

EMEC | **Berth 5 Subsea Cable-End Relocation**

Navigational Risk Assessment Addendum

EMEC Billia Croo Wave Test Site

April 2026



Purpose

This document is provided as an addendum to and should be read in conjunction with the document 'Billia Croo Navigation Risk Assessment (NRA) – REP522'. It describes the key project-specific navigational risks to be addressed in relation to the proposed activities at the European Marine Energy Centre test site at Billia Croo, Orkney Islands, together with proposed mitigation for reduction/elimination of these risks. Site location navigational risks are covered in the site-wide Billia Croo NRA produced by EMEC.

This document has been prepared to support a marine licence application for the relocation of the Berth 5 subsea cable at Billia Croo. For further information regarding the project, please refer to the Project Information Summary.

Document History

Revision	Date	Description	Originated by	Reviewed by	Approved by
1	16/10/25	Draft submission for	AM (EMEC)	DL (EMEC)	DL (EMEC)
2	09/12/2025	Final Draft	AM (EMEC)	DL (EMEC)	DL (EMEC)
2.1	26/02/26	Updated draft post licensing clarification from MD-LOT	AM (EMEC)	DL (EMEC)	DL (EMEC)
2.2	21/04/2026	Updated draft	AM (EMEC)	DL (EMEC)	DL (EMEC)

Disclaimer

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1 Introduction

EMEC wish to lift the dynamic cable present within the EMEC Billia Croo berth 5 area, install a connector to the end of this subsea cable prior to its expected connection to the OE Buoy within the WEDUSEA project (application MS-00011425), and lay the cable back on the seabed at a different position and coordinates. The cable will be returned to the seabed with sufficient suitable materials to allow for the ease of its recovery.

All cable works will be completed in accordance with EMEC's Control of Work (SOP003), EMEC's Electrical Tests – EMEC Subsea Cables Standard Operating Procedure (SOP070) and EMEC's Cable Guidelines (GUIDE008). The cable works of this project are to occur in Q1/Q2 of 2026.

This assessment has been produced as an addendum to the site-wide Navigational Risk Assessment for the Billia Croo test site (REP522). This was recently updated in March 2026. This document identifies and assesses any project-specific navigational risks and discusses the proposed risk control measures to be implemented to reduce the risk associated with the cable movement.

2 Project overview

Further information regarding the project is available in the Project Information Summary.

2.1 Asset information

Assets involved are shown in the figures below. Figure 1 shows the specifications of the Draka cable itself, whilst the ETA dry-mate connector (DMC) – which will be installed at the end of EMEC's subsea cable for safety – is shown in Figure 2.

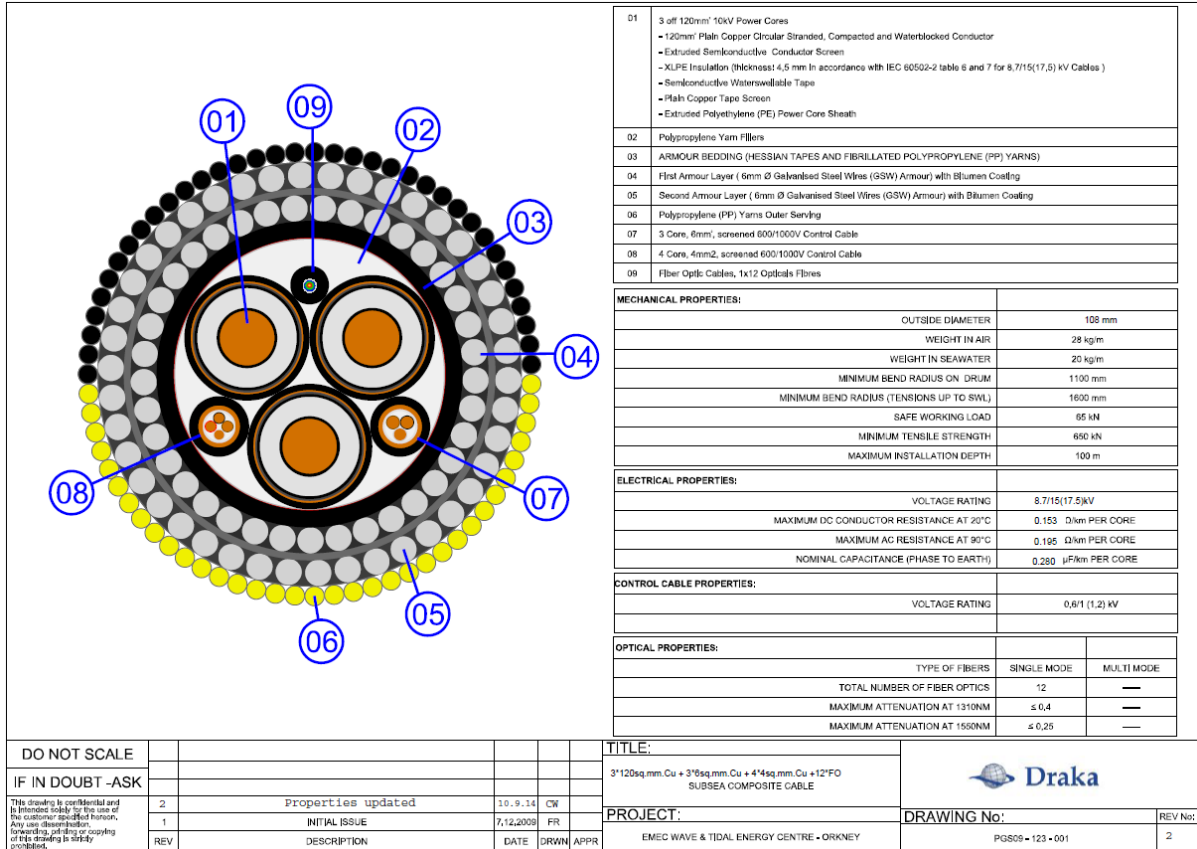


Figure 1. Draka cable specification



Figure 2. Dry Mate Half Connector with abandonment cap

2.2 Schedule and test plan

Key project tasks will occur within Q3 of 2026 (now expected between July and August) and are highlighted below as:

- Task 1- Mooring Operations
 - Mooring Spread 1
 - Mooring Spread 2
- Task 2 – Cable Recovery
- Task 3 – Pre-Splice and Electrical Testing
- Task 4 – Cable Splice
- Task 5 – Cable Redeployment
- Task 6 – Demobilisation

2.3 Deployment location



Figure 3. Billia Croo test site

The cable works will be conducted at the Billia Croo test site which is shown in Figure 3.

The Figures below outline the corridor which highlights the full cable position from shore, and where the cable end will connect to the OE Buoy device coming to the Billia Croo test site. Please note, the OE umbilical cable is indicated within the figures as a connection point reference. It is not part of this application. Instead the umbilical cable specifically falls within the application MS-00011425.

The indicated positioning allows the OE Buoy to have satisfactory distance between itself and the sunken Penguin device – with the north anchor of the OE buoy being over 200m away from the Penguin.

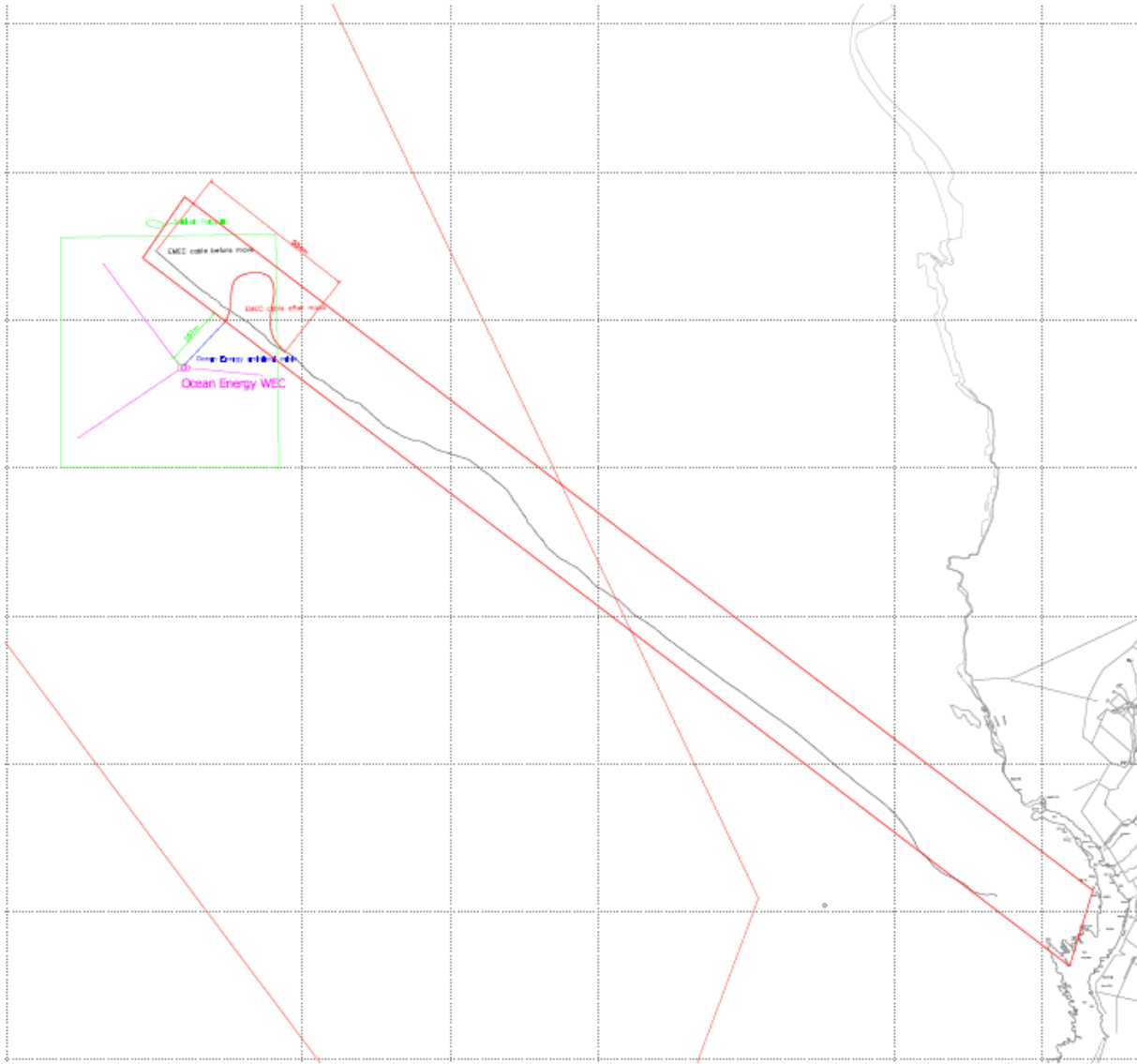


Figure 4. Schematic of corridor from near shore where cable end termination and relocation closer to the OE Buoy will occur (OE umbilical cable indicated as connection point reference – not as part of this application)

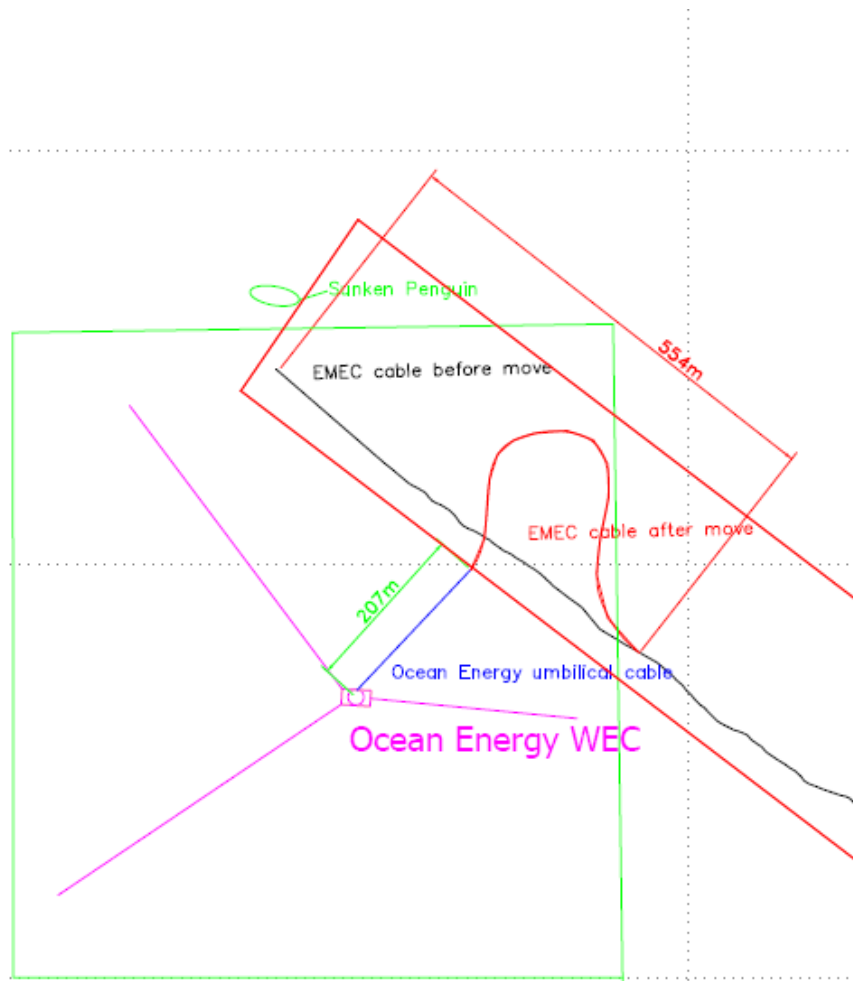


Figure 5. Schematic of corridor where cable end will be terminated and moved into position for connection to the OE Buoy umbilical cable (OE umbilical cable indicated as connection point reference – not as part of this application)

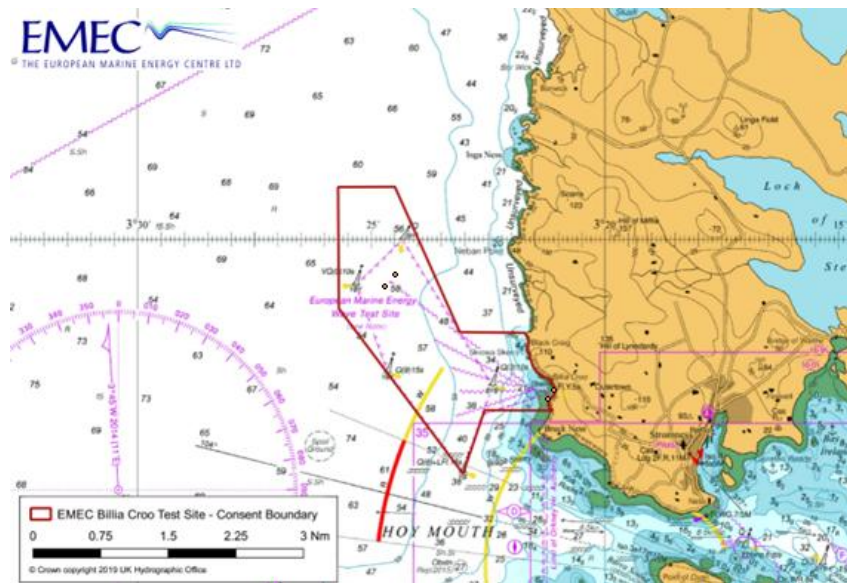


Figure 6. Admiralty chart of Billia Croo site with cable corridor coordinate points attached

Table 1. Coordinates of the cable corridor boundary

Location Description	Latitude and longitude (WGS 84)
Test site outermost boundary points	58°59.240' N 003°25.694' W
	59°00.587' N 003°25.711' W
	59°00.587' N 003°24.491' W
	58°58.393' N 003°22.391' W
	58°57.418' N 003°23.038' W
Subsea Cable Corridor (nearshore to offshore)	1: 58°59.627' N 003°24.455' W
	2: 58°59.450' N 003°24.612' W
	3: 58°58.267' N 003°21.391' W
	4: 58°58.365' N 003°21.214' W

2.4 Cable positioning and measurements

Figures 7 and 8 show where the cable is to be positioned at the Billia Croo test site after movement alongside specific measurements that compare the movement area (554 m), the distance between the Northern mooring line of the OE Buoy and the sunken Penguin device (213 m). The OE Buoy’s umbilical cable (207 m) will attach to the end of the Berth 5 cable after its movement. Please note, however, that the umbilical cable itself is not part of this application and is instead included with the marine license application MS-00011425. These images will also be provided to MD-LOT in PDF format for clearer inspection.

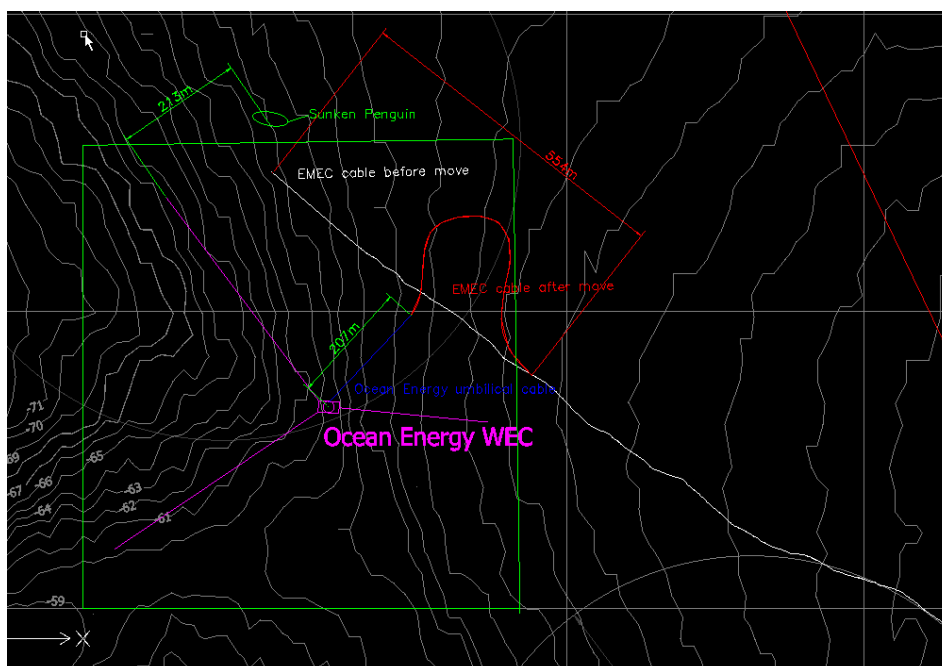


Figure 7. Close up of measurements and likely positioning of cable without shortening applied prior to termination (OE umbilical cable indicated as connection point reference – not as part of this application)

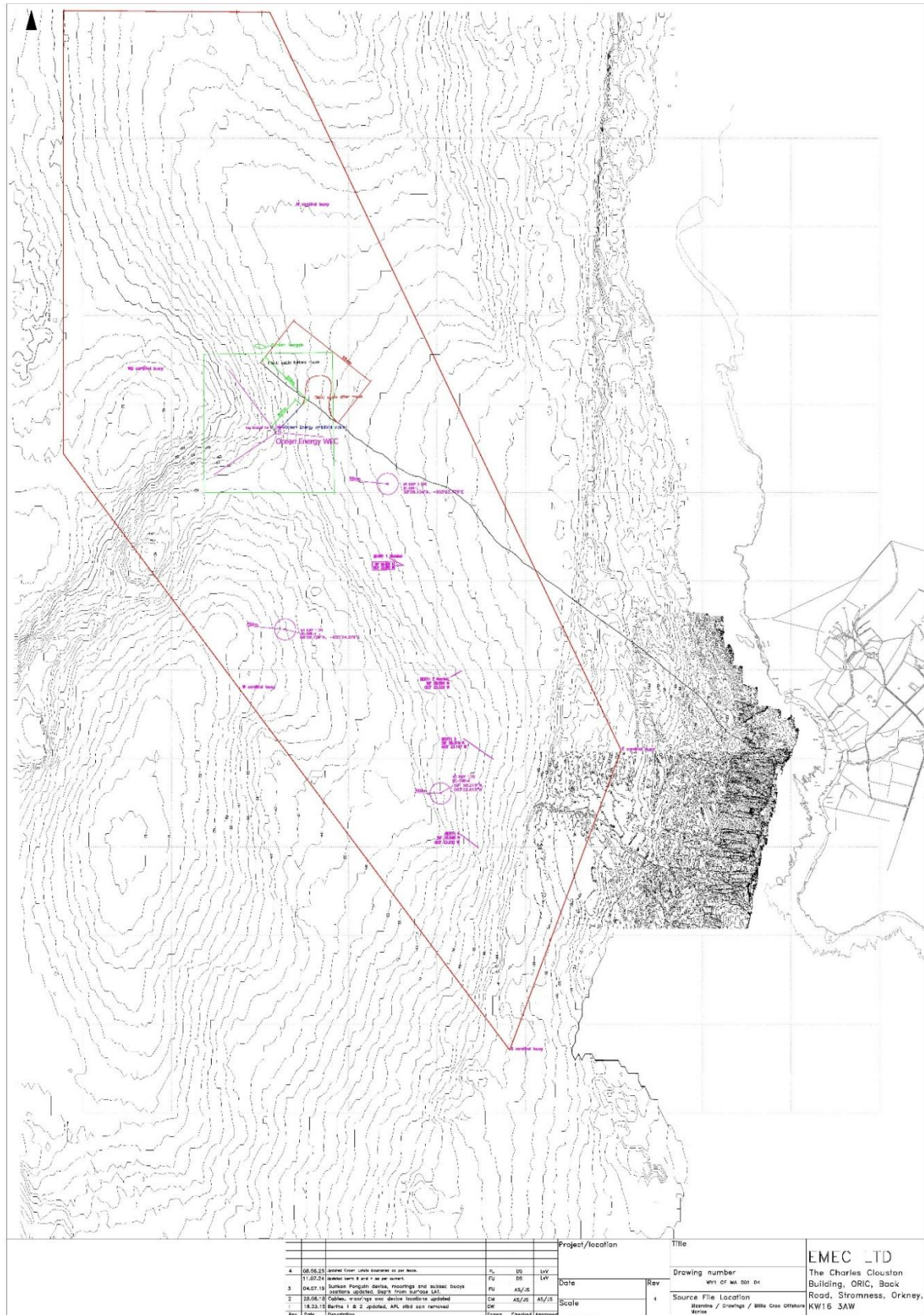


Figure 8. Indication of Berth 5 cable, sunken Penguin device, and OE Buoy within the Billia Croo test site (OE umbilical cable indicated as connection point reference – not as part of this application)

3 Key navigational themes

In order to complete this cable-specific assessment, a comprehensive review of the site-wide NRA for EMEC's Billia Croo test site was conducted. The following navigational themes have been considered during the assessment.

3.1 Vessel routing

Any vessels that do transit the site or in waters adjacent to the site will be aware of the test site presence as it is marked on United Kingdom Hydrographic Charts. Also, a notice to mariners will be issued by Orkney Harbours Authority before any works relating to this project are undertaken.

3.2 Contact / allision risk

A notice to mariners and uses of appropriate marking and lighting to alert other mariners to the cable operations should mitigate the risk of contact. The test site is charted on the United Kingdom Hydrographic Office Charts.

3.3 Collision risk and visual navigation

The scale of the assets to be installed during this project are not expected to hinder visual navigation due to being placed on the seabed and the associated works occurring over a short period of time.

3.4 Communication, radar and positioning system

The scale of the assets to be installed during this project are not likely to impact on electronic communication or positioning systems. Only the end of the cable situated at Berth 5 – which has been onsite since its inception – is involved.

3.5 Mooring operations

3.6.1 Equipment preparation and mobilisation

Two sets of temporary mooring spreads, one at the recovery (cable pick up) location and a second at the cable lay location. Vessel crew will prepare and check the equipment, as shown in Figure 9, prior to mobilisation.

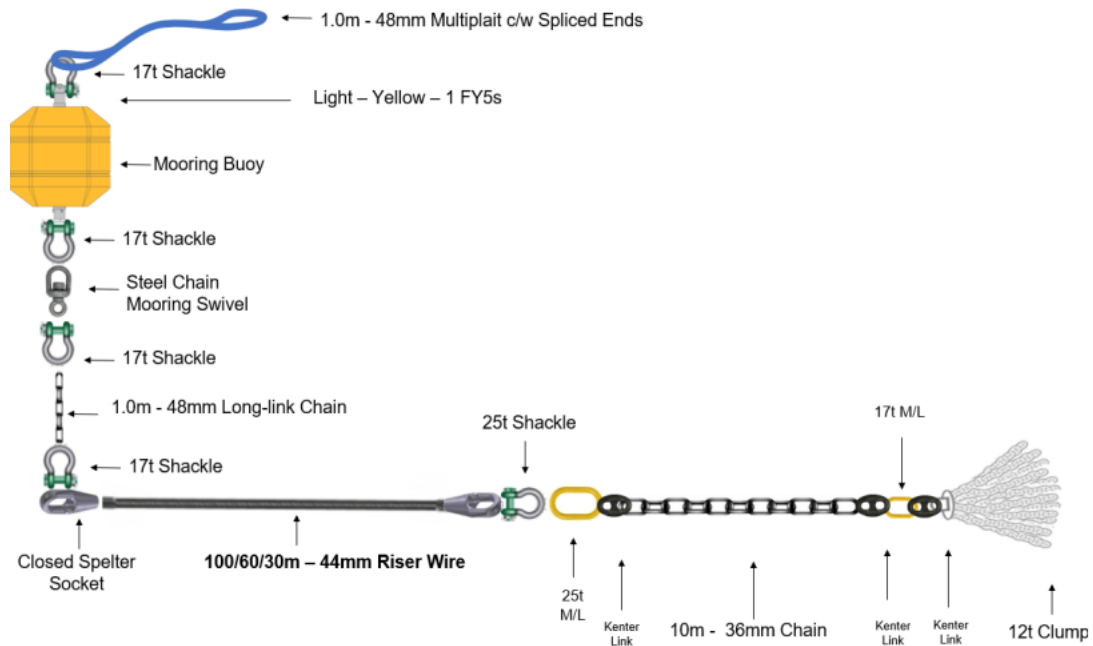


Figure 9. Mooring equipment

Once at the quayside, the contractor personnel will use a vessel crane to load the equipment onto the Multicast from the transport vehicle.

The vessel master will instruct the crew on which lifts and in which order for the stability of the vessel. Only certified lifting equipment will be used by personnel, and the crew will follow a deck plan/ lift plan for equipment placement. Additionally, only essential personnel will be on deck during crane operations.

Once the vessel is on site, it will be positioned at a pre-agreed anchor location. A drop camera can be deployed to ensure the seabed is clear for the anchor position.

3.6.2 Mooring clumps installation

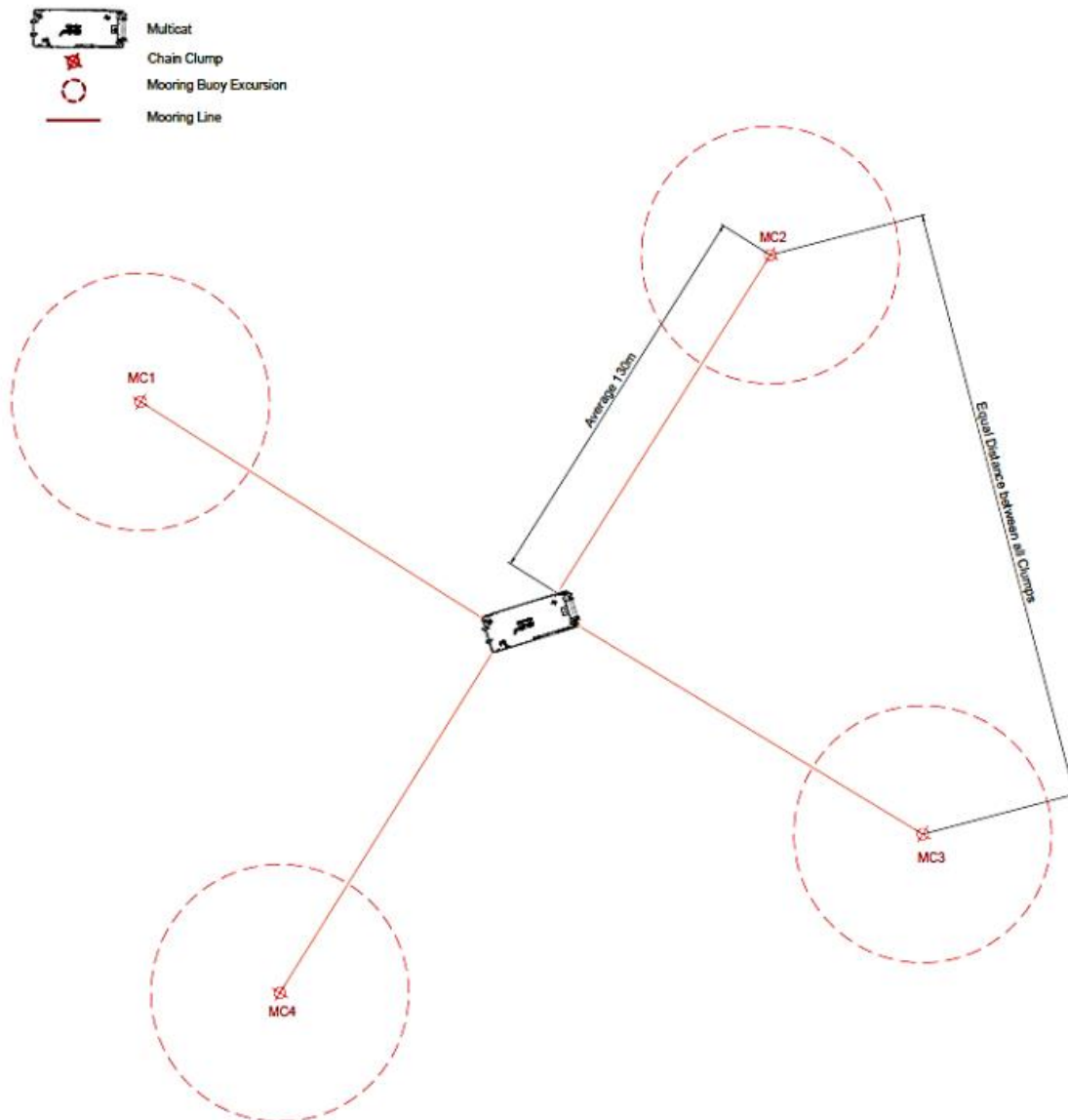


Figure 10. Mooring layout during operations

A Forward Crane will lift the clump over the bow roller and lower until the total weight of the clump is on the Anchor winch wire. The Anchor winch will lower the clump to the seabed, and the vessel will move away from the clump location and payout on the main winch until the end of the wire riser is visible on the vessel deck.

3.6.3 Vessel Connection to Moorings

The following procedure will be repeated until all 4 moorings are connected. A line boat will be deployed using an aft vessel crane. The mooring lines will be extended on deck and the end of it will be handed over to the line boat crew. The line boat will come alongside the Multicat broadside at the position of each mooring line to be deployed.

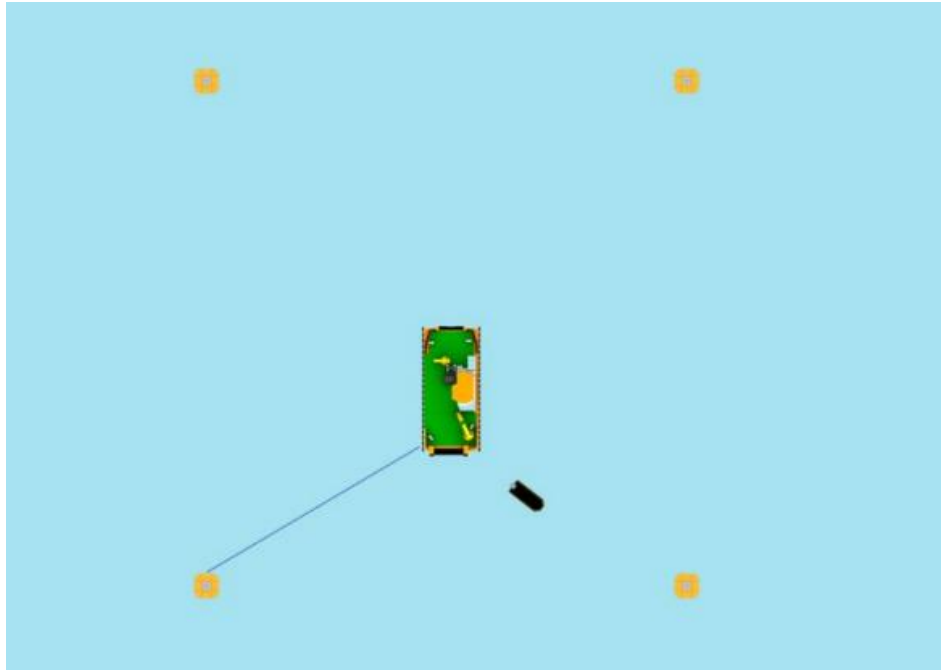


Figure 11. Position of line boat alongside Multicat vessel

The mooring rope will be secured to the side of the line boat, and line boat crew will deliver the rope end to the target mooring buoy.

The Vessel Master will adjust vessel positions as required by taking slack on each independent mooring line until the desired position is achieved.

Mooring recovery will follow a reversed procedure to their installation.

3.6 Station keeping

Collision loads with other large vessels has not been considered in this structural analysis as the cable will lay on the seabed and pose little risk to such. As the collision with another vessel has been classed as low risk - 'Billia Croo Risk Assessment', explicitly analysing the structure against a collision would have little value.

3.7 Fishing activity

Relatively little fishing takes place in the study area and fishermen would generally be expected to take precautions in order to avoid any underwater assets that may be present across the test site. Furthermore, fishers in the area are aware of the cables and that associated operations within the Billia Croo test site occur. This has been the case for significant over two decades and so is usually known to marine users within the vicinity of the site.

3.8 Recreational activity

There is minimal racing or small boat sailing at the test site, and few recreational vessels are recorded in the vicinity.

3.9 Subsea cables

There is no evidence of anchoring or gear snagging on any subsea cable at Billia Croo historically.

3.10 Search and rescue

The cable will not alter the capability of search and rescue operations in the area or interfere with neither RNLI nor helicopter operations.

3.11 Cumulative and in-combination

There are numerous projects coming onto site in the near future which have addressed cumulative impacts within their own marine licenses. The OE Buoy is expected to use Cable 5 to connect with its umbilical cable once deployed. However, the cable is not expected to significantly increase any cumulative or in-combination impact.

4 Risk controls

4.1 Site-wide risk controls

A number of risk controls are embedded by the processes EMEC has implemented in order to operate the site and the layout of the Billia Croo test site. The embedded risk control measures are detailed in Table 2, with any project-specific actions including any divergence from the specified control discussed.

Table 2. EMEC embedded risk controls for Billia Croo test site

ID	Embedded risk control	Description	Project-specific actions
1.	PPE Requirement	Maintenance teams to wear suitable PPE when working on the assets, including life jackets.	The contractor, a highly experienced offshore operator, will be leading the offshore tasks and will enforce their own health and safety regulations before going on site.
2.	Training of staff	Staff to be trained to the required standards for their work and have suitable local knowledge of regulations and operations in the Orkney Islands.	The contracted offshore operator are local to EMEC and are very experienced in working on the EMEC Berths and with Wave Energy converters.
4.	NtM and Promulgation	In addition to NtM, EMEC's Maritime Safety Information Standard Operating Procedures (SOP) ensures that all key navigational consultees are informed prior to any works. Distribution could include HMCG, Orkney Harbours (available via Orkney Islands Council Marine Services website), Orkney Marina noticeboards (as necessary), Orkney Fisheries Association, Scottish Fisheries Federation and UKHO. Stakeholders are targeted with	Notices to mariners will be issued prior to undertaking any related works onsite, specifying the type of works to be carried out and its duration, as well as the vessel(s) involved.

ID	Embedded risk control	Description	Project-specific actions
		information about relevant assets based on their activities and location.	
5.	Incident monitoring and reporting	EMEC to encourage incident/near miss reporting and monitor any safety issues at the test site. If necessary, risk control to be reviewed. Risk assessments to be reviewed following any incidents.	The contractor to encourage incident/near miss reporting and monitor any safety issues at the test site. If necessary, risk control to be reviewed. Risk assessments to be reviewed following any incidents.
6.	EMEC Procedures	<p>EMEC has a number of SOPs and standards in place to reduce navigation risks, such as:</p> <ul style="list-style-type: none"> • Task risk assessment; • Control of work (permit to access) • Hazard identification reporting; and • Maritime safety information. 	
7.	Hydrography	Contractual responsibility for EMEC to return the site to the original condition post-decommissioning.	The contractor will ensure that the site is returned to a suitable condition after cable works
8.	Charting	Site is marked on nautical charts including a chart note.	The cable end's final position will be reported to UKHO for updated charting
9.	Site Monitoring	EMEC's SCADA system provides real-time status information, trends, alarms and remote-control access to facilitate a safe working environment, comprehensive assessment and safe operation of the sites.	
10.	CCTV	Billia Croo test site is monitored by CCTV at EMEC's onshore substation, to satisfy operational requirements for control and monitoring of test site activities, visual checks of the test site environment, monitoring of lone worker safety, effective plant operation and substation security.	
11.	Liaison with local stakeholders	EMEC regularly liaises with key local stakeholders to identify any potential issues as soon as possible. Regular updates include information regarding upcoming deployments and significant operations at the site.	

4.2 Project-specific risk controls

The following table provides a description of the risk controls that will be implemented during the project.

Table 3. Project-specific risk controls

ID	Project-specific risk control	Description
1.	Guard vessels	<p>During retrieval or relocation activities, a guard vessel may be considered to assist in protecting the cable or associated equipment during works from contacts with passing vessel traffic. Due to the low density of traffic, this is not considered necessary except for extraordinary circumstances.</p> <p>If guard vessels are to be used onsite, it is important that such vessels employed to guard the site follow appropriate guidelines, with clear instructions on when to intervene in a potential incident.</p>
2.	Liaison with local stakeholders	<p>Consultation should be undertaken with Orkney Marine Services, the MCA and NLB prior to retrieval and relocation to confirm that adequate risk controls are in place.</p> <p>EMEC also conducts regular stakeholder consultation events to ensure that local marine users are aware of the pipeline of activity.</p>
3.	Retrieval and relocation	<p>All vessels undertaking activities on site should comply with EMEC standard operating procedures. Vessels should be mindful of other navigating vessels and avoid disrupting the activities of others.</p>

5 Summary and conclusion

This document has been prepared to support a marine licence application for the Berth 5 subsea cable works and should be read in conjunction with the document 'Billia Croo Navigational Risk Assessment (NRA) – REP522' and upcoming updated NRA.

In summary, this NRA has concluded that the cable works are low risk with suitable controls in place. The cable is already present on site and has been for several years. Only a short length up to the cable end is being relocated by a short distance to accommodate and mitigate potential impacts of the sunken penguin device's presence on the upcoming WEDUSEA project. Therefore, adverse impacts which differ to those already assessed within the Billia Croo site-wide NRA to navigational safety are not expected with this specific cable move.

Despite an expected increase in vessel activity as the cable relocation works are conducted: this is expected to be for a short and temporary duration with no following works expected (with exception to general operations and maintenance onsite). The use of local contractors who frequent the area also improves navigational uncertainty.

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