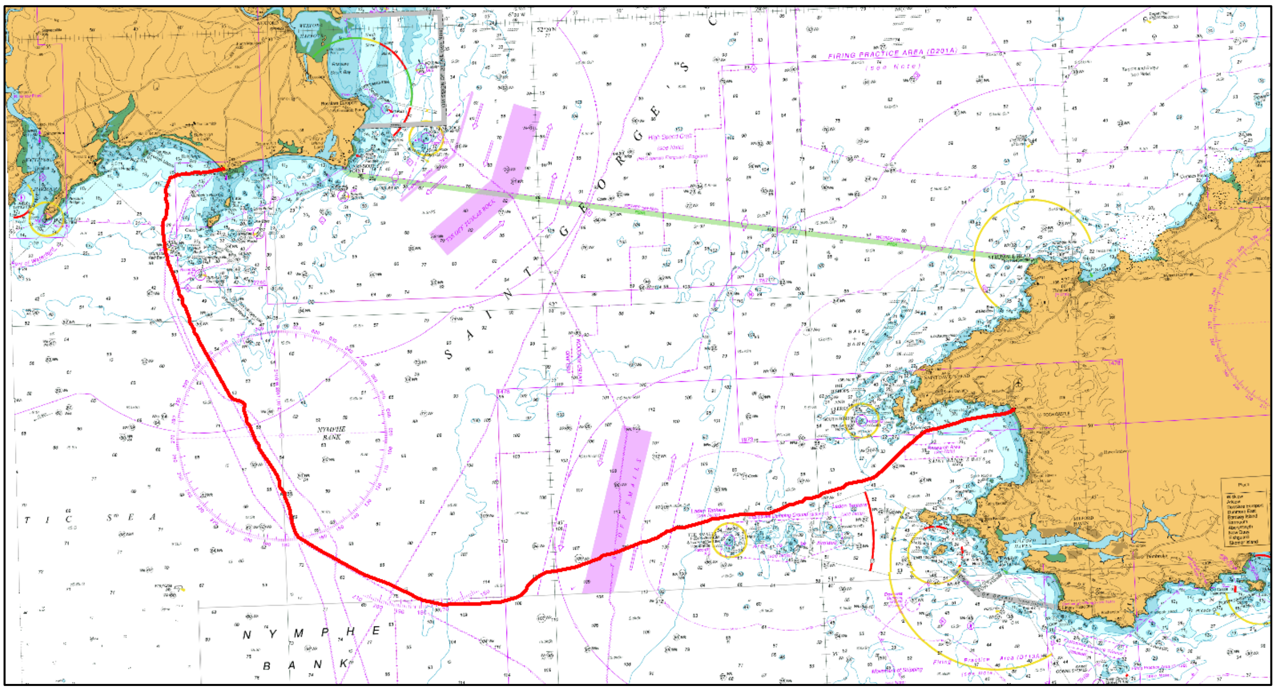
BEAUFORT CABLE SYSTEM



OFFSHORE WORKS METHODOLOGY

MDM

SUBSEA SOLUTIONS, CONNECTED COMMUNITIES

Contents

DOCUMENT CONTROL SHEET

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SUMMARY

i. Amazon MCS Ireland Limited is applying to land the new high-capacity Beaufort submarine fibre-optic cable system in Kilmore Quay, Co. Wexford; linking Ireland to the UK. The Beaufort system will be jointly developed and operated with Microsoft to provide next generation diverse connectivity between Ireland and the UK with onward connectivity to Continental Europe. When fully operational, the cable will support high quality, robust and resilient access to international telecommunications networks - a key driver in social, economic and industrial growth; supporting the development of the region and of Ireland as a whole as outlined in the National Marine Planning Framework.

ii. The existing subsea cable systems in the Celtic Sea linking Ireland and the UK are approaching end of life as they date from the year 2000 and earlier. More recent cable builds between Ireland and the UK have focused on routing directly into Dublin from the Northeast of England and Wales. The new Beaufort system will help ensure the long-term security of communications and resilient connectivity for Ireland and the UK. The system will make use of existing infrastructure such as ducts and the cable landing compound in Kilmore Quay. The system will land in the UK at a landfall in Newgale, Wales.

iii. The Beaufort subsea cable is approximately 33mm in diameter and will be "un-repeatered" (i.e. not powered). It is to be an industry-standard optical fibre cable. The cable will be double armoured in Irish waters.

iv. Beaufort Cable System will re-use the existing ESAT-1 landfall infrastructure at Ballyteige Burrow to the northwest of Kilmore Quay. This includes the duct to sea beneath the dune system, the Beach Manhole, the fronthaul duct from the Beach Manhole to the Cable Landing Station and the Cable Landing Station.

v. This report provides a high level overview of the installation methodology of the offshore section of the Beaufort Cable between the Irish 12 nautical mile (12nm) limit and the Irish Exclusive Economic Zone (EEZ) boundary.

1.0 INTRODUCTION

Overall Route

1.1 Amazon MCS Ireland Limited is planning to construct a new subsea fibre optic cable system to replace an out-of-service cable and upgrade connectivity in the southern sea corridor between Ireland and the UK. The planned cable will extend from Kilmore Quay on the southeast coast of Wexford in Ireland to Newgale, Pembrokeshire on the southwest coast of Wales. The overall scheme is referred to as the Beaufort Cable System and the route configuration is shown in Figure 1.

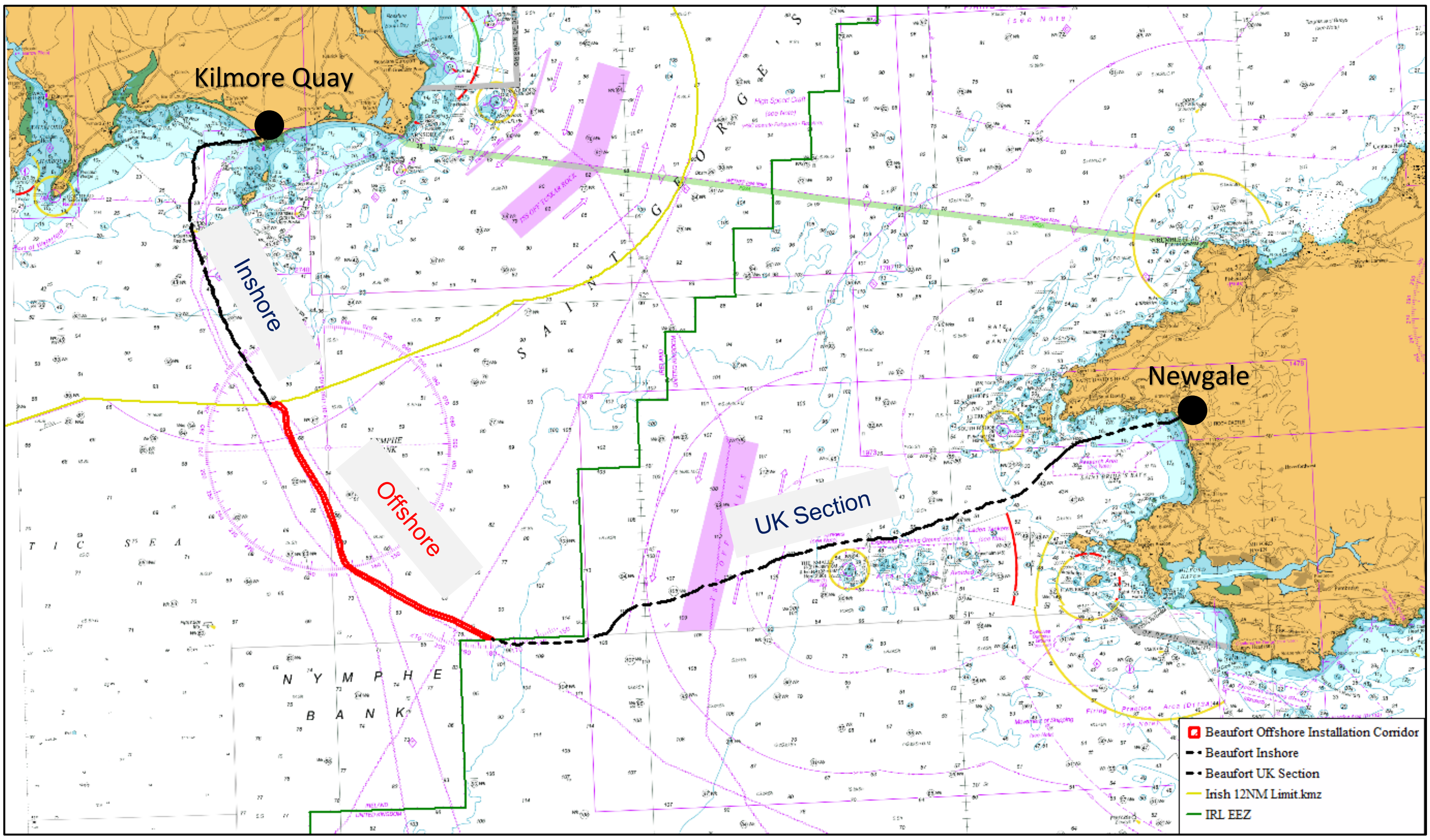


Figure 1: The Beaufort Cable System

1.2 The planned system is comprised of three subsea segments which are defined as follows:

- Inshore Kilmore Quay to Irish 12nm Limit - Granted permission under Foreshore License FS007361 on 29/11/2023.

- Offshore Irish 12nm Limit to Irish EEZ Boundary – This segment will be the primary focus of this report.
- UK Section EEZ Boundary to Newgale –An application for a Marine Licence to install the Beaufort cable in UK waters has been submitted to Natural Resources Wales (NRW), ref: CML2606.

The landfall duct at Kilmore Quay, Wexford has been granted planning permission by Wexford County Council on 25/03/2025 – Application Reference Number: 20250330.

1.3 Several cable systems linking Ireland and the UK have been constructed in the Celtic Sea in the past 25 years and these are shown in Figure 2. These cables include:

- Celtic Kilmore Quay to Land's End 1994
- ESAT-1 Kilmore Quay to Land's End 1998
- UK - IRL Crossing 1 Kilmore Quay to Land's End 1999
- UK - IRL Crossing 2 Ballinesker to Bude 1999
- Solas Kilmore Quay to South Wales 2000

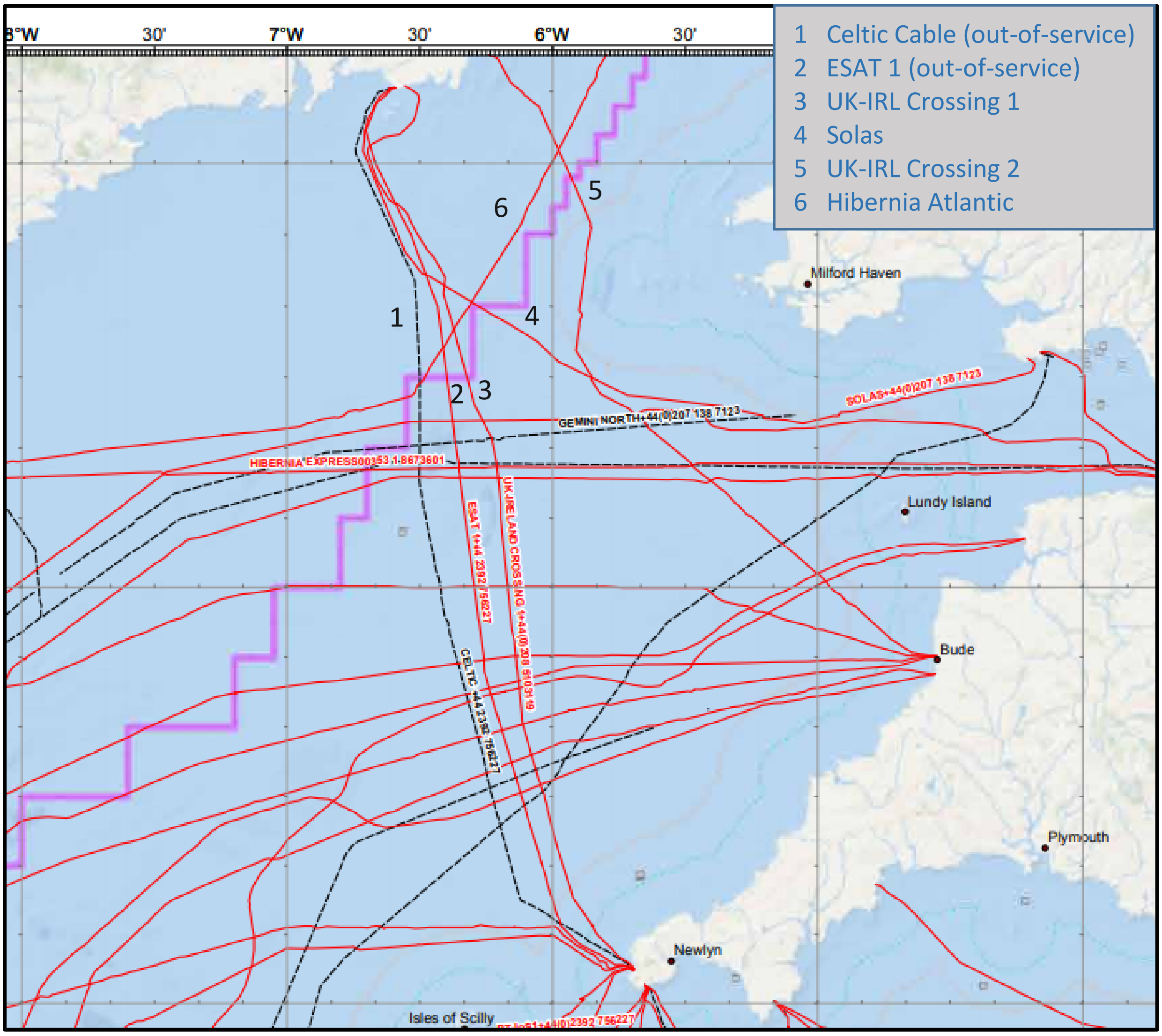


Figure 2: Existing Cable Systems

1.4 Celtic is an old Telecom Eireann / BT cable and has been taken out of service. ESAT-1 was installed in 1998 and has recently been taken out of service. UK-IRL Crossing 1 and UK-IRL Crossing 2 were both installed in 1999 and are relatively old in cable terms. Solas and Hibernia Atlantic installed in 2000 and 2001 respectively are also ageing cables.

1.5 The status of these existing cables leaves Ireland largely reliant on the subsea cables in the Dublin - Lancashire/Anglesey sector of the Irish Sea. This, together with increasing requirements for robustness, security, and resilience in overall network systems, establishes a need for a new and diverse cable system. The planned Beaufort

Cable System is being developed to replace an out-of-service cable and upgrade the connectivity in the southern sea corridor from Ireland to the UK.

1.6 Significant turning points in the offshore installation corridor are listed as follows:

Irish 12 Mile Limit	KP - 39.3
Turning Point	KP - 60.0
Greenlink Interconnector Crossing	KP - 58.8
EEZ Boundary	KP - 78.1

1.7 The overall route configuration is presented on an Admiralty Chart base map in Figure 3.

1.8 The Route Position List (RPL) corresponding to the offshore installation corridor of Beaufort (between the Irish 12nm limit to the EEZ boundary) is presented in Table 1. This corridor is 400m wide, 38.5 km in length and has a total area of approximately 15.38 km^2.

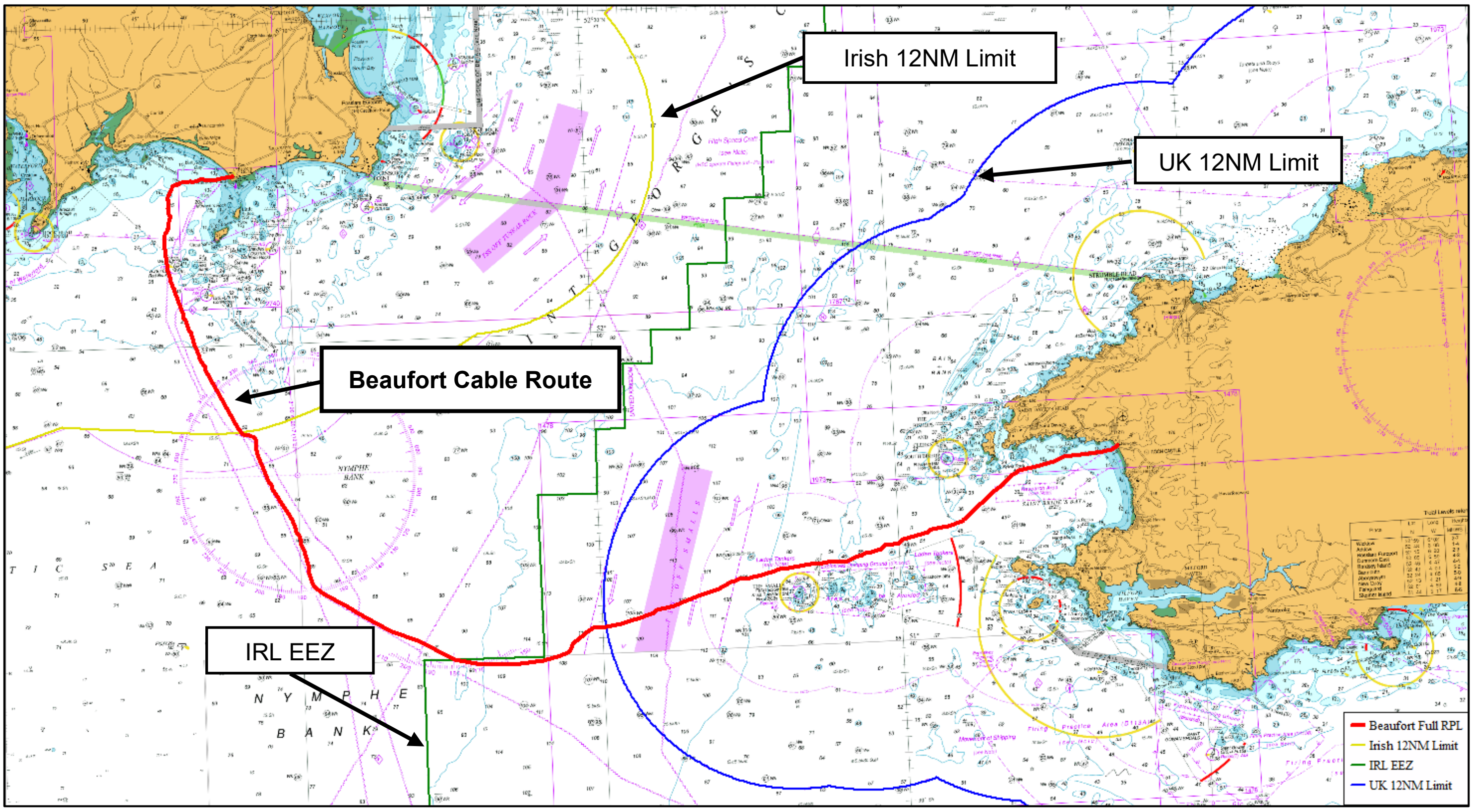


Figure 2*: The Planned Beaufort Cable System Route*

Beaufort IRL Offshore Installation Corridor RPL			
ID	LATITUDE	LONGITUDE	COMMENT
1	51° 54' 35.3826" N	6° 35' 37.2180" W	IRL 12NM Limit
2	51° 54' 36.2943" N	6° 35' 21.7787" W	IRL 12NM Limit
3	51° 54' 37.7038" N	6° 35' 01.6170" W	IRL 12NM Limit
4	51° 54' 38.6017" N	6° 34' 50.6195" W	IRL 12NM Limit
5	51° 54' 34.5993" N	6° 34' 34.7132" W	
6	51° 54' 28.6861" N	6° 34' 19.0584" W	
7	51° 54' 20.9485" N	6° 34' 06.7819" W	
8	51° 54' 11.1139" N	6° 33' 57.6221" W	
9	51° 53' 59.5495" N	6° 33' 52.4391" W	
10	51° 53' 45.6884" N	6° 33' 51.0768" W	
	51° 53' 45.5170" N	6° 34' 01.9208" W	IRL – UK Crossing 1
11	51° 53' 14.1252" N	6° 33' 47.9203" W	
12	51° 52' 53.7233" N	6° 33' 40.7627" W	
13	51° 52' 37.1581" N	6° 33' 29.3758" W	

14	51° 52' 10.7185" N	6° 33' 11.4243" W	
15	51° 51' 33.3104" N	6° 32' 49.4773" W	
16	51° 49' 36.5792" N	6° 31' 03.5939" W	
17	51° 49' 05.5611" N	6° 30' 35.0001" W	
18	51° 48' 02.9995" N	6° 29' 57.0942" W	
19	51° 47' 06.0227" N	6° 29' 27.1952" W	
20	51° 46' 41.1144" N	6° 29' 16.3548" W	
21	51° 46' 00.1548" N	6° 29' 03.4950" W	
22	51° 45' 40.7520" N	6° 28' 59.8563" W	
23	51° 45' 21.0376" N	6° 28' 52.2292" W	
	51° 45' 20.6984" N	6° 29' 02.1085" W	Greenlink Interconnector
24	51° 45' 19.8445" N	6° 28' 51.7652" W	
25	51° 45' 02.1295" N	6° 28' 41.4627" W	
26	51° 44' 52.8960" N	6° 28' 31.8361" W	
27	51° 44' 44.7599" N	6° 28' 17.6373" W	
28	51° 44' 24.8686" N	6° 27' 34.0552" W	
29	51° 43' 39.8560" N	6° 25' 33.8987" W	
30	51° 43' 21.6075" N	6° 24' 47.6985" W	
31	51° 43' 10.3905" N	6° 24' 18.7566" W	
	51° 43' 04.2921" N	6° 24' 24.1696" W	IRL – UK Crossing 1
32	51° 42' 34.0198" N	6° 22' 44.9476" W	
33	51° 41' 59.0889" N	6° 21' 05.5635" W	
34	51° 41' 20.2014" N	6° 18' 29.8712" W	
35	51° 41' 04.2676" N	6° 17' 43.2754" W	
	51° 40' 59.1939" N	6° 17' 47.6817" W	Hibernia Atlantic Crossing
36	51° 40' 25.3143" N	6° 15' 49.1535" W	
37	51° 40' 22.5346" N	6° 15' 41.4168" W	
38	51° 40' 02.7628" N	6° 14' 41.4159" W	
39	51° 40' 00.1217" N	6° 14' 43.6674" W	IRL EEZ
40	51° 40' 00.1071" N	6° 15' 17.8010" W	IRL EEZ
41	51° 40' 11.2094" N	6° 15' 51.4998" W	
42	51° 40' 14.0380" N	6° 15' 59.3727" W	
43	51° 40' 52.9247" N	6° 17' 53.3022" W	

44	51° 41' 08.4850" N	6° 18' 38.8063" W	
45	51° 41' 47.4001" N	6° 21' 14.6130" W	
46	51° 42' 22.8923" N	6° 22' 55.5957" W	
47	51° 42' 59.4103" N	6° 24' 29.7868" W	
48	51° 43' 10.6569" N	6° 24' 58.8060" W	
49	51° 43' 28.8536" N	6° 25' 44.8762" W	
50	51° 44' 14.0909" N	6° 27' 45.6363" W	
51	51° 44' 34.7597" N	6° 28' 30.9234" W	
52	51° 44' 44.4933" N	6° 28' 47.9111" W	
53	51° 44' 56.3414" N	6° 29' 00.2648" W	
54	51° 45' 16.1174" N	6° 29' 11.7682" W	
55	51° 45' 18.0082" N	6° 29' 12.5038" W	
56	51° 45' 38.4847" N	6° 29' 20.4284" W	
57	51° 45' 58.1664" N	6° 29' 24.1218" W	
58	51° 46' 38.1865" N	6° 29' 36.6917" W	
59	51° 47' 02.3312" N	6° 29' 47.2027" W	
60	51° 47' 58.7194" N	6° 30' 16.7997" W	
61	51° 49' 00.0404" N	6° 30' 53.9611" W	
62	51° 49' 30.2000" N	6° 31' 21.7671" W	
63	51° 51' 27.8940" N	6° 33' 08.5376" W	
64	51° 52' 05.9988" N	6° 33' 30.8978" W	
65	51° 52' 32.1171" N	6° 33' 48.6343" W	
66	51° 52' 49.7817" N	6° 34' 00.7791" W	
67	51° 53' 12.3418" N	6° 34' 08.6967" W	
68	51° 53' 44.8955" N	6° 34' 11.9564" W	
69	51° 53' 57.4039" N	6° 34' 13.1874" W	
70	51° 54' 06.0746" N	6° 34' 17.0746" W	
71	51° 54' 13.0597" N	6° 34' 23.5810" W	
72	51° 54' 18.4766" N	6° 34' 32.1761" W	
73	51° 54' 23.0070" N	6° 34' 44.1703" W	
74	51° 54' 26.3966" N	6° 34' 57.6414" W	
75	51° 54' 29.8986" N	6° 35' 18.9298" W	
76	51° 54' 30.3472" N	6° 35' 20.8519" W	

77	51° 54' 35.3826" N	6° 35' 37.2180" W	
78	51° 54' 35.3826" N	6° 35' 37.2180" W	

Table 1: Route Position List – Beaufort Offshore Installation Corridor

1.9 This Report outlines details of the planned route of the Offshore Section, together with the findings of a Marine Archaeological Assessment, an AA Screening and Natura Impact Statement and an Ecological Impact Assessment.

1.10 A MAC (ref: MAC240030) has been granted by the Maritime Area Regulatory Authority for the cable segment from IRL 12nm to IRL EEZ.

Provisional Timeline

1.11 The provisional timeline for the project is as follows:

Pre-submission Consultation & Application Preparation	November 2025
Submit Main-Lay Documentation	April 2026
Main-Lay	Q2/Q3 2027

2.0 BACKGROUND

2.1 The original concept was for the Beaufort Cable system route to follow the line of the ESAT-1 cable (decommissioned under foreshore licences FS007361 and FS004585) southwards from the landfall at Kilmore Quay.

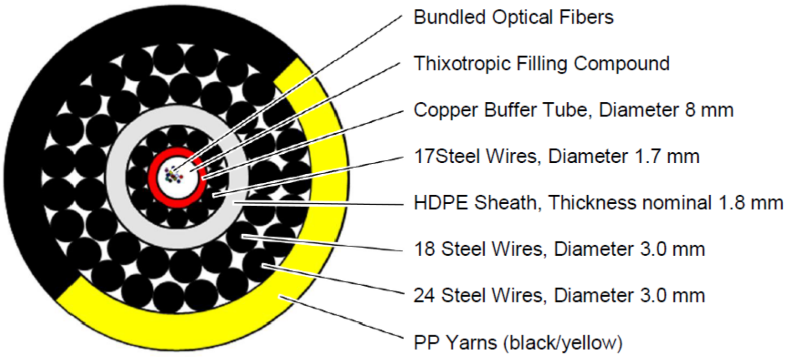
2.2 The As-Laid records for the ESAT-1 cable have been made available by BT Ireland and these provide background information for the installation of the planned Beaufort Cable. The survey information is supplemented by further and more recent material, as outlined in Paragraph 2.3 and the overall material provides an enhanced database for the installation of the planned Beaufort Cable System over a substantial portion of the route.

2.3 The data covering the northern section of ESAT-1, together with the remainder of the route, is further supplemented by the following additional material

- Offshore Seabed Geomorphology.
- Bathymetry, Sidescan Sonar, Magnetometer and Sub-Bottom Profile survey data from cable route surveys commissioned by Amazon and Microsoft.
- Seabed Sediment and Bed-form data.
- Landfall features.
- Admiralty Chart Data.
- Inventory of Wrecks.
- Inventory of existing cables.
- Inventory of marine installations and licence blocks.
- Marine Archaeological Assessment.
- AA Screening and Natura Impact Statement
- Ecological Impact Assessment.
- Other data in the public domain.
- Specific experience from the installation of the ESAT-1 and UK-IRL Crossing 1&2 cables.

Cable Specification

2.4 The NSW MINISUB DA 192 has been chosen for the Beaufort project. The fibre optic cable will be 33mm in diameter and will be “un-repeatered” (i.e. not powered). It is to be an industry-standard cable with the capability to transmit high-speed data and voice via light waves through the 72 optical fibre pairs contained within the core Unit Fibre Structure (UFS). The cable will be double armoured (DA) in Irish waters, and a cut-away section of the cable is shown in Figure 4.



Schematic drawing (not to scale)

Mechanical Characteristics

Outer diameter	nominal	33	mm
Fiber count	up to	192	Fibers
Weight in air	nominal	3150	kg/km
Weight in seawater	nominal	2550	kg/km
Specific gravity in seawater	nominal	5.2	
Minimum bending radius with load		1000	mm

Figure 4 : NSW MINISUB DA 192 Specification

2.5 The UFS is the innermost element of the cable and consists of 72 optical fibre pairs embedded in a buffer gel material inside a copper buffer tube. The buffer gel is a thixotropic material that protects the optical fibres from shear stresses associated with movement inside the tube. Ultra-high strength steel wires are helically wrapped around the UFS and together they act as a pressure vessel that protects the UFS from stresses greater or equal to 100 MPa. The interstices between the steel wires are filled with a hydrophobic elastomeric water-blocking material which resists longitudinal water ingress. A thin layer of ethylene-acrylic and copolymer plastic resin and a thick layer of polyethylene insulating jacket are co-extruded over the copper sheath. This HDPE sheath provides insulation, abrasion resistance and corrosion protection.

2.6 The double armour, consisting of two layers of galvanised wire wrapped around the cable, is coated with hot-blown asphalt and wound with polypropylene yarn. The finished DA Cable has an outer diameter of 33 mm.

3.0 PHYSICAL FEATURES

Irish EEZ Waters

3.1 From the 12nm limit, the Beaufort route follows the line of ESAT-1 to KP 60.0. At this point it changes course and diverges from the route of ESAT-1 to follow a more south easterly course. The proposed route then crosses the EEZ and exits Irish territorial waters at KP 78.1, this is shown in Figure 5.

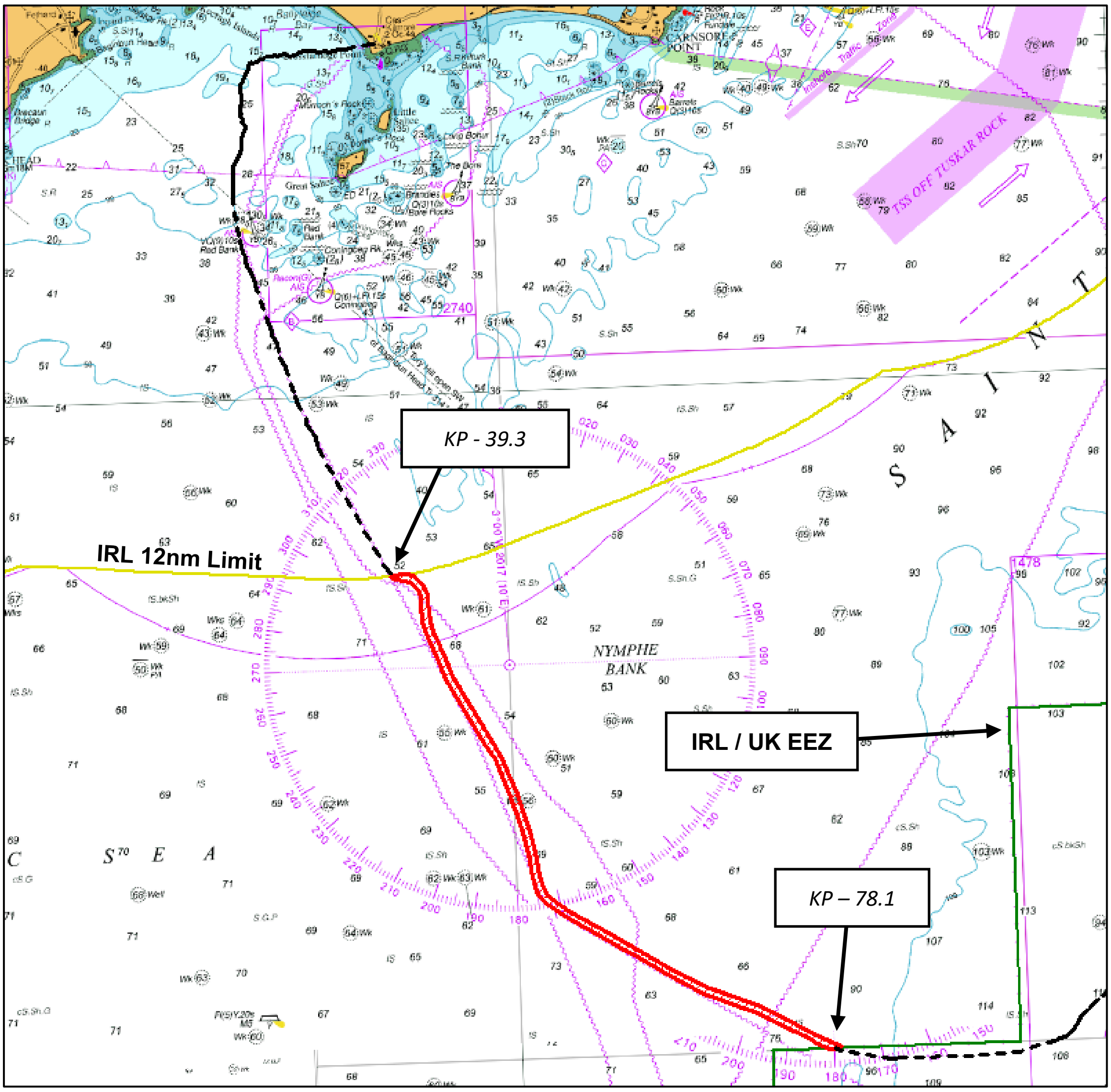


Figure 5: Beaufort Route in Irish EEZ waters

Water depths

3.2 As the route traverses the Irish EEZ waters beyond the 12 Mile Limit the water depths increase gradually from 52 metres to 90 metres at the EEZ boundary

Seabed Sediments

3.3 A key element in planning the overall route system is the availability of seabed conditions which facilitate the installation of a cable, and which will provide stability and security of the cable over its lifespan. A British Geological Survey Seabed Sediment Chart, with the northern section of the overall route system shown on it, is presented in Figure 6.

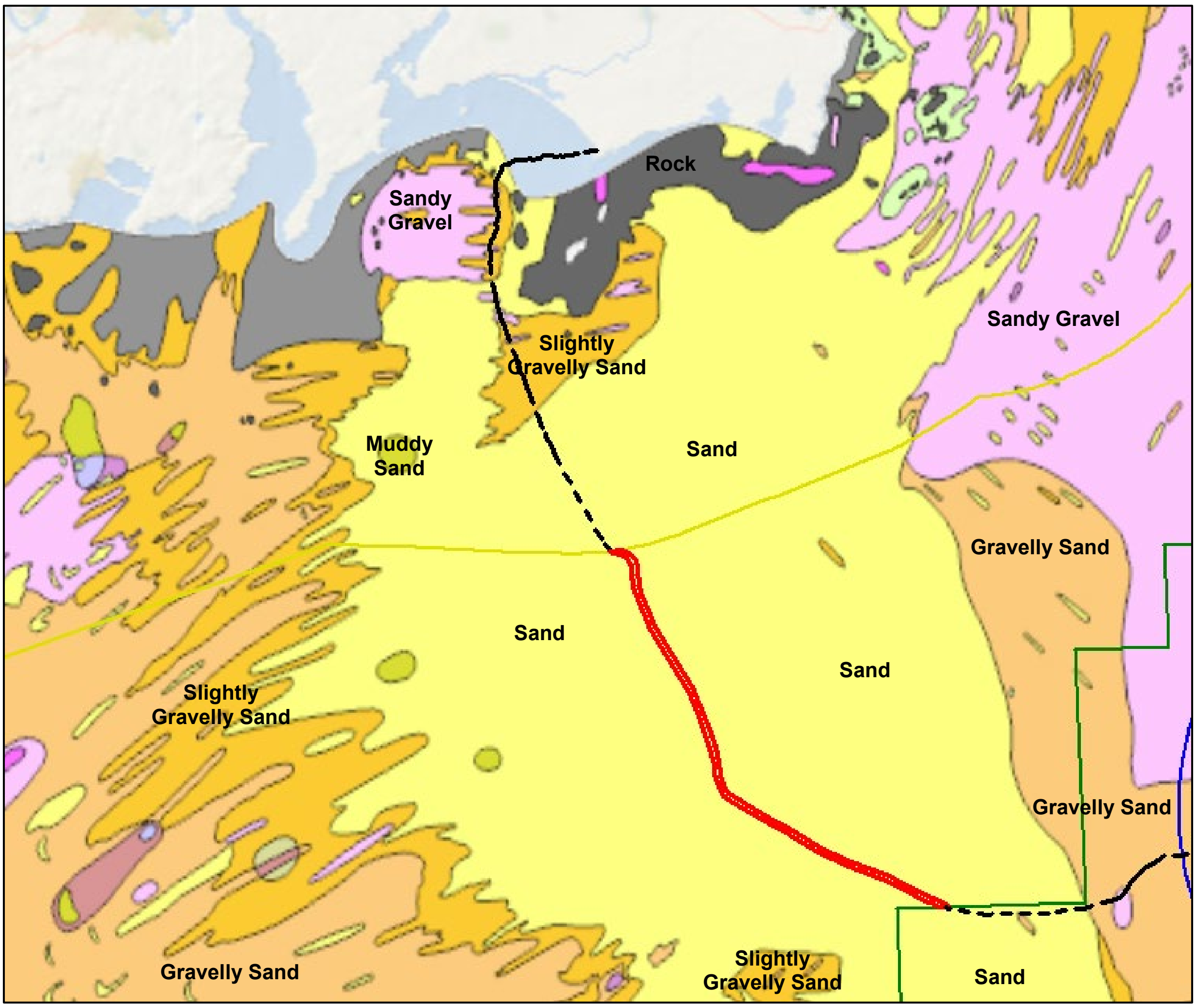


Figure 6: Seabed Sediment Chart

3.4 As shown in Figure 6, the entire offshore section of the Beaufort route between the Irish 12 nautical mile limit and the Irish EEZ traverses sandy seabed.

Infomar Chart

3.5 The Beaufort route is shown with respect to Infomar backscatter data in Figure 7. Areas of light shading indicating softer seabed sediments, therefore this data highlights the sandy conditions in the area of the seabed where the cable will be laid.

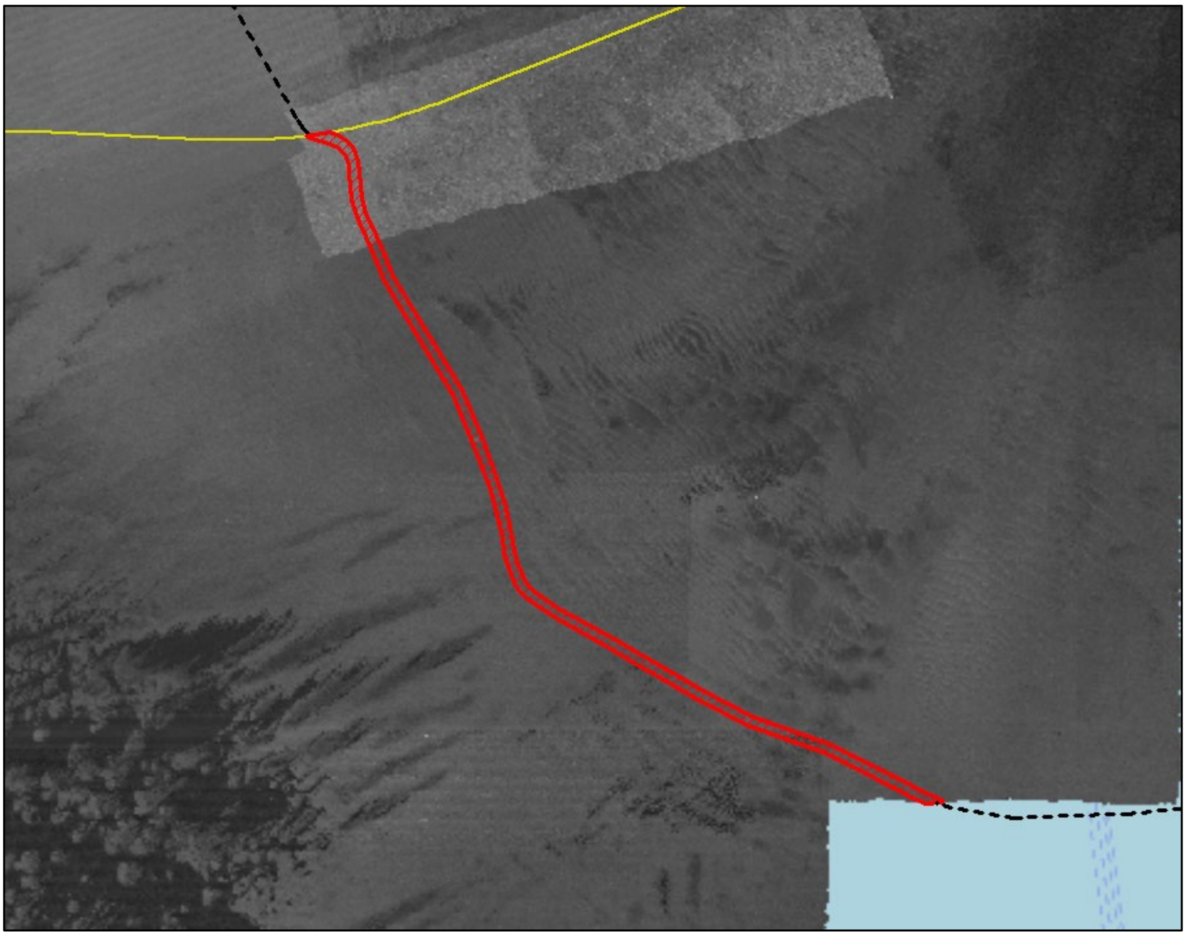


Figure 7: Infomar Chart covering the planned route in Irish Territorial Water

4.0 SUBSEA CROSSINGS

4.1 The proposed route between the Irish 12nm limit and the EEZ boundary entails a total of 4 subsea crossings of existing in-service telecoms cables and an electrical interconnector. Further details of the crossings are shown in Table 2 below.

Name	Type	Position	Water Depth	Latitude	Longitude

UK-IRL Crossing 1	Telecom	KP 41.9	55m	51° 53' 45.5170" N	6° 34' 01.9208" W
Greenlink Interconnector	Electrical Interconnector	KP 58.8	60m	51° 45' 20.6984" N	6° 29' 02.1085" W
UK-IRL Crossing 1	Telecom	KP 65.8	66m	51° 43' 04.2921" N	6° 24' 24.1696" W
Hibernia Atlantic	Telecom	KP 74.4	76m	51° 40' 59.1939" N	6° 17' 47.6817" W

Table 2: Subsea Crossings

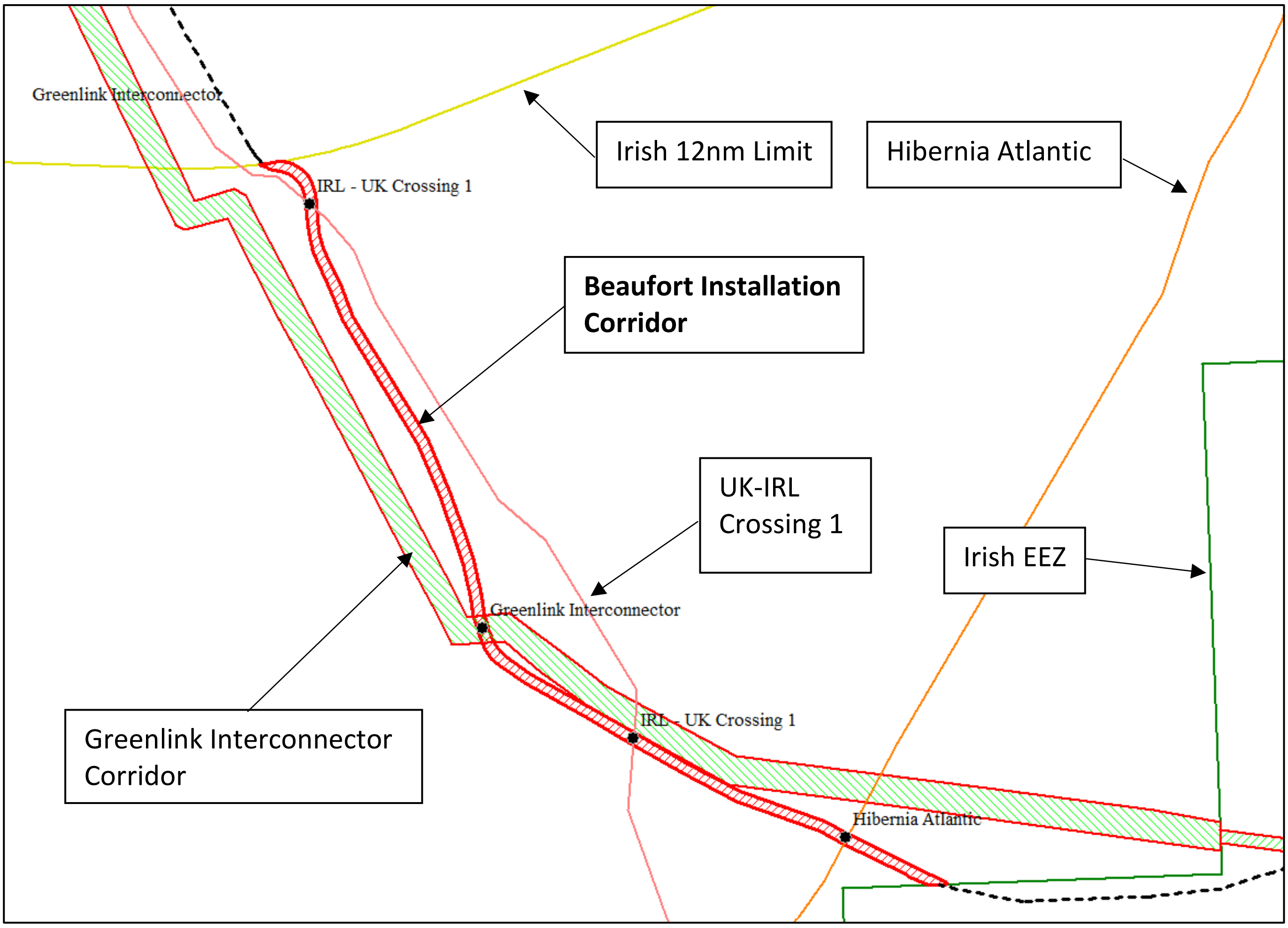


Figure 8: Beaufort Subsea Crossings

In Service Telecoms Cables

4.7 As highlighted in Table 2, the Beaufort cable has 3 crossings over in-service telecoms cables between the Irish 12nm limit and the EEZ boundary, crossing the Ireland-UK Crossing 1 twice and Hibernia Atlantic Seg D once. Crossing agreements will be put in place with the respective cable owners to allow the in-service cables to be crossed directly with the jetting sword in free-float mode. This enables both the crossed cable and the installed cable to be jetted to depth and precludes the need for pre and post crossing works.

4.8 The following methodology will be implemented at the cable crossings: the cable lay speed will be reduced when the cable lay vessel is approaching the crossing. At 20 m from the crossing the sword will be put in the free-floating mode. In the free-floating mode, the sword is pointing 45 degrees downwards, it is not locked in this position, and it will slide over obstructions as illustrated in Figure 10 below. In this mode the sword will trench the cable and the crossed product to a burial depth of approximately 1 metre. CAPJET cannot damage the crossed cable as the trenching method used is high pressure, focussed, water jetting. If requested by the 3rd party asset owner, further cable protection such as cast-iron shells, Uraduct, plastic shells or silicon sleeves can be installed from the installation vessel.

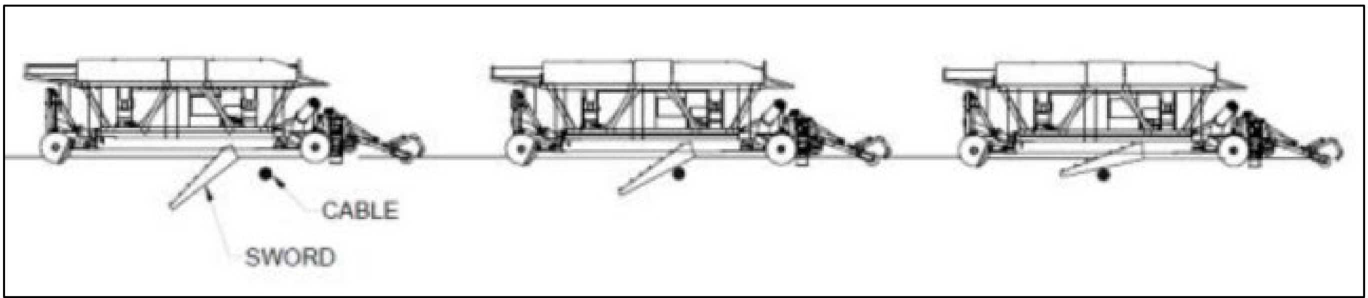


Figure 10: CAPJET in Free Floating Mode when Crossing a Cable

Greenlink HVDC Interconnector Cable

4.2 The Greenlink Interconnector is a submarine power cable running from Baginbun Beach, Co. Wexford (east side of the Hook peninsula) to Freshwater West, Pembrokeshire, Wales. It was installed in 2025, and its overall route is similar to that of Beaufort (shown in Figure 8). As shown in Table 1, The Beaufort cable route will cross the Greenlink Interconnector at: *51°45'20.6984"N, 6°29'02.1085"W.*

4.3 The preliminary crossing design for the Greenlink Interconnector intends to use the same Uraduct crossing cable protection and design as used in in-service telecom cable crossings. Should this not be agreeable with the Greenlink Interconnector owners, alternative forms of crossing protection will be explored. This may involve pre-lay crossing construction. This may involve the installation of an articulated concrete mattress over the crossing point of the interconnector cable (as shown in Figure 9) prior to the main lay cable installation. The interconnector cable is buried at the crossing location. The dimensions of a concrete mattress are 3.0m x 6.0m x 0.45m and the leading edge of each mattress is tapered for hydraulic stability and for cable installation (Figure 9). The Beaufort cable will then be laid over the concrete mattress. The exact crossing design will be confirmed following further consultation with the owners of the Greenlink Interconnector.

Figure 9: Example of Articulated Concrete Mattress

4.4 A summary of the pre-lay crossing construction works is as follows:

- It will be required to install additional protection on the Beaufort cable at the Greenlink crossing. This protection will be a product such as Uraduct, which is a specialized polyurethane ducting designed to wrap around the cable thus minimizing abrasion.
- The concrete mattress required for the interconnector crossing will be loaded onto the Offshore Construction Vessel at the port of mobilisation. A pre-installation inspection will be undertaken at the crossing location including confirmation of crossing positioning and burial depth.
- The concrete mattress will be installed on the seabed using the vessel crane and a mattress installation frame with touchdown monitoring. The installation location will also be verified via beacons mounted on the installation frame. The mattress installation frame slings will be released, and the frame recovered to the deck.

4.5 A marine notice will be issued by the Fisheries Liaison Officer once the concrete mattresses have been installed to notify marine users. A Guard vessel may be positioned at the crossing location from the time of laying the cable until the completion of post-lay rock placement. Fishermen will be informed of the works, and the crossing locations and regular contact will be maintained with fishing fleets during this time.

OOS Telecoms Cables

4.9 The Beaufort cable will not cross any out of service (OOS) cables between the Irish 12nm limit and the EEZ boundary.

5.0 CABLE INSTALLATION

5.1 The principal objective of the main lay installation works is to successfully deploy the fibre optic cable along the proposed route, obtaining the required burial depth to protect the system from external aggression and provide for a safe and secure system, with due regard for environmental, archaeological and ecological considerations.

Sub-Sea Cable Installation

5.2 The Beaufort Cable System will feature a direct landing at Kilmore Quay. The Main Lay Vessel will bring the cable toward the shoreline until reaching the designated landing point. An inshore installation team will be in place to bring the cable ashore. Once the cable is securely landed, the required termination and testing activities will be completed onshore. The Main Lay Vessel will then proceed to deploy and bury the cable in the seabed. The burial tool is operated from and powered by the Main Lay Vessel and is designed to bury the cable at a depth such that the cable will be secure from fishing activities. The target burial depth of 1.5m is subject to reasonable endeavours and where the seabed geology allows.

5.3 Typical burial speed is generally of the order of 0.5 knots and is dependent on the stiffness of the seabed sediment. There is no significant noise generation during burial operations. Cable installation produces only a minor plume of suspension of seabed sediments in the water column, and this is transient and localised due to the nature of the burial and natural backfill activities.

5.4 Typical subsea cable burial tools used to simultaneously install and bury fibre optic cables in the seabed include cable plough (passive and jet assisted) or jetting trenchers (sled or self-propelled). The Nexans CAPJET jetting trencher will be deployed for the installation of the Beaufort cable system.

5.5 The Nexans CAPJET system is a remotely operated jetting trencher developed to bury subsea cables and pipelines into the seabed. It uses high-pressure focussed water jets to fluidize the sediment beneath the cable or pipeline, allowing it to settle into a trench without mechanical cutting. The CAPJET is capable of:

- Trenching to depths of up to 3 m, depending on soil conditions.
- Operating in waters up to 2,000 m deep.
- Performing in a variety of seabed types, from soft sediment to harder soils, with adjustable jet pressure (10–16 bar) and thrust.

It integrates multiple sensors (video cameras, sonar, gyros, pressure sensors) for precise control and real-time monitoring. The system's modular design enables different trenching configurations — for flexible pipelines, steel flowlines, and cable burial.

5.6 In the context of this project the CAPJET will be used to simultaneously lay and bury the Beaufort cable by forming a narrow trench (approx. 150mm) of fluidised seabed using a bespoke jetting sword into which the cable is installed to the target depth through the cable depressor. The seabed sediment is displaced temporarily to form the trench during the burial operation and then allowed to re-form naturally and 'backfill' the trench after the passage of the jetting tool. The CAPJET will be powered and controlled from the cable installation vessel via electrical umbilical. A visual representation of the CAPJET system is shown in Figure 11.

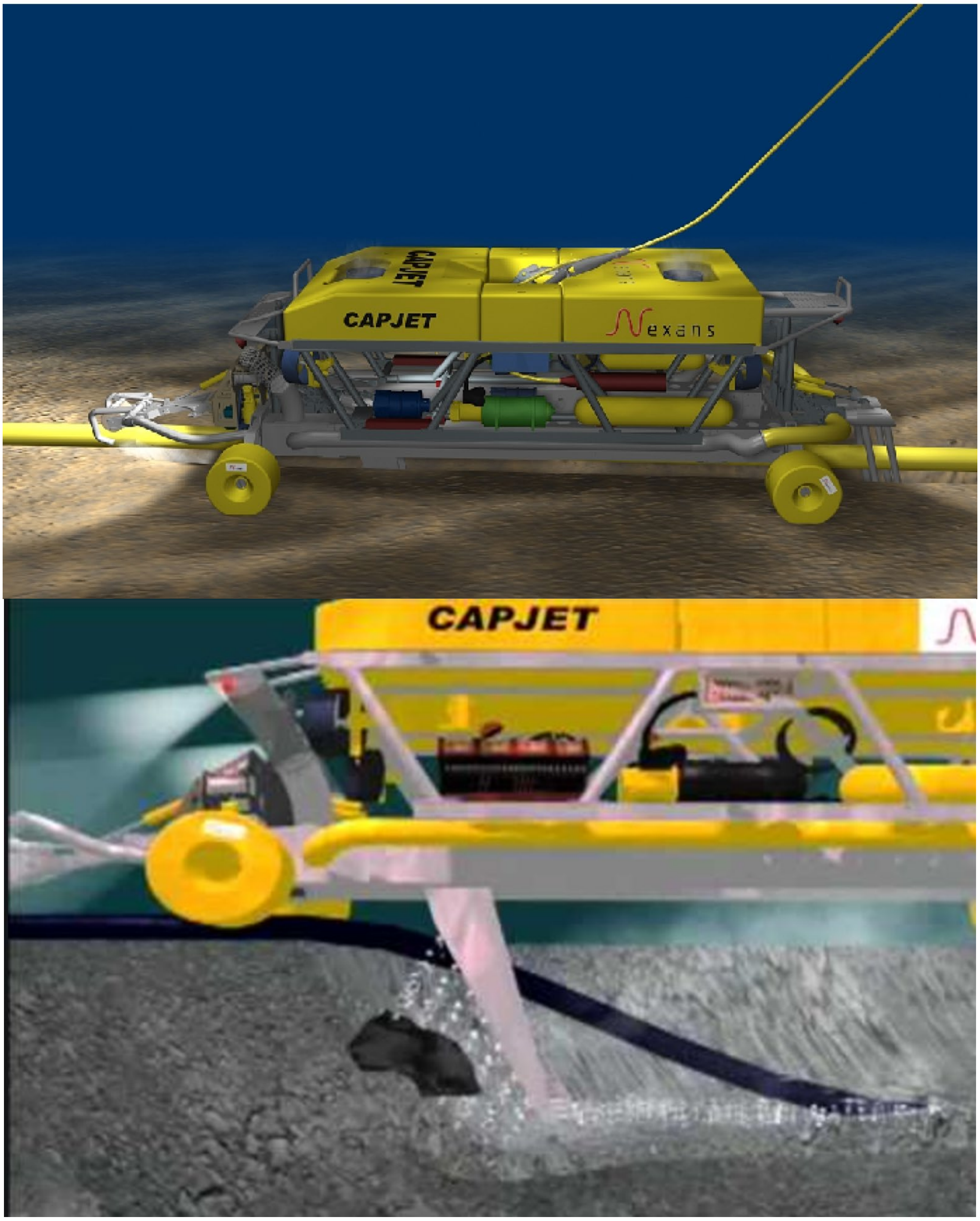


Figure 11: Nexans CAPJET Burial Tool

5.7 The target burial depth for the Beaufort cable system is 1.5 metres. In areas of stiff soil, the actual burial depth may be reduced but is planned to be still at a depth which will protect the cable from fishing operations and generally not less than 1 metre. Where seabed geology prevents burial such as areas of rock or reef, the cable will be directly laid on the seabed surface.

Post Lay Operations

5.8 Following main lay operations, post-lay inspection and burial (PLIB) may be carried out in certain areas to inspect the proper laying and burial of the cable in the seabed. A post-lay burial operation may be performed in order to supplement the burial operations in the following instances:

- Planned recoveries of the burial tool
- Initial and final splice positions within the buried sections – Post-Lay Inspection and Burial is planned for the initial splice location between the Pre-Lay Shore End and main lay section of the cable to 1.5 metre target burial depth.
- Unplanned recoveries due to burial tool breakdown, adverse weather, etc.
- Surface-laid sections due to burial tool malfunction where the burial tool is not brought back on board.

5.9 In limited areas requiring post-lay burial, the CAPJET system is also utilized. As described previously, the CAPJET uses a jetting burial tool to bury the cable to the required depth. The seabed is emulsified in the localised region of the burial, and a narrow trench is formed. The CAPJET system slowly moves along the seabed on the required cable track forming a narrow trench into which the cable is placed. The seabed sediment is displaced temporarily to form the trench during the burial operation and then allowed to re-form naturally and 'backfill' the trench after the passage of the CAPJET's burial tool.

5.10 It should be noted that the surrounding seawater is used for the jetting system, i.e. nothing alien is introduced into the environment. The burial tool does not remove any seabed materials from the area. The CAPJET burial operation is controlled from the main vessel and monitored in real time using high-definition video cameras and imaging sonar mounted on the vehicle.

Post-Lay Greenlink HVDC Interconnector Crossing Operations

5.11 If required, the Greenlink HVDC Interconnector crossing will be inspected following the main lay installation and necessary post lay burial activities within the Safety Zone will be undertaken. It is expected that the Post-Lay Inspection and burial will be undertaken using the Nexans CAPJET burial tool.

5.12 In summary, the Post-Lay Inspection and Burial (PLIB) works are as follows:

- The PLIB vessel will take position at the crossing location.
- The crossing will be inspected by ROV.
- The Nexans CAPJET will be docked on the Beaufort cable at the limit of the Jet Zone, and moving away from the HVDC cable will bury the temporarily surface laid section of the Beaufort cable at a target trenching speed of 400m/hr.

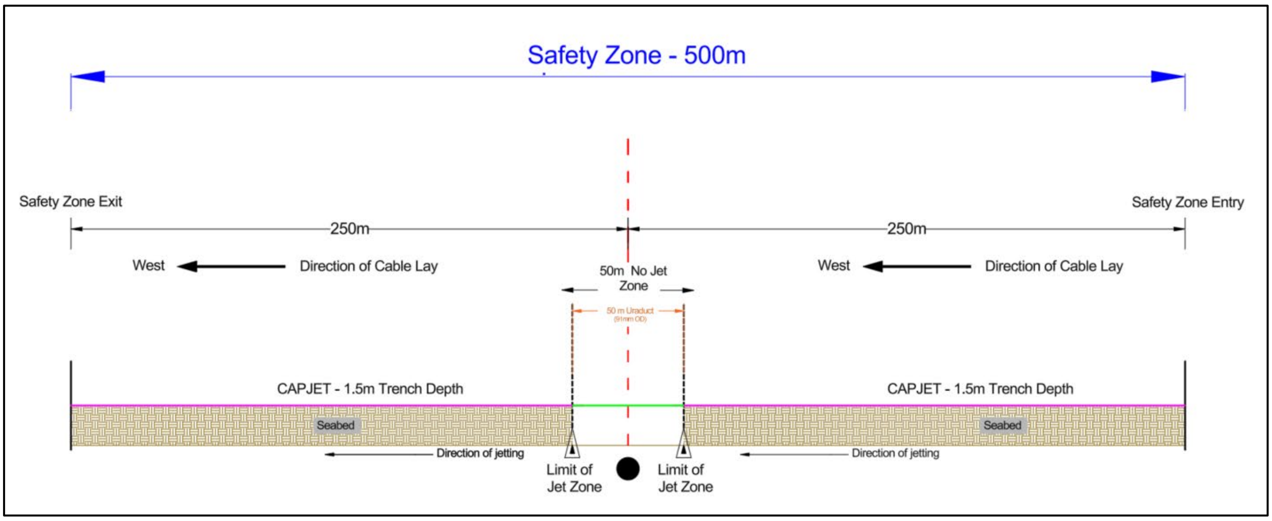


Figure 12: Greenlink HVDC Interconnector Crossing Safety Zone

5.13 Consultation with the owners of the Greenlink Interconnector is currently ongoing.

Post-Lay Greenlink Interconnector Crossing Rock Berm Construction

5.14 Should the previously presented Post-Lay proposal not be agreeable with the Greenlink Interconnector owners, additional post-lay construction of a rock berm to protect the Beaufort cable may be required at the Greenlink HVDC Interconnector crossing.

5.15 The rock berm will extend 13.5m along the interconnector axis, centred at the crossing location, and a berm depth of 0.8m. This will cover the pre-lay concrete mattress. The rock berm along the cable axis will be 64m (total length) x 1.5m (top width). (Figures 14-17).

5.16 The side slopes will be installed to a 1:3 ratio to provide hydraulic stability and protection from snagging of fishing gear etc. The area of the rock berm is 463m^2 (including sloped sides) with a total volume of rock of approximately 220m^3, accounting for a 10% loss in loose rock placement or discrepancies in the seabed geometry. The rock berm will be constructed with a mix of freshly crushed rock (granite/gneiss) with a maximum size of between 12 and 20 cm topped with a 20cm layer of smaller armourstone.

5.17 The height of the proposed rock berm will not interfere with navigation, and the crossing and rock placement is designed to be trawled over by fishing vessels.

5.18 A summary of the rock placement works is as follows:

i. The rock material will be loaded and positioned on the vessel in accordance with its grading and characteristics.

ii. The vessel hopper will be loaded with the rock.

iii. The vessel will transit to the crossing location, and the flexible fall pipe will be deployed.

iv. The vessel will take position over the crossing point and hold position using its Dynamic Positioning (DP) systems.

v. Rock placement will be undertaken in a controlled manner with the position of the fall pipe 'nozzle' above the seabed adjusted in real time to ensure accurate construction of the rock berm (Figure 13).

vi. The crossing will be surveyed by the observation ROV and, if successfully completed, the fall pipe will be recovered.

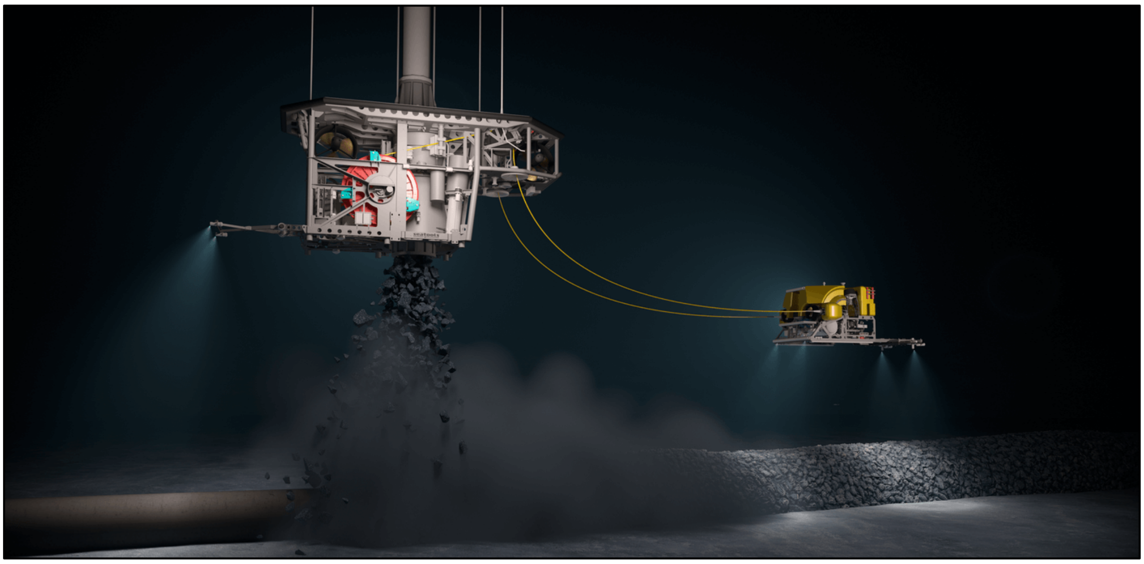


Figure 13: Fall Pipe Discharging Rock

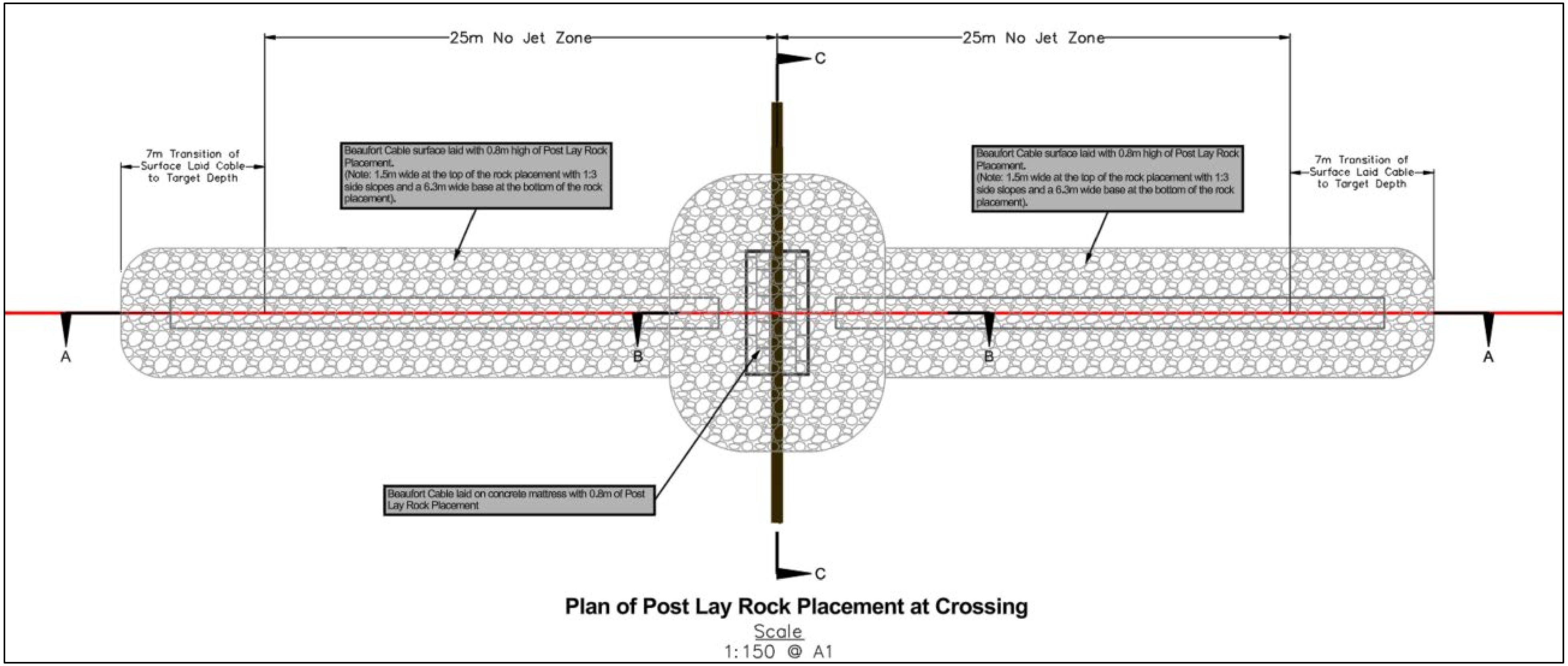


Figure 14: Plan View of Post Lay Rock Berm

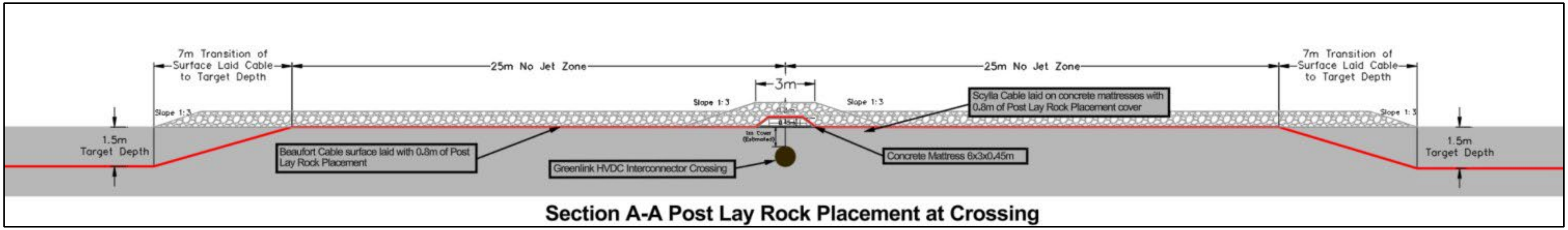


Figure 15: Cross Section A-A of Post Lay Rock Berm

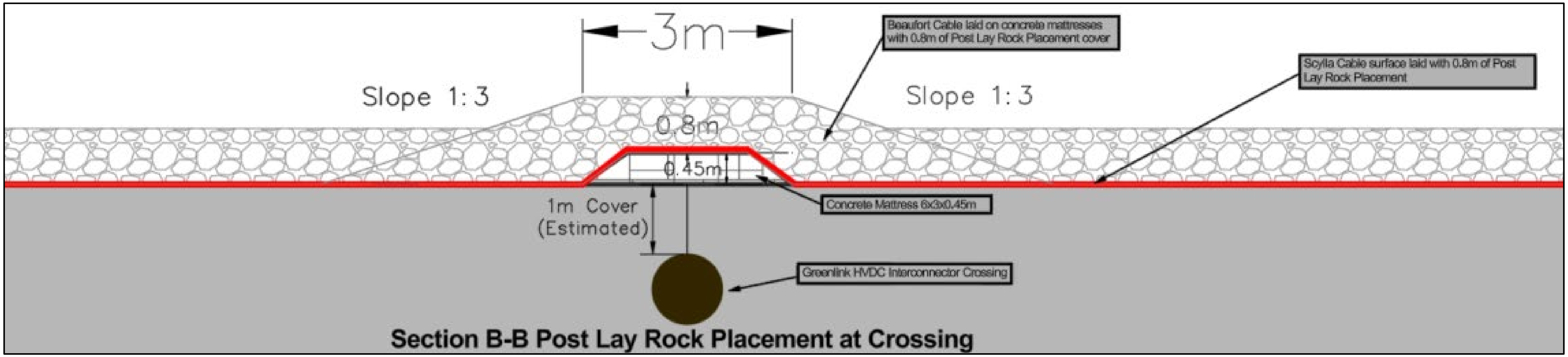


Figure 16: Cross Section B-B of Post Lay Rock Berm

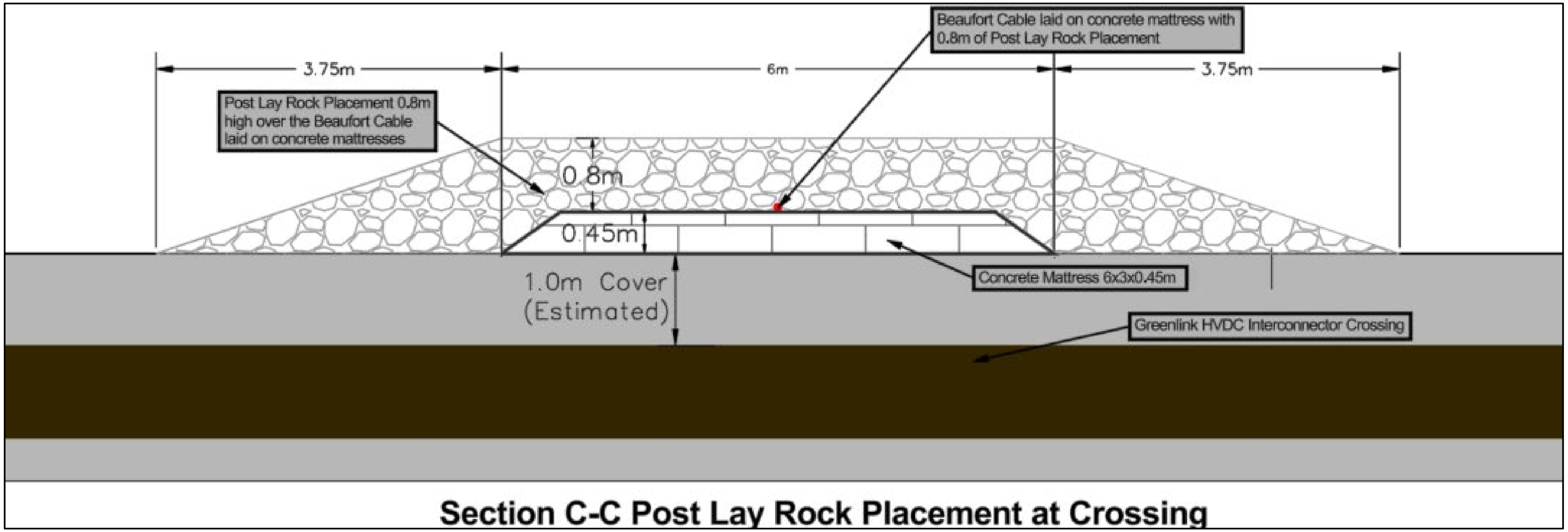


Figure 17: Cross Section C-C of Post Lay Rock Berm

Ultra-Short Baseline (USBL) Subsea Positioning

5.19 An Ultra-Short Baseline (USBL) is a subsea positioning system widely used by the offshore marine industry and scientific research vessels to accurately track the position of towed equipment and sensors. The USBL system consists of a transceiver mounted to the cable vessel, and transponders on the towed burial tool

5.20 To calculate a subsea position, the USBL calculates both a range and an angle from the transceiver to the subsea beacon. Angles are measured by the transceiver, which contains an array of transducers. The transceiver emits an acoustic signal at predetermined periods (often 0.5 seconds) which is returned by the transponder and allows for the bearing and distance to be calculated.

5.21 USBL systems are designed for close range transmission and thus typically emit pulses of medium frequency sound (20 to 50 kHz). Manufacturers report SPL values of 194 to 207dB re 1µPa at 1m depending on the model used, taking as an example the higher range of USBL source (Kongsberg HiPAP) with a SPL of 207dB re 1µPa at 1m.

5.22 All works that involve the use of acoustic instrumentation such as the USBL will follow the Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (Department of Arts, Heritage and Gaeltacht, 2014).

6.0 CABLE INSTALLATION VESSEL

6.1 The main lay installation vessel will consist of a dedicated marine spread which will be suitable for the scope of work required, the water depth and the anticipated seabed conditions of the cable route. The Cecon CLV will be used to carry out the installation works. It is a newly built vessel and is 100m in length, 21m in breadth and can accommodate 100 personnel (consisting of the ship's crew, cable installation personnel and client representatives). A visual representation of the Cecon CLV is shown below.

Figure 18: Cecon CLV

6.2 The cable installation vessel may use a local port with sufficient water draft and quay space for personnel / equipment mobilisation, bunkering and provisioning. All vessels will be fit for purpose, will possess all relevant international and classification certificates and be capable of safely undertaking the installation work required. Health, safety, environment and welfare considerations will be a priority and will be actively managed during cable lay operations.

6.3 Appointed contractors will be required to comply with all legislation relevant to the activities within their scope of work. Prior to installation works taking place, both Project Supervisor for Design Process (PSDP) and Project Supervisor for Construction Stage (PSCS) will be appointed under the relevant legislation and project specific HSE plans will be put in place which will form part of the project execution plans.

6.4 The cable lay will conform to the following minimum requirements as appropriate:

- Compliance with Safety of Life at Sea (SOLAS), International Maritime Organization (IMO) and national requirements for operating within the Irish territorial waters and EEZ.
- Station-keeping and sea keeping capabilities required to carry out the proposed cable lay operations safely.
- Calibrated equipment and spares with necessary tools for all specified works.
- Endurance (e.g. fuel, water, stores, etc.) to undertake the required cable lay works.
- Sufficient qualified staff to allow the cable lay operations to be carried out efficiently, (typically 24 hour continuous); and
- Appropriate accommodation and crew welfare facilities.

6.5 Cable installation vessels will generate some subsea noise in the marine environment from engine noise and dynamic positioning thrusters. Shipping noise is typically within the 50-300 Hz frequency band and is the dominant noise source in deeper water (DECC, 2011). Propellers on vessels all have the potential to produce cavitation noise. This sound is caused by vacuum bubbles that were generated by the collapse of bubbles created by the spinning of the propellers.

6.6 Acoustic broadband source pressure levels typically increase with increasing vessel size, with smaller vessels (<50 m) having source pressure levels 160-175 dB (re 1µPa at 1m), medium size vessel (50-100 m) 165-180 dB (re 1µPa at 1m) and large vessels (>100 m) 180-190 dB (re 1µPa at 1m) (DECC, 2011). Every vessel has a unique noise signature and for each vessel this can change in response to several factors, including ship speed, operational status, vessel load, the condition of the vessel and even the properties of the water that the vessel is operating in.

7.0 TIMELINE AND DURATION OF CABLE LAY ACTIVITIES

7.1 The intention is to commence the cable installation in Spring 2027 accounting for vessel availability, the overall cable installation programme, seasonality and suitable weather windows. The exact mobilisation dates will not be known until closer to the time and once all permits and authorisations are in place in Ireland and the UK. It is anticipated that the main lay operations within the offshore area between the Irish 12nm limit and the EEZ will take less than 2 weeks in total and will be completed over a 2-month period.