

Norfolk Vanguard Offshore Wind Farm Consideration of EN-1 Climate Change Policy in the Application

Applicant: Norfolk Vanguard Limited
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Photo: Kentish Flats Offshore Wind Farm



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1 CONSIDERATION OF EN-1 CLIMATE CHANGE POLICY IN THE APPLICATION

1.1 Introduction

1. During Issue Specific Hearing 1 (Onshore Environmental Matters), the Examining Authority requested that the Applicant provide an explanation of how the key elements of coastal erosion and climate change, as set out in the National Policy Statement (NPS) for Energy (EN-1) are considered as part of the design and assessment of the Norfolk Vanguard project, particularly with regard to the landfall.

1.2 National Policy Statement EN-1

2. Section 5.5.1 of the NPS for Energy (EN-1) states the following objectives in relation to planning and coastal change:

“The Government’s aim is to ensure that our coastal communities continue to prosper and adapt to coastal change. This means planning should:

- *ensure that policies and decisions in coastal areas are based on an understanding of coastal change over time;*
- *prevent new development from being put at risk from coastal change by*
 - (i) avoiding inappropriate development in areas that are vulnerable to coastal change or any development that adds to the impacts of physical changes to the coast, and*
 - (ii) directing development away from areas vulnerable to coastal change;*
- *ensure that the risk to development which is, exceptionally, necessary in coastal change areas because it requires a coastal location and provides substantial economic and social benefits to communities, is managed over its planned lifetime; and*
- *ensure that plans are in place to secure the long term sustainability of coastal areas.”*

3. Additionally, the NPS for Energy (EN-1) states the following in relation to coastal erosion and climate change. It should be noted that the following guidance is stated to be of relevance to onshore energy infrastructure projects (and the impacts of offshore renewable energy projects on marine life and coastal geomorphology are considered in EN3), however this has been included for completeness given the onshore and offshore aspects of the cable route for Norfolk Vanguard.

‘the ES should include an assessment of the effects on the coast. In particular, applicants should assess:

- *The impact of the proposed project on coastal processes and geomorphology, including by taking account of potential impacts from climate change. If the*

development will have an impact on coastal processes the applicant must demonstrate how the impacts will be managed to minimise adverse impacts on other parts of the coast.

- *The implications of the proposed project on strategies for managing the coast as set out in Shoreline Management Plans (SMPs) ... and any relevant Marine Plans [Objective 10 of the East Inshore and East Offshore Marine Plans, which is relevant to the Norfolk Vanguard project, is “To ensure integration with other plans, and in the regulation and management of key activities and issues, in the East Marine Plans, and adjacent areas”. This therefore refers back to the objectives of the SMPs]... and capital programmes for maintaining flood and coastal defences.*

...

- *The vulnerability of the proposed development to coastal change, taking account of climate change, during the project’s operational life and any decommissioning period.’*

4. The EN-1 National Policy Statement (NPS) for Energy (EN-1) also states the following:

‘applicants must consider the impacts of climate change when planning the location, design, build, operation and, where appropriate, decommissioning of new energy infrastructure. The ES should set out how the proposal will take account of the projected impacts of climate change.’

5. This is taken into consideration in the landfall site selection, design and the impact assessment undertaken as part of the Norfolk Vanguard application, as detailed in the following sections and discussed during the onshore issue specific hearing (ISH1).

1.3 Impact of the proposed project on coastal change

6. Chapter 8 of the ES (Marine Geology, Oceanography and Physical Processes) (document reference 6.1.8) details the assessment of potential construction, operation and decommissioning impacts in sections 8.7.7.5 and 8.7.8.6.
7. Embedded mitigation to minimise potential impacts at the landfall from cable installation and operation are described in section 8.7.4 of Chapter 8.
8. It is anticipated that the future erosion rate of the coast at Happisburgh South will be affected by the predicted higher rates of sea-level rise than historically recorded. Higher baseline water levels would result in a greater occurrence of waves impacting the toes of the cliffs, increasing their susceptibility to erosion as identified in Chapter 8 of the Norfolk Vanguard ES (document reference 6.1.8).
9. The allowance for sea-level rise due to climate change up to 2065 is estimated to be 0.42m. This is based on the recent update of the Environment Agency’s guidance for

climate change allowances (Environment Agency, 2016) using the range of published allowances and scenarios in UK Climate Projections 2009 (UKCP09).

10. With respect to waves, climate projections indicate that wave heights in the southern North Sea will increase by between 0 and 0.05m by 2100 and there is predicted to be an insignificant effect on storm surges over the lifetime of Norfolk Vanguard (Lowe et al., 2009).
11. The assessment within Chapter 8 of the ES concludes that there will be no significant impact on coastal processes and geomorphology (and therefore no contribution to coastal change in the area) as a result of the project. This takes account of potential sea level rise as a result of climate change.

1.4 Implications of the proposed project on strategies for managing the coast

12. The selected landfall site for Norfolk Vanguard export cables at Happisburgh South is fronted by unprotected cliffs which are subject to dynamic natural processes. This area of the coastline is considered within the Kelling to Lowestoft Ness Shoreline Management Plan (SMP) published and adopted by North Norfolk District Council (NNDC, 2012). The shoreline policy is 'Managed Realignment' at the landfall.
13. The Applicant has committed to the use of long Horizontal Directional Drilling (HDD) at landfall, avoiding interaction with the cliffs, and cables would be installed at sufficient depth below the coastal shore platform and cliff base to ensure there would be no significant effect on coastal erosion. This has been agreed with North Norfolk District Council as shown in the Statement of Common Ground (SOCG) (Document reference Rep1 - SOCG - 17.1) which notes that the District Council '*consider the 'long' HDD option represents the best and preferred option*'. The document also states the District Council's position as '*the decision to use the 'long' HDD option to bring cable onshore will be unlikely to result in adverse coastal impacts*' and '*any impact on coastal processes would be considered negligible by NNDC*'.

1.5 Effects of coastal change and climate change on the proposed development

14. The potential for coastal change to affect the proposed development has been considered during the site selection and project design stage, taking account of potential climate change.

1.5.1 Site Selection

15. The landfall site selection process is discussed in Chapter 4 Site Selection and Assessment of Alternatives of the ES and was informed by a Coastal Erosion Study (ES Appendix 4.3).

16. Forecast erosion rates presented in both the SMP (NNDC, 2012) and in Appendix 4.3 of the Norfolk Vanguard ES have been and will continue to be considered in the design of the landfall.
17. The Norfolk Vanguard Coastal Erosion Study (ES Appendix 4.3) takes account of the following, in predicting future erosion rates:
 - Various data and information sources, including local knowledge;
 - Modelling of the longshore interactions;
 - Consideration of a range of coastal management scenarios, including a scenario that matches current intentions, both locally and in neighbouring frontages;
 - The upper end estimate of sea level rise from the Environment Agency's Guidance (Environment Agency, 2011); and
 - An increase in wave loading.
18. The Norfolk Vanguard Coastal Erosion Study takes into account the fact that coastal management in this area of the Norfolk coast has varied considerably over recent years; both locally at Happisburgh and in the neighbouring frontage which acts as a control.

1.5.2 Mitigation through Design

19. The landfall design will mitigate against impacts to or from coastal erosion processes over the lifetime of the project. This embedded mitigation also contributes to the final objective in section 5.5.1 of EN-1, regarding securing the long term sustainability of coastal areas. The methodology is underpinned by the following principles and decisions which have been informed by a HDD feasibility study by Riggall & Associates (Document reference: ExA; AS; 10.D1.8A). These principles will ensure the export cables remain buried at landfall during the life of the project and will have no significant impact on either the cliffs or the beach.
20. The Applicant has committed to the use of long HDD at landfall, exiting in water deeper than 5.5m below Lowest Astronomical Tide (LAT). This prevents the requirement for surface excavations on the beach or at the existing cliff face.
21. Norfolk Vanguard has adopted a suitably conservative design to account for coastal erosion and climate change using the following design measures:
 - **Distance from coast**
 - Future erosion rates at Happisburgh are predicted to be between 50m to 110m by 2065.
 - The indicative design life of Norfolk Vanguard is approximately 30 years.

- The HDD entry point will be set back from the existing cliff-line by at least 125m (Figure 1 **Error! Reference source not found.**). Furthermore, the landfall compound zone currently extends a further 200m inland, to allow flexibility in the siting of the landfall post consent, using the most up to date information and forecasts.
 - **Drilling depth**
 - The HDD will be secured beneath the surface of the shore platform and the base of the cliff.
 - Cables will be installed at sufficient depth below the coastal shore platform and cliff base to account for downcutting (downwards erosion) as cliff erosion progresses (Figure 2) to prevent cables becoming exposed during the design life of the project. This has been agreed with North Norfolk District Council as shown in the SOCG (Document reference Rep1 - SOCG - 17.1).
22. Figure 2 graphically illustrates the existing and predicted shoreline position and beach levels at Happisburgh South in 2025, 2055 and 2105 based on the North Norfolk District Council SMP alongside an indicative landfall drill profile. Figure 2 clearly shows the export cables will remain buried beyond the predicted erosion levels up to 2105. Due to the proposed burial depth, Norfolk Vanguard is confident that the cables will remain buried despite potential vertical erosion fluctuations, with burial depths also including a conservative risk mitigation of unexpected accelerated erosion rates. This therefore represents a highly precautionary cable burial (of which Natural England are in agreement with following agreement of the Clarification Note (Appendix 1 of the SOCG with Natural England, document reference Rep1 – SOCG – 13.1)) as the design life of Norfolk Vanguard is expected to be around 30 years.
23. Onshore decommissioning is controlled under Requirement 29 of the draft DCO which provides as follows:
- '29(1) Within six months of the permanent cessation of commercial operation of the onshore transmission works an onshore decommissioning plan must be submitted to the relevant planning authority for approval.*
- (2) The decommissioning plan must be implemented as approved."*
24. The decommissioning plan would be submitted to the relevant planning authority (whose jurisdiction extends to Mean Low Water Springs) under Requirement 29(1), unless otherwise agreed between that relevant planning authority and the Secretary

of State. This is noted in the Applicant Responses to the ExA's First Written Questions (document reference ExA; WQ; 10.D1.3).

1.6 Summary

25. Taking into account the above, and relevant documents submitted as part of the application and examination for Norfolk Vanguard, the Applicant therefore concludes that the relevant matters within the NPS for Energy (EN-1) have been satisfied through the preparation of the ES, including assessments detailed within it and supporting documentation, the design of the project and its proposed mitigation.
26. With particular relevance to Section 5.5.1 and dealing with each point in turn:
 - a. **Decisions to be based on an understanding of coastal change** – Chapters 4 and 8 of the ES (and relevant appendices) provide an assessment of coastal change over time which has informed the design of the Project and particularly the site selection and detailed design at the landfall.
 - b. **Prevent new development (i.e. the cables) from being put at risk from coastal change** - the commitment to site the landfall compound zone back from the existing cliff-line by at least 125m (far beyond the projected levels of erosion) removes the risks of cables becoming exposed as a result of coastal change over its planned lifetime.
 - c. **Ensure that any risks to the new development (i.e. the cables) are managed over their lifetime** - the drill profile is proposed to be sufficiently far back from the existing cliff face and deep enough below the beach to ensure that landfall cable ducts will not become exposed under a worst case scenario during the project lifetime. This was noted as a response to the Examining Authority's written question 9.1 (document reference ExA; WQ; 10.D1.3) and this information has been published in the Landfall Information Sheet submitted at Deadline 1 (document reference ExA; AS; 10.D1.8B). Onshore decommissioning is controlled under Requirement 29 of the dDCO which requires a decommissioning plan to be submitted to the relevant planning authority unless otherwise agreed between that relevant planning authority and the Secretary of State.
 - d. **Ensure plans are in place to secure the long term sustainability of coastal areas** - Chapter 8 of the ES concludes that the Project will not contribute to coastal change in the area. Therefore the project will have no effect on the long term sustainability of the coastal area.

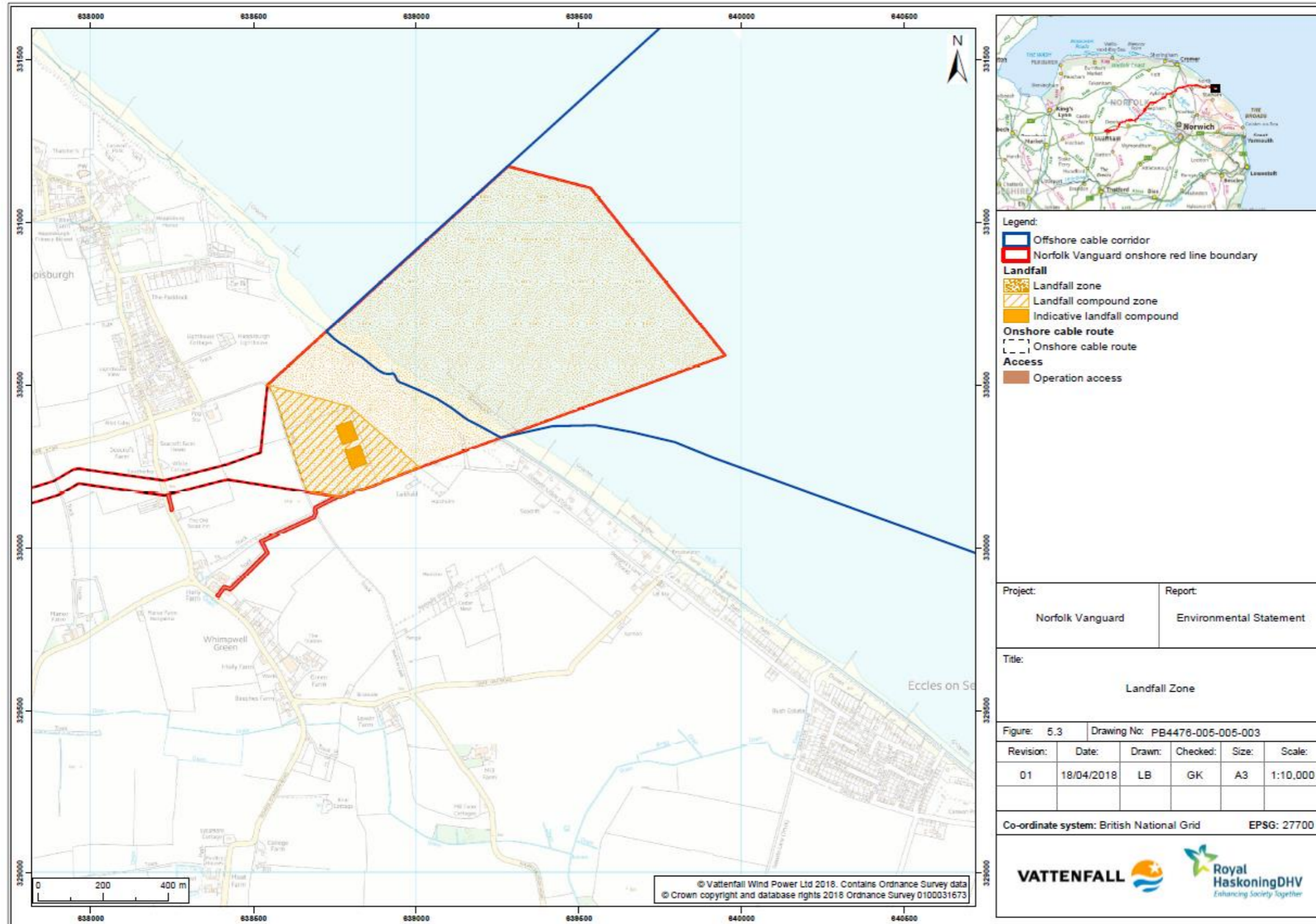


Figure 1 Indicative location of landfall compound within the landfall compound zone.

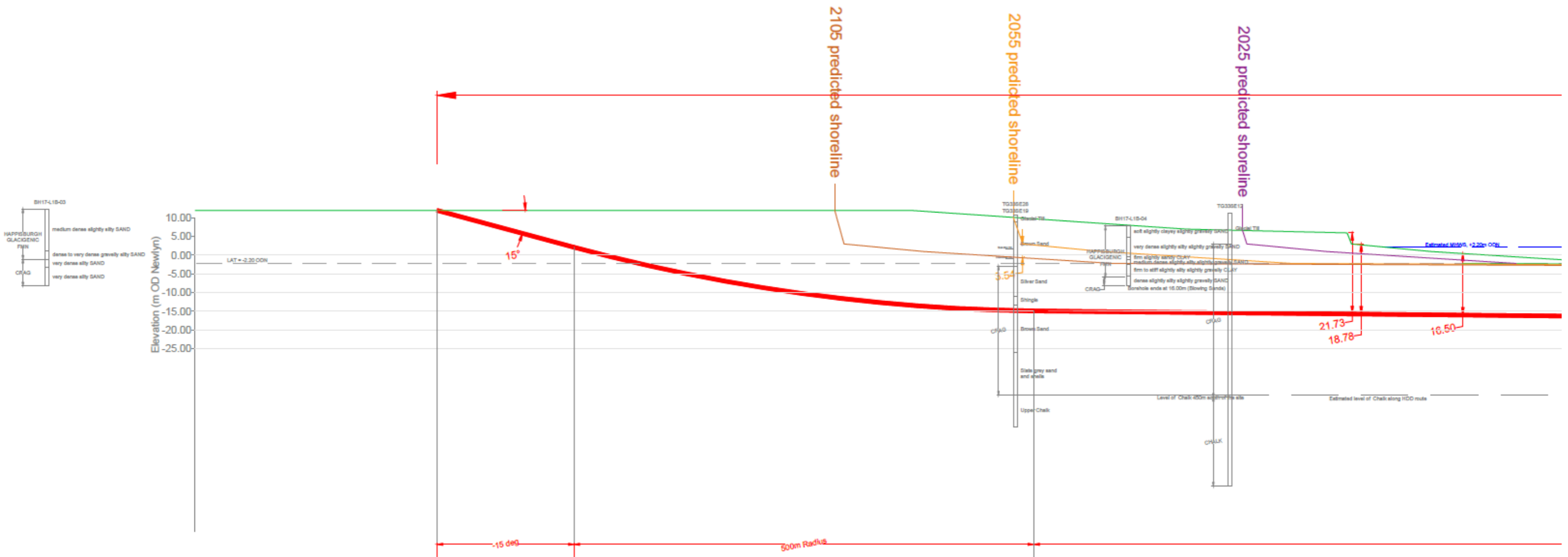


Figure 2 Predicted beach levels in 2025, 2055 and 2105 with indicative cable depth and angle shown