Planning and Environmental Consultants

Environmental Impact Assessment Report (EIAR)

Seskin Renewables Wind Farm

Chapter 4 – Description of the Proposed Development

DOCUMENT DETAILS

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Planning and Environmental Consultants

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4. DESCRIPTION OF THE PROPOSED DEVELOPMENT

4.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) describes the Proposed Development and all its component parts. Two separate planning applications, relating to the Proposed Development, will be made to Kilkenny County Council and to Laois County Council. This chapter also describes elements of the overall project which are not subject to this planning application but are assessed in this EIAR. Construction methodologies for the main infrastructural components of the development are also included in this chapter (or its associated appendices) of the EIAR.

The Overall Proposed Development will consist of the provision of the following:

i. *The construction of 8 no. wind turbines with an overall turbine tip height of 175 metres; a rotor blade diameter of 150 metres; and hub height of 100 metres, and associated foundations and hard standing areas;*

ii. *A permanent 38kV substation compound (control building with welfare facilities, all associated electrical plant and apparatus, security fencing including vegetative screening, underground cabling, wastewater holding tank, site drainage and all ancillary works);*

iii. *Permanent underground electrical (38kV) and communications cabling to the existing Ballyragget 110kV substation in the townland of Moatpark (including joint bays, communication and earth sheath link chambers and all ancillary works along the route);*

iv. *Underground electrical and communications cabling connecting the wind turbines and meteorological mast to the on-site substation;*

v. *A meteorological mast with a height of 100m above ground and associated foundation and hard-standing area;*

vi. *Upgrade of existing tracks and roads and the provision of new site access roads;*

vii. *All works associated with the upgrade of the existing agricultural access off the L58333 local road (including the installation of fencing and steel gates);*

viii. *2 no. temporary construction compounds (including temporary site offices and staff facilities);*

ix. *Accommodation works along the N77 National secondary road, in the townlands of Durrow Townparks, Co. Laois and Ballynaslee, Co. Kilkenny, to facilitate the delivery of turbine components and other abnormal sized loads;*

x. *A borrow pit;*

xi. *Spoil Management;*

xii. *Hedgerow removal;*

xiii. *Biodiversity Management and Enhancement Plan measures (including establishment of new hedgerow, translocation of existing hedgerow and enhancement of existing hedgerow);*

xiv. *Site Drainage;*

xv. *Operational stage site signage; and,*

xvi. *All associated site development works, ancillary works and apparatus.*

The development descriptions for the current planning applications as they appear in the public notices for Kilkenny County Council and Laois County Council are included in Chapter 1, Section 1.4, of this EIAR.

Both applications are seeking a ten-year planning permission and a 35-year operational life from the date of commissioning of the entire wind farm.

Section 1.1.1 of Chapter 1 of this EIAR provides a definition of the various project references used throughout the document. The 'Proposed Development', which encompasses the 'Proposed Wind Farm' and 'Proposed Grid Connection' has been assessed within this EIAR. The Proposed Development is located within the EIAR Site Boundary or the 'Site' which measures approximately 302 hectares (ha). The 'Proposed Wind Farm site' refers to the portion of the Site surrounding the Proposed Wind Farm but excluding the portion of the site surrounding the Proposed Grid Connection underground cabling route. The Proposed Development layout is illustrated on Figure 4-1.

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

4.2 Proposed Development Layout

The layout of the Proposed Development has been designed to minimise the potential environmental effects of the wind farm, while at the same time maximising the energy yield of the wind resource passing over the site. A constraints study, as described in Section 3.2.5.2.1 of Chapter 3 of this EIAR, has been carried out to ensure that turbines and all ancillary infrastructure are located in the most appropriate areas of the site. The Proposed Development layout makes maximum use of the existing access roads and tracks within the site, thereby minimising the extent of proposed new roads required.

The overall layout of the Proposed Development is shown on Figure 4-1. This drawing shows the proposed locations of the wind turbines, electricity substation, grid connection route, spoil repositories, construction compounds, internal roads layout, and the main site entrance. The EIAR Site Boundary does not encompass the turbine delivery accommodation works along the N77 national secondary road in the townland of Durrow Townparks, Co. Laois and at the L58333 local road junction with the N77 national secondary road in the townland of Ballynaslee, Co. Kilkenny. However, these temporary works are included as part of this planning application and are fully assessed as part of the EIAR.

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

Durrow

County Laois

County Kilkenny

T1

T2

T3

T4

T5

T6

T7

T8

RECEIVED: 09/07/2025

Map Legend

- Proposed Turbine Locations
- Proposed Met Mast
- Proposed Hardstands
- Existing Roads to be Upgraded
- Proposed New Roads
- Proposed Borrow Pit
- Proposed Temporary Construction Compounds
- Proposed Hedgerow Planting and Enhancement Measures
- Proposed 38kV Substation
- Proposed 38kV Underground Gird Connection Cabling
- Proposed Horizontal Directional Drilling
- Existing Ballyragget 110kV Substation
- EIAR Site Boundary
- Kilkenny/Laois County Border

Drawing Title: Proposed Development

Project Title: Seskin Renewables Wind Farm

Drawn By	Checked By
ER	EM
Project No.	Drawing No.
231103	Figure 4-1
Scale	Date
1:20,000	2025-06-26

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4.3 Proposed Development Components

This section of the EIAR describes the components of the Proposed Development. Further details regarding Access and Transportation (Section 4.4), Community Gain (Section 4.5), Site Drainage (Section 4.6), Construction Management (Section 4.7) and Construction Methodologies (Section 4.8) are provided subsequently in this chapter.

4.3.1 Proposed Wind Farm

4.3.1.1 Wind Turbines

4.3.1.1.1 *Turbine Locations*

The Proposed Wind Farm turbine layout has been verified using industry standard wind farm design software ensuring that it maximises the energy yield from the Proposed Development, while maintaining sufficient distances between the proposed turbines so as to ensure turbulence and wake effects do not compromise turbine performance. The Grid Reference coordinates of the proposed turbine locations are listed in Table 4-1 below.

The final finished top of foundation level of the turbine foundations will be determined by the actual ground conditions at each proposed turbine location and may differ slightly from those levels listed in Table 4-1. Also, in accordance with the '*Wind Energy Development Guidelines for Planning Authorities'* (Department of the Environment, Heritage and Local Government (DOEHLG), 2006) micro-siting of the turbine positions may be required within the criteria set out in the guidelines.

Table 4-1 Proposed Wind Turbine Locations and Elevations

Turbine	ITM Coordinates		Existing Elevation (m OD)
	Easting	Northing	
T1	641792	675091	152
T2	641224	674883	172
T3	641939	674425	140
T4	641393	674394	174
T5	641969	673942	161
T6	641797	673301	144
T7	642441	673026	101
T8	641873	672889	123

4.3.1.1.2 *Turbine Type*

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

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

Plate 4-1 Wind turbine components

The proposed wind turbines to be installed on the site will have the following dimensions:

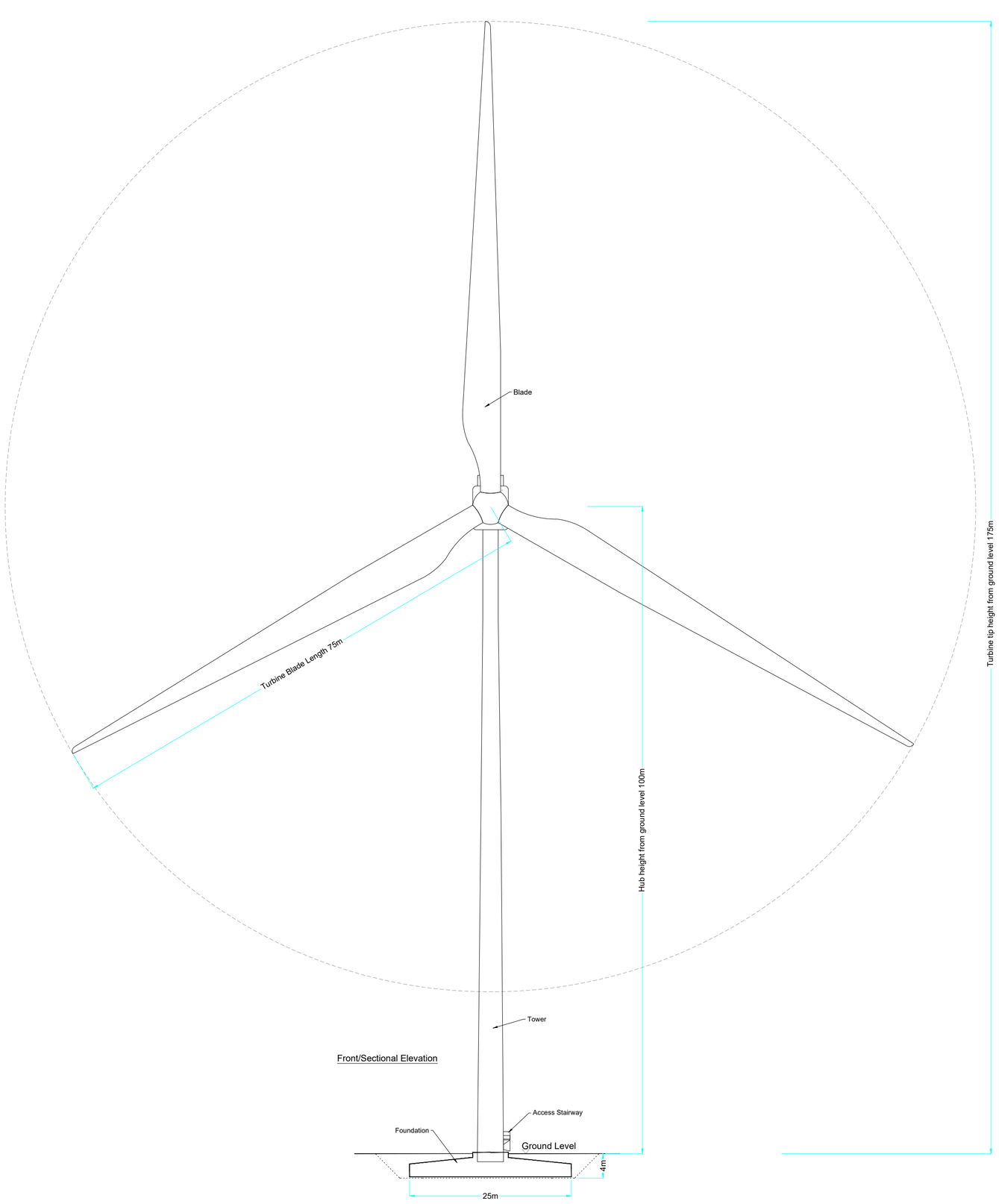
- Turbine Tip Height –175 metres
- Hub Height –100 metres
- Rotor Diameter - 150 metres.
- Blade Length –75 metres

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

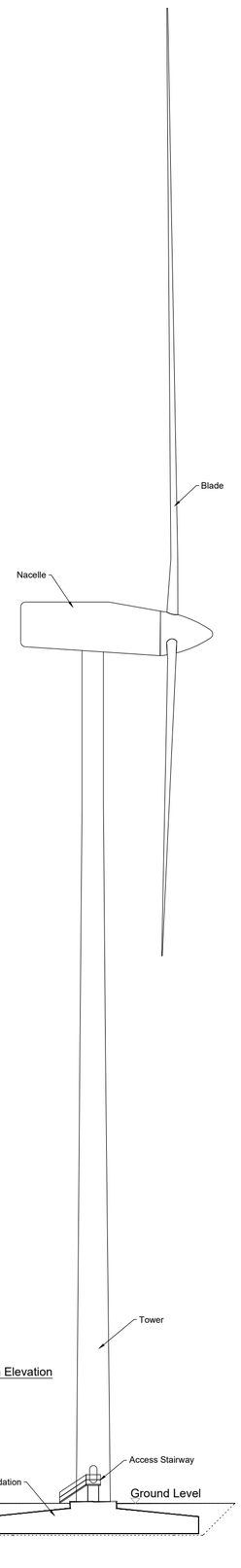
It should be noted that the assessment of the development footprint of the Proposed Development site, within this EIAR, is based on the maximum potential footprint for all of the infrastructural elements. This precautionary approach is taken as the assessment of the maximum development footprint will,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

A drawing of the proposed wind turbine is shown in Figure 4-2.

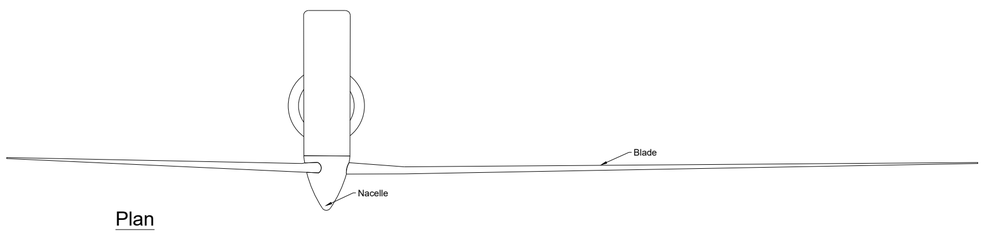
Figure 4-2 also shows the turbine base layout, including turbine foundation, hard standing area, assembly area, access road and surrounding works area. The individual components of a geared wind turbine nacelle and hub are shown in Figure 4-3 below.



Front/Sectional Elevation



Side/Section Elevation



Plan

Drawing Notes

1. Proposed wind turbines to have a maximum ground to blade tip height of 175m, blade length of 75m and hub height of 100m
2. Ground level represents the top of turbine foundation.

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**			
DRAWING TITLE: **Wind Turbine Elevation & Plan**			
PROJECT No.: **231103**		DRAWING No.: **Figure 4-2**	SCALE: **1:500 @ A1**
DRAWN BY: **JOB**	CHECKED BY: **AC**	DATE: **08.07.2025**	REVISION.: P01

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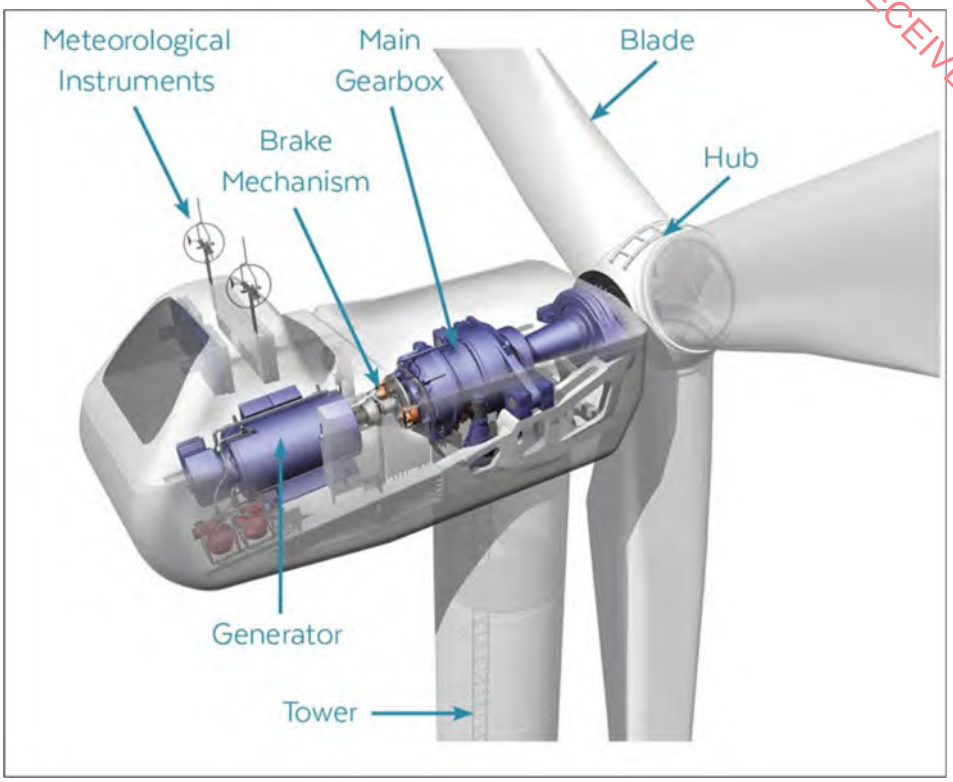


Figure 4-3 Turbine nacelle and hub components

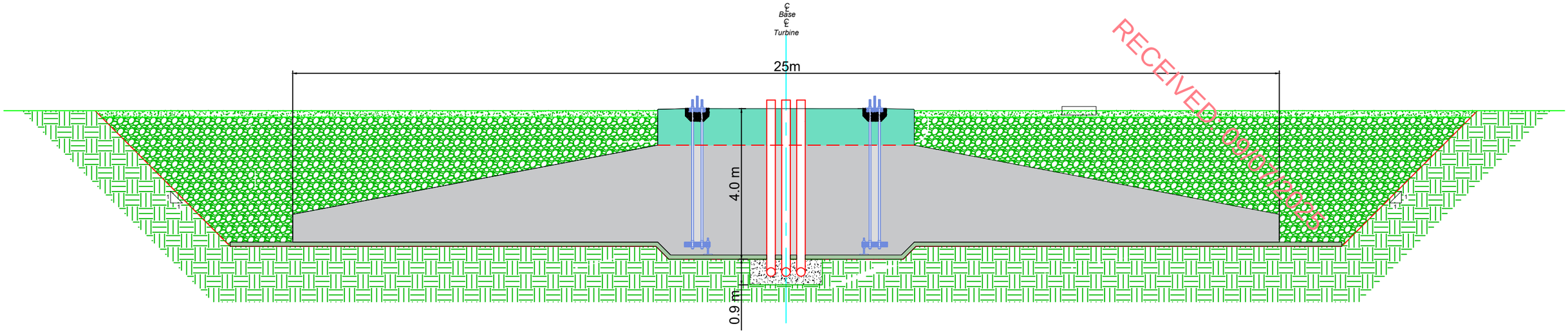
4.3.1.1.3 Turbine Foundations

Each wind turbine is secured to a reinforced concrete foundation that is installed below the finished ground level. The size of the foundation will be dictated by the turbine manufacturer, and the final turbine selection will be the subject of a competitive tender process. Different turbine manufacturers use different shaped turbines foundations, ranging from circular to hexagonal and square, depending on the requirements of the final turbine supplier and a foundation area large enough to accommodate modern turbine models has been assessed in this EIAR. The turbine foundation transmits any load on the wind turbine into the ground. Where ground conditions are unfavourable to use the excavate and replace (gravity), piles (bored or driven) will be installed to formation level. All foundation options have been assessed in this EIAR and are shown in Figure 4-4 ,Figure 4-5 and Figure 4-6.

The maximum horizontal and vertical extent of the turbine foundation will be 25m and 4m respectively, which has been assessed in the EIAR.

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

Section A-A
Scale 1:100



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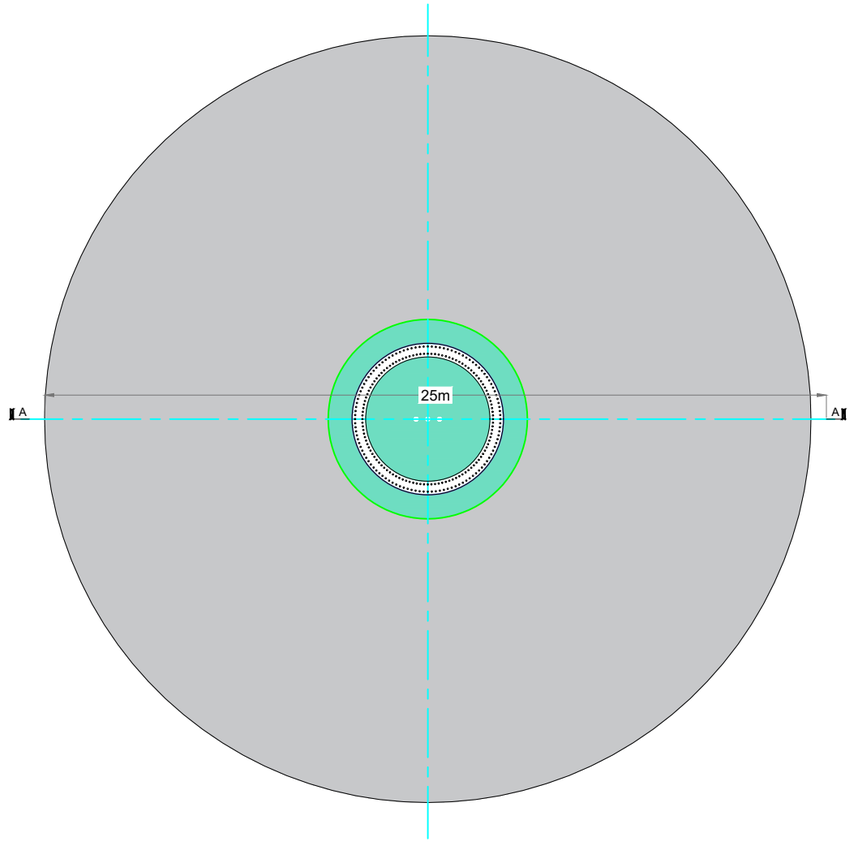

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **Gravity Foundations Details**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Figure 4-4	As Shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	08.07.2025	P01

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Section A-A
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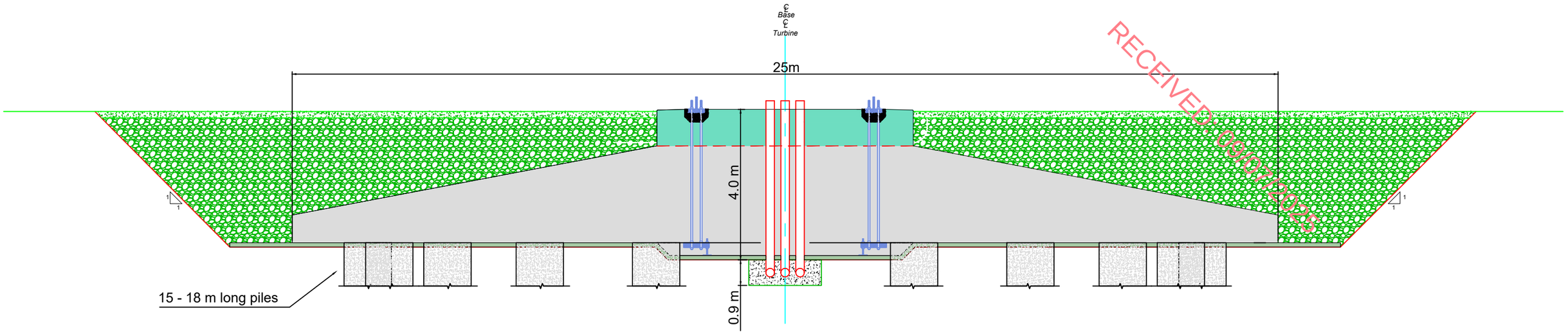

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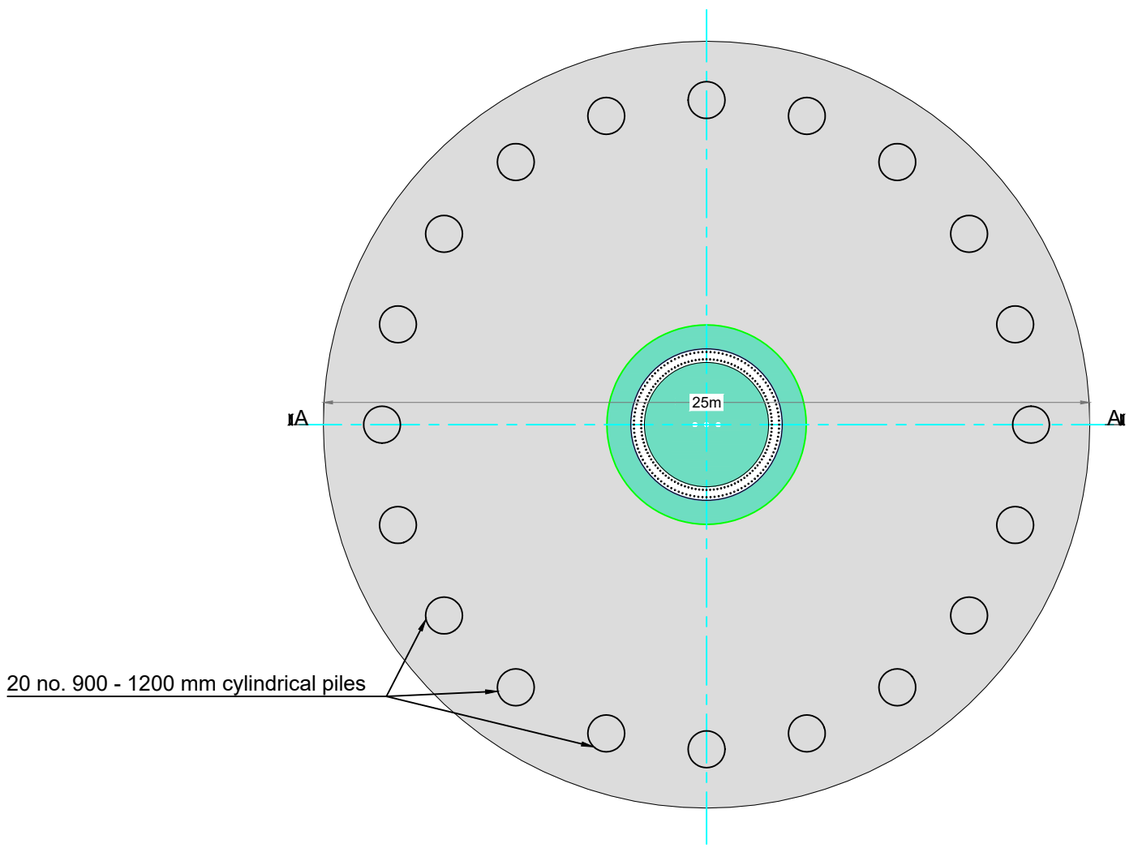
Scale: 1:200



PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **Bored Pile Foundations Details**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Figure 4-5	As Shown @ A3

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JOB	AC	08.07.2025	P01

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Section A-A
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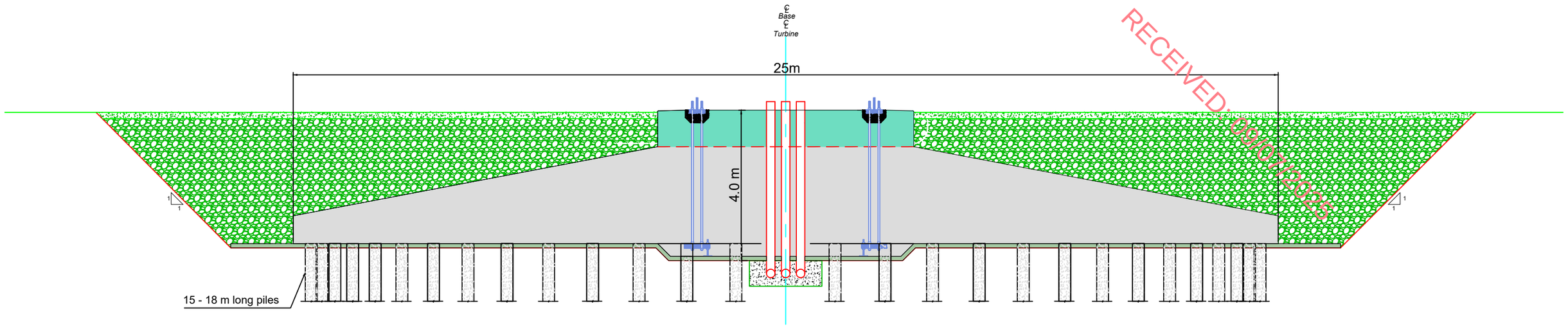
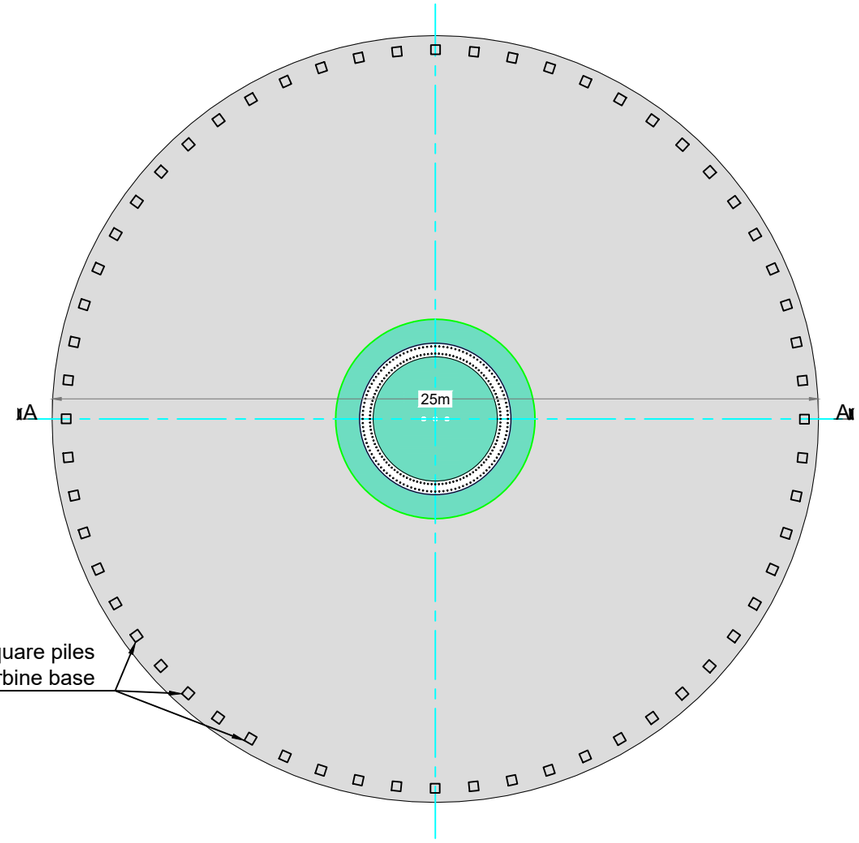


Plan
Scale: 1:200



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

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **Driven Pile Foundations Details**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Figure 4-6	As Shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	AC	08.07.2025	P01

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Plate 4-2 Turbine Foundation Anchor Cage surrounded by reinforcing steel and finished turbine base

4.3.1.1.4 Hard Standing Areas

Hard standing areas consisting of levelled and compacted hardcore are required around each turbine base. These will facilitate access, turbine assembly and turbine erection. The hard-standing areas are used to accommodate cranes used in the assembly and erection of the turbine. The hardstands also allow for the offloading and storage of turbine components, and generally provide a safe, level working area around each turbine position. The hard-standing areas are extended to cover the turbine foundations, once completed, by placing crushed stone over the foundation. The arrangement and positioning of hard standing areas are dictated by turbine suppliers. All crane hardstand areas will be designed taking account of the loadings provided by the turbine manufacturer and will consist of a compacted stone structure. The crane hardstands will be constructed in a similar manner to the excavated site roads. The proposed hard standing areas for each individual turbine are shown as part of the detailed layout drawings included in Appendix 4-1 and represent the maximum sizes required. However, the extent of the required areas at each turbine location may be optimised on-site within the parameters set out and assessed in this EIAR. This will depend on the turbine supplier's exact requirements.

4.3.1.1.5 Assembly Area

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

4.3.1.1.6 Power Output

Current and future wind turbine generator technology will ensure that the wind turbine model, chosen for the Proposed Development, will have an operational lifespan greater than the 35-year operational life that is being sought as part of the planning application. Each of proposed wind turbines will have a generating capacity of 6MW. Turbines of the exact same make, model and dimensions can have different power outputs depending on the capacity of the electrical generator installed in the turbine nacelle. The exact power rating of the installed turbine will be designed to match the wind regime on the Proposed Development site and will be determined by the selected manufacturer.

For the purposes of this EIAR, a rated output of 6 MW has been chosen to calculate the power output of the proposed 8-turbine renewable energy development, which would result in an estimated installed capacity of 48 MW.

Assuming an installed capacity of 48 MW, the Proposed Development therefore has the potential to produce up to 134,554 MWh (megawatt hours) of electricity per year, based on the following calculation:

A x B x C = Megawatt Hours of electricity produced per year

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

B = ... The capacity factor, which takes into account the intermittent nature of the wind, the availability of wind turbines and array losses etc. A capacity factor of 32%[1] is used here.

C = ... Rated output of the wind turbines: 48 MW

The 134,554 MWh of electricity produced by the Proposed Development would be sufficient to supply approximately 32,037 Irish households with electricity per year, based on the average Irish household using 4.2 MWh of electricity[2] (this latest figure is available from the March 2017 CER Review of Typical Consumption Figures Decision Paper).

4.3.1.2 Site Roads

4.3.1.3 Road Construction Types

To provide access within the Proposed Development site and to connect the wind turbines and associated, infrastructure, existing roads and tracks will need to be upgraded and new access roads will need to be constructed. The road construction design, as per the Spoil Management Plan in Appendix 4-2, has taken into account the following key factors:

1. *Buildability considerations;*
2. *Serviceability requirements for construction and wind turbine delivery and maintenance vehicles*
3. *Horizontal longitudinal and cross-fall gradient of the roads;*
4. *Minimisation of excavation arisings;*
5. *Making use of existing infrastructure where possible;*

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

The Proposed Development site makes use of the existing road network insofar as possible. It is proposed to upgrade approximately 1.5 km of existing site roads and tracks, and to construct approximately 4.9 km of new access road on the Proposed Development site. It is proposed to construct passing bays along the proposed access road network to allow construction traffic to safely pass each other. Areas such as wide junctions and proposed hardstands will also be used as passing bays throughout the construction phase of the Proposed Wind Farm site.

Upgrade of Existing Access Roads or Tracks

As noted above, approximately 1.5km of existing roads and access tracks will be upgraded as part of the Proposed Wind Farm construction phase. The existing tracks onsite were constructed using the excavate and replace construction technique, therefore proposed road widening will be founded on competent stratum. Cross section details of the upgrade of existing roads are shown as Figure 4-7. Details on the construction methodology for the upgrading of existing tracks and roads is outlined below in Section 4.8.1.2.2.

[1] *https://www.eirgridgroup.com/site-files/library/EirGrid/ECP-2-2-Solar-and-Wind-Constraints-Report-Area-I-v1.0.pdf*
[2] *March 2017 CER (CRU) Review of Typical Consumption Figures Decision Paper https://www.cru.ie/document_group/review-of-typical-consumption-figures-decision-paper/*

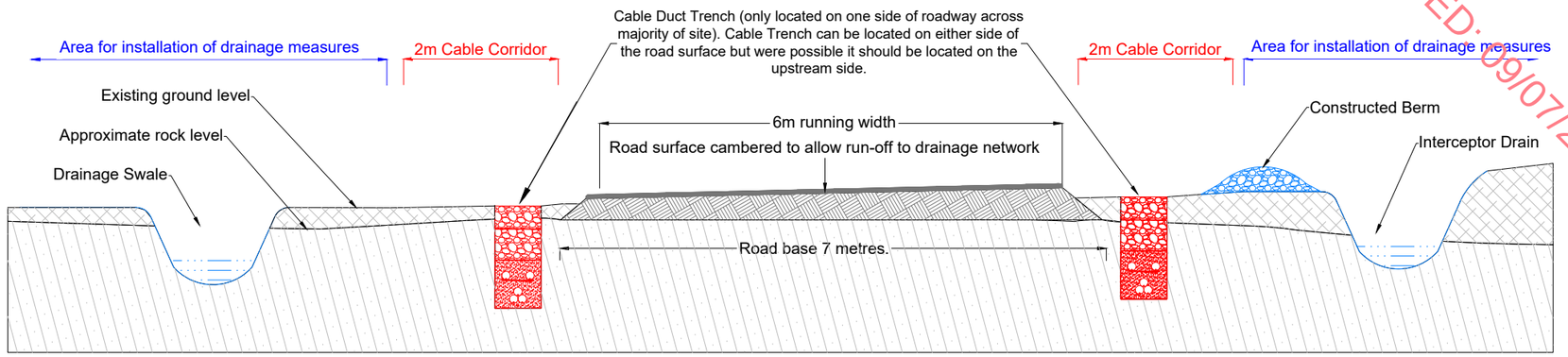
Construction of New Roads

As noted above, approximately 4.9km of new roads will be constructed in order to facilitate the Proposed Wind Farm. Due to the ground conditions, new access tracks proposed on site are proposed to be founded and located on competent stratum. The make-up of the founded access tracks is a stone thickness of c. 400mm. A cross section detail of a new excavated road is also shown in Figure 4-7.

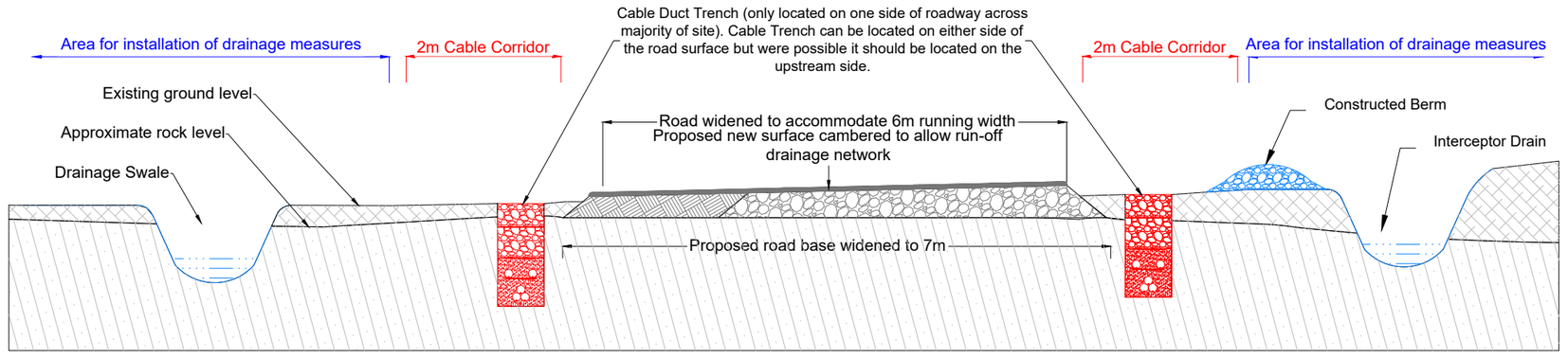
The details on the construction methodology for new excavated roads is outlined below in Section 4.8.1.2.1.

Drawing Notes

1. Widening can occur to either side of existing roads dependent on site conditions.
2. Depths of road fill to vary dependent on site conditions.



Typical excavated road section.



Typical existing excavated road widening section.

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**			
DRAWING TITLE: **Excavated Road Sections**			
PROJECT No.: **231103**		DRAWING No.: **Fig 4-7**	SCALE: **1:75 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **AC**	DATE: **30.06.2025**	REVISION.: P01

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4.3.1.4 Site Underground Electrical (33kV) and Communications Cabling

Each turbine and the meteorological mast (refer to Section 4.3.1.5 below) will be connected to the on-site electricity substation via underground 33 kV (kilovolt) electricity cabling. Fibre-optic cables will also connect each wind turbine and the met mast to the onsite substation. The electricity and fibre-optic cabling connecting to the onsite substation compound will be run in cable ducts approximately 1.2 metres beneath ground level, along the sides of roadways and/or under the roadways. The route of the cable ducts will follow the access track to each turbine location and are illustrated on the site layout drawings included as Appendix 4-1, the exact number and configuration of cable ducting may vary within the cabling trench. Figure 4-8 below shows two variations of a typical cable trench, one for off-road trenches and one for on-road trenches. The cabling may be placed on either side of the roads, on both sides of the road or within the road. The exact configuration of the underground cabling will be set by the requirements of the electrical designers at detailed design stage.

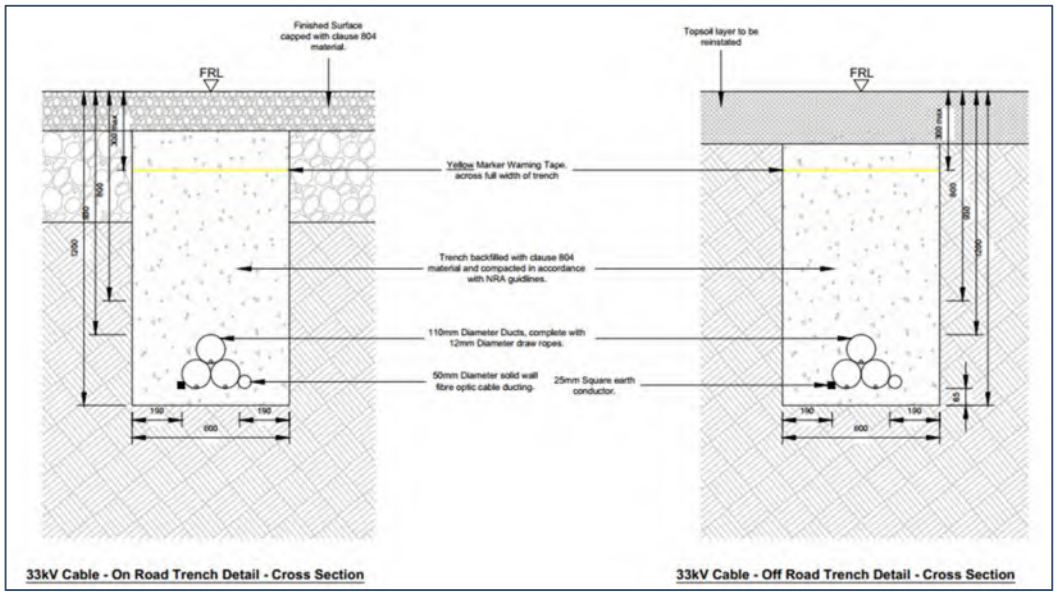
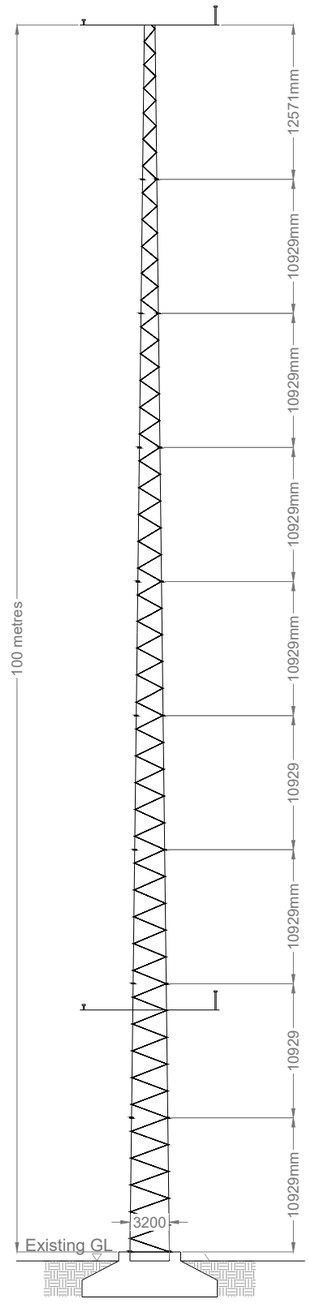


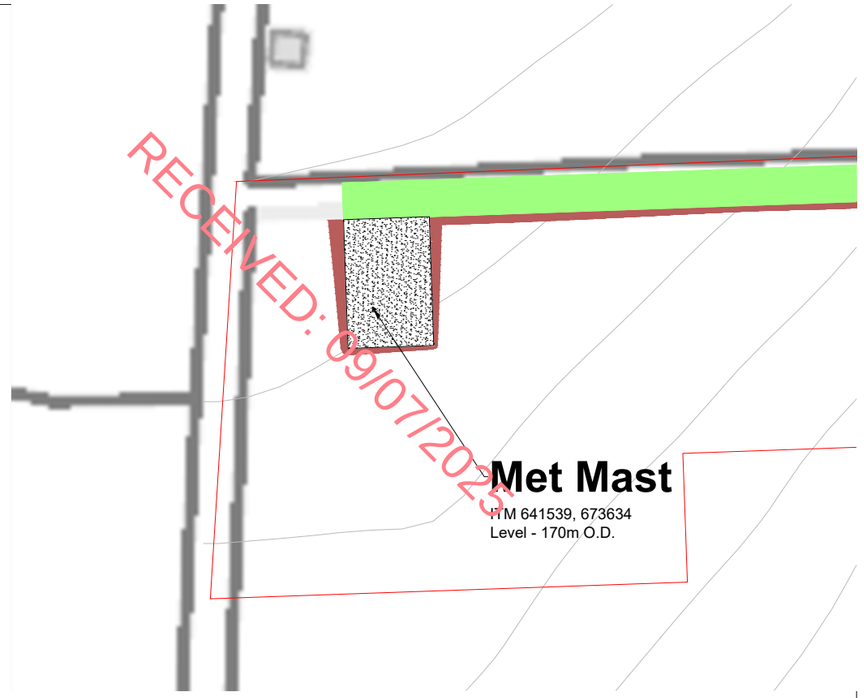
Figure 4-8 Cable trench cross section detail

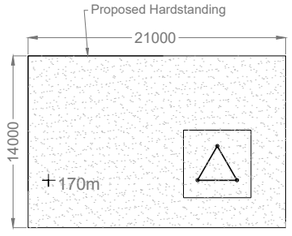
Clay plugs (water flow barrier) will be installed at regular intervals of not greater than 50 metres along the length of the trenches where required to prevent the trenches becoming conduits for runoff water. Backfill material will be compacted in layers with approved engineer's specified material, which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

4.3.1.5 Meteorological Mast

One meteorological (met) mast is proposed as part of the Proposed Development site. The met mast will be equipped with wind monitoring equipment at various heights. The proposed met mast will be located at E641539, N673634 (ITM) as shown on the Proposed Development site layout drawing in Figure 4-1. The mast will be a free-standing slender lattice structure 100 metres in height. The mast will be constructed on a hard-standing area sufficiently large enough to accommodate the equipment that will be used to erect the mast. The elevation and plan view of the proposed met mast is shown in Figure 4-9.







Met Mast Compound Plan

N

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **Met Mast Layout Plan and Elevations**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Fig 4-9	1:500 @ A3

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4.3.1.6 Temporary Construction Compounds

Two temporary construction compounds will be located within the Proposed Development site. The primary construction compound will be located at the 240m southeast of T03, measuring approximately 2,925 square metres (m^2) in area. The secondary construction compound will be located adjacent to the proposed substation, measuring approximately 1,554m^2 in area.

The locations of the proposed construction compounds are shown on the Proposed Development site layout drawing in Figure 4-1. The layouts of the construction compounds are shown on Figure 4-10 and Figure 4-11.

The construction compounds will consist of temporary site offices, staff facilities, construction materials storage and car-parking areas for staff and visitors. Turbine components will be brought directly to the proposed turbine locations following their delivery to the site.

Temporary toilets, located within staff portacabins, will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by a permitted waste collector to wastewater treatment plants. There will also be a water supply on site for hygiene purposes, by way of a temporary storage tank.

The construction compound will also include a bunded refuelling and containment area for the storage of oil, lubricants and site generators etc, and full retention oil interceptor.

Once the proposed wind farm has been commissioned both the compounds will be removed. These areas will be reinstated with previously excavated spoil and either be reseeded or left to revegetate naturally.

4.3.1.7 Biodiversity Management and Enhancement Plan

4.3.1.7.1 *Hedgerow Removal*

The vast majority of field boundaries within the Proposed Wind Farm site are delineated by (managed and unmanaged) hedgerow and treeline habitats. It is anticipated approximately 1,794m of hedgerow habitat will be removed to accommodate the Proposed Development, including turbines and associated bat buffers, wind farm roads and other key infrastructure. The majority of the existing hedgerows in the Proposed Wind Farm site are heavily managed and support high levels of biodiversity or provide adequate commuting and foraging corridors for local wildlife. The locations of hedgerow loss are shown in Figure 2-1 and Figure 2-2, of Appendix 6-4 of the EIAR, the Biodiversity Management and Enhancement Plan (BMEP).

4.3.1.7.2 *Hedgerow Enhancement*

Approximately 2,375m of heavily managed hedgerow will be enhanced through best practice management measures (discussed further below) and additional planting with native hedgerow species. It is proposed to plant some native tree species within the hedgerow habitat to further increase the biodiversity value of linear features within the Proposed Development site. The following species should be planted:

- Hawthorn (Crataegus monogyna)
  - Proportion of hedgerow mix: 75%
  - Age class to be planted: combination of whips and advanced nursery stock (10cm – 12 cm girth trees) to increase structure diversity.
- Hazel (Corylus avellana)
- Blackthorn (Prunus spinosa)
- Guelder rose (Viburnum opulus)

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Site Construction Compound

Site Offices & Staff Welfare Facilities

Staff & Visitor Car Parking

Turbine Component / Material Storage / Temporary Parking Area

65000

45000

40000

10000

3000

153m

155m

157m

159m

161m

156m

154m

153m

152m

151m

149m

148m

40000

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

Drawing Legend

- Planning Application Boundary
- Proposed New Road
- Internal Underground Electrical Cabling Trench
- Borrow Pit
- Cut
- Fill
- Proposed New Hedgerow/Hedgerow Translocation

N

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **Temporary Construction Compound 1**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Fig 4-10	1:500 @ A3

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JOB	AC	30.06.2025	P01

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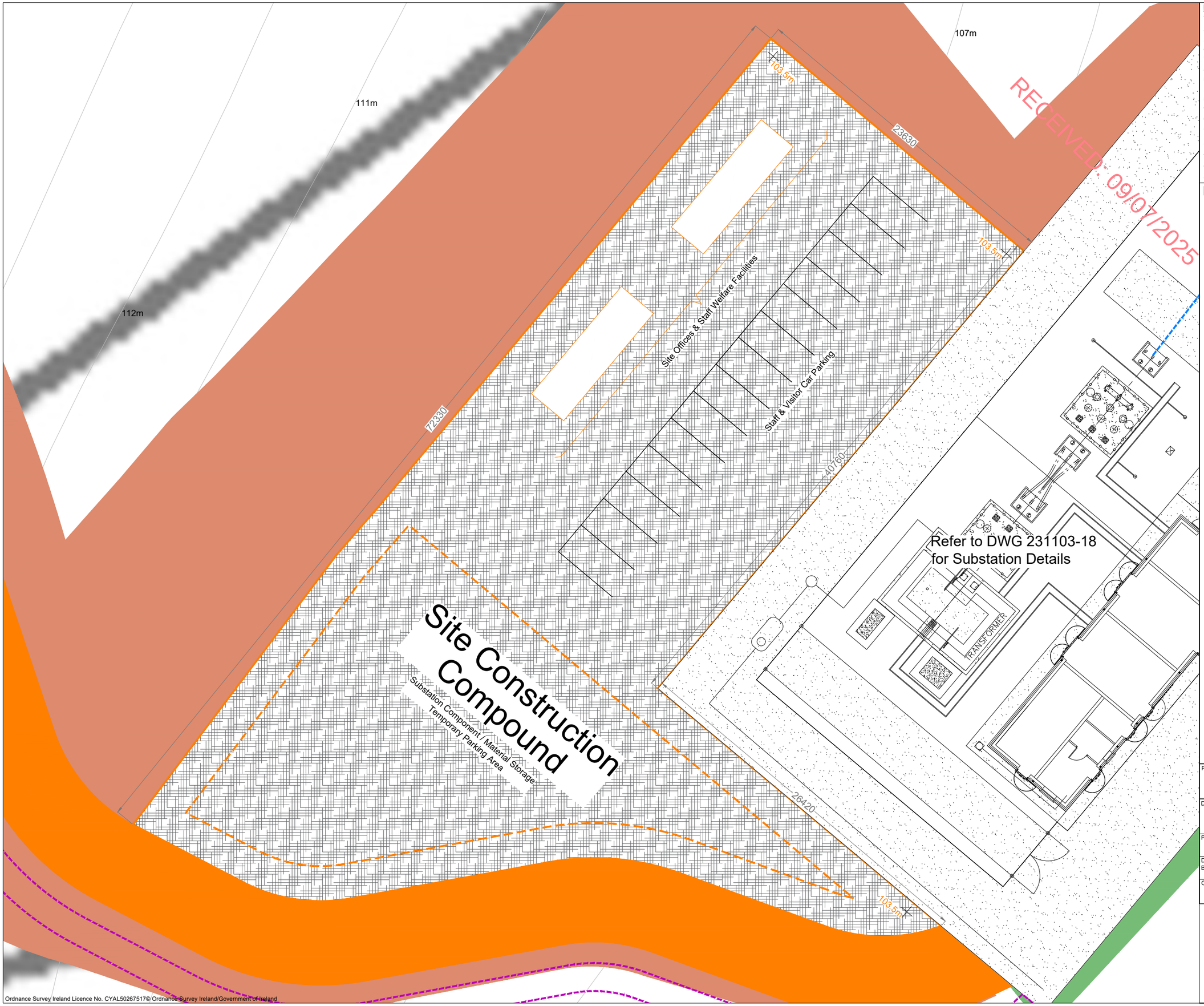

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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.

Drawing Legend

- Proposed New Road
- Internal Underground Electrical Cabling Trench
- Cut
- Fill
- Proposed Underground Grid Connection Cabling Route

N

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **Temporary Construction Compound 2**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Fig 4-11	1:250 @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
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- Holly (Ilex aquifolium)
- Elder (Sambucus nigra)
- Spindle (Euonymus europaeus)
- Wild cherry (Prunus avium)
- Downey birch (Betula pubescens)
- Oak (Quercus robur)
- Goat Willow (Salix caprea)
    - Proportion of hedgerow mix: 25%
    - Age class to be planted: Whips predominantly

Hedgerows should be managed as follows (DAERA, 2022):

- Hedgerows should not be cut every year, as flower buds often form on second-year growth. Hedges should be trimmed on a two- three-year rotation, targeting different sections each year, which will make sure there are always flowers for pollinators in spring and berries for birds in autumn.
- Hedgerows should be trimmed to an 'A' Shape, which is thicker at the base and gets narrower at the top
- A two-meter buffer should be provided next to the hedgerow.
- Where possible, allow trees to develop at roughly 20 metre intervals.

The enhancement of existing hedgerows, translocation of existing (species rich) hedgerow and hedgerow creation will off-set the loss of hedgerows within the Proposed Development site and in the long term will provide a net gain in linear features across the Proposed Development site, increasing the ecological value of the site for local biodiversity. Existing hedgerows identified for enhancement are shown in yellow on Figure 2-3 and Figure 2-4, of Appendix 6-4 of this EIAR, while areas identified as suitable for new hedgerow planting and/or translocation are shown in blue on Figure 2-3 and Figure 2-4. The location of hedgerow planting and enhancement was identified to ensure connectivity with the wider landscape in particular for commuting bats.

4.3.1.7.3 *Hedgerow Creation*

Approximately 2,097m of additional hedgerow will be established within the Proposed Development site, this will be achieved through new hedgerow planting and translocation of existing hedgerows within the site.

Species selected will be indigenous to the local area and will maximise flowering times throughout the year as well as berry availability later in the year as detailed below. For example, species such as guelder rose would be beneficial as this species flowers later in summer. The ideal native hedge is made up of approx. 75% hawthorn and 25% of at least four other species.

A combination of whips and advanced nursery stock (10cm – 12 cm girth trees) will be used for both tree and hedgerow planting across the Proposed Wind Farm site to increase structure diversity and to ensure connectivity gains are immediate.

New hedgerows should be planted between November – March when the woody hedge plants are dormant. When planting new hedgerow, plants will be closely spaced (a maximum of 50cm apart) and planted in a staggered row. The new hedgerow will need to be protected from poaching by livestock, through the erection of new stockproof fencing where required, which will be at least 1m away from the hedge, and installed on each side if required.

- Willow
- Blackthorn
- Whitethorn/Hawthorn
- Spindle
- Elder

- Guelder Rose

4.3.1.7.4 Hedgerow Translocation

A number of hedgerows within the site had a rich and diverse floristic composition. They consisted of a high number of woody species including hawthorn (Crataegus monogyna), blackthorn (Prunus spinosa), elder (Sambuccus nigra) hazel (Corylus avellana), holly (Hedera helix), and spindle (Euonymus europaeus). Mature and semi-mature trees, such as beech (Fagus sylvatica), ash (Fraxinus excelsior), pedunculate oak (Quercus robur), goat willow (Salix caprea), alder (Alnus glutinosa), and aspen (Populus tremuloides) were growing as individual trees within these hedgerows. Some of these hedgerows had well developed understories and a diverse ground flora associated with them with species such as lords and ladies (Arum maculatum), cow parsley (Anthriscus sylvestris), bluebells (Hyacinthoides non-scripta), greater stitchwort (Stellaria holostea), primrose (Primula vulgaris), golden saxifrage (Chrysosplenium oppositifolium), common dog violet (Viola riviniana), wood avens (Geum urbanum), and lesser celandine (Ficaria verna) recorded (See Plate 2-3 and 2-4, of Appendix 6-4, for examples of hedgerows with high biodiversity value that will be lost to the footprint of the Proposed Development).

The identification of hedgerows suitable for translocation should be agreed with an Ecologist. Those species rich hedgerows and those that follow old townland boundaries (see data on specific hedgerows in Appendix 6-1) should be prioritised for translocation including those with a range of ground flora. Hedgerow translocation is practiced widely in the UK (Rooney and Hill 2004, cited in Foulkes, N. 2007) and has been attempted in Ireland on multiple occasions (Foulkes, N. 2007). The benefits of translocation include the following (Devon Hedges Group, 2015):

- Where works are carried out well, the integrity and visual character of the original hedge can be maintained, together with much of its cultural, environmental and landscape value.
- A translocated hedge will establish and grow in its new position more quickly than a new hedge.
- Translocation retains the genetic stock and seed bank of the original woody and herbaceous plants.
- The retention of the original and nutrient poor soils can help to reduce weed infestation problems.
- It can be cheaper than establishing a new hedge.
- The hedge is likely to be more in keeping with the surrounding landscape than a new boundary feature such as a fence or unbanked hedge.

The methodology used to carry out hedgerow translocation is included in Section 2.3.1 of Appendix 6-4 of the EIAR.

4.3.1.8 Borrow Pit

It is estimated that approximately 81,075 cubic metres (m^3) of stone material will be required to construct the Proposed Development. It is intended to obtain the majority of materials for the construction of the Proposed Development from the proposed onsite borrow pit (engineer's specified material may be imported onto the Site should sufficient volumes of suitable material not be encountered during the excavation phase of the proposed infrastructure, to come from local licenced quarries). Please see Figure 4-12 for details of the proposed borrow pit. The proposed onsite borrow pit is located approximately 102m southeast of T3 and measures approximately 15,226m^2 in area.

Access to the borrow pit will be via a proposed new access road running along the southern edge of the borrow pit. Please see Figure 4-1 for details. Post-construction, the borrow pit will be reinstated with excavated spoil and profiled to match the existing ground levels, insofar as possible. The borrow pit area will then be reseeded. A stock-proof fence will be erected around the borrow pit area, to prevent unauthorised access, during the construction phase and until the borrow pit has been fully reinstated.

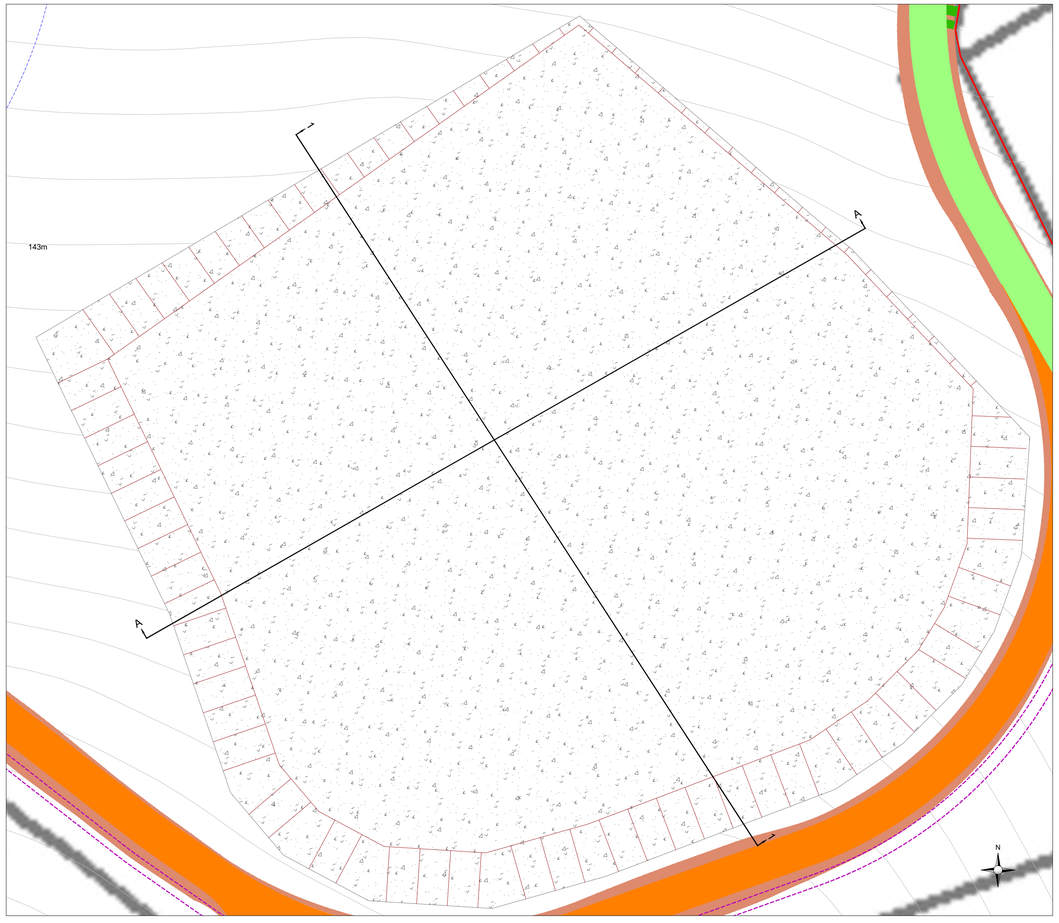
The extraction of material from the borrow pit is a construction phase activity only of the Proposed Development which will be a temporary operation run over a short period of time during the construction phase. The topsoil and subsoil will be stripped back and temporarily stockpiled using standard tracked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

Please see Section 4.8.1.6 below for the methodologies for the breaking and extraction of rock from the borrow pit.

4.3.1.8.1 *Spoil Management Plan*

It is proposed to manage overburden generated through construction activities for the Proposed Development locally within the Site, through backfilling of the proposed borrow pit void in the first instance, and following that within linear berms will be placed along access roads and turbine hardstand areas, where appropriate.

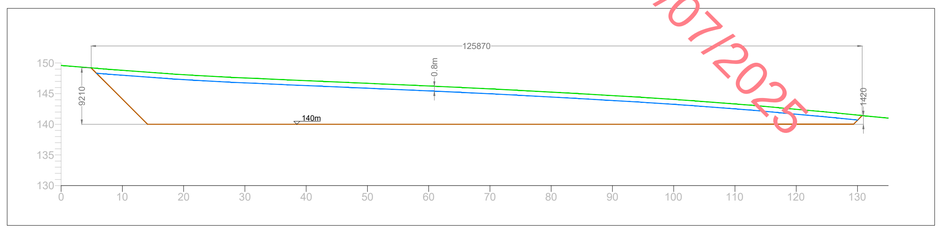
The total estimated volume of spoil to be managed following excavations during the construction phase of the Proposed Development is approximately 100,350m^3. Some material arising from the construction of the Proposed Grid Connection underground cabling route will be sent to an appropriate licenced facility. The majority of soil and subsoil excavated during the works will be used to backfill the proposed borrow pit. Any additional soil and subsoil will be used for site landscaping or will be placed alongside site access roads and turbine hardstands (avoiding environmentally constrained areas).There is more than enough capacity to manage the total volume of spoil requiring management for both the Proposed Wind Farm and the Proposed Grid Connection as detailed in Table 4-2 below.



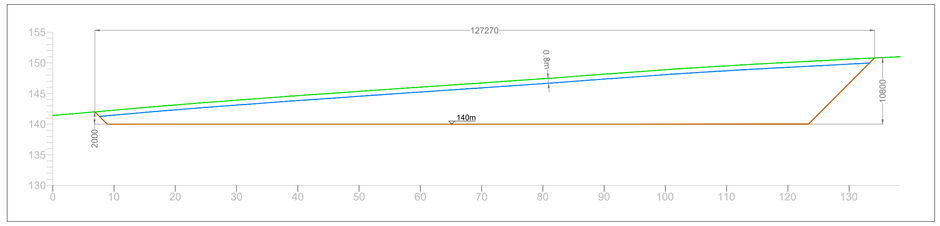
Plan View

Drawing Legend

- Existing Ground
- Assumed Bedrock Level Assumed Bedrock Level (based on trial pit data)
- Proposed Excavation Level



Section A-A



Section 1-1

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **Borrow Pit Layout & Sections**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Fig 4-12	1:500 @ A1

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4.3.2 Proposed Grid Connection

4.3.2.1 Onsite 38 kV Substation

It is proposed to construct a 38kV electricity substation within the Proposed Development site, as shown in Figure 4-1. The proposed onsite 38kVsubstation is located within agricultural pastural land and will be accessed via the Proposed Wind Farm access roads.

The footprint of the proposed onsite 38kV substation compound measures approximately 2,160 square metres in area and will include 1 no. control building and the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine and export that electricity from the onsite 38kV substation to the national grid. The layout elevations and sections of the proposed onsite 38kVsubstation are shown on Figures 4-13, 4-14 and 4-15. The construction and exact layout of electrical equipment within the onsite 38kV substation will be to EirGrid / ESB Networks specifications.

Further details regarding the connection between the onsite 38kVsubstation compound and the national electricity grid are provided in Section 4.8.2 below.

The onsite 38kV substation compound will include steel palisade fencing (approximately 2.5 metre high or as otherwise required by ESB), and internal fences will also segregate different areas within the main substation.

4.3.2.2 Wind Farm Control Building

The wind farm control building will be located within the substation compound and will measure 21.5 metres by 7.3 metres and 6 metres in height. Layout and elevation drawings of the control building are included in Figure 4–16. The wind farm control building will include staff welfare facilities for the staff that will work on the Proposed Development during the operational phase of the project. Toilet facilities will be installed with a low-flush cistern and low-flow wash basin. Due to the specific nature of the Proposed Development there will be a very small water requirement for occasional toilet flushing and hand washing and therefore the water requirement of the Proposed Development does not necessitate a potable source. It is proposed to either harvest rainwater from the roofs of the buildings or, alternatively, install a groundwater well adjacent to the substation in accordance with the Institute of Geologists Ireland, *Guide for Drilling Wells for Private Water Supplies* (IGI, 2007). The well will be flush to the ground and covered with a standard manhole. A pump house is not required as an in-well pump will direct water to a water tank within the roof space of the control building. Bottled water will be supplied for drinking, if required.

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

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

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

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

Drawing Legend

- Proposed New Road
- Internal Underground Electrical Cabling Trench
- Cut
- Fill
- Proposed Underground Grid Connection Cabling Route

N

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **Site Substation Compound Layout**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Fig 4-13	1:250 @ A3

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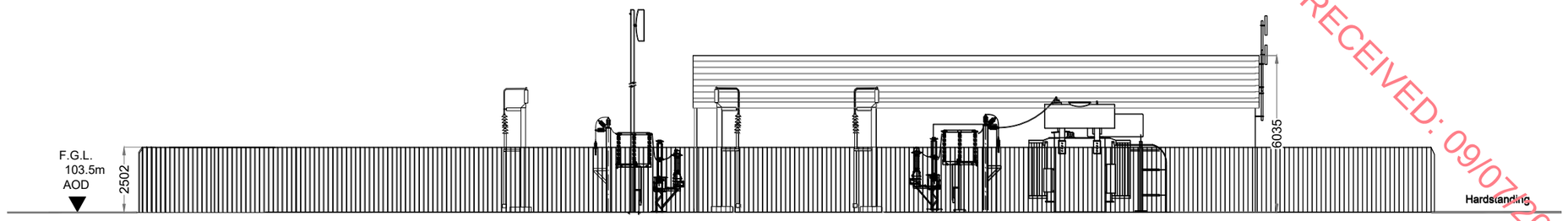
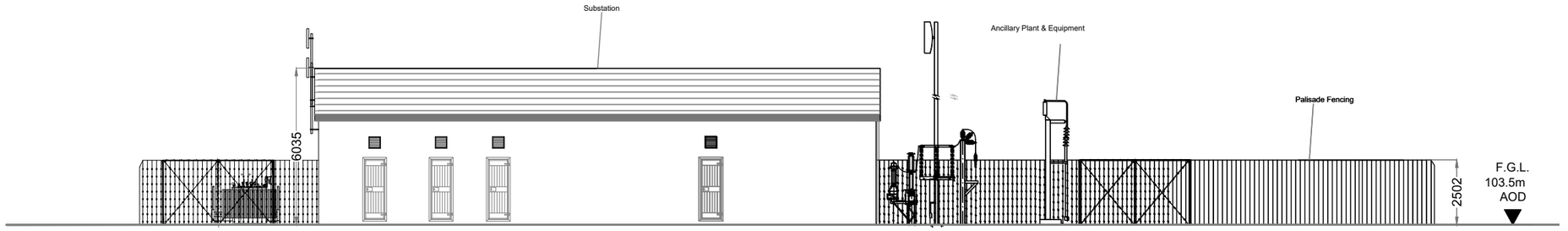
Drawing Notes

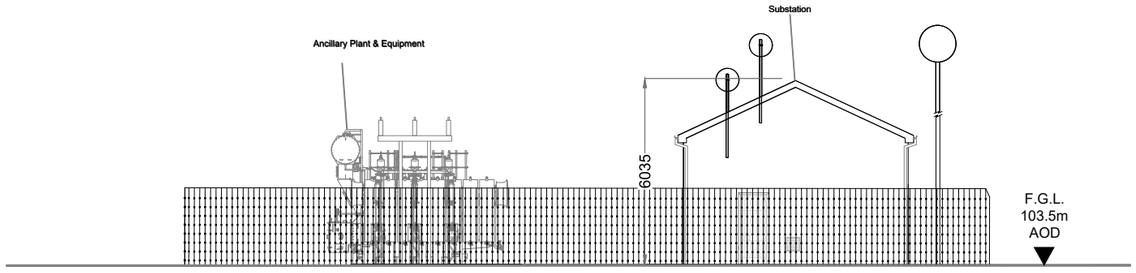
1. Layout and arrangements of substation buildings and electrical equipment is shown indicatively and for illustration purposes only as final specifications of buildings and electrical equipment is to be dictated by Eirgrid/ESB networks requirements.



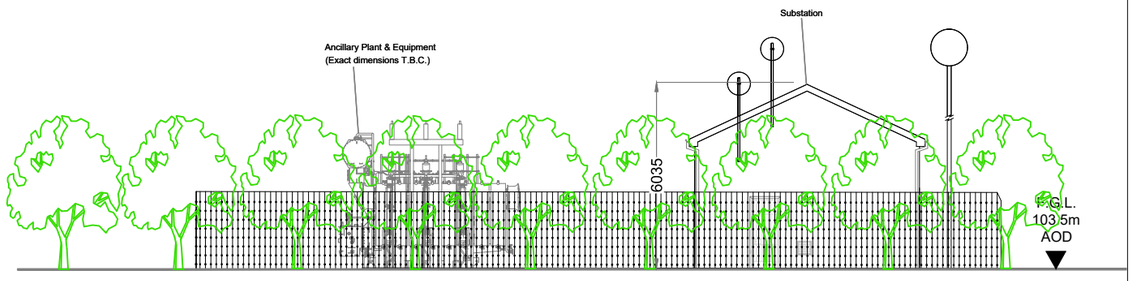
Northern Elevation



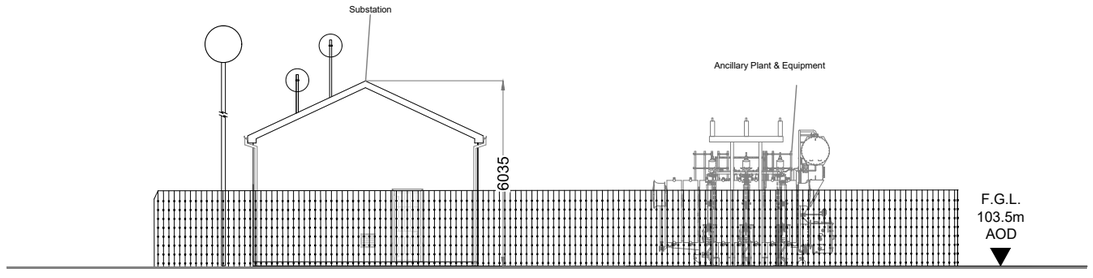
Southern Elevation



Eastern Elevation



Eastern Elevation with Screening



Western Elevation

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **Substation Elevations**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Fig 4-14	1:200 @ A3

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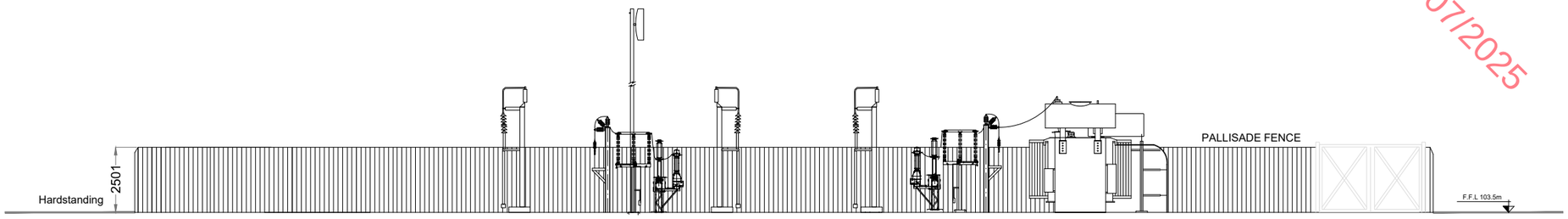
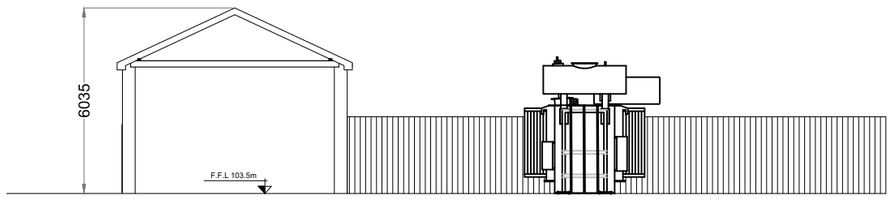


Site Cross Section A-A



Site Cross Section 1-1

Proposed
Hardcore

N

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**			
DRAWING TITLE: **Substation Sections**			
PROJECT No.: **231103**		DRAWING No.: **Fig 4-15**	SCALE: **1:200 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **RD**	DATE: **30.06.2025**	REVISION.: P01

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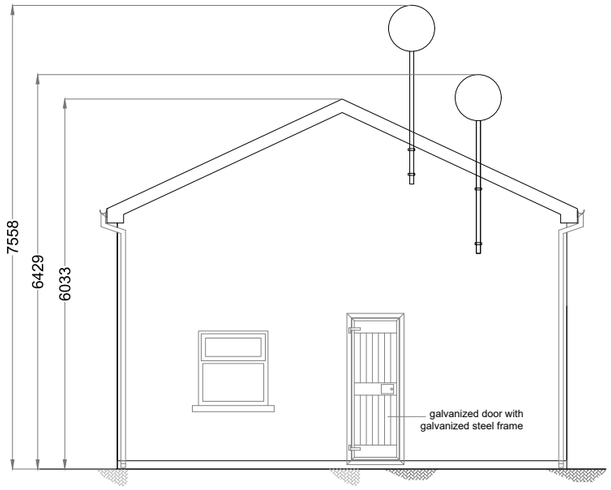
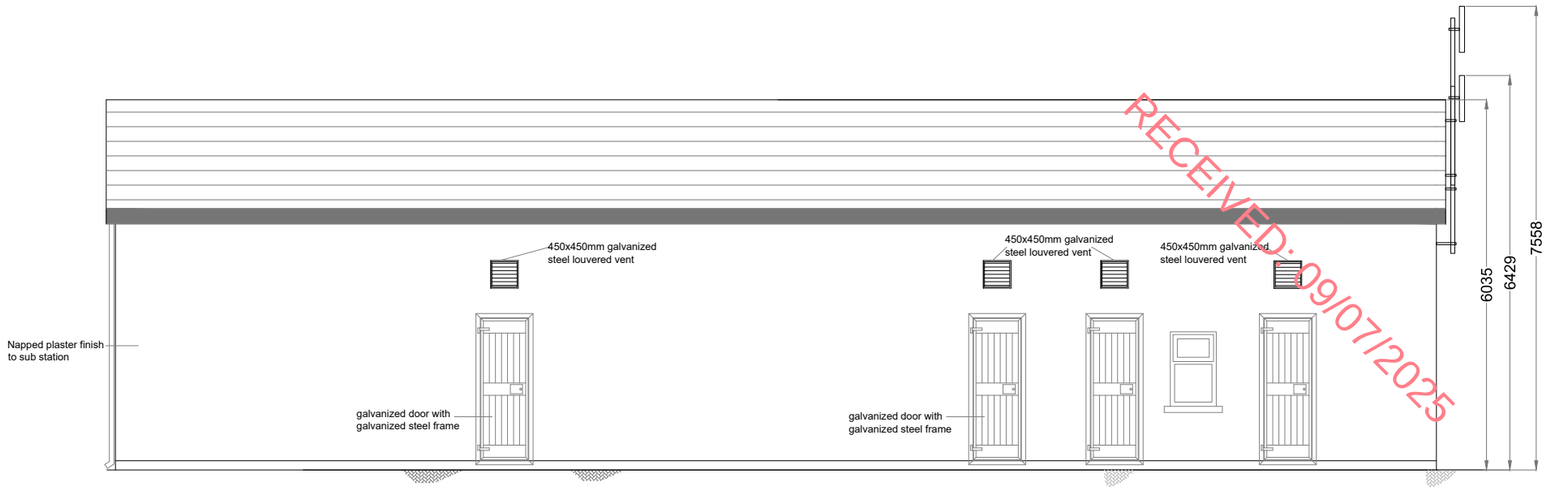
Drawing Notes

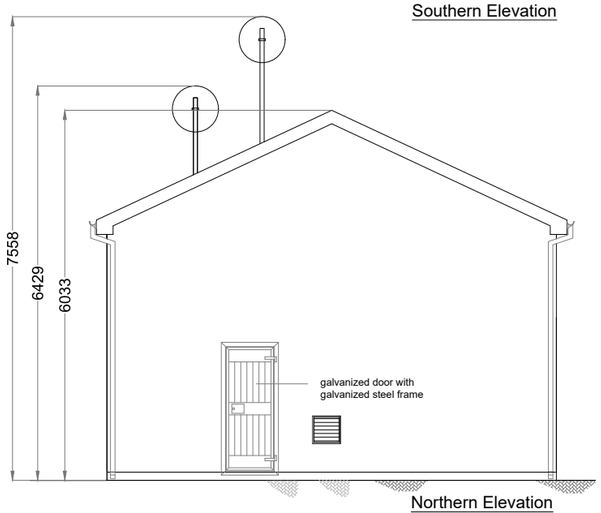
1. Layout and arrangements of substation buildings and electrical equipment is shown indicatively and for illustration purposes only as final specifications of buildings and electrical equipment is to be dictated by Eirgrid/ESB networks requirements.



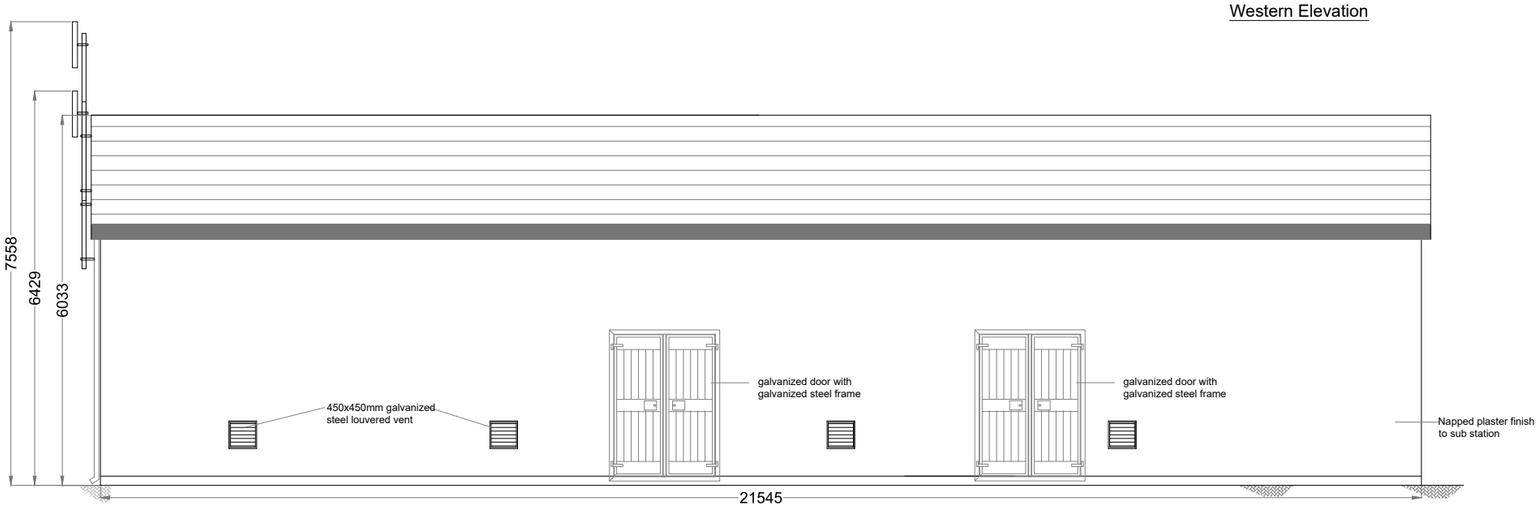
Southern Elevation



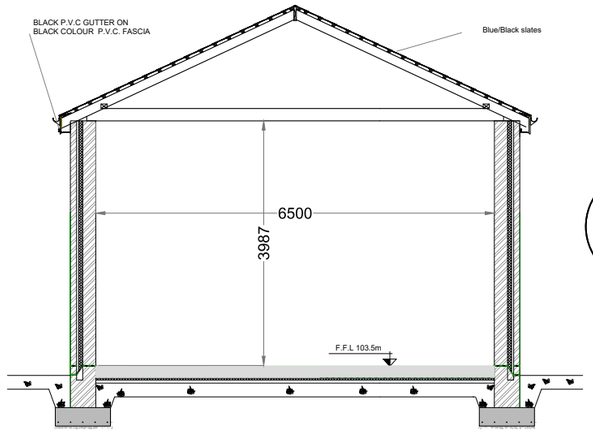
Western Elevation



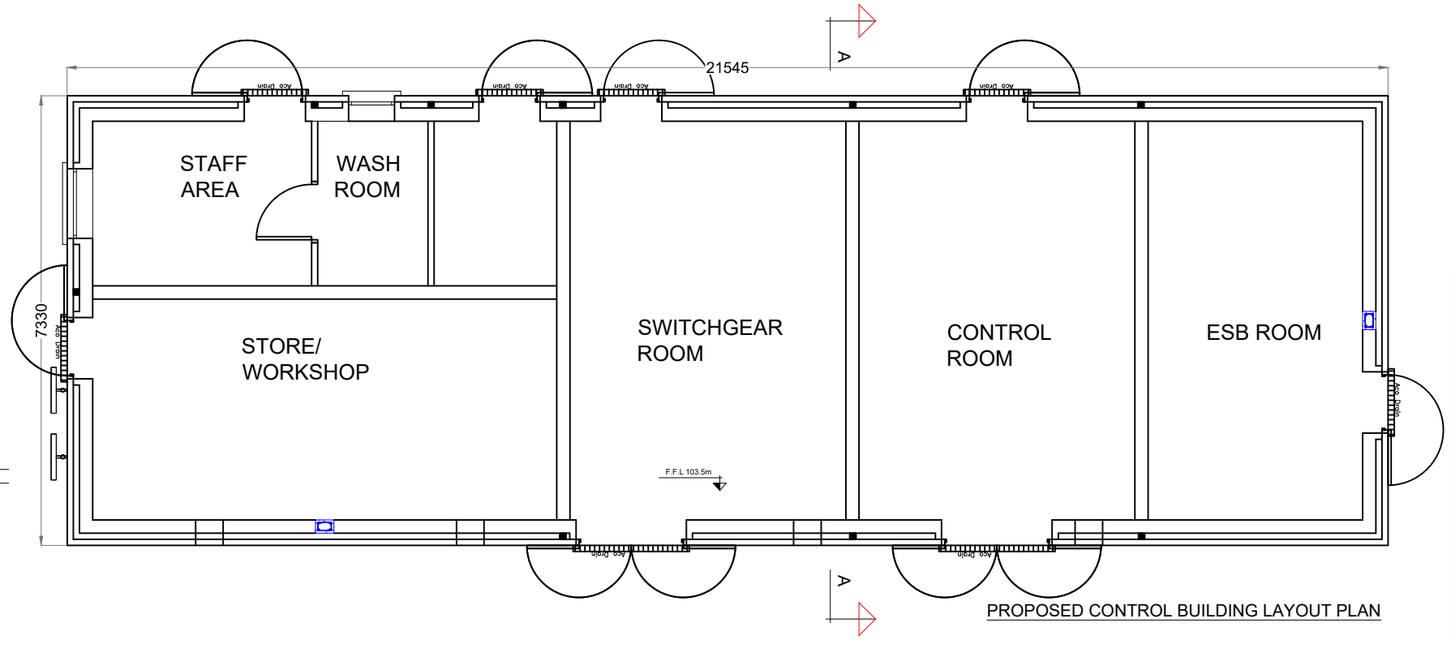
Northern Elevation



Eastern Elevation



SECTION A-A



PROPOSED CONTROL BUILDING LAYOUT PLAN

N

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **Control Building**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Fig 4-16	1:100 @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
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4.3.2.3 Underground Grid Connection Cabling Route

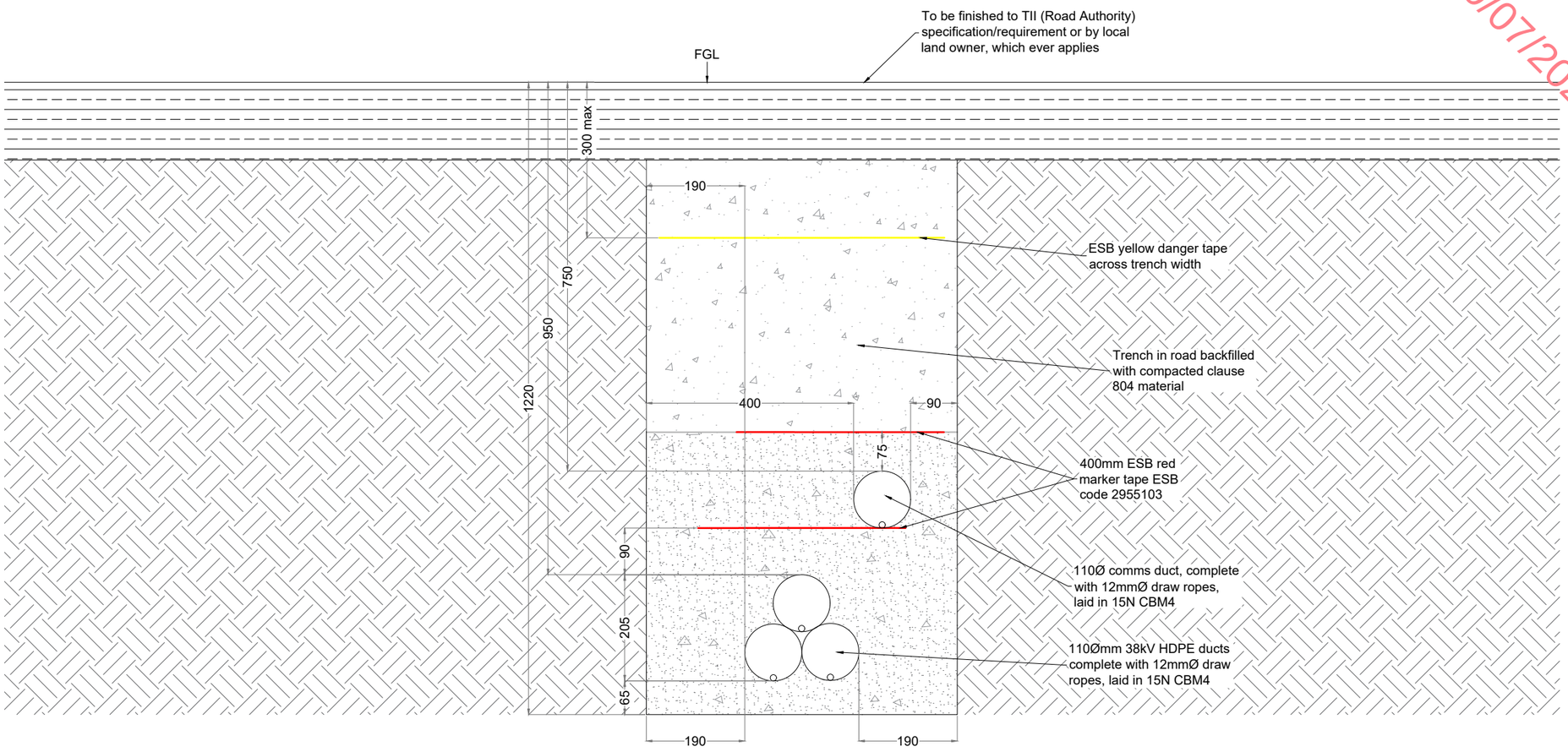
A 38kV connection between the Proposed Development and the national electricity grid will be necessary to export electricity from the Proposed Wind Farm. It is proposed to connect the Proposed Development to the national electricity grid via a 38kV underground electrical cable connection to the existing 110 kV Ballyragget substation, in the townland of Moatpark near the town of Ballyragget, Co. Kilkenny. The underground electrical cabling route is approximately 3.4km in length to Ballyragget substation of which approximately 2.2km is located primarily within the curtilage of the public road network (N77 National Secondary Road).

As part of the detailed design process, every effort has been made to locate the Proposed Grid Connection cabling trench off the existing road carriageway and within the hard shoulder or soft margin/grass verges, avoiding, insofar as possible, other existing underground services/utilities (Refer to Section 4.8.2.4). The existing carriageway of the N77 has been avoided apart from a short section measuring approximately 35m where the cabling trench crosses from west to east across the public road corridor.

The exact location of the grid connection cabling within the curtilage of the public road network may be subject to minor modification following confirmatory site investigations, to be undertaken prior to construction of the proposed wind farm development. A Road Opening Licence will be sought from the Roads Authority i.e. Kilkenny County Council requiring all details to be confirmed before the licence is granted and work can commence.

The Proposed Grid Connection underground cabling route will originate at the proposed onsite substation, in the townland of Ballynaslee, Co. Kilkenny, and run east for 335 metres through agricultural pastoral land. The underground cabling route will then emerge on to the N77 National Secondary Road and run south for 2.2km before turning east into agricultural pastoral land, continuing for 395m in the townland of Ballyconra, Co. Kilkenny. Within the agricultural land, the underground cabling will cross beneath the River Nore via horizontal direction drilling (refer to Section 4.8.2.6.1 below) and continue east for 560m through agricultural land before reaching the Ballyragget 110kV substation in the townland of Moatpark, Co. Kilkenny. The total length of the Proposed Grid Connection underground cabling route measures approximately 3.4km. The underground electrical cabling route is illustrated in Figure 4-1. Standard 38kV underground cabling trench cross sections are shown in Figure 4-17.

Access and maintenance tracks may be required by ESB along short sectons of the Proposed Grid Connection underground cabling route currently proposed within agricultural land to provide access for periodic maintenance during the operational phase of the Proposed Development.



Trench Layout Single Circuit (4-way) Trefoil

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**			
DRAWING TITLE: **Roadside Cable Trench Cross Section**			
PROJECT No.: **231103**		DRAWING No.: **fig 4-17**	SCALE: **1:10 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **RD**	DATE: **30.06.2025**	REVISION.: P01

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4.3.3 Quantities of Spoil and Crushed Stone

The quantity of spoil generated and requiring management on the site of the Proposed Development has been calculated, as presented in Table 4-2 below. In addition, the volume of stone required to build the Proposed Development infrastructure is noted below.

Table 4-2 Spoil and Stone Volumes requiring management

Development Component	Spoil Volume(m3) (approx.)	Crushed Stone Requirement (m3) (approx.)
Proposed Wind Farm		
8 no. Turbines and Hardstanding Areas (including foundations)	38,285	27,400
Access Roads (including met mast hardstand and security cabin)	38,010	40,670
Temporary Construction Compound	2,430	1,755
Met Mast	225	175
Total	78,950	70,000
Proposed Grid Connection		
Onsite Substation (including temporary construction compound)	10,230	2,785
Cabling Trench	2,045	920
Total	12,275	3,705
Total	91,225	73,705
Total (including 10% contingency)	100,350	81,075

Note: A contingency factor of 10% has been applied and is included to the excavated spoil volumes above to allow for expected increase in volume upon excavation and to allow for a variation in ground conditions across the Proposed Wind Farm site.

It is considered that any spoil generated by the proposed cabling trench will be removed and either accommodated within the borrow pit within the Proposed Wind Farm site or transported to a Materials Recovery Facility (MRF) where necessary. Any road material containing tar will be managed separately. Further detail on this can be found in Chapter 15: Traffic and Transport.

There will be a requirement to remove some sections of linear vegetation i.e. hedgerows to facilitate the Proposed Development infrastructure, however, this will not involve the excavation of tree stumps outside of the infrastructure footprint and as such does not affect the excavation volumes.

4.3.4 Site Activities

4.3.4.1 Environmental Management

All proposed activities on the site of the Proposed Development will be provided for in an environmental management plan. A Construction and Environmental Management Plan (CEMP) has been prepared for the Proposed Development and is included in Appendix 4-2 of this EIAR.

The CEMP includes details of drainage, spoil management and waste management, and outlines clearly the mitigation measures and monitoring proposals that are required to be adhered to in order to comply with the environmental commitments outlined in the EIAR. In the event planning permission is granted for the Proposed Development, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for approval.

4.3.4.2 Refuelling

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

4.3.4.3 Concrete Deliveries

Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from a local batching plant in sealed concrete delivery trucks. The quarry that could potentially provide stone and ready mix concrete for the Proposed Development are detailed below in Section 4.4.2.

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

The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area. Where temporary lined impermeable containment areas are used, such containment areas are typically built using straw bales and lined with an impermeable membrane. Two examples are shown in Plate 4-3 below.

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

Plate 4-3 Concrete washout area

Alternatively, a Siltbuster-type concrete wash unit or equivalent (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/) may be used. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids can be disposed of off-site at an appropriate waste facility.

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

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

4.3.4.4 Concrete Pouring

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

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

- Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast.
- Restricting concrete pumps and machine buckets from slewing over watercourses while placing concrete.

- Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets.
- Ensuring that covers are available for freshly placed concrete to avoid the surface washing away in heavy rain.
- The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/) or equivalent.
- Disposing of surplus concrete after completion of a pour in agreed suitable locations away from any watercourse or sensitive habitats.

4.3.4.5 Dust Suppression

In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling/settlement ponds in the Proposed Development site's drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and temporary construction compounds to prevent the generation of dust. Silty or oily water will not be used for dust suppression, because this would transfer the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water may lead to increased runoff.

4.3.4.6 Vehicle Washing

Wheels or vehicle underbodies are often washed before leaving sites to prevent the build-up of mud on public (and site) roads. A wheel wash facility will be provided and a layout of the same is shown in Figure 4-18. The site roads will be well finished with non-friable, compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt.

A road sweeper will be available if any section of the public roads were to be dirtied by trucks associated with the Proposed Development.

4.3.4.7 Waste Management

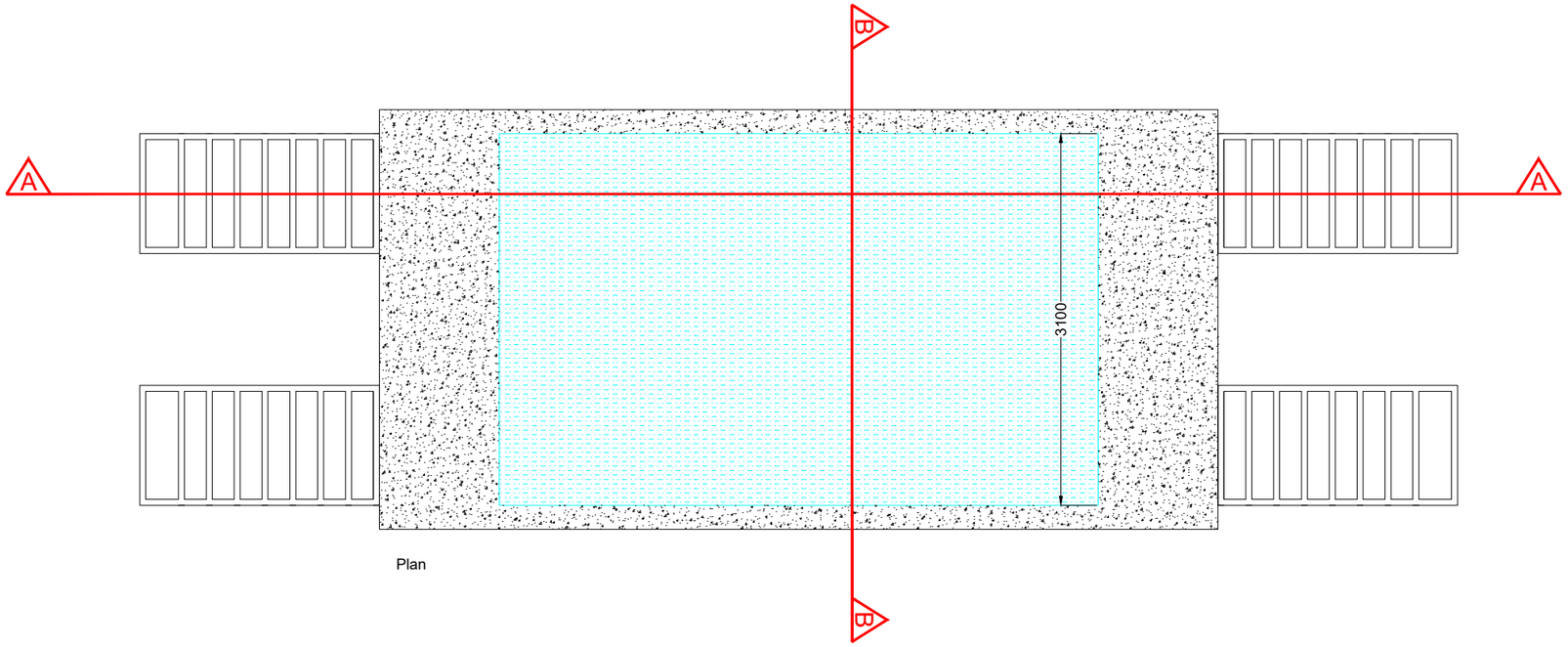
The CEMP, Appendix 4-2 of this EIAR, provides a waste management plan (WMP) which outlines the best practice procedures during the construction phase of the project. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Development. Disposal of waste will be a last resort.

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

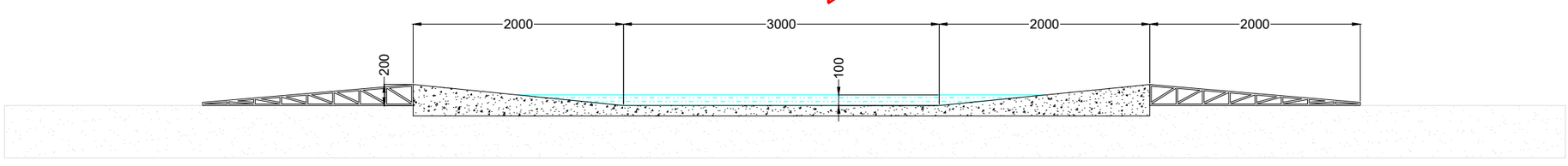
The Act requires that any waste related activity must have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the site of the Proposed Development to ensure that all contractors hired to remove waste from the Site have valid Waste Collection Permits to ensure that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

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

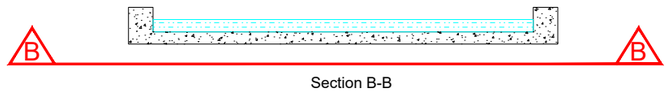
Note
Wheel washes will be appropriately located at all entrances used during construction of the wind farm



Plan



Section A-A



Section B-B

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**			
DRAWING TITLE: **Wheel Wash Detail**			
PROJECT No.: **231103**		DRAWING No.: **Fig 4-18**	SCALE: **1:50 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **RD**	DATE: **30.06.2025**	REVISION.: P01

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authority so that they can ensure everyone working on the development adheres to the management plan.

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

4.4 Access and Transportation

4.4.1 Site Entrance

During the construction phase, the Proposed Development site will be accessed via a proposed new siter road originating from an existing agricultural access off the L58333 local road. The L58333 runs along the eastern boundary of the Proposed Wind Farm site in the townland of Ballynalsee. The local road is, in turn, accessed via the N77 national secondary road. This entrance will be used as the site entrance for HGVs, turbine component deliveries and other abnormal loads during the construction phase of the Proposed Development. Once the Proposed Development is operational, this entrance will remain in place, and it will be used for the operation and maintenance of the Proposed Development during the operational phase and in the unlikely event of the delivery of a replacement turbine component or other abnormal load required for the operational maintenance of the wind farm.

It is proposed to access the proposed onsite 38kV substation, during both the construction and operational phases of the Proposed Development, via this proposed site entrance off the L58333 local road in the townland of Ballynalsee.

For the purposes of delivering large turbine components to the Proposed Wind Farm site, the site entrance will be temporarily widened on the northern side. The existing boundary along the L58333 will be reinstated following the completion of the turbine component delivery phase.

The location of Proposed Development access and temporary widening is shown in Figure 4-19 and Appendix 4-1 of this EIAR.

4.4.2 Deliveries of Stone and Ready-Mix Concrete from Quarries

While it is proposed to source the majority of crushed stone for the construction of the Proposed Development from the onsite borrow pit, a certain volume of crushed stone and hardcore materials and all ready-mix concrete that will be required during the construction phase will be sourced from local, appropriately authorised quarries. For the purposes of assessment within the EIAR, construction materials will be delivered to the Site via selected haul routes that will be determined based on the source of the construction material. All construction materials will ultimately access the site, from the north or south, via the N77 national secondary route. Quarries within a 20km range of the Site, that could potentially provide stone and concrete, are illustrated on Figure 4-20. Traffic movements generated by the Proposed Development are discussed in Section 15.1 of Chapter 15, Material Assets.

4.4.3 Turbine Component Delivery Route

It is envisaged that large wind turbine components will be delivered to the Proposed Development site, from the Port of Cork (Ringaskiddy) (other ports such as Galway Port, Shannon Foynes od Dublin Port could also be used), via the N28, and N40 national roads, the M8 and M7 Motorways N77 National

Drawing Legend

- Existing Road Edge
- Proposed Road
- Sight Line

Location 5 - Site access on L58333

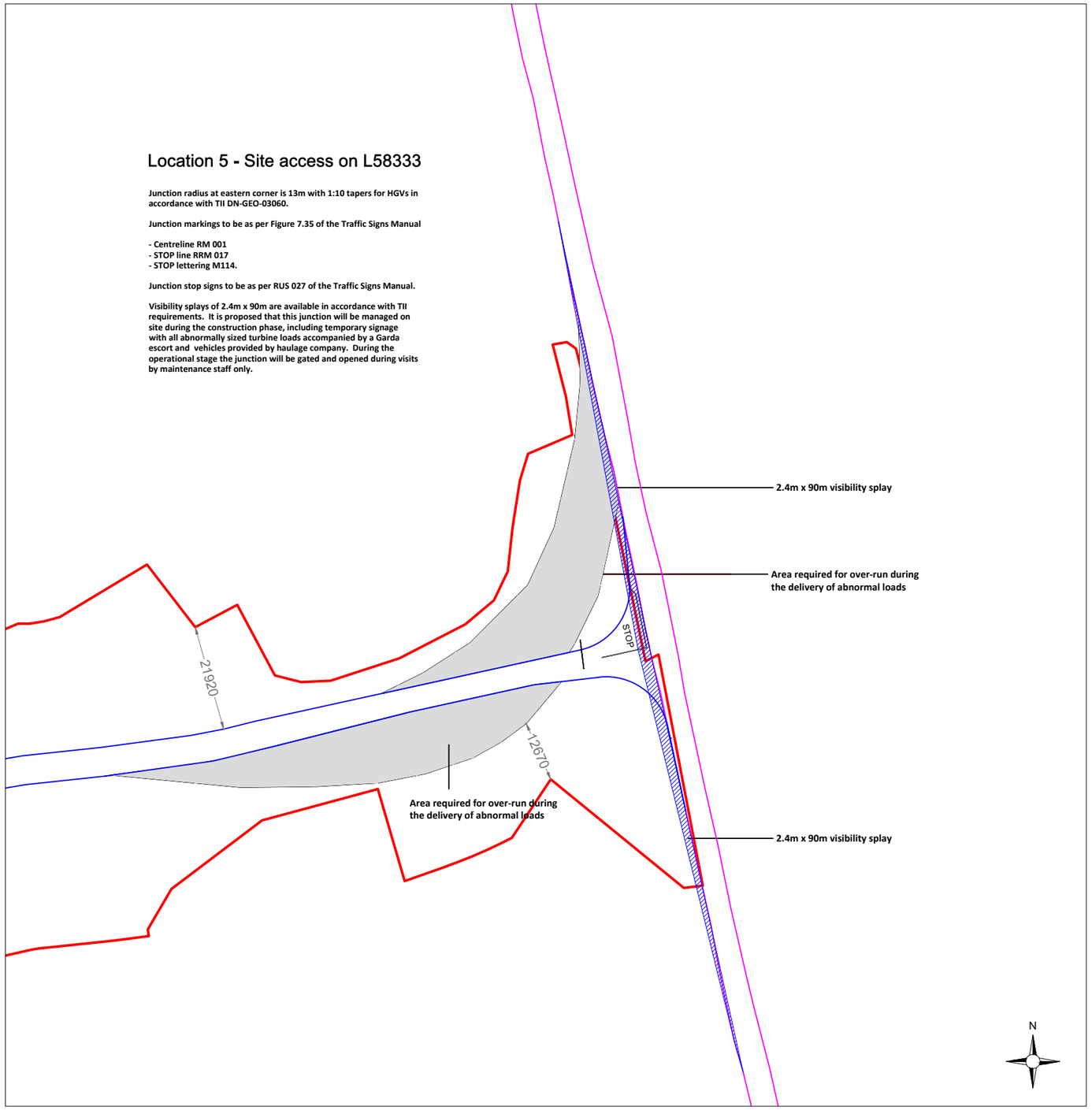
Junction radius at eastern corner is 13m with 1:10 tapers for HGVs in accordance with TII DN-GEO-03060.

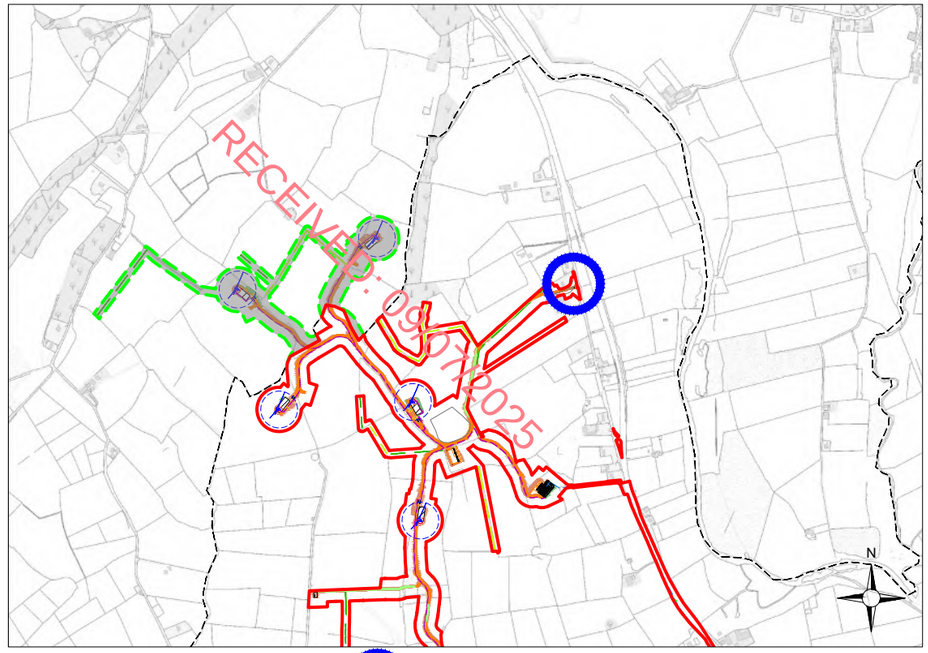
Junction markings to be as per Figure 7.35 of the Traffic Signs Manual

- Centreline RM 001
- STOP line RRM 017
- STOP lettering M114.

Junction stop signs to be as per RUS 027 of the Traffic Signs Manual.

Visibility splays of 2.4m x 90m are available in accordance with TII requirements. It is proposed that this junction will be managed on site during the construction phase, including temporary signage with all abnormally sized turbine loads accompanied by a Garda escort and vehicles provided by haulage company. During the operational stage the junction will be gated and opened during visits by maintenance staff only.





1:25,000 Location on Context Map

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**			
DRAWING TITLE: **Proposed Access Junction**			
PROJECT No.: **231103**		DRAWING No.: **Figure 4-19**	SCALE: **1:1,000 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **AC**	DATE: **08.07.2025**	REVISION.: P01

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County Offaly

County Kildare

County Laois

County Kilkenny

County Tipperary

County Carlow

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Map Legend

- EIAR Site Boundary
- Quarries
- 20km Proposed Turbine Buffer
- Counties Border

Drawing Title
Licensed Quarries within 20km

Project Title
Seskin Renewables Wind Farm

Drawn By	Checked By
ER	EM
Project No.	Drawing No.
231103	Figure 4-20
Scale	Date
1:150,000	2025-06-30

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Secondary Road, and the L58333 local road. The proposed turbine delivery route (TDR) from the M7 to the Proposed Development is shown on Figure 15-1a.

From the Port of Cork (Ringaskiddy), the turbine component delivery vehicles will travel north via the N28 and N40 National Primary Roads before merging onto the M8 Motorway and subsequently the M7 Motorway. At Junction 17 (Portlaoise), the vehicles will exit the M7, travelling south on the N77 National Secondary Road for approximately 25km. The vehicles will travel through the town of Abbeyleix and the village of Durrow in Co. Laois. In the townland of Ballynaslee, Co. Kilkenny the turbine component delivery vehicles will reverse on to the L58333 local road from the existing junction on the N77 and continue north on this local road for approximately 700m to the Proposed Wind Farm entrance. The proposed turbine delivery route (TDR) from the M7 to the Proposed Development is shown on Figure 4-21.

It is also envisaged that general construction traffic (including materials and staff) will travel to the site via the public road network to the east of the site. Traffic movements generated by the Proposed Development are discussed in Section 15.1.6 of Chapter 15, Material Assets.

4.4.3.1 Turbine Delivery Route Accommodation Areas

Road and junction widening are sometimes required along proposed turbine delivery routes to accommodate the large vehicles used to transport turbine components and other abnormally sized loads to wind farm sites. The proposed transport route for the Proposed Development has been the subject of a route assessment to determine if any works are required along its length. Full details of the assessment are included as part of the traffic impact assessment set out in Section 15.1.9 of this EIAR and summarised below. There are sections on the route where the vertical alignment may require specialist transport vehicles. These sections will be further considered by the appointed transport company following turbine procurement process.

Temporary accommodation works will be required at two locations to facilitate the delivery of turbine components and other abnormal loads to the Proposed Wind Farm during the construction phase. The accommodation works will be located within the town of Durrow, Co. Laois, at the Chapel Street/Mary Street (N77) junction and at the junction between the N77/L58333 in the townland of Ballynaslee, Co. Kilkenny. The locations of the accommodation works are shown on Figure 1-2 and these works are fully assessed as part of this EIAR.

The locations of the accommodation areas are shown in Figures 4-22 to 4-23.

Location 1 – Durrow Townparks, Co. Laois

It is proposed to carry out temporary accommodation works within and adjacent to the green space, located at the Chapel Street/Mary Street (N77) junction, in the townland of Durrow Townparks, Co. Laois.

The existing trees, ornamental street furniture, signage and electricity/telecommunication poles, within and around the green space will be temporarily removed for the duration of the turbine component delivery phase. Crushed stone will be used to raise the level of the laneway, which bounds the northwestern side of the green space, up to the level of the grassed area within the green space. Heavy duty, ground protection mats, such as Tufftrak mats (https://www.buyjustrite.eu/en/checkers-tufftrak/content/tufftrak/), will be installed on the grassed area.

Upon completion of the turbine component delivery phase, the crushed stone and ground protection mats will be removed and the trees, ornamental street furniture, signage and electricity/telecommunication poles will be reinstated.

The proposed accommodation area is shown in Figure 4-22 and it forms part of the planning application to Laois County Council.

Location 2– Ballynaslee, Co. Kilkenny

In the townland of Ballynaslee, Co. Kilkenny, it is proposed to construct an accommodation area, using crushed stone, measuring approximately 822m^2, within the grass verge on the southern and northern side of the junction between the L58333 local road and N77. This area is currently under the control of and being maintained by Kilkenny County Council.

Upon the completion of the construction phase, the accommodation area will be covered with a layer of topsoil and reseeded. It will only be used again in the unlikely event that an oversized delivery was required for wind turbine maintenance purposes.

This accommodation area is shown in Figure 4-23 and it forms part of the planning application submitted to Kilkenny County Council.

The works described at Locations 1 and 2 above will facilitate the movement of the turbine component and other abnormal load delivery vehicles through these junctions. Once the accommodation areas have been reinstated, they will only be used again in the very unlikely event that an oversized delivery is required for wind turbine maintenance purposes.

Via M7

Abbeyleix

County Laois

Durrow

Cullahill

Ballyragget

County Kilkenny

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Map Legend

- Proposed Site Entrance
- Turbine Delivery Route
- EIAR Site Boundary
- Kilkenny/Laois County Border

Drawing Title: Turbine Delivery Route

Project Title: Seskin Renewables Wind Farm

Drawn By	Checked By
ER	EM
Project No.	Drawing No.
231103	Figure 4-21
Scale	Date
1:70,000	2025-06-27

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Map Legend

Temporary Accommodation Area (385m2)

N

Drawing Title
Accommodation Works: Durrow Townparks, Co. Laois

Project Title
Seskin Renewables Wind Farm

Drawn By	Checked By
ER	EM
Project No.	Drawing No.
231103	Figure 4-22
Scale	Date
1:300	2025-06-27

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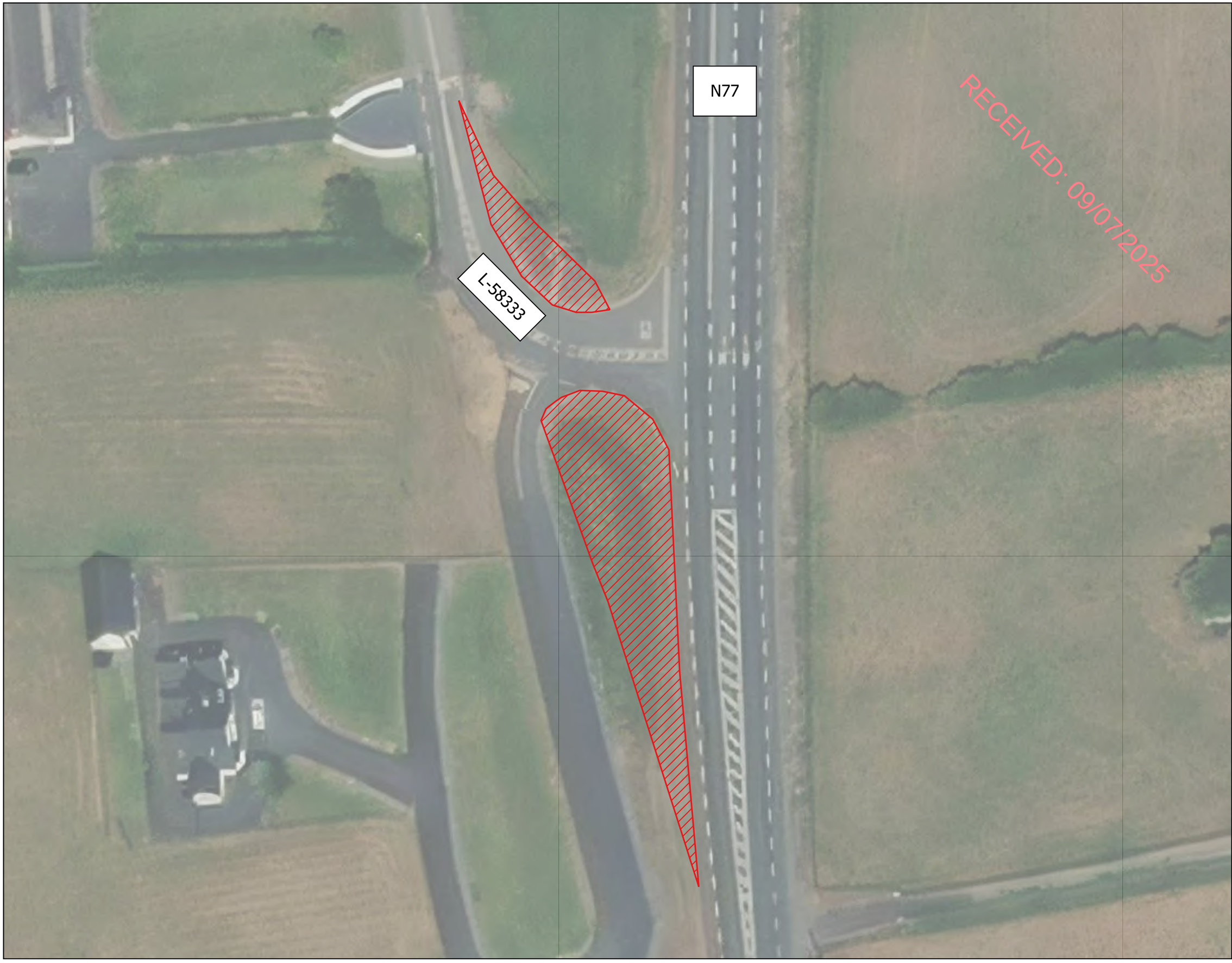

Map Legend

Temporary Accommodation Area (822m2)

Drawing Title
Accommodation Works: Ballynaslee, Co. Kilkenny

Project Title
Seskin Renewables Wind Farm

Drawn By	Checked By
ER	EM
Project No. 231103	Drawing No. Figure 4-23
Scale 1:500	Date 2025-06-27

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4.4.4 Traffic Management

A turbine with the maximum blade length of 75 metres has been used in assessing the traffic impact of the Proposed Development. The blade transporter for such a turbine blade would have a total vehicle length of 81 metres, including the blade which overhangs the back of the vehicle. The total length of the tower transporter is 47 metres with the axles located at the front and rear of the load with no overhang.

The vehicles used to transport the nacelles will be similar to the tower transporter. All other vehicles requiring access to the site of the Proposed Development will be smaller than the design test vehicles. The turbine delivery vehicles have been modelled accurately in the Autotrack assessments for the Proposed Development site access junctions, as detailed in Section 15.1.9 of this EIAR.

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

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

Plate 4-4 Blade adaptor transport system

A detailed traffic management plan has been prepared as part of the traffic impact assessment set out in Chapter 15 of this EIAR. The deliveries of turbine components to the Proposed Development site may be made in convoys of three to four vehicles at a time, and at night when roads are quietest. Convoys will be accompanied by escorts at the front and rear operating a "stop and go" system. Although the turbine delivery vehicles are large, they will not prevent other road users or emergency vehicles

passing, should the need arise. The delivery escort vehicles will ensure the turbine transport is carried out in a safe and efficient manner with minimal delay or inconvenience for other road users.

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

Prior to the Traffic Management Plan being finalised, a full dry run of the transport operation along the potential routes will be completed using vehicles with attachments to simulate the dimensions of the wind turbine transportation vehicles. This dry run will inform the Traffic Management Plan for agreement with the relevant Authorities. All turbine deliveries will be provided for in a Traffic Management Plan which will be finalised in advance of oversized load deliveries, when the exact transport arrangements are known, delivery dates confirmed and escort proposals in place. Such a traffic management plan is typically submitted to the relevant Authorities for agreement in advance of any abnormal loads using the local roads, and will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls.

4.4.4.1 Traffic Management of Other Construction Materials

Aside from the delivery of the large turbine components and other abnormal loads, the construction of the Proposed Development will require the delivery of a large volume of other construction materials (including all crushed stone and concrete required) mainly by HGVs. A detailed traffic management plan (TMP) has been prepared as part of the traffic and transport impact assessment and is included as Appendix 15-2 of this EIAR. The purpose of the TMP is to set out the various traffic management measures that will be implemented during the construction stage of the Proposed Development. The successful completion of the Proposed Development will require significant coordination and planning and a comprehensive set of mitigation measures will be put in place before and during the construction phase of the Proposed Development in order to minimise the effects of the additional traffic generated on the surrounding road network.

All traffic management measures that are to be implemented during the construction phase of the Proposed Development will be agreed with Kilkenny County Council, Laois County Council and the Roads and Traffic Section will be consulted throughout the construction phase.

4.5 Community Gain Proposal

4.5.1 Background

Seskin Renewables Wind Farm has the potential to bring significant positive benefit to the local community. The project will create sustainable local employment, it will contribute annual rates to the local authority, and it will provide opportunity for local community investment in the project. A community benefit fund will be put in place for the lifetime of the project to provide direct funding to those areas surrounding the project.

4.5.2 Renewable Energy Support Scheme

The Renewable Energy Support Scheme (RESS) Terms and Conditions, published by the Department of Communications, Climate Action and Environment on the 29th October 2021, make some high level provisions for how this type of benefit fund will work. Any project which wants to export electricity to the national grid must abide by these broad principles. These include the following:

1. *a minimum of €1,000 shall be paid to each household located within a distance of a 1-2kilometre radius from the Project;*
2. *a minimum of 40% of the funds shall be paid to not-for-profit community enterprises whose primary focus or aim is the promotion of initiatives towards the delivery of the UN Sustainable Development Goals, in particular Goals 4, 7, 11 and 13, including education, energy efficiency, sustainable energy and climate action initiatives.*
3. *a maximum of 10% of the funds may be spent on administration. This is to ensure successful outcomes and good governance of the Community Benefit Fund.*
4. *the balance of the funds shall be spent on initiatives successful in the annual application process, as proposed by clubs and societies and similar not-for-profit entities, and in respect of Onshore Wind RESS 1 Projects, on "near neighbour payments" for households located outside a distance of 1 kilometre from the Project but within a distance of 2 kilometres from such Project.*

4.5.3 Community Benefit Fund

Seskin Renewables Wind Farm Ltd. expects that for each megawatt hour (MWh) of electricity produced by the wind farm, the project will contribute €2 into a community fund for the RESS period or the first 15 years of operation. If this commitment is improved upon in upcoming Government Policy, we will adjust accordingly.

If this project is constructed as currently designed, we estimate that a total of approximately €4 million will be available in the local area for community funding over the lifetime of the project. The above figure is indicative only and will be dependent on the generation capacity of the wind farm which is influenced by a number of factors including:

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

4.5.4 Community Investment Opportunity

The Renewable Energy Support Scheme (RESS) sets out that future renewable energy project proposals enable the possibility for local communities to invest in projects in a meaningful way as a means to directly gain from the financial dividends that a project can provide should it be consented, built and operated. In response to this, the applicant has been working hard with external agencies to develop workable models of Community Investment. As with the benefit fund, the applicant aims to take this work into the community during 2025/2026, to continue to explore this exciting possibility and see how best to embed its design within the community.

4.6 Site Drainage

4.6.1 Introduction

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

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

The drainage design for the Proposed Development has been planned with the intention of having no significant negative impact on the water quality of the Site and its associated rivers, and consequently no impact on downstream catchments and ecological ecosystems. The assessment of potential impacts on hydrology and hydrogeology due to the construction, operation and decommissioning of the Proposed Development is included in Chapter 9: Hydrology and Hydrogeology.

No routes of any natural drainage features will be altered as part of the Proposed Development. Turbine locations and associated new roadways were designed to avoid natural watercourses with existing roads to be used wherever possible. There will be no direct discharges to any natural watercourses or land drains, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses and drains. Buffer zones of 50m around the existing natural drainage features have been used to inform the layout of the Proposed Development.

4.6.2 Existing Drainage Features

A detailed description of the local hydrology of the Site is provided in Chapter 9 of this EIAR.

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

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

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

4.6.3 Drainage Design Principles

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

- Keep clean water clean by intercepting it where possible, upgradient of works areas, and divert it around the works areas for discharge as diffuse overland flow or for rewetting of land.
- Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line, treatment and outfall controls prior to controlled diffuse release as overland flow or for rewetting of land.
- No direct hydraulic connectivity from construction areas to watercourses or drains connecting to watercourses.
- Where possible, maintain 50-metre watercourse buffer zones for the wind turbines.
- No alteration of natural watercourses.
- Maintain the existing hydrology of the Site.
- Blocking of existing manmade drainage as appropriate.
- Daily inspection and recording of surface water management system by on-site Environmental Clerk of Works and immediate remedial measures to be carried out

as required and works temporarily ceased if a retained stormwater/sediment load is identified to have the potential to migrate from the Site.
- Use of siltbuster or equivalent system if required.

Drainage water from any works areas of the Site will not be directed to any natural watercourses within the Site. Two distinct methods will be employed to manage drainage water within the Site. The first method involves keeping clean water clean by avoiding disturbance to natural drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations and construction areas. The second method involves collecting any drainage waters from works areas within the Site that might carry silt or sediment, to allow attenuation and settlement prior to controlled diffuse release. The drainage design is intended to maximise erosion control, which is more effective than having to control sediment during high rainfall. Such a system also requires less maintenance. The area of exposed ground will be minimised. The drainage measures will prevent runoff from entering the works areas of the Site from adjacent ground, to minimise the volume of sediment-laden water that has to be managed. Discoloured run-off from any construction area will be isolated from natural clean run-off. A schematic of the proposed site drainage management is presented in Figure 4-24 below.

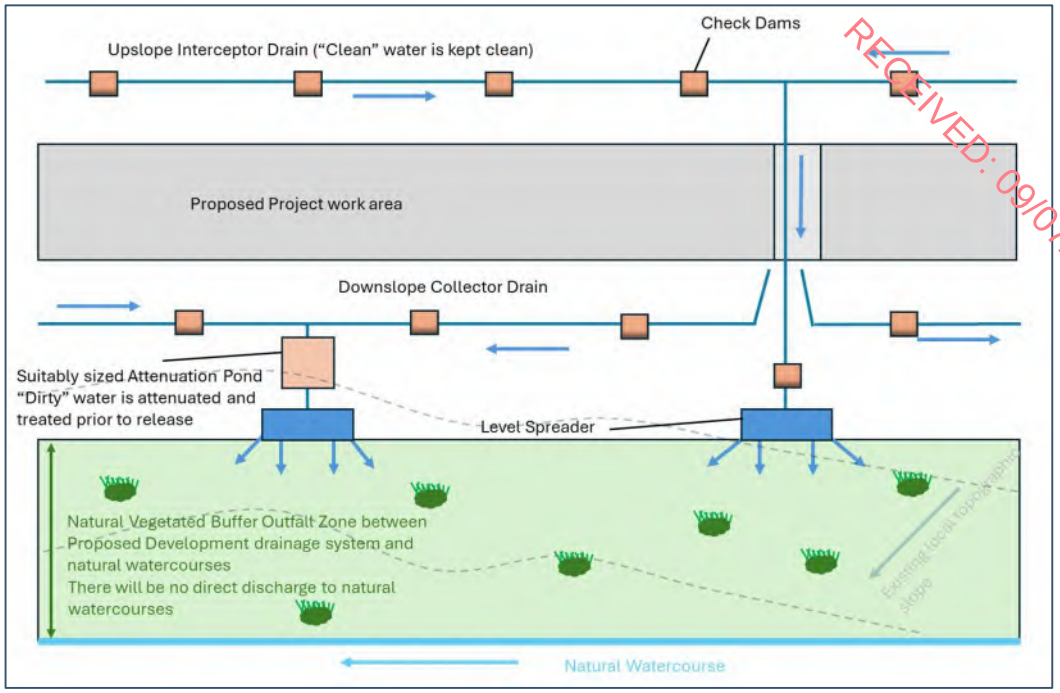


Figure 4-24 Proposed Development Drainage Process Flow

4.6.4 Drainage Design

A drainage design for the Proposed Development, incorporating all principles and measures outlined in this drainage design description, has been prepared, and is included in Appendix 4-3 to this EIAR. The drainage design employs the various measures further described below and is cognisant of the following guidance documents:

- Forestry Commission (2011): Forests and Water UK Forestry Standard Guidelines, Fifth Edition. Publ. Forestry Commission, Edinburgh;
- Coillte Forest (2013): Operations and Water Protection Guidelines;
- Forest Services (Draft) Forestry and Freshwater Pearl Mussel Requirements – Site Assessment and Mitigation Measures;
- Forest Service (2000): Forestry and Water Quality Guidelines. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford;
- COFORD (2004): Forest Road Manual – Guidelines for the Design, Construction and Management of Forest Roads;
- Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Watercourses;
- Scottish Natural Heritage, 2019 Good Practice During Wind Farm Construction
- UK Guidance Note 2020 GPP1 - General Guide to Prevention of Pollution (UK Guidance Note);
- UK Guidance Note 2018 GPP5 – Works or Maintenance in or Near Watercourses
- Construction Industry Research and Information Association (CIRIA) 2006: Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006); and,
- Construction Industry Research and Information Association (CIRIA) 2006: Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 200.

4.6.4.1 Interceptor Drains

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

The interceptor drains will be installed in advance of any main construction works commencing. The material excavated to make the drain will be compacted on the downslope edge of the drain to form a diversion dike. On completion of the construction phase works, it is envisaged that the majority of the interceptor drains could be removed. At that stage, there will be no open excavations or large areas of exposed ground that are likely to give rise to large volumes of potentially silt-laden run off. Any areas in which works were carried out to construct roads, turbine bases or hardstands, will have been built up with large grade hardcore, which even when compacted in place, will retain sufficient void space to allow water infiltrate the subsurface of these constructed areas. It is not anticipated that roadways or other installed Site infrastructure will intercept ground-conveyed surface water runoff to any significant extent that would result in scouring or over-topping or spill over. Where the drains are to be removed, they will be backfilled with the material from the diversion dike. Interceptor drains may have to be retained in certain locations, for example where roadways are to be installed on slopes, to prevent the roadways acting of conduits for water that might infiltrate the roadway sub-base. In these cases, interceptor drains would be maintained in localised areas along the roadway with culverts under the roadway, which would allow the intercepted water to be discharged to vegetation filters downgradient of the roadway. Similarly, in localised hollows where water is likely to be funnelled at greater concentrations than on broader slopes, interceptor drains and culverts may be left in situ following construction. Figure 4-25 below shows an illustrative drawing of an interceptor drain.

The velocity of flow in the interceptor will be controlled by check dams (see Section 4.6.4.3 below), which will be installed at regular intervals along the drains to ensure flow in the channel is non-erosive. On steeper sections where erosion risks are greater, a geotextile membrane will be added to the channel.

Interceptor drains will be installed horizontally across slopes to run in parallel with the natural contour line of the slope. Intercepted water will travel along the interceptor drains to areas downgradient of works areas, where the drain will terminate at a level spreader (see Section 4.6.4.4 below). Across the entire length of the interceptor drains, the design elevation of the water surface along the route of the drains will not be lower than the design elevation of the water surface in the outlet at the level spreader.

4.6.4.2 Swales

Drainage swales are shallow drains that will be used to intercept and collect run off from construction areas of the Site during the construction phase. Drainage swales will remain in place to collect runoff from roads and hardstanding areas of the Proposed Development during the operational phase. A swale is an excavated drainage channel located along the downgradient perimeter of construction areas, used to collect and carry any sediment-laden runoff to a sediment-trapping facility and stabilised outlet. Swales are proven to be most effective when a dike is installed on the downhill side. They are similar in design to interceptor drains and collector drains described above. Figure 4-25 below, shows an illustrative example of a drainage swale.

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

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

4.6.4.3 Check Dams

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

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

The proposed check dams will be made up of straw bales or stone, or a combination of both depending on the size of the drainage swale it is being installed in. Where straw bales are to be used, they will be secured to the bottom of the drainage swale with stakes. Clean 4-6 inch stone will be built up on either side and over the straw bale to a maximum height of 600mm over the bottom of the interceptor drain. In smaller channels, a stone check dam will be installed and pressed down into place in the bottom of the drainage swale with the bucket of an excavator. Figure 4-25, below, shows illustrative examples of check dams.

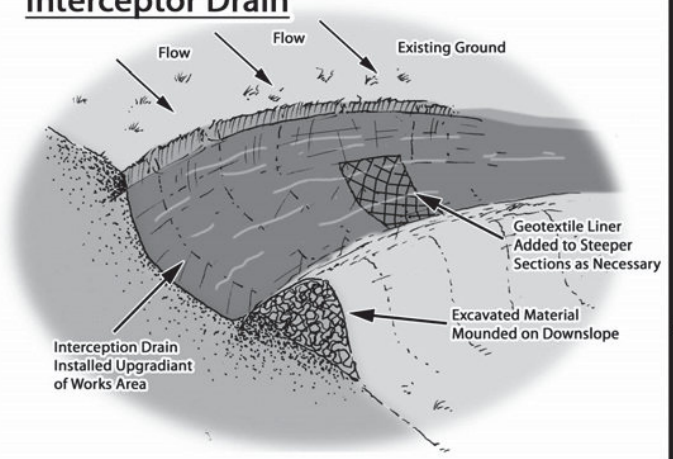
The check dams will be installed at regular intervals along the interceptor drains to ensure the bottom elevation of the upper check dam is at the same level as the top elevation of the next down-gradient check dam in the drain. The centre of the check dam will be approximately 150mm lower than the edges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

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

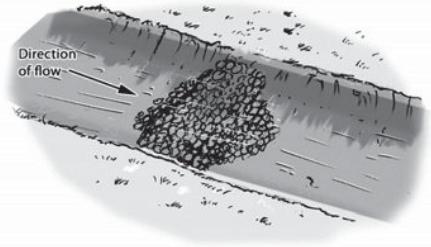
Check dams are designed to reduce velocity and control erosion and are not specifically designed or intended to trap sediment, although sediment is likely to build up. If necessary, any excess sediment build up behind the dams will be removed. For this reason, check dams will be inspected and maintained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

Drainage Design Measures

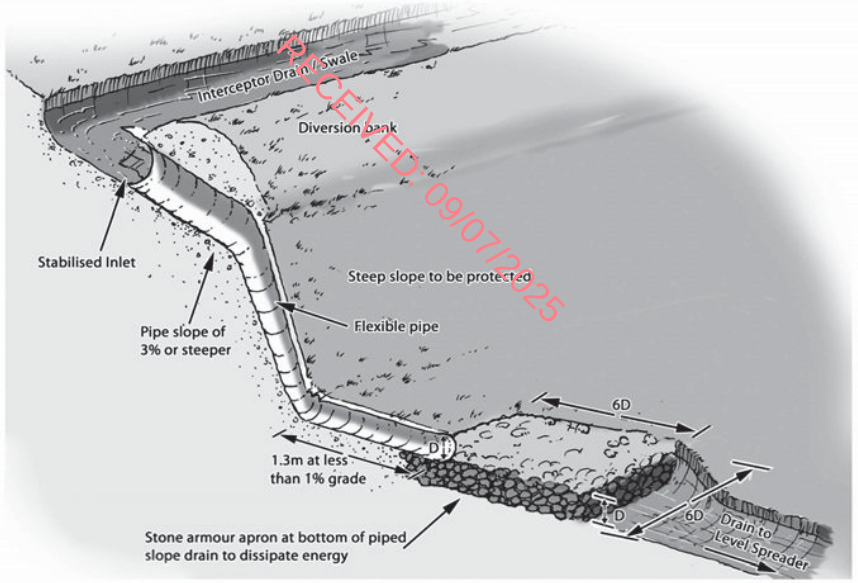
Interceptor Drain



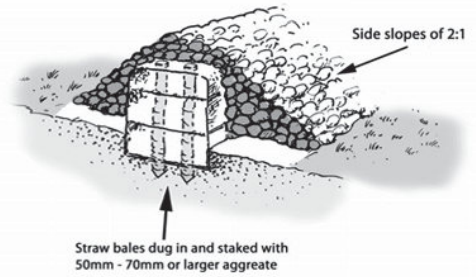
Check Dam (Stone Dam in Drain)



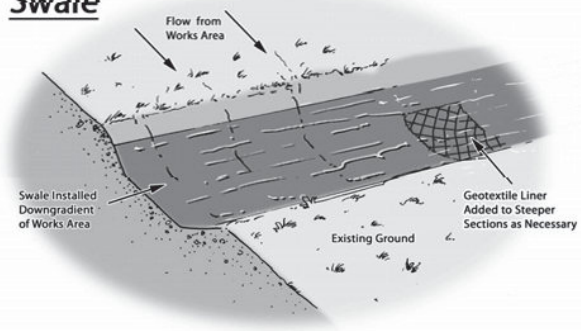
Slope Pipe Drain



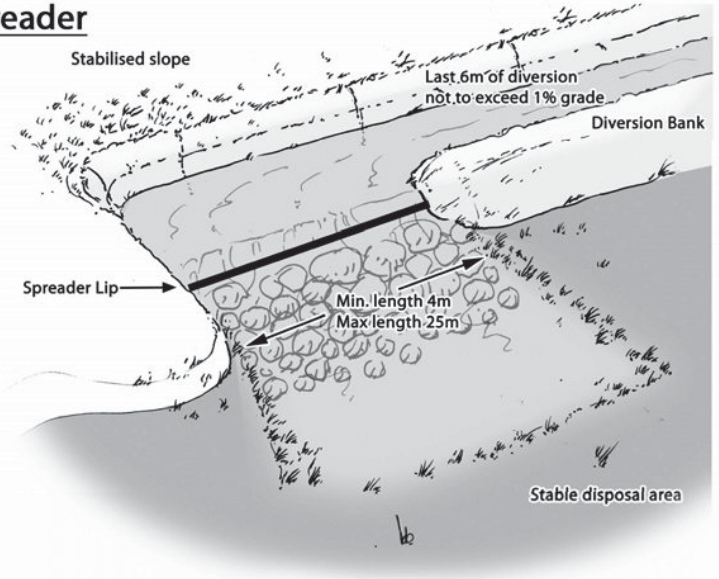
Check Dam (Straw Bale & Stone Dam - Cross Section)



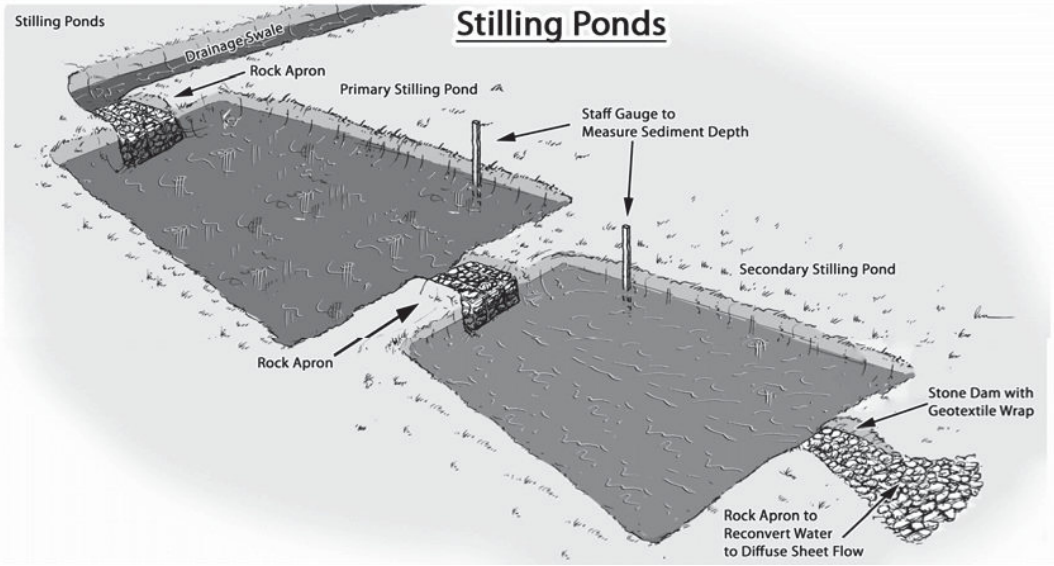
Swale



Level Spreader



Stilling Ponds



Drawing Title: Drainage Design Measures	Drawing No.: Figure 4-25	Scale: NTS
Project Title: Seskin Renewables Wind Farm		Date: 26.06.2025
Drawn By: Edward Ryan	Checked By: Eoin McCarthy	Project No.: 231103

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4.6.4.4 Level Spreaders

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

The water carried in interceptor drains will not have come in contact with works areas of the Site, and therefore should be free of silt and sediment. The level spreaders will distribute clean drainage water onto vegetated areas where the water will not be reconcentrated into a flow channel immediately below the point of discharge. The discharge point will be on level or only very gently sloping ground rather than on a steep slope so as to prevent erosion. Figure 4-25, above, shows an illustrative example of a level spreader.

The slope in the channel leading into the spreader will be less than or equal to 1%.

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

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

4.6.4.5 Piped Slope Drains

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

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

The rock apron at the outlet will consist of 6-inch stone to a depth equal to the diameter of the pipe, a length six times the diameter of the pipe. The width of the rock apron will be three times the diameter of the pipe where the pipe opens onto the apron and will fan out to six times the diameter of the pipe over its length. Figure 4-25, above, shows a diagrammatic example of a piped slope drain and rock apron.

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

Piped slope drains will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and blockages. Stake anchors or fill over the pipe will be checked

for settlement, cracking and stability. Any seepage holes where pipe emerges from drain at the top of the pipe will be repaired promptly.

4.6.4.6 Vegetation Filters

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

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

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

4.6.4.7 Stilling Ponds (Settlement Ponds)

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

Stilling ponds will be excavated/constructed to the appropriate size at each required location as shown on the drainage design drawings included in Appendix 4-3 (Appendix A) of this EIAR. The points at which water enters and exits the stilling ponds will be stabilised with rock aprons, which will trap sediment, dissipate the energy of the water flowing through the stilling pond system, and prevent erosion. The stilling ponds will reduce the velocity of flows in order to allow settlement of silt to occur. Water will flow out of the stilling pond through a stone dam, partially wrapped in geo-textile membrane, which will control flow velocities and trap any sediment that has not settled out.

Water will flow by gravity through the stilling pond system. The stilling ponds have been sized according to the size of the area they will be receiving water from and are large enough to accommodate a 10-year return rainfall event. The settlement ponds are designed for 11hr and 24hr retention times used to settle out medium silt (0.006mm) and fine silt (0.004mm) respectively (EPA, 2006)[3]. The stilling ponds will be dimensioned so that the length to width ratio will be greater than 2:1, where the length is the distance between the inlet and the outlet. Where ground conditions allow, stilling ponds will be constructed in a wedge shape, with the inlet located at the narrow end of the wedge. Each stilling pond will be a minimum of 1-1.5 metres in depth. Deeper ponds will be used to minimise the excavation area needed for the required volume.

The embankment that forms the sloped sides of the stilling ponds will be stabilised with vegetated turves, which will have been removed during the excavation of the stilling ponds area.

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

[3] Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006)

A water level indicator such as a staff gauge will be installed in each stilling pond with marks to identify when sediment is at 10% of the stilling pond capacity. Sediment will be cleaned out of the still pond when it exceeds 10% of pond capacity. Stilling ponds will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and anything else that might interfere with flows. An illustration of a stilling pond is shown in Figure 4-25.

4.6.4.8 Siltbuster

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

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

The unit stills the incoming water/solids mix and routes it upwards between a set of inclined plates for separation. Fine particles settle onto the plates and slide down to the base for collection, whilst treated water flows to an outlet weir after passing below a scum board to retain any floating material. The inclined plates dramatically increase the effective settling area of the unit giving it a very small footprint on site and making it highly mobile. Figure 4-26 below shows an illustrative diagram of the Siltbuster.

The Siltbuster units are now considered best practice for the management of dirty water pumped from construction sites. The UK Environment Agency and the Scottish Environmental Protection Agency have all recommended/specified the use of Siltbuster units on construction projects.

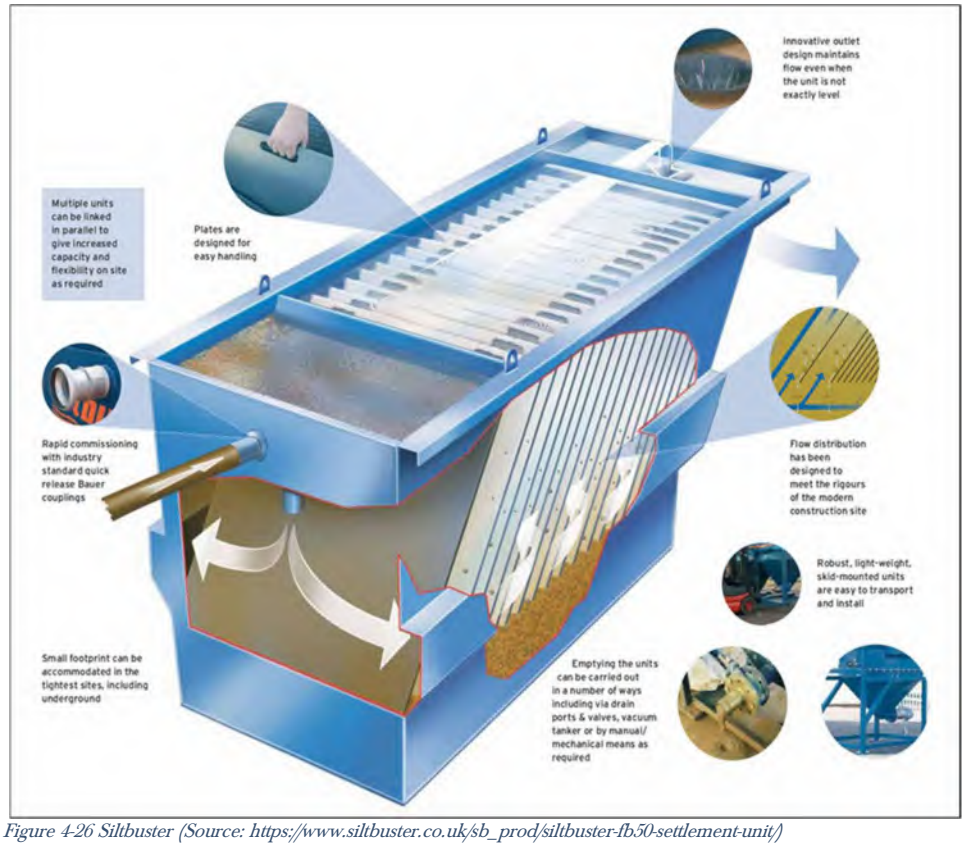


Figure 4-26 Siltbuster (Source: https://www.siltbuster.co.uk/sb_prod/siltbuster-fb50-settlement-unit/)

4.6.4.9 Silt Bags

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

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

The dewatering silt bag that will be used will be approximately 3 metres in width by 4.5 metres (see Plate 4-5 and Plate 4-6 below) in length and will be capable of trapping approximately four tonnes of silt. The dewatering silt bag, when full, will be removed from Site by a waste contractor with the necessary waste collection permit, who will then transport the silt bag to an appropriate, fully licensed waste facility.

Plate 4-5 Silt Bag with water being pumped through

Plate 4-6 Silt bag under inspection

4.6.4.10 Sedimats

Sediment entrapment mats ((see Plate 4-7 below)), consisting of coir or jute matting, will be placed at the outlet of the silt bag to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.

Plate 4-7 Typical Sedimat Details (Source: https://www.hy-tex.co.uk/)

4.6.4.11 Culverts

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

Some culverts may be installed to manage drainage waters from works areas of the Proposed Development, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base. In some cases, two or more smaller diameter culverts may be used where this depth is limited, though this will be avoided as they will have a higher associated risk of blockage than a single, larger pipe. In all cases, culverts will be oversized to allow mammals to pass through the culvert.

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

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

4.6.4.12 Silt Fences

Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50-metre buffer zone of a stream or 100m buffer zone of a lake, which is inevitable where existing roads in proximity to watercourses are to be upgraded as part of the Proposed Development. These areas include around existing culverts, around the headwaters of watercourses, and the proposed locations are indicated on the drainage design drawings included in Appendix 4-3 (Appendix A) of this EIAR.

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

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

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

4.6.4.13 Hydrocarbon Interceptors

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

4.6.5 Drainage Management and Maintenance

A Surface Water Management Plan (SWMP) has been prepared for the Proposed Development. It is intended, as an accompanying document to the Construction and Environmental Management Plan

(CEMP). It compiles the proposed surface water drainage control and treatment measures, set out in the EIAR, the drainage management and maintenance measures and the proposed surface water monitoring programme, set out in the CEMP, in a single document. The SWMP is included as Appendix 4-3 of this EIAR.

The SWMP also provides details in relation to the activity specific drainage control and mitigation measures including those measures to be implemented for the following:

- Cabling Trench Drainage
- Refuelling, Fuel and Hazardous Material Storage
- Cement Based Product Handling

4.7 Construction Management

It is estimated that the construction phase of the Proposed Development will take approximately 12-18 months from starting on Site to the commissioning of the electrical system. In the interest of breeding birds, construction will not commence during the bird breeding season which runs from the 1st of March to the 31st of August inclusive. Construction may commence at any stage from September onwards to the end of February, so that construction activities are ongoing by the time the next breeding bird season comes around and can continue throughout the next breeding season.

4.7.1 Construction Sequencing

The construction phase can be broken down into three main phases, which overlap partially and will take approximately 12-18 months to complete 1) civil engineering works - 9 months, 2) electrical works including grid connection works - 8 months, and 3) turbine erection and commissioning - 6 months. The main task items under each of the three phases are outlined below.

Civil Engineering Works

- Construct new Site roads to temporary compound.
- Clear and hardcore area for temporary Site offices. Install same.
- Construct bunded area for oil storage.
- Construct new Site roads and hard-standings and crane pads.
- Construct drainage ditches, culverts etc. integral to road construction.
- Excavate for turbine bases. Place blinding concrete to turbine bases. Fix reinforcing steel and anchorage system for tower section. Construct shuttering. Fix any ducts etc. to be cast in. Pour concrete bases. Cure concrete. Remove shutters after 1-2 days.
- Excavate trenches for Site cables, lay cables and backfill. Provide ducts at road crossings.
- Backfill tower foundations and landscape with previously stored topsoil.
- Complete Site works, reinstate Site.
- Remove temporary Site offices. Provide any gates, landscaping, signs etc. which may be required.

Electrical Works

- Construct bases/plinths for substation building.
- Install external electrical equipment at substation.
- Install transformer at compound.
- Erect stock proof and palisade fencing around substation area.
- Install internal collector network and communication cabling.
- Construct grid connection cabling.

Turbine and Meteorological Mast Erection

- Erect towers, nacelles and blades.
- Complete electrical installation.
- Grid connection.
- Install meteorological mast.
- Commission and test turbines.
- Complete Site works, reinstate Site.
- Remove temporary Site offices. Provide any gates, landscaping, signs etc. which may be required.

The phasing and scheduling of the main construction task items are outlined in Figure 4-27 below, where the 1st January has been selected as an arbitrary start date for construction activities.

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

Figure 4-27 Indicative Construction Schedule

4.7.2 Construction Phase Monitoring and Oversight

The requirement for a Construction and Environmental Management Plan (CEMP) to be prepared in advance of any construction works commencing on any development site and submitted for agreement to the Planning Authority is now well-established. The proposed procedures for the implementation of the mitigation measures outlined in such a CEMP and their effectiveness and completion is typically audited by the Ecological Clerk of Works (ECoW) on behalf of the Project Developer, in an and objective manner. The basis for auditing is presented in Section 6 of the CEMP which effectively lists all mitigation measures prescribed in any of the planning documentation. The first assessment is a simply Yes/No question, has the mitigation measure been employed on-site or not? Following confirmation that the mitigation measure has been implemented, the effectiveness of the mitigation measures has to be the subject of regular review and audit during the full construction stage of the project. If some remedial actions are needed to improve the effectiveness of the mitigation measure, then these are notified to the site staff immediately during the audit site visit, and in writing by way of the circulation

of the findings of the audit. Depending on the importance and urgency of rectifying the issue, the construction site manager is given a timeframe by when the remedial works need to be completed.

A CEMP has been prepared for the Proposed Development and is included in Appendix 4-2 of this EIAR. The CEMP includes details of drainage, spoil management, waste management etc, and describes how the above-mentioned audit will function and how the findings are presented.

In the event planning permission is granted for the Proposed Development, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for written approval.

The on-site construction staff will be responsible for implementing the mitigation measures specified in the EIAR and compiled in Section 6 of the CEMP. Their implementation will be overseen by the ECoW or supervising hydrogeologists, environmental scientists, ecologists or geotechnical engineers, depending on who is best placed to advise on the implementation. The system of auditing referred to above ensures that the mitigation measures are maintained for the duration of the construction phase, and into the operational phase where necessary.

4.8 Construction Methodologies

This section of the chapter outlines the construction methodologies to be used for the various elements of the Proposed Wind Farm and Proposed Grid Connection. Further details in relation to construction methodologies is included in Section 2 of the CEMP, included as Appendix 4-2 of this EIAR.

4.8.1 Proposed Wind Farm

4.8.1.1 Turbine and Met Mast Foundations

Each of the turbines to be erected on the Site will have a reinforced concrete base that is installed below the finished ground level. It is anticipated that the turbine foundations will be formed on competent strata (i.e., bedrock or subsoil of sufficient load bearing capacity). Where the ground conditions do not have a competent stratum of sufficient load bearing capacity, piling method will be utilised. A methodology for piled foundations is included in Section 2 of the CEMP, Appendix 4-2 of this EIAR.

Overburden will be stripped off the foundation area to a suitable formation using a 360° excavator and will be stored locally for later reuse in backfilling around the turbine foundation. A two-metre-wide working area will be required around each turbine foundation, with the sides of the excavated areas sloped sufficiently to ensure that slippage does not occur. Material excavated to create the working area will be stored locally for later reuse in backfilling and/or landscaping the working area around the turbine foundation. The excavated material will be sealed using the back of the excavator bucket and surrounded by silt fences to ensure sediment-laden run-off does not occur.

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

An embankment approximately 600 mm high will be constructed around the perimeter of each turbine foundation base and a fence will be erected to prevent construction traffic from driving into the

excavated hole and to demarcate the working area. All necessary health and safety signage will be erected to warn of deep excavations etc. Access to and from excavated bases will be formed by excavating a pedestrian walkway to 1:12 grade.

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

The anchor cage is delivered to the Site in 2 or more parts depending on the turbine type. A 360° excavator or crane with suitable approved lifting equipment will be used to unload sections of the anchor cage and reinforcing steel. The anchor cage is positioned in the middle of the turbine foundation base and is assembled accordingly. When the anchor cage is in final position it is checked and levelled by using an appropriate instrument. The anchor cage is positioned 250mm – 300mm from formation level by use of adjustable legs. Reinforcement bars are then placed around the anchor cage, first radial bars, then concentric bars, shear bars and finally the superior group of bars. Earthing material is attached during the steel foundation build up. The level of the anchor cage will be checked again prior to the concrete pour and during the concrete pour. As noted in Section 4.8.1.5 below, the transformer in each turbine is connected to the on-site substation through a network of buried electrical cables which are installed through the centre of the anchor cage.

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

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

4.8.1.2 Site Roads and Hardstand Areas

4.8.1.2.1 *New Site Access Road*

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

- Establish alignment of the new road from the construction drawings and mark out the centrelines with ranging rods or timber posts;
- All drainage measures prescribed in the detailed drainage design for the Proposed Development will be implemented around the works area;
- The road layout has been designed to avoid crossings of natural watercourses where possible;
- Where existing culverts are to be upgraded or extended, the works will be carried out to follow a method statement to be prepared in consultation with Inland Fisheries Ireland;
- The access tracks will be of single-track design with a width of 5m with localised widening at bends and changes in direction. (depending on the location within the Site)
- All spoil excavated will be managed on-site. It will be placed within the borrow pit or placed alongside access roads within the Site. Some topsoil may be temporarily stockpiled locally for reuse for landscaping purposes.
- The subsoil will be excavated down to a suitable formation layer of competent stratum;

- The road will be constructed using well-graded granular fill (imported or site-won), spread and compacted in layers typically of 200mm and a suitable capping layer to provide a homogeneous running surface. The thickness of layers and amount of compaction required will be subject to detailed design by Project Engineer in consultation with the Construction Manager based on the characteristics of the material and the compaction plant to be used;
- The new access roads will be constructed with a camber to aid drainage of surface water;
- Excavations side slopes shall not generally be greater than 1(V): 2 (H). Design slopes will be informed by the Geotechnical Engineer;
- At bends or steep inclines from the road, reflective snow poles will be erected to warn traffic on dark mornings and evenings that there is a turn in the road or a sharp incline beyond the road
- Where underground services are to be traversed during the construction of new roads throughout the Proposed Wind Farm site, they will be traversed as per the methodology as outlined above.

4.8.1.2.2 *Upgrading of Existing Site Access Road*

Approximately 1.5km of the existing roads will require upgrading which will comprise widening of the roadway to a total running width of approximately five metres, with wider sections at corners and the laying of a new surface dressing on the existing section of roadway where necessary. The road widening will be undertaken as follows:

- If it is considered that the current road formation level is adequate to support required bearing, then no upgrade or widening works will be completed.
- Otherwise, where required, the subsoil in the existing road verge will be excavated down to a suitable formation layer.
- All spoil excavated will be managed on-site. It will be placed within the borrow pit or placed alongside access roads within the Site (which will be located outside identified watercourse 50m buffers). Some topsoil may be temporarily stockpiled locally for reuse for landscaping purposes.
- All drainage measures prescribed in the detailed drainage design for the Proposed Development will be implemented around the works area.
- Well-graded granular fill (imported or site-won) will be spread and compacted in layers up to 200mm to provide a homogeneous running surface. The thickness of layers and amount of compaction required will be decided by the Construction Manager based on the characteristics of the material and the compaction plant to be used.
- These layers of granular fill will be brought to the same level as the top of the existing road surface.
- Where required, a layer of geogrid will be installed directly onto the top of the granular fill layer and the existing road surface.
- A layer of finer well graded stone for the running surface will be laid on the geogrid and compacted.
- Upon completion the upgraded roads will be a single-track design with a width of 5m with localised widening at bends and changes in direction (depending on the location within the Site).
- Prior to any works commencing on the upgrade of existing roads, the requirement for additional roadside drainage will be considered by the Project Hydrologist in line with the proposals outlined in Appendix 4-3 of the EIAR.

4.8.1.3 Culvert Crossing

All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Proposed Wind Farm will be suitably sized for the expected peak flows in the watercourse. Some culverts may be installed to manage drainage waters from works areas of the Proposed Wind Farm, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base but will have a minimum 900m diameter. In all cases, culverts will be oversized to allow mammals to pass through the culvert.

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

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

4.8.1.4 Temporary Construction Compound

As discussed in Section 4.3.1.6, there are two proposed construction compounds; the primary construction compound will be located at the 240m southeast of T03. There is also one construction compound adjacent to the proposed 38kV substation that forms part of the Proposed Grid Connection. The compounds will be constructed in the same manner as follows:

- The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter;
- The compound platform will be established using a similar technique as the construction of the substation platform as discussed below in Section 4.8.2.1;
- A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well graded granular material will be spread and lightly compacted to provide a hard area for Site offices and storage containers;
- A limited amount of fuel will have to be stored in appropriately bunded containers and a designated area for oil storage will be constructed within the compound.
- Areas within the compound will be constructed as site roads and used as vehicle hardstandings during deliveries and for parking;
- A bunded containment area will be provided within the compound for the storage of lubricants, oils and site generators etc;
- A waste storage area will be provided within the compound;
- The compound will be fenced and secured with locked gates if necessary; and,
- Upon completion of the Proposed Development, the temporary construction compounds will be decommissioned and allowed to vegetate naturally.

4.8.1.5 Underground Electrical (33kV) and Communication Cabling

The transformer in each turbine and the met mast is connected to the on-site substation through a network of buried electrical and communication cabling. The ground is trenched using a mechanical excavator. The top layer of soil (or road surface) is removed and saved so that it is replaced on completion. The cables will be bedded with suitable material. The cables will be laid at a depth of approximately 1.2m below ground level; a suitable marking tape is installed between the cabling and the surface (see Plate 4-8 below illustrating an example of a single cable trench). On completion, the

ground will be reinstated. The route of the underground electrical and communication cabling will follow the access tracks as illustrated on the Proposed Wind Farm layout drawings included as Appendix 4-1 of the EIAR. The cabling may be placed on either side of the road footprint on both sides of the road and/or within the road. The exact configuration of the underground cabling will be set by the requirements of the electrical designers at detailed design stage.

Plate 4-1 Typical Cable Trench View

4.8.1.6 Borrow Pit

The estimated volume to be extracted from the borrow pit for the construction of the Proposed Wind Farm is up to 81,075m^3. This figure presented is the anticipated maximum volumes; however, the actual volumes to be removed from the borrow pit will be confirmed at the time of construction and following detailed pre-construction site investigation works.

The borrow pit will be excavated and backfilled as follows:

- The area to be used for the borrow pit will be marked out at the corners using ranging rods or timber posts. Drainage runs, and associated settlement ponds will be installed around the perimeter;
- The initial borrow pit excavation will involve removal of soil to the top of bedrock. These materials will be stored temporarily in the borrow pit or placed alongside access roads;
- All drainage measures prescribed in the detailed drainage design for the Proposed Development will be implemented around the works area;
- The bedrock material will be extracted by breaking and blasting (section 4.8.1.6.1 and 4.8.1.6.2 below) from the borrow pit and stockpiled or used as required;
- The use of material won from the borrow pit will be sequential with new road construction or turbine foundation formations;
- Temporary stockpiling of aggregates will be 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 excavation progress and become deeper, surface water and groundwater ingress will be removed via pumping to settlement ponds, and re-distribution locally across natural vegetated areas. Where required, additional

specialist water treatment measures will be employed to ensure no deterioration in downstream water quality occurs;
- When extraction ceases within the borrow pit, the borrow pit will be backfilled with excavated spoil and its associated drainage measures will be removed.
- The extraction area of the borrow pit will have to be permanently secured and a stock-proof fence will be erected around the borrow pit to prevent access to these areas as well as the installation of appropriate health and safety signage.

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

4.8.1.6.1 Rock Breaking

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

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

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

4.8.1.6.2 Rock Blasting

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

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

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

Commission for the Mining and Other Extractive Industries, 2002)[4] and the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*[5].

4.8.2 Proposed Grid Connection

4.8.2.1 Onsite 38kV Electricity Substation and Control Buildings

A detailed drawing of the proposed onsite 38kV substation is shown in Figure 4-13. The proposed onsite 38kV substation will be constructed by constructed by the following methodology:

- The area of the on-site substation will be marked out using ranging rods or wooden posts and the soil and overburden stripped and temporarily stockpiled for later use in landscaping. Any excess material will be sent to the borrow pit or placed alongside access roads.
- 1 no. control building will be built within the on-site substation compound.
- The foundations will be excavated down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it. An anti-bleeding admixture will be included in the concrete mix.
- The block work walls will be built up from the footings to DPC level and the floor slab constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors.
- The block work will then be raised to wall plate level and the gables & internal partition walls formed. Scaffold will be erected around the outside of the building for this operation.
- The roof slabs will be lifted into position using an adequately sized mobile crane.
- The timber roof trusses will then be lifted into position using a telescopic load all or mobile crane depending on-site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather.
- The transformer, electrical equipment, and storage container plinths will be excavated down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it. An anti-bleeding admixture will be included in the concrete mix.
- Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed.
- The electrical equipment will be installed and commissioned.
- Perimeter fencing will be erected.
- The construction and components of the substation will be built to ESBN specifications.

4.8.2.2 Temporary Construction Compound

The temporary construction compound adjacent to the proposed onsite 38kV substation will be constructed as outlined above in Section 4.8.1.4.

4.8.2.3 Underground Cabling Trench

The underground cabling works will consist of the installation of ducts in an excavated trench to accommodate power cables, and a fibre communications cables to allow communications between the proposed 38kV onsite substation and the existing 110kV Ballyragget substation.

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

The proposed grid connection works will require a road opening licence under Section 254 of the Planning and Development Act 2000, as amended, from Kilkenny County Council. A Traffic Management Plan (TMP) (Appendix 15-2 of this EIAR) will be agreed with the local authority prior to the commencement of the development where required. The TMP will outline the location of traffic management signage, together with the location of any necessary road closures and the routing of appropriate diversions. Where diversions are required, these will be agreed with the local authority in advance of the works commencing.

The UGC will be a single circuit connection consisting of 3 no. 110mm diameter HDPE power cable ducts and 1 no. 110mm diameter HDPE communications duct to be installed in an excavated trench, typically 600mm wide by 1,200mm deep. For trench designs there will be variations on the design to adapt to service crossings and watercourse crossings.

The underground electrical cabling will be laid beneath the surface of the Proposed Development site and the public road using the following methodology:

- Before works commence, updated surveying will take place along the proposed cable route, with all existing culverts identified. All relevant bodies i.e. ESB, Kilkenny County Council etc. will be contacted and all up to date drawings for all existing services sought.
- When the cable is located on public roads, a traffic management plan will be prepared prior to any works commencing. A road opening licence will be obtained where required and all plant operators and general operatives will be inducted and informed as to the location of any services.
- A tracked 360-degree excavator will then proceed to dig out the proposed trench, typically to a depth of 1200mm, within which the ducts will be laid.
- The cable ducts will be concrete surrounded where they pass under the public road and under drains or culverts.
- Trench supports will be installed, or the trench sides will be benched or battered back where appropriate and any ingress of ground water will be removed from the trench using submersible pumps, fitted with appropriate silt filtration systems, to prevent contamination of any watercourse.
- Once the trench has been excavated, a base-layer will be laid and compacted, comprising Clause 804, or 15 Newton CBM4 concrete as required.
- The ducting will be installed as per specification, with couplers fitted and capped to prevent any dirt etc. entering the duct. In poor ground conditions, the ends of the ducts will be shimmed up off of the bed of the trench, to prevent any possible ingress of water dirt. The shims will be removed again once the next length has been connected. Extreme care will be taken to ensure that all duct collars (both ends) are clean and in good condition prior to ducts being joined.
- As the works progress, the as-built location of the ducting will be recorded using a total station or GPS.
- As per the associated base-layer (Clause 804 material or 15 Newton CBM4 concrete) will be installed and compacted as per approved detail, with care not to displace the ducting.
- Spacers will be used to ensure that the correct cover is achieved at both sides of the ducting.
- The remainder of the trench will be backfilled in two compacted layers with approved engineer's specified material.
- Yellow marker warning tape will be installed across the width of the trench, at 300mm depth,
- The finished surface is to be reinstated, as per original specification. Off-road cabling may be finished with granular fill to facilitate access to the trench for any potential maintenance that is required during the operational phase of the Proposed Development.

- Marker posts will then be placed at regular intervals (generally at joint bays and any change in direction) to denote the location of the underground power cables.

4.8.2.4 Existing Underground Services

The location and avoidance of existing underground services (e.g. watermains, other underground electricity cables, fibre broadband etc.) was a key consideration in determining the position and alignment of the Proposed Grid Connection underground electricity cabling route. However, notwithstanding this consideration, in order to facilitate the installation of an underground grid connection, it may be necessary to relocate existing underground services such as water mains or existing cables. In advance of any construction activity, the contractor will undertake additional surveys of the proposed route to confirm the presence or otherwise of any services. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works.

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

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

4.8.2.5 Joint Bays

Joint bays are typically pre-cast concrete chambers where lengths of cable will be joined to form one continuous cable. They will be located at various points along the ducting route generally between 700 to 1100 metres intervals or as otherwise required by ESB/Eirgrid and electrical requirements. Joint Bays are typically 2.5m x 6m x 1.75m pre-cast concrete structures installed below finished ground level.

Where possible, joint bays will be located in areas where there is a natural widening/wide grass margin on the road in order to accommodate easier construction, cable installation and create less traffic congestion. Joint Bays will be located in the non-wheel bearing strip of roadways, however given the narrow profile of local roads this may not always be possible. During construction the joint bay locations will be completely fenced off once they have been constructed they will be backfilled until cables are being installed. Once the cabling is installed the joint bays will be permanently backfilled with the existing surface re-instated and there will be no discernible evidence of the joint bay on the ground.

In association with Joint Bays, Communication Chambers are required at every joint bay location to facilitate communication links between the onsite 38kV substation and the existing 110kV Ballyragget substation. Earth Sheath Link Chambers are also required approximately every second joint bay along the cable route. Earth Sheath Links are used for earthing and bonding cable sheaths of underground power cables, installed in a flat formation, so that the circulating currents and induced voltages are eliminated or reduced. Earth Sheath Link Chambers and Communication Chambers are located in close proximity to Joint Bays. Earth Sheath Link Chambers and Communication Chambers will be pre-cast concrete structures with an access cover at finished surface level. The locations of the joint bays and chambers are shown on the site layout drawings included in Appendix 4-1 of this EIAR. Standard joint bay and comms chamber details are shown in Figures 4-28 and 4-29.

The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers within the curtilage of the public road is subject to approval by ESBN and Eirgrid.

4.8.2.6 Underground Cable Watercourse Crossing

There is one identified EPA/OSI mapped watercourse, the River Nore, along the Proposed Grid Connection underground electrical cabling route. This location is shown in Figure 4-1.

The directional drilling construction methodology for this crossing has been designed to eliminate the requirement for in-stream works or the construction of any clearspan crossing structure at this location.

4.8.2.6.1 *Horizontal Directional Drilling*

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

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

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

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

Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring will be put in place during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exits. The directional drilling methodology is further detailed in Figure 4-30.

4.8.2.7 Underground Culvert/Service Crossings

No drainage culverts have been identified along the Proposed Grid Connection underground cabling route. It is likely that underground services exist along this section of the of the N77 National Secondary Road serving the properties along the same. A general description of the various construction methods employed at culvert/ drain/service crossings are described in the following sections below.

In the event that an unidentified existing culvert/service crossing is located during the construction phase, the most appropriate proposed crossing methodology, as outlined below, will be used to traverse the culvert/service depending on culvert/service type, depth, size and local ground conditions.

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

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

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

In the event that none of the above methods are appropriate, directional drilling, as described in Section 4.8.2.6.1 above, will be utilised.

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

Where adequate cover exists above a culvert/service or where a new bottomless box culvert or clear-span structure has been installed at a sufficient depth, the standard ESB approved trefoil arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert. The cable trench will pass over the culvert in a standard trench, as shown in Figure 4-31.

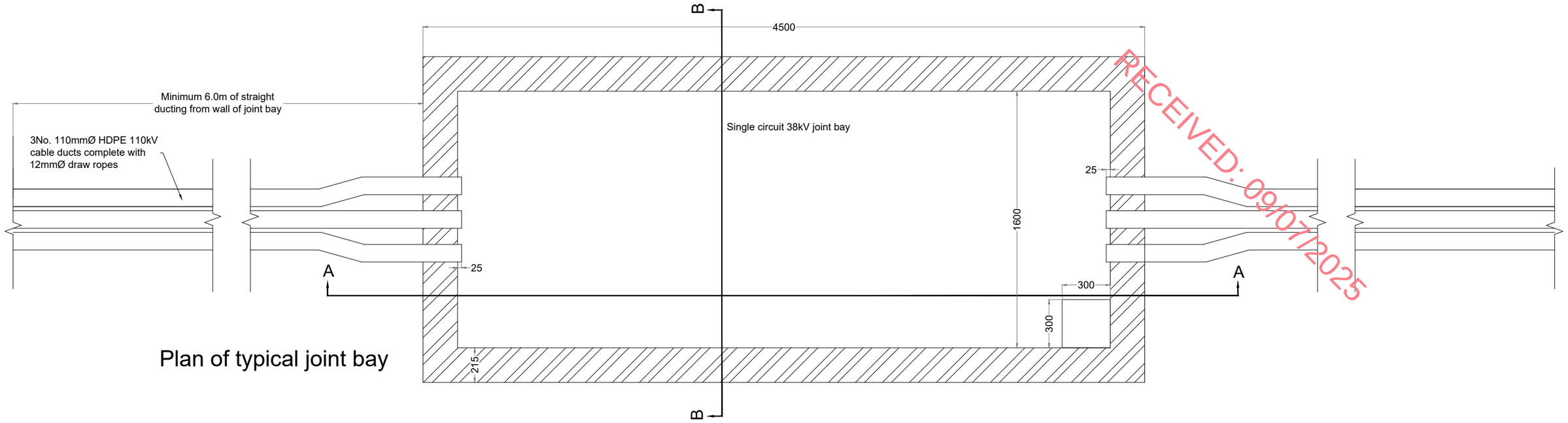
4.8.2.7.2 *Flatbed Formation Under– Option B*

Where cable ducts are to be installed under an existing watercourse or service crossing where sufficient cover cannot be achieved by installing the ducts in a trefoil arrangement, the ducts will be laid in a much shallower trench, the depth of which will be determined by the location of the top of the obstacle or the depth of excavatable material under it. The ducts will be laid in this trench in a flatbed formation under the existing culvert/ service and will be encased in 6mm thick steel galvanized plate with a 35N concrete surround as per ESB Networks specification as shown in Figure 4-32.

4.8.2.7.3 *Flatbed Formation over– Option C*

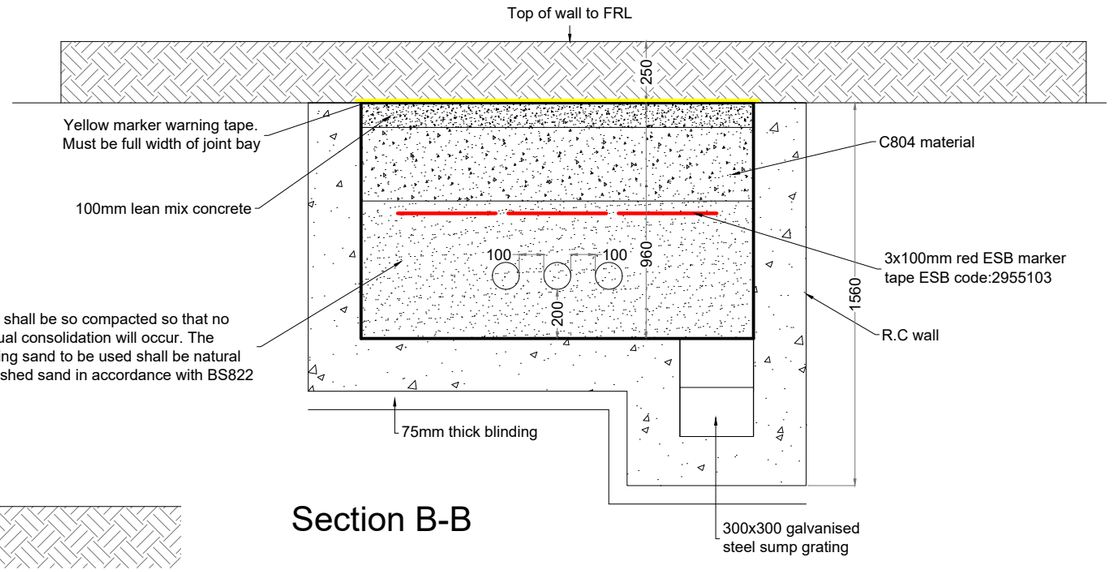
Where cable ducts are to be installed over a culvert or service crossing where sufficient cover cannot be achieved by installing the ducts in a trefoil arrangement, the ducts will be laid in a much shallower trench the depth of which will be determined by the location of the top of the obstacle or the depth of excavatable material over it. The ducts will be laid in this trench in a flatbed formation over the existing culvert and will be encased in 6mm thick steel galvanized plate with a 35N concrete surround as per ESB Networks specification as shown in Figure 4-33.

Where a culvert or service has insufficient cover depth to fully accommodate the required trench, the ducts can be laid in a flatbed formation partially within the existing road surface as shown in Figure 4-34. Where this option is to be employed, the ducts will also be encased in steel with a concrete surround as per ESB Networks specifications. In order to achieve cover over these ducts and restore the carriageway of the road, it may be necessary to raise the pavement level locally to fully cover the ducts. The increased road level will be achieved by overlaying the existing pavement with a new wearing course as required. Any addition of a new pavement will be tied back into the existing road pavement at grade. After the crossing over the culvert has been achieved, the ducts will resume to the trefoil arrangement within a standard trench.

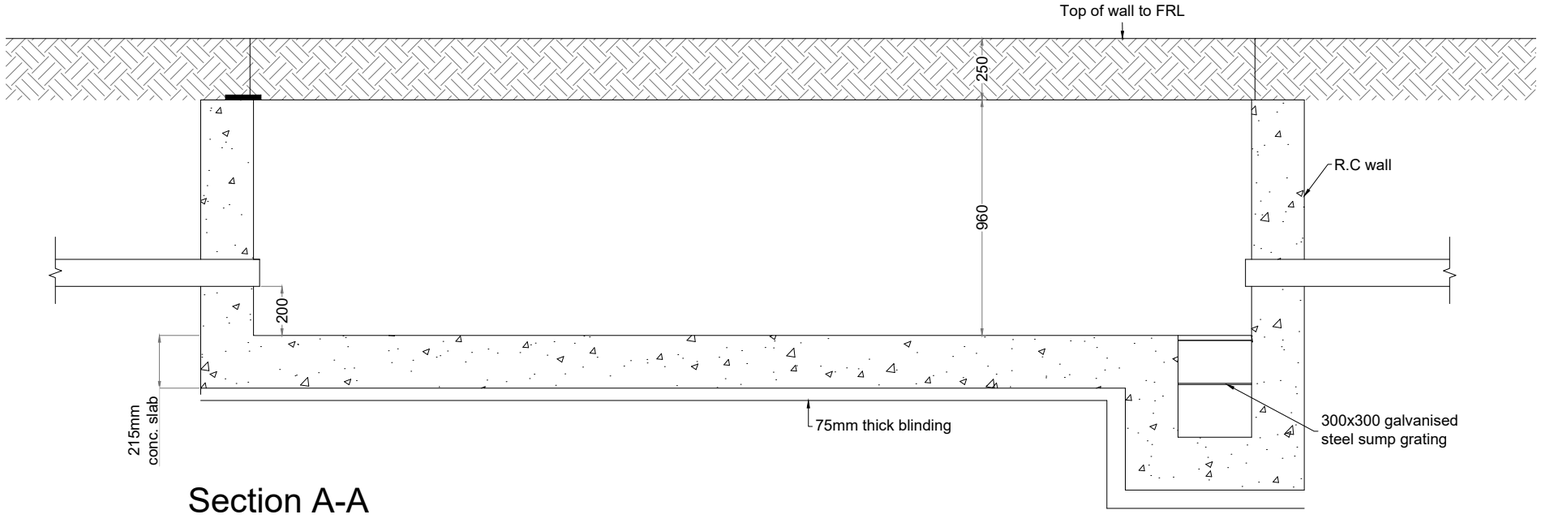


Plan of typical joint bay

Note:
Comms Chamber, as shown in
Dwg No. 231103-31, to be located
adjacent to Joint Bay



Section B-B



Section A-A

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**			
DRAWING TITLE: **Joint Bay Detail**			
PROJECT No.: **231103**	DRAWING No.: **Fig 4-28**		SCALE: **1:25 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **RD**	DATE: **30.06.2025**	REVISION.: **P01**

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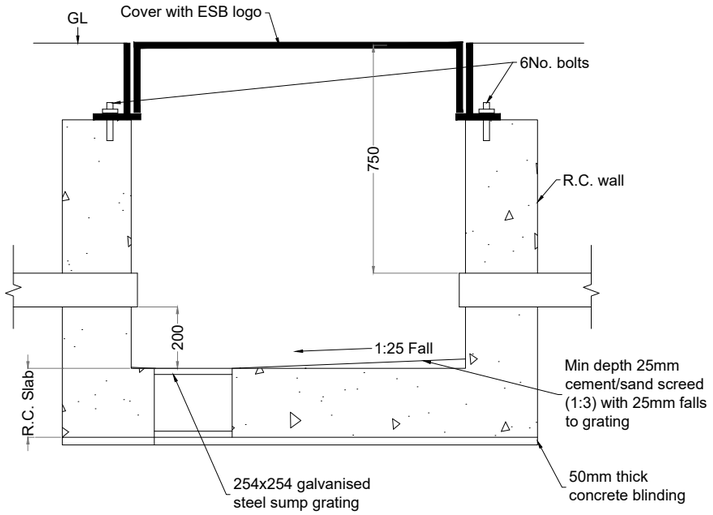
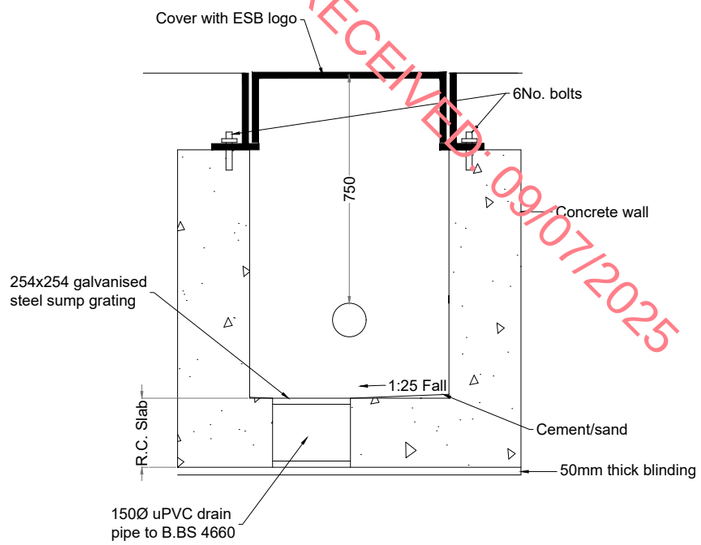
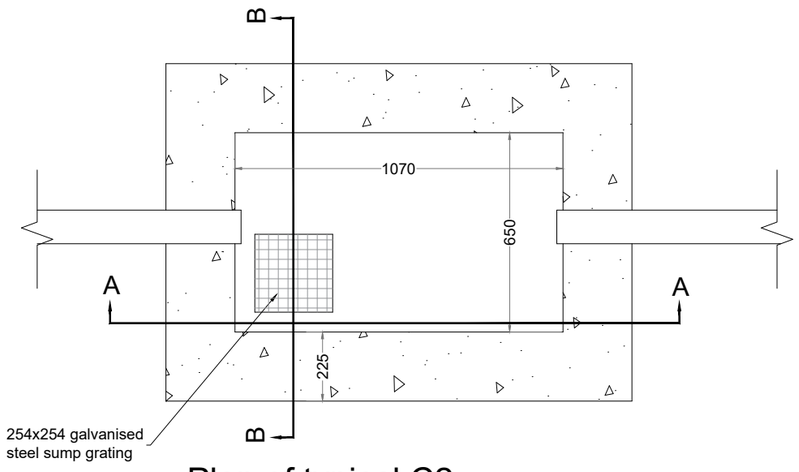


Section A-A



Section B-B



Plan of typical C2
communications chamber

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**

DRAWING TITLE: **C2 Comms Chamber Detail**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Fig 4-29	1:20 @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
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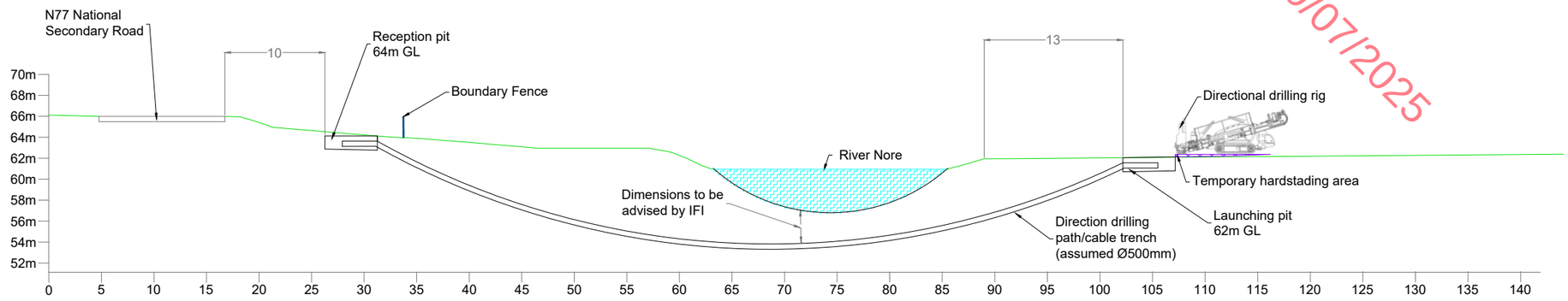
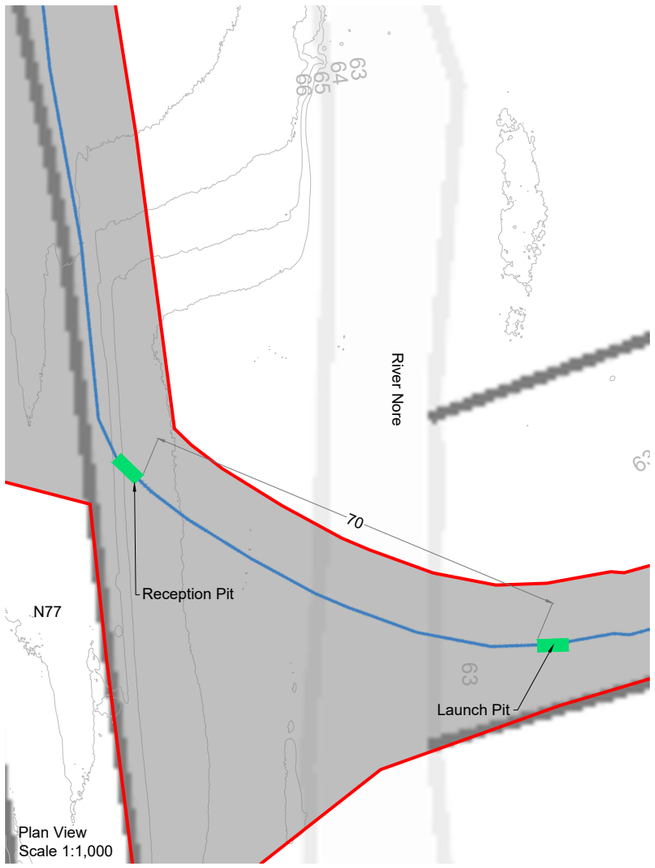


Contextual Section
Scale 1:500



Plan View
Scale 1:1,000

Directional Drilling Rig

Drilling Rig & Launch Pit

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**			
DRAWING TITLE: **Directional Drilling**			
PROJECT No.: **231103**		DRAWING No.: **Fig 4-30**	SCALE: **1:500 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **RD**	DATE: **30.06.2025**	REVISION.: P01

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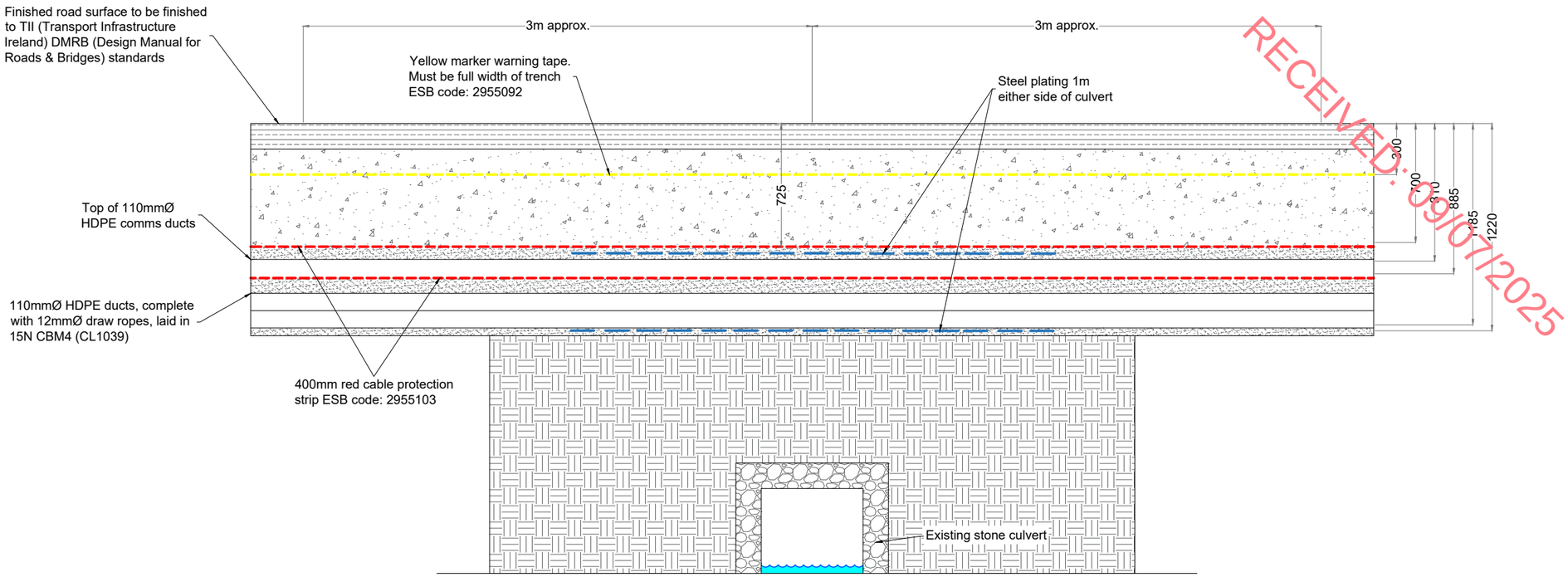
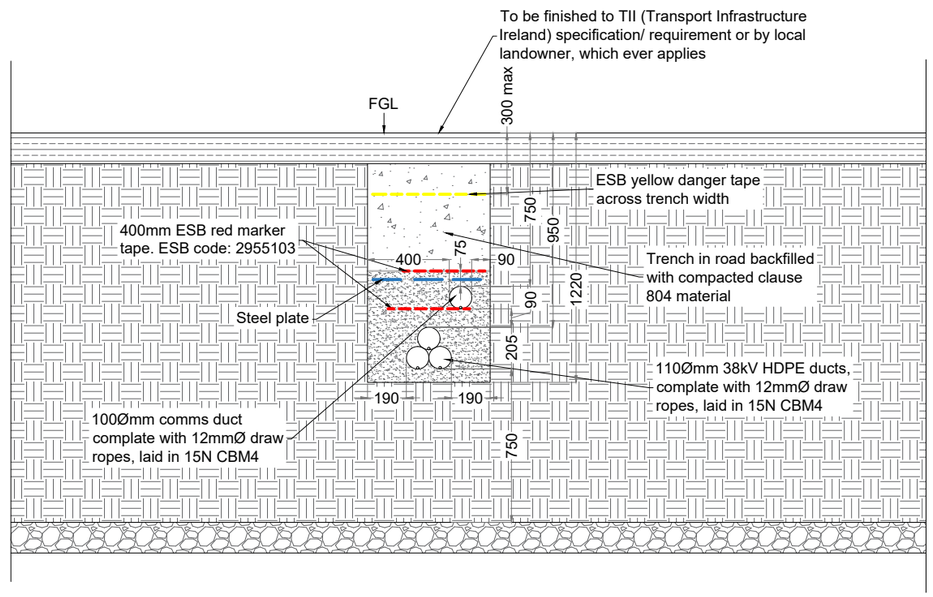


Longitudal section at watercourse crossing



Cross section at watercourse crossing

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**			
DRAWING TITLE: **Cable Trench Over Culvert**			
PROJECT No.: **231103**		DRAWING No.: **Fig 4-31**	SCALE: **1:30 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **RD**	DATE: **30.06.2025**	REVISION.: P01

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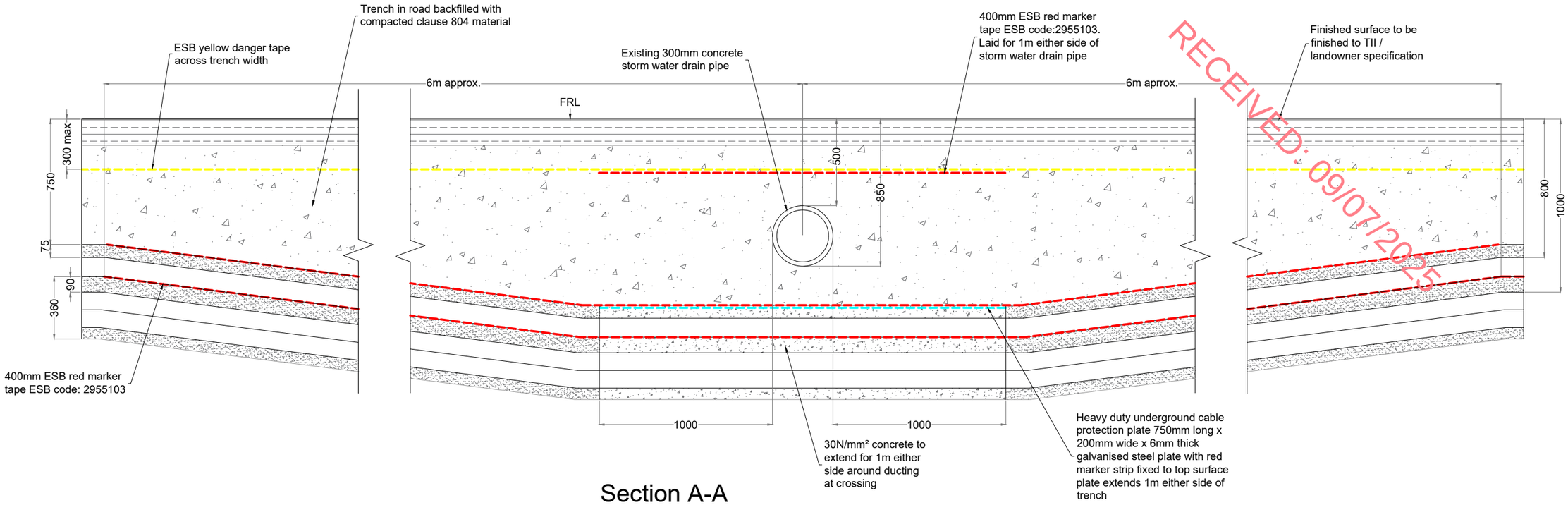
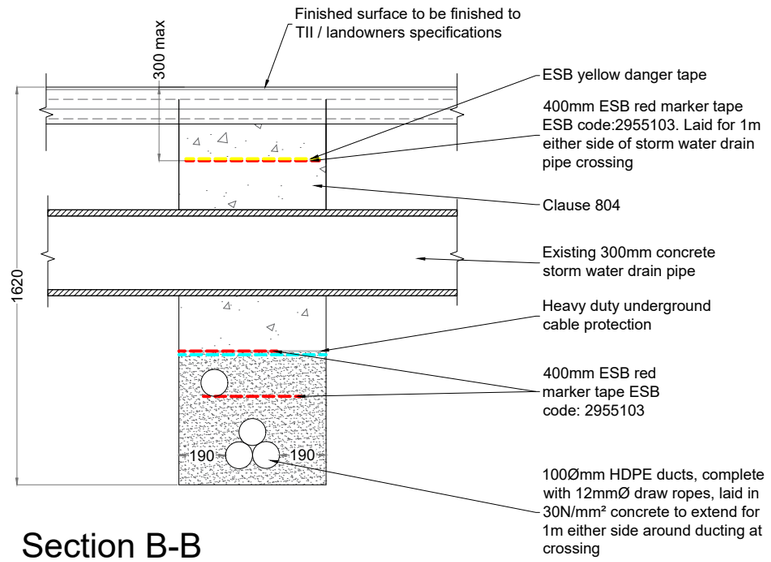


Section A-A

Scale 1:25



Section B-B

Scale 1:25

PROJECT TITLE: **Seskin Renewables Wind Farm, Co. Kilkenny/Laois**			
DRAWING TITLE: **Cable Trench Under Piped Culvert**			
PROJECT No.: **231103**		DRAWING No.: **Fig 4-32**	SCALE: **1:25 @ A3**
DRAWN BY: **JOB**	CHECKED BY: **RD**	DATE: **30.06.2025**	REVISION.: P01

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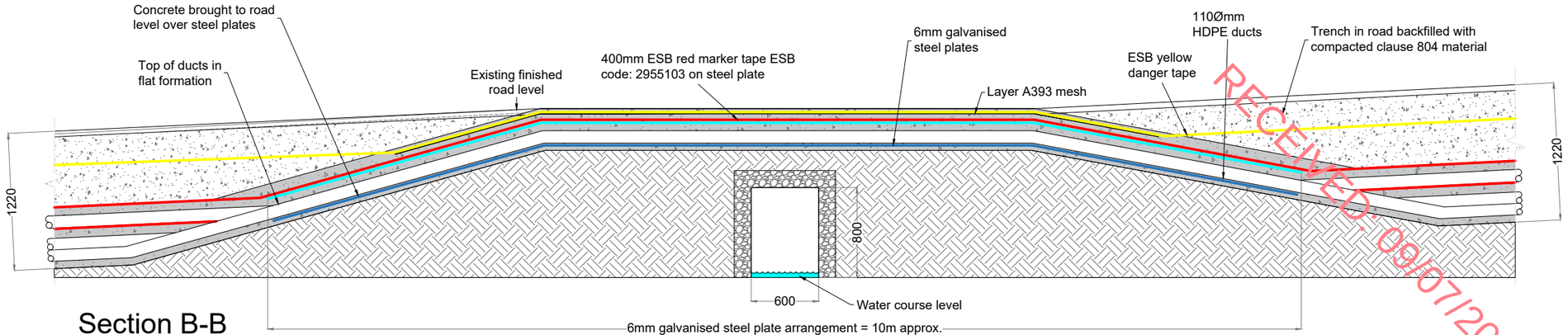

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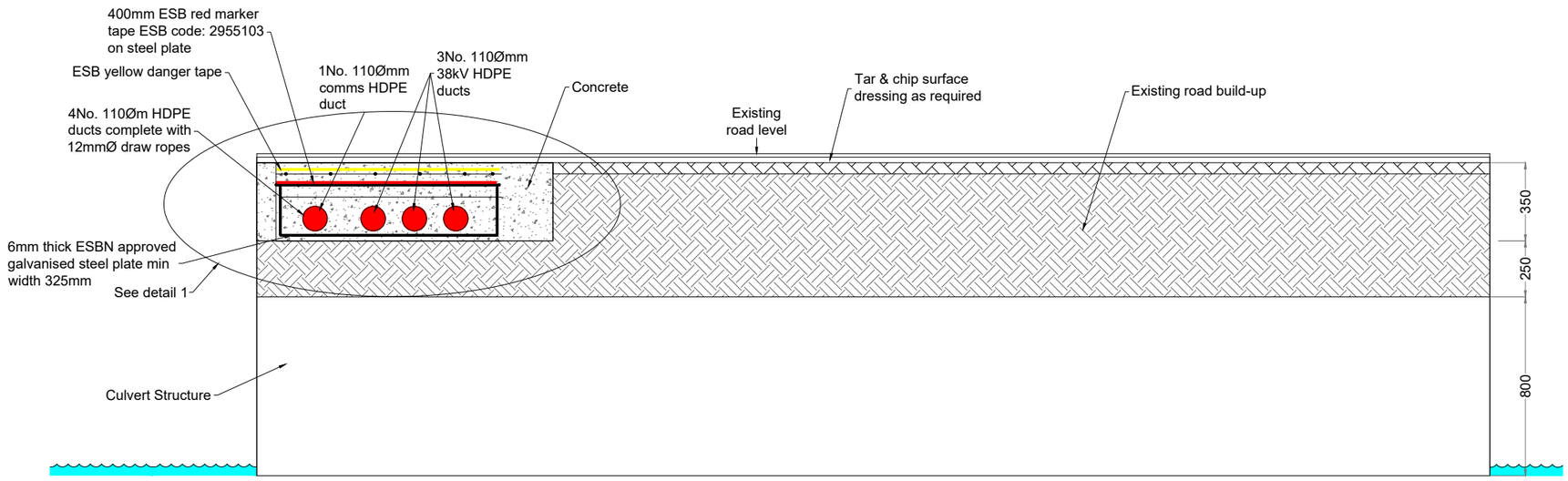

Section A-A

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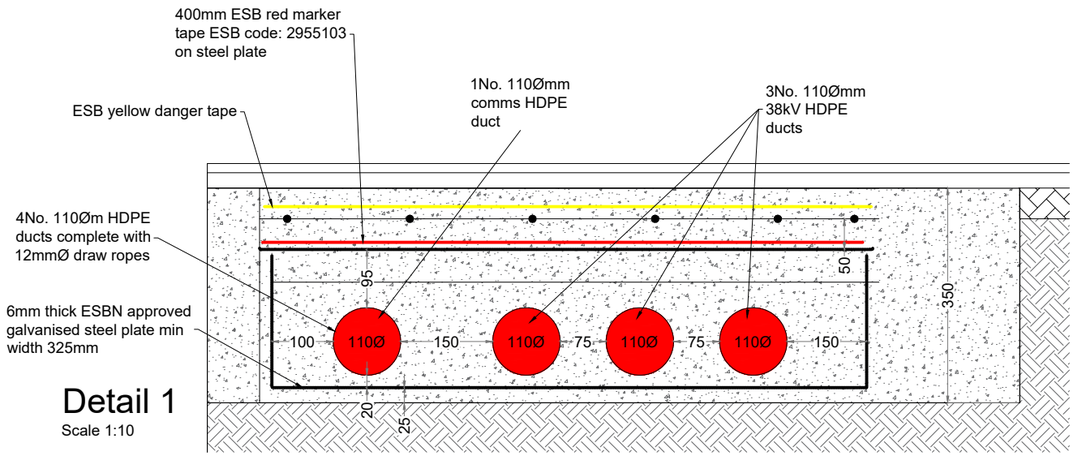

Detail 1

Scale 1:10

PROJECT TITLE:	**Seskin Renewables Wind Farm, Co. Kilkenny/Laois**
DRAWING TITLE:	**Cable Trench Flatbed Formation Over Culvert**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Fig 4-33	As Shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
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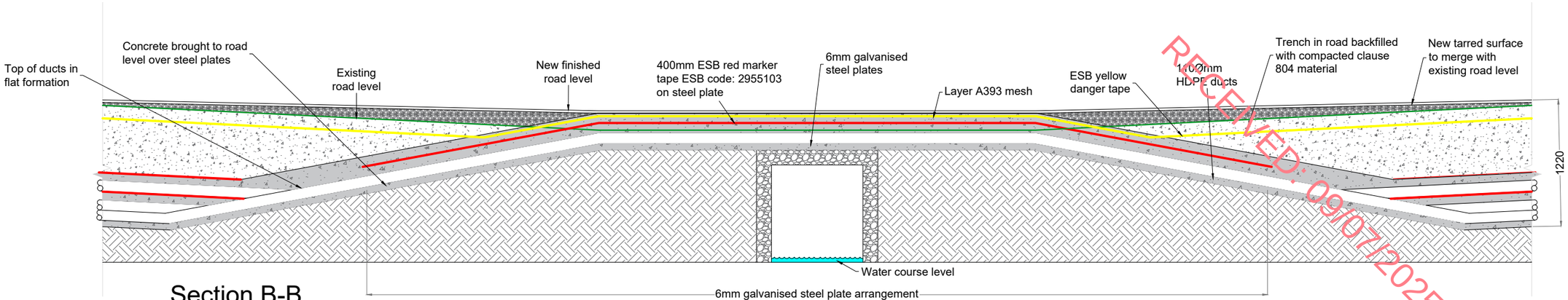

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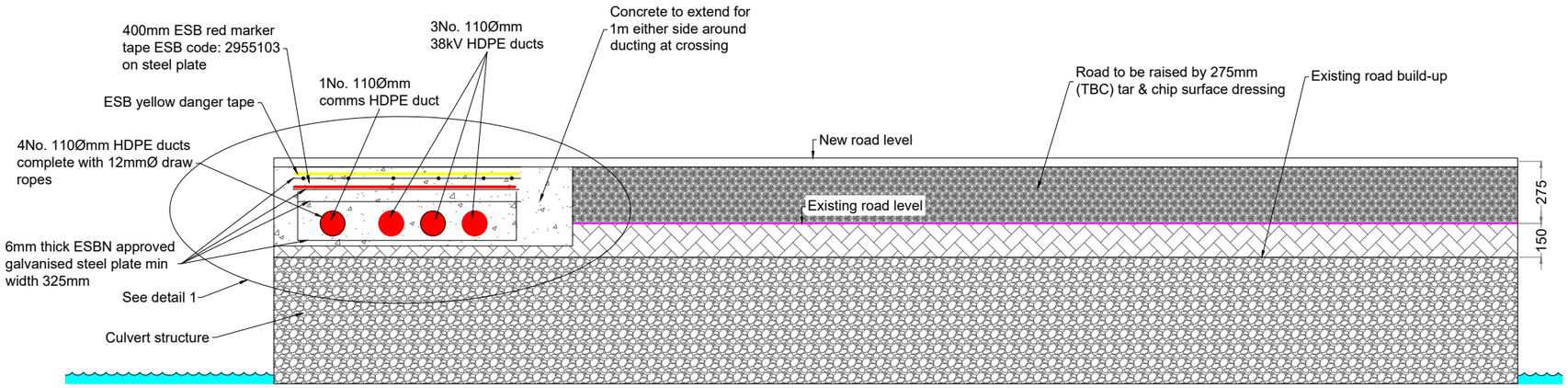
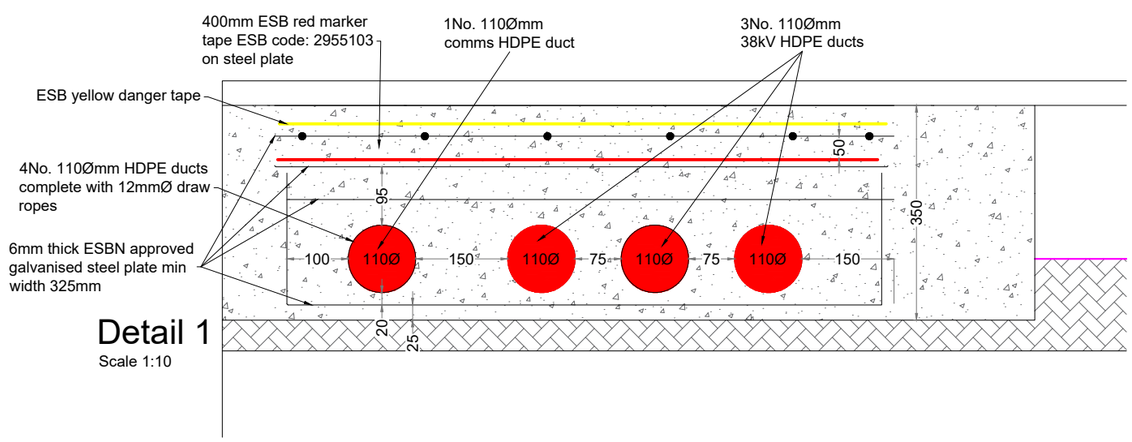
Scale 1:45



Section A-A

Scale 1:25



Detail 1

Scale 1:10

PROJECT TITLE:	**Seskin Renewables Wind Farm, Co. Kilkenny/Laois**
DRAWING TITLE:	**Cable Trench Flatbed at Road Surface Level**

PROJECT No.:	DRAWING No.:	SCALE:
231103	Fig 4-34	As Shown @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
JOB	RD	30.06.2025	P01

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4.9 Operation

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

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

Certain Proposed Development site components will be subject to routine and periodic maintenance. Each turbine would be subject to a routine maintenance programme involving a number of checks and changing of consumables, including oil changes. In addition there is often a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes requiring a crane. Typically maintenance traffic will consist of four-wheel drive vehicles or vans. The site roads will also require periodic maintenance.

4.10 Decommissioning

The wind turbines proposed as part of the Proposed Development are expected to have a lifespan of approximately 35 years. Following the end of the operational life of the wind farm, the wind turbines may be retained and the operational life extended or replaced with a new set of turbines, subject to planning permission being obtained. In the event that neither of the above options are implemented, the Proposed Development will be decommissioned fully as agreed with the Planning Authority. The onsite substation will remain in place as it will be under the ownership of the ESB and will form a permanent part of the national electricity grid.

Upon decommissioning of the Seskin Renewables Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected. The turbines will be disassembled with a similar model of crane that was used for their erection. The turbine will likely be removed from site using the same transport methodology adopted for delivery to site initially. The turbine materials will be transferred to a suitable recycling or recovery facility.

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

All above ground turbine components would be separated and removed off-site for recycling. Turbine foundations would remain in place underground and would be covered with earth and reseeded as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in unnecessary environment emissions such as noise, dust and/or vibration.

Site roadways could be in use for purposes other than the operation of the Proposed Development by the time the decommissioning of the Proposed Development is to be considered, and therefore it may be more appropriate to leave the Site roads in situ for future use. It is envisaged that the roads will provide a useful means of transport as agricultural roads for the pastoral farming on the Site.

The underground grid connection cabling and on-site substation will remain in place as it will be under the ownership and control of the ESB and Eirgrid.

A Decommissioning Plan has been prepared and included as Appendix 4-4 of this EIAR, which will be agreed with the local authority prior to any decommissioning. The plan provides details of the methodologies that will be adopted, throughout decommissioning, the environmental controls that will be implemented, the Emergency Response Procedure to be adopted, methods for reviewing compliance and an indicative programme of decommissioning works.

The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will agreed with the competent authority at that time. The potential for effects during the decommissioning phase of the proposed renewable energy development have been assessed in this EIAR.

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

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