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**Subject:** Norfolk Vanguard - Email 18 of 18 Deadline 1 Submissions  
**Date:** 16 January 2019 15:22:16  
**Attachments:** [ExA\\_AS:10.D1.8B Norfolk Vanguard Additional Submission - Landfall Info Sheet.pdf](#)  
[ExA\\_AS:10.D1.8C Norfolk Vanguard Additional Submission - Substation Info Sheet.pdf](#)  
[ExA\\_AS:10.D1.8A Norfolk Vanguard Additional Submission - Happisburgh HDD Feasibility.pdf](#)

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Dear Tracey

This is email 18 of 18 of the Applicant's submission for Norfolk Vanguard Examination Deadline 1.

We enclose the following documents:

- Norfolk Vanguard Additional Submission - Happisburgh HDD Feasibility
- Norfolk Vanguard Additional Submission - Landfall Info Sheet
- Norfolk Vanguard Additional Submission - Substation Info Sheet

Please could you kindly confirm receipt.

Best Regards

**Gemma Keenan BSc, MIEMA, CEnv**  
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# Norfolk Vanguard Offshore Wind Farm

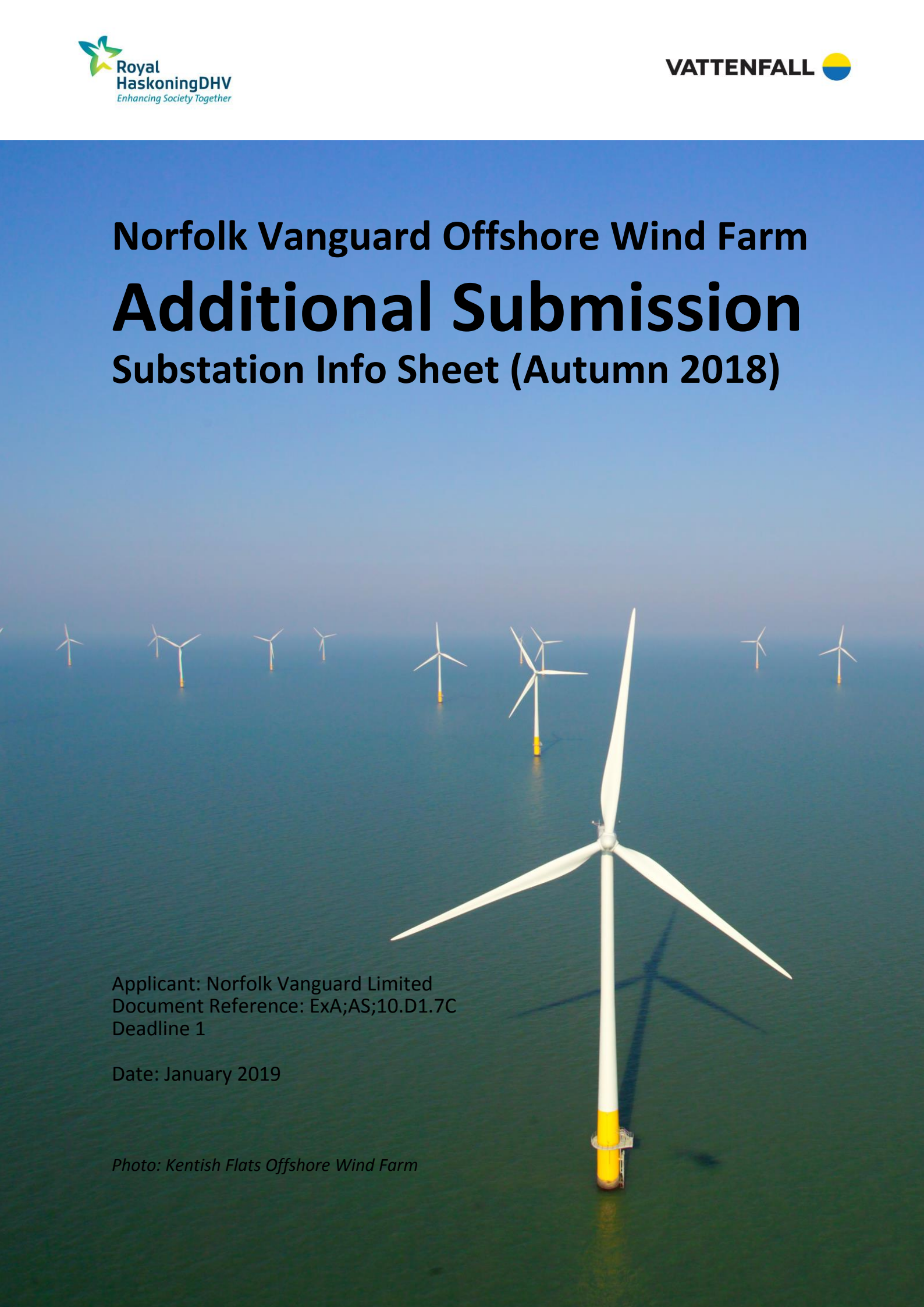
# Additional Submission

## Substation Info Sheet (Autumn 2018)

Applicant: Norfolk Vanguard Limited  
Document Reference: ExA;AS;10.D1.7C  
Deadline 1

Date: January 2019

*Photo: Kentish Flats Offshore Wind Farm*





Viewpoints

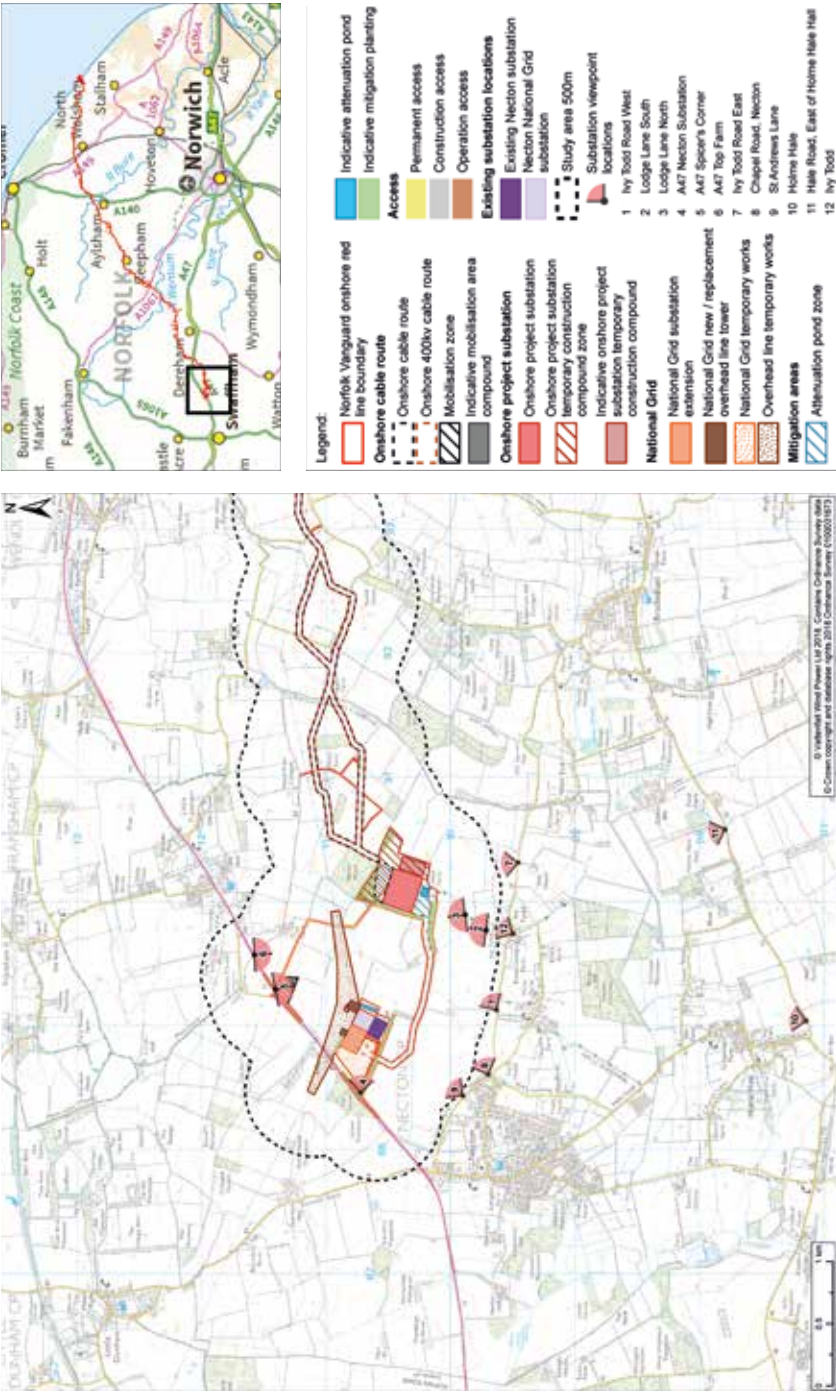
The map on the right shows the location of twelve viewpoints from which the proposed substation infrastructure would be visible.

Photomontages from these viewpoints have been published in the Norfolk Vanguard Environmental Statement. The viewpoints have been chosen to represent those parts of local settlements, public roads and publicly accessible footpaths from which the proposed substation infrastructure would be seen most fully. The extent of visibility across the local area would generally be well-contained and this would limit the effects on local people.

Below, we illustrate two examples, please refer to the Planning Inspectorate's website<sup>4</sup> to review the other photomontages.

**Viewpoint 1** Ivy Todd Road West is representative of glimpsed views of road-users and views from the adjacent countryside.

**Viewpoint 9** St Andrew's Lane is representative of views of residents from the north-east edge of Necton, from where only small parts of the National Grid substation extension would be visible.



The black dotted lines on these viewpoints are to indicate the extent of the substation. They are not part of the infrastructure itself.



Viewpoint 9: St Andrew's Lane

<sup>4</sup> <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001892-Figure%2029.0.4%20Viewpoints.pdf>

# Onshore Project Substation

Autumn 2018



## What is the Onshore Project Substation?

The onshore project substation comprises a converter hall and associated outdoor equipment required to convert the High Voltage Direct Current (HVDC) transmitted electricity from the offshore wind farm, to High Voltage Alternating Current (HVAC). This is required for connection into the National Grid electricity transmission system (NGTS). The NGTS delivers power to UK domestic, commercial and industrial consumers of electricity.

## What is the National Grid substation extension?

The existing National Grid substation requires additional connection points in order to connect the electricity generated by the Norfolk Vanguard project into the electricity transmission network. These additional connection points will be accommodated by extending the existing National Grid substation.

## What are the National Grid overhead line modifications?

Similarly, the existing connection between the National Grid substation and the overhead lines cannot accommodate an additional 1,800 MW of electricity generated by the Norfolk Vanguard offshore wind farm, on top of the electricity generation from Dudgeon offshore wind farm. To connect the additional power, the second circuit of the existing overhead line is required to connect into the National Grid substation extension. This additional connection will use the existing overhead line alignment with one new tower and the modification or replacement of a second tower. To facilitate these works, three temporary towers will be erected to the north and the existing overhead wires moved onto these temporary structures, allowing continued electricity supply. The overhead wires would then be moved back to the existing alignment, on to the new towers, and the temporary towers removed.

## Construction

- Pre-construction works are scheduled to occur over the period 2020-2021 and will include preparatory activities such as road modifications, hedge and tree netting / removal, mitigation planting (where possible), ecological and archaeological preparations and drainage.
- Primary construction works are scheduled to occur over the period 2022-2023 for a maximum of 30 months and will include the construction of temporary construction compounds to facilitate the works, civil and structural works at the project substation and national grid substation extension, and the necessary National Grid overhead line modifications.
- Electrical equipment will then be installed and commissioned over a maximum of two phases, scheduled for 2024 and 2025, in parallel with the installation and commissioning of the offshore wind turbines and electrical cables.
- Construction activities will normally be conducted during working hours of 7am to 7pm. Evening and/or weekend working could be required periodically to maintain programme progress and for specific time critical activities such as transformer oil filling and processing.
- The construction works will be conducted in line with the Code of Construction Practice (CoCP), an outline of which has been included in the Norfolk Vanguard DCO application<sup>1</sup>. This code sets out the management measures that all contractors will be required to adopt and implement such as environmental management, health and safety and construction principles, including relevant best practice method statements and necessary mitigation measures.
- Ahead of and during construction, the project will proactively seek to inform local residents of the type and timing of works programmed. A local liaison officer will respond to queries and concerns.

<sup>1</sup> <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001926-8.01%20Outline%20Code%20of%20Construction%20Practice.pdf>



## Commitment to minimising impacts

### A Access

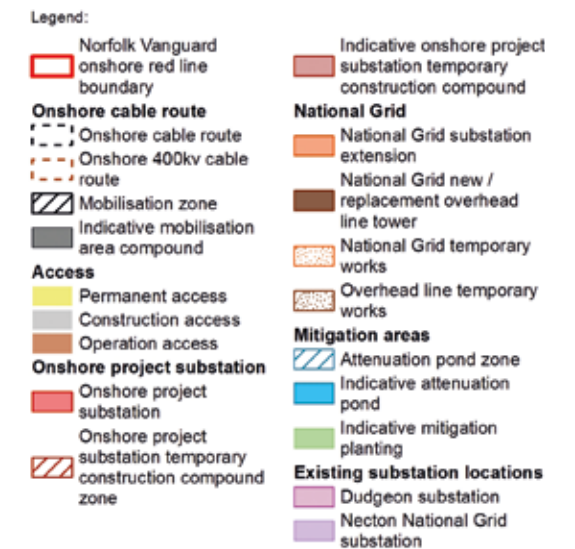
- A dedicated access will be constructed to gain entry to the onshore project substation, from the A47. This will include a new right turn filter lane to minimise disruption to A47 traffic and ensure safe access.
- A “no-right turn” traffic management scheme is proposed to be in place in order to gain safe access to the National Grid substation extension, and to minimise disruption to A47 traffic.

### B Drainage strategy

- The onshore project substation and National Grid substation extension drainage strategy will be guided by the principle of Sustainable urban Drainage Systems (SuDS). The strategy will limit development site surface water run-off to the existing greenfield rate with sufficient attenuation for rainfall events up to 1 in 100 year probability, plus a further 30% allowance for climate change over the lifetime of the project. This will be primarily achieved through the siting of an attenuation pond in close proximity to the onshore project substation and a separate attenuation pond in close proximity to the National Grid substation extension, each of which will be suitability sized and designed to meet the above criteria. SuDS provide a natural approach to managing drainage, prevent water pollution and flooding and create habitats for wildlife.

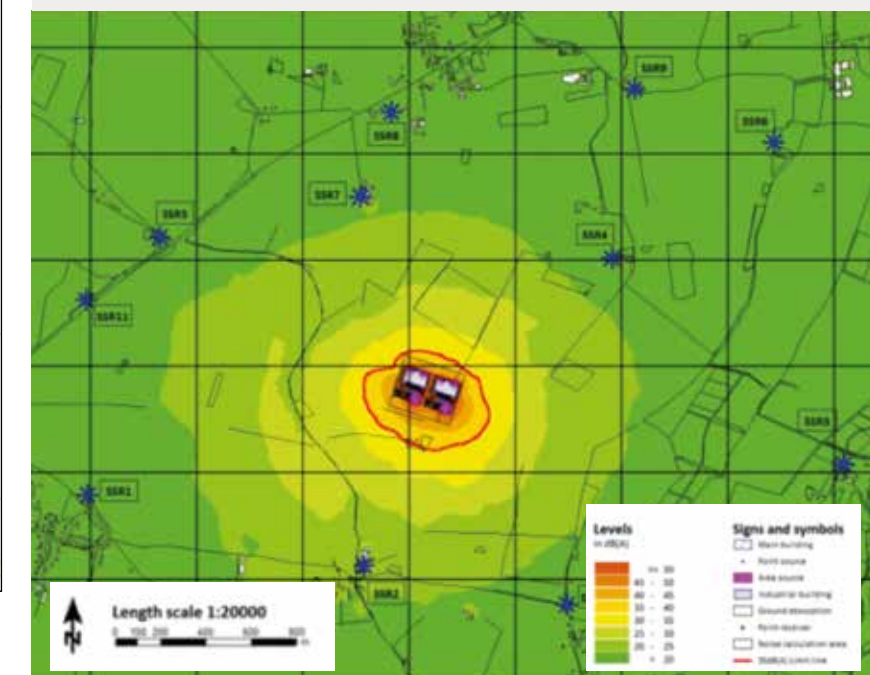
### C Mitigation planting

- Additional mitigation planting will be undertaken to enhance the screening effect of existing hedgerows and woodland blocks in the local area. The location of this planting and photomontages/visualisations are provided in Chapter 29.<sup>2</sup>
- Bunds, or earth mounds, will be constructed where possible to increase the base height and maximise the effectiveness of mitigation planting as screening, as soon as possible during operation.
- Mitigation planting will comprise faster growing ‘nurse’ species and slower growing ‘core’ species. Core species with an average growth rate of 250mm per annum will provide 5m to 7m of growth after 20 years which will characterise the woodland structure over the long term. Nurse species would be faster growing (350mm per annum) to provide 7m to 8m of screening after 20 years.
- Where advanced planting can be achieved (in areas not affected by the construction works), this will commence in 2020 which will provide a minimum 3 years of growth prior to commencement of operation which equates to approximately 1.2m of additional growth.



## Operational Noise

- The development will comply with the requirements (conditions) of Breckland Council which is summarised as not exceeding 35 dB LAeq (5minutes) at any time at a free field location immediately adjacent to any noise sensitive location. A further limit of 32 dB Leq (15minutes) also applies to the 100Hz third octave band.
- Detailed noise assessments have shown that with proven noise reduction technology or procurement of low noise emitting equipment, this requirement can be readily achieved and no impacts will occur.<sup>3</sup>



<sup>2</sup> <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001517-Chapter%2029%20LVIA%20Norfolk%20Vanguard%20ES.pdf>

<sup>3</sup> <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001513-Chapter%2025%20Noise%20and%20Vibration%20Norfolk%20Vanguard%20ES.pdf>