East Anglia ONE North Offshore Windfarm

Substations Design Principles Statement

Applicant: East Anglia ONE North Limited
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Applicable to East Anglia ONE North

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Glossary of Acronyms

AIS	Air Insulated Switchgear
DCO	Development Consent Order
ESC	East Suffolk Council
GIS	Gas Insulated Switchgear
NPS	National Policy Statement
OLEMS	Outline Landscape and Ecological Management Strategy
OLMP	Outline Landscape Mitigation Plan
PRoW	Public Right of Way

Glossary of Terminology

Applicant	East Anglia ONE North Limited
Cable sealing end compound	A compound which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Cable sealing end (with circuit breaker) compound	A compound (which includes a circuit breaker) which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Development area	The area comprising the onshore development area and the offshore development area (described as the 'order limits' within the Development Consent Order).
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia ONE North windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
National electricity grid	The high voltage electricity transmission network in England and Wales owned and maintained by National Grid Electricity Transmission
National Grid infrastructure	A National Grid substation, cable sealing end compounds, cable sealing end (with circuit breaker) compound, underground cabling and National Grid overhead line realignment works to facilitate connection to the national electricity grid, all of which will be consented as part of the proposed East Anglia ONE North project Development Consent Order but will be National Grid owned assets.
National Grid overhead line realignment works	Works required to upgrade the existing electricity pylons and overhead lines (including cable sealing end compounds and cable sealing end (with circuit breaker) compound) to transport electricity from the National Grid substation to the national electricity grid.
National Grid overhead line realignment works area	The proposed area for National Grid overhead line realignment works.
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia ONE North project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia ONE North project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation.
Onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia ONE North project from landfall to the connection to the national electricity grid.
Onshore substation	The East Anglia ONE North substation and all of the electrical equipment within the onshore substation and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia ONE North project.

1 Introduction

1.1 Background

1. This substations design principles statement presents the design principles to be adopted during the detailed design of the onshore substation, National Grid substation and cable sealing end compounds associated with the East Anglia ONE North Offshore Windfarm project, (the Project) for which East Anglia ONE North Limited (the Applicant) is seeking a Development Consent Order (DCO) (the Application).

2. In maintaining the Applicant's co-ordinated design approach to the development of the Project, a version of this substations design principles statement has also been prepared for the East Anglia ONE North Offshore Windfarm project.

3. As presented in ***Section 4***, throughout the pre-application and examination stages of the Project, the Applicant has recognised the localised sensitivities of the substation site, including the potential landscape and visual impacts, potential noise impacts and potential impact on the setting of the Church of St Mary, Friston. It is for these very reasons that the Applicant has, through early engagement with the supply chain, been able to adopt measures to significantly improve the design of the onshore substation and National Grid substation/cable end compounds which in turn reduces the impacts of the substations.

4. Such measures include reducing building and external equipment heights; comprehensive landscape screening; enhanced post-planting landscape management; reductions in noise levels; and an enhanced public right of way network. In addition, the Applicants have sought ensure that an appropriate long-term landscape framework would be established. This will provide opportunities to enhance local biodiversity and also to mitigate the effects on access by the establishment of a wider framework of Public Rights of Way (PRoW) rather than just diverting a single PROW.

5. Through the measures embraced within this substations design principles statement, including consultation with East Suffolk Council, immediate neighbours and the wider community, and engagement with the Design Council (or similar body), the Applicant will further enhance the design and delivery of the onshore substation and National Grid substation/cable end compounds and give confidence to what can be achieved through the final design of the Project.

6. In addition, the Applicant has entered into Section 111 agreements with East Suffolk Council (ESC) which will provide ESC with funding which can be used to support the implementation of wider initiatives.

7. These measures provide the necessary confidence to the Examining Authority and Secretary of State that further design improvements will be implemented during the detailed design of the Project.

8. This substations design principles statement should be read in conjunction with the ***Outline Landscape and Ecological Mitigation Strategy*** (OLEMS) (document reference 8.7).

9. This substations design principles statement has been informed by:

- The National Infrastructure Strategy (HM Treasury, November 2020);
- Response to the National Infrastructure Assessment (HM Treasury, November 2020);
- The National Infrastructure Commission's publication 'Design Principles for National Infrastructure' (National Infrastructure Commission, February 2020);
- The Applicant's ***Outline Onshore Substation Design Principles Statement*** (APP-585) and ***Outline National Grid Substation Design Principles Statemen***t (REP1-046);
- The successful design and delivery process adopted for the East Anglia ONE Offshore Windfarm Project (which included the submission of an outline design principles statement as part of its DCO application; Design Council design review; submission of the substation detailed design details; and subsequent approval by the relevant planning authority), which formed the framework for successfully delivering design improvements and reductions in the onshore substation's environmental impact (see ***Section 3*** below); and
- The Applicant's design and consultation process undertaken to date, which has gathered stakeholder views and opinion on the design of the onshore substation and its associated landscaping.

10. This substations design principles statement updates and supersedes the Applicant's ***Outline Onshore Substation Design Principles Statement*** (APP-585) which was submitted with the Project's DCO application and the ***Outline National Grid Substation Design Principles Statement*** (REP1-046) which was submitted to examination at Deadline 1.

1.2 DCO Requirement 12

11. This substations design principles statement, a certified document under the DCO, will inform the Applicant's submission to the relevant planning authority under Requirement 12 of the ***draft DCO*** (AS-109).

2 Design Principles Guidance

2.1 Introduction

12. The following National Policy Statements and National Infrastructure Strategy and Design Principles for National Infrastructure guidance has informed this substation design principles statement, ensuring that the principles set out are reflective of existing and emerging national policy.

2.2 National Policy Statements

13. Existing policy set out within the Overarching National Policy Statement for Energy (NPS-EN-1) makes clear the requirements of good design in energy projects, with key considerations including:

- Paragraph 4.5.1: *"The visual appearance of a building is sometimes considered to be the most important factor in good design. But high quality and inclusive design goes far beyond aesthetic considerations. The functionality of an object — be it a building or other type of infrastructure — including fitness for purpose and sustainability, is equally important. Applying "good design" to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible. It is acknowledged, however that the nature of much energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area."*
- Paragraph 4.5.3: *"In the light of the above, and given the importance which the Planning Act 2008 places on good design and sustainability, the IPC needs to be satisfied that energy infrastructure developments are sustainable and, having regard to regulatory and other constraints, are as attractive, durable and adaptable (including taking account of natural hazards such as flooding) as they can be."*

14. EN-1 NPS also states that *"Virtually all nationally significant energy infrastructure projects will have effects on the landscape. Projects need to be designed carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints the aim should be to minimise harm to the landscape, providing reasonable mitigation where possible and appropriate."*

15. EN-3 NPS for Renewable Energy Infrastructure states that "*Proposals for renewable energy infrastructure should demonstrate good design in respect of*

landscape and visual amenity, and in the design of the project to mitigate impacts such as noise and effects on ecology."

2.3 National Infrastructure Strategy and Design Principles for National Infrastructure

16. In its National Infrastructure Strategy (HM Treasury, November 2020), the Government states its ambition to deliver an infrastructure revolution – "*a radical improvement in the quality of the UK's infrastructure to help level up the country, strengthen the Union, and put the UK on the path to net zero emissions by 2050*". Woven through that strategy, as part of its ambition to accelerate and improve the delivery of infrastructure projects, is an emphasis on design quality.

17. Published alongside the National Infrastructure Strategy was the Government's Response to the National Infrastructure Assessment (HM Treasury, November 2020). This response mostly endorsed the National Infrastructure Commission's recommendations within the Assessment, including: welcoming the National Infrastructure Commission's design principles; confirming the Government's commitment to "*embedding good design in all major infrastructure projects*"; and noting the critical role that good design plays in "*delivering user satisfaction; social, environmental and economic benefits; and value for money in infrastructure projects…*".

18. The National Infrastructure Commission's publication 'Design Principles for National Infrastructure' (National Infrastructure Commission, February 2020) sets out four design principles to guide the planning and delivery of major infrastructure projects:

- **Climate** (i.e. mitigate greenhouse gas emissions and adapt to climate change);
- **People** (i.e. reflect what society wants and share benefits widely);
- **Places** (i.e. provide a sense of identity and improve our environment); and
- **Value** (i.e. achieve multiple benefits and solve problems well).

19. The guidance, published four months after submission of the Project's DCO application, proposes a useful shared design vision for national infrastructure projects, whilst also recognising that organisations should build upon the approach outlined by developing their own design vision, ambition and plan that embraces the abovementioned design principles and accounts for the circumstances of individual projects.

20. Both the National Infrastructure Commission's Design Principles publication (National Infrastructure Commission, February 2020) and the Government's Response to the National Infrastructure Assessment (HM Treasury, November 2020) recognise the valuable role a senior design champion can play in the evolution of a national infrastructure project. The National Infrastructure Commission's Design Principles publication states:

"*The Commission identified a need for championing of good design at board level on projects. The first National Infrastructure Assessment recommended that a board level design champion be appointed for every nationally significant infrastructure project. Their role will be to make sure good design is prioritised from the early stages of a project, provide a continual emphasis on that design vision throughout and hold board members and project management to account for delivering those design objectives.*

21. To achieve the design principles and objectives set out above and recognising the functional requirements of the onshore substation and National Grid substation, the Applicant has set out in ***Section 5*** below the structure and principles guiding further design maturation post consent.

22. This process set out in ***Section 5*** (and secured by Requirement 12 of the ***draft DCO*** (AS-109)) updates and builds on the process successfully deployed for East Anglia ONE Offshore Windfarm (as described in ***Section 3*** below).

3 East Anglia ONE Offshore Windfarm Design & Delivery Process

3.1 The East Anglia ONE Project

23. East Anglia ONE is a 714 megawatt (MW) offshore windfarm located in the North Sea, 43km from the East Anglian coast. The project connects into an onshore substation at Bramford in Mid-Suffolk. The windfarm is a joint venture between ScottishPower Renewables and Green Investment Group. ScottishPower Renewables is the parent company of East Anglia TWO Limited and East Anglia ONE North Limited, and these projects benefit from the significant experience and expertise gained on the East Anglia ONE project.

3.2 Design Principles Adopted

24. The design and delivery process adopted for the East Anglia ONE onshore substation comprised:

- Engagement with local communities and stakeholders during the pre-application stage of its DCO application regarding the onshore substation design and landscape mitigation;
- Submission of an outline design principles Statement[1] with the DCO application, which set out the considerations and process for finalising the detailed design and which achieved design improvements and reductions in the environmental impact of the onshore substation;
- Engagement with local communities and stakeholders post consent, as part of the detailed design process; and
- Commissioning of the Design Council to undertake an independent design review of the onshore substation.

25. The East Anglia ONE outline design principles statement allowed the East Anglia ONE design teams to further develop and refine the design of the onshore substation based on stakeholder's feedback; the Design Council independent design review; and the design team's challenge and refinement of the design envelope through the procurement and detailed design stage to reduce the environmental impact of the project.

[1] At the time of the East Anglia ONE DCO application, an Outline Convertor Station Design Principles Statement was submitted. Project design evolution resulted in the convertor station being replaced with an onshore substation.

3.3 Design Council Feedback

26. The Design Council's response to the project's initial design brief submission recognised: *"the project team's commitment to good design, the extensive research and analysis undertaken of the existing environment and careful consideration given to the site's natural assets are an excellent starting point for this project"*.

27. The Design Council's feedback comprised of three core themes:

- **Principles:** for instance, a key recommendation was to develop a strategic masterplan to guide the evolution of the landscape in a holistic way and inform the development of an appropriate architectural response. The Applicant has adopted this approach for the Project, through the Outline Landscape Management Plan presented in the ***Outline Landscape and Ecological Management Strategy*** (document reference 8.7), which considers the landscape mitigation necessary for the East Anglia TWO onshore substation, East Anglia ONE North onshore substation, National Grid substation, and National Grid cable sealing end compounds.
- **Landscape:** for instance, use of a varied woodland mix; use of mesh fencing; reuse of excavated material to form berms; establish early planting.
- **Substation building and surrounding equipment:** for instance, development of functional, simple, crisply detailed substation building but which responds successfully to the surrounding context.

3.4 Design Iteration

28. The engagement process and Design Council independent review resulted in improvements to the onshore substation design, which were incorporated into the procurement and detailed design stages of the project which delivered:

- A maximum 'as built' building height of 68m AOD (12m), reduced from 75m AOD (19m) as specified in the DCO (i.e. a 7m reduction); and
- A maximum 'as built' external equipment height of 68m AOD (12m), reduced from 69m AOD (13m) as specified in the DCO (i.e. a 1m reduction).

29. The East Anglia ONE project's successful approach to delivering a co-ordinated design which reflects local stakeholder's views where possible, and reduces the environmental impact of the project, has been adopted for the East Anglia TWO and East Anglia ONE North projects. Furthermore, the approach has been refined for the East Anglia TWO and East Anglia ONE North projects to reflect updated policy and guidance including the National Infrastructure Commission's 'Design Principles for National Infrastructure'.

4 Design Evolution to Date

30. 'Good design' has and continues to be promoted by the Applicant as part of the ongoing design iteration process. This has been applied at various levels, from the strategic siting choices; local siting and co-location of the substations; the landscape design around the onshore substation and National Grid infrastructure; and within the substation layout itself, all of which with regard to reducing the harm to the landscape and local environment through careful siting and design.

31. Feedback from stakeholders during the pre-application stage of the Project (in particular through the 39 Public Information Days held by the Applicants and through the Applicants' consultation on the Project's preliminary environmental information), and through representations made during examination, has been invaluable in allowing the design of the onshore substation and National Grid substation/cable sealing end compounds to be improved.

32. The following sections set out a brief overview on the key measures that have improved the Project's design and sough to reduce its environmental impact.

4.1 Stakeholder Engagement

33. The Applicant has undertaken extensive stakeholder engagement throughout the pre-application stage of the project, including 39 Public Information Days attended by over 2,400 stakeholders, numerous meetings with parish councils and community groups, and numerous meetings with East Suffolk Council, Suffolk County Council and statutory consultees such as Natural England and Historic England. Such feedback informed the Project's design and mitigation measures which formed the basis of the Application.

34. The examination itself has also provided the opportunity for stakeholders to formally make their latest views known and this has in turn allowed the Applicant to further refine and improve the Project's design. In addition to the careful review and addressing of representations made from all parties, including open floor hearings, issues specific hearings and written representations, extensive engagement has also been ongoing throughout the examination stage with East Suffolk Council, Suffolk County Council and statutory consultees such as Natural England and Historic England.

35. This feedback has been invaluable in allowing the design of the onshore substation and National Grid substation/cable sealing end compounds to be improved through the Applicant's acceleration of its supply chain engagement, (which typically occurs post consent) to reduce parameters such as building

heights, external electrical equipment heights and noise levels. These improvements, combined with refinement of the landscaping mitigation and the public rights of way network, have reduced the landscape and visual; cultural heritage; noise; and recreation (public rights of way) impacts whilst also increasing the future PRoW network and also facilitating opportunities for habitat enhancement.

4.2 Site Selection

36. With regard to the onshore substation, National Grid's Guidelines on Substation Siting and Design (The Horlock Rules) have been taken into consideration during the site selection process. The selected onshore substation location demonstrates good aesthetic as far as possible. Specifically, the selected location avoids all International, National, county and local landscape designations. It does not affect any ancient woodland and mitigation measures ensure hedgerow loss which would occur is compensated for in new planting around the onshore substation as set out in the ***OLEMS*** (document reference 8.7) as described further in ***section 4.3***.

4.3 Onshore Substation Design Envelope

37. Since submission of the Application, the Applicant has continued to refine the design of the onshore substation and National Grid substation through engagement with the supply chain and design teams. The following key improvements have been made:

- Reduction in the footprint of the onshore substation and its resulting relocation (as summarised in the ***Project Update Note*** (REP2-007) submitted at Deadline 2);
- Lowering of the finished ground levels at the locations of the eastern onshore substation and National Grid substation (as summarised in the ***Project Update Note for Deadline 3*** (REP3-052); and
- Reduction in the onshore substation maximum heights of the buildings and external equipment (as summarised in the ***Project Update Note for Deadline 3*** (REP3-052).

38. The above yielded a number of environmental improvements for the Project. For example, the reduced onshore substation footprint allowed for the retention of an existing area of established woodland which would have previously been removed. Furthermore, the lowering of maximum building and external equipment heights, and refinement of the estimated finished ground levels resulted in the lowering of the maximum datum height of the onshore substation and National Grid substation buildings and external equipment. This has

benefited both landscape and visual receptors, but also the setting of cultural heritage assets and significantly reduces the visibility of the infrastructure from wider approaches to and from within Friston.

4.4 Outline Landscape and Ecological Management Strategy

39. The ***OLEMS*** (document reference 8.7) demonstrates good landscape design in terms of the sympathetic design of proposed new landscape features, enhancement of woodland areas and restoration of historic field boundaries. New planting has been designed to integrate the development into the landscape, consisting of both backdrop and screening planting, as described in the **OLEMS** to mitigate landscape and visual impacts.

40. The ***OLEMS*** also addresses local design guidance through:

- The use of locally appropriate native woodland and hedging species;
- Design of field layouts to be in keeping with the local field pattern or the historic pattern of boundaries where possible;
- Providing opportunities to design locally appropriate planting schemes to reduce the visual impact further;
- Providing the option to modify the management of existing hedgerows to retain these boundary features at a specific height;
- The careful consideration of the location of the development in relation to existing trees to act either as screening or as a backdrop;
- New planting designed to integrate the development into the character of the landscape, consisting of both backdrop and screening planting;
- Increasing the stock of hedgerow trees; and
- Increasing the extent of woodland cover, with effective management.

4.5 Landscape and Visual

4.5.1 Outline Landscape Mitigation Plan

4.5.1.1 Design Principles / Good Design

41. The Landscape and Visual Impact Assessment (LVIA) of the onshore substation and National Grid substation identified that the extent and height of mature woodland adjacent to their locations, particularly at Grove Wood and Laurel Covert, will provide mitigation of landscape and visual effects from the outset through substantial screening.

42. Deliverable and effective mitigation of the potential landscape and visual impacts of the onshore substation and National Grid infrastructure will also be delivered in the form of new woodland, hedgerow and tree planting linking with these

existing areas of woodland. These are proposed in the ***Outline Landscape Mitigation Plan*** (OLMP) presented within the ***OLEMS*** (document reference 8.7), the development of which was iterative and took into account views expressed by the local community and stakeholders such as East Suffolk Council and Historic England, and gives careful consideration to the locations of types of new planting to ensure potential landscape, visual and cultural heritage impacts have been reduced.

43. The resulting proposals are therefore an appropriate response to the mitigation requirements of the substations in the local landscape context, taking account of the potential impact on the landscape, the opportunities to minimise harm through reasonable mitigation and delivery of good design relative to the landscape, both past and present, its landform, vegetation and views.

44. The OLMP responds to both the national and local policy framework and the comments of the local community and consultation bodies throughout the design process in order to meet policy objectives. The Applicant engaged in extensive consultations with East Suffolk Council, Suffolk County Council, Natural England and Historic England via a series of technical working group meetings. These comments allowed design refinement and have been incorporated within OLMP.

4.5.1.2 Concept Design

45. The location, shape and internal arrangement of the onshore substation and National Grid substation are defined by technical constraints and health and safety requirements. The OLMP proposals focus on the land surrounding the substations and how their landscape and visual impacts may be mitigated and contained within the surrounding landscape.

46. During development of the OLMP, three approaches to landscape design were considered: ‘hidden’, ‘integrated’ and ‘exposed’. These options are illustrated and described in ***Plate 4.1***.

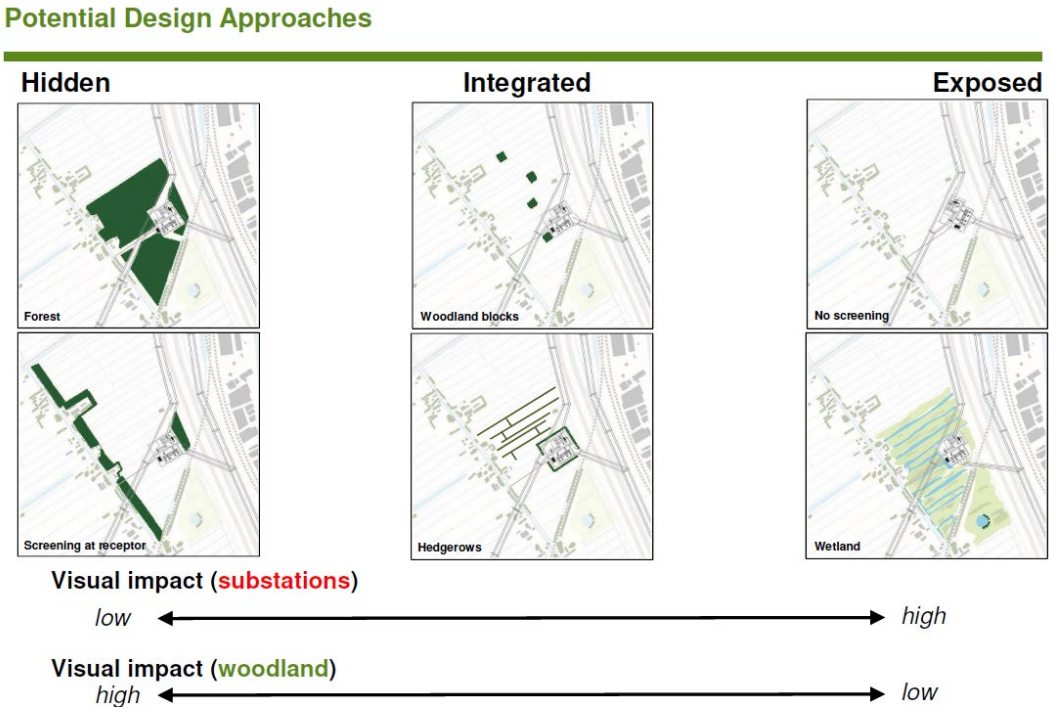


Plate 4.1 Potential Landscape Design Approaches for the OLMP

47. The landscape design approach selected for the substations combines the approaches of hiding and integrating them into the landscape to meet the mitigation requirements and address the local landscape character and the historic landscape context.

48. This approach results in the substations having a lower landscape and visual impact in the long-term, once woodland and hedgerow planting is maturing, with specifically placed woodland blocks / shelterbelts, hedgerows and tree lined field edges to hide and integrate the substations, reducing the visual impact in specific views.

4.5.1.3 Landscape Proposals

49. The OLMP presented within the ***OLEMS*** (document reference 8.7)comprises areas of substantial native woodland planting near the onshore substation and National Grid substation, set back from the main visual receptors (such as Friston) to provide screening, while also retaining the open rural setting; supplemented by smaller characteristic woodland blocks, new hedgerow planting along historic hedgerow field boundaries and individual field boundary tree line planting, to provide a layered screening approach.

50. The OLMP is historically appropriate, through proposals to re-establish field boundaries lost to agricultural intensification, re-establishment of historically

mapped tree-lined enclosures and locally characteristic covert woodland blocks, to achieve screening whilst retaining farmsteads in their essentially open, farmed landscape setting.

51. A newly planted woodland framework will be established around the substations, with the key element being a substantial belt of woodland forming a 'screening zone' linking Grove Wood and Friston House Wood to the north of Friston. This will also deliver biodiversity improvements over the current agricultural land use at the substations. This woodland belt is located north of Friston away from the immediate vicinity of Friston, so as not to significantly impact on the setting of Friston and retain the open rural setting of the village, while also providing screening of the onshore substation and National Grid substation as shown within ***Different Colour Scheme for Substation Design Principles Statement - Viewpoint 2 - Friston, Church Road*** (REP8-067) (merlin grey cladding scheme reproduced in ***Plate 4.2***).

Plate 4.2 Example of the screening provided by the OLMP in local view from edge of Friston (bottom image at Year 15)

52. The OLMP includes the establishment of different types of native woodland planting, consisting of a core native woodland, native edge woodland and native screening woodland. In total, an area of around 11.4 hectares of new woodland

planting is proposed, much of which will convert areas of arable land into native woodland habitat.

53. Early woodland and hedgerow planting will be implemented in locations where it is possible to achieve early planting, in order to ensure the timely establishment and growth of woodland plants.

54. The OLMP includes substantial lengths of new mixed native species hedgerow planting and the reinstatement of existing 'gappy' hedgerows around the onshore substation, totalling approximately 4.5km in length of new native hedgerow habitat.

55. Where other fields will not be returned to agricultural use, species rich grassland areas will be established on around 14.4 hectares around the substations by seeding with locally native grass and flower species, to enhance local biodiversity and provide further 'natural' contrast with the built elements of the onshore substations. Areas of wet grassland will also be established around the SuDS ponds.

56. Overall, the design of the OLMP is intended to respond to local character and as far as possible address potential visual impacts and cultural heritage setting impacts, while delivering habitats that will succeed and thrive over the long-term, providing a meaningful legacy and benefit for local biodiversity and wildlife.

4.5.2 Landscape Management Plan

57. A Landscape Management Plan (LMP) will be developed for the onshore substation and National Grid infrastructure, based on the OLMP, with the LMP to be integrated with the ongoing substation design and to include details of all proposed hard and soft landscaping works, including a detailed scheme of tree and shrub planting and aftercare.

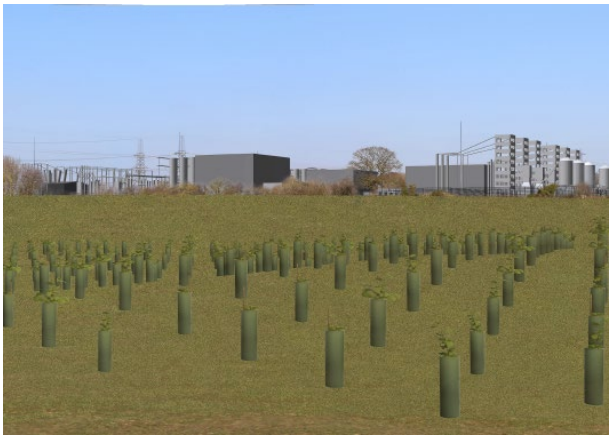
58. The Applicant will prepare and implement a LMP based upon an adaptive planting management scheme, to ensure the application of best practice in the implementation and management of the landscape planting and achieve optimum levels of plant growth and condition, providing confidence that effective screening from the tree planted areas will be achieved.

4.5.3 Architectural Framework

59. Acknowledging the visual representations of the architectural appearance of the substations is based on a concept design, further opportunities exist through the detailed design and stakeholder consultation events to further improve the architectural finish of the substations, and further reduce their impact.

60. ***Plate 4.3*** and ***Plate 4.4*** below illustrates the change in visual appearance which can be achieved through varying the colour palette of the buildings within the onshore substation.

Camouflage



Merlin Grey

Olive Green

Quartz Grey

Plate 4.3 Viewpoint 1 Extract: Example of different colour treatments for substation buildings (*Different Colour Scheme for Substation Design Principles Statement - Viewpoint 1 - Public Rights of Way near Friston House* (REP8-066))

Plate 4.4 Viewpoint 2 Extract: Example of different colour treatments for substation buildings (Document Number ExA.AS-30.D8.V1)

61. These options will be explored with the local community during the post consent engagement strategy, in order to arrive at an acceptable colour solution for the substation buildings.

4.5.4 Benefits of Project Design Refinement

62. The abovementioned Project's design refinements, including the reduction in the footprint of each of the onshore substations and their resulting relocation, reducing in the maximum heights of the buildings and external equipment, as well updates to the OLMP, are beneficial in reducing the landscape and visual effects of the Project's substations and improving their accommodation in the landscape and views.

63. Visual effects principally occur on receptors in a contained geographic area on the northern edge of Friston (Church Road area) and the PRoW network to the north of the village, however visual effects have been reduced as a result of the design refinements in views from the Friston area to the south. The eastern onshore substation in particular, will be virtually screened in its entirety, such that its visual effects are not significant, and effects of the western onshore substation have also been reduced as a result of the reductions in scale and massing of visible elements and increased screening, such that just the upper elements will be visible.

64. The changes in visual effects are smaller from the north and north-west as the National Grid infrastructure is more prominent, and there is less scope for planting in constrained areas near the existing overhead transmission lines, however even from these locations the overall scale and massing of the onshore substations has been reduced, making the proposed mitigation planting measures and existing screening more effective, which combine to lessen the intensity of visual effects experienced by walkers on the local PRoW during the operational life of the substations.

65. Overall, the reduction in the footprint of each of the onshore substations and their resulting relocation, refinements to finished ground levels, reduction in substation equipment heights and updates to the OLMP are beneficial in terms of further mitigation provided and reduction in landscape and visual effects.

4.6 Onshore Ecology

66. The development of onshore substation and National Grid substation will result in the permanent loss of some arable land, hedgerows, a small area of woodland (at Laurel Covert). However, extensive habitat creation and enhancement will be undertaken in and around the onshore substation and National Grid infrastructure locations. This will include enhancing hedgerows with native 'woody' species, creating amenity grassland surrounding the substations and the development of surface water infiltration/attenuation ponds, which will include marginal, wet grassland planting and planting native trees, species rich, where appropriate to do so.

67. These opportunities will result in the creation of approximately 11.4 hectares of woodland, approximately 4.5km of hedgerow and approximately 14.4 hectares of grassland. Although the primary aim of this landscape planting is to mitigate visual impacts associated with the onshore substation and National Grid substation, there will be secondary benefits to ecological receptors. For example, the planting of hedgerows will provide wildlife corridors, most notably commuting and foraging habitat for bats which are a European Protected Species (EPS), as well as providing commuting and foraging habitat for local bird species. Planting

of woodland blocks will provide habitat for local wildlife such as squirrels (*Sciuridae spp.*), foxes (*Vulpes spp.*) and deer (*Cervidae spp.*), including protected species such as badgers (*Meles meles*). The areas of woodland may also provide opportunities for roosting bat species (*Myotis spp.*) or barn owls as individual trees mature. The wetland habitat provided by the establishment of the SuDS ponds will be beneficial to amphibians and common reptile species such as great crested newts (*Triturus cristatus*), common lizards (*Zootoca vivipara*) and grass snakes (*Natrix natrix*). Verge and hedgerow habitat will provide wildlife corridors between existing ponds and the proposed SuDS ponds, as well as connectivity to the wider area, for local wildlife. Verge habitat will additionally provide refuge for local common reptile species.

68. Landscape and ecological works in the vicinity of the substations, such as designing SuDS for biodiversity, 'gapping up' hedgerows and tree planting, ensures that ecological enhancement will occur in this area as a result of the Projects.

69. An Ecological Management Plan (EMP) will be developed, based on the ***OLEMS*** (document reference 8.7), for the onshore substation and National Grid infrastructure. This will be implemented through the appointment of an Ecological Clerk of Works (ECoW). The EMP will include details of the onshore ecological requirements that will be implemented and monitored by the ECoW throughout the works associated with the onshore substation.

4.7 Noise

70. The Applicant has undertaken early engagement with equipment supplies to explore opportunities to further reduce the noise levels from the onshore substation. These discussions have given the Applicant's confidence in the ability to reduce noise levels from key equipment items in order to reduce received noise levels at the nearest residential properties to 31dBA and 32dBA. Feedback from the supply chain, and from the Applicants nose experts, is that these noise levels are considered to be among the lowest for any comparable onshore substation.

71. Further discussion will be undertaken during the detailed design process to where the Applicant will seek to further minimise the operational noise rating level below the limits set out in Requirement 27 of the DCO and avoid any perceptible tones and other acoustic features insofar as these mitigation measures do not add unreasonable costs or delays to the Project or otherwise result in adverse impacts on other aspects of the environment (e.g. landscape and visual impacts). It is at this detailed design stage that determination of the final mitigation measures will be established.

72. The Onshore Substation Operational Noise Assessment (REP5-022) submitted to examination has also reflected the reduced substation footprint. The changes to the modelling included the reduction in footprint of the onshore substation from 190m x 190m to 190m x 170m and the resultant positional micro-siting of equipment and buildings. These changes ultimately enabled a reduction in the ***draft DCO*** (AS-109) noise levels from 34dB $L_{Aeq\ (15\ min)}$ to 32dB $L_{Aeq\ (15\ min)}$ at noise sensitive receptors SSR2 and SSR5 (NEW).

73. As part of this update, and in recognition of the to the north of the substations, the noise sensitive receptor identified as SSR3 has been added to the ***draft DCO*** at the request of East Suffolk Council; the noise rating level at this location is proposed to be 31dB $L_{Aeq\ (15\ min)}$.

74. The above refinements have facilitated agreement with ESC on the noise limits set out in the ***draft DCO*** (AS-109).

75. An additional assessment considering non-residential receptors which addressed primarily noise levels (which, in the context of the PRoW, are notably higher during daytime compared to night-time levels) along the closest Public Rights of Way (PRoW) was also completed, the outcome of which found the noise levels from the operational onshore substation would be negligible in significance.

5 Substations Design Principles

5.1 Design Principles to be Adopted

77. The following design principles will be used to develop (and thereafter submit for approval) details of the onshore substation, National Grid substation and National Grid cable sealing end compounds, in accordance with Requirement 12 of the ***draft DCO*** (AS-109).

78. The design principles are shown in bold in ***Table 5.1***, categorised in line with the four design principles to guide the planning and delivery of major infrastructure as set out in 'Design Principles for National Infrastructure' (National Infrastructure Commission, February 2020).

Table 5.1: Design Principles to be Adopted

Ref	NIC Design Principle	Applicant's Design Principle	Activity
1	People and Value	**Reduction of visual impact of onshore substations, National Grid substation and cable sealing end compounds**	The design of the onshore substations, National Grid substation and cable sealing end compounds will be compliant with the maximum parameters prescribed in the ***draft DCO*** (AS-109). Where cost effective and efficient to do so, the Applicants will seek to further reduce the visual extent of the onshore substations, National Grid substation and cable sealing end compounds, through appropriate equipment procurement and layout considerations.
2	Places	**The cable sealing end compounds will be aligned to existing field boundaries where possible**	The design and orientation of the cable sealing end compounds will be aligned to field boundaries where possible, noting the need to maintain safety distances and alignment with the overhead lines.
3	People and Value	**Operational equipment will be designed and installed to maintain low noise levels of no more than 31dBA at SSR2 and SSR5 (NEW) and 32dBA at SSR3**	The design of the onshore substations and national Grid substation will be compliant with the noise limits prescribed in the ***draft DCO*** (AS-109), considered to be one of the lowest noise limits for such developments. In line with the ***draft DCO*** (AS-109) the Applicant will produce an Operational Noise Design Report which will set out the following: • Layout of the onshore substations and National Grid substation; • Equipment specifications (with regard to sound power levels); • Details of any physical attenuation measures such as acoustic screens or bunds; • Noise prediction methods and the results obtained from the modelling including consideration of uncertainty in the predictions; • Provision of 1/3 octave spectrum information at the noise sensitive locations specified within Requirement 27 of the DCO; • High frequency noise information (in 1/3 octave bands from 8kHz to 20kHz); and

Ref	NIC Design Principle	Applicant's Design Principle	Activity
			• Where available, provide supplier information / measurement data to inform consideration of the audibility of tones using the reference method set out in Section 9.3.3 and Annex D of BS4142:2014+A1:2019. The Applicants will meet with the Councils as required to discuss the findings of the Operational Noise Design Report and will address reasonable queries arising from such engagement. The Applicants will seek to minimise the operational noise rating level below the limits set out in Requirement 27 of the ***draft DCO*** (AS-109) and avoid any perceptible tones and other acoustic features at any residential receptor that would attract a correction in accordance with BS4142:2014+A1:2019, insofar as these mitigation measures do not add unreasonable costs or delays to the Projects or otherwise result in adverse impacts on other aspects of the environment (e.g. landscape and visual impacts).
4	People and Value	**Include engagement with Parish Councils, local residents and relevant planning authorities**	Continued engagement with Parish Councils, local residents and relevant authorities (Suffolk County Council and East Suffolk Council) on design and landscape proposals. Opportunity will be provided through the development of the design and landscape proposals to seek feedback from local communities who will be directly affected by the development and where appropriate, the feedback received will form part of the onshore substation, National Grid substation and National Grid cable sealing end compounds procurement and/or detailed design process. Appendix A presents further information on the engagement which will be undertaken to inform and influence the design development of the substations and the associated timing for those consultation stages.
5	People and Value	**Ensure feedback from appropriate professional expertise in landscape, cultural heritage, planning, engineering and design and from members of the public, will continue to influence the design**	This feedback will ensure opportunities are identified, tested and pursued to achieve an appropriate, fit for purpose design outcome. Through the Applicant's pre-application consultations with stakeholders, including Expert Topic Groups and Public Information Days, feedback has been received which has already influenced the Project's design, including the footprint and height of the onshore substation and the surrounding landscape.

Ref	NIC Design Principle	Applicant's Design Principle	Activity
6	People and Value	**Be informed by a design review with the Design Council (or similar body), in consultation with the relevant local planning authorities**	The output of this design review will inform the onshore substation, National Grid substation and National Grid cable sealing end compounds procurement and/or detailed design process. Appendix A presents further information on engagement with the Design Council (or similar body).
7	People and Value	**Designate a senior business representative as the design champion**	Designation of Mr Jonathan Cole, Managing Director, Iberdrola Renewables Offshore Wind Division, as the design champion for the project, in order to maintain the necessary focal point and co-ordination in the progression of good design.
8	Climate, People, Places and Value	**Consider 'Good Design' in line with the requirements of Overarching National Policy Statement for Energy (NPS EN-1) and the National Infrastructure Commission's 'Design Principles for National Infrastructure' (National Infrastructure Commission, February 2020)**	Use of NPS EN-1 and National Infrastructure Commission's 'Design Principles for National Infrastructure' and these design principles to inform the Project's design process.
9	Places	**The visual impacts of the substation buildings will be minimised as far as possible by their sensitive placing, the use of appropriate design, building materials, shape, layout, coloration and finishes**	Appropriate building design and materials will be actively sought as part of the procurement process.
10	Climate, People, and Places	**Use of planting to minimise visual effect and maximise screening opportunities**	On-site mitigation planting proposals will be undertaken within the onshore development area immediately around the onshore substation, National Grid substation and National Grid cable sealing end compounds, in order to minimise its visual effect and maximise screening opportunities from key viewpoints/receptors, while also responding to local landscape character, pattern and growing conditions.

Ref	NIC Design Principle	Applicant's Design Principle	Activity
11	Climate, People, and Places	**Use of bunds to support visual screening**	The overall site design will maximise the opportunity for site won topsoil and subsoil materials to be reused on site within landscape earthworks 'bunds'. These bunds will support the visual screening of the onshore substation and National Grid substation while having a gradual external slope gradient that appears natural and complements the existing terrain (when looking towards the onshore substation). Further details are presented within the ***OLEMS*** (document reference 8.7). The Applicant is committed to utilising suitable material excavated on site for the creation of bunds (or berms) although note that until detailed ground investigation information is obtained as part of the detailed design process, the quantity of suitable excavated material to form engineered bunds will not be known.
12	Climate, People, Places and Value	**Enhancement of Public Rights of Way**	The overall site design will seek to deliver gains for public amenity, including enhanced access through Public Rights of Way (PRoW) proposals and areas for landscape planting. Further details are presented within the ***Outline PRoW Strategy*** (REP3-024) which describes the ca. 1km of new PRoW to be provided in the area of the onshore substation/National Grid substation.
13	Climate, People, and Places	**Include use of low maintenance ground cover species, establishment of native woodland/trees native woodland and the return of unrequired land to agricultural use where feasible.**	Landscaping planting of species rich grassland areas will be established to provide a low maintenance ground cover which also enhances the local biodiversity in areas that are not to be returned to agricultural use or planted as woodland. The overall site design will also identify land around the onshore substation and National Grid substation that will be returned to agricultural use during the operational period where feasible. Further details are presented within the ***OLEMS*** (document reference 8.7).
14	Climate, and Places	**Incorporation of ecological enhancement considerations within the adopted landscaping scheme to maximise the habitat creation on the site**	On site mitigation planting will promote ecological enhancement and planting proposals will be considered along with building design and layout of ancillary structures. Further details are presented within the ***OLEMS*** (document reference 8.7). The overall site design should have regard to the potential for embedded ecological mitigation and enhancement.

Ref	NIC Design Principle	Applicant's Design Principle	Activity
			The SuDS solution for the onshore substation, National Grid substation and National Grid cable sealing end compounds, as a minimum, will include a ponded area, which will deliver habitat creation on the site. Further details are presented within the ***OLEMS*** (document reference 8.7) and ***Outline Operational Drainage Management Plan*** (REP3-046).
15	Climate	**The design will optimise generation of renewable energy to displace carbon emissions and meet national and international carbon reduction and renewable energy targets, in line with the project objectives**	The fundamental purpose of the Project is to combat climate change through the deployment of a renewable energy source. The functional nature of the onshore substation and National Grid infrastructure and the need to operate a safe and efficient electricity transmission asset is a fundamental design constraint that must be recognised at all times, whilst achieving the above-mentioned design principles.
16	People, Places and Value	**Promotion of an integrated design**	In order to ensure a co-ordinated design is maintained and communicated to stakeholders, as the substations architectural and landscape framework evolves during the detailed design stage, the Applicants will maintain a masterplan of the substation area for information purposes. Masterplans will be made available for information at Stage 1, Stage 2 and Stage 3 of stakeholder consultations (described in ***Appendix A***) and will be provided for information to the relevant planning authority and Suffolk County Council in parallel with the following Requirement Discharge Documents: • Requirement 12 (detailed design parameters onshore); • Requirement 14 (provision of landscaping); • Requirement 17 (fencing and other means of enclosure); • Requirement 21 (ecological management plan); • Requirement 32 (public rights of way); and Requirement 41 (operational drainage management plan).

5.2 Design Champion

79. As demonstrated by the successful delivery of the East Anglia ONE Offshore Windfarm, the organisational structure and process adopted during the detailed design of the East Anglia ONE onshore substation is effective and secured environmental improvements in the delivery of the project.

80. To reaffirm this process for the Project, the Applicant will designate Mr Jonathan Cole, Managing Director, Iberdrola Renewables Offshore Wind Division, as the design champion for the Project in order to maintain the necessary focal point and co-ordination in the progression of good design for the Project's onshore substation the National Grid substation and cable sealing end compounds. The design champion will ensure effective design co-ordination between the Project's onshore substation, the National Grid substation and cable sealing end compounds, and the adjacent East Anglia ONE North project. The design champion will also ensure that good design continues to be prioritised and will provide a continual emphasis on that design vision throughout, holding the Project's delivery team to account for delivering those design objectives.

6 Estimated Finished Ground Levels and Maximum Visual Envelope

6.1 Finished Ground Levels

81. The Applicant has further considered the finished ground levels of the onshore substation and National Grid substation adopted for the Application. Whilst acknowledging the need for future geotechnical and detailed design studies to be undertaken (in order to establish the soil properties, bearing capacity, groundwater levels etc.), further refinement to the estimated finished ground levels has however been possible at this early stage which allows more certainty on the visual envelope of the Project.

82. In considering revisions to the estimated finished ground levels, the following key principles have been followed which are considered reasonable for the current pre-consent/pre-detailed design phase of the Project:

- Maintain the height differential in finished ground levels between each onshore substation and the National Grid substation at no more than 0.5m for constructability and maintenance reasons;
- Ensure excess material from ground levelling is not unreasonably excessive so as to have a consequential impact on assessed vehicle movements;
- Seek reductions in the finished ground levels compared to that presented within the visualisations which accompany ***Chapter 29 – Landscape and Visual Impact*** (APP-077) and therefore seek to reduce the environmental effects of the Projects.

83. Other factors that could influence the final finished ground level, includes surface water drainage design requirements and groundwater constraints, to ensure appropriate management and control of groundwater interactions in the design of the onshore substation.

84. In undertaking this review, the Applicant has revised the estimated finished ground levels (expressed in Above Ordnance Datum (AOD)) from that which the Applicant's photomontages were based (***Chapter 29*** (APP-077)) as presented below:

- Onshore substation (eastern location): Estimated finished ground level reduced from 20.7 to **18.7m AOD**;

- Onshore substation (western location): Estimated finished ground level remains at **18.2m AOD**; and
- National Grid substation: Estimated finished ground level reduced from 18.9m to **18.2m AOD**.

6.2 Onshore Substation Height Reductions

85. Further review of the project design envelope and early supply chain engagement has allowed the Applicant to reduce the height of the buildings and external equipment within the onshore substation from that originally applied for.

86. In undertaking this review, the Applicant has committed to the revised maximum building and external equipment heights presented in ***Table 6.1*** below (heights presented are above finished ground level):

Table 6.1 Revised Onshore Substation Building and External Equipment Heights

Onshore Substation Building / External Equipment	Building or External Equipment Height Presented within the Application	Revised Maximum Building or External Equipment Height Committed to at Deadline 3	Notes
Harmonic filters	18m	**14m**	4m reduction in maximum height achieved
Statcom building	15m	**12m**	3m reduction in maximum height achieved
GIS building	15m	**14m**	1m reduction in maximum height achieved
Lightning protection masts	25m	**20m**	5m reduction in maximum height achieved

87. The maximum height of buildings within the onshore substation is now 14m above finished ground level. The maximum height of external electrical equipment within the onshore substations is now 14m above finished ground level. The maximum height of lightning protection masts within the onshore substations is now 20m above finished ground level.

6.3 Maximum Visual Envelope

88. As noted above, given that the Applicant has yet to undertake ground investigations it is not yet possible to establish the final finished ground levels at this stage of design.

89. The Applicant notes however, that stakeholders would prefer a level of certainty in establishing the maximum visual envelope of the Project. To balance the uncertainty and necessary flexibility in the design of the onshore substation and National Grid substation with certainty with regards to their maximum visual envelope, the Applicant has adopted a maximum vertical datum height (expressed in m AOD) for buildings, external equipment and lightning protection masts (as detailed below).

90. This ensures the Applicant retain the necessary flexibility at the detail design stage of the Project to balance the finished ground levels and (within the limitations of the ***draft DCO*** (AS-109)) the heights of buildings and external equipment, to achieve (and where possible, improve on) the maximum vertical datum height (expressed in m AOD).

91. The maximum building height, maximum external equipment height and maximum lightning protection mast height expressed in AOD, are presented in ***Table 6.2*** below. The onshore substation eastern and western locations are illustrated in ***Figure 1, Appendix B***.

Table 6.2 Maximum Heights

Substation Parameter	Maximum Height (AOD)
Onshore Substation (Eastern Location) - Maximum Building Height	32.7m AOD
Onshore Substation (Western Location) - Maximum Building Height	32.2m AOD
Onshore Substation (Eastern Location) - Maximum External Equipment Height	32.7m AOD
Onshore Substation (Western Location) - Maximum External Equipment Height	32.2m AOD
Onshore Substation (Eastern Location) – Maximum Lightning Protection Height	38.7m AOD
Onshore Substation (Western Location) – Maximum Lightning Protection Height	38.2m AOD
National Grid Substation (AIS Technology) – Maximum Building Height	24.2m AOD
National Grid Substation (GIS Technology) – Maximum Building Height	34.2m AOD
National Grid Substation – Maximum External Equipment Height	34.2m AOD

7 References

Department of Energy and Climate Change (DECC) (2011). Overarching National Policy Statement for Energy (EN-1). July 2011

HM Treasury (November 2020). Response to the National Infrastructure Assessment. November 2020

HM Treasury (November 2020). The National Infrastructure Strategy. November 2020

National Infrastructure Commission (February 2020). Design Principles for National Infrastructure. February 2020

Appendix A: Engagement Strategy

Engagement Strategy

Introduction

1. This document sets out how consultation will be undertaken as the design of the onshore substation, National Grid substation and cable sealing end compounds (together the 'substations') associated with the East Anglia ONE North Offshore Windfarm (the Project) evolves, prior to the discharge of the relevant Development Consent Order (DCO) Requirements.

2. It explains how the substations design principles statement will be implemented as the Project progress and highlights the key elements of these principles for ease of reference.

3. The design of the substations and their environs will be co-ordinated through the development of a **Landscape Masterplan** which will include the land which is required for landscaping and drainage features including SuDS ponds. The Landscape Masterplan will build on the Outline Landscape Management Plan presented in the ***OLEMS*** (document reference 8.7) and will continue to be developed through the design period. There will also be an **Architectural Framework** document which will consider the various options for the finishes and styles of certain elements of the substation development. The location of the substations and the parameters which will be set out in the DCO will not be the subject of consultation. Further information on these documents is presented below.

4. This document describes the approach to the Landscape Masterplan and Architectural Framework documents and explains how engagement will take place in the development of these documents.

DCO Requirements

5. There are a number of Requirements in the ***draft DCO*** (AS-109) which necessitate the relevant planning authority (East Suffolk Council (ESC)) to discharge Requirements which will confirm the final details of a number of matters including the design of each substation, the associated landscape and the surface water management. These Requirements will be discharged using a suite of documents known as Requirement Discharge Documents (RDDs).

6. The RDD in respect of Requirement 12, relating to the final details of each onshore substation, the National Grid substation and cable sealing end

compounds, will be developed separately but in accordance with the Landscape Masterplan which will include phasing of the works, if required.

7. In advance of the preparation of the RDDs relating to the substation area, the Architectural Framework will be prepared, and the Landscape Masterplan will be further developed in consultation with local stakeholders.

8. The Applicant will engage with ESC during the DCO recommendation/determination phase of the Application in order to progress the Landscape Masterplan and Architectural Framework. Once consents for the Project have been granted, the Applicant will formally engage with local stakeholders on the Landscape Masterplan and Architectural Framework.

Landscape Masterplan

9. The primary aim of the Landscape Masterplan is to develop a landscape framework around the proposed substations that provides sufficient screening to mitigate as far as practicable, the visual impact of these developments and integrate them sensitively within the landscape.

10. It will develop the principles and detail set out in the ***OLEMS*** (document reference 8.7) and will be discussed with stakeholders at workshop meetings. The landscaping solutions within the final Landscape Masterplan will be set out in the final Landscape Management Plan for approval by ESC.

11. In line with the ***OLEMS***, the landscape design approach selected for the substations combines the approaches of concealing and integrating the substations into the landscape to meet the mitigation requirements and also as a response to the local landscape character and the historic landscape context.

12. The further development of the Landscape Masterplan will reflect the design of the substations; and the opportunity for both bunding and refinement of woodland planting to address the main aim of providing visual screening of the substations. It will also detail where new hedgerows may be planted to supplement the woodland framework around the substation complex.

13. The final Landscape Masterplan will identify areas of species rich grassland and SuDS ponds, providing enhanced habitat benefits in their own right, while also providing further visual contrast with the 'technological' appearance of the grid connection developments. Arable farming fields that are retained for agricultural use will contribute to retaining the rural character in the area around the developments.

14. It will also present details of any early establishment of tree and hedgerow planting, in order to deliver mitigation as early as possible for the Projects, to the extent that the relevant order limits allow.

Architectural Framework

15. There are a number of important and fundamental technical constraints which are inherent to the design of the substations, particularly in respect to the location, form and appearance of the external electrical equipment and the functionality of buildings. The design principles will also be adopted by the Applicant throughout the substations' procurement and detailed design stage to reduce their environmental impact where efficient, cost effective and safe to do so. The layout of the substations will be determined by their functional demands, safety requirements, and various practical restrictions and considerations which will result in a safe and efficient electrical layout; and the substations design principles. The design criteria for the substation layout are relatively rigid, in order to comply with safety, maintainability and quality of supply obligations. However, within these constraints, other elements will be used to ensure the substations respond as well as possible to a sense of place and to minimise their visual impact. These elements will be set out in the Architectural Framework document which will be accompanied by a commentary on matters considered to reduce the environmental impact of the substations.

16. The Architectural Framework will be prepared to provide further information to guide and inform the detailed design for the individual substations. The design approach outlined therein will provide principles in terms of the form, colour and materials of the following key architectural components:

- Buildings;
- Fencing; and
- Hard landscaping.

17. The Architectural Framework will be prepared with advice from specialists including, landscape architects and design engineers in order to develop an architectural vocabulary that can be applied to the substations throughout all phases of the Projects. It will provide design proposals for the appropriate solutions for external architectural treatment.

18. The Architectural Framework will consider the existing landscape context and will develop an external treatment to the substation complex that will respond successfully to the surrounding environment and context. Where the Project is developed after construction of the East Anglia ONE North project, the

Architectural Framework will also consider the design and finishes of the East Anglia ONE North project's onshore substation and National Grid substation to ensure appropriate design co-ordination is maintained. The document will also respond, as far as is practical, to feedback received during community engagement. The Architectural Framework will ensure that the treatment proposed for the substations is sensitive to place, with visual impacts minimised as far as practical by the use of appropriate design, building materials, shape, layout, coloration and finishes, whilst considering the functional constraints of the substations themselves.

19. The final Architectural Framework will include:

- An overview of the approach taken, based on the established design parameters, principles set out in existing documentation and the advice and comments provided by ESC, the local community and the Design Council;
- Consideration of the form of the substation complex;
- Colour analysis and review of potential façade colours for the external treatment of the substation buildings;
- Review of material options for the primary forms of buildings and fencing; and
- Conclusions relating to the proposed solution for the external appearance of the substation complex in terms of form, colour and materials.

20. Once complete the Architectural Framework will form the base from which the Detailed Design Document (required to satisfy DCO Requirement 12), for each substation will be developed.

Engagement: Stage 1

21. The Applicant and independent chair of the stakeholder engagement workshops will engage directly with residents in the immediate vicinity of the onshore substation and National Grid substation in order to discuss their expectations for landscaping in the vicinity of their properties. Engagement will be held with the owners and occupiers of the following properties, meeting each owner/occupier or neighbouring owners/occupiers separately to allow their particular views on landscape measures to be communicated:

- Friston Moor Farm Barn and High House Farm;
- Little Moor Farm;
- Fairacres;
- Woodside Farm and Orchard Bank].;

- Friston House;
- Moor Farm and Pond House;
- Group of six properties located to north of Church Road at the junction of Church Road/Grove Road;
- The Lindens, Saxmundham Road; and
- Woodside Cottages, Grove Road.

Engagement: Stage 2

22. In order to generate the above-mentioned Landscape Masterplan and Architectural Framework, the following stage 2 engagement will be undertaken which will include an independent design review and engagement with the local community as set out in the following text.

Independent Design Review

23. The draft Landscape Masterplan and Architectural Framework will be submitted for an independent and objective review by a nationally recognised impartial body (such as the Design Council, in consultation with ESC) to inform and guide the final design solutions. It is recognised that for technical and operational reasons, the outcome of the design review process must produce a response that is practicable and capable of implementation in line with the regulatory and safety requirements of the substations.

Parish Council and Local Resident Engagement

24. Parish Council and local resident engagement will be undertaken during the development of the Landscape Masterplan and the Architectural Framework. This engagement will be in respect of the matters which are set out above, describing the Landscape Masterplan and Architectural Framework. Whilst the height of building and external equipment will not be subject of consultation as the maximum heights will be set out in the DCO, the Applicant will outline the rationale for the heights of key buildings and external equipment heights.

25. The purpose of this engagement will be to obtain stakeholders' views on the options that are being considered in respect of matters such as planting, hard landscaping, colours and finishes.

26. A one-day workshop, chaired by an external and suitable experienced chairperson, will be held once the draft Landscape Masterplan and draft Architectural Framework have been developed to a point where it is appropriate to present to stakeholders the various options that require their consideration and input. This will be at a venue close to the substation complex, subject to Covid-19 restrictions.

27. There will be a session at the start of the workshop to provide an introduction and explanation of what is to be discussed. Those attending will then be split into a number of workshop groups. Each group will include stakeholders, developer representatives and technical specialists. A suitably experienced chair/facilitator will make notes and ensure that the discussions run to time. The groups will be facilitated and will spend time discussing a number of pre-defined topics. Each group is envisaged to comprise of no more than 10 people (including the Applicant and National Grid representatives) to ensure constructive discussion and debate.

28. During the workshop it is anticipated that there may be an animated model of the substation complex so that discussion can be undertaken looking at the model and considering different approaches. Photomontages will be used where appropriate and sample materials will be made available. A briefing pack will be sent to all attendees in advance of the workshop.

29. In parallel with the workshops, engagement with the Design Council and local authorities will be progressed to obtain their views on the matters which are being considered and a site visit will be undertaken.

30. Following the workshop, there will be a three week period for attendees to provide further thoughts and feedback to the Applicant. Material such as photomontages and material samples will be provided to the Parish Councils in the briefing pack in order to assist in facilitating this.

31. It is anticipated that the workshops will be attended by representatives of ESC (as the relevant planning authority), Friston Parish Council and Knodishall Parish Council (representing the wider community) and residents in the immediate vicinity of the substations. The final number of attendees from the local community (Parish Councils and local residents) will be in the region of 20.

32. In the event that it is not possible to hold the workshops in person (due to Covid-19 restrictions) then they will be held virtually.

Engagement: Stage 3

33. Feedback from the workshop and the Design Council will then be fed into the Landscape Masterplan and Architectural Framework as appropriate. Once a finalised draft is available, the documents will be circulated to the attendees of the workshop and residents in the immediate vicinity of the onshore substation and National Grid substation (as per Stage 1 engagement), and a further one day workshop will be arranged to present the detail and explain the rationale behind the final decisions and provide an opportunity for final comment.

34. The documents will then be finalised, and details of proposed layout, scale and external appearance of the substations will be submitted to ESC for their approval.

Time Scales

35. The following indicative timescales are proposed to accommodate stakeholder engagement:

- **Prior to Granting of Development Consent Order**
  - Early consultation with ESC during the DCO recommendation and determination period;
  - Further development of the Landscape Masterplan;
  - Development of the Architectural Framework;
  - Design Council early engagement;
  - Supply chain engagement; and
  - Further development and refinement of substations design concept.

- **Following receipt of Development Consent: Month 1**
  - Set up stakeholder engagement workshop and circulate draft documents; and
  - Provide information to Design Council.

- **Month 2**
  - Hold workshop with stakeholders to discuss Landscape Masterplan and Architectural Framework; and
  - Design Council liaison.

- **Month 3**
  - Further develop the Landscape Masterplan following outcomes of workshop;
  - Further develop the Architectural Framework following outcomes of the workshop;
  - Receive final comments from stakeholders; and
  - Receive comments from the Design Council.

- **Month 4**
  - Refine Landscape Masterplan; and

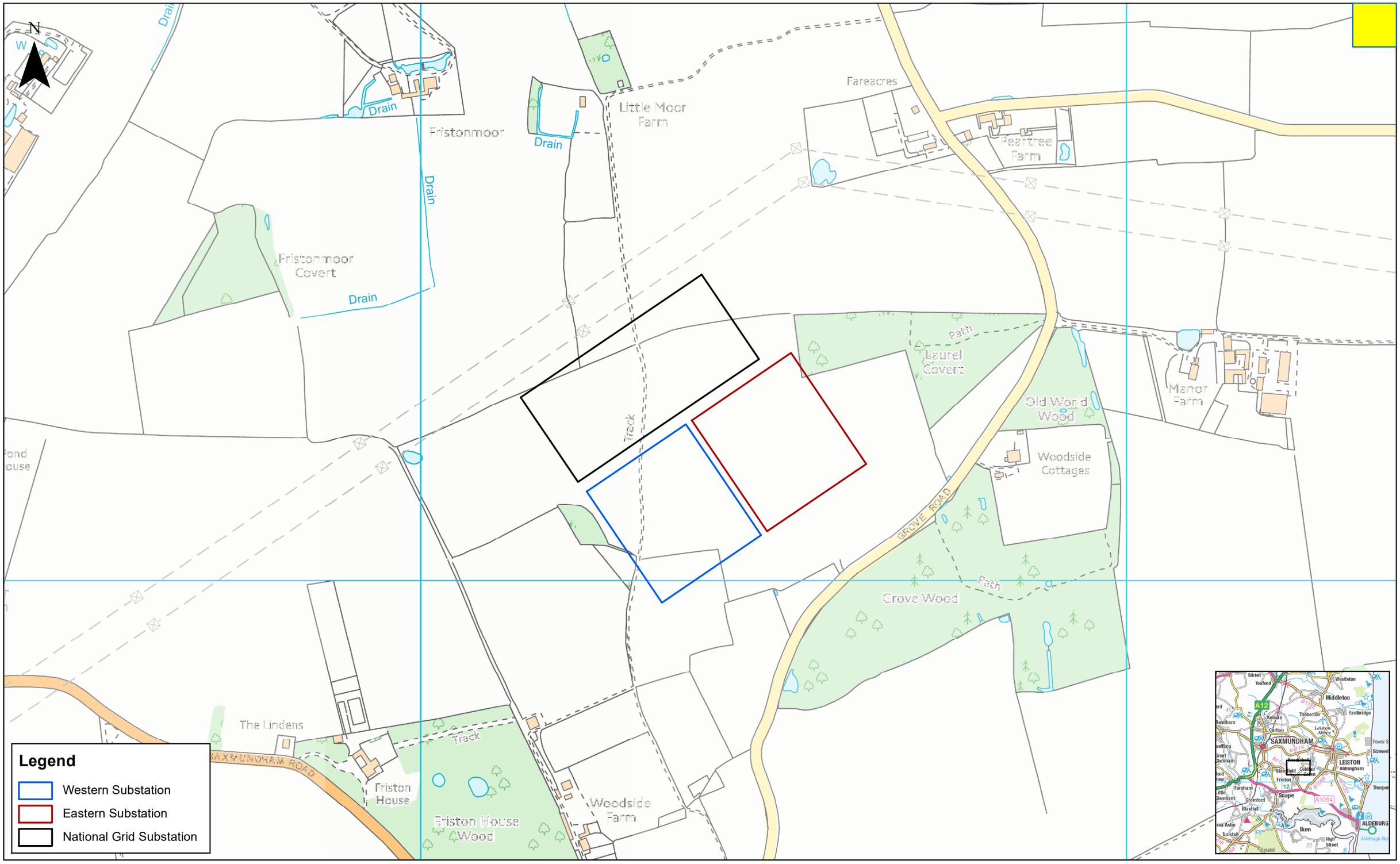
- Refine Architectural Framework.

- **Month 5**
  - Attend workshop with stakeholders to provide update on the Landscape Masterplan and the Architectural Framework; and
  - Submit final Landscape Masterplan and Architectural Framework for ESC comment.

- **Month 6**
  - ESC comments on the Landscape Masterplan and Architectural Framework.

- **Month 7 onwards**
  - Applicant commences process of submitting Requirement Discharge Documents addressing Requirement 12 (Detail Design); Requirement 14 (Landscape Management Plan) and Requirement 17 (Fencing) for the substation complex within the framework of the Landscape Masterplan and Architectural Framework.

Appendix B: Figures



SCOTTISHPOWER RENEWABLES							1:5,000 Scale @ A3	0 100 200 Metres	**East Anglia ONE North**
					Prepared:	AB			Location of Onshore Substation
1	13/01/2021	AB	First Issue.		Checked:	KC			
Rev	**Date**	**By**	**Comment**		Approved:	FM			

Drg No	EA1N-DEV-DRG-IBR-001270
Rev	1
Date	13/01/21
Figure	1

Coordinate System: BNG Datum: OSGB36

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