NORTH FALLS

Offshore Wind Farm

Design Vision (Tracked)

Document Reference:	2.3
Volume:	2
Date:	May 2025~~July 2024~~
Revision:	~~0~~1

Project Reference: EN010119

NORTH FALLS
Offshore Wind Farm

Project	North Falls Offshore Wind Farm
Document Title	Design Vision (Tracked)
Document Reference	2.3
Supplier	Royal HaskoningDHV
Supplier Document ID	PB9244-RHD-ZZ-ON-RP-YE-0153

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
0	July 2024	Submission	LUC	NFOW	NFOW
1	May 2025	Deadline 5	LUC	NFOW	NFOW

Document Control

Version

Prepared - LUC, May 2025

Checked - LUC, May 2025

Accepted - NFOW, May 2025

Section Number	Description of Revision Undertaken since Previous Revision	Page Number or Page Heading
N/A	Date of document amended to reflect current date	Cover Page
N/A	Date of document amended to reflect current date	Document Control
N/A	Revision Table added to Document Control	Document Control
1.4.1	Last sentence omitted as timeline indicates events that have already taken place	Page 6
1.5.1, 1.5.2	Minor gramatical and spelling errors amended throughout	Page 7
1.5.3	Last sentence omitted as statement deemed incorrect	Page 7
1.5.5	Last bullet point omitted	Page 9
1.5.7	Indicative Design Guide feedback process diagram omitted	Page 9
1.5.7	Text changes made concerning stakeholder engagement with parish councilors	Pages 9 and 10
1.5.7	Second bullet point omitted	Page 10
2.1.1	Text changes made concerning National Policy Statement for Energy Infrastructure	Page 12

Table 1: Revisions table indicating changes to the document since previous revision

Table of Contents

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

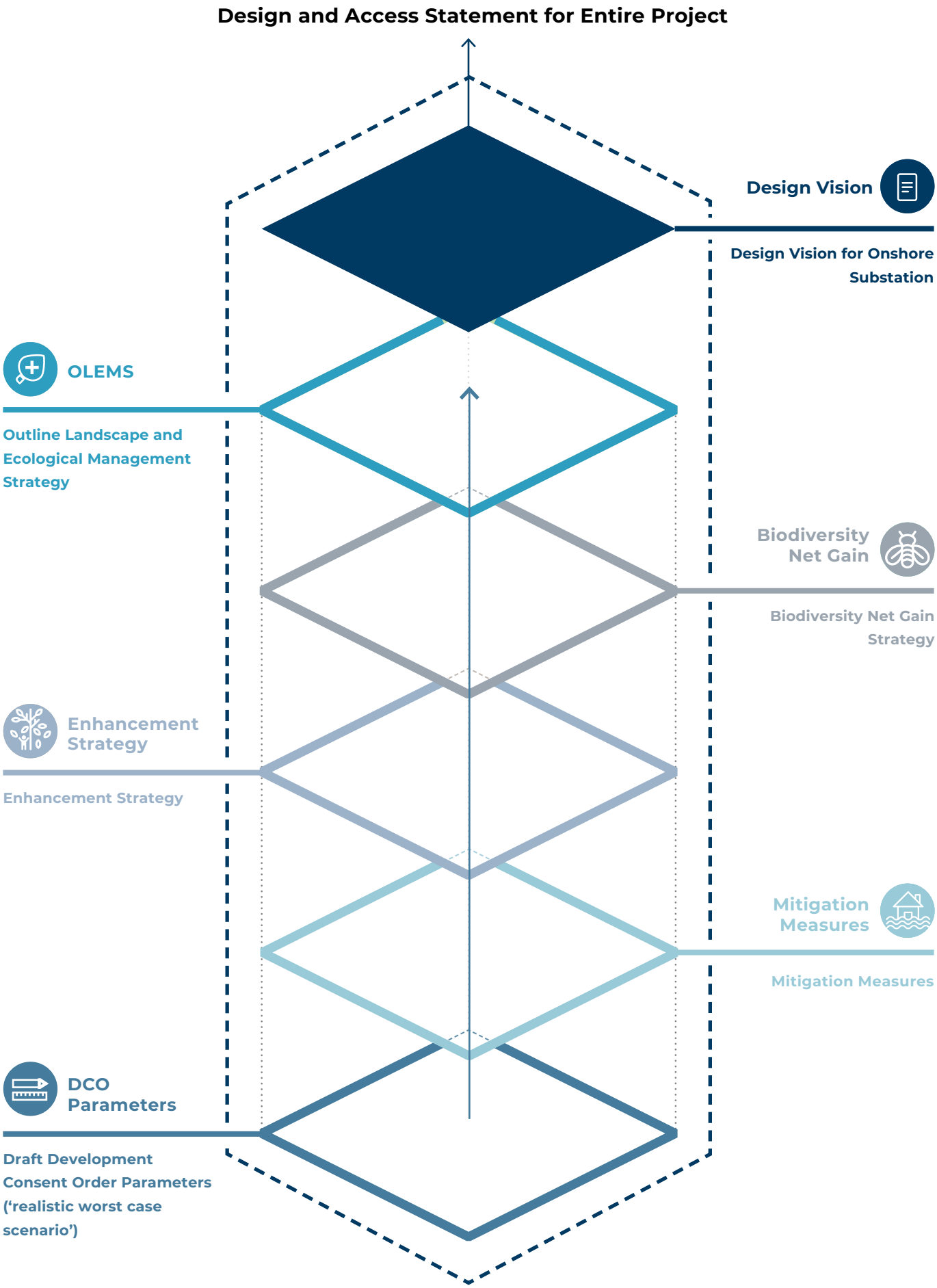
The Design Vision will help guide design and engineering teams, working as a reference document that provides technical and enhancement proposals to mitigate the impacts of the development. It allows all people working on the Project to engage with and implement design principles at every step of the 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



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 on the following page 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.

1.3.3 Baseline Conditions, anticipated environmental impacts and proposed mitigation measures

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 Design Process - Prior to DCO Submission

1.4.1 The flow chart below outlines the design and consultation process undertaken by North Falls prior to the DCO Submission.

Design and Consultation Process - Prior to DCO Submission

Indicative Design Process

Agreement for lease area for proposed North Falls Offshore Wind Farm identified — Aug 2019

Pre-scoping Expert Topic Group (ETG) with SLVIA, Land Use , Health, Socio-economics and Tourism and Recreation stakeholders — July 2021

Confirmation of grid connection, north of existing Lawford substation — Dec 2021

Post-scoping ETG with SLVIA stakeholders — Dec 2021

Site selection process undertaken to identify preferred option for onshore substation (standalone and co-located) — 2021-March 2022

Pre-PEIR ETG scoping with LVIA stakeholders — May 2022

Preliminary environmental assessment of preferred onshore substation options — 2022-April 2023

Section 42 statutory consultation on the PEIR with land interest groups, elected representatives, technical stakeholders and community groups — May - July 2023

Post-PEIR / ES ETG with SLVIA — Sep 2023

Consultation Process

Indicative Design Process

Co-ordinated Outline Design commenced between North Falls and Five Estuaries for a co-located substation, including indicative electrical infrastructure, temporary works, access and drainage designs — Apr - Oct 2023

Design Council Review 1 Site Visit and Kick Off Meeting — Nov 2023

Development of **Landscape Strategy** — Jan-Mar 2024

Targeted consultation on localised changes to the PEIR boundary — Feb 2024

Review consultation responses — Feb 2024

Design Council Review 2 of landscape strategy — Mar 2024

Onshore substation construction access outline design, Landscape Strategy and Design Vision finalised — April 2024

Design Council Review 3 Pre-DCO review of Design Vision — June 2024

DCO application submission — July 2024

DCO Approval

Consultation Process

1.5 Post-DCO Approval - Joint Design Guide

1.5.1 Introduction

North Falls and Five Estuaries have committed to the production of a Joint Design Guide to support the development of detailed proposals for the two co-located onshore substations, and the wider site.

1.5.2 The Joint Design Guide

The purpose of the Joint Design Guide is to;

- To provide further information on the design process and detailed design development to those involved in decision making and the formal approvals process
- To feed into the tender process, providing a clear indication of employer's requirements / performance specification to alert tenderers of the design expectations when tendering
- To facilitate continued review of the design process, the Joint Design Guide will be subject to review by the appointed internal Design Champions, external stakeholders and an independent design review panel, the Essex Quality Review Panel (EQRP).
- To allow stakeholders and interested parties to contribute meaningfully to the design process, where possible, through identifying where optionality exists for certain aspects of the design.
- To ensure that 'Good Design' is maintained throughout the project lifespan, in accordance with National Planning Policy and Best Practice guidance for Nationally Significant Infrastructure Projects (NSIPs).

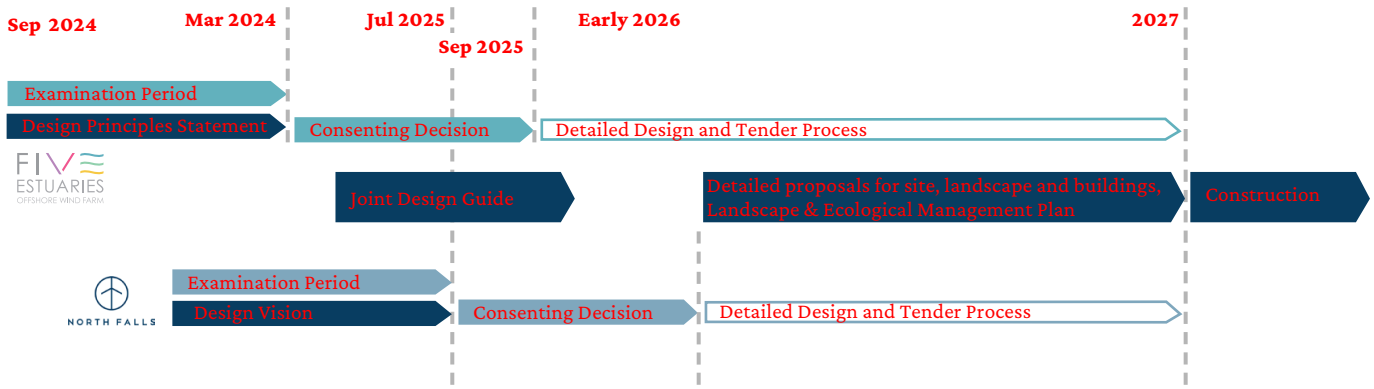
1.5.3

An indicative time line is provided below, which shows how the production of the Joint Design Guide will fit within the DCO Examination, consenting and detailed design processes.

The Joint Design Guide process commenced in May 2025 with the appointment of consultants, working alongside the North Falls and Five Estuaries offshore wind farm and their technical teams.

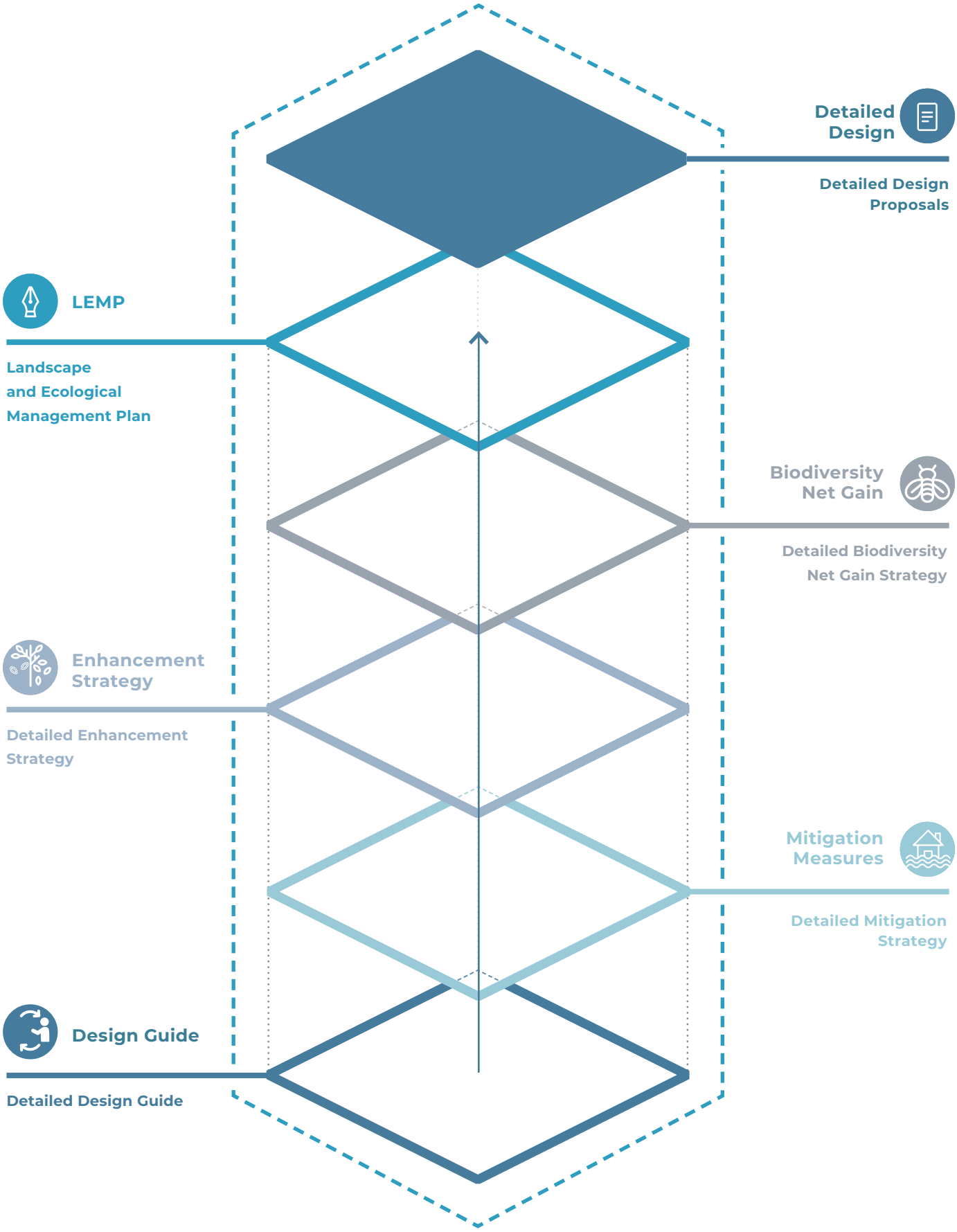
The final version of the Joint Design Guide is anticipated for release in Autumn 2025.

Indicative Process Timeline



1.5 Post-DCO Approval - Joint Design Guide

Design Champion Overview



1.5.5 General approach to Design Guide consultation

The production of the Design Guide will be an iterative process informed by input from internal Design Champions, an independent design review panel (Essex Quality Review Panel) and feedback provided by:

- Representatives from Essex County Council;
- Representatives from Tendring District Council;
- Parish councils intersecting the proposed co-located onshore substations: Ardleigh, Lawford, Little Bromley, Great Bromley (filtered via the county and district councils);
- Landowners intersecting the proposed co-located onshore substations; and
- Other interested parties within the parishes intersecting the proposed co-located onshore substations

As of May 2025, a draft Engagement Strategy for the Joint Design Guide has been prepared and is due to be circulated to Essex County Council and Tendring District Council for review. The indicative Design Guide feedback process is described below.

1.5.6 Internal Design Champions

In 2018, the National Infrastructure Commission's (NIC) first National Infrastructure Assessment recommended the creation of the Design Champion role. North Falls and Five Estuaries offshore wind farms have committed to appointing a Design Champion. The Design Champion will oversee the design review process and retain overarching responsibility for design quality throughout.

1.5.7 Key Stakeholders

Regular meetings will be held with Essex County Council and Tendring District Council to provide updates on the Joint Design Guide process, share working drafts for review and collect feedback on specific Design Principles, where optionality is provided. Other key stakeholders will include the four parish councils and interested parties within those parishes.

Ongoing stakeholder engagement with parish councils and then the county and district councils will:

- Prevent any suggestion of North Falls and Five Estuaries offshore wind farm 'marking their own homework';
- Maintain an open diologue and approach appropriate for this type of engagement. This is highly focused engagement on key aspects of a single document. It is not a further round of public consultation.

1.5.8 Landowners

- Feedback from landowners will be submitted to North Falls and Five Estuaries offshore wind farms directly for consideration.
- Landowners represent their own interests (commercial or otherwise). Therefore, it would not be appropriate for their feedback to be filtered via the county and district councils. North Falls and Five Estuaries have also built strong lines of communication with these landowners over several years of regular communication.

1.5.9 Independent Design Review Panel

Alongside the two-step review process, an external review of the Design Guide will be undertaken by an independent body, the Essex Quality Review Panel (EQRP).

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)

2011 National Policy Statements for energy infrastructure have been superseded by the 2023 revised versions which came into force on 17 January 2024. The NPS for Overarching Energy (EN-1) which sets out the Government's policy for delivery of major energy infrastructure is part of a suite of NPSs issued by the Secretary of State for Energy Security and Net Zero. It sets out the government's policy for delivery of major energy infrastructure. A further 2 technology specific NPSs for the energy sector that are applicable for the Project are as follows:

- National Policy Statement for renewable energy infrastructure (EN-3)
- National Policy Statement for electricity networks infrastructure (EN-5)

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 Heath: 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 bluewavelengths 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.

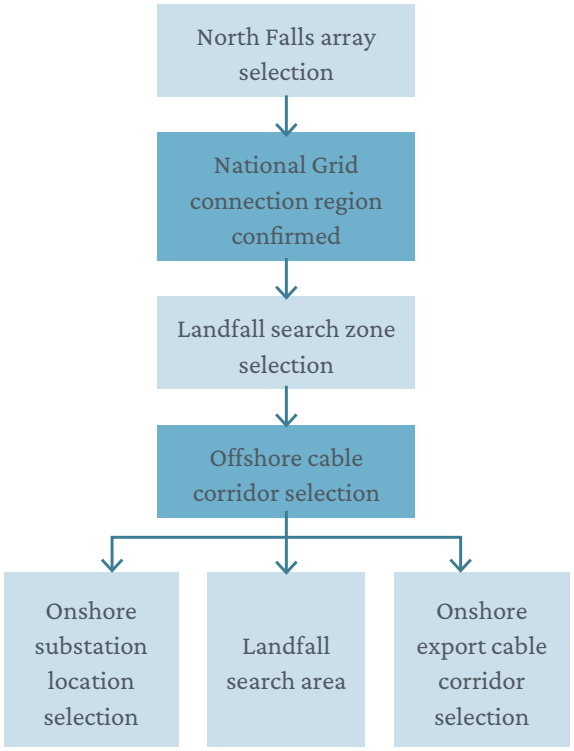


Figure 2: North Falls site selection process

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)

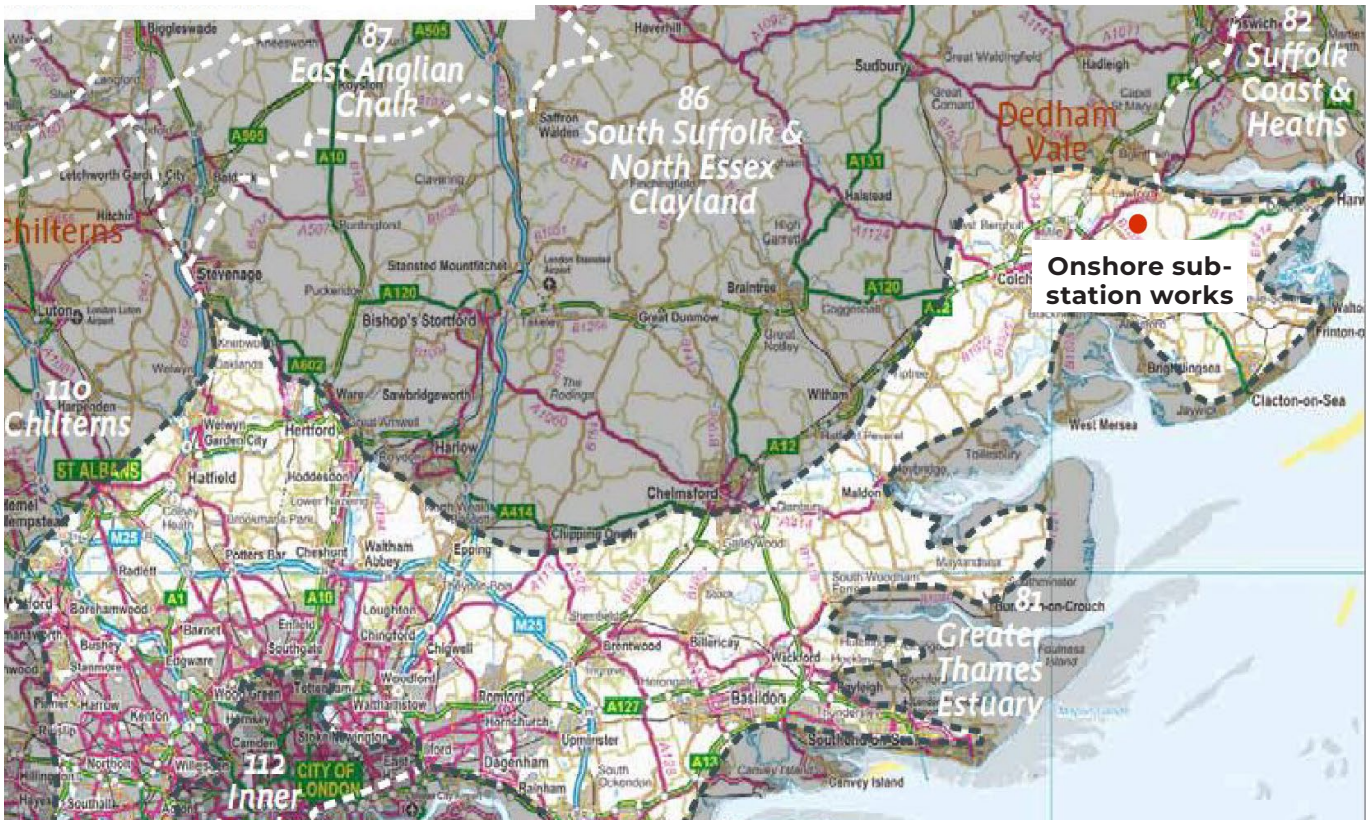


Figure 4: National Character Area 111 (NCA, 2013) – Northern Thames Basin NE466

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:

- *'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 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.*

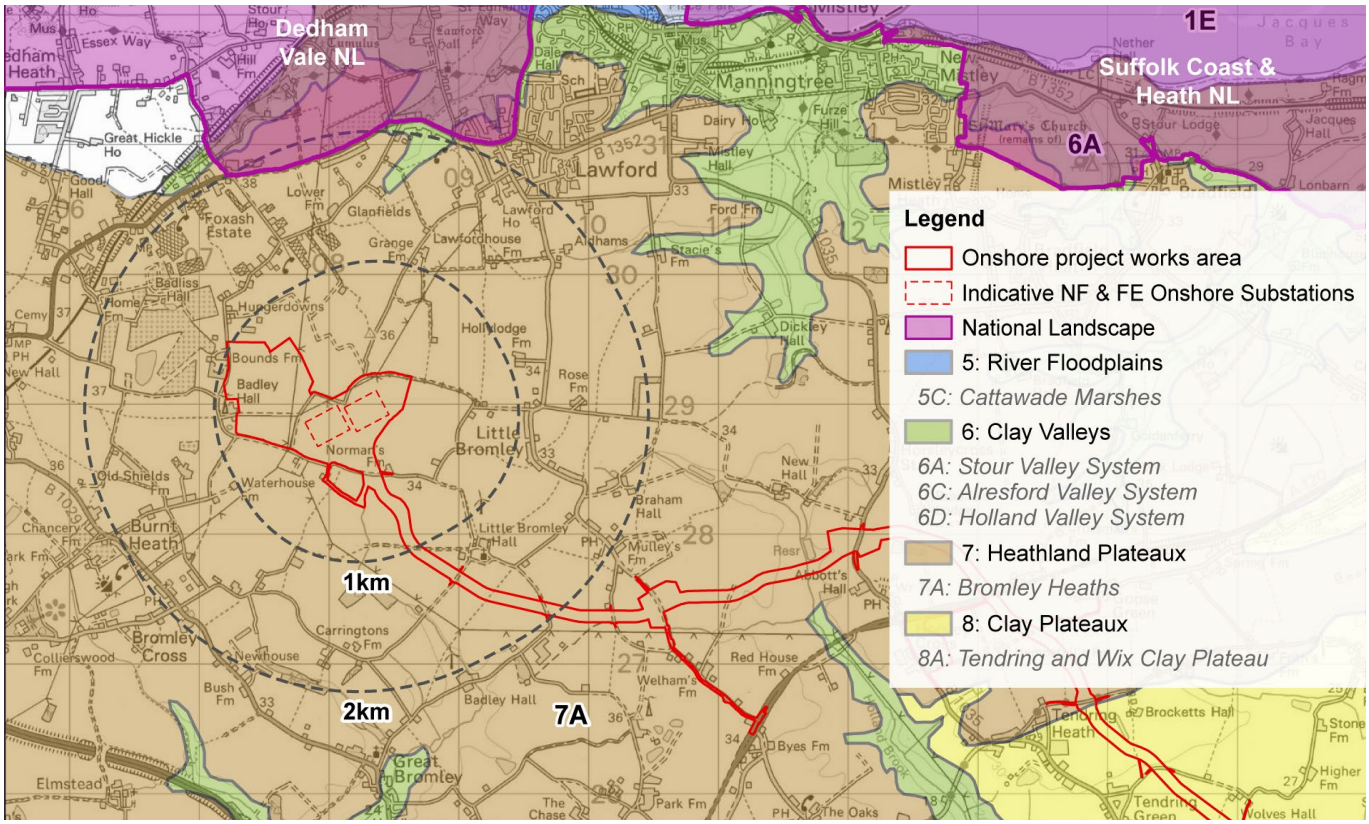


Figure 5: Plan showing landscape character areas encompassing the onshore substation works area

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.

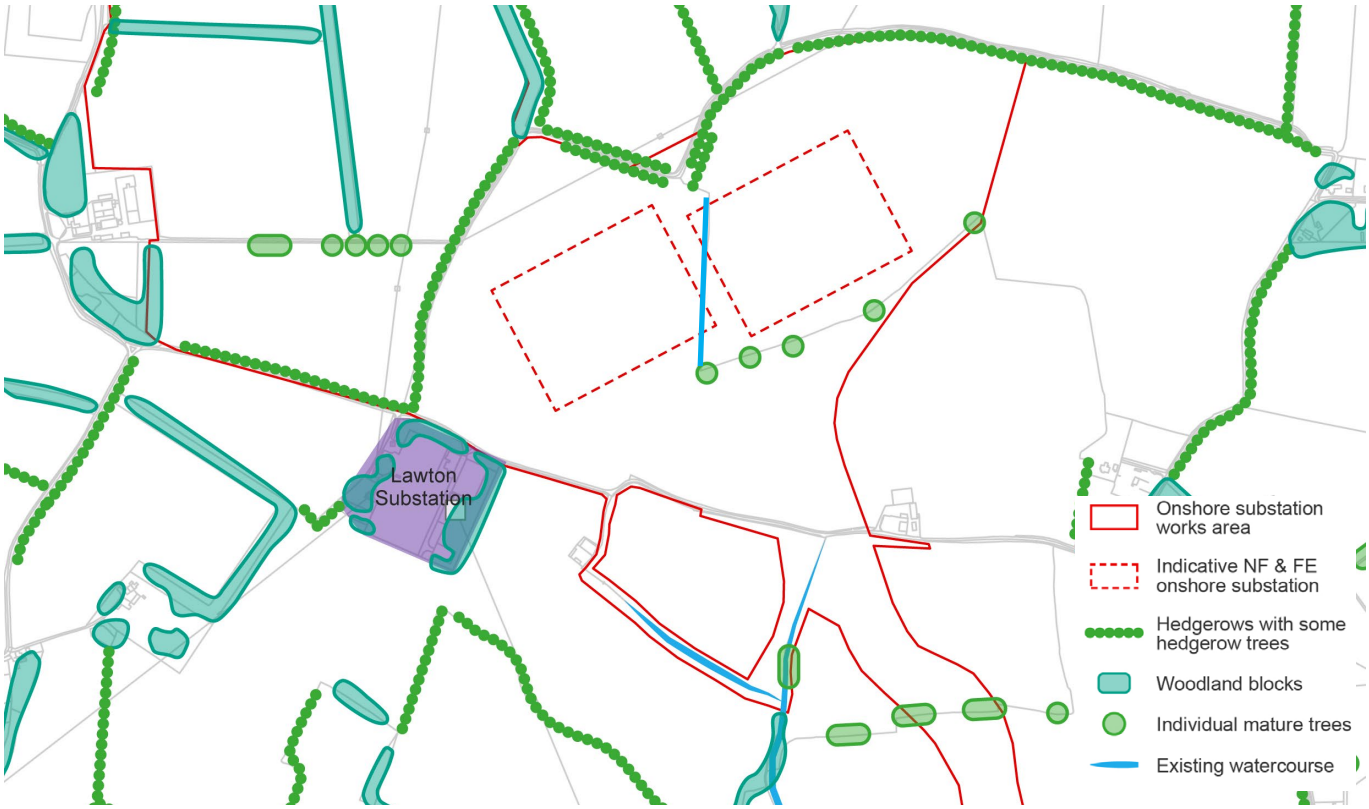


Figure 7: Existing vegetation and watercourses around the site

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

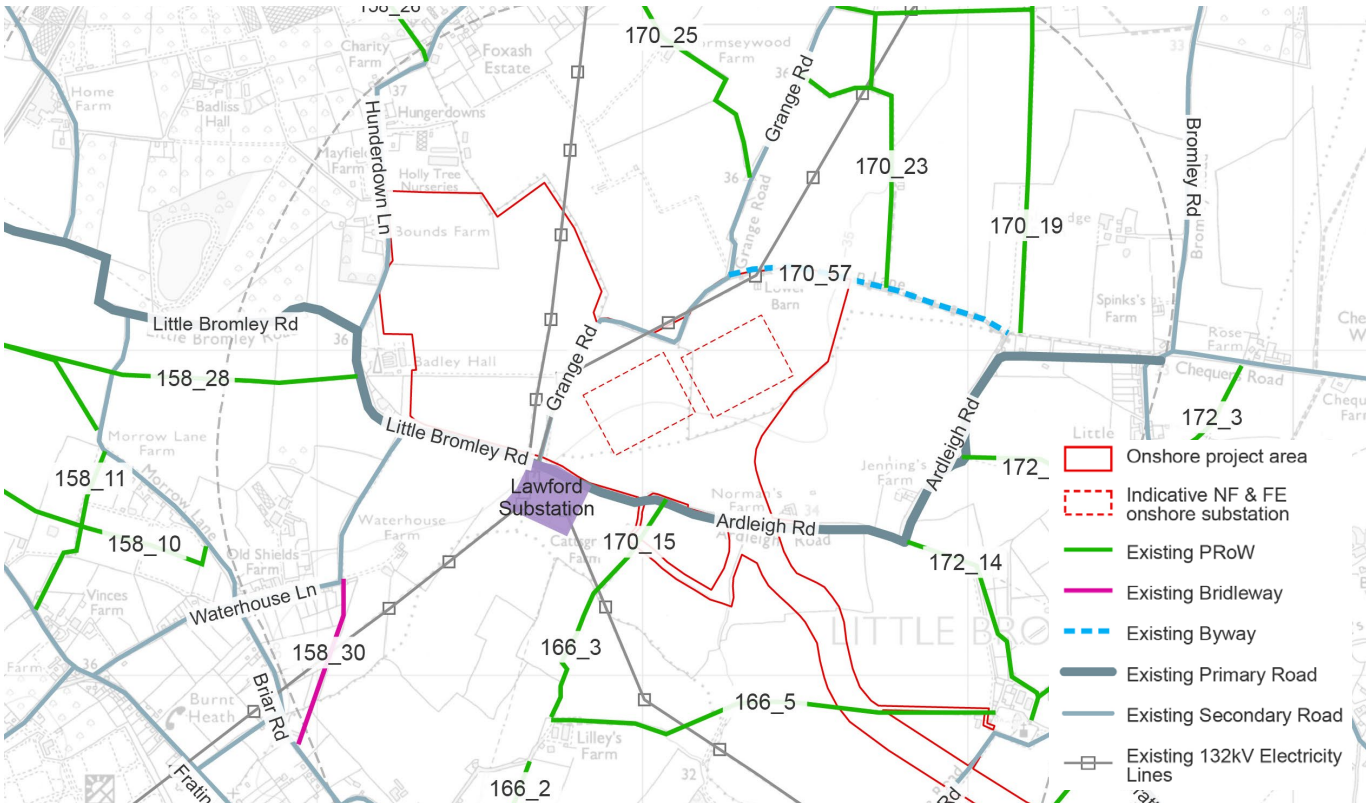


Figure 9: Existing PRoW, byways and bridleways

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.

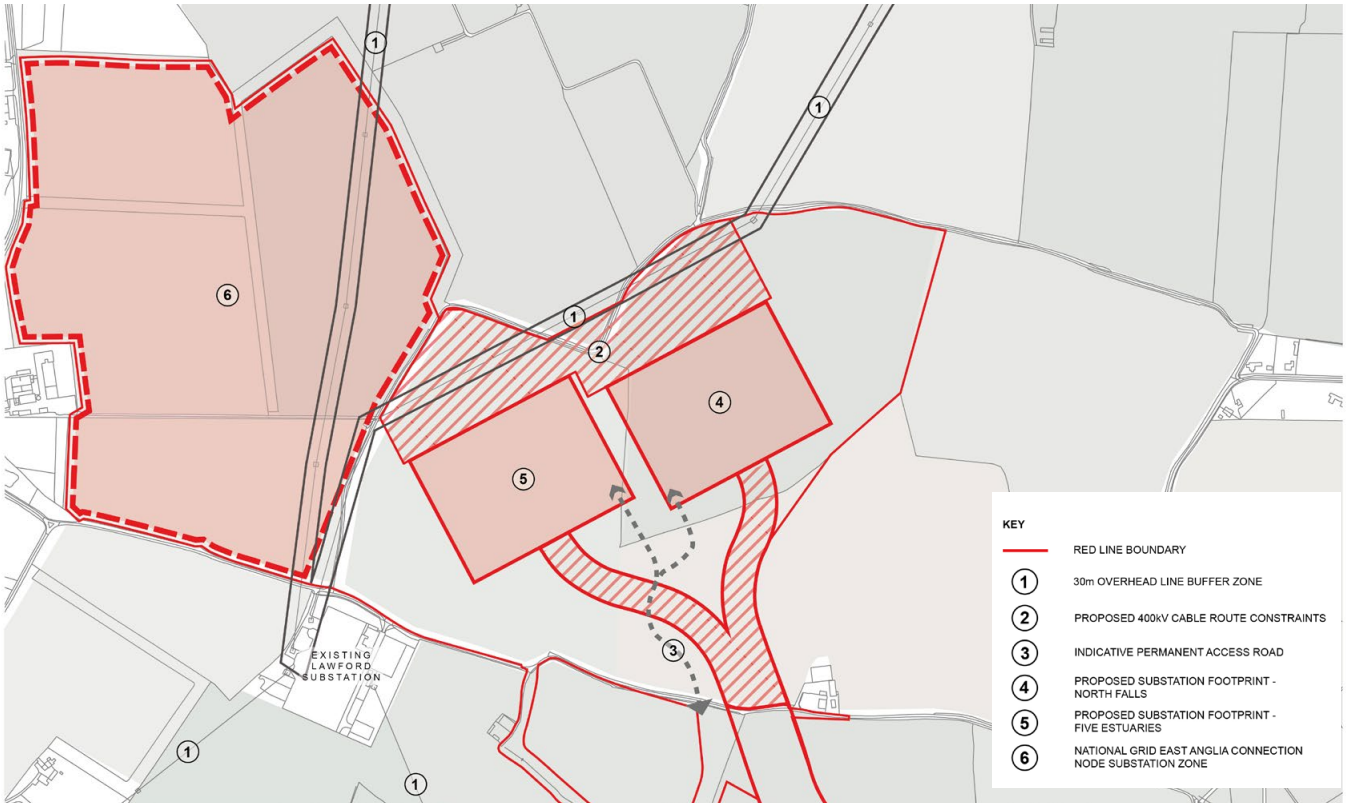


Figure 10: Development Constraints

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.

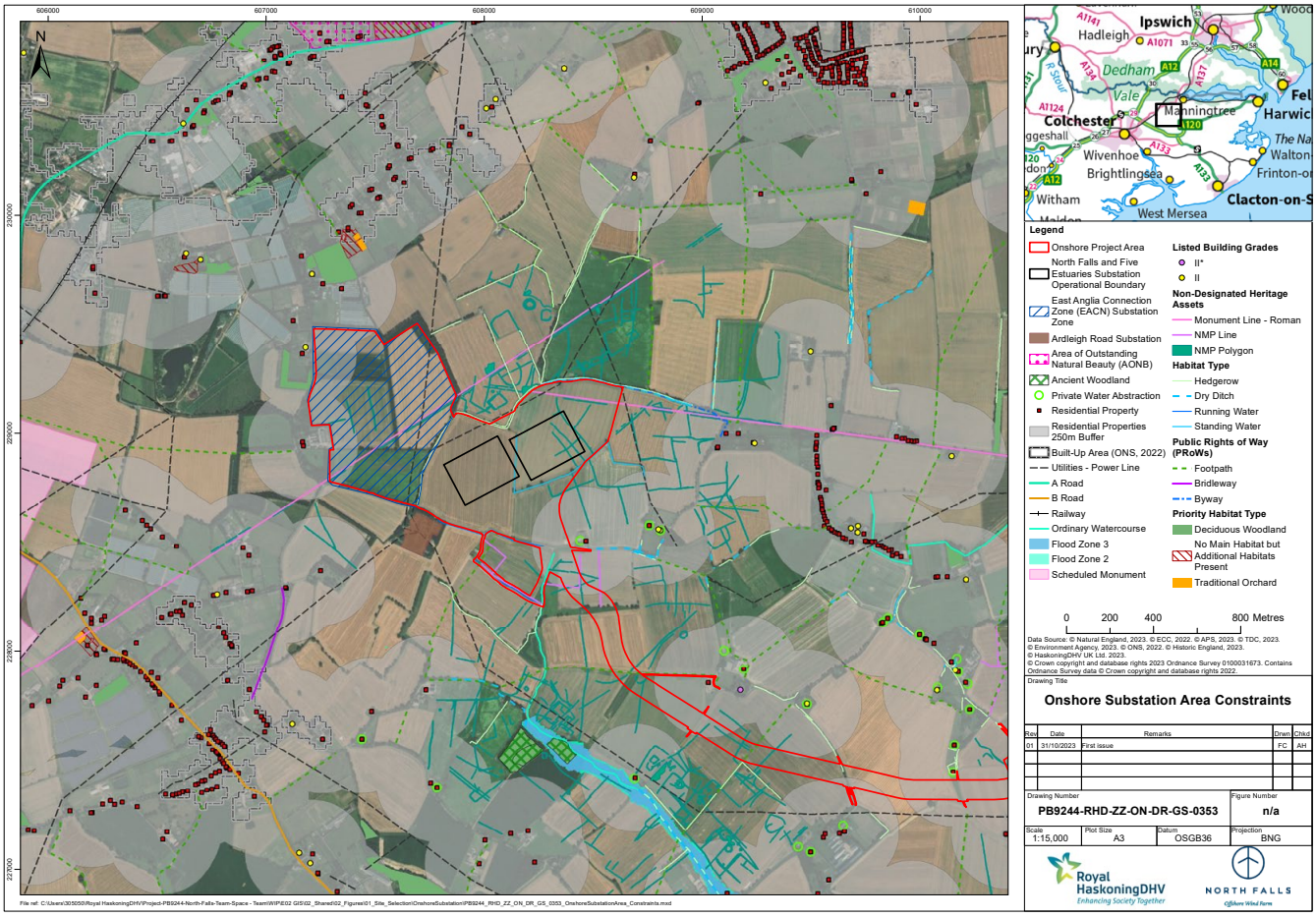


Figure 11: Onshore Substation Working Area Constraints Mapping

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 substation 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$_2$ 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 cowled 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 reseeding 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.

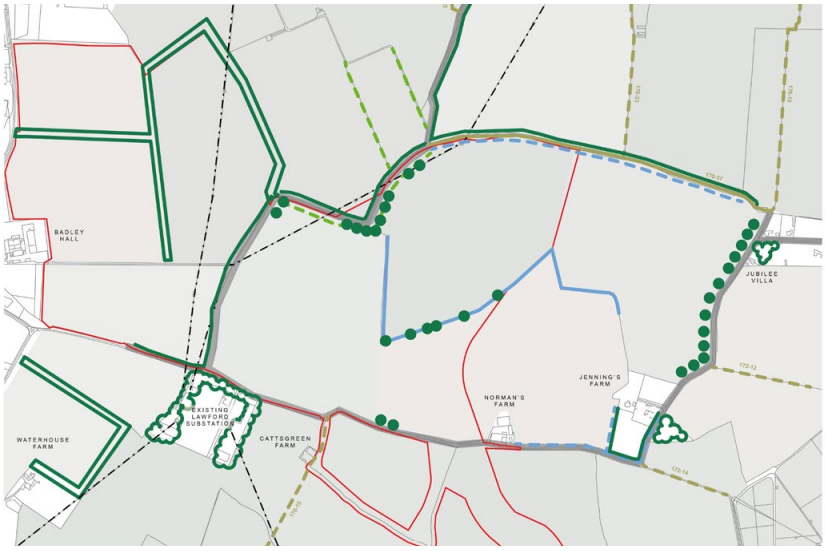
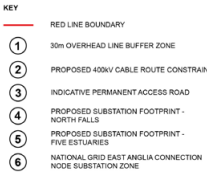


Figure 14: Existing Landscape Context

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.



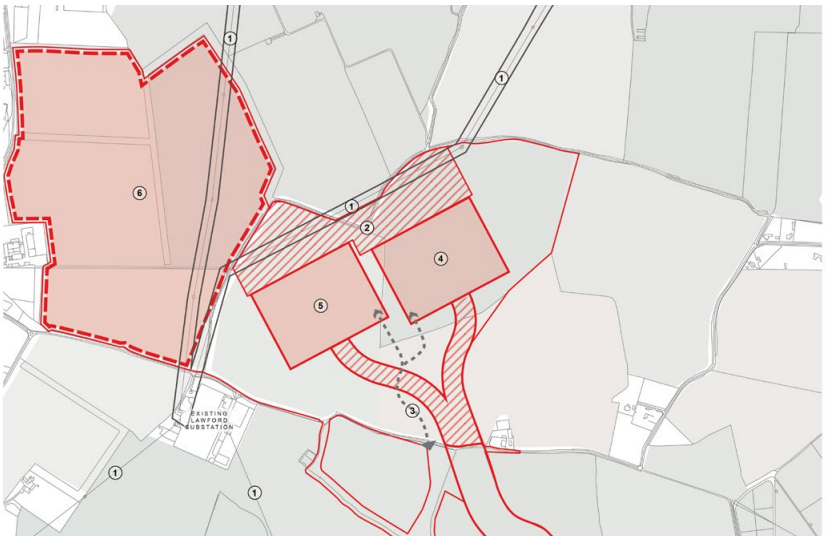


Figure 15: Development Constraints

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.

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.

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.

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

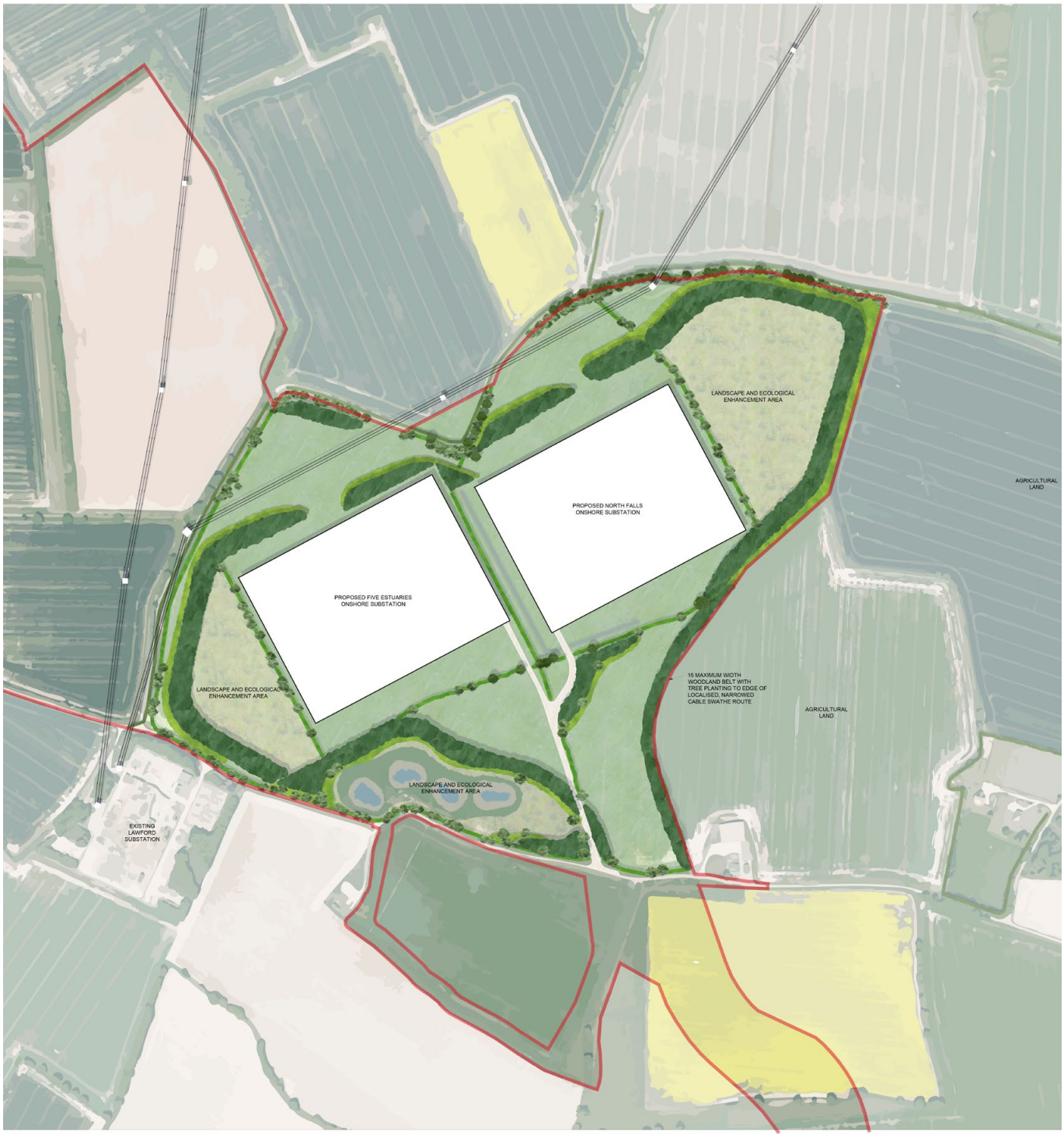


Figure 20: Outline Landscape Strategy Masterplan

5.5.11

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'

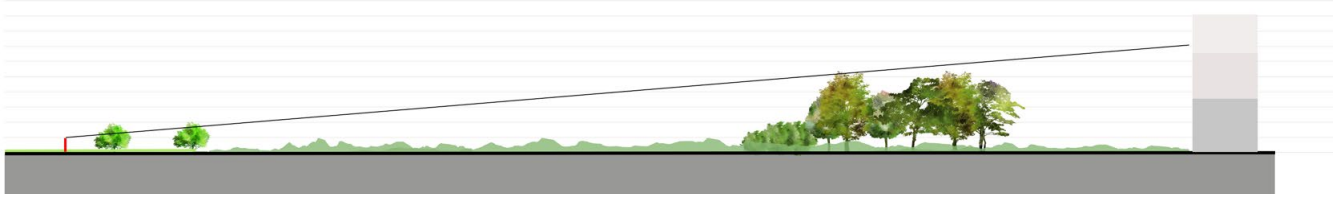
Section DD'

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 2: 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
Expert Topic Group Meeting September 2023		
Essex County Council	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.	These aspects are considered within the Design Vision. A Landscape Strategy has also been prepared.
Suffolk County Council	Consideration of the Dedham Vale National Landscape guidance on use of colour guidance and lighting guidance (for onshore elements).	Lighting and colour guidance documents are referenced within the Design Vision.
Essex County Council	Landscape in-combination effects with EACN Norwich to Tilbury.	Liaison undertaken between NF, VE and NGET to understand and minimise potential effects.
Expert Topic Group Meeting February 2024		
Essex County Council & Natural England	The LVIA should distinguish between planting required as compensation, mitigation and enhancement.	Details of compensation and mitigation are presented in the LVIA and Landscape Strategy. Enhancement proposals are discussed in the Design Vision.

Table 3: 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 (58,800m2)	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.	

Table 4: Fixed parameters and technical considerations table

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.

	NIC Design Principles			
North Falls 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 5: 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.

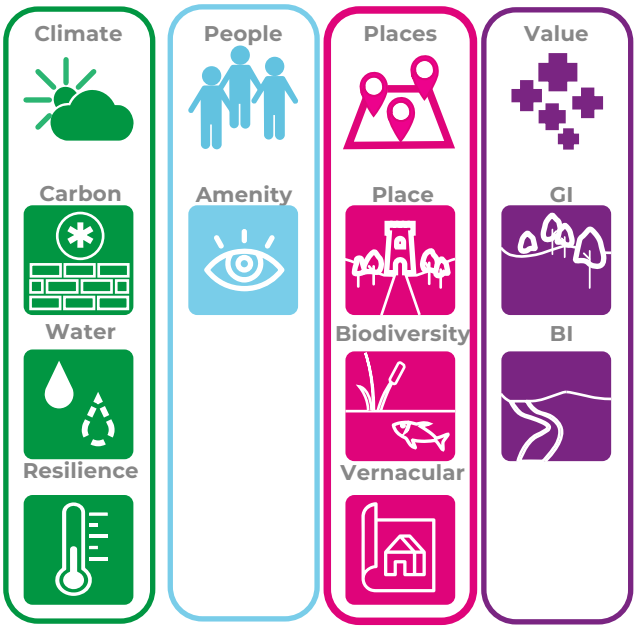


Figure 21: Multi-criteria analysis, derived from NIC Design Principles

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

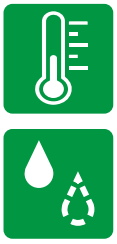
The overarching Design Vision principles for Site Layout include:

- 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

Image 2: Example of AIS site layout

Image 3: Example of GIS site layout

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 Tendring 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

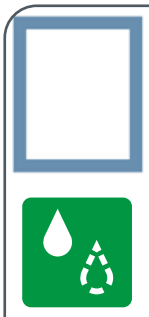
7.3.6 Detailed Design Options

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.

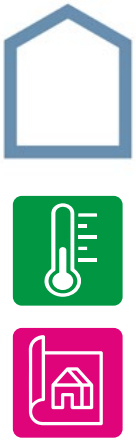
At detailed design stage, more certainty will be known as to whether Five Estuaries will pursue use of a GIS. Following this decision, as part of the design process, a variety of forms will be explored before a final solution is progressed.

7.3.7 Roof Type and Form

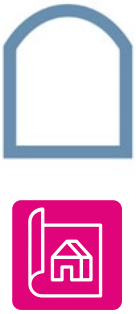
At Outline Design Stage, use of Green or Brown roofs was discounted due to fire risk. There are a number of roof forms that can be explored at detailed design stage, as outlined below:



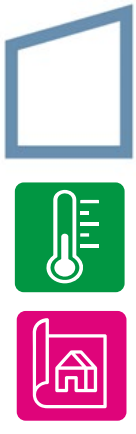
Flat roof - Typical substation-built form that ensures there is sufficient room to house the electrical components required limiting structural footprints and the overall height of the building. This is a somewhat common vernacular in the local area due to the agricultural function within the local area. 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 structures 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 visuals 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 Tendring 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

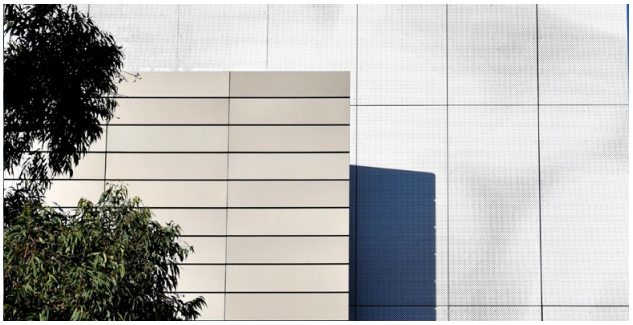


Image 6: Flat metal panelling / Source: Rob Deutscher / CC BY 2.0

Polycarbonate cladding

*No Green Guide ratings available

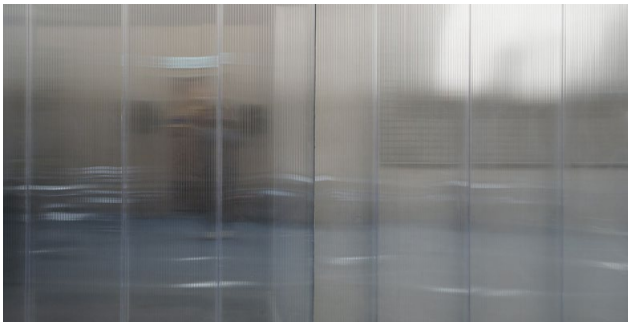


Image 7: Polycarbonate panelling / Source: ACME / CC BY-NC 2.0

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 Tendring 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.

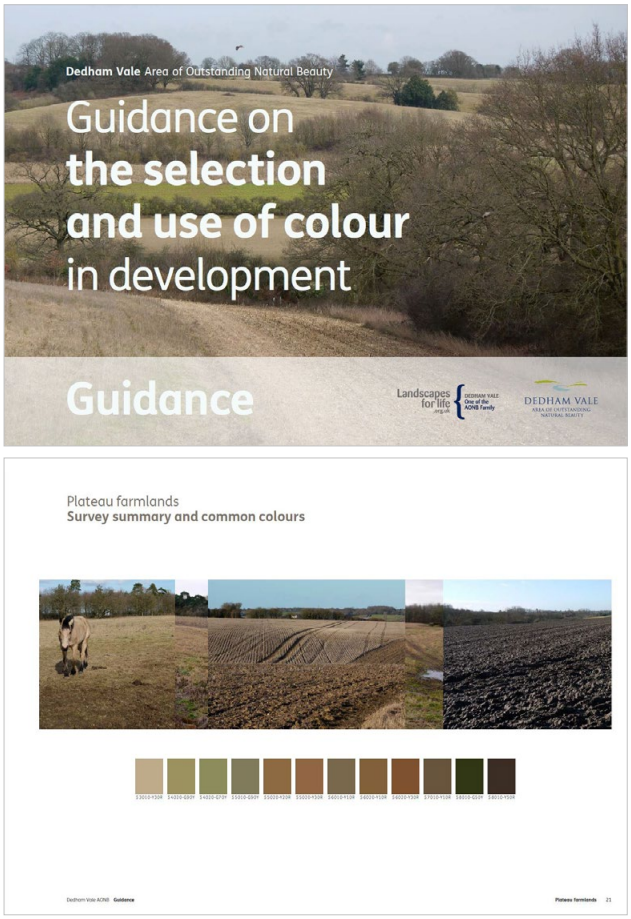


Figure 22: Dedham Vale AONB colour assessment

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.

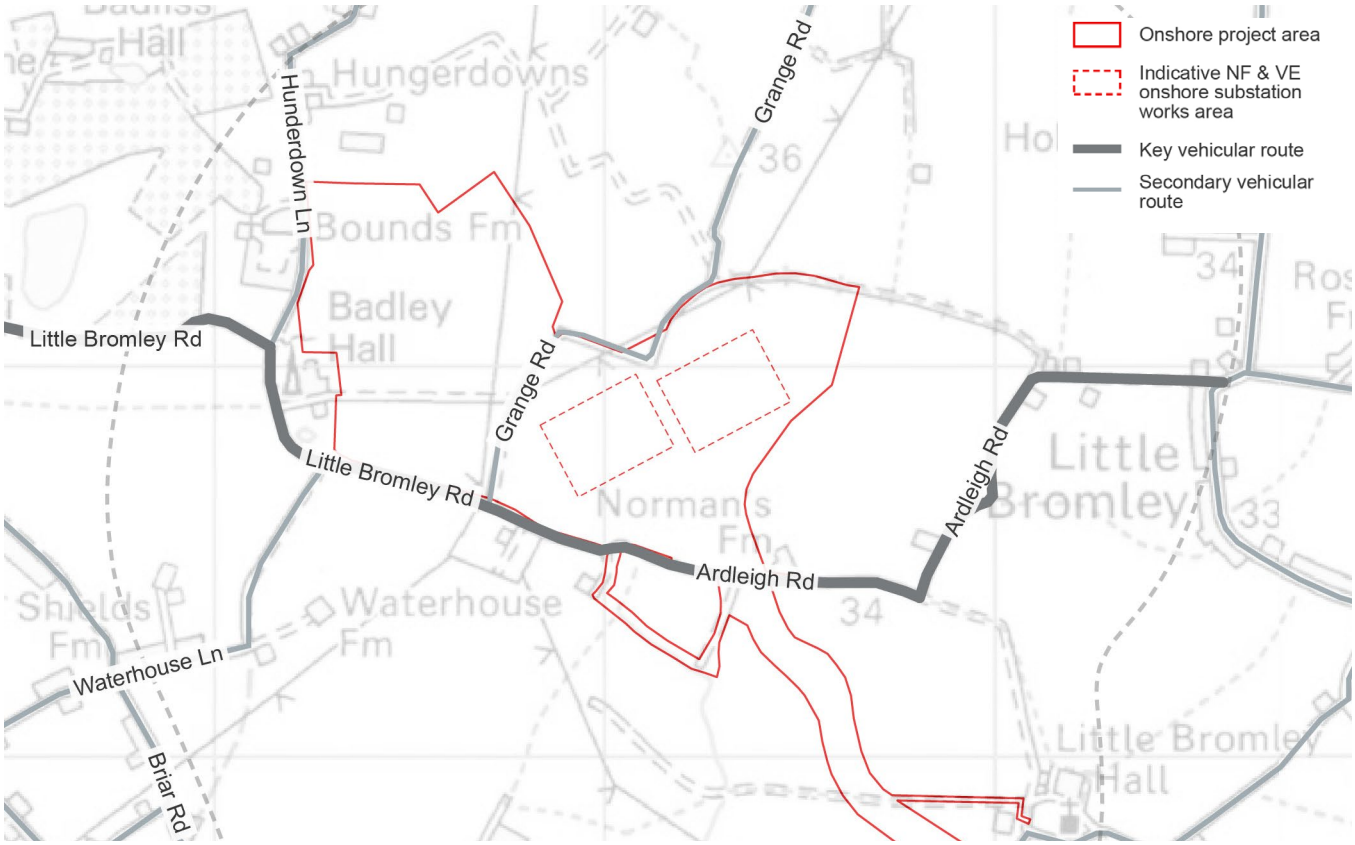


Figure 23: Existing vehicular routes around the site

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 to due 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 ore 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: Zaun

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

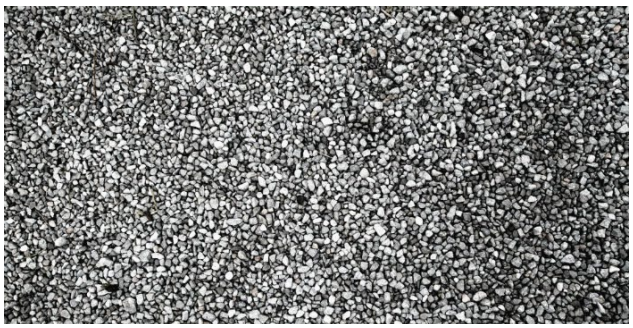


Image 14: Non-porous and Porous Asphalt

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.

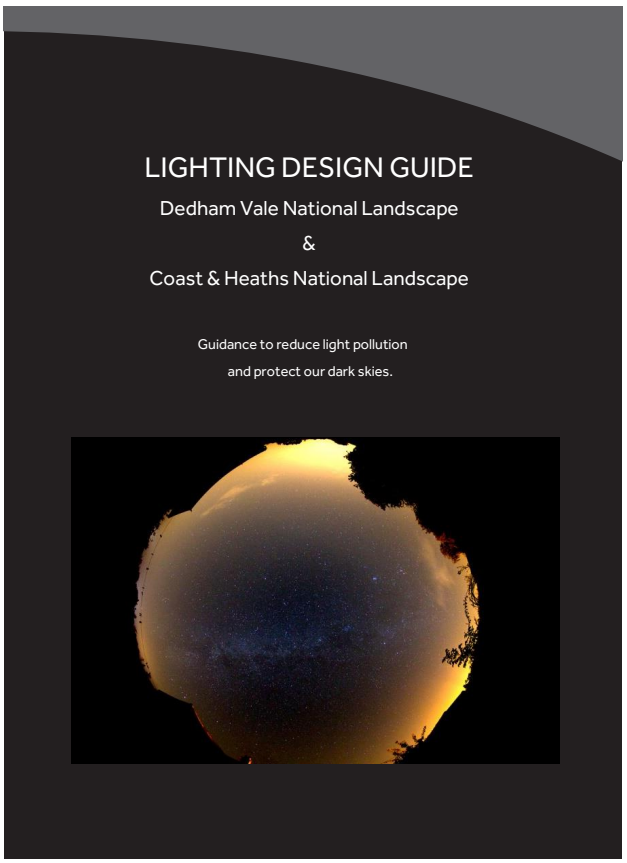


Image 18: Dedham Vale Lighting Design Guide

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

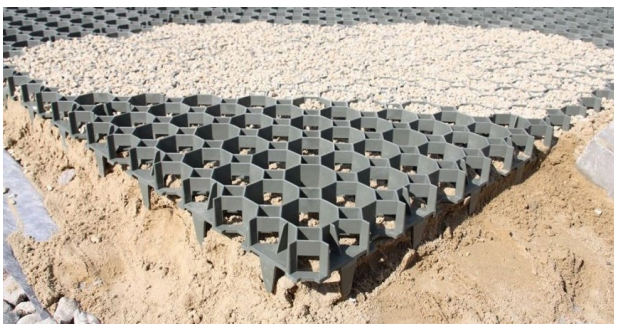


Image 21: Example of permeable paving

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

8.1 References

Image References

8.1.2

Table References

8.1 References

Reference Sources

8.1.3 Delivering Quality Development Environmental Impact Assessment Guide to. (2016). Available at: [redacted]

Essex County Council. (2018). Essex Design Guide. [online] Available at: [redacted]

Essex County Council. (2018). Guide to planting appropriate tree species for Essex | Place Services [redacted] / - (ETP, 2018)

Essex County Council. (2020) Design Guide Sustainable Drainage Systems. [redacted]

Essex County Council. (2020). Essex Green Infrastructure Strategy | Place Services. [redacted] / - (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 - (TLCA, 2001)

Natural England. (2013). NCA Profile:111 Northern Thames Basin - NE466. [online] Natural England - Access to Evidence. Available [redacted]

8.2 Glossary

Glossary of Acronyms

AOD	Above Ordance 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

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,

[redacted]

Design Council Programme Manager

[redacted]

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. 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

9.1.2

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.

9.1.2

Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Optioneering	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.		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.
	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".		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.
	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.		Noted.
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.		The emerging landscape strategy has considered the surrounding landscape context and patterns of vegetation. These comprise hedgerows with scattered hedgerow trees, shelterbellts, 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. Landscape proposals have been developed with ecologists to ensure there is a positive impact on flora and fauna. Areas of the substation that are not considered practical for a return to agriculture will be developed as Biodiversity Net Gain compensation areas.

9.1.1 Response - RAG Table

9.1.2

Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Landscape	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.		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.
	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.		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.
	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		The emerging landscape strategy has considered the surrounding landscape context and patterns of vegetation. These comprise hedgerows with scattered hedgerow trees, shelterbellts, 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.
	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.		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.

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.		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.		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.		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.

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

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).** Whist 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,

[redacted]

Design Council Programme Manager

[redacted]

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. 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	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.		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).
	Primarily, for North Falls this includes carbon usage, land take, and for Five Estuaries decision on the substation type.		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. 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. A noted in the 2nd Panel Meeting, North Falls have committed to an AIS substation, and are only seeking consent for this option. 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.
	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.		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.
Design Approach	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.		Further detail has been added to the Design Vision, identifying the design process, design criteria and choices at detailed design stage. 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.

9.2.2

Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Design Approach	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.		'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).
	This could particularly be utilised for the optioneering of Air Insulated Substation (AIS) vs Gas Insulated Substation (GIS)		'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.
	We recommend conducting a study of all the locations where trees could be planted on site to help inform a more established planting strategy.		'The tree planting strategy is based on the following approach; -Retaining existing trees -Enhancing the existing landscape character by reinforcing the lines of hedgerow trees -Introducing areas of shelter belt planting, which are present within the immediate site context. The site landsape sproposals seek to extendexisting off-site shelter belts throughout the site, creating green infrastructure linkages. -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. -A detailed Biodoversity Net Gain Assessment will be undertaken to inform the planting on the site, this will seek to maximise benefits for flora and fauna The above approach has considered the following; -Excluding areas affected by existing and proposed overhead and underground easements -Introducing planting in such a way that it reads as an extension of existing surrounding planting features that are characteristic of the landscape -Avoid creating shade over ponds and water features 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.
	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.		Diagrams provided within the Design Vision outline the design process and function of the Design Vision in this process.

9.2.2

Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Design Approach	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		Diagrams provided within the Design Vision outline the design process and function of the Design Vision in this process.
	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.		Further detail has been added to the Design Vision, identifying the design process, design criteria and choices at detailed design stage. 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.
	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		The project ambitions are outlined through the Design Vision statement included within the first chapter of the Design Vision. This incudes 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.
	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. 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.		The project ambitions are outlined through the Design Vision statement included within the first chapter of the Design Vision. Areas outside the Order Limits are beyond the scope of the project. NFOW have sough 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.
Sustainability	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		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. Green Guide ratings have been provided, where available, for all landscape materials identified at this stage.

Section	Design Council Comment	RAG Rating	North Falls and Five Estuaries Response
Sustainability	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		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. Green Guide ratings have been provided, where available, for all landscape materials identified at this stage
	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.		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.
	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.		Opportunities for implementing circular economy principles will be considered, albeit within the primary consideration of ensuring all materials 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 detailed design has been undertaken post-consent. A Greenhouse Gas Assessment has been prepared (see ES Chapter 33 Climate Change (Document Reference: 3.1.35) that includes a carbon life-cycle assessment. In addition, a Waste Assessment has been undertaken (ES Appendix 19.3 Waste Assessment (Onshore) (Document Reference: 3.3.22) which details how the Waste Hierarchy will be followed through all waste management during the Project's construction.
Biodiversity Net Gain	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.		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.

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.		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.		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 be better chances of survival with minimal maintenance; best screening the site over the long term.		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 car lowering carbon requirements during construction through reducing the need for rehoming and transporting large established plants.		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.		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.

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

21st 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

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 deign 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 incongruency 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,

Design Council

[redacted]
Design Council Senior Programme Manager
[redacted]

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. 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

ARNESSING 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