The Great Grid Upgrade

Sea Link

Sea Link

Volume 9: Examination Submissions

Document 9.96: Water Depth Baseline Study – Shipping and Navigation Technical Note

Planning Inspectorate Reference: EN020026

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Version History			
Date	**Version**	**Status**	**Description / Changes**
February 2026	A	Final	For Deadline 4 submission
March 2026	B	Final	For Deadline 5 submission – updating errata
April 2026	C	Final	For Deadline 6 – responding to stakeholder comments
April 2026	D	Final	Issued to PINS Deadline 7

1. Introduction

1.1 Purpose of this Document

1.1.1 This Technical Note has been written to supplement **Application Document 9.74 Shipping and Navigation Under-Keel Clearance Marine Engineering Technical Note [REP1A-38]** and provide additional visual representations of cable crossing locations and their predicted burial depths, Areas of Safeguarded Depth, and concurrent shipping vessel activity.

1.1.2 The aim of this Water Depth Baseline Study is to present the surveyed water depth within the context of the consultee Areas of Safeguarded Depth, and the locations and min/max heights of cable crossings and to overlay these datasets with vessel activity. This study can then provide a clear view of shipping and navigation issues surrounding under-keel clearance and enable further assessment of potential impacts of any reduction in water depth at specific locations.

1.1.3 The purpose of providing this document is to share information which can be referred to by the Applicant and ports stakeholders in further discussions around the matters of preserving specific water depths in identified key areas, and to help facilitate the parties coming to agreement on these matters. Additionally, this document can assist in the greater understanding of potential locations where the Maritime and Coastguard Agency's (MCA) 5% requirement may not be met, and where the Applicant needs to engage further with the MCA. A revised version may be issued in due course at a later Deadline, as required.

1.2 Stakeholder Areas of Concern

1.2.1 The Areas of Safeguarded Water Depth were provided to the Applicant by the Port of London Authority (PLA) and are agreed amongst other key port stakeholders as being the areas where specific water depths must be preserved along the Sea Link cable route. The Areas of Safeguarded Depth are shown in Plate 1.1.

1.2.2 The Three PLA Areas of Safeguarded Water Depth are:

- Sunk Pilot boarding area (22 m below Chart Datum (CD) to be preserved);
- Long Sand Head Two-Way Route crossing area (12.5 m below CD to be preserved); and
- NE Spit area (12.5 m below CD to be preserved).

1.2.3 An additional 0.5 m over-dredge requirement was specified by port stakeholders in later communications, which is added to depth criteria, so the absolute depth thresholds are 22.5 m and 13.0 m.

1.2.4 Additionally, the Applicant acknowledges that the MCA's 5% reduction requirement, which is based on the MCA Guidance Note MGN 654 (Maritime and Coastguard Agency, 2021), where the undertaker must not reduce water depth by more than 5% of navigable depth referenced to chart datum unless discussed with the MCA:

- Applies across whole cable route.

1.2.5 From recent discussion with the MCA (in December 2025, January 2026 and March 2026), there is also an additional MCA area of concern, where there is a requirement for no depth reduction. This area is also shown in Plate 1.1:

- Kilometre Point (KP) 33 to KP 38 – no depth reduction.

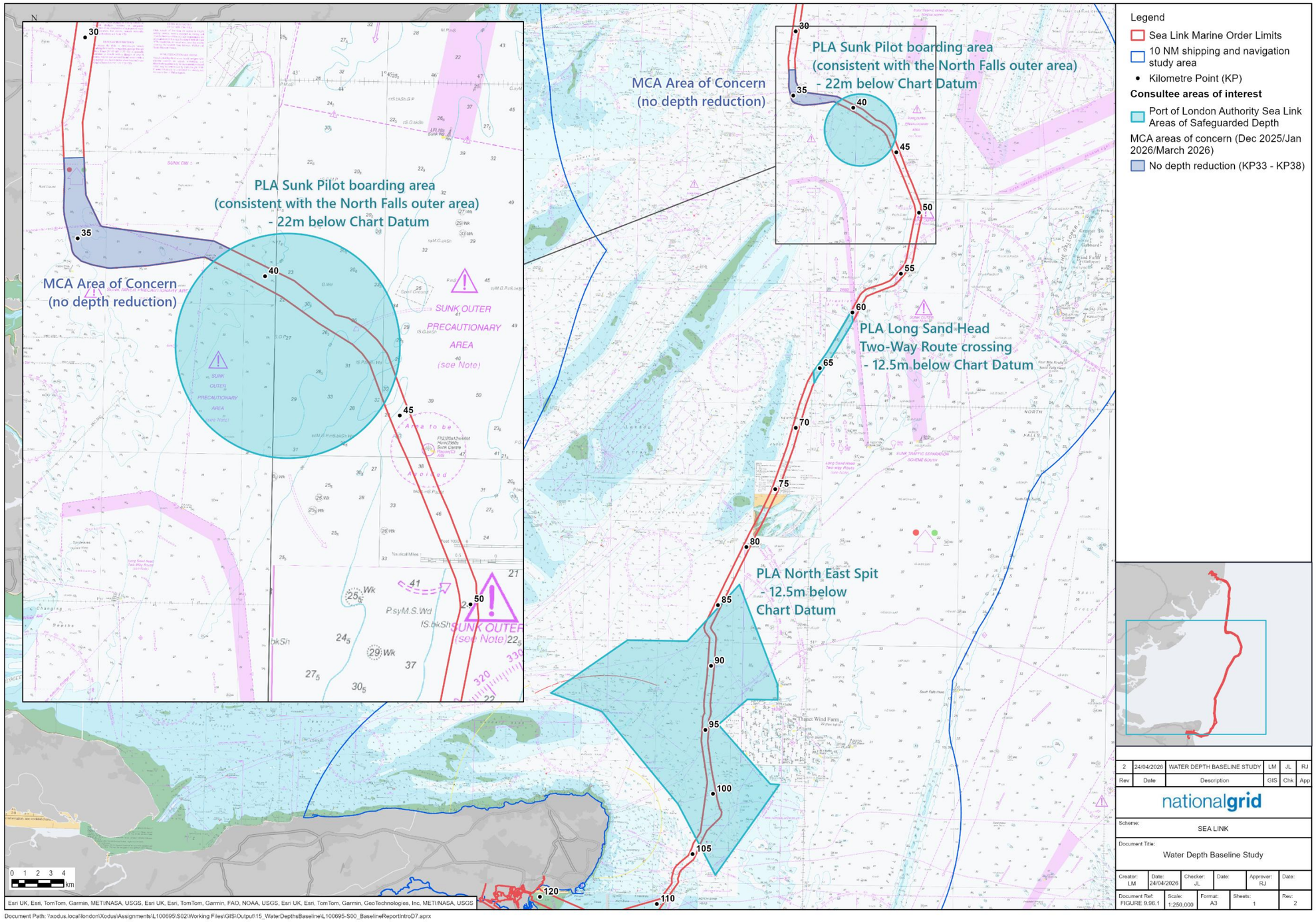


Plate 1.1 Cable route overview showing stakeholder areas of concern in relation to water depth

2. Method

2.1 Data sources and processing

2.1.1 Data was compiled from a variety of sources for this study. A summary of the data sources is given in the list below, with more detail on processing steps in Table 2.1:

- **Application Document 9.80: Integrated Geophysical and Geotechnical Survey Report – Extract [REP2-035];**
- **Application Document 9.21 Sea Link Cable Burial Risk Assessment [PDA-039];**
- **Application Document 9.74 Shipping and Navigation Under-Keel Clearance Marine Engineering Technical Note [REP1A-038]** (to be updated at Deadline 7)**;** and
- **Application Document 6.3.4.7.A (B) Navigational Risk Assessment (Clean) [REP1-063] (NRA)**.

2.1.2 Additionally, a new shipping vessel density grid of 0.1 km^2 resolution cells was created, to allow more detailed inspection of vessel traffic movements, as compared to the 1 km^2 resolution grid used in the NRA.

2.1.3 All depths reported here can be read as equivalent to metres below Chart Datum (CD), consistent with the other reports listed above.

2.1.4 Some vessels with reported draughts deeper than the corresponding water depths in which they were present, were reassigned following further review.

Table 2.1 Data references used in cross-sectional profiles

Data	Data source	Description
Bathymetry (m)	Bathymetry data from 2021 and 2023 surveys as presented in **Application Document 9.80: Integrated Geophysical and Geotechnical Survey Report – Extract [REP2-035]**.	Water depth values were extracted at 1 m intervals along the Sea Link Marine Order Limit, from the eight relevant bathymetry survey files.
MCA 5% reduction threshold (m)	Bathymetry data from 2021 and 2023 surveys as presented in **Application Document 9.80: Integrated Geophysical and Geotechnical Survey Report – Extract [REP2-035]**.	Calculated by subtracting 5% of the water depth from the bathymetry value at each 1 m KP.
Bathy plus CBRA DoL (m)	Bathymetry data from 2021 and 2023 surveys as presented in **Application Document 9.80:**	The Depth of Lowering (DoL) to Top of Product (relative to undisturbed seabed, or Non-Mobile Reference

Data	Data source	Description
	Integrated Geophysical and Geotechnical Survey Report – Extract [REP2-035] and **Application Document 9.21 Sea Link Cable Burial Risk Assessment [PDA-039]** Table 24 Table of Recommended DoL extracted from the CBRA table.	level (NMRL) whichever is the lower) values from each start to end KP range were added to the bathymetry values over that same range.
Cable crossing depth (m)	**Application Document 9.74 Shipping and Navigation Under-Keel Clearance Marine Engineering Technical Note [REP1A-038]** Table 4.2 “Summary of in-service crossings” and Table 4.3 “Summary of planned crossings”.	Water depth at cable crossing. No processing required.
Min crossing depth (m)	**Application Document 9.74 Shipping and Navigation Under-Keel Clearance Marine Engineering Technical Note [REP1A-038]** Table 4.2 “Summary of in-service crossings” and Table 4.3 “Summary of planned crossings”.	The minimum crossing depth was subtracted from the cable crossing depth given above.
Max crossing depth (m)	**Application Document 9.74 Shipping and Navigation Under-Keel Clearance Marine Engineering Technical Note [REP1A-038]** Table 4.2 “Summary of in-service crossings” and Table 4.3 “Summary of planned crossings”.	The maximum crossing depth was subtracted from the cable crossing depth given above.
Max vessel draught (m)	AIS tracklines (March 2022 to Feb 2023) used in **Application Document 6.3.4.7.A (B) Navigational Risk Assessment (Clean) [REP1-063]**.	The maximum vessel draught from the AIS trackline intersections per 100 m stretch of Sea Link RPL.
Vessel counts (all)	AIS tracklines (March 2022 to Feb 2023) used in **Application Document 6.3.4.7.A (B) Navigational Risk Assessment (Clean) [REP1-063]**.	Counts of AIS trackline intersections per 100 m stretch of Sea Link RPL for all vessels.
Vessel counts (>=11 m draught)	AIS tracklines (March 2022 to Feb 2023) used in **Application Document 6.3.4.7.A (B)**	Counts of AIS trackline intersections per 100 m stretch of Sea Link RPL just for vessels with a recorded draught greater than 11 m.

Data	Data source	Description
	Navigational Risk Assessment (Clean) [REP1-063].	
Reference depth lines of 12.5 m and 22 m	**Application Document 7.4.11 Draft Statement of Common Ground Between National Grid Electricity Transmission and the Port of London Authority [REP3-042]**. **Application Document 7.4.10 (C) Draft Statement of Common Ground Between National Grid Electricity Transmission and the Maritime and Coastguard Agency [REP3-040]**.	Reference depth lines of 12.5 m and 22 m are added to the cross-sectional profiles for context, but they have been shown as 13 m and 22.5 m to account for the 0.5 m over-dredge requirement specified by port stakeholders in later communications
Areas of stakeholder concern	**Application Document 7.4.11 Draft Statement of Common Ground Between National Grid Electricity Transmission and the Port of London Authority [REP3-042]**. **Application Document 7.4.10 (C) Draft Statement of Common Ground Between National Grid Electricity Transmission and the Maritime and Coastguard Agency [REP3-040]**.	These were drawn from the stakeholder communications and plotted onto the maps/profiles.

3. Results

3.1 Maps and profiles

3.1.1 The figures in this section present the data previously described (Table 2.1).

3.1.2 In all figures with map views, the three panels are consistent:

- The left panel shows an overview of the key infrastructure along the Sea Link cable route including identified in-service cables, planned cables, the areas of stakeholder concern relating to water depth, and other charted features in the background.
- The middle panel shows the bathymetry, visualised as three depth categories which correspond to the Areas of Safeguarded Depth from stakeholder consultation: yellow indicates water shallower than 12.5 m, orange indicates water depths between 12.5 m to 22 m, and green indicates water deeper than 22 m. The surveyed bathymetry is shown using strong colours, and the EMODnet bathymetry is shown in the background with some added transparency, to provide broader context.
- The right panel shows either the shipping vessel density for all vessels across the study area on a grid cell resolution of 0.1 km^2, or the individual shipping vessel AIS tracklines for vessels with draughts greater than 11 m, depending on the map.

3.1.3 The cable route cross-sectional profile charts show each show:

- surveyed water depths;
- the MCA 5% reduction requirement threshold;
- the predicted depth of lowering of the installed cable;
- shipping vessel activity;
- other cable crossing locations (both existing and future); and
- the stakeholder Areas of Safeguarded Depth.

3.1.4 A summary of the figures provided is given below. The figures cover both full cable route overviews, and sub-sections of the route which allow for more detailed inspection:

- Plate 3.1 – full route overview map;
- Plate 3.2 – full route overview cross-sectional profile;
- Plate 3.3 – KP 0 to KP 30 subsection where lower right panel shows vessel density;
- Plate 3.4 – KP 0 to KP 30 subsection where lower right panel shows tracklines and extra zoom detail on the cross-sectional profile;
- Plate 3.5 – KP 30 to KP 60 subsection where lower right panel shows vessel density;
- Plate 3.6 – KP 30 to KP 60 subsection where lower right panel shows tracklines and extra zoom detail on the cross-sectional profile;
- Plate 3.7 – KP 60 to KP 85 subsection where lower right panel shows vessel density;

- Plate 3.8 – KP 60 to KP 85 subsection where lower right panel shows tracklines and extra zoom detail on the cross-sectional profile;
- Plate 3.9 – KP 85 to KP 120 subsection where lower right panel shows vessel density; and
- Plate 3.10 – KP 85 to KP 120 subsection where lower right panel shows tracklines and extra zoom detail on the cross-sectional profile.

The GridLink crossing indicated within Plates 3.9 and 3.10 will move to the east (within the Limits of Deviation (LOD)) to deeper water in compliance with the safeguarding requirement, however the location is still under discussion with GridLink and relevant stakeholders. The bathymetry along the GridLink alternative route shown in Plate 3.2 is indicative and has not been included on Plates 3.9 and 3.10, as it is not possible to align the route KPs and the alternative route KPs without distortion.

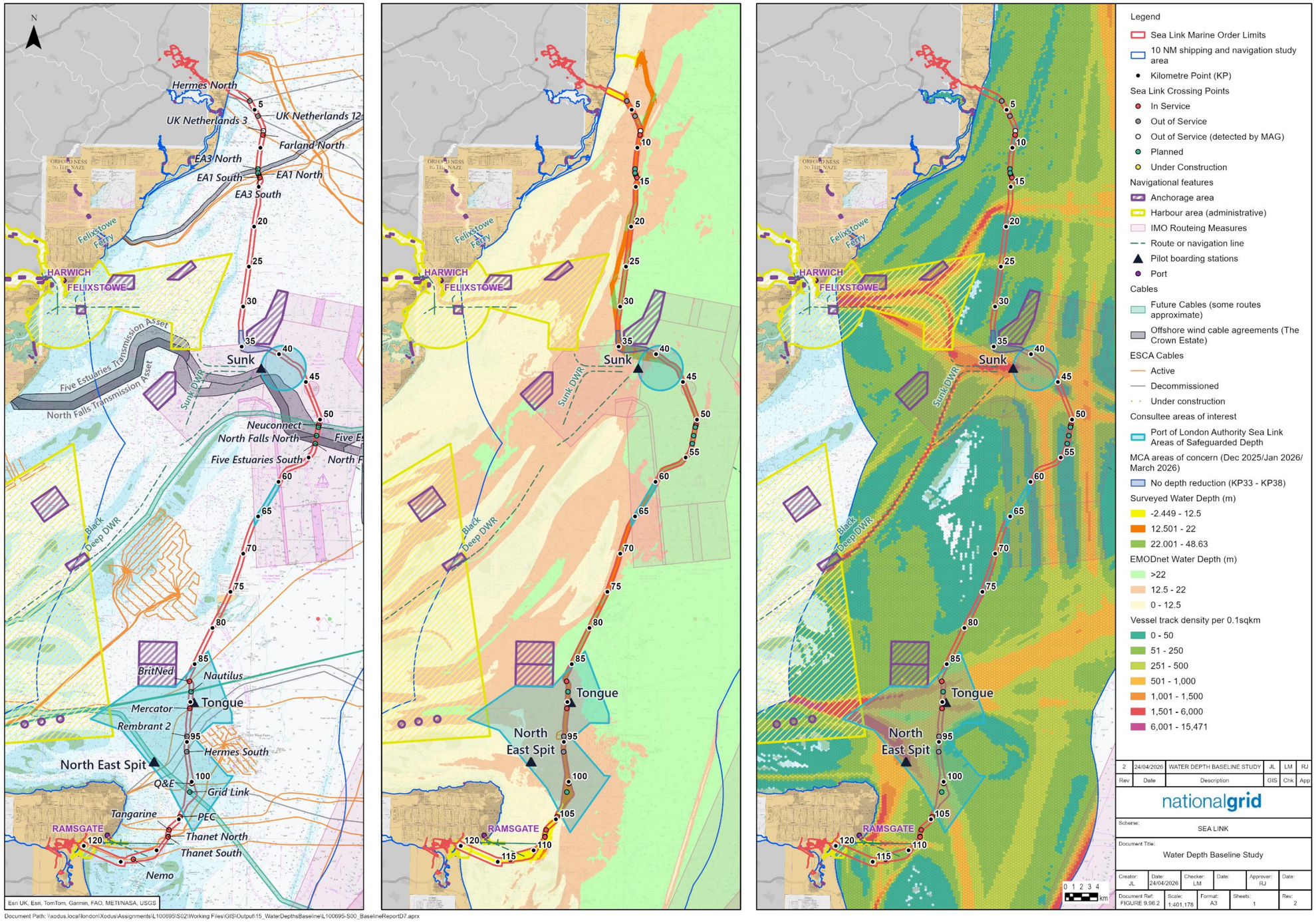
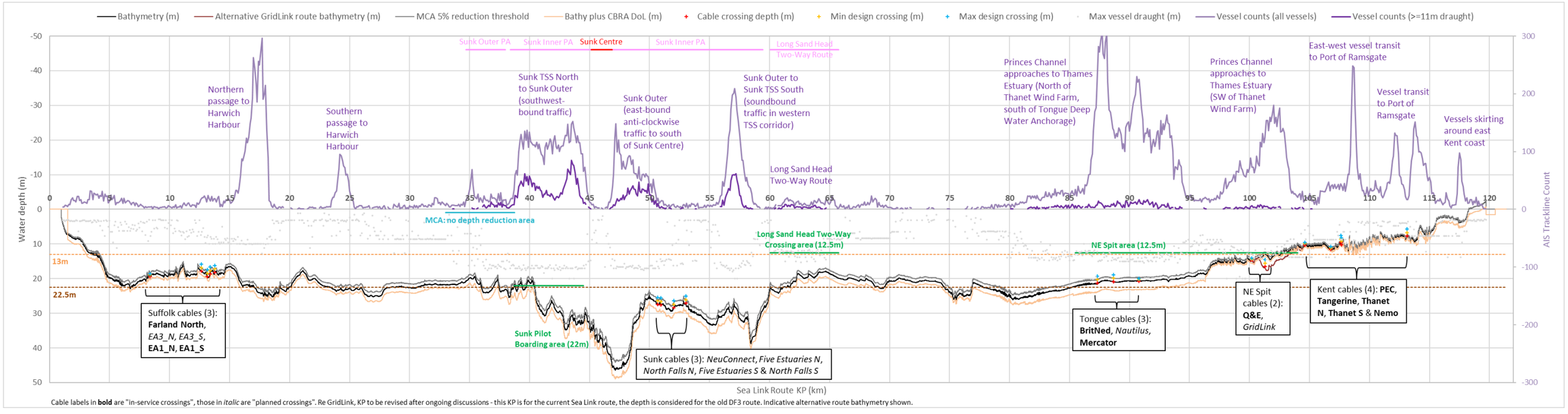


Plate 3.1 Cable route overview showing key infrastructure, cable crossings, water depths, and vessel density



Cable labels in **bold** are "in-service crossings", those in *italic* are "planned crossings". Re GridLink, KP to be revised after ongoing discussions - this KP is for the current Sea Link route, the depth is considered for the old DF3 route. Indicative alternative route bathymetry shown.

Plate 3.2 Cable route cross-sectional profile showing water depths, cable crossings, vessel density and areas of stakeholder concern

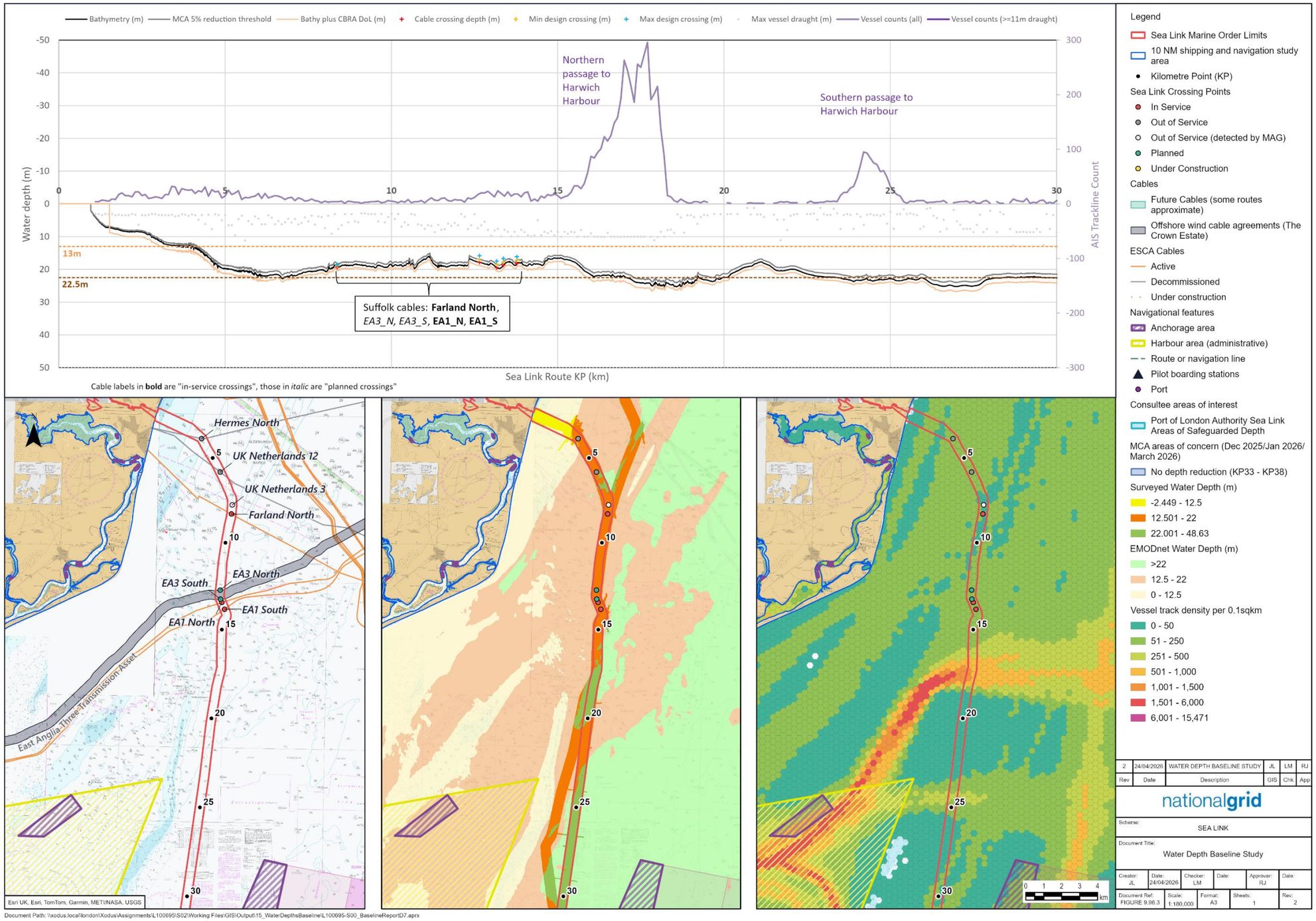


Plate 3.3 Cable route KP 0 to KP 30: depth profile, cable crossings, vessel density and areas of stakeholder concern

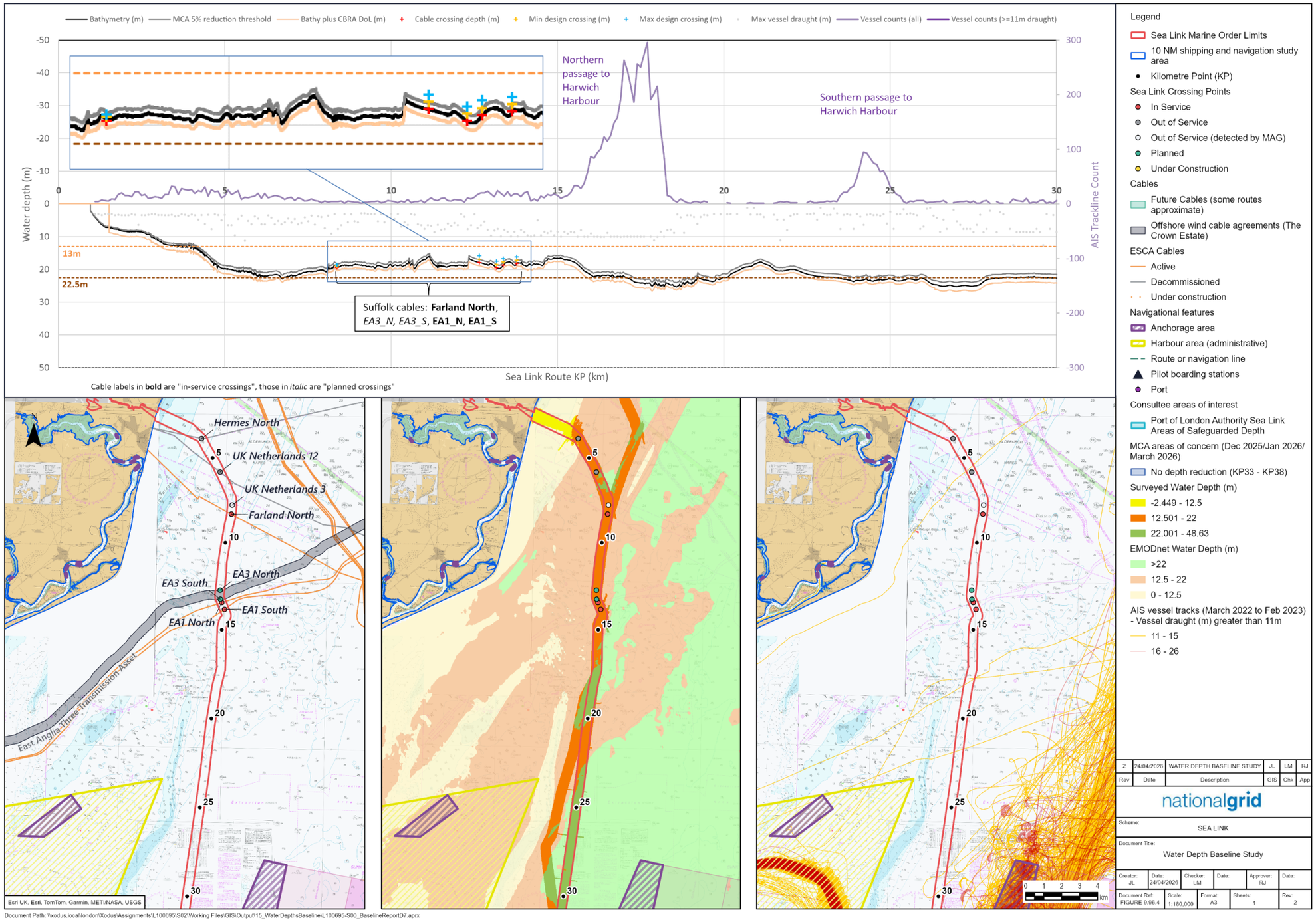


Plate 3.4 Cable route KP 0 to KP 30: depth profile, cable crossings, vessel density and areas of stakeholder concern

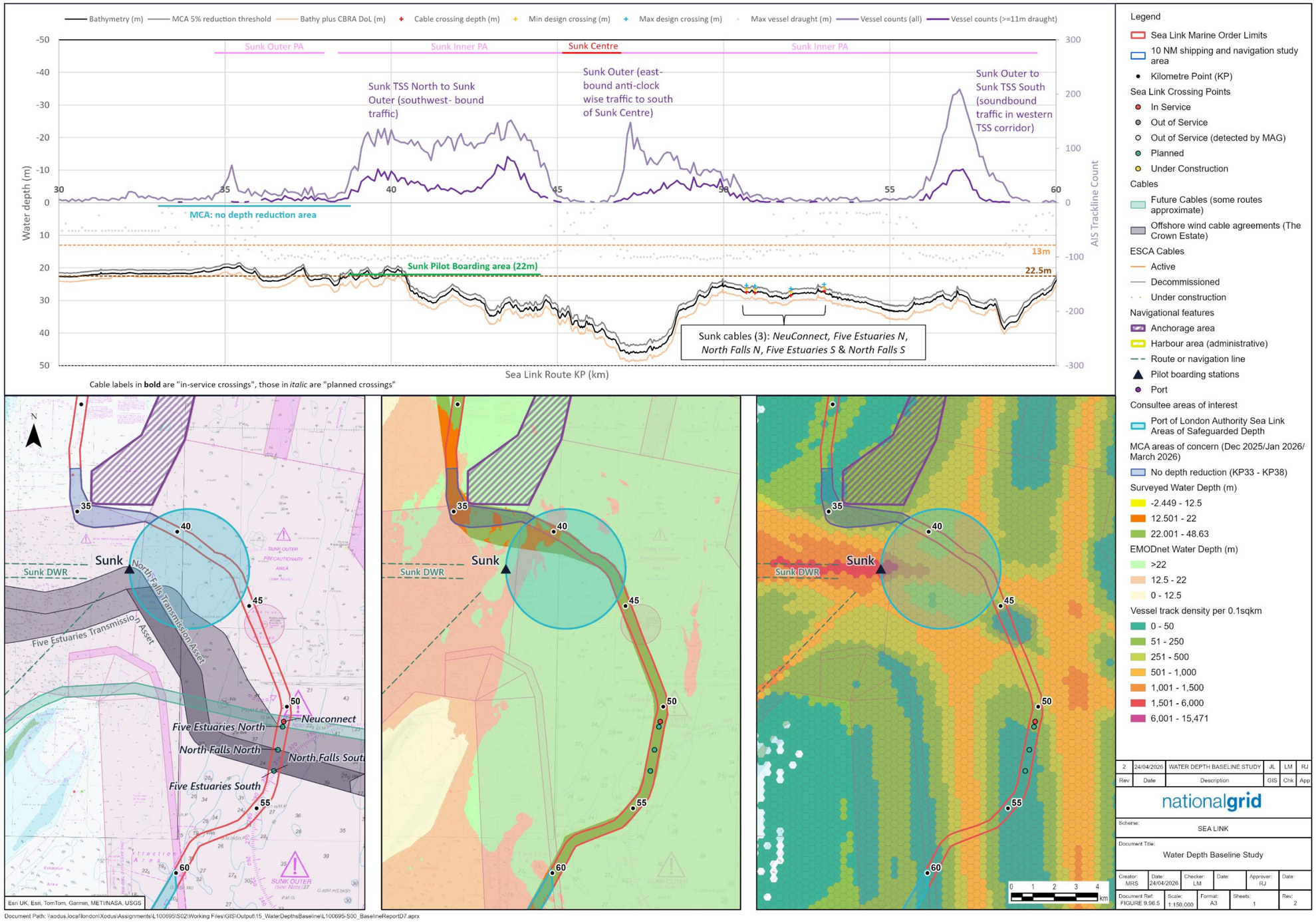


Plate 3.5 Cable route KP 30 to KP 60: depth profile, cable crossings, vessel density and areas of stakeholder concern

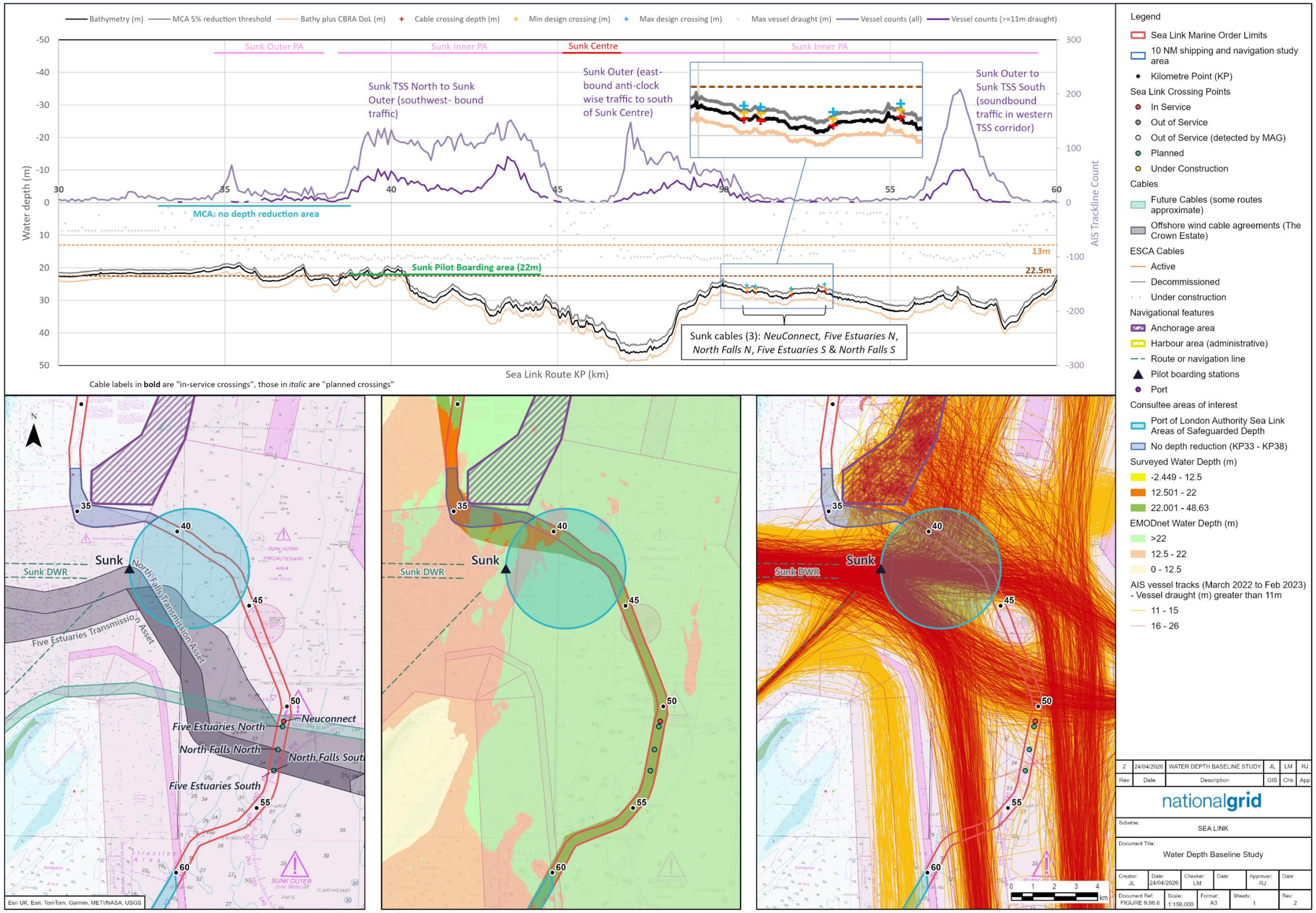


Plate 3.6 Cable route KP 30 to KP 60: depth profile, cable crossings, vessel density and areas of stakeholder concern

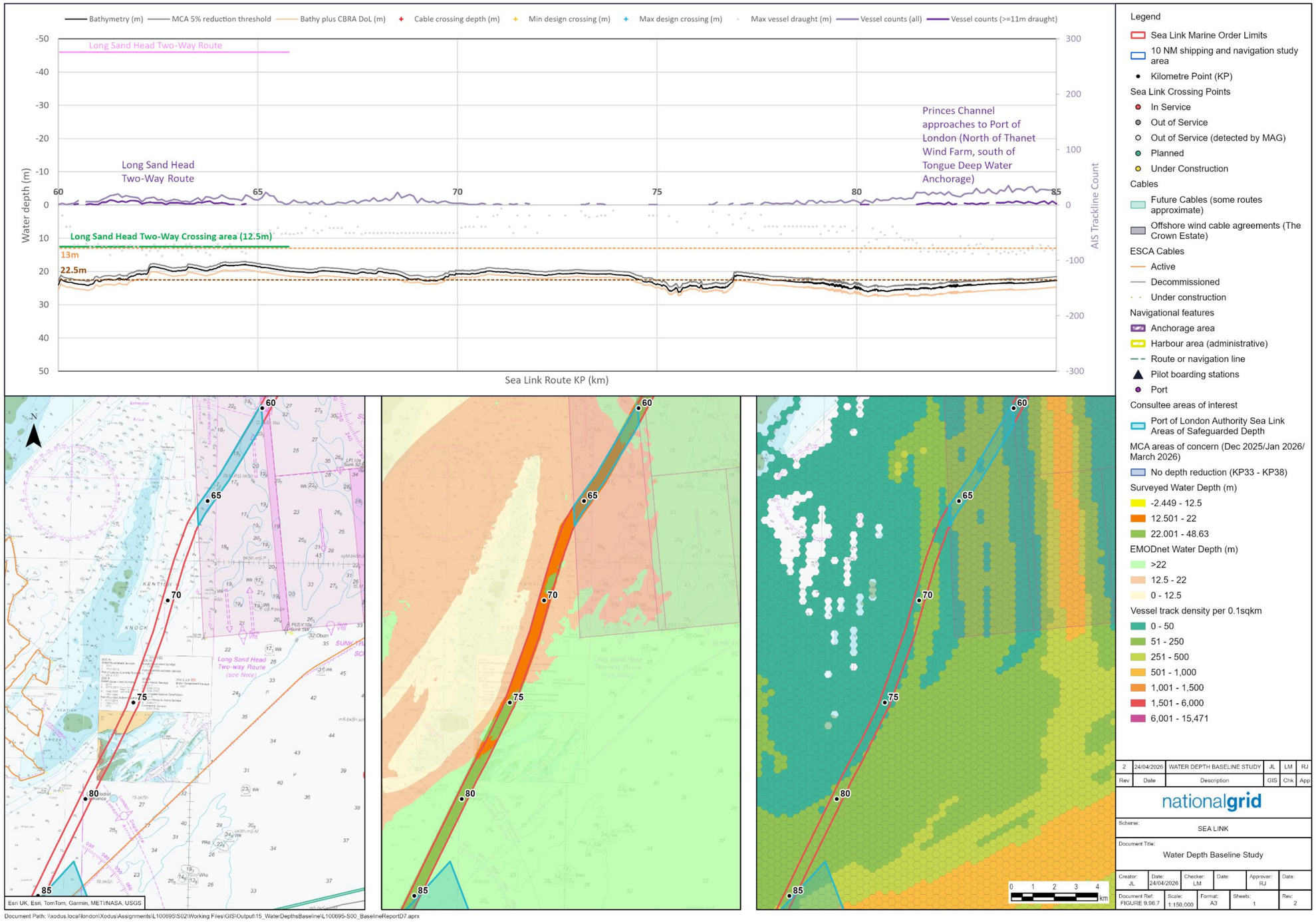


Plate 3.7 Cable route KP 60 to KP 85: depth profile, cable crossings, vessel density and areas of stakeholder concern

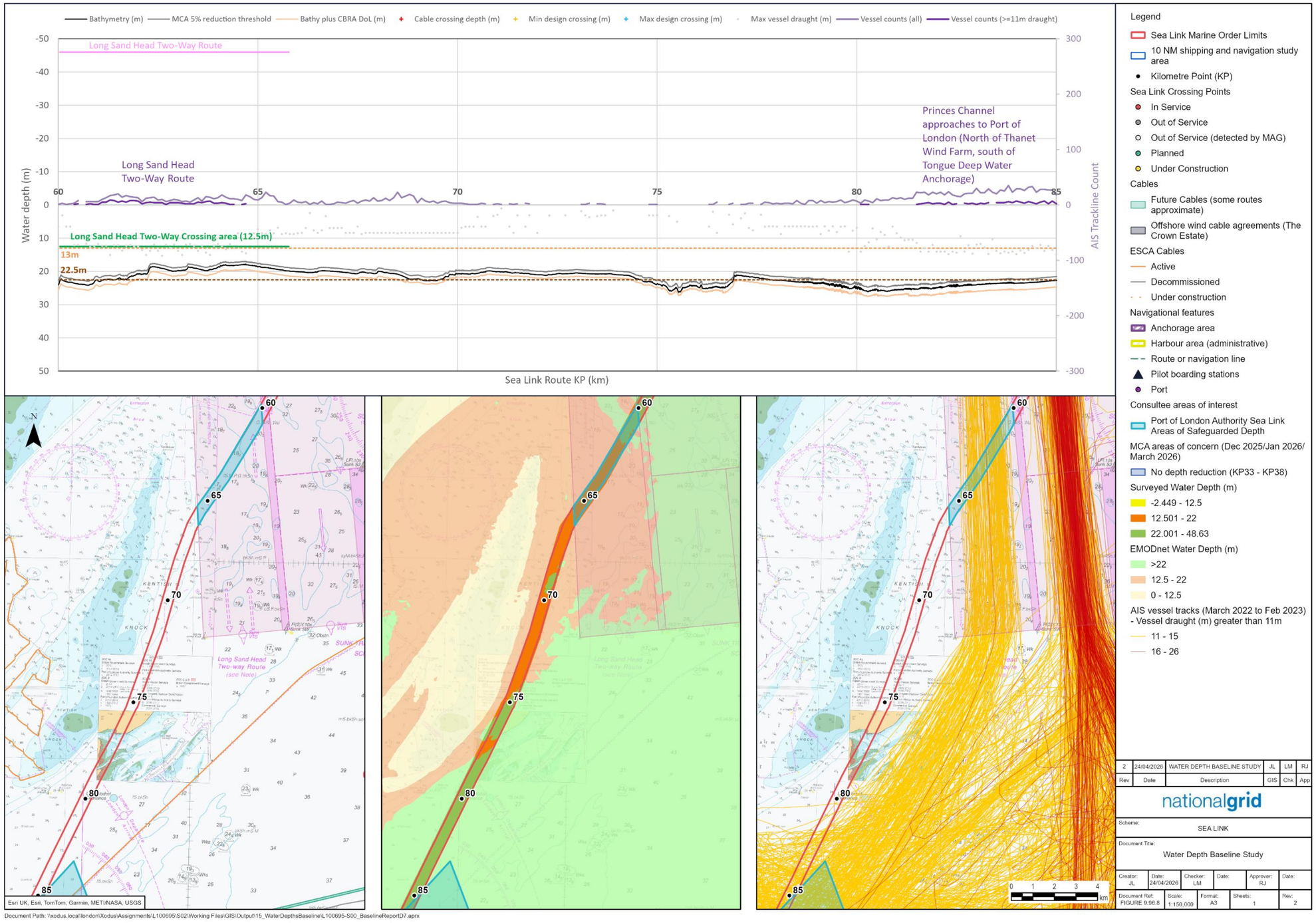


Plate 3.8 Cable route KP 60 to KP 85: depth profile, cable crossings, vessel density and areas of stakeholder concern

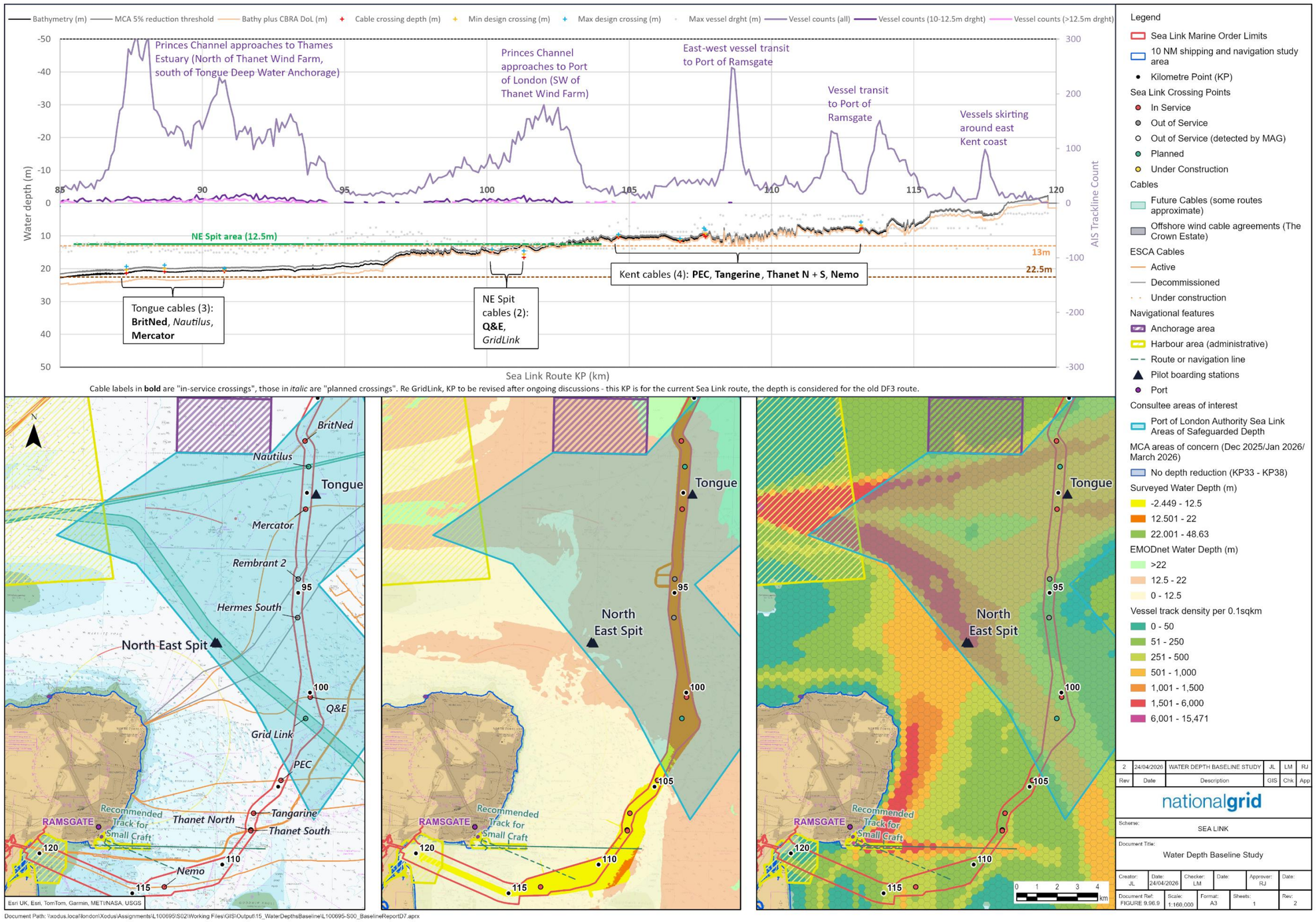


Plate 3.9 Cable route KP 85 to KP 120: depth profile, cable crossings, vessel density and areas of stakeholder concern

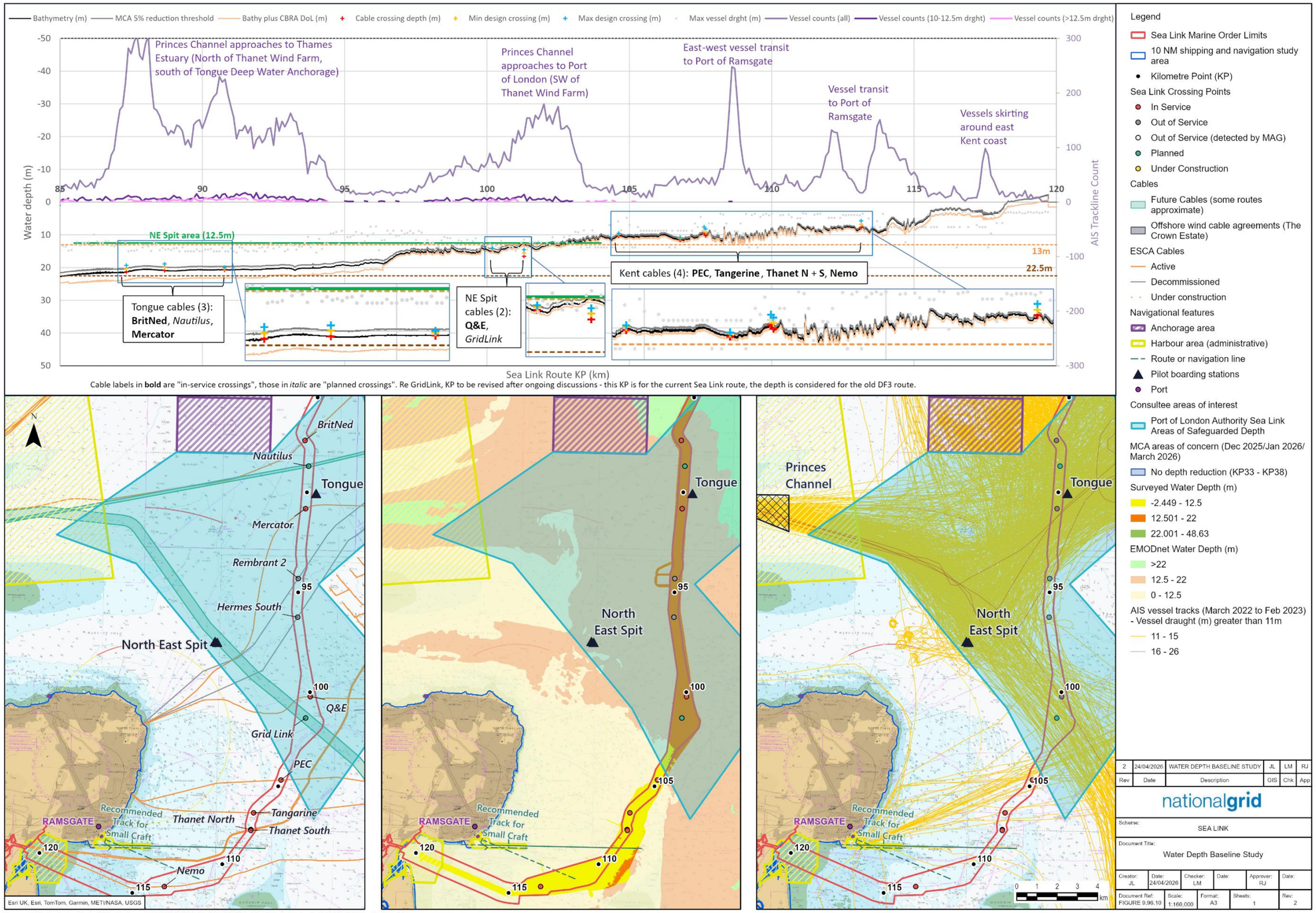


Plate 3.10 Cable route KP 85 to KP 120: depth profile, cable crossings, vessel density and areas of stakeholder concern

References

Maritime and Coastguard Agency. (2021, April). *MGN 654 (M+F) Offshore Renewable Energy Installations (OREI) safety response.* Retrieved from https://assets.publishing.service.gov.uk/media/64637cd60b72d3000c34454c/MGN_654.pdf

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