



APPENDIX 2

**REIAR CHAPTER 4
DESCRIPTION OF THE
EXISTING DEVELOPMENT**

4. DESCRIPTION OF THE EXISTING DEVELOPMENT

4.1 Introduction

This section of the Remedial Environmental Impact Assessment Report (rEIAR) describes the Existing Development and its component parts which is part of an application to An Coimisiún Pleanála (ACP) for Substitute Consent under Section 177E of the Planning and Development Act 2000 (as amended) ('the Act') by Planree Ltd. ('the Applicant'), for the Subject Development.

Substitute consent is being sought for the Subject Development. The substitute consent application seeks to regularise the Existing Development and seeks permission for the Prospective Development. The Existing Development is addressed within this rEIAR. The Prospective Development is addressed within the Environmental Impact Assessment Report (EIAR), which accompanies this planning application.

This chapter of the rEIAR describes the Existing Development, encompassing all works carried out at the Wind Farm Site and Grid Connection Site since November 2019 to date.

As detailed in Section 1.1.1 in Chapter 1 of this rEIAR, the various development components are described and assessed using the following references: 'Subject Development', 'Existing Development', 'Prospective Development', 'Permitted Development', 'Site', 'Wind Farm Site', 'Grid Connection Site', 'BMEP Site', 'Grid Connection', 'November 2020 Peat Slide', '2017 EIAR' and 'proposed turbines' or 'proposed turbine locations'.

For the purpose of this rEIAR, the Existing Development consists of the retention of the following:

- Upgrading of access junctions, tracks and roads, and construction of new site access roads;
- 18 no. wind turbine foundations and hardstand areas at various stages of development;
- A 110kV Electrical substation with 2 no. control buildings (with a combined floor area of 398.1 sqm) with welfare facilities, associated electrical plant and apparatus, security fencing and underground wastewater holding tank;
- 110kV underground grid connection cabling (including joint bays, communication chambers, earth sheath links, and ancillary works along the underground electrical cabling route) connecting the wind farm 110kV substation to the Clogher Substation in the townland of Cullionboy. This cabling route is primarily located within the public road corridor;
- Internal wind farm underground cabling at various stages of development;
- 2no. temporary construction compounds (including 4 no. temporary site offices with a combined floor area of 66 sqm and 1 no. temporary security cabin with a floor area of 30.5 sqm);
- 3no. borrow pits;
- Peat and spoil management;
- Forestry felling;
- Site drainage and sediment control measures; and
- All associated site development works.

All elements of the Existing Development are described in detail in this chapter and have been assessed as part of this rEIAR.

4.2 Existing Development Location

The Site, which comprises three distinct elements – the Wind Farm Site, the Grid Connection Site, and the BMEP Site, measures approximately 1,018 hectares (ha) within the townlands of Meenbog, Croaghonagh, Ardinawark, Keadew Upper, Keadew Lower, Cullionboy, Cashelnavean, Tawnawully Mountains, Friarsbush and Tievecloghoge, as described in Chapter 1 Introduction of this rEIAR, and

briefly below. Please note that no activities associated with the Existing Development occurred within the BMEP Site and therefore this site is not discussed further in this rEIAR.

Construction work commenced at the Wind Farm Site and Grid Connection Site in November 2019. The majority of the civil engineering works, including wind farm access roads, turbine hardstands, turbine foundations, borrow pits and peat cells, were substantially completed over a 12-month period up to November 2020. Works on the electricity substation and associated underground cabling connection to the grid continued until the second quarter of 2021. Construction work resumed briefly between July 2022 and September 2022, during which some additional works were carried out on site roads, internal site ducting, hardstanding areas, borrow pits, and peat cells.

4.2.1 Wind Farm Site

The Wind Farm Site, which refers to the area of the Site surrounding the wind turbines and associated infrastructure (including the onsite 110kV substation) from the wind farm site entrance off the N15 National Road (N15), is located in County Donegal, approximately 8 km southwest of the twin towns of Ballybofey and Stranorlar and approximately 12 km northeast of Donegal Town.

The Wind Farm Site measures approximately 892 ha, within the townlands of Meenbog and Croaghonagh. The Wind Farm Site borders County Tyrone in Northern Ireland, specifically the administrative division of Omagh West, Barony of Termonamongan and the townlands of Slievadoo, Meenakeeran, and Sixth Corgary or Second Croagh along the Southeast of the Wind Farm Site boundary. The Wind Farm Site lies within four Electoral Divisions (EDs); Goland, Dooish, Tawnawully and Clogher, in County Donegal. Current land-use at the Wind Farm Site is comprised of the partially constructed Meenbog Wind Farm and areas of commercial forestry and blanket bog. The surrounding land-use predominantly comprises peat bogs, commercial forestry and other seminatural areas with limited residential use along local roads, as well as a quarry adjacent to the Wind Farm Site entrance off the N15 National Road.

The elevation of the Wind Farm Site is between approximately 180 metres above Ordnance Datum (mOD) and 313 mOD, with elevations on site generally decreasing and sloping in a north or north-westerly direction. A small section to the south of the Wind Farm Site slopes to the southeast. The Wind Farm Site is generally bordered on all sides by forestry plantations with the southeastern boundary also being defined by the Northern Ireland border. The Wind Farm Site drains directly to the Bunadownen River and the Shruhanganve stream, which flow to the north, each of which are tributaries of the larger Mourne Beg River that proceeds to flow downstream into the River Derg. The Wind Farm Site also drains into the Glendergan River to the south-southeast, which is also a tributary of the River Derg.

Existing access is from the N15 National Road in the northwest of the Wind Farm Site and the L-6554 Local Road to the north of the Wind Farm Site. The N15 National Road runs south-west to north-east with the Wind Farm Site lying to the east of the road.

There are 3 no. habitable houses located within one kilometre of the proposed turbine locations, the closest being a holiday cottage located 750 metres (m) northwest of the nearest proposed turbine location.

4.2.2 Grid Connection Site

The Grid Connection Site has a total area of approximately 9 ha and extends from the Wind Farm Site entrance along the N15 National Road to the L-2595 Local Road, then proceeds to the L-1985 Local Road where it travels east along the road and through agricultural lands parallel to the local road before continuing along the L-19852 Local Road and finally following a private road to reach the Clogher 110kV substation.

The Clogher 110kV electrical substation is situated approximately 6.5 km southwest of the on-site 110kV electrical substation. The Grid Connection Site traverses the townlands of Ardinawark, Keadew Upper, Keadew Lower, Cullionboy, Cashelnavean, Tawnawully Mountains and Friarsbush.

Existing Development Layout

The Existing Development layout is illustrated in Figure 4-1. This figure shows the location of all elements of the Existing Development, including the locations of the on-site 110kV electrical substation, wind turbines foundations, peat and spoil management areas, borrow pits, internal access roads and hardstand, construction compounds, the Wind Farm Site entrance, and all other elements of the Existing Development constructed on the Wind Farm Site and Grid Connection Site to date. Detailed drawings of the Existing Development are included in Appendix 4-1 to this rEiAR.

The overall layout of the Wind Farm Site constructed as part of the Existing Development is illustrated in Figure 4-2. The as-built infrastructure footprint of the Existing Development is 32.6 ha (including the onsite 110kV substation which is located within the Wind Farm Site) and is approximately 3.7 % of the Wind Farm Site (892 ha).



Map Legend

Wind Farm and Grid Connection Site Boundary

Grid Connection and Substation

- Substation Compound Area
- As-Built 110kV Underground Grid Connection Cabling
- As-Built Joint Bay
- As-Built Transition Chamber
- As-Built Communication Duct
- As-Built Link Box
- Bridge Crossings Locations - 110kV Underground Grid
- Connection Cabling
- Culvert Crossings Locations - 110kV Underground Grid
- Connection Cabling

Ancillary Infrastructure

- Security Cabin
- As-Built New Culvert Locations
- As-Built Relocated Pond
- As-Built Temporary Construction Area
- As-Built Temporary Laydown Area
- As-Built Concrete Washout Area
- As-Built Bridge Upgrade Location
- As-Built Fence
- Pre-Existing Landowner Gate
- As-Built Gate

Ducting

- As-Built Ducting
- As-Built Pull Pit

Peat

- As Built Peat Cells
- As-Built Berms
- As-Built Side Cast

Borrow Pit

- As-Built Borrow Pit
- As-Built Borrow Pit Working Strip

Temporary Construction Compound

- As-Built Temporary Construction Compound

Cut and Fill

- As-Built Cut
- As-Built Fill

Turbines and Hardstands

- As-Built Turbine Bases - At Various Stages
- As-Built Turbine Bases - Substantially Complete
- As-Built Turbine Hardstands

Additional Areas and Disturbed Ground

- As-Built Additional Area
- As-Built Disturbed Ground

Windfarm Roads

- As-Built Solid Roads
- As-Built Partially Completed Road Widening
- As-built Floating Road
- Pre-Existing Roads

Spatial Reference

Name: IRENET95 Irish Transverse Mercator

Datum: IRENET95

Projection: Transverse Mercator

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SITE LOCATION - NOT TO SCALE

Drawing Title

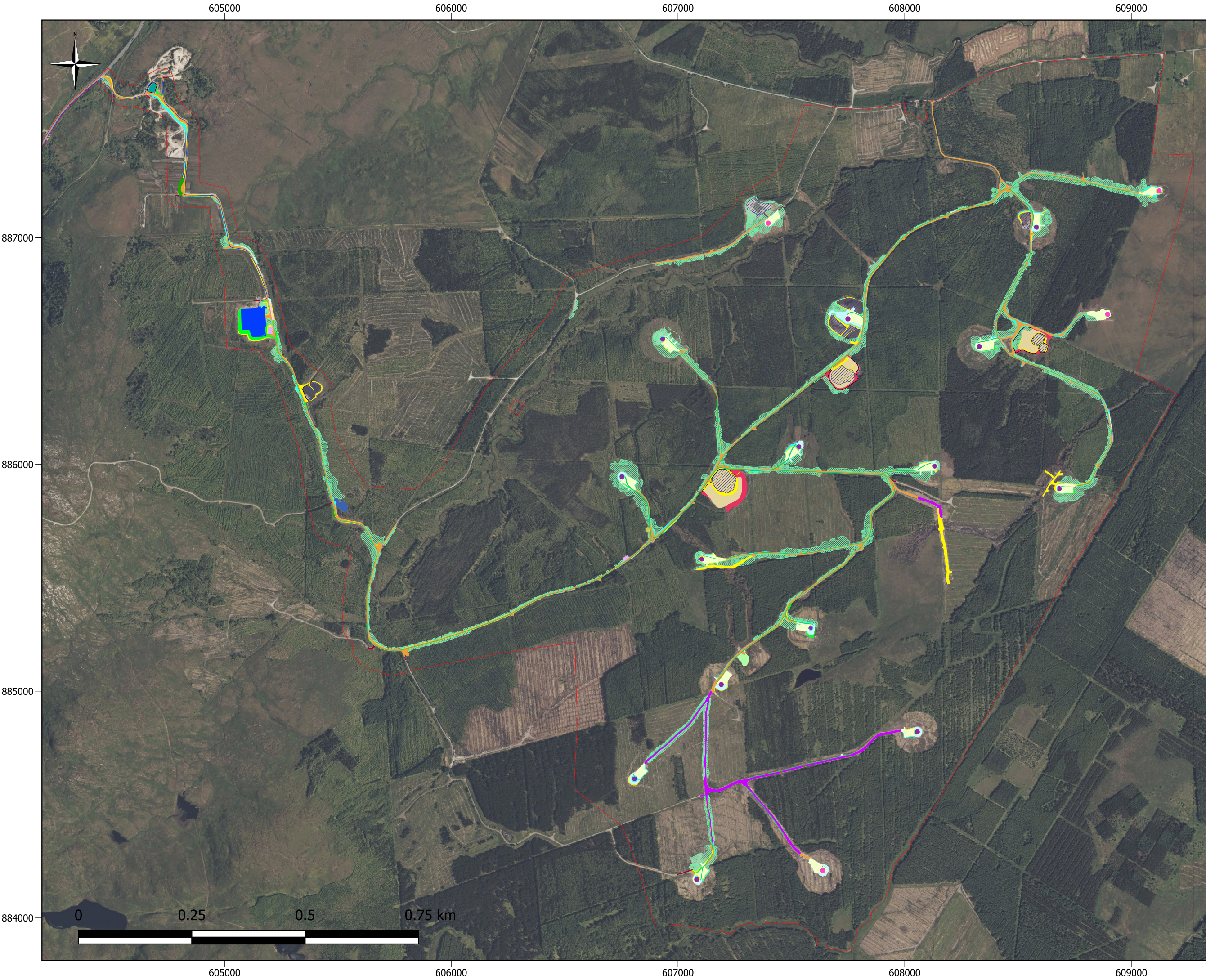
Existing Development Layout

Project Title

Meenbog Wind Farm, Co. Donegal

Project No.	Drawing No.	Scale
240505	Figure 4-1	1:40,000
Drawn by	Checked by	Date
EON	TB	02/07/2026

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



Map Legend

— Wind Farm and Grid Connection Site Boundary

Grid Connection and Substation

- Substation Compound Area
- As-Built 110kV Underground Grid Connection Cabling
- As-Built Joint Bay
- As-Built Transition Chamber
- As-Built Communication Duct
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- Bridge Crossings Locations - 110kV Underground Grid
- Connection Cabling
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Ancillary Infrastructure

- Security Cabin
- As-Built New Culvert Locations
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- As-Built Borrow Pit
- As-Built Borrow Pit Working Strip

Temporary Construction Compound

- As-Built Temporary Construction Compound

Cut and Fill

- As-Built Cut
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- As-Built Turbine Bases - Substantially Complete
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Additional Areas and Disturbed Ground

- As-Built Additional Area
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Windfarm Roads

- As-Built Solid Roads
- As-Built Partially Completed Road Widening
- As-built Floating Road
- Pre-Existing Roads

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

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SITE LOCATION - NOT TO SCALE

Drawing Title

Existing Development Layout

Project Title

Meenbog Wind Farm, Co. Donegal

Project No.	Drawing No.	Scale
240505	Figure 4-2	1:15,000

Drawn by	Checked by	Date
EON	TB	02/07/2026

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

4.4

Components of the Existing Development

This section of the rEIAR describes the components of the Existing Development. The Existing Development is comprised of all works carried out at the Wind Farm Site and Grid Connection Site, including civil engineering works, and management activities, from November 2019 to date.

Further details regarding Site Drainage (Section 4.5), Access and Transportation (Section 4.6), Site Activities (Section 4.7), Construction Management (Section 4.8), and Construction Methodologies (Section 4.9) are provided subsequently in this chapter.

4.4.1 Wind Farm Site

4.4.1.1 Wind Turbines

4.4.1.1.1 Turbine Locations and Foundations

A total of 14 no. of wind turbine foundations (where concrete has been poured) have been completed or predominantly completed, with 2 no. additional foundations prepared with the steel reinforcement and anchor cage in place, and a further 2 no. foundations excavated.

Wind turbine foundations are installed below the finished ground level. The turbine foundation transmits any load on the wind turbine into the ground. The horizontal and vertical extent of each turbine foundation is 22.5m and ~3m respectively. A detail drawing of the turbine foundations is included as drawing MNBG-d020.1.1 in Appendix 4-1 of this rEIAR and is reproduced as Figure 4-3 below. After the foundation level of a turbine has been formed on competent stratum (i.e. bedrock or subsoil of sufficient load bearing capacity), the “Anchor Cage” is levelled and reinforcing steel is then built up around and through the anchor cage. The outside of the foundation is shuttered with formwork to allow the pouring of concrete and is backfilled accordingly with appropriate granular fill to the top of formwork level, to support the concrete pour (Plate 4-1 below).

Foundation locations, top of foundation level, and works completed are listed in Table 4-1 below. A completed turbine foundation at the Wind Farm Site is shown in Plate 4-2.

Table 4-1 Wind Turbine Locations, Top of Foundation Level, and Works Completed

Turbine	ITM Coordinates		Top of Foundation Elevation (mOD)	Works Completed
	X	Y		
T1	607083	884169	287	Concrete pour completed.
T2	607639	884209	269*	Steel reinforcement in place. Concrete pour to be completed.
T3	606809	884614	316	Concrete pour completed.
T4	608056	884820	306	Concrete pour completed.
T5	607191	885029	305	Concrete pour completed.
T6	607587	885277	293	Concrete pour completed.
T7	608211	885488	258*	Not yet constructed.
T8	607105	885583	252	Concrete pour completed.
T9	608682	885893	234	Concrete pour completed.

Turbine	ITM Coordinates		Top of Foundation Elevation (mOD)	Works Completed
	X	Y		
T10	606753	885946	214	Concrete pour completed.
T11	608133	885993	256	Concrete pour completed.
T12	607533	886077	225	Concrete pour completed.
T13	608329	886520	222	Concrete pour completed.
T14	606933	886553	185	Concrete pour completed.
T15	607750	886642	185	Concrete pour completed.
T16	608896	886662	214*	Foundation area excavated. Installation of steel reinforcement and concrete pour to be completed.
T17	608581	887045	183	Concrete pour completed.
T18	607398	887064	169*	Foundation area excavated. Installation of steel reinforcement and concrete pour to be completed.
T19	609123	887206	196*	Steel reinforcement in place. Concrete pour to be completed.

*Intended top of foundation elevation for incomplete turbine foundations



Plate 4-1 Turbine 'Anchor Cage' (left) and predominantly finished turbine base with only backfill outstanding (right)



Plate 4-2 Finished Turbine Base located at T11, within the Wind Farm Site (bolts covered with gravel for protection)

4.4.1.1.2 Hardstanding Areas

The Existing Development includes 18 no. substantially completed or partially completed hardstanding areas. The hardstanding areas consisting of levelled and compacted hardcore are typically used to facilitate access, turbine assembly and turbine erection. The hardstand areas are used to accommodate cranes used in the assembly and erection of the turbine, offloading and storage of turbine components, and generally provide a safe, level working area around each turbine position. All hardstand areas have been designed taking account of the loadings provided by the turbine manufacturer and consist of a compacted stone platform.

Where turbine foundations are completed, as described in Section 4.4.1.1.1 above, the hard-standing areas are extended over the turbine foundations. The works completed at each hardstand area is outlined in Table 4-2. The hardstanding areas are shown on the detailed drawings included in Appendix 4-1. A stockpile of rock material has been stored at several hardstands including T2, T3, T5, T9, T10, T13, T14, T15, and T16. The existing hardstanding areas are illustrated in the planning drawings that accompany this application and are included as drawings MNBG-d009.2.1 to MNBG-d009.2.19 in Appendix 4-1 of this rEIAR. . Additional works are required to complete all hardstands and these works are described in Chapter 4 of the EIAR for the Prospective Development.

Table 4-2 Location and Extent of Substantially Completed and Partially Completed Hardstands

Corresponding Turbine No.	Works Completed		
	Blade Set-down Areas	Rough Grading	Capping
T1	Not Completed	Completed	Not Completed
T2	Not Completed	Not Completed	Not Completed
T3	Not Completed	Not Completed	Not Completed
T4	Not Completed	Not Completed	Not Completed
T5	Not Completed	Not Completed	Not Completed
T6	Not Completed	Not Completed	Not Completed
T7	Not Completed	Not Completed	Not Completed
T8	Not Completed	Not Completed	Not Completed
T9	Not Completed	Not Completed	Not Completed
T10	Completed	Completed	Not Completed
T11	Completed	Completed	Completed
T12	Completed	Completed	Completed
T13	Completed	Not Completed	Not Completed
T14	Completed	Completed	Not Completed
T15	Not Completed	Not Completed	Not Completed
T16	Not Completed	Not Completed	Not Completed

Corresponding Turbine No.	Works Completed		
	Blade Set-down Areas	Rough Grading	Capping
T17	Not Completed	Not Completed	Not Completed
T18	Not Completed	Not Completed	Not Completed
T19	Not Completed	Not Completed	Not Completed

4.4.1.2 Site Roads

4.4.1.2.1 Road Construction

Approximately 19 km of existing access roads are present across the Wind Farm Site and have been in operation for a number of years. To provide access within the Wind Farm Site of the Existing Development, existing forestry roads and tracks were upgraded, and additional new access roads were constructed. The layout of access roads is included in Appendix 4-1.

Approximately 4.1 km of existing solid road was upgraded and approximately 8.9 km of existing floating forestry tracks were upgraded to solid roads.

A total of 3 km of new solid roads were installed at the Wind Farm Site, along with approximately 3 km of new floating roads.

Where existing roads were upgraded, the work included widening of the roadway to a minimum running width of 5m. The design of the access roads had regard to key factors as identified in the *Peat and Spoil Management Plan* which was prepared by Applied Ground Engineering Consultants Ltd. (AGEC) as part of the 2017 EIAR for the Permitted Development and included in Appendix 4-2. Design factors were as follows:

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

Constructed roads are of two types, namely solid road or floating road which are described below.

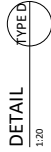
Solid Roads are either upgraded existing roads or newly constructed roads. These road were generally constructed where peat depth was found to be less than 1.5m in depth. Where solid roads were constructed through areas of deeper peat (depths greater than 3m), the displacement method was employed to construct the solid road. Approximately 16 km of solid site roads were constructed or upgraded from existing solid or floating forestry tracks as part of the Existing Development. The width of the constructed road varies between 5 m to 10 m. In some sections of the site roads, solid berms at least 600 mm high with intermittent drainage gaps run each side of the running surface. Typical section of a solid road is included as Figure 4-4.

Floating Roads are newly constructed roads where peat depth was found to be greater than 1.5m in depth. Approximately 3 km of floating roads were constructed at the Wind Farm Site. A typical section of a floating road is included as Figure 4-5.

4.4.1.2.2 Clear Span Bridge

A clear-span bridge was constructed over the Bunadaowen River within the Wind Farm Site. The bridge crossing forms part of the internal site road network and is located on the main spine road that runs from the site entrance to the northeastern side of the Wind Farm Site. The crossing location is at ITM X 607622, Y 887145, and the design avoided the need for in-stream works. The bridge was constructed to widen a pre-existing box culvert crossing of the Bunadaowen River.

The clear-span bridge was 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 were constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material. An as-built drawing of the clear-span bridge is shown in Figure 4-6 and include as drawing MNBG d008.1.3 in Appendix 4-1.



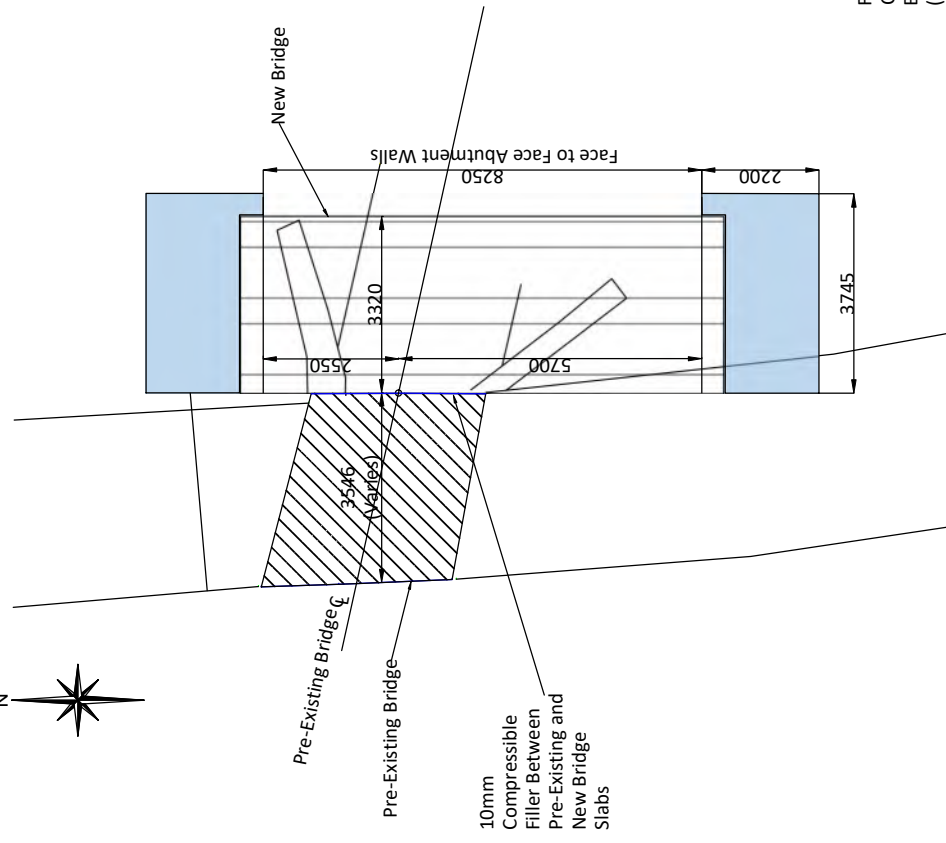
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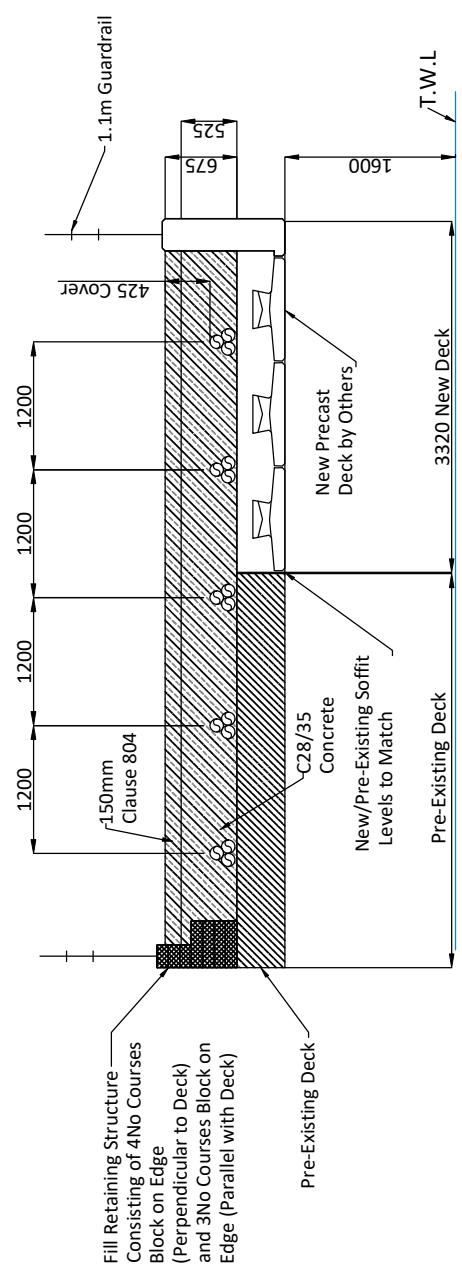
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TYPE D - NEW FLOATED ACCESS ROAD



Scale 1:100



SECTION THROUGH CENTRELINE OF NEW/PRE-EXISTING BRIDGE (EC5)

[illegible]

4.4.1.3 Borrow Pits

As part of the Existing Development, 3 no. borrow pits were established within the Wind Farm Site. The purpose of a borrow pit is to win hardcore material required for the construction of the wind farm infrastructure, namely access roads, turbine foundations and hardstands. The use of borrow pits located within the Wind Farm Site minimised the need for transport of material from external quarries.

During the construction of the Existing Development, a number of rock extraction methods were employed, depending on the ground conditions encountered across the Wind Farm Site. These methods included rock breaking using hydraulic excavators fitted with breaker attachments, and controlled rock blasting where rock could not be removed through excavation and rock breaking methods alone. Extracted rock material was processed and reused where suitable for construction purposes. Each of the borrow pits is described below.

4.4.1.3.1 Borrow Pit 1: East of Turbine 10

Borrow Pit 1 is located approximately 395m east of T10. Borrow Pit 1 has an existing footprint of approximately 25,600 m² including both the excavated area and the working strip. The ITM Coordinates of this borrow pit are X 607214, Y 885893. An existing forestry borrow pit at this location was expanded to win stone on-site ahead of gaining access to the wind farm borrow pits. Stone extraction continued at this borrow pit in lieu of developing a previously proposed borrow pit (BP1 from the 2017 EIAR).

The borrow pit has been partially restored by backfilling with peat and spoil from elsewhere on the Wind Farm Site. Restoration was accomplished by creating a cell to contain excavated peat with a berm constructed along the downslope (north-west) edge of the borrow pit. The borrow pit is bounded to the west and north by wind farm access roads which are constructed to solid formation. A plan and cross section of the borrow pit is provided as Figure 4-7 below. It is estimated that approximately 172,000 m³ of rock was extracted from Borrow Pit 1.

Borrow Pit 1 has been partially reinstated through the backfilling of peat. Since the cessation of peat backfilling in the borrow pit, the surface of the backfilled peat has begun to revegetate with species including soft rush (*Juncus effusus*), Yorkshire fog (*Holcus lanatus*), creeping bent grass (*Agrostis stolonifera*) and tormentil (*Potentilla erecta*).

4.4.1.3.2 Borrow Pit 2: South of Turbine 15

Borrow Pit 2 is located approximately 170m south of T15. Borrow Pit 2 has an existing footprint of approximately 14,000 m² including both the excavated area and the working strip. The ITM Coordinates of this borrow pit are ITM X 607757, Y 886389. It is located adjacent to the wind farm access road. The borrow pit was excavated into the existing ground, commencing at the southern end of the borrow pit. The excavated area was subsequently partially backfilled with peat, with berms constructed on the downslope side of the borrow pit to retain the peat. This area is bounded to the northwest by the wind farm road which is constructed to solid formation. A plan and cross section of the borrow pit is provided as Figure 4-8 below. It is estimated that approximately 66,000 m³ of rock was extracted from Borrow Pit 2.

Borrow Pit 2 has been partially reinstated through the backfilling of peat. Since the cessation of peat backfilling in the borrow pit, the surface of the peat has begun to revegetate with species including soft rush (*Juncus effusus*), Yorkshire fog (*Holcus lanatus*), creeping bent grass (*Agrostis stolonifera*) and tormentil (*Potentilla erecta*).

4.4.1.3.3 **Borrow Pit 3: East of Turbine 13**

Borrow Pit 3 is located approximately 175m east of T13. Borrow Pit 3 has an existing footprint of approximately 11,600 m² including both the excavated area and the working strip. The ITM Coordinates of this borrow pit are ITM X 607757, Y 886389. Excavation into existing ground commenced on the eastern side of the borrow pit area. Individual cells were created within the borrow pit area and the borrow pit area has been partially restored. A plan and cross section of the borrow pit is provided as Figure 4-9 below. It is estimated that approximately 55,000 m³ of rock was extracted from Borrow Pit 3.

Borrow Pit 3 has been partially reinstated through the backfilling of peat in the worked-out portions of the borrow pit. Since the cessation of peat backfilling at this partially constructed borrow pit, the surface of the deposited peat has revegetated with species including soft rush (*Juncus effusus*) and bulbous rush (*Juncus bulbosus*), which are dominant throughout.

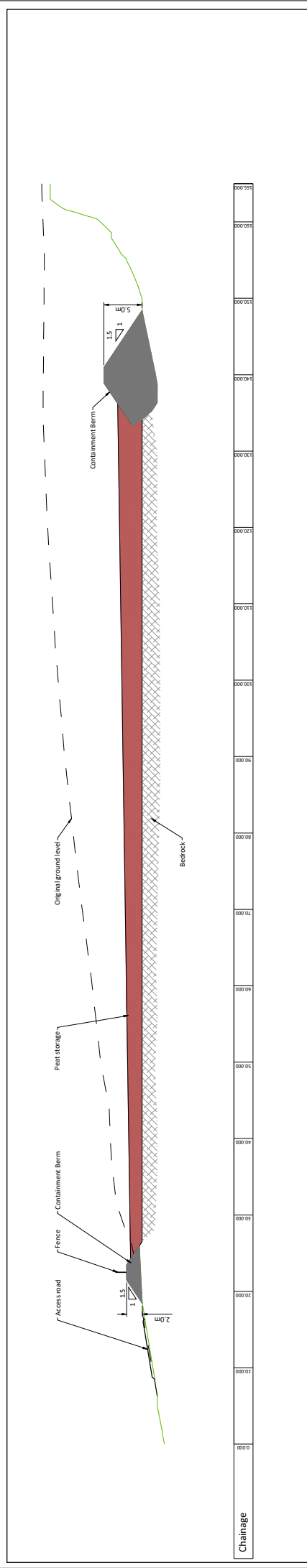
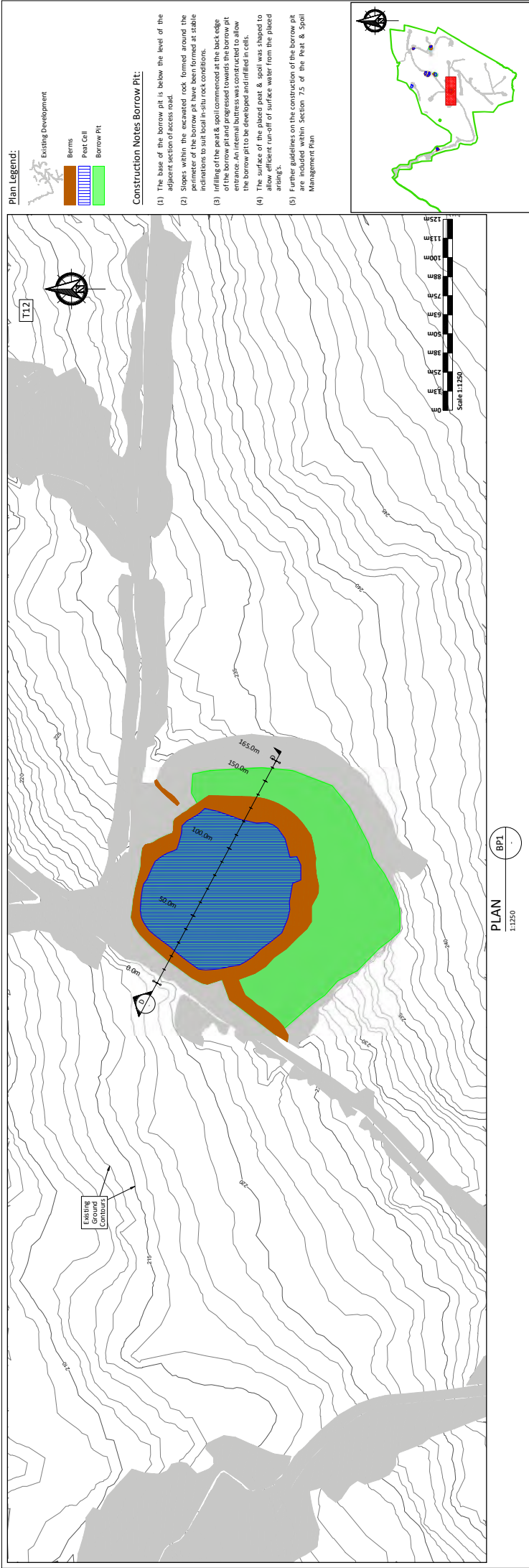
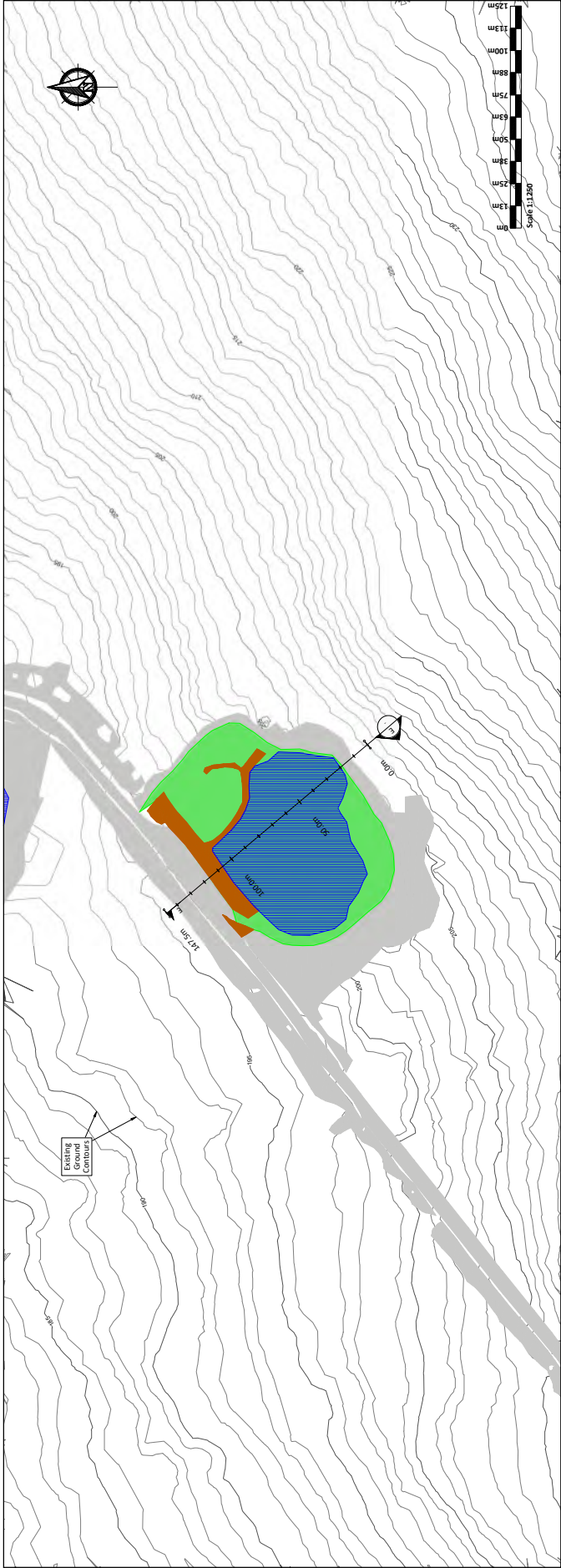


FIGURE 4-7

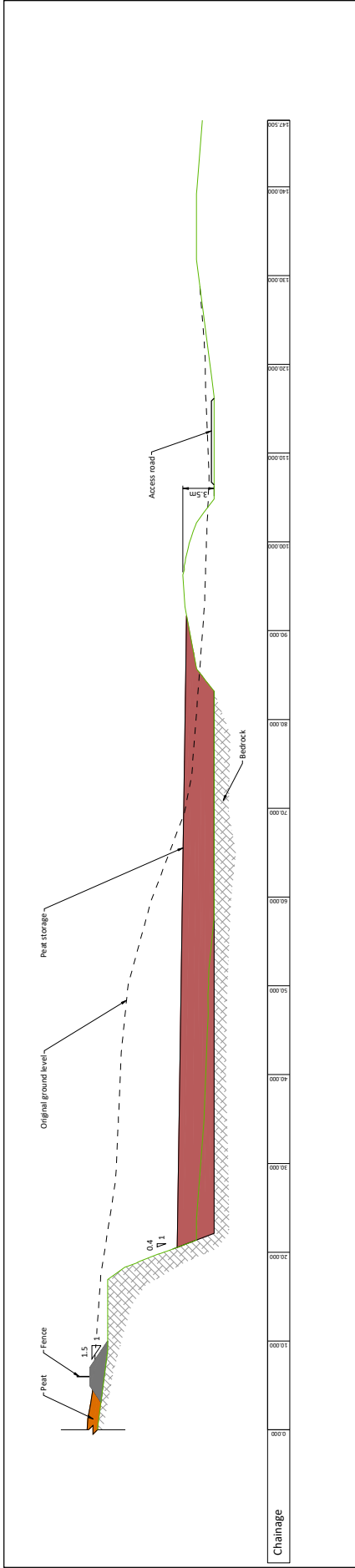
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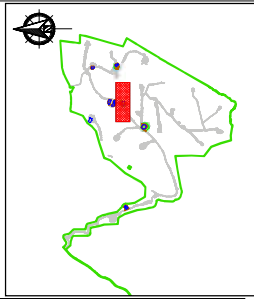
PLAN
1:1250
BP2

Construction Notes Borrow Pit:

- (1) The base of the borrow pit is below the level of the adjacent section of access road.
- (2) Slopes within the excavated rock formed around the perimeter of the borrow pit have been formed at stable inclinations to suit local in-situ rock conditions.
- (3) Infilling of the peat & spoil commenced at the back edge of the borrow pit and progressed towards the borrow pit entrance. An internal buttress was constructed to allow the borrow pit to be developed and infilled in cells.
- (4) The surface of the placed peat & spoil was shaped to allow efficient run-off of surface water from the placed arisings.
- (5) Further guidelines on the construction of the borrow pit are included within Section 7.5 of the Peat & Spoil Management Plan



SECTION
1:250
E-E

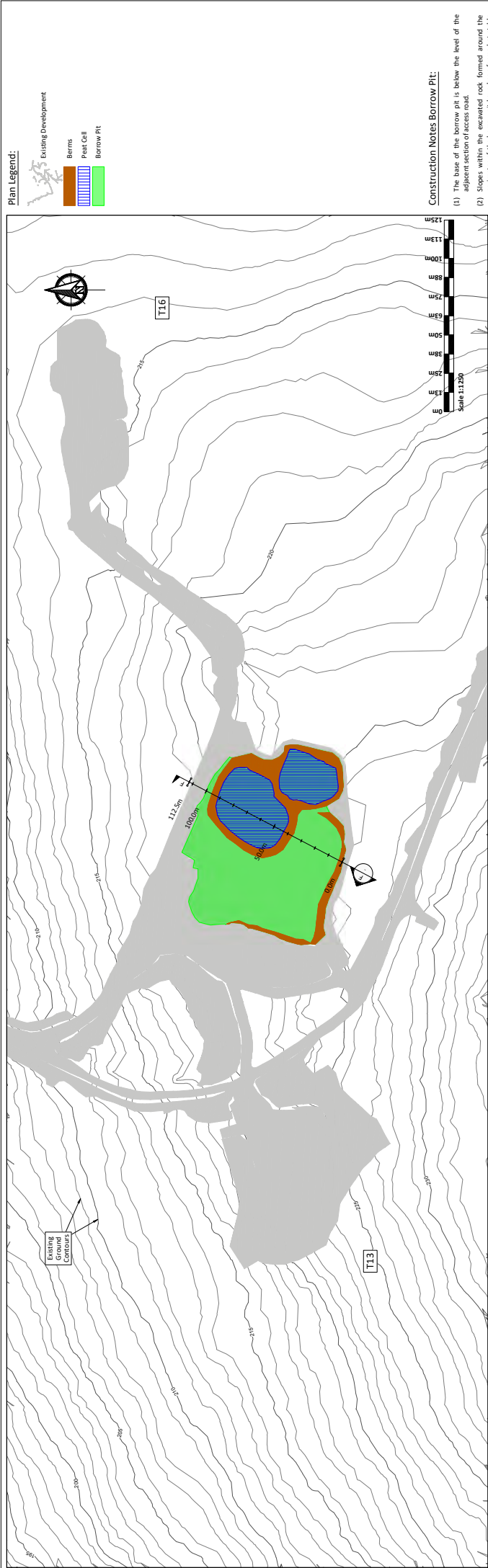


KEY PLAN
1:60000

FIGURE 4-8

PROJECT		CLIENT	
MEENBOG WIND FARM (EXISTING DEVELOPMENT)		MKO	
SHEET		Date	19.06.26
BORROW PIT 2		Drawn by	POR
		Checked by	IH
		Project number	P24-234
		Drawing Number	P24-234-0603-0007
		Scale (@ A1)	AS SHOWN
		Rev	P02

Rev.	Description	App by	Date
P01	FOR INFORMATION	BDH	27.05.26
P02	FOR INFORMATION	BDH	19.06.26



Construction Notes Borrow Pit:

- (1) The base of the borrow pit is below the level of the adjacent section of access road.
- (2) Slopes within the excavated rock formed around the perimeter of the borrow pit have been formed at stable inclinations to suit local in-situ rock conditions.
- (3) Infilling of the peat & spoil commenced at the back edge of the borrow pit and progressed towards the borrow pit entrance. An internal buttress was constructed to allow the borrow pit to be developed and infilled in cells.
- (4) The surface of the placed peat & spoil was shaped to allow efficient run-off of surface water from the placed arising.
- (5) Further guidelines on the construction of the borrow pit are included within Section 7.5 of the Peat & Spoil Management Plan

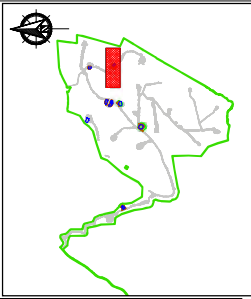
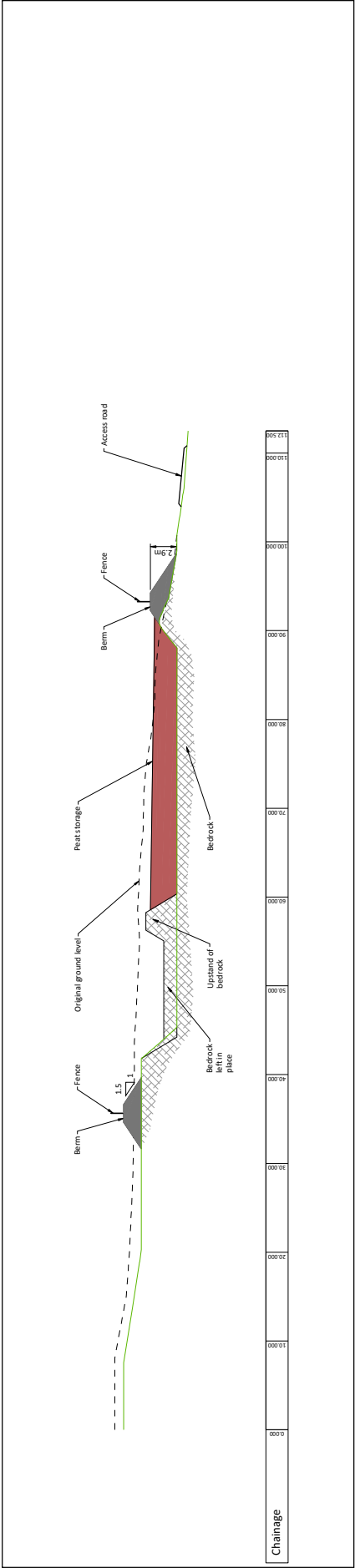


FIGURE 4-9

CLIENT		PROJECT	
MKO		MEENBOG WIND FARM (EXISTING DEVELOPMENT)	
Date		19.06.26	
Drawn by		PDR	
Checked by		IH	
Project number		P24-234	
Drawing Number		P24-234-0603-0008	
Scale (@ A1)		AS Shown	
Rev		P02	

Rev.	Description	App by	Date
P01	FOR INFORMATION	BDH	27.05.26
P02	FOR INFORMATION	BDH	19.06.26

4.4.1.4 **Underground Electrical and Communications Cabling**

Approximately 6 km of the underground cabling ducting has been installed within the Wind Farm Site as indicated in Figure 4-1. The route of the cable ducts generally follows the access tracks to each turbine location and are shown on the detailed drawings included as Appendix 4-1. Cable ducts are approximately 1.2m below the ground level and located within or beside founded roadways. In floating roads, the cable ducting is installed on the shoulder of the road with a berm providing the necessary cover over the cable ducting. The general arrangements of the underground cabling routes relative to internal tracks are illustrated in drawings MNBG d043.1.1 and MNBG d043.1.2 in Appendix 4-1 and are also reproduced as Figure 4-10 and Figure 4-11, below. The areas where each cable arrangement has been used are illustrated in drawing MNBG d024.6.5 to MNBG d024.6.10 in Appendix 4-1. A small amount of cabling has been installed in the cable ducting within the Wind Farm Site.

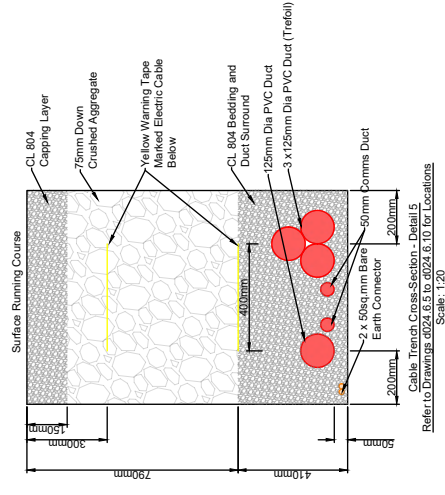
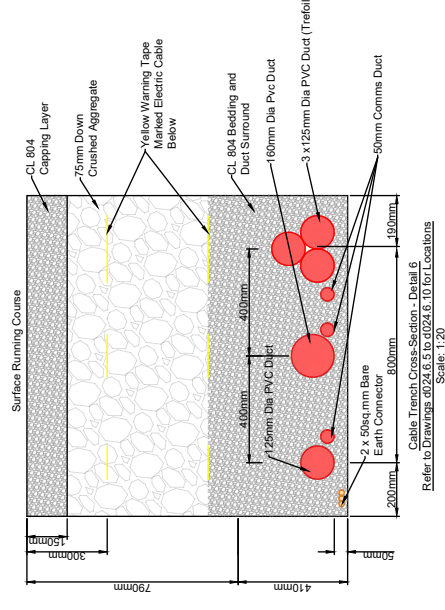
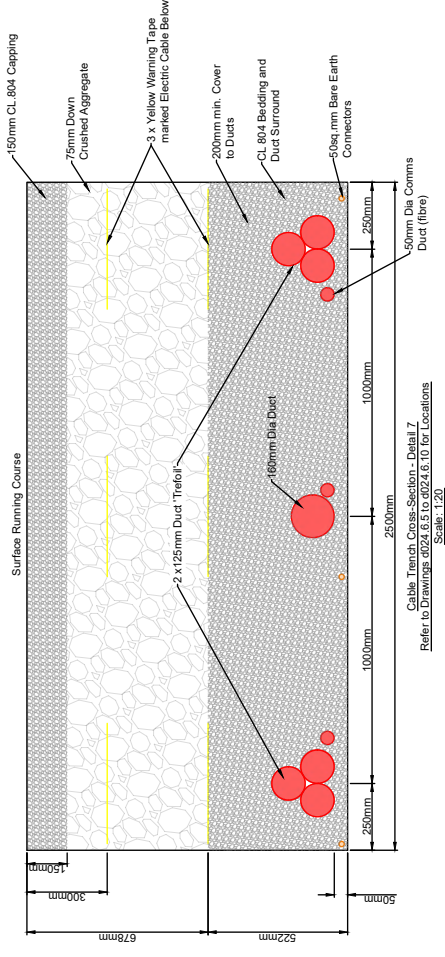
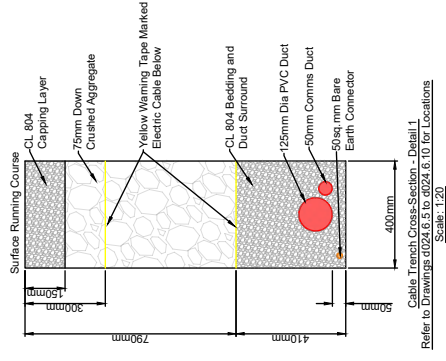
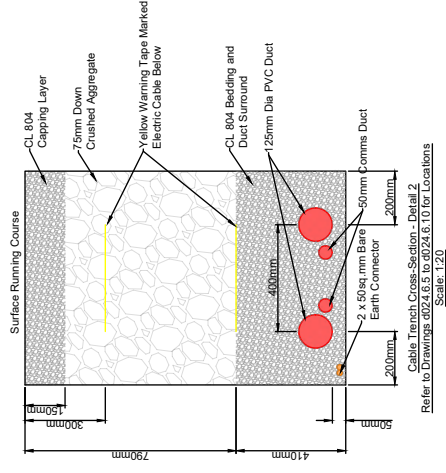
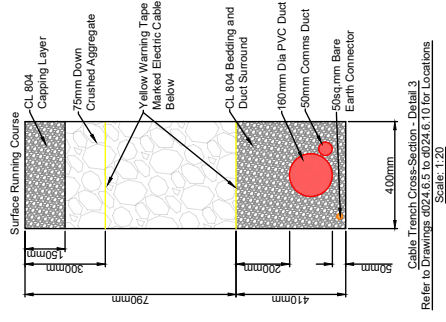
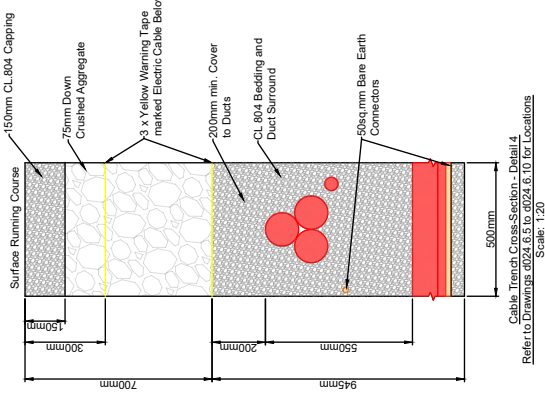


FIGURE 4-10

NOTES									
						AFRY AFRY Ireland Ltd. The Hyde Building, The Park, Carranmore, Kesh, Co. Fermanagh, Ireland Tel +353 (0) 1 445 5031	CLIENT	PROJECT	MEENBOG WIND FARM
						DESIGNER	DATE	SCALE	
						M. BROWNE	09/04/2026	A3	
						CHECKED/ISSUED/APPROVED	DATE	STATUS	EXISTING
						L. POWER	09/04/2026	EXISTING	INTERNAL WIND FARM CABLE TRENCH EXISTING CROSS SECTIONS - SHEET 1
								DRAWING NUMBER	MANAGE d043.1.1
									Sheet: 04/00000 1 of 04
									Project: 04/00000 1 of 04
									Revision: 04/00000 1 of 04
									Drawn: 04/00000 1 of 04
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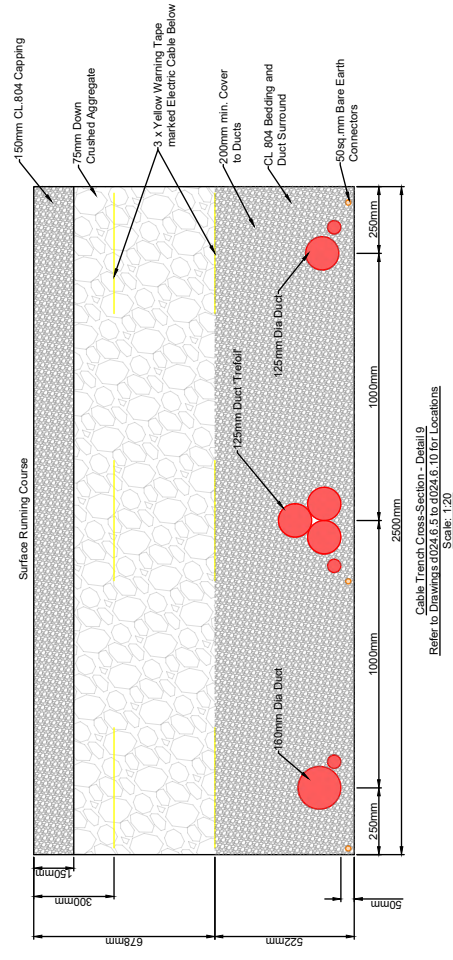
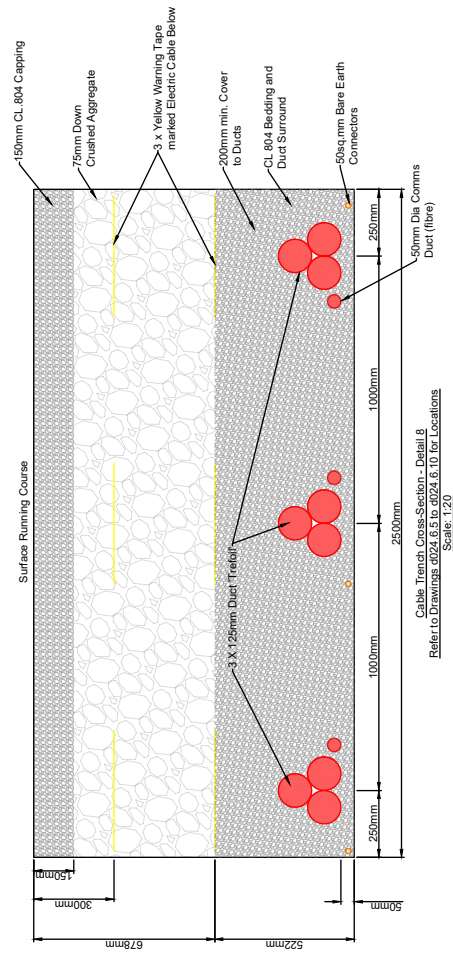


FIGURE 4-11

[illegible]

4.4.1.5 110kV Electrical Substation

An on-site 110kV electrical substation was constructed within the Wind Farm Site as shown in Plate 4-3. The on-site electrical substation compound measures approximately 116m in overall length and 95m in overall width, and includes 2 no. control buildings along with the electrical components necessary to consolidate the electrical energy generated by each wind turbine and export that electricity from the on-site 110kV electrical substation to the national grid via underground electrical cabling.

The electrical equipment in the on-site 110kV electrical substation was installed in line with Eirgrid/ESB Networks specifications. The on-site 110kV electrical substation compound is surrounded by steel palisade fencing approximately 2.6m high, as well as internal fences which segregate elements within the main substation. Plans and Elevations of the substation compound are shown in Figure 4-12.



Plate 4-3 110kV Electrical Substation

Wind Farm Control Buildings

Two wind farm control buildings are located within the substation compound. The Independent Power Producer (IPP) Control Building measures 19m x 11m and 7m in height, located at the south eastern side of the substation compound. The EirGrid Control Building measures 25m x 18m by 8.5m in height, located towards the centre of the substation compound. Layout and elevation drawings of the control buildings are included in Figure 4-13 and Figure 4-14, below.

The substation control buildings include staff welfare facilities. Toilet facilities have been installed with a low-flush cistern and low-flow wash basin. The control buildings include a rainwater harvesting system which can harvest rainwater from the roofs of the buildings to be used to flush toilets.

Wastewater from the staff welfare facilities in the control buildings is managed through a sealed underground storage tank, with all wastewater being tankered off-site by a permitted waste collector to wastewater treatment plants. Wastewater treatment on-site has not been implemented, and therefore the Environmental Protection Agency (2009) *Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses* (p.e. ≤ 10) does not apply. Similarly, the EPA (1999) *Treatment Systems for Small Communities, Business, Leisure Centres and Hotels* does not apply, as it pertains to scenarios where on-site wastewater treatment is proposed.

The wastewater storage tank has been fitted with an automated alarm system that will provide sufficient notice when the tank requires emptying. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007 (as amended), are employed to transport wastewater away from the Wind Farm Site as part of the Subject Development.

NOTES

1. ALL DIMENSIONS IN METRES UNLESS
2. DRAWINGS ARE NOT TO BE SCALED.

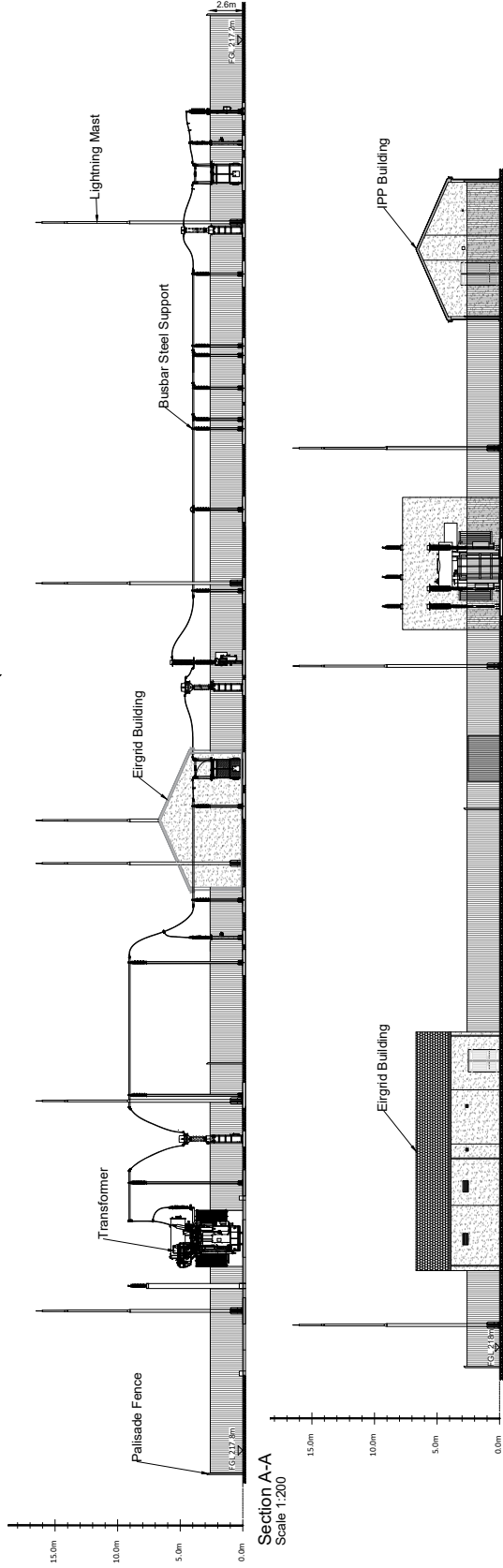
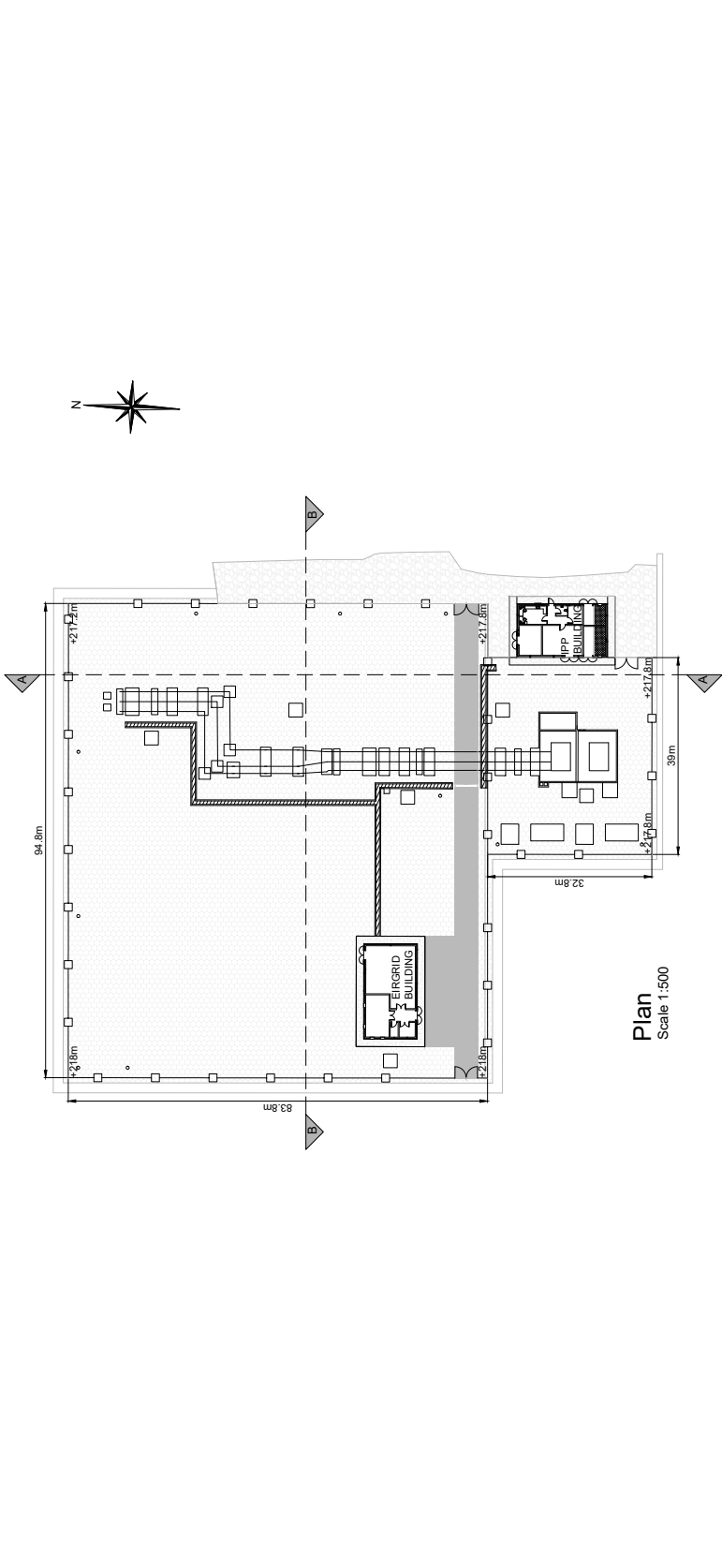


FIGURE 4-12

PROJECT	MEENBOG WIND FARM	
	ONSITE 110KV SUBSTATION COMPOUND	
	PLAN AND SECTIONS	
DRAWING NUMBER	MNBG d004.2.1	
	A	
	A	

NOTES:

1. DRAWING NOT TO BE SCALED.
2. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

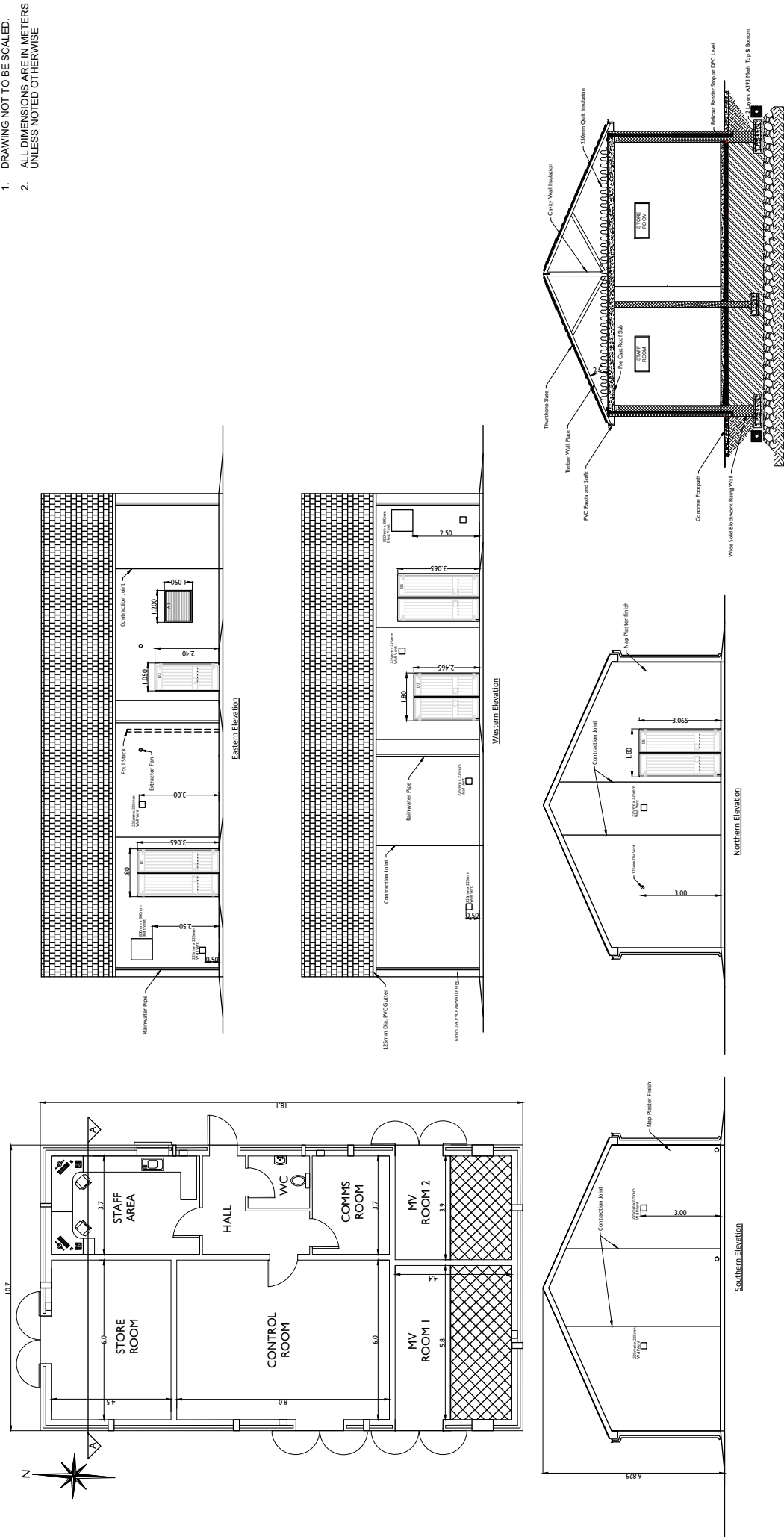


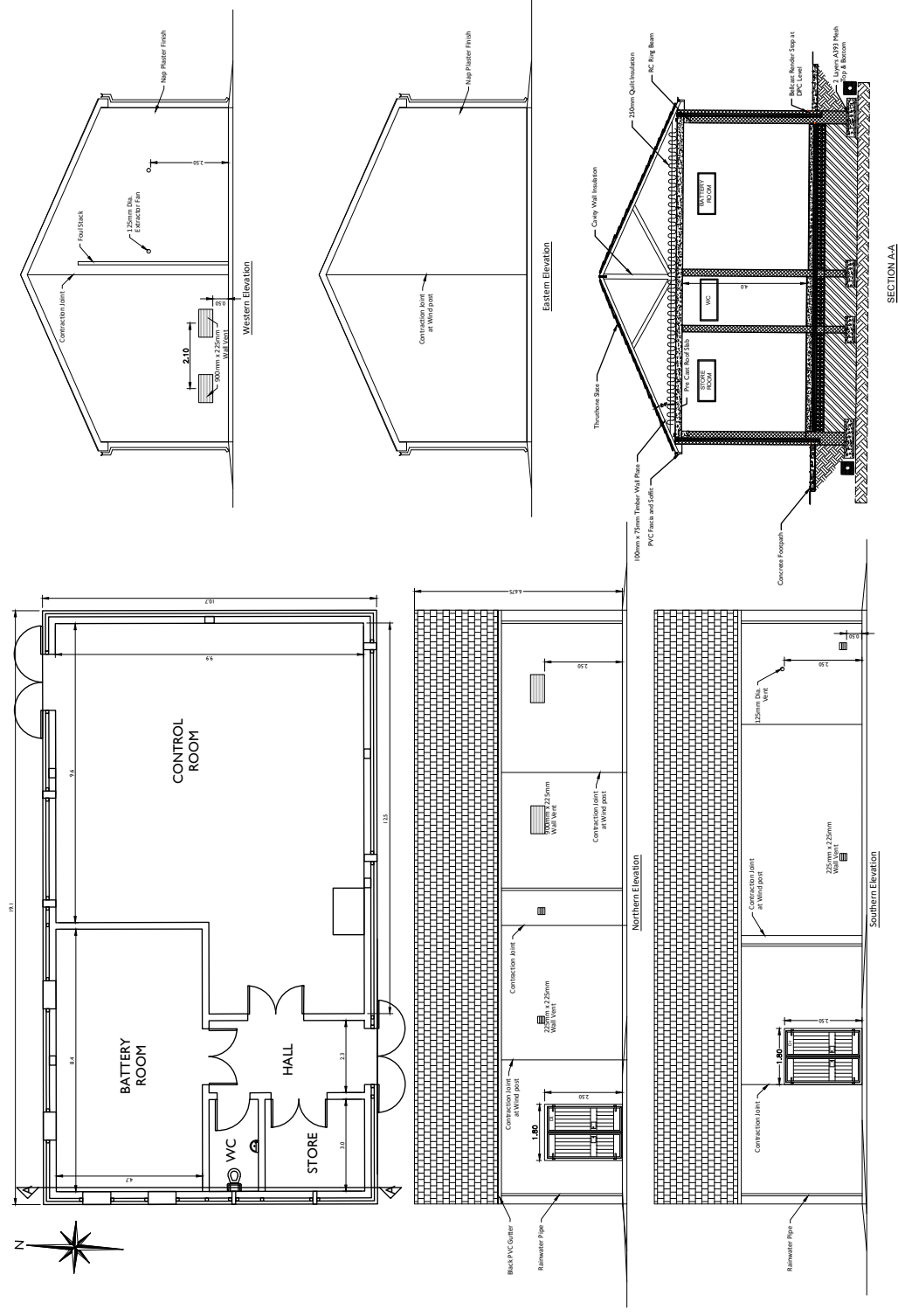
FIGURE 4-13

NOTES	ENGINEER										AFRY Ireland Ltd. The Hyde Building, The Park, 100-102 Park Road, D18B/C44 Dublin 18 Tel: +353 (0)1 845 6031	CLIENT		PROJECT		MEENBOG WIND FARM		REVISION		A					
	DRAWN BY M. BROWNE										DATE 23/06/2026		PAPER SIZE A3		SCALE 1:100										
	CHECKED AND APPROVED L. POWER										DATE 23/06/2026		STATUS EXISTING		DRAWING NUMBER MNBG-d004_6.1										
	FIRST ISSUE DETAILS																								

FIGURE 4-14

NOTES:

1. DRAWING NOT TO BE SCALED.
2. ALL DIMENSIONS IN METERS UNLESS NOTED OTHERWISE



NOTES

NOTES					ENGINEER	 AFRY an irish company	CLIENT		PROJECT MEENBOG WIND FARM	SECTION	
	DATE		SCALE								
	M BROWNE		A3								
	23/06/2026		1:150								
A	23/06/2026	M.B.	L.P.				23/06/2026	EXISTING	EIRGRID BUILDING GENERAL ARRANGEMENT	A	
REV	DATE	DRAWN BY	CHECKED BY	STATUS		DATE					
				EXISTING		DRAWING NUMBER					
										ENB004.03.1	
										DRAWING NUMBER	
										PROJECT	
										AFRY Ireland Ltd. The Hyde Building, The Park, The Hydes Road, Carrigrohane, Dublin D24 Tel: +353 (0) 1 845 5031	

4.4.1.6 Watercourse/Culvert Crossings

The Wind Farm Site is extensively drained by a network of natural watercourses and manmade land drains. These are illustrated in Appendix 4-5 of this rEIAR.

4.4.1.6.1 Culvert Crossing

Several watercourse crossings were constructed/upgraded as part of the Existing Development including:

- A 5m wide clear-span bridge was constructed over the Bunadowen River. This is discussed in detail in Section 4.4.1.2.2 above.
- A total of 109 no. culverts were installed or upgraded over streams/drains along forestry access tracks within the Wind Farm Site.

All new culverts and culvert upgrades at field drain crossings installed as part of the Existing Development were suitably sized for the expected peak flows in the relevant drain.

Some culverts were installed to manage drainage waters from works areas of the Existing Development, particularly where the waters had to be taken from one side of a roadway to the other for discharge. The size of culverts was influenced by the depth of the track or road sub-base. Culverts were constructed as per the methodology detailed in Section 4.9.4. A list of all the culverts on the Wind Farm Site that corresponds to the drainage drawings in Appendix 4-5 is provided as Appendix 4-10 of this rEIAR.

4.4.1.7 Temporary Construction Compounds

A total of 2 no. temporary construction compounds were constructed as part of the Existing Development and are illustrated in Appendix 4-1.

Construction compound No. 1 is located between the on-site 110kV electrical substation and the wind farm access road. This temporary construction compound consisted of temporary site offices, staff facilities and car-parking areas for staff and visitors, however only one security cabin currently exists at this compound. Details of temporary construction compound No. 1 are provided in drawing MNBG-d046.1.1 in Appendix 4-1 of this rEIAR.

Construction Compound No. 2 is located in a layby adjacent to the wind farm main spine road approximately 150m southwest of the road to T10. This temporary construction compound included offices and welfare facilities set up centrally on-site where a natural widening existed along main spine road. Details of temporary construction compound No. 2 are provided in drawing MNBG-d046.1.2 in Appendix 4-1 of this rEIAR.

4.4.1.7.1 Temporary Security Cabin and Site Offices

A temporary security cabin is located beside the on-site 110kV electrical substation, within temporary construction compound No. 1. Plan and Elevations of the existing security cabin is provided as drawings MNBG d039.1.3 in Appendix 4-1. There are also 4 no. temporary site offices located within temporary construction compound No. 2. Plans and Elevations of existing site offices are provided as drawings MNBG d039.1.1.1 to MNBG d039.1.1.4

4.4.1.8 Tree Felling/Replanting

The majority of the Wind Farm Site comprises a commercial coniferous forestry plantation. As part of the works for the Existing Development, tree felling was required within and around the development footprint to allow the construction of turbine bases, access roads, and other ancillary infrastructure. Additional felling was required to provide access for the remediation works undertaken in response to the November 2020 Peat Slide.

A total of 73.33 ha of forestry has been felled as part of the Existing Development at the Wind Farm Site. Of this, 66.57 ha comprises permanent felling, while 6.76 ha relates to temporary felling. The temporarily felled areas will require reinstatement planting as part of the Prospective Development, as outlined in Chapter 4: Description of the Prospection Development, of the EIAR. The location of the tree felling is included in Appendix 4-1.

A total of 7.66 ha was replanted within the Wind Farm Site. The locations of these areas are shown in Figure 4-15. In addition, a total of 58.91 ha of permanent felling was replanted off-site under licence to replace the forestry felled as part of the Existing Development, in accordance with requirements set by the Forest Service. These off-site replanted areas are located in various locations in the Republic of Ireland, outside of Co. Donegal, as detailed in Table 4-3. As a result, there is no potential for interactions between the replanted forestry and the Existing Development. For this reason, the replanted forestry is not included in the list of projects considered in the cumulative assessment for this rEIAR.

Further details on the location and associated technical approvals for the replanted forestry are provided in Appendix 4-3 to this rEIAR.

Table 4-3 Off-Site Replacement Lands

Replacement land	CN	Area (ha)	Status
Inishfoyle, Kerry	CN79423	2.44	Planted
Knockavrogeen, Kerry	CN82845	6.86	Planted
Rahalisk, Cork	CN81603	14.12	Planted
Inishfoyle, Kerry	CN79423	2.53	Planted
Cloghaun More, Clare	CN83600	15.03	Planted
Curraghard, Roscommon	CN83764	9.39	Planted
Cloonierin, Mayo	CN85006	8.03	Planted
Cloonbony, Longford	CN85359	0.51	Planted
Total		58.91	

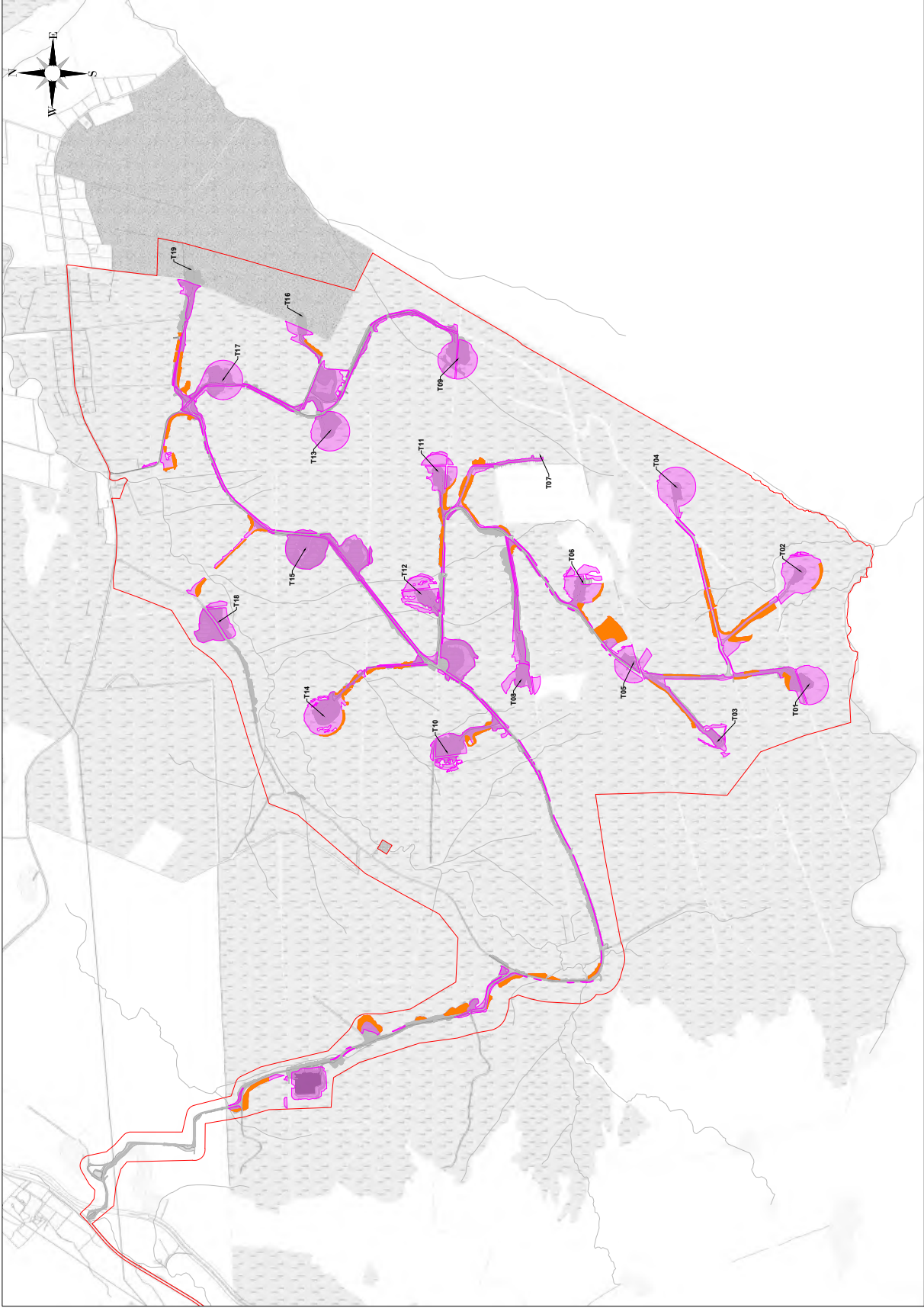


FIGURE 4-15

FILE		DRAWING		PROJECT		CLIENT		PROJECT		TITLE		REVISION	
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						AFRY		AFRY Ireland Ltd, The Woodlands, The Park, Drogheda, Co. Dublin T4, D33 (0) 1445 8331		EXISTING DEVELOPMENT FELLING / PLANTING		A	
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4.4.1.9 Peat, Spoil and Stone Management

4.4.1.9.1 Quantities of Peat and Spoil

Approximately 450,900 m³ of peat and spoil was excavated during the construction of the Existing Development. This total includes material excavated from site roads, turbine foundation, hardstands, the 110kV electrical substation site, and a small amount of peat recovered as part of the emergency works undertaken in response to the November 2020 Peat Slide. Peat and spoil generated from the Existing Development was deposited in a number of peat cells, used to restore borrow pits, and side-cast in appropriate locations around the Wind Farm Site.

The quantity of peat and spoil generated/managed during the construction of the Existing Development has been calculated, as presented in Table 4-4 below.

Table 4-4 Peat and Spoil Volumes

Development Component	Peat and Spoil Volume (m ³) (approx.)
Substation	38,950
Temporary Compounds, Concrete Washouts, and Ancillary Infrastructure	8,100
Peat Stripped from Borrow Pits	58,200
Solid Roads	207,000
Hardstands and Foundation	117,850
Peat Stripped from Peat Cell Locations	14,800
Peat Recovered from Wall 1 after Peat Slide	6,000
Total	450,900m³

Peat was stored at various locations within the Wind Farm Site, as shown in Table 4-5, and described in Section 4.4.1.3 above and Sections 4.4.1.9.2 and 4.4.1.9.3 below.

Table 4-5 Peat and Spoil Storage

Storage Location	Existing Stored Volume (m ³)
Borrow Pit 1	49,500
Borrow Pit 2	29,500
Borrow Pit 3	15,000
Side Casting	311,100
Substation Peat Cell	15,500
T15 Peat Cell	26,000
T17 Peat Cell	4,300
Total	450,900m³

4.4.1.9.2 Peat Cells

A number of peat cells were created as part of the Existing Development. Peat cells were required for the management of peat arising from excavation during construction of the Existing Development. The peat cells were designed to safely contain peat extracted from turbine foundations, road construction and other civil engineering works. Containment of peat in constructed cells minimises environmental impact and facilitates restoration or re-use of the peat post construction. Detailed planning drawings of the peat cells are provided in Appendix 4-1 to this rEIAR. Since the cessation of peat placement in the peat cells, the surface of the deposited peat has revegetated with species including soft rush (*Juncus effusus*), Yorkshire fog (*Holcus lanatus*), creeping bent grass (*Agrostis stolonifera*) and tormentil (*Potentilla erecta*).

Peat Cell southeast of Substation

Peat cell no. 1 created at the southeast of the onsite 110kV electrical substation (ITM Coordinates X 605382, Y 886324). The peat cell is located adjacent to the wind farm main spine road which is constructed to solid formation. The cell area is generally excavated below existing ground level and designed with stone/rock berms containing the emplaced peat. The retaining wall is made up of piled-up rocks and finer material. The berms and adjacent road are constructed to solid formation.

Peat Cell near T18

Peat cell no. 2 was partially constructed northwest of T18 (ITM Coordinates X 607355, Y 887119). It was offset from the wind farm road to allow space for wind turbine blade deliveries. The cell was formed by excavating a cavity into an area of sloping ground to the north of the road. No peat has been deposited in this area to date.

Peat Cells at T15

Peat cell No. 3 is located to the north and south of T15 (ITM Coordinates X 607703, Y 886681). The cells were formed by constructing berms to contain areas of sloping ground to the west of the wind farm spine road. The berms, road and hardstand in this area are constructed to solid formation. In total, these peat cells are approximately 2 ha in size and are within an 84m radius of the proposed turbine.

Peat Cell at T17

Peat cell No. 4 is located to the west of T17 and adjacent to the wind farm road (ITM Coordinates X 608531, Y 887079). The cell was formed by constructing a berm to contain an area of sloping ground to the west of the road. The cell is bounded to the north, west and south by the berm and the wind farm road to the east. The berm and road were constructed to solid formation.

4.4.1.9.3 Side casting of Peat and Spoil

Some peat and spoil excavated on-site was side cast adjacent to the wind farm infrastructure at various locations across the Wind Farm Site in accordance with the Peat and Spoil Management Plan for the Permitted Development (Appendix 4-2 of this rEIAR). Areas of side cast peat and spoil are shown in the drawings provided in Appendix 4-1. Side cast peat is generally less than 1m in depth. The stability of areas of side cast peat is assessed in the Retrospective Peat Stability Assessment Report for the Existing Development which is provided as Appendix 8-1 to this rEIAR. Where appropriate, silt fence was installed downslope of side casting area to ensure the protection of adjacent water courses.

4.4.1.9.4 Crushed Stone

The quantity of crushed stone that was required for the construction of the Existing Development has been calculated as part of the rPSMP in Appendix 4-8, and is presented in Table 4-6 below.

Table 4-6 Volume of Stone used in construction of the Existing Development.

Infrastructure Element	Stone Volume (m³)	Comment
Turbine Foundations and Hardstands	101,500	Hardstanding area and foundation footprint.
Access Roads (including cabling)	224,460	Includes widening on bends, at junctions, laybys, a tie-ins to hardstands.
Substation Platform	3,732	
Temporary compounds, concrete washouts, and ancillary infrastructure	275	
Borrow Pit/Peat Cell Berms	71,635	Floating road section on approach to T4 to be removed and replaced with solid founded road.
Peat stabilising berms and barrage walls	55,425	Used for Wall 1, Wall 2, Wall 3 and berm upslope of T8
Total	457,027 m³	

4.4.2 Grid Connection Site

4.4.2.1 Grid Connection

The existing on-site 110kV electrical substation is connected to the national grid via underground cabling connection to the existing Clogher 110kV electrical substation, located in the townland of Cullionboy, Co. Donegal. The Grid Connection extends from the on-site 110kV electrical substation at Croaghonagh and runs northwest along private road for approximately 1.7 km to the Wind Farm Site entrance. It then runs southwest along the N15 for approximately 5.7 km, southwest along the L-2595 running for approximately 1.1 km before continuing southeast through agricultural fields alongside the L-1985 for approximately 425m. The grid connection cabling then continues southeast along the L-19852 for approximately 210m until running west along a private road for 495m in the townland of Cullionboy to the Clogher 110kV electrical substation. A small agricultural building to the north of the L-1985 was relocated as part of the grid connection works.

The general alignment of the grid connection underground cabling route is shown in Figure 4-1. The grid connection construction methodology including methodologies for water crossings is described in Section 4.9.5 below.

4.4.3 Emergency Works in Response to Peat Movements

The elements of the Existing Development which are described in this section are works which were carried out in response to peat movements that occurred during the construction of the Existing Development. The 2019 Construction and Environmental Management Plan (CEMP) for the Permitted Development outlined emergency response procedures to be followed in the event a peat slide occurring (Appendix 4-4). These works were carried out following the emergency response procedures set out in that CEMP.

The November 2020 Peat Slide occurred during the construction of an access road to T7 in accordance with the plans and particulars which were fully permitted and were being undertaken in line with the project design that had been subject to both Environmental Impact Assessment and Appropriate Assessment. At the time of the failure, construction work was being carried out on the floating road to T7. Construction works for the floating road had progressed to essentially the downslope margin of the upper scar prior to the peat failure. The access track and T7 hard stand and base to the south of the peat failure had yet to be constructed though preparatory works had started, such as laying of timbers and brash along the line of the access track to T7. A detailed description of the November 2020 Peat Slide is provided in Appendix 2-3 and Appendix 8-1 of this rEIAR.

4.4.3.1 Peat Containment Berm at T8

A berm was constructed to the south of T8 as a peat containment safety measure prior to the construction of T8 (ITM Coordinates X 6072522, Y 885562). The berm was extended from stable ground on the east side and continued to just beyond the turbine foundation at the west side. This berm is located on the uphill side of T8 spur road, hardstand and foundation. The containment berm was constructed in July 2020 in response to a peat movement that occurred upslope from T8, preventing further movement. The berm is approximately 250m long and 21m wide at the base. A cross section of the containment berm is provided as Figure 4-16, below.

4.4.3.2 Barrage Walls Associated with November 2020 Peat Slide

Works in response to the November 2020 Peat Slide were undertaken under the supervision of on-site engineers Ionic Consulting (Ionic). The immediate response to the peat slide (emergency works) included the construction of 3 no barrage walls, as well as water and sediment management elements which are described below. The locations of the three barrage walls is provided in Plate 4-4, below. A cross-section drawing illustrating the construction of the barrage walls is provided as Figure 4-17.

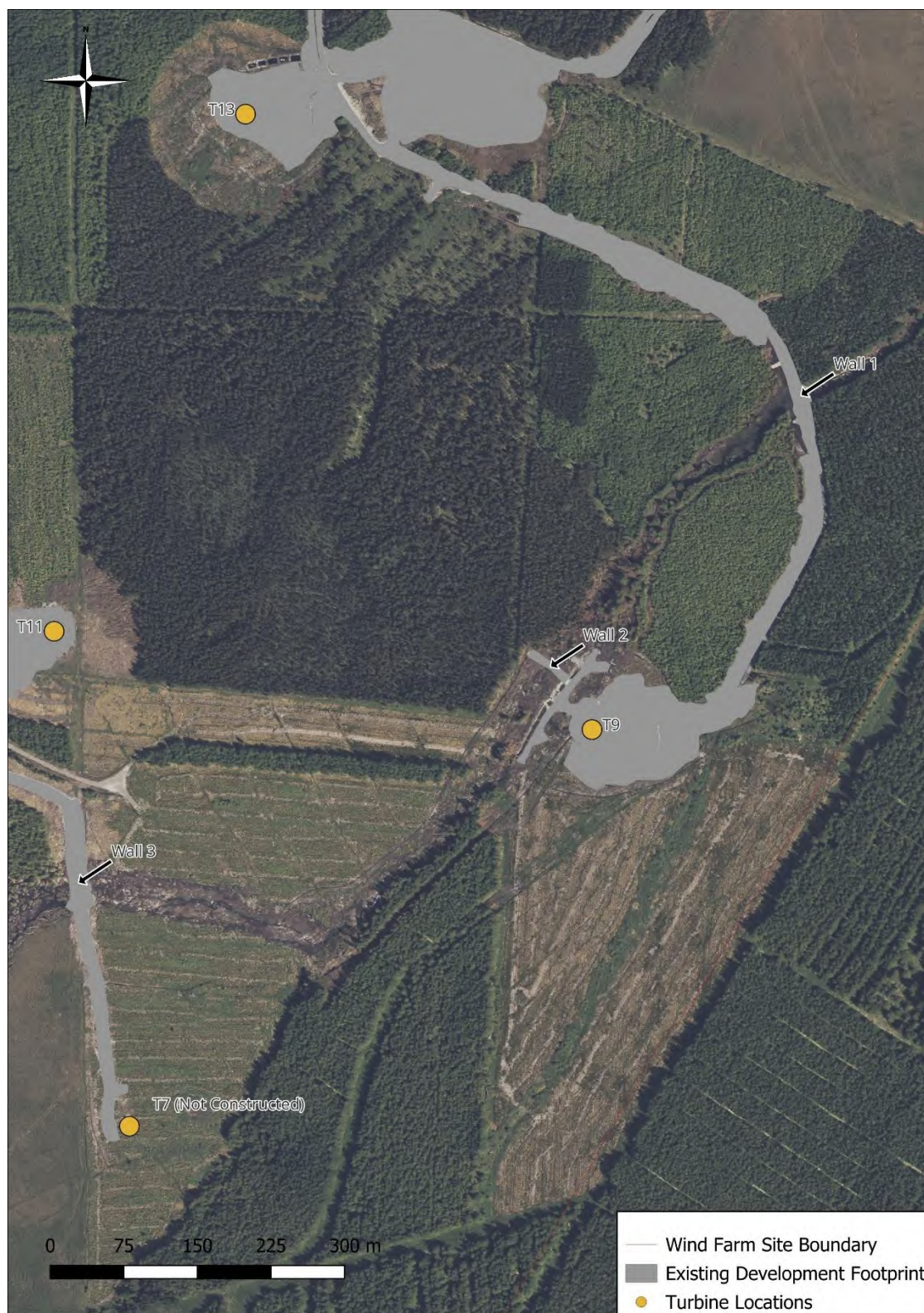


Plate 4-4 Location of Barrage Walls

4.4.3.2.1 **Barrage Wall No. 1**

Barrage Wall No. 1 which is located northeast of T9 was constructed in the immediate aftermath of the peat slide, within 72 hours of the event. The primary aim of Barrage Wall No. 1 was to limit or prevent the flow of liquefied peat into watercourses beyond the Site. A drawing of the as-built Wall 1 is provided as drawing MNBG d048.3.1 in Appendix 4-1.

A drone survey carried out on-site identified the slide path of the peat which had started west of the access road under construction to T7. Water laden peat had slipped in a north eastwardly direction and deposited largely in the shallow Shruhingarve Stream channel which in a north easterly direction. At the most northern extent of the deposit, the existing road which was constructed to provide access to T9 was acting as a dam, with water laden peat being held back to the west upstream of the access road. The CEMP in operation identified the use of check barrages as an emergency measure in the event of risk of pollution to watercourses. As the roadway was already acting as a dam, in order to provide additional capacity for the road to function as a barrage, and to mitigate against the identified risk of the wall being overtopped, immediate action was undertaken which increased the height of embankment on the western side of the roadway. The height of the existing road embankment was increased by up to 3.8m to 221.0 m OD) from the original design level of 217.2 m OD over a length of approximately 100m.

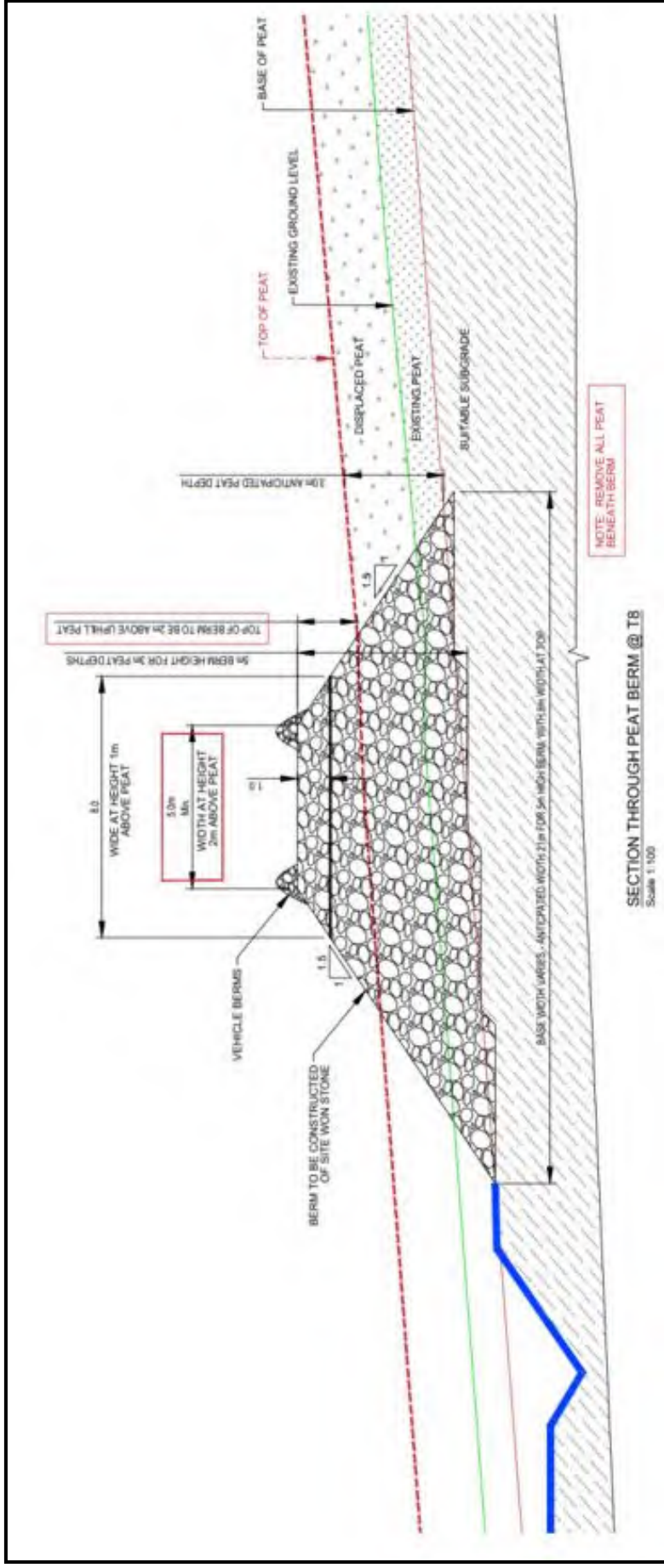
4.4.3.2.2 **Barrage Wall No. 2**

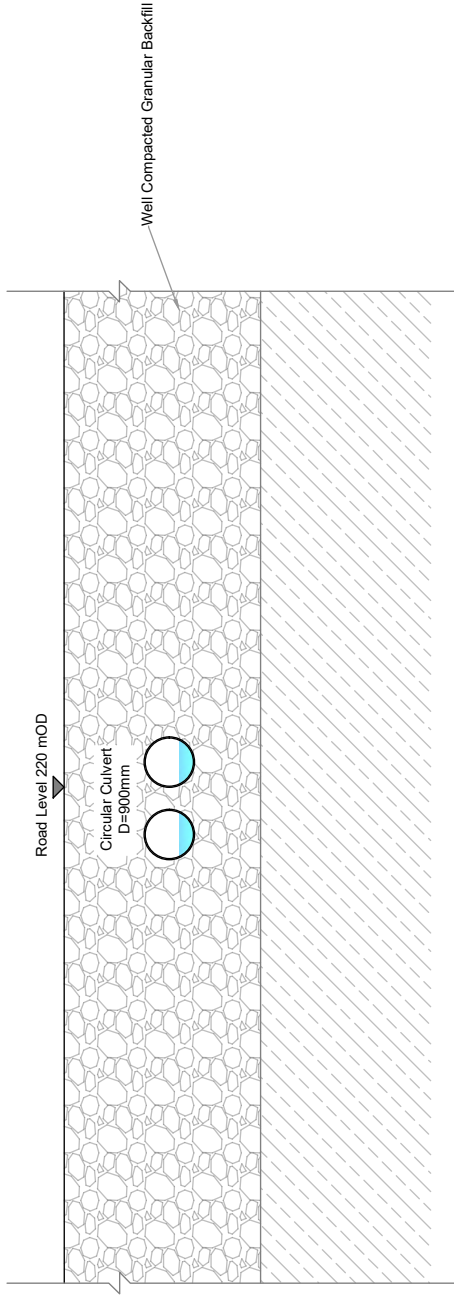
Barrage Wall No. 2 was located to the immediate west of T9 and was the last of the three barrage walls to be constructed, once the slide area above Barrage Walls 1 and 3 had been stabilised. This wall was constructed to keep peat in this area from moving further downstream and to facilitate the removal of peat from the Shruhingarve Stream. Barrage Wall no. 2 was constructed instream from the existing hardstanding area of T9. Barrage Wall No. 2 was subsequently partially removed in order to allow the restored Shruhingarve Stream to flow unimpeded.

4.4.3.2.3 **Barrage Wall No. 3**

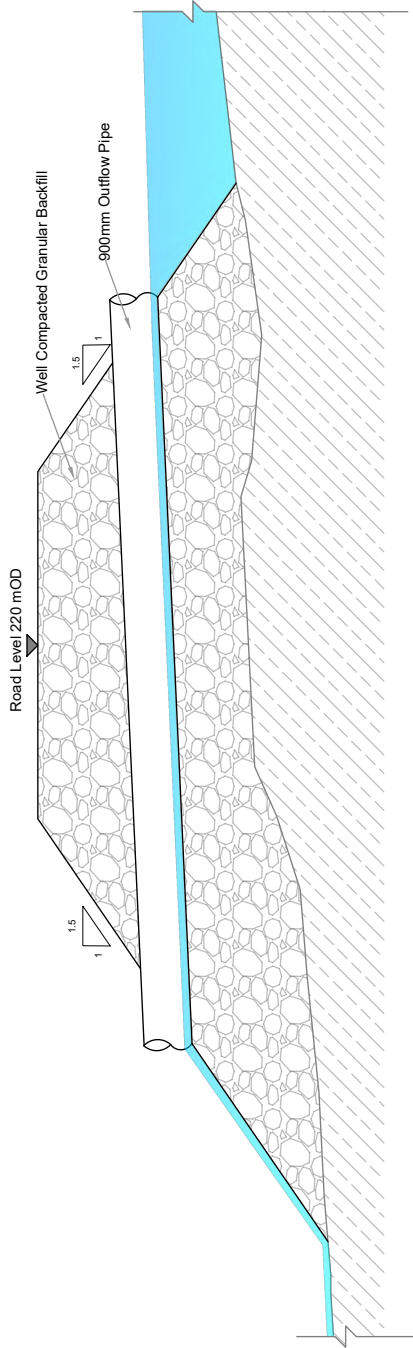
Barrage Wall No. 3 is located along the T7 spur road and immediately downslope of an area of peat which was identified as posing significant risk of further peat movement. The purpose of Barrage Wall No. 3 was to stabilise water laden upslope material and prevent potential flow downslope. Barrage Wall No. 3 was constructed upslope of the existing partially completed roadway to T7.

Figure 4-16 Cross Section of Peat Containment Berm at T8





Existing Built Culvert(PC3) - Cross Section
Scale 1:100



Existing Built Culvert(PC3) - Longitudinal Section
Scale 1:100

FIGURE 4-17

NOTES		ENGINEER		CLIENT		PROJECT	
		AFRY Ireland Ltd. The Hyde Building, The Park, Carrindrum, Kesh, Co. Wick, Ireland Tel +353 (0) 1 445 5031		MEENBOG WIND FARM		PROJECT	
		R. HUGHES 09/06/2026		A3		EXISTING BUILT CULVERT DETAILS	
		M. BROWNE 09/06/2026		1:100		PC3	
				EXISTING		MNBG 0048.3.1	
						A	

4.5

Existing Development Drainage

The vast majority of the Wind Farm Site is located within the Foyle River surface water catchment. This area of the Wind Farm Site is predominantly drained by the Mourne Beg River which flows to the east into the River Finn Special Area of Conservation (SAC) and is also part of the Foyle and its Tributaries SAC and ASSI (Areas of Special Scientific Interest) (Northern Ireland). The southeast of the Wind Farm Site is drained by the Glendergan River which also discharges downstream into the River Foyle and Tributaries SAC and ASSI. Within the Foyle River surface water catchment, the Wind Farm Site is located in 5 no. Water Framework Directive (WFD) river sub-basins which are detailed in Section 9.3.3.1 of Chapter 9: Hydrology and Hydrogeology of this rEIAR. The main watercourses mapped within the Wind Farm Site are the Mary Breen's Burn (referred to by the Environmental Protection Agency (EPA) as the Croaghonagh Stream), the Bunadown River and the Shruhanagarve Stream, all of which flow to the north and discharge into the Mourne Beg River.

A small area in the northwest of the Wind Farm Site is mapped in the Donegal Bay North surface water catchment. This area is drained by the Lowerymore River which flows to the southwest, through Barnesmore Gap, before it discharges into Lough Eske. Lough Eske forms part of the Lough Eske and Ardnamona Wood SAC/proposed National Heritage Area (pNHA).

Prior to the commencement of the Existing Development, drainage management systems were put in place in accordance with the 2017 EIAR and the 2019 CEMP (included at Appendix 4-4). These drainage systems were installed around work areas and were integrated with the pre-existing forestry site drainage network described above. Detailed drainage drawings of the Existing Development are included in Appendix 4-5 of this rEIAR.

The Existing Development drainage system was designed to mitigate effects on surface watercourses by runoff control and drainage management as follows:

- Avoiding disturbance to natural drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations, construction areas and temporary stockpile areas.
- Drainage waters from works areas that carried silt or sediment, and nutrients, were collected and routed towards settlement ponds (or stilling ponds) prior to controlled diffuse release over vegetated surfaces.
- There was no direct discharge from the work areas or from infrastructure footprint to surface waters.
- All runoff from works areas (i.e. dirty water) was attenuated and treated to a high quality prior to being released.

Several watercourse crossings were construction/upgraded as part of the Existing Development including the construction of a clear-span bridge over the Bunadown River, 5 no. new culverts over streams/drains and the upgrade of 19 no. culverts along pre-existing forestry access tracks.

The Existing Development was designed to avoid negative impact on the water quality of the Wind Farm Site and its associated rivers and lakes. Apart from the areas directly affected by the November 2020 Peat Slide, the Existing Development did not alter any natural drainage routes.

Turbine locations and associated new roadways were originally selected to avoid natural watercourses, with existing roads being used wherever possible. All drainage waters were designed to be dispersed as overland flows. All discharges from activities at works areas were made over vegetation filters at a minimum of 50m and 100m distance from streams and lakes respectively. Buffer zones around the existing natural drainage features informed the layout of the Existing Development.

Where existing forestry drains were in place in the vicinity of works areas, these drains were diverted around the works areas to minimise the amount of water in the vicinity of works areas. Where it was not possible to divert existing drains around work areas, the drains were blocked to ensure sediment-laden water from the works areas had no direct route to other watercourses. Where drains had to be blocked,

the blocking took place only after an alternative drainage system to handle the same water was put in place.

Existing artificial drains in the vicinity of existing Wind Farm Site roads were maintained in their present location where possible. In locations where these artificial drains received drainage water from works areas, check dams were added to control flows and sediment loads in these existing artificial drains. Where road widening or improvement works were necessary along the existing roads, where possible, the works took place on the opposite side of the road to the drain.

4.5.1 **Drainage Design Principles**

Two distinct methods were employed to manage drainage water within the Wind Farm Site. In the first instance, disturbance to natural drainage features was avoided, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations and construction areas. The second method involved collecting any drainage waters from works areas within the Wind Farm Site that might carry silt or sediment, to allow attenuation and settlement prior to controlled diffuse release.

The drainage measures prevented runoff from entering the works areas of the Wind Farm Site from adjacent ground and to minimise the volume of sediment-laden water that had to be managed. Discoloured runoff from any construction area was isolated from natural clean runoff.

A schematic line drawing of the drainage design of the Existing Development is presented in Plate 4-5 below.

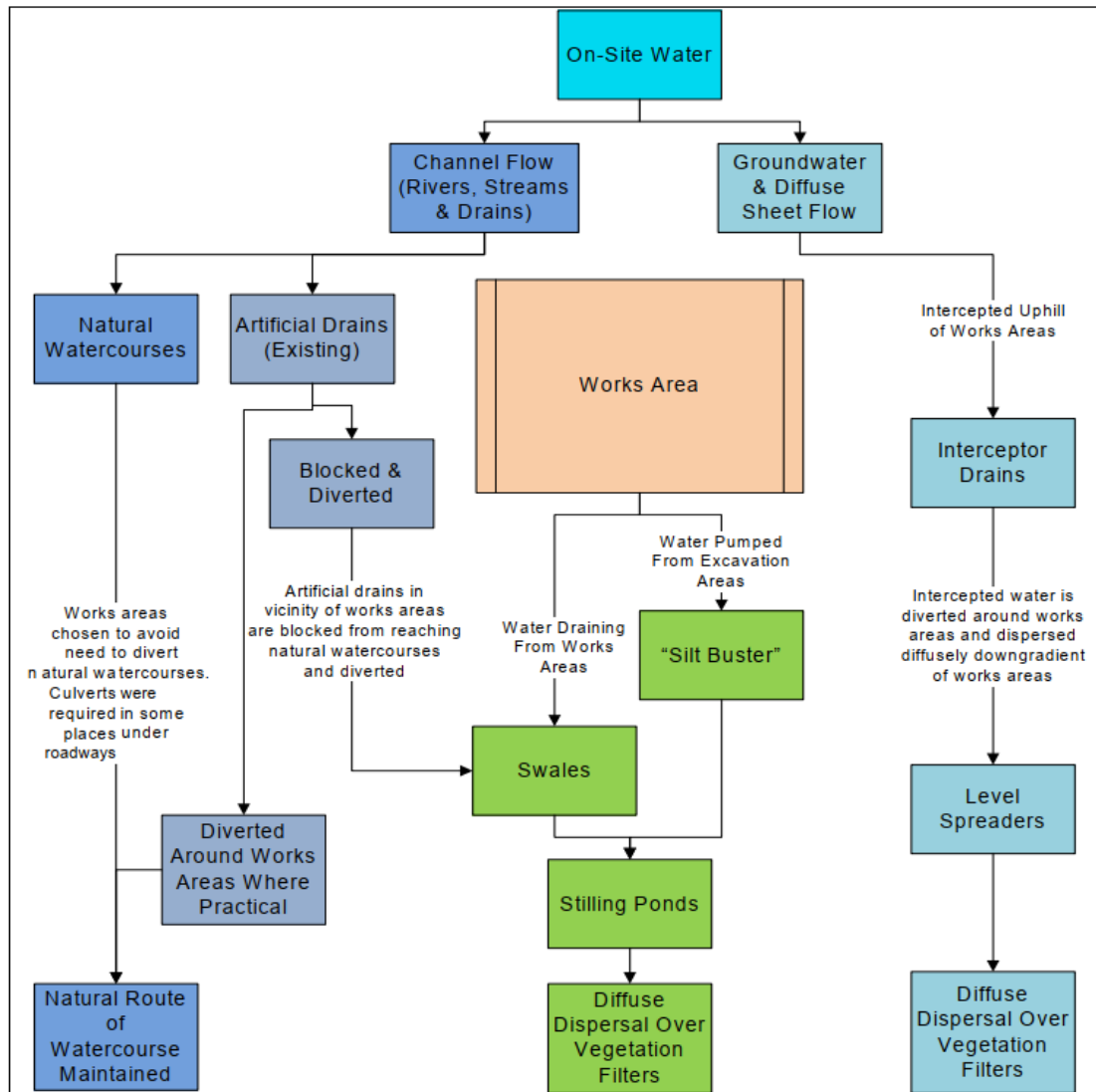


Plate 4-5 Site Drainage Process Flow

4.5.2 Drainage Design

The layout of the Existing Development drainage network incorporating all principles and measures outlined in this drainage design description is included in Appendix 4-5 to this rEiAR. The drainage design employs the various measures further described below and generally illustrated in Plate 4-5.

4.5.2.1 Interceptor Drains

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

The material excavated to make the drain was compacted on the downslope edge of the drain to form a diversion dike. Any areas where works were carried out to construct roads, turbine bases, or hardstands were built up with large grade hardcore, which, even when compacted in place, retained sufficient void space to allow water to infiltrate the subsurface of these constructed areas. Roadways or other installed

Wind Farm Site infrastructure does not intercept ground-conveyed surface water runoff to any significant extent that would result in scouring, overtopping, or spillover.

Interceptor drains were retained in certain locations, for example, where roadways were installed on slopes, to prevent the roadways from acting as conduits for water that might infiltrate the roadway sub-base. In these cases, interceptor drains were maintained in localised areas along the roadway with culverts under the roadway, allowing the intercepted water to be discharged to vegetation filters downgradient of the roadway. Similarly, in localised hollows where water was likely to be funnelled at greater concentrations than on broader slopes, interceptor drains and culverts were left in situ following construction.

The velocity of flow in the interceptor was controlled by check dams (described in Section 4.5.2.3), which were installed at regular intervals along the drains to ensure flow in the channel was non-erosive. On steeper sections where erosion risks were greater, a geotextile membrane was added to the channel.

Interceptor drains were installed horizontally across slopes to run in parallel with the natural contour line of the slope. Intercepted water travelled along the interceptor drains to areas downgradient of works areas, where the drain terminated at a level spreader (described in Section 4.5.2.4 below). Across the entire length of the interceptor drains, the design elevation of the water surface along the route of the drains was not lower than the design elevation of the water surface in the outlet at the level spreader.

4.5.2.2 Swales

Drainage swales are shallow drains which are used to intercept and collect runoff from construction areas of the Wind Farm Site. A swale was 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 stabilized outlet. Swales are effective when a dike was installed on the downhill side and are similar in design to interceptor drains and collector drains described above.

Drainage swales remain in place to collect runoff from roads and hardstanding areas of the Existing Development.

Drainage swales were 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 intercept potentially silt-laden water from the excavations and construction areas of the Site and prevent it from reaching natural watercourses.

4.5.2.3 Check Dams

The velocity of flow in the interceptor drains and drainage swales, particularly on sloped sections of the channel, is controlled by check dams, which are installed at regular intervals along the drains to ensure flow in the swale is non-erosive. Check dams were also installed in some existing artificial drainage channels that received waters from works areas of the Wind Farm Site. Locations of check dams are illustrated in Appendix 4-5.

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

The check dams are made up of straw bales or stone, or a combination of both depending on the size of the drainage swale they were installed in. In smaller channels, a stone check dam was installed and pressed down into place in the bottom of the drainage swale with the bucket of an excavator.

The check dams were installed at regular intervals along the interceptor drains to ensure the bottom elevation of the upper check dam was at the same level as the top elevation of the next down-gradient check dam in the drain. The centre of the check dam was approximately 150 mm 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 were not used in any natural watercourses, only artificial drainage channels and interceptor drains.

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

4.5.2.4 Level Spreaders

A level spreader was 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 are located downgradient of any works areas in locations where they were not likely to contribute further to water ingress to construction areas.

The water carried in interceptor drains does not come in contact with works areas of the Wind Farm Site and is free of silt and sediment. The level spreaders distribute clean drainage water onto vegetated areas where the water is not reconcentrated into a flow channel immediately below the point of discharge. The discharge points are on level or only very gently sloping ground rather than on a steep slope to prevent erosion.

4.5.2.5 Piped Slope Drains

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

Piped slope drains are inspected regularly with inlets and outlets checked for sediment accumulation and blockages. Any seepage holes where the pipe emerged from the drain at the top of the pipe are repaired promptly.

4.5.2.6 Vegetation Filters

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

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

4.5.2.7 Stilling Ponds (Settlement Ponds)

Stilling ponds were constructed as part of the Existing Development and are used to attenuate runoff from works areas of the Wind Farm Site during the construction. 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 allows larger particles to settle out in the stilling ponds, before the runoff water is redistributed as diffuse sheet flow in filter strips downgradient of works areas.

Stilling ponds were excavated/constructed at each required location as two separate ponds in sequence, a primary pond and a secondary pond. The points at which water entered and exited the stilling ponds were stabilised with rock aprons, which trapped sediment, dissipated the energy of the water flowing

through the stilling pond system, and prevented erosion. Water flows out of the secondary stilling pond through a stone dam, partially wrapped in geotextile membrane, which controls flow velocities and trapped any sediment that has not settled out.

Stilling ponds are located towards the end of swales, close to where the water was reconverted to diffuse sheet flow.

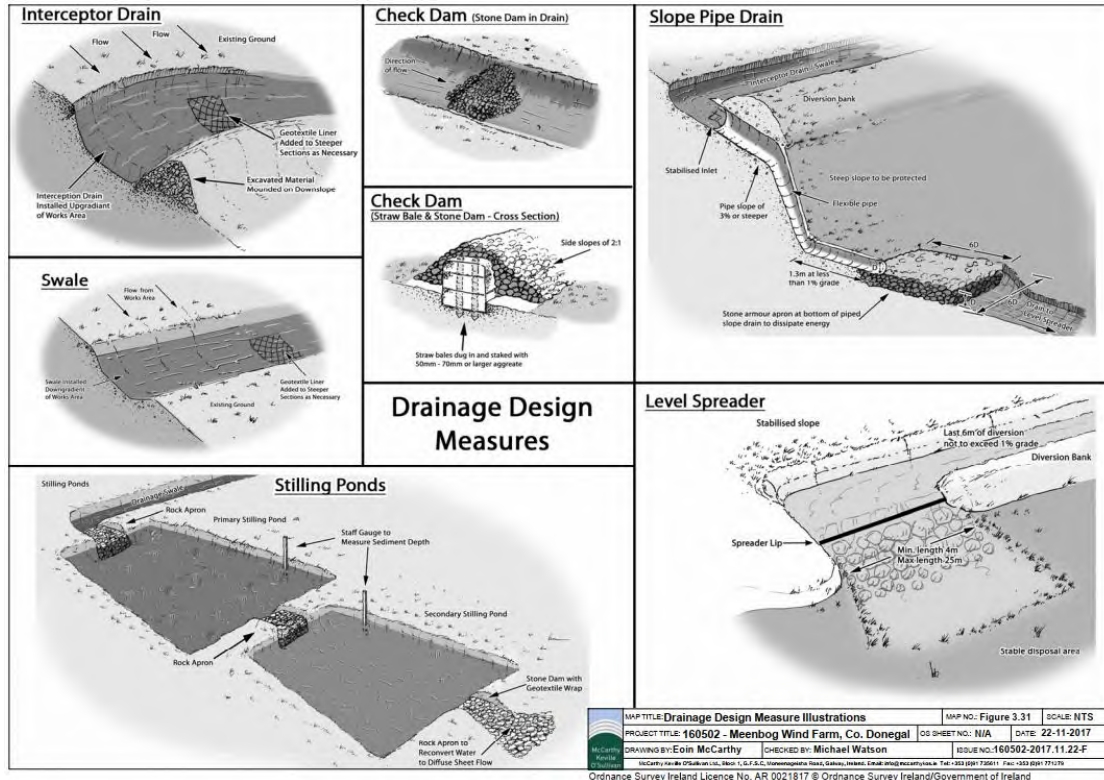


Plate 4-6 Drainage Design Measures Illustration

4.5.2.8 Roadside Berms

Small, low-level roadside berms were used to contain sediment within the road corridor and prevent run-off into the wind farm drainage system at uncontrolled locations. Berms are a minimum of 600 mm high and run perpendicular to the running surface of the constructed roads and have intermittent apses for drainage to settlement ponds. The construction of these berms ensures that runoff is allowed to access the drainage system only via settlement ponds. The purpose of these measures is to protect water quality during the construction and operational phase of the Subject Development.

4.5.2.9 Culverts

Five new stream culverts were installed along with 19 stream culvert upgrades and were the subject of consent applications to the OPW under Section 50 of the Arterial Drainage Act, 1945. Some culverts were installed to manage drainage waters from works areas particularly where the waters had to be taken from one side of an existing roadway to the other for discharge. The size of culverts was influenced by the depth of the track or road sub-base. In some cases, two or more smaller diameter culverts were used where this depth was limited, though this was avoided as they had a higher associated risk of blockage than a single, larger pipe. In all cases, culverts were oversized to allow mammals to pass through the culvert. Culverts were installed with a minimum internal gradient of 1% (1 in 100).

Smaller culverts had a smooth internal surface. Larger culverts had corrugated surfaces which trapped silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone was used to interrupt the flow of water. This helped dissipate its energy and helped prevent problems of erosion. Smaller water crossings simply consisted of an appropriately sized pipe buried in the sub-base of the road at the necessary invert level to ensure ponding or pooling didn't

occur above or below the culvert and water could continue to flow as necessary. All culverts were inspected regularly to ensure they were not blocked by debris, vegetation, or any other material that might impede conveyance. A table of culverts within the Wind Farm Site is provided as Appendix 4-10.

4.5.2.10 Silt Fences

Silt fences were installed as an additional water protection measure around existing watercourses in certain locations, particularly where works were carried out within the 50m buffer zone of a stream or 100m buffer zone of a lake, which was inevitable where existing roads in proximity to watercourses were upgraded. These areas included around existing culverts and around the headwaters of watercourses. The locations are indicated on the detailed drainage design drawings and are included in Appendix 4-5. Silt fences were 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 followed the technical guidance document ‘*Control of Water Pollution from Linear Construction Projects*’ published by CIRIA (Ciria, No. C648, 1996). All silt fencing was formed using Terrastop Premium or equivalent silt fence product. Site fences were inspected regularly to ensure water was continuing to flow through the fabric, and the fence was not coming under strain from water backing up behind it.

4.5.2.11 Borrow Pit Drainage

While surface water was contained in the borrow pit areas, run-off from the borrow pit areas was controlled via a single outlet that was installed at the edge of the borrow pit. The single outfall point was constructed to handle runoff from the borrow pit and its immediate surrounds.

During the construction of the Existing Development, it was necessary to keep the borrow pit area free of standing water while rock was still being extracted. This was achieved by using a mobile pump, which pumped water into the same series of drains, settlement ponds, and level spreader, which received the water from the single outlet.

4.6 Existing Development Access and Transportation

4.6.1 Existing Development Entrance

Access to the Wind Farm Site is from the west via an existing main Wind Farm Site entrance off N15 approximately 8 km southwest of Ballybofey. There is a secondary Wind Farm Site entrance from the local road (L-6554) to the north of the Wind Farm Site. This entrance was used as a staff entrance for workers accessing the northern portion of the Wind Farm Site.

4.6.2 Construction Materials Transport Route

All deliveries of construction materials and construction traffic, including heavy goods vehicles (HGVs), entered the Wind Farm Site by way of the main site entrance off the N15, as can be seen in Figure 4-1 and Figure 4-2. A Traffic Management Plan (TMP) was included in the 2019 CEMP for the Permitted Development and is included as Appendix 4-6 of this rEIAR. The TMP was implemented during the construction of the Existing Development. Traffic and transport are discussed further in detail in Chapter 15 of the rEIAR.

4.7 Existing Development Activities

4.7.1 Environmental Management

Prior to the commencement of construction, a CEMP was prepared and agreed with the Local Authority. A copy of the 2019 CEMP which was in place during the construction of the Existing Development is included in Appendix 4-4 of this rEIAR.

The CEMP provided the environmental management framework which was adhered to during the pre-commencement and construction phases of the Existing Development and was prepared in conjunction with the 2017 EIAR, NIS and Conditions Compliance Statement of the Permitted Development. The CEMP identified the key planning and environmental considerations that were adhered to and delivered during the construction of the Existing Development. The CEMP included details of environmental controls including drainage measures, peat management and waste management as well as an Emergency Response Plan which was to be adopted in the event of an emergency in terms of site health and safety and environmental protection. These controls were applied across both the Wind Farm site and the Grid Connection site. In accordance with best practice the peat and overburden management measures and drainage measures were regularly reviewed and updated on the advice of the project geotechnical engineer and project hydrologist.

The CEMP was updated in accordance with the planning permission conditions set by An Coimisiún Pleanála under ABP-300460-17.

4.7.2 Refuelling

Wherever possible, vehicles were refuelled off-site, particularly for regular road-going vehicles. On-site refuelling of machinery was carried out at designated refuelling areas at various locations throughout the Wind Farm Site. Heavy plant and machinery were refuelled on-site by a fuel truck that came to the Wind Farm Site as required on a scheduled and organised basis. Other refuelling was carried out using mobile double skinned fuel bowser. All refuelling was carried out outside designated watercourse buffer zones. Only designated trained and competent operatives were authorised to refuel plant on-site. Mobile measures such as drip trays and fuel absorbent mats were used during refuelling operations as required. All plant and machinery were equipped with fuel absorbent material and pads to deal with any event of accidental spillage.

4.7.3 Concrete Deliveries

Only ready-mixed concrete was used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. No on-site batching was carried out. When concrete was delivered to the Wind Farm Site, only the chute of the delivery truck was cleaned, using the smallest volume of water necessary, before leaving the Wind Farm Site.

Water generated from washing the concrete lorry's chute was directed into a temporary lined impermeable containment area. Once evaporated, any remnants of concrete were disposed of along with other construction waste.

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

The risks of pollution arising from concrete deliveries were further reduced by the following measures:

- Concrete trucks were not washed out in the Wind Farm Site but were directed back to their batching plant for washout.
- Wind Farm Site roads were constructed to a high standard to allow transport of the turbine components around the Wind Farm Site, and hence, concrete delivery trucks were able to access all areas where the concrete was needed.
- No concrete was transported around the Wind Farm Site in open trailers or dumpers to avoid spillage while in transport.
- All concrete used in the construction of turbine bases was pumped directly into the shuttered formwork from the delivery truck. If this was not practical, the concrete was pumped from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which transferred the concrete to the location where it was needed.

4.7.4 Dust Suppression

In periods of extended dry weather, dust suppression was used along haul roads to ensure dust did not cause a nuisance. Water was taken from stilling ponds in the Wind Farm Site's drainage system and was pumped into a bowser or water spreader to dampen down haul roads and temporary construction compounds to prevent the generation of dust. Silty or oily water was not used for dust suppression.

4.7.5 Vehicle Washing

Due to the length of surfaced Wind Farm Site roads, vehicle or wheel washing facilities were not required as part of the construction phase of the Existing Development. Site roads were formed before road-going trucks begin to make regular or frequent deliveries to the Wind Farm Site (e.g. with steel or concrete). The Wind Farm Site roads were well finished with compacted hardcore, and so the public road-going vehicles were not travelling over soft or muddy ground where they might pick up mud or dirt. The Grid Connection Site mainly included existing roads and therefore vehicle washing was not required.

A road sweeper was available in the event that a section of the public roads was dirtied by trucks associated with the construction of the Existing Development.

4.7.6 Waste Management

The 2019 CEMP for the Permitted Development, Appendix 4-4 of this rEIAR, provided a waste management plan (WMP) which outlined the best practice procedures during the construction phase of the project. The WMP outlined the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Existing Development. Disposal of waste was undertaken as

a last resort. The WMP was updated in line with the EPA's 2021 document '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*' 2021¹.

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

The Act requires that any waste related activity has to have all necessary licenses and authorisations. All contractors hired to remove waste from the Wind Farm Site held valid Waste Collection Permits and waste was delivered to a licensed or permitted waste facility.

Prior to the commencement of the Existing Development, a Construction Waste Manager was appointed by the Contractor. The Construction Waste Manager was in charge of the implementation of the objectives of the plan, ensuring that all hired waste contractors had the necessary permits/licenses and authorisations and that the waste management hierarchy was adhered to. The Construction Waste Manager had the authority to ensure everyone working on the Wind Farm Site adhered to the management plan.

4.8 Construction Management

4.8.1 Construction Timing

Construction work on the Existing Development commenced in November 2019. Although some construction activities have occurred on a sporadic basis throughout the period from November 2019 to the present, the vast majority of construction activities occurred during the 12-month period from November 2019 to November 2020. The following is a brief timeline of construction activities associated with the Existing Development:

- **November 2019 – November 2020:** Construction was ongoing until it was halted due to a peat slide. Approximately 90% of groundworks were completed during this period and a large majority of deliveries to the site occurred during this period.
- **November 2020 – July 2022:** Works on the electricity substation and associated underground cabling connection to the grid continued until the second quarter of 2021. Peat slide remediation works were carried out at the Wind Farm Site at the instruction of Donegal County Council under Section 12 of the Local Government (Water Pollution) Act, 1977. Following extensive investigation, the EPA confirmed their satisfaction that the site was stable and that works could recommence. On 7 July 2022, the DCC Environment Section issued a letter confirming their satisfaction with the peat slide remediation works and closing the Section 12 notices issued.
- **July 2022 – December 2022:** Construction temporarily resumed, during which some additional works were carried out on site roads, internal site ducting, hardstanding areas, borrow pits, and peat cells.

Construction activities were generally carried out during normal daytime working hours (i.e., 0700 – 1900hrs Monday to Saturday). However, to ensure that optimal use was made of good weather period or at critical periods within the programme (i.e., concrete pours) it was necessary on occasion to work outside of these hours. Any such out of hours working were notified in advance to the Local Authority.

¹ EPA (2021) *Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects*. Available at: <https://www.epa.ie/publications/circulareconomy/resources/CDWasteGuidelines.pdf>

4.8.2 Construction Sequencing

The construction of the Existing Development commenced in November 2019 with the majority of works occurring in the 12-month period from November 2019 to November 2020. Additional construction works occurred in the second half of 2022, and sporadic site maintenance worked occurred up to December 2025 and will continue as necessary to ensure good environmental conditions at the Wind Farm Site.

Figure 4-18 Existing Development Construction Sequencing

		2019				2020				2021				2022				2023				2024				2025				2026			
ID	Task Name	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Site Health and Safety																																
2	Site Preparation Works																																
3	Site Compounds																																
4	Site Roads																																
5	Grid Connection																																
6	On-Site Substation																																
7	Internal Site Ducting																																
8	Turbine Foundations																																
9	Hard Standing Areas																																
10	Borrow Pits																																
11	Peat Storage Cells																																
12	Tree Felling																																
13	Peatslide Remediation Works																																
14	Periodic Site Maintenance																																

4.8.3 Construction Phase Monitoring and Oversight

A CEMP was prepared in advance of any construction works commencing at the Wind Farm Site and Grid Connection Site and submitted for agreement to the Planning Authority. The procedures for the implementation of the mitigation measures outlined in the CEMP and their effectiveness and completion was monitored by the Environmental Clerk of Works (ECoW) on behalf of Planree Ltd., in an objective manner. Mitigation measures and construction phase monitoring and oversight was set out in the CEMP for the Permitted Development and is presented in Appendix 4-4.

The provisions of the CEMP were applied to the construction of the Existing Development.

The contractor was responsible for implementing the mitigation measures specified in the CEMP. The contractor was also responsible for ensuring that all construction staff understood the importance of implementing the mitigation measures. The implementation of the mitigation measures was overseen by the ECoW with the support of the supervising hydrogeologists, environmental scientists, ecologists or geotechnical engineers, depending on who was best placed to advise on specific elements of the implementation.

4.9 Construction Methodologies

The following sections of this rEIAR set out the construction methodologies followed for the construction of the Existing Development.

Following the November 2020 Peat Slide, a comprehensive review of the construction methodologies being employed on-site was undertaken by Fehily Timony as part of the response to the EPA investigation of the peat slide. Following this review a document *entitled 'Construction Responses to Fehily Timony Mitigation Measures'*, was prepared by the contractor (MCE Ltd.) in August 2021 (MCE, 2021) to accompany the Fehily Timoney report *'Peat Stability Assessment of Meenbog Wind Farm Site'* (FT, 2021). The MCE (2021) document outlined additional mitigation measures and revised construction methodologies to be utilised during the construction of the outstanding elements required to complete the wind farm. These measures and methodologies were implemented for all construction activities undertaken on-site since the publication of the MCE (2021) document. A copy of MCE, 2021 is included as Appendix 4-7 to this rEIAR.

4.9.1 Turbine Foundations

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

There was a minimum of 100 mm of blinding concrete laid on the formation material, positioned using a concrete skip and 360° excavator to protect ground formation and to provide a safe working platform.

The anchor cage was delivered to the Wind Farm Site. A 360° excavator with suitable approved lifting equipment was used to unload sections of the anchor cage and reinforcing steel. The anchor cage was positioned in the middle of the turbine base and assembled accordingly. When the anchor cage was in its final position, it was checked and levelled using a dumpy level. The anchor cage was positioned 250 mm – 300 mm from the formation level using adjustable legs.

Reinforcement bars were then placed around the anchor cage, first radial bars, then concentric bars, shear bars, and finally the superior group of bars. Earthing material was attached during the steel foundation build-up. The level of the anchor cage was checked again prior to and during the concrete pour.

Formwork to concrete bases was propped/supported sufficiently to prevent failure. Concrete for bases was poured using a concrete pump. Each base was poured in three stages. Stage 1 involved pouring and vibrating the concrete in the centre of the anchor cage to bring the concrete up to the required level inside the cage. Stage 2 involved pouring and vibrating the centre of the steel foundation to the required level. Stage 3 involved pouring the remaining concrete around the steel foundation to bring it up to the required finished level. After a period of time, when the concrete had set sufficiently, the top surface of the concrete was finished with a power float.

Once the base had sufficient curing time, it was filled with suitable fill up to the existing ground level. The working area around the perimeter of the foundation was backfilled with the original material that was excavated.

4.9.2 Wind Farm Site Roads and Hardstand Areas

During the initial construction of the Existing Development, existing forestry tracks were upgraded where possible and new access roads were constructed to provide access within the Wind Farm Site and to connect the wind turbines and associated infrastructure. Crane hardstands were constructed at the base of each of the turbine locations.

Once tree felling was completed, tracked excavators carried out excavation for roads with appropriate equipment attached. The excavations followed a logical route working away from the borrow pit locations. Excavated material was transported back to the borrow pits in haul trucks. Material excavated to create the working area was stored locally for later reuse in backfilling the working area around the turbine foundation. The excavated material was sealed with the back of the excavator bucket and surrounded by silt fences to ensure sediment-laden run-off did not occur.

When the formation layer was reached, stone from the on-site borrow pit was placed to form the road foundation. The sub grade was compacted with the use of a roller. Wind Farm Site roads and hardstand areas were constructed in accordance with the 2019 CEMP for the Permitted Development (Appendix 4-4).

The upgrade of existing floating roads to founded roads was undertaken in accordance with the following methodology:

- The existing floating road was progressively removed by pulling back the engineering fill material and geogrid, before constructing the new road using the excavate and replace/partial displacement² method.
- The road was built incrementally, with peat removed before being backfilled with coarse rock sourced from the borrow pit where the peat depth was relatively shallow (less than 3m). The excavator worked from the founded section of road at all times.
- Rock fill from the borrow pit was transported to the roads and berms using A25 dumpers, with the coarse rock tipped onto the constructed section of road before being used to backfill the excavation. Rock was not end tipped directly from dumpers into the excavation.
- Where deep peat was encountered (greater than 3m), the partial displacement method was used. This removed the peat down to the effective reach of the excavator, typically 3m, but left a thin layer of peat in place at the base of the excavation.
- Coarse boulders (greater than 0.5m, with no fine material) were used in the base of the excavation and were pushed into the base of the peat to the solid stratum below the peat. This displaced the peat upwards, filling the voids between the coarse boulder fill.
- The finished road width has a minimum running width of 5m, with wider sections of up to 10m on bends and corners.
- A final surface layer was placed over the existing access road, where completed, as per design requirements, to provide a road profile and graded to accommodate wind turbine construction and delivery traffic.

² Partial displacement involves excavating peat to a specific depth, leaving in place a layer of peat at the base of the excavation. Coarse rock fill is subsequently placed within the excavation and progressively worked into the underlying peat layer, resulting in the displacement and compaction of the in-situ peat material to form a stable sub-base.

- The construction of access roads in areas of deep peat (greater than 3m) was inspected on a daily basis (by the Site Manager) during the works, particularly before/following trafficking by heavy vehicular loads.

The construction of the new site access roads was undertaken in accordance with the following methodology:

- The alignment of the new site access roads was established from the construction drawings as part of the Permitted Development, and the centrelines were marked out using ranging rods and/or timber posts where required.
- The road layout was designed to avoid crossings of natural watercourses.
- Where existing culverts were upgraded or extended, the works were carried out in accordance with a method statement agreed with IFI. The access tracks were constructed as single-track roads with an overall width of 4.5m to 10m, with localised widening at bends, junctions, and around turbine bases to facilitate the safe passage of large vehicles.
- In some areas where it was considered beneficial, excavated road sections were stripped of turf over the excavation area, with the turf stored, growing side up, for reuse. These stripped areas were oversized to accommodate excavated subsoil material. The subsoil material was subsequently capped with topsoil to form an earth bund around the excavated material.
- In certain areas, where confirmed as more suitable by the on-site Geotechnical Engineer, a non-excavated ground-bearing road was employed. In these cases, a reinforced sub-base was placed directly on the existing ground, incorporating a geotextile separation layer and layers of geogrid reinforcement as designed to achieve the required bearing capacity for the running surface.
- All peat excavated was used as part of the borrow pit restoration or in reinstatement areas. Topsoil was temporarily stockpiled locally for reuse in landscaping over backfilled areas above foundations. A bund constructed of excavated subsoil, covered with a layer of geogrid and capped with peat topsoil, formed the down-gradient boundary to reinstatement areas.
- Subsoil was excavated down to a suitable formation layer of either firm clay or bedrock.
- Where floating roads were constructed, subsoil was not excavated. Instead, a layer of geogrid or layers of brash and timber were laid directly onto the peat surface.
- Well-graded granular fill was spread and compacted in layers to an overall thickness of up to 750 mm, with a suitable capping layer provided to form a homogeneous running surface. Layer thicknesses and compaction requirements were determined by the Construction Manager based on material characteristics and compaction plant used.
- All new roadways were constructed with a camber to facilitate surface water drainage.
- Batters were generally formed at slopes of between 1:1 and 1:2 (depending on depth and material type) and were left as cut to re-vegetate naturally with local species. Design slopes were informed by the on-site Geotechnical Engineer.
- At bends and steep inclines, reflective snow poles were erected to provide visual warning of road alignment changes and sharp gradients during low-light conditions.
- The granular fill used to complete the final running surface of the roads on-site was tested in accordance with BS 812-111:1990 (Ten per cent fines value test) which was undertaken to confirm the strength and suitability of the material for use in road construction within the Wind Farm Site.

The construction of the roadway at the immediate southeast of the entrance (realigned road) included the alteration of an existing quarry water retention pond to the north of the realigned road. The excavation and alteration of the quarry pond followed the following methodology:

- The works were completed under favourable, dry weather conditions to avoid water flowing into and out of the pond during the operation.
- The pond was pumped dry with the pumped water being discharged to ground in the quarry void that was located to the southeast. The pumped water was not discharged to any watercourse and dissipated to ground.
- The peat was replaced by competent rock for stability of the road with the rock gained from the area immediately adjacent to the works.

- Material was excavated from the north to expand the footprint of the pond and restore the original pond dimensions.
- The peat material was removed via dump trucks to a peat cell on the Wind Farm Site and the banks of the new pond were shaped using an excavator from the pond base.
- The seal at the bottom of the old pond was recreated using a plastic liner.
- Finally, the original concrete overflow pipes were extended into the altered pond to reconnect the pond to the quarry drainage network.
- A 2m high chain-link fence was installed around the pond for safety.

4.9.3 Clear Span Bridge Crossing

A 5m wide clear-span bridge was constructed over the Bunadaowen River within the Wind Farm Site. The bridge crossing was upgrading an existing box culvert on the original forestry road. The crossing location is at ITM X 607622, Y 887145 and the design avoided the need for in-stream works.

The clear-span bridge was 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 IFI. Abutments were constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material. A drawing of the clear span bridge is given in Figure 4-6.

The typical construction methodology for the installation of a pre-cast concrete clear-span bridge was as follows:

- The access road on the approach to the watercourse was completed to a formation level suitable for the passing of plant and equipment required for the installation of the watercourse crossing.
- All drainage measures along the proposed road were installed in advance of the works.
- Safe access over the stream for this installation was provided via an existing steel walkway and handrail which spanned the stream.
- Steel boxes for concrete reinforcement were constructed in close proximity to the work for ease of installation and were fixed by competent persons. Steel boxes were placed into position by a 360° excavator. Concrete was placed using an excavator or, where practical, poured from the chute of a truck. A banksman directed the truck once on-site.
- Concrete plinths were poured as per the structural designer's request.
- Precast concrete sections were delivered to the Wind Farm Site and off-loaded with a crane into position under the guidance of a banksman.
- Once the concrete structure was in position, stone backfill was placed and compacted against the culvert up to the required level.
- The finished road level was decided by a Structural Engineer.

4.9.4 Watercourse Crossings

Within the Wind Farm Site, there are a total of 26 no. new watercourse culvert crossings and 76 no. existing watercourse culvert crossings were installed or upgraded. All culvert upgrades at field drain crossings required for the Wind Farm Site were suitably sized for the expected peak flows in the watercourse. Some culverts were installed to manage drainage waters from works areas of the Wind Farm Site, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts was influenced by the depth of the track or road sub-base.

Culverts were installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts have a smooth internal surface. Larger culverts have corrugated surfaces which trap silt and contribute to the stream ecosystem.

4.9.5 Substation and Associated Grid Connection

4.9.5.1 Electrical Substation and Control Buildings

The on-site 110kV electrical substation was constructed as part of the Existing Development and in accordance with the CEMP for the Permitted Development (Appendix 4-4). The 110kV electrical substation and control buildings were constructed within the Wind Farm Site, adjacent to the existing access road as indicated in Figure 4-1. The substation was constructed by the following methodology:

- The area of the substation was marked out using wooden posts.
- The soil was stripped and removed to a temporary placement area for later use in landscaping or placement in a peat cell or borrow pit on the Wind Farm Site.
- No material was removed from the Wind Farm Site, and the temporary placement areas were stripped of vegetation prior to stockpiling, in line with best working practices.
- Wind farm control buildings were built within the substation compound.
- All groundwater and surface water arising from turbine base excavation was pumped to the dirty water system and treated in settlement ponds and/or specialist treatment systems, prior to discharge from the Wind Farm Site.
- The foundations were excavated to the level indicated by the project engineer.
- The foundations were shuttered and poured with reinforced concrete, with an anti-bleeding admixture included in the concrete mix.
- The substation was constructed with masonry blockwork. The blockwork walls were built up from the footings to Damp Proof Course (DPC) level, and the floor slab was constructed after locating any required ducts or trenches for mechanical and electrical contractors.
- The blockwork was raised to wall plate level, and the gables and internal partition walls were formed. Scaffold was erected around the outside of the building for this operation.
- Concrete roof slabs were lifted into position using an adequately sized mobile crane.
- Timber roof trusses were lifted into position using a telescopic load all or mobile crane, depending on site conditions. The roof trusses were then felted, battened, tiled, and sealed against the weather.
- A rainwater harvesting system was installed to provide the small volume of water required for the operation of the substation and control building.
- The electrical equipment was installed and commissioned.
- Perimeter fencing was erected around the substation and control building compound area.
- All wastewater from the staff welfare facilities in the control buildings is directed to a sealed underground storage tank, which is fitted with an automated alarm system to provide sufficient notice when the tank requires emptying. The waste storage tank was emptied by an appropriately licenced waste management contractor to a licenced waste facility.

4.9.5.2 Grid Connection

The Grid Connection underground cabling was constructed using the following methodology:

- The area where excavations were planned was surveyed and all existing services were identified.
- All relevant bodies, i.e., ESB Networks, Bord Gáis, Eircom, Donegal County Council, etc., were contacted and all drawings for existing services were sought.
- A traffic management plan, included as Appendix 4-6 of this rEIAR, was set up prior to any works commencing.
- A road opening licence was obtained (Ref. No. 2020DL0089).
- All plant operators and general operatives were inducted and informed as to the location of any services.
- A 13-tonne rubber-tracked 360-degree excavator was used to excavate the trench to the dimensions specified in the ESB Networks "Specification for the Installation of Ducts and Structures for Underground Power Cables and Communications Cables."
- All excavated material was stockpiled and reused for backfilling where appropriate.
- All excavated material not used for backfilling was removed from the Grid Connection Site using trucks.

- The trench depth was specified at 1250 mm and trench support was installed, or the trench sides were benched or battered back where appropriate.
- Any ingress of groundwater was removed from the trench using submersible pumps.
- A silt filtration system was used to prevent contamination of any watercourse.
- Once the trench was excavated, a base layer of 15 Newton CBM4 concrete was installed and compacted. All concrete was offloaded directly from the concrete truck into the trench.
- Ducting was then placed in the trench as per specification, and approved cable ties were used where required to secure the trefoil ducts together (at 3-metre centres).
- Once the trefoil ducts were installed, couplers were fitted and capped to prevent any dirt, etc., from entering the duct. In poor ground conditions, the end of the trefoil ducts was shimmed up off the bed of the trench to prevent any possible ingress of water or dirt. The shims were removed once the next length was connected.
- Extreme care was taken to ensure that all duct collars (both ends) were clean and in good condition prior to ducts being joined.
- The as-built location of the ducting was surveyed using a total station/GPS.
- Spacers were used to ensure that the correct cover was achieved at both sides of the trefoil ducting.
- ESB marker board was fitted above the trefoil ducting.
- ESB red marker board was installed, and the remainder of the trench was backfilled in two compacted layers with approved material (lean mix concrete or clause 804).
- Yellow marker tape was installed as per approved detail specifications, 300 mm maximum below finished road/ground level.
- The finished surface was reinstated as per agreement with the landowner/Local Authority as appropriate.
- Marker Posts denoted all changes of direction, road crossings, etc.

4.9.5.2.1 **Existing Underground Services**

Any underground services encountered along the cable routes were surveyed for level, and the ducting passed over the service, provided adequate cover was available. A minimum clearance of 300 mm was required between the bottom of the ducts and the service in question. If the clearance could not be achieved, the ducting passed under the service, and again, 300 mm clearance between the top of the communications duct and the bottom of the service was achieved. In deeper excavations, an additional layer of marker tape was installed between the communications duct and the top-level yellow marker tape. If the required separation distances could not be achieved, a number of alternative options were available, such as using steel plates laid across the width of the trench and using 35N concrete surrounding the ESB ducts where adjacent services were within 600 mm, with marker tape on the side of the trench. Backfill around any utility services was done with dead sand/pea shingle where appropriate.

4.9.5.2.2 **Joint Bays**

Joint bays are pre-cast concrete chambers where lengths of cable were joined to form one continuous cable. They are located at various points along the ducting route, generally between 600 m to 1,000 m intervals.

Where possible, joint bays were located in areas where there was a natural widening/wide grass margin on the road in order to accommodate easier construction, cable installation, and create less traffic congestion. During construction, the joint bay locations were completely fenced off and incorporated into the traffic management plan. Once they were constructed, they were backfilled until cables were installed. The joint bays are no longer discernible since the road surface has been reinstated.

4.9.5.2.3 **Grid Connection Water Crossings**

The Grid Connection underground cabling route crossed 45 existing culverts and three existing bridge crossings throughout its length. The construction methodology was designed to eliminate the requirement for in-stream works. A general description of the various construction methods employed at culvert and bridge crossings is provided in the following paragraphs. A list of the bridge crossings and the crossing method utilised at each location is provided in Table 4-7. The crossing methodologies employed along the Grid Connection cable route were selected based on culvert type, depth, size, and local ground

conditions. The culvert crossing and bridge crossing locations are also shown on the underground cable route drawings included as Appendix 4-1.

Table 4-7 Grid Connection Route Bridge Crossings Methodology

Bridge Crossing No.	Name	Description	Watercourse Crossing Option	Extent of In-stream Works
1	Lowerymore Bridge	The existing bridge consists of a concrete deck which could not be excavated for a cable trench. Therefore, the cable was installed under the watercourse by means of directional or horizontal drilling.	Horizontal Drilling	None. No in-stream works required.
2	Lower Keadew Bridge	The existing bridge consists of a concrete deck which could not be excavated for a cable trench. Therefore, the cable was installed under the watercourse by means of directional or horizontal drilling.	Horizontal Drilling	None. No in-stream works required.
3	Bransemore Bridge	Stone arch bridge which could not be excavated for a cable trench. Therefore, the cable was installed under the watercourse by means of directional or horizontal drilling.	Horizontal Drilling	None. No in-stream works required.

Piped Culvert Crossings over Culvert

Watercourses were not directly impacted since no instream works or bridge/culvert alterations were proposed. Where sufficient cover existed above the culvert, the trench was excavated above the culvert, and the ducts were installed in the trefoil arrangement, passing over the sealed pipe without making contact with the watercourse.

Piped Culvert Crossings under Culvert

Where the culvert consisted of a socketed concrete or sealed plastic pipe and sufficient cover over the culvert did not exist to accommodate the cable trench, a trench was excavated beneath the culvert, and cable ducts were installed in the trefoil arrangement under the sealed pipe. If these duct installation methods could not be achieved or utilised, the ducts were installed by alternative means as set out in the following sections.

Flatbed Formation over Culverts

Where cable ducts were to be installed over an existing culvert/bridge where sufficient cover could not be achieved by installing the ducts in a trefoil arrangement, the ducts were laid in a much shallower trench, the depth of which was determined by the location of the top of the culvert or the depth that could be

achieved in the deck of a bridge structure. The ducts were laid in this trench in a flatbed formation over the existing culvert/bridge and were encased in 6 mm thick steel galvanized plate with a 35N concrete surround as per ESB Networks specification. After the crossing over the culvert was achieved, the ducts resumed the trefoil arrangement within a standard trench.

Where a bridge or culvert had insufficient deck cover to fully accommodate the required ducts, the ducts were laid in a flatbed formation partially within the existing road makeup. Where this option was employed, the ducts were also encased in steel with a concrete surround as per Eirgrid and/or ESB Networks specifications. To achieve cover over these ducts and restore the carriageway of the road, it was sometimes necessary to locally raise the pavement level to fully cover the ducts. The increased road level was achieved by overlaying the existing pavement with a new wearing course as required. Any addition of a new pavement was tied back into the existing road pavement at grade. After the crossing over the culvert was achieved, the ducts resumed the trefoil arrangement within a standard trench.

Directional Drilling

In cases where none of the above methods were appropriate, directional drilling was utilised. The directional drilling method of duct installation was carried out using a Vermeer D36 x 50 Directional Drill (approximately 22 tonnes) for the horizontal directional drilling at watercourse/culvert crossings listed above.

The launch and reception pits were approximately 0.55m wide, 2.5m long, and 1.5m deep. The pits were excavated with a suitably sized excavator. The drilling rig was securely anchored to the ground by means of anchor pins attached to the front of the machine. The drill head was then secured to the first drill rod, and the operator commenced drilling into the launch pit at a suitable angle to obtain the depths and pitch required for the line and level of the required profile. Drilling of the pilot bore continued with the addition of 3m long drill rods, mechanically loaded and connected into position.

During the drilling process, a mixture of a natural, inert, and fully biodegradable drilling fluid Clear Bore™ (environmentally friendly product, not toxic to aquatic organisms) and water was pumped through the centre of the drill rods to the reamer head. This mixture was forced into the void, enabling the annulus created to support the surrounding subsoil and prevent collapse of the reamed length. Depending on the prevalent ground conditions, it was sometimes necessary to repeat the drilling process by incrementally increasing the size of the reamers. When the reamer entered the launch pit, it was removed from the drill rods, which were then passed back up the bore to the reception pit. The next size reamer was attached to the drill rods, and the process was repeated until the required bore with the allowable tolerance was achieved.

The use of a natural, inert, and biodegradable drilling fluid such as Clear Bore™ was intended to negate any adverse effects arising from the use of other traditional polymer-based drilling fluids. It was used sparingly as part of the drilling operations, appropriately stored prior to use, and deployed in the required amounts to avoid surplus. In the event that any excess drilling fluid accumulated in the reception or drilling pits, it was contained and removed from the Grid Connection Site in the same manner as other subsoil materials associated with the drilling process to an approved licensed waste facility.

Backfilling of launch and reception pits was conducted in accordance with the normal specification for backfilling excavated trenches.

4.9.6 Temporary Construction Compounds

There are two temporary construction compounds constructed as part of the Existing Development. The Construction Compounds were constructed as follows:

- Compacted layers of well-graded granular material were spread and lightly compacted to provide a hard area for site offices and storage containers.
- Areas within the compound were constructed as Wind Farm Site roads and used as vehicle hardstanding's during deliveries and for parking.
- During the construction phase, a self-contained port-a-loo with an integrated waste holding tank was used on-site for toilet facilities. It was maintained by the service contractor as

required and removed from the Wind Farm Site upon completion of the construction phase.

- The water supply to the Wind Farm Site came from a temporary water storage tank, which was filled using a mobile water tank that sourced water locally as required.

4.9.7 Borrow Pits

The following methodology applied to the construction of borrow pits comprised within the Existing Development:

- The areas to be used were marked out at the corners using ranging rods or timber posts. Drainage runs and associated stilling ponds were installed around the perimeter;
- Tree felling occurred, where necessary;
- The initial borrow pit excavation involved the removal of peat and overburden from the top of bedrock. These materials were used to form a berm on the downhill side of the borrow pit to provide screening of the borrow pit operations;
- Interceptor drainage ditches were excavated on all sides of the borrow pit to catch surface water runoff, and direct it to downstream re-distribution locations;
- The bedrock material was extracted from the borrow pit and stockpiled or used as required;
- The use of material won from the borrow pit was sequential with new road construction or turbine base formations;
- Temporary stockpiling of aggregates was required to accommodate the cut and fill operations within the borrow pit, and the progression of access roads and turbine excavations;
- As the borrow pit excavations progressed, surface water and groundwater ingress was removed via pumping to settlement ponds, and re-distribution locally across natural vegetated areas. Where required additional specialist treatment, including sediment bags and silt fences, was employed to ensure no deterioration in downstream water quality occurred; and
- Following the cessation of rock extraction, the borrow pits were partially backfilled with peat removed from the permanent development footprint areas i.e. excavated roads, hardstanding areas and turbine foundation areas.

4.9.8 Peat and Spoil Management

A Retrospective Peat and Spoil Management Plan (rPSMP) for the Existing Development has been prepared as is included as Appendix 4-8 of the rEIAR. The rPSMP and the Peat Stability Assessment (PSA) Report for the Existing Development (included as Appendix 8-1 of this rEIAR) were reviewed by Conor O'Donnell of AGL Consulting. A copy of the Mr. O'Donnell's review is included as Appendix 4-9 of this rEIAR.

4.9.8.1 Peat Cells

The methodology for the construction of the peat cells is described below. The peat cells were constructed in accordance with the environmental management measures set out in the Permitted Development CEMP (Appendix 4-4). The peat cells were constructed to facilitate the storage of some of the excavated peat generated during construction (Appendix 4-8 rPSMP). Peat cells were constructed using the following methodology:

- The areas to be used were marked out at the corners using ranging rods or timber posts.
- Tree felling occurred, where necessary.
- Ground was prepared in the area to be occupied by the peat cell and, where necessary, material was removed in order to create the required containment area.
- Soil/peat were stripped in order to construct the rock berm.
- Site won rock was deposited and then placed using excavator.
- The berm was constructed in a manner which prevented water retention within the peat cell. This was in order to prevent a build-up of hydrostatic pressure at the base of the berm

at a varying rate across the footprint which could have effectively placed a point load at a specific location.

- Large rocks were placed with an 'open bond' periodically to allow water to pass through the berm in a controlled manner.
- The berm was inspected and signed off by the designer.

The following methodology was utilised for the placement of peat within the peat cells:

- Excavators removed the peat from the development footprint areas i.e. excavated roads, hardstanding areas and turbine foundation areas.
- Temporary, sealed stockpiling areas, located adjacent to the hardstanding areas and turbine foundation areas, were chosen following on-site discussions between the construction site manager, an ecologist, a geotechnical engineer and hydrologist.
- The excavators moved the excavated peat to the designated temporary stockpiling areas within the construction and soft levelled areas.
- The temporary stockpiling areas were surrounded by silt fences to ensure sediment-laden run-off did not occur.
- The excavated peat remained in these areas over a period of time until the volume of the peat has reduced as the water drains out of the mounded peat.
- The excavators then loaded the peat directly into dump trucks, to transport the peat to the nearest peat cell.
- The material was backfilled into the peat cells and spread evenly across the area.
- Once the placement of peat was concluded the peat cells were permanently secured and a stock-proof fence to prevent access. Appropriate health and safety signage will also be installed.

4.9.9 Emergency Works in Response to Peat Movements.

4.9.9.1 Peat Containment Berm at T8

The CEMP for the Permitted Development outlined emergency response procedures to be followed in the event a peat slide occurred (Appendix 4-4). The berm was constructed after a minor peat slide and followed emergency response procedure for peat slide events as follows:

- On alert of a peat slide incident, all construction activities ceased, and all available resources were diverted to assist in the required mitigation procedures.
- Action was taken to prevent a peat slide reaching any watercourse. This took the form of the construction of a check barrage or berm on land immediately upslope of the access road and turbine foundation for T8.
- The localised peat slide did not represent an immediate risk to a watercourse and had essentially come to rest, the area was stabilised initially by rock infill. The failed area and surrounding area were then assessed by the engineering staff and stabilisation procedures implemented. The area was monitored until movements had ceased.

The berm was constructed as follows:

- Soil/peat were stripped in order to construct the rock berm. This peat was moved to the leeward side of the rock berm and spread to a depth of <500 mm using a low ground pressure excavator.
- Articulated dump trucks drew rock from a borrow pit, this was deposited and then placed using excavator.
- Plant operators did not expose excessive amounts of the works area in front of the backfill material.
- The berm was constructed at a minimum of 6m in width at the beginning. It was widened further as construction continued so as to allow articulated dumpers and excavators to easily travel along the top.
- The berm was constructed in a manner which prevented water retention behind the berm. This was in order to prevent a build-up of hydrostatic pressure at the base of the berm at a

varying rate across the footprint which could have effectively placed a point load at a specific location.

- Large rocks were placed with an 'open bond' periodically to allow water to pass through the berm in a controlled manner.
- The berm was inspected and signed off by competent personnel.

4.9.9.2 Barrage Walls

In accordance with the 2019 CEMP, a total of 3 no. barrage walls were constructed in response to the November 2020 Peat Slide. The construction of the walls followed the emergency response procedures outlined in the CEMP for the Permitted Development (Appendix 4-4) and was carried out as follows:

- Articulated dump trucks drew rock from a borrow pit, this was deposited onto the existing road and then placed on the existing berm using excavator.
- The berm was constructed at a minimum of 6m in width at the beginning. It was widened further as construction continued so as to allow articulated dumpers and excavators to easily travel along the top.
- Where constructed using this method, the berm was constructed in a manner which prevented water retention behind the berm. This was in order to prevent a build-up of hydrostatic pressure at the base of the berm at a varying rate across the footprint which could have effectively placed a point load at a specific location.
- Large rocks were placed with an 'open bond' periodically to allow water to pass through the berm in a controlled manner.
- The berm was inspected and signed off by competent personnel.