

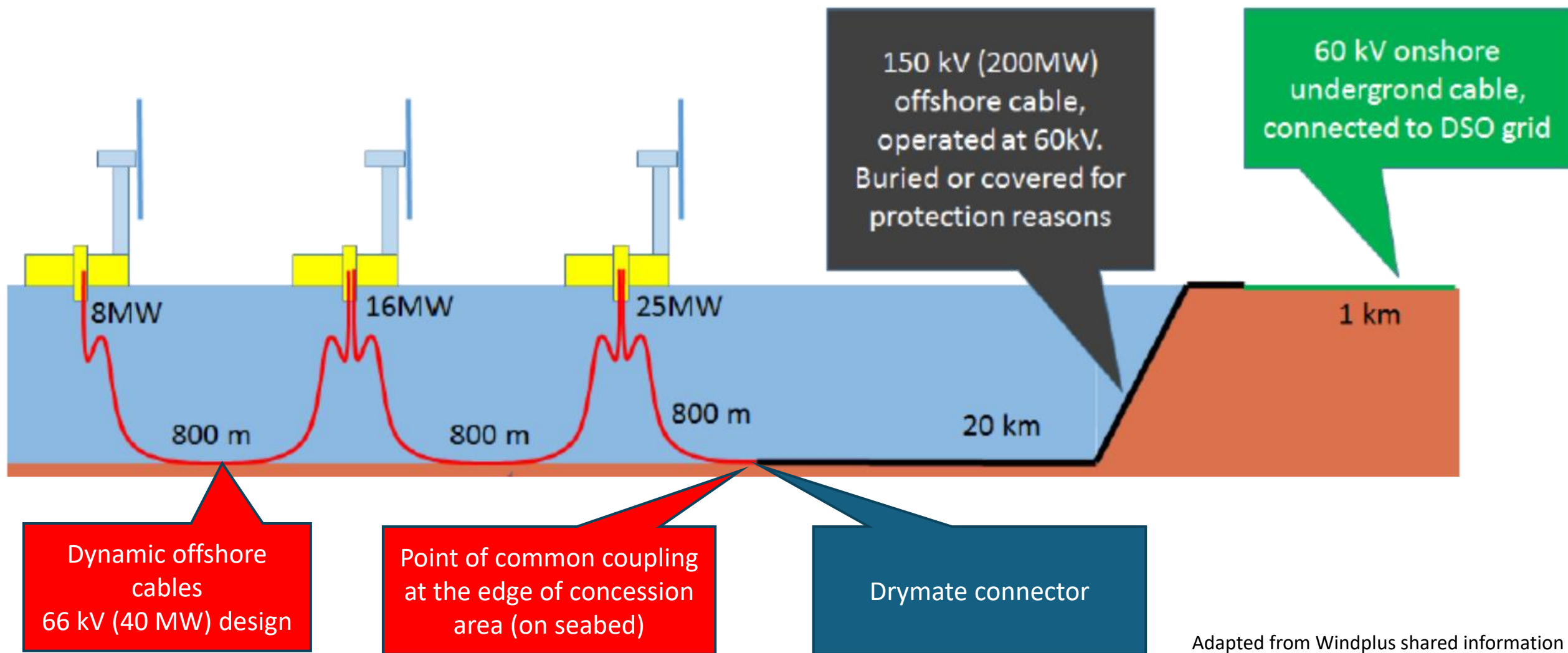
Export Cable Installation for the WindFloat Atlantic Successes and Challenges of Connecting Floating Offshore Wind in the Atlantic

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5th November 2025

RPEI-PE

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Data:		Proprietário:	André dos Santos
Versão:	v1.0	Aprovado por:	-
Classificação:	Publico	Lista de distribuição:	

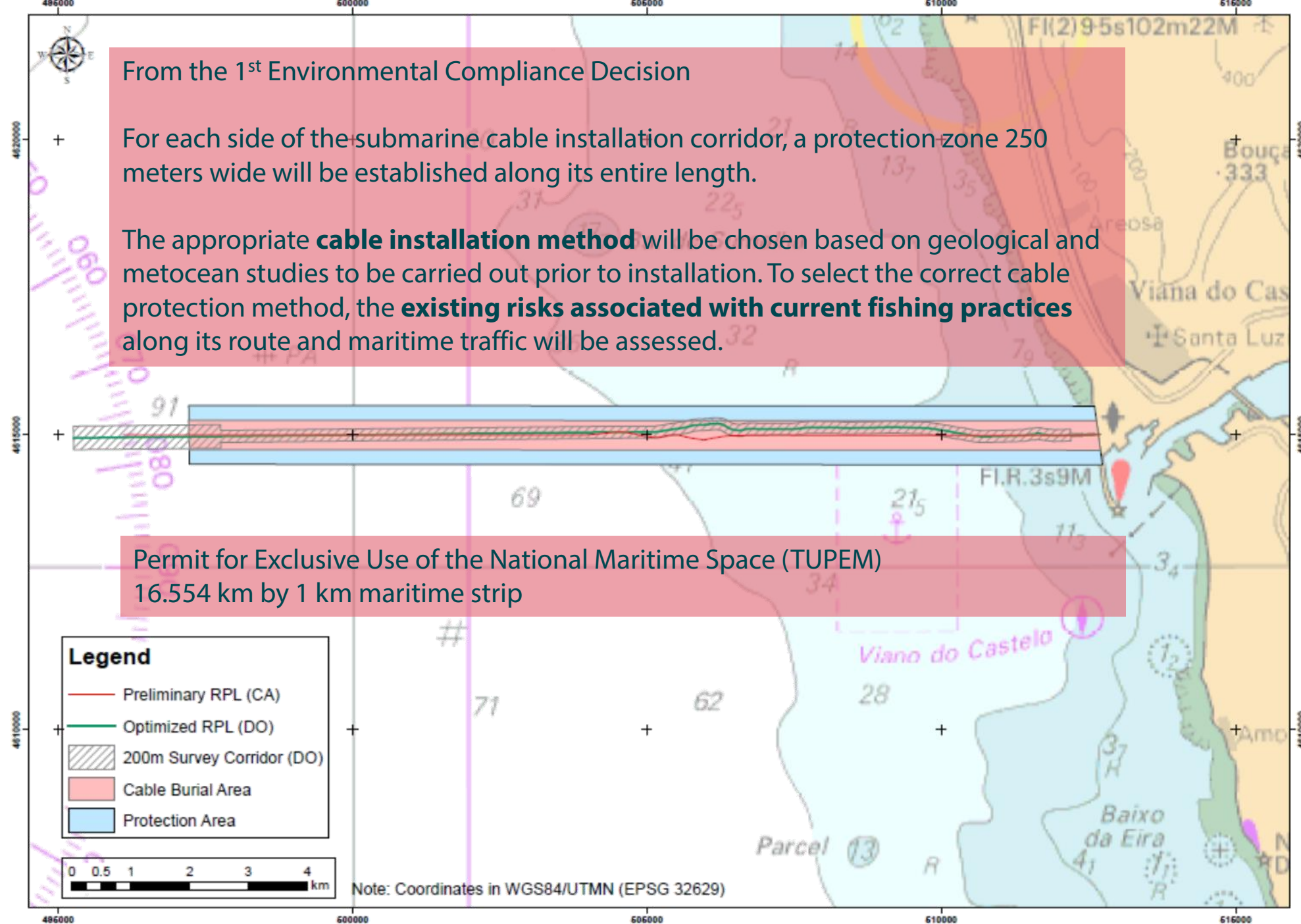
Project overview



Adapted from Windplus shared information

Licensing timeline

- 
- 14 Nov 2015** [WFA] 1st Environmental Compliance Decision (Preliminary Engineering WFA+export cable)
- 4 Mar 2016** [REN] Permit for Exclusive Use of the National Maritime Space (TUPÉM)
- 9 Dec 2016** [REN] The 81-A/2016 resolution of the Council of Ministers mandated REN to pursue the engineering and environmental studies and construct the export subsea electric cable and provide a point of common coupling offshore Viana do Castelo for interconnection of the offshore Windfloat power plant. The infrastructure will be placed in operation in December 2019.
- 23 Jul 2018** [REN] Construction Permit
- 3 Oct 2018** [REN] 2nd Environmental Compliance Decision (Front-End Engineering Design WFA+export cable)
- 17 Jan – 31 Dec 2019** [REN] Construction works





Environmental Compliance Decision (Front-End Engineering Design WFA+export cable)

Mitigation Measures

Archaeological Preservation

Monitor and preserve heritage sites using in-situ conservation whenever feasible.

Submarine Cable Burial

Bury submarine cable at **maximum depth to minimize** seabed disturbance and environmental impact.

Spill Prevention

Equip vessels with spill prevention protocols and containment measures.

Marine Habitat Conservation

Minimize sediment resuspension and disruption during installation activities.

Monitoring Programs

Geological Substrate Surveys

Annual multibeam bathymetry surveys track changes in the seafloor geology and geological changes caused by project infrastructure..

Electromagnetic Field Modeling

Modeling evaluates potential effects on migratory fish, especially eels.

Marine Fauna Monitoring

Visual, acoustic, and radar surveys track cetaceans, birds, and bats in marine ecosystems.

Biodiversity Monitoring

Monitors colonization of structures, cetaceans, birds, bats, and **fish interactions with cables**.

Socioeconomic Engagement

Includes **community complaint registry** to ensure local concerns are addressed effectively.

Cable Burial Risk Assessment (CBRA)

Seabed Condition Analysis

Analyze geological and geotechnical data to understand soil type and sediment stability.

Environmental Factor Assessment

Evaluate wave dynamics, currents, and seasonal changes impacting cable burial and stability.

External Risk Evaluation

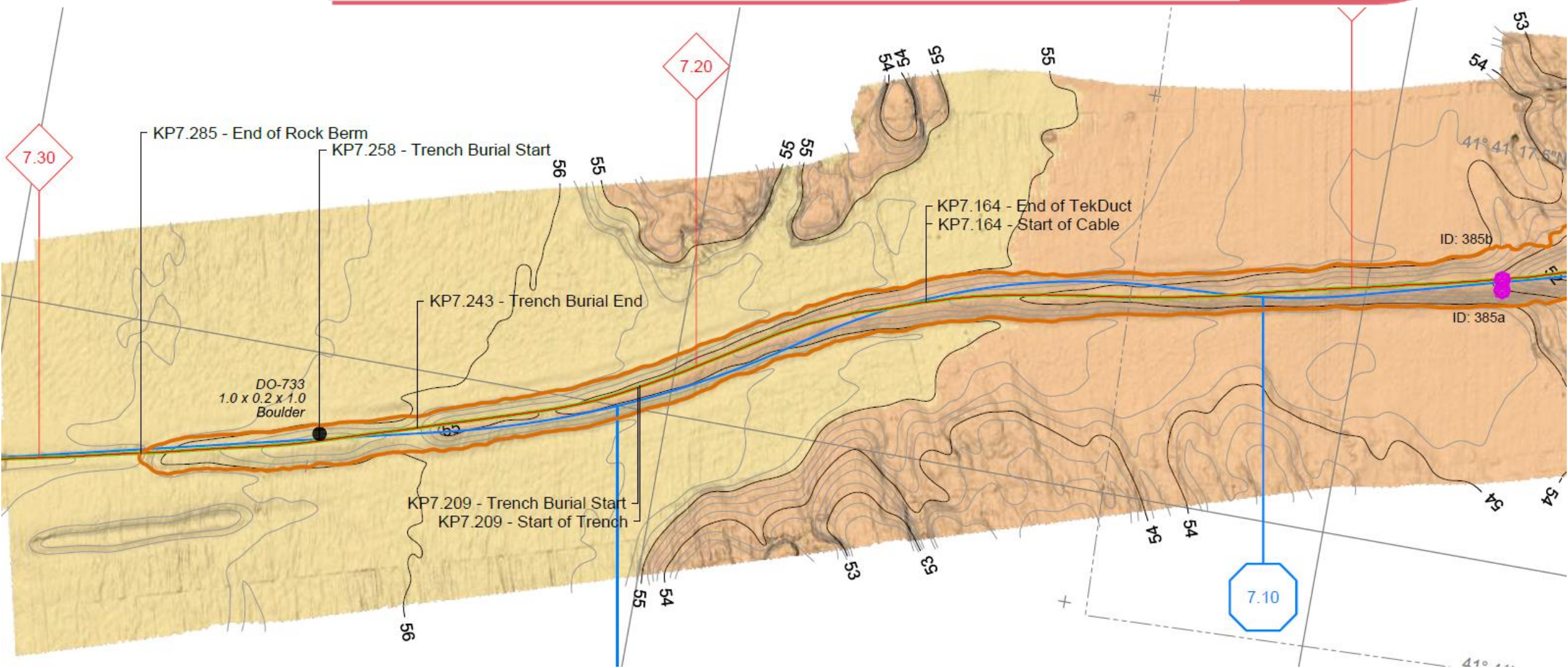
Identify fishing, anchoring, and natural hazards that threaten cable integrity.

Burial Depth and Method Selection

Choose appropriate burial techniques like jetting and trenching to protect cables effectively.



Cable micro-routing after geophysics surveys and CBRA

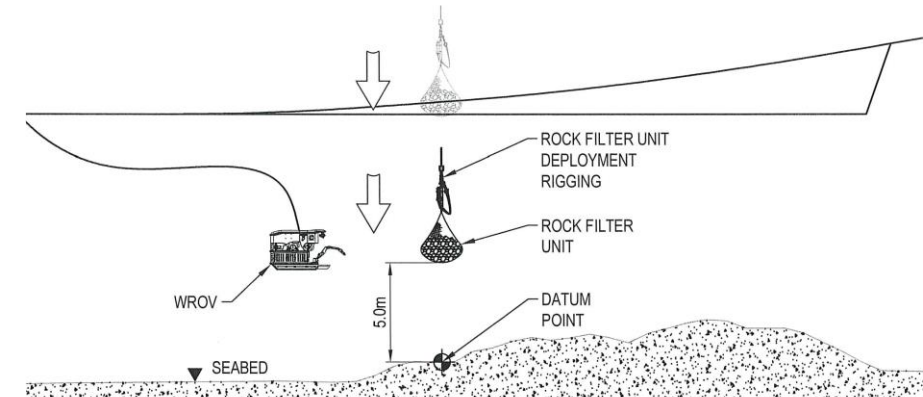
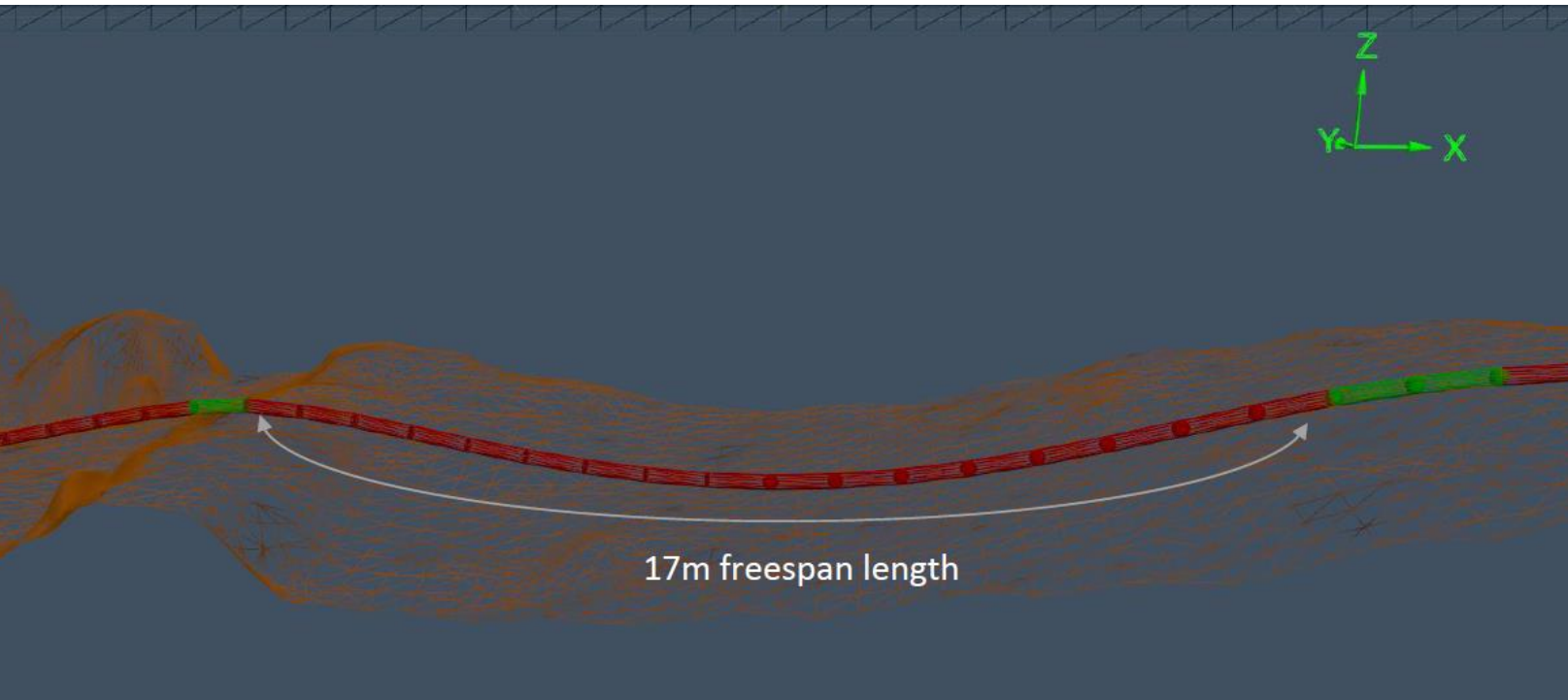


Trench burial PK 7 – 16,4 km

Rock berm PK 0 – 7 km

Rock Berm protection PK 0 – 7km

- Touch surface preparation for cable lay
- Cable points of contact may cause dangerous free spans
- The free span length is reduced to acceptable sizes using rock bags placed at specific locations



Rock Berm protection PK 0 – 7km

The CBRA⁽¹⁾ defined the design of rock berms according to the identified external threats:

- Fishing gear
- 1.5t Anchor

131.000 tons of rock

- 1-8" grading was used as filter layer
- LMA 5/40 was used as armor layer

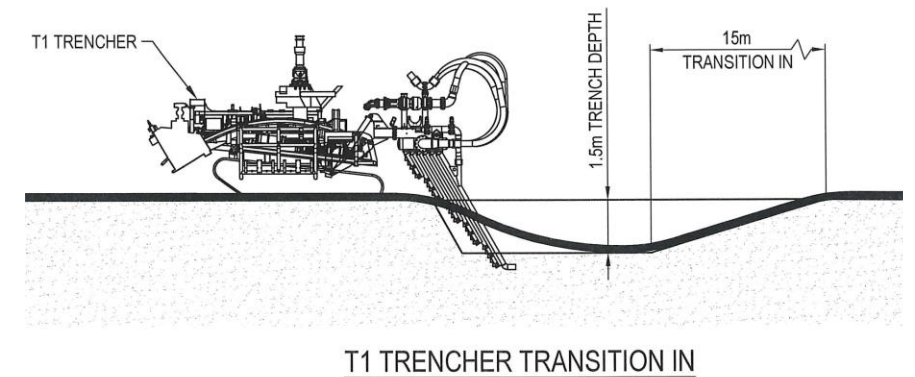
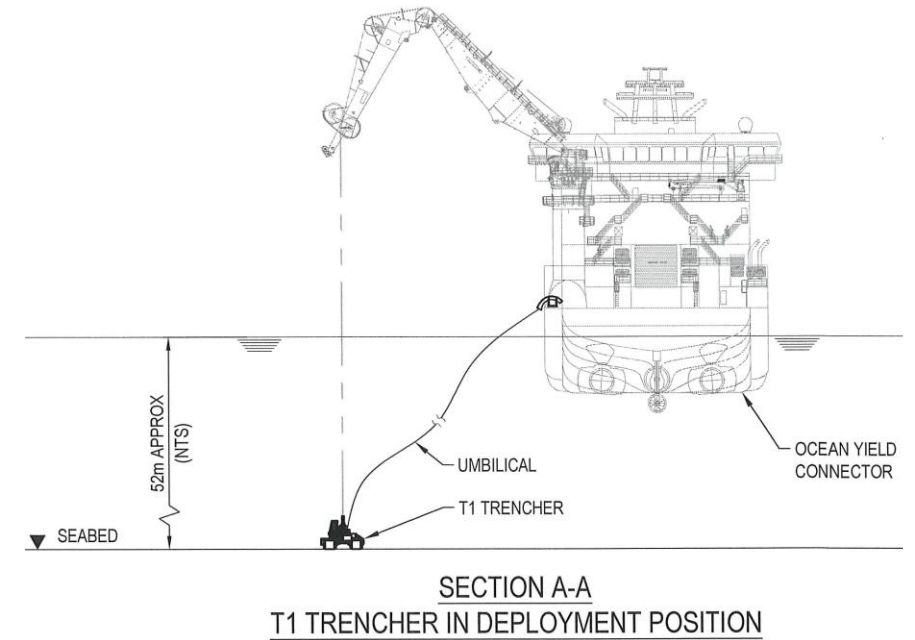
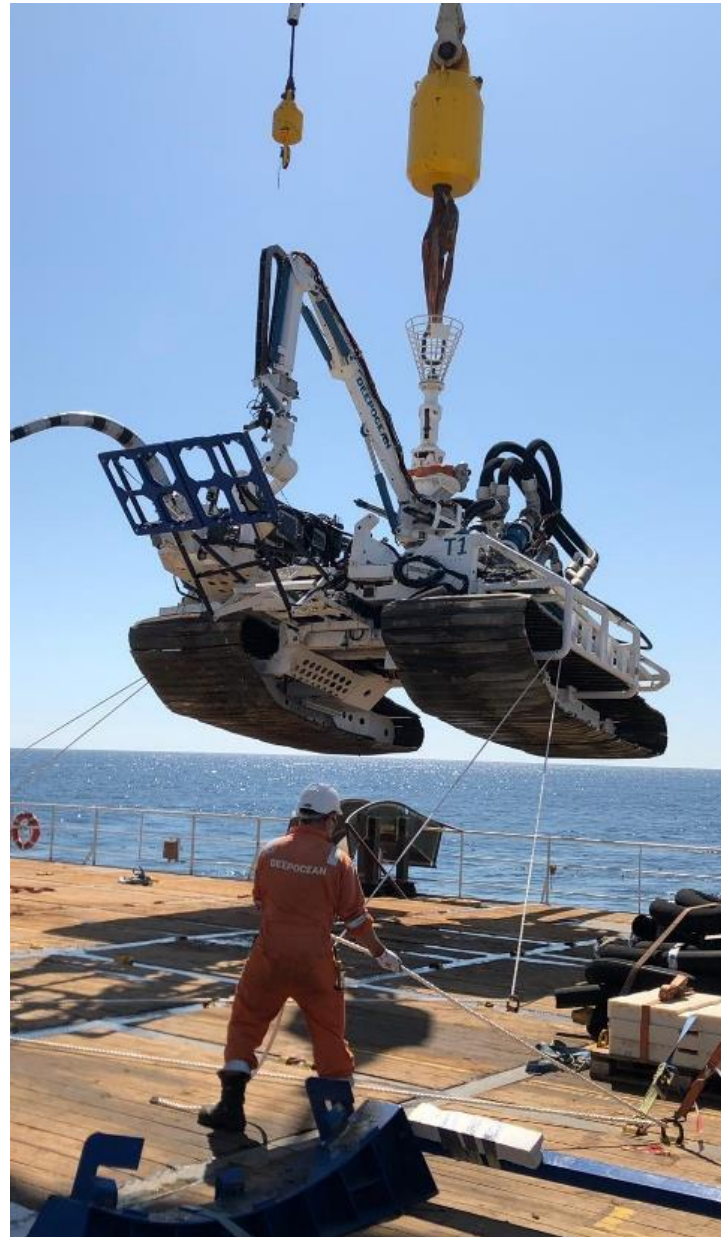
⁽¹⁾Cable Burial Risk Assessment



Trenching PK 7- 16,4 km

The CBRA defined:

- Minimum Depth of Lowering
- Trenching technique using jetting



Fishing and other economic activities

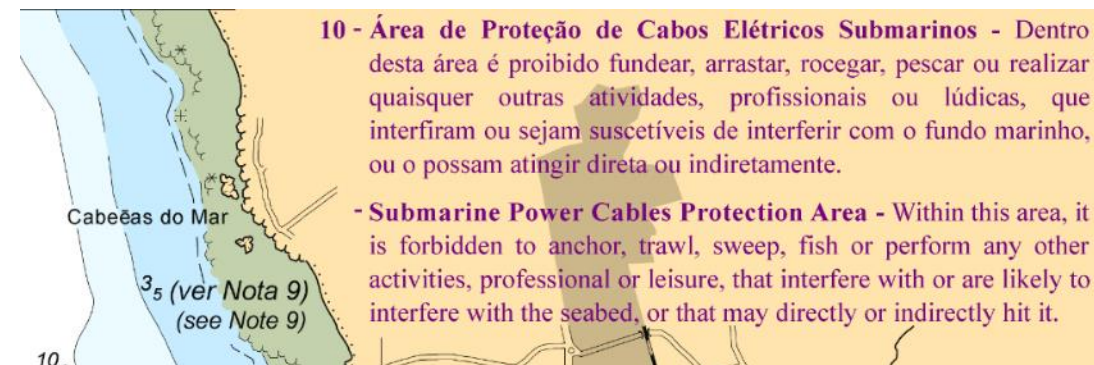


PESCA, NAVEGAÇÃO E CABOS SUBMARINOS

75% Dos danos causados em cabos submarinos ocorrem por ação de embarcações quando estas, lançam ferro/âncora ou desenvolvem atividades de pesca, tanto em zonas de proteção/proibidas, como sobre as suas coordenadas na ZEE Portuguesa, devidamente assinaladas nas cartas náuticas.

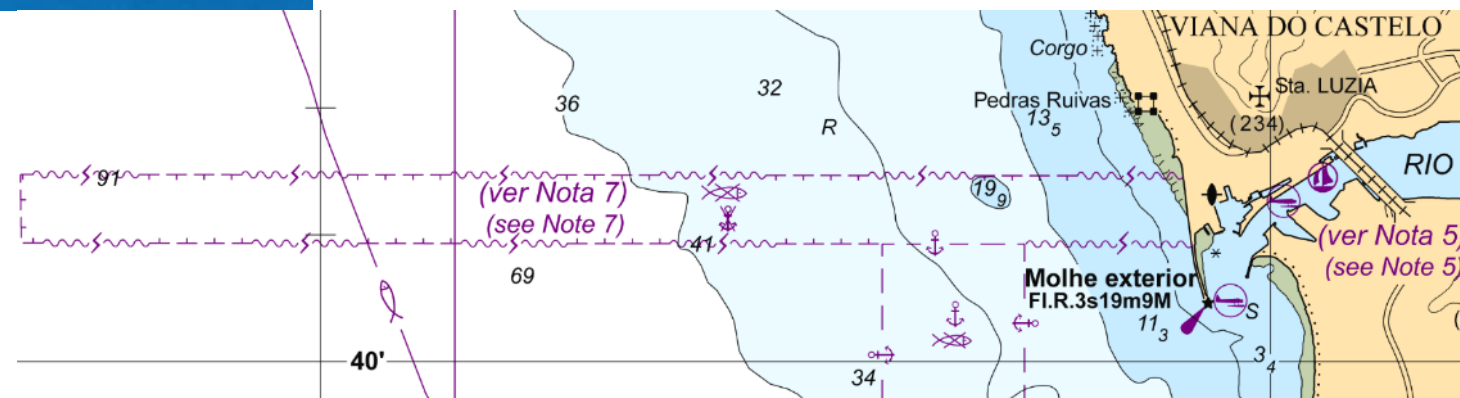
As reparações em cabos submarinos são operações complexas, morosas e extremamente dispendiosas.

A LEI PROÍBE E PUNE CRIMINALMENTE QUEM DANIFICAR CABOS SUBMARINOS E QUEM FUNDEAR OU PESCAR EM ZONAS DE PROTEÇÃO – EVITE CONSEQUÊNCIAS GRAVES QUE O POSSAM AFETAR DIRETAMENTE e que afetem as comunicações nacionais e intercontinentais



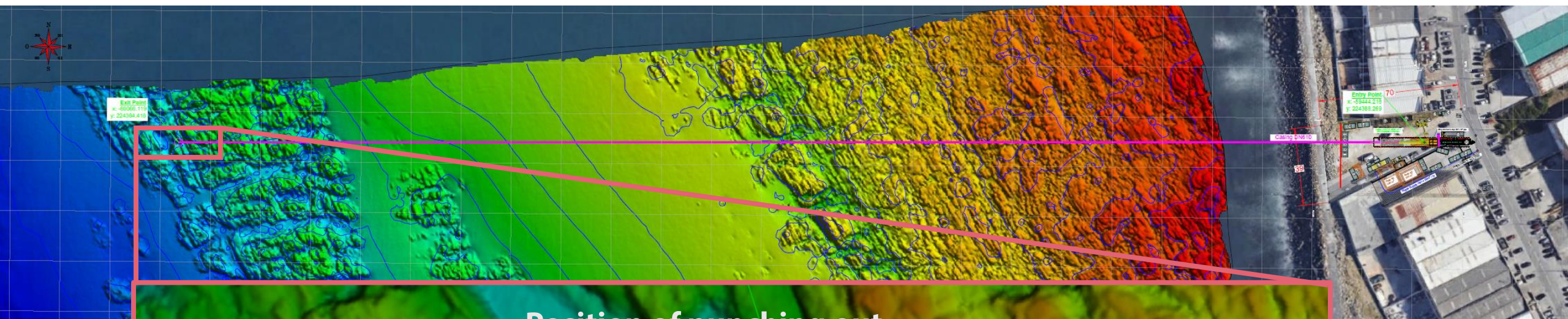
10 - Área de Proteção de Cabos Elétricos Submarinos - Dentro desta área é proibido fundear, arrastar, rocegar, pescar ou realizar quaisquer outras atividades, profissionais ou lúdicas, que interfiram ou sejam suscetíveis de interferir com o fundo marinho, ou o possam atingir direta ou indiretamente.

- Submarine Power Cables Protection Area - Within this area, it is forbidden to anchor, trawl, sweep, fish or perform any other activities, professional or leisure, that interfere with or are likely to interfere with the seabed, or that may directly or indirectly hit it.

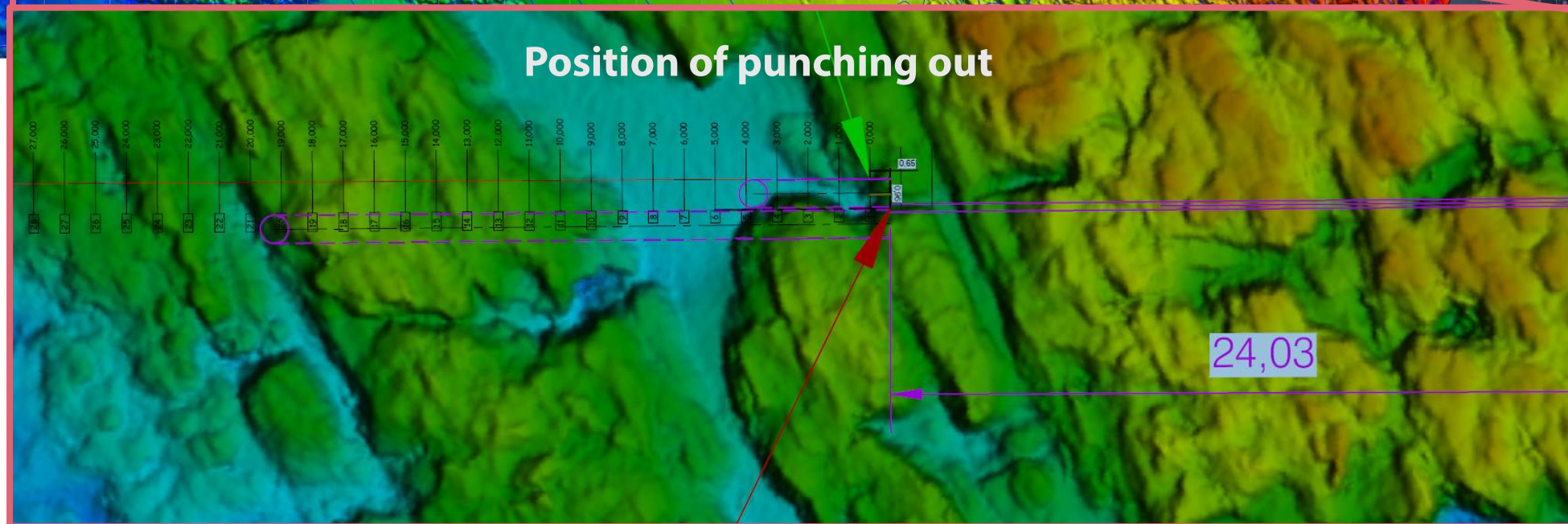


Cable Landfall - HDD

640 m length



Position of punching out





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