

Environmental Impact Assessment Report (EIAR)

Crumhach Wind Farm, Co.
Sligo

Chapter 4 – Description of the
Proposed Project



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GLOSSARY OF TERMS

Terms	Definition
Borrow Pit	A pit resulting from the excavation of material used in construction of the Proposed Wind Farm
Nacelle	Housing component of the turbine generator.
Anchor cage	The bottom section of the turbine (i.e. the foundation) which is backfilled with concrete
Hardstanding	Levelled assembly areas comprising of bare soil surface to support plant and machinery

GLOSSARY OF ACRONYMS

Acronym	Definition
ACP	An Coimisiún Pleanála
BMEP	Biodiversity Management and Enhancement Plan
CEMP	Construction and Environmental Management Plan
ECOW	Ecological Clerk of Works
HGV	Heavy Goods Vehicle
IPP	Independent Power Provider
PSMP	Peat and Spoil Management Plan
PSRA	Peat Stability Risk Assessment
RESS	Renewable Energy Support Scheme
RWMP	Resource Waste Management Plan
SAC	Special Area of Conservation
SID	Strategic Infrastructure Development
SOWOR	Schedule of works operation system
SPA	Special Protection Area
SWMP	Surface Water Management Plan
TMP	Traffic Management Plan
TSO	Transmission System Operator

4. DESCRIPTION OF THE PROPOSED PROJECT

4.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) describes the Proposed Project and all its component parts. The current application for planning permission is being made to An Coimisiún Pleanála (ACP) in accordance with Section 37E of the Planning and Development Act 2000, (as amended) for the Proposed Project. This chapter also describes elements of the overall project which are not subject to this planning application but are assessed in this EIAR. Construction methodologies for the main infrastructural components of the Proposed Project are also included in this chapter of the EIAR.

For the purpose of this application the Proposed Project will consist of the following:

- › *Removal of 23 no. existing turbines permitted under Sligo County Council Ref. No. 97/469, 02/846, 03/619 (the latter granted on appeal by An Coimisiún Pleanála PL21.204790) and 22/291;*
- › *Erection of 17 no. wind turbines within the following parameters:*
 - *a turbine tip height range of 176.6 metres to 180 metres;*
 - *a rotor diameter range of 133.2 metres to 150 metres; and*
 - *a hub height range of 105 metres to 110 metres.*
- › *Permanent turbine foundations, hard-standing and assembly areas;*
- › *A new permanent 110kV electrical substation compound including control buildings (with a combined floor area of 654sq.m) incorporating welfare facilities, all associated electrical plant and apparatus, security fencing, underground cabling, lightning protection poles, an underground wastewater holding tank, drainage and all ancillary works;*
- › *Upgrade of and permanent continued use of 2 no. existing onsite control buildings comprising: 1 no. control building located in the townland of Tawnadremira (with a floor area of c. 118.4sqm), permitted under Sligo County Council Planning References 03/619 (granted on appeal by An Coimisiún Pleanála PL21.204790), 10/371, and 22/291; and 1 no. control building located in the townland of Kingsmountain (with a floor area of c.71sqm), permitted under Sligo County Council Planning References 97/469 and 03/382.*
- › *Underground electrical and communications cabling connecting the proposed wind turbines to the existing onsite control buildings and the proposed 110kV on-site electrical substation;*
- › *4 no. temporary construction compounds with site offices and welfare facilities (with a combined floor area of 324 sqm);*
- › *Upgrade of 1 no. existing site entrance off the L6309 in the townlands of Ballyglass and Crowagh or Dunneill Mountain;*
- › *1 no. new site entrance off the L6309 in the townlands of Ballyglass and Crowagh or Dunneill Mountain;*
- › *Upgrade of 1 no. existing site entrance off the L2702 in the townland of Crowagh or Dunneill Mountain;*
- › *2 no. new site entrances off the L2702 in the townland of Crowagh or Dunneill Mountain;*
- › *Upgrade of existing site tracks and provision of new site access tracks, clear span crossings, junctions and hard-standing areas;*
- › *Accommodation works along the N59 in the townlands of Corhawnagh and Abbeytown, along the R297 in the townland of Knockaculleen, along the L2702 in the townland of Lecarrow and Dromore, along the L2702 in the townland of*

- Rathgoonaun and along the L2702 and L6309 in the townland of Crowagh or Dunneill Mountain, to facilitate the delivery of turbine components and other abnormal sized loads to site;*
- › *A new temporary access road off the L2702 to the L6309 in the townlands of Crowagh or Dunneill Mountain;*
- › *3 no. temporary borrow pits;*
- › *2 permanent LiDAR compounds;*
- › *Peat and Spoil Management areas;*
- › *Tree felling and hedgerow removal;*
- › *Biodiversity Management and Enhancement measures (inclusive of peatland restoration and management);*
- › *Site Drainage;*
- › *Operational stage site signage; and*
- › *All ancillary apparatus and site development works above and below ground, including soft and hard landscaping and drainage infrastructure.*

The Proposed Project is being brought forward as a ‘new renewable energy development’ with repowering elements within the context of the RED III Directive, as the Proposed Project will amount to new generation on areas beyond those assessed as part of the permissions for the Existing Wind Farm.

The ‘Proposed Project’ which entails the Proposed Wind Farm and Proposed Grid Connection Route has been assessed within this EIAR. The Proposed Project is located within the EIAR Site Boundary or the ‘Site’ and measures approx. 1,546 hectares. The Proposed Project is illustrated on Figure 4-1.

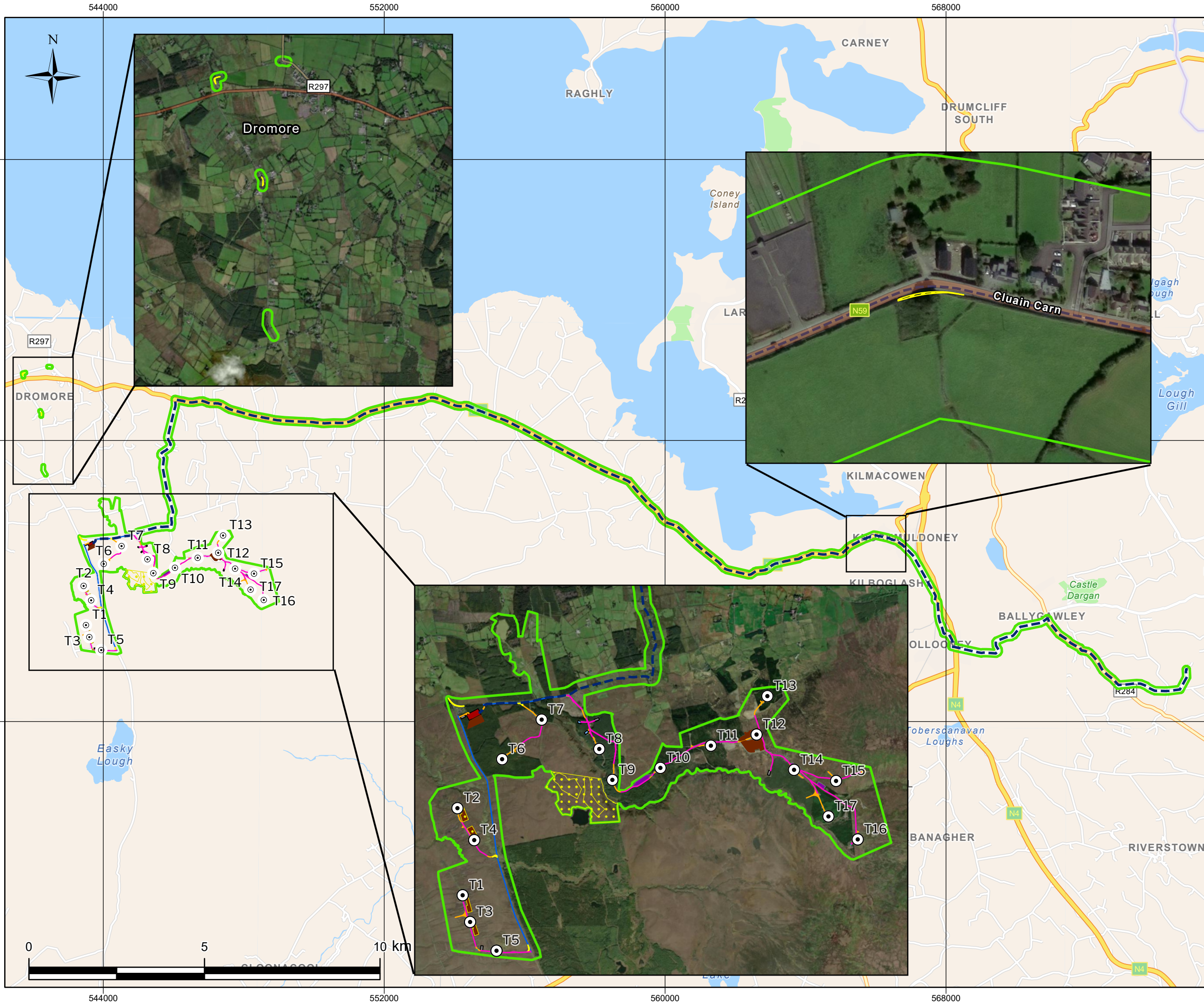
This application seeks a ten-year planning permission and a thirty five-year operational life from the date of full commissioning of the Proposed Wind Farm and subsequent decommissioning. All elements of the Proposed Project in the list above together with the entire turbine delivery route as described in this chapter have been assessed as part of this EIAR.

4.2 Proposed Project Layout

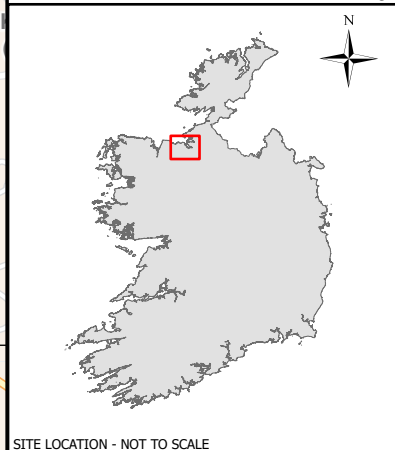
The overall layout of the Proposed Project is shown on Figure 4-1, this includes the Proposed Wind Farm and Proposed Grid Connection Route. The Proposed Wind Farm is then shown in Figure 4-2. The Site location context is outlined in further detail in Section 1.1.4 of Chapter 1 Introduction.

The Proposed Project has been designed to minimise potential environmental effects, while at the same time maximising the energy yield of the wind resource passing over the Site. Constraints studies, as described in Section 3.2.3.2.1 of Chapter 3 of this EIAR, have been carried out to ensure that turbines and all ancillary infrastructure are located in the most appropriate areas of the Proposed Wind Farm. As the Proposed Project involves the repowering of the Existing Wind Farm, a particular effort was made to utilise as much of the existing infrastructure (i.e. access tracks, grid connection infrastructure, areas of hardstanding) as possible.

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



- Map Legend
- EIAR Site Boundary
 - Proposed Turbines
 - Proposed Turbine Hardstands
 - Proposed Blade Storage Set Down Area
 - Proposed Decommissioned Turbine Laydown Area
 - Proposed New Roads
 - Proposed Upgrades to Existing Roads
 - Proposed Upgrades to Public Road
 - Proposed Permanent LiDAR Locations
 - Proposed Peat and Spoil Management Areas
 - Proposed Borrow Pits
 - Proposed Onsite 110kV Substation
 - Proposed Temporary Construction Compound
 - Proposed Temporary Turbine Delivery Overrun Areas
 - Proposed Grid Connection Route Access Track
 - Proposed Enhancement Area
 - Proposed Grid Connection Route



SITE LOCATION - NOT TO SCALE

Drawing Title

Proposed Project Layout

Project Title

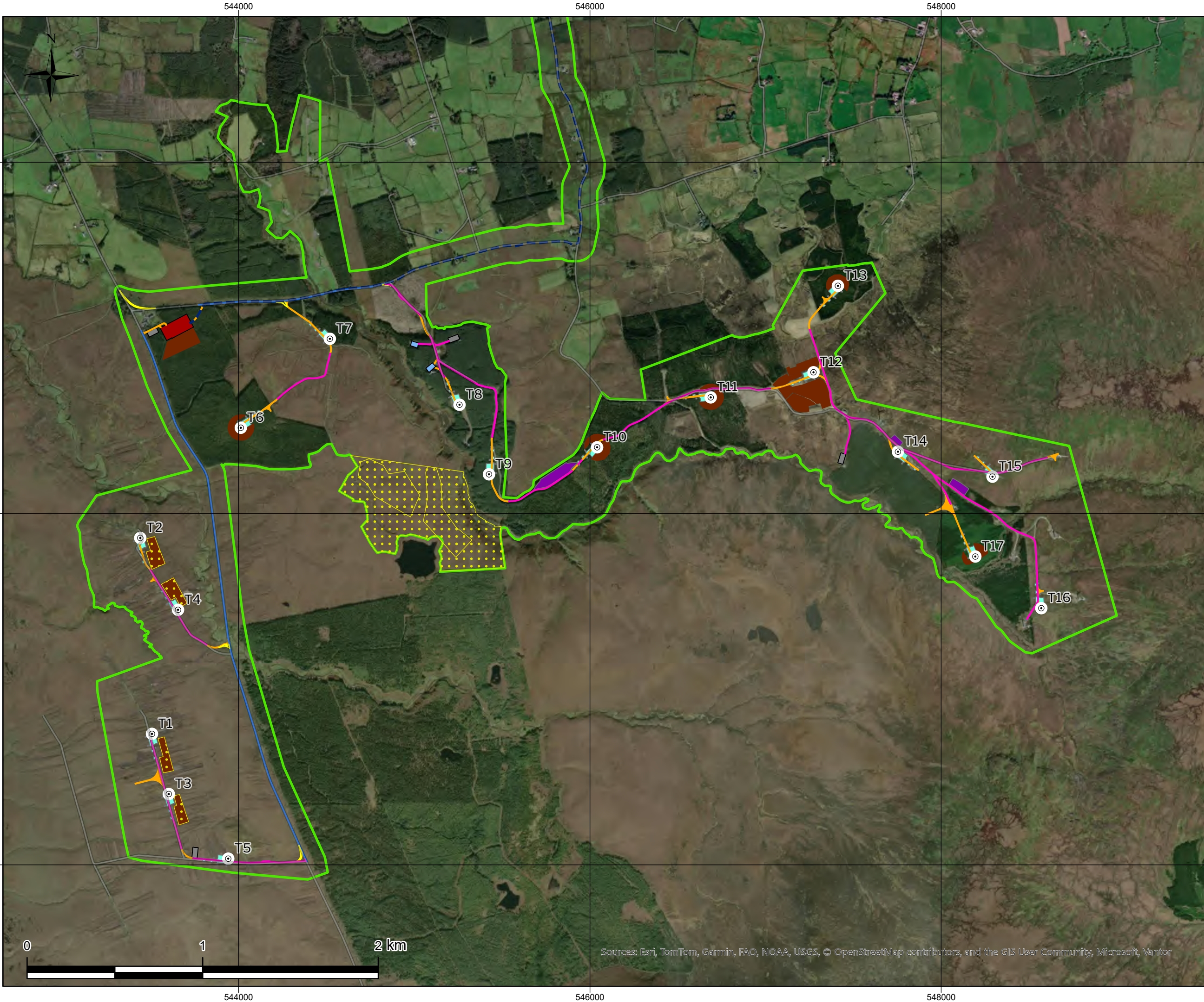
Crumhach Wind Farm, Co. Sligo

Project No.	Drawing No.	Scale
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Drawn By	Checked By	Date
MVN	BT	30/06/2026

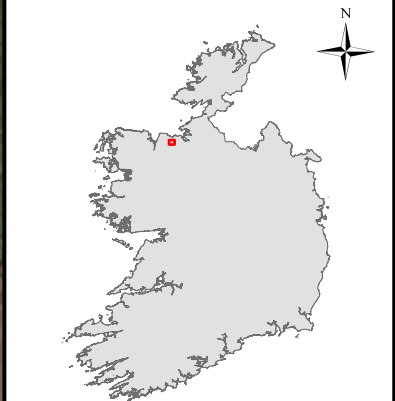
MKO

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

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- Map Legend
- EIAR Site Boundary
 - Proposed Turbines
 - Proposed Turbine Foundations
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 - Proposed Decommissioned Turbine Laydown Area
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 - Proposed Onsite 110kV Substation
 - Proposed Temporary Turbine Delivery Overrun Areas
 - Proposed Grid Connection Route Access Track
 - Proposed Enhancement Area
 - Proposed Grid Connection Route



SITE LOCATION - NOT TO SCALE

Drawing Title

Proposed Wind Farm

Project Title

**Crumhach Wind Farm,
Co. Sligo**

Project No.	Drawing No.	Scale
230841	4-2	1:20,000
Drawn By	Checked By	Date
MVN	BT	30/06/2026



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4.3 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 Drainage (Section 4.6), Construction Management (Section 4.7), and Construction Methodologies (Section 4.8) are provided subsequently in this chapter.

4.3.1 Existing Wind Farm

4.3.1.1 Removal of Existing Turbines and Meteorological Mast

The existing 23 no. turbines onsite will be removed from site in accordance with SSE Renewables standards, whereby all elements of the turbines will be recycled and reused, and no components will be sent to landfill. The removal of turbines from the Existing Wind Farm turbines will be completed in agreement with Sligo County Council (SCC) and in line with the conditions of the current planning permission for Dunneill Wind Farm (Pl Ref: SCC PL03/619 & ABP Pl. Ref. 21.204790, as amended by SCC Reg. Ref PL10/371 and PL10/388).

The methodology for the removal of turbines from the Existing Wind Farm is detailed in Section 4.8.1.1. As part of the construction phase of the Proposed Project, it is proposed to store decommissioned turbine components of the Existing Wind Farm at 2 no. existing hardstands within the Dunneill Wind Farm, as shown in Figure 4-2. The turbine nacelle and tower sections are metallic and can therefore also be recycled. The tower will be broken out into its original tower sections and will be transported offsite to a suitable licenced or waste processing facility.

It is also proposed to dismantle the existing meteorological (met) mast within the Dunneill Wind Farm, the methodology of which is detailed in Section 4.8.1.1.

4.3.1.2 Existing Turbine and Met Mast Foundations

On the dismantling of existing turbines and met mast, it is not intended to remove the concrete foundation from the ground. It is considered that its removal will be the least preferred options in terms of having potential effects on the environment. Therefore, the turbine foundations not incorporated into the Proposed Project will be backfilled and covered with soil material. If there is usable soil or overburden material on the site, this material will be used. Alternatively, where material is not readily available on site, soil will be sourced locally and imported to site on heavy good vehicles (HGVs). The imported soil will be spread and graded over the foundation using a tracked excavator and revegetation enhanced by spreading of an appropriate seed mix to assist in revegetation and accelerate the resumption of the natural drainage management that will have existed prior to any construction. Hardstands shall be covered with imported soil material and regraded to match existing ground contours and profile. The area shall then be reseeded from the surrounding grassland habitats or with a suitable, local seed mix.

4.3.1.3 Existing Control Buildings

It is proposed to continue the use of the 2 no. Existing Wind Farm onsite control buildings for the Proposed Project. The operation of the existing control buildings is proposed to be continued up to the decommissioning of the Proposed Wind Farm. One control building is located approx. 315m north of the proposed T08 and one is located approx. 275m southeast of the proposed T12, which can be seen in Figure 4-2. Both control buildings will be accessed via Existing Wind Farm access tracks. A drawing of the existing control buildings is included in Appendix 4-1.

4.3.1.4 Existing Onsite 20kV Electrical Cabling

As part of the removal of the 23 no. turbines during the construction phase of the Proposed Wind Farm, the existing 20kV onsite electrical cabling will also be removed. The removal methodology is outlined in Section 4.8.1.2.

4.3.1.5 Existing Grid Connection

The Existing Wind Farm is connected to the national grid via the Existing Grid Connection, which comprises an approx. 19km underground cabling connection to the Cunghill 110kV substation in the townland of Cunghill, Co. Sligo. It is proposed to utilise the maximum export capacity from the Existing Grid Connection for the Proposed Project via connection of the onsite control buildings. No upgrade works are required or proposed along the Existing Grid Connection underground cable connection.

4.3.1.6 Reinstatement of Site Infrastructure

The remaining onsite infrastructure includes a number of areas of existing hardstanding associated with the turbine foundations, met mast hardstand, onsite borrow pits and access tracks.

4.3.1.6.1 Existing Access Track Network

The Proposed Project will make use of the majority of the existing track network within the Site as shown on Figure 4-2 above. 8.9km of the Existing Wind Farm access tracks and 4.8km of existing public road will be upgraded to facilitate the Proposed Project. Please refer to Section 4.3.2.2 below for further detail on this.

There are sections of the existing track network which will not be upgraded to facilitate the Proposed Project. These will remain in use by local landowners to access livestock or will be left to naturally regenerate. This will occur by letting natural ecological regeneration and succession take place. Existing access tracks not being utilised for the Proposed Project can be seen in Appendix 4-1.

4.3.1.6.2 Existing Turbine Hardstands

8 no. of the existing turbine hardstands are being re-used for the construction of Proposed Wind Farm. 2 no. existing hardstands will be used as temporary construction compounds (see Section 4.3.2.7) and 1 no. will be used as a proposed onsite LiDAR compound (see Section 4.3.2.8). 2 no. additional existing hardstands are to be used as decommissioned turbine laydown areas as outlined in Section 4.3.1.1. above.

In addition, 3 no. of the existing hardstanding areas will be used as part of the new proposed hardstanding for Proposed Turbines T08, T14 and T15. These areas will be upgraded as detailed in Section 4.3.2 below.

The remaining 15 no. hardstands which will not be re-used to host elements of the Proposed Wind Farm, will be covered with imported soil material and regraded to match existing ground contours and profile. The area shall then be reseeded from the surrounding grassland habitats or with a suitable, local seed mix.

4.3.1.6.3 Existing Met Mast Hardstand

The existing met mast hardstand will be decommissioned and left to regenerate in a similar manner to that outlined in Section 4.3.1.5.1 above.

4.3.1.6.4 Existing Borrow Pit

No works are proposed within the existing borrow pit. Detail on the proposed borrow pits are discussed in Section 4.3.2.4 below.

4.3.2 Proposed Wind Farm

4.3.2.1 Proposed Wind Turbines

4.3.2.1.1 Turbine Locations

The layout of the Proposed Turbines has been optimised using wind farm design software (WindPro) to maximise the energy yield from the Proposed Wind Farm, while maintaining sufficient distances between the Proposed Turbines to ensure turbulence and wake effects do not compromise turbine performance. The ITM Grid Reference coordinates of the Proposed Turbines are listed in Table 4-1 below. The final Top of Foundation Level of the turbine foundations will be determined by the actual ground conditions at each of the Proposed Turbines and may differ slightly from those levels listed below. Additionally, micro-siting of the turbine positions may be required within the criteria set out in the 2006 Guidelines (DoEHLG) and draft 2019 Guidelines.

Table 4-1 Proposed Wind Turbine Locations and Elevations

Turbine	ITM Coordinates		Top of Foundation Elevation (mOD)
	Easting	Northing	
T1	543507	826746	164
T2	543440	827861	180.5
T3	543602	826404	175
T4	543655	827452	185
T5	543941	826036	181
T6	544012	828489	185
T7	544519	828995	156
T8	545257	828620	187
T9	545425	828224	211
T10	546041	828377	240
T11	546688	828662	240
T12	544272	828806	252
T13	547412	829297	230
T14	547754	828353	272

Turbine	ITM Coordinates		Top of Foundation Elevation (mOD)
	Easting	Northing	
T15	548292	828210	339
T16	548570	827462	302
T17	548194	827756	272

4.3.2.1.2 Site Investigations

As part of the design process for the Proposed Project, numerous intrusive site investigations were undertaken across the Proposed Wind Farm, to provide detail and clarity on the nature and extent of sublayers and bedrock as a means of characterising the Proposed Wind Farm. This assisted in providing additional information on the most suitable location for turbines and associated infrastructure. Intrusive Peat Probing was carried out in 2023, 2024, 2025 and 2026 at 850 no. locations across the Site by MKO and Fehily Timoney and Company (FTC).

Geotechnical ground investigations (i.e. trial pitting) were undertaken in July 2025, under the supervision of FTC. The objectives of the intrusive site investigations included mapping the subsoil lithology for all proposed turbines and other identified locations and assessing the underlying bedrock. This data was used to inform the final layout of the Site.

In summary, a total of 20 no. trial pits, supervised by FTC, were carried out at 13 no. Proposed Turbines and at other identified locations including in proximity to proposed borrow pits to investigate the underlying mineral soil lithology and subsoil/bedrock interface. The complete geotechnical ground investigations were carried out in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Ground Investigations with precedence given to IS EN 1997-2 where applicable.

The geotechnical ground investigations were further supplemented by trial pit logs completed during the development of the Existing Wind Farm.

Further details on site investigations completed are outlined in Appendix 4-2 Peat and Spoil Management Plan (PSMP) and Appendix 8-1 Peat Stability Risk Assessment (PSRA).

4.3.2.1.3 Turbine Type

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

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



Plate 4-1 Wind turbine components

The Proposed Turbines to be installed on the Proposed Wind Farm site will have the following dimension range:

- 》 Turbine Tip Height Maximum height 180 metres, Minimum height 176.6
- 》 Hub Height – Maximum height 110 metres, Minimum height 105 metres
- 》 Rotor Diameter – Maximum diameter 150 metres, Minimum diameter 133.2 metres

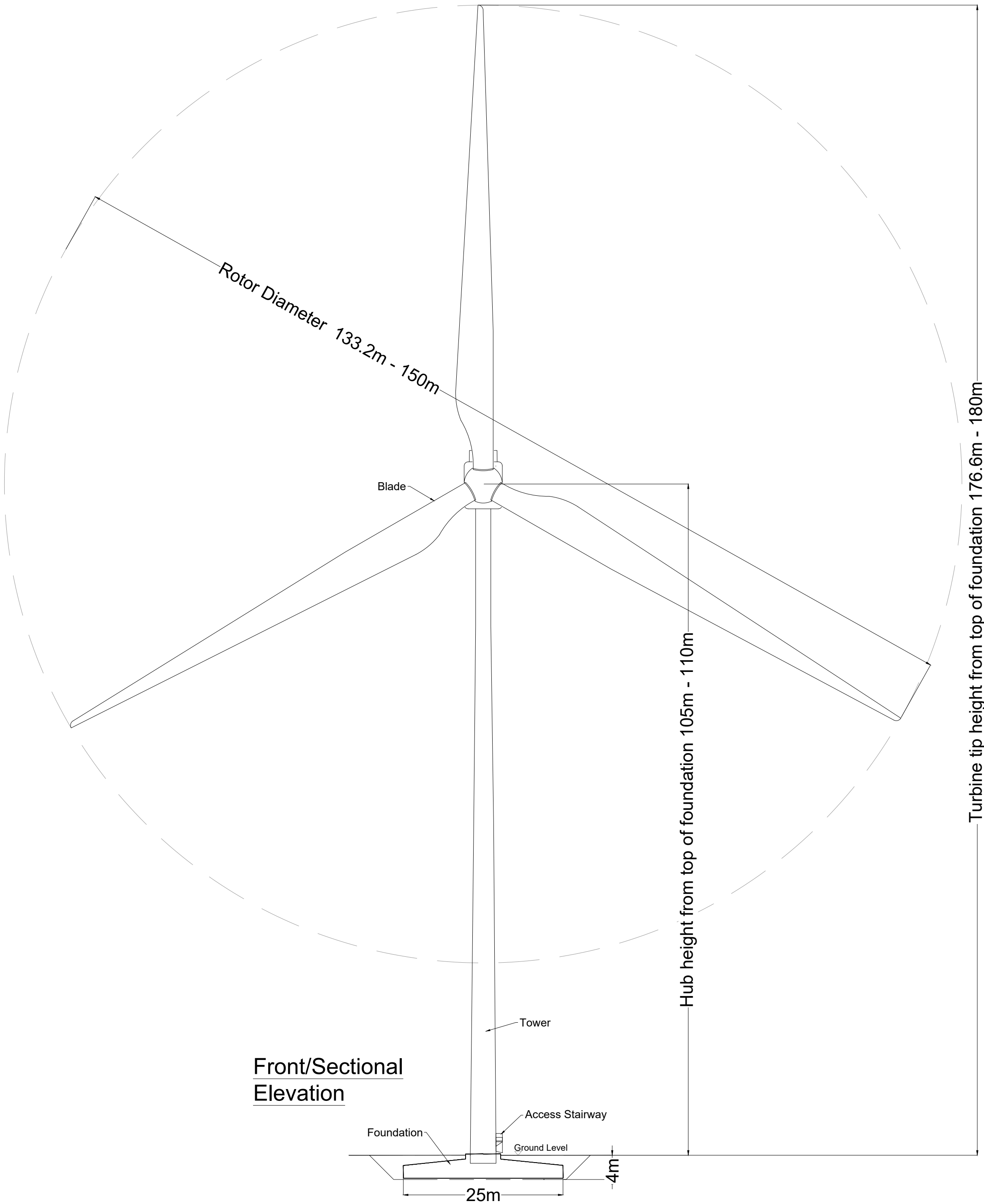
Modern wind turbines from the main turbine manufacturers have evolved to share a common appearance and other major characteristics, with only minor cosmetic differences differentiating one from another. The wind turbines that will be installed as part of the Proposed Project will be conventional three-blade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

The Proposed Turbines will be multi-ply coated to protect against corrosion. It is proposed that the turbines would be of a light grey colour to blend into the sky background to minimise visual impact as recommended in the 2006 Guidelines and 'The Influence of Colour on the Aesthetics of Wind Turbine Generators' (ETSU, 1999).

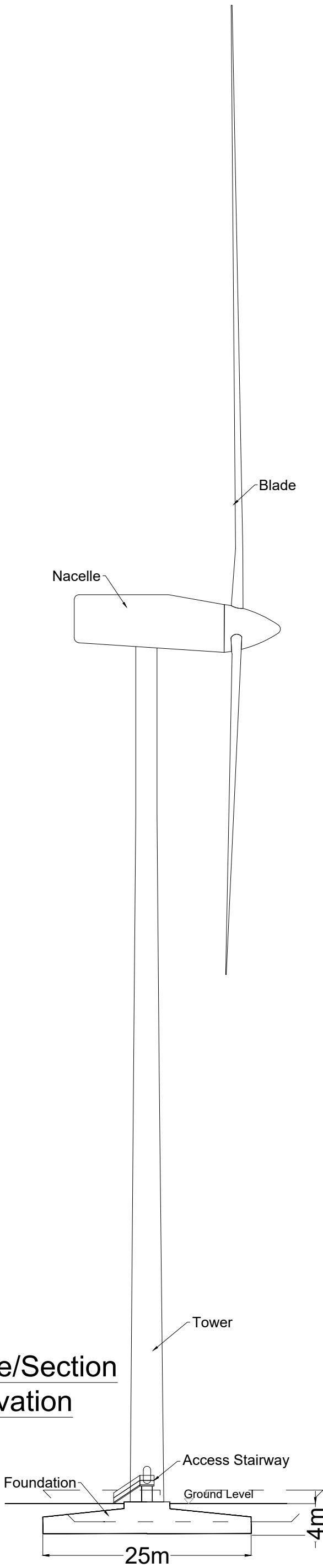
As detailed in Section 1.7.3 of Chapter 1, for the purposes of this EIAR and in compliance with the Opinion issued by ACP and further detailed in Chapter 2, various types and sizes of wind turbines, within the proposed ranges outlined above, have been selected for the purpose of assessing the likely environmental effects of the turbines throughout this EIAR. This allows for a robust assessment of the likely environmental effects of the wind turbines within the proposed dimensional range. Turbine design parameters have a bearing on the assessment of shadow flicker, noise, visual impact, traffics and transport and ecology (specifically birds and bats), as addressed elsewhere in this EIAR.

It should also be noted that the assessment of the development footprint of the Proposed Project within this EIAR is based on the maximum potential footprint for all of the infrastructural elements. This precautionary approach is taken as the assessment of the maximum development footprint will, in the absence of mitigation measures, give rise to the greatest potential for significant effects. Should the development footprint be less than the maximum, this in itself will further mitigate the assessed effects.

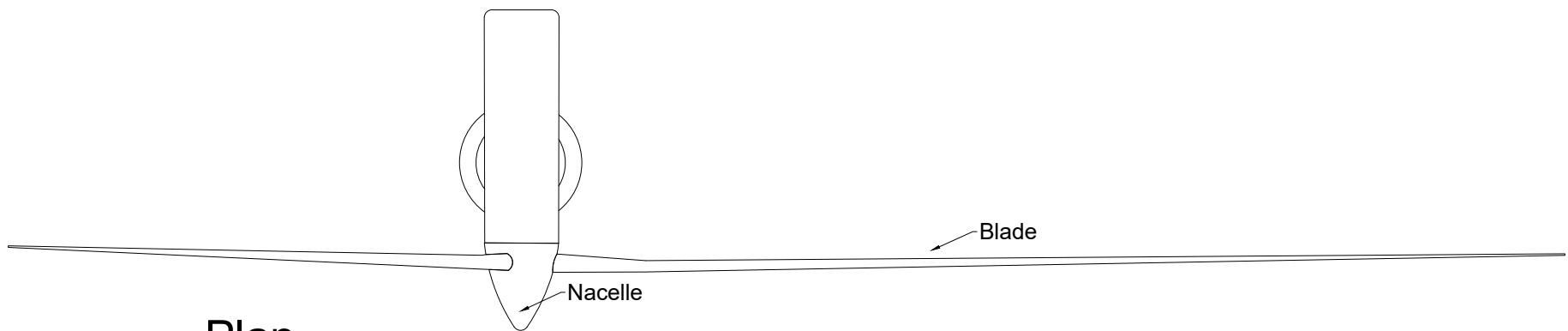
A drawing of the Proposed Turbines is shown in Figure 4-3. The individual components of a geared wind turbine nacelle and hub are shown in Figure 4-4 below.



Front/Sectional
Elevation



Side/Section
Elevation



Plan

PROJECT TITLE: SSE Crumhach Wind Farm			
DRAWING TITLE: Wind Turbine Plan & Elevations			
PROJECT No.: 230841	DRAWING No.: Figure 4-3	SCALE: 1:500	@ A2
DRAWN BY: GO	CHECKED BY: BT	DATE: 28.07.2026	REVISION: P01
			
Email: info@www.mkoireland.ie Website: www.mkoireland.ie			

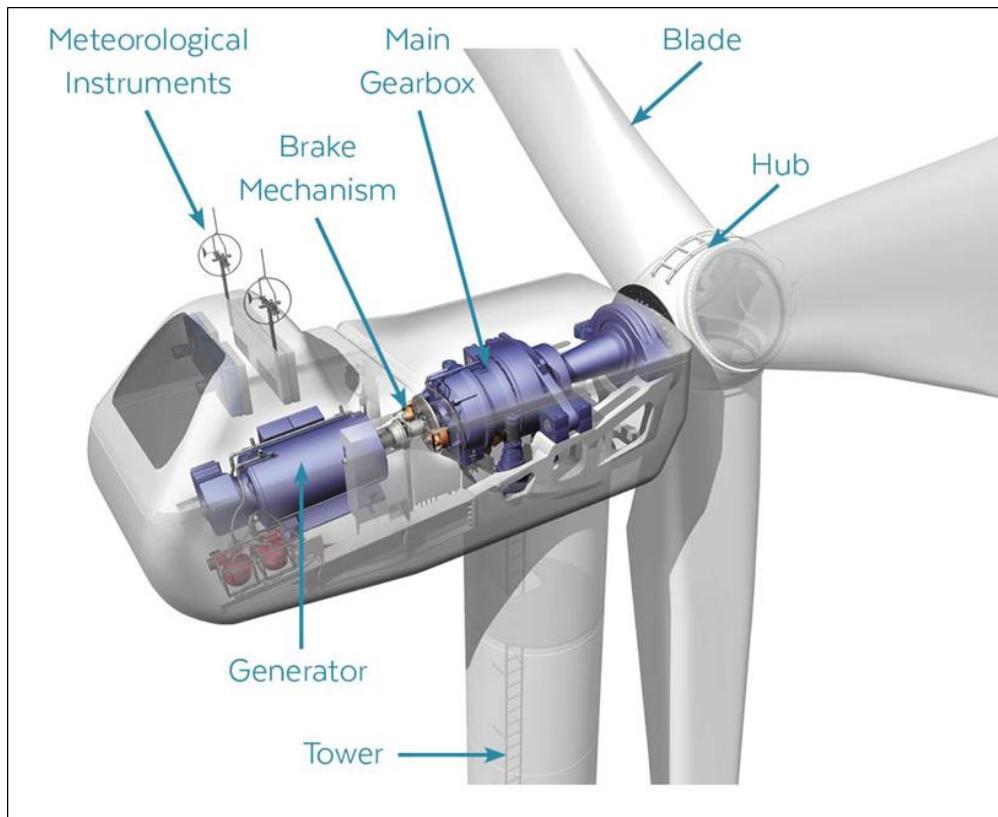
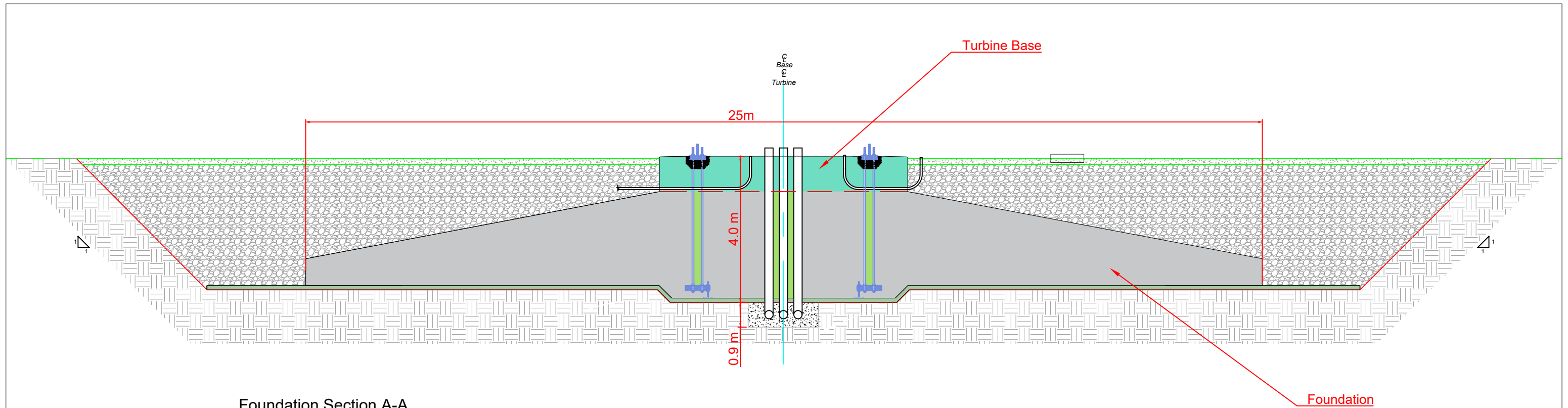


Figure 4-4 Turbine nacelle and-5 hub components

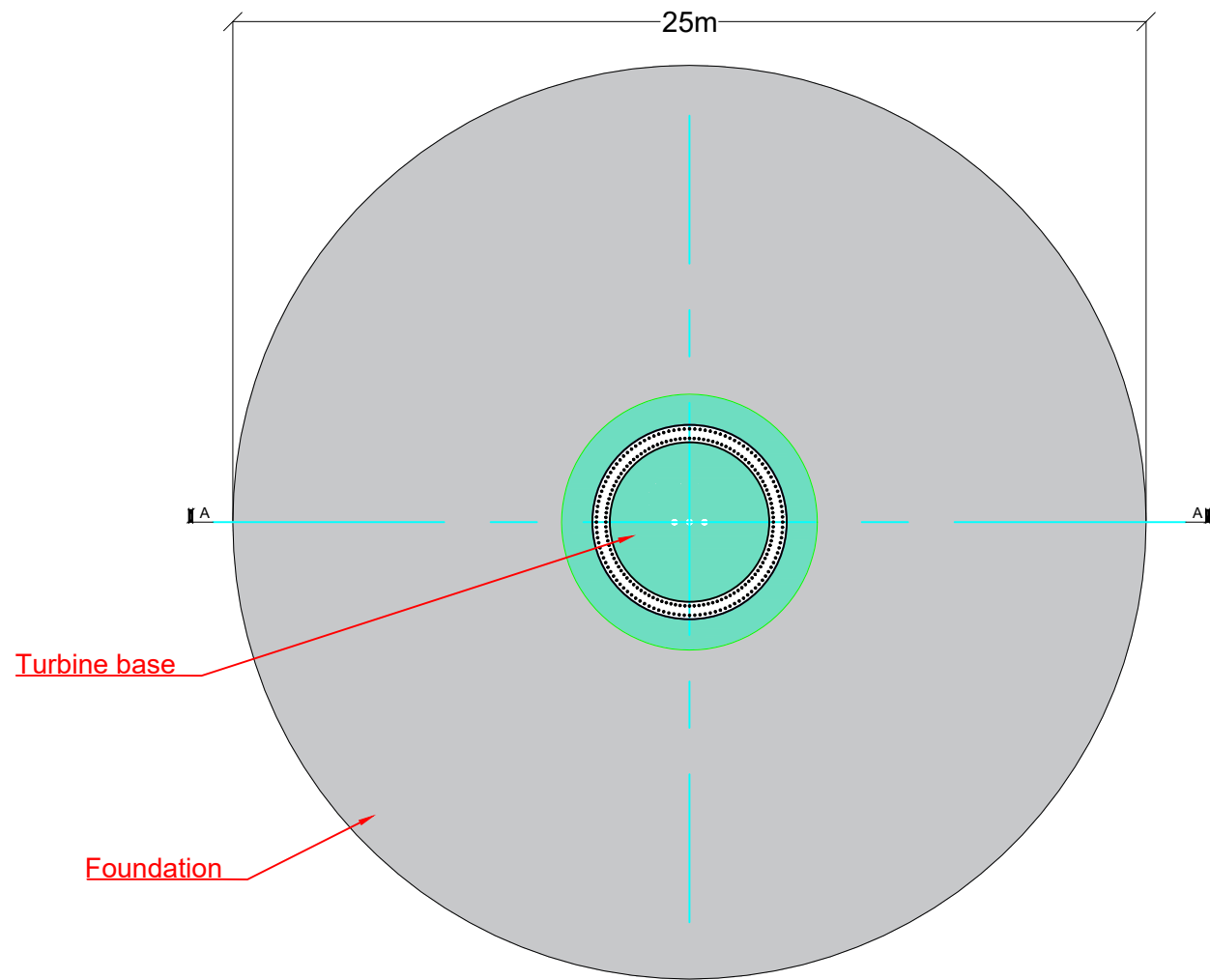
4.3.2.1.4 Turbine Foundations

Each wind turbine is secured to a reinforced concrete foundation that is installed below the finished ground level. The size of the foundation will be dictated by the final turbine selection will be the subject of a competitive tender process. Different turbine manufacturers use different shaped turbine foundations, depending on the requirements of the final turbine supplier, however, a foundation area large enough to accommodate modern turbine models has been assessed in this EIAR adopting a precautionary approach. The turbine foundation transmits any load on the wind turbine into the ground. The horizontal and vertical extent of the turbine foundation will be 25m and 4m respectively. Where ground conditions are unfavourable to excavate and replace, piles will be installed to formation level. Both foundation options have been assessed in this EIAR and are shown in Figure 4-5 and Figure 4-6.

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



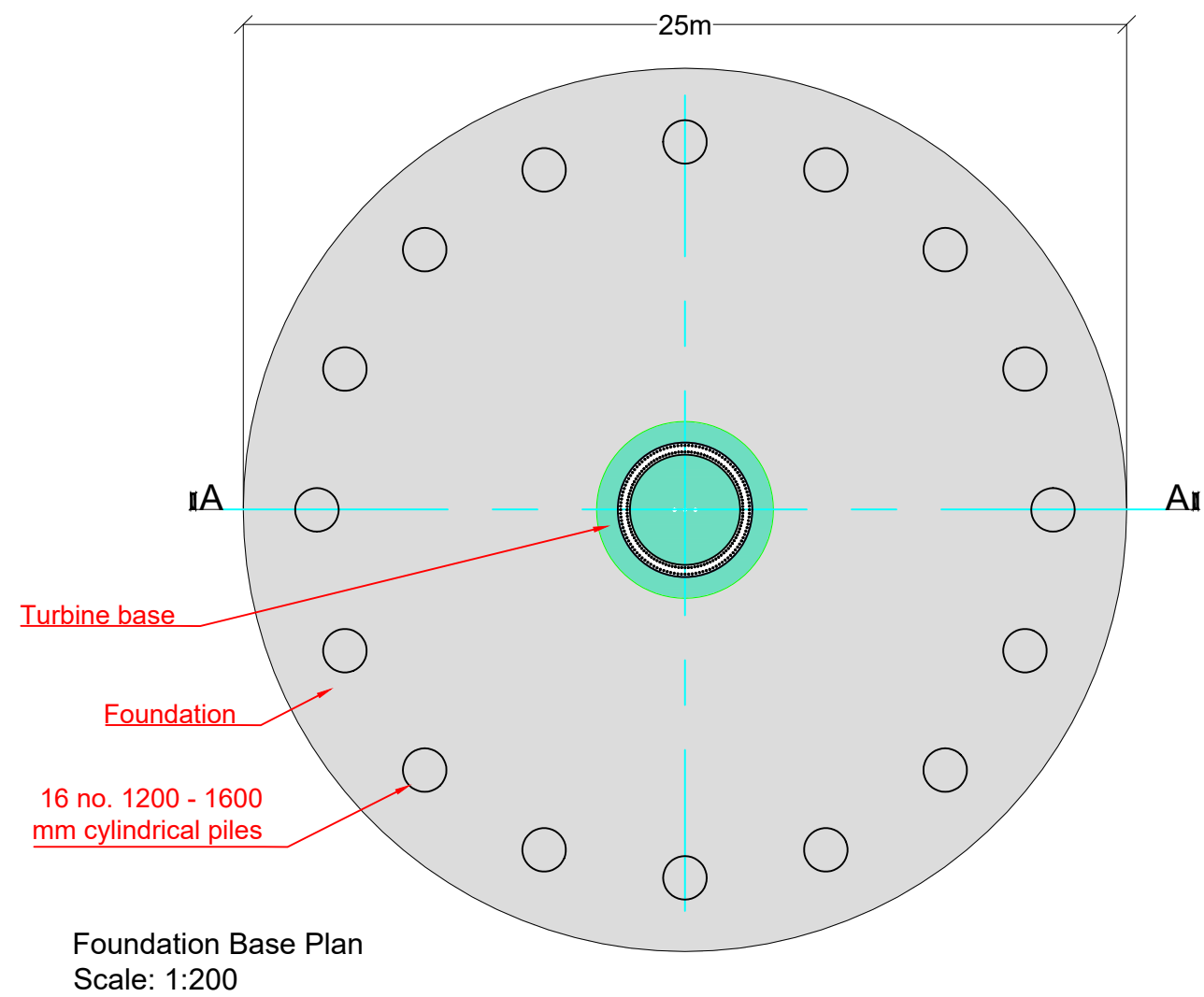
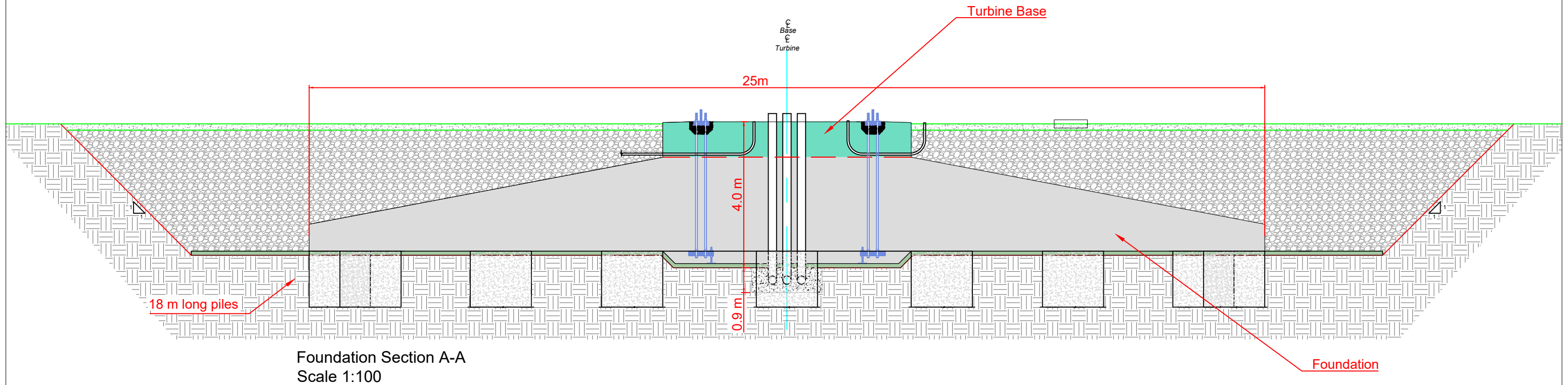
Foundation Section A-A
Scale 1:100



Foundation Base Plan
Scale: 1:200

PROJECT TITLE:			
SSE Crumhach Wind Farm			
DRAWING TITLE:			
Gravity Foundation Details			
PROJECT No.:		DRAWING No.:	
230841		Figure 4-5	
SCALE:		As shown @ A3	
DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
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PROJECT TITLE:			
SSE Crumhach Wind Farm			
DRAWING TITLE:			
Bored Pile Foundation Details			
PROJECT No.:		DRAWING No.:	
230841		Figure 4-6	
		SCALE:	
		As shown @ A3	
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Plate 4-2 Turbine Base Anchor Cage surrounded by reinforcing steel.



Plate 4-3 Finished Turbine Base

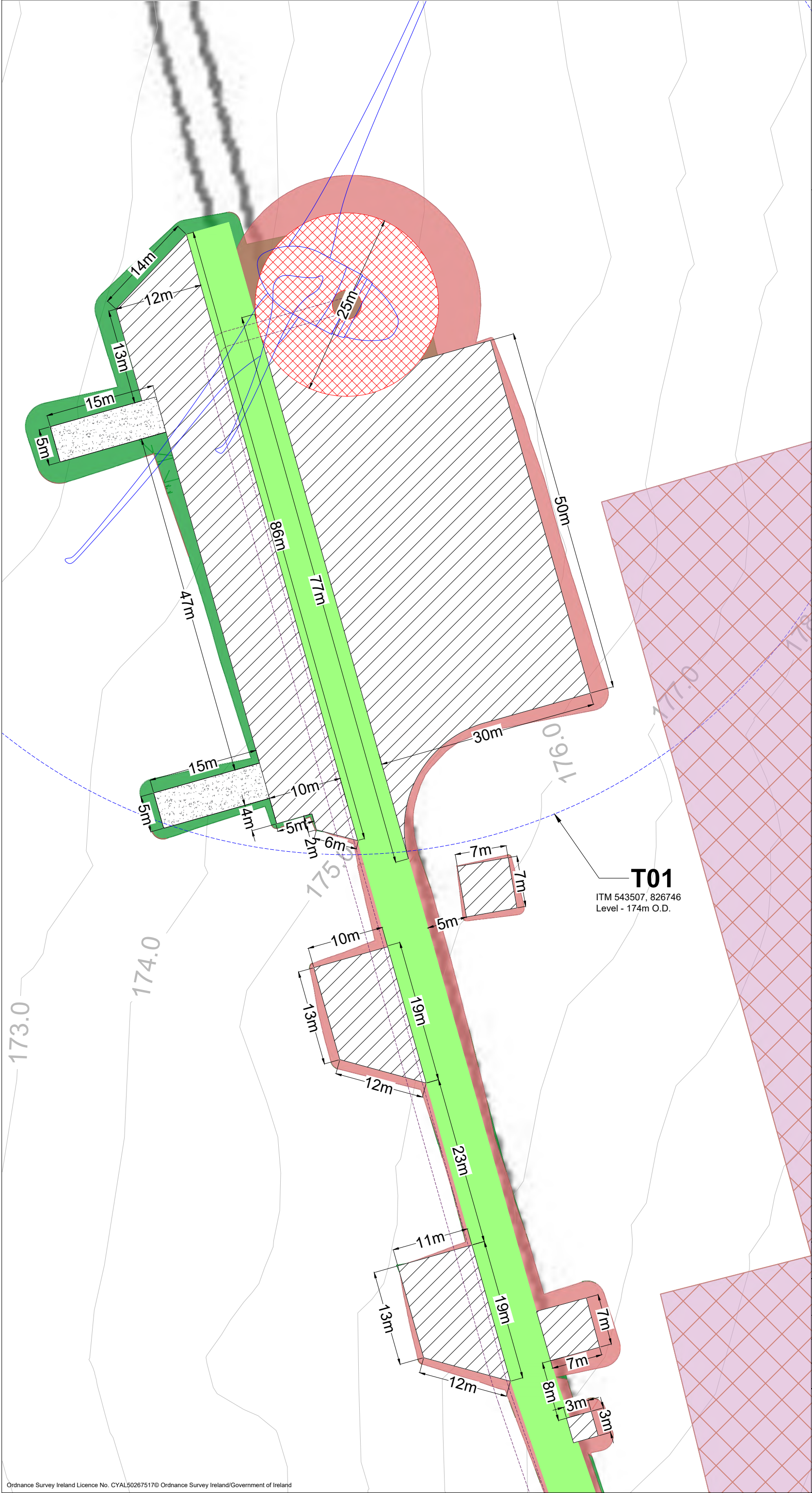
4.3.2.1.5 **Hard Standing Areas**

Hard standing areas consisting of levelled and compacted hardcore are required around each turbine base. These will facilitate access, turbine assembly and turbine erection. The hard-standing areas are used to accommodate cranes used in the assembly and erection of the turbine. The hardstands also allow for the offloading and storage of turbine components, and generally provide a safe, level working area around each turbine position. The hard-standing areas are extended to cover the turbine foundations, once completed, by placing crushed stone over the foundation. The arrangement and positioning of hard standing areas are dictated by turbine suppliers. Figure 4-7 shows a turbine base layout (Turbine No. 1), including turbine foundation, hard standing area, assembly area, access road and surrounding works area. Where Existing Wind Farm infrastructure is to be used for hardstanding areas, these areas will be extended as necessary to accommodate the Proposed Wind Farm infrastructure using methodologies outlined in Section 4.8.2.4 below and Appendix 4-5 (CEMP) of the EIAR.

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 development footprint as outlined in Section 4.3.2.1.3.

4.3.2.1.6 **Assembly Area**

Levelled assembly areas will be located on either side of the hard-standing area as shown on Figure 4-7. These assembly areas are required for offloading turbine blades or turbine blade segments, tower sections and hub from trucks until they are ready to be lifted into position by cranes and to assist the main crane during turbine assembly. The layout represents the full extent of the assembly areas but may be subject to optimisation according to the turbine supplier's requirements.



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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 Access Track to be Upgraded
 - Internal Cable Trench
 - Soft Levelled Area
 - Hardstand
 - Turbine Foundation
 - Turbine Sweep Area
 - Proposed Peat and Spoil Management Areas
 - Fill
 - Cut
 - Proposed Biodiversity Management and Enhancement Area



PROJECT TITLE:
Crumhach Wind Farm, Co. Sligo

DRAWING TITLE:
Turbine 01 Layout

PROJECT No.: 230841		DRAWING No.: Figure 4-7		SCALE: 1:500 @ A3	
DRAWN BY: GO	CHECKED BY: N/A	DATE: 29.07.2026		REVISION:. P01	

OS SHEET No.:
949, 950, 951, 952, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1321, 1322, 1323, 1324, 1325, 1326, 1327



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4.3.2.1.7 Generating Capacity

Modern wind turbine generators currently have a typical generating capacity in the 4 to 7 MW range, with the generating capacity continuing to evolve upwards as technology improvements are achieved by the turbine manufacturers. The exact power rating of the installed turbine will be designed to match the wind regime on the Proposed Wind Farm and will be determined by the selected manufacturer.

Please note, the MW output of the Proposed Wind Farm is considered to be a consequence of turbine design and not a physical attribute on which it is possible to measure or assess the impact of. For the purposes of this EIAR, a rated output of 6MW has been chosen to calculate the potential generating capacity of the proposed 17-turbine renewable energy development, which would result in an estimated installed capacity of 102MW.

Assuming an installed capacity of 102MW, the Proposed Project therefore has the potential to produce up to 312,732 MWh (megawatt hours) of electricity per year, based on the following calculation:

$$A \times B \times C = \text{Megawatt Hours of electricity produced per year}$$

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

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

C = Rated output of the wind turbines: 102 MW

The 312,732 MWh of electricity produced by the Proposed Project would be sufficient to supply approximately 74,460 Irish households with electricity per year, based on the average Irish household using 4.2 MWh of electricity² (this latest figure is available from the March 2017 CER Review of Typical Consumption Figures Decision Paper).

The 2022 Census of Ireland recorded a total of 26,855 occupied households in Co. Sligo. Per annum, based on a capacity factor of 35%, the Proposed Project would therefore produce sufficient electricity for the equivalent of over 100% of all households in Co. Sligo.

With regards to the modern turbine range, i.e., those available on the market at the time of writing, of 4 – 7MW, the resulting electricity produced would range from 208,488MWh to 364,854MWh per annum. The lower end of this range (208,488 MWh) would be sufficient to supply approximately 49,640 Irish households with electricity per year, based on the average Irish household using 4.2MWh of electricity. The higher end of this range (364,854MWh) would be sufficient to supply approximately 86,870 Irish households with electricity per year, based on the average Irish household using 4.2MWh of electricity. Based on the 2022 Census of Ireland results for Co. Sligo, the output range would produce sufficient electricity for the equivalent of over 100% of all households. .

4.3.2.2 Site Access Tracks

During the initial construction of the Existing Wind Farm, existing farm and commercial forestry tracks were upgraded and new access tracks were constructed to provide access within the wind farm site and to connect the wind turbines and associated infrastructure. Site access tracks were constructed of consolidated gravel with a running width of 5m. A photograph of a typical existing site access track is included as Plate 4-4.

¹ Enduring Connection Policy 2.3 Solar and Wind Constraints Report: Assumptions and Methodology
<<https://cms.eirgrid.ie/sites/default/files/publications/ECP-2.3-Solar-and-Wind-Constraints-Report-Assumptions-and-Methodology-v1.1.pdf>> The Proposed Development is located within the B wind region for Ireland with an associated capacity factor of 35%.
² March 2017 CER (CRU) Review of Typical Consumption Figures Decision Paper https://www.cru.ie/document_group/review-of-typical-consumption-figures-decision-paper/



Plate 4-4 Typical Existing Wind Farm access track

As stated above, the layout of the Proposed Turbines was designed so as to make use of the Existing Wind Farm access track network. As shown in Figure 4-2 above, the existing access track network will be upgraded to facilitate the Proposed Wind Farm, with only minor upgrades (i.e. resurfacing and widening in places) due to take place.

4.3.2.2.1 Access Track Construction Types

To provide access within the Proposed Wind Farm and to connect the Proposed Turbines and associated infrastructure, existing access tracks will be upgraded and new access tracks will be constructed. FTC were appointed to assess the existing ground conditions and specify the type of access track required to access all locations onsite. The access track construction design has taken into account the following key factors:

1. *Buildability considerations;*
2. *Making use of existing infrastructure where possible;*
3. *Minimising excavation arisings;*
4. *Serviceability requirements for construction and wind turbine delivery and maintenance vehicles;*
5. *Peat depths;*
6. *Horizontal longitudinal and cross fall gradient of the access tracks, and,*
7. *the requirement to minimise disruption to peat hydrology.*

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

A combination of both new and existing access tracks will make up the access track network within the Proposed Wind Farm site. The Proposed Wind Farm has been designed to utilise as much existing track as possible. Where existing access tracks and public road is to be used, only minor upgrade works are required. It is proposed to upgrade 8.2km of existing access tracks, 4.3km of existing public road corridor and to construct 5.1km of new access tracks on the Proposed Wind Farm. As can be seen on Figure 4-2, there are areas of the existing access track network for upgrade which will be wide enough to allow for construction vehicles to safely pass each other on the access tracks. Some of these areas were constructed as passing bays and formed through the widening of tracks to facilitate turbine delivery for the Existing Wind Farm.

The road construction techniques to be considered are as follows:

- > Upgrade of Existing Access Tracks – Type A and B
- > Construction of New Excavated Access Tracks through Peat – Type C
- > Construction of New Floated Tracks over Peat – Type D

Upgrade of Existing Access Tracks – Type A and B

As noted above, 8.2km of existing access tracks within the Proposed Wind Farm and 4.3km of public road corridor along the L2702 and L6309 local roads will be upgraded as part of the Proposed Project construction phase. The existing access tracks were constructed using both floating and excavate and replace construction techniques. Upgrade works will involve both widening and resurfacing of the existing access tracks. The general construction methodology for upgrading of existing sections of access tracks, as presented in FTC's PSMP in Appendix 4-2 of this EIAR, is summarised below in Section 4.8.2.5.1.

A cross section of Upgrade of Existing Access Tracks (Type A and B) is shown in Figures 4-8 and 4-9 below.

A 970m section of the L2702 local road proposed to be upgraded is located adjacent to the boundary of the Ox Mountain Bog Special Area of Conservation (SAC). All proposed public road upgrade works along this boundary will be maintained to the opposite road verge to avoid overlap with the SAC.

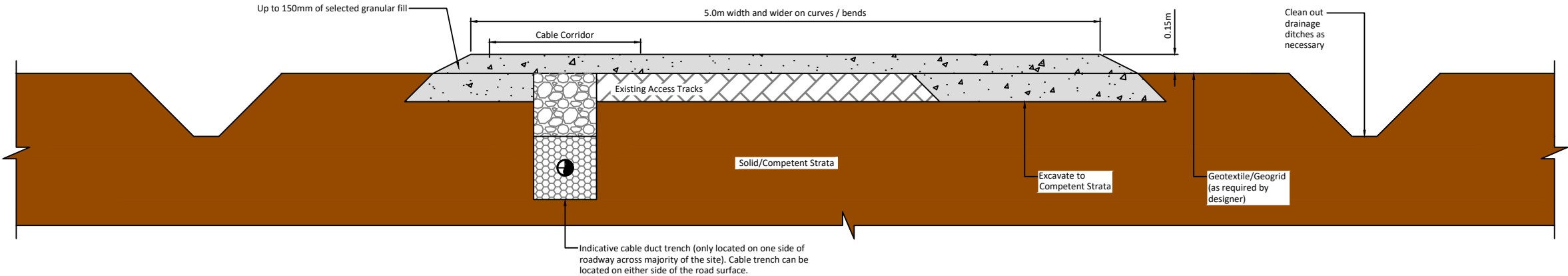
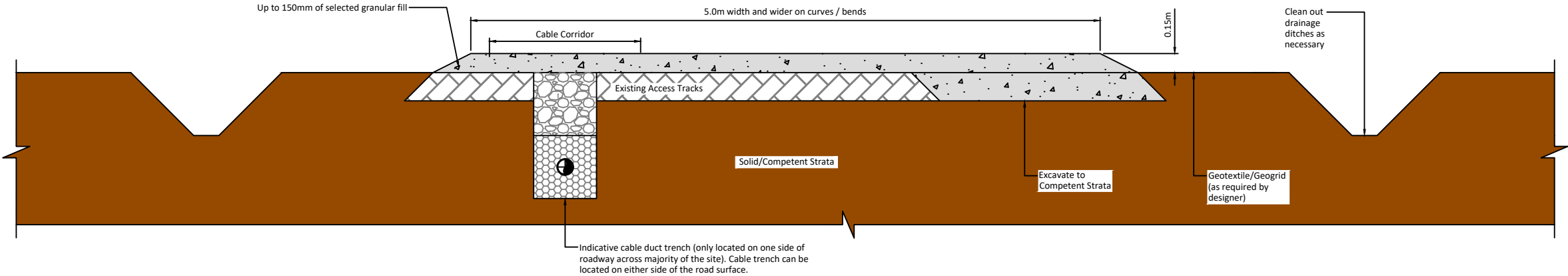
Construction of New Excavated Access Tracks through Peat – Type C

As noted above, 5.1km of new access tracks will be constructed to facilitate the Proposed Wind Farm. Due to the ground conditions, specific sections of new access tracks proposed on site are proposed to be founded and located on competent stratum. The general construction methodology for construction of new excavated access tracks is summarised in Section 4.8.2.5.2. A section of a new excavated access track through peat (Type C) is shown in Figure 4-10.

Construction of New Floated Tracks over Peat – Type D

The use of new floated access tracks will be limited on site to areas of flatter terrain, i.e. less than a 3-degree slope. Floating roads are not proposed on areas of significant sidelong ground (>5 degrees). The general construction methodology for the construction of floating access tracks over peat is summarised in Section 4.8.2.5.3.

A cross section of New Floated Track over Peat (Type D) is shown in Figure 4-11.



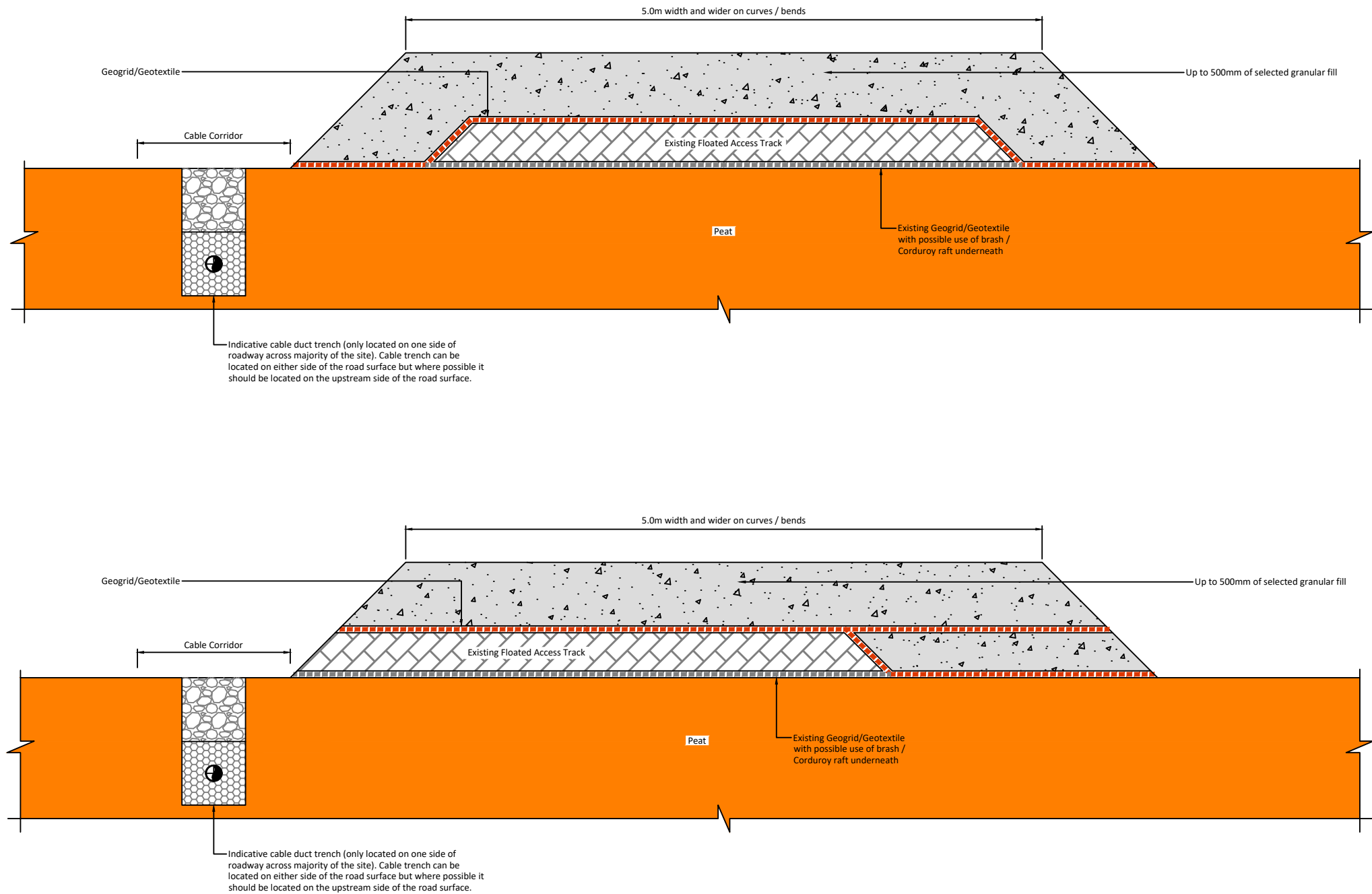
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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	09.04.26
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PROJECT		CLIENT		
CRUMHACH WIND FARM				
SHEET		Date	Project number	Scale (@ A3)
TYPE A UPGRADE OF EXISTING EXCAVATED ACCESS ROAD		30.06.26	P23-240	Scale N/A
		Drawn by	Drawing Number	Rev
		SK	Figure 4-8	P02
		Checked by	IH	

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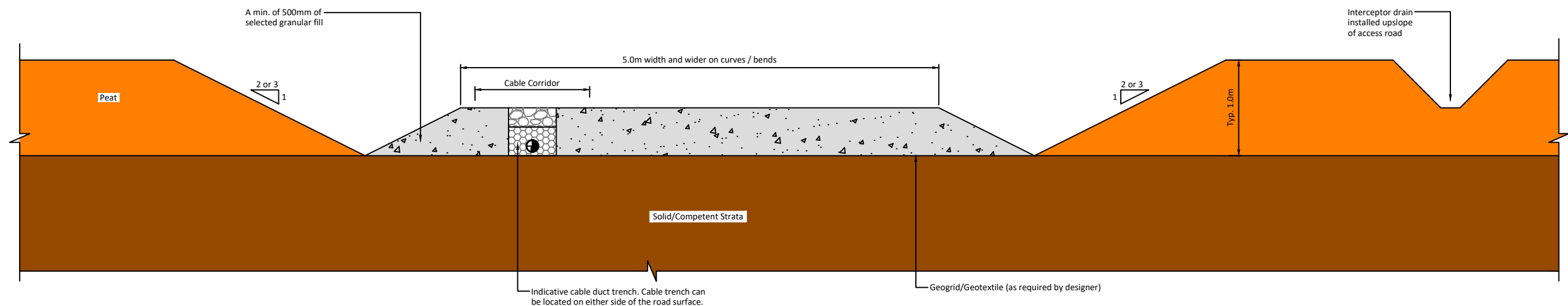


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PROJECT		CLIENT		
CRUMHACH WIND FARM				
SHEET		Date	Project number	Scale (@ A3)
TYPE B UPGRADE OF EXISTING FLOATED ACCESS ROAD		30.06.26	P23-240	As Shown
		Drawn by	Drawing Number	Rev
		SK	Figure 4-9	P02
		Checked by	IH	

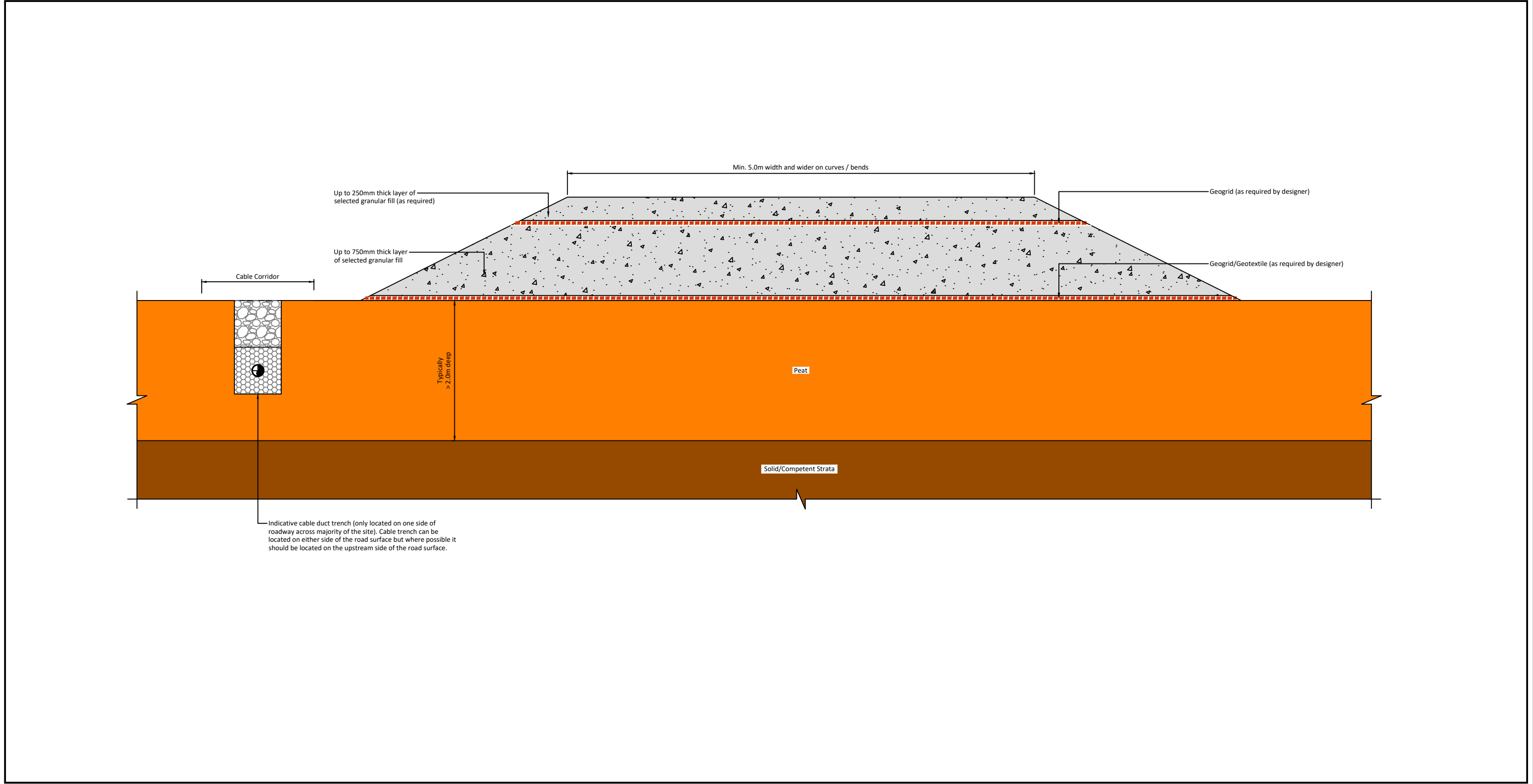


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PROJECT		CLIENT		
CRUMHACH WIND FARM				
SHEET	TYPE C NEW EXCAVATE AND REPLACE ACCESS TRACK		Date	30.06.26
			Project number	P23-240
			Scale (@ A3)	Scale N/A
		Drawn by	SK	Drawing Number
		Checked by	IH	Figure 4-10
				Rev
				P02



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P01	FOR INFORMATION	BDH	09.04.26
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PROJECT		CLIENT					
CRUMHACH WIND FARM							
SHEET	PEAT AND SPOIL MANAGEMENT AREAS - TYPE D - NEW FLOATED ACCESS TRACK	Date	30.06.26	Project number	P23-240	Scale (@ A3)	1:40
		Drawn by	SK	Drawing Number Figure 4-11			Rev P02
		Checked by	IH				
		(Please print and submit this)					

4.3.2.2.2 **Watercourse / Culvert Crossings**

The majority of the Proposed Wind Farm drains to the Dunneill River in the eastern section and the Easky River via the Buncrowey River in the western section. Several headwater streams rise along the western facing slopes of the Proposed Wind Farm and these streams flow south westerly towards the Lackavane River. These streams intercept some of the existing forestry access tracks and Proposed Wind Farm access tracks as described below. Several headwater streams of the Dunneill and Buncrowey Rivers flow off the steep western facing slopes through the Proposed Wind Farm.

There are a total of 19 no. watercourse crossings within the Proposed Wind Farm, of which 9 no. are referenced on EPA/OSI mapping, along existing tracks and public roads. 2 no. new crossings are proposed, along the temporary access track for turbine delivery at the L6309/L2702 junction and within the Existing Wind Farm approaching the existing Dunneill control building which can be seen in Figure 4-12 below.

Clear-Span Crossings

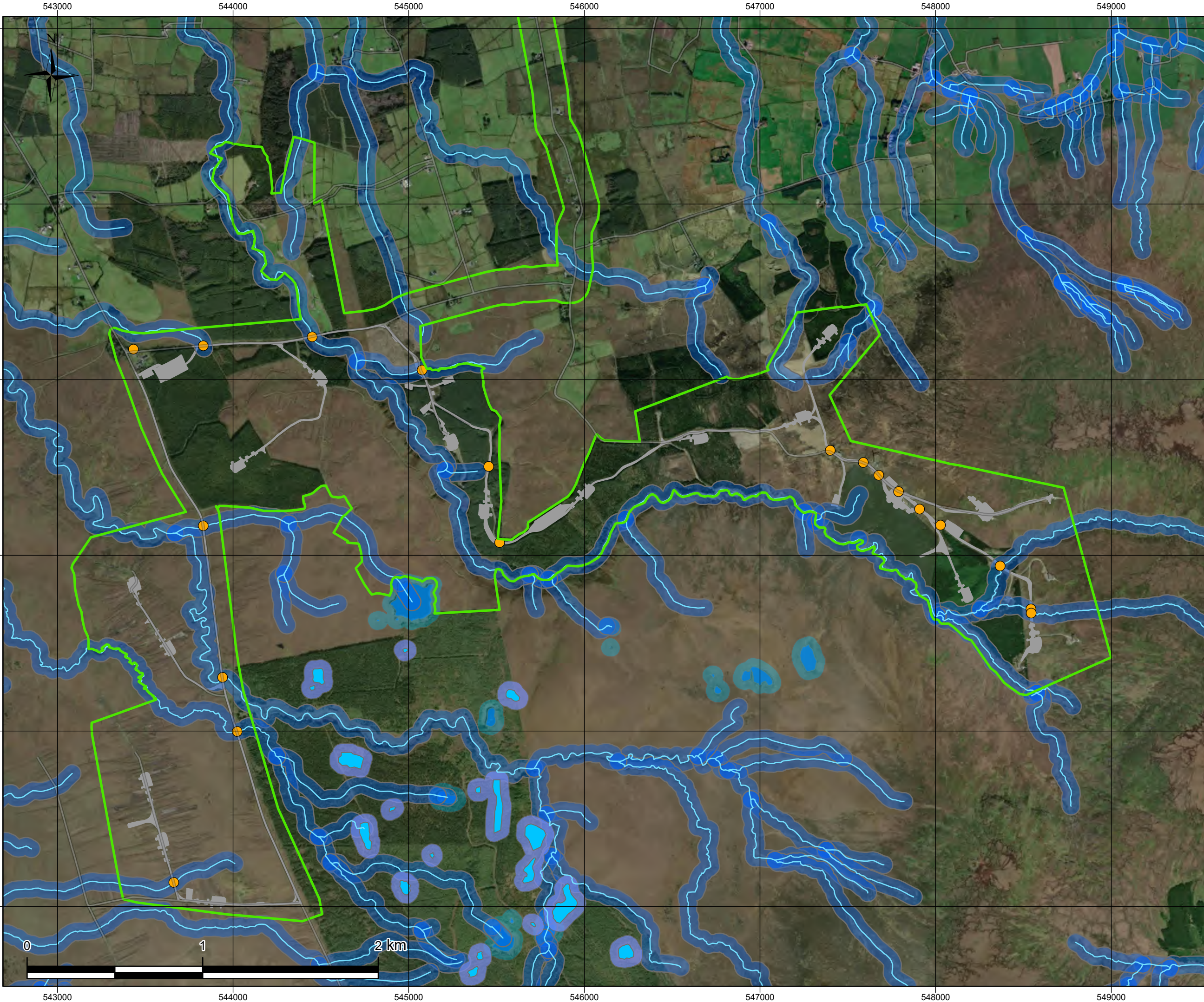
It is proposed to upgrade 1 no. existing culvert crossing of the Dunneill River along the proposed upgrade of existing access track between T03 and T05 and construct 1 no. new watercourse crossing within via a clear-span crossing or bottomless box culvert. The construction methodology for this crossing, inclusive of the decommissioning methodology for the existing watercourse crossing have been designed to eliminate the requirement for in-stream works at these locations. The watercourse crossings will be constructed to the specifications of the Office of Public Works (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 location will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing. Please see Appendix 4-1 for the location of the proposed clear-span crossings, Figure 4-35 for the design details and Section 4.8.2.4.4 for the construction methodology.

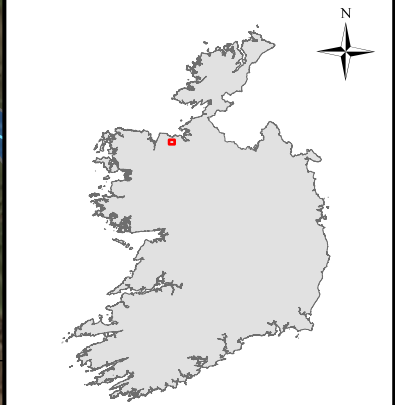
Culvert Crossings

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

Some culverts may be installed to manage drainage waters from works areas of the Proposed Wind Farm, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base. Culverts will be constructed as per the methodology detailed in Section 4.8.2.4.5. All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Please see Appendix 4-1 for the location of these crossings.



- Map Legend
- ElAR Site Boundary
 - Proposed Project Infrastructure Footprint
 - Internal Watercourse Crossings
 - Rivers
 - 50m Rivers Buffer
 - Lakes
 - 50m Lake Buffer
 - Bog Pools
 - 50m Bog Pool Buffer



SITE LOCATION - NOT TO SCALE

Drawing Title
Onsite Watercourse Crossings

Project Title
Crumhach Wind Farm, Co. Sligo

Project No.	Drawing No.	Scale
230841	4-12	1:20,000
Drawn By	Checked By	Date
MVN	BT	01/07/2026



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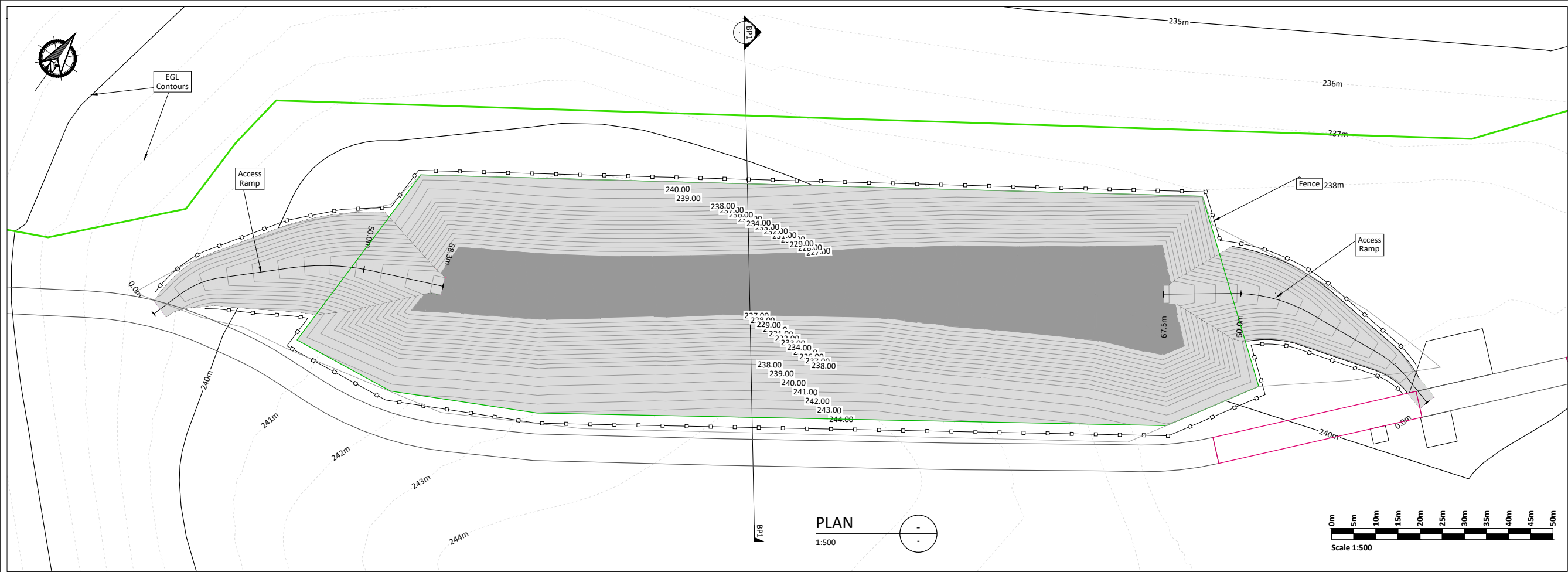
4.3.2.4 Borrow Pits

It is estimated that approximately 299,700 cubic metres (m³) of stone material will be required to construct the Proposed Wind Farm. It is proposed to develop 3 no. borrow pits as part of the Proposed Project. The proposed borrow pits will provide the majority of all rock and hardcore material required during construction of the Proposed Project. Usable rock may also be won from other infrastructure construction, including the turbine base excavations. Engineer's specified material may be imported onto the Site should sufficient volumes of suitable material not be encountered during the excavation phase of the proposed infrastructure, to come from local licenced quarries. Please see Figures 4-13 to 4-15 for details of the proposed borrow pit.

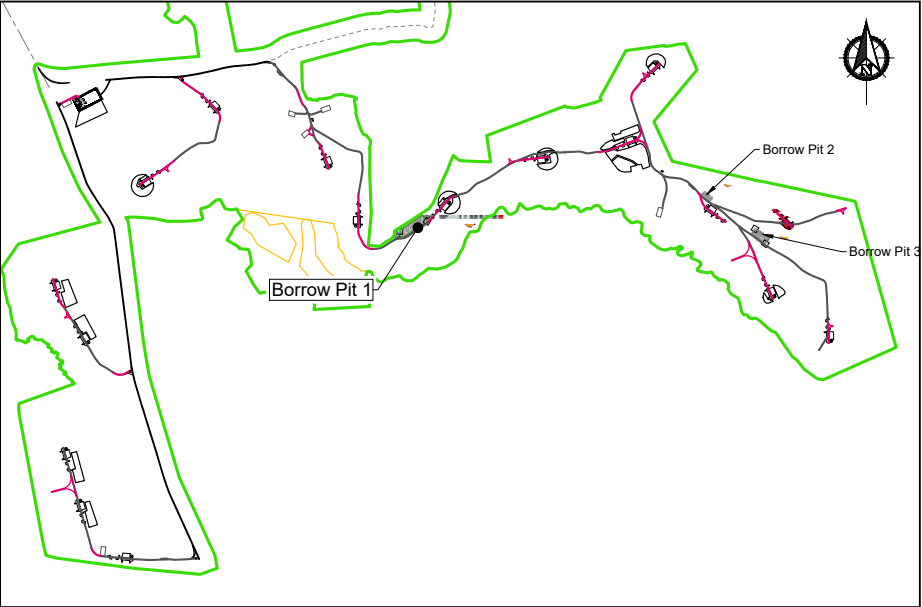
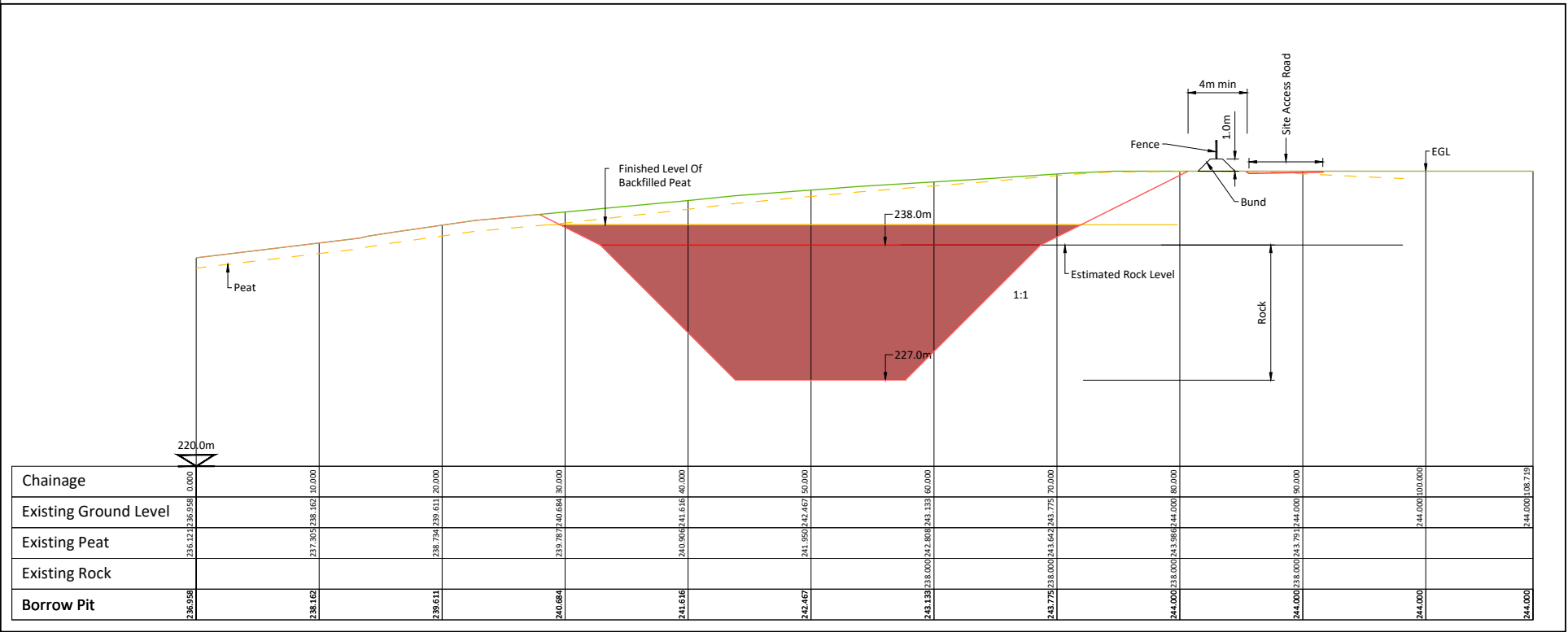
Access to the borrow pits will be via existing access tracks running along the southern edge of each of the 3 no. borrow pits. Post-construction, the borrow pits will be reinstated with excavated spoil. The borrow pit area will then be reseeded. A stock-proof fence will be erected around the borrow pit areas, to prevent unauthorised access, during the construction phase and until the borrow pits have been fully reinstated.

The extraction of material from the borrow pits is a construction phase activity only of the Proposed Project which will be a temporary operation run over a short period of time during the construction phase. The topsoil and subsoil will be stripped back and temporarily stockpiled using standard tracked excavators. Hardcore materials will be extracted from the borrow pits (and some turbine locations, if necessary), principally by means of rock breaking. Depending on the hardcore volume, blasting may also be used as a more effective rock extraction method, capable of producing significant volumes of rock in a matter of milliseconds. Blasting will only be carried out after notifying any potentially sensitive receptors. These two rock extraction methods are discussed below. The processing and crushing of boulders may be required to achieve the grading requirements for use in construction. The potential noise and vibration impact on sensitive receptors associated with the rock extraction measures, detailed below, are assessed in Chapter 12 of this EIAR. Post-construction, any unsafe areas around the borrow pit areas will be permanently secured and a stock-proof fence will be erected around the borrow pit areas to prevent access. Appropriate health and safety signage will also be erected on this fencing and at locations around the fenced areas.

Please see Section 4.8.2.8 below for the construction methodologies for borrow pits.



- Legend:**
- ELIAR Study Boundary
 - Proposed Turbine & Hardstanding
 - Proposed Access Track
 - Existing Access Track to be Upgraded
 - Existing Access Tracks
 - Proposed Passing Bay
- Borrow Pit Construction Notes:**
- It is proposed to construct the borrow pit so that the base of the borrow pit is below the level of the adjacent section of access road.
 - Slopes within the excavated rock formed around the perimeter of the borrow pit will be formed at stable inclinations to suit local in-situ rock conditions.
 - Infilling of the peat & spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress. Excavation and infilling of the borrow pit will need to be sequenced and programmed.
 - The contractor excavating the rock will sequence the borrow pit construction in a way which will allow the excavated peat & spoil to be reinstated safely.
 - The borrow pit will be developed in cells.
 - The internal rock buttress will be founded on competent strata. The founding stratum for the rock buttress will be inspected and approved by the Project Geotechnical Engineer.
 - In order to prevent water retention occurring behind the buttresses, the buttresses will be constructed of coarse boulder fill with a high permeability.
 - Control of groundwater within the borrow pit will be required and measures will be determined as part of the ground investigation programme.
 - An interceptor drain will be installed around the upslope side of the borrow pit to capture surface water flow and divert it around the borrow pit.
 - A perimeter drain will be installed around the individual cells, which will outfall to a settlement pond on the downslope side of the borrow pit (not shown on plan).
 - All the above-mentioned general guidelines and requirements will be confirmed by the designer prior to construction.
 - Further guidelines on the construction of the borrow pit is included within Section 7.5 of the Peat & Spoil Management Plan.



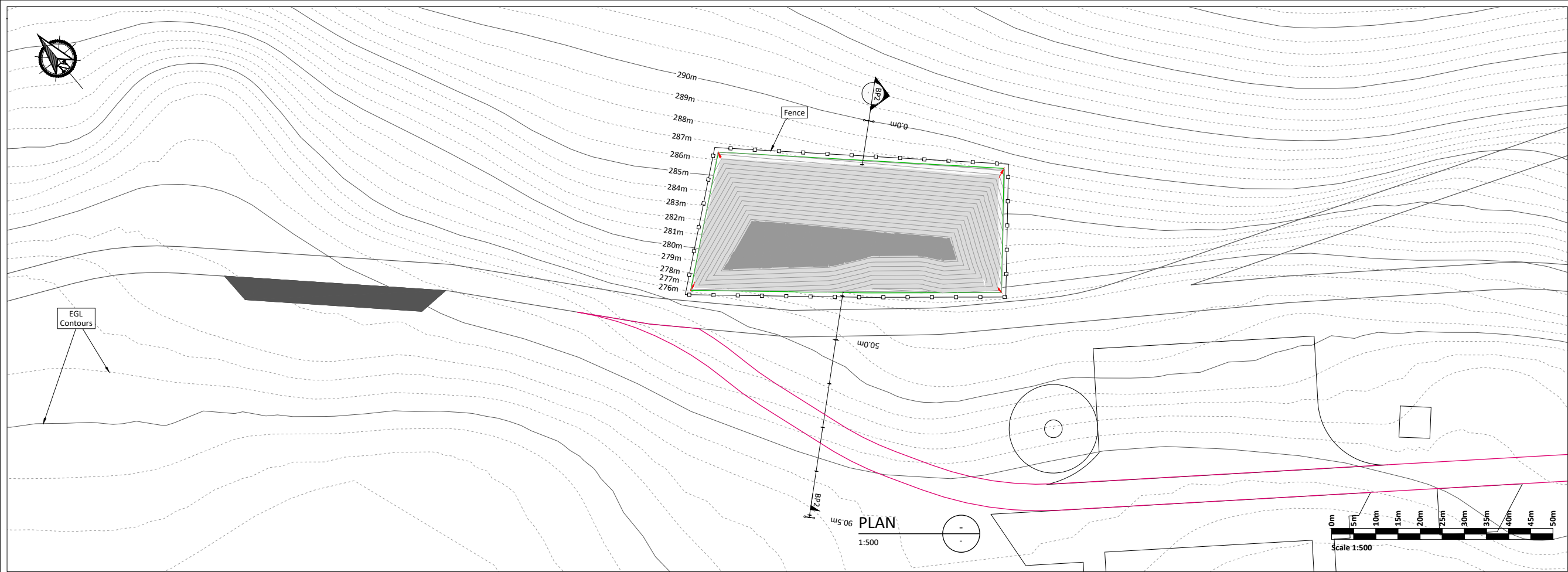
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KEY PLAN
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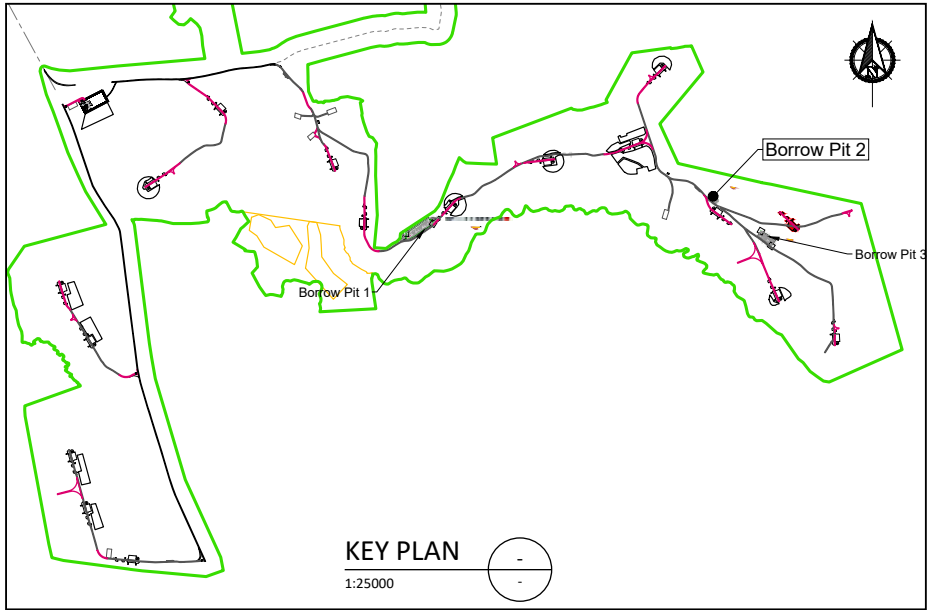
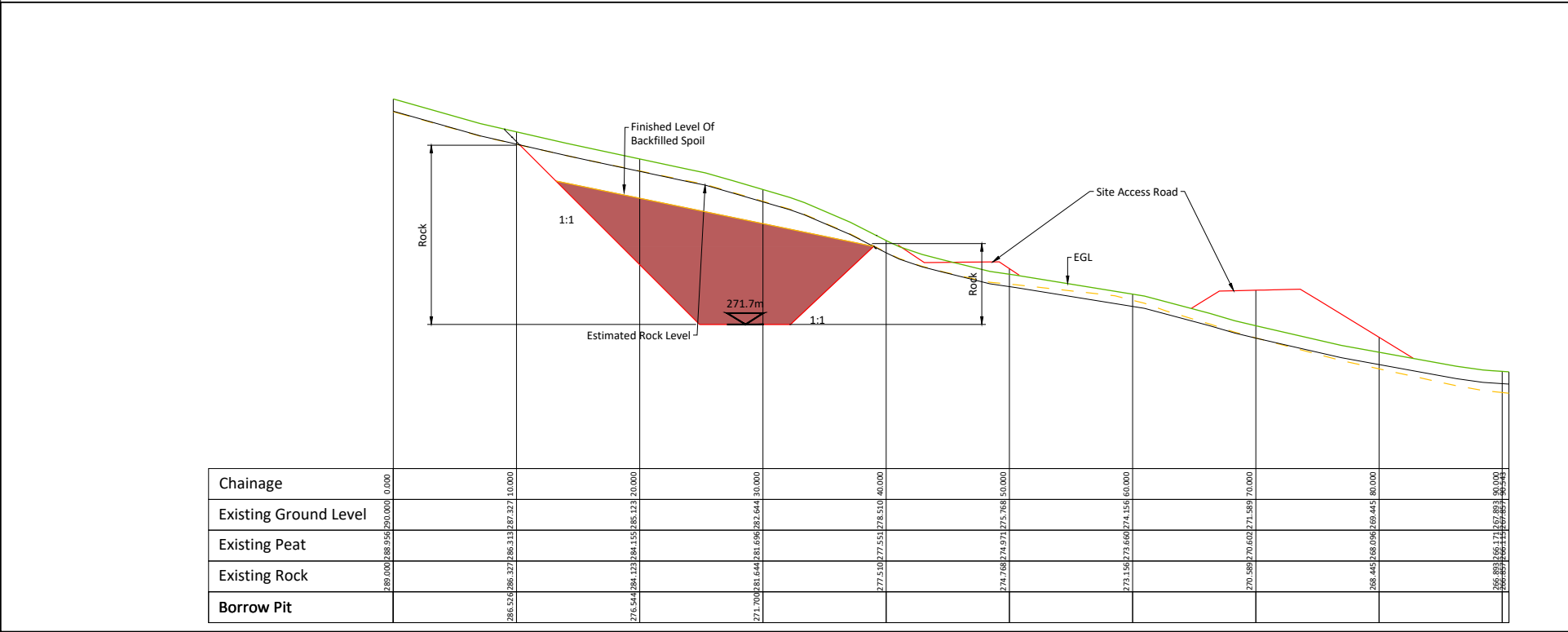
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P01	FOR INFORMATION	BDH	09.04.26
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PROJECT	CLIENT			
SHEET	CRUMHACH WIND FARM			
	BORROW PIT 1 PLAN AND SECTION			
	Date	30.06.26	Project number	P23-240
	Drawn by	SK	Drawing Number	Figure 4-13
Checked by		IH	Scale (@ A1)	1:500
				Rev
				P02



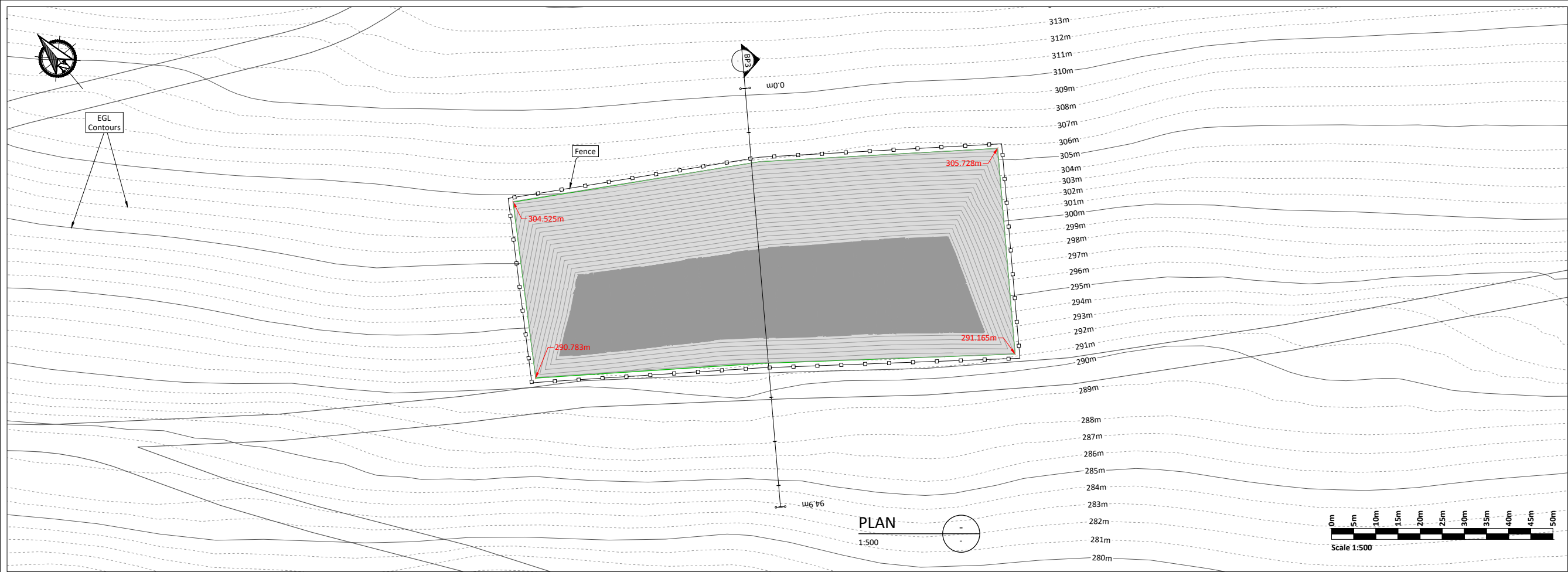
- Legend:**
- ELAR Study Boundary
 - Proposed Turbine & Hardstanding
 - Proposed Access Track
 - Existing Access Track to be Upgraded
 - Existing Access Tracks
 - Proposed Passing Bay
- Borrow Pit Construction Notes:**
- It is proposed to construct the borrow pit so that the base of the borrow pit is below the level of the adjacent section of access road.
 - Slopes within the excavated rock formed around the perimeter of the borrow pit will be formed at stable inclinations to suit local in-situ rock conditions.
 - Infilling of the peat & spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress. Excavation and infilling of the borrow pit will need to be sequenced and programmed.
 - The contractor excavating the rock will sequence the borrow pit construction in a way which will allow the excavated peat & spoil to be reinstated safely.
 - The surface of the placed spoil will be shaped to allow efficient run-off of surface water from the placed arising's. The finished surface of the spoil cells will have a maximum grade of 15 degrees.
 - Control of groundwater within the borrow pit will be required and measures will be determined as part of the ground investigation programme.
 - An interceptor drain will be installed around the upslope side of the borrow pit to capture surface water flow and divert it around the borrow pit.
 - A perimeter drain will be installed around the individual cells, which will outfall to a settlement pond on the downslope side of the borrow pit (not shown on plan).
 - All the above-mentioned general guidelines and requirements will be confirmed by the designer prior to construction.
 - Further guidelines on the construction of the borrow pit is included within Section 7.5 of the Peat & Spoil Management Plan.



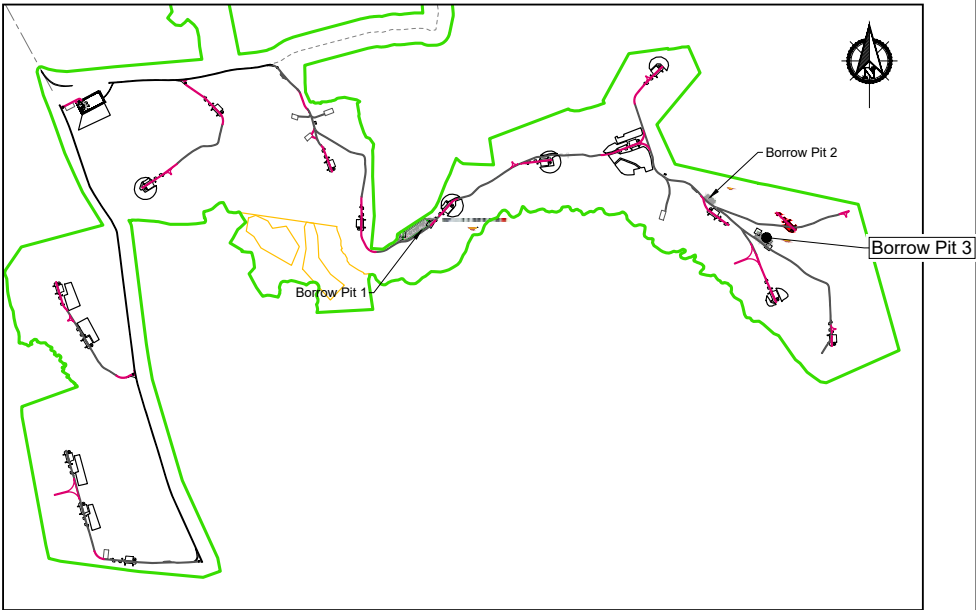
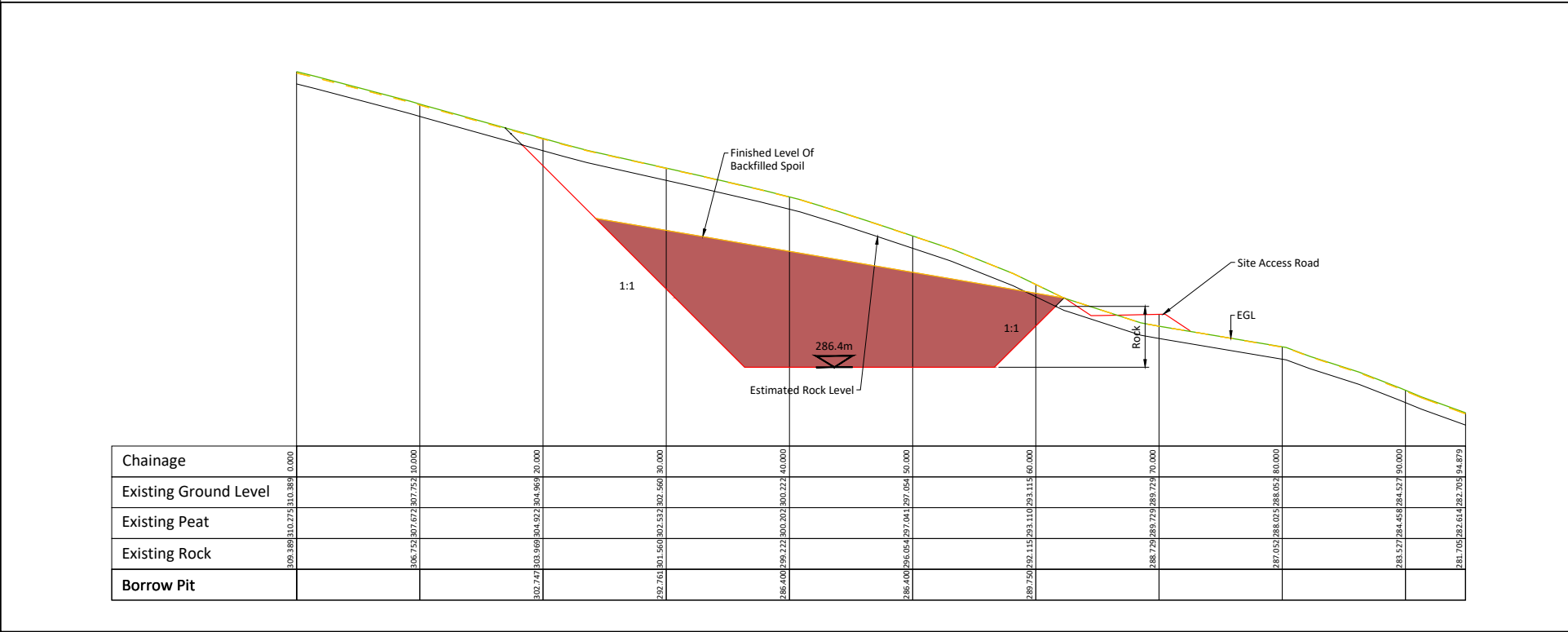
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PROJECT	CLIENT		
SHEET	CRUMHACH WIND FARM		
	BORROW PIT 2 PLAN AND SECTION		
	Date	30.06.26	Project number
	Drawn by	SK	Drawing Number
	Checked by	IH	Figure 4-14
	Scale (@ A1)		Rev
	1:500		P02



- Legend:**
- ELAR Study Boundary
 - Proposed Turbine & Hardstanding
 - Proposed Access Track
 - Existing Access Track to be Upgraded
 - Existing Access Tracks
 - Proposed Passing Bay
- Borrow Pit Construction Notes:**
- It is proposed to construct the borrow pit so that the base of the borrow pit is below the level of the adjacent section of access road.
 - Slopes within the excavated rock formed around the perimeter of the borrow pit will be formed at stable inclinations to suit local in-situ rock conditions.
 - Infilling of the peat & spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress. Excavation and infilling of the borrow pit will need to be sequenced and programmed.
 - The contractor excavating the rock will sequence the borrow pit construction in a way which will allow the excavated peat & spoil to be reinstated safely.
 - The surface of the placed spoil will be shaped to allow efficient run-off of surface water from the placed arising's. The finished surface of the spoil cells will have a maximum grade of 15 degrees.
 - Control of groundwater within the borrow pit will be required and measures will be determined as part of the ground investigation programme.
 - An interceptor drain will be installed around the upslope side of the borrow pit to capture surface water flow and divert it around the borrow pit.
 - A perimeter drain will be installed around the individual cells, which will outfall to a settlement pond on the downslope side of the borrow pit (not shown on plan).
 - All the above-mentioned general guidelines and requirements will be confirmed by the designer prior to construction.
 - Further guidelines on the construction of the borrow pit is included within Section 7.5 of the Peat & Spoil Management Plan.



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PROJECT	CLIENT		
CRUMHACH WIND FARM	M&O		
SHEET	Date	Project number	Scale (@ A1)
BORROW PIT 3 PLAN AND SECTION	30.06.26	P23-240	1:500
	Drawn by SK	Drawing Number	Rev
	Checked by IH	Figure 4-15	P02

D:\ACAD\2023\P23-240\P23-240-0600-0017

4.3.2.5 Peat and Spoil Management Plan

4.3.2.5.1 Quantities – Peat, Spoil and Stone

The construction of the Proposed Project will require the excavation of peat and spoil. The quantities of peat and spoil, requiring management on the Proposed Wind Farm site has been calculated, as presented in Table 4-2 below. The quantities were calculated by FTC as part of the Peat and Spoil Management Plan (PSMP) included as Appendix 4-2 of this EIAR.

Table 4-2 Peat and Spoil Volumes requiring management

Development Component	Area (m2) (approx.)	Peat Volume (m3) (approx.)	Spoil Volume (m3) (approx.)
Proposed Wind Farm			
17 no. Turbines and Hardstanding Areas	27m diameter excavation footprint (25m wide base with 1m of working space around the perimeter of the base) for turbine foundation with 55 x 35m hardstand area	69,000	111,000
Access Tracks	Assumed 5m running surface with 6-8m wide development footprint.	20,000	26,000
Onsite 110kV Substation	Hardstanding area of 165 x 80m	20,000	4,000
Temporary Construction Compounds /LiDAR Compounds	Hardstanding area of 90 x 70m.	2,500	1,500
Borrow Pits	3 no. borrow pits	9,000	41,000
Grid Connection Cable Trench	41.6km in length along public road corridor	5,400	14,600
Total Peat and Spoil to be managed in the Proposed Wind Farm ¹		125,900	197,600
		323,700	

¹**Note** A factor of 10% (bulking factor of 10%) has been applied to the excavated peat and spoil volumes to allow for expected increase in volume upon excavation and to allow for a variation in ground conditions across the Site.

Note: It should be noted that the excavated rock volume from the borrow pits is not included in the total volume quoted above, see the cut-fill assessment in Appendix 4-2 PSMP for further details. It is assumed that the excavated rock volume will be re-used on the Site as part of the construction works for the development and hence will not require reinstatement on site.

Note: A proportion of the material excavated at turbines and hardstands will be rock that can be reused in the works. An estimate of 20,000m³ of reusable rock has been assessed. This is not included in the volumes quoted above.

Note: The total peat/spoil volumes from the Proposed Grid Connection Route is quantified as 50,000m³. Of this total, 10,100m³ is comprised of road make up material which will be sent to an appropriately licensed facility. The remaining spoil volume of 39,100m³ will either be managed in the identified peat and spoil management areas within the Proposed Wind Farm or sent to an appropriately licensed facility. Given the length of the Proposed Grid Connection underground cabling route, it is assumed that approximately 50% (c. 20,000m³) of the spoil generated during the construction of the Proposed Grid Connection Route will be managed in the Proposed Wind Farm, which is identified in the table above, and the remaining volume will be sent to an appropriately licensed facility. This is dependent on the road makeup at locations along the underground electrical cabling route and the distance from the underground electrical cabling route to the Proposed Wind Farm, the main contractor will determine the appropriate location for management of arisings from the Proposed Grid Connection Route.

4.3.2.5.2 Peat and Spoil Management Areas

Peat and spoil will be managed locally within the Proposed Wind Farm site, in dedicated peat and spoil management areas as shown on Figure 4-2. All excavated peat and spoil will be transported to one of the 3 no. borrow pits (see Section 4.3.2.4 above) or to one of the designated peat and spoil management areas around Proposed Turbines.

All the recommendations/best practice guidelines for the placement of spoil in identified spoil management areas and alongside access roads will be confirmed by the Geotechnical Engineer prior to construction.

As identified in Table 4-2 above, the total volume of peat requiring management onsite is estimated at 125,900m³ and the total volume of spoil requiring management onsite is estimated at 197,600m³. This material will be excavated and deposited in the peat and spoil management areas, with a total capacity volume of 171,250m³, around turbine foundations and hardstands within clear felled areas, along access roads, landscaping and within the proposed borrow pits (Section 4.3.2.4 above). As such, there is enough capacity in the peat and spoil management areas within the Proposed Wind Farm site, for the total volumes of peat and spoil requiring management for the Proposed Wind Farm as detailed in Table 4-2 above, as well as associated drainage.

The following (as outlined in the PSMP in Appendix 4-2) particular recommendations/best practice guidelines for the placement of peat and spoil with respect to specific aspects of the wind farm will be considered and taken into account during construction.

4.3.2.5.3 Crushed Stone

The quantity of crushed stone required for the construction of the Proposed Project has been calculated, as presented in Table 4-3 below.

Table 4-3 Crushed Stone Requirement

Development Component	Crushed Stone Requirement (m ³) (approx.)	Comment
Proposed Wind Farm		
17 no. Turbines and Hardstanding Areas (including foundations)	135,000	Hardstanding area and foundation footprint. Allowance included for mini-crane pads and blade finger hardstands associated with the main

Development Component	Crushed Stone Requirement (m ³) (approx.)	Comment
Proposed Wind Farm		
		hardstand, plus allowance for side slopes in areas of fill.
Access Roads (including cabling)	97,000	Allowance includes for widening on bends, at junctions, laybys, and tie-ins to hardstands.
Onsite 110kV Substation	22,000	
Temporary Construction Compounds / LiDAR Compounds	5,500	
Proposed Grid Connection Route Cable Trench	40,000	
Borrow Pits	-	
Total (including 10% contingency)	298,800	

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 Proposed Wind Farm site.

The locations of the peat and spoil management areas are shown in Figure 4-2. The cross sections of the peat and spoil management areas around T12 are shown in Figure 4-16 below and in Appendix 4-2 PSMP.

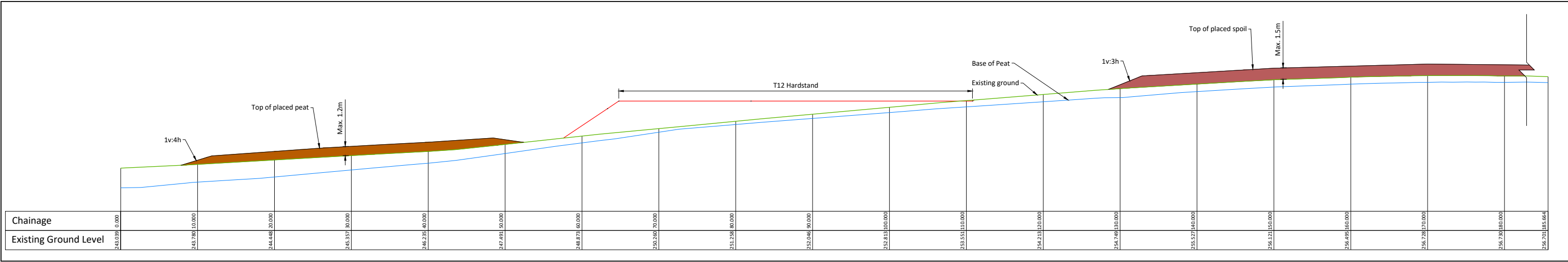


- Legend:**
- EIAR Study Boundary
 - Proposed Turbine & Hardstanding
 - Proposed Access Track
 - Existing Access Track to be Upgraded
 - Existing Access Tracks
 - ▬ Proposed Passing Bay
 - ▬ Proposed Temporary Compound
 - ▬ Decommissioned Turbine Area
 - ▬ Proposed Peat & Spoil Management Areas
 - ▬ Proposed Borrow Pit
 - ▬ Proposed Enhancement Area

Construction Peat & Spoil Management

Area Notes:

- (1) An interceptor drain will also be installed upslope of the peat repository areas.
- (2) A silting pond will be required at the lower side of the peat repository areas.
- (3) It is important that the surface of the stored peat be shaped to allow efficient run-off of water from the stored spoil.
- (4) Supervision by a geotechnical engineer or appropriately competent person is recommended for the construction of the peat repository area.
- (5) All the above-mentioned general guidelines and requirements will be implemented during construction.
- (6) Further guidelines on the construction of the peat storage area are included within Section 7.6 of the Peat & Spoil Management Plan.



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Rev.	Description	App By	Date
P01	FOR INFORMATION	BDH	09.04.26
P02	FOR INFORMATION	BDH	30.06.26

PROJECT	CLIENT		
CRUMHACH WIND FARM	M&O		
SHEET	Date	Project number	Scale (@ A1)
PEAT & SPOIL MANAGEMENT AREAS	30.06.26	P23-240	1:1000
	Drawn by	Drawing Number	Rev
	SK	Figure 4-16	P02
	Checked by		
	IH		

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4.3.2.6 Onsite 110kV Substation

As described in Section 4.3.1.3 above, it is proposed to utilise the maximum export capacity from the Existing Grid Connection for the Proposed Project via connection to the Existing Wind Farm 2 no. onsite control buildings. To accommodate the remaining export capacity of the Proposed Project, the Proposed Wind Farm will connect via internal cabling to a proposed 110kV electricity substation within the Site as shown in Figure 4-2. The proposed onsite 110kV substation is located at the northwest of the Proposed Wind Farm, in the townland of Crowagh or Dunneill Mountain, Co. Sligo. The construction and exact layout of electrical equipment in the onsite electricity substation will be to EirGrid Networks specifications. Access to the proposed onsite 110kV substation will be via a new site entrance along the L2702 local road. Upon decommissioning of the Proposed Wind Farm, the 110kV substation will remain *in situ* and form part of the national grid infrastructure.

The footprint of the onsite 110kV substation compound measures approx. 14,340m² in area and will include 2 no. control buildings and the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine, and export that electricity from the onsite 110kV substation to the national grid via the Proposed Grid Connection Route connection to Srananagh 220kV substation. The layouts and elevations of the onsite 110kV substation are shown on Figures 4-17 and 4-18.

The onsite 110kV substation compound will include steel palisade fencing (approx. 2.4 metre high or as otherwise required by EirGrid), and internal fences will also segregate different areas within the main substation. Please see Appendix 4-1 for fencing details.

4.3.2.7 Wind Farm Control Buildings

Two control buildings will be located within the substation compound. The Transmission Asset Owner (TSO) Control Building will measure approx. 25 metres by 18 metres and approx. 9.7 metres in height. The Independent Power Producer (IPP) Control Building will measure approx. 20 metres by 11 metres and approx. 7 metres in height. The layouts of the control buildings are shown on Figures 4-19 and Figure 4-20.

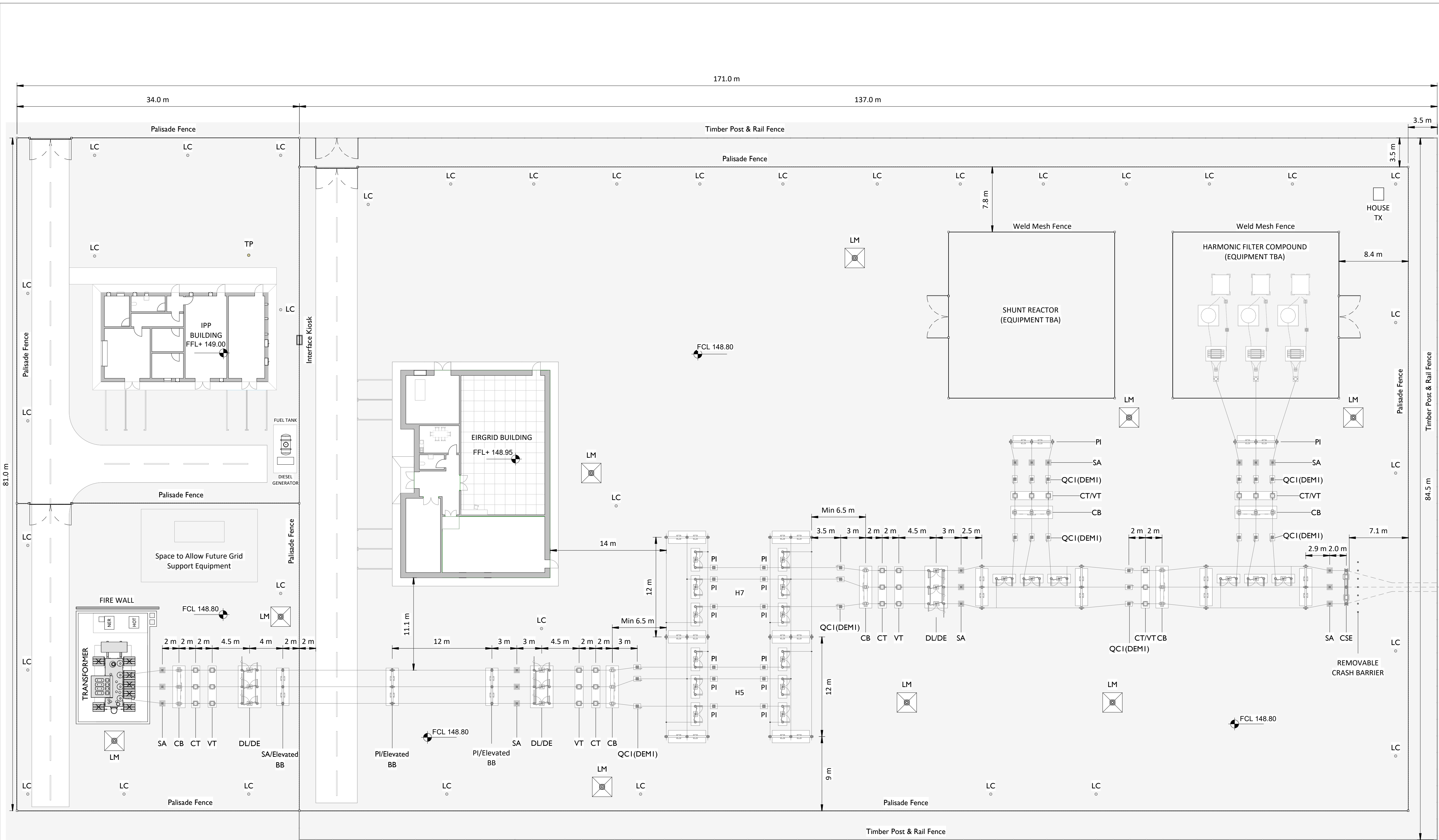
The substation control buildings will include staff welfare facilities for the operational phase of the project. Bottled water will be supplied for drinking, if required. Toilet facilities will be installed with a low-flush cistern and low-flow wash basin. Due to the specific nature of the Proposed Project, there will be a very small water requirement for occasional toilet flushing and hand washing and therefore the water requirement of the Proposed Project does not necessitate a potable source. It is proposed to either harvest rainwater from the roofs of the buildings or, alternatively, install a groundwater well adjacent to the 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.

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

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

The proposed wastewater storage tanks will be fitted with an automated alarm system that will provide sufficient notice that the tanks requires emptying. Full details of the proposed tank alarm system can be submitted to the Planning Authority in advance of any works commencing onsite. The wastewater

storage tank alarm will be part of a continuous stream of data from the sites' turbines, wind measurement devices and electricity substation that will be monitored remotely 24 hours a day, 7 days per week. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007 (as amended), will be employed to transport wastewater away from the substation underground storage tank.



Substation compound Layout Plan

Scale: 1 : 250

	Description
SA	Surge Arrester
DL/DE	Line / Earth Disconnect
CT	Current Transformer
VT	Voltage Transformer
CB	Circuit Breaker
CSE	Cable Sealing End
LM	Lightning Mast
PI	Post Insulator
LC	Lighting Column
TP	Telecoms Pole
QB9(DL)	Line Disconnect
QB91(DT1) QB92(DT2)	Trafo Disconnect
QC9(DE) QC1(DEM1) QC3(DEM3) QC5(DEM5) QC6(DEM6) QC7(DEM7) QC8(DEM8) QC9(DEM4)	Bay Earth Switches

ISSUE/REVISION		
P1	04.08.2026	Issued for Planning
P0	12.06.2026	Issued for Planning
N3	19.02.26	Issued for Information
N2	19.11.25	Issued for Information
N3	15.10.25	Issued for Information
I/R	DATE	DESCRIPTION

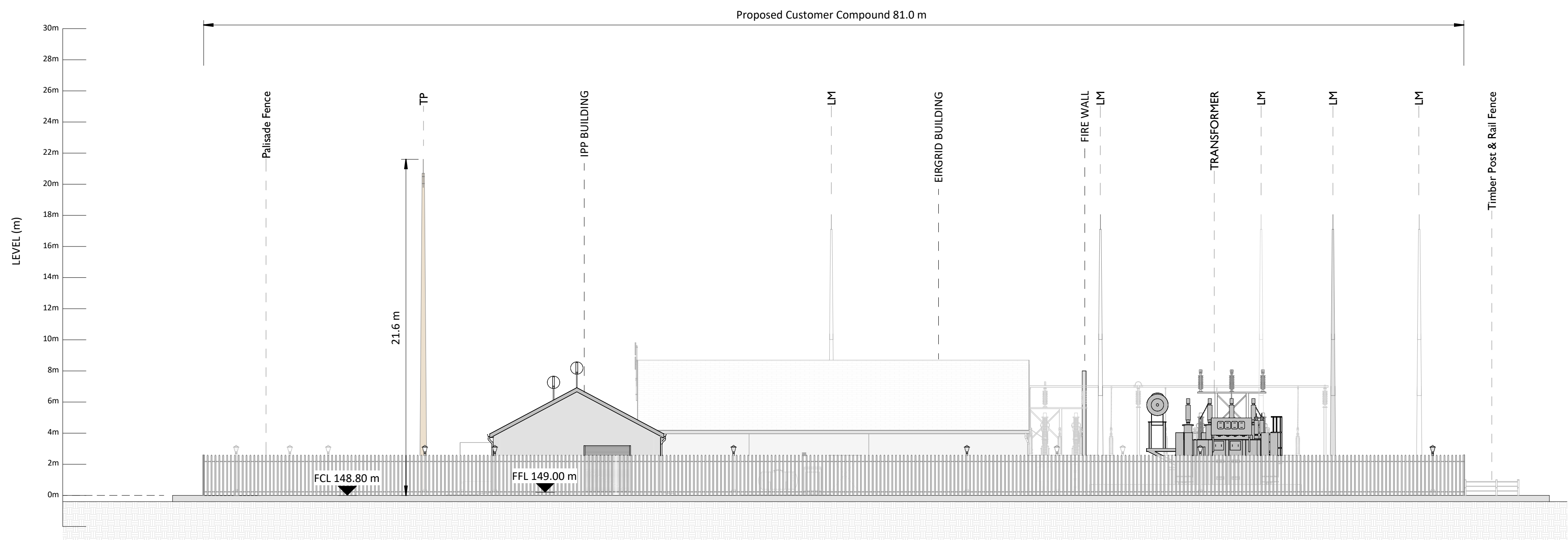
PROJECT NUMBER

SHEET TITLE

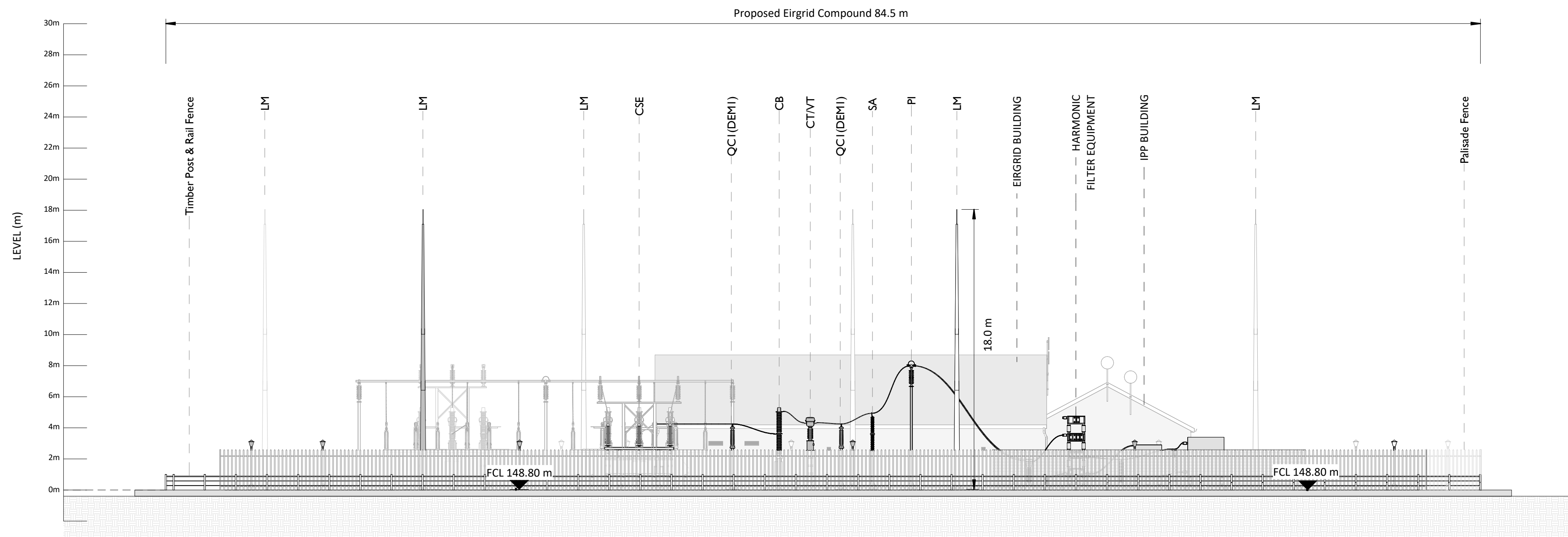
Figure 4-17 Substation compound Layout Plan

SHEET NUMBER

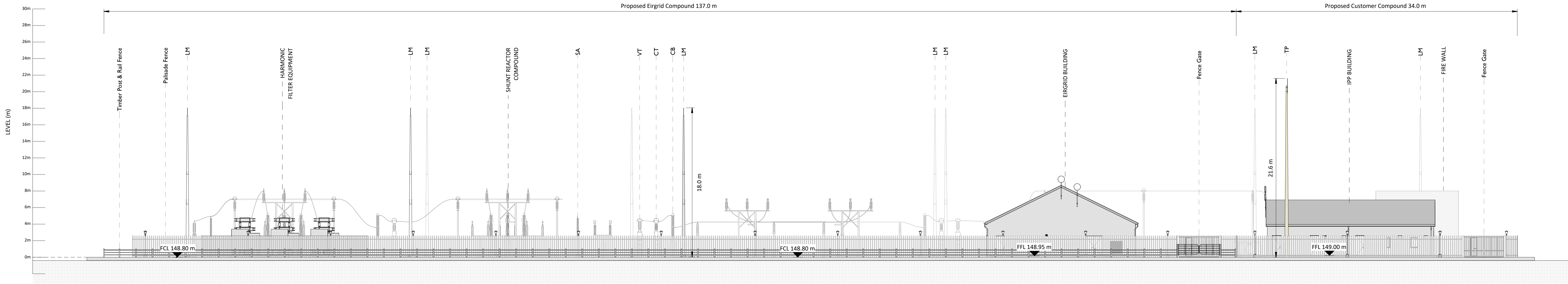
051071-DR-100



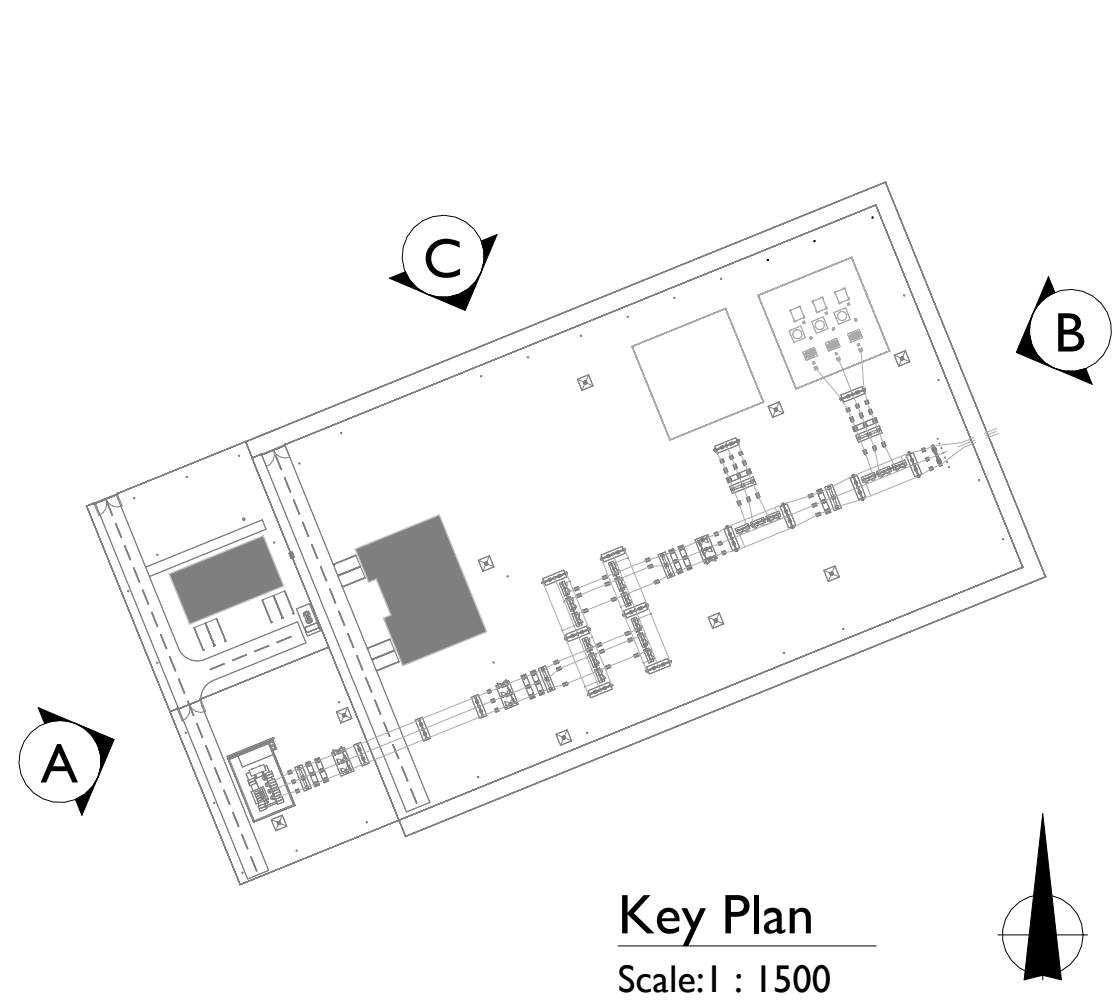
Elevation A
Scale: 1 : 200



Elevation B
Scale: 1 : 200



Elevation C
Scale: 1 : 200



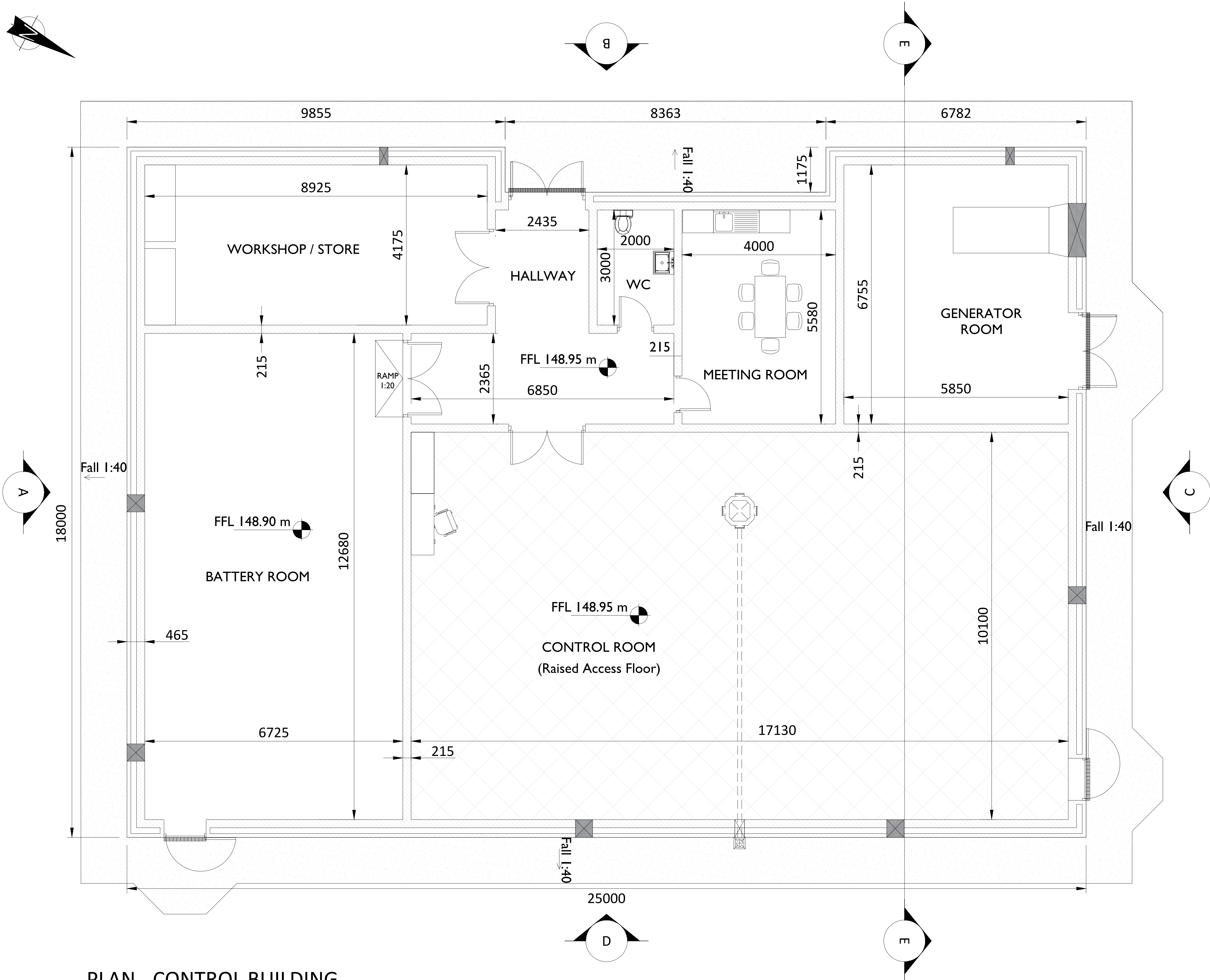
- Layout and Arrangements of Substation Building and Electrical Equipment is shown indicatively and for illustration purposes only.
- Any additional design, harmonic or reactive compensation requirements are to be confirmed with EirGrid prior to planning.
- Dimensions shown are as per current EirGrid Specifications at the time of submission. Dimensions may vary at time of construction to reflect any revisions to EirGrid specifications.
- Final Specifications of Buildings and Electrical Equipment is to be as per EirGrid Specifications.
- The Elevation of the Compound will be depicted by localised Topography such that Cut/Fill Earthworks associated with the construction of the Compound are balanced.

SA	Description
SA	Surge Arrester
DL/DE	Line / Earth Disconnect
CT	Current Transformer
VT	Voltage Transformer
CB	Circuit Breaker
CSE	Cable Sealing End
LM	Lightning Mast
PI	Post Insulator
LC	Lighting Column
TP	Telecoms Pole
QB9(D1)	Line Disconnect
QB91(DT1) QB92(DT2)	Trafo Disconnect
QC9(DE) QC1(DEM1) QC3(DEM3) QC5(DEM5) QC6(DEM6) QC7(DEM7) QC8(DEM8) QC9(DEM4)	Bay Earth Switches

NO	DATE	DESCRIPTION
P1	04.08.2026	Issued for Planning
PO	12.06.2026	Issued for Planning
NO	19.02.2026	Issued for Information
I/R	DATE	DESCRIPTION

ISO A1 594mm x 841mm

Project Management Initials: Designer: AR Checked: TOC Approved: KC



PLAN - CONTROL BUILDING
Scale: 1:50



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Regional Office
Basepoint Business Centre
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Hampshire,
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Tel: 00 44 1256406664

PROJECT

Crumhach Wind Farm
110 kV Grid Connection

CLIENT



CONSULTANTS



- NOTES: -
- Layout and Arrangements of Substation Building and Electrical Equipment is shown Indicatively for Illustration purposes only.
 - Dimensions are in millimeters unless otherwise stated.
 - Dimensions shown are as per current EirGrid Specifications at the time of submission. Dimensions may vary at time of construction to reflect any revisions to EirGrid Specifications.
 - Final Specifications of Buildings and Electrical Equipment is to be as per EirGrid Specifications.

LEGEND: -

Levels on Plans shown thus  FFL 148.95 m

ISSUE/REVISION		
PO	12.06.2026	Issued For Planning
NI	17.12.2025	For Information
I/R	DATE	DESCRIPTION

PROJECT NUMBER

05-1071

SHEET TITLE

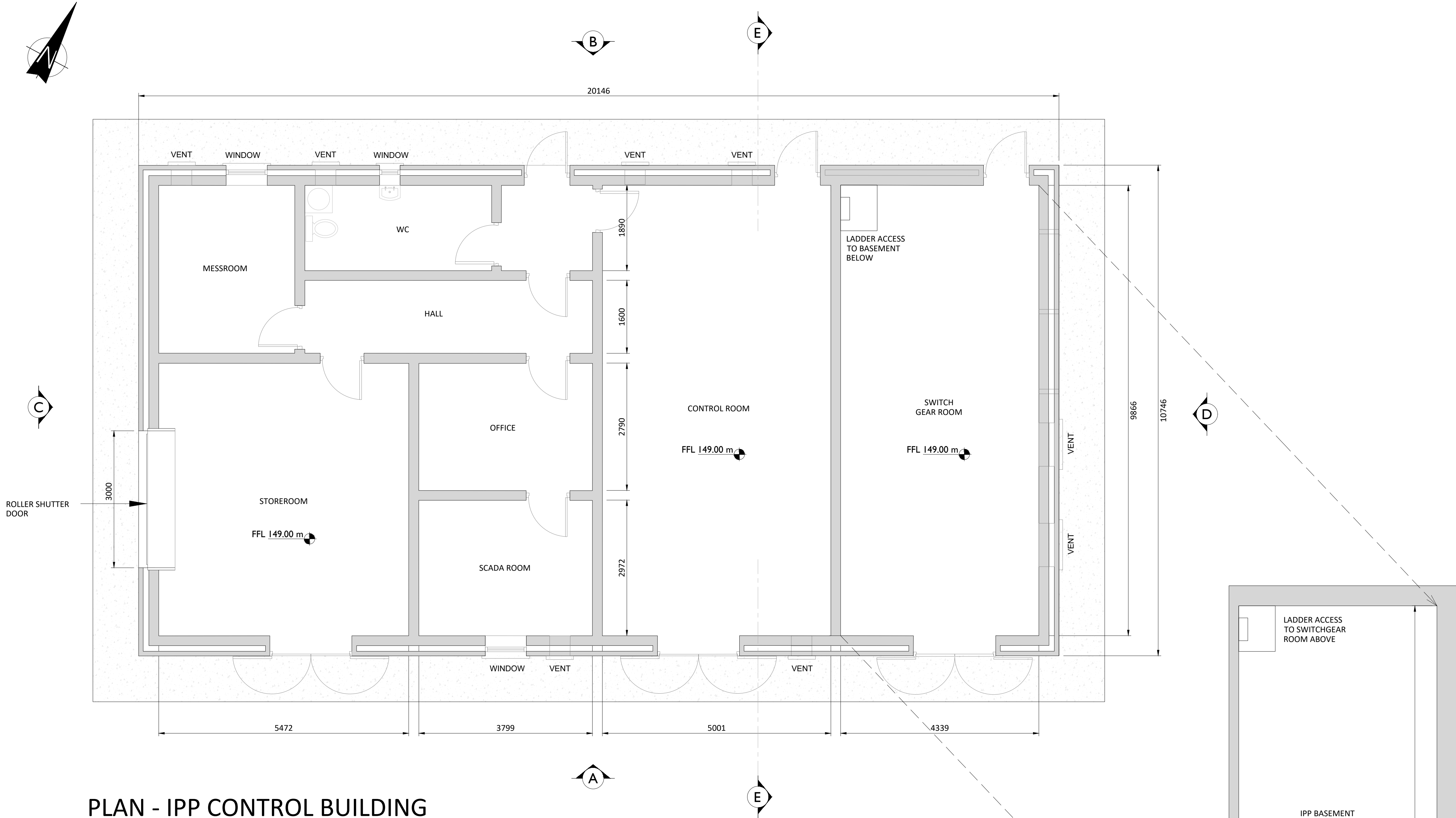
Figure 4-19 Control Building Ground Floor Layout Plan

SHEET NUMBER

051071-DR-110

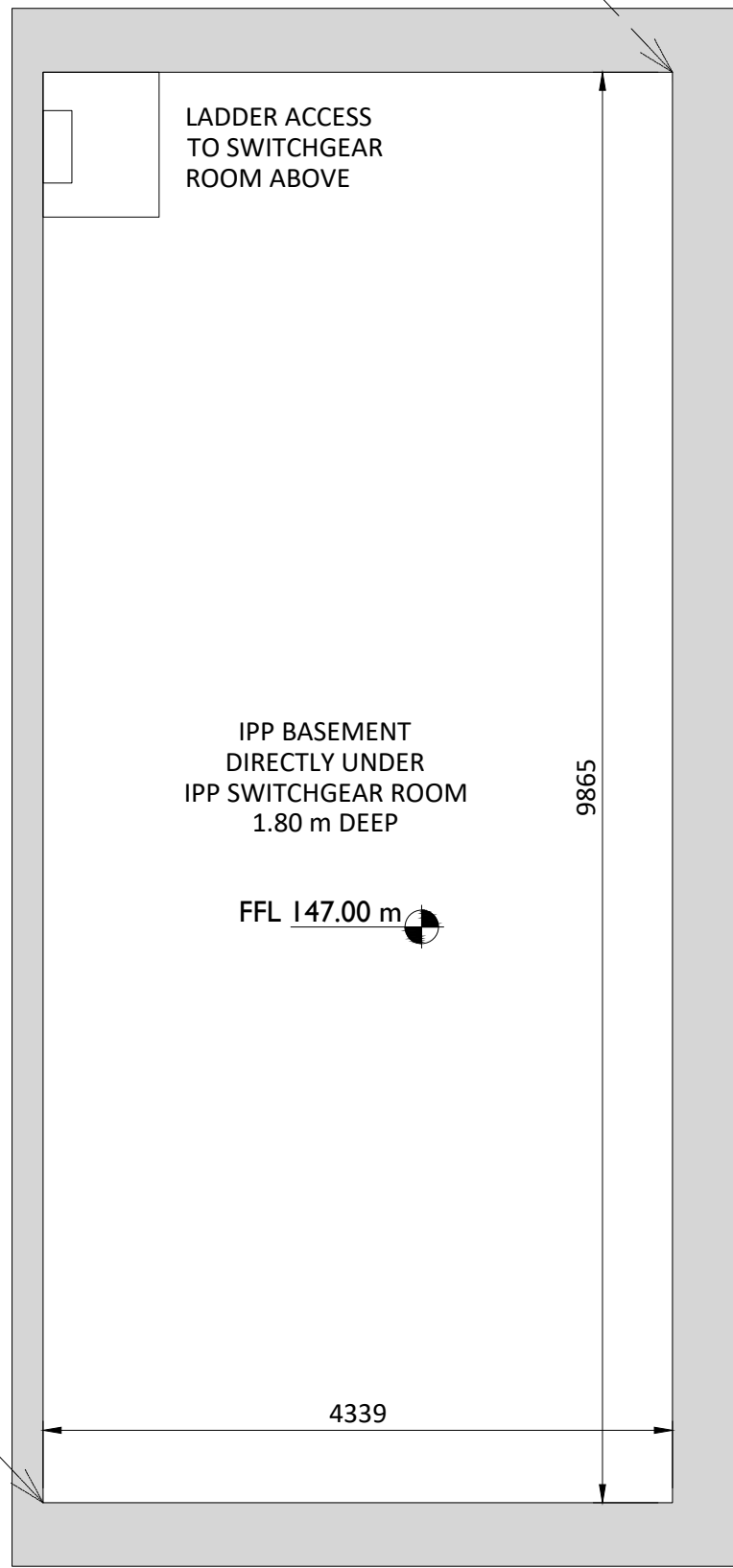
ISO A1 594mm x 841mm

Project Management Initials: Designer: AR Checked: TOC Approved: KC



PLAN - IPP CONTROL BUILDING

Scale: 1:50



BASEMENT IS REQUIRED TO ALLOW ACCESS TO EQUIPMENT FROM UNDER THE SWITCHGEAR ROOM.

BASEMENT PLAN

Scale: 1:50



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RG24 8UP, UK
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PROJECT

Crumhach Wind Farm
110 kV Grid Connection

CLIENT



CONSULTANTS



NOTES: -

1. Layout and Arrangements of Substation Building and Electrical Equipment is shown Indicatively for Illustration purposes only.
2. Dimensions are in millimeters unless otherwise stated.
3. Dimensions shown are as per current EirGrid Specifications at the time of submission. Dimensions may vary at time of construction to reflect any revisions to EirGrid Specifications.
4. Final Specifications of Buildings and Electrical Equipment is to be as per EirGrid Specifications.
5. Civil layout (Roads, drainage, and levels) has been designed by others. Refer to the relevant civil drawings and documentation for full details.
6. Further detailed design will need to be carried at detailed design stage.

LEGEND: -

Levels on Elevations / Section shown thus FFL 149.00 m

ISSUE/REVISION

PI	16.06.2026	Issued for Planning
PO	12.06.2026	Issued for Planning
I/R	DATE	DESCRIPTION

PROJECT NUMBER

05-1071

SHEET TITLE

Figure 4-20 IPP Control
Building Ground Floor
Layout Plan

SHEET NUMBER

051071-DR-115

4.3.2.8 Internal Cabling

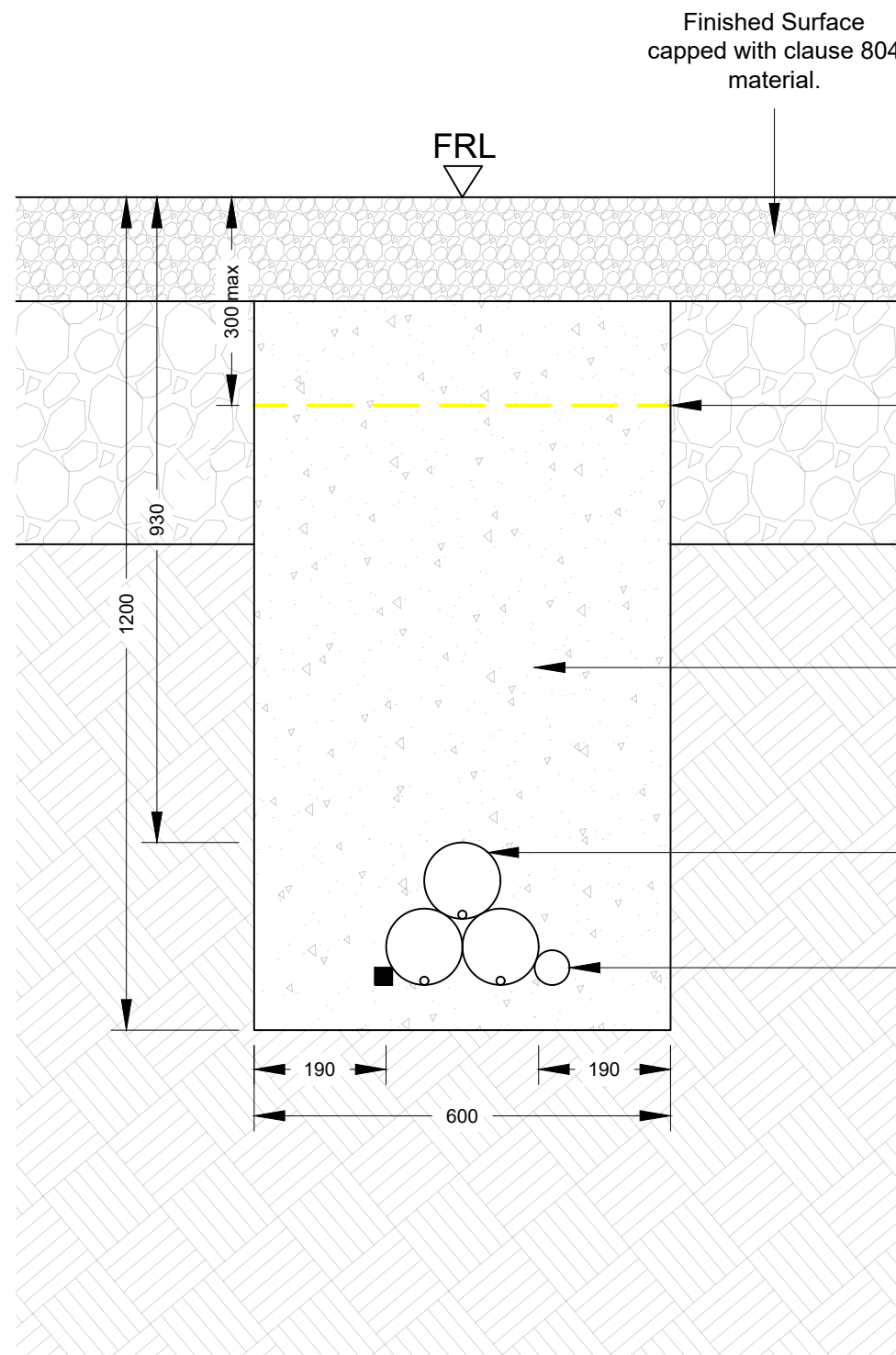
4.3.2.8.1 Site Underground Electrical and Communications Cabling

Each of the Proposed Turbines will be connected to either the existing onsite control buildings or proposed onsite 110kV substation via underground 20kV or 33kV (kilovolt) electricity cabling. Fibre-optic cables will also connect each of the Proposed Turbines to the onsite control buildings or proposed onsite 110kV substation. The electricity and fibre-optic cabling connecting to the onsite control buildings and proposed onsite 110kV substation compound will be run in cable ducts approx. 1.2 metres beneath ground level, along the sides of roadways or under the roadways. The route of the cable ducts will follow the access track to each turbine location and are illustrated on the site layout drawings included as Appendix 4-1, the exact number and configuration of cable ducting may vary within the cabling trench. Figure 4-21 below shows two variations of a typical cable trench, one for off-road trenches and one for on-road trenches. Where multiple cable trenches are required along roads, details are shown in Figure 4-22 below. The exact configuration of the underground cabling will be set by the requirements of the electrical designers at detailed design stage.

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

4.3.2.8.2 Connection into Existing Wind Farm Control Buildings

As outlined in Section 4.3.1.2, there are currently 2 no. control buildings within the Existing Wind Farm. No internal upgrades to both existing control buildings are required. The only proposed works at the existing control building comprise the connection of the 20kV or 33kV electrical cabling from the Proposed Turbines as outlined in Table 4-2 below. There will be no further alterations to the existing control buildings onsite as part of the Proposed Project. The Existing Wind Farm control buildings are shown in Figures 4-23 and 4-24 below.



20/33kV Cable - On Road Trench Detail - Cross Section

Yellow Marker Warning Tape.
across full width of trench

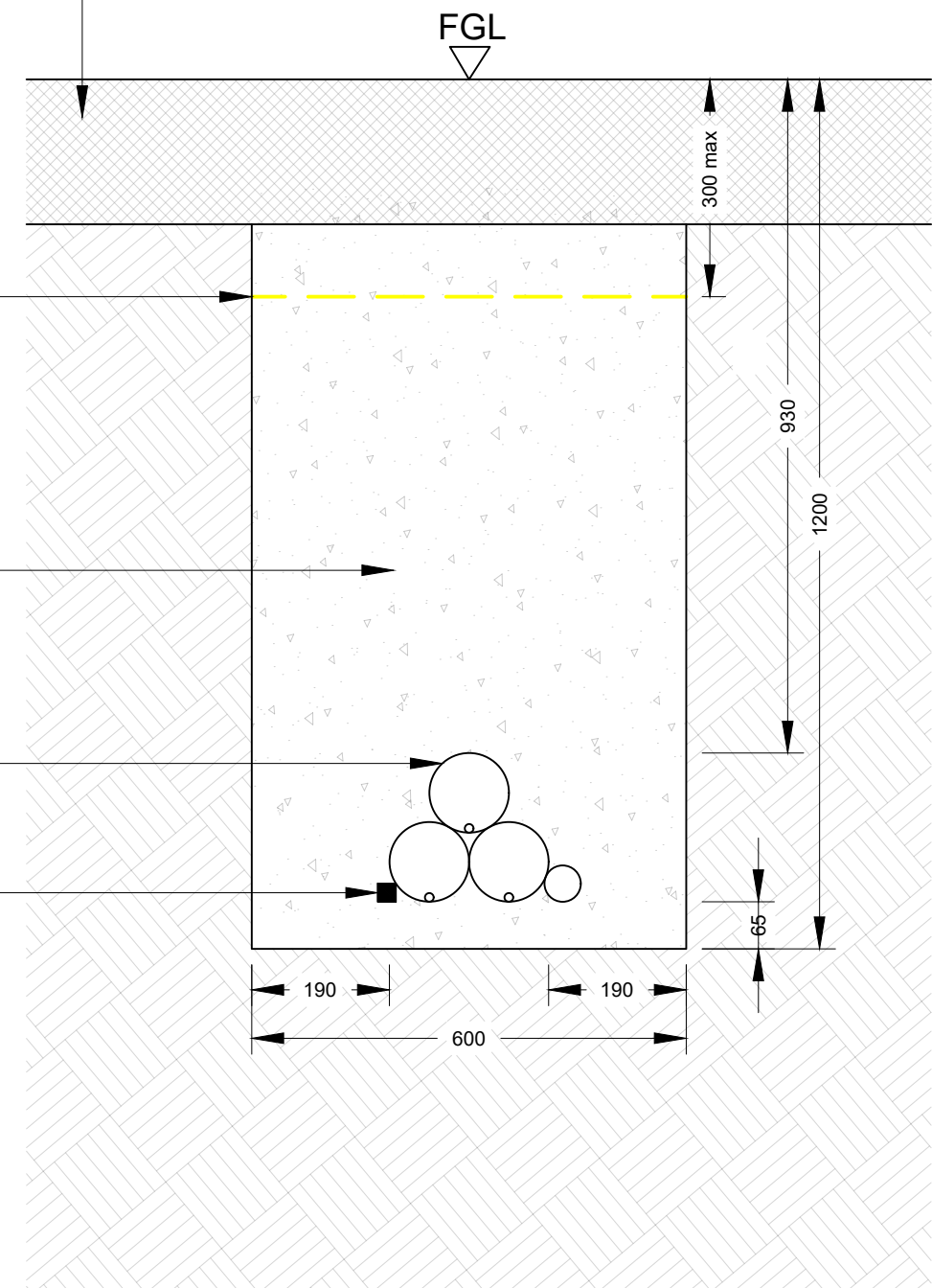
Trench backfilled with clause 804
material and compacted in accordance
with NRA guidelines.

110mm Diameter Ducts, complete with
12mm Diameter draw ropes.

50mm Diameter solid wall
fibre optic cable ducting.

25mm Square earth
conductor.

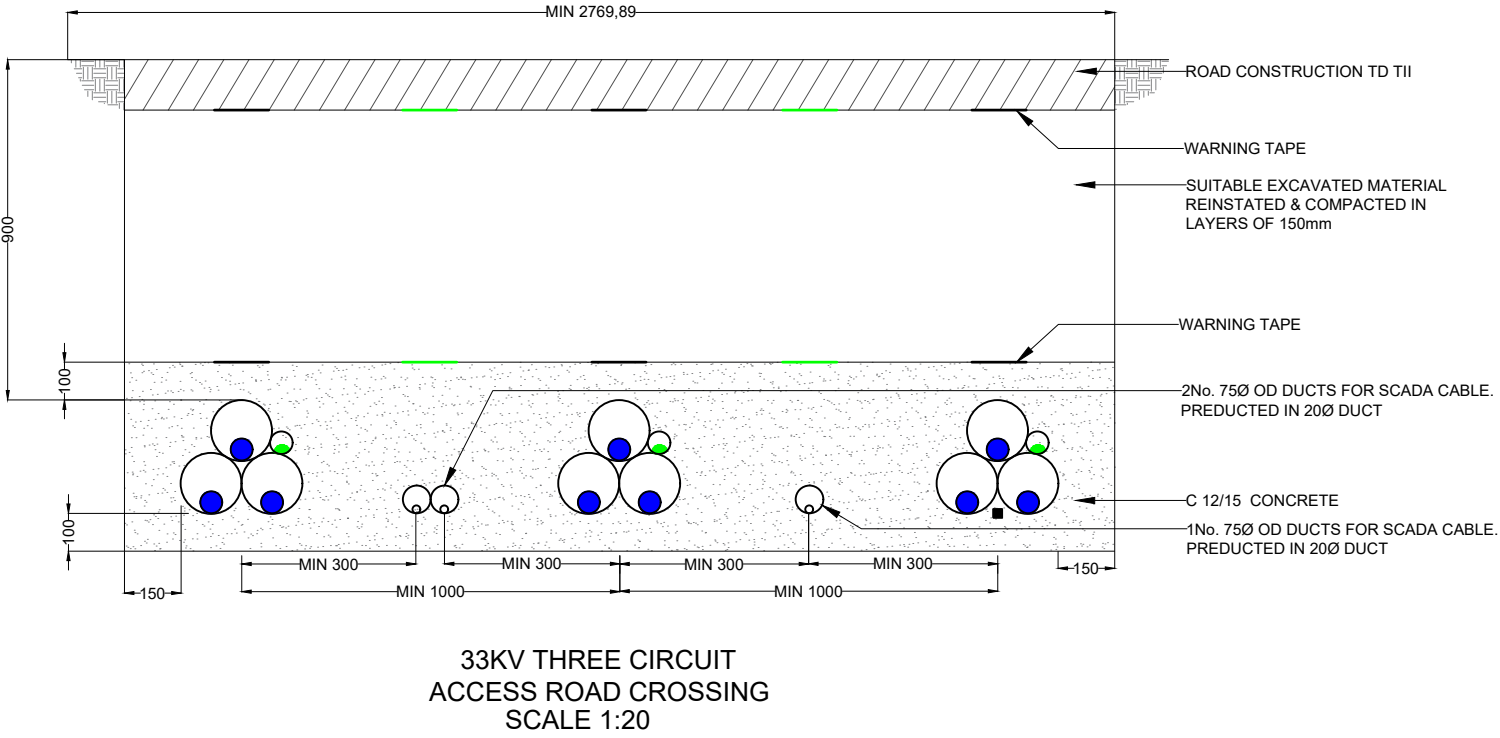
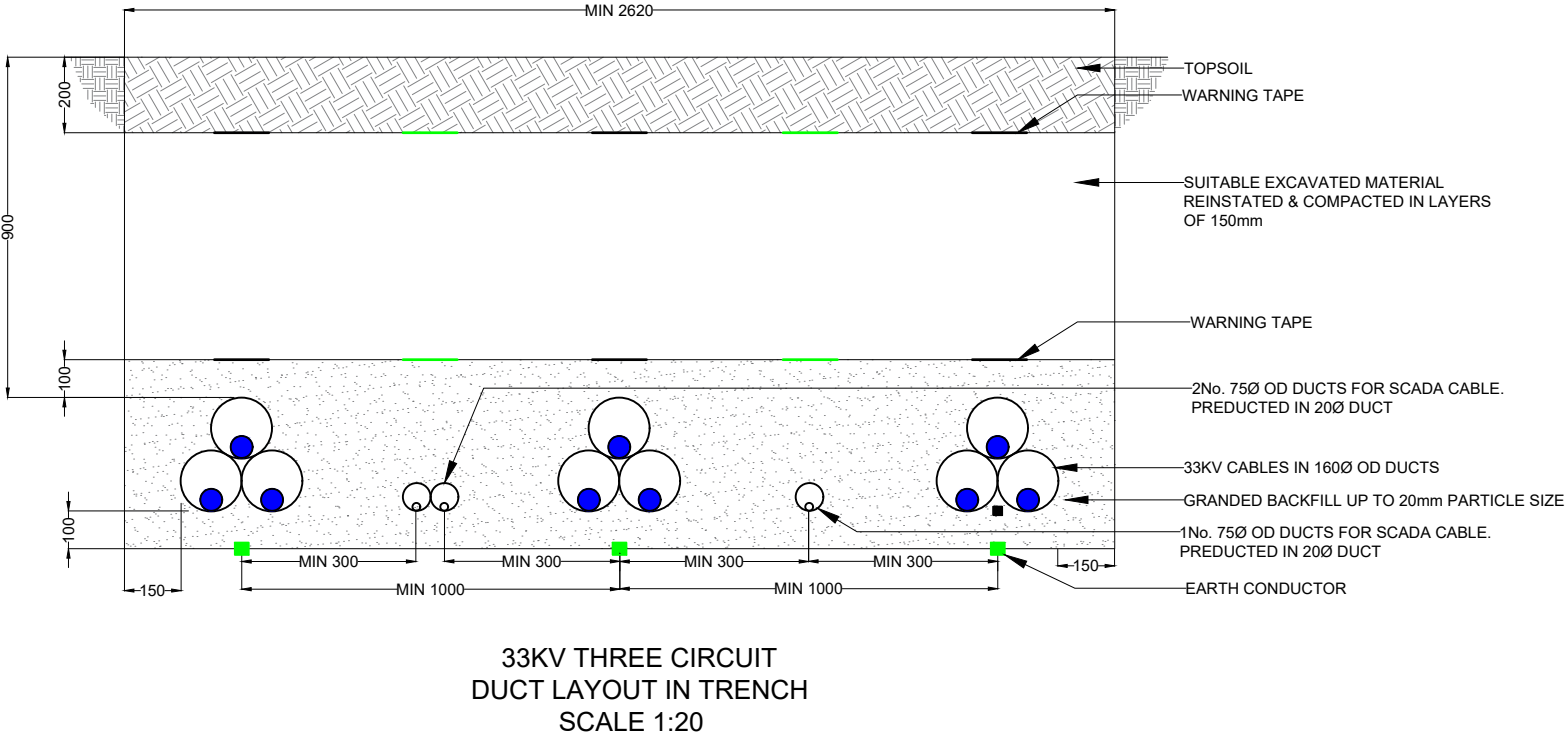
Topsoil layer to be
reinstated



20/33kV Cable - Off Road Trench Detail - Cross Section

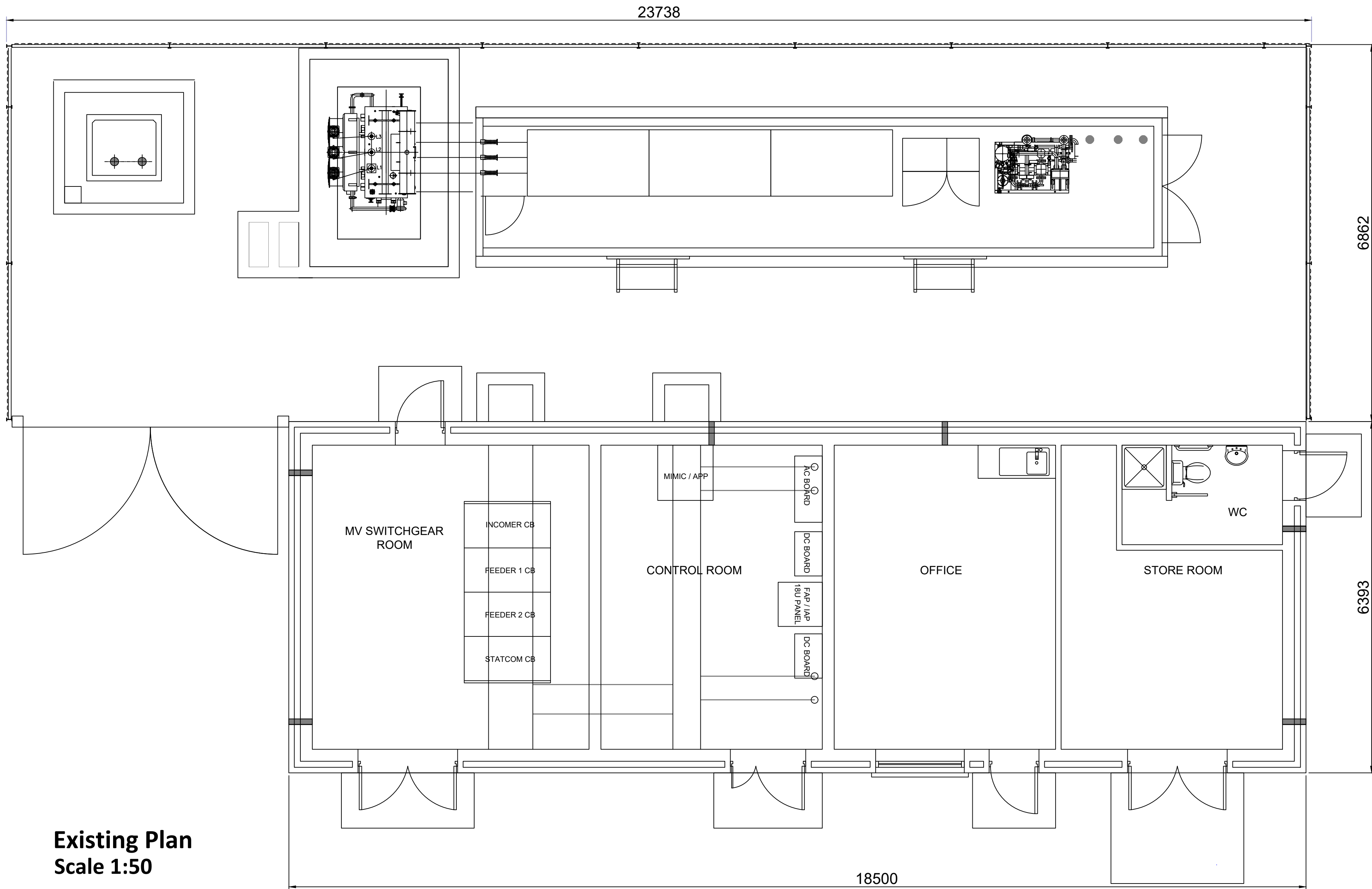
PROJECT TITLE:			
SSE Crumhach Wind Farm			
DRAWING TITLE:			
33kV Cable Trench Details			
PROJECT No.:	DRAWING No.:	SCALE:	
230841	Figure 4-21	1:10 @ A3	
DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
GO	BT	28.07.2026	P01
			
Email: info@www.mkoireland.ie /Website: www.mkoireland.ie			

- NOTES:
1. ALL DIMENSIONS NOTED ARE IN MM
 2. DRAWING IS FOR PLANNING PURPOSES ONLY
 3. 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 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



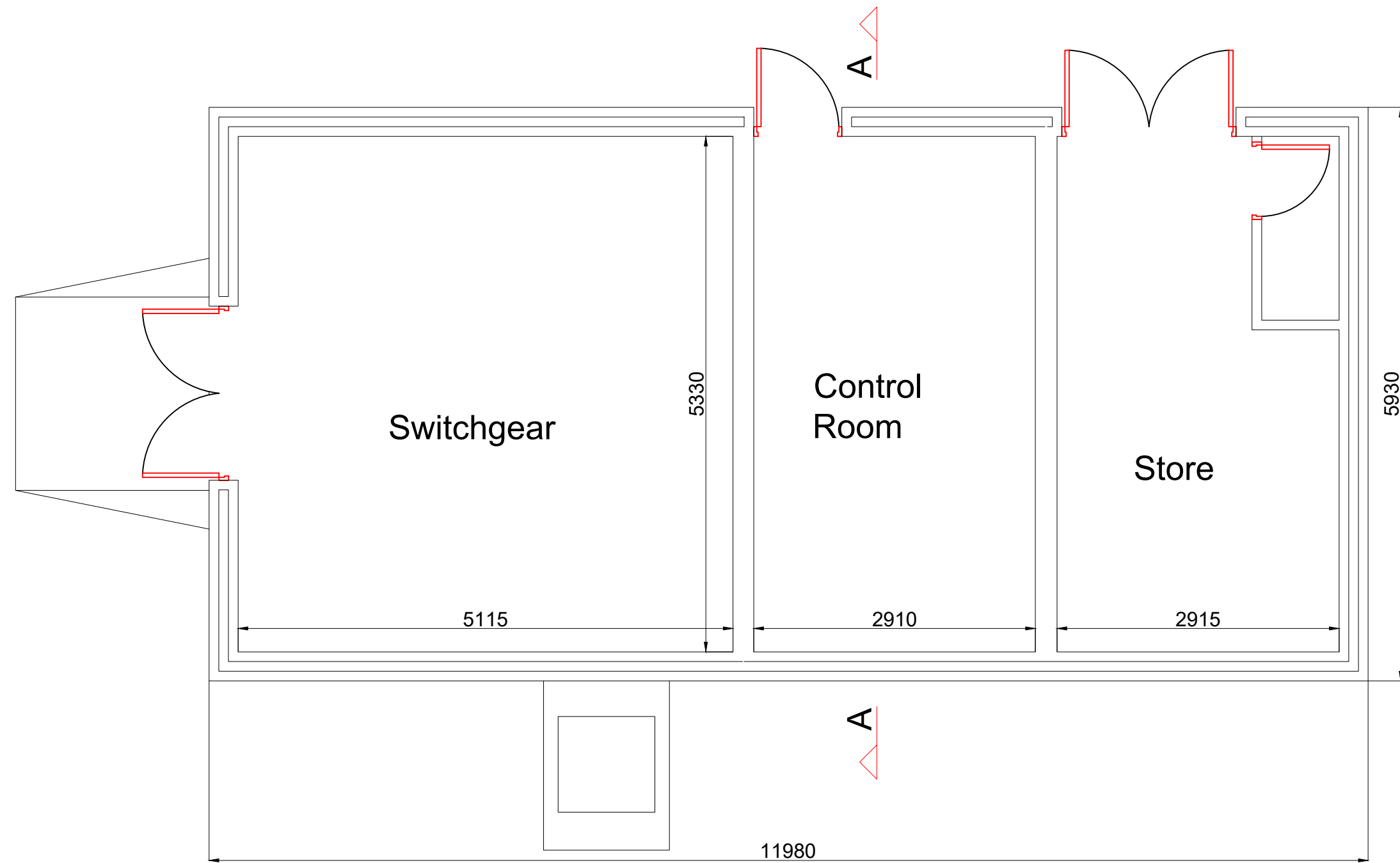
PROJECT TITLE:			
SSE Crumhach Wind Farm			
DRAWING TITLE:			
33KV Three Circuit Details			
PROJECT No.:	DRAWING No.:	SCALE:	
230841	Figure 4-22	1:20 @ A3	
DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
GO	BT	28.07.2026	P01



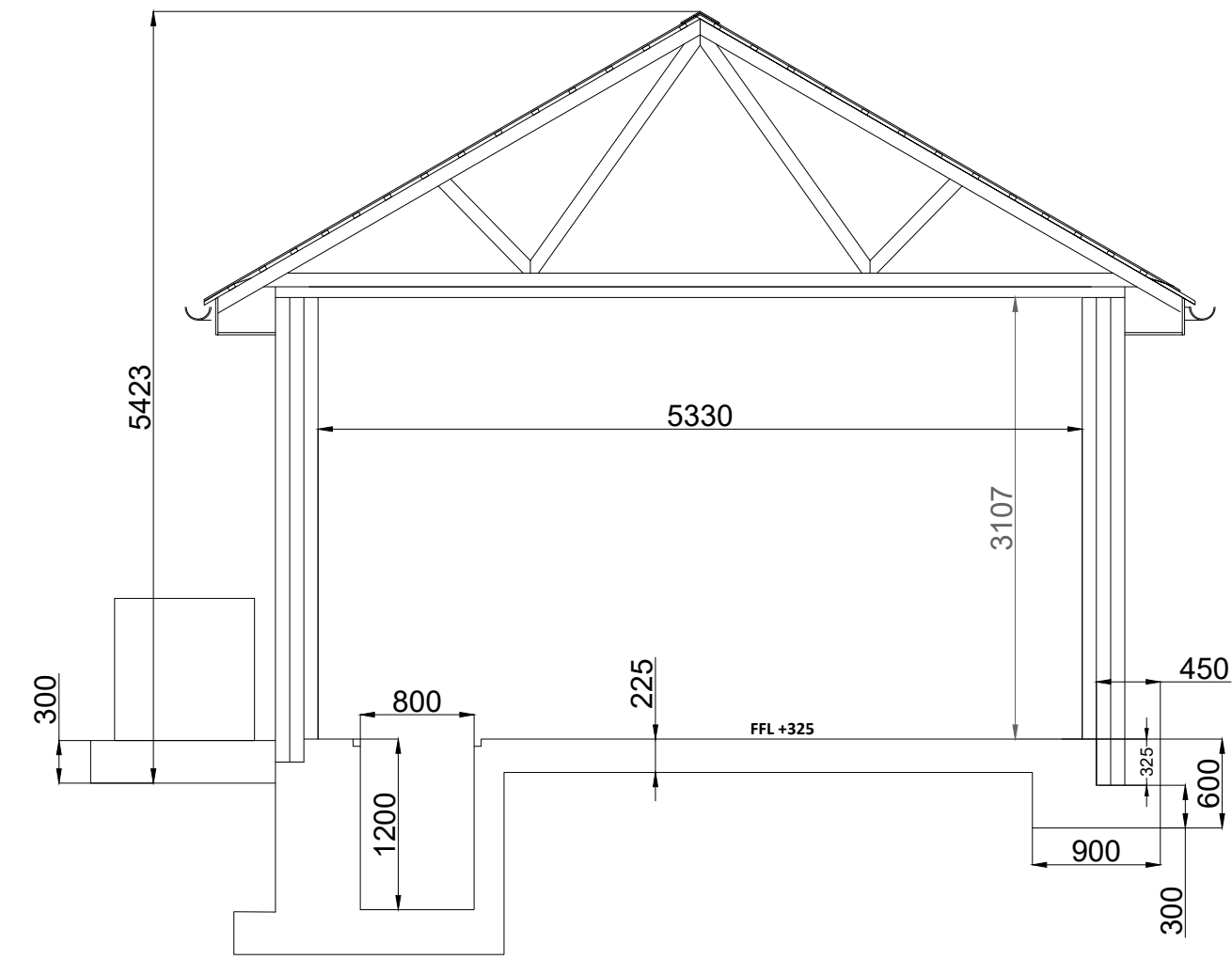


Existing Plan
Scale 1:50

PROJECT TITLE: SSE Crumhach Wind Farm			
DRAWING TITLE: Existing Dunneill Control Building Connection Point			
PROJECT No.: 230841	DRAWING No.: Figure 4-23	SCALE: 1: 50 @ A2	
DRAWN BY: GO	CHECKED BY: BT	DATE: 28.07.2026	REVISION: P01
OS SHEET No.: —			
			
Email: info@www.mkoireland.ie Website: www.mkoireland.ie			



Existing Plan
Scale 1:50



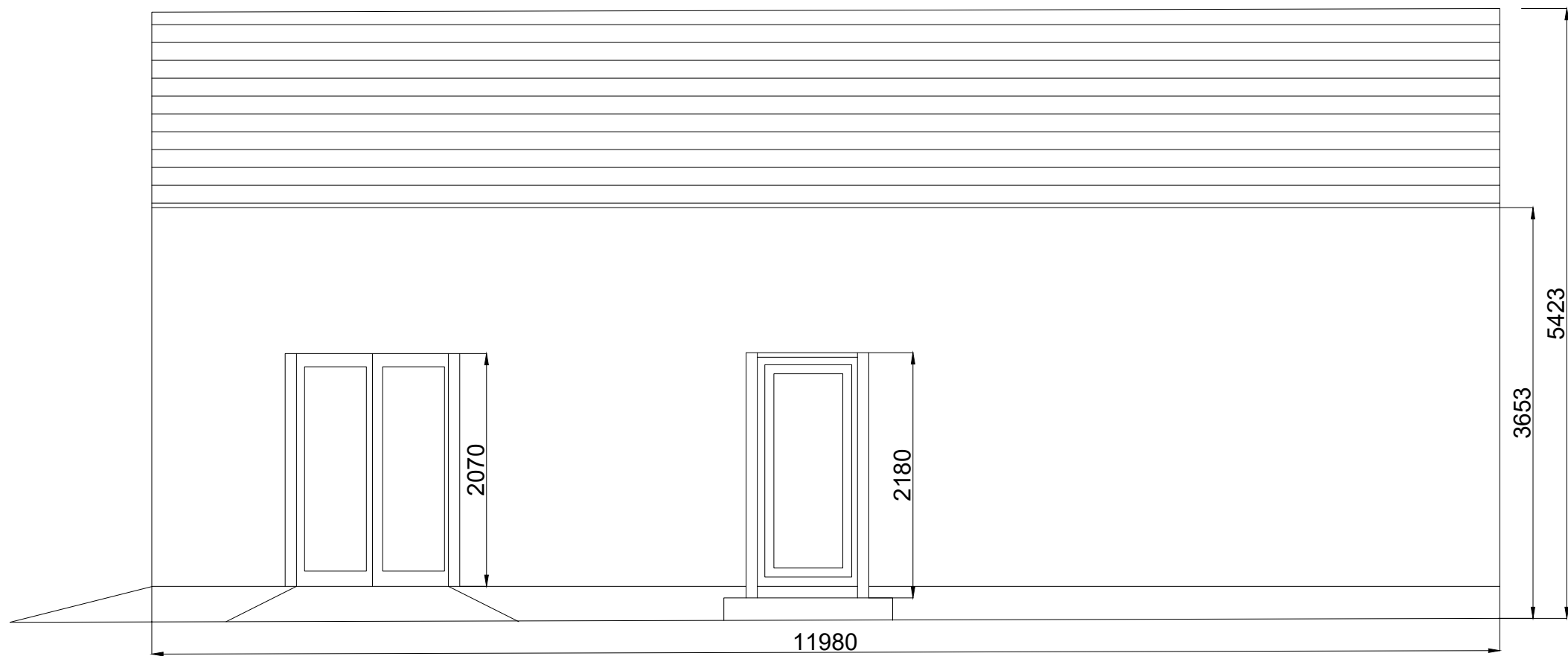
Existing Section 'A-A'
Scale 1:50



Existing Rear Elevation
Scale 1:50



Existing Side Elevation
Scale 1:50



Existing Front Elevation
Scale 1:50



Existing Side Elevation
Scale 1:50

4.3.2.9 Temporary Construction Compounds

There are 4 no. temporary construction compounds proposed as part of the Proposed Project. 2 no. of these temporary construction compounds are located on areas of existing hardstanding which will be upgraded and extended in order to accommodate the compounds. A summary of the temporary construction compounds are provided in Table 4-4 below:

Table 4-4 Temporary construction compounds

Temporary Construction Compound	Location (approx..)	Located on Existing Hardstanding	Area (m2)
1	175m west of T05	No	1,800
2	660m northwest of T06	No	1,800
3	360m north of T08	Yes	1,800
4	325m west of T14	Yes	1,800

The layout of a temporary construction compound is shown on Figure 4-25 (Temporary Construction Compound 1) and further detailed in Appendix 4-1: Site Layout Drawings..

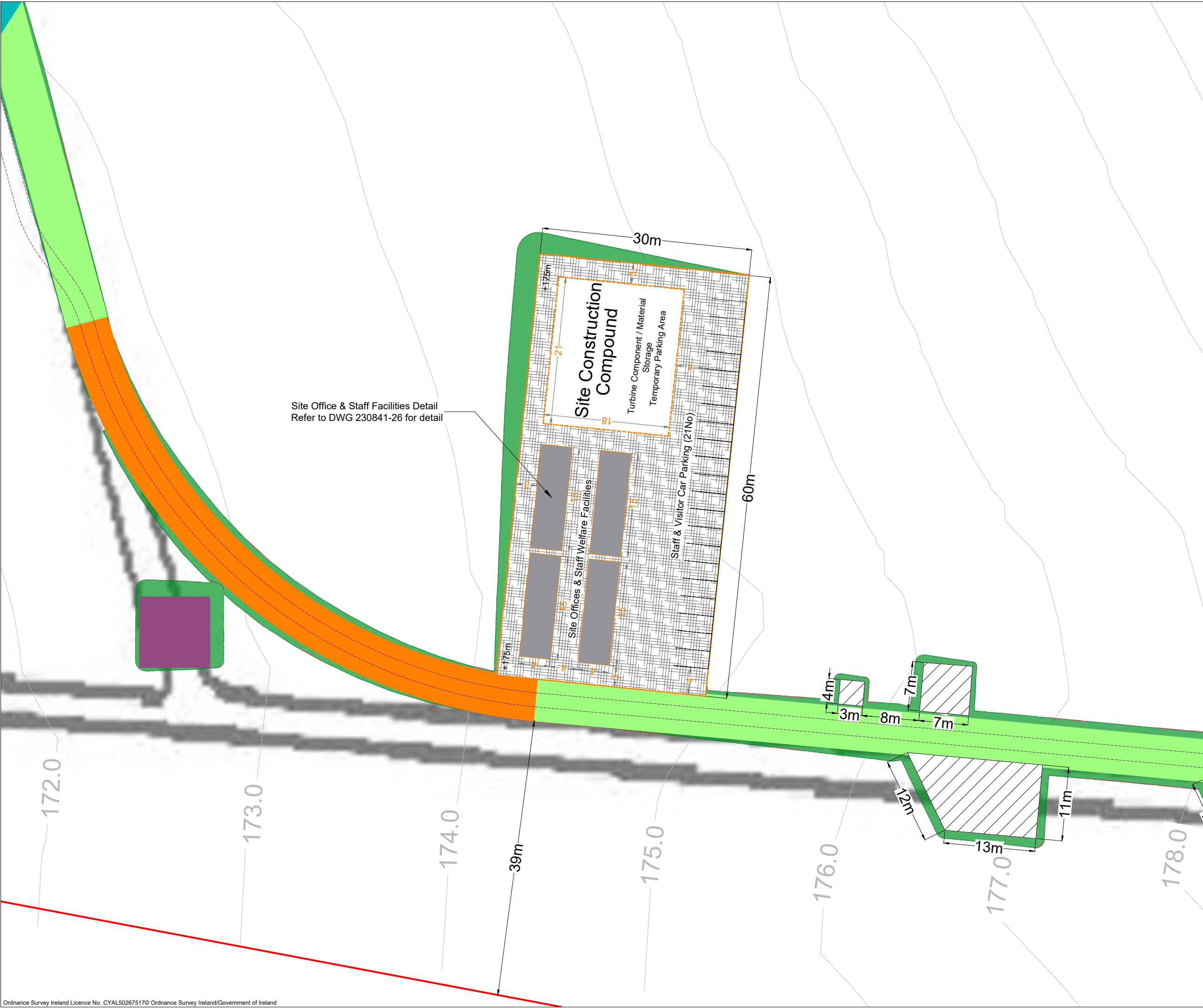
The temporary construction compounds will consist of a bunded refuelling and containment area for the storage of lubricants, oils and site generators, etc, and full retention oil interceptor, waste organic storage area, welfare facilities including temporary site offices, staff facilities and car parking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

Upon completion of the construction phase, the temporary construction compounds will be removed as part of the post-construction reinstatement works of the Proposed Wind Farm. The concrete foundations of the compound will be left in situ and will be left to revegetate naturally.

The temporary construction compounds will facilitate the temporary storage of some general construction materials, however, turbine components will be brought directly to the proposed turbine locations following their delivery to the Proposed Wind Farm.

4.3.2.10 Onsite LiDAR Compounds

2 no. LiDAR compounds are proposed as part of the Proposed Project. One LiDAR compound will be installed approx. 380m west of T05 along an existing access road and the other approx. 110m southwest of T16 on an area of existing hardstanding upon which an existing turbine (which is proposed to be removed as part of the Proposed Project) is situated. These hardstandings will be 17.5m² in area each and will accommodate the equipment that will be used to install the LiDAR compounds. The proposed LiDAR compounds will be equipped with wind monitoring equipment, uninterrupted power supply and interface panel with palisade fencing. will be constructed Detail of the proposed LiDAR compound is shown in Figure 4-26.



- Drawing Notes**
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 2. Drawings not to be used for construction/contract conditions.
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 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
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 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Planning Application Boundary
- Existing Access Track to be Upgraded
- Proposed New Tracks
- Internal Cable Trench
- Hardstand
- Proposed Onsite LiDAR Compound
- Fill
- Cut

PROJECT TITLE:
Crumhach Wind Farm, Co. Sligo

DRAWING TITLE:
Temporary Construction Compound 01

PROJECT No.: 230841 **DRAWING No.:** Figure 4-25 **SCALE:** 1:500 @ A3

DRAWN BY: GO **CHECKED BY:** N/A **DATE:** 29.07.2026 **REVISION.:** P01

OS SHEET No.: 949, 950, 951, 952, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1321, 1322, 1323, 1324, 1325, 1326, 1327

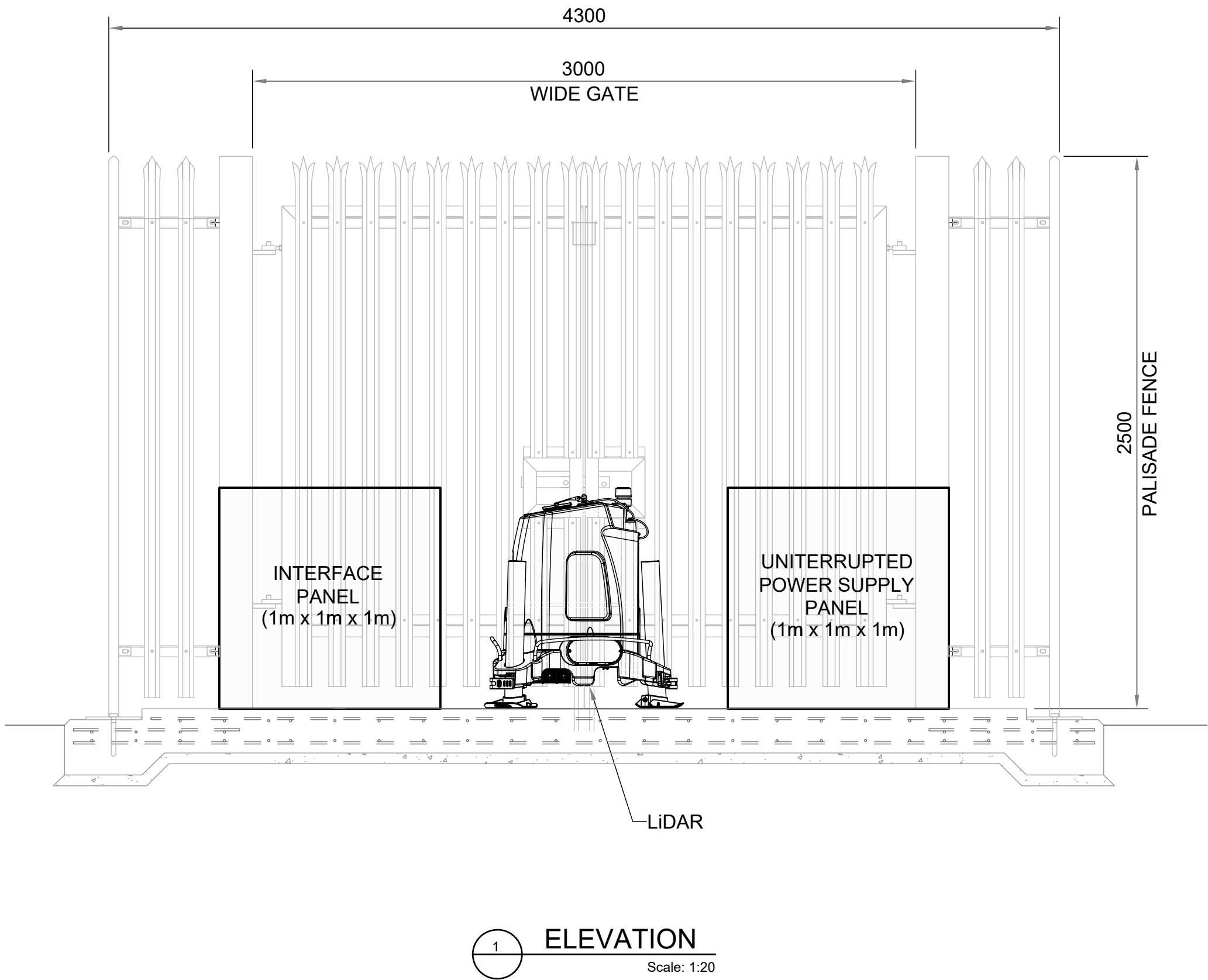
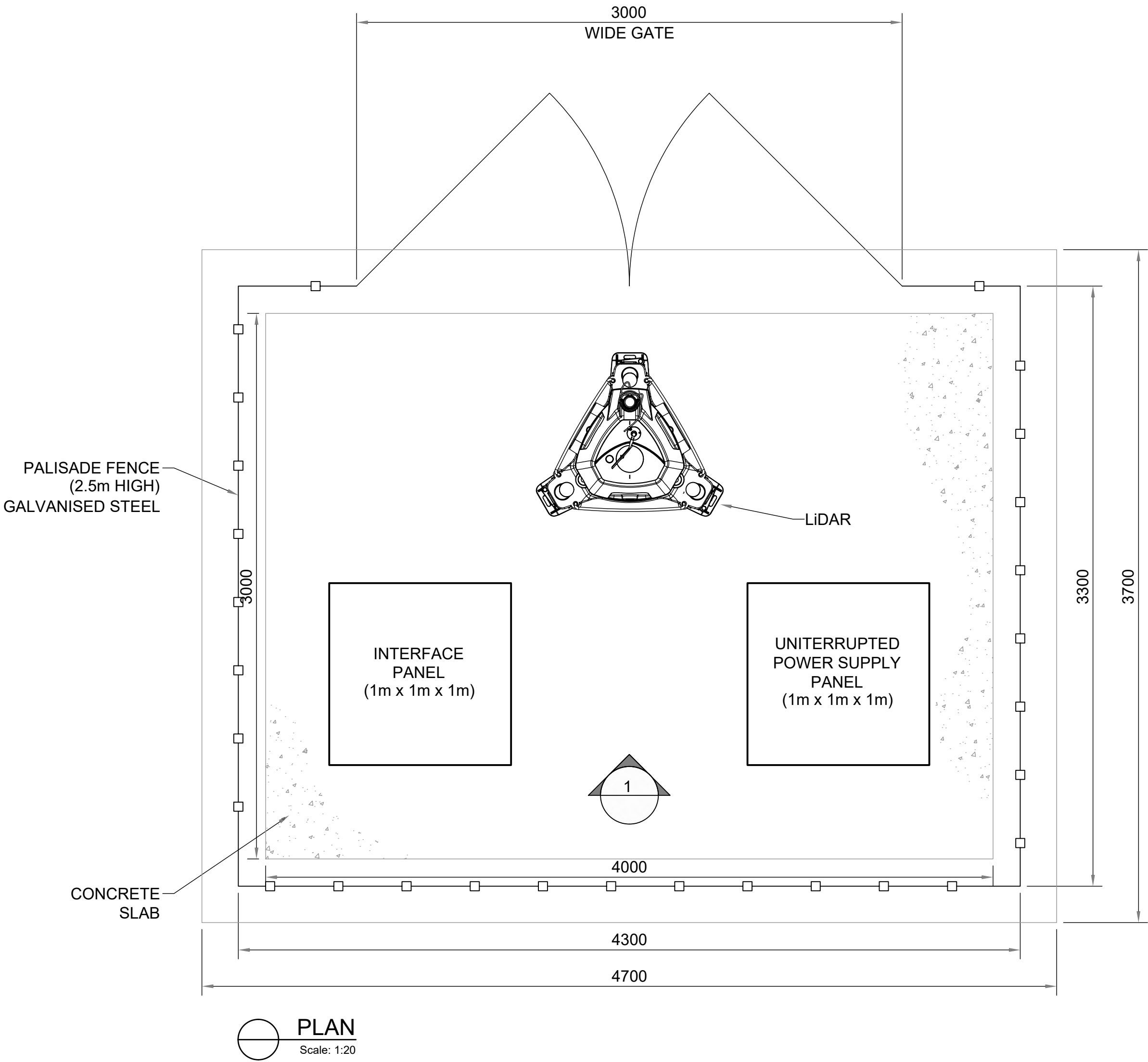
OS SHEET No.: 949, 950, 951, 952, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1321, 1322, 1323, 1324, 1325, 1326, 1327

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Notes

1. All dimensions are in millimetres (mm) unless stated otherwise.



PROJECT TITLE: SSE Crumhach Wind Farm			
DRAWING TITLE: Onsite LIDAR Compound Details & Section			
PROJECT No.: 230841	DRAWING No.: Figure 4-26	SCALE: 1:20 @ A2	
DRAWN BY: GO	CHECKED BY: BT	DATE: 28.07.2026	REVISION: P01
OS SHEET No.: —			
			
Email: info@www.mkoireland.ie Website: www.mkoireland.ie			

4.3.2.11 Biodiversity Management and Enhancement Plan

A Biodiversity Management and Enhancement Plan (BMEP) has been prepared for the Proposed Project and is included as Appendix 6-4 of this EIAR. This plan has been developed to offset the loss of habitats identified within the Proposed Wind Farm site and further enhance the biodiversity of the Proposed Wind Farm and its environs, in line with biodiversity net gain (BNG) requirements identified in the Sligo County Development Plan 2024-2030.

The BMEP has set out measures to be implemented during establishment and management phases to ensure that the measures are successful, as well as regularly monitoring by an ecologist to ensure the success of the habitat restoration measures. The following BMEP objectives are proposed as part of the Proposed Project:

- › **Objective A:** To enhance habitat condition of 36ha of degraded peatland habitats to favourable conservation status for upland blanket bog with affinities to Annex 1 habitat Blanket bog [7130]. For this to be an objective a baseline condition assessment in line with guidance was undertaken showing areas of poor conservation status, the measures, remedial actions and measurements of success proposed which will allow us to demonstrate favourable conservation status of the habitat in future, thereby creating a biodiversity net gain (BNG) by enhancing unfavourable habitats.
- › **Objective B:** To safeguard existing peatland habitats within the 36ha management area which links up existing peatland habitats of the Ox Mountains Bogs SAC, thereby improving habitat connectivity.
- › **Objective C:** To implement a grazing management regime which will enhance 36ha of overgrazed peatland habitats and safeguard existing peatland habitat with good conservation status, thereby protecting existing habitat and offsetting the loss of 0.5ha of marginal blanket bog habitat for the Proposed Project.
- › **Objective D:** To restore the proposed 5.45ha of peat and spoil management areas over cutover bog and restore the peatland condition to an active peat forming system, thereby mitigating the loss of 3.6ha of cutover bog habitat for the Proposed Project.
- › **Objective E:** To provide a management and monitoring plan to ensure the success of the proposed biodiversity enhancement and offsetting measures.

The proposed biodiversity enhancement area is shown on Figure 4-2, and full details of the BMEP are provided in Appendix 6-4 of the EIAR.

4.3.2.12 Tree Felling and Replanting

4.3.2.12.1 Tree Felling for Construction and Operation of Proposed Wind Farm

Tree felling will be required within and around Proposed Wind Farm infrastructure footprint to allow for the construction of 9 no. Proposed Turbine bases, access tracks, onsite 110kV substation, underground cabling, and the other ancillary infrastructure. 29.3ha of conifer plantation will be felled to accommodate the Proposed Wind Farm construction and operation. Areas proposed for tree felling are showing in Figure 4-27 below.

Further details on tree felling required within and around the Proposed Wind Farm footprint on the is detailed in Chapter 6 of this EIAR.

The commercial forestry felling activities required as part of the Proposed Wind Farm will be the subject of a Limited Felling Licence (LFL) application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licences for wind farm developments. The policy requires that a copy of the planning permission for the Proposed Wind Farm be submitted with the felling licence application;

therefore, the felling licence cannot be applied for until such time as planning permission is obtained for the Proposed Wind Farm.

4.3.2.12.2 **Forestry Replanting**

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

The identified 29.3 ha of commercial forestry that will be permanently felled for the Proposed Wind Farm will be replaced or replanted on a hectare for hectare basis as a condition of any felling licence that will be issued in respect of the Proposed Wind Farm. 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 29.3ha of forestry felled as part of the Proposed Wind Farm may occur on any lands, within the State benefitting from Forest Service Technical Approval³ for afforestation, should the Proposed Wind Farm receive planning permission. Under the Forestry Regulations 2017, all applications for licences for afforestation require the prior written approval (technical approval) of the Minister for Agriculture, Food and the Marine. Before the Minister can grant approval, he/she must first determine if the project is likely to have significant effects on the environment (for EIA purposes) and assess if the development, individually or in combination with other plans or projects is likely to have a significant effect on a European site (for Habitats purposes).

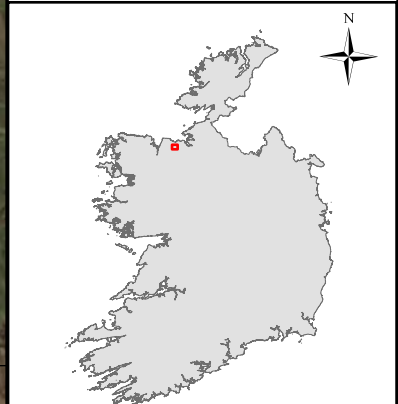
For the balance of the replanting obligation, the Applicant commits to replanting 29.3 ha of forestry outside the hydrological catchment within which the Proposed Project is located. On this basis, it is reasonable to conclude that there will be no cumulative effects associated with the replanting of 29.3 ha of forestry. Therefore, the 29.3 ha of forestry replanting is not considered further in the impact assessment chapters of this EIAR. In addition, the Applicant commits to not commencing the Proposed Project until both a felling and afforestation licence(s) is in place and, therefore, this ensures the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority.

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



- Map Legend
- EIAR Site Boundary
 - Proposed Project Infrastructure Footprint
 - Forestry Felling Areas

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SITE LOCATION - NOT TO SCALE

Drawing Title
Proposed Forestry Felling Areas

Project Title
Crumhach Wind Farm, Co. Sligo

Project No.	Drawing No.	Scale
230841	4-27	1:20,000
Drawn By	Checked By	Date
MVN	BT	01/07/2026



4.3.3 Proposed Grid Connection Route

4.3.3.1 Underground 110kV Electrical Cabling

It is intended to connect the onsite 110kV substation to the existing Srananagh 220kV substation in the townland of Ballysumaghan, Co. Sligo via 110kV underground electrical cabling. The exact connection node is to be confirmed by EirGrid and subject to change at their request. The underground electrical cabling route, illustrated in Figure 4-1, is approx. 41.6km in length and located primarily within the public road corridor, with approx. 130m located within the Proposed Wind Farm.

The Proposed Grid Connection Route will originate at the proposed onsite 110kV substation and run northeast for approx. 130m through a proposed access track before turning continuing east and then north along the L6309 Local Road network for approx. 6.6km. The Proposed Grid Connection Route then follows the N59 National Road east for 26.2km before continuing southeast for 6.9km on the R290 Regional Road. The Proposed Grid Connection Route then joins the R284 Regional Road heading southeast for 2.8km on the L6234 Local Road before heading east onto the L5204 Local Road for 1.8km. From the L5204 the Proposed Grid Connection Route turns left and travels a final 400m into the existing Srananagh 220kV substation.

The Proposed Grid Connection Route underground cabling trench will consist of 3 no. 160mm diameter HDPE power cable ducts, 2 no. 125mm diameter HDPE communications ducts and 1 no. 125mm diameter earth continuity conductor duct to be installed in an excavated trench, typically 825mm wide by 1315mm deep, with variations on this design to adapt to service crossings and watercourse crossings. The power cable ducts will accommodate 1 No. power cable per duct. The communications duct will accommodate a fibre cable to allow communications between the proposed onsite 110kV substation and Srananagh 220kV substation.

The methodology for construction of the Proposed Grid Connection Route underground electrical cabling is presented in Section 4.8.3 below and included in Appendix 4-7 of the EIAR. Cross sections of the 110kV underground cabling trench in public roads and access tracks are shown in Appendix 4-8.

4.4 Site Activities

4.4.1.1 Environmental Management

All proposed activities on the Site will be provided for in a Construction and Environmental Management Plan (CEMP). A CEMP has been prepared for the Proposed Project and is included in Appendix 4-5 of this EIAR.

The CEMP sets out the key environmental considerations to be considered by the contractor during construction of the Proposed Project. The CEMP includes details of drainage, peat and spoil management, waste management, and details the mitigation and monitoring measures to be implemented in order to comply with the environmental commitments outlined in the EIAR and NIS. The contractor will be contractually obliged to comply with all such measures. In the event planning permission is granted for the Proposed Project, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for approval.

4.4.1.2 Refuelling

Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as

required on a scheduled and organised basis. Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use.

All refuelling will be carried out outside designated watercourse buffer zones. Only designated trained and competent operatives will be authorised to refuel plant on-site. Mobile measures such as drip trays and fuel absorbent mats will be used during refuelling operations as required. All plant and machinery will be equipped with spill kits including fuel absorbent material and pads to deal with any event of accidental spillage.

4.4.1.3 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. Quarries that could potentially provide stone and ready-mix concrete for the Proposed Project are detailed below in Section 4.5.2.

The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. When concrete is delivered to Site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the Site. Concrete trucks will be washed out fully at the batching plant, where facilities are already in place.

A dedicated concrete wash out area will be established on site. The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area. The residual liquids and solids will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility. Where temporary lined impermeable containment areas are used, such containment areas are typically built using straw bales and lined with an impermeable membrane. Two examples are shown in Plates 4-4 and Plate 4-5 below.



Plate 4-5 Concrete washout area



Plate 4-6 Concrete Wash Out Area

At the end of the concrete pours, any of the remaining liquid contents will be tankered off-site to an appropriately authorised facility as necessary. Any residual solid contents that will have been cleaned down from the chute will have solidified and can be broken up and disposed of along with other construction waste, as noted above, by an appropriately authorised waste collector for disposal at an authorised waste facility.

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

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

4.4.1.4 Concrete Pouring

Due to the volume of concrete required for each turbine foundation, and the requirement for the concrete pours to be continuous, deliveries are often carried out outside normal working hours in order to limit the traffic impact on other road users, particularly peak period school and work commuter traffic. Such activities are limited to the day of turbine foundation concrete pours, which can be completed in a single day per turbine. The main concrete pours will be planned approximately one 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 lorry's chute will be directed into a temporary lined impermeable containment area,
- › Disposing of surplus concrete after completion of a pour in agreed suitable locations away from any watercourse or sensitive habitats.

4.4.1.5 Dust Suppression

In periods of extended dry weather, dust suppression may be necessary in areas within the Proposed Project footprint and associated haul roads to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling ponds in the Site's drainage system and will be pumped into a bowser or water spreader to dampen down the relevant areas to prevent the generation of dust. Silty or oily water will not be used for dust suppression, as this would generate polluted runoff or more dust.

4.4.1.6 Vehicle Washing

Wheels or vehicle underbodies are often washed before leaving sites to prevent the build-up of mud on public (and site) roads. It is not anticipated that vehicle or wheel washing facilities will be required as part of the construction phase of the Proposed Project as site roads will be formed before road-going trucks begin to make regular or frequent deliveries to the Site (e.g. with steel or concrete). However, to ensure a wheel wash facility is available should this be required, a wheel wash has been included in the design of the Proposed Project. The Proposed Wind Farm roads will be well finished with compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt.

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

4.4.1.7 Waste Management

The CEMP, Appendix 4-5 of this EIAR, provides a waste management plan (WMP) which outlines the best practice procedures during the construction phases of the project. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort. The WMP has been produced in line with the following guidance *'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects'* (EPA, 2021)⁴. The WMP has been prepared to outline the main objectives that are to be adhered to for the preparation of a more detailed WMP to be completed prior to the construction phase of the Proposed Project. The WMP will be in place throughout the construction and decommissioning phase of the Proposed Project and will be in line with all relevant legislation detailed in Section 3.8 in Appendix 4-5.

⁴ EPA 2021 Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects <<https://www.epa.ie/publications/circular-economy/resources/CDWasteGuidelines.pdf>>

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

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

Prior to the commencement of the development, an Ecological Clerk of Works (ECoW) 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 permits/licenses and authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the development adheres to the management plan.

The WMP will provide systems that will enable all arisings, movements and treatments of construction waste to be recorded. The system will describe the waste types expected to be produced during the project and identify the waste management action proposed (please refer to Section 3.8.2 and Section 3.8.3 in Appendix 4-5). Estimates of the quantities to be produced will be inserted into a detailed waste management spreadsheet and the data will be updated as the work progresses, and information is available and performance against the estimates will be monitored. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The WMP can then be adapted with changes that are seen through record keeping.

4.5 Site Access and Transportation

4.5.1 Site Entrances

The location of construction phase and operational phase site access points are shown in Figure 4-28. A Traffic Management Plan is included in Chapter 15 and Appendix 15-2 of this EIAR. In the event planning permission is granted for the Proposed Project, an updated Traffic Management Plan will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned. These access and egress points are shown on the site layout drawings in Appendix 4-1.

Main Site Entrance

During the construction and operation phase, the Proposed Wind Farm will be accessed via the existing site entrance from the L6309 Local Road, previously used for the Existing Wind Farm. This entrance will be widened to facilitate the delivery of the construction materials and turbine components. The Proposed Wind Farm site entrance was subject to Autotrack assessment to identify the turning area required, as described in Section 15.1 of the Traffic and Transport Assessment. Appropriate sightlines will be established to the north and south of the proposed site entrance for the safe access and egress of traffic. The proposed works will result in a permanent upgrade of this existing site access from the L6309 local road, which will also form the main site entrance to the Proposed Wind Farm during the operational phase.

Access and Egress Points

The Proposed Wind Farm site is currently served by a number of existing tracks and public roads. As part of the Proposed Wind Farm, it is proposed to utilise 1 no. existing access/egress locations along the L2702, construct 2 no. new access/egress locations along the L2702 and 1 no. new access/egress location along the L6309. These access and egress entrances will be used throughout the construction, operation, and decommissioning phases of the Proposed Wind Farm to enable delivery of materials and turbine components (construction phase), maintenance and monitoring use (operational phase), and removal of Proposed Wind Farm infrastructure (decommissioning phase).

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 the Traffic and Transport Assessment. Appropriate sightlines will be established for the safe access and egress of traffic during the operational phase, and security gates and compounds will be included at all site entrances. Please see Section 15.1.11 of Chapter 15 for further information

Please see Table 4-5 and Figure 4-28 below for details on the locations of these entrances and their proposed use.



Map Legend

- ElAR Site Boundary
- Site Entrances

SITE LOCATION - NOT TO SCALE

Drawing Title

Site Entrance Locations

Project Title

Crumhach Wind Farm, Co. Sligo

Project No.	Drawing No.	Scale
230841	4-28	1:15,000
Drawn By	Checked By	Date
MVN	BT	01/07/2026

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

Table 4-5 Proposed Construction and Operational Phase Site Entrances

Access and Egress No.	Description	Used for Turbine Delivery	Used during Construction Phase	Used During Operational Phase (maintenance and monitoring)	Existing Entrance	New Entrance
A	Located on the south side of L6309 local road this will be used by the construction/turbine delivery vehicle as an access point off the local road to access other wind farm infrastructure.	✓	✓	✓		
B	Located on the west side of L2702 local road this will be used by the construction/turbine delivery vehicle as an access point off the local road to access other wind farm infrastructure.	✓	✓	✓		✓
C	Located on the west side of L2702 local road this will be used by the construction/turbine delivery vehicle as an access point off the local road to access other wind farm infrastructure.	✓	✓	✓	✓	✓
D	Located on the south side of L6309 local road this will be the main site entrance	✓	✓	✓	✓	✓
E	Located on the east side of L2702 local road this will be used by the construction/operations vehicle as an access point for the proposed onsite 110kV substation.		✓	✓		

4.5.2 Deliveries of Stone and Ready-Mix Concrete from Quarries

While it is proposed to source crushed stone for the construction of the Proposed Project from the onsite borrow pits, a certain volume of crushed stone and hardcore materials and all ready-mix concrete that will be required during the construction phase will be sourced from local, appropriately authorised quarries. For the purposes of assessment within the EIAR, construction materials will be delivered to the Site via selected haul routes that will be determined based on the source of the construction material. All construction materials will ultimately access the wider Proposed Wind Farm via the main site entrance off the L6309 local road.

For the purposes of assessment within the EIAR, 3 no. existing, authorised quarries, located within 25km of the Proposed Wind Farm have been selected, that could potentially provide stone and concrete, are illustrated on Figure 4-29. Traffic movements generated by the Proposed Project are discussed in Section 15.1 of Chapter 15, Material Assets.

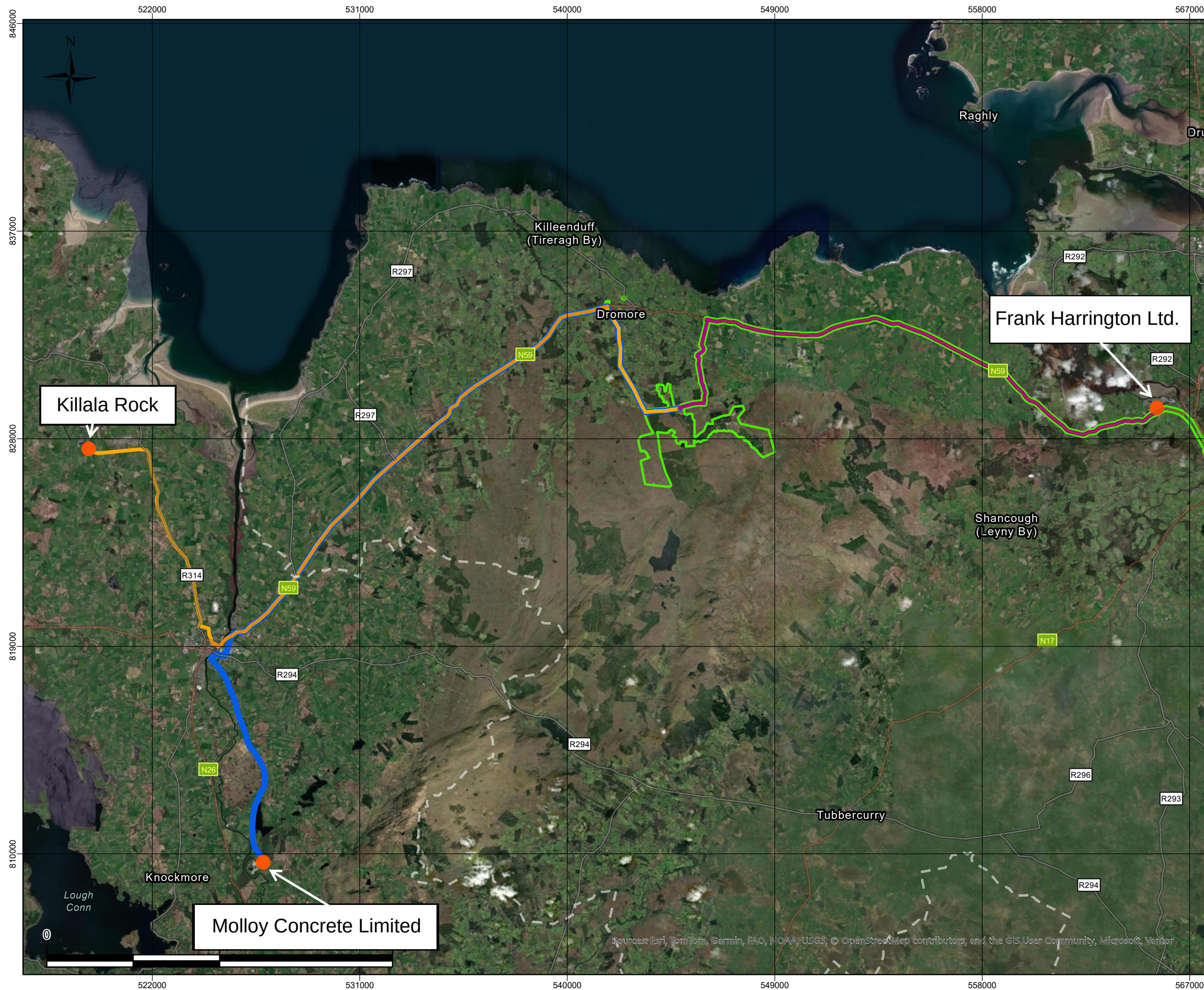
- › Frank Harrington Limited, Co. Sligo - 16.3km east of the Proposed Wind Farm
- › Molloy Concrete Limited, Co. Sligo - 23.1km southwest of the Proposed Wind Farm
- › Killala Rock, Co. Mayo - 24.1km west of the Proposed Wind Farm

4.5.3 Turbine Component Transport Route

It is intended that the port of entry for large turbine components will be Killybegs Port. As detailed in Chapter 3 of this EIAR, Killybegs Port was deemed to be the most suitable delivery port due to its proximity to the Site and the road network and existing infrastructure that exist between Killybegs port and the Site. Vehicles delivering large turbine components and other abnormal loads to the site will depart from Killybegs Port and travel east on the N56 towards Donegal, further south along the N15 towards Sligo before continuing south on N4 through Ballysadare, and subsequently merging onto the N59 heading west towards Dromore West. Delivery vehicles will then head south on the L2702 before turning east towards the site entrance in the townland of Crowagh or Dunneill Mountain, along the L6309. The proposed turbine delivery route is shown in Figure 4-31.

A turbine with the maximum blade length of 74 metres has been used in assessing the traffic impact of the Proposed Project. The blade transporter for such a turbine blade would have a total vehicle length of 83.9 metres, including the blade which overhangs the back of the vehicle. The total length of the tower transporter is 58 metres with the axles located at the front and rear of the load with no overhang.

The vehicles used to transport the nacelles will be similar to the tower transporter. All other vehicles requiring access to the Site will be smaller than the large turbine component transport vehicles. The turbine delivery vehicles have been modelled in the swept path assessments for the Site, as detailed in Chapter 15: Material Assets of this EIAR.



Map Legend

- ElAR Site Boundary
- Quarries
- Construction Haul Routes :
 - Molloy Concrete Ltd.
 - Killala Rock
 - Frank Harrington Ltd.

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

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SITE LOCATION - NOT TO SCALE

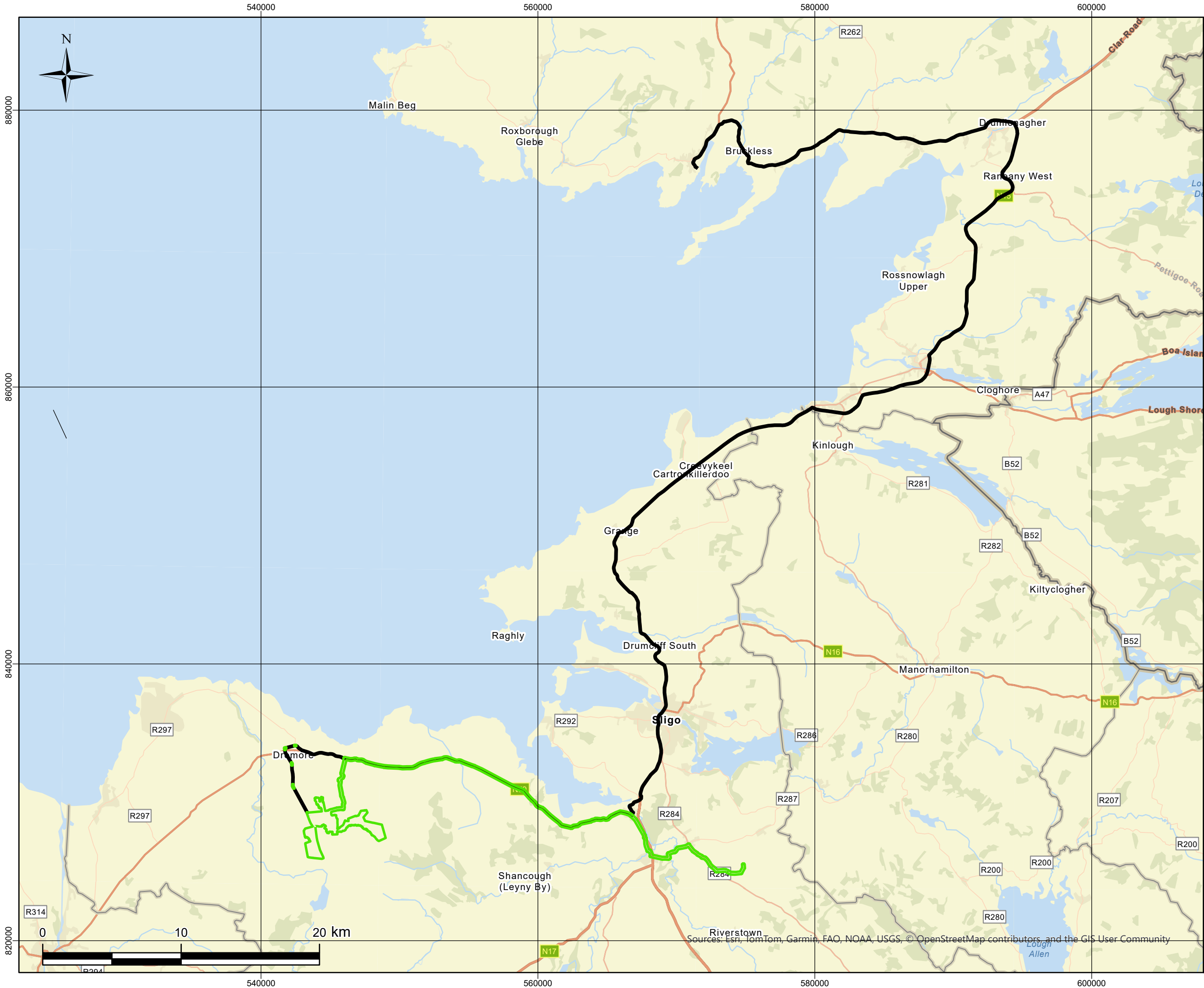
Drawing Title

Quarries within 25km

Project Title		
Crumhach Wind Farm, Co. Sligo		
Project No.	Drawing No.	Scale
230841	4-29	1:150,000
Drawn By	Checked By	Date
MVN	BT	25/05/2026

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

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Microsoft, Vantor



Map Legend

- EIAR Site Boundary
- Proposed Turbine Delivery Route

Spatial Reference
Name: IREN95 Irish Transverse Mercator
Datum: IREN95
Projection: Transverse Mercator

SITE LOCATION - NOT TO SCALE

Drawing Title
Proposed Turbine Delivery Route

Project Title
Crumhach Wind Farm, Co. Sligo

Project No. 230841	Drawing No. 4-31	Scale 1:250,000
Drawn By MVN	Checked By BT	Date 26/05/2026

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4.5.3.1 Turbine Delivery Route Accommodation Works

Road and junction widening are sometimes required along proposed turbine transport routes to accommodate the large vehicles used to transport turbine components to proposed project sites. The proposed transport route for the Proposed Project has been the subject of a route assessment to determine if any works are required along its length. Full details of the assessment are included as part of the traffic impact assessment set out in Section 15.1.10 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 turbine procurement process. Accommodation works will be required at various locations on the national and regional road network between the port of arrival in Killybegs and the Proposed Wind Farm site. These will be limited to temporary measures including temporary local road widening, overruns of roundabout island and private lands and temporary relocation of some signs and street furniture.

The locations of the accommodation areas are shown in Figure 4-1.

A route assessment was undertaken covering the proposed turbine delivery route, with the route assessment location shown in Figure 15-3a of Chapter 15. Full details of the Autotrack assessment for the Proposed Project are outlined in Appendix 15-3.

Location 1 – N15 Drumlonagher Roundabout

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape and roundabout island during the delivery of the abnormally sized loads for blade and truck body oversail, including removal of street furniture. Vegetation will also require to be trimmed.

Location 2 – N15 Tullyearl Roundabout

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape and roundabout island during the delivery of the abnormally sized loads for blade and truck body oversail, including removal of street furniture. An area will be required to be cleared and prepared for vehicle axle load to pass within roundabout island.

Location 3 – N15 Erne Roundabout

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape, and roadside vegetation during the delivery of the abnormally sized loads for blade and truck body oversail, including removal of street furniture. An area will be required to be cleared and prepared for vehicle axle load to pass within roundabout centre road dividers.

Location 4 – N15 Drumacrin Roundabout

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape and roundabout island during the delivery of the abnormally sized loads for blade and truck body oversail, including removal of street furniture. An area will be required to be cleared and prepared for vehicle axle load to pass within roundabout island.

Location 5 – N15 Tullaghan Roundabout

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape and roundabout island during the delivery of the abnormally sized loads for blade and truck body oversail, including removal of street furniture.

Location 6 – Bend on N15 (Near Grange)

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape during the delivery of the abnormally sized loads for blade oversail, including removal of street furniture.

Location 7 – Bend on N15 (Drumcliff)

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape during the delivery of the abnormally sized loads for blade oversail, including removal of street furniture.

Location 8 – Bend on N15 9 (Rathcormac)

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape during the delivery of the abnormally sized loads for blade oversail, including removal of street furniture.

Location 9 – N4 Summerhill Roundabout

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape and roundabout island during the delivery of the abnormally sized loads for blade and truck body oversail, including removal of street furniture.

Location 10 – N4 to N59 Junction

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape and road verge during the delivery of the abnormally sized loads for blade and truck body oversail, including removal of street furniture. An area will be required to be cleared and prepared for vehicle axle load to pass over road verge. Vegetation will also require to be trimmed / removed.

Location 11 – N59 South Bend

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape and road verge during the delivery of the abnormally sized loads for blade and truck body oversail, including removal of street furniture. Vegetation will also require to be trimmed.

Location 12 – N59 Ballysadare Roundabout

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape during the delivery of the abnormally sized loads during the delivery for blade and truck body oversail, including removal of street furniture. An area will be required to be cleared and prepared for vehicle axle load to pass over road verge/footpaths.

Location 13 – N59 Ballysadare Bridge

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape for blade and truck body oversail, including removal of street furniture. An area will be required to be cleared and prepared for vehicle axle load to pass over road verge/footpaths. Vegetation will also require to be trimmed.

Location 14 – N59 Abbeytown Bend

The preliminary swept path analysis indicates that temporary alterations will be required to the existing streetscape and adjacent private lands for blade and truck body oversail, including removal of street furniture and private wall. An area will be required to be cleared and prepared for vehicle axle load to pass over road verge. Vegetation will also require to be trimmed.

Location 15 – N59 Right Turn at Dromore West

The preliminary swept path analysis indicates that minor temporary alterations will be required to the existing streetscape for blade and truck body oversail, including the removal of street furniture. An area will be required to be cleared and prepared for vehicle axle load to pass over footpaths.

Location 16 – Dromore West

The preliminary swept path analysis indicates that temporary alterations will be required to the existing streetscape and adjacent private lands for blade and truck body oversail, including removal of private wall. This private wall will be reinstated 2 metres from the edge of the existing carriageway following the completion of the turbine delivery works.

Location 17 – Dromore West Turn South

The preliminary swept path analysis indicates that temporary alterations will be required to the existing streetscape and adjacent private lands for blade and truck body oversail, including removal of hedgerow vegetation. An existing overrun hardstand area will be required to be cleared and prepared for vehicle axle load to pass over.

The analyses indicates that a temporary run-over area and visibility splays will be required at this junction in order to accommodate the wind turbine vehicles. This utilises overrun area used for the delivery of components to the Existing Wind Farm. The temporary overrun area will only be used for the transportation of abnormally sized loads, which will be delivered with a Garda escort and transient traffic management vehicles operated by the haulage company. This road will not be available for any other traffic and will be closed off and opened only for the delivery of the abnormally sized loads.

Upon the completion of the construction phase, the temporary road will only be used again in the unlikely event that an oversized delivery was required for wind turbine maintenance purposes, appropriate planning would be secured prior to the use of this access track should they be required. The boundary of this field and the public road corridor, at either end of the temporary track will be reinstated to its current condition.

Location 18 – Right Bend in L2702

The preliminary swept path analysis indicates that temporary alterations will be required to the existing streetscape and adjacent private lands for blade and truck body oversail, including removal of a private wall and vegetation. An area will be required to be cleared and prepared for vehicle axle load to pass over private lands to the east of the L2702.

Location 19 – Left Bend in L2702

The preliminary swept path analysis indicates that temporary alterations will be required to the existing streetscape and adjacent private lands for blade and truck body oversail, including removal of vegetation.

Location 20 L2702/L6309 Junction

The preliminary swept path analysis indicates that a temporary overrun area is required in the field east of the L2702/L6309 junction in order to accommodate wind turbine vehicles in the townland of Crowagh or Dunneill Mountain. The temporary overrun area will only be used for the transportation of abnormally sized loads, which will be delivered with a Garda escort and transient traffic management vehicles operated by the haulage company. This road will not be available for any other traffic and will be closed off and opened only for the delivery of the abnormally sized loads.

Upon the completion of the construction phase, the temporary road will only be used again in the unlikely event that an oversized delivery was required for wind turbine maintenance purposes, appropriate planning would be secured prior to the use of this access track should they be required. The boundary of this field and the public road corridor, at either end of the temporary track will be reinstated to its current condition.

4.5.4

Traffic Management During Delivery

A turbine with a maximum blade length of 74 metres has been used in assessing the transport impact of the Proposed Project. The regular blade transporter for such a turbine blade would have a total vehicle length of 83.9 metres, including the blade which overhangs the back of the vehicle. The total length of the tower transporter is 60m 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, but shorter than the tower transporter. All other vehicles requiring access to the site of the Proposed Project will be regular road-going vehicles. The turbine delivery vehicles have been modelled accurately in the autotrack assessments for the site access junctions, as detailed in Section 15.1 of this EIAR.

The need to transport turbine components on the public roads is not an everyday occurrence in the vicinity of the site of the Proposed Project. However, the procedures for transporting abnormal size loads on the country's roads are well established. While every operation to transport abnormal loads is different and requires careful consideration and planning, escort vehicles, traffic management plans, drive tests, road marshals and convoy escorts from the Garda Traffic Corps are all measures that are regularly employed to deliver oversized loads from origin to destination. With just under 400 No. wind farms already built and operating in Ireland (Republic and Northern Ireland combined, as per latest available figures on www.windenergyireland.com), transport challenges are something the wind energy industry and specialist transport sector has become particularly adept in finding solutions to.

As an alternative solution for transport of turbine blades, alternative delivery systems are available. For example, delivery vehicles fitted with blade adapters may be used in order to navigate the existing roads along the turbine delivery route. Blade adaptors allow the turbine blade to be transported at a suitable angle in order to navigate tight bends or obstacles along the delivery route. Plate 4-7 below shows an example of a blade adapter.



Plate 4-7 Blade Adaptor Transport System

A detailed Traffic Management Plan (TMP) will be provided as Appendix 15-2 specifying details relating to traffic management and included in the CEMP prior to the commencement of the construction phase of the Proposed Project. The TMP will be agreed with the local authority and An Garda Síochána prior to construction works commencing on-site. The TMP will include:

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

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

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

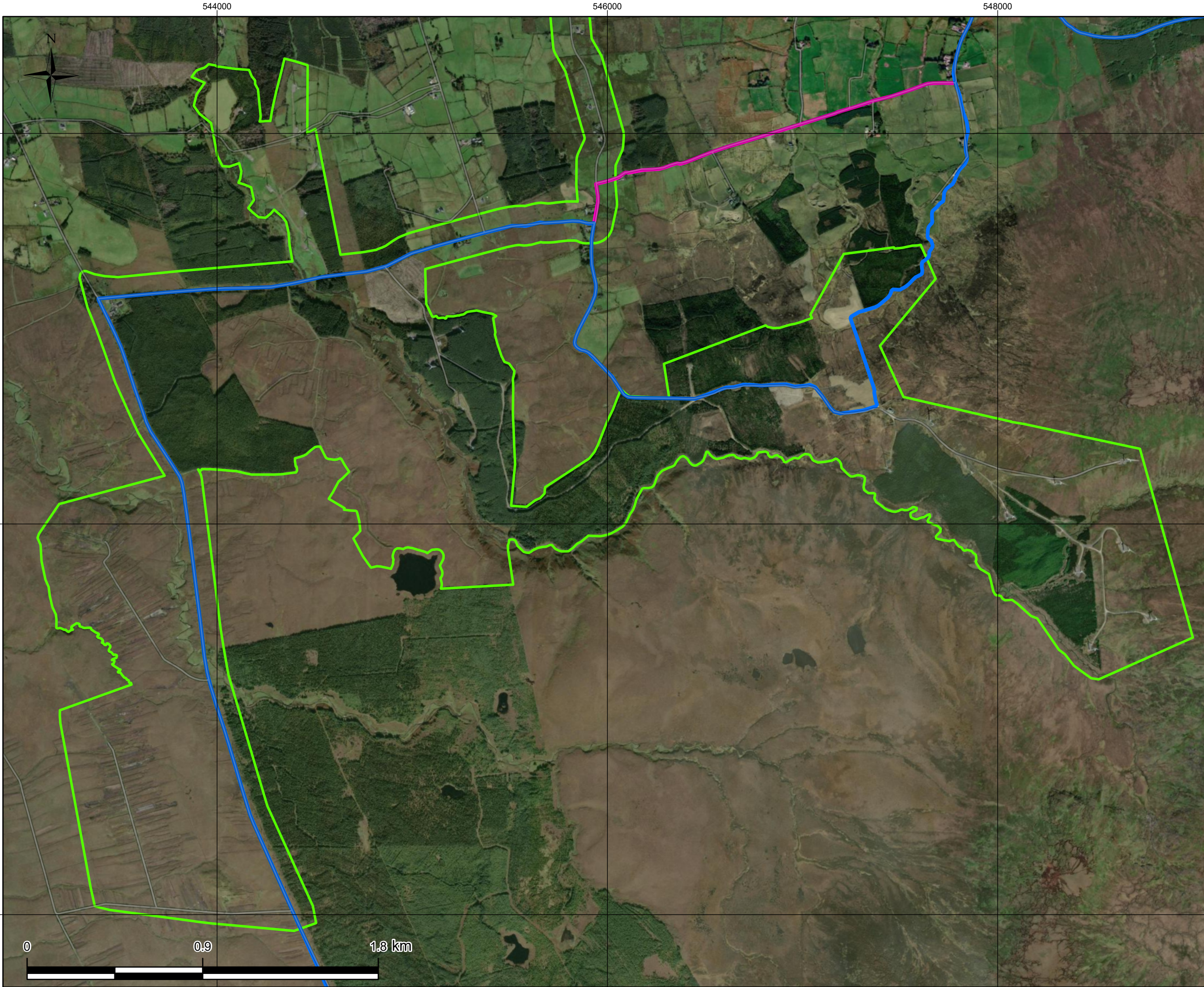
Prior to the TMP being finalised, a full dry run of the transport operation along the potential routes will be completed using vehicles with attachments to simulate the dimensions of the wind turbine transportation vehicles. This dry run will inform the TMP for agreement with the relevant authority. 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 is typically submitted to the relevant authority for agreement in advance of any abnormal loads using the local roads, and will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls. Details are included in Appendix 15-2 of Chapter 15 Material Assets.

The Sligo Way is an identified walking route which traverse the Proposed Wind Farm. The route comprises an 80km route from the Ox Mountains to Dromahair in County Leitrim.⁵ 7.2km of the trail passes through the Proposed Wind Farm, 3.3km via the L2702 local road, 1.6km along the L6309 local

⁵ <https://www.sportireland.ie/outdoors/walking/trails/sligo-way>

road 2.3km with the Existing Wind Farm and local access tracks. The Proposed Grid Connection Route passes under the Sligo Way for 2.3km along the L6309 local road.

During the construction phase of the Proposed Wind Farm, the 2.3km section of the Sligo Way trail within the Existing Wind Farm will be closed temporarily. It is proposed to divert this section of the trail via the L6309 local road to the northeast of the Proposed Wind Farm. Following completion of the construction phase, this section of the Sligo Way trail will be reinstated and remain accessible to users. The proposed diversion route for the Sligo Way trail can be seen in Figure 4-31 below.



Map Legend

- EIAR Site Boundary
- Sligo Way
- Sligo Way Proposed Diversion

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

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SITE LOCATION - NOT TO SCALE

Drawing Title

Sligo Way Construction
Phase Diversion Route

Project Title

Crumhach Wind Farm, Co. Sligo

Project No.	Drawing No.	Scale
230841	4-31	1:18,000
Drawn By	Checked By	Date
MVN	BT	09/06/2026

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

4.6 Site Drainage

4.6.1 Introduction

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

The protection of the watercourses within and surrounding the Site, and downstream catchments that they feed is important to establish the most appropriate drainage proposals for the Proposed Project.

The drainage design for the Proposed Project has been planned with the intention of having no negative impact on the water quality of the Site and its associated rivers and lakes, 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: Hydrology and Hydrogeology. No routes of any natural drainage features will be altered as part of the Proposed Project. Turbine locations and associated new roadways were designed to avoid natural watercourses with existing roads to be used wherever possible. There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Project.

4.6.2 Existing Drainage Features

The routes of any natural drainage features will not be altered as part of the Proposed Project. Turbine locations have been selected to avoid natural watercourses. It is proposed that 1 no. new clear span watercourse crossings are required for the Proposed Wind Farm.

There will be no direct discharges to natural watercourses. All discharges from the proposed works areas or from interceptor drains will be made over vegetated ground at an appropriate distance from natural watercourse and lakes. Buffer zones around the existing natural drainage features have informed the layout of the Proposed Project and are indicated on the drainage design drawings.

Where artificial drains are currently in place in the vicinity of proposed works areas, these drains may have to be diverted around the proposed works areas to minimise the amount of water in the vicinity of works areas. Where it may not be possible to divert artificial drains around proposed work areas, the drains will be blocked to ensure sediment laden water from the works areas has no direct route to other watercourses. Where drains have to be blocked, the blocking will only take place after an alternative drainage system to handle the same water has been put in place.

Existing artificial drains in the vicinity of existing Proposed Wind Farm site roads will be maintained in their present location where appropriate. If it is expected that these artificial drains will receive drainage water from works areas, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. If road widening or improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain.

4.6.3 Drainage Design Principles

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

- Keep clean water clean by intercepting it upgradient of works areas, and divert it around the works areas for discharge as diffuse overland flow or for rewetting of land.

- › Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line, treatment and outfall controls prior to controlled diffuse release as overland flow or for rewetting of land.
- › No direct hydraulic connectivity from construction areas to watercourses or drains connecting to watercourses.
- › Where possible, maintain 50-metre watercourse buffer zones for the wind turbines.
- › No alteration of natural watercourses.
- › Maintain the existing hydrology of the Site.
- › Blocking of existing manmade drainage as appropriate.
- › Daily inspection and recording of surface water management system by onsite Ecological Clerk of Works (ECoW) and immediate remedial measures to be carried out as required and works temporarily ceased if a retained stormwater/sediment load is identified to have the potential to migrate from the Site.
- › Use of siltbuster or equivalent system if required.

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

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

A schematic line drawing of the proposed drainage design is presented in Figure 4-31 below.

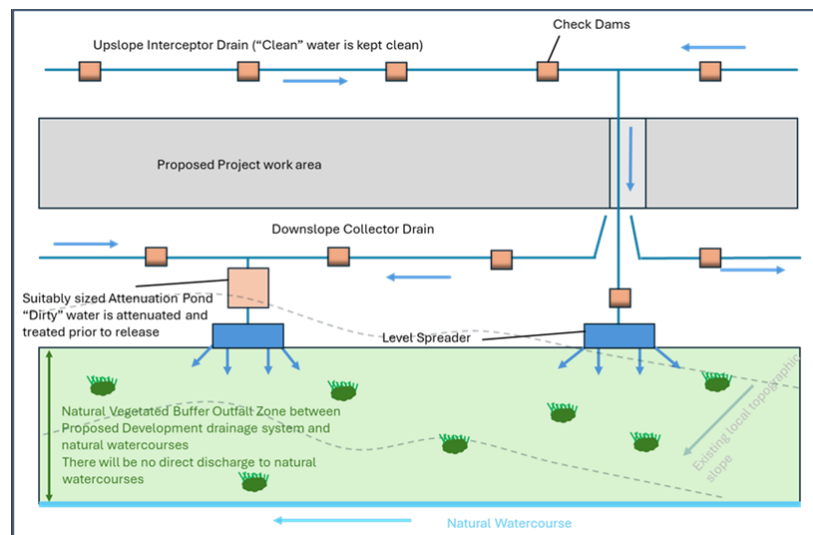


Figure 4-32 Proposed Project Drainage Process Flow

4.6.4 Drainage Design

A drainage design for the Proposed Project, incorporating all principles and measures outlined in this drainage design description, has been prepared, and is included in Appendix 4-5 to this EIAR. The

drainage design employs the various measures further described below and complies with the following guidance documents:

- › Forestry Commission (2011): Forests and Water UK Forestry Standard Guidelines, Fifth Edition. Publ. Forestry Commission, Edinburgh;
- › Coillte Forest (2013): Operations and Water Protection Guidelines;
- › Forest Services (Draft) Forestry and Freshwater Pearl Mussel Requirements – Site Assessment and Mitigation Measures;
- › Forest Service (2000): Forestry and Water Quality Guidelines. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford;
- › COFORD (2004): Forest Road Manual – Guidelines for the Design, Construction and Management of Forest Roads;
- › Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Watercourses;
- › Scottish Natural Heritage, 2019 Good Practice During Wind Farm Construction
- › UK Guidance Note 2020 GPP1 - General Guide to Prevention of Pollution (UK Guidance Note);
- › UK Guidance Note 2018 GPP5 – Works or Maintenance in or Near Watercourses
- › Construction Industry Research and Information Association (CIRIA) 2006: Guidance on ‘Control of Water Pollution from Linear Construction Projects’ (CIRIA Report No. C648, 2006); and,
- › Construction Industry Research and Information Association (CIRIA) 2006: Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2006.
- › 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;
- › 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 DoEHLG 2006 Guidelines) and the Draft Revised Wind Energy Development Guidelines (Draft DoHLGH 2019 Guidelines);
- › Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Watercourses;
- › Good Practice During Wind Farm Construction (Scottish Natural Heritage, 2010);
- › 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).

4.6.4.1 **Interceptor Drains**

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

The interceptor drains will be installed in advance of any main construction works commencing. The material excavated to make the drain will be compacted on the downslope edge of the drain to form a diversion dike. On completion of the construction phase works, it is envisaged that the majority of the interceptor drains could be removed. At that stage, there will be no open excavations or large areas of exposed ground that are likely to give rise to large volumes of potentially silt-laden run off. Any areas in which works were carried out to construct roads, 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 may have to be retained in certain locations, for example where roadways are to be installed on slopes, to prevent the roadways acting as conduits for water that might infiltrate the roadway sub-base. In these cases, interceptor drains would be maintained in localised areas along the roadway with culverts under the roadway, which would allow the intercepted water to be discharged to vegetation filters downgradient of the roadway. Similarly, in localised hollows where water is likely to be funnelled at greater concentrations than on broader slopes, interceptor drains and culverts may be left in situ following construction. Figure 4-26 below shows an illustrative drawing of an interceptor drain.

The velocity of flow in the interceptor will be controlled by check dams (discussed further below), which will be installed at regular intervals along the drains to ensure flow in the channel is non-erosive. On steeper sections where erosion risks are greater, a geotextile membrane will be added to the channel.

Interceptor drains will be installed horizontally across slopes to run in parallel with the natural contour line of the slope. Intercepted water will travel along the interceptor drains to areas downgradient of works areas, where the drain will terminate at a level spreader (discussed below). Across the entire length of the interceptor drains, the design elevation of the water surface along the route of the drains will not be lower than the design elevation of the water surface in the outlet at the level spreader.

4.6.4.2 **Swales**

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

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

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

4.6.4.3 Check Dams

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

Check dams will restrict flow velocity, minimise channel erosion and promote sedimentation behind the dam. The check dams will be installed as the interceptor drains are being excavated. Check dams may also be installed in some of the existing artificial drainage channels on the Site, downstream of where drainage swales connect in. Locations of and requirements for check dams are shown in the detailed drainage design included as Appendix 4-3 of the EIAR.

The proposed check dams will be made up of straw bales or stone, or a combination of both depending on the size of the drainage swale it is being installed in. Where straw bales are to be used, they will be secured to the bottom of the drainage swale with stakes. Clean 4–6-inch stone will be built up on either side and over the straw bale to a maximum height of 600mm over the bottom of the interceptor drain. In smaller channels, a stone check dam will be installed and pressed down into place in the bottom of the drainage swale with the bucket of an excavator. Figure 4-26, below, shows illustrative examples of check dams.

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

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

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

4.6.4.4 Level Spreaders

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

The water carried in interceptor drains will not have come in contact with works areas of the Site, and therefore should be free of silt and sediment. The level spreaders will distribute clean drainage water onto vegetated areas where the water will not be reconcentrated into a flow channel immediately below the point of discharge. The discharge point will be on level or only very gently sloping ground rather than on a steep slope so as to prevent erosion. Figure 4-32 below, shows an illustrative example of a level spreader.

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

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

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

4.6.4.5 Piped Slope Drains

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

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

The rock apron at the outlet will consist of 6-inch stone to a depth equal to the diameter of the pipe, a length six times the diameter of the pipe. The width of the rock apron will be three times the diameter of the pipe where the pipe opens onto the apron and will fan out to six times the diameter of the pipe over its length. Figure 4-32 below, shows a diagrammatic example of a piped slope drain and rock apron.

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

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

4.6.4.6 Stilling Ponds (Settlement Ponds)

Stilling ponds will be used to attenuate runoff from works areas of the Site during the construction phase. When the construction works are finished and the Site is landscaped, the settlement ponds will be filled in. The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing

runoff velocity will allow larger particles to settle out in the stilling ponds, before the run-off water is redistributed as diffuse sheet flow in filter strips downgradient of any works areas.

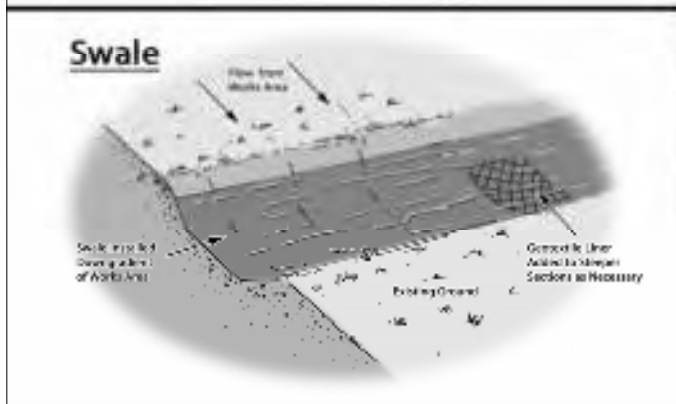
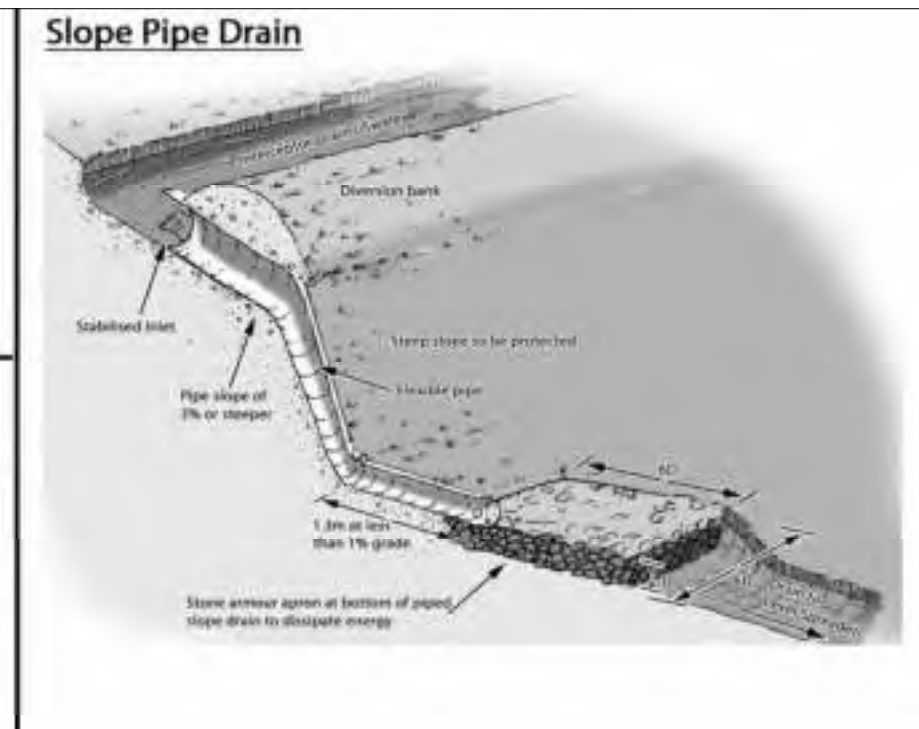
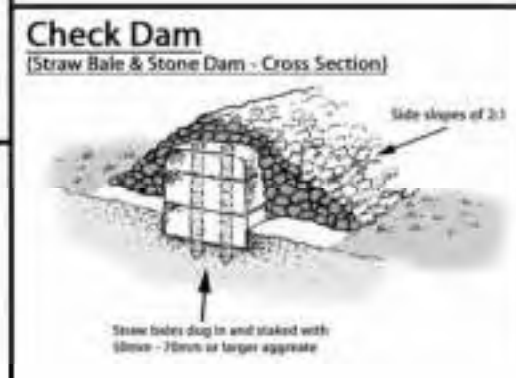
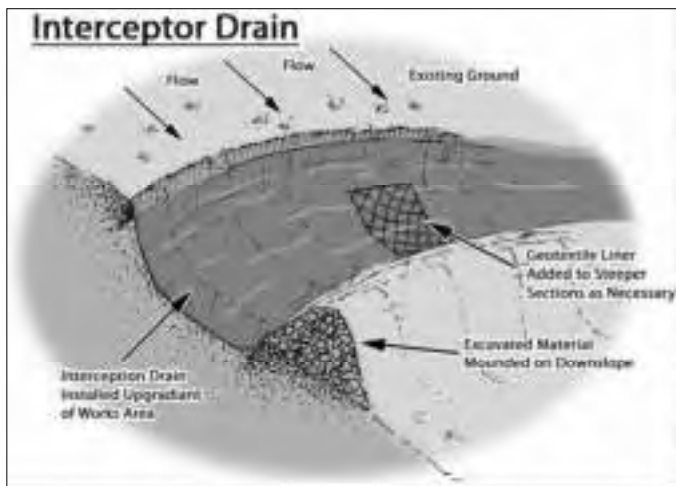
Stilling ponds will be excavated/constructed at each required location as two separate ponds in sequence, a primary pond and a secondary pond. The points at which water enters and exits the stilling ponds will be stabilised with rock aprons, which will trap sediment, dissipate the energy of the water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

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

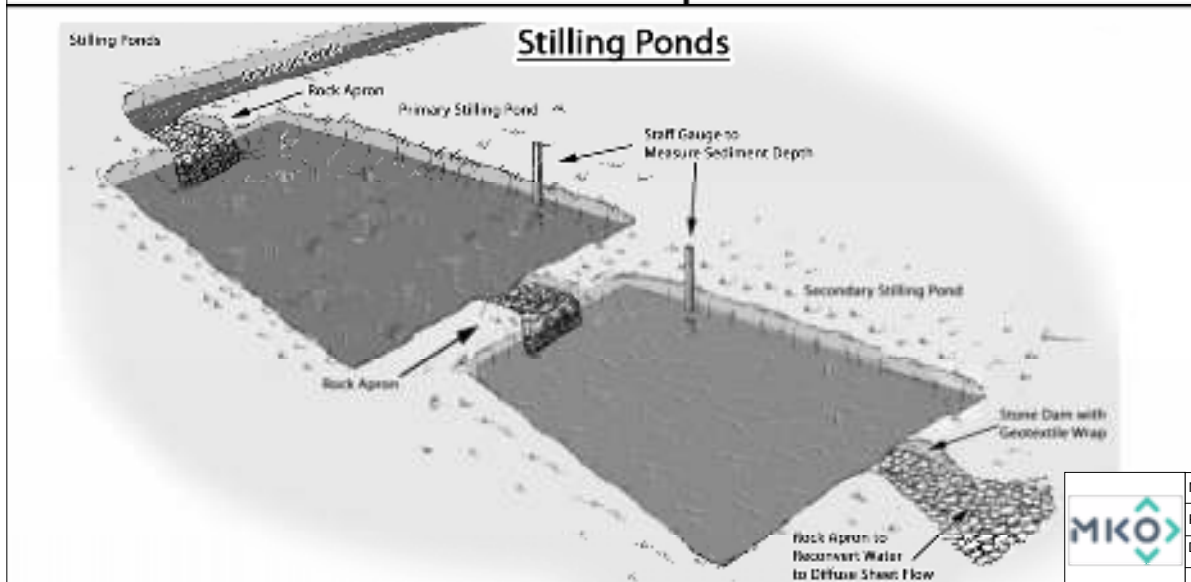
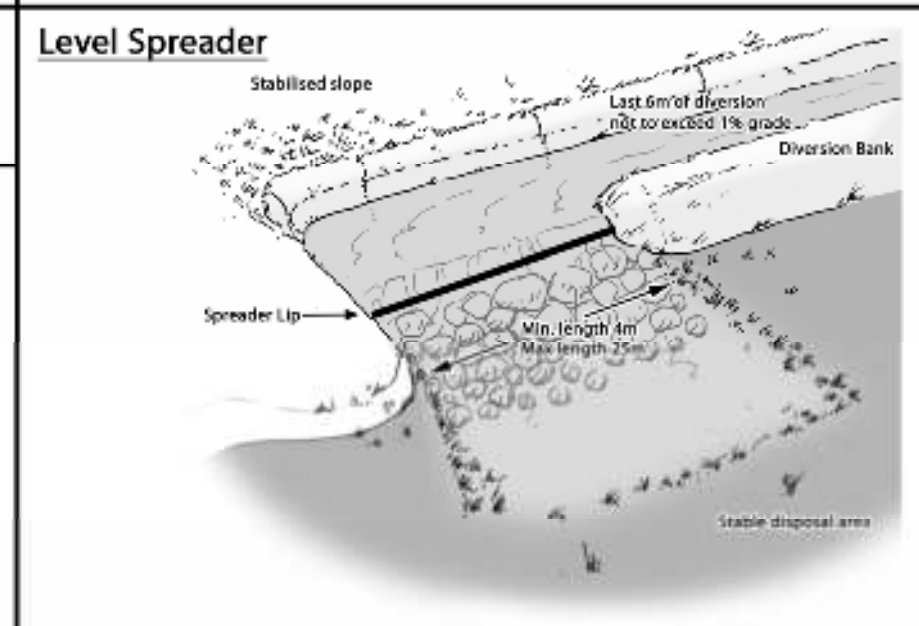
The embankment that forms the sloped sides of the stilling ponds will be stabilised with vegetated turves, which will have been removed during the excavation of the stilling ponds area. All material excavated during pond construction will be used locally for landscaping and berm construction around these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

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

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



Drainage Design Measures



MAP TITLE: Drainage Design Illustrations	MAP NO.: Figure 4-33	SCALE: NTS
PROJECT TITLE: Crumhach Wind Farm, Co. Sligo	DATE: 07.01.2026	
DRAWING BY: Muireann Van Nieuwenhove	CHECKED BY: Ellen Costello	ISSUE NO: 230841 - 2026.07.01
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4.6.4.7 Vegetation Filters

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

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

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

4.6.4.8 Silt Bags

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

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

The dewatering silt bag that will be used will be 3 metres in width by 4.5 metres (see Plate 4-7 below) in length and will be capable of trapping approx. four tonnes of silt. The dewatering silt bag, when full, will be removed from the Proposed Wind Farm by a waste contractor with the necessary waste collection permit, who will then transport the silt bag to an appropriate, fully licensed waste facility.



Plate 4-7 Silt Bag under inspection



Plate 4-8 Silt Bag with water being pumped through

4.6.4.9 Sedimats

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

4.6.4.10 Silt Fences

Silt fences will be installed as an additional water protection measure around existing watercourses where works are proposed within the 50-metre buffer zone of a stream or 100m buffer zone of a lake. These areas include around existing culverts, around the headwaters of watercourses, and the proposed locations are indicated on the drainage design drawings included in Appendix 4-3.

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

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

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

4.6.4.11 Hydrocarbon Interceptor

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

4.6.4.12 Tree Felling Drainage

Tree felling will be required within and around Proposed Project footprint to allow for the construction of the turbine bases, access roads, underground cabling, and the other ancillary infrastructure. Felling will not be undertaken simultaneously with construction groundworks. Keyhole felling to facilitate construction works will take place prior to groundworks commencing.

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

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

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

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

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

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

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

4.6.5 Cable Trench Drainage

Cable trenches will 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 transported to one of the onsite designated spoil management areas or used for landscaping and reinstatement of other areas elsewhere onsite. Along sections of the Proposed Grid Connection Route that are further removed from the Proposed Wind Farm it may be more practical to transport excess excavated material to a nearby licenced facility.

On steeper slopes, silt fences, as detailed in Section 4.5.4.12, above, will be installed temporarily downgradient of the cable trench works area, or on the downhill slope below where excavated material is being temporarily stored to control runoff.

4.6.6 Site Drainage Management

4.6.6.1 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 onsite 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.

4.6.6.2 Pre-emptive Site Drainage Management

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

4.6.6.3 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 Ecological Clerk of Works (ECoW) or supervising hydrologist onsite. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams, interceptor drains or swales as deemed necessary onsite. The drainage design may have to be modified on the ground as necessary, and the modifications will draw on the various features outlined above in whatever combinations are deemed to be most appropriate to situation on the ground as a particular time.

In the event that works are giving rise to siltation of watercourses, the ECoW or supervising hydrologist will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.

4.6.7 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 or the Project Hydrologist. The drainage inspection and maintenance plan are included in the Surface Water Management Plan in Appendix 4-4 and CEMP in Appendix 4-5 of this EIAR.

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

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

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

Silt traps will be inspected weekly during the construction phase of the Proposed Project and following rainfall events. Inlet and outlets will be checked for sediment accumulation and anything else that might interfere with flows.

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

Please see Appendix 4-4 Surface Water Management Plan and Appendix 4-5 CEMP for further detail on drainage systems during the operational and decommissioning phase of the Proposed Project.

4.7 Construction Management

4.7.1 Construction Timing

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

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

4.7.2 Construction Sequencing

The construction phase can be broken down into three main overlapping phases and will take approximately 18-24 months to complete: 1) civil engineering works – 12 - 24 months, 2) electrical works including grid connection works - 9-12 months, and 3) turbine erection and commissioning - 8 months. The main task items under each of the three phases are outlined below.

Civil Engineering Works

- › The existing 23 no. turbines will be removed from site as described in Section 4.3.1.
- › Removal of existing 20kV electrical cabling
- › Install temporary construction compounds.
- › Felling of Forestry (as outlined in Section 4.3.10)
- › Construct new Site roads to temporary compounds
- › Construct new Site entrances.
- › Construction of new site roads, drainage ditches and culverts and upgrades to existing infrastructure as outlined in Section 4.3.1.
- › Construct new turbine foundations, hard standings and crane pads;
- › Excavate/pile for turbine bases where required. Store soil/peat locally for backfilling and re-use. Place blinding concrete to turbine bases. Fix reinforcing steel and anchorage system for tower section. Construct shuttering. Fix any ducts etc. to be cast in. Pour concrete bases. Cure concrete. Remove shutters after 1-2 days.

Electrical Works

- > Clear and hardcore area for temporary Site offices. Install same
- > Clear and Hardcore area for substation footprint
- > Construct foundations/plinths for substation building.
- > Install external electrical equipment at substation.
- > Upgrades to existing onsite control buildings;
- > Install transformer at compound.
- > Erect stock proof and palisade fencing around substation area.
- > Install internal collector network and communication cabling.
- > Construct grid connection cabling.

Turbine Erection

- > Complete temporary accommodation works associated with turbine component delivery
- > Commission erection crane(s) and deliver components to turbine hardstands.
- > Erect towers, nacelles and blades.
- > Complete electrical installation.
- > Commission and test turbines.
- > Complete Site works, reinstate Site.
- > Remove temporary Site offices. Provide any gates, landscaping, signs etc. which may be required.

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

The phasing and scheduling of the main construction task items are outlined in Table 4-6 below, where the 1st of January has been selected as an arbitrary start date for construction activities.

Table 4-6 Indicative Construction Schedule

			Year 1				Year 2			
ID	Task Name	Task Description	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Site Health and Safety									
	Removal of existing turbines	Removal of existing turbines onsite, segmentation of blades, transport offsite								
2	Site Compounds	Site compounds, site access, fencing, gates								
3	Site Roads	Construction/upgrade of roads, install drainage measures, install water protection measures								

4	Substation and Electrical Works	Construction of onsite substation and 110kV grid connection cabling									
5	Upgrades to control buildings	Construction of internal cabling to existing onsite control buildings									
6	Turbine Hardstands	Excavate turbine bases									
7	Turbine Foundations	Fix reinforcing steel and anchorage system, erect shuttering, concrete pour									
8	Backfilling and Landscaping										
9	Turbine delivery and erection										
10	Turbine commissioning										

4.7.3

Construction Phase Monitoring and Oversight

The requirement for a CEMP to be prepared in advance of any construction works commencing on any wind farm development site and submitted for agreement to the Planning Authority is now well-established. The proposed procedures for the implementation of the mitigation measures outlined in such a CEMP and their effectiveness and completion will be audited by the on behalf of the developer, in an and objective manner.

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

A CEMP has been prepared for the Proposed Project and is included in Appendix 4-5 of this EIAR. The CEMP includes details of drainage, overburden management, waste management etc, and describes how the above-mentioned Audit Report will function and be presented. In the event planning permission is granted for the Proposed Project, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for written approval.

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

4.8

Construction Management and Methodologies Overview

This section of the chapter outlines the construction methodologies and management practices to be used for the various elements of the Proposed Wind Farm and Proposed Grid Connection Route. Further details in relation to construction methodologies is included in Section 2.3 of the CEMP, included as Appendix 4-5 of this EIAR.

4.8.1

Existing Wind Farm

4.8.1.1

Removal of Existing Turbines and Met Mast

As outlined in Section 4.3.1 of this Chapter, the existing 23 no. turbines and met mast onsite will be removed during the construction phase of the Proposed Project. The turbines will be disassembled in reverse order to how they were initially constructed i.e. blades will be removed from the nacelle, the nacelle will then be removed from the top of the tower, and the tower sections will then be removed. A crane will be used to remove the blades from the hub. The blades will then be decommissioned following the methodology set out below:

Removal of the Existing Turbines:

- › Cranes will be used to remove the blades from the hub;
- › Blades will be dismantled and removed from site;
- › Technicians will remove root rings and any other associated metal for recycling;
- › The construction crew will ensure that there are no contaminants present (e.g. oils, brake dust, grease rubber hoses);

Prior to decommissioning, all available options for blade management will be assessed in terms of circularity. Assessed options will include blade reuse, blade repurposing, blade recycling and energy from waste (EfW).

Removal of the Existing Met Mast

- › Establish safe working area around mast.
- › Climb mast and remove instruments and logger box.
- › On one side of the mast, transfer guy ropes from ground anchors to excavator.
- › Cut guy rope attached to excavator to allow mast to fall.
- › Excavate mast anchors and anchor bases making good the ground.
- › Dismantle and remove mast components and accessories from site using trailer

4.8.1.2 Removal of Existing 20kV Electrical Cabling

Removal of the existing 20kV onsite electrical cabling will be dependent on how the cabling was placed during the construction of the Existing Wind Farm. There will be two standard approaches to this based on the two methods of cable laying employed on the Existing Wind Farm:

- › Where the cables have been direct buried in peat soils, they will be cut and left in situ;
- › Where the cables have been ducted, the cable will be cut at both ends and pulled from the cable duct.

The 2 no. options above have been determined to be the most environmentally prudent methods to deal with the removal of the onsite electrical cabling. It is noted that, where onsite electrical cables facilitating the connection of the Proposed Wind Farm follow the same route as the Existing Wind Farm cables, these existing cables will be removed once safe to do so.

4.8.2 Proposed Wind Farm

4.8.2.1 Enabling Works

Enabling works to facilitate the construction of the Proposed Wind Farm include the following:

- › The temporary construction compounds will be established;
- › Vegetation and scrub clearance along with some levelling works will be carried out at the turbine hardstand areas and access roads as necessary;
- › Improvements to existing roads

4.8.2.2 Keyhole Forestry Felling

As part of the Proposed Project, keyhole felling of forestry will be required within and around the Proposed Wind Farm footprint to enable the construction of turbine bases, access roads, onsite 110kV substation and the other ancillary infrastructure. Felling is also required around 9 no. Proposed Turbine bases for the reduction of potential effects on bats (refer to Chapter 6 of this EIAR). A total of 28.1

hectares of forestry will be permanently felled within and around the footprint of the Proposed Project in order to facilitate infrastructure construction and turbine erection.

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

Felling works will conform to current best practice Forest Service policies and strategic guidance documents as well as Coillte produced guidance documents, specific guidelines listed below, to ensure that the felling works provides minimal potential impacts to the receiving environment.

- › ‘Standards for Felling and Reforestation’ (Department of Agriculture, Food and the Marine, 2019)
- › ‘Forest Operations & Water Protection Guidelines’ (Coillte, 2009)
- › ‘Methodology for Clear Felling Harvesting Operations’ (Coillte, 2009)
- › ‘Forestry and Water Quality Guidelines’ (Forest Service, 2000)
- › ‘Forestry Biodiversity Guidelines’ (Forest Service, 2000)
- › ‘Forestry Protection Guidelines’ (Forest Service, 2002)
- › ‘Forestry Harvesting and Environmental Guidelines’ (Forest Service, 2000)

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

- › The extent of all necessary forestry felling areas will be identified and demarcated with markings on the ground in advance of any felling commencing.
- › All roads and culverts will be inspected by the ECoW and contractor prior to any machinery being brought on site to commence the felling operation.
- › Existing drains that drain an area to be felled towards surface watercourses will be blocked, and temporary silt/sediment traps (i.e. check dam / silt fence) will be constructed to ensure collection of all silt within felling areas. These temporary silt traps will be cleaned out and backfilled once felling works are complete. This ensures there is no residual collected silt remaining in blocked drains after felling works are completed.
- › New collector drains and sediment traps will be installed during ground preparation to intercept water upgradient of felling areas and divert it away. Collector drains will be excavated at an acute angle to the contour (0.3%-3% gradient), to minimise flow velocities.
- › Sediment traps will be sited in drains downstream of felling areas. Machine access will be maintained to enable the accumulated sediment to be excavated.
- › Sediment removed from traps will be carefully disposed of in the peat repository areas.
- › Machine combinations (i.e. hand-held or mechanical) will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance; however, the general proposed machine combination will comprise a harvester and a low-ground pressure harvester with a 14-tonne bunk capacity.
- › Trees will be cut manually inside the 50m construction watercourse buffer and using machinery to extract whole trees only;
- › Brash mats will be put in place to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur.
- › Brash mat renewal will take place when they become heavily used and worn. Provision will be made for brash mats along all off-road routes, to protect the soil from compaction and rutting.
- › No tracking of vehicles through watercourses will occur. Vehicles will only use existing road infrastructure and established watercourse crossings.
- › Brash which has not been pushed into the soil may be moved to facilitate the creation of mats elsewhere within the site.
- › Extraction routes, and hence brash mats, will be aligned parallel to the ground contours where possible.

- › Harvested timber will be stacked in dry areas, and outside any 50-metre watercourse buffer zone prior to removal off site to authorised sawmills.

4.8.2.3 Turbine Foundations

Each of the turbines to be erected on the Proposed Wind Farm will have a reinforced concrete foundation that is installed below the finished ground level. It is anticipated that the turbine foundations will be formed on competent strata (i.e., bedrock or sublayer of sufficient load bearing capacity). Where the ground conditions do not have a competent stratum of sufficient load bearing capacity, piling method will be utilised. As detailed above in Appendix 4-2 Peat and Spoil Management Plan, numerous intrusive site investigations were undertaken across the Proposed Wind Farm, to provide detail and clarity on the nature and extent of sublayers and bedrock present. This assisted in providing additional information on the most suitable location for turbines and associated infrastructure. A methodology for reinforced concrete foundations and piled foundations is included in Section 2.3.3.1 of the CEMP, Appendix 4-5 of this EIAR.

Please note, confirmation ground investigative works will take place prior to construction of turbine foundations. As identified in Appendix 8-1: Peat Stability Risk Assessment, it is likely that following the completion of these works, it will be identified that the turbine foundations for the Proposed Turbines will require piled foundations. Gravity foundations may alternatively be constructed at the Proposed Turbines, especially at T04, T05 and T06 subject to confirmatory ground investigation to confirm the depth to bedrock.

For the piled turbine foundations, a typical piling type and configuration could be up to 20 no. 900mm rotary bored piles. Pre-construction final design will be carried out after post-consent geotechnical investigations have been completed. 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. A two-metre-wide working area will be required around each turbine foundation, with the sides of the excavated areas sloped sufficiently to ensure that slippage does not occur. Material excavated to create the working area will be stored locally for later reuse in backfilling and/or landscaping the working area around the turbine foundation. The excavated material will be sealed using the back of the excavator bucket and surrounded by silt fences to ensure sediment-laden run-off does not occur.

The formation material will have to be approved by an engineer as meeting the turbine manufacturer's requirements. If the formation level is reached at a depth greater than the depth of the foundation, the ground level will have to be raised with clause 804 or similar hardcore material, compacted in 250 millimetres (mm) layers, with sufficient compacted effort (i.e., compacted with seven passes using 12 tonne roller. Drainage measures will be installed to protect the formation by forming an interceptor drain around the perimeter of the base which will be pumped out or outfall out at the lowest point level spreader or settlement pond.

An embankment approximately 600mm high will be constructed around the perimeter of each turbine foundation base and a fence will be erected to prevent construction traffic from driving into the excavated hole and to demarcate the working area. All necessary health and safety signage will be erected to warn of deep excavations etc. Access to and from excavated bases will be formed by excavating a pedestrian walkway to 1:12 grade.

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

The anchor cage is delivered to the Proposed Wind Farm in two or more parts depending on the turbine type. A 360° excavator or crane with suitable approved lifting equipment will be used to unload sections of the anchor cage and reinforcing steel. The anchor cage is positioned in the middle of the

turbine foundation base and is assembled accordingly. When the anchor cage is in final position it is checked and levelled by using an appropriate instrument. The anchor cage is positioned 250mm – 300mm from formation level by use of adjustable legs. Reinforcement bars are then placed around the anchor cage, first radial bars, then concentric bars, shear bars and finally the superior group of bars. Earthing material is attached during the steel foundation build up. The level of the anchor cage will be checked again prior to the concrete pour and during the concrete pour. As noted in Section 4.8.1.5 below, the transformer in each turbine is connected to the on-site substation through a network of underground cabling ducts which are installed through the centre of the anchor cage.

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

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

4.8.2.4 Site Access Tracks and Hardstand Areas

Site access tracks will be constructed to each turbine base and at each base hardstanding will be constructed to the turbine manufacturer's specifications. Tracked excavators will carry out excavation for new access tracks with appropriate equipment attached. The excavations shall follow a logical route working away from the borrow pit locations. Excavated material not required for localised landscaping will be transported back to the borrow pit in haul trucks. A 2-3m wide working area will be required around each hardstanding area, with the sides of the excavated areas sloped sufficiently to ensure that slippage does not occur. Material excavated to create the working area will be stored locally for later reuse in backfilling the working area around the turbine foundation. The excavated material will be covered with polythene sheets or sealed with the excavator bucket and surrounded by silt fences to ensure sediment-laden run-off does not occur.

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

The construction methodology for the construction of all Proposed Wind Farm access tracks, as presented in the PSMP in Appendix 4-2 of this EIAR, is summarised below.

4.8.2.4.1 Upgrading of Existing Access Track (Type A and B)

1. Access track construction will be to the line and level requirements as per design and the turbine suppliers requirements
2. For upgrading of existing excavated access tracks (Type A) the following guidelines will be implemented in full :
 - a. Excavation of the widened section of access track will take place to a competent stratum beneath the peat (as agreed with the designer) and backfilled with suitable granular fill.

- b. *Benching of the excavation may be required between the existing section of access track and the widened section of access track where the depth of excavation required exceeds 500mm.*
 - c. *The surface of the existing access track will be overlaid with up to 150mm of selected granular fill.*
 - d. *Access tracks will be finished with a layer of capping across the full width of the track.*
 - e. *A layer of geogrid/geotextile may be required at the surface of the existing access track and at the base of the widened section of access road (to be confirmed by the designer).*
 - f. *For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability.*
 - g. *A section of upgraded road runs adjacent to Borrow Pit 1. At this location a 1m high safety berm will be constructed between the road and the borrow pit excavation.*
3. *For upgrading of existing access tracks constructed using a floated construction technique (Type B) the following will apply:*
- a. *Prior to commencing floating road construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m.*
 - b. *Construction of road will be in accordance with appropriate design from the designer.*
 - c. *The surface of the existing access track should be graded/tidied up prior to the placement any geogrid/geotextile, where necessary (to prevent damaging the geogrid/geotextile).*
 - d. *Where granular fill has been used in the existing access track make-up, a layer of geogrid should be placed on top of the existing access track, extending to the full width of the proposed road.*
 - e. *The geogrid will be overlaid with an average of 800mm of selected granular fill on the widened sections of the floating access road.*
 - 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 (to be confirmed by the designer).*
 - g. *Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will not be carried out.*
 - 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 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.*
 - 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.*
4. *The finished access trackwidth will have a running width of 5m, with wider sections on bends and corners.*
5. *On side long sloping ground any access track widening works required will be done on the upslope side of the existing access track, where possible.*
6. *A final surface layer shall be placed over the existing access track, as per design requirements, to provide a road profile and graded to accommodate wind turbine construction and delivery traffic.*

7. *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.*
8. *The construction of access roads in areas of deep peat (greater than 2m) will be inspected on a routine basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/after trafficking by heavy vehicular loads.*

4.8.2.4.2 Construction of New Excavated Roads through Peat – Type C

1. *Prior to commencing the construction of the excavated access tracks movement monitoring posts will be installed in areas where the peat depth is greater than 2.0m. and in areas identified within the peat stability risk assessment (see Appendix 8-1 Geotechnical & Peat Stability Assessment) as requiring monitoring.*
2. *Interceptor drains will be installed upslope of the access track alignment to divert any surface water away from the construction area.*
3. *Excavation of access tracks shall be to the line and level given in the design requirements. Excavation will take place to a competent stratum beneath the peat.*
4. *Access track construction will be carried out in sections of 20m lengths i.e., no more than 20m of access track will be excavated without replacement with stone fill. This length will be reduced to 5m in areas identified within the peat stability risk assessments.*
5. *Excavation of materials with respect to control of peat stability:*
 - a. *Where Acrotelm (to about 0.3 to 0.4m of peat) is required for landscaping, it will be stripped and temporarily stockpiled for re-use as required. Acrotelm stripping will be undertaken prior to main excavations.*
 - b. *Where possible, the acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation.*
 - c. *All catotelm peat (peat below about 0.3 to 0.4m depth) will be transported immediately on excavation, where possible, to the designated placement areas.*
6. *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 storage areas within the borrow pits, in the designated peat and spoil management areas, or reused for landscaping purposes. All peat and spoil management areas will be inspected by the Project Geotechnical Engineer before material is stored in the area. No material is to be sidecast or stored on the in-situ peat on the downslope side of the access roads.*
7. *Excavation side slopes in peat will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction. 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*
8. *End-tipping of stone onto the road during the construction/upgrading of the access road will be carefully monitored to ensure that excessive impact loading, which may adversely affect the adjacent peat, is limited.*
9. *The new excavated access road will be constructed with an average of 500mm of selected granular fill. Granular fill will be placed and compacted in layers in accordance with the TII Specification for Road Works.*
10. *Access roads will be finished with a layer of capping across the full width of the road.*
11. *A layer of geogrid/geotextile may be required at the surface of the competent stratum where cohesive material is present to prevent mixing of the underlying material with the granular fill.*
12. *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.*

13. Where slopes of greater than 5 degrees are encountered along with relatively deep peat (i.e., greater than 2m) and where it is proposed to construct the access road perpendicular to the slope contours it is best practice to start construction at the bottom of the slope and work towards the top, where possible. This method avoids any unnecessary loading to the adjacent peat and greatly reduces any risk of peat instability.
14. Where the above is not possible, a specific Risk Assessment Method Statement (RAMS) from the contractor will be produced, detailing how the downslope works will be undertaken, including that all plant would operate from the already constructed section of track, with no loading of the peat on the downslope slope and limiting the length of ground to be stripped/excavated at any one time. Movement monitoring posts (as described in the Peat & Spoil Management Plan, Section 8.1) will also be installed downslope of the works area to allow for ongoing monitoring during the construction works.
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/after trafficking by heavy vehicular loads.

4.8.2.4.3 Construction of New Floated Track Over Peat – Type D

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

1. Prior to commencing floating access track construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m and will be placed at 10m intervals along these sections.
2. Base geogrid will be laid directly onto the existing peat surface along the line of the access track in accordance with geogrid provider's requirements.
3. Construction of access track will be in accordance with appropriate design from the designer.
4. The make-up of the new floated access track is up to 1,000mm of selected granular fill with 2 no. layers of geogrid with possibly the inclusion of a geotextile separator
5. Granular fill will be placed and compacted in layers in accordance with the TII Specification for Road Works.
6. Following the detailed design of the floated access tracks it may be deemed necessary to include pressure berms either side of the access track 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 track will reduce the likelihood of potential bearing failures beneath the access track
7. The finished access track running width will be 5m, with wider sections on bends and corners.
8. Stone delivered to the floating access track construction will be end-tipped onto the constructed floating access track. 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 access track will be tipped over at least a 10m length of constructed floating access track.
10. Where it is not possible to end-tip over a 10m length of constructed floating access track then dumpers delivering stone to the floating access track 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 access track.
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 access track.
12. A final surface layer will be placed over the full width of the floating access track, as per design requirements, to provide a access track profile and graded to accommodate wind turbine construction and delivery traffic

4.8.2.4.4 Clear-Span Watercourse Crossing

It is proposed to upgrade 1 no. existing mapped watercourse crossing and construct 1 no. new watercourse crossing via a clear-span bridge crossing within the Proposed Wind Farm. The location of these crossings are shown on the layout drawings included in Appendix 4-1. The clear-span watercourse crossing methodology presented below will ensure that no instream works are necessary. The standard construction methodology for the installation of a clear-span watercourse crossing is as follows:

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

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

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

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

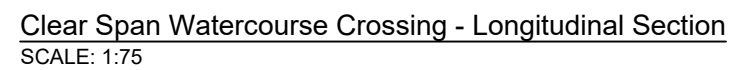
4.8.2.4.5 Culvert Crossing

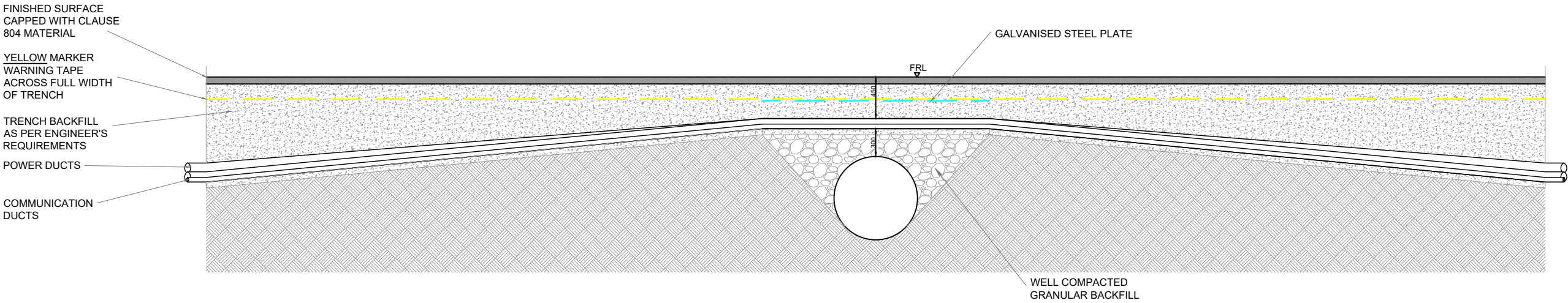
All new proposed culverts and proposed culvert upgrades at drain crossings required for the Proposed Wind Farm will be suitably sized for the expected peak flows in the watercourse. Only 1 no. new culvert will be installed to manage drainage waters from works areas of the Proposed Wind Farm, where the waters have to be taken from one side of an existing access trackway to the other for discharge. The size of culverts will be influenced by the depth of the track or access track sub-base but will have a minimum 900mm diameter.

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

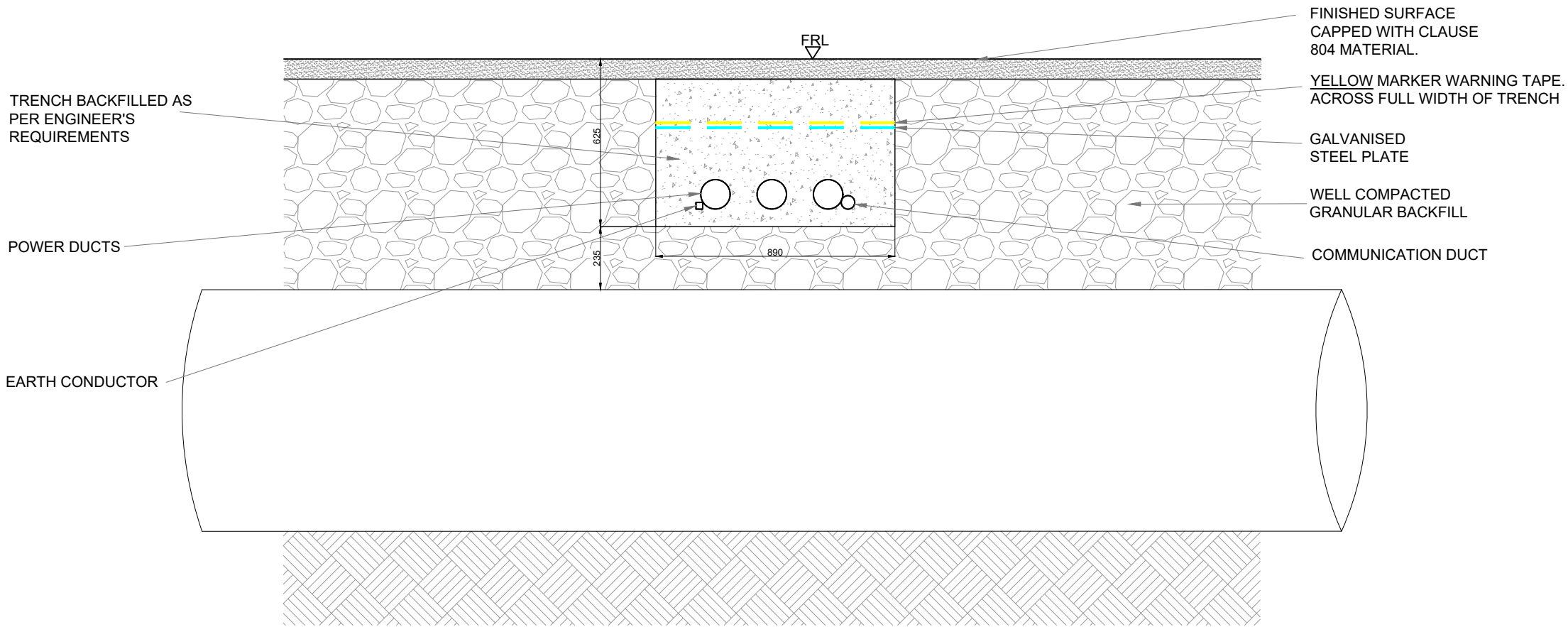
sized pipe buried in the sub-base of the access track at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary.

All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Please see Figure 4-30 for details.





Culvert Crossing - Longitudinal Section
SCALE 1:50



Culvert Crossing - Cross Section
SCALE 1:20

PROJECT TITLE:			
SSE Crumhach Wind Farm			
DRAWING TITLE:			
33kV Culvert Crossing			
PROJECT No.:	DRAWING No.:	SCALE:	
230841	Figure 4-35	As Shown @ A3	
DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
GO	BT	28.07.2026	P01



4.8.2.5 Onsite Electricity Substation and Control Buildings

The onsite 110kV substation will be constructed by the following methodology:

- › The area of the on-site substation will be marked out using ranging rods or wooden posts and the soil and overburden stripped and temporarily stockpiled for later use in landscaping. Any excess material will be sent to one of the designated peat and spoil management areas.
- › 2 no. control buildings will be built within the onsite substation compound;
- › A stoned-out hardstand area will then be established using locally sourced materials.
- › The dimensions of the onsite substation area have been designed to meet the requirements of the ESN and the necessary equipment to safely and efficiently operate the Proposed Wind Farm;
- › The foundations will be excavated down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it. An anti-bleeding admixture will be included in the concrete mix.
- › The block work walls will be built up from the footings to DPC level and the floor slab constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors.
- › The block work will then be raised to wall plate level and the gables & internal partition walls formed. Scaffold will be erected around the outside of the building for this operation.
- › The roof slabs will be lifted into position using an adequately sized mobile crane.
- › The timber roof trusses will then be lifted into position using a telescopic load all or mobile crane depending on-site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather.
- › The transformer, electrical equipment, and storage container plinths will be excavated down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it. An anti-bleeding admixture will be included in the concrete mix.
- › Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed.
- › The electrical equipment will be installed and commissioned.
- › Perimeter fencing will be erected.
- › The construction and components of the substation will be built to EirGrid specifications.

4.8.2.6 Underground Electrical and Communication Cabling

The transformer in each turbine is connected to the onsite substation through a network of buried electrical cables. The ground is trenched using a mechanical excavator. The top layer of soil (or access track surface) is removed and saved so that it is replaced on completion. The cables will be bedded with suitable material. The cables will be laid at a depth of approx. 1.2m below ground level; a suitable marking tape is installed between the cables and the surface (see Plate 4-9 below illustrating an example of a single cable trench). On completion, the ground will be reinstated as described in Section 4.8.2.5. The route of the cable ducts will follow the access tracks as illustrated on the Proposed Wind Farm layout drawings included as Appendix 4-1 of the EIAR. The cabling may be located on either side of the access track and/or within the access track footprint.

All underground cabling watercourse crossings along the public road corridor (L2702 and L6309 local roads) will be completed via horizontal directional drilling methodology. Details of all watercourse crossing methodologies for the Proposed Project are outlined in Section 4.8.3.2 below.

4.8.2.7 Temporary Construction Compounds

The proposed temporary construction compounds will be constructed as follows:

- › The area to be used as the compounds will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter;
- › The compounds in greenfield areas within the Proposed Wind Farm (temporary construction compounds 1 and 2) and extensions from compounds utilising existing hardstanding areas (temporary construction compounds 3 and 4) platforms will be established using a similar technique as the construction of the substation platform as discussed below in Section 4.8.3.1; 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 in appropriately bunded containers and a designated area for oil storage will be constructed within the compound.
- › A waste storage area will be provided within the compound;
- › The compounds will be fenced and secured with locked gates if necessary; and,
- › Upon completion of the Proposed Project, the temporary construction compounds will be decommissioned and allowed to vegetate naturally.

Given the proximity of temporary construction compound 1 from the nearest proposed turbine (175m to T05), during the erection of Turbine 5, an increased temporary exclusion zone will be implemented around the turbine base. This exclusion zone will also encompass the temporary construction compound, where access will be restricted to essential personnel and vehicles directly involved in the lift.

4.8.2.8 Borrow Pits

As outlined in Section 4.3.2.4 above, the estimated volume to be extracted from the 3 no. borrow pits for the construction of the Proposed Wind Farm is 9,000m³ of peat and 41,000m³ of spoil. This figure presented is the anticipated maximum volumes; however, the actual volumes to be removed from the borrow pit will be confirmed at the time of construction and following detailed pre-construction site investigation works.

The construction of the proposed borrow pits will follow a standard sequence as follows:

1. *Peat and overburden will be removed and temporarily stored in localised areas adjacent to the borrow pit locations before being placed into the permanent peat/spoil storage area within the borrow pit, or within the peat/spoil storage area at T12.*
2. *The rock within the proposed borrow pit footprints will be removed by either breaking or blasting depending on its excavatability, which will be determined from a confirmatory ground investigation carried out at the proposed borrow pits. The ground investigation will comprise rotary core drilling with associated engineering logging including rock quality designation and strength and durability testing. From site observations of rock exposures and the results of the intrusive ground investigation breaking is most likely to be suitable to remove the rock, however at depth some blasting may also be required in Borrow Pit 1.*
3. *It is proposed to construct the borrow pits so that the base of the borrow pits are below the level of the adjacent section of access road. As excavation progresses into the back edge of the borrow pit, localised deepening of the borrow pit floors may be required depending on extraction operations*
4. *A temporary ramp will be formed to provide access and egress for construction vehicles at Borrow Pit 1. The proposed locations of the ramps are shown on drawing*

- P23-240-0600-0015 of the PSMP (Appendix 4-2). These ramps will be backfilled with spoil back to the current ground level once the Borrow Pit is completed.*
- 5. Slopes within the excavated rock formed around the perimeter of the borrow pits will be formed at stable inclinations to suit local in-situ rock conditions (45 degrees, 1(v):1(h)). Exposed sections of the rock slopes will be left with irregular faces and declivities to promote re-vegetation and provide a naturalistic appearance. Slopes within the overburden will be formed at 1(v):2(h).*
 - 6. The stability of the rock faces within the borrow pits will be inspected by the Project Geotechnical Engineer upon excavation to ensure stability during construction works and in the long term. This inspection will allow unfavourable rock conditions to be identified and suitable mitigation measures to be applied such as removal of loose rock, in line with best practice guidelines.*
 - 7. It will be necessary to construct rock buttresses founded on in-situ rock within Borrow Pit 1 to create individual cells (up to 3 no.). The cells will be opened in sequence and filled as needed. The rock buttresses will be constructed of coarse crushed rock fill from the borrow pit excavation, placed and compacted in layers. The founding stratum for each rock buttress will be inspected and approved by the Project Geotechnical Engineer.*
 - 8. The rock buttress will be constructed in stages to allow infilling of peat and spoil within cells. The buttress will be constructed of coarse crushed rock fill and placed and compacted in suitable layers to form a buttress of sufficient stability to retain the placed peat and spoil.*
 - 9. The rock buttress will be wide enough (up to 4m) to allow construction traffic access for tipping and grading during the placement of the excavated peat and spoil. The permanent side slopes of the rock buttresses will be constructed at between 40 to 60 degrees.*
 - 10. The internal rock buttress will be founded on bedrock i.e., competent strata. The founding stratum for the rock buttress will be inspected and approved by the Project Geotechnical Engineer.*
 - 11. Infilling of the peat and spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress, allowing the borrow pit to be developed and infilled in cells. The contractor excavating the rock will be required to develop the borrow pits in a way which will allow the excavated peat and spoil to be reinstated safely.*
 - 12. In order to prevent water retention occurring behind the buttress, the buttress will be constructed of coarse boulder fill with a high permeability. The buttress will be constructed of well graded granular rock fill of about 100mm up to typically 500mm in size. In addition, drains will be placed through the buttress to allow surface water to drain from the surface of the placed peat/spoil. These drains will be 150mm diameter flexible plastic drainage pipe or equivalent.*
 - 13. The use of temporary access ramps and long reach excavators during the placement of the excavated peat and spoil will be required.*
 - 14. The surface of the placed peat and spoil will be shaped following backfill using excavators to allow efficient run-off of surface water from the placed arisings towards the perimeter of the borrow pit. The surface of the placed spoil will have a maximum grade of 10 degrees.*
 - 15. An interceptor drain will also be installed around the perimeter of the borrow pit. This drain will divert any surface water away from the borrow pit and hence prevent water from ponding and lodging during construction and also when reinstated.*
 - 16. Temporary control of groundwater within the borrow pit will be required and measures will be determined as part of the ground investigation programme. A temporary pump and suitable outfall location will be required during construction.*
 - 17. A settlement pond will be constructed at the lower side/outfall location of the borrow pit and is shown on the drainage drawings.*

18. *The acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the peat and spoil within the borrow pit.*
19. *Supervision by the Project Geotechnical Engineer is required for the development of the borrow pit.*
20. *All the above-mentioned requirements will be implemented by the Contractor during construction*

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

4.8.2.8.1 **Rock Breaking**

Weathered or brittle rock can be extracted by means of a hydraulic excavator and a ripper attachment. This is a common extraction methodology where fragmented rock is encountered as it can be carefully excavated in layers. In areas where stronger rock is encountered and cannot be removed by means of excavating then a rock breaking methodology may be used. Rock breaking equipment comprises a large hydraulic 360-degree excavator with a rock breaker attachment. Given the power required to break out tight and compact stone at depth, the machines are generally large and in the 40-60 tonne size range. Even where rock might appear weathered or brittle at the surface, the extent of weathering can quickly diminish with depth resulting in strong rock requiring significant force to extract it at depths of only a few metres.

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

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

4.8.2.8.2 **Rock Blasting**

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

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

A properly designed blast should generate rock of a size that can be loaded directly into a mobile crusher, using the same wheeled loader outlined above. The same method is used for processing the rock generated from a blast, as would be used to process rock generated by rock breaking. Generally, the drilling rig will recommence drilling blast holes for the next blast as soon as one blast is finished. The potential impacts and control measures associated with noise and vibration from this extraction method are assessed in Chapter 12: Noise and Vibration. Any blasting will be carried out in accordance with the *Guidance on the Safe Use of Explosives in Quarries* (Safety and Health

Commission for the Mining and Other Extractive Industries, 2002)⁶ and the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*⁷.

4.8.2.9 Peat and Spoil Management Areas

As outlined in Appendix 4-2 of the EIAR, the following commitments for the placement of peat within permanent clearfell areas around 6 no. Proposed Turbines, to the south of the substation, and at 4 no. locations in the open peatlands in the western part of the Proposed Wind Farm will be implemented during construction:

1. *Excavated peat will be placed/spread across the designated areas.*
2. *The peat placed within the areas will be restricted to a maximum height of 1.25m. Weak/liquified peat will be placed within the proposed borrow pits and not stored within these areas. Spoil can be placed to a maximum depth of 1.5m in the storage area at T12.*
3. *The placement of excavated peat will be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the placement areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works.*
4. *Where there is any doubt as to the stability of the peat surface then no material will be placed on to the peat surface. The risk of peat instability is reduced by not placing any loading onto the peat surface.*
5. *It will be ensured that the surface of the placed peat will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat will be carried out as placement of peat within the peat placement area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat.*
6. *Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h). This slope inclination will be reviewed during construction, as appropriate.*
7. *The acrotelm will be placed on the finished surface with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the placed peat and spoil within the placement areas.*
8. *Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on site.*
9. *Supervision by the Project Geotechnical Engineer will be carried out for the works*
10. *An interceptor drain will be installed upslope of the designated peat placement areas to divert any surface water away from these areas. This will help ensure stability of the placed peat and reduce the likelihood of debris run-off.*
11. *All the above-mentioned general guidelines and requirements will be undertaken by the Contractor during construction.*

⁶https://www.hsa.ie/eng/Publications_and_Forms/Publications/Mines_and_Quarries/Guidance%20on%20the%20Safe%20Use%20of%20Explosives%20in%20Quarries.pdf

⁷<https://www.thenbs.com/PublicationIndex/documents/details?Pub=BSI&DocID=305965>

4.8.3 Proposed Grid Connection Route

4.8.3.1 Underground Electrical (110kV) and Communication Cabling

The methodology for the construction of the Proposed Grid Connection Route has been prepared by TLI Group. The underground cabling works will consist of the installation of ducts in an excavated trench to accommodate electrical and fibre communications cables to facilitate a loop connection between the proposed 110kV onsite substation and the existing 220kV Srananagh substation.

The ducts will be installed and the trench reinstated in accordance with the specifications of the Roads Section within Sligo County Council where installed in public roads and reinstated in accordance with the landowner's requirements where installed in private lands. The installation of the electrical cabling/fibre cable will be pulled through in one section in approximately 620 to 680m section lengths. Construction methodologies to be implemented and materials to be used will ensure that the UGC is installed in accordance with the requirements of the Council and private landowners.

4.8.3.1.1 Trenching Methodology

The following section outlines the methodology to be followed during trenching works:

- › The Contractor, and their appointed Site Manager, will prepare a targeted Method Statement concisely outlining the construction methodology and incorporating all mitigation and control measures within the EIAR where relevant;
- › All existing underground services along the Proposed Grid Connection Route shall be identified on site prior to the commencement of construction works;
- › Traffic management measures will be implemented in accordance with those included in Chapter 15 of the EIAR, and a detailed Traffic Management Plan will be prepared and agreed with Sligo County Council;
- › The excavated trench will be approximately 825mm in width and approximately 1315mm deep both within the public road network and within private lands; The 160mm diameter HDPE cable ducting will be placed into the prepared trench, inspected and backfilled.
- › Excavated material will be temporarily stockpiled onsite for re-use during reinstatement. Stockpiles will be restricted to less than 2m in height. Stockpiles will be located a minimum of 50m from surface water features and all stockpiling locations will be subject to approval by the Site Manager and Project Ecological Clerk of Works (ECoW);
- › Excavated material shall be employed to backfill the trench where appropriate and any surplus material will be transported to one of the proposed on-site borrow pits;
- › Any earthen (sod) banks to be excavated will be carefully opened with the surface sods being stored separately and maintained for use during reinstatement;
- › 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. (Please refer to Section 9.0 of Appendix 4-7);
- › Where required, grass will be reinstated by either seeding or by replacing with grass turves;
- › No more than a 100m section of trench will be opened at any one time. The second 100 metres will only be excavated once the majority of reinstatement has been completed on the first;
- › The excavation, installation and reinstatement process will take on average of 1 no. day to complete a 100m section;
- › Where the cable is being installed in a roadway, temporary reinstatement may be provided to allow larger sections of road to be permanently reinstated together;

- › Works will only be conducted in normal working hours of Monday to Friday 07:00 to 19:00 and Saturday 07:00 to 19:00, with no works on Sundays or Bank Holidays except in exceptional circumstances or in the event of an emergency;
- › Following the installation of ducting, pulling the cable will take approximately 1 no. days between each joint bay, with the jointing of cables taking approximately 1 week per joint bay location.

4.8.3.1.2 Ducting Installation Methodology

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

- › Grade, smooth and trim trench floor when the required 1315mm depth and 825mm width have been obtained.
- › Place bedding layer of Cement Bound Granular Mixture B (CBGM B) material in accordance with the specification and compact it so that the compacted thickness is as per the drawings.
- › Lay the bottom row of ducts in trefoil formation as detailed on the design drawings. Use spacers as appropriate to establish horizontal duct spacing. Fit a secure cap / bung to the end of each duct run to prevent the ingress of dirt or water.
- › Carefully surround and cover ducts with CBGM B in accordance with the design drawings and specifications and thoroughly compact without damaging ducts.
- › Place cable protection strips on compacted CBGM B directly over the ducts.
- › Lay the top row of ducts onto the freshly compacted CBGM B including the cable protection strips above the bottom row of ducts. Place a secure cap at the end of each duct to prevent the ingress of dirt or water.
- › Carefully surround and cover ducts with CBGM B material in accordance with the drawings and thoroughly compact without damaging ducts.
- › Place red cable protection strip on top of compacted CBGM B over each set of ducts as shown on the drawings.
- › Place and thoroughly compact CBGM B material or Clause 804 backfill, or soil backfill as specified and place warning tape at the depth shown on the drawings.
- › For concrete and asphalt/bitmac road sections, carry out immediate permanent reinstatement in accordance with the specification and to the approval of the local authority and/or landowners, unless otherwise agreed with local authority (Figure 3).
- › 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 or landowner (Figure 4).
- › 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 ESNB Clerk of Works (CoW) as required.

4.8.3.1.3 Cable Pulling

Once the ducting is installed the electrical cables (situated on a drum) are pulled through the ducting by a specialised mechanical winch. The winch will also monitor the tension on the cables being pulled so as not to damage the cables. A guide rope is installed with the ducting to assist in the cable pulling process. The guide rope also is used for proving the ducts by attaching a mandrel, a sponge or brush, for cleaning the duct installed. Cable lubricant is applied to the outside of the cables being pulled through the duct. The lubricant assists in the pulling process by removing friction between the cable and the rollers. This not only speeds up the process but also prevents snagging and therefore damage to the cable.

4.8.3.1.4 Marker Posts

Surface cable markers will be placed along the route where cable depth is unavoidably shallow, due to constraints such as existing services, to indicate the precise location of the UGC. These markers will be metallic plates in accordance with ESB standards. Marker posts will be used on non-roadway routes where applicable to delineate the duct route and joint bay positions. Corrosion proof aluminium triangular danger signs, with a 700mm base, and with centred lightning symbol, on fluorescent yellow background shall be installed in adequately sized concrete foundations. Marker posts shall also be placed in the event that burial depth is not to standard. The precise siting of marker posts will be dictated by ESBN as part of the detailed design process.



Plate 4-9 Typical Cable Trench View

4.8.3.2 Watercourse/Built Service Crossings

There are 34 no. identified watercourse crossings along the Proposed Grid Connection Route, 31 no. of which are referenced on EPA/OSI mapping. The construction methodology for the 34 no. identified watercourse crossings has been designed to eliminate the requirement for in-stream works on these locations requiring a crossing to be constructed to traverse the watercourse with the cabling ducts. There are also 2 no. built service crossings of a 38kV underground cable and a disused historic railway line.

Where the Proposed Grid Connection Route intersects with existing watercourses, a detailed construction method statement will be prepared by the Contractor prior to the commencement of construction and is to be approved by the Local Authority and relevant environmental agencies. Existing culverts will be crossed using open trenching with either an undercrossing or an overcrossing, depending on the depth of the culvert.

Inland Fisheries Ireland have published guidelines relating to construction works along water bodies entitled '*Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites*'; and these guidelines will be adhered to during the construction of the Proposed Project.

The construction methodology for the Proposed Grid Connection Route is included as Appendix 4-7 of the EIAR. A general description of the various construction methods employed at watercourse crossings are described in the following paragraphs below. An illustration of the proposed crossing

methodologies are included in Appendix 4-1. Table 4-7 below outlines the proposed methodology for each watercourse crossing along the Proposed Grid Connection Route.

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

Where culverts require upgrading, the Applicant will commission a survey of culverts, the results of which will inform the exact details of the upgrade works which will be forwarded to the relevant Local Authority. Having regard to the duration of the consent requested (10 years) it is considered best practice that any such surveys be carried out prior to construction to facilitate accuracy and timely reporting of the surveys.

4.8.3.2.1 **Standard Formation Crossing over Culvert – Option A**

Where adequate cover exists above a culvert or service, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or water course. The cable trench will pass over the culvert in a standard trench as outlined in the Proposed Grid Connection Route construction methodology included in Appendix 4-7 of the EIAR.

Where no crossing currently exists, the cable will pass over the watercourse in a bottomless box culvert or pre-cast concrete slab in a standard trefoil arrangement. Where required existing culvert crossings will be extended using appropriately sized corrippe (see Section 4.6.4 above).

4.8.3.2.2 **Standard Formation Crossing under Culvert – Option B**

Where the culvert or service crossing consists of a socketed concrete or sealed plastic pipe and sufficient depth is not available over the crossing, a trench will be excavated beneath the culvert and cable ducts will be installed in the standard formation 300mm below the existing pipe as outlined in the Proposed Grid Connection Route construction methodology included in Appendix 4-7 of the EIAR.

4.8.3.2.3 **Horizontal Directional Drilling – Option C**

In the event that none of the above methods are appropriate, horizontal directional drilling (HDD) will be utilised. The Proposed Grid Connection Route will involve 15 No. bridge crossings including 15 No. HDD crossings. Drawings of all 15 no. bridge crossings are included in Appendix 4-8 of this EIAR. A standard HDD crossing is also outlined in Figure 4-36 below.

HDD is a method of drilling under obstacles such as bridges, culverts, railways, water courses, etc. in order to install cable ducts under the obstacle. This method is employed where installing the ducts using standard installation methods is not possible.

The HDD method of duct installation will be carried out using Vermeer D36 x 50 Directional Drill (approx. 22 tonnes), or similar plant, for the directional drilling at watercourse/culvert crossings listed in Table 4-5 below. The launch and reception pits will be approx. 0.55m wide, 2.5m long and 1.5m deep. The pits will be excavated with a suitably sized excavator. The drilling rig will be securely anchored to the ground by means of anchor pins which will be attached to the front of the machine. The drill head will then be secured to the first drill rod and the operator shall commence to drill into the launch pit to a suitable angle which will enable him to obtain the depths and pitch required to the line and level of the required profile. Drilling of the pilot bore shall continue with the addition of 3.0m long drill rods, mechanically loaded and connected into position as outlined in Figure 4-36.

During the drilling process, a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water is pumped through the centre of the drill rods to the reamer head and is forced in to void and enables the annulus which has been created to support the surrounding subsoil and thus

prevent collapse of the reamed length. Depending on the prevalent ground conditions, it may be necessary to repeat the drilling process by incrementally increasing the size of the reamers. When the reamer enters the launch pit, it is removed from the drill rods which are then passed back up the bore to the reception pit and the next size reamer is attached to the drill rods and the process is repeated until the required bore with the allowable tolerance is achieved.

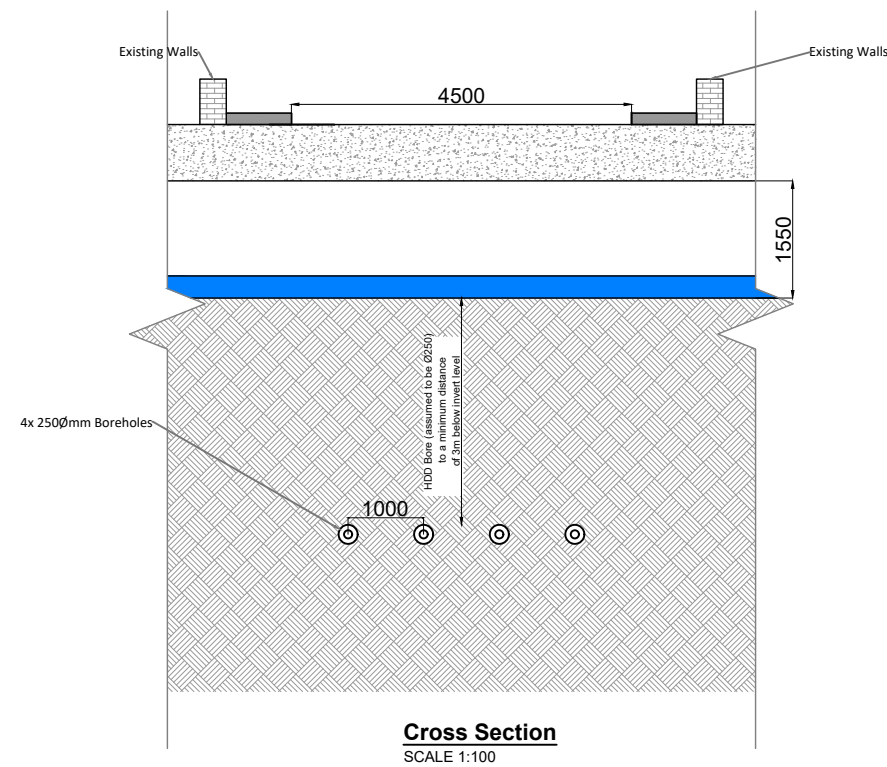
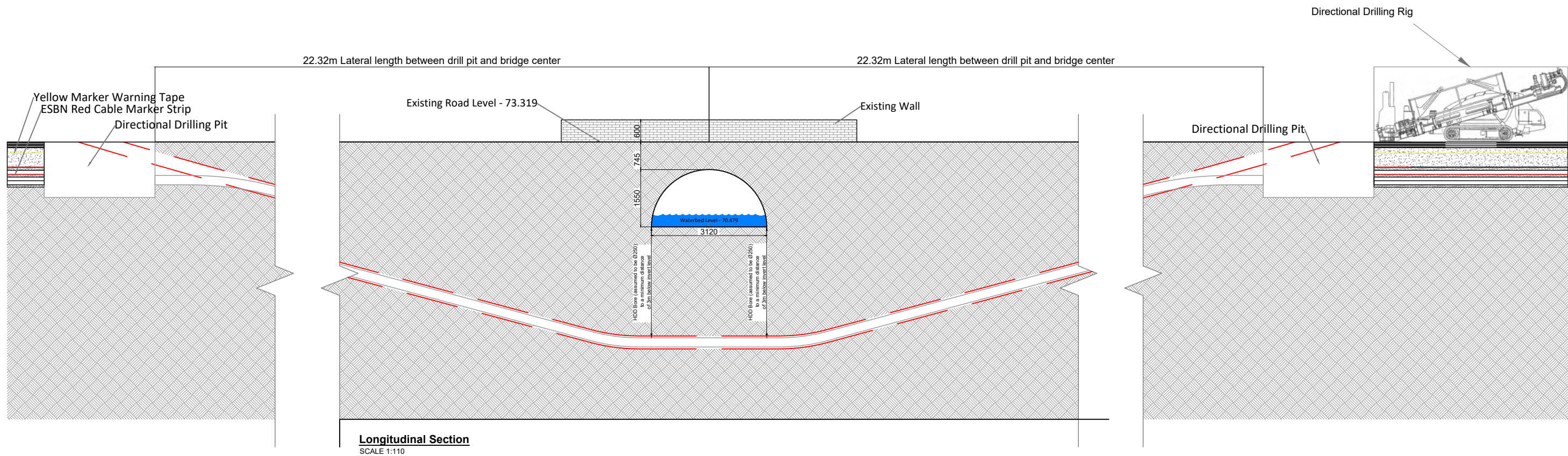
The use of a natural, inert and biodegradable drilling fluid such as Clear Bore™ is intended to negate any adverse impacts arising from the use of other, traditional polymer-based drilling fluids and will be used sparingly as part of the drilling operations. It will be appropriately stored prior to use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

Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring will be put in place during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exists.

Table 4-7 Proposed Grid Connection Route Watercourse crossing types

No.	XITM	YITM	EPA Mapped Watercourse	Watercourse Crossing Type	Width of Crossing (m)	Cover from Road Level to Top of Culvert (m)	Crossing Methodology	Extent of In-Stream Works
1	572355	825627	Y	Stone Arch Bridge	2.4	0.48	HDD (Option C)	No in-stream works required
2	571336	826414	Y	Stone Culvert	2	1.4	Under (Option B)	No in-stream works required
3	571212	826505	Y	Plastic Pipe	N/A	N/A	Under (Option B)	No in-stream works required
4	571044	826702	Y	Concrete Pipe	N/A	N/A	Under (Option B)	No in-stream works required
5	570965	826798	Y	Stone Arch Bridge	2.4	1.16	HDD (Option C)	No in-stream works required
6	570805	826879	Y	Stone Arch Bridge	2.4	1.2	HDD (Option C)	No in-stream works required
7	569919	826457	Y	Concrete Pipe	0.5	0.5	Under (Option B)	No in-stream works required
8	569426	825945	Y	Stone Arch Bridge	8.7	0.6	HDD (Option C)	No in-stream works required
9	567921	826576	Y	Stone Arch Bridge	8	0.39	HDD (Option C)	No in-stream works required
10	567205	828481	Y	Stone Culvert	0.6	1.1	Under (Option B)	No in-stream works required
11	567133	828610	N	Stone Arch Bridge	0.9	0.75	HDD (Option C)	No in-stream works required
12	562971	828380	Y	Plastic Pipe	0.4	0.6	HDD (Option C)	No in-stream works required
13	562221	828218	Y	Concrete Pipe	N/A	N/A	Under (Option C)	No in-stream works required
14	561746	828327	Y	Stone Arch Bridge	1.15	1.5	Under (Option B)	No in-stream works required
15	561038	828915	Y	Concrete Pipe	0.5	0.5	Under (Option B)	No in-stream works required
16	560407	829488	Y	Stone Culvert	2.5	0.9	Under (Option B)	No in-stream works required
17	559751	830009	Y	Plastic Pipe	1.5	2.8	Over (Option A)	No in-stream works required
18	557774	831372	Y	Concrete Pipe	0.5	0.5	Under (Option B)	No in-stream works required
19	557108	831713	Y	Stone Culvert	N/A	N/A	Under (Option B)	No in-stream works required
20	554284	832997	Y	Stone Arch Bridge	4	0.63	HDD (Option C)	No in-stream works required
21	556058	832266	Y	Stone Arch Bridge	4	0.95	HDD (Option C)	No in-stream works required
22	553713	833112	Y	Stone Arch Bridge	4.5	1.39	HDD (Option C)	No in-stream works required
23	550769	832497	Y	Stone Arch Bridge	7	1.38	HDD (Option C)	No in-stream works required
24	548687	832623	Y	Stone Arch Bridge	1.25	1.5	Under (Option B)	No in-stream works required
25	546319	833109	Y	Stone Arch Bridge	11	0.69	HDD (Option C)	No in-stream works required
26	545896	832338	Y	Stone Culvert	0.6	0.4	Under (Option B)	No in-stream works required

No.	XITM	YITM	EPA Mapped Watercourse	Watercourse Crossing Type	Width of Crossing (m)	Cover from Road Level to Top of Culvert (m)	Crossing Methodology	Extent of In-Stream Works
27	545851	832027	Y	Concrete Pipe	N/A	N/A	Under (Option B)	No in-stream works required
28	545698	831533	N	Stone Arch Bridge	N/A	N/A	HDD (Option C)	No in-stream works required
29	545721	831106	Y	Stone Culvert	N/A	N/A	Under (Option B)	No in-stream works required
30	545819	830506	N	Stone Culvert	0.3	0.6	Under (Option B)	No in-stream works required
31	545952	829639	Y	Stone Arch Bridge	2	0.35	HDD (Option C)	No in-stream works required
32	544996	829388	Y	Concrete Pipe	N/A	N/A	Under (Option B)	No in-stream works required
33	544460	829246	Y	Stone Arch Bridge	8	0.78	HDD (Option C)	No in-stream works required
34	543837	829195	Y	Concrete Pipe	0.5	0.5	Under (Option B)	No in-stream works required
35	568427	826080	N/A	Service Crossing	N/A	N/A	HDD (Option C)	N/A
36	567822	826852	N/A	Service Crossing	N/A	N/A	HDD (Option C)	N/A



PROJECT TITLE:			
SSE Crumhach Wind Farm			
DRAWING TITLE:			
Horizontal Directional Drill Under Existing Watercourse Crossing			
PROJECT No.:	DRAWING No.:	SCALE:	
230841	Figure 4-36	1:100 @ A3	
DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
GO	BT	28.07.2026	P01



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

4.8.3.3 Joint Bays

Joint Bays are to be provided approximately every 620m to 680m along the Proposed Grid Connection Route to facilitate the jointing of 2 no. lengths of underground electrical cabling. 110kV Joint Bays are typically 2.5m x 6m x 2.05m pre-cast concrete structures installed below finished ground level. Joint Bays will be located in the non-wheel bearing strip of roadways where possible.

In association with Joint Bays, Communication Chambers are required at every joint bay location to facilitate communication links between Wind Farm and the existing Substation. Earth sheath links are used for earthing and bonding cable sheaths of underground power cables, installed in a trefoil formation so that the circulating currents and induced voltages are eliminated or reduced. Earth sheath link chambers and communication chambers are located close to joint bays. Earth sheath link chambers and communication chambers will typically be pre-cast concrete structures with an access cover at the finished surface level.

The precise siting of all joint bays, earth sheath link chambers, and communication chambers is subject to approval by EirGrid. Marker posts will be used on non-roadway routes to delineate the duct route and joint bay positions. The marker posts will consist of a corrosion-proof aluminium triangular danger sign, with a 750mm base, and with a centred lightning symbol, on engineering grade fluorescent yellow background. They will be installed inadequately sized concrete foundations and will also be placed where the cable has not been buried to the standard depth, due to existing road conditions. Drawings of the joint bays and communication chambers are included within this planning package. The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers, within the curtilage of the public road, is subject to approval by ESBN and EirGrid. Joint bay details are shown within the Proposed Grid Connection Route construction methodology included in Appendix 4-7 of the EIAR. The proposed location of joint bays within the Proposed Grid Connection Route are shown in Appendix 4-8 of the EIAR.

4.9 Operation

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

The Proposed Turbines will be connected, and data relayed from the wind turbines to a central control unit at the onsite substation which will facilitate off-site remote monitoring of the wind farm. Each turbine will be monitored off-site by the appointed Operations and Maintenance contractor (typically the wind turbine manufacturer) and 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 onsite visual inspections will also be carried out by the wind farm operations management company.

4.9.1 Maintenance

Each turbine will be subject to a routine maintenance programme involving several checks and changing of consumables, including oil changes. The meteorological mast will be subject to a routine maintenance programme involving several checks and changing of instrumentation when required. In addition, there will 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. Maintenance of the site roads will involve filling potholes and maintaining road edge markers. Drainage maintenance will typically involve cleaning of drainage ditches when required to prevent water backing up.

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

- › 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:
 - Six-month service – three-week visit
 - Annual service – six-week visit
 - Weekly visits as required.

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

The Proposed Wind Farm will be accessible on a daily basis for authorised persons and vehicles to undertake minor routine maintenance and inspection, if and when required.

Although the level of activity required for the maintenance of the both the Proposed Wind Farm and Proposed Grid Connection Route infrastructure is minimal, the impacts associated with traffic volumes for this period are assessed in Chapter 15 Material Assets: Traffic and Transport.

4.9.2 **Monitoring**

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

- › Monthly water sampling and laboratory analysis will be undertaken for the first six months during the operational phase.
- › The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored.
- › Post-construction bird monitoring will be carried out in accordance with the Bird Monitoring Plan provided in Appendix 7-8.
- › Post-construction bat monitoring will be carried out in accordance with the Bat Report recommendations in Appendix 6-2
- › Post-construction linear habitat restoration monitoring following the main growing season (i.e., in September) in a given year for the first five 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.

4.9.3 **Community Benefit Fund**

In addition to employment during the construction and operational phases of the Proposed Project and annual commercial rates that will be paid to the local authority by the Applicant, additional benefits will be provided to the local community through the provision of a Community Benefit Fund.

The Developer has a long history of delivering local community funds, both in Sligo and throughout Ireland. In Sligo, the Developer has operated a voluntary community fund linked to the two wind farms, since 2004. During that time the Kingsmountain and Dunneill Community Fund has contributed over €650,000 to local groups. Over this period, the fund has supported communities in delivering sustainable, impactful projects that contribute to social, environmental and economic wellbeing, helping to enhance the quality of life for local residents.

The value of the Community Benefit Fund for the Proposed Project will be linked to the productivity of the Proposed Wind Farm and is calculated based on €2/MWh of the overall total generated by the Proposed Wind Farm.

In 2021, the Department of the Environment, Climate and Communications, published the *Renewable Energy Support Scheme Good Practice Principal Handbook*⁸, outlining how community funds should be managed, operated, and distributed to wind and solar projects that are successful in the Renewable Energy Support Scheme (RESS) Auctions. This was further updated to a revised rulebook⁹ in May 2025 (which may be subject to change at the Department's discretion).

A key criterion of the Department's Community Benefit Rulebook, as updated in 2025, is that the projects and initiatives will benefit the communities surrounding the wind farm. As part of this, a Fund Committee will be established and will consist of a number of volunteer community representatives, the Project Developer and Administrator (if applicable). The Fund Committee should aim to represent the widest cross-section of the community possible. The Fund Committee will then develop a strategy for the Community Fund and will work with the Developer's Community Investment Team, on the design and structure of a funding strategy that will be of benefit to the community as a whole. The Fund Committee will make the final decisions on applications submitted for funding. The Crumhach Wind Farm Community Benefit Fund will be delivered in line with industry best practice and any relevant Government rules in place at time of project delivery.

4.10

Decommissioning

The Proposed Turbines are expected to have a lifespan of approx. 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 wind turbines will be disassembled. All above ground turbine and mast components would be separated and removed off-site for recycling. Turbine and mast foundations would remain underground and would be covered with earth and allowed to revegetate. Leaving the foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant temporary environment nuisances such as noise, dust and/or vibration. Site roadways will be used during the operational phase by farm machinery and therefore will be retained where requested post-decommissioning to facilitate these activities.

The underground electrical cabling connecting the turbines to the onsite substation and 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.

The Proposed Grid Connection Route underground electrical cabling route and onsite substation will remain in place as it will be part of the Electricity Grid under the ownership and control of the ESB and EirGrid.

⁸ <https://futureenergyireland.ie/wp-content/uploads/2022/11/RESS-Good-Practice-Principles-Handbook-for-Community-Benefit-Funds.pdf>

⁹ https://assets.gov.ie/static/documents/Rulebook_for_CBFs_under_RESS_branded.pdf

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

As noted in the Scottish Natural Heritage report (SNH) *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013) reinstatement proposals for a wind farm are made approx. 30 years in advance, so within the lifespan of the Proposed Wind Farm, 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”.