5. PROJECT DESCRIPTION

5.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) describes the design details of the Sceirde Rocks Offshore Wind Farm and all its component parts, hereafter referred to as 'the Project'. Consultation with An Bord Pleanála confirmed that the planning application for the Project will be submitted under Section 291 of the Planning and Development Act, 2000, as amended.

The Project will consist of the construction, operation and maintenance, and decommissioning of the following:

Offshore Development:

I. 30 no. offshore Wind Turbine Generators (WTGs) with gravity based fixed-bottom foundations with the following details:
   - Tip height of 324.9m above Lowest Astronomical Tide (LAT),
   - Rotor diameter of 292m;
   - Hub height of 178.9m above LAT;
II. 1 no. 220kV offshore substation (OSS) of 55 m in height above LAT (including crane and communications mast) with a gravity based fixed bottom foundation. The OSS consists of an offshore electrical substation platform with multiple decks accommodating the electrical and communications plant and equipment, ancillary components and welfare facilities;
III. A network of inter-array electrical and communication cables, of approximately 73 km in length, connecting the 30 WTGs to the OSS;
IV. A 220kV offshore export cable complete with communication lines, of approximately 63.5 km in length, laid in and on the seabed from the OSS to landfall in the townland of Killard, Co. Clare;
V. Seabed preparation for WTG, OSS and cable installation including rock placement, dredging and disposal;
VI. Cable protection including trenching and burial, rock berms, and concrete mattresses.

Onshore Development:

VII. An underground Transition Joint Bay (TJB) at the landfall point in the townland of Killard, Co. Clare connecting the offshore export cable to the onshore grid connection cable. The TJB consists of an underground concrete chamber (20m x 5m wide, with a depth of 2.5m), where the proposed offshore export cable will be connected to the onshore grid connection cable;
VIII. 220kV onshore grid connection and communications cables laid underground, primarily in the public road corridor with small sections in third party lands, for approximately 19.3 km between the TJB in the townland of Killard, Co. Clare and the new 220kV Onshore Compensation Compound (OCC) in the townland of Ballymacrinan, Co. Clare;
IX. 220kV onshore grid connection and communication cables laid underground, primarily in the public road corridor with small sections in third party lands, for approximately 3 km between the new 220kV OCC in the townland of Ballymacrinan, Co. Clare and the existing Moneypoint 220kV substation in the townland of Carrowdotia South, Co. Clare;
X. 43 no. joint bays complete with communication chambers and link box chambers along the onshore grid connection route between the TJB in the townland of Killard, Co. Clare to the existing 220kV Moneypoint substation in the townland of Carrowdotia South, Co. Clare;

XI. A 220kV Onshore Compensation Compound located in the townland of Ballymacrinan, Co. Clare. The 220kV onshore compensation compound consists of:
   - Eirgrid 220kV GIS Building (49m x 18.5m, with a total height of 16.7m above Finished Floor Level (FFL);
   - ESB 220kV GIS Building (49m x 18.5m, with a total height of 16.7m above FFL);
   - Customer SCADA and MV power building (18.4m x 8.7m, with a total height of 6.15m above FFL);
   - Statcom building (30.5m x 22m, with a total height of 7.59m above FFL);
   - Upgrade of existing entrance onto the L-6150 including the removal of a small portion of existing stone wall and hedgerow;
   - All associated electrical and communications plant and equipment, welfare facilities, 3 no. foul water holding tanks, 3 no. bored wells, 3 no. attenuation tanks, access roads, car parking, security fencing and gates, rail and post fencing, telecommunications pole, lightning masts, signage, safety bollards, landscaping, drainage infrastructure and all other ancillary works and associated site development works;

XII. 3 no. temporary construction compounds along the onshore grid connection cable route:
   - 1 no. temporary construction compound at the landfall point in the townland of Killard Co. Clare;
   - 1 no. temporary construction compound at the Kilrush Golf Club in the townland of Parknamoney, Co. Clare;
   - 1 no. temporary construction compound at the new 220kV OCC in the townland of Ballymacrinan, Co. Clare;

XIII. Reinstatement of the road or track surface above the proposed onshore grid connection cable trench along existing roads and tracks;

XIV. New and upgraded access tracks above the proposed onshore grid connection cable trench in third party lands;

XV. Temporary entrances from public roads to facilitate construction of the onshore grid connection for construction phase only;

XVI. Provision of 3 no. passing bays and the widening of the L-6150 road in the townland of Ballymacrinan to facilitate the delivery of abnormal loads for the construction of the proposed OCC;

XVII. All works associated with spoil management;

XVIII. All associated site works and ancillary development above and below ground including hard and soft landscaping, habitat enhancement and drainage infrastructure.

A 10-year development permission and a 38-year operational life of the Project from the date of commissioning is sought. Please see Plate 5-1 below for detail on the principal components of the Project. The application relates to a development which comprises an activity requiring a Dumping at Sea licence.

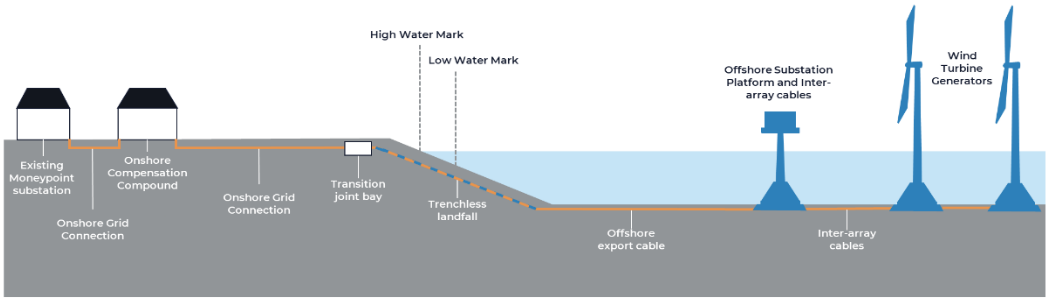


Plate 5-1 Diagram showing the principal components of the Project.

The Offshore Development seaward of High-Water Mark (HWM) and the Onshore Development, landward of Low Water Mark (LWM) are described herein, alongside the proposed methods and timing of the construction, operational and maintenance, and decommissioning phases of the various Project components.

5.2 Project Layout

The Offshore Development includes the Offshore Array Area (OAA) which will include 30 WTGs with a maximum export capacity (MEC) of 450MW, an OSS, GBS foundations and Inter-array Cables (IACs), as well as the Offshore Export Cable Corridor (OECC) and associated Offshore Export Cable (OEC) which will eventually make landfall in the townland of Killard, approximately 3.5km southwest of Doonbeg, Co. Clare (the Landfall). The OEC (total length of 63.5 km) will transition to land using trenchless technology (e.g. Horizontal Directional Drilling (HDD)) at the Landfall. Table 5-1 shows the coordinates of each WTG.

Table 5-1 WTG Coordinates

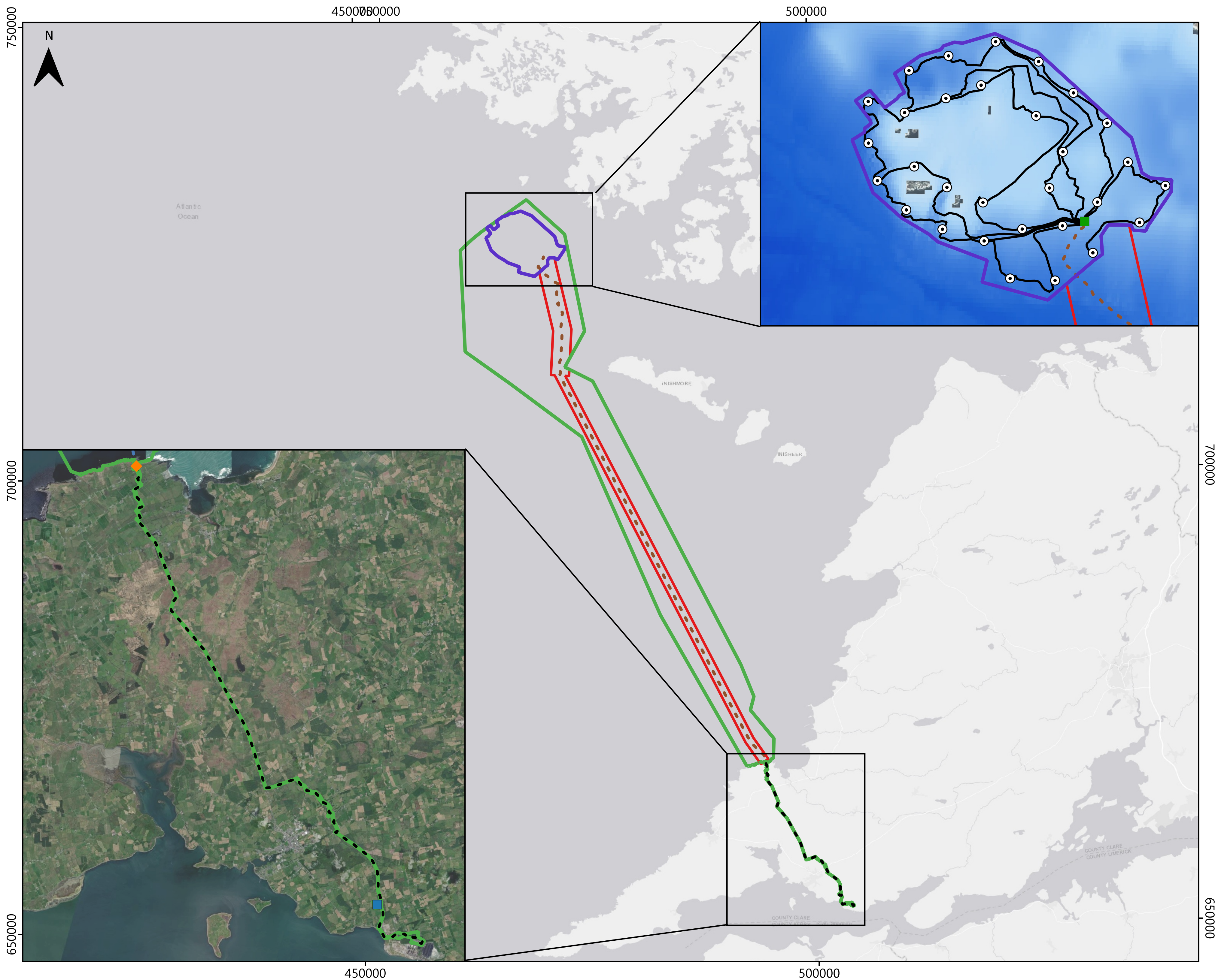
WTG	Easting WGS 84 UTM 29N	Northing WGS 84 UTM 29N
1	434951	5905283
2	433679	5904881
3	433626	5903731
4	432513	5903326
5	431546	5902488
6	432793	5901870
7	431803	5901472
8	432596	5900692
9	433688	5901319
10	434668	5900922
11	434715	5899881
12	435741	5900217
13	436815	5902325
14	436650	5898836
15	436831	5900319
16	436462	5901339
17	437765	5900975
18	438577	5902070
19	437998	5903119
20	433582	5900182
21	437077	5903926
22	434573	5904099
23	436123	5904761
24	436076	5903290
25	431522	5903614
26	437664	5899600
27	435433	5898874
28	432615	5904469
29	438915	5900441
30	439603	5901447

The Onshore Site will include the OLL, the OGC, and the OCC. The OEC will come ashore approximately 3.5km northwest of Doonbeg. The OGC will be connected to the national grid via the proposed OCC located approximately 3km from Moneypoint, Co. Clare in the townland of Ballymacrinan.

The Project has been designed to minimise potential environmental effects, while at the same time maximising the energy yield from the Offshore Site. A constraints study, as described in Section 3.2.5.1.2 of this EIAR, has been carried out to ensure that all infrastructure associated with the Offshore Site is located in the most appropriate areas of the OAA. Similarly, as described in Section 3.2.5.2.2 of this EIAR, a route selection constraints study was undertaken to ensure that the most appropriate route for the OGC route was selected. The overall layout of the Project is shown on Figure 5-1, this includes the Offshore Site and the Onshore Site, with Figure 5-2 showing the Offshore Site only, and Figure 5-6 showing the Onshore Site only presented further on in this chapter.

Detailed planning application drawings of the Project are included in Appendix 5-1 to this EIAR.

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde



LEGEND

EIAR Site Boundary	OGC
Offshore Array Area	OCC
OECC	Landfall
WTG	Bathymetry (m)
IAC Layout	0
OSS	-130
OEC	

0 3 6 NM
0 6 12 km

Data Source

PROJECT TITLE
Sceirde Rocks

MAP TITLE
Project Layout

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-15	KB	OM

DRAWING NO
Figure 5-1

SCALE	PAPER SIZE	DATUM	PROJECTION
1:500,000	A4	WGS84	UTM 29N

5.3 Project Components

This section of the EIAR describes the components of the Project. Further details regarding Transport and Access (Section 5.4), Construction Management (Section 5.5), Construction Methodologies (Section 5.6) are provided subsequently in this chapter.

The Offshore Site includes the OAA, which comprises 30 WTGs with GBS foundations, IACs, the OSS (installed on a GBS foundation) and a section of the OEC where it leaves the OSS. The OAA is approximately 37.2km^2 in size and is located 5 - 11.5km from the shore. The OECC is approximately 62km in length, approximately 1km wide along the majority of its length, and has a total area of approximately 73km^2. The OEC has a total length of approximately 63.5km (from OSS to the TJB), the majority of which lies within the OECC in addition to short sections within the OAA and within the drilled landfall duct.

Where the OEC comes ashore in the townland of Killard, it will terminate at a TJB. The TJB will be required to house the interface joint between the OEC and the OGC. Upon exiting the TJB, the proposed OGC can be broken into two sections, with 220kV underground electrical cabling connecting from the TJB to a proposed OCC in the townland of Ballymacrinan, Co. Clare and in the second section, a further 220kV underground electrical cabling, connecting the OCC to the existing substation at the Moneypoint Power Generation Plant (‘Moneypoint’). The total length of underground electrical cabling routes will measure approximately 22.3km, with the cabling between the TJB and the OCC measuring approximately 19.3km, and the cabling between the OCC and the existing Moneypoint 220kV Substation measuring approximately 3km. The underground cabling will be located within the existing public road corridor, agricultural land, scrub/woodland, and other third-party lands. Where roads do not exist along the proposed underground cabling routes, it is proposed to construct new access track as detailed in Section 5.3.2.2.1 below. The OGC corridor will also include Cable Joint Bays, which are required approximately every 450 – 550 m to join together the onshore cable sections.

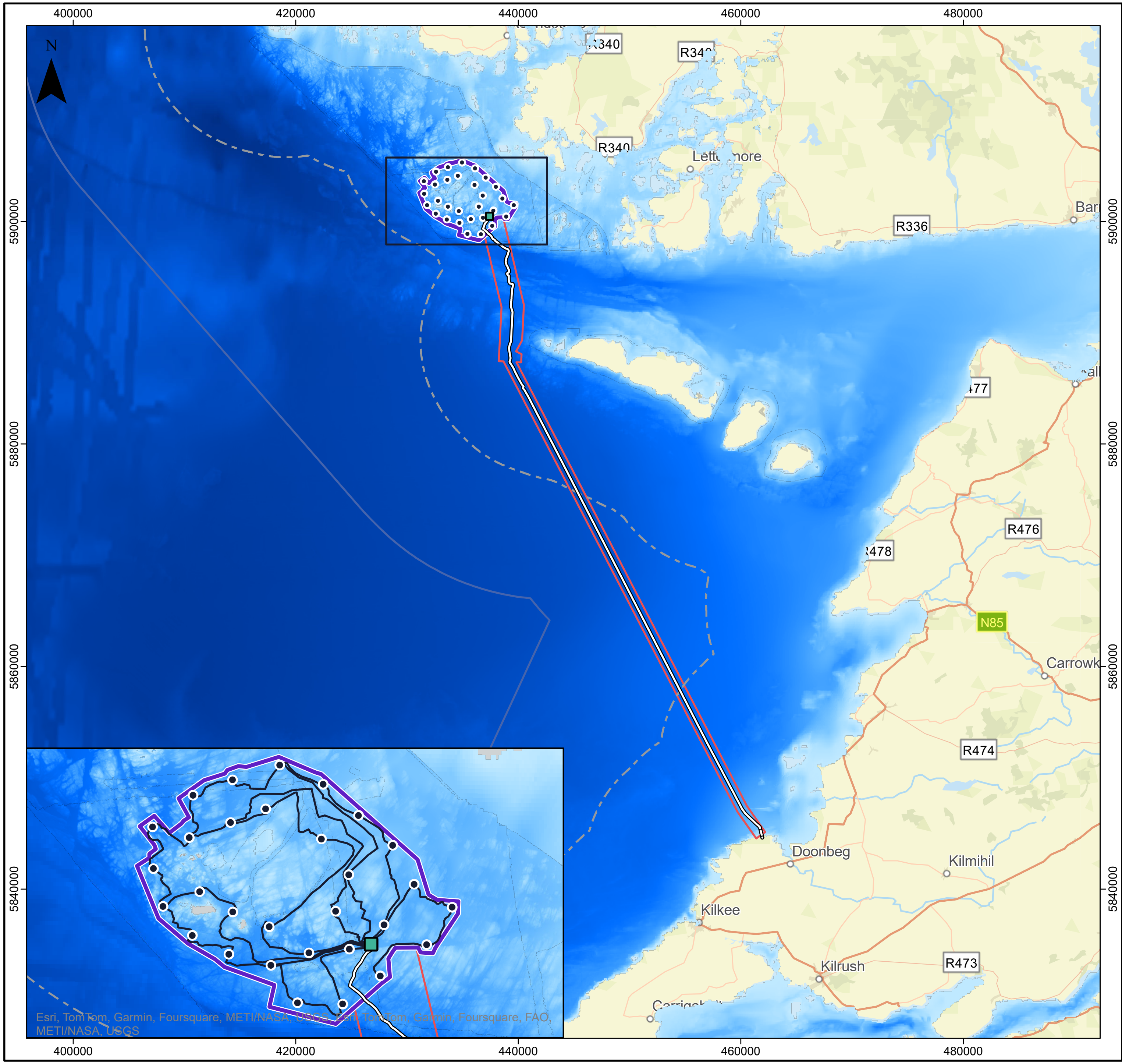
The components, design parameters and proposed installation methods of the Offshore and Onshore Developments are described in detail in the following sections of this chapter. The overall layout of the Project is show in Figure 5-1. Detailed site layout drawings of the Project are also included in Appendix 5-1 to this EIAR.

5.3.1 Offshore Site

The Offshore Site includes the Project infrastructure below HWM. The components of the Offshore Site are:

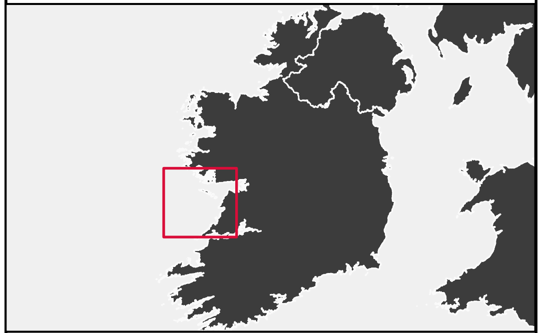
- Seabed preparation for the installation of 31 GBS foundations;
- Transport and installation of 31 GBS foundations;
- 30 fixed foundation WTGs, installed on GBS foundations;
- One OSS, installed on a GBS foundation;
- A network of IACs connecting WTGs to the OSS;
- One OEC, between OSS and the Landfall;
- Cable protection measures (where required);
- Trenchless technology landfall works including ancillary activities (e.g., excavation of HDD exit pits).

Figure 5-2 below shows the layout of the Offshore Site.



SCEIRDE ROCKS WINDFARM

Feirm Ghaoithe Charraigeacha Sceirde



LEGEND

- Offshore Array Area
- Offshore Export Cable Corridor
- Ireland 6 NM limit
- Ireland 12 NM Limit
- Extent of Inset Map
- Offshore Export Cable
- Inter Array Cable Routes
- Offshore Substation (OSS)
- Wind Turbine Generators (WTG)

Bathymetry (m)

0

-130

0 3 6 nm

0 6 12 km

Data Source: Contains public sector information, licensed under the Creative Commons licence v4.0; the Open Government Licence v3.0. INFOMAR 2021 & 2022.

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Offshore Site

VER	REMARKS	DATE	Drawn	Approved
1		06/12/2024	BQ	EE

DRAWING NO

Figure 5-2

SCALE	PAPER SIZE	DATUM	PROJECTION
1:500,000	A4	WGS 84	UTM 29N

5.3.1.1 GBS Seabed Preparation

Prior to installing GBS foundations for WTGs and the OSS, seabed preparation is required to ensure foundations are positioned on a stable, level footprint. This preparation includes dredging of soft and unstable substrate, and the placement of rock aggregate to provide a stable platform for the GBS foundations.

Once installed, scour protection may be required to prevent hydrodynamic scour around the GBS on the seabed. The volume of scour protection that may be required has been incorporated into the total rock volume shown in Table 5-2.

Table 5-2 Foundation Seabed Preparations

Design Parameter	Value
Number of GBS foundations requiring stonebed installation	31 (30WTG and 1 OSS)
Vessel type	Fallpipe rock placement vessel
Total seabed area requiring stonebed for GBS foundations (m^2)	117,604
Total volume of rock required for all GBS foundations (includes scour protection) (m^3)	185,839
Average volume of rock required per GBS foundation (includes scour protection) (m^3)	5,995
Number of locations requiring additional stonebed for WTIV positioning (10 WTG + 1 OSS)	11
Total volume of rock required for WTIV positioning (10 WTG + 1 OSS) (m^3)	702,209
Total area of rock required for WTIV positioning (10 WTG + 1 OSS) (m^2)	110,187

5.3.1.2 Dredging

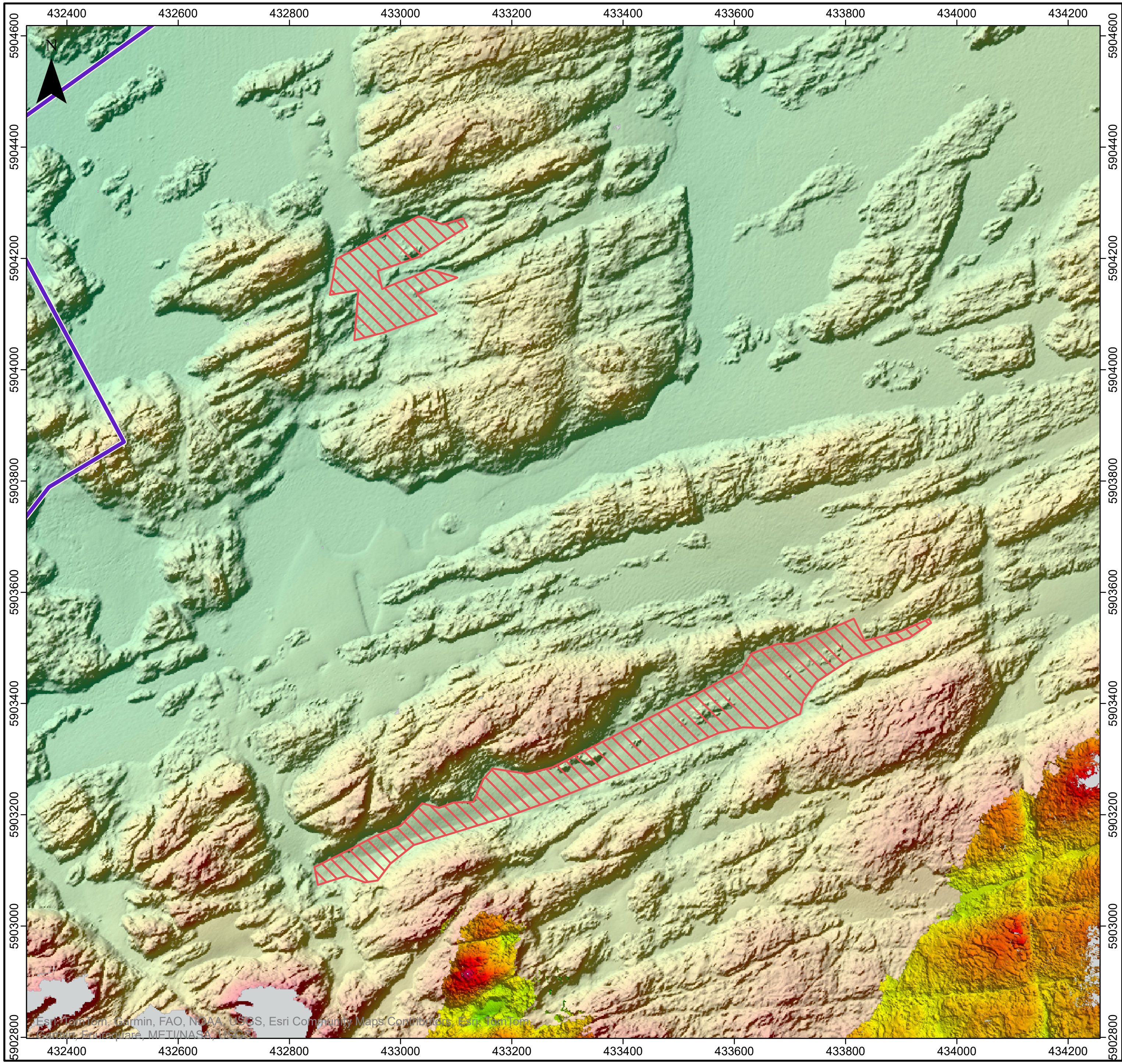
At some of the locations, dredging may be required to remove superficial soft sediments to make a solid and level base for the GBS foundations. Dredging (using a trailing suction hopper dredger; TSHD) will remove the sediment, holding it for disposal at a licensed disposal site.

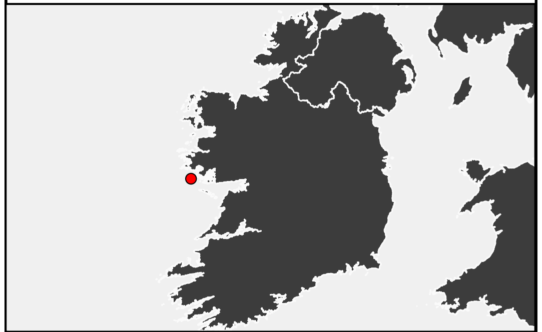
Five locations within the OAA were identified as potentially suitable for disposal of dredged material. Following an environmental and feasibility appraisal, Disposal Sites 1 and 2 were selected as suitable disposal locations (Figure 5-3).

Work on obtaining the Dumping at Sea permit has commenced and will be obtained prior to any dredging and discharging activity. Table 5-3 provides parameters for the disposal of dredged material at the two potential Disposal Sites. No additional seabed preparation is required at Disposal Sites 1 and 2.

Table 5-3 Disposal Locations for Dredged Material

Design Parameter		Disposal Site 1	Disposal Site 2
Centroid of Disposal Locations	Easting WGS 84 UTM 29N	432,990	433,414
	Northing WGS 84 UTM 29N	5,904,222	5,903,326
Area of Disposal Site (m^2)		25,842	78,229
Volume of dredged material to be disposed of at Disposal Site (m^3)		37,500	112,500
Average thickness of dredged material on seabed following disposal at Disposal Site (m)		2.0	2.0





SCEIRDE ROCKS WINDFARM

Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- Offshore Array Area
- Offshore Export Cable Corridor
- Ireland 6 NM limit
- Ireland 12 NM Limit
- Dredge Disposal Sites

0 0.06 0.12 nm

0 0.1 0.2 km

Data Source: Contains public sector information, licensed under the Open Government Licence v3.0, from the UKHO and OS.

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Dredge Disposal Sites

VER	REMARKS	DATE	Drawn	Approved
1		06/12/2024	BQ	EE

DRAWING NO

Figure 5-3

SCALE	PAPER SIZE	DATUM	PROJECTION
1:10,000	A4	WGS 84	UTM 29N

5.3.1.3 GBS Foundations

Through careful consideration of site-specific parameters, it was determined that the most suitable WTG foundation for this project is a concrete self-buoyant GBS (see Plate 5-2). The GBS foundation comprises a disc shaped foundation platform and a concrete shaft and it is temporarily self-buoyant during the installation stage.

Upon arrival at installation location, GBS foundations will require ballasting to obtain negative buoyancy for seabed installation. Ballast could be water, sand, gravel or an alternative high-density aggregate.

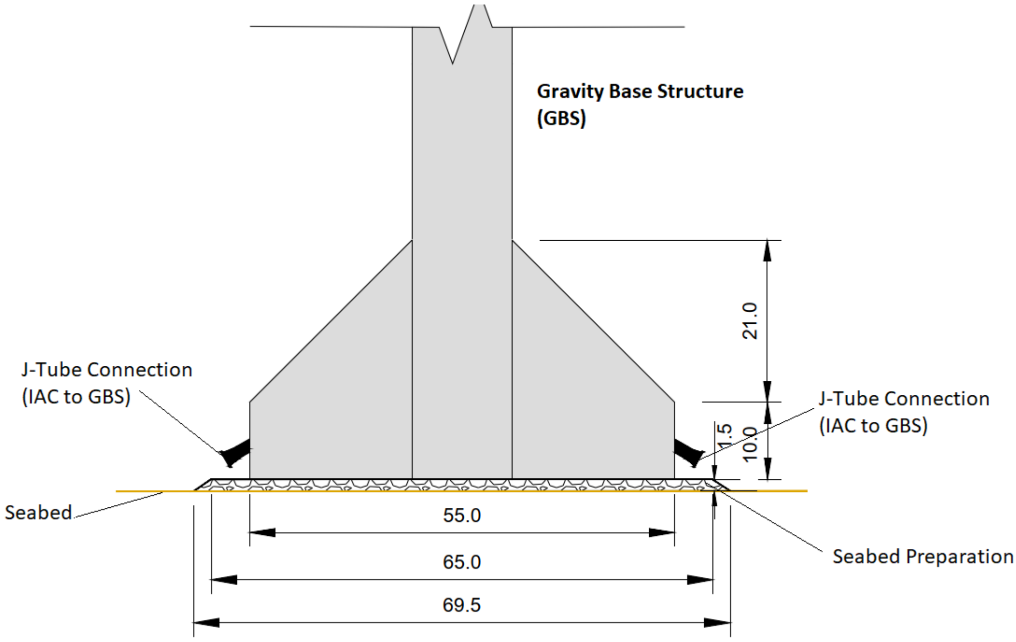


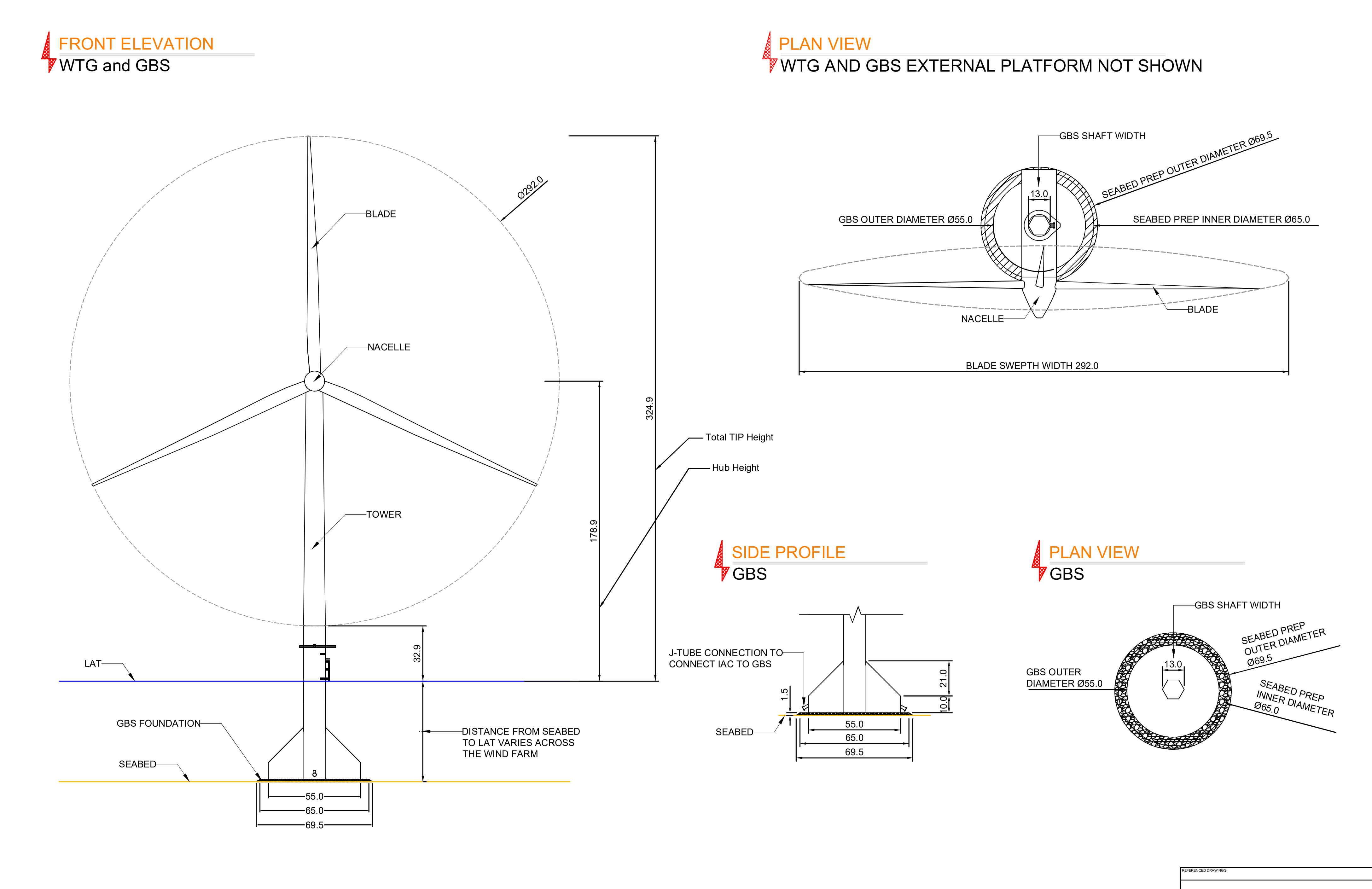
Plate 5-2 Cross section of the GBS foundation to be used for the Project

Table 5-4 GBS Foundation Design Parameters

Design Parameters	Value
Number of Foundations	31 (30 WTG plus one OSS)
Max Base Diameter (m)	55
Column Profile and Width (m)	Hexagonal column; width 13 m
Installation Methodology	Float-in installation
Design Life (years)	38

5.3.1.4 Wind Turbines

The WTGs convert wind energy to electricity and consists of rotor blades, towers, generators, transformers, power electronics and control equipment. Each WTG will consist of a tower supported by a GBS foundation, a nacelle atop of the tower which contains the mechanical and electrical generating components, and three rotating blades (see Figure 5-4).



NOTE(S)
1. ALL DIMENSIONS ARE IN METRES (M) UNLESS OTHERWISE STATED.
2. ACRONYMS:
GRAVITY BASED STRUCTURE (GBS) FOUNDATION
INTER ARRAY CABLE (IAC)
LOWEST ASTRONOMICAL TIDE (LAT)
WIND TURBINE GENERATOR (WTG)

REV	DATE	DRAWN	DWG CHECK	APPR	ISSUE STATUS	COMMENTS
A	29/10/2024	YS	AC	AC	DRAFT	-

REVISION HISTORY

CLIENT LOGO

BUILD NO.

CLIENT'S NO.

SCEIRDE ROCKS WINDFARM

REFERENCED DRAWINGS:

CLIENT / PROJECT: SCEIRDE ROCKS OFFSHORE WIND FARM

TITLE: Wind Turbine Generator & Gravity Based Structure Details

SCALE: 1:1000 | SHEET: 1 OF 1 | SHT SIZE: A1 | DRW NO.: IRE1-FST-WTG-PL-SM-0001 | REV: A

Figure 5-4

The WTG design option will comprise of 30 WTGs with a minimum spacing of 1,017 m. The WTGs will have a lower blade tip height (commonly known as the 'air gap') of 32.9m above LAT. Additionally, the upper blade tip height above LAT is 324.90 m. Further specific information for this WTG design can be seen in Table 5-5.

Table 5-5 Design parameters for the WTGs. Turbine locations are listed in Table 5-1

Design Parameters	Value
Number of WTGs	30
Minimum WTG Spacing Distance (m)	1,017
Hub Height above LAT (m)	178.9
Rotor Diameter (m)	292
Upper Blade Tip Height above LAT (m)	324.9
Lower Blade Tip Height above LAT (m)	32.9
Lower Blade Tip Height above HAT (m)	27.5
Swept Area per WTG (m^2)	66,966
Swept Area for whole Wind Farm (m^2)	2,008,986
WTG Type	3 blade horizontal axis
Operational Life (years)	38

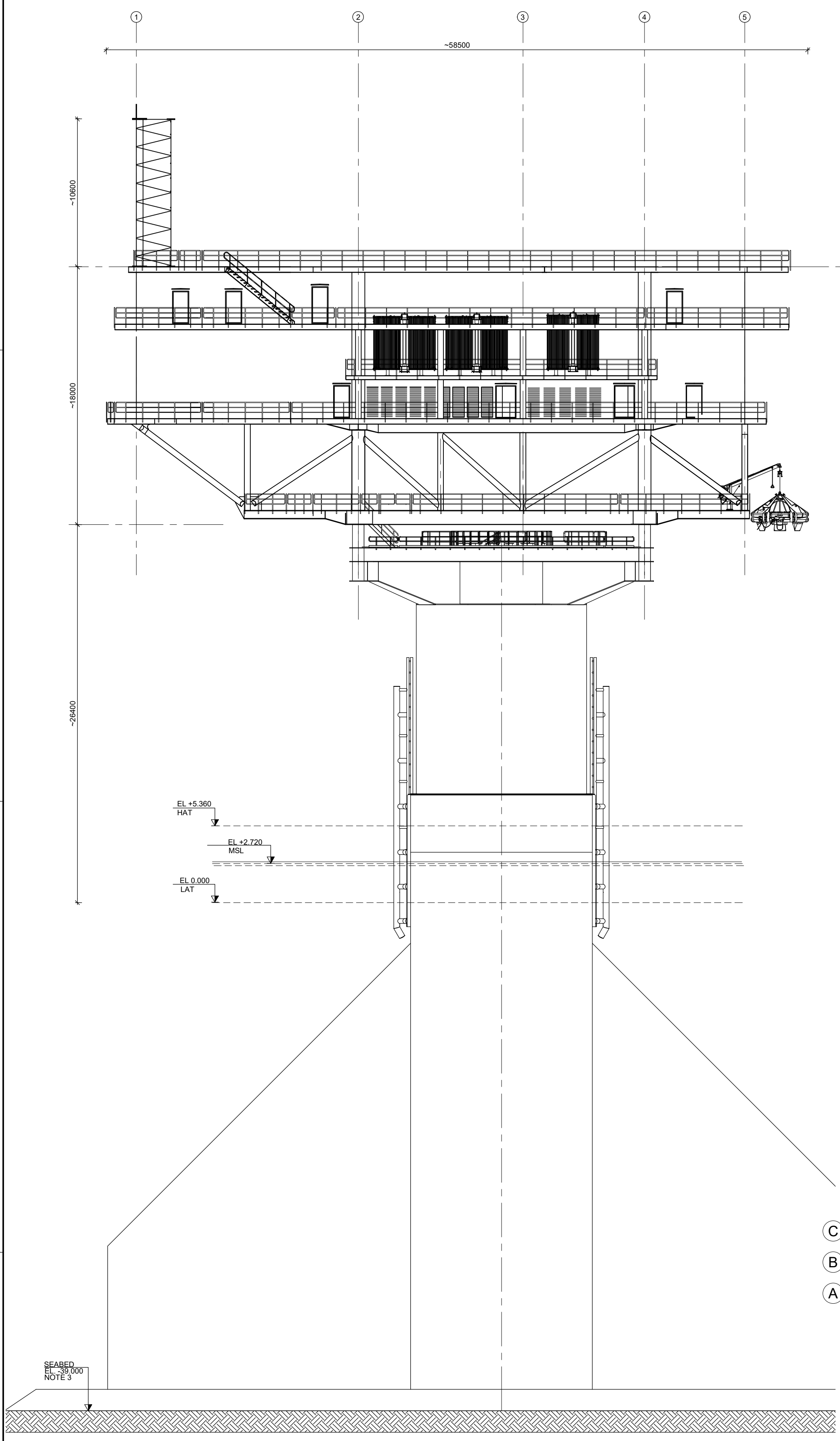
5.3.1.5 Offshore Substation

A single OSS will be installed in the OAA, with its location in eastern landward side of the area. The OSS topside contains electrical equipment and components required to transform the voltage of the electricity generated at the WTGs to a higher voltage suitable to export to the onshore grid network. The OSS will export HVAC electricity with a system voltage of 220 kV on the primary side, with one export cable and two main transformers. Its secondary side will have a system voltage of up to 132 kV. The OSS houses the relevant ancillary components (e.g., service crane, antennas, helideck) and electrical equipment (i.e., switchgear). The total height of the OSS is 45 m above LAT (excluding the crane) and 55 m above LAT (including the crane). Figure 5-5 provides a sectional image of the proposed OSS facing north. Specific details of the OSS can be found below in Table 5-6 and further drawings are located within the planning drawings.

Table 5-6 OSS topside design parameters

Design Parameters	Value
Centroid of OSS Location (relative to WGS 84 UTM 29N)	Easting 437,427; Northing 5,900,450
Max. Quantity of Foundations	1
System voltage (primary side) (kV)	220

System voltage (secondary side) (kV)	up to 132
Max. topside length (m)	58.5
Max. topside width (m)	42.5
Max. topside area (m^2)	2,486.25
Max. topside height (m) (excluding crane and mast)	45 (above LAT)
Max. topside height (m) (including crane and communications antennas)	55 (above LAT)
Topside weight (Te)	2,600



NOTES:

1. DIMENSIONS IN mm.
2. LEVELS IN m RELATIVE TO LAT.
3. SEABED RANGES FROM -38.2m TO -39.3m

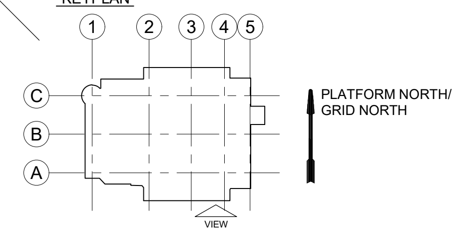
ABBREVIATION:

GBS: GRAVITY BASED STRUCTURE
HAT: HIGHEST ASTRONOMICAL TIDE
MSL: MEAN SEAWATER LEVEL
LAT: LOWEST ASTRONOMICAL TIDE
WLL: WORK LOAD LIMIT
TOS: TOP OF STEEL.

LEGEND:

SEABED

KEYPLAN



ELEVATION LOOKING NORTH
1:150

Rev.	Date	Drawn/Design	Checked	Approved	Description
T02	2024-11-22	AHB	HSP	HSP	ISSUED FOR PLANNING
T01	2024-03-22	JHL	HSP	HSP	ISSUED FOR INFORMATION

Design
ISC RÅDGIVENDE INGENIØRER • CONSULTING ENGINEERS
Hesseløgade 16 DK-2100 Copenhagen Phone +45 35 27 88 00 Mail: info@isc.dk

Client
FUINNEAMH SCEIRDE TEO

OFF SHORE SUBSTATION (OSS)
ELEVATION LOOKING NORTH

Size	Project no.	Dwg. no.	Rev.
A1	22073	IRE1-ISC-OSS-EL-LA-0208	T02

Figure 5-5

5.3.1.6 Inter Array Cables

The IACs collect the power from the WTGs and connect to the OSS. The IACs will transport HVAC electricity in one three-phase circuit, with each phase having a separate metallic conductor (e.g. aluminium or copper) within an armoured trefoil cable (Plate 5-3). IACs will either be buried to a target depth of lowering of 1.0 metres or will be surface-laid and protected with either a cast-iron shell (CIS), rock placement, concrete mattresses or rock/grout bags. The IAC design parameters are shown in Table 5-7.

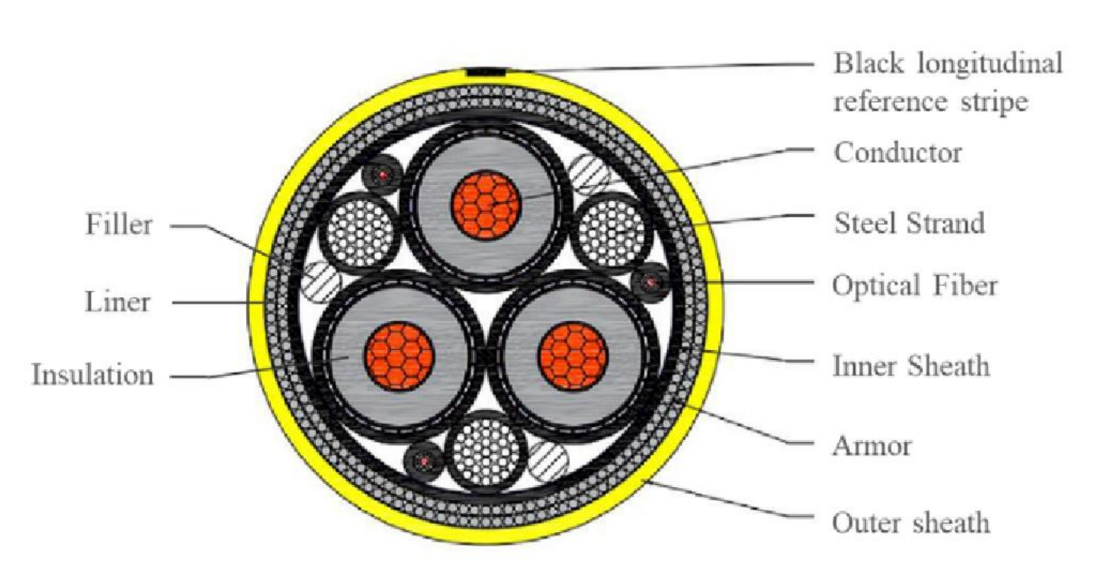


Plate 5-3 Indicative cross-section of IAC[1]

Table 5-7 IAC Design Parameters

Design Parameter	Value
External cable diameter [mm]	240
Maximum Cable Voltage (kV)	132
Minimum bending radius (m)	3.5
Target Depth of Lowering (m)	1.0
Maximum length of IAC [km]	73
Total Volume of Cable Protection (m^3)	1,475,023
Total Footprint of Cable Protection (m^2)	1,282,082
Maximum electromagnetic field (B field) at the seabed surface, assuming 1 m depth of lowering (microtesla; µT)	17.7

[1] *Li, X., Liu, Z., Jiang, X. and Hopman, H. (2024). (PDF) RVE model development for bending analysis of three-core submarine power cables with dashpot-enhanced periodic boundary conditions. Ocean Engineering, 309(9), p.118588.*

Maximum electromagnetic field (B field) at the surface of cast-iron shell protection, assuming no burial (μT)	30.3

5.3.1.7 Offshore Export Cable

HVAC cables are designed to facilitate connection/integration of renewable energy to the existing grid as well as providing grid extensions to single points such as offshore wind installations. The OEC will transport HVAC electricity in one three-phase circuit, with each phase having a separate metallic conductor (e.g. aluminium or copper) within an armoured trefoil cable (Plate 5-4). The cable will have a voltage of 220 kV and a diameter of approximately 300 mm. The OEC will be approximately 63.5km long and run from the OSS to the Landfall at Killard near Doonbeg, Co. Clare. The cable will make the onshore transition via a trenchless technology landfall from a pop-out location below the LWM to avoid the intertidal zone, through an approximately 1km drilled duct. The OEC will either be buried to a target depth of lowering of 1.0 metres or will be surface-laid and protected with either a cast-iron shell (CIS), rock placement, concrete mattresses or rock/grout bags. OEC details are shown in Table 5-8.

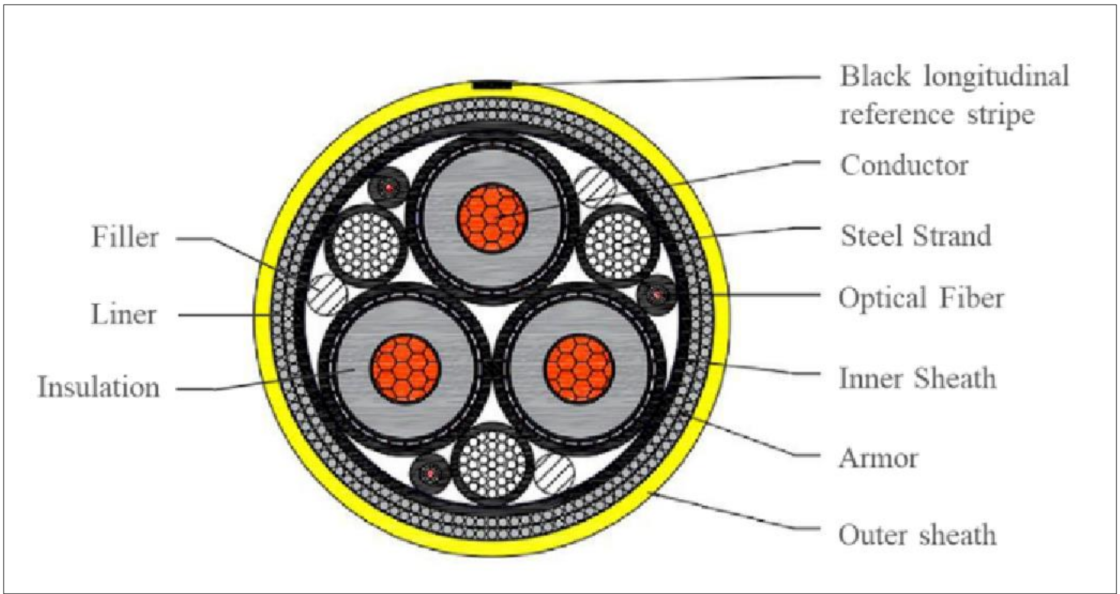


Plate 5-4 Indicative cross-section of OEC[2]

Table 5-8 OEC design parameters

Design Parameters	Values
Number of Export circuits	1
Number of cables per circuit	1
External cable diameter (mm)	300
Maximum Cable Voltage (kV)	220kV
OECC length (km)	62

[2] *Li, X., Liu, Z., Jiang, X. and Hopman, H. (2024). (PDF) RVE model development for bending analysis of three-core submarine power cables with dashpot-enhanced periodic boundary conditions. Ocean Engineering, 309(9), p.118588.*

Total OEC length from OSS to TJB (km)	63.5
Required vertical separation distance between other marine cables at crossing location (m)	0.3
Total Volume of Cable Protection (m^3)	182,511
Total Footprint of Cable Protection (m^2)	165,818
Maximum electromagnetic field (B field) at the seabed surface, assuming 1 m depth of lowering (microtesla; μT)	25.3
Maximum electromagnetic field (B field) at the surface of cast-iron shell protection, assuming no burial (μT)	48.3

5.3.1.8 IAC and OEC Protection

Cable protection will be required on both the IACs and the OEC. Where the cables are not fully buried, several protection methods may be used including CIS or alternative tubular cable protection systems (e.g. HDPE pipe), concrete mattresses, grout/rock bags or rock placement, or a combination of these cable protection measures. The choice of cable installation and protection measure is typically determined through a careful assessment of site-specific conditions and project requirements. A combination of the protection methods may be used depending on the seabed conditions (varying from rock to soft sediment). For the purposes of assessment of effects, based on professional judgment and experience from other projects it is considered that a rock berm will be required over the full length of the IAC. For the OEC it has been determined that 22.5 % of the total length will be covered by a rock berm and 77.5 % will be buried.

5.3.1.8.1 *Cable protection using rock placement*

Using trapezoid rock berms (Plate 5-5 and Plate 5-6 below) made of graded stone on or around the structure provides shallow buried or exposed cables with a structural cover, protecting the cables from external factors, including other marine activities such as fishing and anchoring. Metocean conditions such as waves and currents are determining factors for the grade of rock required for placement in the determined locations, with typically larger grades of rock required nearshore as wave action is greater nearer the coasts. The specific details for IAC and OEC rock quantities and parameters are provided in Table 5-9.

Techniques for rock placement will be similar to those implemented for the installation of the GBS stonebeds through the use of a fallpipe vessel (Section 5.6.1.2.3).

Table 5-9 IACs and OEC seabed preparation

Design Parameter	IACs	OEC
Maximum length of cable protected using rock berm (km)	73.0	13.6
Quantity of rock (m^3)	1,475,023	182,511
Total Footprint of rock (m^2)	1,282,082	164,502
Maximum length of cable protected using CIS (km)	73.0	14.5
Maximum length of cable installed using cutting (km)	73.0	-

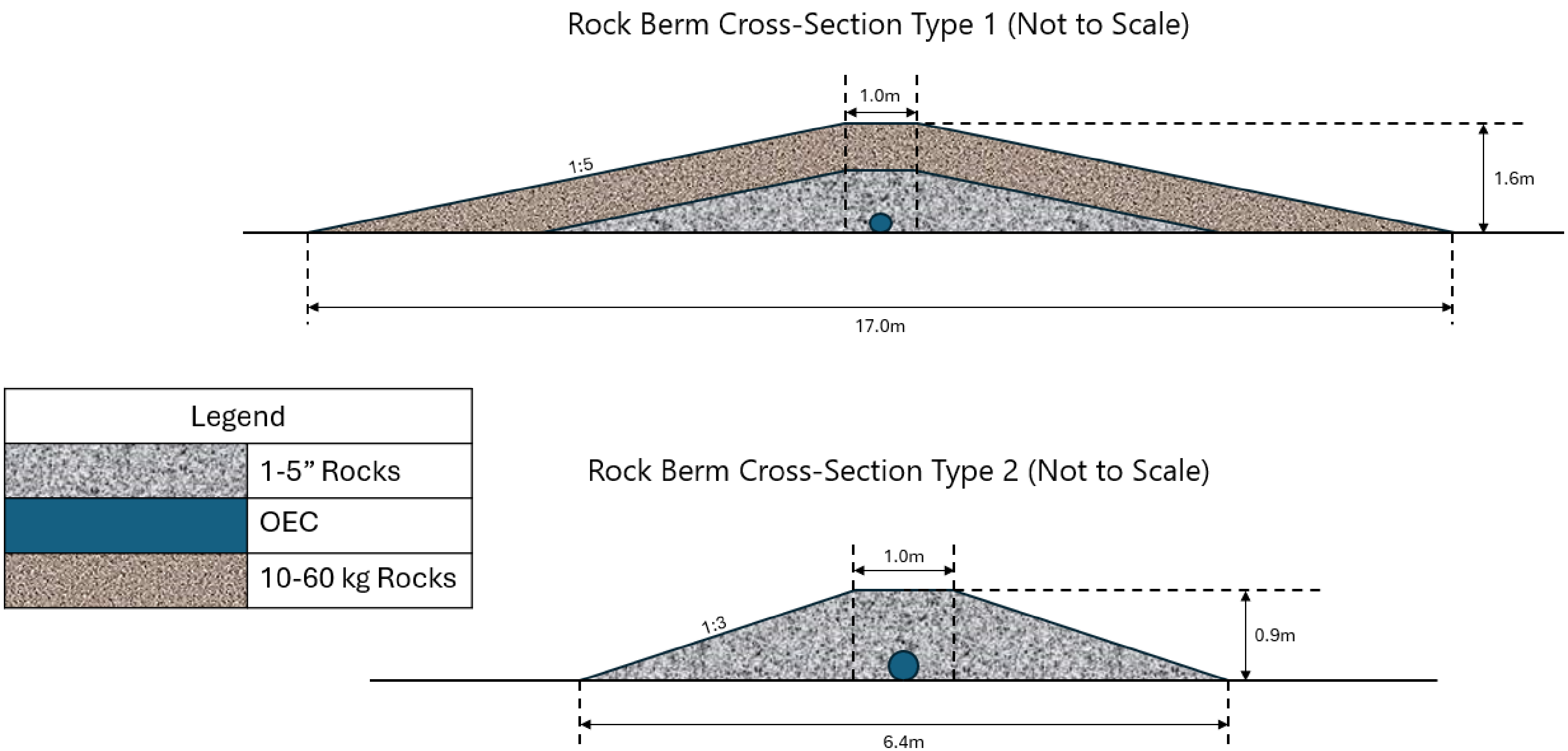


Plate 5-5 Rock Berm Types 1 and 2

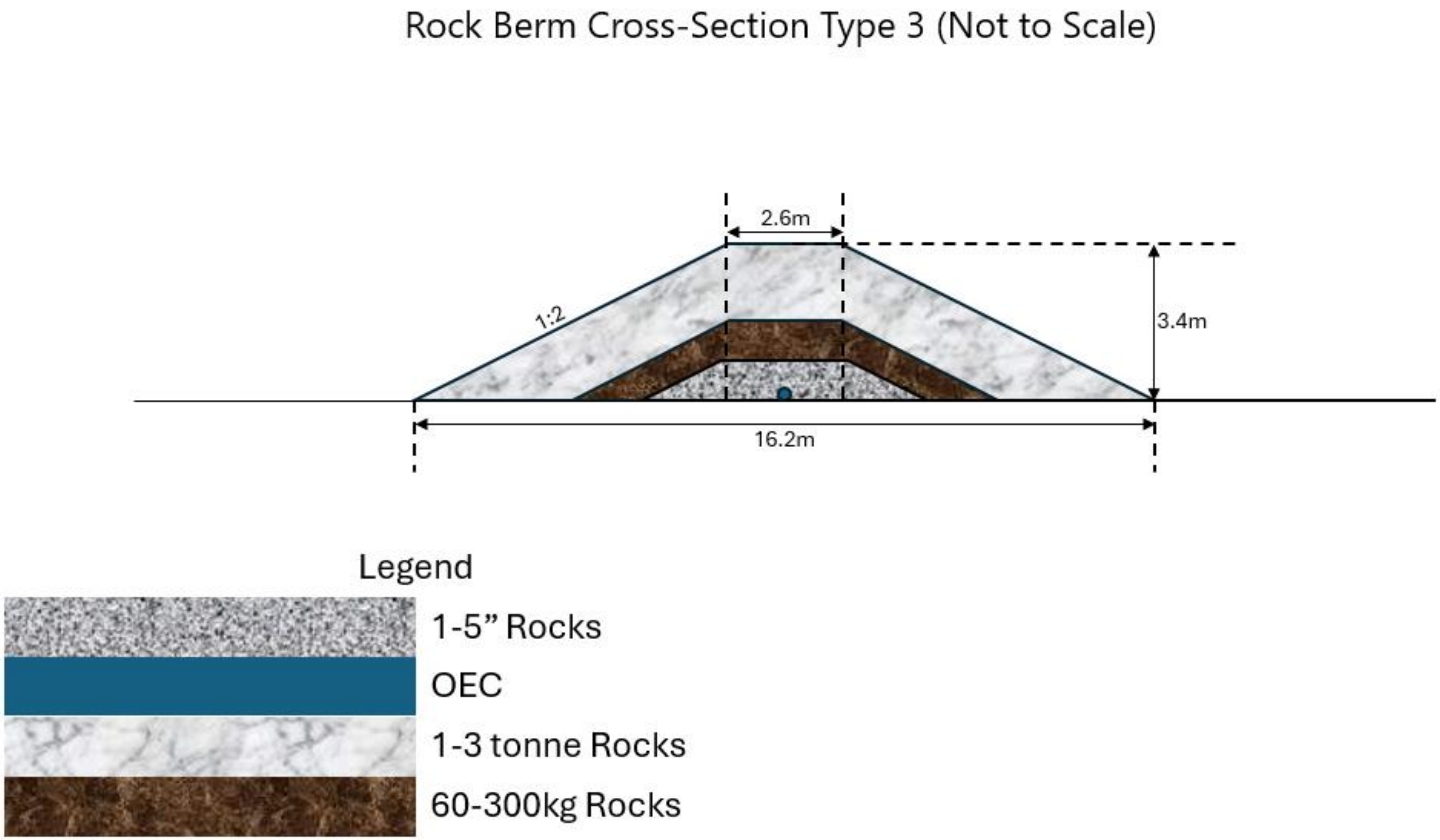


Plate 5-6 Rock Berm Types 3

5.3.1.8.2 Cable protection using concrete mattresses

Concrete mattresses, also known as cable protection mattresses or mattress units, are protective structures used primarily for subsea cable protection. They are designed to be heavy and durable to provide effective protection for underwater cables against various environmental and anthropogenic threats to the cable. The mattresses are typically constructed with a lattice or grid structure, allowing for flexibility and ease of installation. Concrete mattresses come in various sizes and dimensions depending on the specific requirements of the cable installation project. The vessel used to install protection systems such as concrete mattresses is a construction service vessel (CSV), which will hold station using dynamic positioning (DP) before lowering the concrete mattresses to the seabed. An example of concrete mattress deployment can be seen in Plate 5-7.

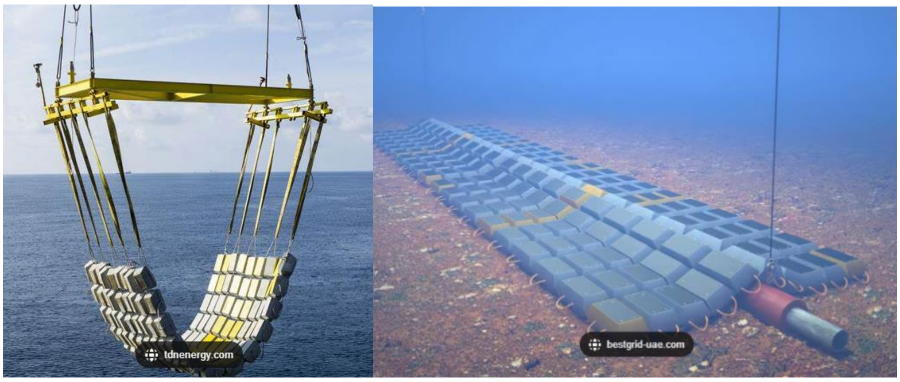


Plate 5-7 Concrete mattress deployment (left) and on seabed over a pipeline (right).

As concrete mattresses are typically smaller than the proposed rock berms (typically 6 m x 3 m), and concrete mattresses could be used as an alternative to rock placement, the footprint of any concrete mattresses will lie within the footprint of the rock berms (Table 5-10).

Table 5-10 IAC and OEC protection using concrete mattresses, rock bags or grout bags

Design Parameter	IACs	EC
Maximum length of cable protected using concrete mattresses, rock bags or grout bags (km)	73.0	13.6
Total Footprint of concrete mattresses, rock bags or grout bags (m^2)	1,282,082	164,502

5.3.1.8.3 Cast Iron Shell Protection

Cast iron shells (CIS) can be used as an alternative cable protection measure. CIS provides good protection against abrasion (possible cable movements), and they provide additional weight for increased stability. An example of cast iron shells can be seen in Plate 5-8.

Plate 5-8 Example cast iron shell images

5.3.1.8.4 Alternative External Protection Measures

Rock bags or grout bags may also be used for cable stabilisation and protection (Plate 5-9).

Plate 5-9 Rock bags (left) and grout bags (right) used as cable protection

As rock bags or grout bags are typically smaller than the proposed rock berms, and rock bags or grout bags could be used as an alternative to rock placement, the footprint of any rock bags or grout bags will lie within the footprint of the rock berms.

5.3.1.8.5 Cable Crossing

At the OEC crossing of the IRIS cable system connecting Ireland to Iceland, crossing protection will also be required. Cable crossing materials may include concrete mattresses, rock placement, grout bags or CIS (Plate 5-9). The materials and design methodology will be agreed with the IRIS cable operator in a crossing agreement. The installation methods are similar to the methods described for the IAC and OEC protection. Cable crossings shall be completed in accordance with International Cable Protection Committee specifications.

An illustration of the proposed crossing design is shown in Plate 5-10.

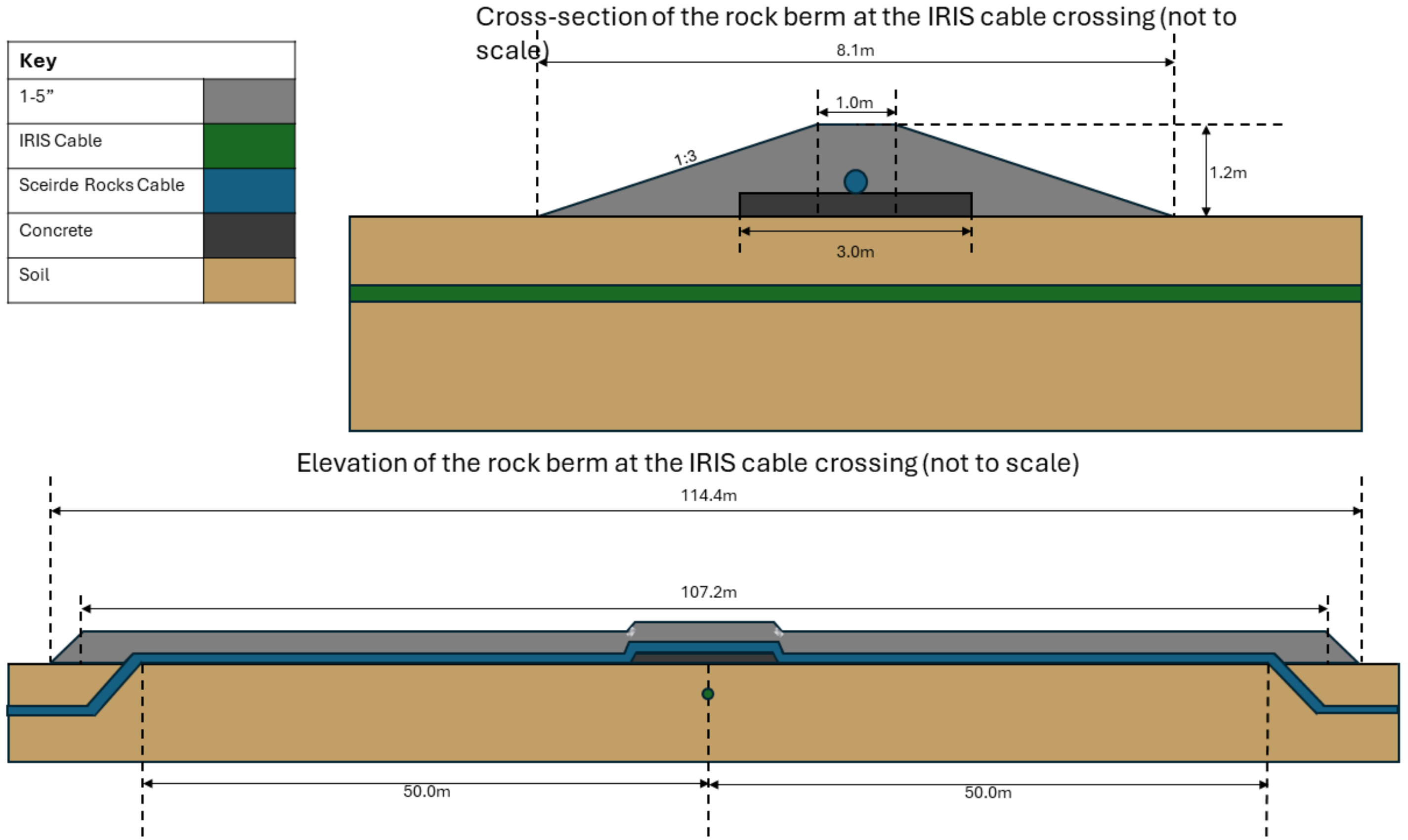


Plate 5-10 Rock berms at the IRIS cable crossing

5.3.1.9 Landfall Exit Location

The OEC will be installed using trenchless technology. This means a duct will be drilled from an onshore location, under the intertidal region and below the seabed to a subtidal emergence location , approximately 1km offshore in approximately 30 metres depth (Table 5-11). Further information on the OEC once its makes landfall and connects to the TJB is detailed below in Section 5.3.2.1.

Table 5-11 Trenchless landfall

Design Parameter	Trenchless Landfall
Approximate length of trenchless drilled landfall duct (km)	1.0
Approximate water depth at trenchless drilled landfall duct emergence location (m) relative to LAT	30
Size of excavated subsea emergence pit (m)	50 x 20 x 2depth

5.3.1.10 Site Activities

5.3.1.10.1 *Environmental Management*

All proposed activities within Offshore Site will be provided for in an Offshore Environmental Management Plan (OEMP), which has been prepared for the Offshore Site and is included as Appendix 5-2 of this EIAR. The OEMP includes details of mitigation protocols, marine pollution and waste management and emergency response plans, and outlines clearly the mitigation measures and monitoring that must be adhered to in order to complete the works in a safe and environmentally sound manner. In the event that development permission is granted for the Project, the OEMP (with various appendices) 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 or required through the appointment of contractors.

5.3.1.10.2 *Refuelling*

Where possible, vessel refuelling (bunkering) will take place at appropriate port locations, following the established practices of those ports. Should a scenario arise where refuelling (bunkering) of vessels is required within the Offshore Site, this will be undertaken in accordance with the Project Marine Pollution Contingency Plan as provided in the OEMP.

5.3.1.10.3 *Stone Deliveries*

A large quantity of high-density aggregate (e.g. graded granite) will be required as part of seabed preparation and cable protection works. This rock will be loaded into fallpipe vessels at an appropriate quarry location, following the established practices of those ports. The quarry considered in this EIAR is Glensanda, Argyll, Scotland, which lies approximately 525km by sea from the Offshore Site. Aggregate will be transported to the Offshore Site in a fallpipe vessel and will be deposited on the seabed via controlled delivery through the fallpipe.

5.3.1.10.4 Waste Management

Any waste generated in the Offshore Site will be retained on vessels and returned to shore for appropriate disposal or recycling, in line with best environmental practice as outlined in the provisions in Appendix 5-5: Waste Management Plan (WMP), within the OEMP.

Dredged seabed material (sediment) will be disposed of at sea at the licensed Disposal Sites, in line with the provisions of a dumping at sea licence which will be sought by the Project. Further details of the proposed Disposal Sites are included in Section 5.3.1.2 above.

5.3.2 Onshore Site

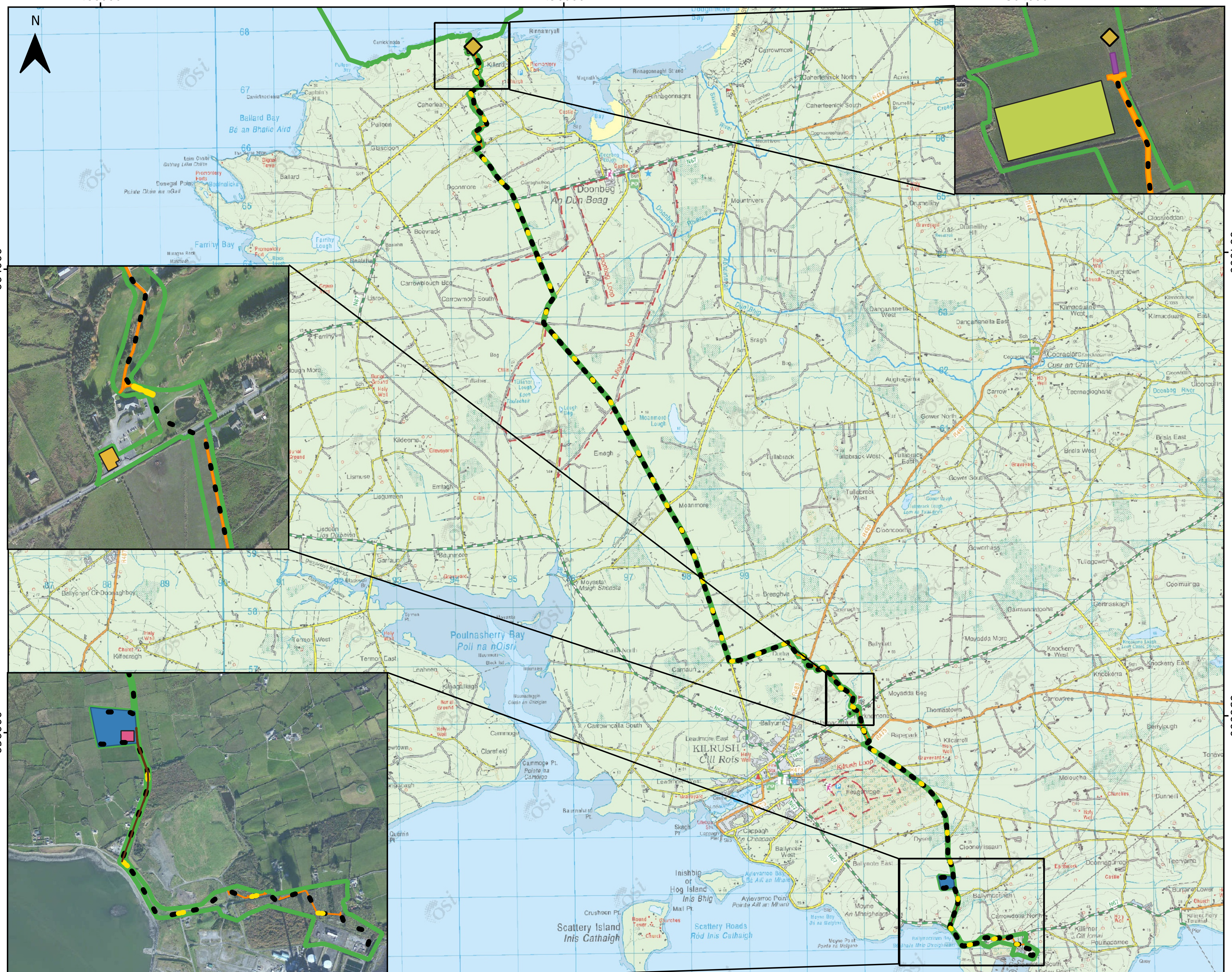
This section of the EIAR describes the components of the Onshore Site. Further details regarding Site Drainage (Section 5.3.2.7), Construction Management (Section 5.6) and Construction Methodologies (Section 5.7) are provided subsequently in this chapter.

The Onshore Site includes the Project infrastructure up to the TJB. The components of the Onshore Site are:

- A temporary construction compound at the Landfall, of 5,460m2 in area, with associated temporary access track in the townland of Killard, to facilitate the HDD operations at the Landfall;
- A high voltage (220kV) alternating current export cable laid underground for approximately 19.3km between the TJB in the townland of Killard, Co. Clare to the new OCC in the townland of Ballymacrinan, Co. Clare;
- Fibre optic cables for operation and control purposes, and earthing cables, laid underground with the export cable for approximately 19.3km between the TJB in the townland of Killard, Co. Clare to the OCC in the townland of Ballymacrinan, Co. Clare;
- A high voltage (220kV) alternating current export cable laid underground for approximately 3km between the OCC in the townland of Ballymacrinan, Co. Clare and the existing Moneypoint 220kV Substation in the townland of Carrowdotia South, Co. Clare ;
- Fibre optic cables for operation and control purposes, and earthing cables, laid underground with the export cable for approximately 3km between the OCC in the townland of Ballymacrinan, Co. Clare and the existing Moneypoint 220kV Substation in the townland of Carrowdotia South, Co. Clare;
- 43 no. joint bays along the OGC route;
- 1 no. onshore 220kV electrical OCC located in the townland of Ballymacrinan, Co. Clare. The OCC consists of an EirGrid 220kV GIS building, a ESB 220kV GIS building, a Customer SCADA and MV power building and a Statcom building, welfare facilities, wastewater holding tank, access track, car parking, security fencing, telecommunications pole, lighting, lightning masts, landscaping, drainage infrastructure and all other ancillary works and associated site development works;
- 2 no. temporary construction compounds (in addition to the temporary construction compound at the Landfall) with temporary offices and staff facilities;
- Reinstatement of the road or track surface above the proposed onshore export cabling trench along existing roads and tracks;
- New and upgraded access tracks above the proposed onshore export cable trench in third party lands
- Temporary entrances from public roads to facilitate construction of the OGC for construction phase only;

- Provision of 3 no. passing bays and the widening of the L6150 road in the townland of Ballymacrinan to facilitate the delivery of abnormal loads for the construction of the proposed OCC.
- All works associated with spoil management;
- All associated site works and ancillary development above and below ground including hard and soft landscaping, habitat enhancement and drainage infrastructure.

Figure 5-6 below shows the layout of the Onshore Site.



SCEIRDE ROCKS WINDFARM

Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- EIAR Site Boundary
- HDD Offshore Exit Location
- Onshore Grid Connection
- OGC Joint Bays
- Landfall TJB
- OCC Location
- Access Tracks
- Passing Bays & Road Widening

Temporary Construction Compounds

- Temporary Construction Compound 1
- Tempoary Construction Compound 2
- Temporary Construction Compound 3

Kilometres

0 1 2 km

Data Source

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Sceride Rocks Onshore Infrastructure

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-08	CF	ÓM

DRAWING NO

Figure 5-6

SCALE	PAPER SIZE	DATUM	PROJECTION
1:81,000	A4	IRENET95	Transverse Mercator

5.3.2.1 Onshore Landfall Location

The proposed OLL will be an interface area between the offshore and onshore elements of the Project, and as such the construction work will typically involve both offshore elements and onshore elements. Landfall components and construction methodologies are described further in Section 5.6.2 below. The location of the OLL will be in the townland of Killard, approximately 1km northwest of White Strand, near Doonbeg in Co. Clare, as indicated in Figure 5-7 below. Site investigations were undertaken at the OLL, commencing on November 21st, 2022, and completing on November 28th, 2022. Boreholes and trial pits were completed in order to confirm the design of the infrastructure at this location. Two trial pits were excavated in the Onshore Site. The pits were logged and photographed by an Engineer with observations made on ground conditions, pit stability and water ingress. Two rotary core boreholes were carried out to establish overburden conditions and rockhead and to establish the nature and integrity of the underlying rock. The full report is included as Appendix 5-12.

The OLL is the point at which the OEC will come ashore and connect to the TJB located above the High-Water Mark. It is proposed to construct a temporary construction area at the OLL measuring approximately 5,460 square metres. An example of a typical Horizontal Direction Drilling (HDD), a form of trenchless drilling, compound is shown in Plate 5-11 below. The compound will be utilised for the OLL construction activities and activities necessary for the construction of the HDD and the TJB. The layout of the OLL including permanent infrastructure and temporary construction areas, is shown in Plate 5-11 below.

Plate 5-11 Example HDD compound

5.3.2.1.1 *Transition Joint Bay*

At the OLL, a TJB will be required to house the interface joint between the OEC and the OGC. The TJB is an underground concrete chamber that will provide a firm, solid base for the cable jointing, while also protecting the jointing from weathering and deterioration. The TJB is buried and will measure approximately 100 square metres in area and 2.5m deep. Following connection of the cables, the TJB will be backfilled to protect the joint. The area will then be reinstated. A temporary working area will also be required to construct the TJB infrastructure, in addition to the OLL infrastructure. The design parameters for the TJB are summarised below in Table 5-12.

The EirGrid functional specifications require permanent access tracks at the OLL to provide vehicular access to the TJB during the construction and operations and maintenance stages of the Project. The existing access to the OLL location from the existing local access track to the south will be used for this purpose.

Table 5-12 TJB Design Parameters

Design Parameter	Project Design
Number of TJBs	1
TJB footprint (m^2)	100
TJB length	20m
TJB width	5m
TJB depth	2.5m
Permanent land-take for TJB (m)	5m x 20m x 2.5m
Maximum volume of excavated materials (m^3)	486

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- EIAR Site Boundary
- OEC HDD Route
- HDD Onshore Exit Location
- OGC
- Landfall TJB
- Landfall TCC
- Access Tracks

0 25 50 m
metres

Data Source

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Location of OLL and Associated Infrastructure

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-09	KB	OM

DRAWING NO

Figure 5-7

SCALE	PAPER SIZE	DATUM	PROJECTION
1:1,500	A4	IRENET95	Transverse Mercator

5.3.2.2 Onshore Grid Connection

5.3.2.2.1 *Onshore Grid Connection Cabling Route*

The OGC, which consists of a 220kV cable, will originate at the OLL after exiting the TJB in the townland of Killard. From there, the export cables will be routed underground in a mostly south-southeasterly direction towards the OCC near Moneypoint. Upon exiting the TJB, the export cables will travel along third-party lands and the local road network before crossing the N67 in the townland of Doonmore and continuing south into the townland of Carrowmore South and along local road L2034. The cables will travel south-southeast along the L2034 for approximately 6.7km through the townlands of Tullaher, Einagh, Moanmore North, Moanmore Upper, Moanmore South, Moanmore Lower, Druha and Carnaun, before travelling east and through the Kilrush Golf Club in the townlands of Ballykett and Parknamoney. After exiting the Kilrush Golf Club, the cable will then travel across the road into third party lands, travelling south for approximately 660m before entering onto local road L6150. The cable will travel through the townlands of Parknamoney, Kilcarroll, Dysert, Clooneylissaun, and Ballymacrinan. Within the townland of Ballymacrinan, the underground electrical cabling will connect into the 220kV OCC. From the OCC, the OGC continues 800m south, in the townland of Carrowdotia North, on the local road network where it joins the N67. From here, it travels 1.7km east in the road verge to the existing Moneypoint 220kV Substation in the townland of Carrowdotia.

The OGC will primarily be located within the public road corridor, except for some portions to the south of the OLL that will be laid in private agricultural land, and another portion northeast of Kilrush that will run through private agricultural land and the Kilrush Golf Club. In these cases, consultation with all relevant landowners was undertaken throughout the design phase of the Project. Surrounding land uses along the OGC include agriculture, low density housing, recreational amenity, and the wider road network. The underground cable will consist of a single circuit, single trench along the entirety of the proposed route. Each trench will consist of the installation of 6 no. ducts within which will be contained 3 no. power cables, 2 no. fibre communications cables and 1 no. earth cable.

There are two sections along the OGC where the cable passes through peat lands. These are detailed further in Appendix 5-17 as Section 01 and Section 02. Fuinneamh Sceirde Teoranta (FST) (the Applicant) undertook peat probing along areas of the OGC were peat was present to determine local peat depths. This information is detailed in Chapter 22 Land Soils and Geology of this EIAR. Further site investigations were undertaken, in June 2024, along the OGC in the R-20301 road, referred to as Section 02 (by Clare Motor Club) in Appendix 5-17. The Applicant, understanding that peat habitat was present undertook geophysical surveys and hand auguring in order to confirm the construction methodologies were appropriate for this section of the OGC. The main objective of the geophysical survey was to determine the depth and type of glacial deposits which underlie the peat and the depth to the top of the rock. Full results of this survey can be found in Appendix 5-13.

Table 5-13 presents an overview of the OGC and the length of the sections within the public road, third-party lands, and the total lengths of each route. Section A refers to the OGC from the OLL (TJB) to the proposed OCC and Section B refers to the OGC from the new OCC to the existing Moneypoint 220kV substation.

Table 5-13 Onshore Grid Route Sections

Cable Route Section	Public Roadway	Road Verge	Third-Party Lands	Total Length
Section A (TJB to OCC)	14.8km	—	4.5km	19.3km
Section B (OCC to Moneypoint)	0.7km	0.7km	1.6km	3.0km
Total				22.3km

Open-cut trenching for cables laid in ducts will be the primary installation method for the OGC, with alternative trenchless methods such as HDD being utilised in certain instances where obstacles are encountered, including sensitive features such as water courses, major roads, sensitive environmental areas, etc. Full details of construction methodologies are provided in Section 5.6.2.2 below and Appendix 5-17. The onshore cable trench will be located within the working corridor, which will also include any access tracks, excavated material and any other equipment/machinery. The working corridor will also include joint bays, which will be required approximately every 450-550m to join together the onshore cable sections depending on the manufacturing specification of the cable supplier. Prior to the works commencing, a re-surveying exercise will be undertaken along the proposed route to ensure/reconfirm all existing services. All relevant bodies such as ESB Networks, EirGrid, Gas Networks Ireland, EIR, Uisce Eireann and Clare County Council will be contacted prior to commencement on-site to reconfirm and provide record drawings of all relevant services. Additionally, Road Opening Licences will be required for all sections of the route along the public road and will be sought from Clare County Council in advance of any works being undertaken on the public road network.

The details of the OGC are provided in Table 5-14 below and shown in Figure 5-8.

Table 5-14 Onshore Grid Connection Design Envelope

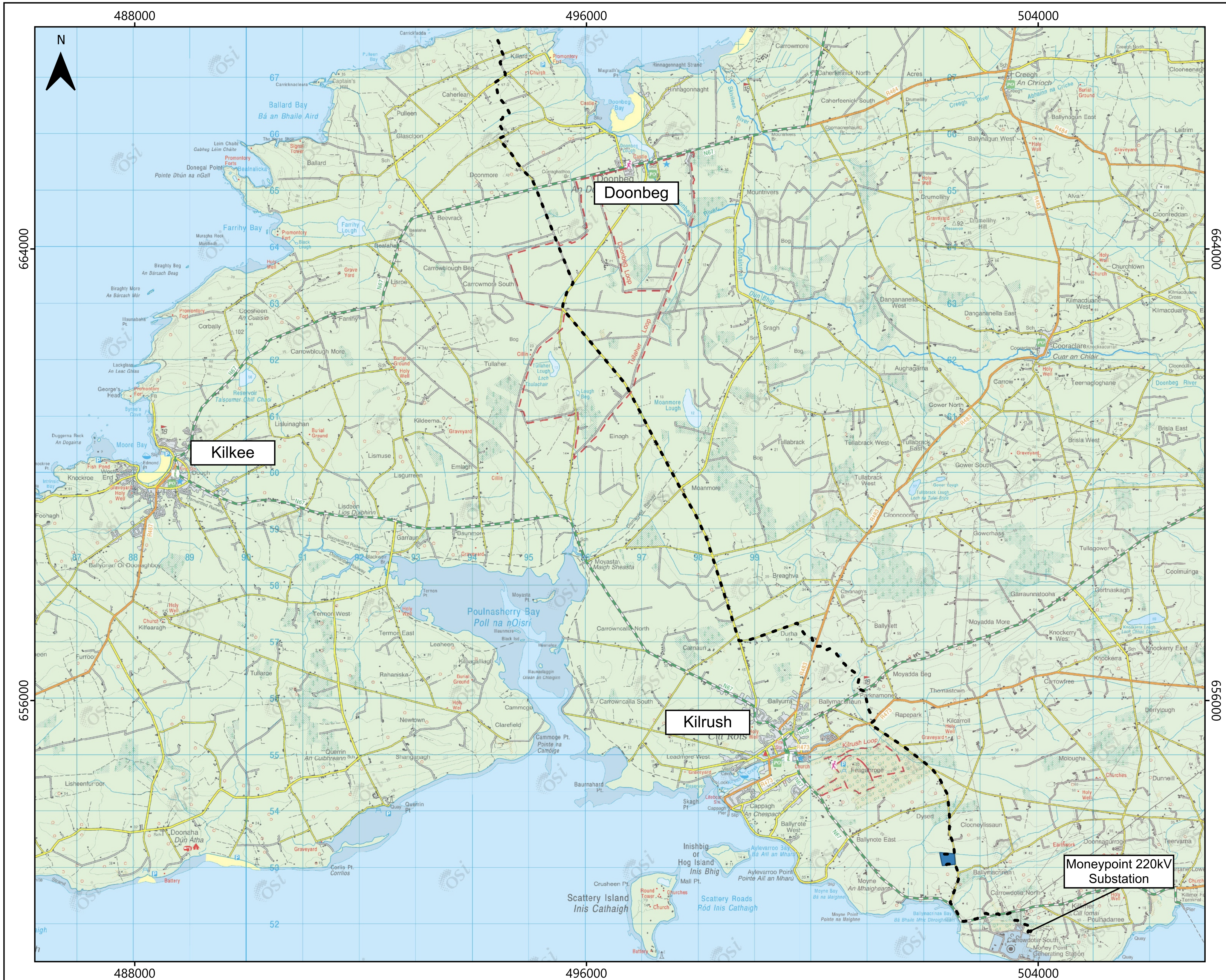
Design Parameter	Project Design Envelope
Export cable voltage (kV)	220
Number of export circuits	1
Number of power cables per circuit	3
Number of communications cables per circuit	2
Number of earth cables per circuit	1
Indicative external cable diameter (mm)	122
Length of OGC (km)	22.3km
Trench width (m)	1.1m
Indicative trench burial depth (m)	1.2m
Number of ducts required per circuit	3
Number of joint bays	43

Cable joint bay dimensions (m) (per bay)	8.0 m by 2.5m
Volume of excavated materials (per metre of trench) (m^3)	1.375

A total of 22.3km of underground cabling will connect the Project to the national grid at the existing Moneypoint 220kV Substation. The 220kV cable will be a single circuit connection and will include power ducts, communication fibre ducts and earth cables laid in a single trench with an excavation depth of approximately 1.2m, as illustrated in Figure 5-9. A methodology for these works is provided in Appendix 5-17.

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 Onshore Site should sufficient volumes of suitable material not be encountered during the excavation phase of the onshore infrastructure.

Where the OGC enters private land, a 3 m access track will be constructed over the cable route, except where the OGC follows the route of existing tracks, so as to cater for access required for maintenance by EirGrid. These can be seen on drawings within Appendix 5-1.



SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- Onshore Grid Connection (OGC)
- Onshore Compensation Compound OCC)

0 1 2 km
Kilometres

Data Source

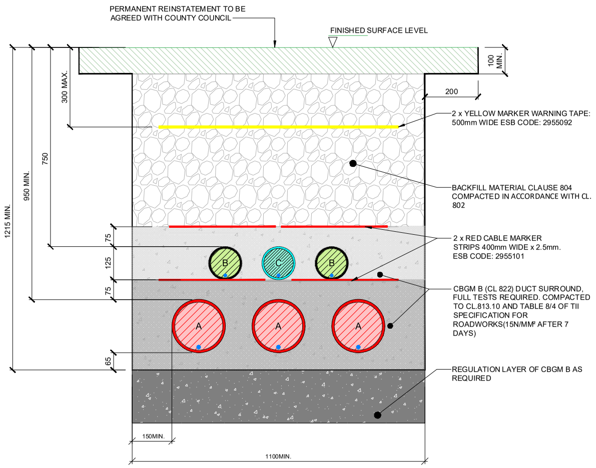
PROJECT TITLE
Sceirde Rocks

MAP TITLE
Onshore Grid Connection Route

VER	REMARKS	DATE	Drawn	Approved
V1		2024-12-01	KB	ÓM
V2		2025-01-09	KB	ÓM

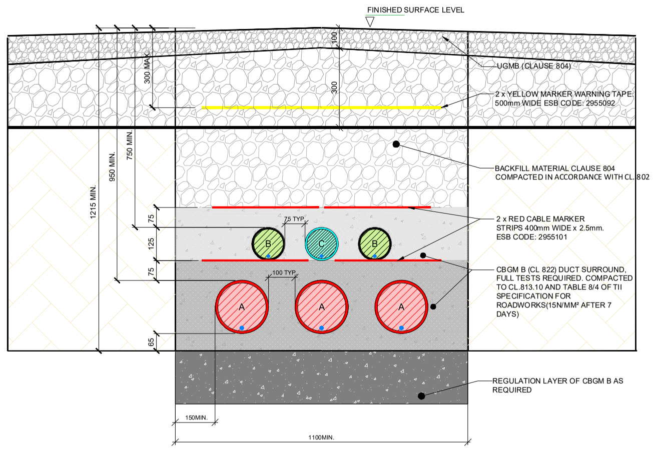
DRAWING NO
Figure 5-8

SCALE	PAPER SIZE	DATUM	PROJECTION
1:80,000	A4	IRENET95	Transverse Mercator



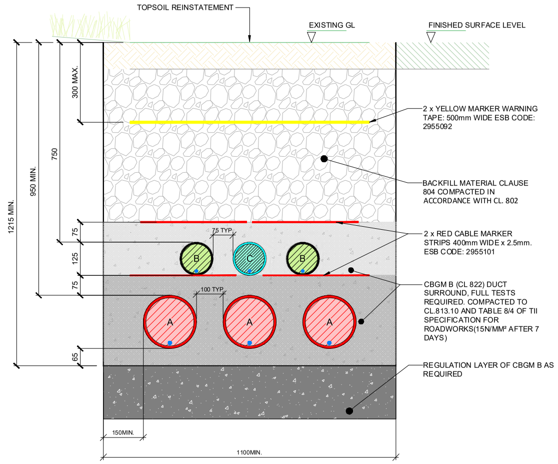
A = 200mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES, SDR = 21, ESB CODE: 9317590
B = 125mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES, SDR = 17.6, ESB CODE: 9317553
C = 125mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES

CABLE TRENCH DETAIL IN PUBLIC ROAD
SCALE 1:10



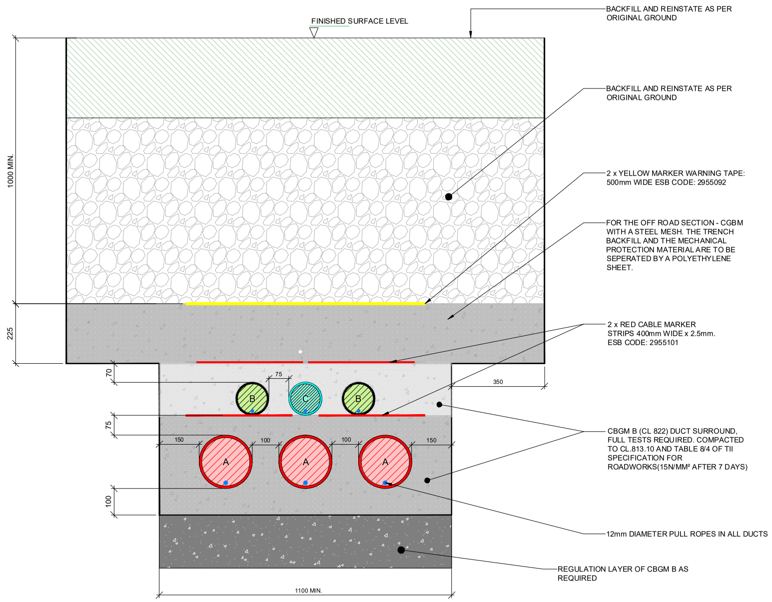
A = 200mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES, SDR = 21, ESB CODE: 9317590
B = 125mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES, SDR = 17.6, ESB CODE: 9317553
C = 125mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES

ACCESS TRACK DETAIL IN PRIVATE LAND
SCALE 1:10



A = 200mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES, SDR = 21, ESB CODE: 9317590
B = 125mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES, SDR = 17.6, ESB CODE: 9317553
C = 125mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES

CABLE TRENCH DETAIL IN PUBLIC ROAD VERGE
SCALE 1:10



A = 200mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES, SDR = 21, ESB CODE: 9317590
B = 125mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES, SDR = 17.6, ESB CODE: 9317553
C = 125mm OUTER DIAMETER HDPE ESB APROVED DUCT WITH 12mm DIAMETER PULL ROPES

CABLE TRENCH DETAIL OFF-ROAD
SCALE 1:10

Figure 5-9

REV	DATE	DESCRIPTION	BY	APP
01	28/11/24	ISSUED FOR PLANNING	PD	CM

PROJECT: SCEIRDE ROCKS OFFSHORE WIND FARM

TITLE: 220 kV CABLE TRENCH DETAILS FLAT FORMATION (ROAD, VERGE, PRIVATE LANDS)

CLIENT: FUINNEAMH SCEIRDE TEO

H&MV ENGINEERING High Voltage Specialists

MWP ENGINEERING AND ENVIRONMENTAL CONSULTANTS
CORK | TRALEE | LONDON | LIMERICK
mwp.ie

DRAWN:	CHECKED:	APPROVED:
P.D.	C.M.	I.B.
PROJECT NUMBER: 24204	DATE: NOV '24	SCALE @ A1: 1:10
STATUS DESCRIPTION: FOR PLANNING		STATUS: S4
DRAWING NUMBER: IRE1 - HMV - ONC - EL - PD - 1004		REV: 01

5.3.2.2.2 Watercourse / Culvert Crossing

The routes of any natural drainage features will not be altered as part of the development of the Onshore Site. The OGC cabling route has been selected to avoid natural watercourses where possible. When water courses such as bridges, culverts and streams are encountered along the OGC route, the preferred method of installation is to place the cable ducts within the bridge deck where minimum cover can be achieved. This methodology is outlined within Appendix 5-17. This is not always possible and other solutions are proposed where this is the case. These alternative solutions include Trenchless Technologies such as HDDor replacement/upgrades of culverts.

5.3.2.2.3 Joint Bays

Joint bays are typically pre-cast concrete chambers where lengths of cable will be joined to form one continuous cable. A total of 43 no. joint bays are proposed along the OGC route from the OLL to the termination point at Moneypoint. They will be located at various points along the underground ducting route at between 450 to 540 metre intervals, or as otherwise required by ESB/electrical design requirements. 30 no. joint bays will be located within the public road. A total of 7 no. of joint bays will be located in agricultural land, a further 2 no. located in the Kilrush Golf Club, 3 no. located in road verge and 1 no. located in ESB lands at Moneypoint. The locations of the joint bays between the OLL and Moneypoint are indicated in Appendix 5-1

Once constructed, they will be backfilled in accordance with TII specifications until the underground cabling is being installed. It is noted that once the cable installation is complete, the cables will be permanently covered and will not be perceptible except for access covers at the surface. Engagement with the Roads Section of Clare County Council has taken place and is proposed to continue as part of the permanent road reinstatement works. Once constructed, joint bays will only require access for maintenance or replacing of cables, which is expected to be infrequent over the Project's lifetime.

5.3.2.3 Onshore Compensation Compound

A proposed 220kV electrical OCC will connect the Project to the national grid, the proposed OCC is located close to the existing Moneypoint 220kV Substation. The proposed OCC is located within agricultural grassland in the townland of Ballymacrinan and will be accessed via local road L6150 and new permanent access tracks within the Onshore Site. The works will consist of the construction of an EirGrid 220kV GIS building, a ESB 220kVGIS building, a Customer SCADA and MV power building and a Statcom building, as well as welfare facilities, all associated electrical plant and apparatus, security fencing, underground cabling, drainage, wastewater holding tanks, and all ancillary works. The OCC will be surrounded by an approximately 2.6-metre-high steel palisade fence in line with standard ESB/EirGrid requirements, and internal fences will also segregate different areas within the OCC. The area to the east of the OCC will serve as an area for the temporary construction compound during the construction phase with all associated facilities being removed before the final sections of the perimeter fence are erected. Excess spoil from the OCC will be distributed within spoil management areas and a landscape management plan has been prepared for the long-term use of the area. The landscape management plan is provided in the planning drawing pack. The construction and electrical components provided within the OCC will be to EirGrid specifications.

Site investigations were undertaken within the area of the OCC on the 3rd July 2024. Trial pits were completed to provide detailed factual geotechnical information of the underlying ground conditions at the OCC. Three trial pits were excavated on the Onshore Site using a tracked excavator. Ground conditions encountered during the completion of the fieldwork were typical and as expected for this region and predominantly consisted of peat and/or silt overlying Glacial Tills. The Glacial Tills in general consisted of slightly sandy gravelly silt/clay with cobbles and boulders. Full details can be found in Appendix 5-14. The design elements of the OCC are provided in Table 5-15 below with further detail on each key element of the OCC detailed in the following paragraphs.

Table 5-15 Onshore Compensation Compound Design Envelope

Design Parameter	Project Design Envelope
OCC Area (ha)	4.98
Equipment	Two number two-storey GIS Substation buildings and one transformer with associated ancillary equipment and enclosures, one single storey Customer SCADA and MV power building, one STATCOM building, one outdoor Harmonic Filter, one Shunt Reactor, one outdoor incomer bay equipped with Shunt Reactor, lightning masts, telecom pole, car parking, associated underground services and roads, and external fencing.
Perimeter Fence Height	2.6m
Number of Buildings	4 (EirGrid 220kV GIS building, ESB 220kV Networks GIS building, Customer SCADA and MV power building and STATCOM Building)
Area of Buildings	EirGrid 220kV GIS building: 49m x 18.5m ESB 220kV GIS building: 49m x 18.5m STATCOM Building: 30.5m x 22m Customer SCADA and MV power building: 8.7m x 18.4m
Height of Buildings	EirGrid 220kV GIS building: 16.7m ESB 220kV GIS building: 16.7m STATCOM Building: 7.6m Customer SCADA and MV power building: 6.1m
Lightning Protection Mast Height (m)	16.5m
Telecom pole (m)	21.6m

5.3.2.3.1 Design and Components

The OCC will contain, as mentioned:

- A EirGrid 220kV GIS building,
- A ESB 220kV GIS building,
- A Customer SCADA and MV power building
- A Statcom building, and
- Welfare facilities

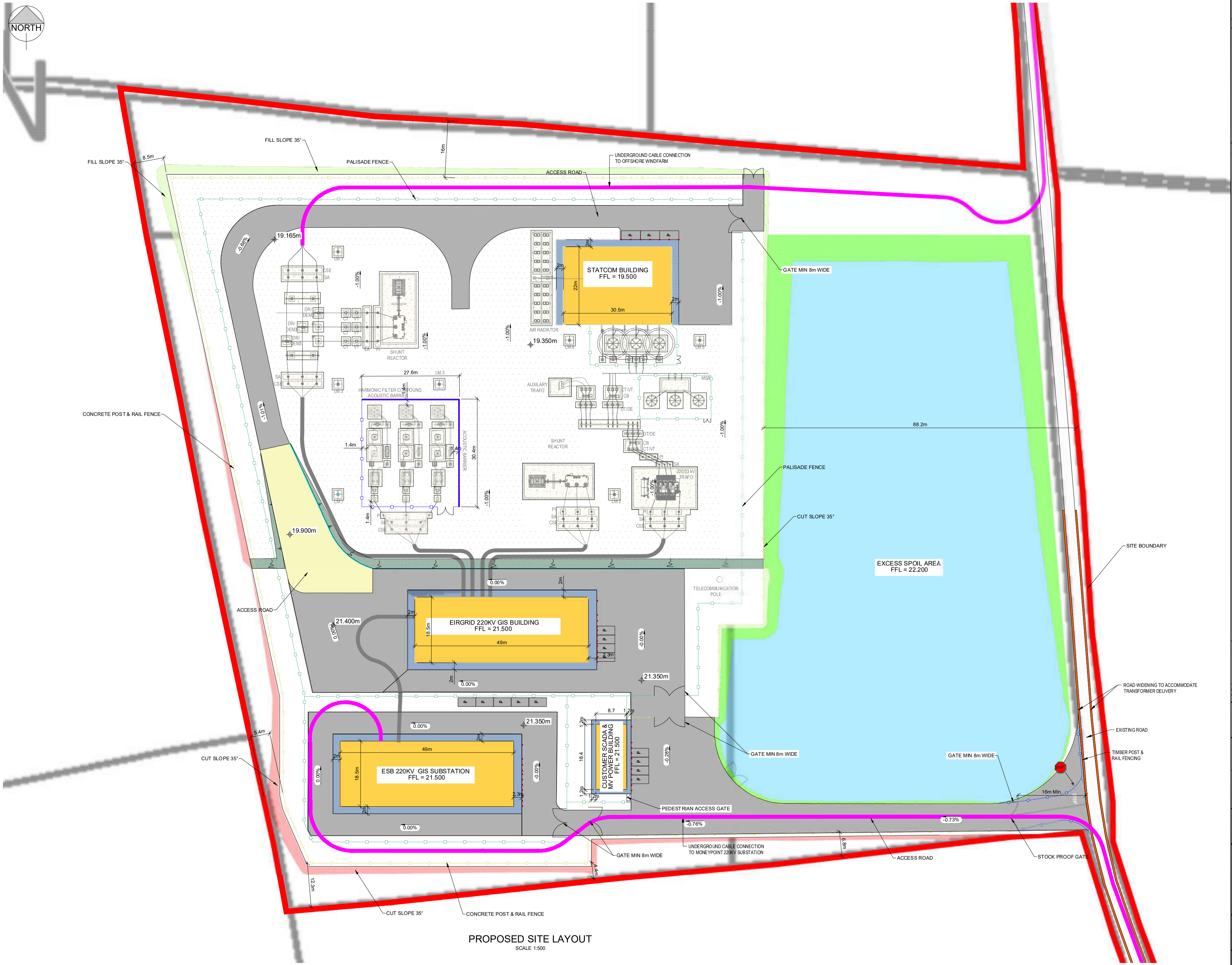
The proposed EirGrid 220kV compound is located to the west (centre and north) of the OCC and has a footprint of approximately 2.2 hectares. This compound contains the proposed two storey EirGrid 220kV GIS building (with a gross floor area of 1,813 sqm, the Statcom building (with a gross floor area of 670sqm) along with associated outdoor equipment. The outdoor equipment within the compound includes one transformer with associated ancillary equipment and enclosures, one outdoor Harmonic Filter, one Shunt Reactor, and one outdoor incomer bay equipped with Shunt Reactor, The EirGrid 220kV GIS building will predominately comprise powder coated profiled metal cladding panels, and all service/escape doors will be finished to match the cladding.

The proposed ESB 220kV GIS buildings is located within its own compound on the southern side of the OCC, the footprint of which measures approximately 0.36 ha and includes the provision of a two storey GIS Substation building with a gross floor area of 1,813 sqm. This two storey GIS building has been designed to meet Eirgrid's standard specifications. The ESB 220kV GIS building will predominately comprise powder coated profiled metal cladding panels, and all service/escape doors will be finished to match the cladding.

To the east of the of the Onshore Site, adjacent to the ESB 220kV GIS building is a single-storey Customer SCADA and MV power building (with a gross floor area of 160 sqm), lightning masts, car parking, associated underground services and roads within a 2.6m high fenced compound and all associated construction and ancillary works. The SCADA building will be constructed with block work with a screed finish.

The OCC buildings will include staff welfare facilities for the staff that will work on the compound during the operational phase of the project. Layout and elevation drawings of the control buildings are in included in Figure 5-10 below. Further details of all the OCC components are included below.

The wastewater and stormwater systems are described in Section 5.6.2.3 below.



DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS IN ALL CASES.VERIFY DIMENSIONS ON SITE AND REPORT ANY DISCREPANCIES TO THE DESIGNERS IMMEDIATELY.
THIS DRAWING TO BE READ IN CONJUNCTION WITH THE DESIGNERS SPECIFICATION.

NOTE:

1. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIFICATIONS, BILLS OF QUANTITIES, ARCHITECTURAL, SERVICES AND ENGINEERING DRAWINGS.
2. ALL LEVELS ARE IN METRES RELATED TO ORDNANCE DATUM NEWLYN.
3. ANY DISCREPANCIES BETWEEN THESE DOCUMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
4. DRAWINGS ARE NOT TO BE SCALED.
5. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.

LEGEND:

- SITE BOUNDARY
- PALISADE FENCE
- CONCRETE POST & RAIL FENCE
- WELD MESH SCREEN FENCE
- ACOUSTIC BARRIER
- BUILDING
- ACCESS ROAD (ASPHALT)
- CAR SPACE
- SUBSTATION COMPOUND
- ROAD SAFETY BOLLARDS
- CUT SLOPE 35°
- FILL SLOPE 35°
- FILL SLOPE 2:1
- EXCESS SPOIL HATCH
- PROPOSED BERM
- PROPOSED RAMP
- PROPOSED EQUIPMENT PLINTH
- PROPOSED CONCRETE PATH (SUITABLE FOR CART & TROLLEY ACCESS)
- KERB

Figure 5-10

REV	DATE	DESCRIPTION	BY	APP
02	29.11.24	ISSUED FOR PLANNING	EP	JL
01	18.11.24	ISSUED FOR PLANNING	EP	JL

PROJECT: SCEIRDE ROCKS 220kV GIS SUBSTATION

TITLE: GENERAL LAYOUT FOR ONSHORE COMPENSATION COMPOPUND

CLIENT: FUINNEAMH SCEIRDE TEO

H&MV ENGINEERING

MWP ENGINEERING AND ENVIRONMENTAL CONSULTANTS
CORK | TRALEE | LONDON | LIMERICK
mwp.ie

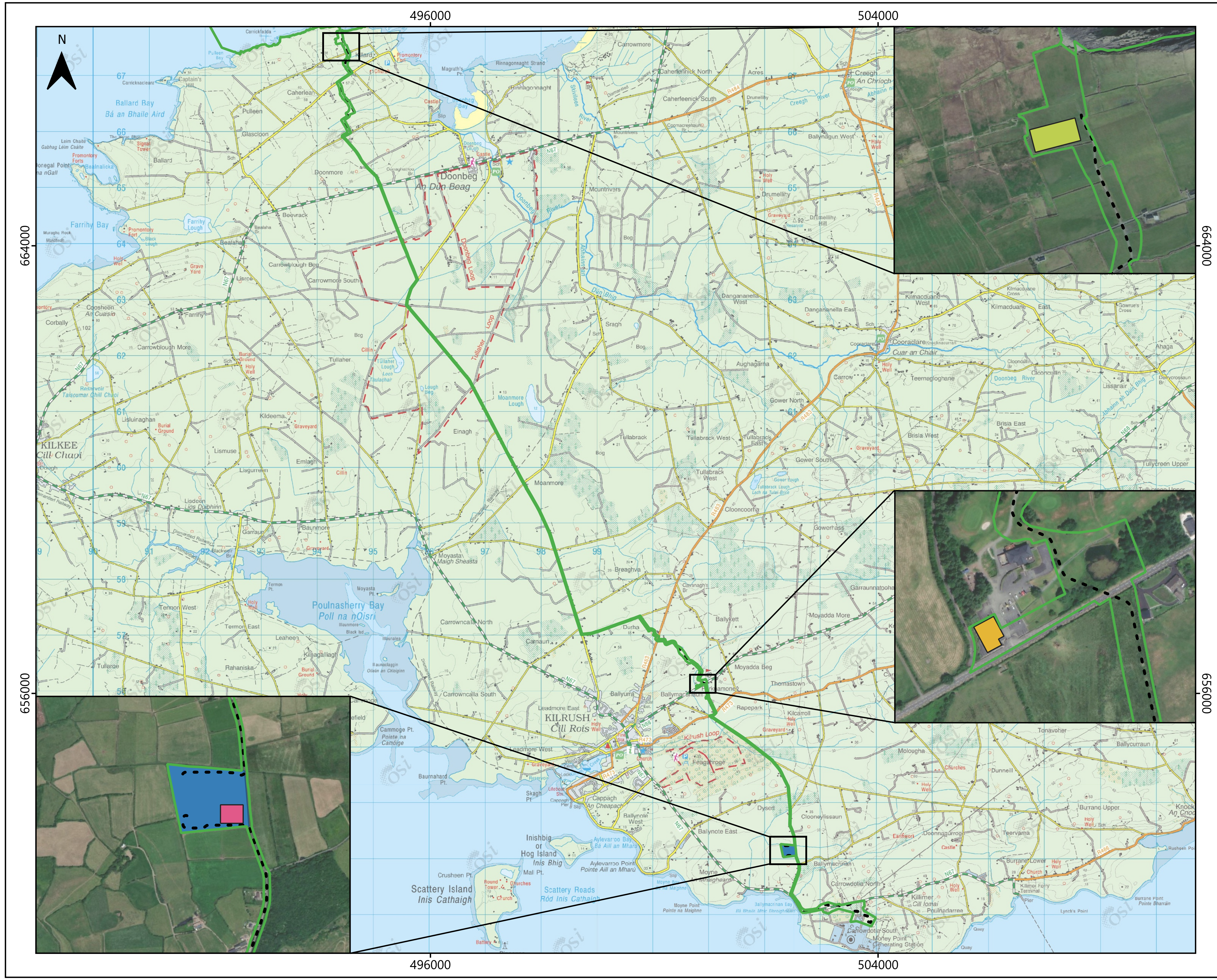
DRAWN:	CHECKED:	APPROVED:
EP	NT	IB
PROJECT NUMBER: 24204	DATE: NOV' 2024	SCALE @ A1: 1:500
STATUS DESCRIPTION: FOR PLANNING		STATUS: S4
DRAWING NUMBER: IRE1-HMV-ONS-EL-PD-1001		REV: 02

5.3.2.4 Temporary Construction Compounds

There are three temporary construction compounds proposed as part of the Onshore Site. These are located at the OLL, within the Golf Course along the OGC route and adjacent to the OCC, as shown detailed below and shown in Figure 5-11 below.

- TCC1 measures approximately 76m*62m in area will be located at the OLL. The layout of this construction compound is shown on Figure 5-12.
- TCC2 measures approximately 25m*32.5m in area will be located within Kilrush Golf Club. The layout of this construction compound is shown on Figure 5-13.
- TCC3 measures approximately 105m*52m in area will be located adjacent to the OCC . The layout of this construction compound is shown on Figure 5-14.

The temporary construction compounds will consist of a bunded refuelling and containment area for the storage of lubricants, bentonite storage, oils and site generators etc, and full retention oil interceptor, waste storage area, temporary site offices, staff facilities and car-parking areas for staff and visitors. Temporary port-a-loo toilets and toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewaters being tankered off site by permitted waste collector to wastewater treatment plants. There will also be a water supply on site for hygiene purposes, by way of a temporary storage tank. Further detail on the construction of the temporary construction compounds are details in Section 5.6.2.3 below and in Appendix 5-17



SCEIRDE ROCKS WINDFARM

Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- EIAR Site Boundary
- OGC
- Landfall TCC
- Golf Club TCC
- OCC TCC
- OCC Location

0 1 2 km

Kilometres

Data Source

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Location of Temporary Construction Compounds

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-08	KB	ÓM

DRAWING NO

Figure 5-11

SCALE	PAPER SIZE	DATUM	PROJECTION
1:80,000	A4	IRENET95	Transverse Mercator

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- Temporary Construction Compound 1
- EIAR Site Boundary

Temporary Construction Compound 1 Layout

- Bentonite Storage
- Canteen
- Carpark
- Wastewater Storage
- Drying Room
- Meeting Room
- Office
- Settlement Tanks
- Storage Space
- Storage Unit

0 25 50
Metres

Data Source

PROJECT TITLE
Sceirde Rocks

MAP TITLE
Temporary Construction Compound 1

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-08	KB	ÓM

DRAWING NO
Figure 5-12

SCALE	PAPER SIZE	DATUM	PROJECTION
1:1,000	A4	IRENET95	Transverse Mercator

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- EIAR Site Boundary
- Temporary Construction Compound 2

Temporary Construction Compound 1 Layout

- Carpark
- Office
- Storage Unit
- Mobile Welfare Unit

Data Source

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Temporary Construction Compound 2

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-08	KB	OM

DRAWING NO

Figure 5-13

SCALE	PAPER SIZE	DATUM	PROJECTION
1:400	A4	IRENET95	Transverse Mercator

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- EIAR Site Boundary
- Temporary Construction Compound 3

Temporary Construction Compound 3 Layout

- Canteen
- Carpark
- Drying Room
- Meeting Room
- Office
- Storage Unit
- Toilets
- Wastewater Storage

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Temporary Construction Compound 3

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-08	KB	ÓM

DRAWING NO **Figure 5-14**

SCALE	PAPER SIZE	DATUM	PROJECTION
1:500	A4	IRENET95	Transverse Mercator

5.3.2.5 Spoil Management

The tables below provide details on the excavations required and the volumes of material for the Onshore Site.

5.3.2.5.1 *Quantities – OLL to OCC*

From the OLL to the OCC, the cable is a total length of approximately 19.3km.

- Approximately 14.749km is located within the public roadway, of which approximately 1.495km is located within a section of peat which facilitates HDD; and
- Approximately 4.499km is located within private lands

Table 5-16 Trench Excavation Quantities requiring management - OLL to OCC

Material	Width (m)	Depth (m)	Area (m^2)	Total Volumes (m^3)
Excavation Works				
Excavation - Public Roadway	1.100	1.250	1.375	17,494
Excavation - Third-Party Lands	1.100	1.250	1.375	6,087
Excavation - Joint Bays Public Road	2.500	2.300	5.750	1,150
Excavation - Joint Bays Private Lands	2.500	2.300	5.750	414
Excavation - Joint Bays Peat Area	2.500	Varies due to peat depths on the Onshore Site	Area varies due to peat depths on the Onshore Site	1,392
Trench Reinstatement - Public Roadway				
CBGM B (CL. 822)	1.100	0.575	0.633	6,547
Backfill Material UGMB (Cl. 804)	1.100	0.575	0.633	8,257
Permanent Reinstatement (Asphalt)	1.500	0.100	0.150	1,958
Trench Reinstatement - Third-Party Lands				
CBGM B (CL. 822)	1.100	0.575	0.633	2,220
Backfill Material UGMB (Cl. 804)	1.100	0.575	0.633	2,800

Topsoil Reinstatement	1.100	0.100	0.110	487

5.3.2.5.2 Quantities – OCC to Moneypoint 220kV Substation

From the OCC to Moneypoint 220kV Substation, the cable is a total length of approximately 3km.

- Approximately 0.7km is located within the public roadway,
- Approximately 0.7km is located within the road verge; and
- Approximately 1.6km is located within private lands.

Table 5-17 Trench Excavation Quantities requiring management - OCC to Moneypoint 220kV Substation

Material	Width (m)	Depth (m)	Area (m^2)	Total Volumes (m^3)
Excavation Works				
Excavation - Public Roadway	1.100	1.250	1.375	1,005
Excavation – Road Verge	1.100	1.250	1.375	888
Excavation - Third-Party Lands	1.100	1.250	1.375	2,102
Excavation - Joint Bays Public Roads	2.500	2.300	5.750	230
Trench Reinstatement - Public Roadway				
CBGM B (CL. 822)	1.100	0.575	0.633	367
Backfill Material UGMB (Cl. 804)	1.100	0.575	0.633	462
Permanent Reinstatement (Asphalt)	1.500	0.100	0.150	110
Trench Reinstatement – Road Verge				
CBGM B (CL. 822)	1.100	0.575	0.633	324
Backfill Material UGMB (Cl. 804)	1.100	0.575	0.633	409
Topsoil	1.100	0.100	0.110	71
Third-Party Lands				

CBGM B (CL. 822)	1.100	0.575	0.633	767
Backfill Material UGMB (Cl. 804)	1.100	0.575	0.633	967
Topsoil	1.100	0.100	0.110	168

Note: all values above are estimations based on typical details and are to be used as an indicative guide in informing the design process.

5.3.2.5.3 OGC Summary

Table 5-18 below shows the total complied quantities of material excavated and reinstated along the OGC.

Table 5-18 Total Excavation and Reinstatement Quantities

Material	Total Volumes (m^3)
Excavation Works	
Public Roadway	18,499
Road Verge	888
Third-Party Lands	8,189
Excavation - Joint Bays	3,186
Trench Reinstatement	
Excavation Works	31,218
CBGM B (CL. 822)	10,224
Backfill Material UGMB (Cl. 804)	12,895
Asphalt	2,068
Topsoil	726

5.3.2.5.4 *Quantities - OCC*

In addition to the above, there will be excavation at the OCC, these volumes are detailed below in Table 5-19.

Table 5-19 OCC Excavation Quantities

Material	Area (m^3)	Area (m^2)	Total Volumes (m^3)
Excavation Works-Cut			
Volume of cut Topsoil	11959.96	29899.91	11959.96
Volume of Subsoil to be reused on Site	29899.91	13256.42	13256.42
OCC Fill/Reinstatement Volumes			
Volume of Import 150mm Compound Stone	2522.7	16817.97	2522.7
Volume of import including 300mm 6F2 stone	17771.19	29899.91	17771.19
Volume of Materail Under Building	3206.86	2234.65	3206.86
40mm of Dense Bitumen Macadam Size 14mm	343.12	8578.01	343.12
60mm of Dense Bitumen Macadam 20mm	514.68	8578.01	514.68
100mm Clause 803	857.8	8578.01	857.8

5.3.2.6 Hedgerow and Woodland Removal and Replanting

5.3.2.6.1 *Hedgerow Removal*

To facilitate the development of the Onshore Site, there will be a total loss of approximately 456m of hedgerow habitat. This is split out as follows:

- A requirement for removal of approximately 33m of hedgerow habitats along the OGC;
- A requirement for removal of approximately 353m of hedgerow habitats within the OCC; and
- A requirement for removal of approximately 90m of hedgerow habitats at the passing bay locations.

There will be no additional loss of hedgerow habitat as a result of the remaining components of the Onshore Site.

In order to compensate for the loss of approximately 4456m of hedgerow habitat to facilitate the Onshore Site, a landscape mitigation plan has been produced by Macroworks (Appendix 27-1) which provides for the bolstering and planting of hedgerow habitat around the OCC.

Existing or marginal hedgerows around the OCC, totalling 870m, will be bolstered and maintained using native stock. Gaps in hedgerow alignment will be filled with native vegetation similar to existing species within the Onshore Site. Additionally, there will be approximately 406m of new hedgerow planted within the OCC.

5.3.2.6.2 *Woodland Removal*

To facilitate the development of the Onshore Site, there will be a total loss of approximately 0.244ha of Mature Scrub/Scrub woodland and approximately 0.327ha of Mixed broadleaved woodland. This is split out as follows:

- A requirement for removal of approximately 0.244ha of mature scrub/scrub woodland along the OGC;
- A requirement for removal of approximately 0.327ha of mixed broadleaved woodland along the OGC; and

There will be no additional loss of woodland habitat as a result of the remaining components of the Onshore Site.

In order to compensate for the loss of approximately 0.244 ha of scrub/scrub woodland and approximately 0.327 ha of mixed broadleaved woodland habitat to facilitate the Onshore Site, a landscape mitigation plan has been produced by Macroworks (Appendix 27-1) which provides for planting of approximately 0.85 ha of native woodland within the OCC.

Species proposed to be planted within the OCC area are listed in Appendix 27-1.

5.3.2.7 Site Drainage

5.3.2.7.1 *Introduction*

The protection of the watercourses within and surrounding the Onshore Site, and downstream catchments that they feed is of utmost importance in considering the most appropriate drainage proposals for the Onshore Site. The Onshore Site's drainage design has therefore been proposed specifically with the intention of having no negative impact on the water quality of the Onshore Site and downstream catchments and ecological ecosystems. No routes of any natural drainage features will be altered as part of the Onshore Site.

For the OGC, there will be no direct discharges to any natural watercourses. Where the OGC is proposed within public roads the road will be reinstated with a finish to at least pre-existing conditions in accordance with Guidelines for Managing Openings in Public Roads and TII Requirements for the Reinstatement of Openings in National[3]. Within the joint bay design, a drainage sump has been included to allow for drainage from the joint bay and to avoid any pooling on the public road.

[3] *Department of Transport, Tourism and Sport (2017) 'Guidelines for Managing Openings in Public Roads'.*

5.3.2.7.2 Onshore Compensation Compound Drainage Strategy

The OCC drainage report which outlines the proposed drainage strategy is provided in Appendix 5-15.

Foul Drainage

The foul drainage design includes 3 no. 5m^3 wastewater holding tanks to be installed. Emptying times of the holding tank may vary depending on usage on the Onshore Site but should be emptied every 6 months at a minimum.

Irish Water code of practice for Wastewater specifies a design daily flow rate of 50 litres/person for an industrial setting (office/no canteen). Assuming the tank is emptied at a minimum of once every 6 months or once the storage volume reaches 4m^3 (80% capacity), this equates to a total of 40 days of use in a 6-month period assuming two operatives per visit:

- 4m^3 Tank volume / (0.05m^3 design load per person per day x 2 operatives) = 40 days

This volume is more than adequate to cater for the expected maintenance visits and usage of the substation building including a suitable buffer for any unforeseen visits.

An alarm will be fitted to the tank to advise the maintenance management that the system is close to capacity such as 80%. This is so that the system can be emptied to prevent the risk of it overflowing. A vent pipe is proposed to serve the tanks to reduce the risk of odour nuisance on the Onshore Site due to the tanks.

Storm Drainage

The storm drainage proposals incorporate the following elements:

- A conservative approach of pipes not surcharging in the 30-year event is used in line with the majority of county development plans.
- The design of the stormwater pipe considers a 100-year event whilst also accounting for a 20% increase in the anticipated stormwater volume due to climate change.
- A 20% additional climate change allowance is also included in the design of the surface water system and the attenuation tank. Refer to Appendix 5-15 for calculations for the sizing of the surface water drainage system.

Refer to Appendix 5-15 for further details on storm water drainage design and the relevant layout drawings.

Collection & Conveyance of Stormwater Runoff

Stormwater runoff will be collected from the hardstanding areas as follows.

- Buildings will be drained via rainwater downpipes to an underground gravity system before attenuation and discharge. Total buildings drainage area is 3210m^2.
- Bund areas will be constructed with benching to fall to a sump where it will be connected to the underground gravity system and will pass through a Full retention oil separator before attenuation and discharge. Total bunds drainage area is 224m^2.
- The proposed access track that is present throughout the Onshore Site will be constructed with the use of permeable asphalt. High voids within porous asphalt pavements cause water to filter through the pavement structure into an underlying drainage base and then into the water table. Total Asphalt Roadways drainage area is 8,459m^2.

- The remaining compound and any runoff from the access track are to drain via natural infiltration through the compound stone and the 6F2 material. Previous installations of this drainage mechanism have shown this approach is successful and the infiltration rate through the 6F2 material is adequate.

Water Quality

All runoff collected within the underground gravity drainage system will pass through a full retention petrol interceptor before entering the Infiltration/attenuation pond.

See Appendix 5-15 for details on Kingspan Klargester fuel/oil separator that will be utilised. An operational system for this oil interceptor will be provided by the Oil interceptor manufacturer and included in the Safety File for the Project.

Attenuation and Discharge of Stormwater Runoff

Stormwater runoff will be attenuated within the Onshore Site using an attenuation tank system. Inlet and outlet manholes will be constructed with 300mm sumps with the outlet manhole fitted with a hydro brake flow restrictor set to greenfield runoff rates for the Onshore Site.

Three attenuation systems have been designed for the Onshore Site, a summary of the three systems is provided in Table 5-20 below. All three systems are based on a Stormtech System OSEA with a hydrobrake outflow restriction.

Table 5-20 Attenuation System Parameters

System Number	System Reference	Contributing Impermeable Area (m2)	Tank Dimensions (L*D*B (m))	Outflow rate (l/s)
1	Draining from the ESB Substation Compound	860	15 x 2 x 0.8	3
2	Draining from the EirGrid Compound	2420	20 x 3.5 x 1.2	6
3	Draining from the Customer Scada Building	150	10 x 2 x 0.6	3

Based on the above, a discharge to an existing stream has been selected as the location to discharge the stormwater runoff from within the Onshore Site. As provided in Table 5-19 above, the peak discharge rate for the Onshore Site is 12l/s with a hydrobrake system implemented to control flow. Rip-rap aprons will be located at the storm water outlets to reduce the potential erosion at the outfall points.

Water Supply to the OCC

There is no existing water supply serving the Onshore Site. It is proposed that a number of bored wells will supply water to the three compounds within the OCC, one borehole is provided per compound. A detail of a bored well is provided in Appendix 5-15.

5.3.2.8 Site Activities

5.3.2.8.1 *Environmental Management*

All proposed activities on the Onshore Site of the Project will be provided for in an environmental management plan. A Construction and Environmental Management Plan (Onshore CEMP) has been prepared for the Project and is included in Appendix 5-16 of this EIAR. The Onshore CEMP includes details of drainage, peat and overburden management and waste management and outlines clearly the mitigation measures and monitoring proposals that are required to be adhered to in order to complete the works in an appropriate manner. In the event that development permission is granted for the Project, the Onshore 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.

5.3.2.8.2 *Refuelling*

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

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

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

5.3.2.8.3 *Concrete Deliveries*

Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in standard concrete delivery trucks.

The use of ready-mixed concrete deliveries will eliminate any potential environmental risks associated with on-site batching. When concrete is delivered to the Onshore Site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the Onshore 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, within the nearest temporary construction compound. 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 5-12 and Plate 5-13 below.

Plate 5-12 Concrete Washout Area

Plate 5-13 Concrete Washout Area

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 at an appropriate licenced waste facility.

Alternatively, a Siltbuster-type concrete wash unit or equivalent[4] may be used. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids will be disposed of off-site at an appropriate licensed waste facility.

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

- 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 Onshore Site roads will not be provided until all bases have been poured. No concrete will be transported around the Onshore Site in open trailers or dumpers so as to avoid spillage while in transport.
- The arrangements for concrete deliveries to the Onshore Site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout and discussing emergency procedures.

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[4] Siltbuster. (2024.). *Concrete Washout - Water Treatment*. [online] Available at: https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/

- 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 Onshore Site.

5.3.2.8.4 Concrete Pouring

The concrete pours that will be required to construct the Project, 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 will include:

- Using weather forecasting to assist in planning large concrete pours and avoiding large pours where a prolonged period 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 or equivalent.
- Disposing of surplus concrete after completion of a pour in agreed suitable locations away from any watercourse or sensitive habitats, for later breaking up and disposal at an appropriate licensed waste facility.

5.3.2.8.5 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 ponds in the Onshore Site's drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and onsite 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.

5.3.2.8.6 Vehicle Washing

Wheels or vehicle underbodies are often washed before leaving construction areas to prevent the build-up of mud on public (and site) roads. It is not anticipated that vehicle or wheel washing facilities will be required as part of the construction phase of the Project because Onshore Site roads will be formed using on-site materials before other road-going trucks begin to make regular or frequent deliveries to the Onshore Site (e.g. with steel or concrete). The Onshore Site roads will be well finished with compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt.

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

5.3.2.8.7 Waste Management

The Onshore CEMP, Appendix 5-16 of this EIAR, provides a Waste Management Plan (WMP) in Section 3.9 which outlines the best practice procedures during the construction phase of the project. The WMP outlines the methods of waste prevention and minimisation by reuse, recycling, or recovery at each stage of construction of the Project. Disposal of waste will be a last resort.

The Waste Management Act 1996 (as amended)[5] 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 site of the development to ensure that all contractors hired to remove waste from the Onshore 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.

The Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2020-2025[6], is Irelands latest roadmap for waste planning and management. The policy was adapted to reflect the EU 2020 Circular Economy Plan and to provide a roadmap for waste planning and management in Ireland. Furthermore, the Circular Economy Programme 2021-2017 is a policy adaptation of goals of the European Green Deal. The circular economy is a concept which involves the driving of resource and material sustainability at the EU and national level (i.e., the Waste Action Plan and the Circular Economy Programme) by optimising material cycles (EPA, 2021a)[7] through:

- Reuse and disposal of materials; and
- The minimisation of waste to make the most of the resources within that process.

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

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

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5 *Irish Statute Book (1996) Waste Management Act 1996 (S.I. No. 10 of 1996).*

6 *Government of Ireland (2020-2025) 'A Waste Action Plan for a Circular Economy 2020-2025' Available at: 86647_dcf554a4-0fb7-4d9c-9714-0b1fbe7dbc1a.pdf*

7 *Environmental Protection Agency (2021) 'The Circular Economy Programme 2021-2027' Available at: https://www.epa.ie/publications/circular-economy/resources/EPA_Circular_Economy_2021_Programme_Apr22_Web.pdf*

5.4 Transport and Site Access

5.4.1 Offshore Site

5.4.1.1 Vessel requirements

5.4.1.1.1 *Construction vessels requirements*

The vessel requirements will be determined by the installation contractor post-consent, and this will depend on vessel availability. However, it is anticipated that a range of vessels will be used in the construction stage, including:

- Cable Laying Vessels; (CLV)
- Trenching Support Vessels (TSV);
- Wind Turbine Installation Vessel (WTIV) – a type of jack-up vessel;
- Tug boats (Main Tug, Assist Tugs, Infield Tug);
- Fallpipe vessel;
- Heavy Lift Vessel (HLV);
- Crew Transfer Vessels (CTV);
- Rock Laying vessel;
- Trailing suction hopper dredger (TSHD);
- Dynamic Position vessel (DP);
- Service Operations Vessel (SOV);
- Survey Vessel; and
- Multi-cat landfall construction support vessel

Based on the Offshore Site construction programme, there will be a total of 23 vessels involved across the construction, with a maximum of 11 vessels within the Offshore Site at any one time (Table 5-21). Several construction activities may take place concurrently e.g. WTG installation and cable protection installation on the IAC. Some vessels e.g. rock placement vessels will be used on various construction activities in different parts of the Offshore Site.

Table 5-21 Anticipated vessels during construction period

Installation method/infrastructure	Anticipated Vessel No.	Considered Vessel Type
Seabed preparation for rock placement	2	› Trailing suction hopper dredger › Fallpipe rock placement
OSS Topside	3	› HLV › Tug › Barge › Option for a WTIV or Jack-up which would replace HLV
IACs	4	› Cable Lay Vessel › Trenching Support Vessels › Service Operation Vessel › Rock Placement Vessel
OEC	6	› Cable Lay Vessel › Trenching Support Vessels › Service Operation Vessel › Rock Placement Vessel › Shallow Water Pull-in Vessel

		Multi-cat landfall construction support vessel
GBS Foundations	4	Main Tug x 1 Assist Tugs x 2 Infield Tug x 1
WTGs	3	WTIV SOV CTV
Construction and major maintenance operations	1	Guard vessel

5.4.1.2 Advisory Safe Clearance Ranges

Two levels of advisory safe clearance ranges are to be implemented for other users of the marine environment (e.g. cargo vessels, passenger vessels, recreational vessels):

- **500 metres** from vessels engaged in construction, decommissioning and major maintenance activities; and
- **50 metres** from installed, operational WTGs.

5.4.2 Onshore Site

5.4.2.1 Site Access

Where the OGC is located within private lands, a number of temporary construction accesses have been proposed from the public road to provide temporary site access during the construction stage of the Project, a number of these are existing site accesses. The location of these temporary construction accesses points are shown on the OGC layouts included in Appendix 5-1, where the OGC leaves the public road and enters third-party lands. Details on the access to the OLL and Kilrush Golf Club are provided below.

Where EirGrid require access to the joint bays during the operational and maintenance phase, this will be provided via the permanent access tracks over the OGC. Operational access will be very intermittent and infrequent.

5.4.2.1.1 *Access to Onshore Landfall Location*

It is proposed to access the OLL via an existing access track off an existing local road. It is proposed to access the OLL via local road L-6150 as a means to facilitate the delivery of the construction materials and landfall component. From the local road, there is an existing access onto an existing access track that travels towards the landfall location for approximately 690m, before there is a requirement for a new permanent access track to reach the OLL. The proposed new permanent road will be a gravel road.

5.4.2.1.2 *Access via Kilrush Golf Course*

In order for the OGC to avoid the town of Kilrush so as to reduce effects on local access and traffic, the OGC will travel from the road network via third party lands through Kilrush Golf Course. Temporary construction traffic will gain access through a new temporary access from the R483 Regional Road and through the existing Kilrush Golf Course entrance off the N68 National Road.

5.4.2.2 Traffic Management

A Traffic Management Plan (TMP) is included in Appendix 29-2 of the EIAR and is in line with Chapter 29: Traffic and Transportation. The TMP sets out the traffic management and mitigation measures that the Applicant will commit to during the construction phase of the Onshore Site. In the event that development permission is granted for the Project, the TMP will be updated to address the requirements of any relevant planning conditions, including any additional mitigation measures that are conditioned. Prior to construction, details of the TMP for the Onshore Site will be agreed with the Roads and Transportation Department of Clare County Council, Transport Infrastructure Ireland (TII), and any other relevant authorities as required. The chosen contractor will prepare a construction stage TMP in line with the requirements of the relevant authority and key stakeholders prior to the construction phase, and the TMP will be maintained and updated throughout the construction phase.

5.5 Construction Management

5.5.1 Offshore Construction Management

The different stages of the Offshore Development construction programme are described in detail in this chapter. The construction timelines provided herein are estimates and are subject to variables such as development permission, the availability of suitable weather windows, supply chain restrictions and other potential timeline constraints, it is anticipated that construction of the Offshore Development will begin in 2026 and take approximately 40 months including the pre-construction surveys and seabed preparations. Offshore construction will typically be undertaken 24 hours a day, 7 days a week, dependent upon weather conditions and the operations being undertaken.

The Offshore Site construction campaigns will include:

- Year 1
    - Pre-construction site surveys
    - Landfall Construction
- Year 2
    - GBS Foundation Seabed Preparation
    - WTIV Stonebed Rock Placement
    - GBS Transportation `
- Year 3
    - GBS Foundation Installation
    - OSS Installation, Hook Up and Commissioning
    - EXC Installation/Burial
    - IAC Installation/Burial
    - EXC Post Installation Cable Protection Placement
- Year 4
    - IAC Post Installation Cable Protection Placement
    - WTG Installation and Commissioning

A summary of the phases of the Offshore Development construction activities is shown Table 5-21 and an indicative construction programme timeline is presented in Figure 5-15. The construction programme and durations of the campaigns are subject to change depending on factors such as contractor/vessel availability, ground and weather conditions and any supply chain or logistical issue that may arise. Furthermore, specific details on installation will vary depending on the technologies adopted and may change due to improvements in both the technology and supply chain.

Table 5-22 Offshore Development activities from pre-installation to commissioning

Activity	Description
Pre-construction surveys and site investigations	Additional pre-construction surveys may be undertaken, including geophysical, geotechnical, benthic, unexploded ordnance (UXO) and metocean investigations. Other surveys, e.g. for birds, may also be undertaken as required.
Site preparation	Seabed preparations will be required prior to the installation of GBS foundations and offshore cable infrastructure. This may include dredging, boulder clearance and UXO clearance. Offshore Site preparation works also include the placement of rock to form a stonebed for GBS foundations and for WTIV operations.
GBS foundation and sub-substructure installation	Prior to installation at the OAA, the GBS foundations are proposed to be temporarily anchored, at a temporary anchor facility which is subject to a separate licence and assessment process. Foundations will be towed to the OAA and installed ahead of the WTG and OSS topside structure.
OSS installation/commissioning	OSS topside structure is installed after the installation of the GBS foundation. Following installation of the OSS and connection to the IAC and OEC, a process of testing and commissioning will be undertaken
OEC – landfall and offshore installation	Following the completion of the necessary onshore works (including the necessary landfall preparations) and the Offshore Site preparations, the OEC will be laid from the Landfall out to the OSS, with the potential for pre-trenching works to be undertaken ahead of cable installation. The export cable will be buried wherever possible and may be installed using a variety of techniques detailed further in Section 5.6.1.8. Following cable lay and burial (which may occur simultaneously or sequentially) external cable protection will be installed, as necessary. Further details on cable protection are provided in Section 5.6.1.9.
IAC installation	The IAC will be installed between the WTGs and between WTGs and the OSS. The installation techniques for the IACs will be similar to that of the OEC.
WTG installation/commissioning	The WTG components will be fabricated onshore and transported to the OAA for installation. Following installation of the WTG and connection to the IAC, a process of testing and commissioning will be undertaken.

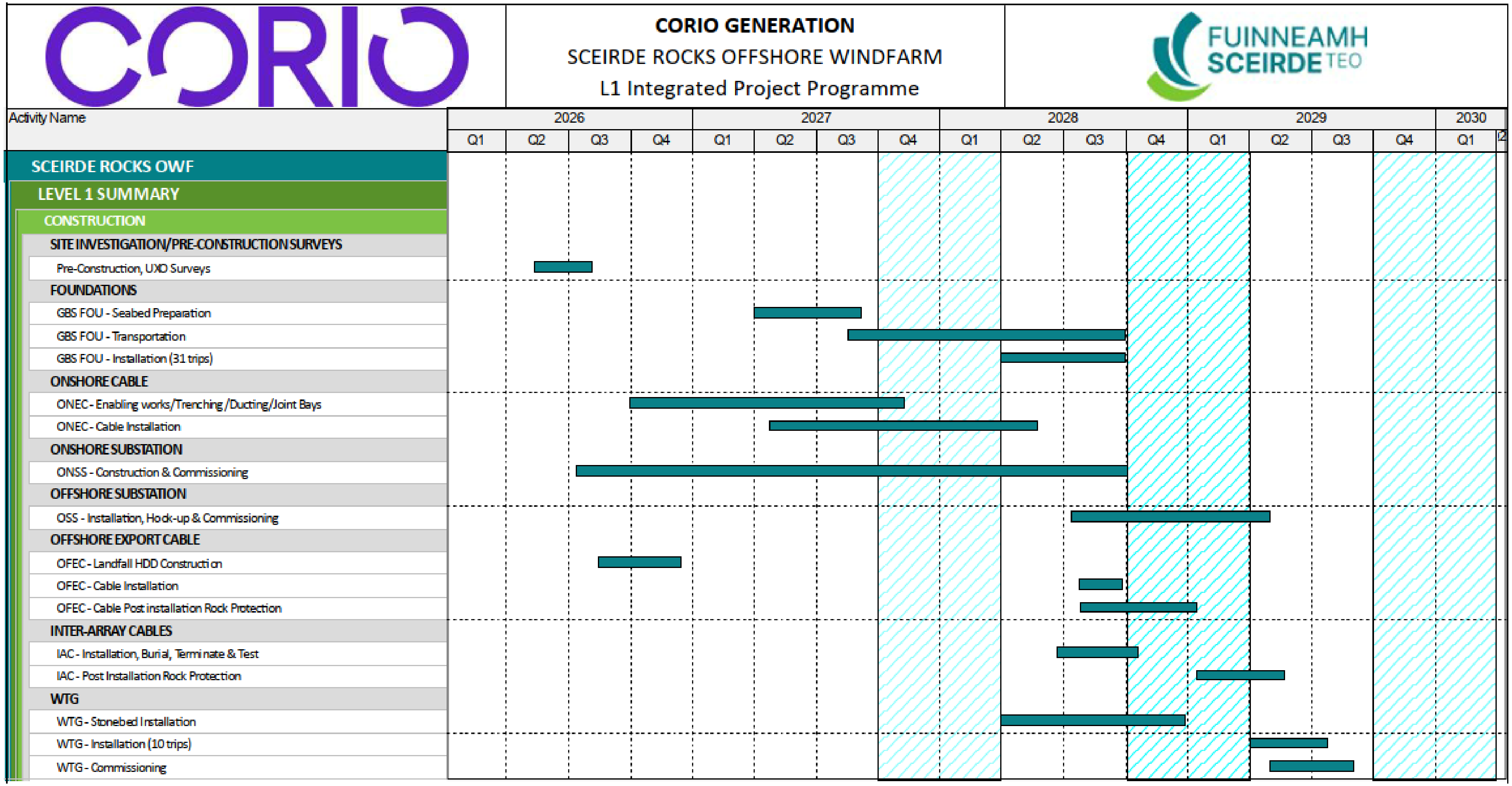

Figure 5-15 Indicative Construction Programme (Offshore and Onshore)

5.5.2 Onshore Construction Management

5.5.2.1 Construction Phasing and Timing

It is estimated that the construction phase of the Onshore Site will take approximately 26 months. Construction Sequencing. This is an estimate, and the final construction programme will be included within the Construction and Environmental Management Plan to be updated pre-construction.

The construction phase for the Onshore Site can be broken down into three main phases, 1) Onshore Cable Trenching and Ducting – 14 months, 2) Onshore Cable Installation – 14 months, and 3) OCC Construction and Commissioning - 26 months. The main task items undertaken are outlined below. The OGC construction works, and the OCC construction will occur in parallel therefore the total length of time for the construction of the Onshore Site is estimated as 26 months.

Civil Engineering Works

- Clear and hardcore area for temporary site offices. Install same.
- Provide bunded area for oil tanks.
- Construct drainage ditches, culverts etc. integral to road construction.
- Construct bases/plinths for transformer.
- Excavate trenches for OGC, lay cables and backfill. Provide ducts at road crossings.
- Excavation of trenches at joint bay locations, lay material and place precast joint bay into location;
- Install communication chambers adjacent to joint bay locations.
- Erect fencing at transformer compound.

Electrical Works

- Construct bases/plinths for OCC.
- Install external electrical equipment at OCC.
- Install transformer at compound.
- Erect palisade fencing around substation area.
- Install electrical and communication cabling in OGC cable ducts

Commissioning

- Test all equipment and ensure all is operating as required and meets relevant standards and grid code
- 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 5-15 above, where Q3 2026 has been selected as an arbitrary start date for onshore construction activities.

5.5.2.2 Construction Phase Monitoring and Oversight

An Onshore CEMP has been prepared for the Project and is included in Appendix 5-16 of this EIAR. The Onshore CEMP includes details of drainage, peat and overburden management, waste management etc, and describes how the Audit Report described below will function and be presented.

Where development permission is granted for the Project, the Onshore 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 listed as planning conditions.

The proposed procedures for the implementation of the mitigation measures outlined in the Onshore CEMP and their effectiveness and completion is typically audited by way of a Construction and Environmental Management Plan Audit Report. The Onshore CEMP Audit Report effectively lists all mitigation measures prescribed in any of the planning documentation and all conditions attached to the grant of development permission and allows them to be audited on a systematic and regular basis. The first assessment is a simple 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 audit report. Depending on the importance and urgency of rectifying the issue, the Construction Site Manager is given a timeframe by when the remedial works need to be completed.

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

5.6 Construction Methodologies

5.6.1 Offshore Infrastructure

5.6.1.1 Offshore Pre-Construction Surveys

Prior to commencement of the construction, further surveys will be conducted to inform engineering and construction planning for the Offshore Development. The Offshore Environmental Management Plan (OEMP) submitted with this application, will be updated in accordance with the permitted plans and agreed with the relevant authority. The OEMP sets out how the works will be completed, the sequence of works and the relevant management plans to be adopted. To date, detailed metocean, geophysical, geotechnical, water/sediment and benthic surveys have been carried out to inform the detailed design of various elements. Additional pre-construction surveys may be undertaken to further refine engineering requirements.

5.6.1.2 GBS Seabed Preparation

The OAA comprises of areas of protruding rocky granite outcrops with intermittent areas of sandy sediments infilling gullies, joints and faults in the rock. Seabed preparations will therefore be required prior to the installation of WTG and OSS foundations to create an even and unobstructed area for the installation of the GBS foundations. This can include boulder clearance and UXO clearance to remove obstructions and debris from the seabed. Dredging may also be required to remove soft seabed material from locations where stonebed material is added. Rock placement to construct stonebeds will be required to provide a solid, level platform for the GBS foundations. Each method that may be used is detailed in this chapter and assessed in relevant subsequent assessment chapters.

A total of 31 GBS foundations (30 WTG; 1 OSS) will be installed in the OAA, and all foundation locations will require seabed preparation.

5.6.1.2.1 Dredging

Prior to commencing rock placement at GBS foundation locations, some locations may require removal of the soft superficial sediments around the stonebed placement areas. Dredging to excavate the seabed will be undertaken using a trailing suction hopper dredger (TSHD) (Plate 5-14), which extracts mud, sand, clay and gravel from the seabed. The TSHD stores the dredged material in its own hopper ready for disposal.

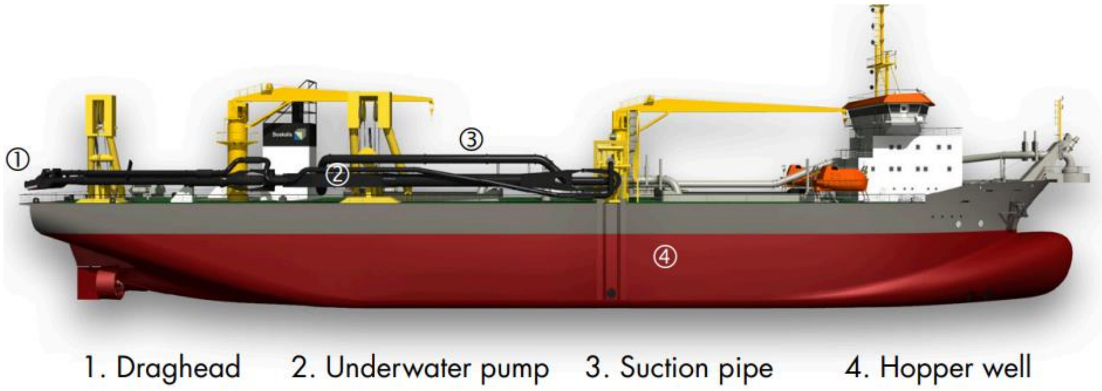

Plate 5-14 Example of a Boskalis trailing suction hopper dredger.[8]

5.6.1.2.2 Disposal of Dredged Material

As described in Section 5.3.1.2, dredged material will be disposed of the previously identified Disposal Sites (Figure 5-3). No seabed preparation is required at these Disposal Sites. The TSHD will hold position so that the disposal method deposits material within the Disposal Sites.

Deposit of the dredged material will be undertaken using entirely subsurface methods thus eliminating the risk of large, suspended sediment plumes affecting sensitive benthic features. The TSHD hopper will be emptied by depositing the dredged material either through a fallpipe or, in reverse of the dredging procedure, through the suction pipe, releasing the material approximately 5 metres above the seabed, at the designated Disposal Site.

5.6.1.2.3 Rock Placement

All 31 locations require rock placement to ensure a stable and level surface for the placement of the GBS foundations. The rock will be placed in position via a fallpipe vessel. Ten of the WTG locations and the OSS location will also require the construction of a stonebed to support WTIV operations. Details relating to the installation of stonebeds can be found in Table 5-9. All foundations will require a minimum averaged stonebed depth of 1.5 m to be installed, and further rock may be needed to correct any stonebed slopes, or if the seabed conditions require further rock reinforcement.

A number of rock quarries are within a feasible distance from the Project to enable economic provision of the stonebed material required for seabed preparation works. Glensanda Quarry in Argyll, Scotland has been preliminarily selected as it is one of the largest granite quarries in Europe and produces high-quality aggregates but there are other quarries in Europe from which the stone aggregate may be sourced. Figure 5-16 shows the location of the Glensanda Quarry in relation to the Project.

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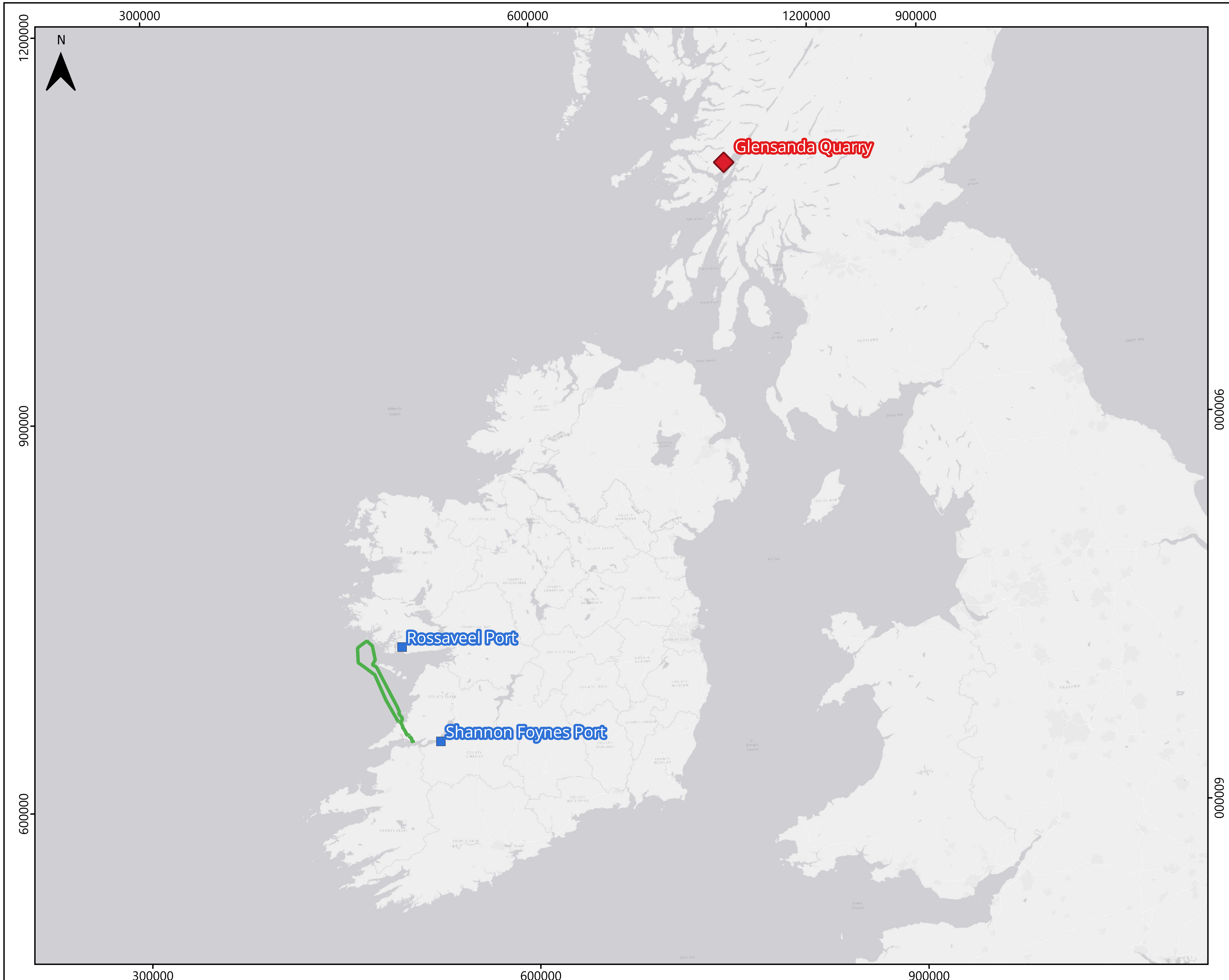
[8] *Boskalis (2024) Capability Sheet – Trailing Suction Hopper Dredger (TSHD) A Sea-Going Self -Propelled Free-Floating Vessel that Loads Dredged Material into Its Hopper Well. Available at:* https://boskalis.com/media/zlofmina/capability-sheet-trailing-suction-hopper-dredgers-mar24.pdf



SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- EIAR Site Boundary
- Glensanda Quarry
- Project Ports

0 20 40 NM

0 40 80 km

Data Source

PROJECT TITLE
Sceirde Rocks

MAP TITLE
Project Ports and Quarry

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-12	KB	ÓM

DRAWING NO
Figure 5-16

SCALE	PAPER SIZE	DATUM	PROJECTION
1:3,500,000	A4	WGS84	UTM 29N

Upon arrival on the OAA, the vessel used for stonebed construction will position itself above the target area. The fallpipe is then undocked and deployed in the correct position. A conveyor feeds the fallpipe with the rocks from the cargo hold, with rocks rolling down the fall pipe to the seabed (see Plate 5-15 and Plate 5-16 for placement vessel and methodology example).

Plate 5-15 Boskalis Fallpipe Vessel[9]

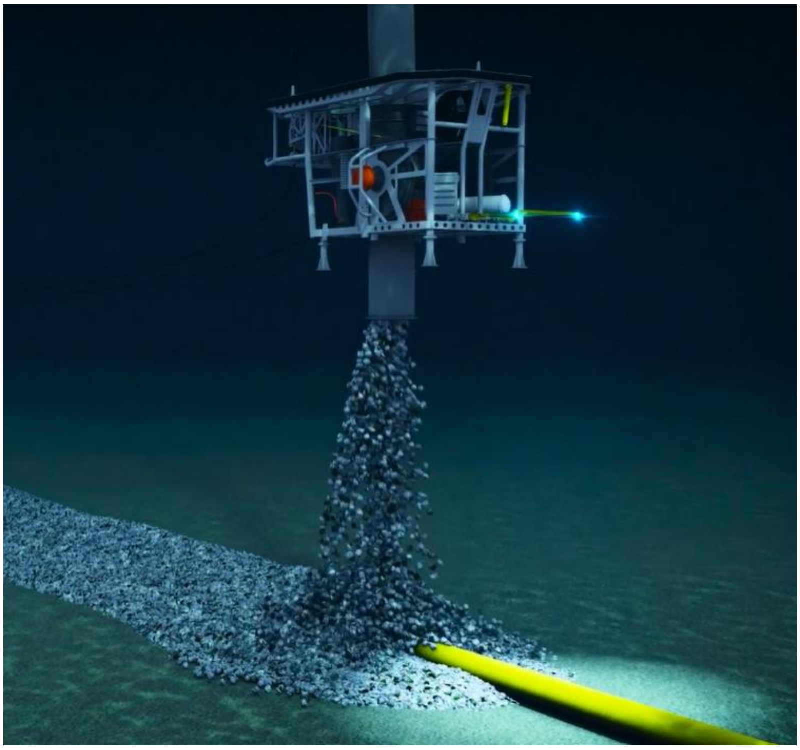


Plate 5-16 Boskalis Flexible Fallpipe installing rock over a submarine cable

5.6.1.3 Other Seabed Preparation Activities

Several other seabed preparation activities may be required, both within the OAA or within the OECC, to prepare the Offshore Site for construction of Project infrastructure.

5.6.1.3.1 *Boulder Clearance*

[9] *Boskalis (2024). Fallpipe vessels | Boskalis. [online] Available at: https://boskalis.com/about-us/fleet-and-equipment/dredgers/subsea-rock-installation-vessels*

Additional pre-construction surveys will be used to determine the boulder clearance requirements within the OAA and along the OECC. The Offshore Site area includes some boulder fields and minor sand ripples within the OAA and in the north of the OECC, with some boulders in the south of the OECC. Boulders can be cleared using a boulder plough or grab and the cleared boulders will be moved to a suitable distance to enable the safe and efficient construction of the Offshore Site components. Examples of a boulder grab and scar plough which may be used during boulder clearance are shown in Plate 5-17. The sand ripples do not require clearance prior to construction.

Plate 5-17 Boulder Grab / Scar Plough

5.6.1.3.2 Unexploded Ordnance

Based on the surveys carried out to date, and a subsequent unexploded ordnance (UXO) risk assessment, the requirement for UXO clearance within the Offshore Site is very unlikely to be required. However, in the unlikely event that subsequent site surveys do locate any possible (pUXO) or confirmed UXO (cUXO) that cannot be avoided, UXO clearance will be undertaken following this hierarchy:

- Relocate (also known as “lift and shift”); this involves physically manoeuvring and repositioning the UXO in a safe location;
- Low noise methods of in situ disposal; for example, low order deflagration, which uses a small explosive charge to initiate a rapid burn (deflagration) without the initiation of a chain reaction with resultant detonation;
- Only if relocation or a low-noise disposal method were not possible or not successful would high-order detonation be used; this involves positioning a small explosive charge adjacent to the UXO, and the detonation of this donor charge initiates a detonation of the UXO. As this method has the potential to generate the largest sound emissions, high-order detonation has been assessed in Chapter 12: Marine Mammals and Other Megafauna.

5.6.1.3.3 Pre-lay grapnel run

PLGR may be carried out to clear debris detected on the seabed from the Offshore Site. This process involves towing a line of hooks or grapnels specifically designed to remove debris on the seabed surface. Any debris retrieved during the PLGR will be recycled or disposed onshore at a licensed facility. Typical widths for different grapnel types and assemblies do not exceed 2 m.

5.6.1.3.4 Controlled flow excavation

Controlled Flow Excavation (CFE) (Plate 5-18) maybe used to prepare any areas of seabed with sand waves or mega ripples. The systems are mobilised onto construction vessels and suspended from the crane. High pressure water pumps are used to direct streams of high-pressure water at the sand waves thus dispersing them. This fluidises the seabed material which may then be removed by suction system.

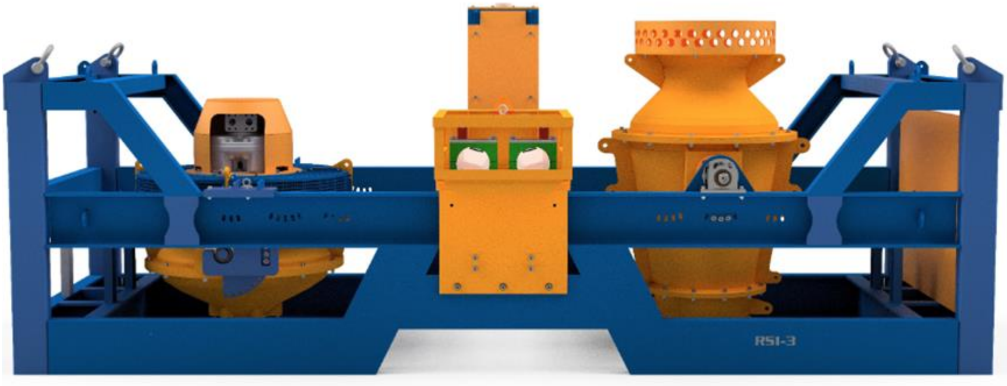


Plate 5-18 Controlled Flow Excavator

5.6.1.4 GBS Foundations

The GBS foundations will be manufactured off-site before being temporarily anchored close to the Offshore Site prior to installation within the OAA. An area within the Shannon Estuary is being considered as a potential temporary anchorage area for the Project however this is subject to a separate licencing process. Other temporary anchorage locations with appropriate bathymetry, space and within an acceptable distance from the OAA are also being considered by the Project team. Further information is detailed below in Section 5.6.1.4.1.

5.6.1.4.1 *GBS Temporary Anchorage*

The objective of anchoring the GBS foundations temporarily is to build up a suitable reserve of components prior to commencing offshore construction operations, thus significantly de-risking the execution schedule should transport of GBS foundations from the manufacturing location be delayed. The temporary anchorage area also provides a sheltered location for the GBS foundation installation contractor to prepare the GBS foundation for transit and installation (installing installation aids / hooking up tugs, etc).

The base case is to store the GBS foundations in a floating configuration with the GBS semi-submerged and moored to pre-installed drag anchors.

The GBS foundations will be transported to a temporary anchorage location on an HTV (Plate 5-19). Once the semi-submersible HTV arrives at the temporary anchorage area, it will hold position at a designated float-off area inside the estuary. If required, deck stoppers or similar sea-fastening elements used only during transport will be removed at this point. Tug lines will be connected to each GBS prior to float-off. After float-off, the GBS will be towed by two tug boats to the mooring location. Mooring lines will be connected to the pre-installed anchors.

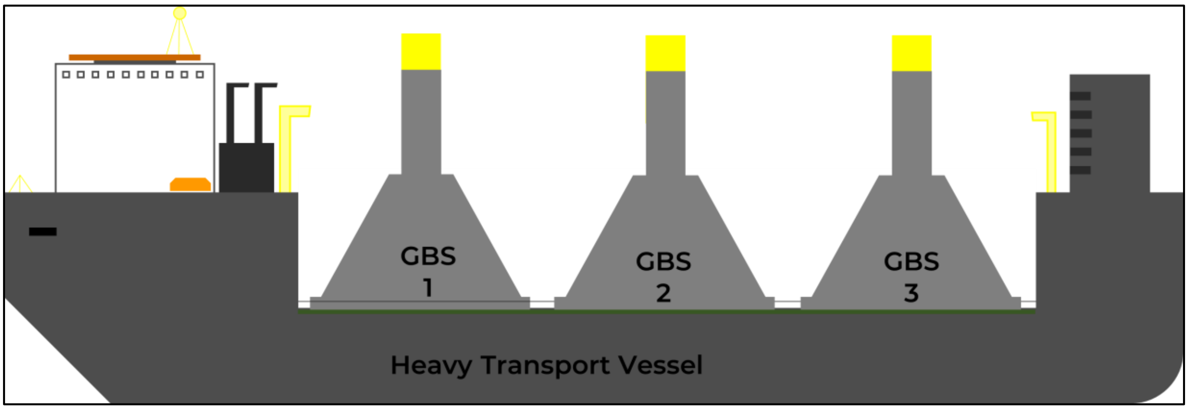


Plate 5-19 Illustration showing GBS foundations on semi-submersible HTV

When float-off operation has been completed, the semi-submersible HTV will be disconnected from the pre-installed moorings and will return to the GBS fabrication site for further GBS foundation transportation until transport of GBS foundations to the temporary anchorage area has been completed. The complete float-off operation for three GBS foundations, including all preparatory and completion works, is estimated to have a duration of approximately 3 – 5 days.

5.6.1.4.2 GBS Foundation Installation

For the GBS foundation installation, the components will first be towed from the temporary anchorage area to the OAA. Two methodologies are considered for the installation of the GBS: GBS wet tow tug installation and HLV installation. These options are detailed below. Various different vessels will be required for the GBS foundation installation, and these are summarised in Table 5-23 below.

Table 5-23 Vessels required for the GBS foundation installation

Foundation Installation	Parameters
Vessel Type	1. *Main Tug* 2. *Assist tugs* 3. *Infield tug* 4. *Heavy Lift Vessel (HLV) (option for HLV installation)* 5. *Barge (option for HLV installation)*
Installation Method	Floating Installation (with or without Transport Installation Module; TIM); or HLV installation

For each tow to the OAA, one main tug and two or three assist tugs will be required. It is envisaged that a third assist tug will support operations once the fleet arrive at the OAA. Examples of the potential tugs can be seen below in Plate 5-20.

There may be a requirement to use a Remotely Operated Underwater Vehicle (ROV) post installation to check that the GBS has gained full bearing on the stonebed. The ROV will be launched from a construction support vessel (or similar) already in the OAA.

Plate 5-20 DOF's Skandi Hera main tug and the BB Coaster assist tug

GBS foundation Installation - wet tow tug installation

- The GBS foundations are towed to the OAA using tugs.
- If required, a TIM (Transport Installation Module) is coupled to the GBS to increase its stability and increase installation operability (increase level of weather conditions).
- At the OAA, Dynamic Positioning (DP) vessels will aid in lowering and ballasting the GBS with ballast material (e.g. sand, gravel, water, high density aggregate) to the previously prepared seabed (Section 5.6.1.2).
- The ROV will operate the valves that control the set-down velocity. After set-down, another DP vessel will perform the sand/gravel/water ballasting operation. The quantity and type of ballast material will depend on the specific requirements (location dependent) of each GBS. The ballast will assist to submerge the GBS into position on the previously installed seabed preparation.
- During the transport and installation operations, the GBS will be towed by conventional tugboats and will be escorted by a control vessel, which will host all the remote control and monitoring equipment. Alternatively, the remote control and monitoring equipment can be also installed onboard one of the tugboats if a TIM is not used.

GBS foundation Installation – with HLV

This option involves loading the GBS foundation onto a barge which is then towed to the OAA. The barge is then moored to a HLV which lifts the GBS foundation from the barge and places it in the water at the required installation position. Similar to the installation technique previously described for the wet tow tug installation, the GBS is ballasted such that it is submerged into position on the previously installed seabed preparation.

Alternatively, the HLV can directly load the GBS foundations from the temporary anchorage location and then transit to OAA for direct installation from the deck of the HLV. The exemplar HLV, *Saipem 7000*, has cranes of suitable size for this type of operation. The crane is used to lift the GBS from the deck of the HLV into the water at the required installation position. Similar to the previous installation techniques described, the GBS is ballasted such that it is submerged into position on the previously installed seabed preparation.

5.6.1.5 WTG

5.6.1.5.1 *WTG Construction*

Additional project-specific pre–construction surveys and site preparation works will be conducted at the Offshore Site ahead of commencement of construction of the WTGs (see Section 5.5.2). Once the GBS foundations have been installed on the seabed, the WTG components can be using a suitable WTIV. Prior to the installation of the WTGs Offshore, the WTG components are stored in a marshalling harbour. Shannon Foynes Port, Rossaveel, Cork and Belfast harbours, along with ports in the UK and continental Europe, are all being considered as the marshalling harbour for the Project. This is subject to project-specific requirements and the availability of ports and other local facilities during construction, a multi-port approach may also be considered prior to commencement of construction.

The WTIV is a self-propelled vessel which does not require any external assistance when positioning offshore or in harbour. A typical loading arrangement on a WTIV is shown in Plate 5-21. Upon commencement of the WTG construction campaign, the WTIV will arrive at the quayside within the chosen marshalling harbour, once in position the WTG components are loaded onto the WTIV. The WTIV deck area is sufficient to carry between 2-5 WTG component sets per trip, depending on the WTIV chosen for the project. A set of components would consist of the tower sections, blades and the nacelle. The components are loaded onto preinstalled sea fastening grillages, on the WTIV deck, using the WTIV crane or a quayside crane in the port. The grillages ensure that the WTG components are safely positioned for the transit / installation phase.

From the marshalling harbour the WTIV will transit to the OAA. The transit distance from the marshalling harbour to the OAA will depend on the final location of the marshalling harbour. Once offshore, at each WTG position, the legs of the WTIV are lowered to the seabed and the hull of the WTIV is jacked up out of the water. The WTIV will jack up to an elevation which is sufficient to ensure that the WTIV crane can install all of the components on top of the previously installed GBS foundation.

The WTIV will be required to jack up at each WTG location to install the components. At 10 locations, there will be a requirement to preinstall stonebeds that the WTIV will jack up on. The volumes of stonebed required for this were previously provided in Section 5.3.1.1.

Plate 5-21 WTIV jackup vessel (after installation of one WTG)[10]

[10] 4c Offshore. (2021). Cadeler unveils fleet expansion plans. Available at: https://www.4coffshore.com/news/cadeler-unveils-fleet-expansion-plans-nid22432.html

Table 5-24 WTG installation methods.

WTG Installation	Value
No. of Vessels used	3
Vessel Type	› WTIV › Service Operation Vessel (SOV) › Crew Transfer Vessel (CTV)
No of WTIV feet	4 (on WTIV)
WTIV feet total footprint (m^2)	728
No. of jacking events at each WTG	2
WTIV temporary footprint on seabed per location (m^2)	1,456

5.6.1.5.2 Colour Scheme, Marking and Lighting

The WTGs will be designed to meet the standards stated in the Irish Aviation Authority's (IAA) guidance for lighting, marking and radar enhancement determined by the Commissioner of Irish Lights (CIL) and lighting and marking requirements may differ between aviation and marine traffic (IAA, 2015). At least three months prior to commencement of construction the following information will be supplied to the IAA:

- Estimated position of each WTG and other structures in the Geodetic System of 1984 (WGS84). Co-ordinates will be in degrees, minutes and seconds;
- Proposed details of lighting and marking of offshore structures (including WTGs);
- Estimated maximum elevation of each structure (in feet and metres) and the estimated minimum and maximum distance between structures;
- Confirmation of whether Marine Radar Automatic Identification System (AIS), radar enhancer or transponder technology will be fitted;
- Planned earliest date of erection of WTGs; and
- Additional information relevant for air navigation.

At least three months in advance of commencement of construction, the above information will also be submitted to the CIL in an Application of Statutory Sanction (required under the Merchant Shipping Acts). The IAA and CIL must be regularly updated on construction progress and relevant lighting and marking details. The developer will be responsible for providing any updated information thereafter.

5.6.1.6 Installation of the OSS Topside

OSS topside installation activities can only commence on the successful completion of the OSS GBS foundation. Once the GBS is ready the main installation vessels (HLV & OSS Tug) can be mobilised for the OSS topside installation campaign.

The OSS topside will be loaded onto a barge which is directly towed to the OAA using a large tug with suitable bollard pull. A HLV will also be mobilised to the OAA for OSS installation activities. The barge is moored up to the HLV and the OSS topside is connected to the HLV crane. Upon sea fastening release the OSS topside is then lifted and landed onto the OSS GBS foundation and secured in place. Examples of the possible tug and HLV can be seen in Plate 5-22.

Plate 5-22 BOKA Pegasus (Left) and Example HLV – Saipem S7000 (right).

Alternatively, depending on the Wind Turbine Installation Vessel (WTIV) selected, the OSS topside could be installed using the WTIV crane. If this methodology was selected, the OSS topside would be transported to OAA on a barge towed by a large tug. The WTIV would then jack up on the stonebed (constructed for jack-up operations adjacent to the OSS GBS foundation), the barge would move next to it and the OSS topside would be directly lifted and positioned on top of the OSS GBS foundation. A list of OSS topside installation vessels can be seen in Table 5-25.

Table 5-25 OSS installation vessels

Property	Value
Vessel Type	*1. Heavy Lift Vessel (HLV)* *2. Tug* *3. Barge* Option: WTIV

5.6.1.7 IAC and OEC Installation

Prior to cable installation seabed preparations will be carried out as described in Section 5.5.2. Additional offshore pre-construction surveys may be required which will confirm any seabed obstructions such as boulders which need to be moved.

The IAC and EC installation techniques will be similar. The cables are proposed to be installed once the connecting GBS foundations are in place. It is, however, possible to install the IACs without the corresponding GBSs being in place and “wet store” the cables on the seabed for pull-in hang-off operations at a later stage. The Cable Lay Vessel (CLV) will transpool the IAC onto its integrated carousel at the cable manufacturing yard. Based on the current IAC properties (diameter, weights, lengths, etc.) one IAC loadout campaign is expected. Upon completion of the IAC loadout operation, the CLV transits directly to OAA and begins the installation operation. IAC may also be delivered to a location near the OAA. Upon arrival the IAC may be transpooled onto storage carousels located onshore, for collection by the CLV at a later date. An example of a CLV can be seen in Plate 5-23. The OEC will be handled in a similar manner.

Plate 5-23 Example Cable Lay Vessel - NKT Victoria.

The IACs and OEC may be buried under the seabed or surface laid. If the cables are buried, a burial trench will be created using equipment such as a jet trencher, mechanical cutting trencher and/or controlled flow excavator. Additional cable protection may be required if the target depth of lowering cannot not be achieved. If the cable is surface laid on the seabed, it will be protected by covering it with e.g. rock, concrete mattresses and/or grout bags or sheathing the cable with cast iron shells prior to surface laying. It is possible that a combination of the above methods may be used to facilitate installation and cable protection. The exact method or combination of methods will be determined prior to installation based on detailed site surveys.

Where the cable is proposed to be buried, a cable trench will be created, and the cable will be lowered into the trench. A dedicated self-propelled trenching vessel is assumed, for example the "Grand Canyon III" (Plate 5-24). It is assumed that the cable laying and trenching will be performed in the same campaign, with the cable lay taking place immediately after trenching.

Table 5-26 IAC and OEC installation methods.

Property	IACs	EC
Estimated no. of Vessels Used	4	5
Width of seabed disturbed by cable installation within cable corridor (m)	20	20
Total seabed disturbed (km^2)	1.28	1.15
Vessels Required	Cable Lay Vessel Trenching Support Vessel Service Operation Vessel Rock Placement Vessel Shallow Water Pull-in Vessel (for EC)	
Installation Method Options	1. Simultaneous Lay & Burial (coupled) 2. Lay then Burial (de-coupled) 3. Lay then burial (coupled or de-coupled) then protect 4. Surface Lay then protect Cable protection measures are provided below	
Width of trench (m)	0.5 – 1.0	
Burial Method	- Jet Trencher - Mechanical Cutter	

Target depth of lowering (m)	1.0
External cable protection measures	• Rock placement • Cast iron shell (CIS) or alternative tubular cable protection systems (e.g. articulated high-density polyethylene (HDPE) pipe) • Concrete mattresses • Grout/Rock bags

Plate 5-24 Grand Canyon III Trenching Support Vessel.[11]

For trenching, jet trencher or mechanical trencher may be used. The trenching and cable lay can either be coupled (cable laying occurring at the same time as trenching) or uncoupled, with the cable being laid before a separate trenching campaign. Jet trenchers fluidise the seabed by injecting water at high pressure into the sediment. The cable is then lowered to the required depth and any displaced material in the water column then resettles. A jet trencher can be operated as an ROV or as a towed jetting sledge. An example of a jet trencher is shown in Plate 5-25.

Mechanical trenchers can be operated in a variety of sediment types from soft sediment to soft bedrock, utilising toothed wheels, chisel or saws to cut a trench. Cut trenches will be between 0.5 m to 1 m in width. The mechanical trencher would collect previously surface-laid cables to protect them from trenching activities before laying them in the cut trench and backfilling sediment onto the cables. The cable can be laid and buried using the same vessel or two vessels can be utilised: a cable lay vessel and a chaser trenching vessel.

[11] *VesselFinder (2016). GRAND CANYON III, Offshore Support Vessel - Details and current position - IMO 9695963 - VesselFinder.* https://www.vesselfinder.com/vessels/details/9695963

Plate 5-25 Examples of a mechanical trencher (left) and a jet trencher (right).

5.6.1.8 IAC and OEC Burial

5.6.1.8.1 *Jet trenching*

Jet trenching is the preferred method of cable burial for the IAC and the OEC. This involves a tool, operated from a vessel at the surface, producing a high-pressure water jet, which liquefies the seabed sediment and allows the cable to sink to a proposed burial depth. Up to three passes of the trenching tool might be required to achieve a target depth of lowering of 1 metre.

5.6.1.8.2 *Mechanical cutting*

Mechanical Cutting may be deployed when the seabed soil shear strength is in excess of 150 kPa, where traditional jetting systems would struggle to achieve burial. Typically, mechanical cutting systems are operated from a vessel at the surface, and are used to cut channels in stiff clays, rock and rocky outcrops. The noise from this type of machinery would depend on the system used but it would be generally similar to that of a jetting system (Jiménez-Arranz *et al.* 2020[12]). Where required, it would most likely be needed in the areas identified as requiring external cable protection. The trench width would be 500mm and up to 3 passes might be required in any section to achieve a target depth of lowering of 1 metre.

5.6.1.9 IAC and OEC External Protection

The preferential method of cable protection is cable burial to a target depth of lowering of 1 metre. However, in some locations, this target depth of lowering will not be achievable, and additional external cable protection measures will be required.

5.6.1.9.1 *Rock protection*

Rock protection can be deployed over the cable from a fallpipe vessel, using the same method as outlined in Section 5.6.1.2.3. Rock is deployed as a trapezoid berm to minimise risk to other users of the marine environment. Rock protection can be deployed over surface-laid cable, and also over partially buried cable to increase the burial depth and provide additional stability.

[12] Review On Existing Data On Underwater Sounds Produced By The Oil And Gas Industry (2020), Guillermo Jiménez-Arranz, Nikhil Banda, Stephen Cook and Roy Wyatt

5.6.1.9.2 Cast-iron shell

CIS can be installed to protect the cable simultaneous with cable-lay. These articulated, sectioned cast-iron tubes provide stability and protection to cables. They can be laid on the seabed with or without additional protection or stabilisation (from rock or concrete mattresses).

5.6.1.9.3 Concrete mattresses, rock bags or grout bags

Other forms of external cable protection can be deployed from construction vessels and manoeuvred into location over the seabed-laid cables. As with rock protection, concrete mattresses or rock/grout bags can be deployed over surface-laid cables and also partially buried cables to provide additional protection.

5.6.1.10 Landfall Construction

The Landfall is located in the townland of Killard near Doonbeg. Co. Clare. The Landfall is the transition from the offshore to onshore part of the Project and will require elements of both. A concrete TJB will be required onshore at Landfall to house the interface between the offshore and onshore cables and a trenchless technology landfall solution will be utilised to bring the offshore cable ashore.

Trenchless technology landfall involves drilling from an onshore location (entry point) to a punch out location (exit point offshore) beyond the intertidal zone below the LWM. This exit point is located at a position of suitable depth and distance offshore for a cable laying vessel (CLV) to operate. Generally, the drill hole is monitored and any corrections such as sufficient enlargement of the hole to allow the cable to pass through will be conducted. Once the onshore equipment for the works is mobilised at the adjacent landfall compound, excavation of material offshore is undertaken to prepare the exit point. Pilot holes are then drilled from the onshore location beneath the intertidal zone to the exit point.

The offshore exit of the trenchless technology landfall will be located at a water depth of approx. 30m. An emergence pit will require the temporary excavation of an area of approx. 50 m x 20 m x 2 m of seabed sediment. A dredger will be used to excavate and side cast the superficial seabed sediments (sand). Following standard practice at locations where the seabed substrate is sandy, any dredged material will not be transported away from the Offshore Site and the seabed will be left to recover naturally (through typical sedimentary processes) over time.

During pilot hole drilling, drilling fluids are injected into the hole behind the drill to lubricate the tooling, suspend the annulus of the created duct (the empty space between any drilling equipment) stabilising the pilot hole and to remove the drill cuttings that are produced. Water-based drilling muds (WDM) are used during this process and bentonite powder, a non-toxic inert natural clay mineral, will generally be the primary component of the WDM (approximately 90 % water and 10 % bentonite). In the event of fluid loss, Lost Circulation Material (LCM) can be added to the drilling fluid to close up permeable areas. All drilling fluids are biodegradable are routinely used for these types of operations and are on the OSPAR List of Substances Used and Discharged Offshore which Are Considered to Pose Little or No Risk to the Environment (PLONOR).

Upon exiting the punch out location, the drill bit is removed. Reamers are attached to the drill string to enlarge the pilot holes to the desired diameter. This may need to be done in several passes to reach the required diameter for the cable ducts.

Once complete, the cable duct is installed from the entry point at the onshore compound. The cable pull-in operation commences, with the OEC pulled ashore through the duct. Once the OEC is installed, onshore trenchless equipment is removed, and the Onshore Site will be restored to the original condition.

5.6.2 Onshore Infrastructure

5.6.2.1 General Requirements

Prior to works commencing on the Onshore Site, the Onshore CEMP submitted with this application with be updated in accordance with the permitted plans and agreed with Clare County Council. The Onshore CEMP sets out how the works will be completed, the sequence of works and sets out how progress will be made along each section of the route. It is envisaged that approximately 500 m of duct installation will be completed per week, subject to local topography, weather, efficient access and storage of material and road width.

The Construction Traffic Management Plan (CTMP) is to be updated prior to commencement on-site to address any relevant planning conditions that may arise, this including any additional mitigation measures, which are conditioned.

On appointment of a main contractor, it is their responsibility to produce a detailed Construction Resource & Waste Management Plan which is to be a live document updated throughout the project lifecycle by the main contractor as appropriate.

5.6.2.2 Onshore Grid Connection

5.6.2.2.1 *Trenching Works*

The first stage of the trenching works, in the public road, involves the trench extent being saw cut along the road surface with excavation works taken place thereafter. As material is removed from the trench, it is to be removed off-site by a licensed haulier and brought to a licensed facility for disposal in-line with the best practice measures for waste management included in Section 3.9 of the Onshore CEMP. Records of any materials taken off-site are to be maintained and recorded throughout the project. Receipts from the licensed waste disposal facility are to be included in the project safety file upon completion.

Details of the trenching works are provided in Appendix 5-17: Onshore Grid Construction Methodology.

All trenching and reinstatement works are to be in line with EirGrid specifications and feedback/consultation with Transport Infrastructure Ireland (TII) and Clare County Council, design in accordance with *Guidelines for the Opening, Backfilling and Reinstatement of Openings in Public Roads*[13] and TII's requirements for the Reinstatement of Openings in National Roads, where appropriate.

[13] https://www.rmo.ie/uploads/8/2/1/0/821068/guidelines_for_managing_openings_in_public_roads_apr._2017.pdf

Plate 5-26 Typical Cable Trench View

5.6.2.2.2 Accommodation of Third-Party Services

Working near Third-Party Services is somewhat unavoidable when installing cables within the public roadway. When installing a cable trench parallel to an existing underground service a minimum of 300mm clearance must be maintained from the edge of the ducts to the edge of the third-party duct. This distance may increase depending on the size and depth of third-party services.

When crossing third-party services, a 300mm clearance is to be always maintained. It is good practice to route high voltage cables under existing services whenever possible as this reduces the possibility of cable faults from third-party excavations.

Existing services were identified as part of the cable route design and the route and has been designed to minimise works adjacent to any identified services. All works adjacent to third-party services and third-party service crossings will be completed in line with EirGrid specifications.

5.6.2.2.3 Watercourse Crossings

When encountering water courses along the proposed OGC route such as bridges, culverts and streams, the preferred method of installation is to place the cable ducts within the bridge deck where minimum cover can be achieved, as outlined within Section 5.3.2.2.2 of this report. This is not always possible and other solutions will need to be considered where this is the case. These alternative solutions may include trenchless technologies such as HDD or excavation and replacement/upgrade of culverts. Proposed crossing methods are set out in Table 5-26 and detailed in Appendix 5-17. The works will be undertaken in line with NRA (TII) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes[14]. All of the below works will be supervised by the Environmental Clerk of Works and the Project Hydrologist.

[14] *National Roads Authority (2008) 'Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes' Environmental Series on Construction Impacts. Available at:* https://www.tii.ie/media/qy5el5mi/guidelines-for-the-crossing-of-watercourses-during-the-construction-of-national-road-schemes.pdf

5.6.2.2.4 Construction of Joint Bays

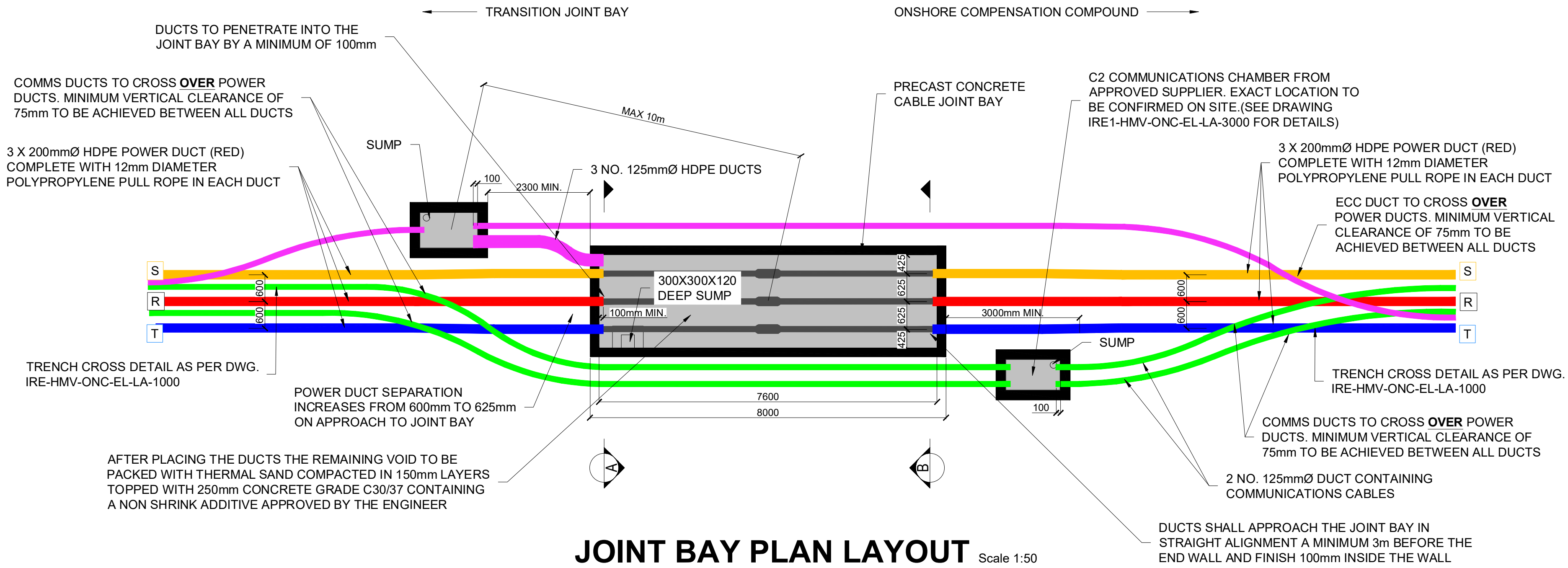
The location of joint bays as detailed within the relevant drawings accompanying this document are selected in accordance with EirGrid specifications and can be seen in Appendix 5-1. The locations chosen are determined by the optimum cable length between joint bays, density of existing services, minimising disruption to traffic and space requirements for cable drums and cable pulling equipment. C2 Communication Chambers and Link Box Chambers are to be installed adjacent to each joint bay along the cable route

A gravel access track of 3 m width will be constructed over or alongside all cables in fields to provide access for future maintenance. The cable route was designed to make use of existing access tracks where possible.

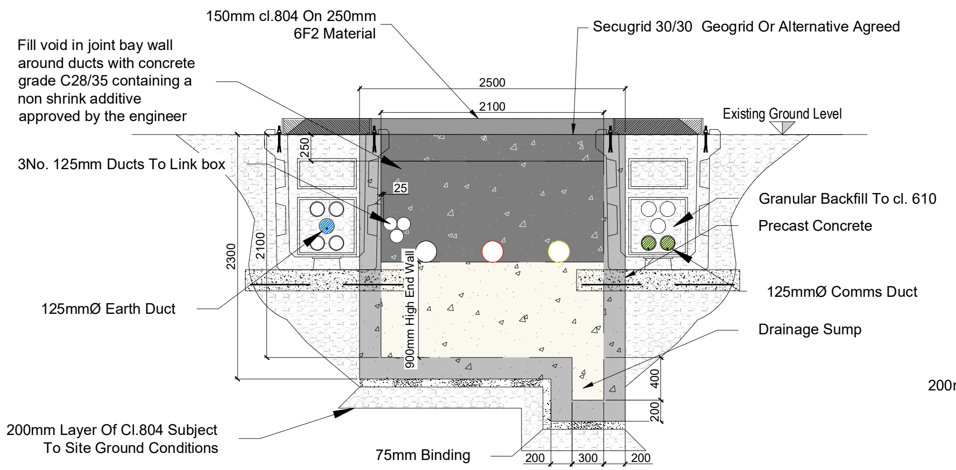
The locations of all joint bay locations are to be surveyed by a qualified engineer and included on the As-Constructed Records.

Full details on the construction of the joint bays are provided in Appendix 5-17.

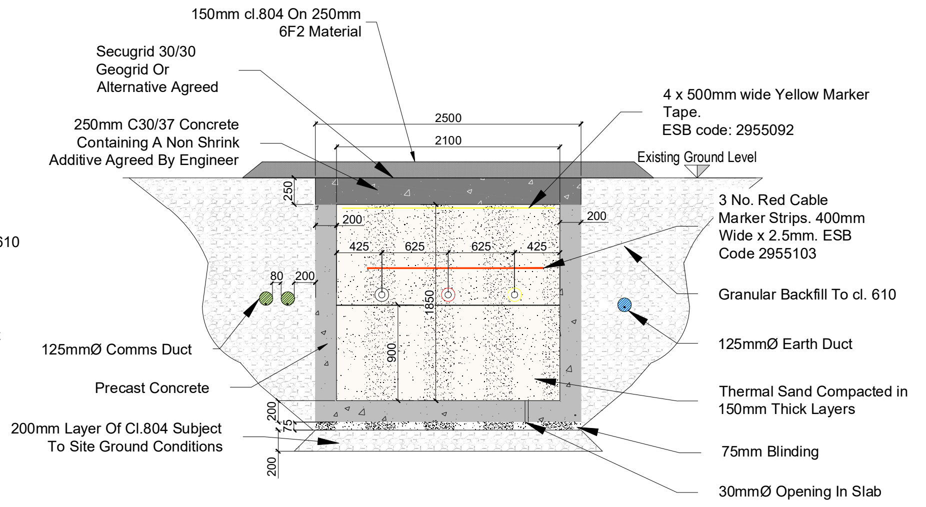
A joint bay section is shown in Figure 5-17 below



JOINT BAY PLAN LAYOUT Scale 1:50



SECTION A-A Scale 1:25



SECTION B-B Scale 1:25

Figure 5-17

REV	DATE	DESCRIPTION	BY	APP
01	28/11/24	ISSUED FOR PLANNING	PD	CM

PROJECT: SCEIRDE ROCKS OFFSHORE WIND FARM

TITLE: JOINT BAY DETAIL

CLIENT: FUINNEAMH SCEIRDE TEO

H&MV ENGINEERING

MWP ENGINEERING AND ENVIRONMENTAL CONSULTANTS
CORK | TRALEE | LONDON | LIMERICK
mwp.ie

DRAWN: P.D.	CHECKED: C.M.	APPROVED: I.B.
PROJECT NUMBER: 24204	DATE: JAN '24	SCALE @ A1: AS SHOWN
STATUS DESCRIPTION: FOR PLANNING		STATUS: S4
DRAWING NUMBER: IRE1 - HMV - ONC - EL - PD - 2000		REV: 01

5.6.2.2.5 *Duct Installation in Peat Areas*

Along the proposed OGC, there are two sections of the route where the cable passes through peat land areas. A series of site investigation works were conducted in order to determine the depths of peat that will be encountered. Stemming from the site investigation works Section 01 (North of the OCC) has approx. depths of 1.0m below ground level with Section 02 (by Clare Motor Club) has approx. depths of 4.0m below ground level. The latter being critical to the design due to the depths of peat involved.

Two construction methodologies are considered for areas where the OGC is proposed within peat areas. The preferred method of installing OGC would be to utilise standard trenching methods which would be the most practical and economical solution in most instances. One of the potential issues with conventional trench solutions within peat is that it could lead to the introduction of drainage channels into the peat which may have potential impacts on this sensitive habitat. On review, Section 01, due to its shallow nature, would suit a standard trenching method.

The second option for constriction is to use trenchless methods, such as HDD. Based on the depth of peat in Section 02 it is proposed to adopt the HDD methodology, the OGC is proposed to be installed at depths of approximately 8.0m (4.0m below bottom of peat layer). It is proposed to string the HDD from joint bay to joint bay along the route (approx. 500m) thus, minimising the impact along the route. The advantage of utilising this approach is that the Impact on the Bog Rampart/Legacy Road is greatly reduced, sterilisation of the road network is reduced due to cable depths.

Further details on the Section 01 and Section 02 and the methodology for the construction of the HDD within Section 02 is provided in detail in Appendix 5-17.

5.6.2.2.6 *Power Cable Installation*

Once the underground cable ducts have been installed from joint bay to joint bay it is necessary to carry out a test to ensure that they have been installed to EirGrid standards. To do this the ducts will be thoroughly cleaned, brushed and a propriety mandrel will be pulled through the ducts in accordance with EirGrid specification.

Once the above is completed the cable drums are then brought to the Onshore Site on a suitable transporter. They are then positioned in line with the back of the joint bay by utilising drum lifting equipment. A cable winch is attached to the cable which is then pulled through the ducts.

Once the power cables are pulled through the ducts at either side of a joint bay, they are then joined to each other by a cable joint. This is undertaken within a clean dry environment for jointing which will help to prevent contamination of the joint by foreign bodies.

On completion, the jointed cables are supported in the joint chamber on a number of sandbags. Permanent reinstatement can then take place whereby the joints are surrounded by thermal sand with the remainder of the joint bay backfilled using appropriate material as required by the site conditions and relevant road authority.

5.6.2.2.7 *Trenchless Installation Methods*

Where necessary, trenchless installation methods will be utilised as part of the Project, this is determined after exhausting all other methods before determining trenchless installation is the most viable option. This will be done using the HDD method.

HDD is to be used where there is insufficient cover or road profile depth on bridge or culvert crossings to allow the OGC to be placed within the bridge in a standard trefoil or flat formation. The launch and receptor pits are to be located on or adjacent to public roadways or along the grass margin as indicated in the relevant drawings. The locations of any HDD will be reinstated with a finish to a least pre-existing condition.

5.6.2.2.8 *As-Constructed Drawings*

As part of the works on the OGC, As-Constructed (As-Built) drawings are to be maintained in line with EirGrid specification. These As-Constructed drawings are to record cable locations, joint bay locations and any other key features as the works progress.

5.6.2.2.9 *Cable Installation and Watercourse/Service Crossings*

A series of watercourses and existing culvert crossings have been identified along the proposed OGC route and these are summarised in Appendix 5-17. A general description of the various construction methods employed at watercourse/bridge/culvert/drain crossings are described in the following paragraphs, and in Table 5-26 which provides a summary of the survey results of the existing watercourse/bridge/culvert/drain features along the grid route and proposed crossing methodologies at each. The EPA/OSI mapped crossing locations are shown in Figure 5-18.

Option 1 – Crossing Using Standard Trefoil Formation

Watercourses will not be directly impacted as no in-stream works or bridge alterations are proposed. Where adequate cover exists within a given bridge, a standard trefoil arrangement will be used where the ducts will pass over the bridge without any contact with the top of the bridge or watercourse.

Option 2 – Flatbed Formation over Bridges

Where ducts are to be installed over an existing bridge and sufficient cover cannot be achieved by installing a standard trefoil arrangement, the ducts will be laid in a much shallower trench. The ducts will be laid in a flatbed formation over the existing bridge and encased in a concrete surround with galvanised steel protection plates over the cables. It may be necessary to locally raise the level of the existing road, if suitable, in order to achieve the required cover over the ducts. The increased road level will be achieved by overlaying the existing road with a new wearing course where any addition of new pavement will be tied back into the existing road. Any works to locally raise the level of the existing road and potentially the bridge parapets, if suitable, are to be agreed with Clare County Council prior to commencement with all works and reinstatement carried out to their satisfaction. Once the ducts have crossed the bridge the ducts will revert to the standard trefoil arrangement.

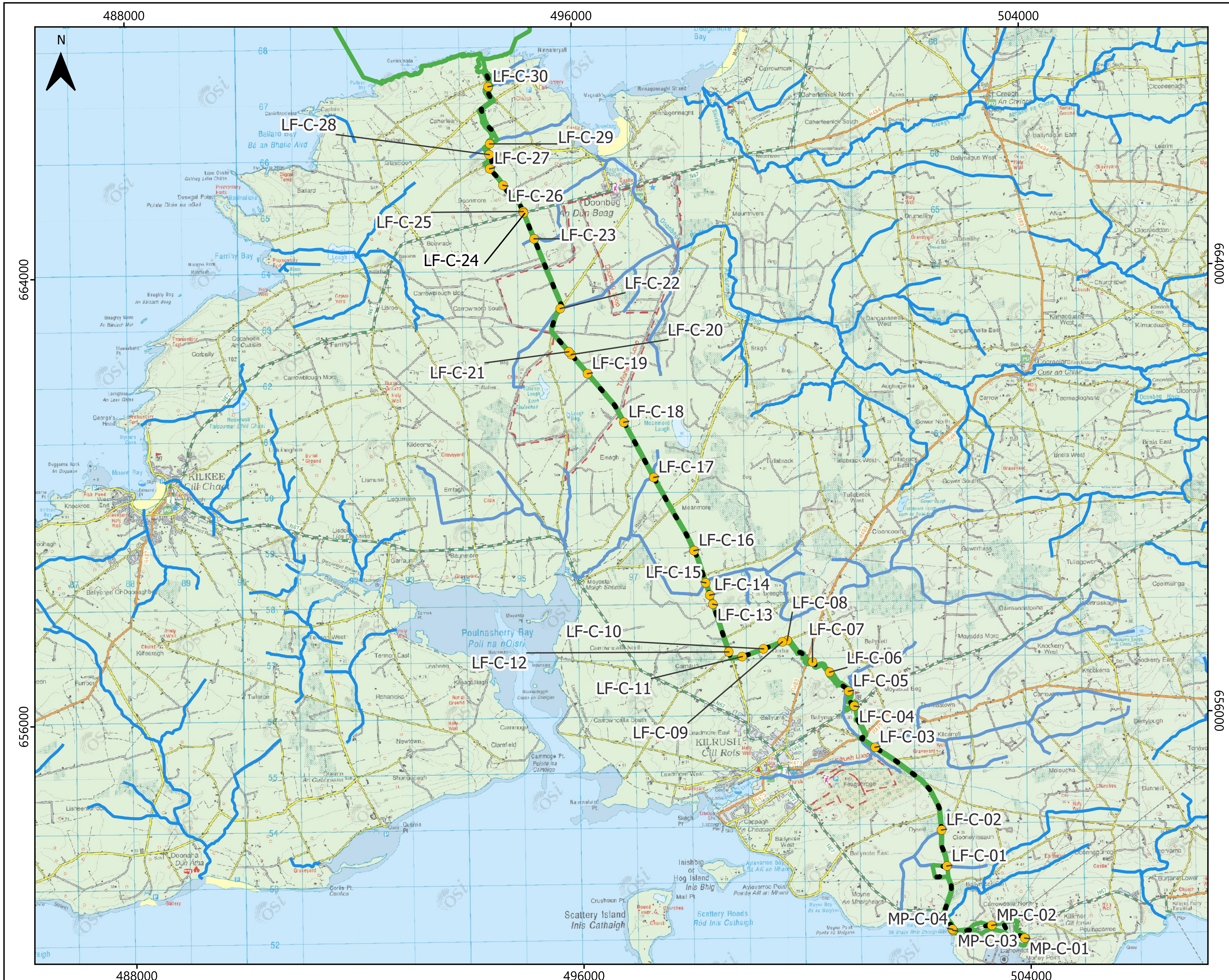
Option 3 – HDD under Bridges and Watercourses

In the event that none of the above methods are appropriate, HDD will be utilised, which will require a service trench (launch pit and receiving pit) for the drill in the road either side of the bridge or watercourse. The directional drill process will require that the depth of the service trench will deepen in a defined slope as it approaches the watercourse crossing on either side.

The directional drill will be carried out as follows:

- The HDD machine will set up at a launch pit (an enlarged portion of on-road trench, i.e. a service trench on either side of the crossing point at approx. 25m back from the watercourse). The drill will then bore in an arc under the watercourse feature. Full and approved traffic management will be incorporated prior to mobilization and set up of the HDD rig.
- The drilling head of the boring tool has a series of nozzles that feed a liquid bentonite mix along the bore direction, which provides both lubrication and support to the bore.

- Once the bore reaches the far side, the duct is then attached to the drill head and the duct is pulled back along the OGC of the bore to the original drilling point.
- Any bentonite mix is deposited within the bore shaft and is collected at either end of the bore within the dedicated launch/receiver pits; all excavated material and excess bentonite will be removed from the Onshore Site and brought to an authorised waste facility.
- Once the duct is in place under the watercourse, the normal process of road trenching can continue from either side of the watercourse structure.
- The launch and reception pits will be backfilled with appropriate engineered backfill and filled back up to the ground level with a finish to at least pre-existing conditions as agreed with Clare County Council. Suitable warning tapes will also be installed in the pits as per EirGrid approved design specifications.



SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- EIAR Site Boundary
- Watercourse Crossings
- Onshore Grid Connection
- Watercourses

0 1 2 km

Kilometres

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Watercourse/Service Crossings

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-09	CF	ÓM

DRAWING NO

Figure 5-18

SCALE	PAPER SIZE	DATUM	PROJECTION
1:81,000	A4	IRENET95	Transverse Mercator

Table 5-27 Onshore Grid Connection Underground Cable Route – Watercourse Crossings Methodology

Crossing Reference No.	Crossing Type	Width at HDD Location (m)	Available Cover (Allowing 300mm Separation) (m)	Crossing Option Description	Extent of In-Channel Works
MP-C-01	Open Drain Crossing	N/A	N/A	Undercrossing	None. No instream works required.
MP-C-02	N67 National Roadway	6.5m Approx.	N/A	Horizontal Directional Drilling 01	None. No instream works required.
MP-C-03	Piped Watercourse Crossing from Fly Ash Disposal Area piped to shore outfall	N/A	3.7m Approx	Overcrossing	None. No instream works required.
MP-C-04	Box Culvert Outfall	N/A	3.7m Approx	Overcrossing	None. No instream works required.
LF-C-01	Piped Watercourse 1050mm Ogee Type RC Pipe	N/A	1.55m	Overcrossing	None. No instream works required.
LF-C-02	Stone Culvert Approx 700mm High and 1000mm Wide	3.140m	0.7m	Horizontal Directional Drilling 02	None. No instream works required.
LF-C-03	Double Arch Masonry Bridge each Arch Approx 3.0m Wide and 1.6m High	4.980m	0.3m	Horizontal Directional Drilling 03	None. No instream works required.
LF-C-04	N68 National Road Crossing	9.50m Approx.	N/A	Horizontal Directional Drilling 04	None. No instream works required.

LF-C-05	Concrete Piped Crossing	N/A	N/A	Overcrossing	None. No instream works required.
LF-C-06	Concrete Piped Crossing	N/A	N/A	Overcrossing	None. No instream works required.
LF-C-07	Open Field Drain	N/A	N/A	Undercrossing	None. No instream works required.
LF-C-08	Stone Culvert 0.3m x 0.3m	2.515m	0.6m	Culvert Replacement	None. No instream works required.
LF-C-09	Stone Culvert 0.3m x 0.3m	2.550m	0.6m	Culvert Replacement	None. No instream works required.
LF-C-10	Stone Culvert 0.3m x 0.3m	2.450m	0.45m	Horizontal Directional Drilling 05	None. No instream works required.
LF-C-11	375mm RC Pipe Crossing	2.440m	0.85m	Horizontal Directional Drilling 06	None. No instream works required.
LF-C-12	450mm RC Pipe Crossing	N/A	1.3m	Overcrossing	None. No instream works required.
LF-C-13	Stone Culvert	N/A	TBC	Horizontal Directional Drilling 07	None. No instream works required.
LF-C-14	Stone Culvert Approx 600mm Wide and 500mm High	5.325m	0.85m	Horizontal Directional Drilling 08	None. No instream works required.

LF-C-15	Masonry Bridge, Overlain with Concrete Slab Arch 2.4m High	5.085m	0.8m	Horizontal Directional Drilling 09	None. No instream works required.
LF-C-16	300mm Twin Wall Plastic Pipe	N/A	0.6m	Undercrossing	None. No instream works required.
LF-C-17	2nr 1200mm Concrete Pipes	N/A	1.1m	Overcrossing	None. No instream works required.
LF-C-18	Assumed Stone Culvert	4.870m	1.3m	Horizontal Directional Drilling 10	None. No instream works required.
LF-C-19	2nr 600mm Concrete Pipes	4.315m	0.55m	Horizontal Directional Drilling 11	None. No instream works required.
LF-C-20	600mm Concrete Pipe	4.100m	0.55m	Horizontal Directional Drilling 12	None. No instream works required.
LF-C-21	Stone Culvert 0.6m High	4.600m	0.55m	Horizontal Directional Drilling 13	None. No instream works required.
LF-C-22	2nr 1200mm Concrete Pipes	N/A	0.9m	Overcrossing	None. No instream works required.
LF-C-23	Twin Stone Culvert 0.7m High	3.00m	1.05m	Horizontal Directional Drilling 14	None. No instream works required.
LF-C-24	N57 National Road Crossing	7.500m Approx.	N/A	Horizontal Directional Drilling 15	None. No instream works required.

LF-C-25	0.35H x 0.7w Stone Culvert	5.300m	0.8m	Horizontal Directional Drilling 16	None. No instream works required.
LF-C-26	Stone Culvert 0.7m High	2.620m	0m	Horizontal Directional Drilling 17	None. No instream works required.
LF-C-27	Stone Culvert 0.6m Wide 0.4m High	2.515m	0.15m	Horizontal Directional Drilling 18	None. No instream works required.
LF-C-28	Open Field Drain	N/A	N/A	Undercrossing	None. No instream works required.
LF-C-29	Open Field Drain	N/A	N/A	Undercrossing	None. No instream works required.
LF-C-30	Stone & 450mm Pipe Culver	3.375m	0.5m	Horizontal Directional Drilling 19	None. No instream works required.

5.6.2.3 Onshore Compensation Compound

5.6.2.3.1 *Site Preparation and Pre-Construction Works*

Before construction commences a number of preparatory activities will be carried out. Any detailed ground investigations required, as well as verification of existing services to support the construction process will be carried out and finalised.

The temporary construction compound, to be located on the east of the Onshore Site adjacent to the roadside, will be marked off and the necessary facilities will be put in place.

5.6.2.3.2 *Site Access*

Access will be gained to the OCC via the existing agricultural entrance, off the L1650 local road, which will be widened to accommodate the entrance requirements. All materials and equipment shall be brought onsite via the proposed access on the L6150. Sight lines shall be achieved and maintained. The proposed junction layout is shown in detail in Appendix 29-3 of the EIAR. The Contractor shall further develop the Traffic Management Plan into the Construction Stage Traffic Management Plan, and this will be agreed with the relevant authority prior to the commencement of construction activities.

5.6.2.3.3 *Excavation and Earthworks*

The Applicant has undertaken a series of trial pits, as detailed in Section 5.3.2.3, within the OCC and the results of these have been modelled in a Civil 3D model to fully understand the excavation requirements of the Onshore Site. Existing levels, proposed levels and rock levels are used to generate surfaces within the model and in turn cross sections of the Onshore Site and finally a cut and fill output for the proposal.

All excavation and earthworks will be carried out in accordance with BS6031:2009 Code of Practice for Earthworks[15]. Soil handling, extraction and management will be undertaken with regard to best practice guidelines such as Guidance on the Waste Management (Management of Waste from the Extractive Industries) Regulations 2012[16]. The following practices will be followed in relation to the excavation of cable trenches, topsoil stripping and any other earthworks:

- Excess soil is to be re-used, for landscaping and screening within the Onshore Site. Any side casted soil to be kept a minimum of 20m from any watercourse.
- Although unlikely, if any contaminated earth is uncovered, this will be stored separately and disposed of accordingly once the contaminant has been identified.
- Efforts will be made to ensure that water does not accumulate in excavated areas.
- All topsoil and subsoil will be stored separately, and care will be given to ensure the structure and quality of the soil is not damaged.
- The amount of exposed ground and soil stockpiles will be kept to a minimum and any stockpiles in place for an extended period of time will be allowed to re-vegetate naturally.
- Earthworks shall not occur during unsuitable weather conditions, including when soils are waterlogged or very dry.

[15]British Standards Institution (2009) 'BS 6031:2009 Code of Practice for Earthworks'. Available at: https://knowledge.bsigroup.com/products/code-of-practice-for-earthworks?version=standard

[16] *Irish Statute Book (2009) 'S.I. No. 566/2009 – Waste Management (Management of Waste from the Extractive Industries) Regulations 2009' Government of Ireland 2009 Available at:* https://www.irishstatutebook.ie/eli/2009/si/566

- Any excavated soil which is not re-used or dispersed across the Onshore Site and shall be stored on the impermeable surface at the construction compound and covered to prevent silt runoff and dust creation

5.6.2.3.4 Construction Methodology

The methodology for constructing the OCC will include the following steps:

1. *The buildings will be marked out by a qualified engineer.*
2. *Topsoil and subsoil will be removed from the footprint of the compound using an excavator. The excavated material will be temporarily stored in adjacent berms for later use during reinstatement works. Levels will be reduced to formation levels.*
3. *A layer of geotextile material will be laid over the footprint of the compound.*
4. *Using an excavator, a base layer of Unbound Granular Mixture (Clause 804) material will be laid. 6F2 material will be laid in layers to the formation levels indicated on the drawings.*
5. *All spoil will remain onsite.*
6. *Each layer will be compacted using a vibrating roller.*
7. *Earthing cable will be laid underground around the building for connection to the various electrical components during the electrical fit out phase.*
8. *The foundations of the buildings will be spread footings or rafts constructed from reinforced concrete. The foundations will be on a suitable bearing stratum. The concrete will be mixed offsite and brought to the Onshore Site in concrete trucks. The concrete will be poured into pre-formed formwork to the dimensions required by the detailed design.*
9. *The construction of an ESB GIS substation building, an EirGrid GIS substation buildings, a Statcom building, a Customer Scada and MV power building and associated electrical equipment and associated access track will be carried out.*
10. *The finish of the buildings shall include steel cladding on the GIS and Statcom buildings. The exterior of the MV building shall have a plastered finish, a black slate finish roof and plaster finished walls. Doors are to be galvanised steel doors in accordance with ESB Networks specification. Adequate lighting will be installed in/on the building.*
11. *Any telecom dishes or antennae (if required) for central control of the substation as part of the national grid will be mounted to the building according to ESB Networks/Telecoms standards.*
12. *The MV cables will enter via ducts under the buildings and access track.*
13. *The electrical installation includes the following:*
    a. *Delivery and installation of switchgear and control panels. GIS and Statcoms equipment. Transformer deliveries. These deliveries will be managed in accordance with the construction traffic management plan.*
    b. *Wiring and cabling of MV/LV equipment, protection, and control cabinets.*
    c. *Commissioning of all newly installed equipment.*

5.6.2.3.5 Material Storage

Materials and waste will be stored in a manner that minimises risk to the environment and reduces the potential for wastage due to exposure to the elements or damage.

Topsoil

- To be stored beside the works to a height of no more than 3m.
- Do not compact.
- To be stored separately from subsoil.
- Topsoil must be stored at least 3 metres away from any trees and hedgerows.

Subsoil

- To be stored beside the works to a height of no more than 5m.
- Do not over compact.
- To be stored separately from topsoil.
- Subsoil must be stored at least 3 metres away from any trees and hedgerows.

Sand/Stone

- To be stockpiled in the allocated lay down area in the Onshore Site in a way to minimise dust and wastage.

Cement

- To be stored in the original packaging on pallets inside the COSHH stores.
- If cement is to be stored outside temporarily it should be stored off the ground on pallets, away from sensitive or heavily trafficked areas and covered with tarpaulin.

Chemicals, Bitumen, Paints, Solvents

- In line with the Environmental Management Plan

Waste

- In line with the Environmental Management Plan
- Inert waste to be kept separate from non-hazardous and hazardous waste in a clearly designated area, in a labelled skip located on hardstanding where possible

Empty Drums/Containers

- To be stored in a designated area prior to disposal.
- Away from sensitive boundaries and watercourses
- Screening from external receptors, if possible

5.6.2.4 Temporary Construction Compounds

The temporary construction compounds will be constructed 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 where required;
- A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well graded granular material will be spread and lightly compacted to provide a hard area for site offices and storage containers;
- Areas within the 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 construction phase of the Onshore Site, the temporary construction compound will be decommissioned and allowed to vegetate naturally.

5.7 Operation and Maintenance

5.7.1 Offshore Site

5.7.1.1 Operations and Maintenance Strategy

Operation and Maintenance phase (O&M) activities can be categorised into two main types: planned/preventative and unplanned/corrective maintenance. The O&M period of the Project's life cycle commences once the Project is commissioned. The operational life of the Project is anticipated to be 38 years. Planned and unplanned O&M activities will be conducted out of the O&M base except where specialist vessels are required. CTV(s), SOVs and helicopters will be used for O&M of the Project, with up to two CTVs used daily for routine work(up to four daily return trips). The anticipated O&M campaigns and frequencies are shown in Table 5-28.

5.7.1.2 O&M Activities

Planned maintenance follows a regime of scheduled maintenance activities, and includes general inspection and servicing of equipment, safety-related inspections, oil sampling/change, cleaning of equipment, investigation of faults, minor fault rectification and replacement of consumables. These types of scheduled maintenance activities will generally take place during the summer months.

Unplanned maintenance covers fault rectification, unexpected minor repairs and major component replacements/repairs. As these cannot always be foreseen, they may take place at any time of the year across the Offshore Development's life cycle and may require urgent intervention to rectify any critical issues as quickly as possible.

O&M activities will be conducted in accordance with OWF industry best practices with the intention of adhering to:

- Original Equipment Manufacturer (OEM) guidance;
- Laws and regulations;
- Maintaining safety; and
- Optimizing yield and availability.

For the WTGs, minor maintenance or repairs (carried out either remotely or with technicians and/or trouble-shooters deployed to the Offshore Site) may be required if unplanned events such loss of generation require intervention. Large scale maintenance and repairs cannot always be planned but are likely to occur, over the lifetime of the Project, and may include the replacement of blades, gearboxes, transformers, generators, main bearings or switchgear. Whilst these are unplanned events, efforts will be taken to try and undertake these activities in the summer months, although this will not always be possible. Major repairs of this kind may require the deployment of a WTIV or HLV or a semi-submersible crane vessel.

Cable maintenance and repairs may also be required during the lifetime of the Project. Cable surveys will be conducted annually in the first years at least, to determine if intervention is needed, and less frequently as conditions are established. Interventions required could include increasing the cable depth of lowering in locations along the cable route where a mobile seabed may lead to cable exposure risk. If a need for cable maintenance or repair is identified, the location, scale and type of damage will determine the repair methodology and timing. The affected area may require cable cutting, replacement and/or jointing of the cable sections and installation of additional cable protection.

Additionally, planned and unplanned maintenance for the OSS will be conducted as necessary. It is anticipated the GBS foundations will require maintenance during the Project lifetime.

The location of the O&M based is still under consideration by the project team, however the current assumption is that the O&M base will be located in Rossaveel, Co. Galway.

Table 5-28 Operations parameters and timescales.

Property	Description
O&M Base Locationv(assumed)	Rossaveel
Logistics Strategy	CTV, SOV, Helicopter
No. of CTV's	up to 2 vessels per day
No. of SOV's	1 vessel per day
No. of Helicopters	1 per day
No. of daily return vessel movements	Up to 4 (CTVs)
No. of annual jack up interventions	Up to 2 campaigns (may cover more than 2 locations)
Repair platform (blades)	Up to 1 campaign per year
Drones	Up to one campaign per year
Cable repair vessels	Expected to be less than 5 unscheduled interventions over life
Cable survey vessels	Annually for first 5-10 years, less frequently thereafter if conditions are stable
Oil exchange vessels/ plant may be required for certain WTG models	Approximately every 10 years.

5.7.2 Onshore Site

5.7.2.1 Operation and Maintenance

The proposed OCC components will require periodic maintenance throughout the operational phase. It is proposed to manage wastewater from the staff welfare facilities in the control building by means of a sealed underground storage tank, with all wastewaters being tankered off site by permitted waste collector to wastewater treatment plants. Hydrocarbons and oils will be present during the operation of the OCC however these will be stored in an appropriately bunded area. The operation of a substation is not a recognized source of environmental emissions or nuisance and so there will be no adverse effects associated with its operation.

The Onshore Site tracks will also require periodic maintenance. Although the level of activity required for the maintenance of the Onshore Site is not significant, the impacts associated with traffic volumes for this period are assessed in Chapter 29: Traffic and Transportation.

EirGrid may require access to the joint bay locations along the OGC periodically during the O&M phase, where the joint bay is located in private lands, access will be gained through the provision of a permanent access track along the route.

5.8 Decommissioning

A Rehabilitation Schedule has been prepared for the Project (Appendix 5-18). The Rehabilitation Schedule will be updated prior to the end of the operational and maintenance period in line with decommissioning methodologies that may exist at the time and any proposed changes will be agreed with the competent authority at that time. The potential for effects during the decommissioning phase of the Offshore Site has been fully assessed in each relevant section of this EIAR.

Table 5-29 Decommissioning Approach

Component	Approach
Wind Turbine Generators (WTG)	Full removal of infrastructure
OSS Topside	Full removal of infrastructure
GBS (WTG and OSS)	Full removal of infrastructure
GBS and WTIV Seabed Preparation	Left in situ
Offshore Cables (IAC and OEC)	Exposed cables (above the seabed and where accessible) will be cut and removed. Buried cables will be left in situ. Cable protection will be left in situ.
Landfall	TJB infrastructure left in situ Cable through trenchless burial left in situ Cable cut at TJB for onshore removal
OGC (TJB to OCC and OCC to Moneypoint), Cable, Cable ducting and joint bays	Cable Ducts and joint bay infrastructure left in situ. Cable pulled through ducts and fully removed (starting from TJB).
Onshore access tracks (on private lands)	Left in situ
OCC buildings and electrical infrastructure	Full removal of all above ground infrastructure
Planted area on OCC	Left in situ

5.8.1 Offshore Site

5.8.1.1 WTG and OSS

It is imperative before commencing decommissioning activities that the system is de-energised, and the electrical systems are isolated from the grid.

WTG removal will be a reverse of the proposed installation procedure. The WTG is dismantled component by component and removed from the Offshore Site.

The decommissioning of the OSS will follow a similar method as described for the decommissioning of the WTG. The complete OSS topside structure will be separated from the GBS structure and removed in a single lift, taken by a suitable vessel to an onshore facility where the equipment and structure will be dismantled and the constituent parts processed for re-use, recycling and/or disposal.

5.8.1.2 Gravity-Based Structure Foundations

GBS decommissioning will involve the full removal of the GBS, while leaving in place the stonebeds from the seabed preparation. The GBS is re-floated by reversing the installation methodology, i.e. removing the ballast and subsequently re-floating the GBS. Then, with the help of tugs and/or external auxiliary tools, the GBS is towed away from the Offshore Site.

GBS Stonebeds and the WTIV Stonebeds will be decommissioned in-situ.

5.8.2 Cables (Inter-array and Export Cables)

A similar methodology is adopted for both the IAC and OEC. Initially both would be de-energised from the grid.

All exposed and accessible cabling will be cut and removed via an offshore vessel utilising divers and/or an ROV and offshore lifting grab. The cabling will then be removed from the Offshore Sit.

All buried cables would be cut at the ends and left in situ as this is considered to be the Best Environmentally Practicable Option (BEPO) with the least amount of disturbance to the seabed.

Cable protection will be decommissioned in-situ.

During decommissioning a thorough investigation of the Offshore Site infrastructure will be conducted. The electrical systems will be de-energised and isolated from the grid and any hazardous material or loose items will be removed from structures (e.g. lubricants from WTGs). The general decommissioning approach can be seen in Table 5-29. The decommissioning base locations could include Shannon Foynes, Cork and/or Belfast depending on what facilities are available at the time of decommissioning.

5.8.3 Onshore Site

5.8.3.1 Landfall

The OEC at the Landfall will be installed using trenchless methodologies, and following decommissioning this will remain in situ. The buried cables would simply be cut at TJB and left in situ as this is considered to be the Best Environmentally Practicable Option (BEPO) with the least amount of disturbance to the seabed.

The TJB infrastructure at the OLL will remain in situ, the cable will be cut within the TJB to allow for the onshore cable to be pulled through. Given that the TJB will be buried below ground, its presence is not visible. Leaving the TJB in situ is considered a more environmentally prudent option, as to remove and dispose of that volume of reinforced concrete from the ground could result in significant environmental nuisance such as noise, dust and/or vibration.

5.8.3.2 Onshore Grid Connection

The ducts and joint bay infrastructure will remain in situ and can be used for future cable installation if required.

The joint bays will be opened up and the cables will be cut. Once cut, the cables are pulled through the ducting and removed. The joint bays are then backfilled and reinstated to the relevant road standards, or to original condition for those located on private lands. The cables are striped back to expose the copper or aluminium components which will be recycled and reused. Any remaining materials or residues will be disposed of to a suitable licenced facility. Traffic management requirements during this stage will be similar to that implemented during the installation stage albeit reduced due to the ducts and joint bay infrastructure remaining in situ.

Onshore access tracks within private lands will remain insitu and can be provided for alternative future use by the landowners.

5.8.3.3 Onshore Compensation Compound

The above ground components of the OCC building and compound will be removed fully from the Onshore Site. For the underground components, such as the foundations and non-electrical infrastructure, the Best Environmentally Practicable Option (BEPO) is for these to remain in situ.

For the electrical infrastructure to be removed from the Onshore Site, any materials that can be reused or recycled will be. For example, steel or aluminium can be recycled and reused as building materials. This ensures that the volume of waste generated during decommissioning is kept to a minimum and promotes a circular economy.

The planted area adjacent to the OCC, as presented in the Landscape Mitigation Plan in Appendix 27-1, will remain in situ as this is considered to be the Best Environmentally Practicable Option (BEPO). The remainder of the Onshore Site will be reinstated to its original form with a grassed surface.

5.9 Community Gain Proposal

5.9.1 Background

The Project has the potential to have significant benefits for the local economy, by means of job creation and increased economic activity associated with the construction and operation of the Project.

Key findings of the standalone Economic assessment report of the project, Appendix 6-2 of this EIAR state that in an Irish context, the Project would represent direct, indirect and induced economic impacts of an estimated €81 million Gross Value Added (GVA) and 837 full time equivalent jobs annually during the development and construction phase, €13 million annual (GVA) and support 174 full time equivalent jobs annually, totalling an estimated 5,095 full time equivalent jobs over the operational phase and an estimated €4 million GVA and support 69 full time equivalent jobs annually during the decommissioning phase, with Project lifetime GVA amounting to approximately €564 million and supporting 1,080 annual full time equivalent jobs.

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

Community gain proposals can take a number of forms, generally depending on the nature and location of the Proposed Wind Farm and the nature and make-up of the local community. The nature of the community gain proposal will be subject to discussions with and input from the local community. The ORESS 1 auction was run by EirGrid in May 2023. The Project was announced as one of four successful projects to be awarded long-term contracts. The Project plans to provide an estimated €70 million of funding over 20 years to local communities through a new Community Benefit Fund. The Project will be one of the largest infrastructure projects to be developed in the Connemara region, in what is one of the most economically deprived areas of the country. The Community Benefit Fund will deliver lasting, tangible benefits to the region through community-driven initiatives. It will also help to preserve the Gaeltacht language, culture and traditions of the area. It is estimated that the value of an ORESS community scheme for the Project would be worth over €3.5 million annually once the Project is operational, the support scheme commences at construction stage in line with the ORESS 1 Community Benefit Fund Rulebook These funds may then be used for a variety of projects, such as environmental improvements, local amenities and facilities, voluntary and sporting groups and clubs, educational projects, energy efficiency improvement works and direct payments to nearby households.

A Community Report is included as Appendix 2-3 to this EIAR, which sets out further detail on the proposals for the Community Benefit Fund.

5.9.2 Offshore Renewable Electricity Support Scheme

The Offshore Renewable Electricity Support Scheme (ORESS) is a Government scheme that provides support to offshore renewable electricity projects in Ireland. ORESS is a pivotal component of the Programme for Government and is a major step in achieving Ireland's target of at least 80% renewable electricity by 2030, and at least 5 GW of offshore wind energy by 2030. Eligible projects compete to deliver the lowest price of electricity for the consumer. The projects with the lowest price of electricity are accepted into the scheme and the price that they bid is the price that they will receive for each unit of electricity produced for the duration of the scheme.

Each ORESS project, when built, sells its electricity into the market. When the market price is lower than the bid price, the government tops up the payments so that the bid price is achieved. When the market price is higher than the bid price, the project must return the difference to the government. The average bid price for ORESS1 was €86.05 per megawatt hour (MWh) which is lower than the average price of electricity in 2021, 2022, 2023 and so far in 2024 (up to end July). If the ORESS1 projects were operating over this time they would have generated money for the government. This long-term price assists projects to get finance but also provides price stability and security of supply for Irish consumers.

The ORESS 1 auction was run by EirGrid in May 2023. The Project was one of 4 projects out of 5 that were eligible that were successful in ORESS 1. The Project was announced as one of four successful projects to be awarded long-term contracts. The Project plans to provide an estimated €70 million of funding over 20 years to local communities through a new Community Benefit Fund, which if further detailed below

5.9.3 Community Benefit Fund

Community gain proposals can take a number of forms, generally depending on the nature and location of a proposed wind farm and the nature and make-up of the local community. The nature of the community gain proposal will be subject to discussions with and input from the local community. The Project will be one of the largest infrastructure projects to be developed in the Connemara region, in what is one of the most economically deprived areas of the country. The Community Benefit Fund will deliver lasting, tangible benefits to the region through community-driven initiatives. It will also help to preserve the Gaeltacht language, culture and traditions of the area. It is estimated that the value of an ORESS community scheme for the Project would be worth over €3.5 million annually once the Project is operational, the support scheme commences at construction stage in line with the ORESS 1 Community Benefit Fund Rulebook. These funds may then be used for a variety of projects, such as environmental improvements, local amenities and facilities, voluntary and sporting groups and clubs, educational projects, energy efficiency improvement works and direct payments to nearby households.

Based on the current Offshore Renewable Electricity Support Scheme (ORESS1)[17] guidelines, it is required that for each MWh of electricity produced by the wind farm, the project will contribute €2 into a community fund for the first 20 years of operation of the Project.

Based on proposed layout and technology, this will deliver a community contribution in the region of approximately €3,500,000 per annum for the local community. The value of this fund would be directly proportional to electricity generated by the wind farm. The Project will be one of the largest infrastructure projects to be developed in the Connemara region, in an area that has limited economic opportunity. The Community Benefit Fund will deliver lasting, tangible benefits to the region through community-driven initiatives. It will also help to preserve the Gaeltacht language, culture and traditions of the area.

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

A Community Report is included as Appendix 2-3 to this EIAR, which sets out further detail on the proposals for the Community Benefit Fund.

[17] *Department of Communications, Climate Action and Environment (2023) Renewable Electricity Support Scheme (ORESS) 1. DCCAE, Dublin.*

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Acronym	Definition
B	Magnetic components
CaP	Cable Plan
CBRA	Cable Burial Risk Assessment
CD	Chart Datum
CIL	Commissioner of Irish Lights
CIS	Cast Iron Shell
COSHH	Control of Substances Hazardous to Health
CTV	Crew Transfer Vessel
DP	Dynamic Positioning Vessel
E	Electric
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
GBS	Gravity Base Structure Fixed-Bottom Foundations
GW	Gigawatt
HAT	Highest Astronomical Tide
HDD	Horizontal Directional Drilling
FDPE	High-Density Polyethylene
HLV	Heavy Lift Vessel
HMR	Helicopter Main Route

Acronym	Definition
HTV	Heavy Transport Vessel
HVAC	High Voltage Alternating Current
HWM	High Water Mark
IAA	Irish Aviation Authority
IAC	Inter-Array Cable
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
ICAO	International Civil Aviation Organisation
iE	Induced Electric
INNS	Invasive Non-Native Species
Km	Kilometre
kV	Kilovolt
LAT	Lowest Astronomical Tide
LMP	Lighting and Marking Plan
LWM	Low Water Mark
m^2	Square metres
MAC	Maritime Area Consent
MARPOL	The International Convention for the Prevention of Pollution from Ships
MGN	Marine Guidance Notice
MLW	Mean Low Water
MPCP	Marine Pollution Contingency Plan
MSDS	Materials Safety Data Sheets

Acronym	Definition
MSL	Mean Sea Level
MVAC	Medium Voltage Alternating Current
MW	Megawatt
NAO	North Atlantic Oscillation
OAA	Offshore Array Area
OCC	Onshore Compensation Compound
OEC	Offshore Export Cable
OECC	Offshore Export Cable Corridor
OSP	Offshore Substation Platform
OWF	Offshore Windfarm
PAD	Protocol for Archaeological Discoveries
PLGR	Pre-Lay Grapnel Run
ROV	Remotely Operated Underwater Vehicle
SAR	Search and Rescue Checklist
SGRE	Siemens Gamesa Renewable Energy
SOLAS	International Regulations for the Safety of Life at Sea
SOPEP	Shipboard Oil Pollution Emergency Plan
SOV	Service Operation Vessel
T&I	Transport and Installation
TIM	Transport Installation Module
TJB	Transition Joint Bay

Acronym	Definition
UK	United Kingdom
UXO	Unexploded Ordnance
V m-1	Volts per metre
VMP	Vessel Management Plan
WBDM	Water-Based Drilling Mud
WSI	Written Scheme of Investigation
WTG	Wind Turbine Generator
WTIV	Wind Turbine Installation Vessel