one side of the R414 to the other for radial cable installation. It is not intended for material delivery or general site access.

Notes:
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY

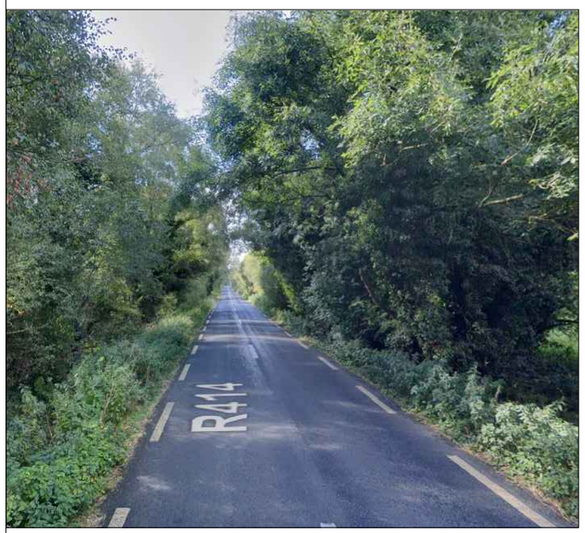
PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare
DRAWING TITLE: Proposed Project Access Junction 5
PROJECT No.: 250708
DRAWING No.: Figure 4-46B
SCALE: As Shown
DRAWN BY: FB
CHECKED BY: RD
DATE: 22.10.2026
REVISION: P02

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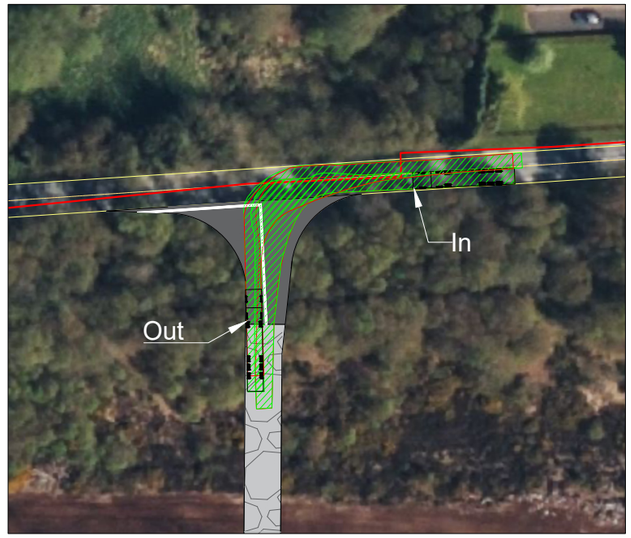


R414 LOCATION L - SITE ENTRANCE AND VISIBILITY SPLAY - SCALE 1:500

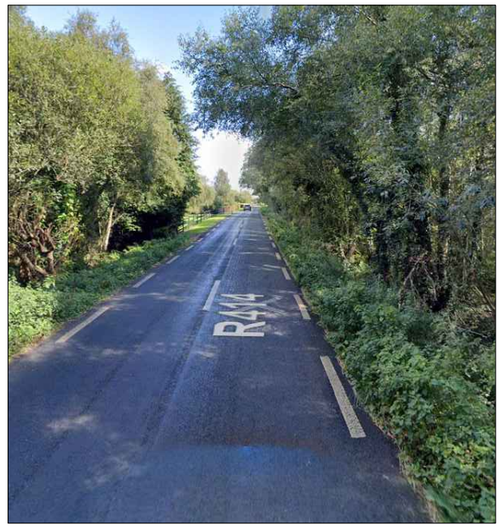
N



R414 LOCATION L - RIGHT SOUTH VIEW



R414 LOCATION L - AUTOTRACK ASSESSMENT - SCALE 1:500



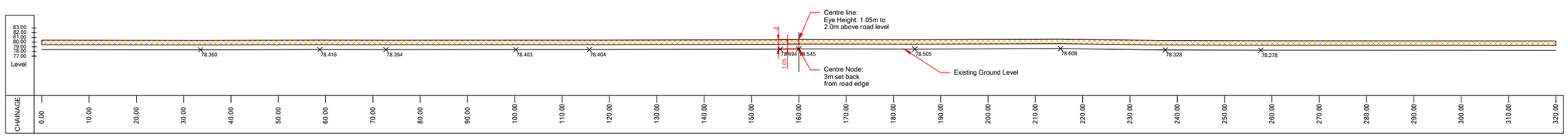
R414 LOCATION L - LEFT NORTH VIEW

Site Entrance 6L
R414 Design Considerations

Setback distance = 3.0 m.
Speed Limit 80 km/h
Design speed = 85 km/h.
Required Visibility = 160 m in both directions.
Recommended increased visibility splays as observed speeds were:
NB = 75.2km/hr
SB = 75.2km/hr
Taper lengths in accordance with DN-GEO-03060

Existing vegetation to West and East. Heavy vegetation to be removed from entrance and trimmed back from road edge

Obstructions within sight triangles to be maintained below 1m.



R414 LOCATION L - VERTICAL PROFILE ALONG VISIBILITY SPLAY- SCALE 1:500

Legend
- Planning Application Boundary
- 160m Sight Line
- 120m Sight Line
- Node
- Road Edge
- Road Centre
- Vegetation
- Wall
- Gate
- Site Entrance
- Site Access Track

Notes:
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare
DRAWING TITLE: Proposed Project Access Junction 6
PROJECT No.: 250705
DRAWING No.: Figure 4-47
SCALE: As Shown
DRAWN BY: FB
CHECKED BY: RD
DATE: 22.10.2026
REVISION: P03

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L6002 LOCATION M - SITE ENTRANCE AND VISIBILITY SPLAY- SCALE 1:500



L6002 LOCATION M - RIGHT SOUTH VIEW



L6002 LOCATION M - AUTOTRACK ASSESSMENT - SCALE 1:500



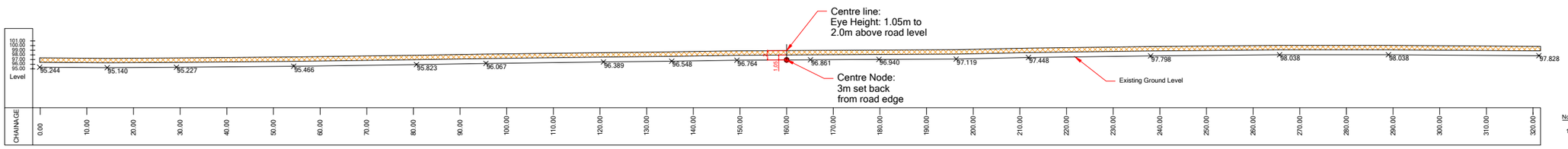
L6002 LOCATION M - LEFT NORTH VIEW

Site Entrance 7M
L6002 Design Considerations:

Setback distance = 3.0 m.
Speed Limit 80 km/h
Design speed = 85 km/h.
Required Visibility = 160 m in both directions.
Taper lengths in accordance with DN-GEO-03060

Existing vegetation to be removed from entrance and trimmed back from road edge

Obstructions within sight triangles to be maintained below 1m.



L6002 LOCATION M - VERTICAL PROFILE ALONG VISIBILITY SPLAY - SCALE 1:500

Notes:
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. DRAWING FOR PLANNING PURPOSES ONLY
3. DRAWINGS ARE NOT TO BE SCALED, USE FIGURED DIMENSIONS ONLY

PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare
DRAWING TITLE: Proposed Project Access Junction 7
PROJECT No.: 250708
DRAWING No.: Figure 4-48
SCALE: As Shown
DRAWN BY: FB
CHECKED BY: RD
DATE: 22.10.2026
REVISION: P03

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4.5.2 Proposed Haul Routes

4.5.2.1 Deliveries of Stone and Ready-Mix Concrete from Quarries

Construction materials will be delivered to the Project Site via selected Proposed Construction Haul Routes; these have been determined based on the identified proposed source of the construction material. All crushed stone, hardcore materials and ready-mix concrete that will be required during the construction phase will be sourced from local, appropriately authorised quarries. There are no borrow pits proposed as part of the Proposed Project. For the purposes of assessment within the EIAR, 9 no. existing, authorised quarries, with the required capacity and material available have been identified within 20km of the Project Site have been selected and assessed as part of this EIAR. Refer to Figure 4-52.

The Proposed Construction Haul Routes and associated traffic movements are discussed in Section 15.1.10 of Chapter 15: Material Assets.

It is envisaged that general construction traffic (including materials and staff) will travel to the Project Site via the public road network to the relevant construction site access points, detailed above.

Site Entrance 6L and Site Entrance 7M will facilitate access to the Proposed Onsite Substation. Site Entrance 8M will facilitate access to the Proposed Offsite Substation. Refer to Table 4-7 above for further information on site entrances. The Proposed Construction Haul Routes for HGVs from each identified quarry to the closest relevant site entrance location is provided below. Deliveries of stone and ready-mix concrete for use in construction of the Proposed Project, are discussed in further detail in Chapter 15 of this EIAR.

Roadstone Quarry, Derrygreenagh Co. Offaly

HGVs will depart from Roadstone Quarry in the townland of Derrygreenagh, Co. Offaly and turn left onto the R400 regional road. They will travel for 6.3 km before taking the second exit at the roundabout to continue on the R400. After travelling south on the R400 for 1.6 km the HGVs will turn left on to the R401. They will continue on the R401 for 9.4 km before taking the second exit on the roundabout to continue on the R401 for 400 m. The HGVs will then turn right and travel for 900 m before turning right onto the R402. They will continue on the R402 for 600 m and then turn left onto the R401 the HGVs will continue travelling in a southerly direction for 3.7 km to Site Entrance 1A where they will turn left to enter the Proposed Wind Farm.

Kilsaran Quarry, Derryarkin/Derrycoffey Co. Offaly

HGVs will depart from Kilsaran Quarry in the townland of Derryarkin, Co. Offaly and turn right onto the R400 regional road. They will travel for 6.3 km before taking the second exit at the roundabout to continue on the R400. After travelling south on the R400 for 1.6 km the HGVs will turn left on to the R401. They will continue on the R401 for 9.4 km before taking the second exit on the roundabout to continue on the R401 for 400 m. The HGVs will then turn right and travel for 900 m before turning right onto the R402. They will continue on the R402 for 600 m and then turn left onto the R401 the HGVs will continue travelling in a southerly direction for 3.7 km to Site Entrance 1A where they will turn left to enter the Proposed Wind Farm.

Walshes Sandpit, Carbury, Co. Kildare

HGVs will depart from Walshes Sandpit in the townland of Carbury, Co. Kildare and turn left onto L1006. They will travel for 1.3 km before turning right onto the L1005. The HGVs will continue on the L1006 for 3.8 km before turning right onto the R402 for 400 m. They will then take the first exit at the

roundabout to travel on the R403 for 5.9 km to Site Entrance 6L where they will turn left to enter the Proposed Wind Farm.

Hanlon Concrete, Robertstown, Co. Kildare

HGVs will depart from Hanlon Concrete in the townland of Robertstown, Co. Kildare and turn left onto Lowtown local road for 1.5 km. They will then turn right onto the R415. The HGVs will continue on the R415 for 1.8 km and then turn left onto the R403. They will travel on the R403 for 6.6 km to Site Entrance 6L where they will turn left to enter the Proposed Wind Farm.

Roadstone Quarry, Allen, Co. Kildare

HGVs will depart from Roadstone Quarry in the townland of Allen, Co. Kildare and turn right to continue for 1.2km on the L3002 before turning left onto the R415. They will continue for 2 km before turning left to stay on the R415. They will continue on the R415 for 5.4 km and then turn left onto the R403. They will travel on the R403 for 6.6 km to Site Entrance 6L where they will turn left to enter the Proposed Wind Farm.

Arkil Sand and Gravel, Rathangan, Co. Kildare

HGVs will depart from Arkil Sand and Gravel in the townland of Rathangan, Co. Kildare and turn left onto the L3002 local road. They will continue on the L3002 for 2.1 km and then continue onto the R401 for 1.7 km before bearing right over Rathangan Bridge. They will travel for 1.2 km and then take the third exit at the roundabout onto the L3001 where they will continue for 1.8 km to Site Entrance 2C and Site Entrance 3E where they will enter the Proposed Wind Farm.

Sheridans Quarry, Shean, Co. Offaly

HGVs will depart from Sheridans Quarry in the townland of Shean, Co. Offaly and turn right onto a local road for 700 m before turning left onto the R401. They will continue on the R401 for 1.1 km to Site Entrance 1A where they will turn left to enter the Proposed Wind Farm.

Kilsaran Concrete, Bunaterin, Tullamore, Co. Offaly

HGVs will depart from Kilsaran batching plant in the townland of Bunaterin, Co. Offaly and turn left onto the N52 before turning right onto the R420. They will turn left onto the R402 until they turn right onto the R401 until they reach Site Entrance 1A where they will turn left to enter the Proposed Wind Farm.

Roadstone Concrete, Tullamore, Co. Offaly

HGVs will depart from Roadstones batching plant in the townland of Ballykilmurry, Co. Offaly and turn Right onto the R420 before turning left onto the R443 and then right onto the N52. They will turn left onto the R420 before turning left again onto the R402 until they turn right onto the R401 until they reach Site Entrance 1A where they will turn left to enter the Proposed Wind Farm.

630000
660000
750000
720000
N
Mullingar
Royal Canal
Glebe (Farbill By)
River Deel
Ballivor
R161
R158
N4
Lough Ennell
127 m
N52
R391
Kinnegad
Towlaght
Baconstown
M4
M6
Roadstone Quarry, Derrygreenagh
Walshes Sandpit
Enfield
R446
R401
115 m
R402
Kilbeggan
Kilsaran Quarry
225 m
R441
Sheridan's Quarry
Edenderry
Grand Canal
Dreenan
Roadstone Concrete, Tullamore
Moyliniagh
Townparks (Philipstown Lower By)
Curryhill
Tullamore
R420
Robertstown East
Ballyteige South
Hanlon Concrete
Geashill
R400
Kilsaran Concrete
N80
R419
Arkil Sand and Gravel
Roadstone Quarry, Allen
Newbridge
Clonaslee
187 m
Bracklone
R423
Kildare
Cowpasture
Nicholastown (Kilculler
0
4
8
16
24
32
Kilometers

Legend

- Project Site
- Proposed Construction Haul Routes
- Local Quarries

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Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

SITE LOCATION - NOT TO SCALE

Drawing Title
Location of Local Quarries and Proposed Construction Haul Routes

Project Title
Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	4-49	1:282,118
Drawn By	Checked By	Date
LPM	EC	06/10/2026

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

4.5.2.2 Turbine Component Transport Route

There are a number of ports on the island of Ireland that have proven capability to accept and store large wind turbine components such as Cork, Shannon Foynes, Galway and Dublin ports. Furthermore, subsequent access to the national motorway network during transportation from these ports has been demonstrated. The facilities within the ports and access to and from the ports is continually being upgraded as part of general improvements. It is on this basis that it is not foreseen that the Proposed Project will result in any material change to the port selected should it be consented and enter into the construction phase.

For the purposes of this EIAR, Galway Port has been selected and assessed to facilitate turbine delivery to the Project Site. Galway Port is regularly used for the delivery of wind turbine components, and the transport of abnormal loads from the port to the national motorway network is well established.

Prior to the commencement of turbine component delivery, the final port of entry will be confirmed following a detailed review of Irish ports and their capacity to facilitate the transport of the Proposed Project's turbine components via the national motorway network.

It is proposed that the large wind turbine components will be delivered to the Project Site via the M6, exiting south at Junction 5 (Tullamore/Kilbeggan) onto the N52, and travelling south towards Tullamore. Turbine delivery vehicles will continue southeast along R420 regional road before turning northeast along the R402 east of Daingean toward the entrance of the existing Cloncreen Wind Farm. Turbine delivery vehicles will progress through the existing Cloncreen Wind Farm before reaching the Site Entrance 1A. Abnormal loads will utilise the internal site access roads and associated site entrances (see Table 4-7 above) in order to ensure delivery to all Proposed Turbine locations. The Proposed Turbine Delivery Route is shown on Figure 4-50. All deliveries of turbine components to the Project Site will only be by way of the Proposed Turbine Delivery Route detailed in Figure 4-53. The route identified for abnormal load delivery has been previously utilised for the delivery of turbine components to the now operational Cloncreen Wind Farm. Turbine delivery during the construction phase of Cloncreen Wind Farm was successful and therefore this route has been considered for the Proposed Wind Farm, subject to further assessment relevant to present conditions and the Proposed Turbines.

All other construction materials will be delivered to the Project Site via the proposed construction haul routes shown on Figure 4-50 and will access the Project Site using the appropriate site entrance based on the source of the construction material, detailed in Table 4-7 above, which will be included in the Traffic Management Plan (TMP) for the Proposed Project, included as Appendix 15-2 to the EIAR. Traffic movements generated by the Proposed Project are discussed in in Section 15.1 of Chapter 15: Material Assets.

4.5.2.3 Turbine Delivery Accommodation Works

Road and junction widening are sometimes required along the Proposed Turbine Delivery Route to accommodate the large vehicles used to transport turbine components to the Proposed Wind Farm. The Proposed Turbine Delivery Route for the Proposed Project has been the subject of a route assessment to determine if any works are required along its length (Appendix 15-3). Full details of the assessment are included as part of the traffic impact assessment set out in Section 15.1.14 of this EIAR and summarised below. There are sections on the route where the vertical alignment may require specialist transport vehicles. These sections will be further considered by the appointed transport company following the turbine procurement process. Accommodation works will be required at various locations on the national and regional road network between the port of arrival in Galway and the Proposed Wind Farm site. These will be limited to temporary measures including temporary local road widening, overruns of roundabout island and temporary relocation of some signs and street furniture.

Location 1 – M6 East / N52 Roundabout and N52 / M6 West Roundabout

Dwg Nos. 414429-60A1.2 and Dwg Nos. 414429-70A1.1 as shown in Appendix 15-3

The abnormally sized loads will undertake a three point turn at the northern M6 East / N52 Roundabout. At this location the roundabout centre island and 2 splitter islands will be levelled and surfaced to provide temporary routes for the abnormally sized loads. The temporary removal of bollards, road signs, a lamp post and some trees will be required.

At the southern N52 / M6 West Roundabout the abnormally sized loads will drive through the centre island of the roundabout. At this location the route through the roundabout centre island will be levelled and surfaced to provide the temporary route for the abnormally sized loads. This resurfacing is already in place. The temporary removal of road signs will be required.

Location 2 – N52 Arden Roundabout

Dwg No. 414429-80A1.1 as shown in Appendix 15-3

At this roundabout the abnormally sized loads will drive on a temporary route proposed on the eastern side of the roundabout centre island that will connect the N52 north and N52 south arms of the roundabout. The route through the roundabout centre island will be levelled and surfaced to provide for the abnormally sized loads.

Location 3 – N52 / L2025 Cappancur Roundabout

Dwg No. 414429-90A1.2 as shown in Appendix 15-3

It is proposed that the abnormally sized loads will travel contraflow through this roundabout. It is also proposed that they will drive on a temporary route proposed on the western side of the roundabout centre island that will connect the N52 north and N52 south arms of the roundabout. The route through the roundabout centre island will be levelled and surfaced to provide for the abnormally sized loads. The temporary removal of one road signs will be required.

Location 4 – N52 / R420 Cloncollog Roundabout

Dwg No. 414429-300A1.1 as shown in Appendix 15-3

It is proposed that the eastern section of the centre island of this roundabout will be temporarily levelled and surfaced to provide for the abnormally sized loads travelling from the N52 north arm to the R420 southeastern arm of the roundabout. The temporary removal of road signs and a lamp post will be required.

Location 5 – R420 / R402 Junction Autotrack Assessment

Dwg No. 414429-310A1.1 as shown in Appendix 15-3

Significant temporary works have been undertaken for the delivery of turbine components at this location which have since been fenced off.

The extent of the area on the northeast corner of the junction that will be surfaced to accommodate the wheels of the abnormally sized delivery vehicles, is illustrated, as is the additional are that is required to be cleared to facilitate overhang of the blade. The temporary removal of road signs an electricity pole, trees and existing boundary will be required.

Location 6 – R402 / L2025 Junction in Ballingar Autotrack Assessment

Dwg No. 414429-320A1.3 as shown in Appendix 15-3

An area on the western side of the R402 comprising of third-party land and a public park, will be required temporarily to provide an over-run area for the delivery of the abnormally sized loads, with an additional area required to provide for oversail of the blade tip. In this area trees, 2 poles, a hedgerow, a fence, a wall and road signs will be temporarily removed. To the east of the junction with the L2025, a splitter island and associated street furniture will also be removed temporarily.

Location 7 – Left bend on R402 in Ballingar Autotrack Assessment

Dwg No. 414429-140A1.1 as shown in Appendix 15-3

At this left hand band on the R402 one electricity pole located on the north side of the road will be temporarily removed in order to facilitate blade overhang of the northern carriageway edge.

Location 8 – Right bend on R402 in Daingean Autotrack Assessment

Dwg No. 414429-150A1.1 as shown in Appendix 15-3

In order to accommodate the abnormally sized vehicles at the right hand bend on the R402 in Daingean a narrow section of temporary road widening will be implemented on the northern side of the road. The assessment also shows an area on the west side of the R402 that will be cleared temporarily of all obstructions to facilitate oversail of the blade time, and similarly an area on the south east corner of the bend that will be cleared to accommodate overhang of the blade. During the delivery period, on-street parking restrictions will be required in addition to the removal of a lamp post, an electricity pole and the pruning of some trees.

Location 9 – R402 / L1003 Junction Autotrack Assessment

Dwg No. 414429-160A1.1 as shown in Appendix 15-3

At this junction the autotrack assessment shows that the tip of the blade will oversail the northern carriageway edge of the R402 but will not extend beyond the existing boundary fence. The assessment also shows that the body of the blade will overhang the south western corner of the R402/ L1003 junction into third party lands. During the delivery period, a telegraph and 2 road signs will be removed on the southwest corner of the junction.

Location 10 – L1003 / Cloncreen Wind Farm Junction Autotrack Assessment

Dwg No. 414429-170A1.2 as shown in Appendix 15-3

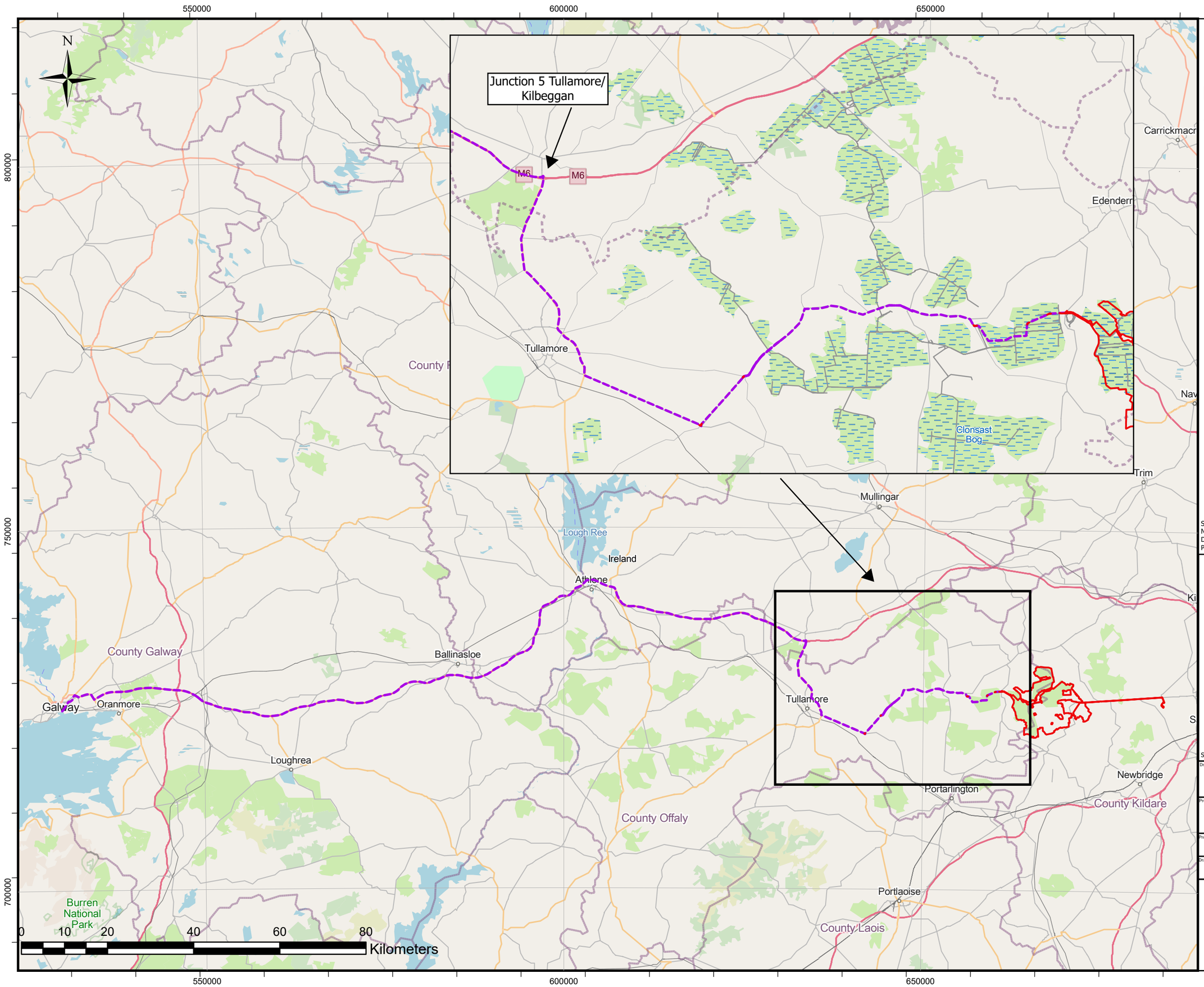
It is proposed that the abnormally sized delivery vehicles will enter the Cloncreen Wind Farm at the existing access off the eastern side of the L1003. The autotrack assessment shows that an addition to the existing access road and area on the eastern side of the L1003 and to the south of the existing access will be temporarily surfaces in order to accommodate the largest vehicles. In addition, a short strip to the north of the existing access road will be cleared of any obstruction to accommodate overhang of the blade. A narrow strip on the west side of the L1003 to the north of the access road will also be kept clear to permit minor oversail of the blade tip across the western carriageway edge. Existing boundary features at the temporary access will also be removed.

Remaining Route to Site Entrance 1A

Dwg Nos. 414429-230A1.1 and 414429-240A1.1 as shown in Appendix 15-3 to Chapter 15: Material Assets to the EIAR

The abnormally sized loads will then travel east via the internal road network of the Cloncreen Wind Farm, with minor temporary remedial works required at 2 locations to accommodate the abnormally sized loads generated by the Proposed Project.

The Proposed Turbine Delivery Route then enters the Proposed Wind Farm site by means of a crossing of the R401 (Site Entrance 1A), with the loads abnormally sized loads distributed through the Proposed Wind Farm site via crossings of the L3001 (Site Entrance 2B) and the L1001 (Site Entrance 3D and Site Entrance 3E), as shown in Figure 15-2. All 3 of these locations are straight crossing and are accommodated within the proposed junction designs.

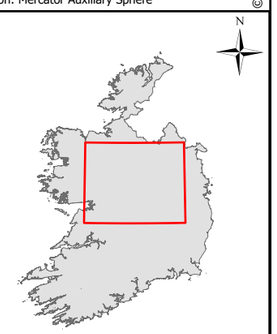


Legend

- Project Site
- Proposed Turbine Delivery Route

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Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere



SITE LOCATION - NOT TO SCALE

Drawing Title
Proposed Turbine Delivery Route

Project Title
Ballydermot Wind Farm
Co. Offaly & Co. Kildare

Project No.	Drawing No.	Scale
250708	4-50	1:800,000
Drawn By	Checked By	Date
LPM	CJ	20/10/2026

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

4.5.3 Turbine Delivery Traffic Management

A turbine with a blade segment length of 85m has been used in assessing the traffic impact of turbine delivery for the Proposed Wind Farm. The blade transporter for such a turbine blade would have a total vehicle length of 93m, including the blade which overhangs the back of the vehicle. The total length of the tower transporter is 100.5 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 Project Site will be smaller than the design test vehicles.

The turbine delivery vehicles have been modelled accurately in the swept path analysis assessments for the Proposed Wind Farm access junctions, as detailed in Section 15.1.10 of this EIAR.

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 on the island of Ireland (Ireland and Northern Ireland combined, per latest available figures on www.windenergyireland.com), transport challenges are an issue for which the wind energy industry and specialist transport sector has become particularly adept in finding solutions.

A detailed TMP has been prepared as part of the traffic impact assessment set out in Chapter 15 of this EIAR and is provided as Appendix 15-2. The deliveries of turbine components to the Proposed Wind Farm 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.

Refer to Section 4.5.1 above for further information on site access points for abnormal load delivery – the entrances to be utilised to facilitate turbine delivery are detailed in Table 4-7.

Prior to the delivery of abnormal loads, the TMP will be reviewed and finalised. Prior to the TMP 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 TMP for agreement with the relevant authorities. All turbine deliveries will be provided for in a TMP 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 will be 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. See Appendix 15-2 for details of this traffic management plan.

4.6 Site Activities

4.6.1 Environmental Management

All proposed activities on the Project Site 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 4-4 of this EIAR.

The CEMP includes details of drainage, peat and spoil management, and resource and waste management, and clearly outlines the mitigation measures and monitoring proposals that are required to be adhered to in order to comply with the environmental commitments outlined in the EIAR. In the event that 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.

4.6.2 Refuelling

Wherever possible, vehicles will be refuelled off-site. This will be the case for regular, road-going vehicles. However, for construction machinery that will be based on-site continuously, a limited amount of fuel will have to be stored on site in appropriately bunded containers.

On-site refuelling of machinery will be carried out at dedicated refuelling locations using a mobile double-skinned fuel bowser. The fuel bowser, a double-axle, custom-built refuelling trailer, will be re-filled off site and will be towed around the Project Site by a 4x4 jeep to where machinery is located. It is not practical for all vehicles to travel back to a single refuelling point, given the size of the cranes, excavators, etc. that will be used during the construction of the Proposed Project. The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use.

Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays, spill kits and fuel absorbent mats will be used during all onsite refuelling operations.

4.6.3 Concrete Deliveries

Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. When concrete is delivered to site, only the chute of the delivery truck will be cleaned (in dedicated concrete washout areas only, as described below), using the smallest volume of water necessary, before leaving the Project Site. Concrete trucks will be washed out fully at the batching plant, where facilities are already in place.

The small volume of water that will be generated from washing of the concrete truck's chute will be directed into a temporary, lined, impermeable containment area. Where temporary lined impermeable containment areas are used, such containment areas will be built using straw bales and lined with an impermeable membrane. Two examples are shown in Figure 4-51 and Figure 4-52 below.

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



Figure 4-51 Concrete washout area



Figure 4-52 Concrete Wash Out Area

Alternatively, a Siltbuster-type concrete wash unit or equivalent[9] 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 will be disposed of off-site at an appropriate waste facility.

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

- Concrete trucks will not be washed out on the Project Site but will be directed back to their batching plant for washout.
- Internal site access roads will be constructed to the required standard to allow transport of the turbine components around the Project Site, and hence, concrete delivery trucks will be able to access all areas where the concrete will be needed. No concrete will be transported around the Project Site in open trailers or dumpers to avoid spillage while in transport. All concrete used in the construction of turbine bases will be poured 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 poured 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 Project Site will be agreed with suppliers before work starts, agreeing routes, prohibiting on-site washout and to agree emergency procedures.
- Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating that the washout of concrete trucks is not permitted on the Project Site.

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

4.6.4 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 required 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.

Given the scale of the turbine base concrete pours which form part of the Proposed Wind Farm, the pours will be planned approximately 1 week in advance. Special procedures will be adopted in advance of and during all concrete pours to minimise the risk of pollution. These will include:

- Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast.
- Restricting concrete pumps and machine buckets from slewing over watercourses (including drains and ditches) while placing concrete.
- Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets.
- Ensuring that covers are available, and used, when necessary, 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 truck's chute will be directed into a temporary, lined, impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent.
- Surplus concrete after completion of a pour will be taken off-site and disposed of at an appropriately authorised facility.

4.6.5 Dust Suppression

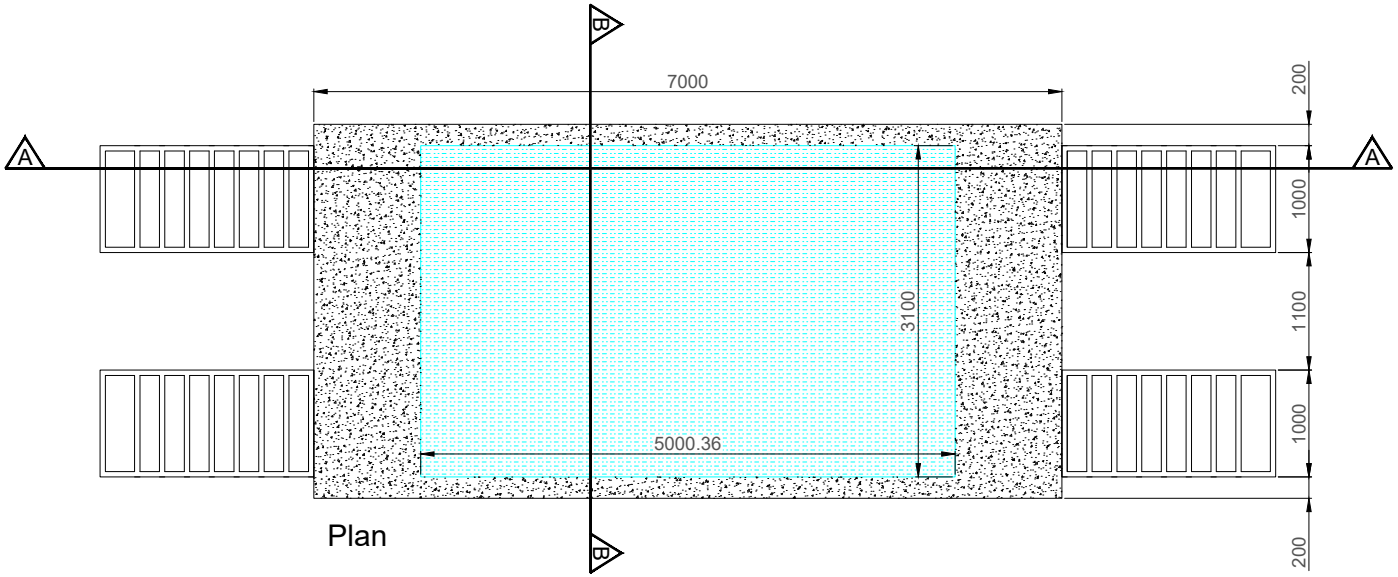
In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling/settlement ponds in the Project Site's drainage system and will be pumped into a bowser or water spreader to dampen down haul 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.

4.6.6 Vehicle Washing

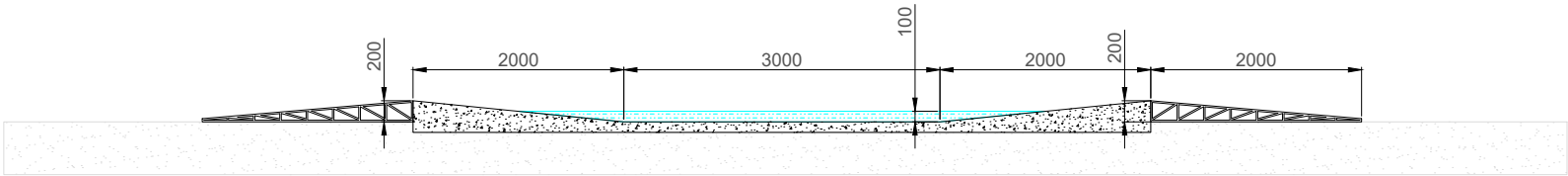
Wheels or vehicle underbodies will be washed before leaving sites to prevent the build-up of mud on public (and site) roads. Internal site access roads will be constructed before other road-going trucks begin to make regular or frequent deliveries to the Project Site (e.g., with steel or concrete). The internal site access roads will comprise granular fill, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt.

A wheel wash facility has been included in the design of the Proposed Project. Figure 4-53 includes details of a proposed self-contained wheel wash system for use during the construction phase of works. A wheel wash will be located at each of the construction and delivery entrances as shown on the site layout drawings included as Appendix 4-1. The inclusion and final design associated with a wheel wash will be subject to agreement with the relevant local authority.

The contractor will be responsible for ensuring that all vehicles egressing the Project Site have used the wheel wash facilities. However, a road sweeper will be made available by the contractor for the cleaning of public roads in the event that they are dirtied by trucks associated with the Proposed Project.



Plan





Section B-B

Note:

All dimensions are in millimeter, unless noted otherwise.

All dimensions to be checked on site and any discrepancy to be reported to the engineer.

Figured dimensions only to be used, drawings not to be scaled. If in doubt ask.

For illustration purposes only. Exact size and appearance of unit subject to manufacturer selection.

Wheel washes will be appropriately located at all entrances used during construction of the wind farm

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Wheel Wash Detail

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-53	As Shown

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
GO	RD	23.10.2026	P03

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

4.6.7 EPA IPC Licence

BnM was granted an Integrated Pollution Control Licence (IPC) Licence (Ref. P0503-01) for peat extraction activities from the EPA for the Allen Bog Group, in May 1999 within which the Proposed Wind Farm, Proposed Enhancement Areas, Proposed Onsite Substation, and 0.5km of the Proposed Grid Connection underground electrical cabling route (i.e. the Proposed Wind Farm site) are located. The EPA issues IPC licences that contain conditions on how an activity must operate to protect the environment with regards to emissions to air, water and land. The EPA Act, 1992 specifically prohibits the EPA from granting a licence if emissions from an activity would cause pollution.

The EPA has undertaken Technical Amendments of the IPC Licence P0503-01 on 27th of September 2012 for the purpose of aligning the operational conditions of the licence to the objectives of National and European environmental protection legislation enacted over the lifetime of the licence.

The current IPC Licence is subject to 14. No. conditions pertaining to the ongoing monitoring and maintenance to ensure any emissions from site activities comply with and not contravene, any of the requirements of Section 83(3) of the Environmental Protection Agency Act, 1992. Conditions 1-4 of the licence outlines the Scope, Management, Interpretation and Notification procedures required. Conditions 5 to 10 pertain to environmental monitoring and management and are discussed further below and Conditions 11 to 14 detail the Monitoring (equipment use), Recording and Reporting, Emergency Response and Financial Provisions duties of BnM. The IPC Licence is managed by BnM with a Compliance Officer managing the day-to-day IPC compliance requirements.

Condition 5 to 10 of the license that is still active within the licensed area, and are required to be monitored and reported on annually, are:

- Control emissions to atmosphere, dust and air emissions - to provide for the protection of the environment by way of control, limitation, treatment and monitoring of emissions;
- Protect emission to water, surface waters and groundwater & operate robust silt pond and drainage management systems, to provide for the protection of the environment by way of control, limitation, treatment and monitoring of emissions;
- Manage waste responsibly and maintain records, to provide for the disposal of waste and the protection of the environment;
- Adhere to noise control, to provide for the protection of the environment by control of noise;
- Water protection in workshops and depots, to provide for the protection of surface waters and groundwater; and
- Draft Cutaway Bog Decommissioning and Rehabilitation Plans for agreement, to make provision for the proper closure of the activity ensuring protection of the environment.

The IPC Licence (P0503-01) is publicly available online here: https://leap.epa.ie/licence-profile/P0503/versions/22c7e87d-7c61-e211-9eb5-0050568a69e2

Condition 10 of the IPC Licence relates to decommissioning and rehabilitation of the site after the cessation of the licenced activity. In accordance with Condition 10.2.1 of the IPC Licence, the licensee must prepare a plan for the permanent rehabilitation of the cutaway boglands within the licenced area. Condition 10.2.2 of the IPC Licence requires these plans to be reviewed and updated every two years, with any measures outlines in the plans to be approved in writing by the EPA before their implementation. In accordance with these conditions, BnM has prepared Draft Cutaway Bog Decommissioning and Rehabilitation Plans ('Draft Rehabilitation Plans') for each of the bog units which comprise the Proposed Wind Farm site. These plans will, by necessity, remain draft until such time as they are agreed in writing with the EPA. The Draft Rehabilitation Plans have the flexibility to change, in response to stakeholder consultation and in order to adapt to the evolving conditions and dynamic

nature of the site as necessary, ensuring the correct habitat management measures are implemented in the correct place. The overarching aim of the Draft Rehabilitation Plans is to environmentally stabilise the bogs, which is achieved through the encouragement of re-vegetation of bare peat areas, as well as through targeted active management as appropriate, such as drain blocking at suitable locations.

The Draft Rehabilitation Plan for 10 no. of the bogs within the Proposed Wind Farm site (i.e., Ballydermot, Blackriver, Barnaran, Killina, Lullymore, Lullybeg, Derrybrennan, Glashabaun, Codd and Ticknevin). The Draft Rehabilitation Plans for Ballydermot North, Ballydermot South, Glashabaun North, Glashabaun South, Codd 1 and Codd 2 have been combined into the respective Ballydermot, Glashabaun and Codd Draft Rehabilitation Plans. BnM have produced a final Cutaway Bog Decommissioning and Rehabilitation Plan for Lodge Bog, where the Proposed Onsite Substation is located, see section 4.6.8 for more detail. Refer to Appendix 2-4 for details of 10 no. Draft Rehabilitation Plan and Lodge Bog Cutaway Bog Decommissioning and Rehabilitation Plan.

Peat extraction was permanently ceased by BnM in the Allen Bog Group in June 2020, however BnM's statutory duties to discharge the conditions of its IPC Licence remains on-going. These ongoing IPC compliance duties, such as environmental monitoring, decommissioning works and site management do not facilitate the continuation of peat extraction but rather ensure compliance with BnM's IPC Licence. Irrespective of the consenting or construction of the Proposed Project, BnM's statutory duties to discharge the conditions of its IPC Licence will remain ongoing.

The targeted rehabilitation measures set out in the Draft Rehabilitation Plans will be implemented following completion of the construction phase in a phased manner under the IPC Licence, subject to agreement and approval by the EPA.

4.6.8 Peatland Climate Action Scheme

The Peatland Climate Action Scheme (PCAS)[10] is a programme of enhanced peatland rehabilitation with the primary aim of optimising climate action benefits of rewetting former industrial peat extraction areas by creating soggy peatland conditions that will allow compatible peatland habitats to redevelop. These measures are separate to those defined by the IPC Licence Condition 10.2.1 (discussed in Section 4.6.7 above). PCAS has been developed to optimise ecosystem service benefits of peatland rehabilitation and restoration, particularly carbon storage and reducing carbon emissions. In addition, PCAS activities will benefit biodiversity and water (water quality and catchment management).

PCAS is supported by Government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan administered by the Department of Environment, Climate and Communications (DECC). Refer to https://www.bnmpcas.ie/ for details. The National Parks and Wildlife Service (NPWS) acts as the Scheme regulator and there is ongoing engagement with the EPA. To date the PCAS has rehabilitated approximately 24,503ha of peatland[11].

Within the Project Site, PCAS has been completed on Lodge Bog, with a total of 365.7 ha being rehabilitated. The rehabilitation measures implemented consisted of Deep Peat (96.92 ha), Dry Cutaway (55.6 ha), Wetland (150.83 ha), Additional Land (targeted drain blocking) (26.24 ha), Marginal (35.4 ha) and the removal of the pumping regime. An example of where a wind farm and PCAS have successfully been implemented is at Cloncreen Wind Farm[12], operational since 2022 with PCAS measures being implemented during and post construction of the wind farm. Refer to Section 2.5.4 of Chapter 2 and Section 11.3.2.4 of Chapter 11: Climate for further details.

[10] *The Peatlands Climate Action Scheme (PCAS) is also referred to as the Enhanced Decommissioning, Rehabilitation and Restoration Scheme (EDRRS).* https://www.bnmpcas.ie/
[11] https://www.bnmpcas.ie/news-and-updates/
[12] https://www.bnmpcas.ie/wp-content/uploads/sites/18/2022/07/Cloncreen-Final-Rehab-Plan_v7.pdf

Proposed infrastructure within Lodge Bog includes, approximately 2.5km of internal access road, 2 no. peat and spoil areas, the Proposed Onsite Substation and associated telecommunications tower along with all ancillary infrastructure, and approximately 0.5km of the Proposed Grid Connection underground electrical cabling route. The Proposed Project infrastructure is located outside the PCAS areas. Lodge Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2022[13] was developed during Ballydermot Wind Farm pre-planning stage and where part of the planned infrastructure occurs within Lodge Bog, these areas have been constrained from the rehabilitation plan. The Proposed Project has also been designed to ensure that these activities can coexist with, and not preclude, the PCAS measures.

The completed PCAS activities at Lodge Bog have been taken account in describing the baseline environment in the vicinity of the Proposed Project and in the relevant assessments. Furthermore, the cumulative impact assessments carried out in each of the subsequent chapters of this EIAR consider all potential significant cumulative effects arising from these activities in the vicinity of the Proposed Project.

4.6.9 Resource and Waste Management

The CEMP, Appendix 4-4 of this EIAR, provides a Resource and Waste Management Plan (RWMP) which outlines the best practice procedures during the excavation, construction and decommissioning phases of the Proposed Project. The RWMP 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)[14]. Disposal of waste will be a last resort. The RWMP has been prepared to outline the main objectives that will be adhered to for the preparation of a more detailed RWMP to be completed prior to the construction phase of the Proposed Project. The RWMP will be in place throughout the construction phase and decommissioning phase of the Proposed Project and will be in line with all relevant legislation detailed in Section 3.8 in Appendix 4-4.

The Waste Management Act 1996 (the Act) 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 Project Site to ensure that all contractors hired to remove waste from the Project 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 RWMP will provide systems that will enable all arisings, movements and treatments of construction waste to be recorded. The system will describe the waste types expected to be produced during the project and identify the waste management action proposed (refer to Section 3.8 in Appendix 4-4). Estimates of the quantities to be produced will be inserted into a detailed waste management spreadsheet and the data will be updated as the work progresses, and information is available and

[13] https://www.bnmpcas.ie/wp-content/uploads/sites/18/2022/06/Lodge-Bog-Final-Rehab-Plan-v4.pdf
[14] *EPA 2021* Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects. *Available at:* https://www.epa.ie/publications/circulareconomy/resources/CDWasteGuidelines.pdf

performance against the estimates will be monitored. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The RWMP can then be adapted with changes that are observed through record keeping.

4.7 Site Drainage

4.7.1 Introduction

The drainage design for the Proposed Project has been prepared by Hydro Environmental Services (HES). The drainage design has been informed by the experience of HES on other wind farm sites in peat-dominated environments, and the best practice guidance documents referred to in the References section of the EIAR.

The protection of the groundwater and surface water within and surrounding the Project Site, and downstream catchments is a critical aspect of establishing the most appropriate drainage proposals for the Proposed Project. The existing drainage system and surface water discharges from the Project Site are regulated by the EPA (Licence Ref. P0503-01). The drainage design for the Proposed Project has been designed with the intention of having no negative impact on the water quality of the Project Site and its associated watercourses, 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 Chapter 9: Water.

The routes of any natural drainage features will not be altered as part of the Proposed Project. Turbine locations have been selected to avoid natural watercourses where possible; however, as outlined in Section 4.4.1.11 above, within the Proposed Wind Farm, there are a total of 13 no. watercourse crossing locations over natural watercourses (rivers and streams). Refer to Section 4.9.1.7 below for details on the crossing methodology to be deployed at each crossing location.

There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows using in-situ drainage and settlement ponds. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses, i.e., 50m. Buffer zones of 50m around the existing natural watercourses have been used to inform the layout of the Proposed Project.

4.7.2 Existing Drainage Features

The Proposed Wind Farm is located within a former peat extraction site. An extensive network of drainage channels is present throughout the peatland which is managed under IPC licence P0503-01 Allen Bog Group. As outlined in Section 9.2.3 of Chapter 9, HES completed site inspections, walkover surveys, drainage mapping, and baseline monitoring/sampling at within the Proposed Wind Farm site as part of this EIAR and to inform the planning application for the Proposed Project. These site investigations comprised of peat probing, geological mapping and drainage mapping completed by HES on 6th, 15th and 22nd October 2020, 5th, 10th, 12th and 18th November 2020, 1st April 2021, 11th December 2025 and 15th May 2026. 3 no. rounds of surface water sampling, field hydrochemistry and surface water flow monitoring were completed on 1st April 2021, 11th December 2025 and 15th May 2026 on the watercourses draining the Project Site.

The surface of the cutover bog is drained by a network of parallel field drains that are typically spaced every 15 - 20m. The field drains are approximately 0.5 - 1.5m deep and in most areas, they intercept the mineral subsoil underlying the peat. These field drains mostly feed into larger main drains which drain the bogs towards the outfall locations. There are a number of shorter cross drains (sometimes piped below ground in lower lying areas) which intersect the small field drains. There are various outfalls on the bog boundaries.

Over the lifetime of the bog, arterial drainage works were installed to achieve the levels of drainage required to allow the extraction of peat to the bog floor, pumping of whole bog areas or certain portions of bog areas arose where gravity drainage did not provide the required environment for peat extraction.

Lullymore Bog has a network of parallel north-south orientated field drains. There is 1 no. silt pond located in the southeast of the bog. Lullymore Bog is a gravity drained bog.

Glashabaun North Bog has a network of parallel southwest-northeast orientated field drains. There are 3 no. silt ponds on the west of the bog. Glashabaun North has 2 no. pumps on site, one submersible pump and one screw pump.

Glashabaun South Bog has a network of parallel southwest-northeast orientated field drains. There are 11 no. silt ponds located in the west and east of the bog. Glashabaun South is a gravity drained bog.

Ballydermot North Bog primarily has a network of parallel west-east orientated field drains. It is a gravity drained bog with no silt ponds located on site.

Ballydermot South Bog has a network of parallel north-south orientated field drains. There are 2 no. silt ponds and 2 no. submersible pumps located in the northwest of the bog.

Blackriver Bog primarily has a network of parallel north-south orientated field drains. There are 4 no. silt ponds and 2 no. submersible pumps located on the west of the bog.

Lodge Bog has a network of parallel southwest-northeast orientated field drains. There are 4 no. silt ponds located on the east of the bog.

Killina Bog has a network of parallel northwest-southeast orientated field drains in the eastern side and west-east orientated field drains in the western side of the bog. There are 2 no. silt ponds in the northeast of the bog. Killina is a gravity drained bog.

Barnaran Bog has a network of parallel east-west orientated field drains. There are 3 no. silt ponds on the west of the bog and no pumps. Barnaran is a gravity drained bog.

Lullybeg Bog has a network of parallel east-west orientated field drains. There are 2 no. silt ponds on the north-east of the bog and no pumps. Lullybeg is a gravity drained bog.

Derrybrennan Bog has a network of parallel southwest-northeast orientated field drains. There are 2 no. silt ponds in the northwest of the bog. Derrybrennan is a gravity drained bog.

Codd 1 primarily has a network of parallel east-west orientated field drains. There are 5 no. silt ponds located in the northwest, northeast and east of the bog and 1 no. submersible pumps are also located on the bog.

Codd 2 has a network of parallel north-south and northwest-southeast orientated field drains. There are 11 no. silt ponds located on the boundary of the bog. Codd North is a gravity drained bog.

Ticknevin has a network of parallel north-south orientated field drains. There are 6 no. silt ponds located in the south of the bog and 2 no. submersible pumps.

Surface water draining from the Project Site is routed via settlement ponds (in accordance with the IPC licence requirements) prior to discharge into off-site drainage channels, streams and rivers.

The drainage proposed within the part of the Project Site under IPC Licence, i.e., the Proposed Wind Farm site, will not significantly alter the existing drainage regime within the Allen Bog Group. Moreover, the proposed drainage system will be fully integrated into the existing bog drainage systems.

Existing field drains and main drains will be routed under/around access tracks using culverts as required.

Runoff from access tracks, turbine bases, and developed areas (temporary construction compounds, Proposed Onsite Substation, 1 no. relay mast, 2 no. met mast) will be collected and treated in local (proposed) silt traps and settlement ponds and then discharged to existing peat field drains. From there, this water will flow towards the relevant bog boundaries into existing field drains and main drains and then be treated further in the existing main (bog) settlement ponds prior to discharge from the Proposed Wind Farm site.

Ponding would occur in these areas to a very shallow depth, and only intermittently following heavy rainfall. No large open bodies of water are proposed, and where intermittent ponding occurs this will be broken up into small areas using peat berms.

4.7.3 Drainage Design Principles

The drainage layout for the construction phase of the Proposed Project has been designed to collect surface water run-off from hardstanding areas within the Proposed Wind Farm site and discharge to temporary construction settlement ponds prior to entering existing IPC licensed drainage system. Therefore, any surface water from the proposed works that finds its way into the existing drainage system will then be captured in the existing system of IPC silt / settlement ponds, before final discharge to the receiving watercourse. The existing IPC silt / settlement ponds are upstream and downstream of the external pumping stations to allow sediment to settle out of the water before it is discharged to the external streams.

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 Project Site.
- Re-routing existing local drainage pathways as required.
- Weekly inspection and recording of surface water management system by on-site Environmental Clerk of Works (EnvCoW) 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 Project Site.

Drainage water from any works areas of the Project Site will not be directed to any natural watercourses. Two distinct methods will be employed to manage drainage water within the Project 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 Proposed Wind Farm site that might carry silt or sediment, to allow attenuation and settlement within the Proposed Wind Farm site prior to controlled diffuse release via recharge into the existing IPC drainage system.

The drainage design is intended to maximise erosion control, which is a more effective system 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 Project Site from adjacent ground, to minimise the volume of sediment-laden water that must 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 4-54 below.

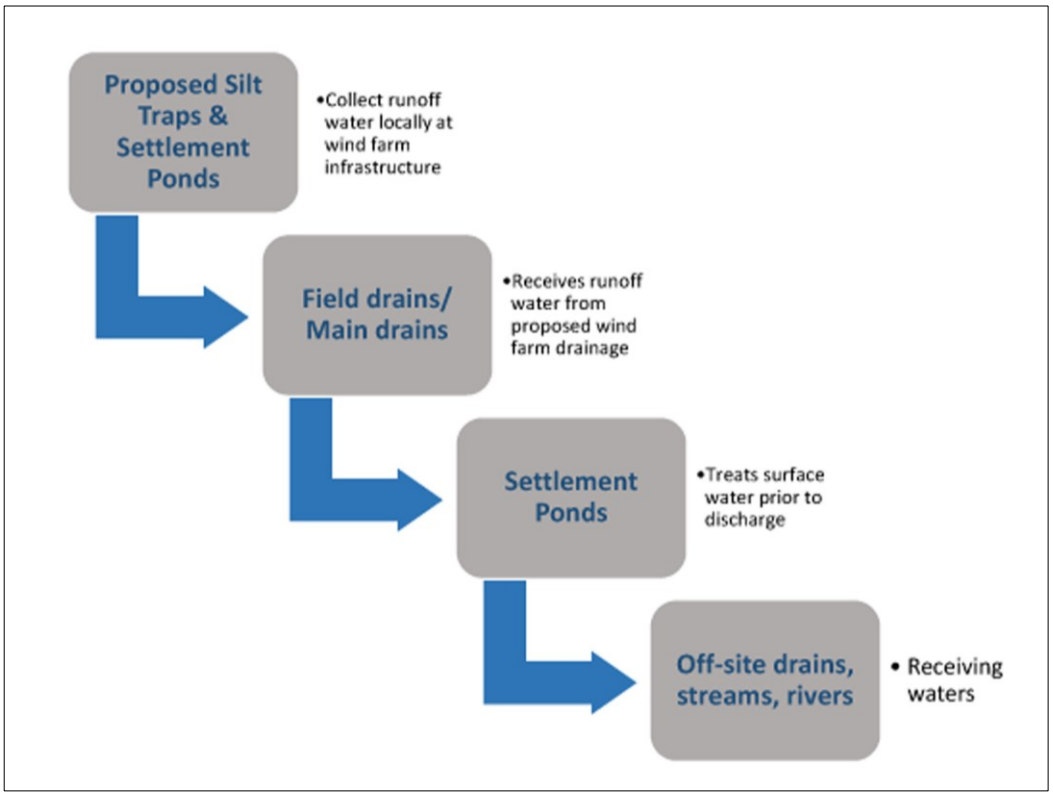


Figure 4-54 Proposed Project Drainage Process Flow

During the construction phase, all runoff from works areas (i.e., dirty water) will be attenuated and treated prior to being released within the Project Site. All drainage outfall from the Project Site is routed through existing IPC settlement ponds that remain in situ from the previous site use. Refer to Section 4.7.4 below for further detail on drainage design.

4.7.4 Drainage Design

A preliminary drainage design for the Proposed Project, incorporating all principles and measures outlined in this drainage design description, has been prepared, and is included in the drainage figures included in Appendix 4-1 to this EIAR. The drainage design employs the various measures further described below and complies with 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;
- Institute of Geologists Ireland (2013) Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements (hereafter referred to as 'IGI Guidance');
- 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 WEDG 2006) and the Draft Revised Wind Energy Development Guidelines (Draft WEDG 2019);
- 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);
- PPG1 - General Guide to Prevention of Pollution (UK Guidance Note);
- PPG5 – Works or Maintenance in or Near Water Courses (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 Plant 2018-2021 (DAFM, 2018).

Drainage drawings are included as part of Appendix 4-1. The detailed drainage will be finalised following a pre-construction confirmatory survey by the EnvCoW to confirm the baseline hydrological condition of the Project Site at the time of construction.

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 Project Site where it might otherwise have come into contact with exposed surfaces and collected 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 create 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 will be removed. At that stage, there will be no open excavations or large areas of exposed ground that are likely to give rise to large volumes of potentially silt-laden run off. Any areas in which works were carried out to construct roads, turbine bases or hardstands, will have been built up with large-grade hardcore, which even when compacted in place, will retain sufficient void space to allow water to infiltrate the subsurface of these constructed areas. It is not anticipated that roadways or other installed site infrastructure will intercept ground-conveyed surface water runoff to any significant extent that would result in scouring or over-topping or spill over. Where the drains are to be removed, they will be backfilled with the material from the diversion dike. Interceptor drains shall be retained in certain locations, for example where roadways are to be installed on slopes, to prevent the roadways acting of 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 shall be left in situ following construction. Figure 4-56 below shows an illustrative drawing of an interceptor drain.

The velocity of flow in the interceptor will be controlled by check dams (see Section 4.7.4.4 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 construction settlement pond/field drain. 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 Collector Drains

Collector drains (or swales) are shallow drains that will be used to intercept and collect runoff from the main construction areas of the Project Site during the construction phase (i.e., from turbine base/hardstand areas, construction compounds, and the substation). Drainage swales (i.e., collector drains) will remain in place to collect runoff from roads and hardstanding areas of the Proposed Project during the operational phase. A collector drain 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. Collector drains are proven to be most effective when a dike is installed on the downhill side. They are similar in design to the interceptor drains described above.

Collector drains will be installed downgradient of the main works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and collected silt and sediment. Swales will intercept the potentially silt-laden water from the excavations and construction areas of the Project Site and prevent it reaching natural watercourses. Collected water will travel along the collector drains to areas downgradient of the main works areas, where the drain will terminate at a settlement pond and outfall to a field drain (see Section 4.7.4.9).

Collector drains 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.

Figure 4-56 below shows an illustrative drawing of collector drains.

4.7.4.3 Over-The-Edge Drainage

Within the Project Site layout there are sections of proposed floating road between turbine infrastructure. In these sections, and depending on intermediate topography, a collector drain (dirty water system as described above) may be used during construction phase, otherwise over-the-edge (OTE) drainage will occur. OTE drainage allows runoff from access tracks to flow into local field drains and be managed via the existing site drainage system. OTE drainage will only occur where topography allows, in areas of low risk and remote from outfall locations (at least 150m from bog outfall locations). Silt traps and check dams will be installed in field drains downstream of OTE drainage areas, and these measures will provide attenuation and treatment of any arising dirty water. In addition, all drainage water from the bogs will travel along field drains, and main drains, and then into existing IPC settlement ponds prior to outfall from the Project Site into surrounding receiving waters.

Figure 4-56 below shows an illustrative drawing of OTE drainage.

4.7.4.4 Check Dams

Drainage gradients within the site are generally low, and as such the use of and spacing between check dams is less frequent than on hillside sites.

The velocity of flow in the interceptor drains and collector drains will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the drain is non-erosive. Check dams will also be installed in some existing artificial drainage channels present on the site under the IPC drainage network that will receive waters from works areas of the Project Site.

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 will also be installed in some of the existing IPC field drains on the Project Site, downstream of where drainage swales connect in. Installation will be confirmed during the finalisation of detailed drainage design following a pre-construction survey.

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- to 6-inch stone layers 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.

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 (field drains) and interceptor/collector drains.

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 during construction

Figure 4-56 below shows an illustrative drawing of check dams.

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.

Maintenance checks will also ensure the centre elevation of the dam remains lower than the sides of the dam.

4.7.4.5 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 Project Site.

Dewatering silt bags are also used where water is pumped temporarily from excavations (e.g., turbine bases). Water is pumped into the silt bags, and then arising discharge is filtered through the silt bag fabric and flows into local collector drains.

Dewatering silt bags can also be used as an additional filtration measure downgradient of settlement ponds, wherever it is deemed appropriate, throughout the Project Site. The water will flow, via a pipe, from the stilling ponds into the silt bag. The silt bag will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water after it has gone through the previous drainage measures. The dewatering silt bags will ensure that there will be no loss of peaty silt into any field drain/main drain (see Figure 4-54 above).

The dewatering silt bag that will be used will be approximately 3m in width by 4.5m (see Figure 4-55 below) in length and will be capable of trapping approximately 4 tonnes of silt. The dewatering silt bag, when full, will be removed from the Project Site by a waste contractor with the necessary waste collection permit/license, who will then transport the silt bag to an appropriately licensed waste facility.



Figure 4-55 Silt Bag with water being pumped through and Silt Bag under inspection

4.7.4.6 Culverts

All new proposed culverts 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 must be taken from one side of an existing roadway to the other for discharge. Installation will be confirmed during the finalisation of detailed drainage design following a pre-construction survey.

The size of culverts will be influenced by the depth of the track or road sub-bas and the size of the drain. For example, 2 no. or more smaller diameter culverts may be used where depth is limited, though this will be avoided as they will have a higher associated risk of blockage than a single, larger pipe. 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 stones 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 beneath the road/track or 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.

4.7.4.7 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. Installation locations will be confirmed during the finalisation of detailed drainage design following a pre-construction survey.

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 CIRIA (No. C648, 1996).

Silt fence material will comprise Terrastop™ Premium material, and silt fences will be installed per the manufacturer's guidelines. Silt fences will be inspected on a regular basis to ensure that they are operating effectively.

4.7.4.8 Peat Ditch Silt Traps

Silt traps where required will be installed in field drains downstream of drainage outfalls from works areas. The purpose of the silt traps is to capture silt by means of slowing water flow within the field drains. The existing field drains have a low gradient already, and with the installation of local silt traps drainage water from the wind farm works will be filtered and treated on its onward journey towards the existing settlement ponds.

The peat ditch silt traps will be constructed using stacked timber logs, or marine plywood. These can also be covered in geotextile to enhance filtration.

The majority of peat ditch silt traps will be left in situ following the construction phase.

4.7.4.9 Temporary Construction Settlement Ponds

Temporary construction settlement ponds will be used to attenuate runoff from main works areas (i.e., from turbine base/hardstand areas, construction compounds, and the substation) of the Project Site during the construction phase. The purpose of the temporary settlement 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 discharged to existing IPC field drains/main drain within the Project Site.

Settlement ponds will be located towards the end of collector drains, close to where the treated water will be discharged to existing IPC field drains/main drains.

During the construction phase, a water level indicator such as a staff gauge will be installed in each stilling pond with marks to identify when sediment is at 10% of the stilling pond capacity. Sediment will be cleaned out of the still pond if it exceeds 10% of pond capacity. Stilling ponds will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and other issues that might interfere with flows.

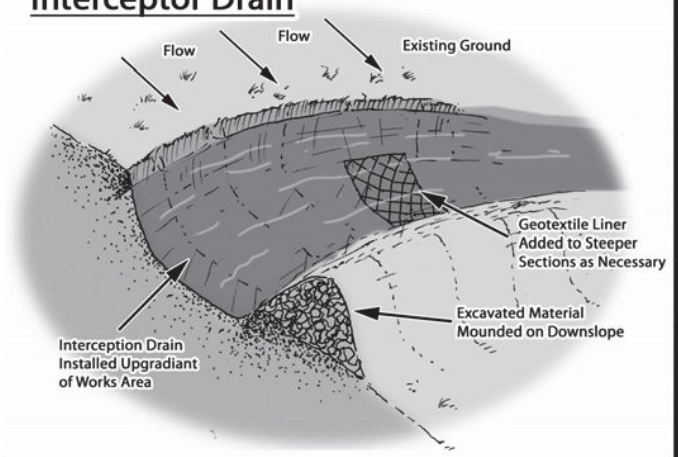
Temporary settlement ponds (at main works areas) will be removed at the end of the construction phase. They will not be needed beyond that point, as there is an existing IPC drainage system and boundary settlement ponds already located within each bog.

Figure 4-56 below shows an illustrative drawing of settlement ponds.

During the operational phase all drainage water leaving the Project Site will drain via field drains, main drains, and be treated in the existing IPC settlement ponds prior to outfall.

Drainage Design Measures

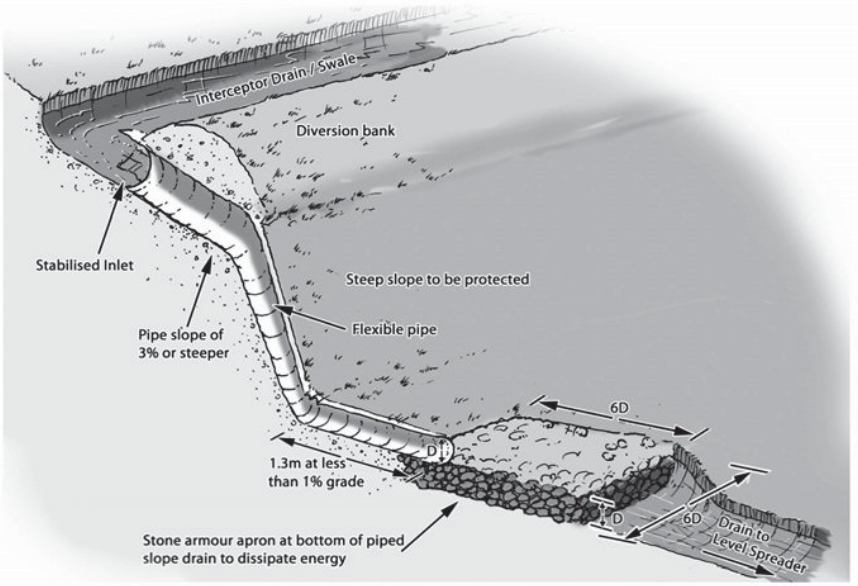
Interceptor Drain



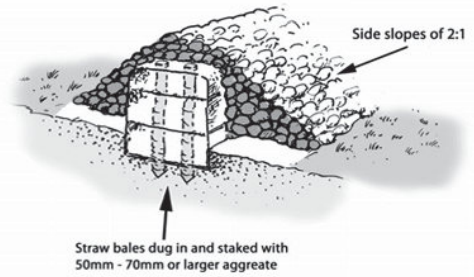
Check Dam (Stone Dam in Drain)



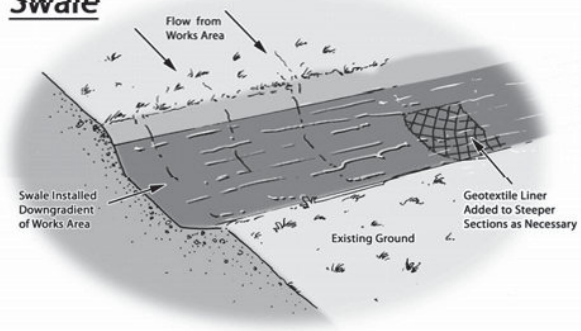
Slope Pipe Drain



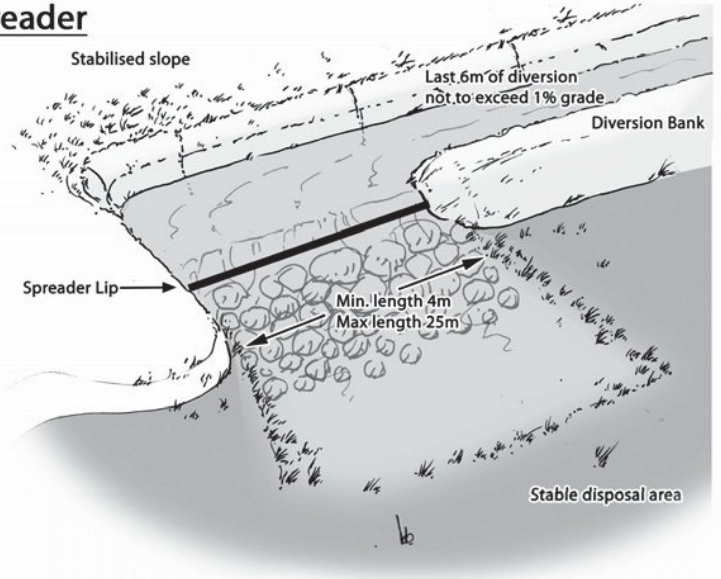
Check Dam
(Straw Bale & Stone Dam - Cross Section)



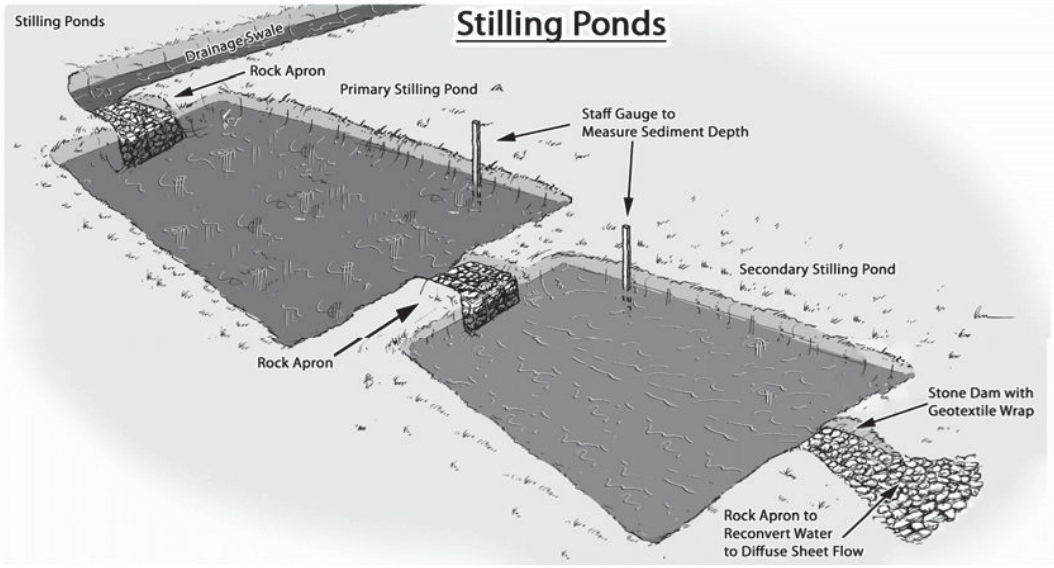
Swale



Level Spreader



Stilling Ponds



Drawing Title: Drainage Design Illustrations	Drawing No.: Figure 4-56	Scale: NTS
Project Title: Ballydermot Wind Farm, Co.Offaly & Co. Kildare		Date: 12.10.2026
Drawn By: LPM	Checked By: EC	Project No.: 250708

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4.7.4.10 Cable Trench Drainage

Cable trenches are proposed to be 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. This operation normally occurs over a period of 2-4 hours.

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 backfilled into the existing trench

On steeper slopes, silt fences, as detailed in Section 4.7.4.7, 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.

4.7.5 Development Interaction with the Existing Bog Drainage Network

The Proposed Wind Farm and Proposed Onsite Substation drainage will not significantly alter the existing drainage regime within the bogs. Moreover, the proposed drainage system will be fully integrated into the existing bog drainage systems.

Existing field drains and main drains will be routed under/around access tracks using culverts or diversion drains as required.

Runoff from access roads, turbine bases, and developed areas (construction compounds, Proposed Onsite Substation, met mast) will be collected and treated in local silt traps and settlement ponds, which will be implemented as part of the proposed drainage and mitigation measures, and then discharged to existing peat field drains. From there, this water will flow towards the relevant bog boundaries in existing field drains and main drains and then be treated further in the existing main IPC settlement ponds prior to discharge from the bogs.

One of the proposed ecological aspects of the drainage design is to re-wet the Proposed Wind Farm site in certain areas, where possible, to create wet areas such as wetland features which are good for overall site biodiversity (refer to Section 9.5.2.19 of Chapter 9 for an assessment of the proposed enhancement measures). Ponding would occur in these areas to a very shallow depth, and only intermittently following heavy rainfall. No large open bodies of water are proposed, and where intermittent ponding occurs this will be broken up into small areas using peat berms.

Refer to Section 4.7.9 below for further detail on operational phase drainage.

4.7.6 Site and 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 onsite 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 in particular, working under a schedule of works operation system (SOWOR) system as proposed in the planning application; further detail is provided in Appendix 4-6 Surface Water Management Plan (SWMP). 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 on-site. The ECoW will respond to changing weather, ground or drainage conditions on the ground as the Proposed 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 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 onsite will be prepared in advance of commencement of any works on the Proposed Project. Regular inspections of all installed drainage features will be carried out, 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. Refer to Section 9.5 of Chapter 9: Water and Appendix 4-4 CEMP for further information.

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 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.

Peat ditch 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.

A water level indicator such as a staff gauge or level marker will be installed in each temporary settlement pond with marks to identify when sediment is at 10% of the pond's capacity. Sediment will be cleaned out of the stilling pond when it exceeds 10% of pond capacity. Stilling ponds will be inspected weekly during the construction phase of the project and following rainfall events. Inlet and outlets will be checked for sediment accumulation and impediments to flow. Any excess sediment build-up behind inlets and outlets will be removed.

The frequency of drainage system inspections will be reduced following completion of the construction phase of the Proposed Project. The ECoW will inspect and review the drainage system after construction has been completed to provide guidance on the requirements of an operational phase drainage system. An annual drainage inspection will be completed during the operational phase.

See Section 9.5.2, Section 9.5.3 and Section 9.5.4 of Chapter 9 for further detail on drainage during the operational and decommissioning phase of the Proposed Project.

4.7.8 Proposed Drainage Management (Construction Phase)

Runoff control and drainage management are key elements in terms of mitigation measures to reduce potential effects on downstream surface water bodies. Drainage management within the Project Site will be risk based, and will employ various SuDs methods, building on the existing drainage systems within the Proposed Wind Farm site where available and appropriate.

The drainage design principles are outlined in Section 4.7.3 above with drainage design measures outlined in Section 4.7.4 above.

The main tenet of the proposed drainage plan is ensuring to 'keep clean water clean' by avoiding unnecessary or significant disturbance to existing drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations, construction areas and temporary storage areas through the construction of interceptor drains. Where possible (depending on orientation), existing field drains can be used as interceptors drains, otherwise, new interceptor drains will be excavated locally, and new drains will outfall to existing field drains downstream of the works areas.

The second method involves collecting any construction area drainage waters (from turbine base/hardstand areas, temporary construction compounds, and the substations) and routing that water through new Proposed Project settlement ponds (or stilling ponds) prior to controlled release into the existing drainage network (field drains or main drains as required/available). There will be no discharges to the existing drainage network without prior treatment.

Within the Proposed Wind Farm site, the majority of the roads will be constructed using a floated technique. In these sections, and depending on intermediate topography, a collector drain (dirty water system as described above) will be used during construction phase, or over the edge (OTE) drainage will occur. OTE drainage allows runoff from access tracks to flow overland and onwards into local field drains and be managed via the existing site drainage system. OTE drainage will only occur where topography allows, and it is only proposed in areas of low risk and remote from outfall locations (at least 150m from bog outfall locations). Silt traps and check dams will be installed in existing field drains downstream of OTE drainage areas, and these will provide attenuation and treatment of dirty water.

During the construction phase, all runoff from works areas (i.e., dirty water) will be attenuated and treated prior to being released within the Project Site. All drainage outfall from the bogs associated with the Proposed Wind Farm and the Proposed Onsite Substation is routed through existing IPC licence settlement ponds that will remain in-situ. Drainage systems will also be put in place at the Proposed Offsite Substation to ensure that there is no discharge of untreated or unattenuated water.

4.7.9 Operational Phase Drainage

The construction phase drainage infrastructure, including collector drains and Proposed Project settlement ponds will be retained and maintained during for the operational phase drainage system. However, in some areas local construction settlement ponds may become redundant.

As the part of the Proposed Project drainage design, it is proposed that runoff from the proposed infrastructure will be collected locally in new proposed silt traps/settlement ponds and vegetated buffer areas prior to release into the existing drainage network. The proposed drainage measures will then create significant additional attenuation to what is already present. The operational phase drainage system will include the following:

- Interceptor drains (for collecting and redistributing clean water) will be installed up-gradient of proposed infrastructure to intercept clean surface water runoff and minimise the volume of runoff entering construction areas where suspended sediment could become entrained. Intercepted clean water will be directed around the works and redistributed to downstream field drains. Where practicable, existing field drains will be utilised for this purpose; otherwise, new interceptor drains will be installed;
- Collector drains will be installed downstream of works areas to collect runoff from access roads, Proposed Turbine hardstands and other construction areas where suspended sediment may become entrained. This runoff will be conveyed to local settlement ponds for treatment and settlement of suspended sediment prior to discharge to the nearest downstream field drain or main drain;
- On steeper sections of access road, transverse drains ('grips') will be installed, where appropriate, within the road surface to intercept runoff and divert it to adjacent roadside collector drains;
- Check dams will be installed along sections of access road collector drains, where appropriate, to reduce flow velocities and promote the settlement of suspended sediment. Check dams will be constructed using 4/40 mm non-friable crushed rock and will be installed at 25 m or 50 m intervals, depending on the local gradient;
- Settlement ponds, emplaced downstream of access road sections and at Proposed Turbine locations, will buffer volumes of runoff discharging from the existing drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to existing downstream field/main drains; and,
- Finally, all surface water runoff from the Proposed Project will have to pass through the existing IPC licence settlement ponds at the existing bog outfall locations prior to onward flow to surround streams and rivers.

4.7.9.1.1 *Interaction of Operational Phase Drainage and the Future Environmental Trends*

The existing baseline condition represents the hydrological environment at the time of this assessment (October 2026); however, this condition is not expected to remain static over the operational lifetime of the Proposed Wind Farm. The 14 no. bogs comprising the Proposed Wind Farm site are subject to decommissioning and rehabilitation in accordance with the IPC licence. Therefore, over the operational lifetime of the Proposed Project, the environmental characteristics of the bogs will change.

The Proposed Project infrastructure footprint is relatively small in the context of the Proposed Wind Farm site. The Proposed Project infrastructure footprint of approximately 152 ha within the Proposed Wind Farm site represents approximately 2.9% of the total area of the Proposed Wind Farm site. The majority of the cutover bog will therefore remain available for rehabilitation, and the presence and operation of the Proposed Wind Farm will not preclude the implementation or achievement of rehabilitation objectives across the wider bog area.

The Proposed Project drainage system has been designed to minimise interference with the existing drainage regime and to provide appropriate control, attenuation and discharge of runoff from the Proposed Project infrastructure. Consequently, the drainage associated with the Proposed Project is not expected to result in a significant alteration of the hydrological regime across the wider residual cutover bog. To illustrate the proposed drainage approach, a schematic Conceptual Site Model (CSM) is included in Appendix 9-5, providing a visual representation of how the proposed drainage infrastructure will interact with the wider bog drainage system. The potential for interaction between the Proposed Project drainage and future peatland rehabilitation is considered below.

- The influence of the Proposed Project drainage infrastructure will be primarily associated with the Proposed Project infrastructure footprint and its immediate receiving environment.
- The relatively limited spatial extent of the infrastructure footprint means that the majority of the Proposed Wind Farm site will remain available for rehabilitation, including areas located within the same surface water drainage areas as the Proposed Project infrastructure.
- The existing physical characteristics of the cutover bog, including the presence of field drains, main drains, peat facebanks, local topographic undulations and areas of intervening peat and spoil, provide a degree of hydrological separation and limit the potential for drainage effects to extend across large areas of the Proposed Wind Farm site.
- Therefore, the introduction of the Proposed Project drainage infrastructure will not result in a continuous or widespread modification of drainage conditions across the Proposed Wind Farm site. Alterations to surface water runoff and drainage patterns will be localised.
- Where required, local hydrological isolation measures will be incorporated into the drainage design. These may include cell bunding to limit the lateral propagation of drainage effects away from the Proposed Project infrastructure.
- Rehabilitation measures for the cutover bog are likely to include the blocking of existing field drains. The Proposed Project drainage infrastructure will remain as a discrete drainage system serving the Proposed Project infrastructure and will not require the wider cutover bog to remain drained in accordance with the existing baseline drainage regime.
- The progressive rehabilitation of the wider cutover bog can therefore proceed without compromising the operational drainage requirements of the Proposed Project.
- Residual raised bog areas are typically located towards the margins of the cutover bog and are generally separated from the Proposed Project infrastructure by a combination of distance, elevation differences, intervening topography and existing drainage infrastructure (field drains and main drains). Consequently, significant hydrological effects on these areas of remnant high bog as a result of the Proposed Project drainage are not anticipated.
- Experience from other completed peatland rehabilitation projects within the BnM landholding demonstrates that rehabilitation measures can be implemented in proximity to existing drainage features, including deep perimeter drains (e.g. Bracklin Bog) and drains associated with residual railway infrastructure (e.g. Carranstown Bog), where the rehabilitation design takes account of the local drainage configuration. These completed rehabilitation examples provide relevant evidence that the presence of existing drainage infrastructure does not, in itself, prevent the successful rehabilitation of adjacent peatland.

4.7.10 Decommissioning Phase Drainage

The drainage requirements during the decommissioning phase will be broadly similar to those identified for the construction phase, as decommissioning will involve a period of temporary works associated with the removal of infrastructure, and reinstatement of areas disturbed by decommissioning activities.

Decommissioning works will be planned and undertaken having regard to the prevailing drainage and hydrological conditions at that time, including the condition of the operational drainage infrastructure, the status of peatland rehabilitation measures and the condition and connectivity of existing surface water drainage pathways.

A decommissioning plan will be agreed with both Offaly County Council and Kildare County Council prior to decommissioning of the Proposed Project. A decommissioning plan is included as Appendix 4-7.

4.8 Construction Management

4.8.1 Construction Timing

It is estimated that the construction phase will take approximately 30 to 36 months from starting onsite to the full commissioning of the wind farm. The commencement of construction works where the removal of woody vegetation is required, or where works take place in sensitive breeding habitats (such as birch scrub and emergent wetland vegetation), will be scheduled to occur outside the bird nesting season (1st of March to 31st of August) to avoid any potentially significant effects on currently nesting birds. Construction may commence at any stage from September onwards to March, so that construction activities are ongoing by the time the next breeding bird season comes around and can continue throughout the next breeding season; certain construction activities such as forestry felling, immature woodland removal and scrub clearance will not be carried out during the bird breeding season. However, it is envisioned that these works will take place at the beginning of the construction phase and therefore no overlap with the breeding bird season is envisioned.

Construction activities will be carried out during normal daytime working hours (i.e., weekdays 0700 – 1900hrs and Saturdays 0700 – 1400hrs). However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e., concrete pours) or to accommodate delivery of large turbine component along public routes it could be necessary on occasion to work outside of these hours. Any such out-of-hours working will be agreed in advance with the Local Authorities.

4.8.2 Construction Sequencing

The construction phase is estimated to take approximately 30 to 36 months, and the works can be broken down into three main overlapping phases, 1) civil engineering works: 24 months, 2) electrical works: 27 months, and 3) turbine erection and commissioning: 21 months. The main task items under each phase are outlined below.

Civil Engineering Works

- Erect all necessary safety signage.
- Create new entrances and hardcore existing entrances (where required).
- Clear and hardcore area for temporary construction compounds, including material storage, site welfare facilities, and site offices.
- Construct turbine hard standings and crane pads.
- Construct new internal site aceess roads, drainage ditches and culverts. The internal site access roads will be a mixture of permanent (construction/operational and amenity) roads and amenity tracks.
- Construct drainage ditches, culverts, etc., integral to road construction.
- Construct the substation, control buildings and groundworks for both the Proposed Onsite Substation and Proposed Offsite Substation compounds and associated drainage ditches and culverts.
- Construct Proposed Onsite Substation and Proposed Offsite Substation compounds.
- Construct electrical apparatus bases/plinths and bund for transformer.

- Excavate/pile as required for turbine bases. Sidecast or store soil/peat locally for backfilling and re-use, if deemed feasible.
- Place blinding concrete to turbine bases using either a piled solution or on competent strata. Fix reinforcing steel and anchorage system for tower section. Construct shuttering. Fix any ducts, etc., to be cast in. Pour concrete bases. Cure concrete. Remove shutters after 1-2 days.
- Backfill tower foundations and cover with previously stored granular material.
- Excavate cable trenches and install electrical ducting.
- Complete site works and reinstate site.
- Remove temporary site offices. Provide any gates, landscaping, signs, etc., which may be required.
- Install amenity links and associated amenity car parks.

Electrical Works

- Construct bases/plinths for transformer.
- Excavate trenches for site cables, lay cables and backfill. Provide ducts at road crossings.
- Delivery and installation of all High-Voltage Equipment.
- Wiring and cabling of High-Voltage / Low-Voltage Equipment, protection and control circuit.
- Install external electrical equipment at substations.
- Install transformer at substation compound.
- Erect stock proof and palisade fencing around substation area.
- Install internal collector network and communication cabling.
- Establish traffic management.
- Construct grid connection.

Turbine Erection and Commissioning

- Backfill tower foundations and cover with suitable material.
- Set up erection crane(s) and deliver components to hardstands.
- Erect towers, nacelles, rotors and blades.
- Complete electrical installation.
- Install new permanent meteorological masts.
- Commission and test turbines.
- Complete site works and reinstate site.
- Remove temporary site offices. Provide any gates, landscaping, signs, etc., which may be required.

The phasing and scheduling of the main construction task items are outlined in Table 4-8 below, where the 1st of January 2030 has been selected as an arbitrary start date for construction activities.

Table 4-8 Indicative Construction Schedule

ID	Task Name	Task Description	2030				2031				2032			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Site Health and Safety													
2	Grid Connection	Construct Proposed Grid Connection to Maynooth-Dunstown 220kV overhead line												
3	Site Compounds	Site compounds, site access, fencing, gates												
5	Site Roads	Construction/upgrade of roads, install drainage measures, install water protection measures (amenity track interacting with the site compounds will be constructed following removal of the compounds)												
6	Turbine Hardstands	Excavate/pile for turbine bases where required												
7	Turbine Foundations	Fix reinforcing steel and anchorage systems, erect shuttering, concrete pour												
8	Substation and Electrical Works	Construct Proposed Onsite Substation and Proposed Offsite Substation, and underground cabling between turbines												

9	Backfilling and Landscaping									
10	Turbine Delivery and Erection									
11	Substation Commissioning									
12	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 development site and submitted for agreement to the Planning Authority is now well-established.

The proposed procedures for the implementation of the mitigation measures outlined in such a CEMP and their effectiveness and completion will be audited by the ECoW on behalf of the Project Developer, in an objective manner. The basis for auditing is presented in Section 10.2 of the CEMP which effectively lists all mitigation measures prescribed in any of the planning documentation. 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 effectiveness of the mitigation measures must be the subject of regular review and audit during the full construction stage of the project. If some 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 findings of the audit. 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 4-4 of this EIAR. The CEMP includes details of drainage, spoil management, resource and waste management, etc., and describes how the above-mentioned audit will function and how the findings are presented. All of the mitigation measures specified in the EIAR, NIS, CEMP and any other documents enclosed in the planning submission will be implemented, and the construction contractor will be responsible for actioning and communicating the requirements with all staff on-site. 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 (provided in Chapter 18: Schedule of Mitigation & Monitoring Measures) and compiled in Section 7 of the CEMP. The implementation of the mitigation measures will be overseen by the supervising ECoW, ecologists, archaeologists and/or geotechnical engineers, as appropriate, 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

4.9.1 Proposed Wind Farm

4.9.1.1 Turbine, Met Mast, and Relay Mast Foundations

Each wind turbine and met mast will require either piled foundations, bored foundations or a gravity foundation of reinforced concrete (RC) foundation comprising a base slab bearing onto rock or other competent substrata with a central upstand to support the tower.

Trial pitting, boreholes, and peat probing has been carried out at each of the turbine base locations to determine the approximate depth of excavation and fill required (refer to Section 4.4.1.7).

Piling depths will depend on site conditions. These will be established by detailed post-consent geotechnical investigations. Pre-construction final design will be carried out after post-consent

geotechnical investigations have been completed. Additional geotechnical investigations will be undertaken at each turbine location with associated sampling and laboratory testing.

Each of the turbines to be erected on the Proposed Wind Farm will have a reinforced concrete base that is installed below the finished ground level. The turbine foundation may be formed using piling methods or on competent strata (i.e., bedrock or subsoil of sufficient load-bearing capacity). Where the ground conditions do not have a competent stratum of sufficient load-bearing capacity, piling methods will be utilised. A methodology for reinforced concrete foundations and piled foundations is included in Section 2.3.3.1 of the CEMP, Appendix 4-4 of this EIAR.

Overburden will be stripped off the foundation area to a suitable formation using a 360° excavator and will be stored locally for later reuse in backfilling around the turbine foundation or within the dedicated peat and spoil areas. A 5m-wide working area will be put in place around each turbine base, with the sides of the excavated areas sloped sufficiently as outlined in the PSMP to ensure that slippage does not occur. The excavated material will be sealed using the back of the excavator bucket and surrounded by silt fences to ensure sediment-laden runoff does not occur.

The soil at sub-formation level will have to be approved by a suitably qualified 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 have to be raised with clause 804 (crushed rock) or similar hardcore material, compacted in 250mm layers, with sufficient compacted effort (i.e., compacted with seven passes using 12-tonne roller). Drainage measures will be installed to protect the formation by forming an interceptor drain around the perimeter of the base which will outfall out at the lowest point level spreader or IPC settlement pond.

An embankment approximately 600mm high will be constructed around the perimeter of each turbine base and a fence will be erected to demarcate the working area and prevent construction traffic from driving into the excavated hole. 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 100mm of blinding concrete laid on the formation material positioned using concrete skip and 360° excavator to protect ground formation and provide a safe working platform.

The turbine anchor cage components are delivered to the Proposed Wind Farm and assembled in situ. An approved and certified mobile telescopic crane or teleporter of suitable size will be used to unload reinforcing steel to required areas. The turbine anchor cage will be assembled and lifted into position using a crane and approved lifting appliances, prior to fixing the bottom mat of steel, reinforcing steel will be positioned around the anchor cage in accordance with the turbine suppliers' requirements. 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 prior to the concrete pour.

Formwork for concrete bases will be propped/supported. Concrete for bases will be poured using a concrete pump. Each base will be poured in three stages:

- Stage 1: the concrete is poured and vibrated in the centre of the anchor cage to bring the concrete up to the required level inside the cage.
- Stage 2: the centre of the steel foundation is poured and vibrated to the required level.
- Stage 3: the remaining concrete is poured around the steel foundation to the required finished level. After the concrete has set sufficiently the top surface of the concrete surface is finished with a power float.

Once the base has sufficient curing time it will be backfilled with suitable fill up to the finished ground level and finished with the original material that was excavated.

4.9.1.2 Site Roads and Crane Pad Areas

The construction methodologies for the road types and crane pad areas are described below. Straight sections of proposed internal site access roads will require a running width of approximately 6m to accommodate the transportation of large turbine components. Corners and junctions will be locally wider to allow the vehicles to manoeuvre around bends. The proposed new roads will include passing bays to facilitate traffic passing around the Project Site. The site access roads will be battered to safe permanent side slopes of 1V:3H. All site access roads will comply with the turbine supplier's requirements.

4.9.1.2.1 *Construction of New Floating Roads*

Floating access roads are the predominant road construction type proposed for the Project Site. The use of new floated access tracks will be limited on site to areas of flatter terrain with slopes typically less than 5 degrees.

The general construction methodology for floating roads, as presented in the Peat and Spoil Management Plan in Appendix 4-3, is summarised below.

1. *Prior to commencing floating road construction movement monitoring posts will be installed in areas where the peat depth is greater than 2.5m and will be placed at 10m intervals along these sections.*
2. *Base geogrid will laid directly onto the existing peat surface along the line of the road in accordance with geogrid provider's requirements.*
3. *Construction of the road will be in accordance with an appropriate design from the designer.*
4. *The typical make-up of the new floated access road is 800mm of selected granular fill with 2 no. layers of geogrid with possibly the inclusion of a geotextile separator (drawing P2319-0600- 0022).*
5. *Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works, Series 600 (2024).*
6. *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.*
7. *The finished road width will be 6.0m (5.5m running width), with wider sections on bends and corners.*
8. *Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will be avoided.*
9. *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating road will be tipped over at least a 10m length of constructed floating road.*
10. *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.*
11. *Following end-tipping a suitable bulldozer will be employed to spread and place the tipped stone over the base geogrid along the line of the road.*
12. *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.*

4.9.1.2.2 Construction of New Excavated Roads

The general construction methodology for the construction of excavated roads, as presented in the Peat and Spoil Management Plan (Appendix 4-3), is summarised below and illustrated in in Plate 4-5 and Plate 4-6 below.

1. *Prior to commencing the construction of the excavated roads, movement monitoring posts will be installed in areas where the peat depth is greater than 2.5m, and in areas identified within the peat stability risk assessment (see Geotechnical & Peat Stability Assessment, FT, 2026 (Appendix 8-1)) as requiring monitoring.*
2. *Interceptor drains will be installed upslope of the access road alignment to divert any surface water away from the construction area.*
3. *Excavation of roads will be to the line and level given in the design requirements. Excavation will take place to a competent stratum beneath the peat.*
4. *Road construction will be carried out in sections of approximately 20m lengths i.e. no more than 20m of access road should be excavated without re-placement with stone fill.*
5. *Once excavated, peat will be side-cast locally to the excavation or within the designated peat and spoil areas.*
6. *Excavation of materials with respect to control of peat stability:*
    a. *Acrotelm (upper, vegetated layer within the peat to about 0.3 to 0.4m of peat) is generally 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. *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 (more decomposed peat below about 0.3 to 0.4m depth) will be transported immediately on excavation to the designated peat and spoil*
7. *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 peat and spoil areas or reused for landscaping purposes. All peat and spoil areas will be inspected by the Project Geotechnical Engineer before material is stored in the area*
8. *Excavation side slopes in peat 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. Battering of the side slopes of the excavations will be carried out as the excavation progresses.*
9. *The excavated internal access road will be constructed with a minimum of 800mm of selected granular fill. Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works, Series 600.*
10. *The finished road width will have a running width of 5.5m, wider sections on bends and corners where required*
11. *Internal access roads will be finished with a layer of capping Cl 804/UGM across the full width of the road.*
12. *A layer of geogrid/geotextile may be required at the surface of the competent stratum, where this stratum is cohesive in nature.*
13. *At transitions between floating and excavated roads a length of road of about 10m will have all peat excavated and replaced with suitable fill. The surface of this fill will be graded so that the road surface transitions smoothly from floating to excavated road (P2319-0600-0024).*
14. *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.*
15. *A final surface layer will be placed over the excavated road and graded to accommodate wind turbine construction and delivery traffic.*

16. *The construction and upgrading of access roads in areas of deep peat (greater than 2m) will be inspected on a routine basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/following trafficking by heavy vehicular loads.*



Plate 4-5 Internal roads under construction using the excavate and replace method. Source BnM.



Plate 4-6 Internal Road under construction demonstrating laying of geogrid/geotextile. Source BnM.

4.9.1.2.3 Upgrading of Existing Track – Floated Road

Approximately 2.8km of the existing roads will require upgrading which will comprise widening of the roadway to a total running width of approximately 6m, with wider sections at corners and the laying of a new surface dressing on the existing section of roadway where necessary. The road widening will be undertaken as follows:

1. *For upgrading of existing access roads constructed using a floated construction technique (Type A – Drawing P2319-0600-0025) the following will apply:*

a. *Prior to commencing floating road upgrades movement monitoring posts will be installed in areas where the peat depth is greater than 2m and will be placed as described in Section 11.*
b. *Construction of upgraded existing track- floated road will be in accordance with appropriate design from the designer.*
c. *The surface of the existing track- floated road will be graded/tidied up prior to the placement any geogrid/geotextile (to prevent damaging the geogrid/geotextile).*
d. *Where granular fill has been used in the existing track- floated road make-up, a layer of geogrid will be placed on top of the existing track- floated road.*
e. *The basal geogrid on the widened section will be overlaid with an average of 800mm of selected granular fill.*
f. *Additional geogrid and granular fill may be required in certain sections of the works, such as where excessive rutting is noted in the existing track- floated road (to be confirmed by the designer).*
g. *Stone delivered to the upgrades of existing track – floated road will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will not be carried out.*
h. *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.*
i. *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 5m wide pressure berm (1.0m in height) either side of the access road will reduce the likelihood of potential bearing failures beneath the access road.*
j. *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.*

2. *The finished road width will have a running width of 5.5m, with wider sections of up to 8m on bends and corners.*
3. *On side long sloping ground any road widening works required will be done on the upslope side of the existing access road.*
4. *A final surface layer shall be placed over the existing access road, as per design requirements, to provide a road profile and graded to accommodate wind turbine construction and delivery traffic.*
5. *The upgrade of existing track – floated road in areas of deep peat (greater than 2m) will be inspected on a routine basis (by the Site Manager/ECoW/Project Geotechnical Engineer) during the works, particularly before/following trafficking by heavy vehicular loads.*

At transitions between new floating and existing excavated roads a length of about 10 to 20m will have all peat excavated and replaced with suitable fill. The surface of this fill will be graded to accommodate wind turbine construction and delivery traffic

4.9.1.2.4 Crane Hardstands

All crane pads will be designed taking account of the loadings provided by the turbine manufacturer and will consist of a compacted stone structure. The crane hardstands will be constructed in a similar manner to the excavated site roads (Section 4.9.1.2.2 above) and will measure in accordance with the turbine manufacturer's requirements. Where an excavated crane hardstand cannot be used due to the depth of peat, the hardstand will be supported by using reinforced concrete piles per the methodology outlined for piled foundations discussed in Section 4.9.1.1 above. Refer to Figure 4-1 for crane hardstand locations.

4.9.1.3 Site Underground 33kV Electrical and Communications Ducting

The transformer in each Proposed Turbine will be connected to the Proposed Onsite Substation through a network of buried electrical cables. 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 ducts will be bedded with suitable material. The ducts will be laid at a depth of approximately 1m below ground level; a suitable marking tape is installed between the ducts and the surface (see Plate 4-7 below illustrating an example of a single cable trench). On completion, the ground will be reinstated as previously described above. The route of the cable ducts will follow the access tracks as illustrated on the Project Site layout drawings included as Appendix 4-1 of the EIAR. The ducting may be located on either side of the roads/hardstanding and/or within the road footprint. The exact location and detail of the 33kV cable system will be determined by the appointed contractors at detailed design stage.



Plate 4-7 Cable Trench View Source: BnM.

4.9.1.4 Temporary Construction Compounds

As part of the Proposed Project, 10 no. temporary construction compounds are proposed as part of the Proposed Project as discussed in Section 4.4.1.5 above.

Temporary construction compounds will provide site offices, staff welfare facilities, storage areas (including waste and recycling areas), and car-parking areas for staff and visitors. The accommodation onsite is likely to consist of temporary porta-cabins constructed on a granular platform. The peat/topsoil will be stripped where temporary construction compounds foundations are proposed. The temporary construction compounds foundations will be constructed to heights of >0.5 m above existing ground level based on the various extents of potential surface water flooding across the Project Site.

The construction compounds will be constructed using floated or excavate and replace methods pending the results of the detailed ground investigations.

- The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter.

- The compound platform will be established using a similar technique as the construction of floated roads as discussed in Section 4.9.1.2.1 above or as excavated roads as discussed in Section 4.9.1.2.2 above.
- A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well-graded granular material will be spread and lightly compacted to provide a hard area for site offices and storage containers.
- A limited amount of fuel will have to be stored on the Project Site and for the grid connection in appropriately bunded containers, a bunded area for oil storage will be constructed within the compound.
- Areas within the compound will be constructed as site roads and used as vehicle hardstanding's during deliveries and for parking.
- A waste storage area will be provided within the compound.
- The compound will be fenced and secured with locked gates if necessary.

Once the Proposed Wind Farm has been commissioned, the 10 no. proposed temporary construction compounds will be removed and reinstated and left to revegetate naturally or be reseeded. See Section 4.4.1.5 above for further details on the temporary construction compounds.

4.9.1.5 Amenity Car Parks

As part of the Proposed Wind Farm, 4 no amenity car parks are proposed to facilitate amenity access to the Proposed Wind Farm during the operational phase.

The construction methodology is as follows:

- The area to be used for the car park will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter.
- The platform will be established using a similar technique as the construction of the substation platform as discussed in Section 4.9.2.1 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.

See section 4.4.1.9 above for further detail on amenity at the Proposed Wind Farm.

4.9.1.6 Internal Amenity Tracks

The internal amenity tracks are discussed above and shown in the Ballydermot Amenity Plan which is contained in Appendix 4-2 and are illustrated in Figure 4-1. Approximately 13.4km of new dedicated internal amenity track and 1km of dedicated equestrian track will be provided and will measure 3m in width and will be constructed using the same methodology as outlined in Section 4.9.1.2.1 (construction of new floating roads) above.

Approx 844m of the amenity tracks, known as board walkway, will be located above raised bog and will be constructed as a boardwalk. This work will include the following steps:

1. *All construction activities will use methods that minimise impact on the raised bog, preserving hydrology and vegetation.*
2. *Initial access will be planned to avoid damage to sensitive areas in collaboration with the environmental clerk of works*
3. *Temporary routes will be minimised and controlled.*
4. *The boardwalk will be supported on timber piles.*
5. *Piles will be driven into position by hand or using lightweight/low pressure mechanical means to reduce ground disturbance.*

6. *A timber deck will be laid on the installed piles section by section.*
7. *Modular or prefabricated sections will be used where possible to reduce time on site and insitu works.*
8. *Plant and personnel will use where possible completed sections of the boardwalk to access the next work area, avoiding direct contact with the bog surface.*
9. *FSC-certified timber and non-toxic treatments will be used to ensure sustainability and durability.*
10. *Only low-impact tools and machinery will be permitted.*
11. *All plant and equipment will be inspected before attending site for leaks and fitness of purpose to confirm there are no oil leaks or other defects that could pose a risk an environmental risk*
12. *Spill kits will be available at all times; no fuel or chemicals stored on the bog and refuelling to take place away from the raised bog area in a designated refuelling area.*
13. *All waste will be removed from the raised bog area daily, no disposal on site.*
14. *Continuous checks will ensure compliance with environmental guidelines and safety standards.*

Seating areas and detailed site signage will be present throughout the Proposed Wind Farm, refer to Appendix 4-2 for further detail.

The construction methodology for floating amenity track over an archaeological feature (i.e., a togher), is summarised below

1. *Geotextile layer to be placed on the surface of the peat, extending 5m either side of the toghers. The extent of the togher will be confirmed on site by an archaeological specialist.*
2. *A layer of clean sand, 0.5m in thickness, will be placed on top of the geotextile to act as a buffer between the togher and the access road. The top of the clean sand layer will be dead rolled, without vibration.*
3. *Base geogrid to be laid on top of the sand layer along the line of the road in accordance with geogrid provider's requirements. Geogrid to be laid across the full width of the road, including the widened area for the cable trench.*
4. *Construction of road to be in accordance with appropriate design from the designer.*
5. *The typical make-up of the new floated internal road is up to 1,000mm of selected granular fill with 2 no. layers of geogrid.*
6. *Granular fill for the road construction to be placed and compacted in layers in accordance with the TII Specification for Road Works, Series 600 (2013).*
7. *The amenity track at these locations is to be widened to accommodate the cable trench. A minimum of 2m horizontal space is required between the edge of the access road and the edge of the cable trench.*

4.9.1.7 Proposed Watercourse Crossings

As outlined in Section 4.4.1.11 above, there are 15 no. watercourse crossing located over natural watercourses within the Proposed Wind Farm. There are 5 no. new crossing points and 10 no. crossing points which will be upgraded as part of the Proposed Wind Farm. Of the 10 no. crossing points for upgrade, 5 no. will be upgraded with a clear span bridge and 5 no. are culverts which will be upgraded via a box culvert or bottomless culvert, see Section 4.9.1.8 below. The locations of these crossings are shown on the layout drawings included in Appendix 4-1 of this EIAR with further detail provided in Table 4-9 below.

The clear-span watercourse crossings will be installed using the methodology outlined below. There are existing clear-span bridges present at 2 no. location (Proposed Wind Farm Crossing 4 and Proposed Wind Farm Crossing 7 as per Section 4.4.1.11 above) that will be demolished prior to the construction of the new proposed clear-span crossings.

The demolition methodology is as follows:

1. *Prior to any works commencing, Inland Fisheries Ireland (IFI) will be consulted to inform detailed design of the demolishing of the existing Clear-Span Watercourse Crossing structure.*
2. *These works will only be carried out during the period permitted by IFI for in-stream works according to the IFI (2016) guidance document "Guidelines on protection of fisheries during construction works in and adjacent to waters", i.e., July to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI);*
3. *Timing of these works will be planned based on expected weather within the optimum period of July to September, ground conditions and current flow in the drainage ditch, to minimise construction period and disturbance to any potential downstream aquatic environment.*
4. *The Project Engineer will set out the works area and silt fencing will out erected at run-off areas adjacent to the works area.*
5. *The works area will be fenced off with post and rope to demarcate the works area. Prior to any works taking place, the area will be CAT scanned to identify any potential unknown underground services.*
6. *Oil booms will be established both upstream and downstream of the works and spill kits, inclusive of oil-only absorbent booms, will be required on both banks of the stream*
7. *The centre line of the new clear span crossing will be set out by the engineer on both upstream and downstream sides*
8. *The topography and ground conditions will be reviewed at the location. Safe access will be provided for all operatives. This may involve the creation of ramps, temporary walkways etc.*
9. *Pumping equipment will be set up at the upstream end of the works area. The hose will have a suction head fitted which will reduce the possibility of any aquatic species that may be present being sucked into the pump. Additionally, the hose will be positioned to one side of the channel and surrounded by clean stone offering further protection. The delivery hose shall be laid out across the road, which shall discharge, re-entering the watercourse downstream of the works area on the opposite side of the road.*
10. *The delivery line may need to be undergrounded across the access track to allow site traffic to access the works area.*
11. *A dam will be constructed at the upstream end by an excavator placing impermeable 1m^3 sandbags within the drainage channel. These can be supplemented with smaller sandbags to plug any gaps.*
12. *Water will be allowed to partially self-empty from the isolated section. If the drainage channel is deemed to be fisheries sensitive, a smaller dam will then be placed at the downstream end before the section completely empties out and further consultation with IFI in relation to electrofishing and determining the presence of fish will be carried out. Once the presence of fish has been ruled out, the section can be fully dewatered. A pump may be used to aid this if necessary.*
13. *Water will be over pumped and discharged to an approved location downstream.*
14. *Clean stone may be used at the discharge point to protect the drainage channel against scouring. It will also act to filter silty water arising from dam installation and removal afterwards.*
15. *The existing bridge deck, beams, and abutments will be dismantled using excavators and mechanical equipment positioned away from the watercourse.*
16. *Debris netting or sheeting will be placed near the bank to prevent material entering the channel.*
17. *Material will be segregated and transported to licensed disposal or recycling facilities.*
18. *The excavated bridge and associated structure will be loaded into a dumper and transported to a suitable disposal area.*

19. *Any suitable materials from the drainage channel bed will be removed and stockpiled for reinstatement in the new bed upon completion of the construction works.*

Following removal of existing infrastructure, Proposed Wind Farm Crossing 4 and Proposed Wind Farm Crossing 7, along with the 3 no. new clear span crossings will be installed using the methodology outlined below.

The standard construction methodology for the installation of a clear-span bridge watercourse crossing is as follows:

1. *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.*
2. *All drainage measures along the proposed road will be installed in advance of the works.*
3. *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.*
4. *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.*
5. *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.*
6. *Where the bottomless box culvert is installed in sections, the joints will be sealed to prevent granular material entering the watercourse,*
7. *Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations.*
8. *Underground cabling ducting will be contained within the road make-up of the proposed crossing.*
9. *Temporary works, bunds, and containment systems will be removed once approved by the ECoW.*
10. *Post-construction inspections will be carried out to confirm no sedimentation or pollution has occurred.*
11. *A final compliance report will be prepared and submitted as required by the regulatory authorities and the new bridge structure will be inspected annually by a competent civil engineer*

A standard design drawing of a pre-cast concrete, clear-span crossing is shown in Figure 4-57.

The clear-span watercourse crossing methodologies presented will ensure that no instream works are necessary.

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 (see Section 2.9.4.6 of Chapter 2 for further detail on consultation with 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 location will be carried out by the Project Civil/Structural Engineer prior to the construction of the crossing.

4.9.1.8 Culvert Crossings

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; refer to Table 4-9 below for further detail. Some culverts may be installed to manage drainage waters from works areas of the Proposed Wind Farm, particularly where the waters must 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 900mm diameter. In all cases, culverts will be oversized to allow mammals to pass through the culvert.

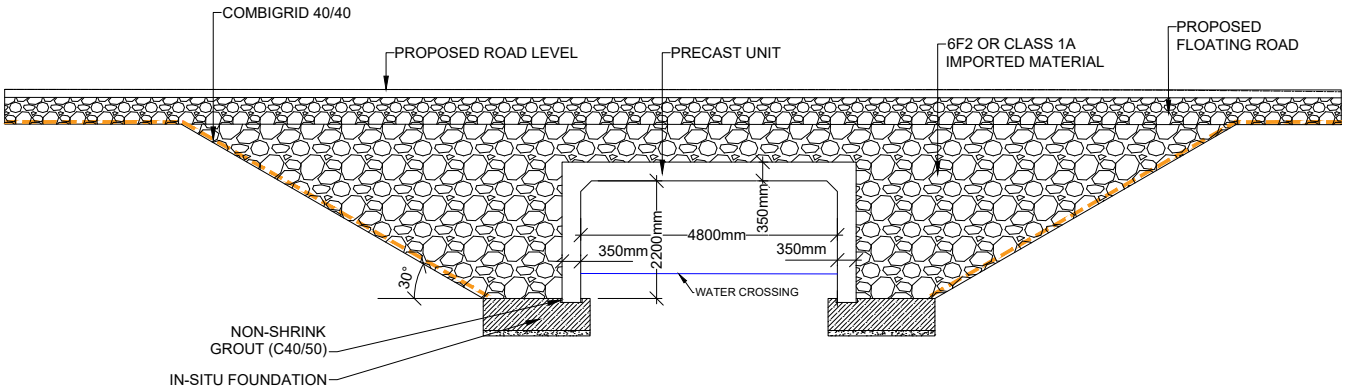
Culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of 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. At minimum, the base of each culvert will be buried below the invert of it's given channel to ensure no barriers to migrating fish are created.

All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Refer to Figure 4-58 for details.

Table 4-9 Watercourse Crossing Types

Crossing No.	Watercourse Type	Crossing Type Description	Watercourse Crossing Type
WC-WF-01	Culvert Crossing	Existing Crossing to facilitate Site Entrance 3E located on the internal site access road between T08 and T11, consisting of a BnM piped drain, A new internal access road is to be constructed over the piped drain at this point adjacent to the L3001.The drain runs directly into the River Cushaling. The existing crossing will be removed, and new culvert will be constructed	Box culvert/ Bottomless culvert / Pipe
WC-WF-02	Culvert Crossing	New Crossing to facilitate Site Entrance 3C, a secondary entrance off the L-3001. The drain runs directly into the River Cushaling.	Box Culvert / Bottomless Culvert / Pipe.
WC –WF-03	Culvert Crossing	Existing Crossing to facilitate Site Entrance 3D – along proposed amenity track. No structural upgrade necessary to existing crossing. Floated track for amenity use only	Existing
WC -WF-04	Clear Span Bridge	Existing Crossing – The existing crossing will be demolished and replaced with a Clear span bridge to facilitate the internal site access road south west of T26 over the Figile River	Clear Span Bridge

Crossing No.	Watercourse Type	Crossing Type Description	Watercourse Crossing Type
WC -WF-05	Culvert Crossing	Existing Culvert Crossing – Facilitating Site Entrance 1A	Existing
WC -WF-06	Clear Span Bridge Crossing	Existing Clear Span Bridge Crossing – Facilitating Site Entrance 1A	Existing
WC -WF-07	Clear Span Bridge	Existing bridge to be demolished and replaced with a clear span bridge.	Clear Span Bridge
WC -WF-08	Culvert Crossing	Existing crossing to be used. Floated access track for amenity use only	Existing
WC-WF-09	New Proposed Crossing	No existing crossing, proposed new crossing	Clear Span Bridge / Bottomless Culvert
WC-WF-10	New Proposed Crossing	No existing crossing, proposed new crossing over the Figile River	Clear Span Bridge / Bottomless Culvert
WC-WF-11	New Proposed Crossing	No existing crossing, proposed new crossing over the Figile River	Clear Span Bridge / Bottomless Culvert
WC-WF-12	Existing	Existing Culvert Crossing – Upgrades to existing culvert crossing to facilitate internal site access road south of T35	Bottomless Culvert
WC-WF-13	Existing	Existing Culvert Crossing – Upgrades to existing culvert crossing to facilitate internal site access road north of T34	Bottomless Culvert
WC-WF-14	Existing	Existing Culvert Crossing – Upgrades to existing culvert crossing to facilitate internal site access road to T10	Box Culvert / Bottomless Culvert / Pipe
WC-WF-15	Culvert Crossing	New Crossing –crossing to facilitate proposed internal site access road to T10 and T09	Box Culvert / Bottomless Culvert / Pipe

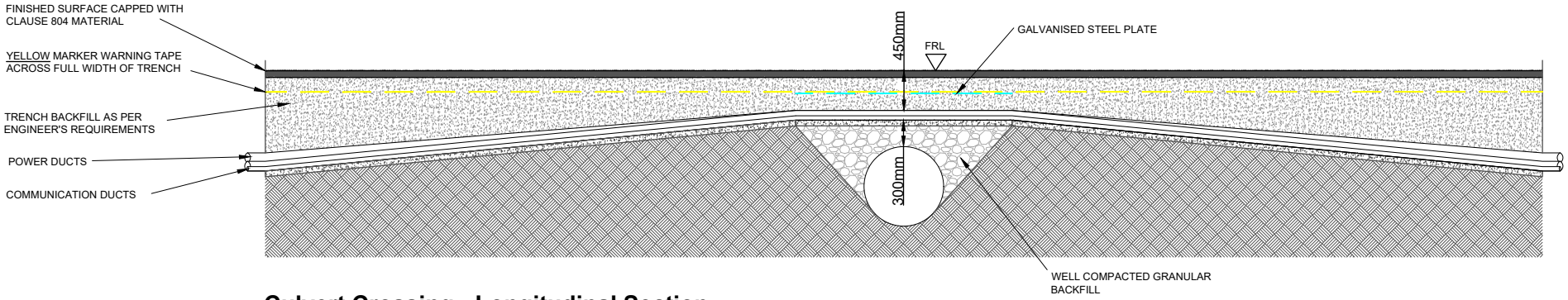


Clear Span Section

Scale 1:100

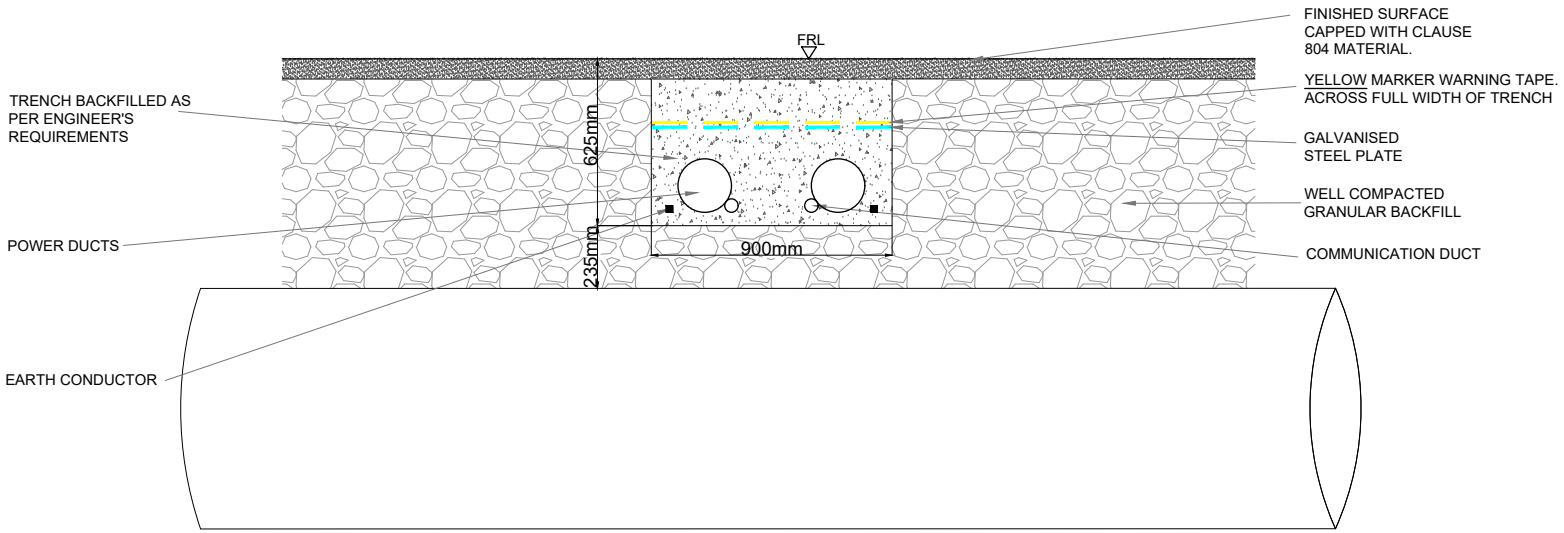
PROJECT TITLE: **Ballydermot Wind Farm, Co. Offaly and Co. Kildare**			
DRAWING TITLE: **Clear Span Water Crossing Detail**			
PROJECT No.: **250708**		DRAWING No.: **Figure 4-57**	SCALE: **As Shown**
DRAWN BY: **GO**	CHECKED BY: **RD**	DATE: **23.10.2026**	REVISION.: P03

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Culvert Crossing - Longitudinal Section

SCALE 1:50

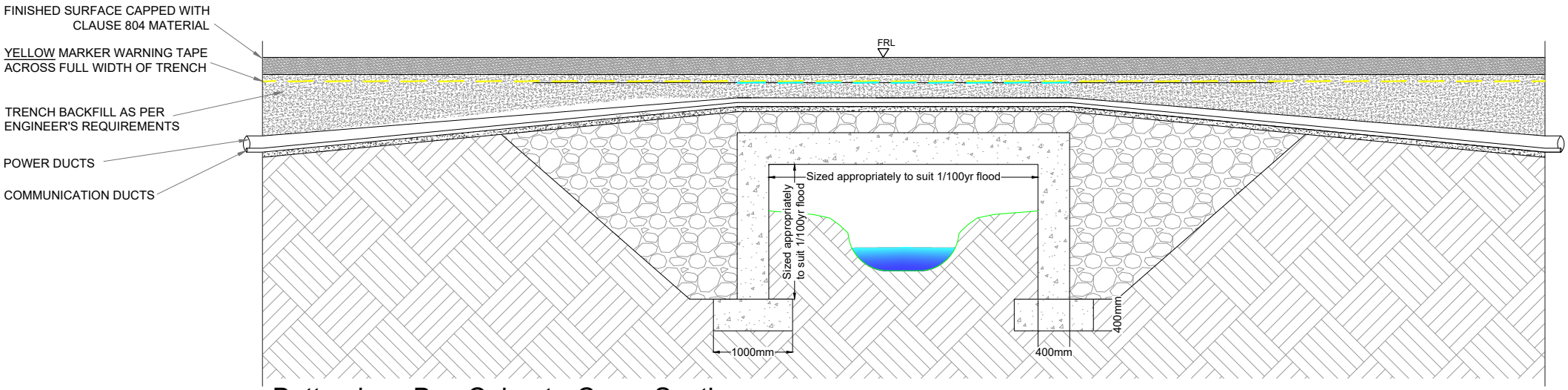


Culvert Crossing - 33kV - Cross Section

SCALE 1:20

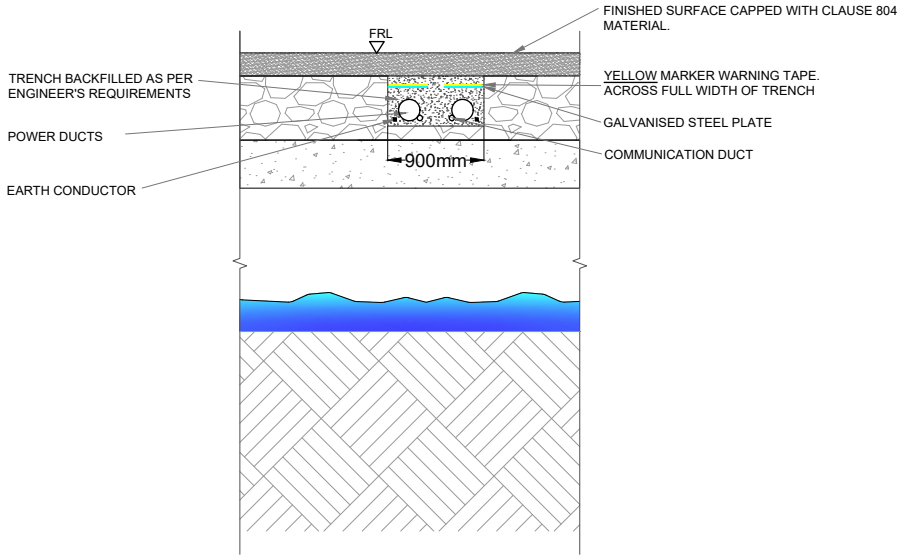
PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare			
DRAWING TITLE: Culvert Crossing			
PROJECT No.: 250708		DRAWING No.: Figure 4-58A	SCALE: As Shown
DRAWN BY: GO	CHECKED BY: RD	DATE: 23.10.2026	REVISION.: P03

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Bottomless Box Culvert - Cross Section

SCALE: 1:50

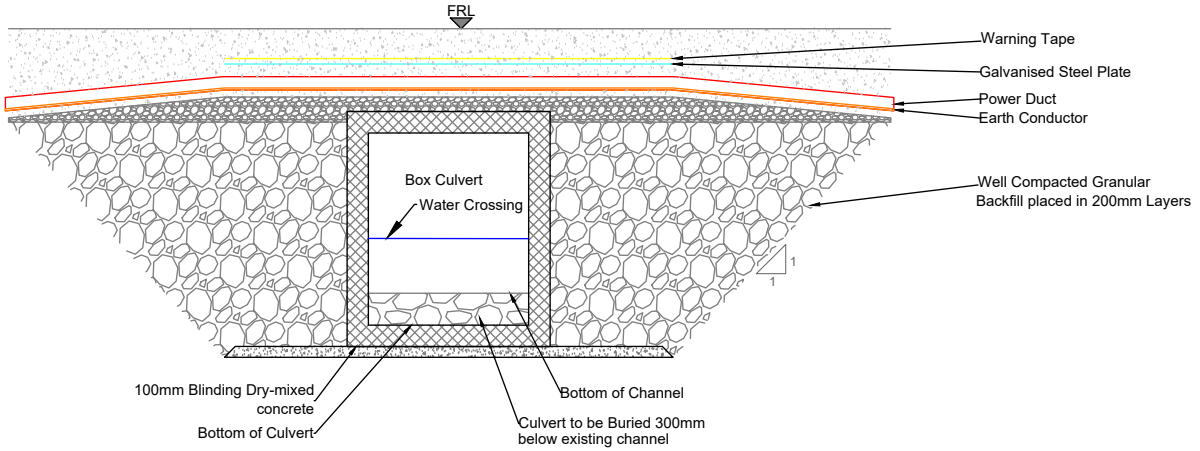


Bottomless Box Crossing - 33kV - Cross Section

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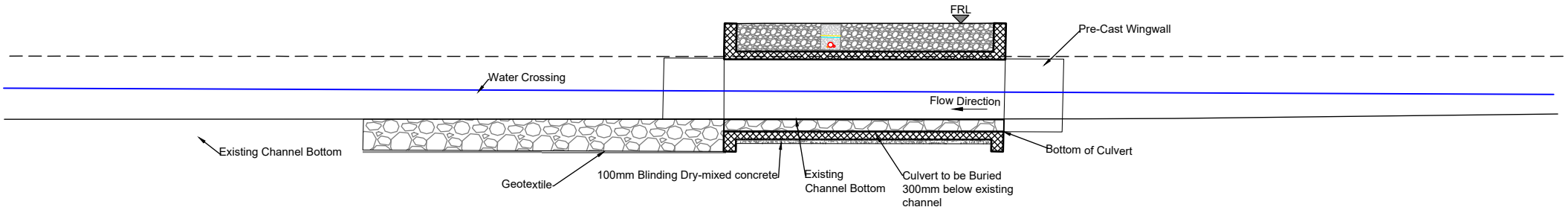
PROJECT TITLE: Ballydermot Wind Farm, Co. Offaly and Co. Kildare			
DRAWING TITLE: Bottomless Box Culvert Crossing			
PROJECT No.: 250708		DRAWING No.: Figure 4-58B	SCALE: As Shown
DRAWN BY: GO	CHECKED BY: RD	DATE: 23.10.2026	REVISION.: P03

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Proposed Culvert Upgrade (PC2) - Cross Section

SCALE 1:50



Proposed Culvert Upgrade (PC2) - Longitudinal Section

SCALE 1:100

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Box Culvert Crossing

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-58C	As Shown

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
GO	RD	23.10.2026	P03

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4.9.2 Proposed Grid Connection

The Proposed Grid Connection will connect to the national electricity grid via the Proposed Onsite Substation which is in the townland of Allenwood South, Co. Kildare and the Proposed Offsite Substation which is located in the townland of Killybegs, Co. Kildare. The two substations will be connected via 13.1 km of underground electrical cabling primarily located in the public road network.

The Proposed Offsite Substation will connect to the existing Maynooth–Dunstown 220kV OHL through 0.06km of overhead line, incorporating 2 no. new steel masts and 2 no. new gantry structures. The OHL conductor will be broken between Towers 46 and 47, with no removal of existing infrastructure. The mast locations have been determined based on ground surveys, profiles, allowable angles, and ruling span checks.

4.9.2.1 Substations and Control Buildings

Proposed Onsite Substation

The construction of the Proposed Onsite Substation compound will consist of a 220kV two-storey switching GIS building, a 110kV two-storey switching GIS building, an IPP control building, a 36m telecommunications mast, and associated outdoor electrical equipment. Once ground preparation per the methodology for site roads as described previously is completed, the Proposed Onsite Substation will be constructed by the following methodology:

1. *The 220kV Gas-Insulated Substation (GIS) building and 110kV GIS building will be in a compound, which includes the IPP control building. The onsite substation compound including the IPC control building is approximately 224m by 117m, surrounded by a 2.6m-high palisade fence with a total area approximately 25,615 m^2. See Plate 4-8 below for a 220kV GIS switching substation.*
2. *The IPP compound will have a shared fence line with the 220kV substation.*
3. *The substation and IPP compound drainage will be marked by a qualified engineer.*
4. *A drainage system will be installed around the compound area.*
5. *Topsoil and subsoil will be removed from the footprint of the compound using an excavator. The excavated material shall be temporally stored in adjacent berms for layer use during reinstatement works.*
6. *A layer of geotextile material will be laid over the footprint of the compound (see Plate 4-9 below).*
7. *Using an excavator, a base of clause 804 material will be laid followed by a 6F2 layer which will provide a finished surface. Clause 804 material is a specific type of material used in road construction and sub-base layers consisted of crushed stone, crushed concrete, or a mixture of both, 6F2 material is a granular fill material consisting of crushed concrete, crushed brick, or reclaimed construction aggregate.*
8. *Each layer will be compacted using a vibrating roller.*
9. *Earthing cable will be laid underground around the vicinity of the substation for connection to various electrical components during the electrical fit-out phase.*
10. *Adequate lighting will be installed around on the compound on lighting masts.*
11. *Lighting protection masts with an approximate height of 18m will be installed to provide lighting protection to the substation compound.*
12. *The electrical equipment will be installed and commissioned.*
13. *Perimeter fencing will be erected.*

The construction and components of the substation will be to ESB or EirGrid specifications. The Proposed Onsite Substation and all ancillary infrastructure will be accessible from a dedicated road as shown on Planning Drawing in Appendix 4-1.

Proposed Offsite Substation

The construction of the Proposed Offsite Substation compound will consist of a 220kV two-storey switching GIS building, 2 no. new steel masts, and 2 no. new gantry structures and associated outdoor electrical equipment. Once ground preparation as per the methodology for site roads as described previously is completed, the Proposed Offsite Substation will be constructed by the following methodology:

1. *The 220kV Gas-Insulated Substation (GIS) building will be in a compound of approximately 113.5m by 82m, surrounded by a 2.6m-high palisade fence with a total area approximately 9,307m^2*
2. *The substation drainage will be marked by a qualified engineer.*
3. *A drainage system will be installed around the compound area.*
4. *Topsoil and subsoil will be removed from the footprint of the compound using an excavator.*
5. *A layer of geotextile material will be laid over the footprint of the compound (see Plate 4–9 below).*
6. *Using an excavator, a base of clause 804 material will be laid followed by a 6F2 layer which will provide a finished surface. Clause 804 material is a specific type of material used in road construction and sub-base layers consisted of crushed stone, crushed concrete, or a mixture of both, 6F2 material is a granular fill material consisting of crushed concrete, crushed brick, or reclaimed construction aggregate.*
7. *Each layer will be compacted using a vibrating roller.*
8. *Earthing cable will be laid underground around the vicinity of the substation for connection to various electrical components during the electrical fit-out phase.*
9. *Adequate lighting will be installed around on the compound on lighting masts.*
10. *Lighting protection masts with an approximate height of 18m shall be installed to provide lighting protection to the substation compound*
11. *The 2 no. new steel masts and 2 no. new gantry structures are required to connect the 220kV overhead lines into the substation – these will be constructed in line with the methodology outlined in Section 4.9.2.4 below.*
12. *The electrical equipment will be installed and commissioned.*
13. *Perimeter fencing will be erected.*

The construction methodology and sequencing will be decided by the EPC contractor in line with their construction philosophy and equipment delivery schedules.

The construction and components of the substation will be to ESBN and/or EirGrid specifications. The Proposed Offsite Substation and all ancillary infrastructure will be accessible from a dedicated road as shown on Planning Drawing in Appendix 4-1.



Plate 4-8 220kV GIS Substation. Source: BnM



Plate 4-9 Crushed Rock Roadway Build-Up with Geo-Textile. Source: BnM

4.9.2.2 Bored Well

The bored well will be constructed adjacent to the Proposed Onsite Substation and Proposed Offsite Substation in line with the construction methodology of a common domestic borehole using a drilling rig. The rig will be reversed to the target drill site to the exact proposed well location. Final plumbing and centralising will be completed utilising hydraulic jacks and packing plates to ensure a secure base for the rig. When this has been completed, the mast will be erected, and final levelling will take place.

Open hole drilling will commence using a rotating drill head to accommodate a 200mm outer conductor steel casing to adequate depth. A nominal 125mm PVC well sleeve will be placed mid-range within the borehole once drilling head and string have been removed.

The drill string is the part of the drilling unit which works mainly within the borehole, connecting the surface drill rig to the bit. In effect the main function of the drill string is the efficient transmission of power in the deepening hole. As required the drill pipes are mechanically lifted into place and released when the drill pipe is over the table. The next pipe is then screwed into the last drill pipe and torqued up as drilling continues.

Air and water will be used to flush out the hole as drilling proceeds. Discharge water and drill cuttings will be diverted to an adapted skip by Bauer pipe from drill table at the back of the drilling rig. This will allow settlement of fines and sediment.

An in-well pump will direct water to a water tank within the roof space of the proposed control building (subject to final design).

4.9.2.3 Underground 220kV Electrical Cabling

The underground electrical cabling route from the Proposed Onsite Substation to the Proposed Offsite Substation, as shown in Appendix 4-1, will primarily require open cut trenching construction methods, with one location requiring HDD. HDD is required to traverse underneath the Grand Canal approximately 0.2km west of the Shee Bridge Co. Kildare. The route of the underground electrical cabling between substations is outlined in Section 4.4.2.2 above. The entirety of the underground electrical cabling route has been assessed throughout this EIAR.

Before works commence, updated surveying will take place along the Proposed Grid Connection underground electrical cabling route, with all existing culverts and services identified. All relevant bodies i.e., ESBN, Uisce Éireann, Kildare County Council, etc. will be contacted and all up to date information for all existing services sought.

When the underground cabling is located on public roads, a traffic management plan will be prepared prior to any works commencing. A road opening licence will be obtained, and all plant operators and general operatives will be inducted and informed as to the location of any services.

The ducts for the cables of the underground connections will primarily be installed using both trefoil and flat formatting where appropriate as aligned with the requirements of EirGrid. Construction methodologies to be implemented and materials to be used will ensure that the Proposed Grid Connection underground electrical cabling route is installed in accordance with the requirements and specifications of EirGrid and ESB. The general construction methodology for trenching and sequencing is anticipated to be as follows:

1. *The Contractor, and their appointed Site Manager, will prepare a targeted Method Statement concisely outlining the construction methodology and incorporating all mitigation and control measures included within the planning application and accompanying reports and as required by planning conditions where relevant;*
2. *All existing underground services will be identified on site prior to the commencement of construction works;*
3. *At watercourse crossings, the contractor will be required to adhere to the environmental control measures outlined within the planning application and accompanying reports, the detailed Construction Environmental Management Plan (CEMP), located in Appendix 4-4 to be prepared prior to the commencement of construction, and best practice construction methodologies;*
4. *Where the cable route intersects with culverts, the culvert will remain in place (where possible) and the ducting will be installed either above or below the culvert to provide minimum separation distances in accordance with ESBN/EirGrid and Uisce Eireann specifications;*
5. *Traffic management measures will be implemented in accordance with those included in the Traffic Management Report, and a detailed Traffic Management Plan will be prepared and agreed with Kildare County Council;*

6. *A one lane closure will be maintained during the construction of the grid connection;*
7. *Excavated material will be used to backfill the trench where appropriate and any surplus material will be transported off site and disposed of at a fully authorised soil recovery site;*
8. *Any earthen (sod) banks to be excavated will be carefully opened with the surface sods being stored separately and maintained for use during reinstatement;*
9. *The excavated trench will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, dirty water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature;*
10. *Where required, grass will be reinstated by either seeding or by replacing with grass turves;*
11. *No more than a 100-120msection of trench, to be agreed with the county council, will be opened at any one time. A second part will only be excavated once the majority of reinstatement has been completed on the first or to the agreement of the licenced authority. The standard length agreed will be approximately 100m;*
12. *The excavation, installation and reinstatement process will take one crew on average of 1 no. day to complete a section of 100m to 120m;*
13. *Where the cable is being installed in a roadway, temporary reinstatement may be provided to allow larger sections of road to be permanently reinstated together;*
14. *Following the installation of ducting, pulling the cable will take approximately 1 no. day between each joint bay, with the jointing of cables taking approximately 1 week per joint bay location.*
15. *Typical HV Underground Duct Installation*
16. *For the trenching and ducting works the following step by step methodology will apply:*
17. *Grade, smooth and trim trench floor when the required 1425mm depth and 700mm width have been obtained.*
18. *Place bedding layer of Cement Bound Granular Mixture B (CBGM B) material in accordance with the specification and compact it so that the compacted thickness is as per the drawings.*
19. *Lay the bottom row of ducts in trefoil formation as detailed on the design drawings. Use spacers as appropriate to establish horizontal duct spacing. Fit a secure cap / bung to the end of each duct run to prevent the ingress of dirt or water.*
20. *Carefully surround and cover ducts with CBGM B in accordance with the design drawings and specifications and thoroughly compact without damaging ducts.*
21. *Place cable protection strips on compacted CBGM B directly over the ducts.*
22. *Lay the top row of ducts onto the freshly compacted CBGM B including the cable protection strips above the bottom row of ducts. Place a secure cap at the end of each duct to prevent the ingress of dirt or water.*
23. *Carefully surround and cover ducts with CBGM B material in accordance with the drawings and thoroughly compact without damaging ducts.*
24. *Place red cable protection strip on top of compacted CBGM B over each set of ducts as shown on the drawings.*
25. *Place and thoroughly compact CBGM B material or Clause 804 backfill or soil backfill as specified and place warning tape at the depth shown on the drawings.*
26. *For unsurfaced/grass sections, backfill 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, etc.*
27. *Clean and test the ducts in accordance with the specification by pulling through a brush and mandrel. Install 12 mm polypropylene draw rope in each duct and seal all ducts using robust duct end seals fitted with rope attachment eyes in preparation for cable installation at a later date. All the works should be witnessed by ESBN Clerk of Works (CoW) as required.*



Plate 4-10 Typical underground cable trench. Source: BnM

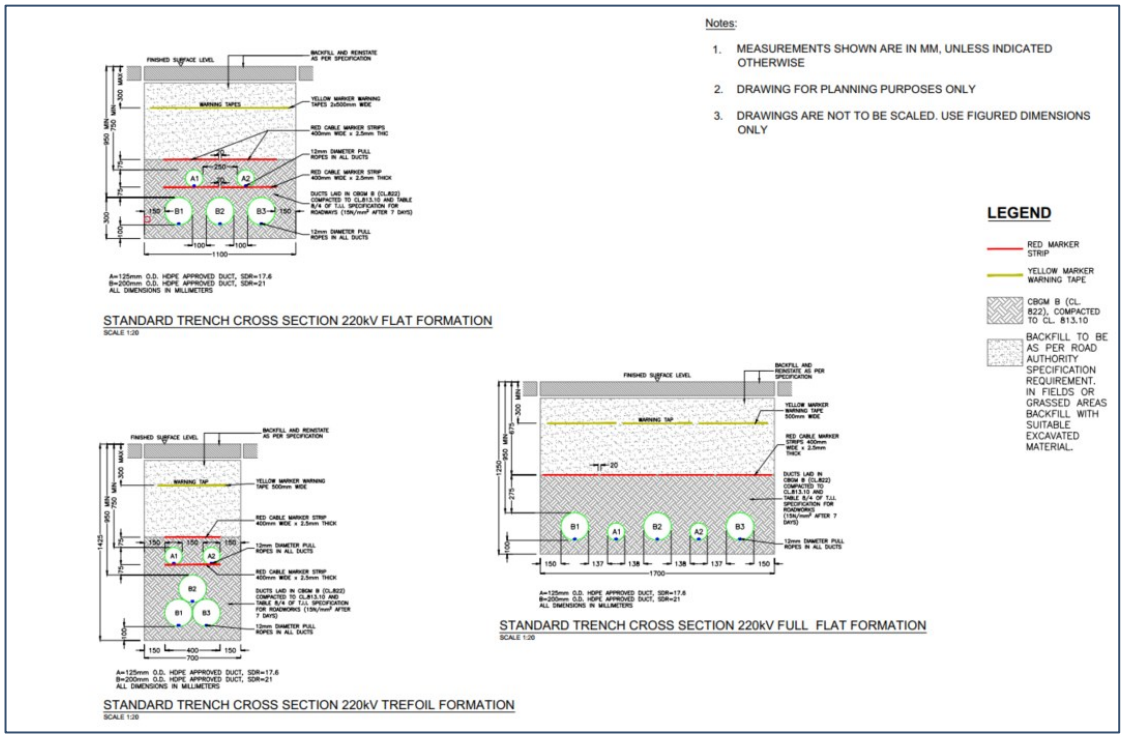


Plate 4-11 Typical 220kV Single Circuit Trench Proposed Crossing Formations. Source: EirGrid

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

Marker posts will be used on non-roadway routes to delineate the cable route and joint bay positions. Corrosion proof aluminium triangular danger sign, with 700mm base, and with centred lightning symbol, on engineering grade fluorescent yellow background shall be installed in adequately sized concrete foundations. Marker posts will also be placed in the event that burial depth is not to standard. Siting of marker posts to be dictated by ESBN as part of the detailed design process. Refer to Plate 4-16.

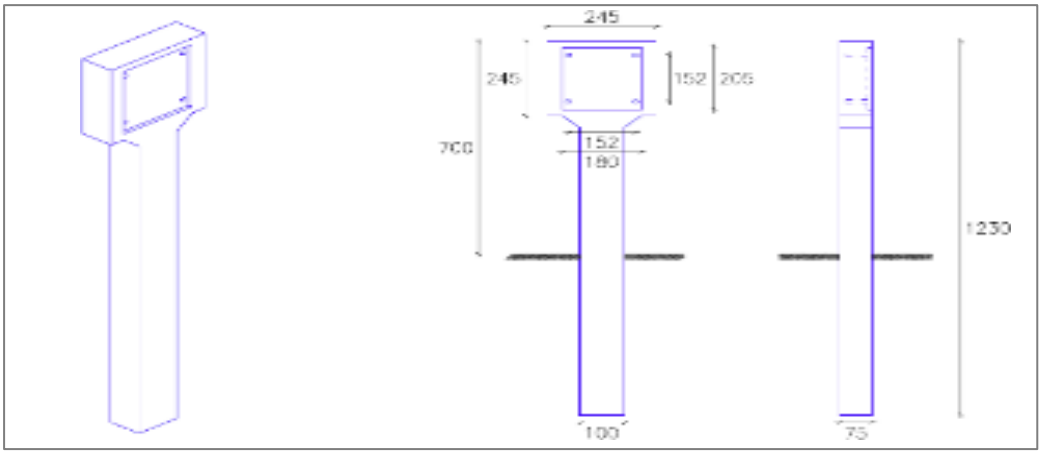


Plate 4-12 Typical ESB Marker Posts Example. Source: BnM

The general construction methodology for HDD is provided in Section 4.9.2.7.4 below.

4.9.2.4 Overhead Line 220kV Electrical Cabling Route

The Proposed Offsite Substation will connect to the existing Maynooth-Dunstown 220kV OHL via 0.12km of overhead line (comprising 0.06km of OHL from the proposed steel masts for the loop-in from the Proposed Offsite Substation to the existing OHL), 2 no. new steel masts, and 2 no. new gantry structures.

The general construction methodology and sequencing for the OHL connection to the existing Maynooth-Dunstown 220kV OHL is as follows:

- Safety precautions will be in place reflecting working in the vicinity of a live line and to mitigate any potential risk to the operational line during construction works. Mast sites are scanned for underground services such as cables, water pipes etc.
- The duration of works of the overhead line construction is anticipated to be twelve weeks. The timeframe for construction of foundations for masts is approximated to seven days each allowing time for curation of the concrete. The erection of the masts is approximated to 5 days, dependent on suitable weather conditions at time of installation. Stringing of conductors is typically a four-week process and final connection to the existing grid will be carried out by Electricity Supply Board Networks (ESBN).
- The construction of the 2 no. new steel masts and 2 no. new gantry structures will be as outlined below. To allow for safe construction where ground conditions are good, the excavation will be stepped back which requires additional area to be excavated. The formation levels (depths) will be checked by the onsite engineer.

Disconnection of existing conductors and connection of the 2 no. new steel masts to the existing Maynooth-Dunstown 220kV OHL will be carried out by ESBN and at that point in time live commissioning and testing of the Electricity Grid Connection can start. The construction methodology and sequencing for the line break into the Maynooth-Dunstown 220kV OHL will be decided by the appointed contractor in line with their construction philosophy and equipment delivery schedules.

Gantry Structures

The following section outlines the methodology to be followed during construction works of the gantry tower structures which will be constructed underneath the existing Maynooth-Dunstown 220kV OHL:

1. *A foundation of approximately 5m x 4m x 2.35m deep will be constructed. To be determined at detailed design stage.*

2. *Reinforced bars shall be lifted into each excavated foundation using the excavator and chains/slings. The base and body section of each gantry will be assembled next to the excavation*
3. *A setting template is used to set and hold the gantry J-bolts in position while the concrete is being poured and cured.*
4. *Concrete trucks shall pour concrete directly into each excavation in distinct stages. A final pour for the base is the encasing of the gantry leg which shall be finished 300mm over finished ground level.*
5. *The gantry foundations shall be backfilled on leg at a time with a 200mm layer of deep compacted T.0 graded granular fill material. A finishing 100mm layer of compound stone is layered on top of a geotextile to finish the compound ground level. The backfill shall be placed and compacted in layers.*
6. *A hardstand area for the crane shall be created by laying geogrid material on the ground surface and overlaying this geogrid with a suitable grade of aggregate.*
7. *A physical barrier (Heras Fence Site Boundary) and virtual barriers shall be put in place to restrict plant from coming too close to the OHL.*
8. *A temporary access road shall be constructed to allow access to the tower locations.*
9. *A temporary hardstand area shall be constructed to allow the assembly and laydown of the gantries.*
10. *The gantries shall be constructed lying flat on the ground beside the recently installed cable compound on the temporary hardstand.*
11. *The gantry section will be lifted into place using the crane and guide ropes and the body section will be bolted into place (see Plate 4-17 below)*



Plate 4-13 Stepped Back Excavation for Gantry Foundations. Source BnM

Steel Mast Structures

Indicatively strain towers are required for the loop-in connection, exact detail to be confirmed at detailed design stage following signoff by ESBN/EirGrid. The following section outlines the methodology to be followed during construction works of the new steel masts which will be constructed underneath the existing Maynooth-Dunstown 220kV OHL:

1. *Mast sites are scanned for underground services such as cables, water pipes etc.*
2. *For leg of the 2 masts (8 legs in total) a foundation approximately 4.4m x 4.4m x 3.6m is excavated and the formation levels (depths) will be checked by the onsite foreman. To be determined at detailed design stage. See Plates 4-18 and 4-19 below.*

3. *A concrete pipe will be placed into each excavation to allow operatives level the mast at the bottom of the excavation. The frame of the reinforcing bars will be prepared and strapped to a concrete pipe with spacers as required. The reinforcing bars will be lifted into each excavated foundation using the excavator and chains/slings. The base and body section of each mast will then be assembled next to the excavation.*
4. *In areas of insufficient ground and high-water table, it may be necessary to use sheet piles supported by hydraulic frame(s) to prevent collapse of the sides and prevent the excavation becoming too large. In this scenario, the requirement of a concrete pipe (which is typically used in tower foundations) is removed. During any dewatering activities, a standard water filtration system shall be utilised to control the amount of sediment in surface ware runoff.*
5. *A setting template is used to set and hold the tower stubs in position while the concrete is being poured and cured. And water in the excavation will be poured out prior to any concrete being poured into the foundation.*
6. *Concrete trucks will pour concrete directly into each excavation in distinct stages.*
7. *A final pour for the mast is the encasing of the mast leg which shall be finished 300mm over finished ground level. The leg of the mast is required to be shuttered with metal panels to form its required shape (see Plate 4-20 below)*
8. *Once concrete is set after five days, the shuttering is removed along with sheet piles (if required).*
9. *The mast foundations will be backfilled one leg at a time with the material already excavated at the location. The backfill will be placed and compacted in layers. All surplus excavated material and removed from the mast locations and stored in berms for use across the construction site*
10. *For the masts located under the existing line, the line will be de-energised by ESB so work can commence on the construction of the masts. Where it is offline the masts will be built without an outage.*
11. *An earth mat consisting of copper wire will be laid approximately 400mm below ground around the mast.*
12. *Once the base section of each mast is completed and its concrete is sufficiently cured, it is ready to receive the mast body.*
13. *A hardstand area for the crane will be created by laying geogrid material on the ground surface and overlaying this geogrid with a suitable grade of aggregate*
14. *A physical barrier (Heras Fence Site Boundary) will be put in place to restrict plant from coming too close to the OHL.*
15. *The conductor will be centred over the masts and held in place. Once the conductor is secured at both ends it is then cut and attached onto each mast. The section of conductor in between the two masts will be removed and utilised as connector wire for the new masts.*
16. *A temporary hardstand area will be constructed to allow the assembly and laydown of the towers.*
17. *As the masts are located under the existing 220kV line, the line will be de-energised by ESB Networks so work can commence on the construction of the masts.*
18. *The mast section will be lifted into place using the crane and guide ropes and the body sections will be bolted into position*
19. *The circuit will be tested in both directions before the line is re-energised.*



Plate 4-14 Steep Back Excavation. Source: BnM



Plate 4-15 Typical Steel lattice tower foundation completed. Source: BnM



Plate 4-16 Typical Completed End Mast Tower

Stringing of Conductors

Stringing of OHLs on the supporting lattice structures will be kept clear of all obstacles along the straight by applying sufficient tension. This method requires the pulling of a light pilot line (nylon rope) which is normally carried by hand into the stringing wheels. This in turn is used to pull a heavier pilot line (steel rope) which is subsequently used to pull the conductors from the drum stands using specifically designed "puller – tensioner" machines (Plate 4-21). The main advantages with this method are:

- The line is protected from surface damage.
- Major obstacles can be completed without any significant disruption.



Plate 4-17 Puller – Tensioner Machine

Once the conductors have been pulled into position, one end of the straight is terminated on the appropriate tension fittings and insulator assemblies. The free end of the straight is then placed in temporary clamps which take the conductor tension. The conductor is then cut from the puller-tensioner, and the conductor is sagged using a chain hoist. Bird flight diverters or warning spheres can be added following the sagging procedure if required.

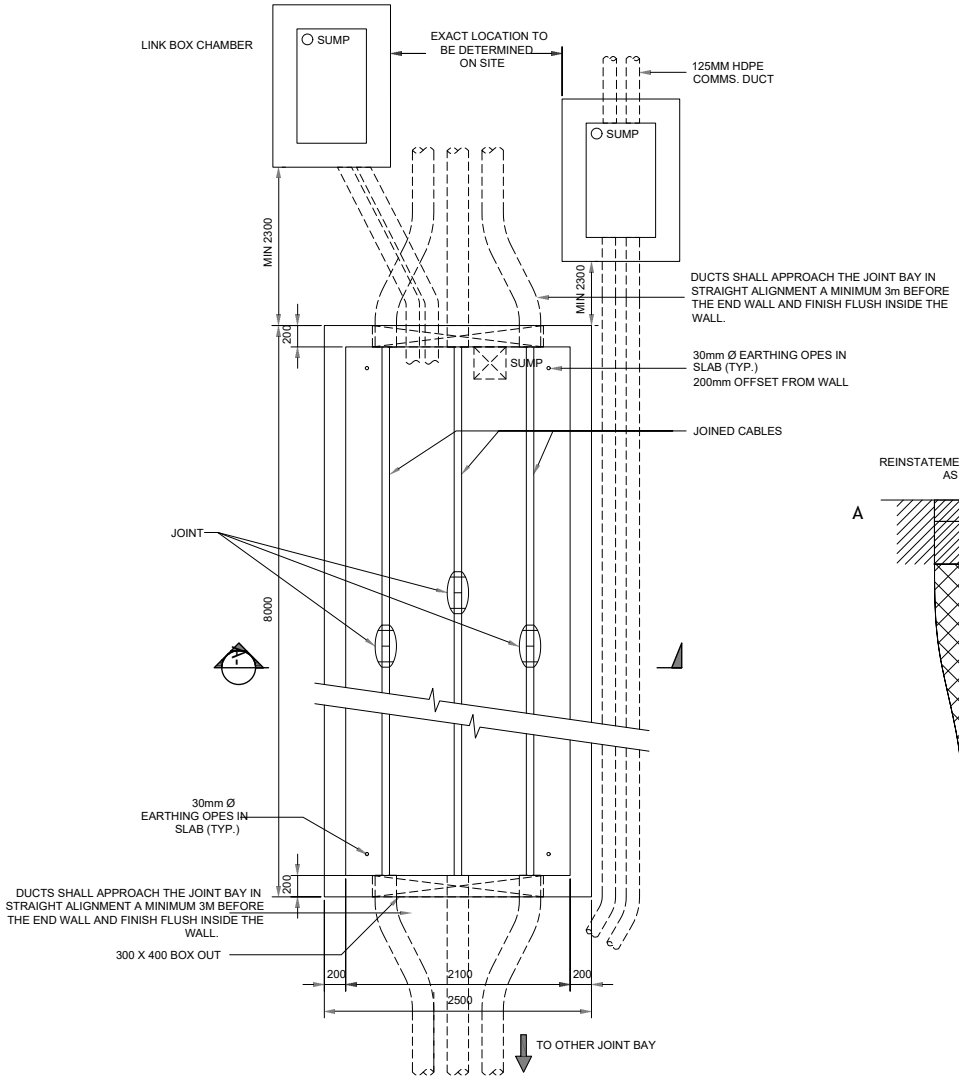
4.9.2.5 Joint Bays

Joint bays are pre-cast concrete chambers where lengths of cable will be joined to form one continuous cable. Joint bays will be located at various points along the Proposed Grid Connection route generally between 600 to 800 metre intervals or as otherwise required by ESBN and electrical designer requirements. Joint Bays are approximately 6m x 2.5m x 1.475m pre-cast concrete structures installed below finished ground level.

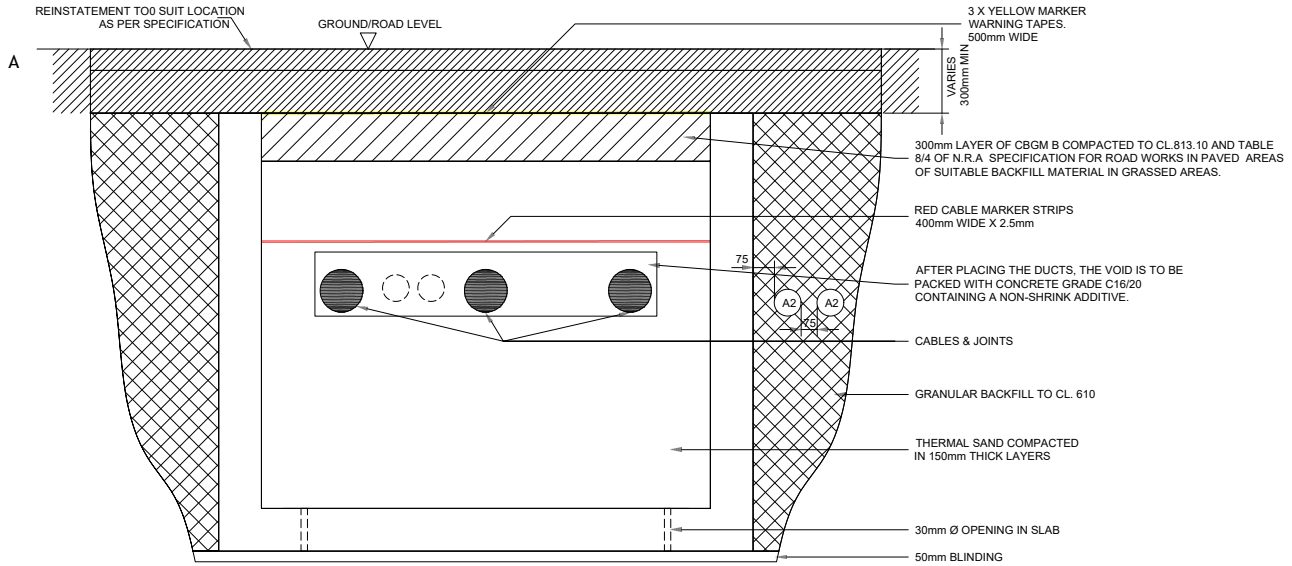
Where possible, joint bays will be located in areas where there is a natural widening/wide grass margin on the road in order to accommodate easier construction, cable installation, ease of maintenance and create less traffic congestion. Joint Bays will be located in the non-wheel bearing strip of roadways and the construction of joint bays will adhere to the Department of Transport (2026) Interim Guidance and to the agreement of the TSO. 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. Mitigation measures will be implemented throughout the construction process to ensure the installation and construction of the joint bays does not impact nearby protected structures and/or watercourses.

In association with Joint Bays, Communication Chambers are required at joint bay locations to facilitate communication links between the Proposed Onsite Substation and Proposed Offsite Substation. Earth Sheath Link Chambers are also required approximately every joint bay along the Proposed Grid Connection underground electrical cabling route. Communication Chambers will typically be pre-cast concrete structures with an access cover at finished surface level. The indicative locations of the joint bays and chambers are shown in Appendix 4-1.

The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers within the corridor assessed is subject to detailed design approval by ESB Networks.



TYPICAL PLAN OF JOINT BAY IN ROAD
SCALE 1:50



SECTION A
SCALE 1:25

A2 = 125mm Ø HDPE DUCT (COMMS)

GENERAL NOTES

1. ALL DRAWING TO BE READ IN CONJUNCTION WITH THE RELEVANT EIRGRID FUNCTIONAL SPECIFICATIONS. ANY DISCREPANCIES ARE TO BE NOTED IN WRITING TO EIRGRID IMMEDIATELY.
2. ALL DIMENSIONS ARE IN mm.
3. DO NOT SCALE DIMENSIONS
4. THE COMPACTION OF BACKFILL MATERIAL AROUND CABLES SHALL BE CARRIED OUT BY HAND.
5. THE CONTRACTOR SHALL PROVIDE TEST CERTIFICATES CONFIRMING THAT THE THERMAL RESITIVITY OF THE THERMAL SAND IS A MAXIMUM OF 2.7K.m/W.

PROJECT TITLE:
Ballydermot Wind Farm, Co. Offaly and Co. Kildare

DRAWING TITLE:
Joint Bay Detail

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-59	As Shown

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
GO	RD	23.10.2026	P03

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

4.9.2.6 Existing Underground Services

Any underground services encountered along the Proposed Grid Connection underground electrical 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 ducting 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.

Where the Proposed Grid Connection underground electrical cabling route interacts with existing underground services, the service crossings will be constructed in accordance with best practice information from the relevant entities, supplemented by detailed engineer design. The Applicant will hold consultation with the relevant entities prior to the commencement of works along the Proposed Grid Connection.

4.9.2.7 Underground Cabling Watercourse/Culvert/Service Crossings

A total of 11 no. existing watercourses have been identified that intersect / cross the Proposed Grid Connection underground electrical cabling route. The locations of the watercourse crossings are shown on the detailed layout drawings in Appendix 4-1 and below on Figure 4-60. The watercourse crossing methodologies are set out below; the proposed crossing methodology is illustrated on Figure 4-61 to Figure 4-64, with the most appropriated option being selected for each crossing. Instream works are not required at any watercourse crossing along the Proposed Grid Connection underground route.

Should an alternative methodology to those listed in Table 4-10 below be required for individual crossings during the construction process this will be agreed with the relevant authorities including Kildare County Council prior to works commencing.

4.9.2.7.1 *Crossing Using Standard Trefoil Formation Over – Type 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 or where a new bottomless box culvert or clear-span structure has been installed at a sufficient depth, the standard ESB approved trefoil arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert, water course or existing underground service. The cable trench will pass over the crossing in a standard trench.

Refer to Figure 4-61 below for further details.

4.9.2.7.2 *Flatbed Formation Under– Type 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 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 under 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.

Refer to Figure 4-61 below for further details.

4.9.2.7.3 Flatbed Formation Over– Type C

Where cable ducts are to be installed over a 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 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 over it. The ducts will be laid in this trench in a flatbed formation over the existing culvert 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 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.

Refer to Figure 4-61 below for further details.

4.9.2.7.4 Horizontal Directional Drilling – Type D

The proposed HDD methodology is as follows:

1. *The drilling rig and fluid handling units located on one side of the crossing will be stored on double bunded 0.5mm PVC bunds which will contain any accidental fluid spills and storm water run-off.*
2. *Entry and exit pits (2m x 2m x 1.5m) will be excavated; the excavated material will be temporarily stored within the works area and used for reinstatement or disposed of to a licensed facility.*
3. *A 2m x 2m x 1.5m steel box will be placed in each pit. This box will capture any drilling fluid returns from the borehole.*
4. *The drill bit will be set up by a surveyor, and the driller will push the drill string into the ground and will steer the bore path under the stream-ways and the forestry.*
5. *A surveyor will monitor drilling works to ensure that the modelled stresses and collapse pressures are not exceeded.*
6. *The drilled cuttings will be flushed back by drilling fluid to the steel box in the entry pit.*
7. *Once the first pilot hole has been completed a hole-opener or back reamer will be fitted in the exit pit and will pull a drill pipe back through the bore to the entry side.*
8. *When all bore holes have been completed, a towing assembly will be set up on the drill and this will pull the ducting into the bore.*
9. *The steel boxes will be removed, and the drilling fluid disposed of to a licensed facility.*
10. *The ducts will be cleaned and proven and their installed location surveyed.*
11. *The entry and exit pits will be reinstated as per the landowners' requirements.*
12. *A typical HDD would take 3 days. This is dependent on a number of factors such as ground conditions, geology, etc. and would be taken into account during design stage by the HDD contractor.*

Refer to an illustration of the HDD methodology on Figure 4-62 below.

Watercourses

Table 4-10 Watercourse Crossing Types

Crossing No.	Watercourse Type	Crossing Type Description	Watercourse Crossing Type
PGCWC 1 (EPA Mapped WC)	Stone Arch Bridge	Existing crossing along the R414. Sufficient cover will be achieved from the top of the bridge to the R403 road at this watercourse crossing to lay the cables in a flat formation on top or below the existing crossing. This scenario ensures that the cable trench will have no impact on the watercourse	Type B or Type C
PGCWC 2 (pNHA crossing)	Canal	The Proposed Grid Connection underground electrical cabling route will travel east on the R414 for approximately 2.1km to approximately 0.4km west of the Shee Bridge. The Proposed Grid Connection underground electrical cabling route will utilise Horizonal Directional Drilling (HDD) to cross the Grand Canal and will not interact with the Shee Bridge	Type D
PGCWC 3 (EPA Mapped WC)	Clear Span Bridge	This Clear Span Bridge passes over a watercourse along the R403. Sufficient cover will be achieved from the top of the bridge to the road. There is sufficient cover at this watercourse crossing to lay the cables in a flat formation on top or below the existing crossing. This scenario ensures that the cable trench will have no impact on the watercourse	Type B or Type C
PGCWC 4 (non-EPA Mapped WC)	Stone Arch Bridge	Existing crossing along the R403. Sufficient cover will be achieved from the top of the bridge to the R403 road. There is sufficient cover at this watercourse crossing to lay the cables in a flat formation on top or below the existing crossing. This scenario ensures that the cable trench will have no impact on the watercourse	Type B or Type C
PGCWC 5 (non-EPA Mapped WC)	Stone Arch Bridge	Existing crossing along the R403 Sufficient cover will be achieved from the top of the bridge to the R403 road. There is sufficient cover at this watercourse crossing to lay the cables in a flat formation on top or below the existing crossing. This scenario ensures that the cable trench will have no impact on the watercourse	Type B or Type C
PGCWC 6 (EPA Mapped WC)	Pipe or Culvert Crossing	Existing crossing along the R403. No Visible Watercourse – Pipe or Culvert Crossing	Type B or Type C
PGCWC 7 (non-EPA Mapped WC)	Pipe or Culvert Crossing	Existing crossing along the R403. No Visible Watercourse – Pipe or Culvert Crossing	Type B or Type C

Crossing No.	Watercourse Type	Crossing Type Description	Watercourse Crossing Type
PGCWC 8 (EPA Mapped WC)	Pipe or Culvert Crossing	Existing crossing along the R403. No Visible Watercourse – Pipe or Culvert Crossing	Type B or Type C
PGCWC 9 (EPA Mapped WC)	Pipe or Culvert Crossing	Existing crossing along the R403. No Visible Watercourse – Pipe or Culvert Crossing	Type B or Type C
PGCWC 10 (non-EPA Mapped WC)	Pipe or Culvert Crossing	Existing crossing along the R403. No Visible Watercourse – Pipe or Culvert Crossing	Type B or Type C
WC 11 (non-EPA Mapped WC)	Culvert Crossing	Existing crossing along the R403. Sufficient cover will be achieved from the top of the culvert to the R403. There is sufficient cover at this watercourse crossing to lay the cables in a flat formation on top or below the existing crossing. This scenario ensures that the cable trench will have no impact on the watercourse	Type B or Type C

Built Services

The Proposed Project has been designed to avoid identified services and utilities insofar as possible. Prior to commencement of construction, detailed site investigations will be carried out to confirm design assumptions and undertake additional surveys to identify any new services and utilities and ensure they will not be impacted by the Proposed Project.

The are 6 no. OHLs that cross through the Proposed Wind Farm site and no existing substations located within the Proposed Wind Farm site.

A data request was sent to Gas Networks Ireland (GNI) in March 2026. GNI returned the latest dataset on the 28th of July 2026 which identified that there are no gas pipelines within the Proposed Wind Farm site, 1 no. gas pipeline (medium pressure) are located within the Project Site; i.e. in 1 no. gas pipeline is located in Prosperous Co. Kildare where the Proposed Grid Connection underground electrical cabling route will run parallel for approximately 1.1km before the gas pipeline turns right onto Buttermilk Lane while the Proposed Grid Connection underground electrical cabling route will continue straight on the L6002 (Hatters Cross Road) towards the Proposed Offsite Substation. There is also 1 no. gas pipeline located in Tullamore along the Proposed Construction Haul Routes.

There is 1 no. underground water main located within the Project Site that travels within the R414. The watermain crosses through the Project Site between Lullybeg and Lodge bog when it will traverse perpendicular to the internal 33kV electrical cabling from the Proposed Turbines to the Proposed Onsite Substation. The watermain then travels alongside the Proposed Grid Connection underground electrical cabling route in the R414 from the Proposed Onsite Substation to the Proposed Offsite Substation. The Proposed Grid Connection underground electrical cabling will run parallel to the water main for approximately 10.8km before turning right onto the L6002 (Hatters Cross Road).

Refer to Section 15.3 of Chapter 15: Material Assets of the EIAR for further information on the impact of the Proposed Project on these built services.

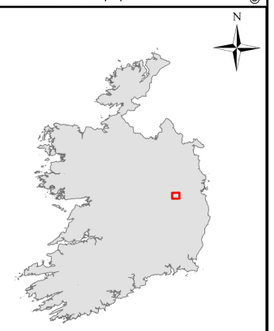


Legend

- Project Site
- Proposed Grid Connection Underground electrical cabling
- EPA Mapped Streams
- EPA Mapped Rivers
- Proposed Watercourse Crossings

Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere

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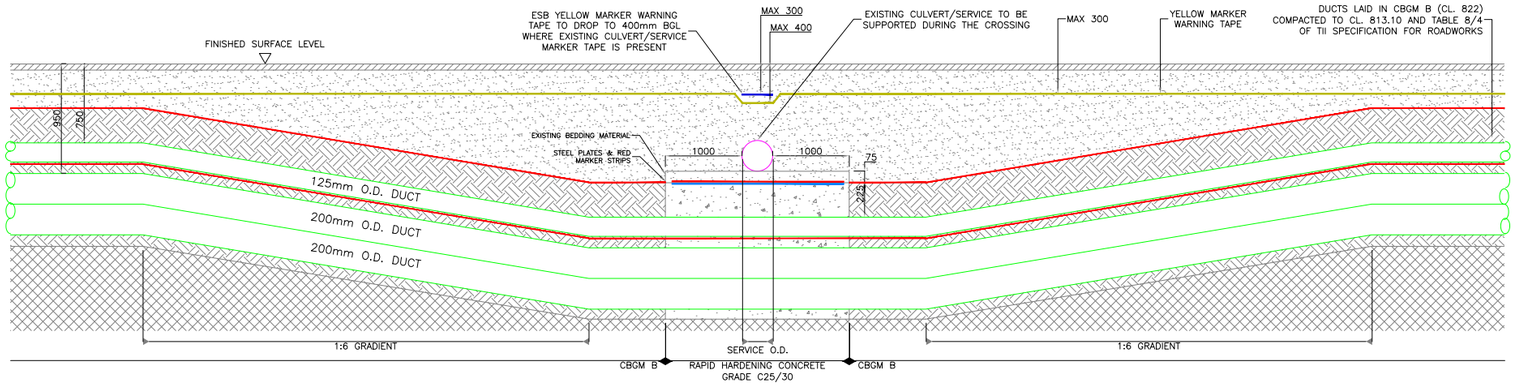
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Drawing Title: Proposed Grid Connection Underground Electrical Cabling Route Watercourse Crossings

Project Title: Ballydermot Wind Farm Co. Offaly & Co. Kildare

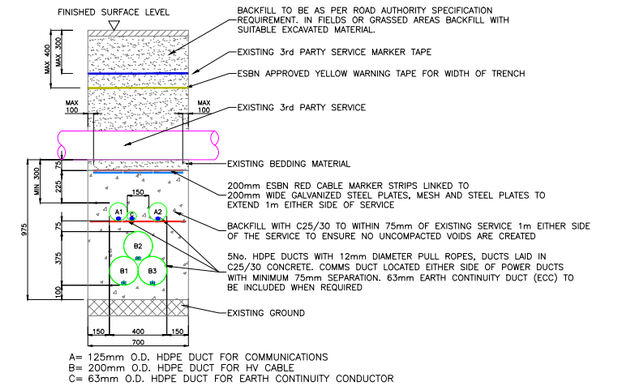
Project No.	Drawing No.	Scale
250708	4-60	1:58,000
Drawn By	Checked By	Date
LPM	EC	07/10/2026

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

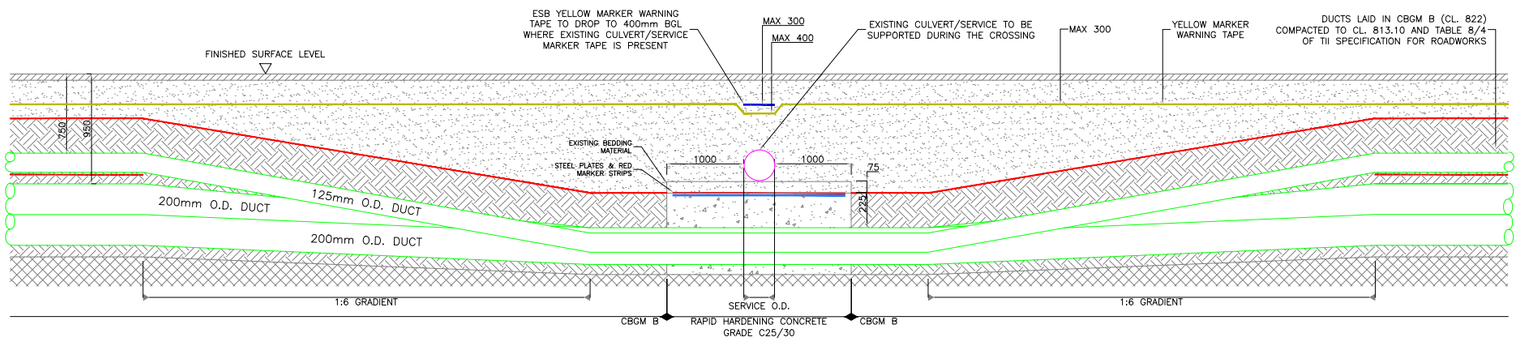


STANDARD 220KV CABLE - STANDARD 3RD PARTY CROSSING 200mm BELOW IN TREFOIL FORMATION

SCALE 1:100

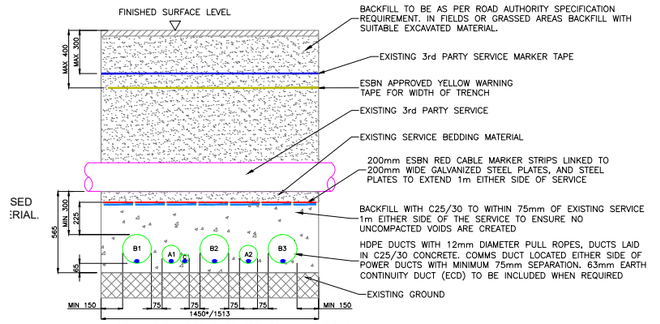


A= 125mm O.D. HDPE DUCT FOR COMMUNICATIONS
B= 200mm O.D. HDPE DUCT FOR HV CABLE
C= 63mm O.D. HDPE DUCT FOR EARTH CONTINUITY CONDUCTOR



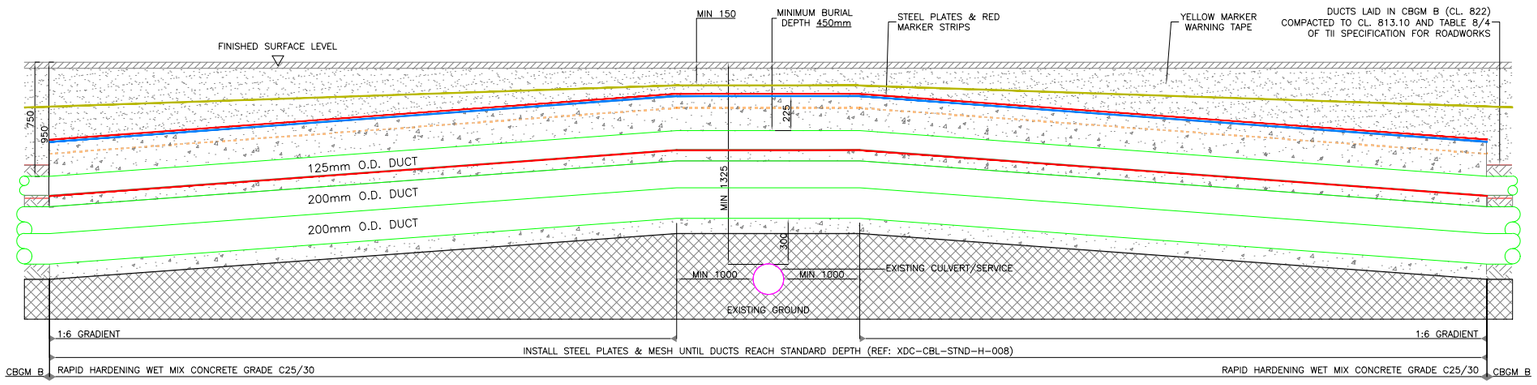
STANDARD 220KV CABLE - STANDARD 3RD PARTY CROSSING 200mm BELOW IN FULL FLAT FORMATION

SCALE 1:100



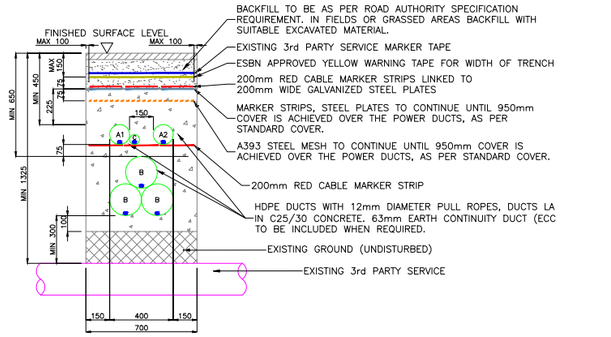
A= 125mm O.D. HDPE DUCT FOR COMMUNICATIONS
B= 200mm O.D. HDPE DUCT FOR HV CABLE
C= 63mm O.D. HDPE DUCT FOR EARTH CONTINUITY CONDUCTOR

* MIN 1450mm WHERE ECC NOT REQUIRED

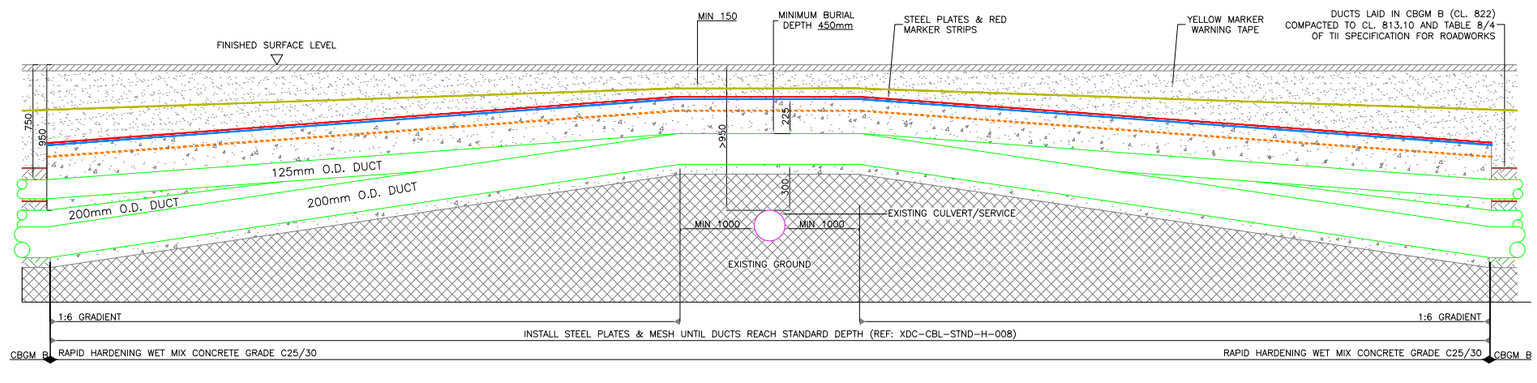


STANDARD 220KV CABLE - STANDARD 3RD PARTY CROSSING 200mm ABOVE IN TREFOIL FORMATION 200 OD HV DUCTS

SCALE 1:100

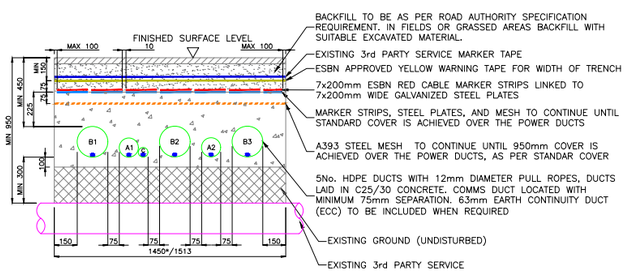


A= 125mm O.D. HDPE DUCT FOR COMMUNICATIONS
B= 200mm O.D. HDPE DUCT FOR HV CABLE
C= 63mm O.D HDPE DUCT FOR EARTH CONTINUITY CONDUCTOR



STANDARD 220KV CABLE - STANDARD 3RD PARTY CROSSING 200mm ABOVE IN FULL FLAT FORMATION 200 OD HV DUCTS

SCALE 1:100



A= 125mm O.D. HDPE DUCT FOR COMMUNICATIONS
B= 200mm O.D. HDPE DUCT FOR HV CABLE
C= 63mm O.D. HDPE DUCT FOR EARTH CONTINUITY CONDUCTOR

* MIN 1450mm WHERE ECC NOT REQUIRED

NOTES:

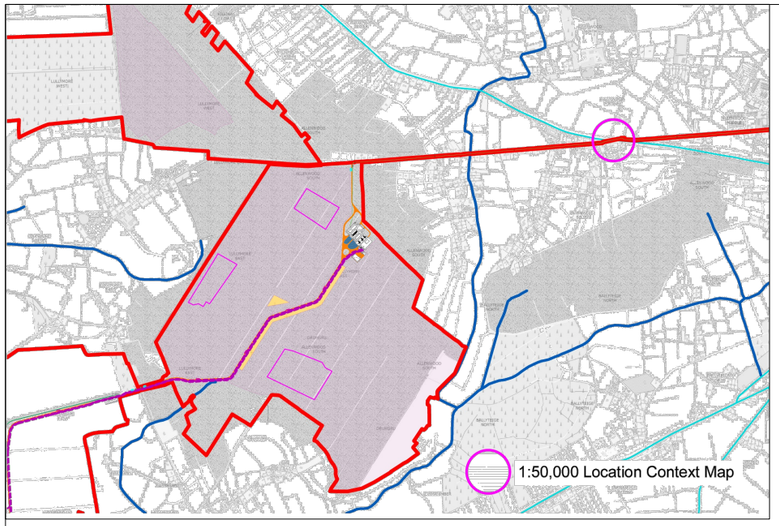
1. MEASUREMENTS SHOWN ARE IN MM, UNLESS INDICATED OTHERWISE
2. ALL PRODUCTS AND MATERIALS TO BE UTILIZED DURING CONSTRUCTION TO COMPLY WITH ERIGRID FUNCTIONAL SPECIFICATION, ESBN STANDARDS, TII SPECIFICATION FOR ROAD WORKS AND ALL RELEVANT CODES OF PRACTICE AND LEGISLATION.
3. 300mm MINIMUM VERTICAL AND HORIZONTAL CLEARANCES TO BE OBSERVED BETWEEN CABLE DUCTS AND THIRD PARTY SERVICES (e.g. GAS PIPES, WATER MAINS, CULVERTS, etc.) IN THE CASE OF HIGH RISK 3rd PARTY SERVICES, GREATER CLEARANCES MAY BE REQUIRED. DESIGNER TO CONSULT ERIGRID AND 3rd PARTY SERVICE OWNERS FOR GUIDANCE.
4. STEEL PLATES MUST COVER DUCTS. NO OVERLAP IS REQUIRED BETWEEN STEEL PLATES. MINIMUM GAP OF 10mm TO BE PROVIDED. MAXIMUM SPACING OF 10mm TO BE MAINTAINED BETWEEN STEEL PLATES TO PREVENT THE TRANSFER OF STRAY CURRENT.
5. THE MINIMUM CLEARANCE BETWEEN ALL HV AND COMMUNICATION DUCTS IS 75mm. (CABLE RATING CALCULATIONS TO BE PROVIDED FOR ACCEPTANCE)
6. THIS DRAWING IS TO BE USED TO AID THE PROJECT SPECIFIC METHOD STATEMENT AND RISK ASSESSMENT.
7. TEMPLATES ARE TO BE USED AT 3m INTERVALS DURING DUCT INSTALLATION IN CBGM. PRE-MADE 75mm WIDE CONCRETE SPACERS TO BE USED DURING DUCT INSTALLATION IN WET CONCRETE.
8. MINIMUM SPACING BETWEEN POWER DUCTS TO BE CONFIRMED WITH RATING CALCULATION.
9. HAND DIG WITHIN 500mm OF EXISTING SERVICE.
10. WHERE EXISTING SERVICE MARKER TAPE IS NOT PRESENT, THE ESBN YELLOW MARKER TAPE SHOULD BE INSTALLED AT MAXIMUM 300mm BELOW FINISHED SURFACE LEVEL

LEGEND

- RED MARKER STRIP
- YELLOW MARKER WARNING TAPE
- EXISTING SERVICE MARKER STRIP
- 6mm GALVANISED STEEL PLATE
- ORANGE MARKER A393 STEEL MESH#
- DUCT
- CULVERT
- RAPID HARDENING WET CONCRETE C25/30
- CBGM B (CL. 822), COMPACTED TO CL. 813.10
- BACKFILL TO BE AS PER ROAD AUTHORITY SPECIFICATION REQUIREMENT. IN FIELDS OR GRASSED AREAS BACKFILL WITH SUITABLE EXCAVATED MATERIAL
- EXISTING GROUND

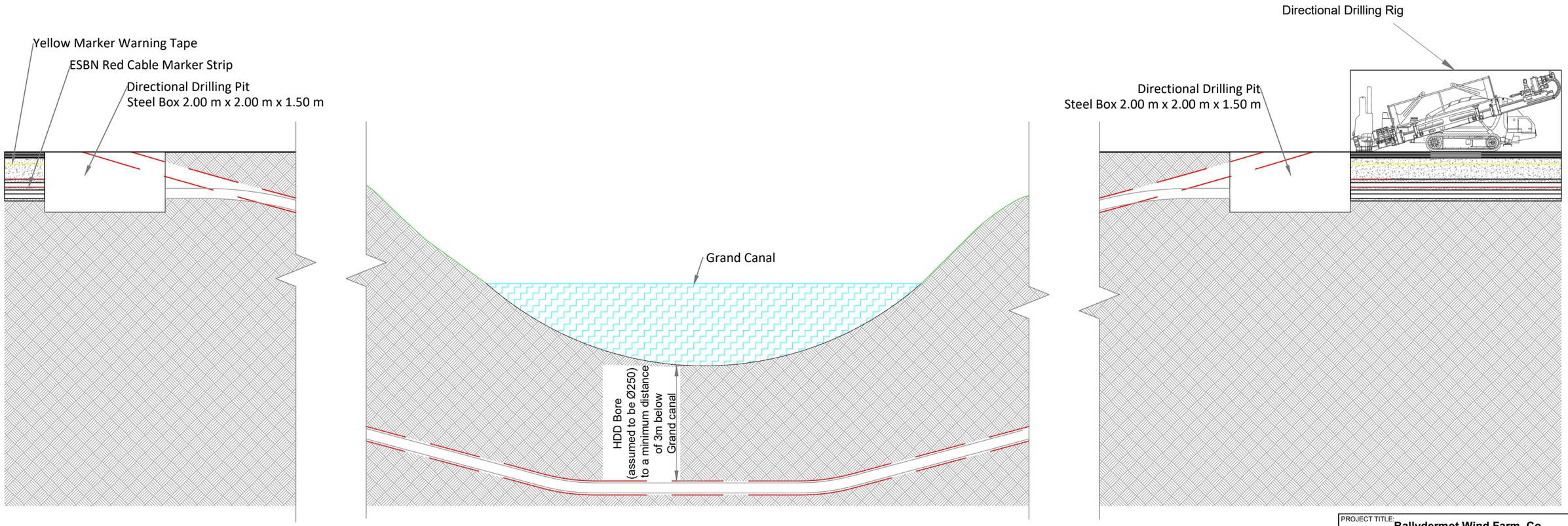
PROJECT TITLE:	**Ballydermot Wind Farm, Co. Offaly and Co. Kildare**
DRAWING TITLE:	**Option A B and C – Typical 220kV Trench Detail**
PROJECT No.: 250708	DRAWING No.: Figure 4-61
SCALE: As Shown	
DRAWN BY: GO	CHECKED BY: RD
DATE: 23.10.2026	REVISION: P03

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



Notes:

1. DRAWING FOR PLANNING PURPOSES ONLY
2. DRAWINGS ARE NOT TO BE SCALED. USE FIGURED DIMENSIONS ONLY



Longitudinal Section

SCALE N.T.S

PROJECT TITLE: **Ballydermot Wind Farm, Co. Offaly and Co. Kildare**

DRAWING TITLE: **Option D HDD Crossing**

PROJECT No.:	DRAWING No.:	SCALE:
250708	Figure 4-62	N.T.S @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
GO	RD	23.10.2026	P03

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

4.10 Community Benefit Proposals

BnM presently manages 7 no. Community Benefit Funds at its wind farms in Derrinlough, Mountlucas, Cloncreen, Sliabh Bawn, Oweninny Phase 2 and Bruckana and Timahoe North Solar Farm. The first of these Funds were established in 2014 thanks to the help and cooperation of the communities surrounding the wind farms. The Community Gain Schemes for Mountlucas and Bruckana Wind Farms were set up on the basis of community involvement.

The Mountlucas, Bruckana and Sliabh Bawn Community Funds consist of a fixed level of funding (based on the installed capacity of the wind farm) that is made available each calendar year for community led projects in the local area. During 2017 and 2018, a 'near neighbour' scheme was established for residents in the vicinity of these wind farms. The near neighbour schemes offer electricity bill payers living within a prescribed distance of a wind turbine an annual contribution towards their electricity usage as described in Section 4.10.1 below.

The Cloncreen and Oweninny Wind Farm Phase 2 Community Funds are calculated in line with Renewable Energy Support Scheme (RESS) requirements and are linked to the generation of the wind farm on an annual basis. While both of these Funds include funding for community groups and near neighbours (similar to Mountlucas, Bruckana and Sliabh Bawn), they also include an Education Scholarship Fund to support local students in accessing further education. The Scholarship includes a monetary grant to successful applicants, for each year of study, up to a maximum of 4 years. The Scholarship may be used towards course fees, accommodation, tools, transport costs etc.

BnM is proposing to replicate its proven Community Benefit Fund model for Ballydermot Wind Farm in accordance with best practice requirements. The Fund will look to support the local communities, near neighbours and local students.

4.10.1 Community Gain and Near-Neighbour Scheme

In addition to employment during the construction and operational phases of the Proposed Project and annual rates that will be paid to the local authority by the developer, a range of other benefits associated with the Proposed Project will be provided to the local community through the Community Benefit Fund. The Community Benefit Fund will be developed during the first year of operation and will include the following:

- The Fund will provide financial assistance to local communities and not-for-profit organisations within 10 km of the Proposed Project will be considered first and given priority - subject to the project meeting the overall terms and conditions of the Fund. A key criterion is that the projects and initiatives will benefit the communities surrounding the wind farm. A Fund Committee will be established and will consist of a number of volunteer community representatives and the project Developer. Generally speaking, the Fund Committee should aim to represent the widest cross-section of the community possible.
- The Fund will also provide an Educational Scholarship Scheme to support a number of local students in accessing further education. It will provide a monetary grant to successful applicants, for each year of study, up to a maximum of 4 years, for a number of students (including apprenticeships) living in the vicinity the proposed development. The Scholarship may be used towards course fees, accommodation, tools, transport costs etc.
- The Fund will also implement a Near Neighbour Scheme which will offer principle primary residents within a prescribed distance of a wind turbine an annual contribution towards their electricity usage. In addition to the electricity contribution payment, this scheme will also offer participants a contribution towards the completion of energy measures on the property and/or education support. This is in

line with existing near neighbour schemes that are active at other Bord na Móna operational wind farms.
- The value of the Community Benefit Fund will be directly proportional to the energy produced at the site (per loss adjusted metered generation), which based on current Funds, will be in the region of €24 million over the first 15 years of operation.

A detailed description of the Community Benefit proposal is outlined below and in the 'Ballydermot Wind Farm Community Report' which is contained in Appendix 2-2.

4.11 Operation

The Proposed Wind Farm is expected to have a lifespan of approximately 35 years. As part of the planning application, permission is being sought for the full operational life 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 on-site 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 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.

Once operational, the Proposed Project will support 6 – 8 long term, high quality technical jobs in operation and maintenance as well as a number of jobs in ancillary functions.

The operational phase will include dedicated amenity tracks that will be open to the public for recreational access. Dedicated car parks will be provided; all detail in relation to proposed amenity is provided in Section 4.4.1.9 above.

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 may be a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes requiring a crane. Typically, maintenance traffic will consist of four-wheel-drive vehicles or vans. The site roads will also require periodic maintenance.

The Proposed Onsite Substation, the Proposed Offsite Substation, and internal access roads will also require periodic maintenance. The Proposed Onsite Substation and the Proposed Offsite Substation would be operational 24 hours per day, 7 days per week throughout the year. Substations can be operated remotely and manually. Supervisory operational and monitoring activities will be carried out remotely using a Supervisory Control and Data Acquisition (SCADA) system, with the aid of computers connected via a telephone modem link. The following maintenance procedures will also be adhered to:

- Periodic service and maintenance works which include some vehicle movement.
- For operational and inspection purposes, substation access is required.
- Servicing of the substation equipment will be carried out in accordance with the manufacturer's specifications, which would be expected to entail the following:
    - 6-month service – 3-week visit.
    - Annual service – 6-week visit.
    - Weekly visits as required.

Occasional technical problems may require maintenance visits by technical staff. During the 6-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 Project 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 Project Site by 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 is minimal, the impacts associated with traffic volumes for this period are assessed in Chapter 15: Material Assets.

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 will be consulted for detailed information on the monitoring requirements during the operational phase. However, a brief summary of the key information is provided below:

- The drainage system will be monitored by the Project Hydrologist/EnvCoW 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 (October to March) carried out by the Project Ornithologist which includes breeding bird surveys, winter roost surveys and corpse searching on the Project Site determine the level of fatalities for the Project Site as a result of collisions with the installed turbines. These surveys will be completed in accordance with guidelines issued by the Scottish Natural Heritage (SNH, 2009).
- Post-construction bat monitoring will be undertaken for at least 3 years by the ECoW post construction of the renewable energy development. The monitoring will also include corpse searching in the areas surrounding the turbines to gather data on any actual collisions.
- Post-construction linear habitat restoration monitoring carried out by the ECoW following the main growing season (i.e., in September) in a given year for the first 5 years of growth.
- Monitoring for shadow flicker at properties where any exceedance of the shadow flicker limit has been predicted as outlined in Chapter 5.
- Post turbine commissioning noise monitoring.

4.12 Decommissioning

The wind turbines proposed as part of the Proposed Wind Farm 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 may be decommissioned fully.

Upon decommissioning of the Proposed Wind Farm, the Proposed Turbines will be disassembled in the reverse order to how they were erected. The Proposed Turbines will be disassembled with a similar model of crane that was used for their erection. The Proposed Turbines will likely be removed from the Proposed Wind Farm using the same transport methodology adopted for delivery to the Proposed Wind Farm initially. The Proposed Turbines materials will be transferred to a suitable recycling or recovery facility.

The underground electrical cabling connecting the Proposed Turbines to the Proposed Onsite Substation will be removed from the cable ducts and any direct buried cables will be cut and left in situ. 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.

All above-ground turbine components would be separated and removed from the Project Site for recycling. Turbine foundations would remain in place underground. 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 environmental emissions such as noise, dust and/or vibration.

The Project Site internal access roads could be in use for purposes other than the operation of the Proposed Project by the time the decommissioning of the Proposed Wind Farm is to be considered, and therefore it may be more appropriate to leave the Project Site internal access roads in situ for future use. It is envisaged that the roads will be widely utilised for amenity purposes by the local community.

Upon decommissioning of the wind farm, the Proposed Grid Connection including all the associated transmission infrastructure i.e. underground cables, overhead line cabling, steel masts, etc, Proposed Onsite Substation and Proposed Offsite Substation will form part of the national grid infrastructure and operate in perpetuity as part of Transmission System and TAO assets and will remain in-situ. The assets transferred to the TAO will not form part of the decommissioning works.

A Decommissioning Plan has been prepared (Appendix 4-7), the detail of which will be agreed with the Local Authority prior to any decommissioning. The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will be agreed with the Planning 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 (SNH) report *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".*