

Submission ID: 34608

On behalf of North Falls Offshore Wind Farm Limited in response to the Five Estuaries Examining Authority's Rule 17 request for further information dated 20 February 2025, we are submitting the following documents into Five Estuaries Examination Deadline 7:

- Cover Letter (North Falls document reference 11.1).
- Outline Landscape and Ecological Management Strategy (Rev 1) [North Falls Examination reference: REP1-035].
- Design Vision [North Falls Examination reference: APP-234]



# NORTH FALLS

*Offshore Wind Farm*

## Cover Letter

North Falls Offshore Wind Farm Limited  
Response to Request for Further Information  
(Rule 17) from the Examining Authority for the  
Five Estuaries Offshore Wind Farm

Document Reference:	11.1
Volume:	11
Date:	March 2025
Revision:	0

**Project Reference: EN010115**



**NORTH FALLS**

*Offshore Wind Farm*

<b>Project</b>	Five Estuaries Offshore Wind Farm
<b>Document Title</b>	Cover Letter: North Falls Offshore Wind Farm Limited Response to Request for Further Information (Rule 17) from the Examining Authority for the Five Estuaries Offshore Wind Farm
<b>Document Reference</b>	11.1
<b>Supplier</b>	North Falls Offshore Wind Farm Limited

This document and any information therein are confidential property of North Falls Offshore Wind Farm Limited and without infringement neither the whole nor any extract may be disclosed, loaned, copied or used for manufacturing, provision of services or other purposes whatsoever without prior written consent of North Falls Offshore Wind Farm Limited, and no liability is accepted for loss or damage from any cause whatsoever from the use of the document. North Falls Offshore Wind Farm Limited retains the right to alter the document at any time unless a written statement to the contrary has been appended.

<b>Revision</b>	<b>Date</b>	<b>Status/Reason for Issue</b>	<b>Originator</b>	<b>Checked</b>	<b>Approved</b>
0	March 2025	Submission to Five Estuaries Examination	NFOW	NFOW	NFOW

**Contents**

- 1. North Falls Documents Submitted into Five Estuaries' Examination ..... 5
  - 1.1 Documents requested in the Rule 17 Letter ..... 5
- 2. Contact details ..... 5

c/o Grahame Gould  
Lead Member of the Panel of Examining Inspectors for the Five Estuaries Examining  
Authority  
National Infrastructure Planning  
Temple Quay House  
2 The Square  
Bristol, BS1 6PN

North Falls Offshore Wind Farm Limited  
Windmill Hill Business Park  
Whitehill Way  
Swindon  
Wiltshire  
SN5 6PB  
United Kingdom

[northfalls@planninginspectorate.gov.uk](mailto:northfalls@planninginspectorate.gov.uk)

03 March 2025

Dear Mr Gould,

**Planning Act 2008**

**Project Title:** North Falls Offshore Wind Farm

**Applicant:** North Falls Offshore Wind Farm Limited

**Application Reference:** EN010115

This letter is provided in response to the Examining Authority's (ExA) Rule 17 Letter – request for further information and is submitted at Five Estuaries Offshore Wind Farm (Five Estuaries) Examination Deadline 7.

This Cover Letter (**document reference 11.1**) is structured as follows:

- Section 1 – North Falls Documents Submitted into Five Estuaries' Examination; and
- Section 2 – Contact Details.

# 1. NORTH FALLS DOCUMENTS SUBMITTED INTO FIVE ESTUARIES' EXAMINATION

## 1.1 Documents requested in the Rule 17 Letter

1.1.1 Further to the Rule 17 Letter issued by the Five Estuaries' ExA on 20 February 2025, North Falls have submitted the following documents into Five Estuaries' Examination at Deadline 7:

- Design Vision [**North Falls Examination reference: APP-234**] (which is the equivalent of the Onshore Substation Design Principles Document - current Five Estuaries examination library reference [REP6-018]); and,
- Outline Landscape and Ecological Management Strategy (Rev 1) [**North Falls Examination reference: REP1-035**] (which is the equivalent of the Outline Landscape and Ecological Management Plan - current Five Estuaries examination library reference [REP6-026]).

1.1.2 The North Falls Examination is currently in progress and is due to finish on 28 July 2025. Consequently, the Design Vision [**APP-234**] and Outline Landscape and Ecological Management Strategy (Rev 1) [**REP1-035**] may be updated during this time.

1.1.3 North Falls would like to note that the ExA for North Falls has been informed that these documents have been shared with the ExA for Five Estuaries.

## 2. CONTACT DETAILS

2.1.1 If we can be of any further assistance, please do not hesitate to contact us using the details provided below:-

Yours Faithfully,

Daniel Harper

Consents Manager

@sse.com



North Falls Offshore Wind Farm Limited



**NORTH FALLS**

*Offshore Wind Farm*



## **HARNESSING THE POWER OF NORTH SEA WIND**

*North Falls Offshore Wind Farm Limited*

*A joint venture company owned equally by SSE Renewables and RWE.*

*To contact please email [contact@northfallsoffshore.com](mailto:contact@northfallsoffshore.com)*

© 2024 All Rights Reserved

**North Falls Offshore Wind Farm Limited** Registered Address: Windmill Hill Business Park, Whitehill Way, Swindon, Wiltshire, SN5 6PB, United Kingdom  
Registered in England and Wales Company Number: 12435947



**NORTH FALLS**

*Offshore Wind Farm*

# **Outline Landscape and Ecological Management Strategy (Clean)**

Document Reference: 7.14  
Volume: 7  
Date: February 2025  
Revision: 1



**Project Reference: EN010119**



**NORTH FALLS**

*Offshore Wind Farm*

<b>Project</b>	North Falls Offshore Wind Farm
<b>Document Title</b>	Outline Landscape and Ecological Management Strategy (Clean)
<b>Document Reference</b>	7.14
<b>Supplier</b>	Royal HaskoningDHV
<b>Supplier Document ID</b>	PB9244-RHD-ZZ-ON-RP-ON-0283

This document and any information therein are confidential property of North Falls Offshore Wind Farm Limited and without infringement neither the whole nor any extract may be disclosed, loaned, copied or used for manufacturing, provision of services or other purposes whatsoever without prior written consent of North Falls Offshore Wind Farm Limited, and no liability is accepted for loss or damage from any cause whatsoever from the use of the document. North Falls Offshore Wind Farm Limited retains the right to alter the document at any time unless a written statement to the contrary has been appended.

<b>Revision</b>	<b>Date</b>	<b>Status/Reason for Issue</b>	<b>Originator</b>	<b>Checked</b>	<b>Approved</b>
0	July 2024	Submission	RHDHV	NFOW	NFOW
1	February 2025	Deadline 1	RHDHV	NFOW	NFOW

**Contents**

- 1. Introduction ..... 9
  - 1.1 Project background..... 9
  - 1.2 Purpose of the document ..... 9
  - 1.3 Key relevant components of the Project ..... 10
  - 1.4 Scope ..... 10
  - 1.5 Structure..... 12
  - 1.6 Content of the EMP ..... 13
- 2. Onshore Ecology ..... 13
  - 2.1 Ecological Clerk of Works..... 13
  - 2.2 Pre-construction mitigation measures ..... 15
    - 2.2.1 General pre-construction measures..... 15
    - 2.2.2 Habitats ..... 18
    - 2.2.3 Protected and notable species ..... 19
  - 2.3 Construction mitigation measures ..... 27
    - 2.3.1 General construction measures..... 27
    - 2.3.2 Habitats ..... 28
    - 2.3.3 Designated sites ..... 29
    - 2.3.4 Protected and notable species ..... 30
  - 2.4 Post-construction mitigation measures..... 36
    - 2.4.1 Protected and notable species ..... 36
  - 2.5 Long-term ecological management ..... 37
    - 2.5.1 Habitats ..... 37
    - 2.5.2 Protected Species ..... 38
  - 2.6 Biodiversity enhancements..... 39
  - 2.7 Monitoring and reporting..... 40

2.7.1	Reporting .....	40
2.7.2	Monitoring.....	41
2.8	Indicative timetable of suitable works period .....	43
3.	Landscape .....	46
3.1	Content of the Written Landscape Scheme .....	46
3.2	Landscape context .....	46
3.3	Design principles .....	47
3.4	Construction stage landscape and visual mitigation .....	48
3.4.1	Design mitigation .....	48
3.4.2	Habitat management and reinstatement.....	48
3.5	Operational stage landscape and visual mitigation .....	48
3.5.1	Design mitigation .....	48
3.5.2	Embedded mitigation.....	48
3.5.3	Additional landscape mitigation .....	49
3.6	Outline Landscape Strategy .....	49
3.7	Relevant onshore archaeology and cultural heritage mitigation .....	50
3.8	Landscape strategy principles .....	50
3.9	Planting information.....	51
3.9.1	Advance Planting.....	51
3.9.2	Planting Growth Rates.....	51
3.9.3	Planting Restrictions .....	51
3.10	Landscape maintenance .....	52
3.10.1	Aftercare period .....	52
3.10.2	Longer term management .....	52
4.	References .....	54

## Tables

Table 1.1 Summary of OLEMS Changes .....	9
Table 2.1 Pre-construction ecological survey requirements .....	16
Table 2.2 Key for Table 2.3 showing an indicative programme for optimal works relating to Ecology .....	43
Table 2.3 Indicative programme for optimal works relating to onshore ecology .....	44
Table 3.1 North Falls Project Components and corresponding LCA .....	47

## Glossary of Acronyms

AIA	Arboricultural Impact Assessment
AMS	Arboricultural Method Statement
AOD	Above Ordnance Datum
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BNG	Biodiversity Net Gain
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CLoWS	Candidate Local Wildlife Site
CoCP	Code of Construction Practice
CRoW	Countryside and Rights of Way
DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero
EclA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
EFC	Essex Field Club
EIA	Environmental Impact Assessment
EMP	Ecological Management Plan
EPP	Evidence Plan Process
EPS	European Protected Species
ES	Environmental Statement
ETG	Expert Topic Group
GI	Green Infrastructure
HDD	Horizontal Directional Drilling
IAQM	Institute of Air Quality Management
ILP	Institute of Lighting Professionals
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LPA	Local Planning Authority
NERC	Natural Environment and Rural Communities
NFOW	North Falls Offshore Wind Farm Limited
NVC	National Vegetation Classification
OCoCP	Outline Code of Construction Practice
OLEMS	Outline Landscape and Ecological Management Strategy
PEA	Preliminary ecological appraisal
PEIR	Preliminary Environmental Information Report
PMoW	Precautionary method of working
PRF	Potential Roost Feature

RAMs	Reasonable Avoidance Measures
RAMS	Risk Assessment and Method Statement
RWE	RWE Renewables UK Swindon Limited
SEER	SEE Renewables Offshore Windfarm Holdings Limited
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
TCC	Temporary Construction Compound
TPP	Tree protection plans
UKHPI	UK Habitats of Principal Importance

## Glossary of Terminology

400kV onshore cable route	Onshore route within which the onshore substation to National Grid connection point onshore export cables and associated infrastructure would be located.
Haul road	The track along the onshore cable route used by construction traffic to access different sections of the onshore cable route.
Horizontal directional drill (HDD)	Trenchless technique to bring the offshore cables ashore at the landfall. The technique will also be used for installation of the onshore export cables at sensitive areas of the onshore cable route.
Landfall	The location where the offshore export cables come ashore at Kirby Brook.
Landfall compound	Compound at landfall within which HDD or other trenchless technique would take place.
Landfall search area	The area considered at PEIR, comprising the Essex coast between Clacton-on-Sea and Frinton-on-Sea within which the landfall is located.
National Grid connection point	The grid connection location for the Project. National Grid are proposing to construct new electrical infrastructure (a new substation) to allow the Project to connect to the grid, and this new infrastructure will be located at the National Grid connection point.
National Grid substation connection works	Infrastructure required to connect the Project to the National Grid connection point.
Onshore cable route	Onshore route within which the onshore export cables and associated infrastructure would be located.
Onshore project area	The boundary within which all onshore infrastructure required for the Project will be located (i.e. landfall; onshore cable route, accesses, construction compounds; onshore substation and cables to the National Grid substation).
Onshore substation	A compound containing electrical equipment required to transform and stabilise electricity generated by the Project so that it can be connected to the National Grid.
Onshore substation construction compound	Area set aside to facilitate construction of the onshore substation. Will be located adjacent to the onshore substation.
Onshore substation works area	Area within which all temporary and permanent works associated within the onshore substation are located, including onshore substation, construction compound, access, landscaping, drainage and earthworks.
Temporary construction compound	Area set aside to facilitate construction of the onshore cable route. Will be located adjacent to the onshore cable route, with access to the highway where required.
The Applicant	North Falls Offshore Wind Farm Limited (NFOW).

The Project Or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Trenchless crossing	Use of a technique to install limited lengths of cable below ground without the need to excavate a trench from the surface, used in sensitive areas of the onshore cable route to prevent surface disturbance. Includes techniques such as HDD.
Trenchless crossing compound	Areas within the onshore cable route which will house trenchless crossing (e.g. HDD) entry or exit points.

# 1. Introduction

## 1.1 Project background

1. North Falls Offshore Wind Farm Limited ('the Applicant' or 'NFOW') is seeking a Development Consent Order (DCO) for the North Falls Offshore Wind Farm (hereafter referred to as 'the Project' or 'North Falls').
2. The North Falls Offshore Wind Farm is located in the southern North Sea, c. 40km from the East Anglian coast at its closest point. North Falls will be connected to the shore by offshore export cables to a landfall point at Kirby Brook, on the Essex coast. From there, onshore export cables will transport power over approximately 24km to a new high voltage alternating current (HVAC) onshore substation. The onshore substation will be constructed to accommodate the connection of North Falls to the transmission grid. A full project description is given in the Environmental Statement (ES) Chapter 5 Project Description (Document Reference: 3.1.7).

## 1.2 Purpose of the document

3. This document sets out the Outline Landscape and Ecological Management Strategy (OLEMS) for the Project in respect of onshore ecology, ornithology and landscape receptors. This OLEMS sets out an outline of the measures that are proposed to avoid or mitigate ecological and landscape impacts during the pre-construction, construction and operation phases of the Project, as identified through the Project's Environmental Impact Assessment (EIA).
4. This OLEMS will form the basis for a final Ecological Management Plan (EMP) and Written Landscape Scheme, which will both be prepared and submitted to the Local Planning Authority (LPA) (Essex County Council) for approval prior to construction of the Project. The EMP and the Written Landscape Scheme are secured by DCO Requirements.
5. Following the submission of the DCO application, comments have been provided by stakeholders regarding the content of the OLEMS. Table 1.1 provides a summary of the amendments that have been made in response.

**Table 1.1 Summary of OLEMS Changes**

OLEMS Revision Number	Summary of Changes	Relevant Section of the OLEMS
1	Addition of pre-construction bat hibernation surveys, if required	Section 2.2.3.2
	Confirmation that transportation routes will not be through the Holland Haven Marshes SSSI	Section 2.3.3



### 1.3 Key relevant components of the Project

6. The Project's onshore infrastructure is located entirely within the Tendring peninsula of Essex and comprises transmission infrastructure required to connect the Project's offshore transmission cable to the national grid. The key components of the Project's onshore infrastructure are:
  - Landfall and associated transition joint bays;
  - Onshore export cables housed within cable ducts and associated joint bays and link boxes;
  - Onshore substation and ancillary works;
  - Connection to the national grid;
  - Trenchless crossing works (e.g. Horizontal Directional Drilling (HDD));
  - Works to improve Bentley Road and provision of temporary non-motorised user route;
  - Temporary works to facilitate construction (Temporary Construction Compound (TCCs), temporary means of access); and
  - Operational accesses.
7. Optionality in the Project's design envelope has been retained at this stage, prior to detailed design. The main grid connection options considered in the Project's DCO application are:
  - Option 1: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, with a project alone onshore cable route and onshore substation infrastructure;
  - Option 2: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, sharing an onshore cable route and onshore duct installation (but with separate onshore export cables) and co-locating separate project onshore substation infrastructure with Five Estuaries Offshore Wind Farm ('Five Estuaries');  
or
  - Option 3: Offshore electrical connection, supplied by a third party.
8. The earliest that construction would commence under any scenario is 2027, with the onshore construction works likely to commence first.
9. Further details of the key components of offshore and onshore infrastructure can be found in ES Chapter 5 Project Description (Document Reference: 3.1.7).

### 1.4 Scope

10. The purpose of this OLEMS is to provide a single document that presents the outline management and mitigation measures that have been identified through the Project's EIA and that are required prior to, during and post construction of the onshore elements of the Project for onshore ecological and landscape receptors. It also provides information on any long-term management measures required to enable the reinstatement and/or enhancement of habitats.

11. This OLEMS provides details of pre-construction ecology surveys which will be required post consent in order to update the ecological baseline and inform the final EMP.
12. This OLEMS has been drafted based on the findings of pre-consent surveys undertaken between 2021 and 2023. Further information and full survey results can be found within the following documents:
  - ES Appendix 23.1 Extended Phase 1 Habitat Survey Report (Document Reference: 3.3.30);
  - ES Appendix 23.2 Great Crested Newt eDNA Survey Report (Document Reference: 3.3.31);
  - ES Appendix 23.3 Riparian Mammals (Water Vole and Otters) Survey Report (Document Reference: 3.3.32);
  - ES Appendix 23.4 Reptile Survey Report (Document Reference: 3.3.33);
  - ES Appendix 23.5 Hazel Dormouse Survey Report (Document Reference: 3.3.34);
  - ES Appendix 23.6 Terrestrial and Aquatic Invertebrate Survey Report (Document Reference: 3.3.35);
  - ES Appendix 23.7 National Vegetation Classification (NVC) Survey Report (Document Reference: 3.3.36);
  - ES Appendix 23.8 Bat Emergence / Re-Entry Survey Report (Document Reference: 3.3.37);
  - ES Appendix 23.9 Bat Activity Survey Report (Document Reference: 3.3.38);
  - ES Appendix 24.1 Onshore Landfall Area: 2020-21 Non-breeding Bird Surveys Report (Document Reference: 3.3.40);
  - ES Appendix 24.2 Onshore Landfall Area: 2021 Breeding Bird Surveys Report (Document Reference: 3.3.41);
  - ES Appendix 24.3 Onshore Landfall Area: 2021-22 Non-breeding Bird Surveys Report (Document Reference: 3.3.42);
  - ES Appendix 24.4 Onshore Landfall Area: 2022 Breeding Bird Surveys Report (Document Reference: 3.3.43);
  - ES Appendix 24.5 Onshore Cable Route: Non-breeding Bird Surveys 2021-22 Report (Document Reference: 3.3.44);
  - ES Appendix 24.6 Onshore Cable Route: Non-breeding Bird Surveys 2022-23 Report (Document Reference: 3.3.45);
  - ES Appendix 24.7 Five Estuaries Onshore Cable Route Breeding Bird Surveys 2022 Report (MKA Ecology) (Document Reference: 3.3.46); and
  - ES Appendix 24.8 Five Estuaries Onshore Cable Route Breeding Bird Surveys 2022 Report (Ecology Resources) (Document Reference: 3.3.47).
13. This document has been informed by the Project's Biodiversity Net Gain (BNG) Strategy (Document Reference: 7.22) and Green Infrastructure Plan (Document

Reference: 3.3.39). The information presented in this OLEMS has been informed by the initial BNG assessment work undertaken on the Project's design information available at this stage, and it is recommended that the OLEMS and BNG Strategy are read in parallel for a full explanation of how BNG has been considered with the landscape and ecological mitigation measures, enhancement and net gain proposed.

14. The document has also been informed by the Project's Design Vision (Document Reference: 2.3), which has been subject to design review by the Design Council during 2023 and 2024.
15. This OLEMS should be read in conjunction with the Project's Outline Code of Construction Practice (OCoCP) (Document Reference: 7.13), which provides outline details of the environmental management measures to be implemented during the Project's construction, and which will be used as the basis of a final Code of Construction Practice (CoCP) prepared post-consent, secured by DCO Requirement.
16. Following the completion of the pre-construction surveys and the completion of detailed design undertaken post-consent, an EMP will be produced which will detail the final mitigation measures which will be adhered to during the Project's construction and operation. A Written Landscape Scheme will also be produced, which will be based on this OLEMS and which detail the landscape mitigation measures which will be implemented during the project's construction an operation. Furthermore, a BNG Assessment, based on the BNG Strategy submitted with the Project DCO application (Document Reference: 7.22) will be produced which will provided final BNG calculations and proposals for BNG based on the Project's detailed design. These three documents will all be secured via DCO Requirements.

## 1.5 Structure

17. This OLEMS is set out in the following structure:
  - Section Onshore Ecology:
    - Section 2.1 – Ecological Clerk of Works;
    - Section 2.2 – Pre-construction mitigation measures;
    - Section 2.3 – Construction mitigation measures;
    - Section 2.4 – Post-construction mitigation measures;
    - Section 2.5 – Long-term ecological management;
    - Section 2.6 – Biodiversity enhancements;
    - Section 2.7 – Monitoring and reporting;
    - Section 2.8 – Indicative timetable of suitable works period;
  - Section 3 - Landscape:
    - Section 3.1 – Content of the Written Landscape Scheme;
    - Section 3.2 – Landscape context;
    - Section 3.3 – Design principles;

- Section 3.4 – Construction stage landscape and visual mitigation;
- Section 3.5 – Operational stage landscape and visual mitigation;
- Section 3.6 – Outline Landscape Strategy;
- Section 3.7 – Relevant onshore archaeology and cultural heritage mitigation;
- Section 3.8 – Landscape strategy principles;
- Section 3.9 – Planting information; and
- Section 3.10 – Landscape maintenance.

## 1.6 Content of the EMP

18. The EMP, secured by DCO Requirement, will set out full details of the ecological mitigation measures which will be adhered to during the Project's construction. This will include:

- A programme of works;
- A list of roles and responsibilities for ecological mitigation, including the role of an ecological clerk of works (ECoW);
- A plan showing ecological constraints;
- Full details of good industry practice mitigation required in relation to all species and habitats affected by the Project;
- Full details of any project-specific mitigation identified within this chapter, including habitat creation or protected species mitigation programmes. Any such programmes will be accompanied by mitigation layout plans;
- A list of protected species licences and site consents required to facilitate construction;
- Habitat reinstatement method statements for all habitats proposed to be reinstated following the completion of construction (including grassland, hedgerows, watercourses and arable field margins – see below); and
- Any associated standalone mitigation plans, e.g., reptile precautionary method of working, invasive species management plan, etc. as required.

## 2. Onshore Ecology

### 2.1 Ecological Clerk of Works

19. All of the ecological work described in the final EMP will be undertaken under the guidance of the appointed North Falls lead ECoW.
20. Site inductions and toolbox talks for all site personnel will include reference to the requirements of the EMP and CoCP. The lead ECoW will undertake, or delegate, the following tasks:
- Arrange any specialist ecological surveys required immediately prior to, or during construction;

- Undertake regular ecological site inspections;
  - Assist (where deemed necessary) the Principal Contractor in delivering site inductions and toolbox talks (i.e. presentations and the dissemination of information to site personnel on ecological matters). All briefings will include reference to the requirements set out in the EMP. The site-wide ecological requirements will be explained within these briefings. Additional toolbox talks may also be provided for each new area of works to ensure that area-specific requirements are fully understood and implemented;
  - Assist in reviewing Risk Assessments and Method Statements (RAMS); and
  - Notifying the Principal Contractor of any issues/breaches in the EMP and/or CoCP.
21. Given the scale of the project it is anticipated that an ECoW team would be required, with the lead ECoW delegating duties to an appropriately skilled and experienced deputy/ assistant ECoW(s), where necessary. The lead ECoW would be expected to have a minimum of three years' experience as a professional ecologist including suitable ECoW experience, preferably on large linear infrastructure projects with knowledge of UK ecological policy and legislation. The lead ECoW would be a member or an appropriate professional body, in the case of the Chartered Institute of Ecology and Environmental Management (CIEEM) this would be Associate grade (ACIEEM) or above. They would also hold a Construction Skills Certification Scheme (CSCS) card (or equivalent). Deputy/ assistant ECoWs would also be expected to possess a suitable qualification and/or relevant professional experience.
  22. All site personnel will be briefed on the role and responsibility of the ECoW team. Contact details for the lead ECoW and any deputy/ assistant ECoWs would be provided within the EMP and will be made available to site workers and contractors. A copy of the EMP will be kept on site at all times and site workers would be made aware of its location along with the details of the person to contact in order to obtain a copy.
  23. The ECoW and any deputy/ assistants will be appointed either by the Principal Contractor or by the Applicant to oversee onshore site preparation and construction works. It is also possible that separate ECoW will be appointed by the Principal Contractor and the Applicant, with each ECoW performing different roles.
  24. Any known breaches of the requirements documented within the EMP will be reported to the lead ECoW by the Principal Contractor or site personnel (either directly or through the Principal Contractor) as soon as practicable. Should it become evident to the ECoW that a breach of the requirements of the EMP has occurred, the ECoW will be responsible for reporting this breach to the responsible NFOW Onshore Environmental Manager and Site Manager. Where necessary, the responsible Onshore Environmental Manager and Site Manager would report any breaches to the relevant authorities.
  25. The ECoW will be responsible for developing an appropriate ecology and nature conservation incident response plan for any breach of the EMP, should an ecological incident occur. The NFOW Onshore Environmental Manager would

ensure that any remedial measures proposed are communicated and where required, approved by the relevant LPA (Essex County Council). Where appropriate Natural England would be consulted to obtain their agreement for any remedial measures that may be required, as would the Environment Agency specifically in relation to wetlands and watercourses.

26. The final EMP would be a live document and the ECoW would be responsible for reviewing and updating the EMP, ensuring that the Principal Contractor and all site personnel are aware of the latest version.

## 2.2 Pre-construction mitigation measures

27. This section describes the ecological mitigation measures that would be undertaken prior to the commencement of construction to ensure the protection of ecological receptors.

### 2.2.1 General pre-construction measures

28. Due to the mobility of species and the period of time which will have lapsed between the pre-application surveys and the start of construction, all features surveyed during the pre-application survey effort will be re-surveyed, where necessary, in accordance with industry guidance and methodology (i.e. following the approach used during pre-application surveys, or updated best practice at that time).
29. It is possible that additional ecological receptors may be recorded during these pre-construction surveys. Where this occurs, the EMP will be reviewed and updated to include measures for such receptors where appropriate. All pre-construction surveys will be undertaken by appropriately experienced and, where necessary, licensed ecologists. All surveys will be carried out in accordance with bio-security risk assessments and safe systems of works (i.e. RAMS), which will be produced by the appropriately experienced surveying ecologists and subsequently approved by the Applicant, prior to the commencement of a survey.
30. Table 2.1 presents an indicative list of the pre-construction surveys that will be undertaken alongside each optimal survey period, compared to the surveys carried out prior to consent.
31. The requirement for, and scope of, updated surveys will be dependent on the time elapsed since previous surveys and the extent of any change to supporting habitats, which will be informed through an updated preliminary ecological appraisal (PEA) survey of the onshore construction footprint (including appropriate species-specific buffers).

**Table 2.1 Pre-construction ecological survey requirements**

Baseline survey	Survey area	Survey timing	Survey required pre-construction?	Justification
Extended Phase 1 Habitat survey	Habitats within and up to 50m of the onshore project area.	March - October	No	The proposed mitigation is not expected to change as a result of updated surveys.
Badger surveys	Habitats within and up to 50m of the onshore project area.	Any time of year	<b>Yes</b>	New badger setts may have established since the pre-consent baseline surveys; thus this could have implications as to the mitigation, in particular, licensing required by the Project.
Great crested newt eDNA surveys	All suitable ponds within and up to 250m of the onshore project area.	March - June	No	The use of District Level Licensing negates the need for further surveying.
Riparian mammal surveys	All sui waterbodies within and up to 50m of the onshore project area.	March – September for water vole  Any time of year for otter	<b>Yes</b>	New otter holts and water vole burrows may have established since the pre-consent baseline surveys; thus this could have implications as to the mitigation, in particular, licensing required by the Project.
Reptile surveys	All suitable habitat mosaics within and up to 50m of the onshore project area.	May – June and September - October	<b>Yes</b>	Surveys would be required to understand the current population size / distribution, confirm the need for translocation, identify a suitable translocation site which provides the correct habitat features for the populations to be translocated (if required) and identify the appropriate duration of trapping days required for translocation.
Hazel dormouse surveys	All suitable habitats within and up to 50m of the onshore project area.	April - November	<b>Yes</b>	New hazel dormouse nests may have established since the pre-consent baseline surveys; thus this could have implications as to the mitigation, in particular, licensing required by the Project.
Terrestrial and aquatic invertebrate surveys	All suitable habitats within Holland Haven Marshes Site of Special Scientific Interest (SSSI).	May - September	No	Impacts are avoided at the Holland Haven Marshes SSSI.
NVC surveys	All habitats within Holland Haven Marshes SSSI.	April - August	No	Impacts are avoided at the Holland Haven Marshes SSSI.

Baseline survey	Survey area	Survey timing	Survey required pre-construction?	Justification
Bat emergence/ re-entry surveys	Suitable roosting features within and up to 50m of the onshore project area.	April - October	<b>Yes</b>	New bat roosts may have established since the pre-consent baseline surveys; thus this could have implications as to the mitigation, in particular, licensing required by the Project.
Bat activity surveys	All suitable habitats within and up to 50m of the onshore project area.	April - October	No	The proposed mitigation is not expected to change as a result of updated surveys.
Breeding bird surveys	All suitable habitats within and up to 50m of the onshore project area.	March - August	<b>Yes</b> (breeding bird checks)	New bird nests may have established since the pre-consent baseline surveys; thus this could have implications as to the mitigation, in particular, licensing required by the Project.
Non-breeding bird surveys	All suitable habitats within the onshore project area.	October - March	No	The proposed mitigation is not expected to change as a result of updated surveys.



32. In addition to the survey updates, a tree survey will be undertaken by an appropriately qualified arboriculturist. The survey will also be accompanied by an Arboricultural Impact Assessment (AIA) will be undertaken to assess the quality of the existing trees along the length of proposed onshore cable route. All reports and plans will comply with '*British Standard 5837:2012 Trees in relation to design demolition and construction – Recommendations*' and should provide details on all existing trees and vegetation to be retained and/or removed to facilitate the Project, outlining any arboricultural impacts and constraints. This will identify any trees within the onshore project area that would pose a constraint to the Project and if they are of sufficient quality to merit protection and/or retention. An Arboricultural Method Statement (AMS) and associated tree protection plans (TPP) will be required to ensure retained vegetation is adequately protected throughout the course of the Project's construction. The tree survey report, AIA, AMS and TPPs will be appended to the EMP and submitted to and agreed with the LPA (Essex County Council) prior to the commencement of any construction works.
33. Prior to construction, the arable field margins will be re-surveyed to assess their conservation value and to inform habitat reinstatement. Further information related to habitat reinstatement can be found in Section 2.5.1.

## 2.2.2 Habitats

### 2.2.2.1 Protective Buffer Zones

34. The EMP would specify protective buffer zones around key retained habitats (e.g. woodland, veteran trees, ponds, important grasslands and sections of watercourses). These would be specified in the EMP and relevant construction drawings, with reference to other appropriate documents, including TPPs which would be derived from the AIA and assessment undertaken post-consent, CoCP and standard industry guidance (e.g. BS5837:2012). No works would be undertaken within these buffer zones, which would be maintained throughout the construction period.
35. A 15m buffer zone will be in place surrounding most areas of ancient woodland to avoid direct impacts during construction. A buffer of at least 10m will also be in place around Holland Mill Wood.
36. No specific protective buffer zones will be put in place around UK Habitats of Principal Importance (UKHPI), however protective fencing will be installed around retained UKHPI located directly adjacent to working areas.
37. Additional buffer zones, where required, would be identified by the ECoW around habitat features of value to protected species.
38. All buffer zones would prohibit the tracking of heavy vehicles, and the storage of vehicles, machinery, equipment and soils. Buffer zones would be clearly marked out as specified in the TPP (e.g. using Heras fencing or equivalent) or using high-visibility Netlon fencing or coloured tape, and/or signs describing the prohibitive requirements of the zones would be installed at appropriate locations. Where necessary, specific locations and any requirements would be discussed on site.

39. Pre-construction measures in respect of protected and notable species would be specified in the EMP. Key measures are set out below.

### 2.2.3 Protected and notable species

#### 2.2.3.1 Birds (*wintering and breeding*)

40. The key mitigation measures for birds will comprise:

- Where practicable, works will aim to be scheduled to avoid the breeding bird season (March – September inclusive, although weather dependent) in order to negate potential disturbance of nesting birds. Where this cannot be achieved, all nesting bird habitat would be subject to pre-construction checks by the ECoW (or a suitably experienced ornithologist, where the task is delegated) for the presence of active birds' nests no more than 48 hours prior to removal. Should a nest be found, a buffer zone (minimum 5m, species-dependent) around the nest must be created, and no works must be undertaken within the buffer zone until the young have fledged and/or nest is no longer active. For Schedule 1 listed bird species, further mitigation measures may be required to avoid disturbance to breeding adults, as advised by the ECoW or ornithological expert.
- The buffer zones around active bird nests would be based on species type and sensitivity (advice on this being provided by the ECoW or a suitably experienced ornithologist) but would be at least 5m and marked out to prevent accidental disturbance (advice on the most appropriate technique for the species and location being provided by the ECoW or a suitably experienced ornithologist).
- Measures would be adopted to minimise noise, light and disturbance on identified breeding birds, such as visual screening (e.g. opaque fencing) where necessary. Lighting will be cowled and angled downwards and does not shine directly on sensitive habitats. Lighting is motion activated to minimise unnecessary lighting.
- Construction activities would be monitored by an ECoW or suitably qualified ornithologist, who would seek to ensure compliance with the Wildlife and Countryside Act 1981 (as amended), e.g. by avoiding destruction of nests, eggs or young, and affording increased protection from disturbance to any Schedule 1 species of breeding birds.
- Where breeding bird activity is recorded, all construction works (excluding vehicle and personnel movements) within that area may be halted immediately until a disturbance risk assessment is undertaken by the ECoW or a suitably experienced ornithologist. The risk assessment would consider the nature of construction activity, likelihood of disturbance, and possible implications of the construction activities on the breeding attempt and set out measures to ensure that no disturbance occurs. Where it is determined that breeding birds are not likely to be affected, construction works would continue. Where it is determined that breeding birds may be affected, additional mitigation works would be implemented to prevent disturbance. Where, in the opinion of the suitably qualified ecologist,

disturbance cannot be avoided by mitigation, construction works within the area of disturbance would be suspended until chicks have fledged.

41. The ECoW will maintain a record of all pre-construction bird nest surveys undertaken. The record will be provided to the NFOW Onshore Environmental Manager, and a copy will be made available to relevant stakeholders upon request.

#### 2.2.3.2 *Bats*

42. Pre-construction surveys will be undertaken in advance of works commencing to identify the location of any active bat roosts. Trees within and up to 50m of the onshore project area will be re-assessed for their suitability to support roosting bats prior to construction start, as the potential roost features on trees are likely to change and new features can form overtime due to weather effects and natural processes, such as tree decay. Trees with bat roost potential will then be subject to further survey in or to determine presence / likely absence of roosts. Surveys will be conducted in accordance with best practice guidelines and once completed, a roosting bat impact assessment will be completed. Survey methods include, but are not limited to, endoscope and tree climbing by a bat licenced ecologist.
43. During the pre-construction surveys, trees within and within up to 50m of the onshore project area will also be re-assessed for their potential to support hibernating bats. Where trees are deemed to have moderate to high potential for supporting hibernation roosts, Potential Roost Feature (PRF) inspection surveys will be carried out in line with good industry practice at the time of survey. PRF inspection surveys will comprise detailed internal inspection using torches, mirrors and endoscopes. PRF inspection surveys will only be undertaken by ecologists suitably qualified, trained and experienced and who hold a minimum Level 2 bat survey or research class licence (CL18). PRF inspection surveys will also only be undertaken where it is safe to do so, for example avoiding dead trees which may not be safe to ascend. PRF inspection surveys for hibernation roosts will take place between core wintering months (December - February) to allow an assessment of the impacts to hibernating bats. If deemed appropriate based on the pre-construction PRF inspection surveys, deployment of static bat detectors may also be used as a complementary method to PRF inspection to collect additional species data. Static bat detector surveys for winter activity will be in line with good industry practice at the time of survey.
44. A report of the pre-construction bat survey findings and recommendations would be produced by the suitably qualified and bat licensed ecologist and provided to the NFOW Onshore Environmental Manager. The report will be appended to the EMP, and would also be made available to relevant stakeholders, upon request.
45. Hedgerow removal will be programmed for winter where practicable, to give bats time to adjust to the change prior to the maternity period. Hedgerows will be removed in the preceding winter as close to the onset of works as practicable and works will not commence after nights of poor weather (in case of bad weather roosts being used).

46. Where existing habitats are located adjacent to the onshore project area, these areas will be retained and protected from damage where practicable, using fencing.
47. All trees with 'low' bat roost potential, as classified in accordance with Bat Conservation Trust (BCT) guidelines (Collins, 2023), would be soft-felled, as would any trees with 'high' or 'moderate' bat roost potential where targeted surveys had found no evidence of roosting bat presence. Trees with 'negligible' roost potential will not need to be soft-felled. Soft-felling will likely be included (amongst other mitigation measures) within the method statement of any bat European Protected Species (EPS) mitigation licences to fell any trees in which roosting bats have been confirmed to be present, although this will be determined on an individual (per tree) basis depending on the nature of the roost feature. Trees with 'high' or 'moderate' bat roost potential which have been found (through targeted surveys) to support no roosting bats will still be soft-felled as a precaution, although this would not need to be done under licence given that appropriate surveys would have confirmed no roosting bat presence. Soft-felling involves severance of the feature with bat roost potential (e.g. a limb with a niche in it, or a part of a tree trunk with a woodpecker hole in it, for example) from the tree structure, without damaging the potential roost feature itself, and gentle lowering to the ground, typically using ropes. The severed limb/tree part is then left on the ground overnight, with the intact potential roost feature facing sideways/upwards (not facing into the ground) so as to allow any bats present to emerge. All tree surgeons would be briefed on this approach prior to commencing works on relevant trees.
48. Where roosts of low conservation significance are lost to the Project, bat boxes will be installed as mitigation. The type of bat box needed will depend on the species found in the onshore project area, and these will be determined once pre-construction surveys have been concluded.
49. Confirmed roosting sites that cannot be retained will be removed pre-construction, in line with a Natural England EPS mitigation licence method statement and BCT best practice guidelines (Collins, 2023): gently taking down the tree in sections and leaving them on the ground for 24 hours to allow any bats to vacate the feature(s).
50. A Natural England licence return form and report of the works undertaken would then be completed by the suitably qualified and bat licenced ecologist (e.g. the bat licence holder). A copy of this form and report would be provided to Natural England and the LPA (Essex County Council) as soon as reasonably practicable, and as prescribed by the conditions of the Natural England development licence.

#### 2.2.3.3 Badgers

51. A pre-construction badger survey will be undertaken across the onshore project area plus a 30m buffer zone, to confirm the status of badgers prior to works commencing in order to confirm whether there have been any changes to the site conditions recorded during the pre-consent surveys, as well as noting any new badger setts that have been excavated. All pre-construction surveys will be undertaken sufficiently in advance of the commencement of works to ensure that should there be the potential that construction works will directly affect an

active sett, a licence will be required from Natural England before works can commence.

52. A report of the pre-construction badger survey findings and recommendations would be produced by the suitably qualified ecologist and provided to the NFOW Onshore Environmental Manager. The report will be appended to the EMP, and would also be made available to relevant stakeholders, upon request.
53. If the pre-construction surveys identify areas of key commuting value for badgers (such as well-worn paths connecting setts or foraging grounds) which would be bisected by the onshore project area, warning signs would be installed and reduced speed limits for construction vehicles would be implemented to address increased risk of road traffic accidents with badgers.
54. Where active badger setts are identified but works can be maintained at least 30m away (e.g. where a Natural England licence is not required as works are located out of the 30m buffer zone), the ECoW would ensure that a 30m buffer is set up around those active setts. No works would be undertaken within this 30m buffer unless advised to be acceptable by the ECoW.
55. If an active badger sett needs to be closed to facilitate construction, then a mitigation licence will be sought from Natural England. Mitigation within a Natural England development licence for badgers may require:
  - Main sett replacement in the proposed Mitigation Areas and closure under licence;
  - A replacement sett must be in place in advance of closure of existing sett, and badgers must have used the artificial sett;
  - Sett closure can only occur between 1 July and 30 November;
  - If it is a main sett, proof of discovery of the artificial sett is required prior to closure of the main sett; and
  - Bait marking surveys may be required to ensure the artificial sett is not being built in another clan's territory.
56. If required, a Natural England licence return form and report of the works undertaken will be completed by the ECoW. A copy of this form and report will be provided to Natural England as soon as reasonably practicable and as prescribed under the conditions of the licence. Once the licence has been obtained, the works would need to be carried out in accordance with the requirements of the licence and supervised by the ECoW.

#### *2.2.3.4 Otter and water vole*

57. A pre-construction survey will be undertaken prior to construction to confirm the presence/absence of water voles and otters within the onshore project area. This pre-construction survey will include re-appraising all watercourses within the onshore project area, as part of the updated PEA survey. Any watercourses which are found to provide suitable habitat for otter and/or water vole and which are due to be directly impacted (i.e. through open-cut installation of the onshore export cables) will be the subject of detailed field surveys as part of the pre-construction surveys. No pre-construction surveys are proposed for watercourses which are to be crossed using trenchless techniques.

58. A report of the pre-construction otter and water vole survey findings and recommendations would be produced by the suitably qualified ecologist and provided to the NFOW Onshore Environmental Manager. The report will be appended to the EMP, and would also be made available to relevant stakeholders, upon request.
59. Subject to the results of any pre-construction otter and water vole surveys, if required an application to Natural England for the required licence(s) would be submitted. No works would be undertaken affecting these species until the licence(s) is in place, and works would be undertaken in accordance with the licence method statement(s).
60. Based on the findings from the pre-consent survey results detailed in ES Appendix 23.3 (Document Reference: 3.3.32), there is no specific licence requirements for otter or water voles at this stage. However, general mitigation measures that will be implemented during the works include:
  - Night-time working near watercourses would be avoided or minimised as far as possible; and
  - Exit ramps from excavations near watercourses would be provided at night, so to provide otter/water vole with an escape route and to avoid entrapment.
61. If water vole presence is confirmed during the pre-construction surveys the following measures would be considered. It is envisaged that dissuasion techniques (e.g. strimming of vegetation to encourage water voles to move out from the working area) and exclusion fencing would be used to ensure water voles are not harmed by the Project. Displacement works are recommended to be carried out between February and April and where sufficient available alternative habitat exists. Regular repeat strimming would be undertaken to maintain the habitat's unsuitability for water voles.
62. Trapping and translocation of water voles, if required, should be completed between February and April and under a Natural England licence. A suitably qualified ecologist would be responsible for ensuring a Natural England licence application is submitted to Natural England prior to the commencement of works. A works-free buffer zone of at least 15m would be established around watercourses supporting water voles until a Natural England licence has been obtained.
63. A licence application would be informed by any prior surveys and would contain a detailed method statement and mitigation plan. Licenced works would be carried out under a water vole watching brief, supervised by the suitably qualified ecologist who holds the water vole licence.
64. A suitably qualified ecologist would be responsible for producing a licence return form and report of works carried out under licence. A copy of this form and report would be provided to Natural England and the LPA (Essex County Council) as soon as reasonably practicable and as prescribed under the conditions of the Natural England licence.

#### *2.2.3.5 Reptiles*

65. A pre-construction survey will be undertaken to understand the current population size / distribution, identifying a suitable translocation site which

- provides the correct habitat features for the populations to be translocated and identifying the appropriate duration of trapping days required for translocation.
66. A report of the pre-construction reptile survey findings and recommendations would be produced by the suitably qualified ecologist and provided to the NFOW Onshore Environmental Manager. The report will be appended to the EMP, and would also be made available to relevant stakeholders, upon request.
  67. For those habitat mosaics which support 'good' populations of reptiles, which are directly affected during construction, a reptile translocation programme will be undertaken where necessary. This will be included in the EMP and supervised by an ECoW. The translocation programme will follow Natural England's *Reptiles: advice for making planning decisions* (2022) and the *Herpetofauna Worker's Manual* (Gent and Gibson, 2003). Once trapping is complete the site will be cleared using a precautionary method of working to minimise potential impacts upon any remaining individuals.
  68. If habitat is cleared during the reptile hibernation period (which is typically between November and February inclusive, dependent on local weather conditions), then trees and scrub would only be cut to approximately 30cm above ground-level. This is to minimise the potential for disturbance to root balls where hibernating reptiles may be located. Remaining rough grass cover would be mowed short (approximately 5cm to 10cm above ground-level) and maintained at this height prior to clearance for construction works. This phased clearance would encourage reptiles to move away from the working area before ground clearance and construction works commence. This clearance will deter reptiles and reduce the requirement for the need for reptile fencing to be installed prior to the hibernation season.
  69. Above ground vegetation removal will be avoided during the reptile active period (March – October inclusive) wherever practicable and avoiding undertaking below ground vegetation removal e.g., roots and coppice stools during the reptile hibernation period (November – February inclusive) where practicable. If not practicable, above ground vegetation identified as suitable to support reptiles removed during the reptile active period must be done so whilst adhering to a precautionary method of working (PMoW) for reptiles, supervised by a suitably qualified ecologist.
  70. A PMoW for vegetation removal will involve cutting vegetation to a minimum height of 150mm, allowing reptiles to vacate the area, allowing the ECoW (or a suitably qualified ecologist, where the task is delegated) to search for any reptiles, then once cleared further cutting can take place. For any reptiles found during construction, a suitable translocation area will be decided upon to re-release the reptiles away from construction activities. The PMoW would be provided as an appendix to the final EMP.
  71. Areas would be maintained in a condition not favoured by reptiles (e.g. with minimal ground cover) until the commencement of construction, through regular mowing of ground vegetation.
  72. If habitat clearance for reptiles is to be undertaken during the breeding bird season, habitats of potential value to nesting birds would be surveyed as described above, allowing any active bird nests to be located.

73. The EMP would include details of measures to avoid killing/injury of reptiles during construction. No works (e.g. site clearance) likely to impact areas where reptiles are present would be undertaken, until required measures (e.g. displacement or exclusion, or capture and translocation, under supervision of the ECoW) are in place.
74. A record of works will be maintained by the ECoW and a copy of this record will be made available to the LPA (Essex County Council) on request

#### 2.2.3.6 *Great-crested newts*

75. As part of embedded mitigation during ongoing Project design refinement, the Project has sought to avoid standing water bodies as far as practicable.
76. Embedded mitigation for impacts to great crested newts is via project siting and design. The embedded measures which are pertinent to great crested newts include retention of all ponds with the potential to support great crested newts, with trees and hedgerows retained wherever practicable. Additional key principles that will be followed in order to mitigate for impacts are described below.
77. North Falls propose to ensure appropriate mitigation for impacts upon great crested newts through Natural England's District Level Licensing (DLL) scheme for Essex. This scheme is designed to allow developers to pay for off-site compensation as an alternative to undertaking detailed on-site surveys and applying for a mitigation licence. This ensures that money which would have been spent on costly mitigation is better spent in targeted improvement to the district great crested newt population. Consultation with Natural England regarding the proposal and the viability of using the scheme for North Falls has taken place to date as part of the evidence plan process. It is proposed that North Falls will enter into the scheme in advance of DCO award, with a formal submission for a DLL being made post-consent.
78. However, the Applicant is committed to going beyond the requirements of the DLL during pre-construction activities and will be applying a number of techniques to reduce the risks of impacting individual great crested newts, collectively termed 'Reasonable Avoidance Measures' (RAMs). These RAMs would be captured under a great crested newt PMoW which would be included in the final EMP. The great crested newt PMoW would include measures such as:
  - Phased vegetation clearance, as described for reptiles above;
  - Rubble or log piles present within the construction footprint to be disassembled and moved during the newt active season (March to October inclusive);
  - Storage of materials that might act as a refuge for newts on hard standing or previously cleared ground; and
  - Excavations and working areas to be managed so as not to create temporary waterbodies which may attract newts.



### 2.2.3.7 Hazel dormice

79. All hedgerows and woodland areas suitable for hazel dormice will be subject to pre-construction surveys. The pre-construction survey will comprise of a nest-tube monitoring survey of suitable hedgerows, and a nest box survey of all suitable woodlands. The survey would be undertaken in accordance with good industry practice methods from *The Dormouse Conservation Handbook* (Bright, Morris and Mitchell-Jones, 2006). If dormouse nests are confirmed within hedgerows due to be removed, Natural England licensing will be sought prior to the commencement of works.
80. If pre-commencement/ pre-construction surveys or ECoW pre-clearance checks conclude the species is present and there is potential for the detailed design to affect dormouse, then mitigation for temporary habitat loss and disturbance may include:
- Creation of temporary compensation/ mitigation habitats for use by dormice in immediately adjacent areas. Where practicable, additional feeding sites and nesting boxes would be installed in hedgerows and woodland edges outside of the onshore project area, to accommodate for any hazel dormice disturbed by noise (Bright, Morris and Mitchell-Jones, 2006);
  - Scheduling of certain work to avoid sensitive periods of the dormouse life cycle; standard practice would be followed i.e., a two-stage removal. Top growth of the hedgerow would be removed in the winter months (November – February) when dormouse are hibernating, avoiding ground disturbance. Clearance of stumps, roots and other vegetation would be undertaken from May – September thereafter;
  - Deterrence from areas where there is risk of injury or death in advance; and
  - Reinstatement of hedgerow habitats immediately after construction.
81. Trenchless techniques will be used for cable route installation works under all hedgerows which have confirmed dormice presence, and where practicable also under those identified as suitable to support dormice.
82. For the two hedgerows where small-scale hedgerow removal is required, the hedgerow is recommended to be cleared during the hibernation period (November to March inclusive) to avoid the risk of killing or injuring individuals during clearance works.
83. In order to mitigate the effects of habitat fragmentation, temporary hedgerows would be put in place across the gap during the active season (April to October inclusive). These temporary hedgerows would be taken down during the day to allow vehicles to use the haul road, and put back in place overnight when the dormice are active. They would consist of 'dead hedges', or containerised hedges, with the final proposed method being detailed within the EMP.

### 2.2.3.8 Invasive non-native species

84. Known locations of Invasive Non-Native Species (INNS) should be avoided by construction works in order to limit their spread.

85. Where avoidance is not feasible, they will be removed and disposed of appropriately (e.g. as part of pre-construction vegetation removal works). The implementation of control measures will be detailed in the CoCP, an outline version of which will be submitted with the DCO application (Document Reference: 7.13), including species specific removal methodologies.
86. Prior to the commencement of construction works, an INNS Management Plan would be developed and appended to the EMP. This plan will likely include the following measures:
- A plan of all INNS locations and extents;
  - A protocol for removing INNS and or managing the waste generated;
  - All machinery to be cleaned and inspected prior to working on the onshore project area, as biosecurity measure to prevent to introduction of any INNS species;
  - Good site practice measures for managing the spread of INNS during works at watercourses; and
  - A requirement for the ECoW to hold responsibilities in relation to INNS, and details of these responsibilities.

## 2.3 Construction mitigation measures

87. This section describes the ecological mitigation measures that would be undertaken during the construction phase of the Project to ensure the protection of ecological receptors.

### 2.3.1 General construction measures

88. All construction would be undertaken in accordance with the EMP and CoCP (see the OCoCP (Document Reference: 7.13)). Measures that will be specified in the CoCP will include:
- All works would be carried out taking full account of legislative requirements and Environment Agency (EA) guidance;
  - Staff toolbox talks on pollution prevention and spill procedures;
  - Appropriate and adequate measures would be in place to ensure levels of dust are controlled to avoid effects on important ecological features;
  - Appropriate and adequate measures would be in place to minimise surface water flooding;
  - Noise and vibration levels would be controlled to avoid effects on important ecological features;
  - Storage of the excavated subsoil separately from the topsoil, with sufficient separation to ensure segregation; and
  - Restricting movement of heavy plant and vehicles to specified routes.
89. Working hours are 07:00 – 19:00 Monday to Saturday, and night working is not scheduled as part of the normal construction working hours and may only be

undertaken for specific activities (e.g. for trenchless crossing operations, which once started cannot be halted until complete).

90. Where night working is unavoidable, or lighting is required for security/health and safety reasons, light fixtures would be directed towards working areas and away from adjacent or nearby habitats of value to protected or notable species. Any security lighting would be motion activated on short timers. Any such installations would be specified in the CoCP and inspected by the ECoW for compliance.

### 2.3.2 Habitats

91. All protective buffer zones described within Section 2.2.2, would be maintained throughout the construction phase. This would include the adherence and implementation of the protocols to manage the potential accidental release of lubricants, fuels and oils from construction machinery and trenchless crossing operations should there be a release/break-out of inert drilling fluids.
92. The ECoW would monitor adherence to the requirements of the buffer zones a minimum of once every two weeks and would maintain a record of all findings and site checks undertaken. Should any breach of the requirements become evident, the ECoW would advise what remedial measures are required to be undertaken as soon as practicable to resolve the situation and minimise effects on ecology.
93. Trenchless crossings, such as HDD, would be used where practicable to avoid the need for hedgerow removal.

#### 2.3.2.1 Trenchless crossing

94. Full details as to the locations where trenchless techniques such as HDD have been committed to are set out in ES Appendix 5.1 Crossing Schedule (Document Reference: 3.3.2).
95. Where possible trenchless crossings will be used to prevent loss and impacts on the hedgerows. However, in the worst-case scenario, based on the Project's outline design 12 hedgerows within the onshore project area could be crossed using open cut trenching. Hedgerow removal will not exceed a 30m swathe at each trenched hedgerow crossing along the onshore cable route.
96. As referenced in the OCoCP (Document Reference: 7.13), trenchless crossing techniques such as HDD have been committed to where the onshore cable route crosses all main rivers to avoid direct interaction with these watercourses. Although ground disturbance will occur at the trenchless entry and exit points, there would be no direct disturbance to the watercourses crossed using trenchless techniques. Therefore, there is no direct mechanism for impacts to occur to the geomorphology, hydrology, and physical habitats of these watercourses. Appropriate hydrological pollution prevention measures will also be adopted (as outlined in the OCoCP).
97. At all trenched watercourse crossings, good industry practice measures will be in place to minimise disturbance of the beds, banks and downstream habitats (see ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.23)). Where temporary dams are used:

- The onshore export cables would typically be a minimum of 3 m below the channel bed (dependent on local geology and geomorphological risks). This would avoid exposure during periods of higher energy flow when the bed could be mobilised. This depth takes into consideration anticipated climate-change related changes in fluvial flows and erosion that will occur over time;
  - The amount of time that temporary dams or flumes are in place will be kept to a reasonably practicable minimum;
  - Flumes or pumps would be adequately sized to ensure that flows downstream are maintained whilst minimising upstream impoundment;
  - Scour protection would also be used to protect the river bed downstream of the dam from high energy flow at the outlets of flumes and pumps;
  - If a diversion channel is required, geotextiles or similar techniques will be used to line the channel and prevent sediment entering the watercourse;
  - Vegetation would not be removed from the banks unless necessary to undertake the works, in which case removal would be restricted to the smallest practicable footprint;
  - Channel bed and banks would be sympathetically reinstated (e.g. by replacing re-sectioned banks with more natural profiles that are typical of the natural geomorphology of the watercourse); and
  - Prior to dewatering the area between the temporary dams, a fish rescue would be undertaken.
98. For watercourses potentially requiring the construction of a 6m wide haul road crossing, which could affect the flow and integrity of the watercourse, the construction techniques will ensure that water flow is maintained and that risk of release of pollutants and sediment is minimised as far as practicable. Reinstatement and monitoring of habitat will take place post-construction.
99. Direct loss of woodland habitats and veteran trees will be avoided by using trenchless techniques (e.g. HDD) to install cable ducts at all locations where woodland is encountered along the onshore cable route.
100. Embedded mitigation relating to the trenchless crossing design and break-out contingency planning will be implemented to minimise the risk of effects on habitats. Details as to how the HDD will be undertaken safely to reduce risk of break-out and management of break-out should it occur are detailed in Outline Horizontal Directional Drill Method Statement and Contingency Plan has been provided with the DCO application (Document Reference: 7.15).

### 2.3.3 Designated sites

101. The landfall compound will be located within an agricultural field supporting modified grassland that also constitutes the Section 41 (S41) (of the Natural Environment and Rural Communities (NERC) Act 2006) priority habitat coastal and floodplain grazing marsh, located immediately adjacent to, but outside of the Holland Haven Marshes SSSI. The following measures are proposed to protect the SSSI and its notified features:

- Use of HDD avoids direct impacts on saltmarsh habitats of Holland Haven Marshes SSSI and LNR;
- A 20m standoff buffer zone will be in place for works on the north side of the Holland Haven Marshes SSSI; and
- No vehicles will access the landfall compound by tracking through the Holland Haven Marshes SSSI. All vehicles will access via the onshore cable route from the north during construction.

#### 2.3.4 Protected and notable species

102. The following measures in respect of protected and notable species would be implemented during the Project's construction, in accordance with the EMP.
103. The following protected species methods statements will be produced as part of the final EMP:
  - Reptile PMoW;
  - Great crested newt PMoW; and
  - INNS management plan.
104. If other species-specific method statements are required following the completion of pre-construction surveys, these will also be included.

##### 2.3.4.1 Protected species licensing

105. Based on the baseline data collected to date, the only protected species licence required by the Project is a great crested newt District Level Licence (DLL). The DLL scheme is designed to allow developers to pay for off-site compensation as an alternative to undertaking detailed on-site surveys and applying for a mitigation licence. This ensures that money which would have been spent on costly mitigation is better spent in targeted improvement to the district great crested newt population. Consultation with Natural England regarding the proposal and the viability of using the scheme for North Falls has taken place to date. NFOW are in the process of entering the scheme in advance of DCO award, with a formal application for a DLL being made post-consent.
106. Following the pre-construction surveys, the protected species licence requirements for the Project will be reassessed ahead of construction.

##### 2.3.4.2 Birds (wintering and breeding)

107. All works would be undertaken in accordance with the EMP and CoCP (see the OCoCP (Document Reference: 7.13)). In the event that additional vegetation clearance is required in areas that are likely to support nesting birds, this would be undertaken outside of the bird nesting season (March to the end of August), or subject to inspection by the ECoW.
108. If active birds' nests are found during construction, the same approach as that set out in Section 2.2.3.1 will be carried out to negate any disturbance on nesting birds during construction.
109. A number of barn owl nest boxes are located within and surrounding the Holland Haven Marshes SSSI. Occupancy and breeding success of these is likely to have reduced over time due to the deterioration of the wood constructions and

occupation by jackdaws in some of them. Effort would be made in consultation with the Essex Wildlife Trust, Tendring District Council and Natural England, to repair or replace existing nest boxes, or add new ones in suitable locations across the onshore project area to enhance nesting conditions, and ultimately increase the productivity of the local breeding population.

110. Soft landscaping works committed to within the onshore substation works area will be designed to be sympathetic for the year-round habitat requirements of grey partridge and nesting skylark, by providing hedgerows and tree planting with thick, grassy cover on low banks for nesting and semi-improved grassland for chick-rearing.
111. Although the presence and distribution of quail may vary each year in response to agricultural land use changes, if construction activity is likely to occur during the breeding season within the 27ha field where quails were recorded in 2022 (ES Figure 24.23 (Document Reference: 3.2.20)), provisions would be made to ensure that the field (or adjacent field within the onshore project area) remains suitable for breeding. This would be achieved by enhancing the areas of unfarmable land in the field so that they provide suitable habitat, for example the growth of permanent (e.g. retained from the previous year), tall and dense vegetation (cereal, linseed and/or grassland).
112. Measures will be adopted to seek to minimise noise, light and disturbance on key aggregations of non-breeding birds, such as: keeping existing hedgerows and vegetation for visual screening, or the installation of additional solid or acoustic fencing around compounds or noisy plant where considered necessary. This is of particular relevance to the landfall HDD works near the Holland Haven Marshes SSSI.
113. Construction activity in important areas for non-breeding Important Ornithological Features (IOFs) (e.g., the two agricultural reservoirs near Thorpe-le-Soken used by green sandpipers) would be monitored by the ECoW and should it be determined that construction activities may impact upon non-breeding birds inasmuch as to them affecting survival rates, additional mitigation would be deployed, and may include measures such as avoidance of work around dawn and dusk, high tides, or extended periods of cold weather.

#### 2.3.4.3 Bats

114. All works affecting confirmed bat roosts confirmed during pre-construction surveys would be undertaken in accordance with a Natural England bat mitigation licence and the EMP.
115. Should a new bat roost be located during construction, works within 15m of the roost will be halted immediately and site workers will inform the ECoW as soon as practicable, either directly or through the Site Manager. Any potential construction lighting in nearby areas will be directed away from the roost site.
116. Mitigation in relation to new roosts identified during construction will follow that set out in Section 2.2.3.2.
117. In the unlikely event of a 'missed' tree roost being accidentally felled or disturbed, the ECoW will ensure that a Natural England bat licensed ecologist attends the site as soon as practicable. The bat licensed ecologist will ensure the section containing the roost is moved to a suitable safe and sheltered

location, at least 15m from the works area and away from any potential obstructions that could prevent the exit of bats which may still be present. If required, the bat licensed ecologist will capture and relocate any disturbed bat(s) to a suitable alternative roost site, such as the pre-installed bat roost box. Alternately, if considered necessary, the bat(s) will be taken to a Natural England licensed handler who can monitor its recovery prior to release.

118. A record of findings and measures undertaken to protect any disturbed roosting bats will be maintained by the ECoW and provided to the NFOW Onshore Environmental Manager. The ECoW will inform Natural England of the event and measures undertaken as soon as practicable. If a Natural England licence is required to continue the works, the ECoW will complete and submit an application, and works will not recommence until the licence has been obtained. Works would then be carried out in accordance with the licence and as necessary, under the watching brief of a Natural England bat licensed ecologist.
119. In the event that additional trees or other features potentially suitable for roosting bats are identified that would be impacted by the works (e.g. if there was a previously unforeseen need to fell or manage a tree), the affected feature would be subject to appropriate surveys by a suitably experienced/licensed bat ecologist.
120. All lighting will only operate when required and will be directional to avoid unnecessary illumination. All necessary lighting shall be designed to minimise light scatter (kept near or below the horizontal) and would be designed in accordance with the BCT and Institute of Lighting Professionals (ILP) guidance note on *Bats and Artificial Lighting at Night* (ILP and BCT, 2023). Any changes to lighting requirements would need to be discussed and approved in advance with the ECoW.

#### 2.3.4.4 Badger

121. All measures in respect of badgers would be undertaken in accordance with the EMP and Natural England Licence (if relevant). The need for a licence has not yet been determined by Natural England.
122. Where practicable, works-free buffer zones will be demarcated on site around areas of badger activity to ensure these are kept fully intact and with minimal interference from construction.
123. Night working will be avoided unless essential (OCOCP (Document Reference: 7.13)). Where night working may be required, lighting will be focused on works areas and directed away from badger setts and areas of high potential value to foraging badgers (e.g. areas of rough grassland and woodland). Lighting will be kept to a minimum, where it is located within 30m of an active badger sett.
124. The ECoW would undertake regular site inspections to confirm compliance with these measures. In the event that additional setts (or potential setts) are identified, either by the ECoW or site staff, all works within 30m of the potential sett would cease, until the ECoW had inspected the potential sett.
125. A report of findings of the site visit and implications for construction will be produced by the ECoW and provided to the NFOW Onshore Environmental Manager.

126. Any works likely to damage or disturb the newly identified sett would be subject to a Natural England development licence; no works would be undertaken within the 30m impact zone (or as otherwise advised by the ECoW), until the licence was in place and all required measures (e.g. sett closure) implemented.
127. Excavations left open overnight would be left with a battered (sloped) edge or exit ramp no steeper than 40° so that any animals which fall in can climb out rather than become trapped. All excavations would be visually checked by contractors to ensure no animals are present before the excavation is backfilled.
128. Night lighting of the construction site would be minimised or avoided entirely where practicable, particularly during the period from March to October inclusive. This is to seek to minimise disturbance to badgers and numerous other nocturnal and crepuscular species.
129. If construction works result in the death or injury of a badger, the appropriately experienced pre-approved ecologist will determine the cause of death where possible (through speaking to site workers, inspecting the body if possible, and investigating site conditions). If the death is considered likely to be a result of construction works the need for further mitigation measures such as the installation of badger exclusion fencing around working areas or the use of additional covering of excavations to prevent access into dangerous areas, will be assessed and determined. Findings of the assessment and measures proposed will be reported to the NFOW Onshore Environmental Manager as soon as practicable.

#### 2.3.4.5 Otter and water vole

130. If water voles / otter are encountered during the works, then works within 15m (water vole) / 100m (otters) of the relevant watercourse would cease, and the ECoW or suitably qualified ecologist contacted.
131. The ECoW would assess the need for further mitigation measures including the requirement for a Natural England licence, as set out in Section 2.2.3.4, prior to works re-commencing. Construction works would be carried out in accordance with the requirements of the licence and under the guidance of the suitably qualified ecologist and, where necessary, an ecological watching brief.
132. Vegetation on the riverbanks should be retained, as these areas often act as shelter and ideal holt areas for otters. The following standard mitigation should be followed during construction:
  - Any pipes over 15 cm in diameter should be capped or sealed at the end of every working day to prevent otter from accessing;
  - Any holes or trenches which are left open overnight should be covered or have an exit ramp installed. The ramp may comprise a formed slope or wooden plank capable of supporting an otter at no steeper than 45 degrees. All areas should be checked at the beginning of the shift to ensure exit ramps are still intact and no otter have entered during the night;
  - During construction, all chemicals and materials to be used on site should be safely and correctly stored and labelled, ideally within a bunded area and spill kits shall be made available on-site in case spills do occur;



- An emergency procedure should be implemented by site workers if otters are unexpectedly encountered. All work within 30m will cease until advice has been provided by a suitably qualified ecologist; and
  - Works within 100m of a river shall not take place at night or within one hour of sunset and sunrise, where practicable.
133. Additionally, all equipment used during construction that could potentially harm otters should be cordoned off at the end of each construction day by temporary fencing, to ensure otters are not injured if investigating the onshore project area.
134. Mitigation for temporary habitat loss and disturbance for water voles may include:
- Micro-siting to avoid water vole burrows (if present).
  - Scheduling of work to avoid sensitive periods of the water vole life cycle.
  - Removing vegetation back to bare earth in spring and autumn.
  - Carrying out a destructive search of water vole burrows, after an appropriate monitoring period, after removing vegetation.
  - Creation of temporary compensation/ mitigation habitats for use by water vole in immediately adjacent areas (such as provision of nest boxes or feeding stations, sympathetic management of bankside habitats) for the construction plus vegetation re-establishment period.
  - Reinstatement of bankside habitats immediately after work, to include sowing with species-rich locally appropriate sward and fencing to prevent stock access.
135. If working at night is undertaken within or adjacent to watercourses, any lighting will be focused on working areas and directed away from the watercourse and other watercourses of potential value to otters. Lighting will be kept to a minimum, up to approximately 100m from otter holts or other identified resting places.

#### 2.3.4.6 Reptiles

136. As stated in Section 2.3.4, a PMoW will be put in place for all suitable reptile habitat within the onshore project area and this will be detailed and agreed through the Project's final EMP.
137. In the event that reptiles are encountered during construction, the ECoW would be contacted, who would move the reptile to suitable retained habitat if possible and advise on additional measures that would be required to ensure killing/injury to reptiles was avoided.

#### 2.3.4.7 Hazel Dormice

138. In order to mitigate the effects of habitat fragmentation, temporary hedgerows would be put in place across the gap during the active season (April to October inclusive). These temporary hedgerows would be taken down during the day to allow vehicles to use the haul road and put back in place overnight when the dormice are active. The final proposed method will be detailed within the EMP.

#### 2.3.4.8 *Great crested newts*

139. All ponds with confirmed great crested newt presence will be avoided during construction and cable routing.
140. As mentioned in Section 2.3.4.1, all works would be undertaken in accordance with the Natural England great crested newt DLL.
141. If a great crested newt is located during construction, works in the area would cease immediately and the ECoW would be informed. To maintain the welfare of the great crested newt, a Natural England great crested newt licensed ecologist would attend the site to handle and where necessary, relocate any great crested newt to outside the working area and provide further ecological advice as to the way forward.

#### 2.3.4.9 *Invasive non-native species*

142. The main risks of INNS are associated with the transfer of INNS between watercourses or waterbodies. However, the majority of watercourse crossings are being undertaken using a trenchless crossing technique e.g. HDD but there remains a risk of INNS transfer where works are undertaken in or near water.
143. Construction activities would be monitored by on-site workers to identify potential invasive species, as informed by toolbox talks. Should INNS be located within the works area, the following measures would be applied:
  - To avoid disturbance and spread of INNS, where practical an exclusion zone would be created around INNS of at least 7m;
  - Signage would be erected to indicate the location of soils, materials or water contaminated with INNS;
  - Vegetation clearance within areas of INNS would be undertaken by an appropriately qualified contractor, under the watch of the ECoW; and
  - Topsoil containing INNS would be managed separately and contained within restricted areas to avoid the spreading INNS to unaffected areas.
144. Construction practices would be implemented in accordance with an INNS Management Plan, provided with the EMP.
145. Measures would be set in place to minimise the potential for pollution from silt deposition into watercourses and from works vehicles, including measures to prevent transfer of invasive plant or animal species between watercourses.
146. All construction vehicles and machinery entering and leaving the onshore project area would follow the biosecurity measures of the GB Non-native Species Secretariat (NNSS) “check, clean, dry” guidance. In addition, the following biosecurity protocols would be adopted in all areas known to support INNS as a minimum:
  - All vehicles arriving on site would be checked to ensure that they are clean and free from any INNS prior to entering the onshore project area.
  - If soil or other material is imported to the onshore project area, documentation from suppliers would be obtained to ensure it is free from INNS.

- All footwear of construction workers would be inspected visually to ensure they are clean from soil and debris before entering and leaving the onshore project area.
  - All vehicles would be kept clean, in particular removing any accumulated mud/material before entering and leaving the onshore project area.
  - All facilities within onshore project area would be equipped with disinfectant to clean footwear/equipment/vehicles prior to entering and leaving the onshore project area.
  - All removed material and/or disinfectant used to clean footwear/equipment/vehicles would be appropriately disposed of.
  - All access to onshore project area would be kept to a minimum and all vehicles and personnel would keep to maintained tracks, with vehicles parked within designated areas and/or hard standing.
  - Wherever possible, personnel and vehicles would avoid areas known to contain INNS.
147. The ECoW would undertake regular inspections of the work area to confirm the presence of INNS and adherence to required measures.
148. In the event that additional areas of INNS are identified the ECoW would review and update the INNS Management Plan to include these additional areas/INNS and their appropriate measures.

## 2.4 Post-construction mitigation measures

149. This section describes the mitigation measures that will be undertaken as soon as practicable following the completion of the works. These measures will be to mitigate the impacts of development on features of ecological and nature conservation interest and to provide biodiversity benefit.
150. Measures related to habitats are set out in Section 2.5.1.

### 2.4.1 Protected and notable species

151. Where a Natural England licence for protected species has been obtained or identified to be required for construction works to be undertaken, the licence applications may include habitat restoration and enhancement measures for the benefit of the protected species that the licence applies to. These would be carried out by landscape contractors working under the guidance of a suitably qualified ecologist and/or licence holder.
152. The suitably qualified ecologist and/or Natural England licence holder would be responsible for producing any required Natural England licence return forms and report of the works undertaken. A copy of the forms and reports would be provided to Natural England and the relevant LPA as soon as reasonably practicable and as prescribed under the conditions of the Natural England licence.
153. As set out in Section 2.3.4.2, soft landscaping works committed to within the onshore substation works area will be designed to be sympathetic for the year-

round habitat requirements of grey partridge and nesting skylark. Section 2.3.4.2 also highlights that effort would be made in consultation with the Essex Wildlife Trust, Tendring District Council and Natural England, to repair or replace existing nest boxes for barn owls within Holland Haven Marshes SSSI or add new ones in suitable locations across the onshore project area.

## 2.5 Long-term ecological management

154. This section describes ecology measures be undertaken following the completion of post-construction mitigation described above.

### 2.5.1 Habitats

155. Reinstated habitats will be subject to an aftercare period of up to 10 years following reinstatement, to be extended (if required) if reinstatement is not deemed to have been successful. The methods of aftercare will be agreed in the Written Landscaping Scheme and subject to the results of monitoring but are likely to include the management of undesirable weeds. During the aftercare period certain areas (such as adjacent to public rights of way (PRoW)) are likely to need protection from disturbance by people, dogs and grazing animals. The precise methods for protection will be agreed as part of the EMP, but is likely to involve the use of temporary fencing and signage. This aftercare period applies to all habitats created and reinstated.
156. During the establishment phase, failed plants will be replaced like-for-like as required to prevent any significant gaps in planting and as agreed with landowners for up to 10 years post-construction.
157. Should Natural England development licences be required for works to be undertaken, long term habitat management would be carried out in accordance with the requirements of these licences.
158. All topsoil stripped in grassland areas would be stored separately and reinstated following the completion of construction. Topsoil storage would be subject to a Soil Management Plan as part of the Project's Code of Construction Practice (CoCP) (secured through a DCO Requirement), which would also detail measures for soil storage and handling. Grassland reseeded would be undertaken using a local seed mix, to be agreed in advance with Natural England and Essex Wildlife Trust.
159. Where practicable, harvesting a green hay crop from the grassland areas being lost will be carried out, for use as seed on the reinstatement and compensation areas. Where practicable the salvage of turves from grasslands areas being lost will be carried out for re-use on the reinstatement and compensation areas.
160. Compensation for loss of hedgerows will be provided by re-instating native, species-rich hedgerows with trees, and including ditches where these were also present originally. Hedges will be reinstated at their original location and comprise a locally appropriate mixture of locally important and native species, as advised by Essex Wildlife Trust. Pre-planting will be carried out where possible so hedgerows and trees can establish as close as possible to the time of initial habitat loss.

161. Hedgerow replanting will follow in the first winter after construction, with the exception of the 6m gap required for the haul road, which will be replanted following the completion of onshore construction (i.e., after at most 18 months). Replanting will follow guidance to encourage insect biomass (Collins, 2023).
162. Future hedgerow management along the onshore cable route will include allowing standard trees (with the exception of a 6m buffer from each cable centre) to develop during the period of aftercare (up to 10 years) to improve quality of the hedgerow as a foraging resource.
163. All retained hedgerows within the onshore project area should, where practicable, be allowed to thicken up during construction and operation to facilitate use as feeding and commuting corridors for wildlife.
164. In the longer term, woodland within the onshore substation works area will require regular maintenance to ensure that trees do not interfere with the operation and maintenance of the project.
165. Future enhancement would include thinning woodland and starting a coppicing process. Under a coppicing regime, cuts will be made on a cyclical rotation to ensure that the screening benefits are not compromised.
166. The final Written Landscaping Scheme will include details of planting methodologies and plant species lists.
167. Efforts will be made to reinstate arable field margins, in consultation with Essex Wildlife Trust and the local landowners, to ensure the optimum benefits can be gained from each margin affected. Attempts will be made to ensure habitat reinstatement takes the form of one of the following (Joint Nature Conservation Committee (JNCC), 2008):
  - Cultivated, low-input margins (land managed specifically to create habitat for annual arable plants);
  - Margins sown to provide seed for wild birds (margins or blocks sown with plants that are allowed to set seed and which remain in place over the winter);
  - Margins sown with wildflowers or agricultural legumes and managed to allow flowering to provide pollen and nectar resources for invertebrates;
  - Margins providing permanent, grass strips with mixtures of tussocky and fine-leaved grasses.

### 2.5.2 Protected Species

168. Where a Natural England licence for protected species has been obtained or identified to be required for works to be undertaken, the licence holders would be responsible for maintaining a record of all ecology works completed, which would be provided to Natural England and the relevant LPA as soon as practicable and as prescribed under the conditions of any Natural England licence. Should any Natural England licences for protected species be required, the licence holders (e.g. ECoW) will notify the NFOW Onshore Environmental Manager of any additional survey and habitat requirements.

## 2.6 Biodiversity enhancements

169. Details of the BNG commitments are presented in the BNG Strategy (Document Reference: 7.22).
170. North Falls are exploring opportunities to deliver a minimum of 10% BNG for the onshore elements of the Project. The Project is engaging with Natural England and other ecological stakeholders and members of the Onshore Ecology Expert Topic Group (ETG) to identify suitable projects and plans for delivering this BNG. Further details regarding the location of the Project's BNG are set out within the BNG Strategy (Document Reference: 7.22).
171. As part of North Falls BNG targets, habitat creation will be required to off-set losses in biodiversity value within the onshore project area. Habitat creation will be detailed in the EMP and post-consent BNG Assessment Report, secured by DCO Requirements.
172. All habitats created as part of ecological compensation or enhancement within the onshore substation works area will be subject to longer term monitoring and management, as these areas are included in the Early Design BNG calculations as post-development habitat creation. Habitats included within the Project's BNG calculations must be subject to a 30 year maintenance period, to ensure habitats are maintained at the target condition during this period. This includes the 10 year aftercare period. A detailed post-construction monitoring and management plan will be prepared, the full details will be included in the Written Landscaping Scheme.
173. In the event that additional measures are required for protected species, these shall be monitored against defined aims and objectives which shall be included in the Written Landscaping Scheme.
174. Local and national biodiversity strategies will be considered in the biodiversity enhancements by:
  - Ensuring woodland plantation as part of landscaping follows the Essex County Council guidance Essex Tree Palette: A guide to choosing the most appropriate tree species for Essex sites according to landscape character and soil type (2018);
  - Use of Sustainable Drainage Systems (SuDS) in line with the Essex Green Infrastructure (GI) Strategy (Essex County Council, 2020);
  - Strategic planting to ensure habitat connectivity is created with the surrounding landscape, in line with the Essex GI Strategy (Essex County Council, 2020);
  - Retention of trees and hedgerows where possible, in line with the Essex GI Strategy (Essex County Council, 2020); and
  - Planting of lowland meadow UK Habitat of Principle Importance (UKHPI) as listed in Section 41 of the Natural Environments and Rural Communities Act (as amended) 2006.
175. The following biodiversity enhancements will also be incorporated into the Written Landscaping Scheme in order to target locally important ecological receptors at the onshore substation:

- Reptile and amphibian hibernacula, placed to create transitional areas between areas of woodland and grassland;
- Scrape creation within open grassland for butterfly and moth species dependent on colonising plant species. Such areas would also provide basking habitat for reptiles;
- Sustainable Drainage System (SuDS) pond design will be tailored to ensure suitability for supporting breeding amphibians, in line with criteria set out in Oldham et al. (2000) and the Great Crested Newt Conservation Handbook (Langton, Beckett and Foster, 2001).

## 2.7 Monitoring and reporting

### 2.7.1 Reporting

#### 2.7.1.1 Pre-construction

176. The ECoW will maintain a record of all pre-construction surveys which are undertaken. The ECoW will be responsible for the production of the pre-construction survey reports.
177. Survey reports, including advice regarding implications for construction, will be provided to the NFOW Onshore Environmental Manager and a copy will be made. Copies will also be appended to the EMP.
178. Should any Natural England development licences be required, the ECoW will be responsible for the production of the Natural England licence applications which will be submitted to Natural England. Reports will support Natural England licence applications where required. Copies of the application will be provided to NFOW.

#### 2.7.1.2 During construction

179. The ECoW will maintain a record of all ecological work which is undertaken during the construction period, including any ecological watching briefs or protected species surveys and findings of any site visits. Reports will be provided to the NFOW Onshore Environmental Manager and where appropriate to Natural England.
180. The ECoW will maintain a record of any breaches of the requirements and any measures undertaken to mitigate potential impacts of a breach. Records will be provided to the NFOW Onshore Environmental Manager and if necessary, Natural England.
181. If any reasonable changes to the measures are considered necessary by the ECoW to achieve the objectives and adhere to the requirements of the EMP and any relevant legislation, the ECoW will produce a report of these proposed changes, detailing the reasons for them, and this report will be provided to the LPA (Essex County Council) for approval prior to the measures being carried out on site.
182. Should a Natural England licence be required during the construction period, the ECoW will be responsible for applying for a licence. The ECoW and/or Natural England licence holder will be responsible for producing any required Natural England licence return forms and report of the works undertaken.

183. A copy of the forms and reports will be provided to the NFOW Onshore Environmental Manager, Natural England and the LPA (Essex County Council) as soon as reasonably practicable and as required under the conditions prescribed by the Natural England licence.

#### 2.7.1.3 Post-Construction

184. Should any Natural England development licences be required, the ECoW and/or Natural England licence holder will be responsible for producing and distributing any required Natural England licence return forms and report of the works undertaken.
185. The ECoW will be responsible for producing a report to confirm habitat reinstatement or enhancement requirements have been carried out in accordance with this plan and the Written Landscaping Scheme.
186. All post-construction monitoring surveys would be undertaken by appropriately experienced and where necessary, licensed ecologists.
- All surveys would be undertaken in accordance with bio-security risk assessments and approved risk assessments would be in place prior to the commencement of any survey.

#### 2.7.2 Monitoring

187. The ECoW would be responsible for monitoring adherence requirements of the EMP during construction through:
- Weekly site inspections; and/or
  - Weekly meetings with the Site Manager.
188. The ECoW would regularly monitor adherence to the requirements of the protective buffer zones, at least once every two weeks. Should any breach of these requirements become evident, the ECoW would inform the NFOW Onshore Environmental Manager. The ECoW would inform the Site Manager of measures required to rectify any potential impacts. The NFOW Onshore Environmental Manager would be responsible for notifying Natural England of any breaches to the buffer zones if necessary and as advised by the ECoW.
189. New planting would be monitored during the establishment phase by the NFOW Onshore Environmental Manager, landscape contractor, landowner or farm manager, as agreed between all parties. Failed plants would be replaced (subject to agreement with landowners) like for like as required to prevent the development of a significant gap in planting. Post-construction monitoring of protected species as required under any potential Natural England licences would be undertaken by the ECoW or appropriately experienced and if necessary, licensed ecologist(s), who would be pre-approved by the ECoW.
190. Hedgerows that are re-instated would be monitored once a year for the minimum of 10 year aftercare period post construction to ensure that the hedgerow has fully established. If it has not, then remediation works should be undertaken to ensure that it is achieved, including the replanting failed plants.
191. Populations of overwintering (October to February) and breeding birds (March to September) should be monitored throughout as it is possible there will be a



change in population sizes over time. For example, overwintering bird roosts may increase in size, and new species may utilise the habitats within and surrounding the onshore project area.

192. An ECoW will need to check for the presence, spread from adjacent land or introduction of any INNS during pre-construction surveys. If they arise within the Onshore Development Area, appropriate course of actions according to the species in question must be taken in order to control spread and/ or avoid establishment.
193. If mitigation licences for any species reviewed within this document are obtained, then monitoring will be required as part of licence conditions. In most cases, the monitoring would be very focused, such as to the relevant trees (in the case of roosting bats where replacement bat roosting sites have been created) or the monitoring of newly constructed badger setts. Any monitoring requirements will be outlined within the relevant species' licences.
194. Should compensatory features be required for EPS as part of licence conditions, then ecological monitoring during, and post construction would be required in order to confirm the effectiveness of mitigation measures described above. As a minimum, ecological monitoring for the scheme would comprise:
  - Monitoring of bat boxes installed during and post construction as part of the bat mitigation on site (if required), this will include checking their condition and clearing them out as well as for presence of roosting bats;
  - Monitoring of bird boxes installed during and post construction as part of the bird mitigation on site, this will include checking their condition and clearing them out as well as monitoring their use by birds;
  - Monitoring the establishment of any new shrubs, trees and other plants created as part of mitigation for habitat loss;
  - Monitoring the populations of all species that require specific surveys and mitigation; and
  - Ensuring eradication of any INNS species if identified in a works area, if they would need to be disturbed. If they are not in the works area then an appropriate cordon depending on species must be implemented.

#### *2.7.2.1 Construction*

195. The ECoW would maintain a record of all ecological work which is undertaken during the construction period, including any ecological watching briefs or protected species surveys and findings of any site visits.
196. The ECoW would maintain a record of any breaches of the EMP and any measures undertaken to mitigate potential impacts of a breach. Records would be provided to the Site Manager and the North Falls Environmental Manager, and if necessary the relevant LPA and Natural England. Should a Natural England licence be required during the construction period, the ECoW would be responsible for applying for the licence.

#### *2.7.2.2 Post-construction*

197. Post-construction monitoring of protected species as required under any potential Natural England licences would be undertaken by the ECoW or

appropriately experienced and if necessary, licensed ecologist, who would be pre-approved by the ECoW.

198. The ECoW would be responsible for producing a report to the relevant LPA (Essex County Council) to confirm that all measures have been implemented in accordance with the EMP.
199. New planting would be monitored for up to 10 years during the aftercare period along the onshore cable route, and for the operational life for planting at the particularly around the onshore substation.
200. Should any Natural England development licences be required, the ECoW and/or Natural England licence holder would be responsible for producing and distributing any required Natural England licence return forms and report of the works undertaken.

## 2.8 Indicative timetable of suitable works period

201. Table 2.3 provides an indicative programme outlining the optimal and optional months during which the works detailed in this document could be undertaken. Table 2.2 sets out the key for interpretation of Table 2.3.

**Table 2.2 Key for Table 2.3 showing an indicative programme for optimal works relating to Ecology**

	Ecology works period (optimal time)
	Ecology works period (sub-optimal time)
	No ecology works

**Table 2.3 Indicative programme for optimal works relating to onshore ecology**

Work Description	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Pre-construction</b>												
Breeding bird checks												
Pre-construction bat emergence/ re-entry surveys												
Pre-construction badger survey												
Pre-construction riparian mammal surveys												
Pre-construction hazel dormouse surveys												
Up-rooting of vegetation or clearance of materials of potential value to hibernating reptiles												
Habitat management to deter reptiles												
Applications for Natural England licences (should they be required)												
<b>Construction</b>												
Optimal period for clearance of hedgerows, scrub and trees												
Pre-clearance survey for nesting birds (should clearance not commence before nesting bird season)												
Clearance of hedgerows, scrub and trees, when pre-clearance surveys confirm no nests												
<b>Post-construction</b>												
Reinstatement and enhancement planting in accordance with the Written Landscape Scheme.												
Installation of bat boxes												
<b>Long-term management</b>												
Installation of bat boxes												

Work Description	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Replanting of failed plants during establishment period (10 years post planting).												

## 3. Landscape

### 3.1 Content of the Written Landscape Scheme

202. The Written Landscape Scheme, secured by DCO Requirement, will set out full details of the landscape mitigation measures which will be implemented as part of the Project. This will include:
- Details of trees, woodland and hedgerows to be protected and/or removed as part of the Project;
  - Details of earth bunding and finished ground levels; and
  - Full details of planting including planting schedules and method statements, as well as aftercare and maintenance requirements; and
  - A programme of works.

### 3.2 Landscape context

203. The landscape context of the onshore works is set out in ES Chapter 30 Landscape and Visual Impact Assessment (Document Reference: 3.1.32). The LVIA study area has been defined as a 500m radius around the onshore project area, combined with a 2km radius around the North Falls onshore substation.
204. The onshore substation works area is located to the north-east of an existing substation, and to the north of Ardleigh Road. It is located approximately 2km to the south-west of the settlement of Lawford, in Tendring. The onshore substation is proposed to be co-located with the Five Estuaries onshore substation.
205. The landform across the onshore substation works area is generally flat, and is approximately 35m Above Ordnance Datum (AOD). The landcover is characterised by arable farmland with a large-scale field pattern. Field boundaries are generally open in character. There are some hedgerow boundaries with occasional hedgerow trees. There is a higher level of tree cover along the boundary with Barn Lane and Grange Road, to the north and west, and also around the existing Lawford substation on Ardleigh Road. The onshore substation works area is open to farmland to the east and south. A steel-tower overhead electricity line crosses the north-western edge of the onshore substation works area.
206. The onshore substation works area is not located in any nationally designated landscapes (e.g. National Parks; National Landscapes) or locally designated landscapes (Areas of Special Character, as identified in the Tendring District Local Plan 2013-2033 and Beyond (Tendring District Council, 2021)).
207. The landfall will be located on the coastline between Frinton-on-Sea and Clacton-on-Sea (refer to ES Figure 30.1.1b, Document Reference: 3.2.26). The onshore export cables will link the landfall to the onshore substation, and will be buried underground. The onshore cable route is shown on ES Figure 30.1.1b (Document Reference: 3.2.26). From the landfall location, the onshore cable route travels north-west, through Tendring. It passes to the north of the small

settlement of Thorpe-le-Soken. The cable route then continues in a north-west direction, where it crosses the A120 near Horsley Cross and then continues in a more westerly direction on the approach to the onshore substation. There will also be a short section of 400kV onshore cable to link the proposed onshore substation to National Grid Electricity Transmission's (NGET) proposed East Anglia Connection Node (EACN) substation, North Falls' National Grid connection point (refer to ES Figure 30.1.5 (Document Reference 3.2.26) for location). The onshore cable route mainly passes through mixed farmland. Areas of woodland have been avoided during site selection as far as practicable, or where not practicable have been avoided through the use of trenchless techniques for cable duct installation.

208. Table 3.1 identifies the Landscape Character Areas (LCA) that the project components will be within, as defined in the Tendring District Landscape Character Assessment (LUC, 2001). LCAs are shown in ES Figure 30.1.3 (Document Reference: 3.2.26).

**Table 3.1 North Falls Project Components and corresponding LCA**

Landscape Character Area	Project components
7A Bromley Heaths – (Heathland Plateaux LCT)	The North Falls onshore substation works area will be within this LCA, as well as a section of the onshore cable route between Tendring Heath and the onshore substation. The Five Estuaries onshore substation will also be within this LCA.
2C Holland Haven (Drained Estuarine/ Coastal Marsh LCT)	The landfall and a section of the onshore cable route will be within this LCA.
3D Holland Coastal Slopes (Coastal Slopes LCT)	A short section of the onshore cable route will be within this LCA.
8B Clacton and the Sokens Clay Plateau (Clay Plateaux LCT)	A section of the onshore cable route will be within this LCA, between Great Holland and Thorpe-le-Soken.
6D Holland Valley System (Clay Valleys LCT)	Two short sections of the onshore cable route will be within this LCA, near Great Holland and near Tendring.
3A Hamford Coastal Slopes (Coastal Slopes LCT)	A section of the onshore cable route will be within this LCA, near Thorpe-le-Soken.
8A Tendring and Wix Clay Plateau	A section of the onshore cable route will be within this LCA, between Thorpe Green and Tendring Heath.

### 3.3 Design principles

209. A Design Vision document (Document Reference: 2.3) has been prepared to support the application, and this OLEMS should be read in conjunction with that document. The Design Vision provides detailed information on the application process; relevant policy, guidance and standards; design development and design principles to inform the site, landscape and architectural design of the co-located onshore substations; and details on consultation.
210. Following DCO approval, a Design Guide will be prepared that builds on the principles established in the Design Vision to inform the detailed design. The intention is for the Design Guide to be prepared joint with Five Estuaries, to support collaboration and good design across the two projects. The Design Guide will be subject to consultation with key stakeholders.

### 3.4 Construction stage landscape and visual mitigation

211. All areas subject to temporary disturbance during construction will be reinstated following the completion of construction. Table 30.3 of ES Chapter 30 LVIA (Document Reference: 3.1.32) provides details of proposed construction stage mitigation. This is summarised below.

#### 3.4.1 Design mitigation

212. NFOW have committed to reduce the onshore cable route working width to 30m at hedgerow crossings where open cut trenching is proposed, to minimise the amount of hedgerow removal required. This will be achieved by not including the topsoil/subsoil storage bunds in the onshore cable route working width at hedgerow crossings.

#### 3.4.2 Habitat management and reinstatement

213. The measures described in Section 2.5.1 in relation to habitat management and reinstatement will be implemented as part of the landscape and visual mitigation.

### 3.5 Operational stage landscape and visual mitigation

214. Mitigation of landscape and visual effects will be undertaken through design modifications and input to the design process. This includes consideration of the location of the various components within the onshore substation works area, and consideration of the materials used, colour palette and boundary treatments.

215. The following provides a summary of operational stage embedded and additional mitigation, as identified in ES Chapter 30 LVIA (Document Reference: 3.1.32). Further detail is provided in the Design Vision document (Document Reference: 2.3).

#### 3.5.1 Design mitigation

216. The onshore substation will be designed to reduce the overall height and massing of associated structures and other elements as far as possible. Landscape proposals will include measures for the enhancement of local biodiversity during the operational phase of the onshore substation. This will include landscape screening of the onshore substation through hedgerow and woodland planting. Once matured, this will help to integrate the onshore substation into the existing landscape of arable fields and boundary trees/hedgerows.

#### 3.5.2 Embedded mitigation

- Mitigation of landscape and visual effects undertaken through design modifications and input to the design process.

- The Design Vision also considers the location of the various components within the onshore substation works area, consideration of the materials used, colour palettes and boundary treatments.
- An arboricultural survey will be undertaken post-DCO consent to identify the locations and condition of existing trees, in order to maximise retentions on site, where possible.

### 3.5.3 Additional landscape mitigation

- Enhance and strengthen the existing landscape character, with reference to the Tendring Landscape Character Assessment.
- Create new GI features and connections through the site to surrounding linear features, such as hedgerows, screening belts and woodland clusters. These will provide multiple benefits in terms of enhancing habitat connectivity and visual amenity to road corridors and PRow.
- Enhance the necessary infrastructure within the site, for example, ensuring that attenuation ponds (if required) can provide multiple benefits, not only in terms of sustainable drainage but as landscape features and ecological habitats.
- Enhance the ecological and landscape condition of land parcels which cannot be returned to meaningfully agricultural use.
- All hedgerow sections removed to facilitate construction will be replaced.
- Hedgerows and trees will be replanted using locally native species as advised by Essex Wildlife Trust.
- Grassland reseedling will be undertaken using a local seed mix.

## 3.6 Outline Landscape Strategy

217. The Outline Landscape Strategy is shown in ES Figure 30.1.6 (Document Reference: 3.2.26). It provides an illustrative vision for the onshore substation works area that indicates how the layers of design analysis could respond to a developed site layout. The layout is based on the 'realistic worst case scenario' for North Falls and the 'maximum design scenario' for Five Estuaries, as assessed within the EIA.
218. The Outline Landscape Strategy builds up over a series of layers that explore:
- the existing site context and broader setting;
  - ways in which to improve the baseline condition through enhancement;
  - compensation for features likely to be lost;
  - strengthening of green and blue infrastructure; and
  - mitigation for adverse landscape and visual effects.
219. Further detail on the species and specification of planting and seeding will be agreed with the LPA, post consent. Reference will be made to the Essex County Council Tree Palette and Forestry Research guide to climate resilient species.



Locally important and native species will be used, as advised by Essex Wildlife Trust.

220. The Essex County Council Tree Palette notes that within Glacial Till Plateau Landscapes, where the onshore substation will be located, the following species are present:
- Abundant species: field maple *Acer campestre*, hazel *Corylus avellana*;
  - Frequent species: hornbeam *Carpinus betulus*, hawthorn *Crataegus monogyna*, bird cherry *Prunus avium*, blackthorn *Prunus spinosa*, oak *Quercus robur*;
  - Occasional species: alder *Alnus glutinosa*, holly *Ilex aquifolium*, white willow *Salix alba*, crack willow *Salix fragilis*, yew *Taxus baccata*;
  - Rare: black poplar *Populus nigra betulifolia*, sessile oak *Quercus petraea*, wayfaring tree *Viburnum lantana*;
  - Native species not recommended for planting: silver birch *Betula pendula*, downy birch *Betula pubescens*, poplar *Populus tremula*, elder *Sambucus nigra*.

### 3.7 Relevant onshore archaeology and cultural heritage mitigation

221. Impact to the historic landscape character (including hedgerows and parish boundaries) will be minimised by returning field boundaries / areas / hedgerows to their pre-construction condition and character post-construction, as part of a sensitive programme of backfilling and reinstatement / landscaping. Certain hedgerows and field boundaries (e.g., parish boundaries) may require recording prior to the construction process and enhanced provisions made during backfilling and reinstatement.

### 3.8 Landscape strategy principles

222. The landscape strategy considers how to enhance both the immediate development site and its broader landscape setting, through an understanding of the baseline landscape character, ecology, visual amenity, and the values placed on it by the local community and other users.
223. The onshore substation works area comprises large arable fields with limited boundary vegetation, comprising a short stretch of species-poor hedgerow and scattered trees (oak *Quercus robur* and ash *Fraxinus excelsior*). Two of these trees have been identified as bat roosts. Ditches and standing water are occasionally associated with field boundaries.
224. Off-site hedgerows can be found to the west and north of the onshore substation works area. These comprise hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, ivy *Hedera helix*, bramble *Rubus fruticosus* and oak *Quercus robur*.
225. Beyond the site boundary, woodland copses can be found at the point where several field boundaries join, at acute field boundary junctions, in proximity to farmsteads and large residential properties, landscaped estates (Ardleigh Park,

Green Island Gardens) and the perimeters of industrial areas (Martells Industrial Estate, Lawford Substation).

226. Key species recorded within local woodland areas include oak *Quercus robur*, ash *Fraxinus excelsior*, elm *Ulmus glabra*, white poplar *Populus alba*, sweet chestnut *Castanea sativa*, hazel *Corylus avellana*, holly *Ilex aquifolium*, sycamore *Acer pseudoplatanus*, birch *Betula* spp., and pines *Pinus* spp.
227. The Outline Landscape Strategy seeks to strengthen the existing fragmented landscape character and to knit it back into its wider landscape context, whilst strengthening ecological value and habitat connectivity.
228. The Outline Landscape Strategy presents opportunities to improve the existing landscape condition through hedgerow and tree planting and connecting these to small woodland copses that will provide intermittent visual screening and potential habitat for bats and dormice.
229. Restoration of grassland areas and treatment of field margins reflects the proposed ecological mitigation.
230. The inclusion of attenuation ponds as part of the permanent SuDS strategy presents an opportunity to develop a new wildlife habitat and amenity feature, which could provide an alternative visual focus at the heart of the site. Inclusion of seating and other wildlife viewing opportunities could be considered.

### 3.9 Planting information

#### 3.9.1 Advance Planting

231. Where practical, landscape mitigation planting will be established as early as practicable in the construction phase. Opportunities for early landscape planting will be subject to the extent and timings of construction works, and will be explored and agreed through consultation with Five Estuaries, NGET and Essex County Council, before commencement of construction.

#### 3.9.2 Planting Growth Rates

232. Mitigation planting will be of mixed natives in largely unexposed conditions. An average annual growth of 30 cm/year in the first 5 years can normally be assumed. Once established, growth rate will increase, and circa 50 cm/year for the next 10 years can be anticipated. If planted as transplants, this gives a height of 2-2.5 m in the fifth year and 7-7.5 m after 15 years. For more exposed locations it is recommended that annual growth is calculated by taking clues from the existing trees and hedges in the locality.

#### 3.9.3 Planting Restrictions

233. There is a restriction on canopy trees (trees >5m in height) over a 6m width from each cable centre. Sub-canopy (i.e. hedgerow) trees and other planting will be acceptable above the cables.
234. There is a restriction on tree planting within a 30m easement to overhead lines (15m either side).

235. Planting around SuDS ponds will be confirmed once the drainage plan (secured by DCO Requirement) has been developed.

### 3.10 Landscape maintenance

#### 3.10.1 Aftercare period

236. The success of planting will be monitored over an initial 10-year aftercare period after planting. During this period any plants which fail, die, are removed, or become seriously damaged or diseased, shall be replaced in the first available planting season with a specimen of the same species and size as that originally planted.
237. The purpose of the planting is to reinstate hedgerows and trees removed to facilitate construction works, and to provide landscape and visual mitigation along the extents of the onshore works, as well as to deliver BNG and benefit to the landscape of the area more generally. Maintenance activities will be undertaken in accordance with these purposes and will aim towards the establishment of dense, diverse hedgerows and naturalistic, species-rich woodland and grasslands.
238. During the 10-year aftercare period, activities will be carried out in accordance with a maintenance schedule that will be developed post-consent. This will set out requirements for monitoring visits, and where required watering, weed control, cutting/trimming, and replacement of failed plants. Progress in vegetation establishment will also be monitored to make sure that an appropriate mosaic of woodland, grassland and scrub habitats develop. Litter, refuse and debris will be removed from site after every site visit. At the end of the 10-year maintenance period, all stakes, ties and plant shelters will be removed from the planting area.
239. Maintenance activities will be undertaken in accordance with the following, subject to any updates:
- BS4428: 1989 Code of practice for general landscape operations (excluding hard landscapes); and
  - BS8545: 2014 Trees: from Nursery to independence in the landscape – Recommendations.

#### 3.10.2 Longer term management

240. Habitats created as part of the landscaping within the onshore substation works area will be subject to a 30-year management and maintenance period, to ensure habitats created can contribute towards BNG targets. All other reinstated habitats will be subject to the 10-year aftercare period only, which will ensure the establishment of reinstated habitats is successful. The specific details of the 30-year management and monitoring period for created habitats will be detailed in the Project's final BNG Assessment Report, submitted post-consent and secured through DCO Requirement.

#### 3.10.2.1 *Woodland*

241. In the longer term, woodland belts will require management and regular maintenance to ensure their effectiveness as screening, and to ensure that trees do not interfere with the operation and maintenance of the project.
242. Beyond the 10-year management period, regular inspections (at least annually) will be required for signs of diseased trees, dangerous limbs or rot requiring removal.
243. Future management could include selectively thinning woodland, ground flora management measures, and potentially starting a coppicing process. Under a coppicing regime, cuts would be made on a cyclical rotation to ensure that the screening benefits are not compromised.
244. As the woodland matures it is important to identify and develop a plan of succession. The age structure will be diversified to benefit the widest range of wildlife, the highest level of resilience, and long-term effectiveness of screening.
245. Before completion of the 10-year management period, a scheme regarding the measures to be implemented during the longer-term maintenance period will be developed and agreed with Essex County Council.

#### 3.10.2.2 *Individual trees*

246. Existing trees will be monitored on an annual basis for signs of disease, dieback, dangerous limbs or any rot requiring removal. Veteran trees should be retained as features within the landscape wherever possible (where not affecting operational areas or within publicly accessible areas).

#### 3.10.2.3 *Hedgerows*

247. Once established, hedgerows should be managed for wildlife and to maintain GI connectivity, both within the site and to enhance links to adjacent areas. Maintenance of buffer strips adjacent the hedgerow will facilitate habitat connectivity and provide nesting and overwintering areas.
248. Hedgerows should be cut on a 2-3 year rotation, thus allowing some sections to develop flowers and berries to support fauna. Cutting should be avoided within the bird nesting window and during winter months to maintain food sources for birds.


#### 3.10.2.4 *Grassland*

249. Grassland areas within the onshore substation should be managed to facilitate operational integrity. Outside the onshore substation footprint, once-established, grassland areas should be managed for wildlife, in line with the objectives of the BNG Strategy (Document Reference: 7.23).

#### 3.10.2.5 *Ponds and water bodies*

250. Ponds and water bodies should be maintained to provide a range of habitats for wildlife. This will primarily require selective clearance of shoreline vegetation to prevent overshadowing and clearance of pond plants to prevent over-dominance. Ponds should be monitored for the presence of invasive plants and algal blooms.

## 4. References

Bat Conservation Trust and Institution of Lighting Professionals (2023) Guidance Note 08/23 Bats and artificial lighting at night. Institute of Lighting Professionals, Rugby.
Bright, P., Morris, P. and Mitchell-Jones, T. (2006) The Dormouse Conservation Handbook. English Nature, Peterborough.
CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.
Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4 <sup>th</sup> Edition). The Bat Conservation Trust, London.
Essex County Council (2018) Essex Tree Palette: A guide to choosing the most appropriate tree species for Essex sites according to landscape character and soil type. Available at: 
Gent, A.H. and Gibson, S.D. (eds) (2003) Herpetofauna Workers Manual. JNCC, Peterborough.
JNCC (2008) UK Biodiversity Action Plan Priority Habitat Descriptions: Arable Field Margins. JNCC, Peterborough.
Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation Handbook. Froglife, Halesworth.
Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt ( <i>Triturus cristatus</i> ). Herpetological Journal 10(4), 143-155.
Tendring District Council (2021) Tendring District Local Plan 2013-2033 and Beyond



**NORTH FALLS**

*Offshore Wind Farm*



**RWE**

## **HARNESSING THE POWER OF NORTH SEA WIND**

*North Falls Offshore Wind Farm Limited*

*A joint venture company owned equally by SSE Renewables and RWE.*

*To contact please email [contact@northfallsoffshore.com](mailto:contact@northfallsoffshore.com)*

© 2024 All Rights Reserved



# NORTH FALLS

*Offshore Wind Farm*

## Design Vision

Document Reference: 2.3  
Volume: 2  
APFP Regulation: 5(2)(q)  
Date: July 2024  
Revision: 0

**Project Reference: EN010119**



**NORTH FALLS**

*Offshore Wind Farm*

<b>Project</b>	North Falls Offshore Wind Farm
<b>Document Title</b>	Design Vision
<b>Document Reference</b>	2.3
<b>APFP Regulation</b>	5(2)(q)
<b>Supplier</b>	Royal HaskoningDHV
<b>Supplier Document ID</b>	PB9244-RHD-ZZ-ON-RP-YE-0153

This document and any information therein are confidential property of North Falls Offshore Wind Farm Limited and without infringement neither the whole nor any extract may be disclosed, loaned, copied or used for manufacturing, provision of services or other purposes whatsoever without prior written consent of North Falls Offshore Wind Farm Limited, and no liability is accepted for loss or damage from any cause whatsoever from the use of the document. North Falls Offshore Wind Farm Limited retains the right to alter the document at any time unless a written statement to the contrary has been appended.

<b>Revision</b>	<b>Date</b>	<b>Status/Reason for Issue</b>	<b>Originator</b>	<b>Checked</b>	<b>Approved</b>
0	July 2024	Submission	LUC	NFOW	NFOW



# Table of Contents

<b>1</b>	<b>Design Vision Overview</b>	<b>01</b>
1.1	Introduction	02
1.2	Scope of the Design Vision	03
1.3	DCO Submission - Function of the Design Vision	04-05
1.4	Design Process - Prior to DCO Submission	06
1.5	Post DCO Approval - Function of the Design Guide	07
1.6	Design Process - Post DCO Approval	08
<b>2</b>	<b>Policy, Guidance and Standards</b>	<b>10</b>
2.1	National Planning Policy	11
2.2	National Design Guidance	12 - 13
2.3	Local Design Guidance	14 - 15
2.4	Technical Standards	16
<b>3</b>	<b>Onshore Substations - Project Description</b>	<b>18</b>
3.1	North Falls - Project Description	19
3.2	Five Estuaries - Project Description	20
3.3	East Anglia Connection Node - Project Description	21
<b>4</b>	<b>Context Study</b>	<b>22</b>
4.1	National and Local Context	23 - 25
4.2	Onshore Substation Context	26 - 30
<b>5</b>	<b>Design Development</b>	<b>32</b>
5.1	Site Selection	33
5.2	Optioneering	34
5.3	Mitigation Requirements	35
5.4	Outline Landscape Strategy	36 - 40
<b>6</b>	<b>Consultation</b>	<b>41</b>
6.1	Introduction	42
6.2	PEIR Responses	42
6.3	Expert Topic Group	43
6.4	Design Council	44 - 48

<b>7</b>	<b>Onshore Substation Design Principles</b>	<b>49</b>
7.1	Design Criteria	50-51
7.2	Site Layout	52-53
7.3	Built Form	54-55
7.4	Building Materials	56-57
7.5	Colour	58
7.6	Site Access	59
7.7	Public Rights of Way	60
7.8	Earthworks and Land form	61
7.9	Boundary Treatments	62-63
7.10	Surfacing	64
7.11	Lighting	65
7.12	Planting	66
7.13	Biodiversity Enhancements	67
7.14	Drainage and Water	68-69
<b>8</b>	<b>References and Glossary</b>	<b>71</b>
8.1	References	72-74
8.2	Glossary	74
<b>9</b>	<b>Appendices</b>	<b>75</b>
9.1	Design Advice Letter 1 and Response	76
9.2	Design Advice Letter 2 and Response	89
9.3	Design Advice Letter 3 and Response	101

# Section 1

Design Vision Overview



**NORTH FALLS**

*Offshore Wind Farm*

## 1.1 Introduction

**1.1.1** This Design Vision for the North Falls Offshore Wind Farm Onshore Substation (hereafter referred to as ‘North Falls’ or ‘the Project’) presents the approach to the design of the Project’s onshore substation and its associated infrastructure at Little Bromley, in support of the Project’s Development Consent Order (DCO) application. It sets out how design parameters, primary and secondary mitigation, landscape and ecological enhancements and biodiversity net gain measures interact to create an overarching Vision for the development that respects its landscape and heritage context, with an accompanying set of coherent design principles to guide detailed design post-consent.

**1.1.2** The Design and Access Statement sets out the overall approach to design for the wider project including the landfall and onshore cable route. In addition it demonstrates compliance with the relevant national and local design policies, and makes reference to the Design Vision where appropriate.

**1.1.3** The Design Vision statement for the North Falls project is to ‘Develop a Greener Future for All’. This recognises the integral role the North Falls co-located site plays in the delivery of sustainable energy, in conjunction with Five Estuaries and the National Grid Electricity Transmission (NGET). It also reflects the ambitions to develop a holistic and unified approach to the design of Nationally Significant Infrastructure, through a scheme which aims to be an exemplar of green design and good practice in sustainability.

**1.1.4** The Design Vision has been developed as an iterative document. Prepared initially as part of the Preliminary Environmental Information Report (PEIR), it has evolved as greater detail about the Project and site constraints have become known, and feedback received from key stakeholders. Drawings or visualisation tools are presented to illustrate examples of how proposals will evolve during the design development stages of the Project.

**1.1.5** The Design Vision should be read in conjunction with the following:

- Environmental Statement (ES) Chapter 5 Project Description (Document Reference: 3.1.7)
- Design and Access Statement (Onshore Works) (Document Reference: 2.4)
- Outline Landscape and Ecological Management Strategy (OLEMS) (Document Reference: 7.14)
- Biodiversity Net Gain (BNG) Strategy (Document Reference: 7.22)
- Outline Skills and Employment Plan (Document Reference: 7.18)
- ES Chapter 33 Climate Change (Document Reference: 3.1.35)
- ES Appendix 19.3 Waste Assessment (Onshore) (Document Reference: 3.3.22)

The core elements of the Design Vision including the relevant project mitigations are secured via respective elements of the draft DCO. Final details will be agreed with relevant stakeholders prior to discharge of the relevant DCO Requirements and informed by design and engineering requirements.



## 1.2 Scope of the Design Vision

### 1.2.1 Design Quality Benchmark

Due to the complex nature of offshore wind farm development, many details may be unknown to the Applicant, both at the commencement of the design process and also at the time of DCO submission.

The Design Vision will provide a set of simple, concise, illustrated design requirements to provide specific, detailed parameters for the physical development of the onshore substation.

The Design Vision represents a commitment to design quality. It expresses clear design intentions, in relation to the design aspects of the site, its layout, the built form, structures, enclosures, hard and soft landscape treatments, approach to mitigation and enhancement.

The Design Vision only covers design principles for the onshore substation works area and will form part of the North Falls DCO Submission.

### 1.2.2 Informing an Iterative Design Process

The draft Design Vision was prepared in February 2023 to support the development of the North Falls PEIR, optioneering for the site and early testing of site layouts. For PEIR purposes, the Design Vision only considered a single substation footprint. It was understood that another wind farm developer, Five Estuaries, were also developing proposals for an onshore substation in the same area. In addition, National Grid had commenced a feasibility study for a grid connection point nearby.

Since the PEIR was submitted, North Falls and Five Estuaries have been working closely together to develop co-located substations on the same site. The PEIR-stage Design Vision has been used to inform site optioneering for the two substation footprints and emerging outline designs.

### 1.2.3 Creating a clear 'Vision' to inform early design stages

The Design Vision for the North Falls Offshore Wind Farm Onshore Substation establishes the overall 'Vision' for the site to support the DCO submission. It identifies how the four design criteria identified within the National Infrastructure Commissions Design Principles for National Infrastructure (climate, people, places and value) have informed the overarching design principles. It also identifies a coherent design process that will take place post DCO approval, securing design principles to ensure ideas and best practice are evidenced and carried through to ensure a robust scheme is achievable in practice.

### 1.2.4 Identifying a coherent context for design decisions

The Design Vision provides information on the baseline conditions within the site, its wider surroundings, and the planning, statutory and technical context that has informed the outline proposals.

At DCO submission, the application will be based on a 'Realistic Worst Case Scenario' that specifies a range of design parameters, rather than a fixed design. This provides flexibility of options, where the full details are not known at the time of application and represents the 'Realistic Worst Case Scenario'. This is the basis for the Landscape and Visual Impact Assessment, and other chapters forming the Environmental Statement.

The Design Vision provides details of the range of design options that are both available and appropriate for consideration at the next stage of design, based on the baseline situation and technical constraints. In this manner they will provide a quality benchmark for the subsequent detailed design. The design principles respond positively to the range of constraints and opportunities arising from the site and its surrounding context, whilst responding to the necessary technical requirements of the Project and statutory guidance.

The principles set out in the Design Vision ultimately seek to enhance and strengthen the landscape character of the North Falls setting, ensuring that a sensitive and high-quality development is successfully integrated within the local community.

### 1.2.5 Facilitating Design Engagement

Throughout its duration, the Design Vision has been used to facilitate meaningful engagement in the design process. It formed part of the public consultation at PEIR stage and has been shared at Expert Topic Group meetings with key stakeholders. It has also formed the focus for independent review by the Design Council.

### 1.2.6 Identifying Design Principles

The Design Vision will help guide design and engineering teams, working as a reference document that provides technical and enhancement proposals to mitigate the impacts of the development. It allows all people working on the Project to engage with and implement design principles at every step of the Project's development and delivery. The design principles identified below will evolve through the early stages of the Project's development, later providing a fixed reference point through the later stages to ensure a successful scheme is delivered responding to all relevant design opportunities. Key considerations include:

- Site layout
- Built Form
- Materials
- Colour
- Access
- Public Rights of Way (PRoW)
- Earthworks
- Boundary Treatments
- Hard Landscape
- Planting
- Lighting
- Biodiversity Enhancements; and
- Drainage and Water

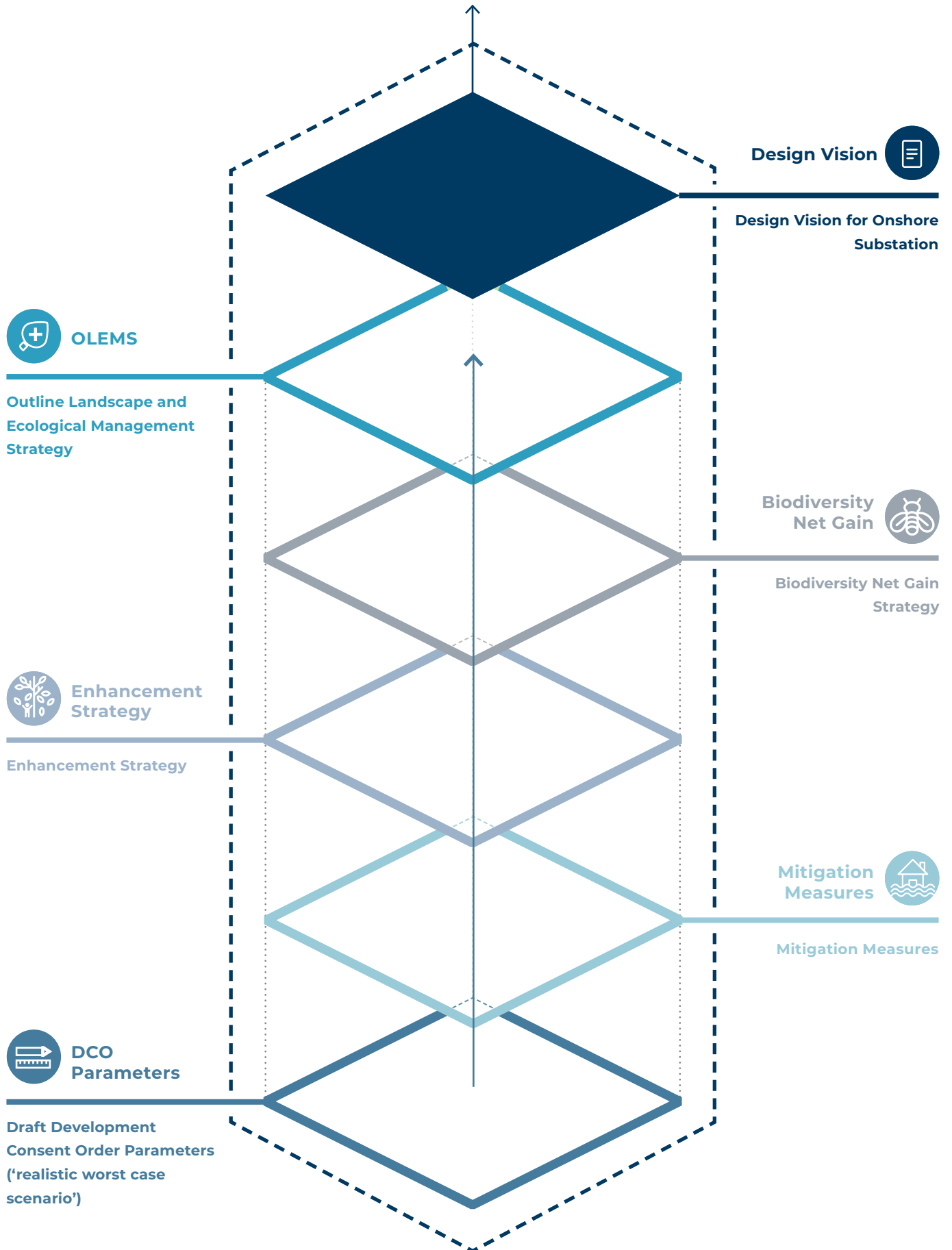
Noise, Carbon and Climate Change have also been considered as part of multi-criteria analysis.

The visualisations, plans and precedent imagery shown throughout the Design Vision are intended to provide visual representations for illustrative purposes only. The final design of the North Falls onshore substation and associated infrastructure will be confirmed through detailed design and engineering that will be undertaken post-consent and agreed with relevant stakeholders and local authorities.



1.3 DCO Submission - Function of the Design Vision

Design and Access Statement for Entire Project



Design Vision

Design Vision for Onshore Substation

OLEMS  
Outline Landscape and Ecological Management Strategy

Biodiversity Net Gain

Biodiversity Net Gain Strategy

Enhancement Strategy  
Enhancement Strategy

Mitigation Measures

Mitigation Measures

DCO Parameters  
Draft Development Consent Order Parameters ('realistic worst case scenario')

### 1.3.1 Introduction

The diagram overleaf identifies how the Design Vision will sit within the suite of documents that will form the DCO application. The Design Vision brings together information from a number of sources and presents it in a coherent manner in order that its relevance and application to the site and substation design can be readily comprehended.

The time line overleaf identifies the design and consultation process that has been followed in the development of the Design Vision.

### 1.3.2 DCO Parameters

Draft Development Consent Order (Document Reference 6.1) - Consents the overarching maximum parameters associated with North Falls ES Chapter 5 Project Description. (Document Reference: 3.1.7) further refines the 'Realistic Worst Case Scenario' for the onshore substation, providing additional parameters not outlined in the draft DCO.

### Baseline Conditions, anticipated environmental impacts and proposed mitigation measures

#### 1.3.3

Volume 3: Environmental Statement. Relevant chapters have provided detailed information around topics discussed in the Design Vision, such as visual receptors highlighted in ES Chapter 30 Landscape and Visual Impact Assessment, or Biodiversity Net Gain (BNG) opportunity areas highlighted in ES Chapter 23 Onshore Ecology. Chapters relevant to the Design Vision principles will be referenced throughout the document and include:

- ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.23)
- ES Chapter 22 Land Use and Agriculture (Document Reference: 3.1.24)
- ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25)
- ES Chapter 24 Onshore Ornithology (Document Reference: 3.1.26)
- ES Chapter 25 Onshore Archaeology and Cultural Heritage (Document Reference: 3.1.27)
- ES Chapter 26 Noise and Vibration (Document Reference: 3.1.28)
- ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29)
- ES Chapter 30 Landscape and Visual Impact Assessment (Document Reference: 3.1.32)
- ES Chapter 33 Climate Change (Document Reference 3.1.35)
- ES Appendix 19.3 Waste Assessment (Onshore) (Document Reference: 3.3.22)
- ES Outline Skills and Employment Plan (Document Reference: 7.18)

### 1.3.4 Outline Landscape and Ecological Management Strategy.

- Outline Landscape and Ecological Management Strategy (OLEMS) (Document Reference: 7.14)

This document outlines the approach to the management of landscaped areas and ecological habitats and features within the site.

### 1.3.5 Biodiversity Net Gain Strategy

- Biodiversity Net Gain Strategy (Document Reference: 7.22)

This document outlines the proposed approach to achieve 10% biodiversity net gain (BNG) in relation to the Project's onshore works.

## 1.4 Post-DCO Consent

### 1.4.1 Introduction

The North Falls and Five Estuaries have liaised to agree an indicative design process for the detailed design to be undertaken post-DCO consent. This process also aligns with the identified timescales for the DCO submission for NGET's EACN project

### 1.4.2 Design Champion

A board-level Design Champion will be appointed following DCO-consent. Their role is to retain over-arching responsibility for design quality throughout the Project. They will maintain an overview of the Design Vision and guide the production of a Design Guide, which will inform the detailed design of the substation.

### 1.4.3 Design Guide

The close working relationship between North Falls and Five Estuaries will be maintained in order to develop a holistic approach to the co-located onshore substations, their shared infrastructure and immediate setting. The Design Principles described within the Design Vision will be developed as decisions are made regarding the substation technology, site layout, onward connections to NGET's EACN etc.. These will enable production of a Design Guide to inform the detailed design proposals.



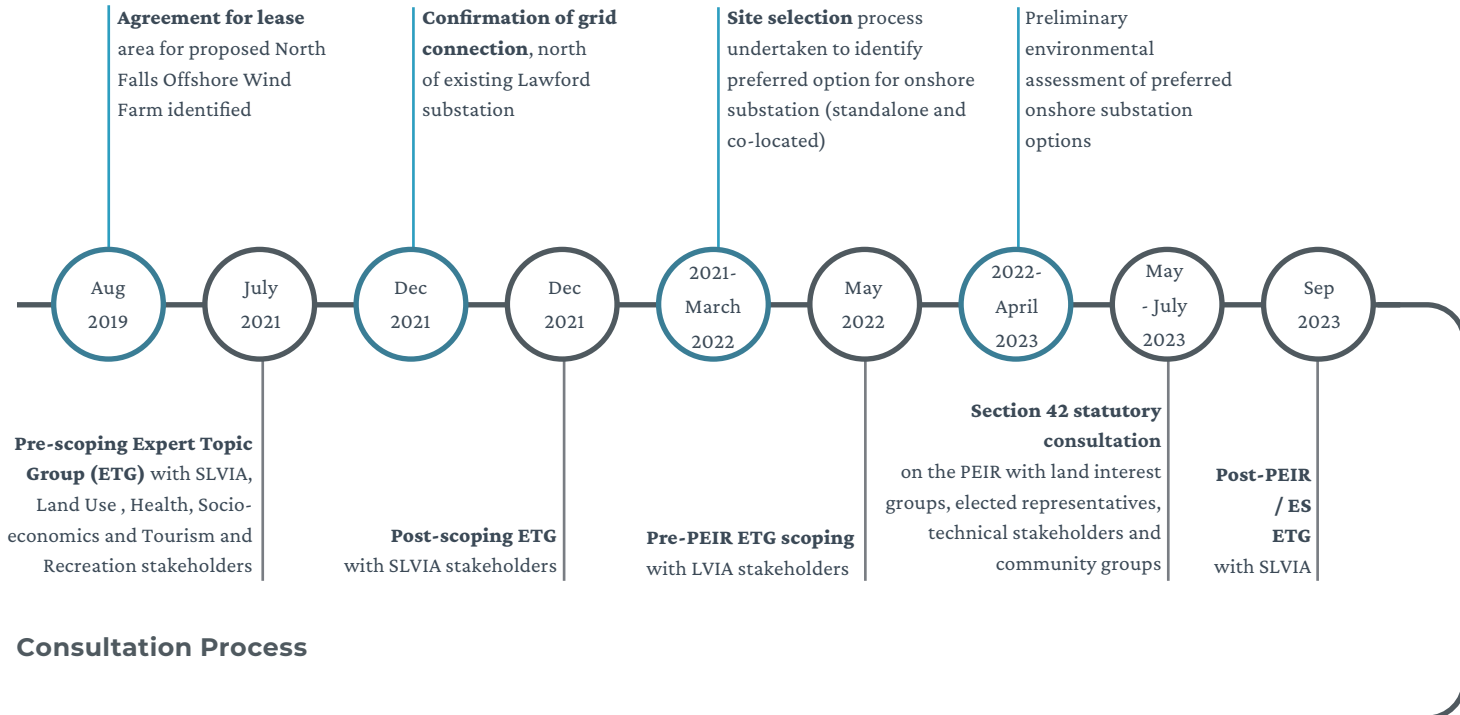
## 1.5 Design Process - Prior to DCO Submission

1.5.1

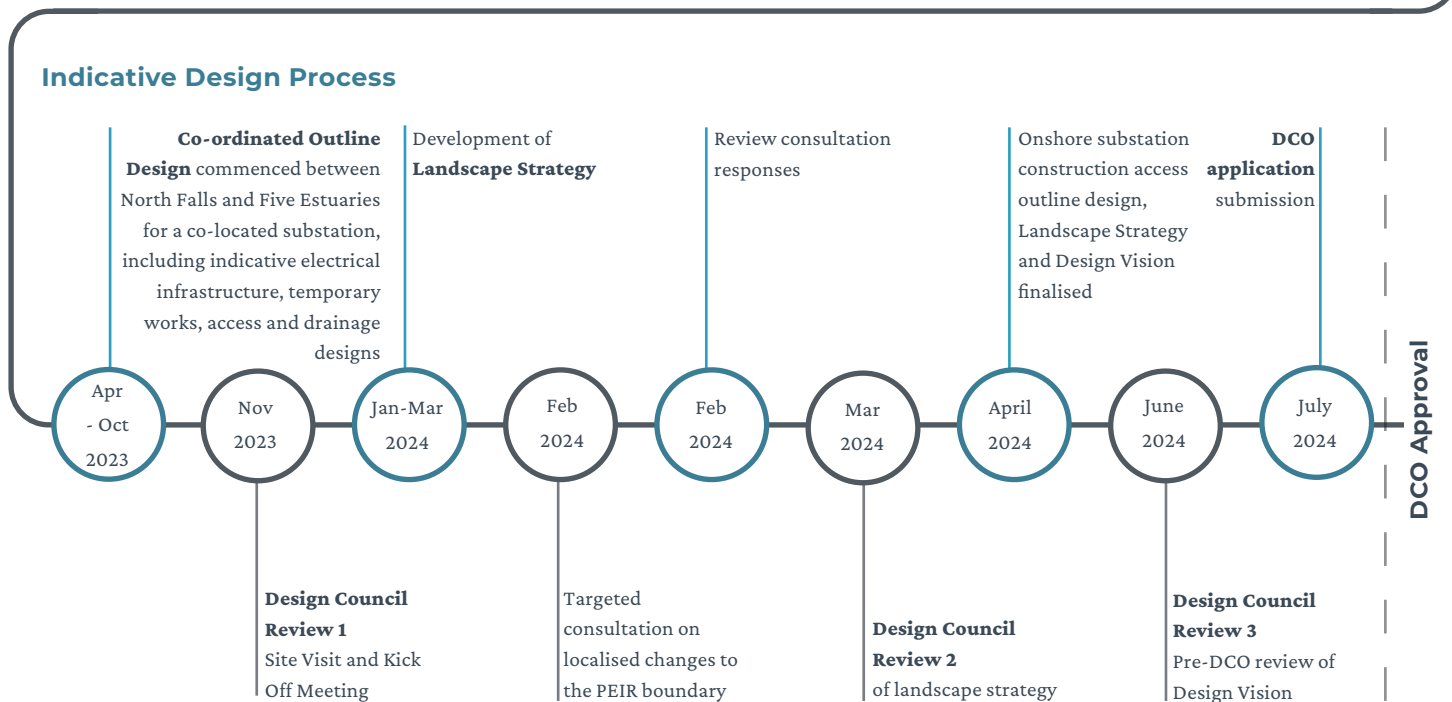
The flow chart below outlines the design and consultation process undertaken by North Falls prior to the DCO Submission. Dates are indicative based on the current consenting time line, and are subject to change.

### Design and Consultation Process - Prior to DCO Submission

#### Indicative Design Process



#### Consultation Process



#### Consultation Process





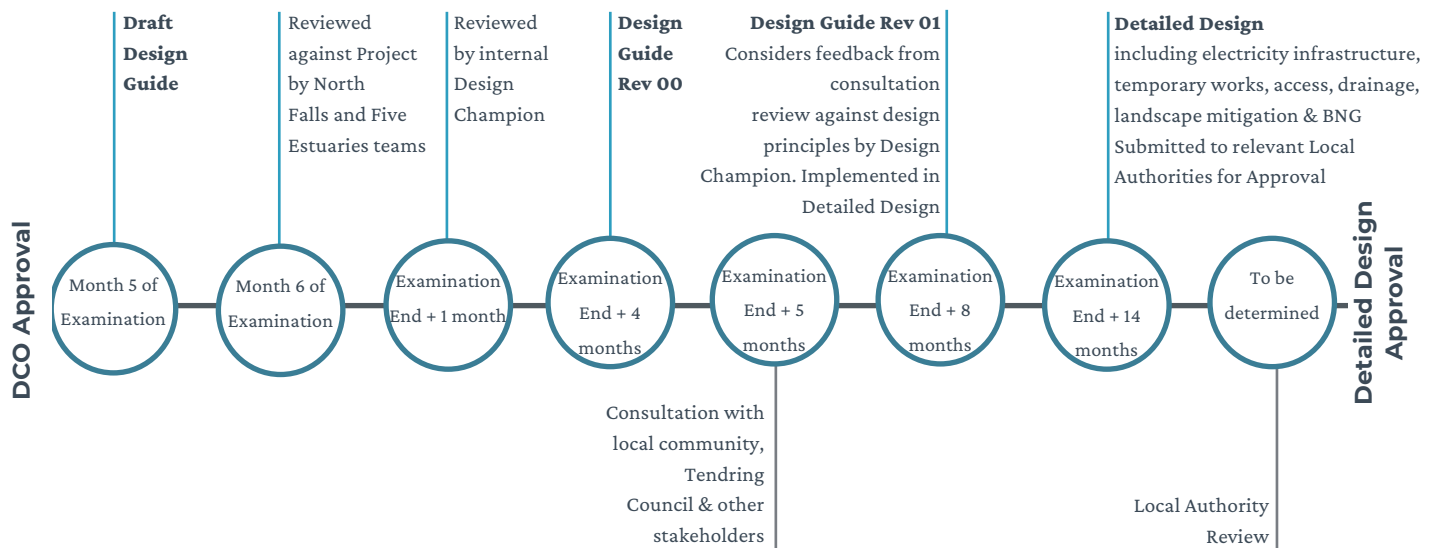
## 1.6 Design Process - Post-DCO Consent

1.6.1

The flow chart below outlines the design and consultation process to be undertaken by North Falls and Five Estuaries following DCO consent. The timescales indicated in the flow chart relate to the North Falls Examination only.

### Design and Consultation Process - Following DCO Approval

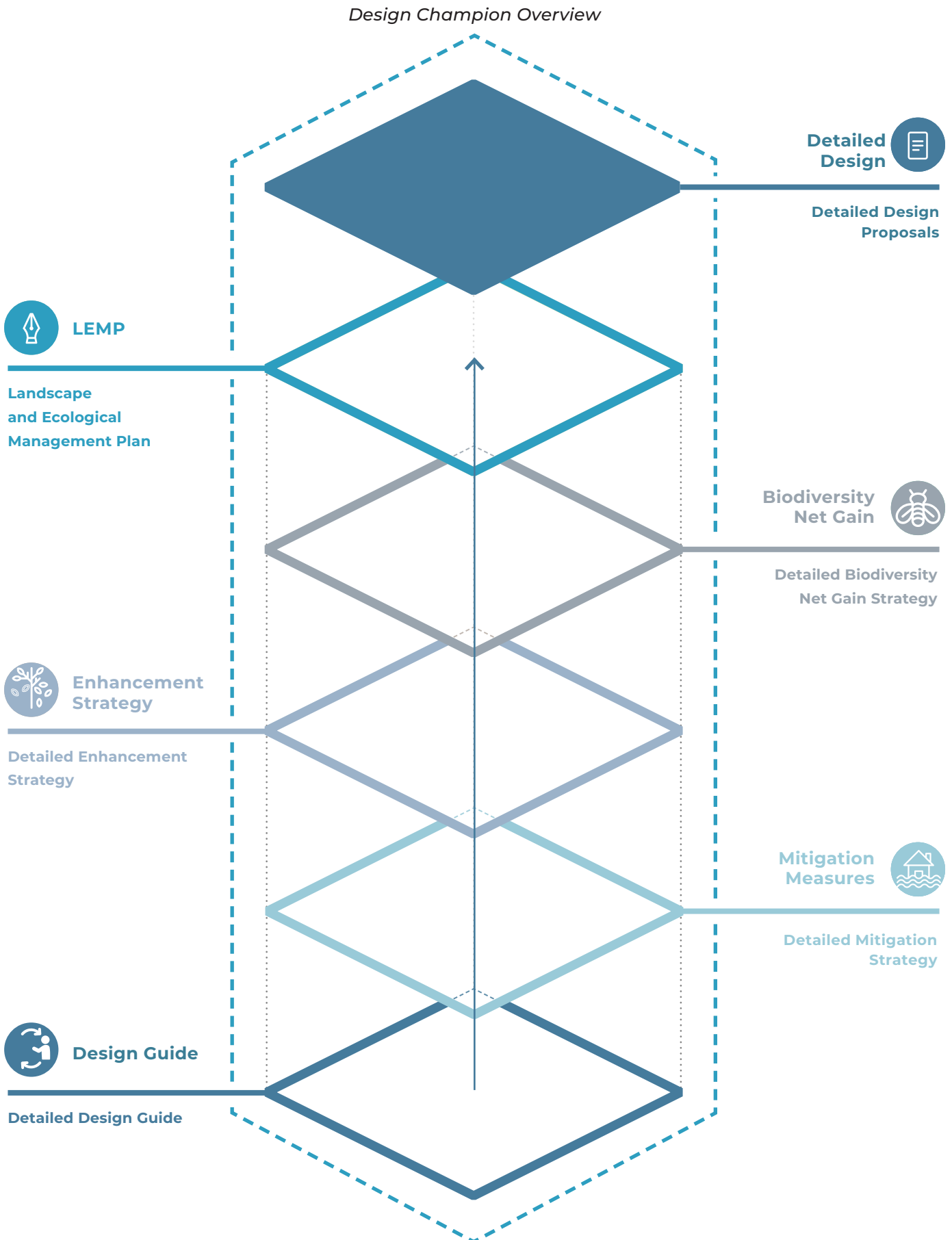
#### Indicative Design Process



#### Consultation Process



### 1.7 Post-DCO Approval - Function of the Design Guide



# Section 2

Policy, Guidance and Standards



**NORTH FALLS**

*Offshore Wind Farm*

## 2.1 National Planning Policy

### 2.1.1 National Policy Statement for Energy Infrastructure, 2011 (NPA, 2011)

There are six National Planning Policy Statements, which set out current government policy on different types of national energy infrastructure development. The NPS for Overarching Energy (EN-1) sets out the Government's policy for delivery of major energy infrastructure.

### 2.1.2 Overarching National Policy Statement for Energy, EN-1 (DESNZ, 2024)

Section 4.7 identifies the criteria for 'good design' for energy infrastructure, and states the following:

- The visual appearance of infrastructure and how it relates to the landscape is sometimes considered to be the most important factor in good design, but functionality, fitness for purpose and sustainability is equally important.
- Applying good design should produce sustainable infrastructure, sensitive to place, including heritage, efficient use of natural resources and energy, matched by an appearance that demonstrates good aesthetic, as far as possible.
- Good design should also ensure that policy objectives in the NPSs can be met.
- Projects should use modern methods of construction and sustainable design practices.
- Applicants should consider how good design can be applied during the early stages of the project life cycle.
- Design principles should be established from the outset, to guide development from conception to operation. Applicants should consider how their design principles can be applied post-consent.
- Whilst there may be limited choice in the physical appearance of energy infrastructure, there may be opportunities to demonstrate good design in terms of siting relative to existing landscape character, land form and vegetation.
- Applicants should seek to embed nature inclusive design within the process.
- Applicants must demonstrate in their applications how the design process was conducted and how the proposed design evolved.
- To ensure good design is embedded, a project board level design champion could be appointed, and a representative design panel used to maximise the value provided by the infrastructure.
- Applicants should consider taking independent professional advice on the design aspects, such as the Design Council and consider design guidance developed by the local planning authority.

The Secretary of State should take into account the ultimate purpose of the infrastructure and bear in mind the operational, safety and security requirements which the design has to satisfy. Many of the wider impacts of a development, such as landscape and environmental impacts, will be important factors in the design process.

### 2.1.3 NPS for Renewable Energy Infrastructure, EN-3 (DNESNZ, 2023)

Paragraph 2.4.2 requires renewable energy infrastructure proposals to demonstrate good design, particularly in respect of landscape and visual amenity, opportunities for co-location with other terrestrial uses, and in the design of the Project to mitigate impacts such as noise and effects on ecology and heritage.

### 2.1.4 NPS for Electricity Networks Infrastructure, EN-5 (DNESNZ, 2023)

When considering factors influencing site design, Paragraph 2.2.2 acknowledges that the development zone of new electricity networks infrastructure is largely determined by system capacity and resilience requirements and the location of network connections.

Paragraph 2.2.6 notes that these constraints do not exempt applicants from their duty to balance site-selection constraints. The applicant should consider characteristics such as local topography, possibilities for screening and options for mitigation of impacts.

Schedule 9 of the Electricity Act 1989 places a duty on all transmission and distribution licence holders to “have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and ...do what [they] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.”

Section 2.3 sets out the considerations that the applicant should take into account in order to ensure that the infrastructure is resilient to the effects of climate change.

Section 2.5 recognises that electrical infrastructure projects can provide excellent opportunities to reconnect important habitats via green corridors, biodiversity stepping zones, and re-establishment of appropriate hedgerows and connect people to the environment, for instance via footpaths and cycleways constructed in tandem with environmental enhancements.



## 2.2 National Design Guidance

**2.2.1** There is a wide body of national and design guidance documents which cover best practice and design standards, which will be used in the development of the onshore substation where relevant. An overview of some of the key documents has been provided below which includes:

- National Infrastructure Commission Design Principles for National Infrastructure, (NIC, 2020);
- IEMA Environmental Impact Assessment Guide to Delivering Quality Development, (IEMA, 2016); and
- National Infrastructure Strategy, (NIS, 2020)
- The Double Diamond (Design Council, 2004)

**2.2.2 National Infrastructure Commissions Design Principles for National Infrastructure (NIC, 2020):**

The most prominent guidance document is the National Infrastructure Commissions (NIC) Design Principles for National Infrastructure, 2020. The NIC outlines four key design principles, that should be key considerations throughout the design process to shape a positive future for infrastructure design in the UK. These are:

- **Climate:** *Mitigate greenhouse gas emissions and adapt to climate change;*
- **People:** *Reflect what society wants and share benefit wisely;*
- **Places:** *Provide a sense of identity and improve our environment; and*
- **Value:** *Achieve multiple benefits and solve problems well*

The four key principles have been referenced throughout the Design Vision (Section 5 of this document) highlighting how these principles have influenced the design approach to achieve a successful scheme that provides benefits throughout the Project’s lifespan.



Figure 1: NIC Key Design Principles (NIC, 2020)

**2.2.3 IEMA Environmental Impact Assessment Guide to Delivering Quality Development (IEMA, 2016):**

The focus of the guide is on the delivery of mitigation associated with new development; improving practice so that efforts at the design and pre-application stage to develop mitigation are carried forward with full understanding at the implementation and management stages.

Three key principles to delivering quality development are set out within the report. Principle 1 is the most relevant to the development of a Design Vision. This states that “*there should be pro-active collaboration with stakeholders, both internally within the project team (developer / designer / contractor / construction delivery teams) and externally (consenting authority and key stakeholders)*”.

Consideration of likely mitigation should be undertaken by competent environmental experts from the earliest possible design stage following the completion of baseline data collection and appraisal, interacting with the Project team, consenting authority, key stakeholders and ideally the construction teams/contractors responsible for the delivery of the Project. This approach maximises the likelihood of success and cost effectiveness of mitigation and ensures the technical and financial viability of mitigation can be rigorously evaluated.

The guidance states that the design and incorporation of mitigation measures should be an iterative process, continuing beyond the pre-application process.

## 2.2 National Design Guidance

### 2.2.4 National Infrastructure Strategy (NIA,2020):

The National Infrastructure Strategy sets out plans to transform how UK infrastructure is delivered, designed and funded. As stated, *'This Strategy sets out the government's plans to transform its approach to infrastructure policy and delivery, to meet both the short- and long-term challenges facing the UK'*.

Embedding good design in all infrastructure projects is an essential element in securing high performance of infrastructure from the start. The National Infrastructure Strategy outlines three methods for embedding good design in line with the design principles set out by the NIC. These include:

- *'Local plans which set clear rules rather than general policies for development, so that quality cannot be negotiated away, nor can the lived experience of the consumer be ignored too readily';*
- *'A reformed planning system which brings forward a new focus on design and sustainability in national policy and practice, building on the National Design Guide'; and*
- *'Requiring all infrastructure projects to have a board level design champion in place by the end of 2021 at either the project, programme or organisational level, supported where appropriate by design panels'.*

### 2.2.5 The Double Diamond (Design Council,2004)

The Double Diamond is a visual representation of the design and innovation process, prepared by the Design Council to describe the steps taken in any design and innovation project, irrespective of methods and tools used.

Outlined below are the key aspects of the Double Diamond design process, including examples to show how the Design Vision is aligned with the ethos.

Four key design stages to the process;

- **Discover.** The first diamond helps people understand, rather than simply assume, what the problem is. It involves speaking to and spending time with people who are affected by the issues.
- **Define.** The insight gathered from the discovery phase can help you to define the challenge in a different way.
- **Develop.** The second diamond encourages people to give different answers to the clearly defined problem, seeking inspiration from elsewhere and co-designing with a range of different people.
- **Deliver.** Delivery involves testing out different solutions at small-scale, rejecting those that will not work and improving the ones that will.

Four core design principles are outlined within the framework;

- **Put people first.** Start with an understanding of the people using a service, their needs, strengths and aspirations.
- **Communicate visually and inclusively.** Help people gain a shared understanding of the problem and ideas.
- **Collaborate and co-create.** Work together and get inspired by what others are doing.
- **Iterate, iterate, iterate.** Do this to spot errors early, avoid risk and build confidence in your ideas.



## 2.3 Local Design Guidance

### 2.3.1 Tendring Landscape Character Assessment – LCA 7A (TLCA, 2001):

This provides an overview of the existing landscape character covering the onshore substation working area and vicinity. It is wholly located within Landscape Character 7A - Bromley Heaths. General design guidance to inform new development notes:

- *'The large-scale open landscape means that particular care must be taken in siting and design. Any new development, even single farm buildings have the potential to be highly visible over long distances';*
- *'Plateau edges form highly visible skylines and are particularly sensitive to built development';*
- *'The church towers frequently form prominent landmark features within this open landscape and views to these should be conserved';*
- *'Care should be taken in the siting of communication masts or other vertical elements – isolated elements may act as landmark features, but several can lead to a cluttered skyline';*
- *'New buildings should be constructed in such a way that they blend with the landscape in scale, colour and design. In this very large scale, open landscape it would be inappropriate to try and hide a new building behind earth bunds or vegetation';*
- *'Opportunities exist for innovative architecture providing it fits with the scale of the landscape, responds to local land form and utilises local materials';*
- *'Sympathetic roof design and materials are critical to the character of local buildings'; and*
- *'Local features of interest, such as louvred panels, can add detail to farm buildings'.*

### 2.3.2 Essex Design Guide (EDG, 2018):

The Essex Design Guide originated in 1973, with a focus on the design of new housing areas. Whilst it continues to primarily offer guidance on residential areas, it also provides other guidance on schools, solar farms and mixed-use development. There is also a section providing Commercial, Industrial and Larger Footprint Building Guidance, identifying five key design principles, four of which are identified as relevant to the development site;

**Principle 1 - Layout:** the guidance recognises that large footprint commercial and industrial buildings are one of the more challenging developments to design sympathetically and effectively, with much of the success coming from an appropriate and well thought out approach to the layout. The guidance reinforces the need for each site to respond to its specific context, allowing larger footprint buildings to assimilate and integrate well with the prevailing landscape and existing built form. Use of land form, either by sinking elements into the landscape, using gradients to build into the landscape, retaining pre-existing land form and natural site boundaries (hedgerows, lines of trees) to screen are all identified. Though should also be given to using appropriate boundary treatments and planting to provide shading to buildings and parked vehicles, improving local air quality, enhancing local biodiversity and ensuring sustainable drainage on site.

**Principle 2 - Access and Parking:** the guidance recognises that larger footprint buildings are often located in remote/edge of settlement locations and have a high reliance on car use. Useful guidance is provided on the design and layout of parking areas, with the aim to achieve a safe, attractive and flexible environment, which future-proofs provision in preparation for changes in technology, car ownership and driving behaviour. Measures to reduce the visual dominance of parking areas are recommended, including use of permeable hard surfaces and regular landscape breaks to 'soften' the environment, offering additional benefits to biodiversity, micro-climate and SUDs.

**Principle 3 - Materials, Character and Architecture:** the guidance advises that a contextual appraisal, landscape character assessments and local vernacular guides should inform the design process, choice of materials, boundary treatments and architectural style. Appropriate proportion and scale are highlighted as being challenging to large scale industrial or commercial buildings and options to visually 'break up' elevations should be considered. Effective and innovative methods of interpreting the traditional, vernacular palette should be explored, with landscaping considered an integral part in the contribution to the character, aesthetics and sense of place.

**Principle 5 - Sustainability and Health:** This guidance states that principles for sustainable design and construction will apply to larger footprint buildings, including use of locally sourced materials, renewable energy sources and creation of comprehensive water and waste management schemes. They should also seek to provide a biodiversity 'net gain' by considering the inclusion of living walls, green roofs and considering other sustainable measure such as rainwater harvesting and permeable paving.

### 2.3.3 Essex Sustainable Drainage Systems Design Guide (ESuDS,2020):

The Essex Sustainable Drainage Systems Design Guide promotes and highlights the benefits of Sustainable Drainage Systems (SuDS):

- Water quality – SuDS can help prevent and treat pollution in surface water runoff, protecting and enhancing the environment;
- Amenity – SuDS can have visual and community benefits for the community; and
- Biodiversity – SuDS can provide the opportunity to create and improve habitats for wildlife, enhancing biodiversity, and enable multi-functional green infrastructure.

The document outlines the best practice and technical guidance for the implementation of appropriately designed and constructed SuDS. This will be used to inform the development of appropriate, site-specific SuDS designs for the North Falls site.



## 2.3 Local Design Guidance

### 2.3.4 Essex Green Infrastructure Strategy (EGIS,2020)

Essex Green Infrastructure Strategy was created in 2020 to promote high quality green spaces and green infrastructure in Essex. As stated in the document introduction ‘The aim is to guide and shape planning and other services through setting principles that can inform plans and strategies, that will enable a coherent approach and partner collaboration in the delivery and long-term management of multi-functional natural assets, which will provide environmental, social and economic benefits’.

Some of the relevant environmental, social and economic benefits of green infrastructure, which will be relevant to the design of the onshore substation include:

- *Space and habitat for wildlife, with access to nature for people;*
- *Adapting to and mitigating climate change, such as managing floods and air pollution; and*
- *Enhancing and protecting biodiversity*

Tendring authority has been classified as having 16.9% Green Infrastructure, with higher GI percentages found to the south of the county. Conversely, authorities in the north of the county have higher proportions of arable lands and pastures, with Tendring having between 65.1-82.8 percent of GI classed as agricultural land.

### 2.3.5 Essex Tree Palette (ETP,2018)

Essex Tree Palette provides a guide for selecting the most appropriate species of locally native tree that are suitable to plant in non-urban parts of Essex according to the predominant landscape character and soil geology. The palette includes trees suitable for hedgerows and woodlands. As stated, ‘The palette is deliberately a small list with the intention that the planting will be enriched by natural regeneration from the surrounding countryside which will better reflect the local variation in tree species. We advocate considering using natural regeneration on its own where viable’. As well as suggesting species that are relevant to plant it also suggests species, which should be avoided.

This guidance, baseline ecological surveys and landscape character information, will be used to inform the list of species suggested within the Design Vision principles.

### 2.3.6 Dedham Vale AONB Guidance on the selection and use of colour in development (July 2018):

This document provides guidance on the use of colour for built development within the National Landscape. This covers all types of buildings, including infrastructure developments associated with transport, flood defences, power generation, distribution communications and utilities.

Guidance is informed by detailed colour studies, developed into a colour palette that best represents the colours and tones found within Landscape Character Areas. The ‘Plateau Farmlands’ character area extends beyond the National Landscape boundary to the edge of Ardleigh Heath. The palette for this area offers a useful insight into the colours and tones that might be identified within the onshore substation site context as part of the detailed colour assessment, post-DCO approval.

### 2.3.7 Dedham Vale National Landscape Lighting Design Guide (2023):

The NL is renowned for its tranquil landscapes and scenic beauty including the beauty of the night sky within a dark landscape. Use of a Sky Quality Meter (SQM) has recorded levels of 21+, incredibly rare in the UK. This guidance aims to minimise impacts on the dark skies within Dedham Vale, looking at impacts beyond immediate areas to be lit. Six dark sky lighting principles are identified:

- Any light should be justified with a clear purpose and benefit. The overall lighting impact should be appropriate for the task and the local setting, regardless of the design.
- Light should be directed to where it is needed and not spill into neighbouring spaces. All light above the horizontal should be avoided. Zero upward light is essential. Asymmetric lights should be used where practicable to reduce light spill, lower mounting heights, improve efficiency and eliminate upward light.
- Lights should provide the right illuminance referenced against design standards where appropriate. Do not use needlessly over-bright lights as there will be more pollution and unnecessary glare. Use 500 lumens and less for domestic lighting. Lights should be installed at their lowest practical height.
- Turn off when not needed with manual switches, timers or proximity (PIR) sensors. Ensure lights are dimmed or selectively activated when activity is low, to reduce light and energy use.
- For larger non-domestic installations, professional designers should be consulted to ensure that illuminance, and control of spill light and glare, are appropriate for the task. Use the minimum possible number of lights and adhere to relevant standards.
- Lamps should be 3000K or less and ideally 2700K. These are sometimes described as ‘warm white’. Lamps above 4000K described as ‘neutral’ and ‘cool’ should be avoided as they generally have more blue light within the spectrum. Spectral emission should avoid blue wavelengths of <500nm.





## 2.4 Technical Standards

2.4.1

The key technical standards in relation to the Project are identified below:

- National Grid Technical Specification 'Substations'
- National Grid 'Design Guidelines for Development Near High Voltage Power lines'. Minimum trees clearance from overhead power lines - 7.3m.
- NGTS 3.10 General Technical Specification for Civil Engineering Works and Electricity Substations
- NG TS 2.22 Technical Specifications - Perimeter Security Fencing for Substations and Other Operational Compounds Perimeter Security Fencing for Substations and Other Operational Compounds. Boundary fencing as a minimum - Category 2, 2.4m high fencing to comply with National Grid Technical Standard 2.22.



This page left intentionally blank



# Section 3

Onshore Substations - Project Description



**NORTH FALLS**

*Offshore Wind Farm*

### 3.1 North Falls - Project Description

**3.1.1** North Falls is a proposed extension located west of the existing Greater Gabbard offshore wind farm, which is located off the east coast of England in the Southern North Sea and was opened in 2013. The Project is being developed by North Falls Offshore Wind Farm Limited (NFOW), a joint venture between SSE Renewables Offshore Windfarm Holdings Limited (SSER) and RWE Renewables UK Swindon Limited (RWE).

**3.1.2** The North Falls project will provide an additional 504MW capacity and up to 57 new turbines. These will connect to two offshore electrical substation platforms which will be connected to the shore by offshore export cables installed within the offshore cable corridor. The Project also requires onshore infrastructure in order to connect the offshore wind farm to the national grid, the footprint for which is collectively referred to as the 'onshore project area'.

**3.1.3** The onshore project area will comprise:

- Onshore Landfall;
- Buried onshore export cables located within the onshore cable route located within the onshore cable corridors, from landfall (between Clacton-on-Sea and Frinton-on-Sea) to the onshore substation and National Grid substation;
- Onshore substation; and
- Onshore cable connection to NGET EACN

This Design Vision relates to the onshore substation only.

**3.1.4** In April 2021, National Grid provided North Falls with a draft offer for connection at a new 'East Anglia Coastal' substation. No confirmed location for the new substation was provided within the offer. In December 2021 National Grid provided North Falls with confirmation that the new substation would be located in land east of the village of Ardleigh in Tendring district, Essex. NGET are currently undertaking PEIR consultation for this substation.

**3.1.5** NFOW have used this information as the basis of the site selection process for the Project, which has resulted in the identification of an onshore substation zone. It is an approximately 60ha area located either side of Ardleigh Road to the east of the village of Ardleigh in Tendring district, Essex. Subsequent site selection and refinement, in collaboration with Five Estuaries, has now refined this down to an 'onshore substation works area' located to the north of Ardleigh Road, with capacity to site two project onshore substations and associated infrastructure.

**3.1.6** The onshore substation will comprise a compound containing electrical equipment required to transform and stabilise electricity generated by the Project so that it can be connected to the National Grid. The detail and location of the various equipment will be determined as the Project design develops. The use of air-insulated switchgear (AIS) is proposed, which will reduce the number and height of substation buildings on the site but will require a larger footprint to accommodate external busbar equipment.

**3.1.7** The buildings required for each technology will be included within the Project's design as presented as part of the Project's DCO application. The operational and functional requirements of the onshore substation will inform the detailed design and layout. The principles outlined in the Design Vision identify the design response that responds to the range of design and mitigation opportunities that will arise during the construction, operation and decommission of the onshore substation, within the DCO Order Limits.

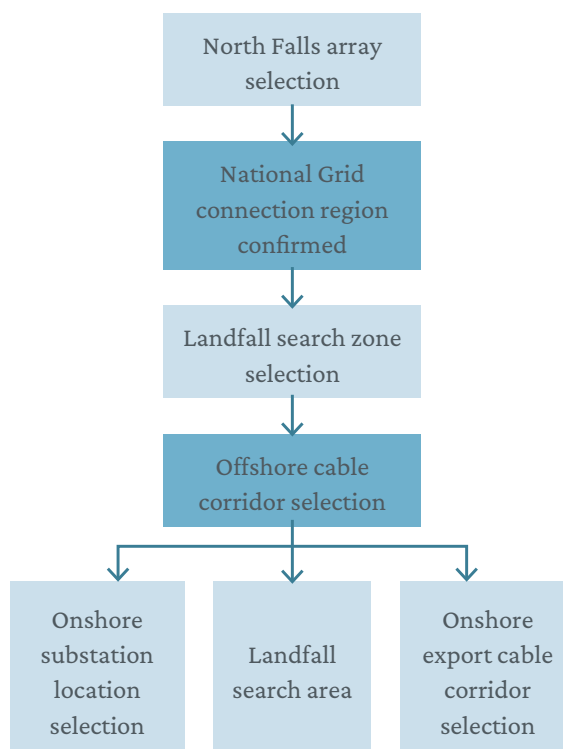


Figure 2: North Falls site selection process

### 3.2 Five Estuaries - Project Description

**3.2.1** The proposed Five Estuaries Offshore Wind Farm is an extension of the Galloper Offshore Wind Farm (GOWF). GOWF is located in the North Sea, around 30km off the coast of Suffolk. It has 53 wind turbines and capacity of 353MW.

**3.2.2** The Five Estuaries project will provide an additional 353MW capacity and up to 79 new turbines. The Project comprises the array, the offshore and onshore cable routes and the onshore substation. The onshore cable routes and onshore substation would be located within a similar location to North Falls.

**3.2.3** North Falls and Five Estuaries will connect to the national grid at a point opposite Lawford substation, near the village of Ardleigh. Due to the Projects' proximity to each other and following stakeholder feedback noting a preference for collaboration, the Projects have sought to co-ordinate on proposed onshore infrastructure where practicable.

The agreement to explore grid-related opportunities was formalised in a statement published in July 2022 as part of the Offshore Transmission Network Review.

**3.2.4** North Falls and Five Estuaries have undertaken a co-ordinated design process to agree a co-located layout for their two substations. This places the North Falls onshore substation to the northeast of the Five Estuaries ONSS. Post-PEIR, both the OLEMS and Design Vision have been developed on the basis of the co-located design. Five Estuaries have been an active participant in the three Design Council review process, initiated by North Falls. They have also provided input on the emerging North Falls Design Vision.

**3.2.5** Five Estuaries submitted their Development Control Order application in March 2024. This includes an Onshore Substation Design Principles Document which sets out the design principles to be applied during the detailed design stages, once the DCO has been approved. Both parties have agreed the draft process for detailed design identified in Chapter 1.

**3.2.6** The Landscape Visual Impact Assessment (LVIA) for Five Estuaries considers effects resulting from the ONSS in conjunction with North Falls as part of its Cumulative Assessment.



Figure 3: Map showing offshore array site context (source: Five Estuaries)

### 3.3 East Anglia Connection Node - Project Description

- 3.3.1** Norwich to Tilbury (NtT) is a proposal by National Grid Electricity Transmission (NGET) to reinforce the high voltage power network in East Anglia between the existing substations at Norwich Main in Norfolk, Bramford in Suffolk, and Tilbury in Essex, as well as connect new offshore wind generation.
- 3.3.2** NGET are also exploring the potential of siting a substation in the Little Bromley area. The substation is referred to as the 'East Anglia Connection Node (EACN). This is proposed on land to the west of the North Falls onshore substation and Five Estuaries ONSS.
- 3.3.3** NGET are at much earlier stages of the design and consultation process, with their PEIR issued for public consultation in April 2024. However, initial discussions have been held between the three parties to establish a closer working relationship and the proposed layout for EACN has been shared between all parties. It is envisaged that this collaborative approach will be continued post-DCO approval, as identified in the draft process for detailed design identified in Chapter 1.
- 3.3.4** The Landscape Visual Impact Assessment (LVIA) for North Falls onshore substation considers effects resulting from the onshore substation in conjunction with EACN as part of its Cumulative Assessment.



# Section 4

Context Study



**NORTH FALLS**

*Offshore Wind Farm*

## 4.1 National and Local Context

### 4.1.1 Introduction

Reviewing the local context of the onshore substation helps provide a better understanding of the intrinsic landscape character, condition, visual amenity and underlying sensitivity of the area surrounding the onshore substation works area. Gaining an understanding of the inherent opportunities and constraints within the site context and identifying particularly sensitive receptors to potential impacts has allowed the development of more robust and locally appropriate mitigation and enhancement proposals as part of the design response to the development.

Design guidance provided within baseline information sources, identified separately in Section 2.1, has also been used to inform the Design Vision.

### 4.1.2 Landscape Character - National Scale

The onshore substation works area falls within National Character Area Profile 111 Northern Thames Basin:

- *“There is a diverse range of semi-natural habitats... ancient woodland, lowland heath and floodplain grazing marsh. These provide important habitats for a wide range of species including great crested newt, water vole, dormouse and otter”;*
- *‘Parts of Essex are heavily wooded. Other areas within Essex are more open in character. There are also significant areas of wood pasture and pollarded veteran trees’;*
- *‘Extensive tracts of flat land’;*
- *‘The field pattern is very varied, reflecting historical activity’;* and
- *‘The landscape has mixed farming uses.’ (NCA, 2013)*

NCA 111 also sets out 4 Statements of Environmental Opportunities (SEO) for the Northern Thames Basin:

- *‘SEO 1 – Manage rivers and river valleys to protect and improve water quality and help to reduce flooding in the downstream urban areas’;*
- *‘SEO 2 – Manage the agricultural landscape and diverse range of soils which allow the Northern Thames Basin to be a major food provider’;*
- *‘SEO 3 – Protect and appropriately manage the historic environment, which contributes to local character and sense of identity’;* and
- *‘SEO 4 - Manage and expand the significant areas of broad leaf woodland and wood pasture.’ (NCA, 2013)*



Figure 4: National Character Area 111 (NCA, 2013) – Northern Thames Basin NE466



## 4.1 National and Local Context

### 4.1.3 Landscape Character - Local Scale

The onshore substation works area falls within Tendring landscape character area 7A Heathland Plateaux – Bromley Heaths, as described within the Tendring District Landscape Character Assessment. The key characteristics of this landscape are:

- 'Exposed and windswept plateau corresponding to highest part of the district';
- 'Deep, coarse, loamy and often stoneless brown soils which support a high-grade agricultural land';
- 'Large scale productive arable fields divided by low, gappy hedgerows where hedgerow oaks stand out as silhouettes against the skyline';
- 'Apple orchards around Ardleigh, Elmstead and Frating are sheltered by belts of poplar or fast growing Leylandii';
- 'Former heaths largely converted to smallholdings or regenerating woodland. Small areas of remnant heath survive';
- 'Neglected oak/sweet chestnut coppice with ground flora typical of acidic woodland soils';
- 'Low density, rural settlement pattern of scattered farms and halls, hamlets villages and small market towns';
- 'Network of narrow lanes connect scattered farms and villages, and roadside verges often contain gorse and bracken'; and
- 'Dramatic, dominating skyline.' (TLCA, 2001)

### 4.1.4 Design guidance for LCA 7A Heathland Plateaux – Bromley Heaths includes:

- Large-scale open landscape means that particular care must be taken in siting and design. Any new development, even of farm buildings, has the potential to be highly visible over long distances
- Care should be taken in the siting of communication masts or vertical elements - isolated elements may act as landmark features but several can lead to a cluttered skyline
- New buildings should be constructed in such a way that they blend with the landscape in scale, colour and design. In this very large scale, open landscape it would be inappropriate to try and hide a new building behind earth bunds or vegetation
- Opportunities exist for innovative architecture provided it fits with the scale of the landscape, responds to local land form and utilises local materials
- Sympathetic roof design and materials are critical to the character of local buildings; and
- Local features of interest, such as louvred panels, can add detail to farm buildings.

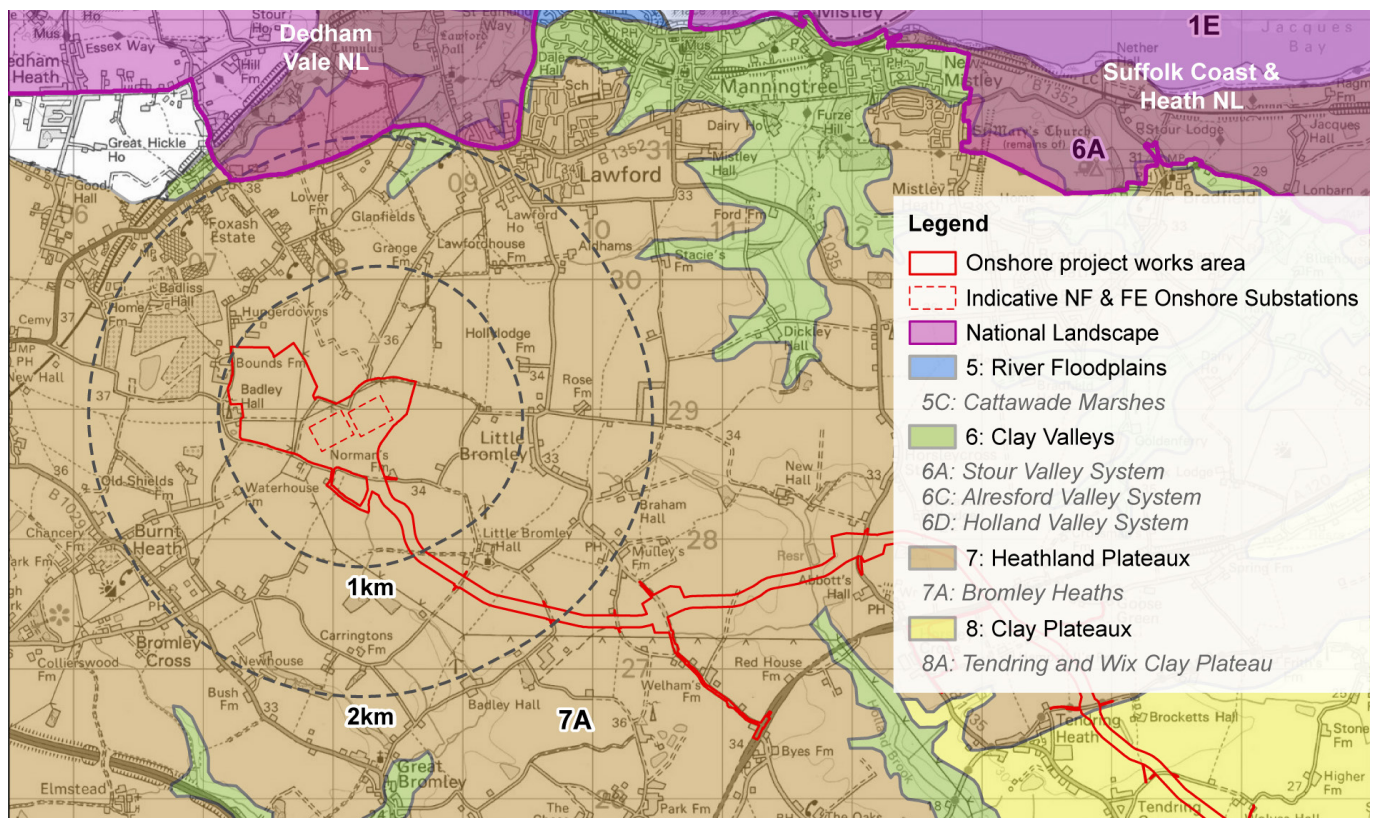


Figure 5: Plan showing landscape character areas encompassing the onshore substation works area

## 4.1 National and Local Context

### 4.1.5 Landscape Designations

Additional context considerations include landscape designations within the site itself or the wider study area. As stated in ES Chapter 30 LVIA ES (Document Reference: 3.1.32), the site is not located in any nationally designated landscapes (National Parks, National Landscape) or locally designated landscapes (Areas of Special Character, as identified in the emerging Tendring District Local Plan 2013-2033 and beyond, publication draft).

The Suffolk Coast and Heaths National Landscape is located outside of the study area being situated around 2km to the north. Viewpoint assessment in ES Chapter 30 LVIA (Document Reference 3.1.32) confirms that visibility from the National Landscape, towards the onshore substation working area, is limited. Due to distance and the limited nature of actual visibility, landscape effects on the special qualities of the National Landscape are unlikely to be significant.

The Dedham Vale National Landscape is located to the north-west of the study area. ES Chapter 30 LVIA (Document Reference 3.1.32) notes that the potential for notable views from this designated landscape is considered unlikely, given the more inland location, narrower nature of the river corridor and intervening vegetation.



Figure 6: Onshore project area and co-located onshore substation works area.

## 4.2 Onshore Substation Context

### 4.2.1 Landscape Context

The proposed North Falls onshore substation works area is located to the north-east of the existing National Grid substation, on Ardleigh Road. The site is located approximately 2km to the south-west of the settlement of Little Bromley, in Tendring.

The site is approximately 35m Above Ordnance Datum (AOD), with a generally flat land form across the site. The land cover is characterised by arable farmland with large-scale field patterns.

Field boundaries across the onshore substation works area are generally open in character, with some hedgerow boundaries with occasional hedgerow trees. The ecological survey has identified sections of existing species poor hedgerow on the northern boundary of the substation site. This offers scope for enhancement with new infill hedge planting providing greater habitat and GI connectivity.

Historic mapping indicates that a line of trees located within the middle of the site formed part of a field boundary system that originally subdivided the larger agricultural fields. The hedgerow itself has become lost over time.

There is a higher level of existing tree cover along the boundary with Barn Lane and Grange Road, to the north and west, and around the existing substation on Ardleigh Road, to the south-west of the onshore substation working area. These filter views across the site from the northeast.

Shelter belts, of around 20m width, are a common feature in the wider landscape, where they form boundaries to horticultural uses and farms. Elsewhere, small copses of trees are clustered in the corners of fields and at the junctions of field boundaries, near to isolated residential properties.

A drainage ditch runs through the centre of the site, with others located close to the boundary of the wider onshore substation working area.

Lawford substation is located immediately to the south of the site on the opposite side of Little Bromley Road. It is surrounded by a woodland belt varying in depth between 12-40 metres. Two 132kv overhead electricity transmission lines run northwards from the substation, one of which crosses the western boundary of the site.

There are existing Public Rights of Way (PRoW) to the north of the site (FP170-25, FP170-21, FP170-22), east of the site (FP170-23, FP170-57, FP170-19, FP172-12, FP172-14) and south of the site (FP172-15). Barn Lane, a local byway (170-57) runs along the north-eastern boundary of the site.

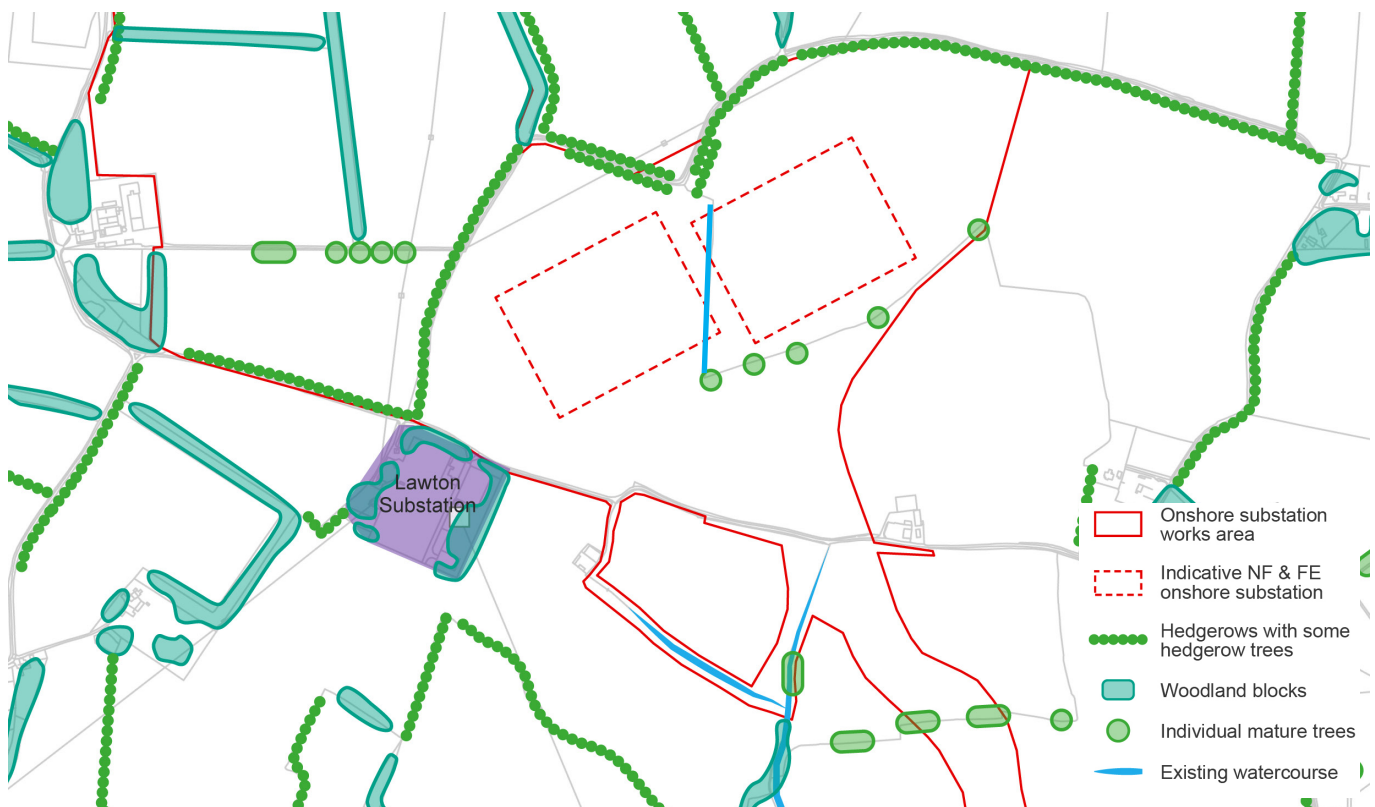


Figure 7: Existing vegetation and watercourses around the site

4.2.2 Visual Context

The onshore substation works area is located between a number of small settlements including Little Bromley approximately 1km to the east, Bromley Cross approximately 1.5km to the southwest and Lawford approximately 2km to the northeast. The surrounding landscape slopes gradually from northwest to southeast, but is generally flat with some long-range views.

The onshore substation works area is adjacent to the existing Lawford substation situated to the southwest of Ardleigh Road. Pylons connecting to the existing substation are visible in the landscape, but views of other electrical infrastructure equipment are screened from local receptors by mature clusters of trees. Ardleigh Road passes through the onshore substation works area, running northwest to southeast. An existing PRoW runs to the south connecting Ardleigh Road to Lilley's Lane.

The onshore substation works area is located within arable farmland with large scale field patterns. Field boundaries consist of a mixture of mature and gappy hedgerows with occasional hedgerow trees that provide seasonal screening. The individual and clusters of mature trees surrounding the onshore substation works area are easily visible in the landscape providing focal points. These natural elements enhance the rural character of the area. The only watercourse present in the onshore substation works area and the surrounding area runs through the fields

to the south of the zone heading southwest. As stated in ES Chapter 30 LVIA (Document Reference 3.1.32), potential visual receptors surrounding the onshore substation works area include:

- Residents, including views from isolated properties and small hamlets and settlements such as Norman’s Farm to the east;
- Road users along Little Bromley Road, Grange Road and Ardleigh Road (including tourists);
- Those engaged in recreational activities (e.g. walkers using PRoW and bridleways, and cyclists and users of the coastal edge near the proposed landfall) primarily along PRoW 170\_57, 172\_15, 172\_14 and 172\_12; and
- People at their place of work, including agricultural workers to the northwest of the site.

Chapter 30 highlights that ‘there are a small number of properties and farmsteads generally focused to east and south-east of site (beyond 250m). Norman’s Farm, to south-east, is the closest residential property and likely to experience more open secondary views to site. Views from properties on the western edge of Little Bromley, to the east, are secondary and typically filtered/ screened by intervening vegetation... There is a hedge lined footpath along Barn Lane (and associated bridleway) to the north-east of site... In terms of wider views, the substation study area is generally flat and hedgerows and areas of woodland will generally help to filter and screen middle to longer distance views.’



Figure 8: Substation sitting zone visibility

#### 4.2.3 Onshore Archaeology and Cultural Heritage Context

ES Chapter 25 Onshore Archaeology and Cultural Heritage (Document Reference 3.1.27) identifies the following opportunities for mitigation within the immediate context of the substation;

- Impact to the Historic Landscape Character (including hedgerows and parish boundaries) will be minimised by returning field boundaries / areas / hedgerows to their pre-construction condition and character post-construction, as part of a sensitive programme of backfilling and reinstatement / landscaping.
- Certain hedgerows and field boundaries (e.g., parish boundaries) may require recording prior to the construction process and enhanced provisions made during backfilling and reinstatement.
- The onshore substation will be designed to reduce the overall height and massing of associated structures and other elements as far as possible. Landscape proposals will include measures for the enhancement of local biodiversity during the operational phase of the onshore substation. This will include landscape screening of the onshore substation through hedgerow and woodland planting. Once matured, this will help to integrate the onshore substation into the existing landscape of arable fields and boundary trees/hedgerows.

#### 4.2.4 Drainage Context

The onshore substation is situated to the northern end of the Tenpeny Brook WFD Surface Water Operational Catchment. The Environment Agency Historical Flood Extent map shows that the onshore substation is situated wholly within Flood Zone 1. None of the onshore substation works area is situated within a historical flood extent.

Mapping indicates that there are two Ordinary Watercourses comprising ditches along field boundaries to the south of Ardleigh Road adjacent to the entry point for the onshore cable route into the onshore substation works area.

1 in 100 year +45% for climate change will be accommodated, through the provision of appropriate on-site attenuation and storage, in accordance with the Essex County Council Sustainable Drainage Systems Design Guide. The implementation of temporary construction compounds may increase surface water temporarily, therefore an appropriate surface water drainage scheme will be developed.

The Outline Operational Drainage Strategy (Document Reference 7.20) identifies provision of the following features:

- Permanent swales to perimeter of each compound
- Permanent swale to east of access road
- Permanent swale to south of Ardleigh Road
- Permanent division of ditch through centre of site
- Permanent attenuation basins

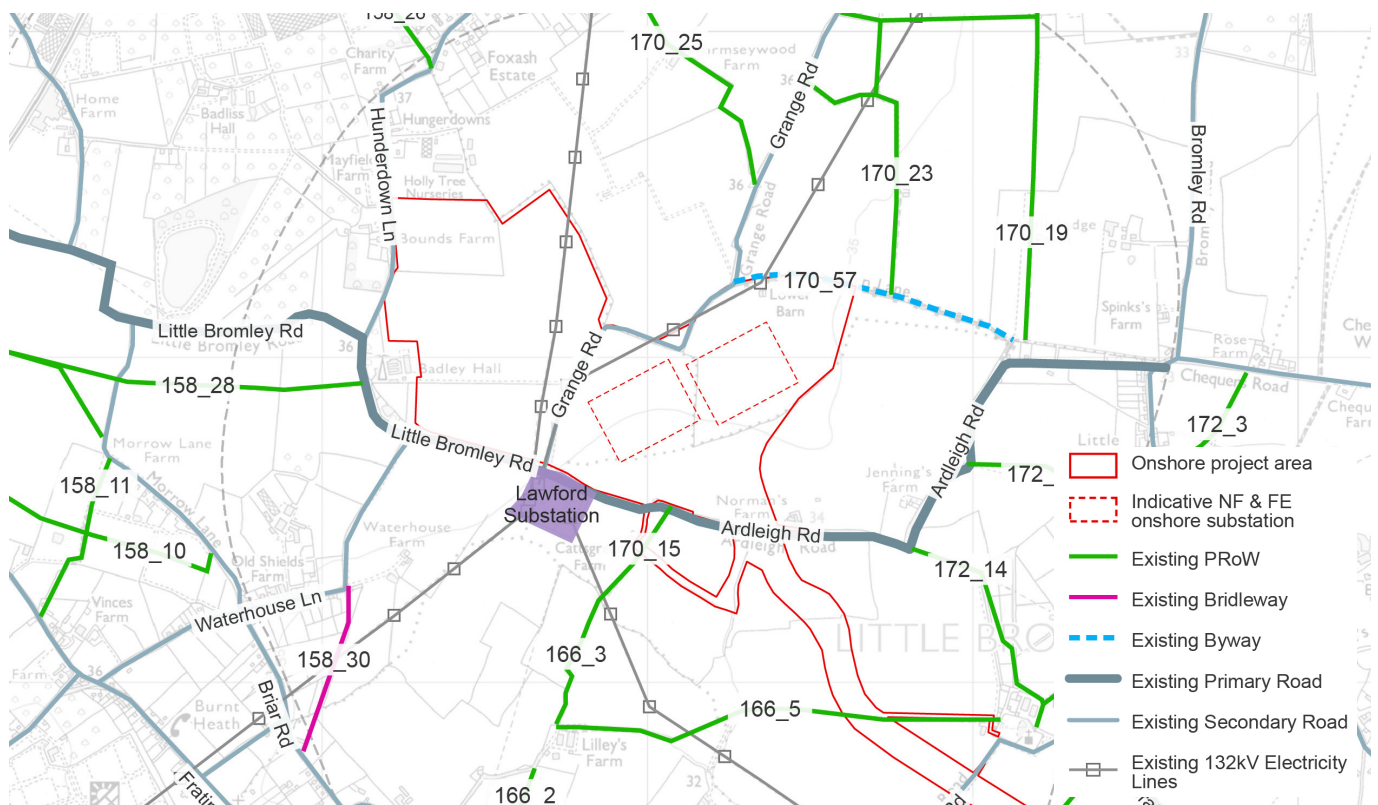


Figure 9: Existing PRoW, byways and brideways

#### 4.2.5 Ecological Context

ES Chapter 23 Onshore Ecology (Document Reference 3.1.25) identifies the following mitigation:

- Reinstatement of the existing drainage ditch running through the site.
- Grassland reseeding would be undertaken using a local seed mix, to be agreed in advance with Natural England and Essex Wildlife Trust.
- Reinstatement of all hedgerows using locally important and native species, as advised by Essex Wildlife Trust and following the Essex Hedgerow Local Biodiversity Action Plan (LBAP).

Biodiversity Net Gain Strategy (Document Reference 7.22) has also identified the following beneficial features;

- Maintenance of permanent water level within the attenuation ponds and variation in depth to create a range of marginal and wetland habitats.
- Creation of a mosaic of habitats; woodland, scrub, hedgerow, open grassland, and aquatic habitats, including the transitions between these.

#### 4.2.6 Noise Context

3D noise modelling, identified within ES Chapter 26 Noise and Vibration (Document Reference 3.1.28), has been undertaken to determine the substation sound levels within 1km of the substation. Sound levels on nearby receptors (residential properties, public rights of way) have been calculated to understand the degree of change in sound level predicted during the Project's operation. These levels are presented in ES Chapter 26 Noise and Vibration (Document Reference: 3.1.28).

The Project has committed to ensuring that sounds generated by the onshore substation at all nearby receptors stay below an acceptable rating level of 35dB. In order to ensure compliance with this commitment, a number of mitigation measures been proposed. These include:

- Use of electrical components with reduced sound power levels;
- Use of enclosures or localised screening around selected noisy components (typically concrete and steel structures of equivalent height to the emitter);
- Placement of buildings and other structures within the onshore substation to form a noise barrier.
- An acoustic barrier around some or all of the onshore substation;

The exact measures used would be determined post-consent once detailed design has been undertaken, and the noise modelling updated. Noise monitoring requirement not anticipated



Image 1: Viewpoint from Bridleway at Barn Lane

#### 4.2.7 Site and Development Opportunities

Development of the site clearly has the potential to affect existing visual amenity and the views experienced by a number of receptor groups. A number of opportunities and constraints have been identified, the design approach outlined in Section 6 and design principles identified in Section 7 provide a considered response to them. These include:

- Generally flat topography within the onshore substation works area - this provides flexibility for initial siting and for construction of the substation and associated infrastructure.
- Scope to enhance existing landscape - the existing site is used for intensive arable cultivation with minimal boundary vegetation, therefore provides significant scope for landscape, habitat and biodiversity enhancement through the introduction of native planting, SuDS etc..
- Local vernacular - the existing agricultural and horticultural structures around the onshore substation works area form a local vernacular reference that can be explored to better integrate the onshore substation into the setting.
- Scope to enhance and reinforce the pattern of field boundaries, including new hedgerow planting with scattered trees, in keeping with the baseline characteristics of the receiving LCA.
- Scope to enhance biodiversity across the site through the enhancement of existing features and incorporation of new ones.

#### 4.2.8 Site and Development Constraints

- Generally flat topography within surrounding landscape - this creates opportunities for long range views across the onshore substation works area and defines the type of vegetation or mitigation that can be used in certain areas due to landscape character;
- Sensitive visual receptors in the vicinity of the site – views of the site can be gained from visual receptors such as local residents and PRoW, consideration will need to be given siting of buildings and infrastructure, materials and colours used and the potential use of land form or vegetation to enhance screening of the site;
- Existing PRoW running along the north-east site boundary - this will require screening and potentially additional wayfinding to connect the PRoW network; and
- Additional substation buildings and infrastructure will be required within the adjoining area for NGET's EACN project. This may increase the visual impact and mitigation needs of the onshore substation due to the quantity of electrical infrastructure in the surrounding areas.
- Existing valued landscape features should be retained or replicated within the new layout. These include trees along the site boundary and running through the centre of the site and an existing drainage ditch running through the centre of the site.
- Existing electrical infrastructure; such as 132kv overhead line crossing the western boundary of the site and Lawford Substation.

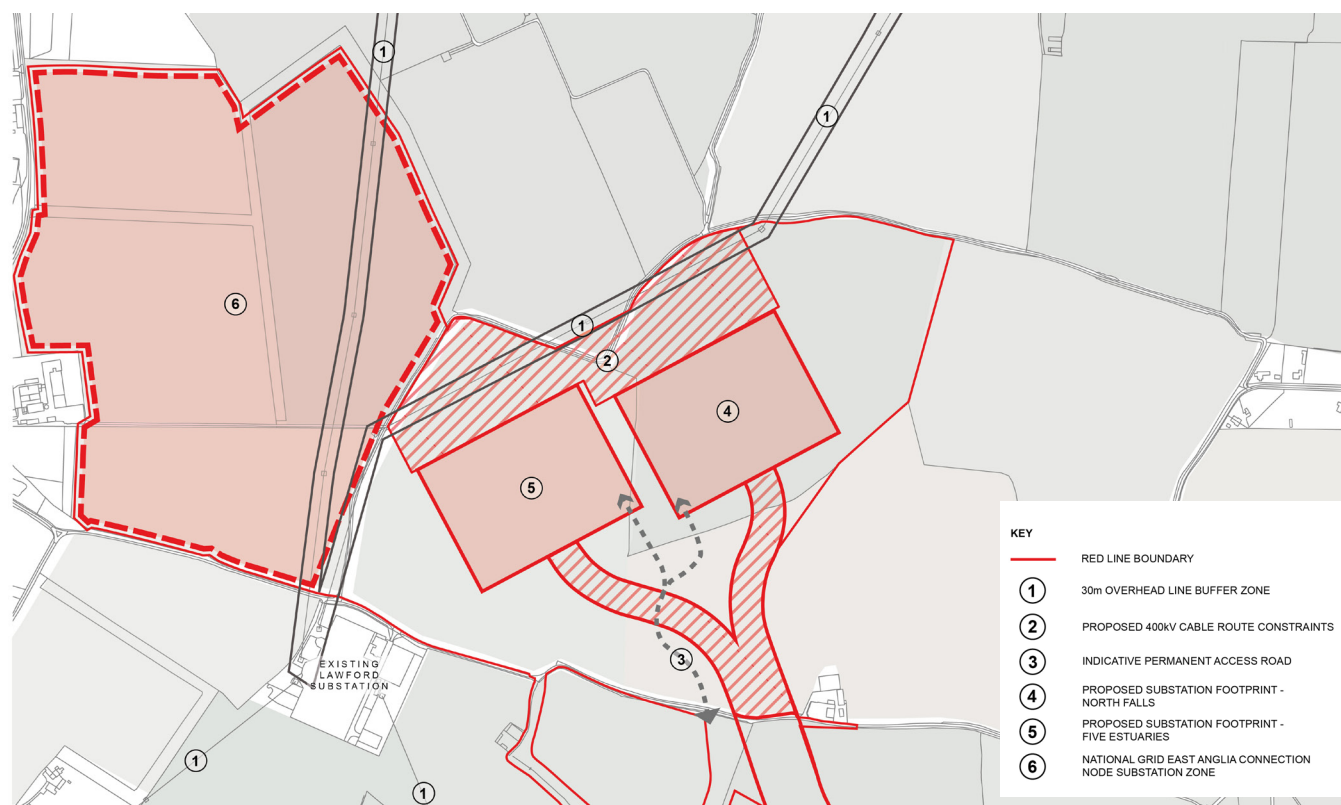


Figure 10: Development Constraints

This page left intentionally blank



# Section 5

Design Development



**NORTH FALLS**

*Offshore Wind Farm*

### 5.1 Site Selection

**5.1.1** The siting and refinement of the North Falls and Five Estuaries onshore substation working area has considered environmental, physical, technical, commercial, social aspects and feedback from early engagement with communities and stakeholders.

Some of the key principles underpinning the onshore substation works area selection include:

- Locate as close as possible to the proposed National Grid substation;
- Include adjacent land for temporary works and permanent access to the highway network;
- Consider sites that will have the lesser impact to environmental effects locally;
- Must be technically feasible and economically viable, subject to a constructibility review; and
- Consider whether co-location with other known developments and/or shared infrastructure is feasible.

Further details are provided within ES Chapter 4 of the Environmental Statement: Site Selection and Consideration of Alternatives (Document Reference: 3.1.6).

**5.1.2** The location for the coordinated onshore substation working area is located near Little Bromley, adjacent to the existing Lawford Substation. The detailed site selection for all elements of the Project’s onshore infrastructure aims to avoid and minimise impacts as far as possible taking into account:

- Location of NGET EACN substation connection point;
- National, regional and local landscape designations; e.g. National Parks, National Landscapes;
- Tourist attractions (e.g. golf course, caravan parks);
- PRoW and NCN routes;
- National, regional and local heritage designations; e.g. World Heritage Sites, Conservation Areas, Listed buildings and scheduled monuments;
- National, regional and local nature conservation designations; e.g. SPA, SAC, Ramsar sites, SSSIs, NNRs, LNRs;
- Areas of important habitat (e.g. trees, hedgerows, ponds and agricultural ditches);
- Historic landfill sites;
- Key settlements and residential properties;
- Traffic constraints; and
- Utilities.

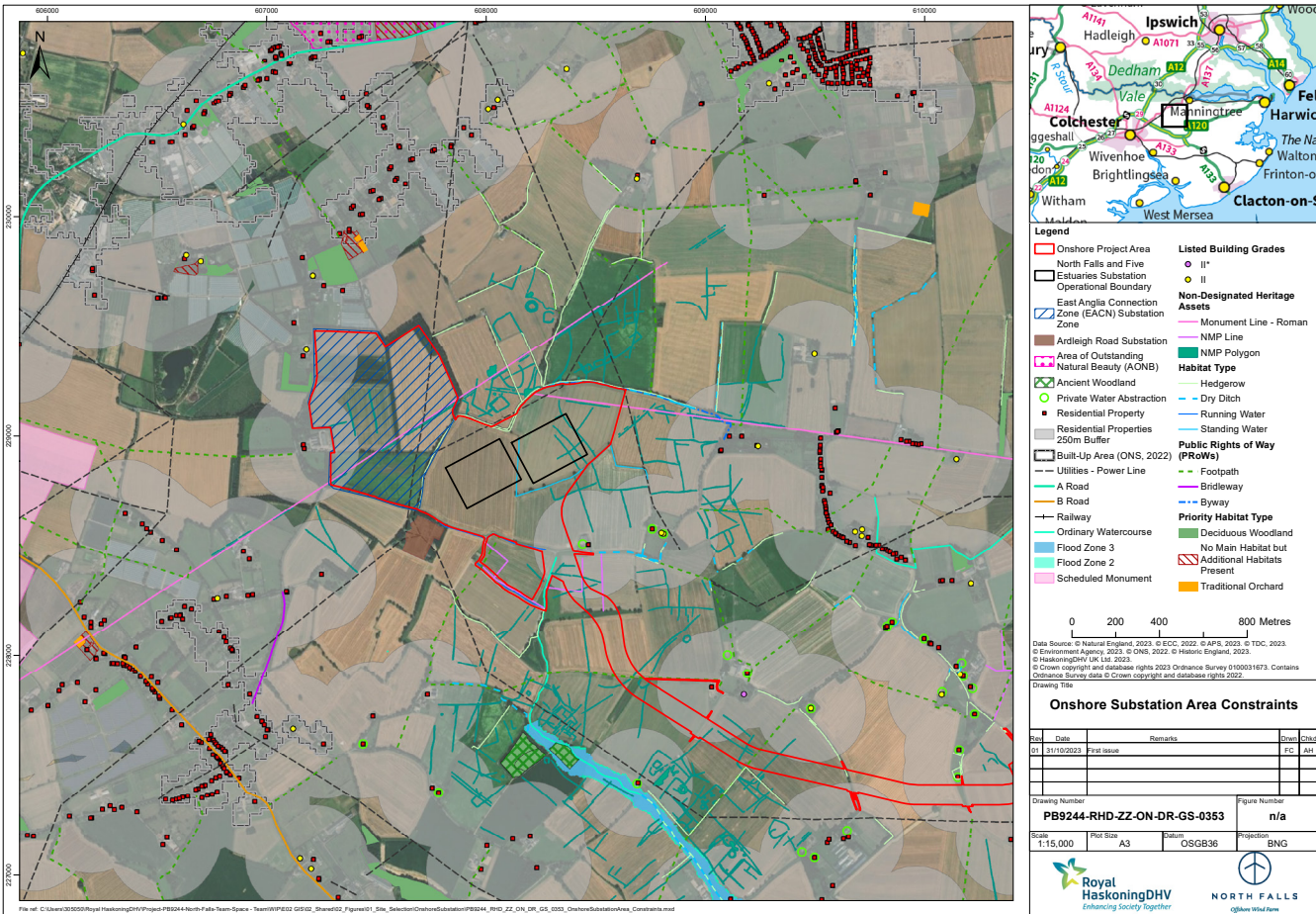


Figure 11: Onshore Substation Working Area Constraints Mapping

## 5.2 Optioneering

**5.2.1** During the site optioneering phase undertaken by North Falls in conjunction with Five Estuaries, various orientations of the two substations were tested to make the best use of space possible.

### OPTIONEERING - OPTION 1

- The orientations shown in the following two plans made it difficult to fit in the required substation infrastructure efficiently;
- The north-eastern substation is constrained by the presence of the Roman road running east west across the point of the field;

### 5.2.1 OPTIONEERING - OPTION 2

- The Temporary Construction Compound has had to be reduced in size to 34000m<sup>2</sup> due to the field drain to the south of the leaf shaped field;
- Both orientations shown would have required the Temporary Construction Compound to be located south of Ardleigh Road, which would have resulted in safety concerns for traffic crossing Ardleigh Road; and
- Additionally, there is a potential solar farm being developed in the field south of Ardleigh Road.



Figure 12: Optioneering 1



Figure 13: Optioneering 2

## 5.3 Mitigation Requirements

### 5.3.1 Introduction

The following section summarises the range of mitigation requirements, as identified during PEIR and subsequent stages of the Project development.

### 5.3.2 Types of Mitigation

Mitigation measures will be introduced through:

- Embedded mitigation - mitigation through design or good practice, which will be undertaken regardless of assessment outcomes; and
- Additional mitigation - identified following the completion of the environmental assessment, as required to minimise the effects identified.

Mitigation measures, whether embedded or additional, will ensure significant adverse effects are minimised and significant beneficial impacts are maximised.

### 5.3.3 Landscape and Visual Mitigation

Some of these measures include:

#### Potential landscape effects during operations - Embedded mitigation

- Mitigation of landscape and visual effects undertaken through design modifications and input to the design process.
- The Design Vision also considers the location of the various components within the onshore substation works area, consideration of the materials used, colour palettes and boundary treatments
- An arboricultural survey will be undertaken post-DCO consent to identify the locations and condition of existing trees, in order to maximise retentions on site, where practicable.

#### Potential effects on visual receptors - Additional Mitigation

- Visual receptors using existing PRoW close to the onshore substation works area may have long range, short range or direct views of the onshore substation, depending on its siting.
- Existing hedgerows and clusters of trees may provide visual screening, but additional layered vegetation should be considered to prevent views and provide ecological enhancements.

### 5.3.4 Ecological Mitigation

#### Potential effects on ecological receptors - Embedded mitigation

- Lighting will follow guidance from the Bat Conservation Trust (BCT) and Institute of Lighting Professionals. This includes:
- Lighting cowed and angled downwards;
- Ensure lighting is motion activated; and
- Follow good practice.

#### Potential effects on hedgerows - Embedded Mitigation

Mitigation measures employed in relation to hedgerows include:

- Hedgerows will be replanted using locally native species as advised by Essex; and
- All hedgerow sections permanently removed at the onshore substation will be replaced.

#### Potential effects on Habitats - Embedded Mitigation

All habitats subject to temporary disturbance during construction, will be reinstated in full following the completion of construction.

Mitigation includes:

- Grassland habitats - Grassland reseedling would be undertaken using a local seed mix;
- Trees and hedgerows - Hedgerows should facilitate use as feeding and commuting corridors for wildlife; and
- Arable field margins - this habitat will be reinstated in consultation with Essex Wildlife Trust and the local landowner. This will involve wild flower seeding and low input management to create varied habitats.

#### Potential effects on Wildlife - Additional mitigation

Wildlife mitigation will include:

- Retention of as many mature trees as possible;
- Where roosts of low conservation significance are lost, bat boxes will be installed;
- Where practicable, introduce feeding sites and nesting boxes in hedgerow and woodland edges to accommodate disturbance; and
- Soft landscaping works within the onshore substation works area will be sympathetic for the habitat requirements of bird species.

### 5.3.5 Archaeology and Cultural Heritage Mitigation

#### Potential effects on Archaeology & Cultural Heritage - Additional Mitigation

Archaeological and Cultural mitigation is envisaged to include:

- Historic Landscape Character (including hedgerows and parish boundaries) will be minimised by returning field boundaries / areas / hedgerows to their pre-construction condition and character post-construction;
- Record sections of hedgerows and field boundaries prior to construction;
- The onshore substation will be designed to reduce the overall height and massing; and
- Landscape proposals will include measures for the enhancement of local biodiversity during the operational phase of the onshore substation.



## 5.4 Enhancements

**5.4.1** Mitigation is required to address any significant adverse effects identified through the Environmental Impact Assessment (EIA) process.

Outline plans for the site seek to go beyond mitigation, in line with the recommendations from Design Council Advice Letter 1. The Outline Landscape Strategy identified on the following pages includes specific measures to enhance the site and its immediate context. These include;

- Measures to enhance and strengthen the existing landscape character, with reference to the Tendring Landscape Character Assessment
- Measures to create new green infrastructure features and connections through the site to surrounding linear features, such as hedgerows, screening belts and woodland clusters. These will provide multiple benefits in terms of enhancing habitat connectivity and visual amenity to road corridors and PRoW.
- Measures to enhance the necessary infrastructure within the site, for example, ensuring that attenuation ponds (if required) can provide multiple benefits, not only in terms of sustainable drainage but as landscape features and ecological habitats.
- Measures to enhance the ecological and landscape condition of land parcels which cannot be returned to meaningfully agricultural use.

## 5.5 Outline Landscape Strategy

### 5.5.1 Design Analysis

The strategy has been developed as a series of layers to inform a coherent masterplan for the site that responds directly to its context. These include;

- Existing Landscape Context
- Development Constraints
- Historic Landscape Structure
- Landscape Enhancements
- Visual Mitigation
- Ecological Enhancements and Biodiversity Net Gain

### 5.5.2 Outline Landscape Masterplan and Sections

The outline landscape masterplan provides an illustration vision for the site that indicates how the layers of design analysis could respond to a developed site layout. This layout is based on the 'Realistic Worst Case Scenario' for North Falls and the 'Maximum Design Scenario' for Five Estuaries, as assessed within the EIA.

Illustrative site sections accompany the masterplan to demonstrate the application of the mitigation and enhancement measures to the site and show how it can be knitted into its immediate context. The heights of buildings and boundaries shown on the section reflect the design parameters outlined above.

Reference should also be made to the verified views prepared to accompany ES Chapter 30 LVIA (Document Reference: 3.1.32) as these provide a more accurate representation of the visual mitigation measures.



## 5.4 Outline Landscape Strategy

### 5.5.3 Design Analysis

The following diagrams represent the design analysis that was undertaken to develop the Outline Landscape Strategy

### 5.5.4 Existing Landscape Context

Analysis of the existing landscape features was undertaken to understand where features of value were located and identify how they could be incorporated within the final layout. Opportunities to enhance features of lesser value have then been evaluated.

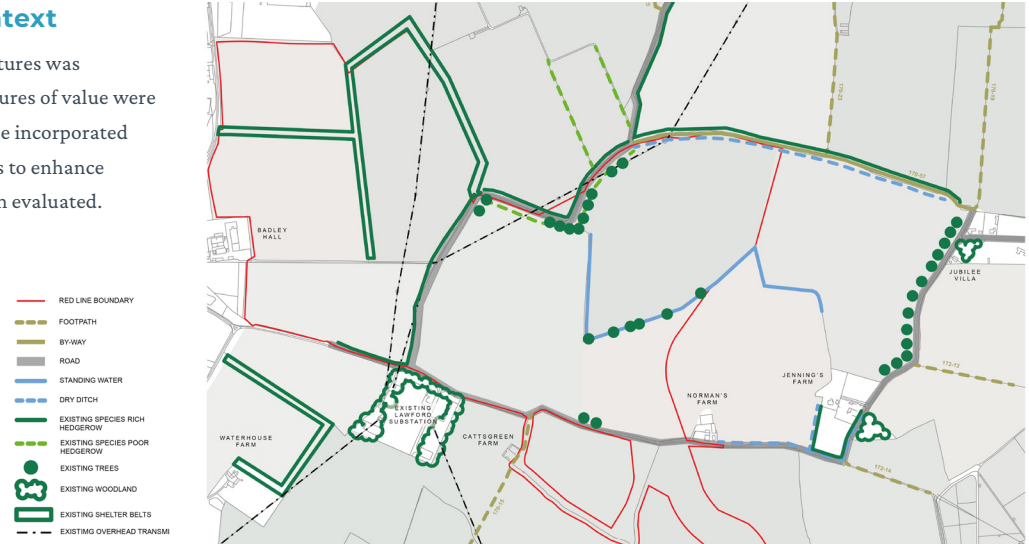


Figure 14: Existing Landscape Context

### 5.5.5 Development Constraints

Analysis of the constraints placed on the site from existing infrastructure and proposed above and below ground development. These may limit the physical extent of mitigation and enhancement measures, for example the location of screening vegetation for visual mitigation.

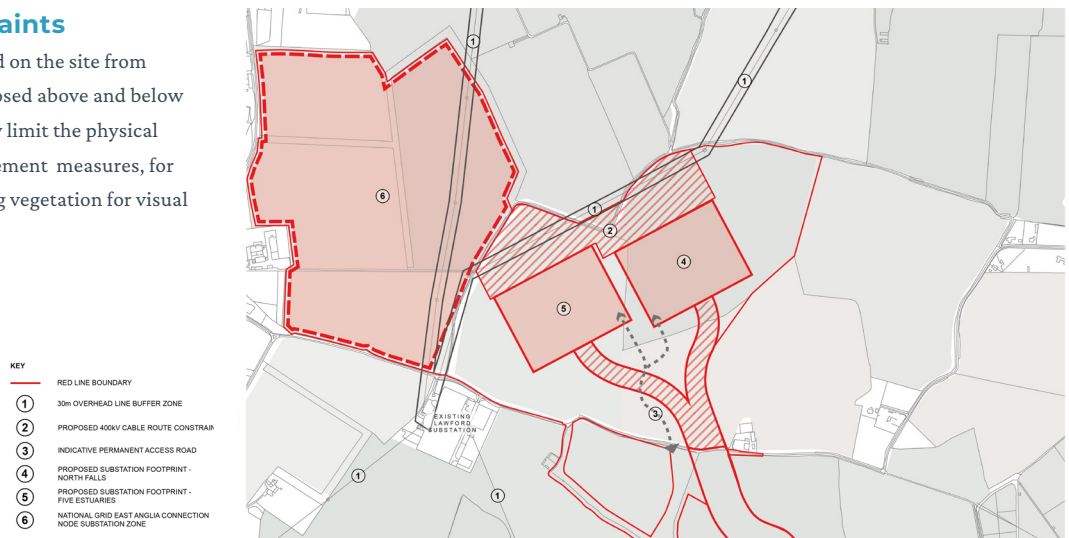


Figure 15: Development Constraints

### 5.5.6 Historic Landscape Structure

Analysis of the historic field boundaries, as shown on Ordnance Survey mapping of 1840. These identify the loss of multiple hedgerows and can inform the locations for new hedgerows to strengthen the localised landscape character and mitigate archaeological and cultural heritage impacts identified in 5.3.5.



Figure 16: Historic Landscape Structure

## 5.4 Outline Landscape Strategy

### 5.5.7 Landscape Enhancements

Analysis of the scope to enhance the landscape character of the site through the planting of new hedgerows and scattered trees, a characteristic of the 7A Heathland Plateaux – Bromley Heaths LCA. This would provide additional benefits in the form of green infrastructure and habitat connectivity.

- KEY
- RED LINE BOUNDARY
- SUBSTATION FOOTPRINT
- SITE CONSTRAINTS
- WOODLAND COPSE TO BE RETAINED
- FOOTPATH
- INDICATIVE PROPOSED ACCESS ROAD
- EXISTING HEDGEROWS RETAINED
- REINSTATEMENT OF HISTORIC FIELD BOUNDARIES
- EXISTING FIELD BOUNDARIES ALLOWED TO THICKEN WHERE POSSIBLE WITHIN ONSHORE PROJECT AREA
- NEW HEDGEROWS TO BE PLANTED USING LOCALLY IMPORTANT AND NATIVE SPECIES
- NEW WOODLAND COPSE PLANTING TO JUNCTIONS OF FIELD BOUNDARIES REFLECTING LOCAL LANDSCAPE PATTERN
- EXISTING TREES RETAINED
- PROPOSED HEDGEROW TREE PLANTING USING APPROPRIATE SPECIES SUGGESTED WITHIN THE ESSEX TREE PALETTE

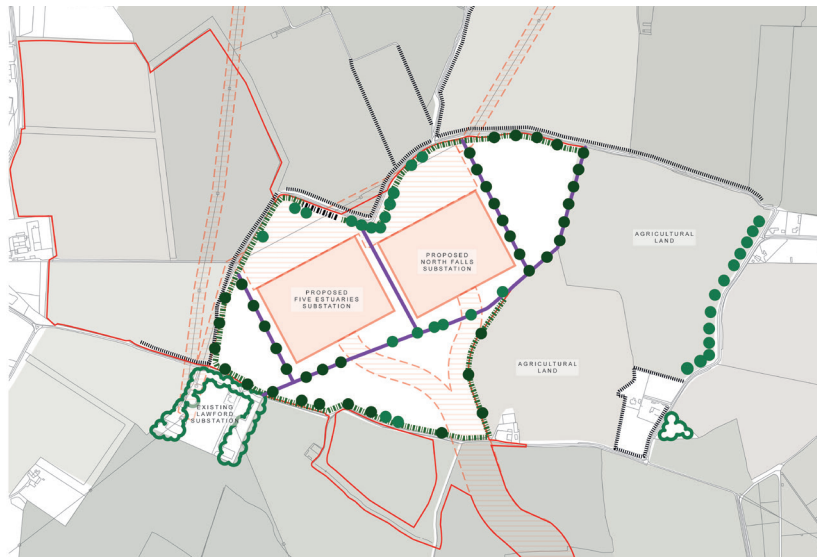


Figure 17: Landscape Enhancements

### 5.5.8 Visual Mitigation

Analysis of scope to provide visual mitigation through the introduction of screening planting. The illustrative proposals respond to the findings of the LVIA and potential effects that could be experienced by visual receptors surrounding the site.

- KEY
- RED LINE BOUNDARY
- SUBSTATION FOOTPRINT
- SITE CONSTRAINTS
- WOODLAND COPSE TO BE RETAINED
- FOOTPATH
- INDICATIVE PROPOSED ACCESS ROAD
- EXISTING HEDGEROWS RETAINED
- REINSTATEMENT OF HISTORIC FIELD BOUNDARIES
- EXISTING FIELD BOUNDARIES ALLOWED TO THICKEN WHERE POSSIBLE WITHIN ONSHORE PROJECT AREA
- NEW HEDGEROWS TO BE PLANTED USING LOCALLY IMPORTANT AND NATIVE SPECIES
- NEW WOODLAND COPSE PLANTING TO JUNCTIONS OF FIELD BOUNDARIES REFLECTING LOCAL LANDSCAPE PATTERN
- EXISTING TREES RETAINED
- PROPOSED HEDGEROW TREE PLANTING USING APPROPRIATE SPECIES SUGGESTED WITHIN THE ESSEX TREE PALETTE

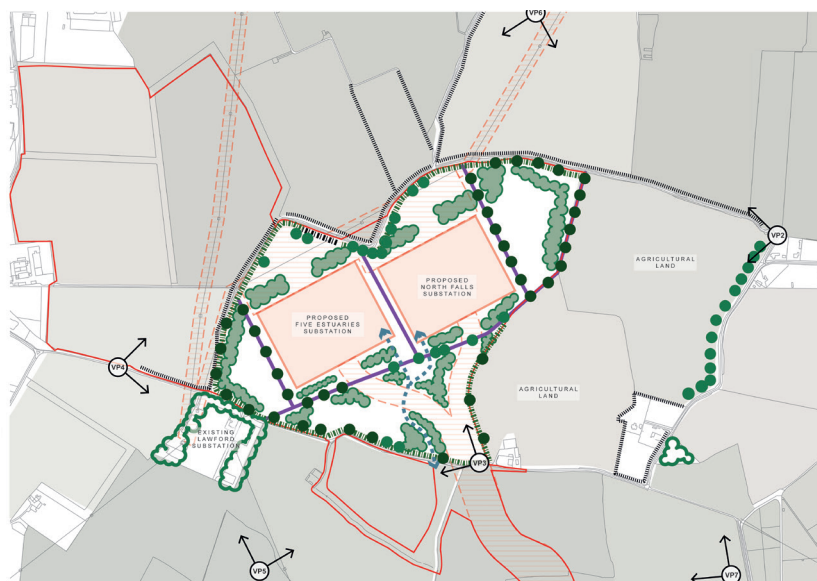


Figure 18: Visual Mitigation

### 5.5.9 Ecological Enhancements and Biodiversity Net Gain

Analysis of the scope for additional ecological enhancements.

Areas of land that are not considered feasible to return to agriculture are targeted for their potential contribution to BNG.

- KEY
- RED LINE BOUNDARY
- SUBSTATION FOOTPRINT
- SITE CONSTRAINTS
- WOODLAND COPSE TO BE RETAINED
- FOOTPATH
- INDICATIVE PROPOSED ACCESS ROAD
- EXISTING HEDGEROWS RETAINED
- REINSTATEMENT OF HISTORIC FIELD BOUNDARIES
- EXISTING FIELD BOUNDARIES ALLOWED TO THICKEN WHERE POSSIBLE WITHIN ONSHORE PROJECT AREA
- NEW HEDGEROWS TO BE PLANTED USING LOCALLY IMPORTANT AND NATIVE SPECIES
- NEW WOODLAND COPSE PLANTING TO JUNCTIONS OF FIELD BOUNDARIES REFLECTING LOCAL LANDSCAPE PATTERN
- EXISTING TREES RETAINED
- PROPOSED HEDGEROW TREE PLANTING USING APPROPRIATE SPECIES SUGGESTED WITHIN THE ESSEX TREE PALETTE
- REINSTATEMENT OF ARABLE FIELD MARGINS TO CULTIVATED AREAS WHERE POSSIBLE
- GRASSLAND RESEEDING USING LOCAL MIX GRASSLAND
- SEEDING WITHIN SUBSTATION COMPOUND USING LOCAL MIX
- SUDS FEATURES DESIGNED FOR MAXIMUM ECOLOGICAL AND AMENITY BENEFIT



Figure 19: Ecological Enhancements and Biodiversity Net Gain



5.5 Outline Landscape Strategy

5.5.10

Outline Landscape Strategy Masterplan

The Outline Landscape Strategy builds up over a series of layers that explore the existing site context and broader setting, ways in which to improve the baseline condition through enhancement, compensate for features likely to be lost, strengthen green and blue infrastructure, and mitigate for adverse landscape and visual effects. Mitigation measures must take overall precedence within the strategy, with compensation and enhancement if it is not possible to reduce or avoid the effects.

-  Proposed Trees
-  Proposed Scrub
-  Proposed Riparian Scrub
-  Proposed Attenuation Feature
-  Proposed Wildflower Planting
-  Proposed Landscape Bund
-  Proposed Hedgerow
-  Existing Woodland & Hedgerow
-  Indicative Building Footprint
-  Existing Pylons and OHL
-  Proposed Public Footpaths
-  Existing Public Footpaths
-  Potential Vehicular Entrance into Site
-  Proposed Barrier Fence
-  Proposed Visual Screen



Figure 20: Outline Landscape Strategy Masterplan



## 5.5 Outline Landscape Strategy

5.5.11

### Indicative Site Sections

The following indicative site sections provide an illustration of the principles of visual mitigation, landscape and ecological enhancement throughout the site. Reference should also be made to visual representations within ES Chapter 30 LVIA (Document Reference: 3.1.32)



#### Section AA'



#### Section BB'



#### Section CC'



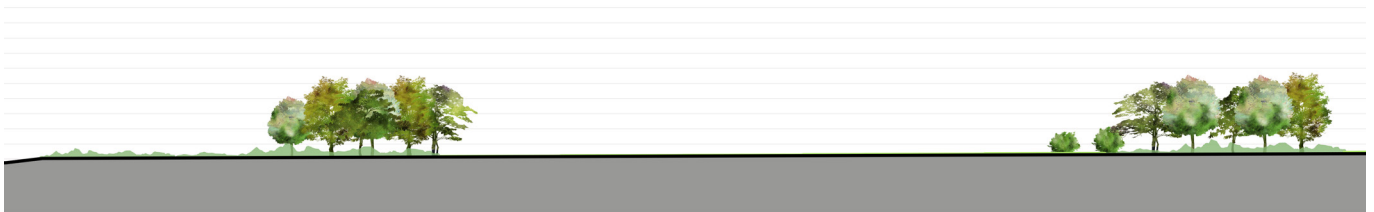
#### Section DD'



### 5.5 Outline Landscape Strategy



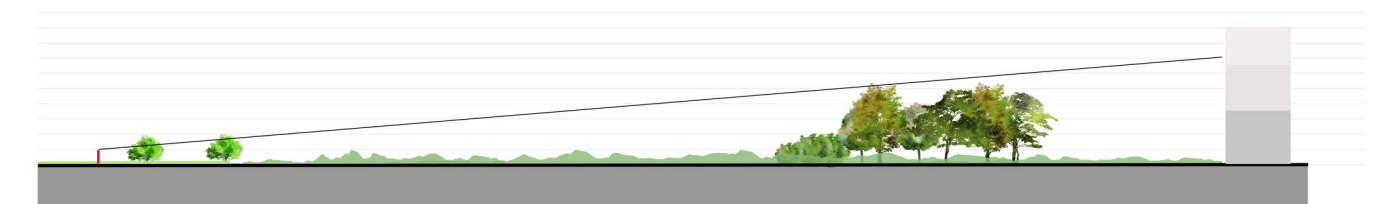
#### Section EE'



#### Section FF'



#### Section GG'



# Section 6

Consultation



**NORTH FALLS**

*Offshore Wind Farm*

## 6.1 Introduction

**6.1.1** As a Nationally Significant Infrastructure Project (NSIP), North Falls has carried out consultation with statutory consultees in accordance with the Planning Act 2008 and also consultation with non-statutory consultees. Local stakeholder and community consultation has been undertaken in the pre-application phase, providing the opportunity for stakeholders to review plans, provide comments, submit feedback on elements of the process and the development, which North Falls has considered.

## 6.2 PEIR Responses

**6.2.1** PEIR information was published in May 2023.

The table below summarises the responses received to PEIR documentation from key stakeholders:

Consultee	Concern	Response
Essex County Council	Effects on mature trees	The Project is aiming for no removal of mature trees / woodland. There is a commitment to microsite the cable corridor around trees to avoid the need for replacement tree planting along the cable route. Hedgerows affected by the onshore cable will also be replanted. The detailed design will be informed by an arboricultural survey to be carried out post-consent, as set out in the OLEMS.
Essex County Council	Effects on Dedham Vale National Landscape	Effects on the National Landscape have been reconsidered against the current substation proposals within the LVIA.
Natural England	Cumulative effects	The cumulative assessment considers the above ground (operational stage) features including the proposed Five Estuaries and National Grid (Norwich to Tilbury Project) Substations, plus other relevant features in the LVIA study area. As more information on these projects is now available, a more detailed cumulative assessment is presented.

Table 1: PEIR Consultation Responses



### 6.3 Expert Topic Group

**6.3.1** Expert Topic Group meetings have been held at regular intervals with participants including Essex and Suffolk County Council and Natural England. These have focused on the LVIA, ecology and landscape mitigation.

The table below summarises the responses received to PEIR documentation from key stakeholders:

	Concern Raised	Response to Concern
<b>Expert Topic Group Meeting September 2023</b>		
<i>Essex County Council</i>	<i>Consideration of options for AIS; exploring options to reduce the height of AIS and include the use of bunding and screen planting in the design.</i>	<i>These aspects are considered within the Design Vision. A Landscape Strategy has also been prepared.</i>
<i>Suffolk County Council</i>	<i>Consideration of the Dedham Vale National Landscape guidance on use of colour guidance and lighting guidance (for onshore elements).</i>	<i>Lighting and colour guidance documents are referenced within the Design Vision.</i>
<i>Essex County Council</i>	<i>Landscape in-combination effects with EACN Norwich to Tilbury.</i>	<i>Liaison undertaken between NF, VE and NGET to understand and minimise potential effects.</i>
<b>Expert Topic Group Meeting February 2024</b>		
<i>Essex County Council &amp; Natural England</i>	<i>The LVIA should distinguish between planting required as compensation, mitigation and enhancement.</i>	<i>Details of compensation and mitigation are presented in the LVIA and Landscape Strategy. Enhancement proposals are discussed in the Design Vision.</i>

Table 2: Expert Topic Responses



## 6.4 Design Council

6.4.1

The Design Council were invited to provide an independent review of the Design Vision and Landscape Strategy for the site in Autumn 2023. This process aligns with guidance set out in the Overarching National Policy Statement for Energy, EN-1 (DESNZ,2024).

The Design Council commissioned a panel of Design Experts to review the PEIR-stage Design Vision and emerging landscape strategy and provide objective, professional feedback, covering aspects of landscape design, architecture, ecology and sustainability. For consistency, the same members of the design review panel attended the first two sessions, namely:

- Emily Whyman - Design Council, Senior Programme Manager
- Katie Norman - Design Council, Programme Manager
- Annie Coombs - Design Panel Lead, Design Panel Expert, Landscape Architecture
- Richard Cass - Design Panel Expert, Landscape Architecture
- David Ubaka - Design Panel Expert, Architecture and Urban Design
- Paul Appleby- Design Panel Expert, Sustainability
- Lynn Ceeney- Design Panel Expert, Sustainability
- Jonathan Ward- Design Panel Expert, Engineering and Sustainability

Katie Norman was not present for the third review session and Frederik Weissenborn, Design Council Programme Lead attended in her absence.

The Design Review process entailed one on-site meeting and two online review meetings. After each meeting, the Design Council co-ordinated and issued a detailed design advice letter to North Falls. The advice provided was reviewed by the Project team and incorporated, where it was considered appropriate to do so.

### 6.4.2 Design Review Session 1 - December 2023

This session consisted of a day-long meeting in Colchester and the environs of the onshore substation site. Prior to the session, a detailed briefing pack was sent to the design review team, outlining the background to the Project and key technical constraints influencing the design.

The session commenced with an accompanied site visit, stopping at key viewpoints identified within the PEIR-stage LVIA and providing a general overview of the site and its wider context. This was followed by an in-person briefing in Colchester.

Following the meeting, a detailed Design Advice letter was issued. The letter and schedule identifying responses to the range of issues raised are included within the Appendices to this Design Vision. Key points are summarised below.

### 6.4.3 General

- *These projects have opportunity to be an exemplar of sustainable, integrated design for energy infrastructure which looks beyond requirements to benefit people, place and planet with partnership*

*working at the core and to set an exemplary precedent for future substation developments.*

### 6.4.4 Design Vision

- *We support the ambition to create 'greener futures for all', therefore, we expect that these schemes and their work to expand the UK's renewable energy supply should permeate through the narrative of the projects. The projects should have a net positive impact on the environment and for local people.*
- *Begin the vision document with a one-line vision statement that summarises the ambitions for the projects. We suggest that this vision statement is ambitious, galvanising and simple.*
- *We urge that the project teams look to 50 plus years to the future to consider the long-term impacts of the schemes on the environment and how lifespan, futureproofing and landscape approaches can be taken to maximise the opportunity for these schemes to provide the best possible outcomes for generations to come.*

### 6.4.5 Sustainability, Carbon and Circular Economy

- *More specific sustainability goals and research into carbon use should be defined for each of the projects.*
- *We would urge the design team to consider circular economy principles throughout the design process.*

### 6.4.6 Optioneering

- *We urge the design teams to ensure they are evaluating their options during the optioneering process in a measured way which thoroughly compares and contrasts all possible options before drawing conclusions.*
- *One critical aspect is the optioneering of land take, which necessitates a thorough examination of spatial requirements and potential implications associated with different land-use options. More work must be done to explain this process prior to final allocation of the two substation footprints on site, as well as when deciding how remaining land is utilised.*

### 6.4.7 Landscape Character

- *Move away from mitigation strategies...encompass a net positive impact on flora, fauna, and communities....establish a new industry benchmark. Look 50 plus years to the future...*
- *Consider the projects standing within the broader landscape context.*
- *Unused land could present a more valuable use than reinstating small plots of agricultural land...responding to the ever-changing landscape.*
- *We encourage the project teams to think outside of the red line boundary to create a truly integrated landscape approach. This may include planting of trees and hedgerows within the wider area.*
- *Looking beyond arable agricultural land uses, the land has been stripped of hedgerows and trees. This presents an opportunity to give rewild historical copses and woodland whilst carbon offsetting some of the impacts of construction. Planting should create transition in the landscape, be biodiverse, and resilient to rising temperatures, ensuring long-term survival.*



#### 6.4.8 Visual Amenity

- *It will not be possible to differentiate between the two substations at a distance, therefore we suggest orienting differently, using colour, and planting to break up the massing.*
- *Adhere to a low-profile design, avoid the use of reflective materials.*
- *Screening should be contextual and expanded into a comprehensive planting strategy.*
- *Consider visual interruptions of the schemes will have on wayfinding to PROW users, using nodes such as St Mary's church to gauge their location.*
- *Members of the public may notice the building but are comfortable with its presence and passing by.*

#### 6.4.9 Phasing and Partnerships

- *We urge the project teams to continue efforts to engage with National Grid as it also works to develop a substation north of the North Falls and Five Estuaries sites. If a tri-party agreement could be reached between the three organisations, it could ensure a cohesive approach and more successful short and long term outcomes from mitigating construction needs to cohesive planting strategies, further minimising adverse local impacts.*

#### 6.4.10 Design Review Session 1 - Consideration of Advice Letter

The advice letter was reviewed by the North Falls and Five Estuaries teams and a response schedule collated in order to track responses and communicate design changes back clearly to the design review panel. A RAG rating was used to identify areas for further development and aspects for further consideration. Advice regarding the formatting and content of the Design Vision was welcomed and has led directly to a detailed review of content and change in presentation for the DCO submission. Advice regarding the approach to landscape mitigation, enhancement and visual impact has fed directly into the Landscape Strategy.

Specific changes to the scope of the landscape strategy and Design Vision are noted below:

- Development of a landscape strategy for the site (Section 5.5) that looks beyond mitigation to consider how the site should respond holistically to its context
- Net positive impacts for climate, people and place demonstrated through the inclusion of the NIC Design Principles and Multi-Criteria matrices (Section 7.1)
- Inclusion of a Vision Statement at the start of the document (Section 1.1)
- Further consideration of sustainability, carbon reduction and climate resilience within the multi-criteria analysis (Section 5.5)
- Details of site selection and design optioneering provided (Sections 5.1, 5.2 and 5.4)
- Addressing the function of land that cannot be feasibly returned

to agricultural use (Section 5.4)

- Exploring optioneering, impact of form, use of colour and materiality and their influence on visual mitigation (Section 7 Design Principles)
- Continuing to undertake close liaison with Five Estuaries to develop the co-located site and commencing discussions with NGET in relation to EACN.

There were a number of items not targeted for inclusion due to technical aspects or a difference of professional opinion, comprising;

- Inclusion of photovoltaic panels on substation buildings - for North Falls the use of an Air Insulated Substation will limit both the number of buildings and the area of roof available per building therefore a commitment to the use of PV cannot be made at this stage. This will be subject to further review at detailed design stage.
- The use of certain tree species - these were considered inappropriate due to ongoing persistence of disease in these species
- Use of mounding - the use of extensive mounding is not proposed as it is considered inappropriate to the local landscape character
- Works outside the red line boundary - extensive works outside the red line boundary are not proposed because these are beyond the Projects' influence.
- Provision of energy to the local community - Ownership of the substations will be transferred to an Offshore Transmission Owner (OFTO) therefore it is not within the Project's remit to pursue these suggestions

#### 6.4.11 Design Review Session 2 - March 2024

A second meeting with the design review panel was held in March 2024. This was an online meeting, which focused on the development of the Landscape Strategy.

Following the meeting, a second detailed Design Advice letter was issued. The letter and schedule identifying responses to the range of issues raised are included within the Appendices to this Design Vision. Key points are summarised below.

#### 6.4.12 General Comments

- *Explore the best-case scenario*
- *Visualise and share the design process*
- *Demonstrate flexibility diagrammatically; show the process of designing for flexibility*
- *Outline the decision-making process clearly; conduct a multi-criteria analysis to demonstrate the decision making incorporates a wide view of needs*

#### 6.4.13 Design Vision

- *Establishing a best practice approach to underpin an exemplar GI scheme, which brings together landscape and biodiversity.*



- Ensuring that the DCO process is balanced with a creative, aspirational approach in order to keep the project forward-looking and ensure it most successfully responds to the site needs with a design-led approach, which may require vision for areas outside the Order Limits.
- Clearly defining the driving force of the schemes. We think that it should be clearer conceptually that these are future thinking schemes and nationally significant for GI. This should be apparent within the vision statement.
- Defining words such as mitigation and enhancement within the document can ensure a shared understanding of how these approaches support these particular schemes.

#### 6.4.14 Landscape Strategy

- The overall landscape mitigation strategy is moving in the right direction. We think more granularity is now needed to ensure it is truly a site-specific strategy. Alongside this, we suggest the project team builds a compelling narrative that highlights the positive BNG the site could achieve. Additionally, we see the opportunity for the landscape to be forward looking to respond and thrive in the changing environmental context of climate change, alongside the previous exploration into the heritage of the site. An integrated design approach which incorporates ecology and visual character should be a foundational approach to the landscape mitigation strategy to unify screening with environmental benefit.

#### 6.4.15 Planting

- To ensure the landscape strategy and subsequent planting will be resilient in a changing climate, we suggest exploration and analysis of data on the climate resilience of species of plants. This would provide an evidenced approach to creation of the right types of habitats for the site. The Woodland Trust and Forestry Commission can provide guidance on the landscape mitigation strategy and how to ensure woodland planting lasts for the long term.
- To match the scale of the site we would expect to see 2 or 3 times the amount of woodland to create viable woodland habitats. Creation of more substantial woodland would ensure the planting strategy will have better chances of survival with minimal maintenance; best screening the site over the long term. We also see the opportunity for use of smaller forestry planting and whips. Unless in areas where protection of particular views is required more immediately, this planting technique can become better established on the site over the long term. This strategy will also assist with lowering carbon requirements during construction through reducing the need for rehoming and transporting large established plants.

#### 6.4.16 Screening

- Care has been taken to establish the screening strategy. However, given the needed flexibility, it is currently unclear as to how the screening strategy directly responds to the substation equipment and ensuring infrastructure, electrical equipment and fencing are shielded properly. We suggest that integrating buildings into the landscape whilst prioritising screening of engineering equipment will inform the most successful landscape screening strategy.
- The neighbouring Lawford substation incorporates planting that reaches

20 meters deep. We suggest that this should be used as a minimum standard for planting on the North Falls and Five Estuaries sites. In addition to this, we recommend that the percentage of evergreen planting is considered carefully to ensure screening of the infrastructure year round.

#### 6.4.17 SuDS and Attenuation Ponds

- Inclusion of wetland areas will provide additional variety in the biodiversity on site and help flood management. With these ambitions in mind, and considering the large amount of water that the attenuation ponds will collect at times, we question if the ponds should be extended to ensure they properly serve the water management needs on site. Additionally, we note that the shape of the ponds will be important to successful visual assimilation and integration of fauna into the site. We suggest that an evidenced approach is taken to establishing the shape of these ponds, which addresses their function and aesthetics in times of flood and drought and considers the variety of areas established for wildlife.
- We suggest improving the permeability of more of the surfaces across the site, to increase water drainage. For example, exploration should be undertaken into if areas of the platforms could be covered in gravel as opposed to concrete.

#### 6.4.18 Bunding

- We recognise that the site is relatively level, therefore stripping of topsoil will be minimal during construction and to create the attenuation ponds. We urge the project team to weave this into the project's sustainability story, ensuring that all soil is retained on site to minimise the carbon impact. Even at low levels, we suggest that any mounding is not harshly created and instead maintains a more organic look. Mounded areas would provide an optimal location for new planting as they thrive in the aerated soil.

#### 6.4.19 Landscape Management and Maintenance

- Ensuring that management and maintenance is designed into the landscape strategy is vital to long term success. The new NPS EN-1 will be a key consideration for examining authorities, so it is important to clearly demonstrate how management and maintenance will be secured for the site. We suggest that management and maintenance is secured for at least 15 years following commencement of operation of the sites.

#### 6.4.20 Noise Attenuation

- We have yet to see the results of the cumulative effects study that has been undertaken to assess the noise attenuation of the three substations (North Falls, Five Estuaries and National Grid's East Anglia Connection Node) which will sit in close proximity to one another. It will be vital to mitigate the noise effects properly, particularly on such a rural and open landscape. There is an opportunity for the landscape design and materials strategy to mitigate the noise attenuation on site, and request that this approach and the materiality is presented at the following review. It is important to note that the new NPS EN-1 and EN-5 state that mitigation measures through incorporating good design should be taken to minimise noise transmission through natural or purpose-built barriers.





#### 6.4.21 Architecture

- *The buildings were not presented in this Design Review. As a guide, we think that the relationship between the buildings and the landscape are important, and in our view the buildings should become part of the landscape in line with the surrounding typology of agricultural buildings. Well-designed buildings with minimal reflection would sit well within the surrounding context. In the following Design Review, we would welcome insight into the architectural design process, such as massing, land-take, building finishes and roof type.*

#### 6.4.22 Surrounding Context

- *We understand that important aspects of landscape enhancement would take place outside of the Order Limits. Although this isn't a part of the DCO submission, we urge the design teams to consider how to best approach landscape enhancement surrounding the substations' sites as this should be an important part of the holistic design vision and would be central to BNG delivery. Specifically, this will involve understanding and responding properly to the emerging context. On these sites, this includes the National Grid East Anglia Connection Node to the north west and potential new battery storage to the south.*
- *Although these would emerge following DCO, we encourage the project team to consider how the schemes would link, the impact on the North Falls and Five Estuaries sites and how the cumulative effects (noise, visual, construction and others) can be best mitigated.*

#### 6.4.23 Sustainability

- *We think there is opportunity to build sustainability further into the core programme of work.*
- *Decarbonisation; separate evaluation of the carbon impacts should be completed*
- *Biodiversity Net Gain; the team were urged to be more ambitious with the amount of BNG and aim beyond the mandatory target*
- *Legacy after Construction; the team were urged to consider life cycle analysis for material re-use*

#### 6.4.24 Decarbonisation.

- *Separate evaluation should be completed of the carbon impact of construction and operational stages. We urge the design team to explore examples of best practice in decarbonising to decide the areas that would value most from carbon budgeting and investment into lower impact choices. There is an opportunity to produce less carbon than currently proposed through evidencing and choosing more environmentally conscious options.*

#### 6.4.25 Optioneering of Air Insulated Substation (AIS) or Gas Insulated Substation (GIS).

- *Despite the need for flexibility at this stage, we would expect a decision to have been made regarding the type of substation for both sites. As per our previous comments in December 2023, to maintain this project as a truly GI project, the AIS substation would be the only viable option. Maintaining flexibility on such a central decision means that the landscape screening strategy cannot properly be created to respond to either situation.*

#### 6.4.26 Biodiversity Net Gain (BNG).

- *Whilst more in-depth work has been completed on the landscape mitigation strategy, we would urge the design team to be more ambitious with the amount of BNG to be provided on site. BNG will facilitate many functions for the site beyond singularly screening of the substations. It will reinforce the narrative for this being an integrated GI project; establish a biodiverse environment for native species to thrive; create habitat for fauna, and help to minimise effects of heat islands and high rainfall through creation of Sustainable Drainage Systems (SuDS). For this to be an exemplary project we would expect the amount of BNG on site to be significantly increased. We note that significant landscape enhancement is needed in order to reach BNG targets, and recommend that the design team refers to the downgraded weight that the Secretary of State gave to delivering GI outside of the Order Limits, where locations were not fixed, in the recent Yorkshire Green Energy Enablement Project decision letter.*

#### 6.4.27 Legacy after construction.

- *We re-emphasise the importance of considering re-use of construction materials locally to meet community needs. For example, if a new community building could be created from any temporary structures required during construction. This would help to reduce waste and lower the carbon required in creation of the substations.*

#### 6.4.28 Design Review Session 2 - Consideration of Advice Letter

The advice letter was reviewed by the North Falls and Five Estuaries teams and a response schedule collated in order to track responses and communicate design changes back clearly to the design review panel. A RAG rating was used to identify areas for further development and aspects for further consideration.

Further advice regarding the approach to landscape mitigation, enhancement and visual impact has fed directly into the Landscape Strategy. Further advice regarding the Design Vision has been reviewed and incorporated, where appropriate to do so.

Specific changes to the scope of the landscape strategy and Design Vision are noted below:

- Further detail of the design and decision making process and function of the Design Vision have been represented diagrammatically (Section 1)
- Further detail on the design process, including site selection optioneering, site analysis and scope for mitigation and enhancement provided (Section 5)
- Additional consideration has been paid to climate resilience of future planting schemes, referencing the work of the Forestry Commission (Section 7)
- Illustrative sections have been provided that show the impact of screening planting in conjunction with site buildings and equipment. These are based on North Falls 'Realistic Worst Case



Scenario' and Five Estuaries 'Maximum Design Scenario' (Section 5).

- Additional detail in response to points raised in relation to planting, bunding, drainage and water included (Section 7).
- The OLEMS will cover a period of 30 years to ensure that Biodiversity Net Gain targets can be delivered.
- Further detail on the consideration of noise and attenuation measures has been incorporated (Section 4).
- Details of the cumulative considerations of the Project in conjunction with Five Estuaries and NGET's EACN are considered within the ES.
- Further detail on the consideration of carbon and BNG measures has been incorporated (Section 4 and 7).
- Further consideration of BNG and GI, as shown in the developed Landscape Strategy (Section 5).

There were a number of items not targeted for inclusion due to technical aspects or a difference of professional opinion, comprising;

- The increase in woodland cover to 2 or 3 times what was previously shown is not considered appropriate for the site, considering the inherent landscape characteristics within the LCA and the need for a diverse range of habitats as identified within the BNG strategy.
- Detailed building proposals cannot be provided at this stage, when the decision between AIS and GIS has not been made and there is still further work to be undertaken post-DCO consent to determine the configuration on site.

#### 6.4.29 Design Review Session 3 - June 2024

A third online meeting with the design review panel was held on the 17th June 2024. This was a half day meeting, with the content focussing on the design team response to the second advice letter and the measures taken to achieve the criteria for 'Good Design', as set out in NPS EN-1.

Following the meeting, a third Advice letter was issued. The feedback provided has informed the finalisation of the Design Vision and will also feed into the detailed stages of design post-DCO consent.

Specific changes incorporated to the Design Vision are noted below:

- Minor amendments to the formatting of the Design Vision
- Clarifying the role of the Design and Access Statement in the process

Feedback to be actioned post-DCO Consent:

- Comments on the landscape mitigation will be reviewed once the Design Guide and detailed design stages commence.



# Section 7

Onshore Substation Design Principles



**NORTH FALLS**

*Offshore Wind Farm*

## 7.1 Introduction

**7.1.1** This section provides details of the Design Principles that can be adopted for various components of the substation and its wider site infrastructure. It sets out how the principles take cognisance of fixed design parameters, governed by technical or statutory requirements, align with the NIC Design Principles and achieve multi-criteria benefits. Each design principle is clearly coded to identify the potential benefits.

## 7.2 Design Parameters

**7.2** The table below identifies where the design of the site and key components is subject to fixed parameters. It identifies the technical considerations that will inform the eventual design choices and lists the range of options available for review at detailed design stage.

This information is then referenced within the relevant design principle section.

Design Vision Principle	Fixed Parameter	Technical Considerations
Plan form	The configuration/layout of the electrical infrastructure will be firstly constrained by operational, constructional and technical requirements.  Relevant building regulations, RWE Renewables requirements, SSE Renewables internal requirements and National Grid technical specifications for electrical substations will have to be followed.	The following aspects shall be considered: - Magnetic clearance from the air core reactors - Limitation of fire risk and water supplies for fire fighting purposes - Site lighting and security systems - Pedestrian access requirements to equipment/building - Lightning protection
Location of buildings within onshore substation and spacing between individual buildings	Onshore substation is anticipated to include the following: - Control building - STATCOM buildings and switchgear - Storage / amenity building - Transformers (including noise enclosures) - Reactor noise enclosures - Water tanks - Distribution Network Operator (DNO) package substation - DNO meter cabinet	The primary factor influencing the site layout is the choice between Air Insulated Switchgear (AIS) or Gas Insulated Switchgear (GIS). North Falls have committed to use of AIS technology for the DCO Application.
Spacing between electrical equipment	Detailed consideration has been given to the minimum safety distances between electrical equipment. These minimum safety distances have been set to limit health and safety risks.	Minimum safety distances: 400kV system = 3.1m 275kV system = 2.4m 33kV system = 0.8m
Spacing from cable routes	The location of the onshore cable route presents a limiting factor on the location of the onshore substation buildings.	Restrictions to be defined
Building height	The tallest height of any structure would be lightning masts, which would be a maximum of 18m tall.  Indicative heights of the building and main equipment: - Control building: 5m - STATCOM buildings and switchgear: 7m - Storage / amenity building: 4m - Transformers (including noise enclosures): 7m - Reactor noise enclosures: 7m - Water tanks: 6m - Distribution Network Operator (DNO) packaged substation - DNO meter cabinet - Harmonic filter: 12.5m	
Building footprint	Substation footprint 280 x 210m Overall substation compound footprint is 5.88 ha (58,800m <sup>2</sup> )	A flat platform is required for the construction of each onshore substation works area.
Building elevations	Developed using the descriptions outlined above for site layout and building height. Cannot be changed.	
Location of site access point	The location of the site access from Ardleigh Road has been identified based on consultation with ECC and the findings of a Stage 1 Road Safety Audit.	



## 7.1 Design Criteria

### 7.1.1 NIC Design Principles Identification

Table 3 below shows how each design principle can directly contribute to the four NIC design principles. Summary text is provided after each section to highlight how good design is achieved in relation to the three principles of 'Climate', 'People' and 'Place'. The integration of at least two or more NIC design principles in each section highlights the principle incorporates multiple 'Values' which are not separately identified.

North Falls Design Principles	NIC Design Principles			
	Climate	People	Places	Value
Site Layout	X	X	X	X
Built Form	X	X	X	X
Building Materials	X	X	X	X
Colour	X	X	X	X
Site Access		X	X	X
Public Rights of Way		X	X	X
Earthworks and Landform	X	X	X	X
Boundary Treatments	X	X	X	X
Surfacing	X		X	X
Lighting	X	X	X	
Planting	X	X	X	X
Biodiversity Enhancements	X	X	X	X
Lighting	X	X	X	X
Drainage and Water	X	X	X	X

Table 3: NIC Design Principles (NIC,2020)

### 7.1.2 Multi-Criteria Analysis

Additional MCA has been developed to demonstrate how decision making will incorporate a wide view of needs and impacts and to demonstrate compliance with good design.

Multi-criteria analysis has been carried out to benchmark how different detailed design options may perform against detailed design or performance criteria, derived from the four NIC design principles;

- Climate: Sustainable Materials (benchmarked through Green Guide Ratings), Conservation of Water and Climate Resilience.
- People: Visual Amenity, Noise, Health, Social Value
- Places: Sense of Place, Biodiversity (both Flora and Fauna), Local Vernacular
- Value: Green Infrastructure, Blue Infrastructure

The symbols identified within the matrix below will be used to signify where design principles can help to meet these criteria.

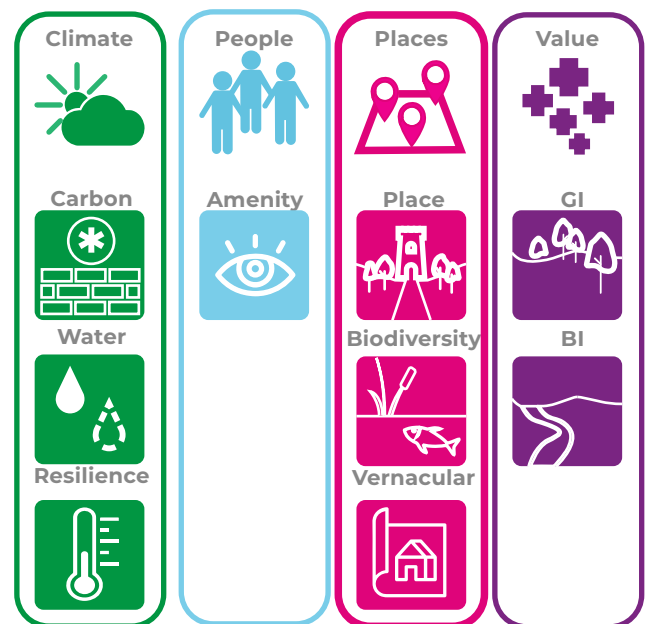


Figure 21: Multi-criteria analysis, derived from NIC Design Principles

## 7.2 Site Layout

### 7.2.1 Fixed Parameters

The configuration/layout of the electrical infrastructure will be firstly constrained by operational, constructional and technical requirements. Relevant building regulations, RWE requirements, SSER internal requirements and National Grid technical specifications for electrical substations will have to be followed.

### 7.2.2 Design Vision Principles

The overarching Design Vision principles for Site Layout include:

- Producing a buildable and functional substation that satisfies engineering and operational requirements;
- Reducing visual impact of the onshore substation in the local landscape and for visual receptors; and
- Creating a uniform arrangement that limits visual clutter and makes screening or visual mitigation possible.

The outlined design principles positively respond to the NIC Design Principles climate, places and people, whilst bringing value to the Project. This is achieved through:

### 7.2.3 Climate

- Considering orientation of buildings on site to benefit from solar gain and solar shading;
- Design an efficient site layout that makes effective use of space in order to reduce heat island effect and minimise surface water runoff;
- Design an efficient site layout that reduces hard landscape requirements (surfacing, boundaries) to minimise the use of materials overall and reduce materials wastage.
- Design a site layout that responds to future flood risk and can accommodate storm events.



### 7.2.4 People

- Create a site layout that limits sprawl and visual clutter within the landscape generally;
- Create a site layout that allows the taller, vertical elements to be placed with minimal interruption to key existing views of the landscape.



### 7.2.5 Places

- Organise the site layout to retain key valued landscape, heritage, green and blue infrastructure (GBI), considering the role that existing vegetation can play in allowing the new development to be successfully integrated within its surrounds;
- Design a site layout that responds sensitively to site topography, reducing the need for extensive cut and fill or retaining structures.



### 7.2.6 Value

- Organise the site layout to retain key valued ecological features, considering the role that new vegetation, drainage features etc. can play in habitat enhancement, creation and connectivity



**7.2.6 Detailed Design Options**

The primary factor influencing the site layout is the choice between Air Insulated Substation (AIS) or Gas Insulated Substation (GIS). North Falls have committed to use of AIS technology for the DCO Submission. Five Estuaries retain flexibility for either technology in their DCO submission, with a decision made post-consent.

**7.2.7 Air Insulated Substation (AIS)**

An AIS does not place electrical equipment in buildings, but instead relies on the surrounding air to provide the insulation between pieces of equipment. This means that there will be fewer buildings of a lower height (maximum 7m), although electrical equipment (13m) and lightning masts (18m) would be exposed. An AIS will have a larger footprint for the onshore substation works area, due to the increased distances required for insulation, therefore greater areas of hard standing.

- Indicative area dimensions of AIS site - 280 x 210m.
- Maximum height of buildings - 7m
- Typical number of buildings on site -
  1. 2 x STATCOM buildings - 55 x 15 x 7m
  2. 2 x STATCOM switchgear - 15 x 5 x 5m
  3. 1 x Control building (possibly several adjacent containerised buildings) - 50 x 20 x 5m
  4. 1 x Storage/Amenity building - 20 x 9 x 4m
  5. 2 x Transformer noise enclosures - 18 x 9 x 7m
  6. 6 x Reactor Noise Enclosures - 14 x 14 x 7m
  7. 1 x DNO packaged substation - 3 x 2 x 2.4m

**7.2.8 Gas Insulated Substation (GIS)**

A GIS relies on gas to provide the insulation between pieces of electrical equipment, with equipment housed within buildings. This means that there will be more buildings of a greater height (maximum 15m), although less electrical equipment would be exposed. A GIS will have a smaller footprint for the onshore substation works area (typically 25-30% less), due to the reduced distances required between equipment.

As previously identified, North Falls have committed to use of AIS technology whilst Five Estuaries have retained flexibility for either technology in their recent DCO submission. The information provided below aligns with the Maximum Design Scenario (MDS) identified within their submission.

- Indicative area dimensions of GIS site - 250 x 180m.
- Maximum height of buildings -15m
- Typical number of buildings on site -
  8. 1 x GIS building (275kV) - 60 x 27 x 15m high
  9. 1 x GIS building (400kV) - 40 x 28 x 15m high
  10. 2 x STATCOM buildings - 55 x 15 x 7m
  11. 1 x Control building (possibly several adjacent containerised buildings) - 50 x 20 x 5m
  12. 1 x Storage/Amenity building - 20 x 9 x 4m
  13. 2 x Transformer noise enclosures - 18 x 9 x 7m
  14. 6 x Reactor Noise Enclosures - 14 x 14 x 7m



## 7.3 Built Form

### 7.3.1 Fixed Parameters

The following section proposes design principles in relation to the built form of the onshore substation. All built forms must adhere to the relevant building regulations, National Grid technical specifications, internal requirements of both RWE and SSE and best practice guidelines and will require technical review to assess their feasibility.

### 7.3.2 Design Vision Principles

The built form of the onshore substation should follow best practice in substation design, whilst considering a Design Vision approach that:

- Produces a buildable and functional substation that satisfies engineering and operational requirements;
- Reduces visual impact of the onshore substation works area in the local landscape and for visual receptors; and
- Creates a cohesive environment that contains all electrical infrastructure limiting sprawl and visual clutter.
- Reflects local building vernacular where practicable, including barns and other large agricultural and horticultural structures. This should take account of the scale of the proposed buildings and ensure forms are directly comparable.

The outlined design principles positively respond to the NIC Design Principles climate, places and people. This is achieved through:



Image 4: AIS control building (source - RWE)

### 7.3.3 Climate

- Considering whether multiple building uses could be combined into one, to minimise material use, energy requirement etc.;
- Considering forms that are suitable for e.g. rainwater harvesting, green/brown roofs, amenity roof, green walls etc.;
- Considering built forms that will benefit from solar gain and solar shading;



### 7.3.4 People

- Utilising human-scale built forms that will not be overly dominant when experienced from adjacent properties, PRoW or roads.



### 7.3.5 Places

- The guidance for Tending Landscape Character Area 7A - Bromley Heaths states *'that new buildings should be constructed in such a way that they blend with the landscape in scale, colour and design'* (TLCA, 2001).
- The Essex Design Guide defines the traditional built form in Essex as 'typically made up of rectangular rather than square plan forms, with pitched roofs' (EDG, 2018). The built form considerations (subject to engineering review and operational requirements), include:
  - Consider reducing the height of roof lines to minimise visual impact within the landscape;
  - Consider whether multiple building uses could be combined into one, to minimise visual clutter or whether several smaller buildings are more appropriate within the surrounding landscape context; and
  - Where building scales are comparable, consider use of vernacular forms which could be integrated more successfully within the surrounding landscape context
- Considering forms that may benefit local flora and fauna e.g. incorporating nest boxes.





## 7.3 Built Form

### 7.3.6 Detailed Design Options

The primary factor influencing the **height, footprint** and **massing** of the built form is the choice between Air Insulated Substation (AIS) or Gas Insulated Substation (GIS). North Falls have committed to use of AIS technology for the DCO Submission. Five Estuaries retain flexibility for either technology in their DCO submission.

At detailed design stage, more certainty will be known as to whether Five Estuaries will pursue use of a GIS. Following this decision, as part of the design process, a variety of forms will be explored before a final solution is progressed.

### 7.3.7 Roof Type and Form

At Outline Design Stage, use of Green or Brown roofs was discounted due to fire risk. There are a number of roof forms that can be explored at detailed design stage, as outlined below:



**Flat roof** - Typical substation-built form that ensures there is sufficient room to house the electrical components required limiting structural footprints and the overall height of the building. This is a somewhat common vernacular in the local area due to the agricultural function within the local area. Installation of PV panels would not be possible with this roof form. Rainwater harvesting could be considered with this form.



**Pitched Roofline** - This will somewhat soften a structure's visual impact against the landscape and skyline depending on its orientation and overall height. This would also require larger components to be placed more centrally but may still provide a larger footprint for component placement depending on the pitch's angle. This is a very common vernacular in the local area due to the high density of agricultural barns to the southwest. Installation of PV panels would be possible with this roof form.



**Curved Roofline** - This will soften a structure's visual impact against the landscape and skyline. The use of this building form would require a more considered layout with larger components placed centrally but could allow an overall lower roofline. This is a very common vernacular in the local area due to the high density of agricultural barns and produce tunnels to the southwest. Installation of PV panels would not be possible with this roof form.



**Single Pitch Roofline** - A single pitch roofline would allow structures to be softened that are orientated towards visual receptors but would retain a larger internal area to house electrical components. This would have a very similar look to the pitched roof for visual receptors and is a common vernacular in the local area. Installation of PV panels would be possible with this roof form, dependent on orientation of the pitch.



## 7.4 Building Materials

### 7.4.1 Fixed Parameters

The choice of material for the proposed buildings serves a functional and structural requirement. As such, the choice of materials to be used will be dictated by the functional requirements of the onshore substation. All materials must adhere to the relevant building regulations, National Grid technical specifications, internal requirements of both RWE and SSE and best practice guidelines and will require technical review to assess their feasibility.

### 7.4.2 Design Vision Principles

The materiality of the onshore substation should follow best practice in substation design, whilst considering a Design Vision approach that offers the following benefits:

- Hard wearing and long-lasting;
- Allows flexibility to vary the elevational treatment dependent on the aspect and nature of view;
- Allows for contribution to visual mitigation through variation of colour, tonality, form, scale or similarity to existing local materials.
- Respond to the requirements of NPS EN-1 which stipulates ‘efficient use of natural resources’

The outlined design principles positively respond to the NIC Design Principles climate, places and people. This is achieved through:

### 7.4.3 Climate

- Choosing materials with low embodied carbon
- Selecting robust materials and fixings that are not maintenance intensive and which allow re-use / recycling
- Ideally be from a sustainable source and locally available where practicable, with potential to be used reused or recycled at the end of its operational life.



### 7.4.4 People

- Opportunity to utilise a variety of materials depending on the visibility of the onshore substation structures.
- This could be achieved by using lower cost metal cladding where the structures are not visible by external receptors, with materials which provide a higher visual mitigation used only on areas of the structures visible by external receptors.



### 7.4.5 Place

- The guidance for Tending Landscape Character Area 7A -Bromley Heaths states ‘that new buildings should be constructed in such a way that they blend with the landscape in scale, colour and design’ (TLCA, 2001).
- The Essex Design Guide defines some of the traditional material in Essex as ‘Red Brick, Traditional Coloured Render, Black Weather Boarding, Buff Brick, Slate/ Tiles, Coloured Weather Boarding, Brick Patterning, Zinc and Panelling’ (EDG, 2018).



**7.4.6 Detailed Design Options**

Material options will be considered and finalised during the detailed design stage of the Project, subject to functional and technical requirements.

At Outline Design Stage, use of timber for cladding or screening within the onshore substation works area was discounted due to fire risk.

Options under consideration include:

**7.4.7 Metal cladding**

The benefits of this material include:

- Hard wearing;
- Available in a variety of textures, shapes and colours;
- Readily available and generally low maintenance; and
- Blend into the existing agricultural infrastructure surrounding the onshore substation.

The negative considerations for metal cladding include:

- Some treatments and finishes may become reflective, increasing visual impact; and
- Use of metal cladding on very large-scale structures may create a predominantly industrial aesthetic, increasing visual impact.

**7.4.8 Polycarbonate**

The benefits of this material include:

- Lightweight and easy to install;
- Can be easily formed around curved or complex structures;
- Available in a variety of shapes and colours; and
- Can provide higher acoustic insulation if necessary.

The negative considerations for polycarbonate include:

- More expensive and less readily available; and
- Requires additional cleaning and maintenance.

**Metal cladding**

\*Green Guide rating dependant on full details of external wall construction, ranging from A+ to D



Image 5: Corrugated metal panelling / Source: Brian H / CC BY-SA 2.0



Image 6: Flat metal panelling / Source: Rob Deutscher / CC BY 2.0

**Polycarbonate cladding**

\*No Green Guide ratings available

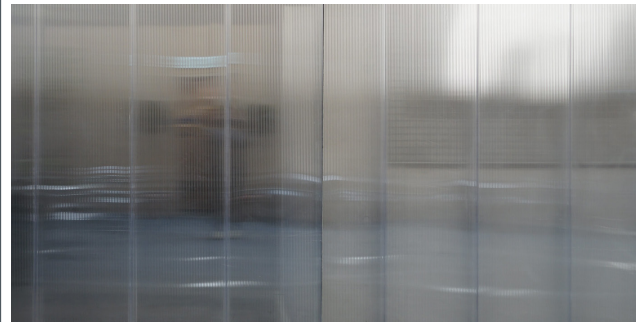


Image 7: Polycarbonate panelling / Source: ACME / CC BY-NC 2.0

## 7.5 Colour

### 7.5.1 Fixed Parameters

The choice of colour will not be dictated by the functional requirements of the onshore substation works area. To satisfy accessibility requirements a colour contrast may be required to minor building fixtures and fittings, which will not significantly alter the look or character of the development

### 7.5.2 Design Vision Principles

The colour and finish of the final material application can provide increased visual mitigation, integrating the onshore substation into the landscape. The application of colour may not be limited by the functional requirements of the onshore substation.

The Landscape Institute have prepared a Technical Information Note on Environmental Colour Assessment (ECA). This is an objective process that helps to resolve many of the issues associated with colour selection and specification, especially in the external environment. Its use can also lead to significant landscape and visual enhancements.

The objective of ECA is to produce a range of colours that is used to inform and guide the use of colour on buildings and structures within a particular environment. These are based on survey and analysis of indigenous colours.

Tonality is also a relevant factor. When trying to lose a development within the landscape, when viewed from afar, tones are typically selected which match, or are slightly darker than, the tonality of the landscape context colours against which the development would be viewed.

Guidance on the selection and use of colour in development has been prepared for the Dedham Vale National Landscape. This identifies three different palettes according to three simplified landscape character types (LCT) identified within the boundary to the National Landscape. Areas to the immediate south of the National Landscape are identified as the Plateau Farmlands LCT. The study identifies a range of 'integration' colours, which form the main colour choice. Alongside these are a range of accent colours that can be used for trims and frames and brick and tile shades. It may be useful to consult this palette when considering the impact on views from just outside the National Landscape, when facing south to the development.

A detailed colour sampling exercise will be undertaken post DCO approval as part of the detailed design process, once the scale, form and location within the site of the intended buildings is known. Ideally, this should be undertaken during the winter months, as this is when the underlying colour palette of rock, soil, and essential vegetation is exposed.

The exact colours will be reliant on chosen materials, manufacturer limitations, availability and other co-located substations within the cluster. This would be finalised during detailed design with consideration of feedback from stakeholders. The application of colour can be achieved through single block colours, banding or mixed colour panelling. The colour application will be considered at a later stage.

7.5.3 The outlined design principles positively respond to the NIC Design Principles people and places. This is achieved through:

### 7.5.4 People

- Considering use of locally appropriate colour palettes within facade treatments to assist with visual mitigation of built form from adjacent properties, PRoW or roads.



### 7.5.5 Places

- The guidance for Tending Landscape Character Area 7A -Bromley Heaths states '*that new buildings should be constructed in such a way that they blend with the landscape in scale, colour and design*' (TLCA, 2001).
- Considering use of locally appropriate colour palettes within facade treatments to assist with visual mitigation of built form.

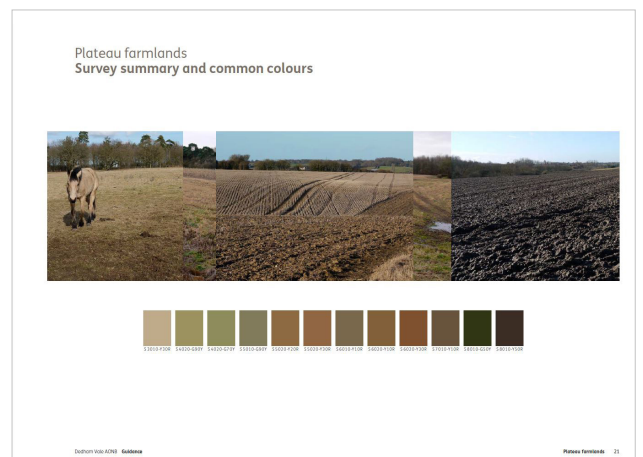


Figure 22: Dedham Vale AONB colour assessment



## 7.6 Site Access

### 7.6.1 Fixed Parameters

There are a number of existing vehicular routes that interact with the onshore substation works area. At this stage, both construction and operational accesses to the substation are at an early stage of development. Therefore, only general principles can be applied to the site entrance as set out below.

### 7.6.2 Design Vision Principles

The Design Vision considerations for site access includes:

- Aligning the road so as to prevent a direct view to substation infrastructure from the road edge and restrict corridor views;
- Screening the site entrance where appropriate to limit visual impact for local receptors, depending on health and safety considerations and highways design standards - DMRB;
- Minimising the visual impact and reducing clutter of signage, street furniture, security measures and lighting at the road edge;
- Considering the local vernacular, colour and materials when developing detailed proposals for site access control and boundary treatments; and
- Appropriate security infrastructure to promote a safe, secure site.

The outlined design principles positively respond to the NIC Design Principles climate, people and places. This is achieved through:

### 7.6.3 Climate

- Considering materials with low embodied carbon;
- Considering use of permeable materials for access routes, layover and parking areas;
- Directing surface water runoff to SuDS measures e.g. filter strips, swales; and
- Considering use of recycled / site-won aggregates for sub-base or surface dressings.



### 7.6.4 People

- Minimising requirements for excessive signage, barriers and/or lighting that could detract from the surrounding amenity, subject to the Traffic Signs Regulations.



### 7.6.5 Places

- Considering use of locally appropriate materials, in keeping with the surrounding landscape character; and
- Locating access routes to minimise conflicts with users of the local highway network.

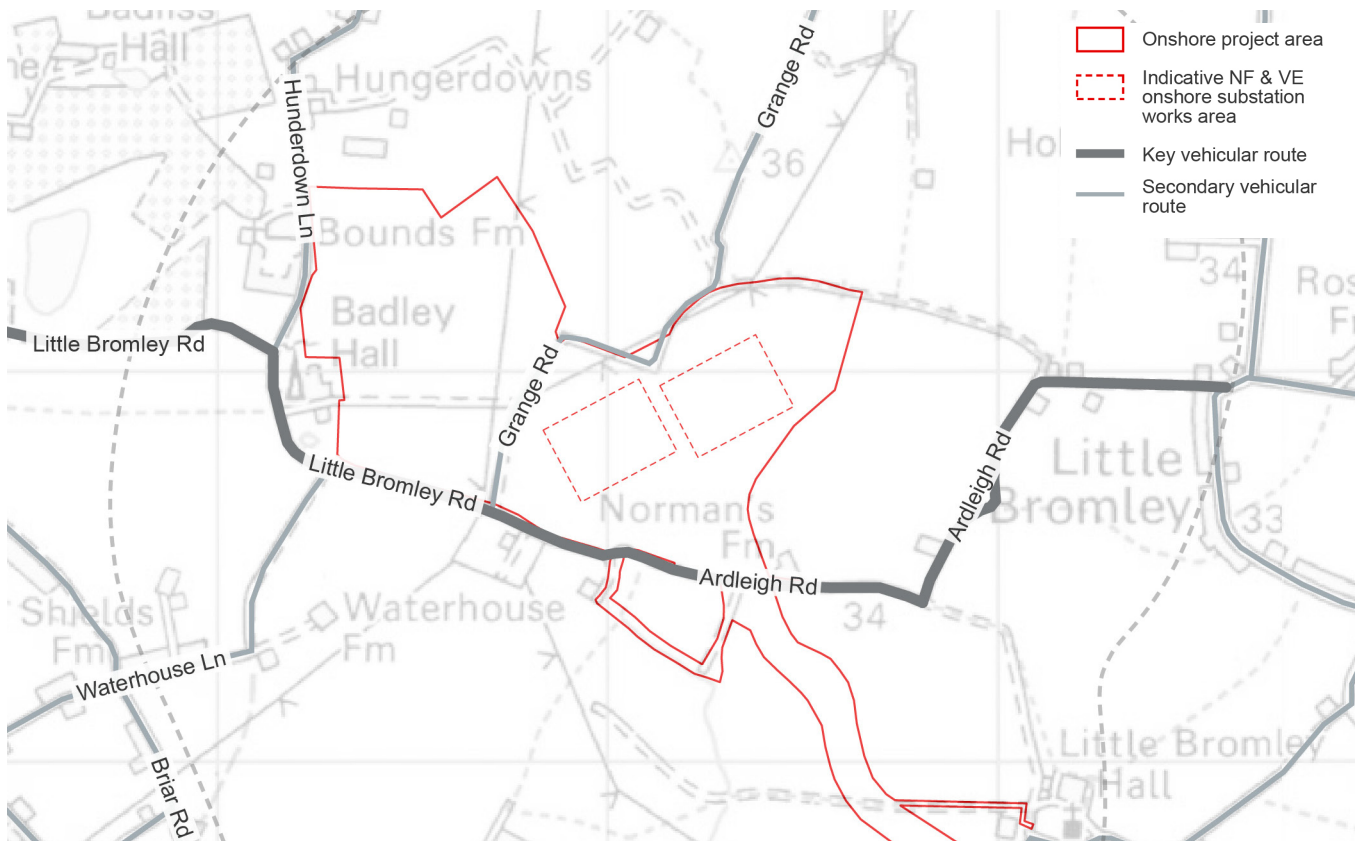


Figure 23: Existing vehicular routes around the site

## 7.7 Public Rights of Way

### 7.7.1 Fixed Parameters

No physical changes to existing PRoW are envisaged within the onshore substation working area.

### 7.7.2 Design Vision Principles

Users of PRoW will experience visual effects as a result of the onshore substation. The location of affected PRoW and nature of the existing view will determine what approach to screening may be needed within the onshore substation working area. For example:

- Direct views / Viewpoint 1 - PRoW 170\_15 exits onto Ardleigh Road within the onshore substation works area as shown in Figure 5.3. There is currently no boundary vegetation present with open views of the onshore substation works area. Vegetated boundaries are present in the area and can be introduced along the site boundary to provide screening;
- Short range / Viewpoint 2 - PRoW 170\_57 is a byway that exits onto Barn Lane. The vegetation in this area is gappy and may provide seasonal and year-round long-range views of the onshore substation works area. Additional layered vegetation should be considered to provide screening of the onshore substation works area; and
- Long range / Viewpoint 3 - PRoW 170\_25 is situated north of the onshore substation works area. The vegetation in this area is gappy and may provide seasonal and year-round long-range views of the onshore substation works area. Additional layered vegetation should be considered to provide screening of the onshore substation works area.

The outlined design principles positively respond to the NIC Design Principles climate, people, and places, whilst bringing value to the Project. This is achieved through:

### 7.7.3 Climate

- Considering how any indirect changes to PRoW, such as the introduction of landscape and biodiversity mitigation and enhancement measures, can enhance routes and increase usage for active travel.

### 7.7.4 People

- Locating access routes to the onshore substation working area to minimise conflicts with pedestrians, cyclists, horse riders or other users of the PRoW;
- Considering the impact of tall or dominant built form or boundary treatments on users of PRoW. Look to provide suitable buffer distances from routes and/or provide a gradation in landscape treatment to the boundary, in keeping with the local landscape character.



### 7.7.5 Places

- Considering use of locally appropriate materials and boundary treatments, in keeping with the surrounding landscape character;
- Considering the impact of tall or dominant built form or boundary treatments on users of PRoW. Looking to provide suitable buffer distances from routes and/or providing a gradation in landscape treatment to the boundary, in keeping with the local landscape character



### 7.7.6 Value

- Considering the inclusion of new landscape treatments e.g. hedgerows, scattered trees to enhance the existing landscape character, strengthen localised green infrastructure and provide additional filtering to views from visual receptors.



## 7.8 Earthworks and Land form

### 7.8.1 Fixed Parameters

A flat platform is required for the construction of each onshore substation. There is no specific requirement for bunds.

### 7.8.2 Design Vision Principles

An initial cut and fill exercise has identified a target finished level for the development platform. This effectively balances cut and fill, through close alignment with the existing site topography.

The LVIA has identified that certain groups of receptors will experience a change in view as a result of the development. The Outline Landscape Mitigation Proposals do not currently include the use of bunds due to their susceptibility to drying out, creating sub-optimum conditions for the successful establishment of woody vegetation. In addition, the guidance for Tendring Landscape Character Area 7A - Bromley Heaths, stated that *‘in this very large scale, open landscape it would be inappropriate to try and hide a new building behind earth bunds or vegetation’* (TLCA, 2001).

It is recognised that some bunding may be required to assist with visual mitigation and cut and fill balance at detailed design stage, dependent on the final design of the onshore substations. Due to the flat topography around the onshore substation works area, earthwork bunds could be introduced only in limited locations where they would assist in screening the substation from surrounding properties and users of the PRow network but not form a prominent or discordant feature within the landscape.

Proposed bunds are not intended to completely obstruct views of the substation, rather screen and reorientate views in sensitive locations. The use of earthwork bunds would need to be reviewed on a location-by-location basis to ensure they do not look unnatural in the landscape. In this scenario, the design of the bunds could be subtle, organic and integrated well into the surrounding landscape. A sensitive design approach to scale, form and vegetation cover will further mitigate the highlighted risk of them becoming prominent features in the generally flat landscape.

The outline design principles positively respond to the NIC Design Principles climate, people and places. This is achieved through:

### 7.8.3 Climate

- Considering whether site-won materials from excavations can be retained on site through incorporation within land form or bunds, thus avoiding off-site transportation.
- Considering whether planting within bunds is more susceptible to drying out, therefore will require more watering for successful establishment (or allowance for replacement planting).

### 7.8.4 People

- Considering whether new land form can be used to assist with visual mitigation

### 7.8.5 Place

- Considering whether new land form will be a detracting or incongruent feature within the landscape

## Detailed Design Options

- 7.8.6** Bunds would create a raised embankment for planting, with the form and scale of planting helping to integrate any proposed bunds into the landscape. The mix of vegetation will promote biodiversity and enhance the sites aesthetic value. The bunds can utilise existing subsoil and topsoil from the onshore substation’s construction. This is generally created through cut and fill across the site and is usually stored on site until the end of construction, where as much as possible is then used in landscaping. Retaining as much of the subsoil and topsoil on site as possible reduces costs and the environmental impacts of transporting and waste disposal.



Image 8: Naturalised bunding / Source: Peter O’Connor / CC BY-SA 2.0

## 7.9 Boundary Treatments

### 7.9.1 Fixed Parameters

National Infrastructure Guidance requires installation of a secure boundary to the perimeter of the substation. This must comprise 2.4m high steel fencing, either a Palisade or Weldmesh-type with a 1.0m electric fence on top.

Acoustic fencing may be a requirement, dependent on the type of equipment specified at detailed design stage, it's location on site and in relation to acoustic receptors and the proximity of built form or other noise limiting structures within the site.

There is no specific requirement for hedges, however they may be specified to provide screening or enclosure, where security requirements do not take precedence.

### 7.9.2 Design Vision Principles

Boundary treatments around the onshore substation will need to be fit for purpose and provide robust site security. There will be a variety of boundary treatments required across the onshore substation works area, these include:

- Onshore substation secure boundary;
- Visual screening around the Onshore substation; and
- Acoustic fencing if required in specific locations.

The outlined design principles positively respond to the NIC Design Principles climate, people and places. This is achieved through:

### 7.9.3 Climate

- Considering choosing boundary treatments with low embodied carbon, including use of hedges for natural screening and habitat creation;
- Selecting robust materials and fixings that are not maintenance intensive and which allow re-use / recycling.



### 7.9.4 People

- Considering use of locally-appropriate colour palettes within boundary treatments to assist with visual mitigation of built form from adjacent properties, PRoW or roads; and
- Considering the scale of fencing, ensuring that will not be overly dominant when experienced from adjacent properties, PRoW or roads.
- Consider use of vegetation in conjunction with fencing, to soften and screen elements that may have an industrial appearance



### 7.9.5 Places

- Where hedges are proposed, using native species that are appropriate to the local landscape character and enhance biodiversity;
- Considering use of locally appropriate materials, in keeping with the surrounding landscape character;
- Considering use of locally-appropriate colour palettes within boundary treatments to assist with visual mitigation of built form.



Image 9: Existing open boundaries to the site, Viewpoint from Norman's Farm



## 7.9 Boundary Treatments

### 7.9.6 Detailed Design Options

The following section identifies options for boundary treatment that can be considered at the detailed design stage.

### 7.9.7 Onshore Substation Secure Boundary

There are two options for the fence type that will form the secure substation boundary;

### 7.9.8 Weld mesh Fencing

Weld mesh fencing offers better visibility for surveillance than palisade fencing and is more aesthetically pleasing due to its more open appearance, which allows views through. Use of the right colour palette can help the fence to ‘recede’ into the background. Tightly-woven mesh is typically much harder to climb.

### 7.9.9 Palisade Fencing

Palisade fencing is constructed from individual metal pales, which can be targeted for vandalism, leaving panels vulnerable to entry. Palisade provides a more solid appearance to the fence panel, therefore is better at screening unattractive development behind, but also views through and out of the site. Use of the right colour palette can help the fence to ‘recede’ into the background.

### 7.9.10 Other Boundaries

Other options for boundaries associated with the onshore substation are as follows:

### 7.9.11 Hedgerows

Native species hedgerows can be used to provide enclosure where security is not a requirement but enclosure of the site is required for purposes of visual mitigation, enhancement of landscape character or biodiversity net gain.

### 7.9.12 Acoustic Fencing

Acoustic fencing may be required at locations within the site or at its perimeter to mitigate the potential acoustic effects experienced by receptors at adjacent properties or using existing PRoW. Aesthetically-pleasing options for acoustic fencing include timber or willow rod panels with an acoustic fill layer.

#### Weld mesh Fencing

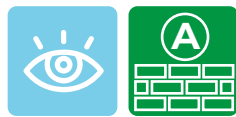


Image 10: Weld mesh fencing / Source: Zaub

#### Hedgerows

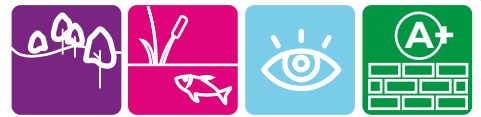


Image 11: Natural Screening hedgerows

#### Palisade Fencing



Image 12: Palisade fencing / Source: Oakdale

#### Acoustic Fencing



Image 13: Acoustic fencing / Source: Jacksons

## 7.10 Surfacing

### 7.10.1 Fixed Parameters

The extent of hard surfacing within the onshore substation will be dictated by the site’s technical requirements and maintenance needs. All surfacing will comply with industry guidance, such as British Standards, Specification for Highways Works and National Grid technical specifications for operational substations.

### 7.10.2 Design Vision Principles

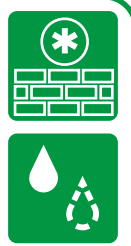
The Design Vision aspirations and considerations for the proposed hard landscape materials include:

- Permeability/drainage impacts;
- Sustainability of chosen material;
- Reduction of visual impact through choice of colour and material type; and
- Robustness of material for movements of heavy goods vehicles for replacement of infrastructure.

The outlined design principles positively respond to the NIC Design Principles climate and places. This is achieved through:

### 7.10.3 Climate

- Reducing the extent of hard landscape within the site;
- Consideration of materials with low embodied carbon;
- Considering use of recycled aggregates for sub-base or surface dressings;
- Use of permeable surfaces; and
- Colour of lighter coloured materials to reduce solar absorption and glare.



### 7.10.4 Places

- Considering use of locally appropriate materials, in keeping with the surrounding landscape character.



### 7.10.5 Detailed Design Options

#### Asphalt

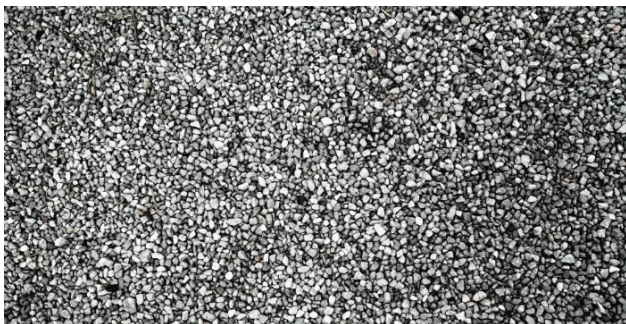
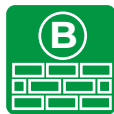


Image 14: Non-porous and Porous Asphalt

#### Self-binding Gravel

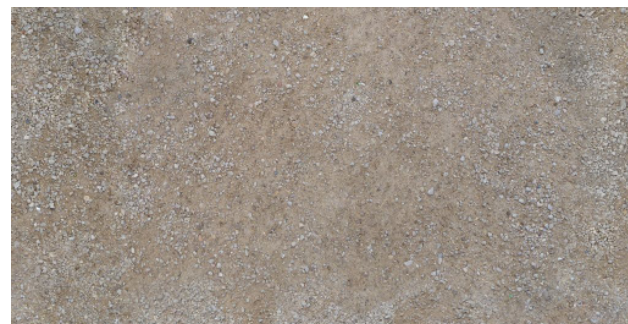


Image 15: Self binding gravel (Source: LUC)

#### Reinforced Gravel



Image 16: Reinforced gravel

#### Reinforced Grass



Image 17: Reinforced grass / Source:

## 7.11 Lighting

### 7.11.1 Fixed Parameters

Detailed specifications of operational lighting will be set out in separate construction and operational lighting plans developed at detailed design.

### 7.11.2 Design Vision Principles

Within the onshore substation lighting should be directional and limited to areas that require lighting for functional purposes such as key routes, wayfinding and buildings and building entrances. Luminaires should be situated to provide the most efficient spread of light, with lighting integrated into the built form where practicable to reduce visual clutter within the site. Lighting should only operate when required where practicable, through the use of motion sensors or timed controls to reduce the site being lit unnecessarily.

The use of artificial light will be minimised to levels that are sufficient to ensure that safety and security requirements are met but light scatter outside of the substation compound is minimised. Dark corridors around the site boundary and unlit areas should be maintained as to not disturb any local wildlife such as bats.

Whilst not located within the Dedham Vale National Landscape, lighting design and specification should adhere to the guidance set out in the Lighting Design Guide for Dedham Vale National Landscape wherever possible, to preserve the dark sky environment.

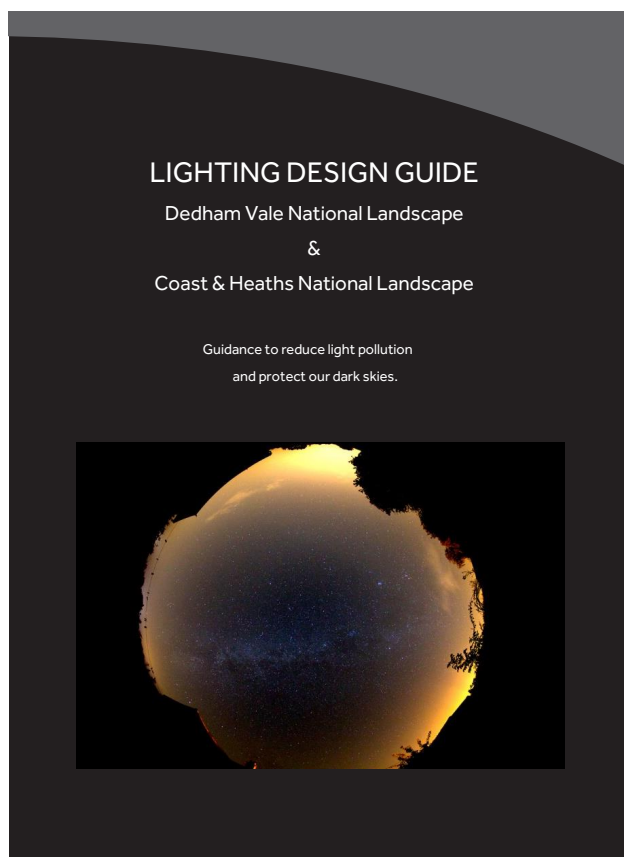


Image 18: Dedham Vale Lighting Design Guide

The outlined design principles positively respond to the NIC Design Principles climate, people and places. This is achieved through:

### 7.11.3 Climate

- Minimising the extent of lighting within the site;
- Considering the scale and quantity of light fittings;
- Considering use of motion sensors or timers to restrict the hours of illumination;
- Ensuring luminaires are used which suit the needs of wildlife (while meeting health and safety requirements); and
- Using energy efficient luminaires.

### 7.11.3 People

- Minimising the extent of lighting within the site;
- Considering the scale and quantity of light fittings;
- Considering use of motion sensors or timers to restrict the hours of illumination;
- Considering use of specific luminaires to reduce light spill; and
- Direction of lighting; pointing away from residential dwellings, wherever possible.



### 7.11.4 Places

- Considering the impact of lighting on localised tranquillity and aiming to reduce light pollution wherever possible; and
- Considering use of specific luminaires to reduce light spill.



## 7.12 Planting

### 7.12.1 Fixed Parameters

There are no fixed parameters in relation to planting at the onshore substation, although planting designs and specifications must be prepared with full cognisance to the operational requirements of the substation, in particular safety and security. Planting designs and specifications must also adhere to industry guidance in relation to the easements to overhead and underground utilities easements.

Planting specifications should also comply with industry guidance and best practice, such as British Standards.

### 7.12.2 Design Vision Principles

Planting is proposed as part of the visual mitigation, and landscape and biodiversity enhancement proposals. The exact location of planting, species and sizes will be determined once the detailed site layout has been developed. The Outline Landscape Strategy in Section 5 provides an illustrative plan indicating retained soft landscape elements and locations for new planting;

- Seek to retain hedgerow boundaries and occasional hedgerow trees along the north-western boundary, where practicable;
- Seek to reinstate 'lost' historic field boundaries
- Infill gaps in existing poor-quality hedgerows and extend along the site boundaries through new native-species hedgerow planting
- Seek to retain scattered mature trees along the south-eastern site boundary, where practicable;
- Introduce further scattered hedgerow tree as part of the site boundary enhancement works. Planting around the onshore substation boundary will integrate the site into the surrounding landscape, with elements such as field boundary hedgerows and clusters of trees being common in the area.
- Reference existing local landscape characteristics, such as shelter belts and small copses within visual mitigation proposals to ensure that screening planting is contextually sensitive

The outlined design principles positively respond to the NIC Design Principles climate, people and places, whilst bringing value to the Project. This is achieved through:



Image 19: View looking southwest from Grange Road and PRoW 170\_19 / Source: LUC

### 7.12.3 Climate

- Considering the impact of climate change when specifying trees and plants. Research undertaken by Forest Research can be used to identify suitable tree species for the local area, according to different climate scenarios predicted for 2050.



### 7.12.4 People

- Considering use of locally appropriate planting types e.g. hedges, scattered trees, woodland to enhance both amenity and biodiversity, and provide filtering to views experienced by visual receptors.



### 7.12.5 Places

- Retaining existing trees and hedgerows, where practicable, to maintain age and species diversity within the site and its vicinity;
- Species selection for trees and hedgerows shall be informed by initial assessments and species referenced in the Essex Design Guide and Essex Tree Palette;
- Selecting locally appropriate planting types e.g. hedges, scattered trees, woodland to enhance both ecology and strengthen the underlying landscape character;
- Using locally native species and source material from within the local area, where practicable; and
- Considering use of planting which provides seasonal sources of food for invertebrates, birds and mammals.



### 7.12.6 Value

- Considering the wider connectivity of planting to the enhance GBI and habitat connectivity beyond the site.



## 7.13 Biodiversity Enhancements

### 7.13.1 Fixed Parameters

There are no fixed parameters in relation to biodiversity at the onshore substation, Biodiversity and habitat creation measures must be prepared with full cognisance to the operational requirements of the substation, in particular safety and security. The design and specification of any related planting must also adhere to industry guidance in relation to the easements to overhead and underground utilities easements. They should also comply with industry guidance and good practice.

### 7.13.2 Design Vision Principles

Throughout the design of the North Falls onshore substation, efforts will be made to ensure that opportunities for ecological enhancement are sought. As stated in the Essex Design Guide *'new developments in Essex will be expected to enhance existing biodiversity and to create new habitats, together with providing resources for the management of those habitats into the future.'* *'Good design can provide many opportunities for biodiversity, and these should be maximised. Furthermore, all developments should ensure that networks of habitats are maintained to prevent fragmentation and isolation'* (EDG, 2018).

Ecological enhancements should aim to provide both mitigation of any habitat losses and may also include habitat enhancement, creation and works to improve habitat connectivity, where practicable. Ecological enhancement will feed into Design Vision aspects related to proposed vegetation, structure, drainage, boundary treatments and land form. A landscape and ecological management plan will be a DCO requirement and principles in the Design Vision will inform this plan as it is developed. Consideration needs to be given to the location and structure of any planting in response to the existing site conditions (topography, soil, vegetation cover etc.) and the proposed scheme (screening, easements, visual mitigation etc.).

The Project is exploring opportunities to achieve 10% biodiversity net gain (BNG) in relation to the Project's onshore works. The Project is engaging with Natural England and other ecological stakeholders and members of the Onshore Ecology Expert Topic Groups to identify suitable projects and plans for delivering BNG.

The outlined design principles positively respond to the NIC Design Principles climate, people and places, whilst bringing value to the Project. This is achieved through:

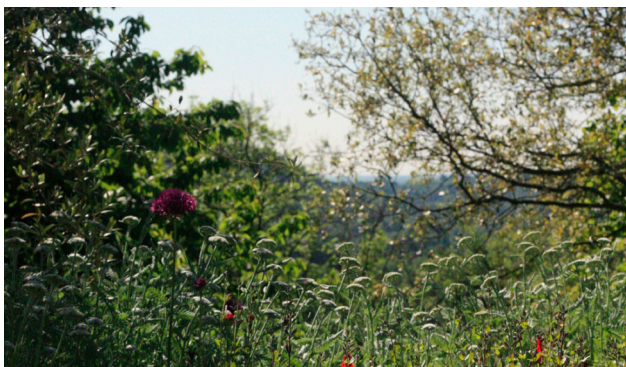


Image 20: Ecological enhancements through vegetation / Source: LUC

### 7.13.3 Climate

- Considering the impact of climate change when specifying trees and plants. Research undertaken by Forest Research can be used to identify suitable tree species for the local area, according to different climate scenarios predicted for 2050.



### 7.13.4 People

- Considering habitat creation or other measures that will enhance opportunities for wildlife viewing; and
- Considering use of locally appropriate planting types e.g. hedges, scattered trees, woodland to enhance both ecology and provide filtering to views experienced by visual receptors.



### 7.13.5 Places

- Retaining existing features and habitats;
- Where existing features are fragmented or damaged, seeking to strengthen their connectivity or repair; Retain existing trees as landscape features and to maintain age and species diversity within the site and its vicinity;
- Considering use of locally appropriate planting types e.g. hedges, scattered trees, woodland to enhance both ecology and strengthen the underlying landscape character;
- Species selection for trees and hedgerows shall be informed by initial assessments and species referenced in the Essex Design Guide and Essex Tree Palette;
- Using locally native species and source material from within the local area, where practicable;
- Seeking to improve existing biodiversity levels to achieve a 10% BNG (note: ecologist/client to provide further detail throughout the Project);
- Using locally native species and source material from within the local area, where practicable; and
- Considering use of planting which provides seasonal sources of food for invertebrates, birds and mammals.



### 6.12.6 Value

- Considering the introduction of features that will enhance wider GBI or links to habitats



## 7.14 Drainage and Water

### 7.14.1 Fixed Parameters

Drainage proposals must accommodate 1 in 100 year +45%, allowing for future climate change. This will be accommodated, through the provision of appropriate on-site attenuation and storage, in accordance with the Essex County Council Sustainable Drainage Systems Design Guide.

The location, scale and feasibility of any of these features would be subject to detailed design and groundworks investigations including infiltration testing. At detailed design stage the location of SuDS measures must avoid any areas subject to Abnormal Indivisible Loads.

### 7.14.2 Design Vision Principles

Water management requirements across the onshore substation works area provides the opportunity to introduce natural drainages features. As stated in the Essex Sustainable Drainage Systems Design Guidance *'When managing rainfall, the SuDS network should be designed to match natural drainage routes, infiltration rates and discharge rates as far as possible [...] The provision of storage helps to reduce flooding whilst helping to control the peak allowable runoff rate. In addition, well-designed SuDS schemes can significantly improve and promote biodiversity and amenity in an area through the use of above ground storage.'* (ESuDS, 2018).

The outlined design principles positively respond to the NIC Design Principles climate and places. This is achieved through:

### 7.14.3 Climate

- Considering use of rainwater harvesting technology for site buildings with flat roofs;
- Reducing areas of impermeable hard standing within the site; and
- Considering use of SUDs techniques (permeable paving, filter strips, swales, rain gardens, ponds) to manage surface water runoff on site rather than traditional underground drainage systems or large attenuation tanks.



### 7.14.4 Places

- Considering how SUDs features can be used to reflect and strengthen local landscape character or provide attractive features for people and wildlife; and
- Reinstatement of the existing drainage ditch running through the centre of the site to maintain biodiversity and habitat connectivity.



7.14.5 Detailed Design Options

It should be noted that the use of one option may reduce the need for or extent of other options. There is a careful balance to be considered at detailed design stage to reach a solution that maximises benefits.

**Filter Drains or Permeable Surfaces:** Filter drains and permeable surfaces allow water run-off to soak into the ground through drainage aggregate. Drainage aggregates can reduce pollutants in the run-off from soaking into the ground. Permeable surfaces could be introduced within the onshore substation at parking areas or lightly trafficked portions of the site. Increasing permeability across the onshore substation will reduce the level of run-off ensuring that natural drainage solutions can provide ample capacity.

**Attenuation Ponds:** Attenuation ponds situated within vegetated boundaries create both a drainage solution and additional habitats for local fauna providing biodiversity and climate resilience. Water run-off from the onshore substation and surrounding infrastructure collects in the attenuation ponds and soaks back into the ground, whilst being treated by native aquatic and marginal planting to reduce pollutants. The surrounding planting and scale of the attenuation features provide additional visual mitigation for the onshore substation. Sufficient storage capacity should be provided to store yearly rainfall as well as

storm flood frequencies, as stated in the relevant Standards, such as NGET TS2.10.13 Flood Defences for Electricity Substations. The form and structure of attenuation ponds can create additional ecological value through varying water depths for wintering bird and smaller pools around the ponds margins to allow local fauna to use the site.

**Swales:** Swales provide a sustainable drainage solution in areas with restricted space or where water needs to be directed away from the onshore substation site. Swales consist of linear grass depressions that channel water run-off to attenuation features. Swales need to be located closer to source of the run-off so could be well situated adjacent to entrance roads, or where the site boundary is constrained. These areas will be dry prior to run-off or rain events, with planting around the upper edges. The introduction of vegetation will provide biodiversity and climate resilience.

**Traditional drainage methods** such as underground pipes, gullies and controlled outflow may be required within the onshore substation to meet design guidance and technical requirements for the substation operation. These traditional drainage methods could connect with any proposed natural drainage systems to create an ecologically sustainable drainage solution, whilst introducing additional biodiversity, habitat opportunities and protect adjacent agricultural land.

**Permeable surfacing**




Image 21: Example of permeable paving

**Swales**




Image 22: Example of dry swales / Source: Daniel Filippi / C

**Attenuation Ponds**






Image 23: xample of attenuation pond / Source: Essex SuDS design guide

**Traditional drainage**




Image 24: Example of traditional drainage

This page left intentionally blank





# Section 8

References and Glossary



**NORTH FALLS**

*Offshore Wind Farm*

## 8.1 References

### Figure References

8.1.1

- Figure 1** - NIC Design Principles / Source- (NIC, 2020) / pg 12
- Figure 2** - North Falls site selection process / pg 19
- Figure 3** - Map showing offshore array site context / Source: <https://fiveestuaries.co.uk/> / pg 20
- Figure 4** - National Character Area 111 / Source - (NCA, 2013) - Northern Thames Basin NE466 / pg 23
- Figure 5** - Plan showing landscape character areas encompassing the onshore substation works area / pg 24
- Figure 6** - Onshore Substation works area / pg 25
- Figure 7** - Existing vegetation and watercourses around the site / pg 26
- Figure 8** - Substation sitting zone visibility / pg 27
- Figure 9** - Existing PRoW, byways and bridleways / pg 28
- Figure 10** - Development constraints / pg 30
- Figure 11** - Onshore Substation working area constraints mapping / Source - Royal HaskoningDHV / pg 33
- Figure 12** - Optioneering 1 / Source - Royal HaskoningDHV / pg 34
- Figure 13** - Optioneering 2 / Source - Royal HaskoningDHV / pg 34
- Figure 14** - Existing Landscape Context / pg 36
- Figure 15** - Development Constraints / pg 36
- Figure 16** - Historic Landscape Structure / pg 36
- Figure 17** - Landscape Enhancements / pg 37
- Figure 18** - Visual Mitigation / pg 37
- Figure 19** - Ecological Enhancements and Biodiversity Net Gain / pg 37
- Figure 20** - Outline Landscape Strategy Masterplan / pg 38
- Figure 21** - Multi-criteria analysis, derived from NIC Design Principles/ pg 51
- Figure 22** - Dedham Vale AONB colour assessment / pg 59
- Figure 23** - Existing vehicular routes around the site / pg



## 8.1 References

### Image References

8.1.2

- Image 1** - Viewpoint from Bridleway at Barn Lane. LUC / Pg 29
- Image 2** - Example of GIS site layout / Provided by North Falls Ltd. / Pg 54
- Image 3** - Example of AIS site layout / Provided by North Falls Ltd. / Pg 54
- Image 4** - AIS control building / Source - RWE / Pg 55
- Image 5** - Corrugated metal panelling / Source - Brian H / CC BY-SA 2.0 / Pg 58
- Image 6** - Flat metal panelling / Source - Rob Deutscher / CC BY 2.0 / Pg 58
- Image 7** - Polycarbonate panelling / Source - ACME / CC BY-NC 2.0 / Pg 58
- Image 8** - Naturalised bunding / Source - Peter O'Connor / CC BY-SA 2.0 / Pg 62
- Image 9** - Existing open boundaries to the site, viewpoint from Norman's Farm / Pg 63
- Image 10** - Weld mesh fencing / Source - <https://www.zaun.co.uk/products/security-mesh-fencing/> / Pg 64
- Image 11** - Natural screening hedgerows / Pg 64
- Image 12** - Palisade fencing / Source - <https://www.oakdalefencing.co.uk/product-category/fencing/metal-security-fencing/> / Pg 64
- Image 13** - Acoustic fencing / Source - <https://www.jacksons-fencing.co.uk/acoustic-fencing/> / Pg 64
- Image 14** - Non-porous and Porous Asphalt / Source - <https://greenblue.com/gb/permeable-pavement-the-pros-and-cons-you-need-to-know/> / Pg 66
- Image 15** - Self binding gravel / Source - LUC / Pg 66
- Image 16** - Reinforced gravel / Source - <https://www.geosyn.co.uk/product/golpla-grass-gravel-reinforcement/> / Pg 66
- Image 17** - Reinforced grass / Source - / Pg 66
- Image 18** - Dedham Vale Lighting Design Guide / Source - <https://dedhamvale-nl.org.uk/2023/08/07/new-landscape-lighting-design-guide-published/> / Pg 19
- Image 19** - View looking southwest from Grange Road and PRoW 170\_19 / Pg 67
- Image 20** - Ecological enhancements through vegetation / Pg 68
- Image 21** - Example of permeable paving / Source - <https://therubbercompany.com/grass-ground-reinforcement/ground-pavers/toughgrid-permeable-paving-grids/> / Pg 70
- Image 22** - Example of dry swales / Source - [https://wiki.sustainabletechnologies.ca/index.php?title=File:Grass\\_bioretention\\_swale\\_1.jpg](https://wiki.sustainabletechnologies.ca/index.php?title=File:Grass_bioretention_swale_1.jpg) / Pg 70
- Image 23** - Example of attenuation pond / Source - <https://www.essexdesignguide.co.uk/suds/rates-and-storage/green-spaces-and-biodiversity/> / Pg 70
- Image 24** - Example of traditional drainage / Source - <https://www.selfbuildanddesign.com/beginnersguides/nextsteps/drainage/> / Pg 70

### Table References

- Table 1** - PEIR Consultation Responses. / Pg 43
- Table 2** - Expert Topic Responses. / Pg 44
- Table 3** - NIC Design Principles. / Pg 51



## 8.1 References

### Reference Sources

8.1.3

Delivering Quality Development Environmental Impact Assessment Guide to. (2016). Available at: <https://www.iema.net/download-document/7014> - (IEMA, 2016)

Essex County Council. (2018). Essex Design Guide. [online] Available at: <https://www.essexdesignguide.co.uk/> - (EDG, 2018)

Essex County Council. (2018). Guide to planting appropriate tree species for Essex | Place Services. [online] Available at: <https://www.placeservices.co.uk/resources/natural-environment/essex-tree-palette/> - (ETP, 2018)

Essex County Council. (2020) Design Guide Sustainable Drainage Systems. Available at: [https://www.essexdesignguide.co.uk/pdf/SuDS\\_Design\\_Guide\\_2020.pdf](https://www.essexdesignguide.co.uk/pdf/SuDS_Design_Guide_2020.pdf) - (ESuDS, 2020)

Essex County Council. (2020). Essex Green Infrastructure Strategy | Place Services. [online] Available at: <https://www.placeservices.co.uk/resources/built-environment/essex-gi-strategy/> - (EGIS, 2020)

GOV.UK. (2011). National Policy Statements for energy infrastructure EN1, EN3 and EN5. [online] Available at: <https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure>. - (NPS, 2011)

GOV.UK. (2021). Planning for new energy infrastructure: review of energy National Policy Statements. [online] Available at: <https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-review-of-energy-national-policy-statements> - (DNPS, 2021)

GOV.UK. (2021). Planning for new energy infrastructure: review of energy National Policy Statements. [online] Available at: <https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements> - (NPS, 2023)

GOV.UK. (2020). National Infrastructure Strategy. [online] Available at: <https://www.gov.uk/government/publications/national-infrastructure-strategy> - (NIS, 2020)

LUC (2001). Tendring District Landscape Character Assessment. [online] Available at: [https://www.tendringdc.gov.uk/sites/default/files/documents/planning/Planning\\_Policy/TDC\\_040%20Landscape%20Character%20Assessment%20Vol%201.pdf](https://www.tendringdc.gov.uk/sites/default/files/documents/planning/Planning_Policy/TDC_040%20Landscape%20Character%20Assessment%20Vol%201.pdf) - (TLCA, 2001)

Natural England. (2013). NCA Profile:111 Northern Thames Basin - NE466. [online] Natural England - Access to Evidence. Available at: <http://publications.naturalengland.org.uk/publication/4721112340496384> - (NCA, 2013)

## 8.2 Glossary

### Glossary of Acronyms

AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
BNG	Biodiversity Net Gain
DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero
EACN	East Anglia Coastal Node substation
GBI	Green and Blue Infrastructure
GI	Green Infrastructure
LCA	Landscape Character Area
LCT	Landscape Character Type
LVIA	Landscape Visual Impact Assessment
MD	Minimum Design
MDS	Maximum Design Scenario
NCA	National Character Area
NGET	National Grid Electricity Transmission
NFOW	North Falls Offshore Wind Farm Limited
NPS	National Policy Statements
NSIP	Nationally Significant Infrastructure Project
OLEMS	Outline Landscape and Ecological Management Strategy
PEIR	Preliminary Environmental Information Report
PRoW	Public Right of Way
RWE	RWE Renewables UK Swindon Limited
SEO	Statements of Environmental Opportunity
SSER	SSE Renewables Offshore Windfarm Holdings Limited
SuDS	Sustainable Drainage Systems
TLCA	Tendring District Landscape Character Assessment

### Glossary of Terminology

Onshore project area	The boundary within which all onshore infrastructure required for the Project will be located (i.e. landfall; onshore cable route, accesses, construction compounds; onshore substation and 400kV onshore cable route).
The Applicant	North Falls Offshore Wind Farm Limited (NFOW)
The Project or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Onshore cable corridor(s)	Onshore corridor(s) considered at PEIR within which the onshore cable route, as assessed at ES, is located.
Onshore substation	A compound containing electrical equipment required to transform and stabilise electricity generated by the Project, so that it can be connected to the National Grid.
Onshore substation works area	Area within which all temporary and permanent works associated within the onshore substation are located, including onshore substation, construction compound, access, landscaping, drainage and earthworks.



# Section 9

Appendices



**NORTH FALLS**

*Offshore Wind Farm*

## 9.1 Design Advice Letter 1 and Response

### 9.1.1 Design Advice Letter 1

9.1.1

**Design  
Council**

**FAO:** Cormac Rooney,  
Windmill Hill Business Park,  
Whitehill Way, Swindon,  
Wiltshire,  
United Kingdom,  
SN5 6PB

**18 December 2023**  
**Our reference: DC/5686**

#### **North Falls and Five Estuaries Offshore Wind Farm Onshore Substations Design Review 1**

Dear Cormac,

Thank you for providing the North Falls Design Review Panel with the opportunity to comment on the emerging plans for the North Falls and Five Estuaries Offshore Wind Farm Onshore Substations on 5 December 2023. We thank the project teams for arranging a comprehensive site visit for the project teams and panel prior to the design review.

This design review encompassed two schemes; the North Falls and Five Estuaries projects who have a Good Neighbour Agreement in place to allow them to explore a collaborative approach to investigate the optimal alignment of their onshore cable routes and onshore substation; this review focused on the onshore substation. The panel discussion focused on the vision and landscape approach of the proposals and how this can be secured as the projects each move towards submitting a Development Consent Order (DCO). The letter below summarises the comments and advice provided during the session.

#### **Summary**

We appreciate the work completed to date to explore options, views and engagement in particular. We welcomed the clear presentation of the current position and the collaborative participation from both developer teams. These projects have opportunity to be an exemplar of sustainable, integrated design for energy infrastructure which looks beyond requirements to benefit people, place and planet with partnership working at the core and to set an exemplary precedent for future substation developments.

Consideration of the following points primarily will help both the North Falls and Five Estuaries projects to have greater focus and take a more holistic approach to design development as the projects begin to form in greater detail:

- More work is required to solidify the vision and ensure a clear approach to design that all stakeholders can easily understand, as well as taking a holistic approach to sustainability which encompasses every aspect of the two projects.
- Move away from mitigation strategies and encourage a net positive approach that establishes a new industry benchmark. This will actively contribute to beneficial outcomes for all.
- Continue refinement of the projects through careful optioneering. Clear consideration should be made throughout decision making, and the projects as a whole should consider their standing within the broader landscape context. Refinement should lead to clarity on the extent of flexibility and fixed matters.



## Vision

We urge the project teams to ensure the vision is succinct and ambitious. We support the ambition to create ‘greener futures for all’, therefore, we expect that these schemes and their work to expand the UK’s renewable energy supply should permeate through the narrative of the projects. The projects should have a net positive impact on the environment and for local people. This can be stated clearly through the vision.

Begin the vision document with a one-line vision statement that summarises the ambitions for the projects. We suggest that this vision statement is ambitious, galvanising and simple, such as ‘substations in a forest’ or to ‘regreen energy’.

Across the rest of the document, we recommend using a simple framework to break down the vision into a series of subheadings in order to define the vision with more rigour and levels of detail. It may also be beneficial to clearly define what falls under each subheading within the vision to keep the content focused and to reduce overlapping topics. In addition to the topics already outlined within the vision, the following topics should be considered: social value; jobs and skills; climate resilience; circular economy; energy; community benefit; and local economy. Adding an appendix may also help in reducing the text within the core of the vision document.

Additionally, there have been several lengthy documents provided for the projects so far that overlap in context, we recommend that these could be made more succinct, and potentially contained in one document, with clarity on which documents are secured by the DCO. This will help clarify the ambitions and approach for the DCO submission.

There is scope yet to be covered within the vision to ensure that these projects maintain a long legacy. We urge that the project teams look to 50 plus years to the future to consider the long-term impacts of the schemes on the environment and how lifespan, futureproofing and landscape approaches can be taken to maximise the opportunity for these schemes to provide the best possible outcomes for generations to come.

## Sustainability, Carbon and Circular Economy

More specific sustainability goals and research into carbon use should be defined for each of the projects. An outline life cycle carbon analysis will be important for the projects and should be approached from several different angles, exploring all phases of construction and operation. Findings, if fed back into the design effectively, will help to inform design decisions and reinforce the approach to create a truly greener energy system. High level embodied carbon pie charts would be one way of demonstrating this.

We would urge the design team to consider circular economy principles throughout the design process. This approach can help at all stages of a scheme from design, construction, use, and end of life, and we suggest that at this stage it can particularly help to inform the choice of materials through considering durability, longevity, and future use. We suggest that materials should be properly tested, and the process should be clearly documented. For example, an exploration of material reuse could explore how at the end of their use, unneeded construction elements could be used within the local community for their needs, such as construction of a village hall. In addition, we support the continuation of work being undertaken to look at lower embodied carbon options for materials such as concrete.

We suggest the incorporation of photovoltaic (PV) panels, if flat roofs are utilised, to further demonstrate an approach to sustainable design. This approach aligns with the ambition to move towards renewable energy sources by permeating them throughout the schemes and



would mitigate the environmental effects of the projects. By utilising PV on flat roofs, the design would not only enhance the energy performance of the buildings, but would also align with broader sustainability goals, demonstrating a forward-thinking approach to infrastructure development and a conscientious effort to integrate eco-friendly solutions into the project's architectural fabric. However, we question the vision's outline of use of flat roofs on this site. Following the local typology, pitched roofs are typically found on agricultural buildings in the area, so we suggest that in line with local character, pitched roofs should be used within these projects, in which case use of PV may not be applicable.

### Optioneering

We urge the design teams to ensure they are evaluating their options during the optioneering process in a measured way which thoroughly compares and contrasts all possible options before drawing conclusions. Submitting to DCO, inspectors will recognise the need for flexibility in the project's design, but will expect a demonstration of how options have been refined to align with clear standards. This ensures regulatory compliance while preserving flexibility where required. The documentation presented should provide a transparent account of the decision-making process, showcasing how options have been reigned in when necessary, in line with the project's overarching goals.

We urge both the North Falls and Five Estuaries projects to utilise an Air Insulated Substation (AIS) rather than Gas Insulated Substation (GIS). Not only does AIS require a lower profile, which would impact views of the infrastructure onto the landscape to a lesser extent, but it is also the only viable option to ensure the project does not utilise fossil fuels, tying into the possible vision for these projects to have net positive impacts.

One critical aspect is the optioneering of land take, which necessitates a thorough examination of spatial requirements and potential implications associated with different land-use options. More work must be done to explain this process prior to final allocation of the two substation footprints on site, as well as when deciding how remaining land is utilised. We note that with the current allocated locations for the site from a wider landscape view it will not be possible to differentiate between the two substations at a distance, therefore we suggest orienting them differently, or using colour, and planting to break up the massing. This evaluation requires understanding of the flexibility of the exact location of the two substations and exploring the feasibility of relocating them. It will be important in the DCO application to be clear on the extent of the flexibility of land take that is being sought.

We suggest that particular emphasis is placed on minimising the visibility of the building. The design of the site and experience of passing by could be characterised in the design vision with a high-level design statement. This primarily entails adhering to as low-profile design possible, avoiding the use of reflective materials and designing screen planting which blends naturally with the adjacent vegetation mosaic. Therefore, when using footpaths around the site members of the public may notice the building but are comfortable with its presence and passing by. In this sense, the vision statement may be "I'm here, but you can pass by".

Ensure that design decisions align with new National Policy Statements (NPS) on all matters including adjacent infrastructure. We recommend engaging with and listening to advice from regulatory bodies early in the process to establish a good working relationship and align designs and presentations to their requirements from an early stage.





## Landscape

The landscape approach for the substations could be developed further, beyond sole mitigation efforts, to encompass a fully net positive impact on flora, fauna, and local communities. By using this vision, it will not only enhance the design but also set a precedent for future substation developments. A key route to achieving this approach is the integration of good design throughout the projects. Good design inherently mitigates environmental impact. Examples include: attenuation measures alternatively being viewed as marshland, along with the implementation of elements such as green walls. Such strategies not only fulfil mitigation objectives but also contribute positively to the overall environmental benefit of the site.

Given the open environment and expansive landscape views of the site, a sensitive landscape approach is imperative. A lot of work has been done to explore views of the substations and there is now room to explore the views that the substations would interrupt. Particularly crucial is the consideration of visual interruptions the schemes will have on wayfinding, specifically for ramblers, cyclists, and horse riders, who may currently use nodes such as St Mary's church to gauge their location. To mitigate this, we urge that careful consideration of visual impact and consulting with the local authority on viewpoints will be integral in this context.

Screening, an essential aspect for this type of development, should be contextual and can be expanded into a more comprehensive planting strategy. Currently, a process-oriented view of the landscape is being taken. However, a more forward-looking perspective is recommended, exploring the evolving landscape and recognizing the value that these programmes of work can add to the environment in the future. We suggest that land on site that will be unused for the two substation footprints could present a more valuable use than reinstating small plots of agricultural land, through responding to the ever-changing landscape. Looking back beyond arable agricultural land uses, the land has been stripped of hedgerows and trees. This presents an opportunity to give back, rewild historical copses and woodland whilst carbon offsetting some of the impacts of construction. Planting should create transition in the landscape, be biodiverse, and resilient to rising temperatures, ensuring long-term survival. Re-establishing lost native tree species to the site such as Elm and Ash trees and renewing hedgerows would benefit the natural environment for a relatively low-cost. Moreover, the strategy should promote the habitation of fauna, fostering a resilient, thriving, and well-connected ecosystem.

An advance planting approach should be secured. This can demonstrate good faith to local people, enable planting to mature, and begin screening the site at an early stage. To further this greening approach, there is an opportunity to use the onshore cable route to create a new green corridor to establish a wider network of local ecosystems. If additional income is required to carry this amount of planting out, carbon credits could be sold. Communicating this work would help to bring stakeholders on board by demonstrating the positive impact these projects will bring.

We encourage the project teams to think outside of the red line boundary to create a truly integrated landscape approach. This may include planting of trees and renewal of hedgerows within the wider area. To achieve this, visioning and partnership work with local land owners, National Grid, and the local authority would be key to establish a coordinated approach.

We welcome the vision document's description of an organic approach to mounding and suggest that securing this approach to mounding should be incorporated within engineering drawings as an important element of the landscape approach. By integrating



mounds into technical drawings, the design not only communicates the landscape design approach of the schemes better, visually representing intentions, but also contributes to the cohesive integration of the substations into their surroundings.

### Phasing and Partnerships

It is positive to see that conversations are being had between North Falls and Five Estuaries to align designs and construction methods. We urge the project teams to continue efforts to engage with National Grid as it also works to develop a substation north of the North Falls and Five Estuaries sites. If a tri-party agreement could be reached between the three organisations, it could ensure a cohesive approach and more successful short and long-term outcomes from mitigating construction needs to cohesive planting strategies, further minimising adverse local impacts. It will be important that cumulative effects assessments cover all potential scenarios.

We welcomed the attendance of the local planning officer at the design review meeting and noted that ongoing engagement is taking place by both developers, which we encourage continuation of.

It is imperative to address and mitigate potential disruptions proactively recognising the substantial adverse effects of the scale of the projects on a small village, particularly during the three-year construction phase. This approach would demonstrate a commitment to responsible construction practices and community well-being, cementing the broader ethos of minimising adverse effects on the local environment and residents. We note that one crucial aspect to consider is the implementation of a temporary access road to minimise disturbances to the local community. If this road is required, it should be thoroughly considered from a carbon and circular economy lens and in collaboration with the three substation developments to maximise use.

### Consultation

Taking a proactive approach to community consultation could help to further improve buy-in from residents on the schemes and offer the opportunity for learnings to be fed back into designs. This may be achieved through looking at the voting register in the area, knocking on doors, reaching out to communities such as rambling groups, and inviting people along on elements of decision making – for example, when exploring colour options on site. Additionally, being clear and creative with how information is shared with stakeholders can help ensure understanding and create reassurance. A clear vision statement that people easily understand will help build clarity. Another approach is the use of a physical site model to demonstrate the projects effectively to stakeholders and humanise complex and technical engineering projects. Taking this approach may mitigate potential opposition during the DCO process.

Drawing from the vision, a net positive approach can be used to drive social benefit and establish positive engagement with local stakeholders. While there will be elements where the substations will have an adverse effect on the local community (such as the cumulative noise of a potential four substations within close proximity), explaining how the project can also benefit them and the longevity of the schemes will help build good favour. To increase community benefit, the projects could provide energy for the community, subsidise local energy bills, or allow community ownership of any on-site PV panels.

### Next steps

We look forward to comment on these schemes again at a later stage, particularly at the detailed design stage and for the onshore cable routing.



Thank you for consulting us about the North Falls and Five Estuaries onshore substations, we hope you have found the review process and the content of this letter helpful. Should you have any queries about the content of this letter, or matters which you would like to discuss further, please do not hesitate to contact us.

Yours sincerely

**Katie Norman**

Design Council Programme Manager  
[katie.norman@designcouncil.org.uk](mailto:katie.norman@designcouncil.org.uk)

### Review process

Following a site visit and discussions with the Design Team, the schemes were reviewed in a design review in Colchester by Annie Coombs (Chair), David Ubaka, Jonathan Ward, Lynn Ceeney, Paul Appleby and Richard Cass. These comments supersede any views we may have expressed previously.

### Confidentiality

Since the schemes are not yet the subject of a DCO application, the advice contained in this letter is offered in confidence, on condition that we are kept informed of the progress of the projects, including when they become the subject of a planning application. We reserve the right to make our views known should the views contained in this letter be made public in whole or in part (either accurately or inaccurately). If you do not require our views to be kept confidential, please write to [deliveryprogrammes@designcouncil.org.uk](mailto:deliveryprogrammes@designcouncil.org.uk). cc (by email only).

### Attendees

Cormac Rooney	North Falls
David Reid	North Falls
Victoria Harrison	Five Estuaries
Gordon Campbell	Royal HaskoningDHV
Ellen Shields	Royal HaskoningDHV
Tom Jonson	LUC
Mark Woodger	Essex County Council

### Design Council

Emily Whyman	Design Council
Katie Norman	Design Council

CC: HaskoningDHV UK Limited,  
 Westpoint,  
 Lynch Wood Business Park,  
 Peterborough  
 PE2 6FZ



## 9.1.1 Response - RAG Table

9.1.2

Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Summary	More work is required to solidify the vision and ensure a clear approach to design that all stakeholders can easily understand, taking a holistic approach to sustainability which encompasses every aspect of the projects.		Noted
	Move away from mitigation strategies and encourage a net positive approach that establishes a new industry benchmark. This will actively contribute to beneficial outcomes for all.		Suggests that the Landscape Mitigation Plan is developed in a more encompassing Landscape Strategy. This would go beyond what is required for the DCO submission.  Need to agree which principles we can commit to for the DCO and be clear what the intention is i.e. what is required landscape and visual mitigation, what is an enhancement/added benefit.  Broader aspirations e.g. works outside the red line boundary that cannot be committed to by NF, could be identified separately to show how the landscape could evolve in future
	Continue refinement of the projects through careful optioneering. Clear consideration should be made throughout decision making, and the projects as a whole should consider their standing within the broader landscape context. Refinement should lead to clarity on the extent of flexibility and fixed matters.		Pre-consent our dialogue with National Grid will continue, seeking to mitigate cumulative impacts.  Post-consent dialogue with Five Estuaries and National Grid will continue, this will feed into detailed design of the onshore substations and their surround.  In particular a Landscape and Ecological Management Plan will be developed between North Falls and Five Estuaries for the combined site.
Vision	The Design Panel urge the project teams to ensure the vision is succinct and ambitious. We support the ambition to create 'greener futures for all', therefore, we expect that these schemes and their work to expand the UK's renewable energy supply should permeate through the narrative of the projects		A succinct Vision is supported.  Over the next few months our continued dialogue with Five Estuaries and National Grid will explore how a shared narrative can be developed.  While the opportunities around the design of the onshore substation will be optimised, the limited scope in respect of the functional and safety requirements of large scale energy developments must be recognised.
	The projects should have a net positive impact on the environment and for local people. This can be stated clearly through the vision.		Benefits for the environment can be clearly stated (landscape, visual, ecology and biodiversity, etc.).  Benefits for the community will be summarised from the EIA Human Health & Climate Change chapter and the GHG Assessment/Circular Economy Statement.
	Begin the vision document with a one-line vision statement that summarises the ambitions for the projects. We suggest that this vision statement is ambitious, galvanising and simple, such as 'substations in a forest' or to 'regreen energy'.		A one line Vision is supported and will be subject to further dialogue between the teams.
	We recommend using a simple framework to break down the vision into a series of subheadings to define it with more rigour and detail. It may be beneficial to define what falls under each subheading to keep content focused and reduce overlapping topics. In addition to topics already outlined, the following should be considered: social value; jobs and skills; climate resilience; circular economy; energy; community benefit; and local economy. Adding an appendix may also help in reducing the text within the core of the vision document.		A simple and clear structure is supported.  As this document is a Design Vision for the Onshore Substation, we would consider the key subheadings as follows: landscape, ecology and biodiversity, hydrology, architecture and engineering, community, and climate resilience



Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Vision	There have been several lengthy documents provided for the Project so far that overlap in context, we recommend that these could be made more succinct, and potentially contained in one document, with clarity on which documents are secured by the DCO. This will help clarify the ambitions and approach for the DCO submission.		It is the Design Vision and Outline Landscape and Ecological Mitigation Strategy that will accompany the DCO application. Other reports issued to date have been explanatory presentations.
	The DC urges that the Project teams look to 50 plus years to the future to consider the long-term impacts of the schemes on the environment and how lifespan, future-proofing and landscape approaches can be taken to maximise the opportunity for these schemes to provide the best possible outcomes for generations to come.		Site-wide soft landscaping, including mitigation measures, landscape enhancements and Biodiversity Net Gain requirements will be subject to a 30-year landscape and ecological management plan. This will be developed once detailed proposals have been developed post DCO approval.  The North Falls landscape strategy for the combined substation sites has considered how landscape approaches can enhance the baseline landscape character of the site and be continued throughout the wider surrounding to strengthen green infrastructure, which would result in positive outcomes for local people and future generations. The extent of land occupied by the development must consider maximising retention of most productive agricultural land. For this reason, any works beyond the red line boundary are shown as an aspiration as cannot be delivered as part of this project.
Sustainability, Carbon, and Circular Economy	More specific sustainability goals and research into carbon use should be defined for each of the Projects. An outline life cycle carbon analysis will be important for the Projects and should be approached from several different angles, exploring all phases of construction and operation. Findings, if fed back into the design effectively, will help to inform design decisions and reinforce the approach to create a truly greener energy system. High level embodied carbon pie charts would be one way of demonstrating this.		A greenhouse gas assessment has been undertaken which considers the potential effects of the Project on climate change via GHG emissions created and avoided by project activities during the construction, O&M, and decommissioning phases. Emissions and their effect significance are presented per project phase. To contextualise the outcomes of the GHG assessment, emissions from a 'do nothing' or 'without Project' scenario are quantified, and compared to the Project's GHG emissions during the O&M phase to determine the Project's GHG savings as a result of avoided emissions. The Design Vision will sign post to these assessments.
	The DC urge the design team to consider circular economy principles throughout the design process. This approach can help at all stages of a scheme from design, construction, use, and end of life, and we suggest that at this stage it can particularly help to inform the choice of materials through considering durability, longevity, and future use.		Opportunities for implementing circular economy principles will be considered, albeit within the primary consideration of ensuring all material are of the highest safety and technical specification for their purpose as part of a large-scale energy development. This will be reviewed as part of the procurement process with our Supply Chain team once we have detailed design post application determination.
	The DC suggest that materials should be properly tested, and the process should be clearly documented. For example, an exploration of material reuse could explore how at the end of their use, unneeded construction elements could be used within the local community for their needs, such as construction of a village hall. In addition, we support the continuation of work being undertaken to look at lower embodied carbon options for materials such as concrete.		Opportunities for implementing circular economy principles will be considered, albeit within the primary consideration of ensuring all material are of the highest safety and technical specification for their purpose as part of a large-scale energy development. This will be reviewed as part of the procurement process with our Supply Chain team once we have detailed design post application determination.



## 9.1.1 Response - RAG Table

9.1.2

Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Sustainability, Carbon, and Circular Economy	The DC suggest the incorporation of photovoltaic (PV) panels, if flat roofs are utilised, to further demonstrate an approach to sustainable design. By utilising PV on flat roofs, the design would not only enhance the energy performance of the buildings, but would also align with broader sustainability goals, demonstrating a forward-thinking approach to infrastructure development and a conscientious effort to integrate eco-friendly solutions into the Project's architectural fabric. However, we question the vision's outline of use of flat roofs on this site. Following the local typology, pitched roofs are typically found on agricultural buildings in the area, so we suggest that in line with local character, pitched roofs should be used within these projects.		As an AIS substation, North Falls will have a limited number of buildings with limited surface area. Flat and pitched roofs are considered feasible although pitched does give slightly higher overall buildings - internal space is critical. The Project does not currently intend to incorporate PV panels however their inclusion can be considered at detailed design stage.  Pitched roofs would be the preference for Five Estuaries, which would limit the potential for PV inclusion. The Minimum Design Standards for the application will allow further discussion when equipment for the selected Onshore Substation infrastructure is procured (not known at this stage).
Optioneering	The DC urge the design teams to ensure they are evaluating options during the optioneering process in a measured way which compares and contrasts all options before drawing conclusions. Submitting to DCO, inspectors will recognise the need for flexibility in the Project's design, but will expect a demonstration of how options have been refined to align with clear standards. This ensures regulatory compliance while preserving flexibility where required. Documentation should provide a transparent account of the decision-making process, showcasing how options have been reigned in when necessary.		Optioneering for the onshore substations has continued as part of the iterative design process.  Early discussions have also taken place with National Grid regarding East Anglia Coastal Node (Norwich to Tilbury). Design development post-consent will consider further optioneering co-ordination between all parties.  All optioneering is being recorded.
	The DC urge both the North Falls and Five Estuaries projects to utilise an Air Insulated Substation (AIS) rather than Gas Insulated Substation (GIS). Not only does AIS require a lower profile, which would impact views of the infrastructure onto the landscape to a lesser extent, but it is also the only viable option to ensure the Project does not utilise fossil fuels, tying into the possible vision for the		North Falls will utilise an Air Insulated Substation (AIS)  Five Estuaries wish to retain the flexibility for use of either AIS or GIS, with GIS selected for the DCO submission as representing the worst case scenario.  The opportunities to take a green approach in every aspect of the design is constrained by the technical and safety requirements of large scale energy developments. Further opportunities will be explored post consent / The fact that this is a renewable energy development means that the associated impacts will be offset as detailed in the Green House Gas (GHG) Assessment.
	One critical aspect is the optioneering of land take, which necessitates a thorough examination of spatial requirements and potential implications associated with different land-use options. More work must be done to explain this process prior to final allocation of the two substation footprints on site, as well as when deciding how remaining land is utilised.		The co-located footprints have been selected to allow sufficient construction areas to the sides of the respective substations, allowing for temporary compounds to facilitate construction, whilst avoiding below ground archaeological constraints. The footprints also ensures the substations are as far as practicable from critical noise receptors. The current layout is based on an envelope approach, with the current equipment selected based on a credible worst case scenario. As the design develops, it is hoped some of this equipment can be removed, giving flexibility to adjust the spatial requirements.  Adjacent land to the co-located footprints will likely be used for environmental mitigation, enhancement and net gain and these areas have been indicatively included within the RLB of the outline landscape plan.



Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response	
Optioneering	<p>We note that with the current allocated locations for the site from a wider landscape view it will not be possible to differentiate between the two substations at a distance, therefore we suggest orienting them differently, or using colour, and planting to break up the massing. This evaluation requires understanding of the flexibility of the exact location of the two substations and exploring the feasibility of relocating them. It will be important in the DCO application to be clear on the extent of the flexibility of land take that is being sought.</p>		<p>The co-located footprints have been selected to allow sufficient construction areas to the sides of the respective substations, allowing for temporary compounds to facilitate construction, whilst avoiding below ground archaeological constraints. The footprints also ensures the substations are as far as practicable from critical noise receptors. The current layout is based on an envelope approach, with the current equipment selected based on a credible worst case scenario. As the design develops, it is hoped some of this equipment can be removed, giving flexibility to adjust the spatial requirements.</p>	
	<p>We suggest that particular emphasis is placed on minimising the visibility of the building. The design of the site and experience of passing by could be characterised in the design vision with a high-level design statement. This primarily entails adhering to as low-profile design possible, avoiding the use of reflective materials and designing screen planting which blends naturally with the adjacent vegetation mosaic. Therefore, when using footpaths around the site members of the public may notice the building but are comfortable with its presence and passing by. In this sense, the vision statement may be “I’m here, but you can pass by”.</p>			<p>North Falls have committed to an AIS substation with a limited number of buildings at an expected height of 7m. The tallest piece of electrical equipment is anticipated to be in the order of 13m with lightening masts anticipated to be in the order of 18m. Five Estuaries wish to maintain the flexibility for a GIS substation at DCO. Considering the layout of the site, having the substations aligned can be helpful in screening each other in views from the west and the east. The potential to re-orientate is limited owing to the technical requirements relating to the ingress and egress of cables.</p>
	<p>Ensure that design decisions align with new National Policy Statements (NPS) on all matters including adjacent infrastructure. We recommend engaging with and listening to advice from regulatory bodies early in the process to establish a good working relationship and align designs and presentations to their requirements from an early stage.</p>			
Landscape	<p>The landscape approach for the substations could be developed further, beyond sole mitigation efforts, to encompass a fully net positive impact on flora, fauna, and local communities. By using this vision, it will not only enhance the design but also set a precedent for future substation developments.</p>			



## 9.1.1 Response - RAG Table

9.1.2

Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Landscape	<p>A key route to achieving this approach is the integration of good design throughout the Projects. Good design inherently mitigates environmental impact. Examples include: attenuation measures alternatively being viewed as marshland, along with the implementation of elements such as green walls. Such strategies not only fulfil mitigation objectives but also contribute positively to the overall environmental benefit of the site.</p>	Green	<p>The draft landscape strategy has considered how necessary infrastructure can be sensitively designed within the overall setting. It has considered the alignment of the access road and positioning of planting to break up corridor views. It proposes that the attenuation ponds are designed with naturalistic forms and inclusion of marginal areas, which will be of greater benefit from an ecological perspective. Further opportunities for creative design collaboration will be explored post-DCO consent.</p>
	<p>Given the open environment and expansive landscape views of the site, a sensitive landscape approach is imperative. A lot of work has been done to explore views of the substations and there is now room to explore the views that the substations would interrupt. Particularly crucial is the consideration of visual interruptions the schemes will have on wayfinding, specifically for ramblers, cyclists, and horse riders, who may currently use nodes such as St Mary's church to gauge their location. To mitigate this, we urge that careful consideration of visual impact and consulting with the local authority on viewpoints will be integral in this context.</p>	Orange	<p>Extensive work on the visual context has been undertaken, this considers the impact on views attainable from road and PRoWs (ramblers, cyclists, horse riders). LVIA studies indicate that the North Falls and Five Estuaries substations would not be anticipated to obscure or interrupt key views to and from landmark features. Neither substation will impact the setting of St Mary's Church, or interrupt views towards this node. These considerations have informed the selection of representative viewpoints, and these have been agreed with the local authority as part of the LVIA Expert Topic Group. The cumulative impacts of the two substations in conjunction with East Anglia Coastal Node are being fully considered.</p>
	<p>Screening, an essential aspect for this type of development, should be contextual and can be expanded into a more comprehensive planting strategy. Currently, a process-oriented view of the landscape is being taken. However, a more forward-looking perspective is recommended, exploring the evolving landscape and recognizing the value that these programmes of work can add to the environment in the future</p>	Green	<p>The emerging landscape strategy has considered the surrounding landscape context and patterns of vegetation. These comprise hedgerows with scattered hedgerow trees, shelterbelts, small copses and blocks of plantation woodland. A multi-layered has been taken, considering the following: strengthening the landscape character by replanting hedgerows, particularly the replanting of lost historic field boundaries and planting of new hedgerows and shelterbelts, connecting to the surrounding landscape framework. These will be used to create a multi-layered approach to screening, and will enhancing green infrastructure connectivity and biodiversity.</p>
	<p>We suggest that land on site that will be unused for the two substation footprints could present a more valuable use than reinstating small plots of agricultural land, through responding to the ever-changing landscape. Looking back beyond arable agricultural land uses, the land has been stripped of hedgerows and trees. This presents an opportunity to give back, rewild historical copses and woodland whilst carbon offsetting some of the impacts of construction. Planting should create transition in the landscape, be biodiverse, and resilient to rising temperatures, ensuring long-term survival. Re-establishing lost native tree species to the site such as Elm and Ash trees and renewing hedgerows would benefit the natural environment for a relatively low-cost. Moreover, the strategy should promote the habitation of fauna, fostering a resilient, thriving, and well-connected ecosystem.</p>	Orange	<p>Areas of land (to north, west and east of footprints) reviewed to ascertain if they could be used to meet landscape/ecological mitigation requirements or BNG requirements. The renewal of hedgerows has been identified within draft landscape strategy, also hedgerow tree planting. Planting species will be informed by the Essex Tree Palette, which identifies which trees are most appropriate due to underlying soil and landscape character. Planting of Ash is not currently appropriate due to the persistence of Ash dieback and ban on movement of Ash trees across the country.</p>





Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Landscape	An advance planting approach should be secured. This can demonstrate good faith to local people, enable planting to mature, and begin screening the site at an early stage. There is an opportunity to use the onshore cable route to create a new green corridor to establish a wider network of local ecosystems. If additional income is required to carry this amount of planting out, carbon credits could be sold. Communicating this work would help to bring stakeholders on board by demonstrating the positive impact these projects will bring.	Orange	Opportunities for advanced planting will be implemented where practicable. This will be reviewed post-consent when further details about the site phasing and layout are known.
	The DC encourage the Project teams to think outside of the red line boundary to create a truly integrated landscape approach. This may include planting of trees and renewal of hedgerows within the wider area. To achieve this, visioning and partnership work with local land owners, National Grid, and the local authority would be key to establish a coordinated approach.		The draft landscape strategy has carefully considered how proposed planting and vegetation within the site will knit into the wider landscape context, by reflecting existing vegetation patterns. Proposals have considered how green infrastructure could be extended across adjoining land areas, however at present no works will be undertaken by North Falls beyond the red line boundary.
	We welcome the vision document's description of an organic approach to mounding and suggest that securing this approach to mounding should be incorporated within engineering drawings as an important element of the landscape approach. By integrating mounds into technical drawings, the design not only communicates the landscape design approach of the schemes better, visually representing intentions, but also contributes to the cohesive integration of the substations into their surroundings.	Red	The Design Vision included mounding as a suggestion for mitigation, however subsequent development of the scheme suggests that only very limited and shallow mounding would be suitable within the landscape context. Additional concerns around use of mounding note that planting does not establish or grow as well on made mounds and they are prone to being eroded during flooding and drying out during drought.
Phasing and Partnerships	It is positive to see that conversations are being had between North Falls and Five Estuaries to align designs and construction methods. We urge the Project teams to continue efforts to engage with National Grid as it also works to develop a substation north of the North Falls and Five Estuaries sites. If a tri-party agreement could be reached between the three organisations, it could ensure a cohesive approach and more successful short and long term outcomes from mitigating construction needs to cohesive planting strategies, further minimising adverse local impacts. It will be important that cumulative effects assessments cover all potential scenarios.	Green	The Project team have commenced dialogue with National Grid, who are at an early stage in project planning. The cumulative assessment covers all scenarios. We envisage that the dialogue will continue up to North Fall's DCO application and post-consent. Further update will be provided within the presentation.
	The DC welcomed the attendance of the local planning officer at the design review meeting and noted that ongoing engagement is taking place by both developers, which we encourage continuation of.		An Expert Topic Group meeting was held 27th February. Further update will be provided within the presentation
	It is imperative to address and mitigate potential disruptions proactively recognising the substantial adverse effects of the scale of the Projects on a small village, particularly during the three-year construction phase. This approach would demonstrate a commitment to responsible construction practices and community well-being, cementing the broader ethos of minimising adverse effects on the local environment and residents		The potential for disruption to local receptors have been assessed in both projects ES's and mitigated as appropriate via various construction management plans.



## 9.1.1 Response - RAG Table

9.1.2

Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Phasing and Partnerships	We note that one crucial aspect to consider is the implementation of a temporary access road to minimise disturbances to the local community. If this road is required, it should be thoroughly considered from a carbon and circular economy lens and in collaboration with the three substation developments to maximise use.		Retention and re-use of the haul road by both projects has been considered in North Falls ES via consideration of construction scenarios and selection of a realistic worst case scenario. Selection of the chosen construction scenario will be determined post consent and is influenced by external factors.
Consultation	Taking a proactive approach to community consultation could help to further improve buy in from residents on the schemes and offer the opportunity for learnings to be fed back into designs. This may be achieved through looking at the voting register in the area, knocking on doors, reaching out to communities such as rambling groups, and inviting people along on elements of decision making - for example, when exploring colour options on site.		The next opportunity the public will get to see the outline OLEMS and DV will be at DCO application stage and the subsequent Pre-examination and Examination. It should be noted that Environmental Colour Assessment is a defined process that is informed by the baseline colours in a local landscape. This requires specialist skills and experience and therefore the potential for public input may be limited.
	Additionally, being clear and creative with how information is shared with stakeholders can help ensure understanding and create reassurance. A clear vision statement that people easily understand will help build clarity.		Noted under item 8
	Another approach is the use of a physical site model to demonstrate the Projects effectively to stakeholders and humanise complex and technical engineering projects. Taking this approach may mitigate potential opposition during the DCO process.		It is considered unlikely that a physical model would provide any benefit at pre-DCO stage as it would not be possible to accurately represent the views experienced from visual receptors and the scale of the development may be misinterpreted due to lack of context. This may result in skewed responses to issues of e.g. visual amenity. Visualisations created using computer modelling representing worst-case scenario have been prepared. These are based on viewpoints agreed between North Falls and Five Estuaries.
	Drawing from the vision, a net positive approach can be used to drive social benefit and establish positive engagement with local stakeholders. While there will be elements where the substations will have an adverse effect on the local community (such as the cumulative noise of a potential four substations within close proximity), explaining how the Project can also benefit them and the longevity of the schemes will help build good favour.		Noted. Forms part of wider consultation strategy.
	To increase community benefit, the Projects could provide energy for the community, subsidise local energy bills, or allow community ownership of any on-site PV panels.		Ownership of the substations will be transferred to an OFTO and as such it is not within the Projects remit to pursue these suggestions.



## 9.2 Design Advice Letter 2 and Response

### 9.2.1 Design Advice Letter 2

9.2.1

**Design  
Council**

**FAO:** Cormac Rooney,  
Windmill Hill Business Park,  
Whitehill Way,  
Swindon,  
Wiltshire,  
United Kingdom,  
SN5 6PB

10 April 2024  
Our reference: DC/5686

#### **North Falls and Five Estuaries Offshore Wind Farm Onshore Substations Design Review 2**

Dear Cormac,

Thank you for providing the North Falls Design Review Panel with the opportunity to comment on the emerging plans for the North Falls and Five Estuaries Offshore Wind Farm Onshore Substations at the second Design Review on 25 March 2024.

The Design Advice in this letter focuses predominately on the landscape mitigation plan, however includes comments that encompass wider topics, such as the Design Vision, design approach and architecture. We hope that covering these areas will support the project and design teams as they move forward with both projects to enable a more integrated approach to design and the development of exemplary Green Infrastructure (GI) schemes.

#### **Summary**

Promising progress has been made on the landscape mitigation strategy, and we note the need for continued development of the schemes' climate resilience, Biodiversity Net Gain (BNG), Design Vision and on the overall design approach. We think that the current overarching design approach is compromised by the lack of clarity at this stage. We note that many decisions are being pushed back to the detailed design stage following the Development Consent Order (DCO), if consented. Primarily, for North Falls this includes carbon usage, land take, and for Five Estuaries decision on the substation type. Whilst we recognise the challenging circumstances of having many 'unknowns' due to the requirement of maintaining flexibility, we urge the project team to define the project further by securing design principles which can help to ensure ideas and best practice are evidenced and carried through to ensure robust schemes are achieved in practice. We recommend taking a holistic approach that incorporates function, place, people and the environment.

#### **Design Approach**

We recognise the need for flexibility at this stage, but note that clearer and more thorough design methods need to be established to provide insights and evidence into the possible options. We suggest the following steps are taken:

- **Explore the best-case scenario.** Currently the designs explore the schemes based on the worst-case scenario. We would expect to also see demonstration of what may actually be built and the best-case scenario. This could particularly be utilised

[designcouncil.org.uk](https://designcouncil.org.uk)

[info@designcouncil.org.uk](mailto:info@designcouncil.org.uk)

Registered charity number 272099



for the optioneering of Air Insulated Substation (AIS) vs Gas Insulated Substation (GIS), and we recommend conducting a study of all the locations where trees could be planted on site to help inform a more established planting strategy.

- **Visualise and share the design process.** Using schematics such as the Design Council’s Double Diamond can help to showcase the design process. This could help to define where flexibility can be kept within designs, whilst outlining an evidenced approach to making design-led decisions.
- **Demonstrate flexibility diagrammatically.** There is a need to show the process of designing for flexibility specifically to ensure understanding across teams. We suggest a diagrammatic explanation will best demonstrate intent and how options can be successfully maintained and assessed. This can be beneficial when getting stakeholders on board with choosing options that would best serve the scheme and wider area.
- **Outline the decision-making process clearly.** Conducting a multi-criteria analysis can help to demonstrate decision making that incorporates a wide view of needs and impacts. This will also support the incorporation of good design as outlined in the National Policy Statement (NPS) for Energy [EN-1](#) and for Electricity Networks Infrastructure [EN-5](#) if optioneering can be clearly demonstrated. There is a need to present this information properly, for example in a Design and Access Statement for reference at the detailed design stage.

## Design Vision

We recognise that we have not seen an updated Design Vision document since the first Design Review in December 2023, and understand that more work is yet to be undertaken on this document. The Design Vision could benefit from responding to the proceeding advice in a way which clearly outlines project ambitions for both internal teams and external stakeholders, and sets the outline approach for both now and beyond DCO approval. Showing best practice and how this is an exemplar project for GI will be beneficial for gaining buy-in.

When revising the document, we recommend:

- Establishing a best practice approach to underpin an exemplar GI scheme, which brings together landscape and biodiversity.
- Ensuring that the DCO process is balanced with a creative, aspirational approach in order to keep the project forward-looking and ensure it most successfully responds to the site needs with a design-led approach, which may require vision for areas outside the Order Limits.
- Clearly defining the driving force of the schemes. We think that it should be clearer conceptually that these are future thinking schemes and nationally significant for GI. This should be apparent within the vision statement.
- Defining words such as mitigation and enhancement within the document can ensure a shared understanding of how these approaches support these particular schemes.



## Sustainability

We think there is opportunity to build sustainability further into the core programme of work. Consideration of carbon use is yet to cover all aspects of the schemes such as vehicles and earth moving, and review of the different impacts and associated response at construction and operational stages. Moving forward, we suggest that the following areas are explored in more detail:

- **Decarbonisation.** Separate evaluation should be completed of the carbon impact of construction and operational stages. We urge the design team to explore examples of best practice in decarbonising to decide the areas that would value most from carbon budgeting and investment into lower impact choices. There is an opportunity to produce less carbon than currently proposed through evidencing and choosing more environmentally conscious options.
- **Optioneering of Air Insulated Substation (AIS) or Gas Insulated Substation (GIS).** Despite the need for flexibility at this stage, we would expect a decision to have been made regarding the type of substation for both sites. As per our previous comments in December 2023, to maintain this project as a truly GI project, the AIS substation would be the only viable option. Maintaining flexibility on such a central decision means that the landscape screening strategy cannot properly be created to respond to either situation.
- **Biodiversity Net Gain (BNG).** Whilst more in-depth work has been completed on the landscape mitigation strategy, we would urge the design team to be more ambitious with the amount of BNG to be provided on site. BNG will facilitate many functions for the site beyond singularly screening of the substations. It will reinforce the narrative for this being an integrated GI project; establish a biodiverse environment for native species to thrive; create habitat for fauna, and help to minimise effects of heat islands and high rainfall through creation of Sustainable Drainage Systems (SuDS). For this to be an exemplary project we would expect the amount of BNG on site to be significantly increased. We note that significant landscape enhancement is needed in order to reach BNG targets, and recommend that the design team refers to the downgraded weight that the Secretary of State gave to delivering GI outside of the Order Limits, where locations were not fixed, in the recent [Yorkshire Green Energy Enablement Project](#) decision letter.
- **Legacy after construction.** We re-emphasise the importance of considering re-use of construction materials locally to meet community needs. For example, if a new community building could be created from any temporary structures required during construction. This would help to reduce waste and lower the carbon required in creation of the substations.

## Landscape Mitigation

The overall landscape mitigation strategy is moving in the right direction. We think more granularity is now needed to ensure it is truly a site-specific strategy. Alongside this, we suggest the project team builds a compelling narrative that highlights the positive BNG the site could achieve. Additionally, we see the opportunity for the landscape to be forward-looking to respond and thrive in the changing environmental context of climate change, alongside the previous exploration into the heritage of the site. An integrated design approach which incorporates ecology and visual character should be a foundational approach to the landscape mitigation strategy to unify screening with environmental benefit.



### Planting

To ensure the landscape strategy and subsequent planting will be resilient in a changing climate, we suggest exploration and analysis of data on the climate resilience of species of plants. This would provide an evidenced approach to creation of the right types of habitats for the site. The Woodland Trust and Forestry Commission can provide guidance on the landscape mitigation strategy and how to ensure woodland planting lasts for the long term.

To match the scale of the site we would expect to see 2 or 3 times the amount of woodland to create viable woodland habitats. Creation of more substantial woodland would ensure the planting strategy will have better chances of survival with minimal maintenance; best screening the site over the long term. We also see the opportunity for use of smaller forestry planting and whips. Unless in areas where protection of particular views is required more immediately, this planting technique can become better established on the site over the long term. This strategy will also assist with lowering carbon requirements during construction through reducing the need for rehoming and transporting large established plants.

### Screening

Care has been taken to establish the screening strategy. However, given the needed flexibility, it is currently unclear as to how the screening strategy directly responds to the substation equipment and ensuring infrastructure, electrical equipment and fencing are shielded properly. We suggest that integrating buildings into the landscape whilst prioritising screening of engineering equipment will inform the most successful landscape screening strategy.

The neighbouring Lawford substation incorporates planting that reaches 20 meters deep. We suggest that this should be used as a minimum standard for planting on the North Falls and Five Estuaries sites. In addition to this, we recommend that the percentage of evergreen planting is considered carefully to ensure screening of the infrastructure year-round.

### SuDS and Attenuation Ponds

Inclusion of wetland areas will provide additional variety in the biodiversity on site and help flood management. With these ambitions in mind, and considering the large amount of water that the attenuation ponds will collect at times, we question if the ponds should be extended to ensure they properly serve the water management needs on site. Additionally, we note that the shape of the ponds will be important to successful visual assimilation and integration of fauna into the site. We suggest that an evidenced approach is taken to establishing the shape of these ponds, which addresses their function and aesthetics in times of flood and drought and considers the variety of areas established for wildlife.

We suggest improving the permeability of more of the surfaces across the site, to increase water drainage. For example, exploration should be undertaken into if areas of the platforms could be covered in gravel as opposed to concrete.

### Bunding

We recognise that the site is relatively level, therefore stripping of topsoil will be minimal during construction and to create the attenuation ponds. We urge the project team to weave this into the project's sustainability story, ensuring that all soil is retained on site to minimise the carbon impact. Even at low levels, we suggest that any mounding is not



harshly created and instead maintains a more organic look. Mounded areas would provide an optimal location for new planting as they thrive in the aerated soil.

### Landscape Management and Maintenance

Ensuring that management and maintenance is designed into the landscape strategy is vital to long term success. The new NPS EN-1 will be a key consideration for examining authorities, so it is important to clearly demonstrate how management and maintenance will be secured for the site. We suggest that management and maintenance is secured for at least 15 years following commencement of operation of the sites.

### **Noise Attenuation**

We have yet to see the results of the cumulative effects study that has been undertaken to assess the noise attenuation of the three substations (North Falls, Five Estuaries and National Grid's East Anglia Connection Node) which will sit in close proximity to one another. It will be vital to mitigate the noise effects properly, particularly on such a rural and open landscape. There is an opportunity for the landscape design and materials strategy to mitigate the noise attenuation on site, and request that this approach and the materiality is presented at the following review. It is important to note that the new NPS EN-1 and EN-5 state that mitigation measures through incorporating good design should be taken to minimise noise transmission through natural or purpose-built barriers.

### **Architecture**

The buildings were not presented in this Design Review. As a guide, we think that the relationship between the buildings and the landscape are important, and in our view the buildings should become part of the landscape in line with the surrounding typology of agricultural buildings. Well-designed buildings with minimal reflection would sit well within the surrounding context. In the following Design Review, we would welcome insight into the architectural design process, such as massing, land-take, building finishes and roof type.

### **Surrounding Context**

We understand that important aspects of landscape enhancement would take place outside of the Order Limits. Although this isn't a part of the DCO submission, we urge the design teams to consider how to best approach landscape enhancement surrounding the substations' sites as this should be an important part of the holistic design vision and would be central to BNG delivery. Specifically, this will involve understanding and responding properly to the emerging context. On these sites, this includes the National Grid East Anglia Connection Node to the north west and potential new battery storage to the south. Although these would emerge following DCO, we encourage the project team to consider how the schemes would link, the impact on the North Falls and Five Estuaries sites and how the cumulative effects (noise, visual, construction and others) can be best mitigated.

### **Next steps**

We look forward to commenting on these schemes again this summer prior to North Falls' DCO application, particularly to review the updated Design Vision, strategy for optioneering at the detailed design stage, and to see further definition of the landscape mitigation strategy.

Thank you for consulting us about the North Falls and Five Estuaries onshore substations, we hope you have found the review process and the content of this letter helpful. Should



you have any queries about the content of this letter, or matters which you would like to discuss further, please do not hesitate to contact us.

Yours sincerely,

**Katie Norman**

Design Council Programme Manager  
[katie.norman@designcouncil.org.uk](mailto:katie.norman@designcouncil.org.uk)

### Review process

Following a site visit and discussions with the Design Team, the schemes were reviewed in an online design review via Microsoft Teams by Annie Coombs (Chair), David Ubaka, Jonathan Ward, Lynn Ceeney, Paul Appleby and Richard Cass. These comments supersede any views we may have expressed previously.

### Confidentiality

Since the schemes are not yet the subject of DCO approval, the advice contained in this letter is offered in confidence, on condition that we are kept informed of the progress of the projects, including when they become the subject of a planning application. We reserve the right to make our views known should the views contained in this letter be made public in whole or in part (either accurately or inaccurately). If you do not require our views to be kept confidential, please write to [deliveryprogrammes@designcouncil.org.uk](mailto:deliveryprogrammes@designcouncil.org.uk). cc (by email only).

### Attendees

Cormac Rooney	North Falls
Victoria Harrison	Five Estuaries
Renata Schmitt Noronha	Five Estuaries
Gordon Campbell	Royal HaskoningDHV
Ellen Shields	Royal HaskoningDHV
Caroline Osbourne	LUC
Mark Woodger	Essex County Council

### Design Council

Emily Whyman  
Katie Norman

CC: HaskoningDHV UK Limited,  
Westpoint,  
Lynch Wood Business Park,  
Peterborough  
PE2 6FZ



## 9.2.2 Response - RAG Table

9.2.2 Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Summary	<p>The Design Council note the need for continued development of the schemes' climate resilience, biodiversity net gain (BNG), Design Vision and on the overall design approach. The Design Council think that the current overarching design approach is compromised by the lack of clarity at this state and we note that many decisions are being pushed back to the detailed design stage following the DCO, if consented.</p>		<p>Due to the complex nature of offshore wind farm development, many details may be unknown to the Applicant at the time of DCO submission. This is due to the uncertainties around scheme design inherent in the commercial development of a multi-year renewable energy project, such as the need to vary the size/scale of elements of the infrastructure depending on market conditions and technological developments between consent and the commencement of construction. This is a well-established approach for NSIPs and in particular for offshore wind farms, and adheres with PINS NSIPs Advice Note Nine: Rochdale envelope (2018).</p>
	<p>Primarily, for North Falls this includes carbon usage, land take, and for Five Estuaries decision on the substation type.</p>		<p>Additional sections have been included within the Design Vision to identify how selection of the site, site optioneering and use of land within the site have been informed.</p> <p>The Environmental Statement (ES) Chapter 33 Climate Change (Document Reference: 3.1.35), includes a detailed GHG assessment for the project, including carbon budget.. The Design Principles also identify Green Guide ratings for materials, where available.</p> <p>A noted in the 2nd Panel Meeting, North Falls have committed to an AIS substation, and are only seeking consent for this option.</p> <p>Five Estuaries have submitted a DCO application which includes both AIS and GIS optionality at the substation, however they are currently undertaking a further design review of the options to see whether they have enough information to make a decision at this stage. The Design Council's input has been useful in feeding into this process.</p>
	<p>Whilst the Design Council recognise the challenging circumstances of having many 'unknowns' due to the requirement of maintaining flexibility, we urge the project team to define the project further by securing design principles which can help to ensure ideas and best practice are evidenced and carried through to ensure robust schemes are achieved in practice. The Design council recommend taking a holistic approach that incorporates function, place people and the environment.</p>		<p>The development's of the Project's Design Vision has sought to include within the vision for the project an holistic approach to onshore substation design, within the constraints of those parameters which are required for technical substation functionality and which cannot be varied.</p>
Design Approach	<p>The Design Council recognise the need for flexibility at this stage, but note that clearer and more thorough design methods needs to be established to provide insights and evidence into the possible options.</p>		<p>Further detail has been added to the Design Vision, identifying the design process, design criteria and choices at detailed design stage.</p> <p>A Design and Access Statement will be prepared for the whole scheme. This Design Vision focusses solely on the design process and decisions affecting the onshore substation.</p>



Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
<p>Design Approach</p>	<p>The Design Council suggest exploring the best case scenario. Currently the design explore the schemes based on the worst-case scenario and we would expect to also see demonstration of what may actually be built and the best case scenario.</p>		<p>‘Worst-case scenario’ refers to the maximum design extent required. However the landscape mitigation plan looks at a realistic scenario of what could be positively achieved with the available land (neither best or worst case), and as such what is present in relation to landscape design at the onshore substation is a realistic case. Note that in terms of the infrastructure required, the Project is required to present a ‘worst-case’ when seeking to consent a Rochdale Envelope, as prescribed under PINS Advice Note Nine (see above).</p>
	<p>This could particularly be utilised for the optioneering of Air Insulated Substation (AIS) vs Gas Insulated Substation (GIS)</p>		<p>‘Five Estuaries have submitted a DCO application which includes both AIS and GIS optionality at the substation, however they are currently undertaking a further design review of the options to see whether they have enough information to make a decision at this stage. The Design Council’s input has been useful in feeding into this process.</p>
	<p>We recommend conducting a study of all the locations where trees could be planted on site to help inform a more established planting strategy.</p>		<p>‘The tree planting strategy is based on the following approach;</p> <ul style="list-style-type: none"> <li>-Retaining existing trees</li> <li>-Enhancing the existing landscape character by reinforcing the lines of hedgerow trees</li> <li>-Introducing areas of shelter belt planting, which are present within the immediate site context. The site landscape sproposals seek to extendexisting off-site shelter belts throughout the site, creating green infrastructure linkages.</li> <li>-Introducing new areas of screening planting to provide visual mitigation, where required, to screen buildings or electrical infrastructure. These will be informed by the local landscape character assessment, Essex Tree Guide,Forestry Commission research into climate resiliet planting and discussions with Natural England.</li> <li>-A detailed Biodiversity Net Gain Assessment will be undertaken to inform the planting on the site, this will seek to maximise benefits for flora and fauna</li> </ul> <p>The above approach has considered the following;</p> <ul style="list-style-type: none"> <li>-Excluding areas affected by existing and proposed overhead and underground easements</li> <li>-Introducing planting in such a way that it reads as an extension of existing surrounding planting features that are characteristic of the landscape</li> <li>-Avoid creating shade over ponds and water features</li> </ul> <p>We do not agree that maximising tree planting across the entire site is the best planting strategy. Planting must be appropriate to place, create meaningful and useable green infrastructure and enhance biodiversity. It is acknowledged that to increase biodiversity net gain, a mosaic of habitats may be required.</p>
<p>The Design Council suggest visualising and sharing the design process, using schematics such as the Design Council’s Double Diamond can help showcase the design process. This could help to define where flexibility can be kept within design, whilst outlining an evidenced approach to making design-led decisions.</p>			<p>Diagrams provided within the Design Vision outline the design process and function of the Design Vision in this process.</p>



Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
<p>Design Approach</p>	<p>The Design Council suggest demonstrating flexibility dramatically to ensure understanding across teams. We suggest a diagrammatic explanation will be best to demonstrate intent and how options can be successfully maintained and assessed. This can be beneficial when getting stake holders on board with choosing options that best serve the scheme and wider area</p>		<p>Diagrams provided within the Design Vision outline the design process and function of the Design Vision in this process.</p>
	<p>The Design Council suggest outlining the decision-making process clearly. Conducting a multi-criteria analysis can help to demonstrate decision making that incorporates a wide view of needs and impact this will also support the incorporation of good design as outlined in National Policy Statement (NPS) for Energy En-1 and for Electricity Networks Infrastructure EN-5 if optioneering can be clearly demonstrated. There is a need to present this information properly, for example in a Design and Access statement for reference at the detailed design stage.</p>		<p>Further detail has been added to the Design Vision, identifying the design process, design criteria and choices at detailed design stage.</p> <p>A Design and Access Statement will be prepared for the whole scheme. This Design Vision focusses solely on the design process and decisions affecting the onshore substation.</p>
	<p>The Design Vision could benefit from responding to the proceeding advice in a way which clearly outlines project ambitions for both internal teams and external stakeholders, and sets the outline approach for both now and beyond DCO approval. Showing best practice and how this is an exemplar project for GI will be beneficial for gaining and buy-in</p>		<p>The project ambitions are outlined through the Design Vision statement included within the first chapter of the Design Vision. This includes a description of the proposed approach to ensuring good design in the post-consent phase of the project. A GI Plan has also been produced and will be submitted with the DCO application.</p>
	<p>When revising the document, the Design Council recommend establishing a best practice approach to underpin and example GI scheme, which brings together landscape and biodiversity and clearly defining the driving force of the schemes, being future thinking schemes that are nationally significant for GI. This should be apparent in the visions statement.</p> <p>In addition to ensuring that the DCO process is balanced with a creative, aspirational approach in order to keep the project forward-looking and ensure it most successfully responds to the site needs with a design-led approach, which may require vision for areas outside the Order Limits. The design council also recommend defining words such as mitigation and enhancement within the document to ensure a shared understanding of how these approaches support these particular schemes.</p>		<p>The project ambitions are outlined through the Design Vision statement included within the first chapter of the Design Vision.</p> <p>Areas outside the Order Limits are beyond the scope of the project. NFOW have sought to demonstrate where connection to local GI networks can be made to improve overall local GI provision, but the projects has no control over delivering any improvements outside the Order limits.</p>
<p>Sustainability</p>	<p>Consideration of carbon use is yet to cover all aspects of the schemes such as vehicles and earth moving, and review of the different impacts and associated response at construction and operational stages</p>		<p>The Environmental Statement includes ES Chapter 33 Climate Change (Document Reference: 3.1.35), which includes a detailed GHG assessment for the project, including carbon budget.</p> <p>Green Guide ratings have been provided, where available, for all landscape materials identified at this stage.</p>



Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response	
Sustainability	<p>The Design Council suggest decarbonisation. Separate evaluation should be completed of the carbon impact of construction and operational stages. We urge the team to explore examples of best practise to decide areas that would value most from carbon budgeting/investment into lower impact choices. There is an opportunity to produce less carbon through evidencing/choosing more environmentally conscious options</p>		<p>The Environmental Statement includes ES Chapter 33 Climate Change (Document Reference: 3.1.35), which includes a detailed GHG assessment for the project, including carbon budget.</p> <p>Green Guide ratings have been provided, where available, for all landscape materials identified at this stage</p>	
	<p>Optioneering of AIS or GIS- Despite the need for flexibility at this stage, we would expect a decision to have been made option for both sides. As part of previous comments in December 2023 to maintain this project as a truly green infrastructure project the AI S substation would be the only viable option. Maintaining flexibility on such a central decision means that the landscape screening strategy cannot properly be created to respond to either situation.</p>			<p>Five Estuaries have submitted a DCO application which includes both AIS and GIS optionality at the substation, however they are currently undertaking a further design review of the options to see whether they have enough information to make a decision at this stage. The Design Council’s input has been useful in feeding into this process.</p>
	<p>Legacy after construction- The Design Council re-emphasise the importance of considering re use of construction materials locally to meet community needs. For example, if a new community building could be created from any temporary structure required during construction. This would help reduce waste and lower the carbon required in the creation of the substations.</p>			
Biodiversity Net Gain	<p>Biodiversity net gain- While small in-depth work has been completed on the landscape mitigation strategy we would urge the design team to be more ambitious with the amount of BNG me to be provided on site. BNG will facilitate many functions for the site beyond singularly screening of the sub stations. It will reinforce the narrative for this being an integrated green infrastructure project; establish a biodiverse environment for native species to thrive; create habitat for fauna, and help to minimise effects of heat islands and high rainfall through creation of sustainable drainage systems (SuDS). For this to be an exemplary project we would expect the amount of BNG on the site to be significantly increased. The design council note that significant landscape enhancement is needed in order to reach BNG targets and recommend that the design team refers to the downgraded weight that the Secretary of State gave to delivering green infrastructure outside the order limits, where locations were not fixed, in the recent Yorkshire Green Energy Enablement Project design letter.</p>		<p>The Project is exploring opportunities to deliver up to 10% BNG on site, which also includes net gain in relation to elements of the onshore cable route. The onshore substation is the area of the project where there is the best opportunity to deliver BNG due to the temporary nature of rights held along the cable route, but onsite delivery of BNG at the onshore substation has to be a trade off with other planning concerns (e.g. loss of BMV). The Project is focussed on ensuring that the BNG created makes the best use of the land available, by ensuring it is well-connected to wider ecological networks, and provide habitat for key species identified as present in the local area and in need to habitat improvement through extensive ecological surveys.</p>	



Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Landscape Mitigation	More granularity is now needed to ensure it is a truly site specific strategy. In addition to suggesting the project team builds a compelling narrative that highlights the positives of being BNG the site could achieve. We see the opportunity for the landscape to be forward-looking to respond and thrive in the changing environmental context of climate change, alongside the previous exploration into the heritage of the site. An integrated design approach which incorporates ecology and visual characters should be a foundational approach to the landscape mitigation strategy to unify screening with environmental benefit.	Orange	Due to the complex nature of offshore wind farm development, many details may be unknown to the Applicant, both at the commencement of the design process and also at the time of DCO submission. At this stage more granularity cannot be provided for the buildings and site equipment.  At the last meeting we outlined the principles for the Landscape Strategy, these include landscape and visual mitigation, measures to enhance the landscape character of the site,
	To ensure the landscape strategy and subsequent planting will be resilient in a changing climate we suggest exploration and analysis of data on the climate resilience of species of plants. This would provide an evidenced approach to creation of habitats for the site. The Woodland trust and Forestry Commission can provide guidance on the landscape mitigation strategy and how to ensure woodland planting last for the long term.	Green	The Design Vision acknowledges the need for future-proofing of landscape proposals in terms of climate resilience. The Forestry Commission research is included as a reference within the design principles for planting. At detailed design stage this will inform species selection, along with local landscape character guidance, Essex Tree Strategy and dialogue with Natural England
	To match the scale of the site we would expect to see two or three times the amount of woodland to create viable woodland habitats. Creation of Morse substantial woodland would ensure the planting strategy have better chances of survival with minimal maintenance; best screening the site over the long term.	Red	As outlined above, we do not agree that maximising tree planting across the entire site is the best planting strategy. Planting must be appropriate to place, create meaningful and usable green infrastructure and enhance biodiversity and landscape character.  Project ecologist have reviewed the proposals as part of development of the landscape strategy. It is acknowledged that to increase biodiversity net gain and create suitable habitat for flora and fauna, a mosaic of habitats will be required.
	We also see the opportunities to you for use of similar forestry planting and whips. Alas in the area where protection figures right more immediately, this planting technique can become better established on the site over the long term. This strategy will also assist with lowering carbon requirements during construction through reducing the need for rehoming and transporting large established plants.	Green	Planting proposals will typically include a range of sizes. These will consider the following factors; speed of establishment, risk of failure, requirement for visual mitigation screening (larger sizes may be utilised in areas with most sensitive views to provide greater height initially), use of nurse species to aid establishment etc. It is recognised that planting of smaller material, such as whips, is typically more successful than use of e.g. semi-mature stock.
	Screening- Care has been taken to establish the screening strategy. However, given the needed flexibility, it is currently unclear as to how the screening strategy directly responds to the substation equipment and ensuring infrastructure, electrical equipment and fencing a show did properly. We suggest that integrating buildings into the landscape was prioritising screening of engineering equipment will inform the most successful landscape screening strategy.	Green	During the last meeting, illustrative sections were presented that indicated the effect of planting in relation to site building and infrastructure. These are included within the Design Vision as reference to principles of our screen strategy. At this stage in the design, the site layout and final locations for buildings cannot be finalised. The landscape strategy therefore responds to an illustrative scenario based on a typical layout that adheres to the various technical requirements.  As outlined in the Design Vision principles, the Site layout will be carefully considered to ensure that the positioning of building and infrastructure minimises visual impacts, where practicable



Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Landform	We recognise that the site is relatively level, therefore stripping of topsoil will be minimal. We asked the project team to weave this into the project sustainability story, ensuring that soil is retained on the site to minimise the carbon impact. Even at low levels we suggest that any mounding is not harshly created and instead maintains a more organic look. Mounded areas would provide an optimal location for new planting as they thrive in the aerated soil		As noted within the meeting, a minimal amount of excavation is envisaged due to the flat topography of the site. Careful cut and fill design will ensure that excess soil stripping is not required and that all can be reused within proposed landscaped areas.
Drainage	Inclusion of wetland areas will provide additional variety in biodiversity on site. With these ambitions in mind, we question if the pond should be extended to ensure they properly serve the water management needs on site. Additionally, we note that the shape of the ponds will be important to successful visual assimilation and integration of fauna into the site. We suggest that approaches are taken which address their function and aesthetics in time of floods and drought and considers the variety of areas established for wildlife. We suggest improving the permeability of surfaces across the site to increase water drainage. For example exploration should be undertaken into if areas of the platforms could be covered in gravel as opposed to concrete.		At present infiltration tests are yet to be undertaken therefore the full extent of any SuDS measures is unknown. As outlined in the Design Vision, the preference is the provision of multi-functional, biodiverse forms of SuDS, wherever possible. Sizing of ponds to provided a permanent water level and range of edge habitats will be considered at detailed design, through liaison with the project ecologist. The drainage scheme will include specification of surfaces, and will include consideration of permeable surfaces where relevant. Where surfaces are required to be impermeable by functional specification then this cannot be avoided.
Management and Maintenance	Ensuring that management and maintenance is designed into the landscape strategy is vital to long term success. The new NPS EN-1 will be a key consideration for examining authorities so it is important to clearly demonstrate how management and maintenance will be secured for the site. We suggest that the management of maintenance is secured for at least 15 years.		An Outline Landscape and Ecological Management Strategy will accompany the submission. This will cover the 30-year management period.
Noise Attenuation	We have yet to see results of the cumulative effects study that has been undertaken to assess the noise attenuation of the three substations, set in close proximity to one another. It will be vital to mitigate the noise affects properly, particularly on such a rural and open landscape. There is an opportunity for the landscape and material strategy to mitigate the noise attenuation on the site. The new NPS EN-1 and EN-5 state that mitigation measures through incorporating good design should be taken to minimise noise transmission through natural or purpose built barriers.		At this stage of design, the scope of noise attenuation measures cannot be fully determined. The Design Vision includes a section on noise attenuation. Where practicable, barriers will be placed as close to the emitter as possible to void the need for large structures within the landscape, being placed close to visual receptors. The principles of the Design Vision will be considered during the design of any required noise barriers.
Architecture	The buildings were not presented in the design review. We think that the relationship between the buildings and the landscape are important and in our view the building should become part of the landscape in line with the surrounding typology of architectural buildings. Well designed buildings with minimal reflection would sit well within the surrounding context. In following the design review we would welcome insight into the architectural design process such as massing, land take, building finishes and roof type.		Due to the complex nature of offshore wind farm development, many details may be unknown to the Applicant, at the time of DCO submission. For this reason certain design decisions cannot be made at this stage of the design process. The Design Vision sets out the fixed parameters, design considerations and options available at detailed design stage.
Surrounding Context	We understand that the important aspects of landscape enhancement would take place outside of the order limits. Although this isn't a part of the DCO submission we urge the design teams to consider how best to approach landscape enhancement surrounding their substations' sites as this should be an important part of the holistic design vision and would be central to BNG delivery.		Cumulative effects of the projects are assessed as part of the EIA. These aspects will be subject to further review and liaison between project teams post DCO submission. The Design Vision outlines an indicative timeline. This aligns with NGET's timescales for delivery of the EACN project.



## 9.3 Design Advice Letter 3 and Response

### 9.3.1 Design Advice Letter 3

9.3.1



FAO: Cormac Rooney,  
Windmill Hill Business Park,  
Whitehill Way,  
Swindon,  
Wiltshire,  
United Kingdom,  
SN5 6PB

21<sup>st</sup> June 2024  
Our reference: DC/5686

#### North Falls and Five Estuaries Offshore Wind Farm Onshore Substations Design Review 3

Dear Cormac,

Thank you for providing the North Falls Design Review Panel with the opportunity to comment on the emerging plans for the North Falls and Five Estuaries Offshore Wind Farm Onshore Substations at the third Design Review on 17 June 2024.

#### Summary

Overall, the scheme has progressed positively since the first review. We were pleased with the way the presentation was structured to respond directly to questions and comments raised in previous reviews. We nevertheless think there remain areas for improvement, including where more detail could be provided, and list these here.

The advice in this letter focusses on the Design Vision Document, the proposed masterplan, landscape mitigation, sustainability, materiality and key documentation that will aid engagement with stakeholders and authorities during the examination process and thereafter assist in securing good design if consent is granted. The proximity of the proposed National Grid substation with its later timescale is acknowledged to add complication to progressing some detailed design decisions. Nevertheless, we consider there is a need for more detail to be provided to give local authorities robust principles against which they consider post-consent approvals.

#### Design Vision Document

The Design Vision Document has greatly improved since the last review, in particular, the visualisations and sections regarding water and climate adaptation for water. However, we think there is opportunity to push the vision further to present a bold statement on the scheme and improve clarity in certain areas. It is essential that the Design Vision Document and landscape mitigation are both bold and visionary as they will guide the project phases for years to come.

The document should communicate a bold vision for North Falls / Five Estuaries, demonstrating how these can be exemplar schemes. We think the current vision could be more progressive in its approach to sustainability and creating infrastructure that is designed in a planet-first approach. That includes exploring opportunities to reintroduce endangered wildlife/fauna, and realising wider social value through the scheme. We recommend revisiting the vision and adjusting the narrative to communicate a clear narrative that puts

[designcouncil.org.uk](https://designcouncil.org.uk)

[info@designcouncil.org.uk](mailto:info@designcouncil.org.uk)

Registered charity number 272099



the sustainability of the scheme at the forefront, and that this then links thematically through the proceeding documentation.

A relationship diagram would be useful at the start of the document. This should show the purpose of documentation, how it is secured, the relationship between documents, link to the Design and Access Statement (DAS), Design Principles Document and the Design Vision. This diagram could be useful during examination and hearings, for Examining Authorities and wider stakeholders.

We advise you to include more illustrations of best practice in the document. We do not think the example of the shed with eaves constitutes best practice and recommend revisiting this precedent. Examples of good design across the vision will help to visualise the ambitions of the project across the document, especially where there is less written detail available.

### Social Value

There is an opportunity for the scheme to communicate the social value it will create more clearly in the form of employment opportunities, sourcing of local products/services, and developing new green skills in the local area. This would speak to the People component of the NIC principles and should have clear targets attached to it. We do not yet think the document communicates this clearly and think this should be communicated widely to encourage local buy-in to the scheme.

### Design Champion

We support the inclusion of a design champion and advise this role should be actioned quickly in order to maximise their opportunity to influence the scheme positively. The design champion should be a specialist, with design credentials that can both champion the scheme's design aspirations and challenge decisions where these are not conducive to the realisation of long-term, considered design outcomes. We questioned which board the design champion would sit on and you were referred to an example where a design champion was appointed as a non-executive director as one governance mechanism. The champion will need to play an important role in ensuring the scheme meets the needs of a changing climate, pushing the project team to be bold in their vision and decision making.

### Masterplan

We support the project teams' ambitions to create a masterplan, joint DAS, mitigation schedule and governance framework for the scheme. The masterplan should be integrated and cover earthworks, fauna and approach to land assembly. Whilst we recognise that this will be a complicated task, we are clear that a joined-up approach will help realise value for the scheme, specifically by helping ensure coordination with adjacent and co-located schemes, for instance on aesthetic details like the choice of fencing and the overall colour scheme. We question why work on colour could not have been progressed at this stage. We urge parties to find the best route to procure the masterplan, covering all three substations. This may be a task that could be led by the Local Authority and funded through a Planning Performance Agreement (PPA) or commissioned jointly by the three parties.

During the review, the design team asked about examples of co-located NSIPs and how and if masterplanning had assisted delivery. We suggest that PINs may be able to provide good examples of masterplans in this situation and we recommend requesting further information.

The joint masterplan should identify areas that are common to all schemes – for example, drainage, planting design, shared targets and visual impact. It should also identify areas that



are specific to each scheme – for example, whether using an AIS or a GIS substation. It should also identify a risk management approach to delivery and address the possibility of only two out of three substations progressing.

Alongside the masterplan, we suggest creating a strategy that covers the buildings and equipment across the scheme. This will ensure that a consistent visual approach is used – for example, creating unified screening across the site using the same tree planting and species.

### Landscape Mitigation

We do not think the current landscape assessment reflects the changing nature of the site, something which restricts the vision for the landscape. The site represents an opportunity for habitat (re-)construction, and we think the approach should reflect this, alongside a more ambitious planting strategy. Whilst we recognise the benefits of restoring hedgerows – and the desire to meet local policy – we think that hedgerow restoration is not necessarily appropriate for this site. Hedgerows have historically been used for agricultural management, which will not be the function of this landscape in the future. We therefore recommend revisiting the landscape assessment and factoring in how the development of large-scale substations – along with wider drivers of change, such as a warming climate – will change the purpose of this site and be bold in communicating this.

We suggest viewing the site as a whole when conducting the landscape mitigation and ecological habitat studies rather than as individual areas. This will open up opportunity to maximise potential biodiversity across the site – for example, utilising the cable corridors and access roads, for which there should also be a landscape vision.

We question the use of mounding and encourage consideration of how subtleties of groundworks such as changes in slope and/ or orientation can benefit biodiversity across the site.

The planting proposals could be more ambitious considering that there will be 10-12 hectares of substation across the site. We recommend creating as much planting screening as possible, not solely focussing on viewpoints. We acknowledge your comments on our previous suggestions for more woodland, but still think that more work is needed to provide effective screening, which is biodiverse and could be delivered with a wider variety of species over a larger area. The planting was shown to be the same height, depth and species on sections. We suggest revisiting the planting strategy to create more diversity in terms of edges, planting spacing species as this will maximise biodiversity in the woodland areas.

We recognise the difficulties of working with engineering constraints, yet we advise that challenging engineering decisions may realise value where there is opportunity for biodiversity or landscape improvement.

In addition to this, we note there are large gaps around perimeter fences, particularly to the east. This may be difficult to maintain as these areas could become open grassland that then becomes a fire hazard. We recommend revisiting this to avoid potential safety issues in the future.

### Sustainability & Biodiversity Net Gain (BNG)

We strongly urge the design team to set ambitious targets for the scheme that align with the NIC principles. The targets should cover carbon and fauna as well as wider social benefit (as discussed above). We think the BNG aspirations should be at least 10%, rather than up to 10%. Setting clear targets in the document will push the projects exemplar status and ensure



that sustainability interventions are not value engineered out when reaching construction phase.

We recommend starting some of the BNG planting as soon as possible. Advance planting will allow trees to grow to maturity for when operations begin. Established trees can furthermore shield some of the construction works and allow for claimant of carbon sequestering.

### Materiality

We recommend keeping design options open when looking at materiality, and we question the proposed use of steel and polycarbonate both of which have high levels of embodied carbon. This will be particularly important at the design principles stage, where decisions on materials will be made. We think that more sustainable solutions should be included, such as green roofs, PVs and timber cladding.

We question why the colour study has not yet been completed. We urge the project team away from using black asphalt which will create heat islands across the site. The UKCP temperature projections may be a useful reference that outlines projects of temperature. The colour study should be completed as part of the joint masterplan to avoid incongruity of materials used across the three substations.

### Land

We understand that the project teams are working under the presumption of land acquisition for the substations. If this is the case, then we recommend that a management and maintenance plan is worked up and a commitment to management and maintenance in perpetuity is set out.

### Policy and guidance compliance

We recognise and support the work that has been undertaken in aligning the Design Vision with policy and guidance. However, we urge the design teams to step back and ensure that this does not result in too tentative an approach to good design. We think that there is potential for more ambition.

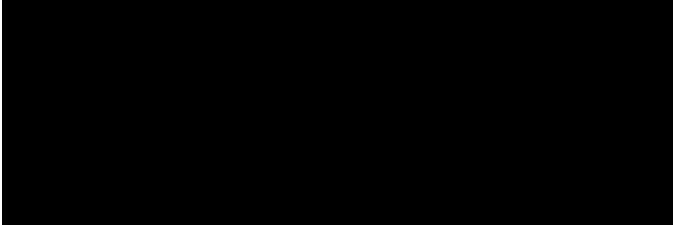
Whilst the scheme has progressed since the first review, we have not seen enough information to endorse compliance with good design in EN-1. This furthermore is not the role of the panel. We nevertheless advise that evidence should be provided for "efficient in use of natural resources", and "efficiency in use of energy in construction and operation" for the scheme to meet EN-1 standards.

### Next steps

We have made comments above about the proposed design champion and regarding use of independent design review, we trust that the three reviews have shaped and supported the applications. We suggest considering what role there is for further independent design review following consent, especially as considerable design detail will be left for post-consent approvals.

Thank you for consulting us about the North Falls and Five Estuaries onshore substations, we hope you have found the review process and the content of this letter helpful. Should you have any queries about the content of this letter, or matters which you would like to discuss further, please do not hesitate to contact us.

Yours sincerely,



### Emily Whyman

Programme Manager  
[emily.whyman@designcouncil.org.uk](mailto:emily.whyman@designcouncil.org.uk)

### Review process

Following a site visit and discussions with the Design Team, the schemes were reviewed in an online design review via Microsoft Teams by Annie Coombs (Chair), David Ubaka, Jonathan Ward, Lynn Ceeney, Paul Appleby and Richard Cass. These comments supersede any views we may have expressed previously.

### Confidentiality

Since the schemes are not yet the subject of DCO approval, the advice contained in this letter is offered in confidence, on condition that we are kept informed of the progress of the projects, including when they become the subject of a DCO application. We reserve the right to make our views known should the views contained in this letter be made public in whole or in part (either accurately or inaccurately). If you do not require our views to be kept confidential, please write to [deliveryprogrammes@designcouncil.org.uk](mailto:deliveryprogrammes@designcouncil.org.uk). cc (by email only).

### Attendees

Cormac Rooney	North Falls
Jo Phillips	OPEN
Victoria Harrison	Five Estuaries
Gordon Campbell	Royal HaskoningDHV
Ellen Shields	Royal HaskoningDHV
Caroline Osbourne	LUC

### Design Council

Frederik Weissenborn  
 Emily Whyman

CC: HaskoningDHV UK Limited,  
 Westpoint,  
 Lynch Wood Business Park,  
 Peterborough  
 PE2 6FZ





**NORTH FALLS**

*Offshore Wind Farm*



**RWE**

## **HARNESSING THE POWER OF NORTH SEA WIND**

*North Falls Offshore Wind Farm Limited*

*A joint venture company owned equally by SSE Renewables and RWE.*

*To contact please email [contact@northfallsoffshore.com](mailto:contact@northfallsoffshore.com)*

© 2024 All Rights Reserved

**North Falls Offshore Wind Farm Limited** Registered Address: Windmill Hill Business Park, Whitehill Way, Swindon, Wiltshire, SN5 6PB, United Kingdom  
Registered in England and Wales Company Number: 12435947

---

*NorthFallsOffshore.com*