Preliminary Environmental Information Report Volume 1

Chapter 15 Noise and Vibration

LLK1-ARU-REP-ENV-000015
Version 0.0
January 2026

Contents

Glossary of Project Terminology

This Glossary has been provided to define terms used across a number of the LionLink Proposed Scheme documents.

Terms and abbreviations specific to this technical chapter are provided at the end of the document in the **Topic Glossary and Abbreviations.**

Term	Description
Amendment to Kiln Lane Substation Scenario	The scenario where the Proposed Scheme will comprise the amendments to Kiln Lane Substation that would be required if Kiln Lane Substation was built out pursuant to the EA1N/EA2 DCOs.
Applicant, the	National Grid Lion Link Limited (NGLLL)
Bellmouth	A flared vehicular access/egress point connecting permanent route to the public highway.
Converter Station	A converter station changes electricity between High Voltage Alternating Current (HVAC), which power our homes, and High Voltage Direct Current (HVDC) which is more efficient for transporting electricity over long distances and vice versa. The proposed Converter Station is located to the east of Saxmundham.
Converter Station Site	The Converter Station Site as a whole, allowing for the co-location of the Converter Station with the Converter Station being separately consented as part of the Sea Link project.
Co-ordination	The process of people or entities working together.
Co-location	Where different elements of a project, or various projects, are located in one place.
Construction Compound	Temporary compounds installed during the construction phase of the Proposed Scheme. Each compound is likely to contain storage areas such as laydown areas, soils storage, and areas for equipment and fuel, drainage, generators, car parking and offices and welfare areas (portacabins).
Development Consent Order (DCO)	An order made by the Secretary of State pursuant to the Planning Act 2008 (as amended) granting development consent for a Nationally Significant Infrastructure Project. It grants consent to develop the approved project and may include (among other things) powers to compulsorily acquire land and rights where required and deemed marine licences for any offshore works.
Draft Order Limits	The area of land identified as being subject to the DCO application. The Draft Order Limits are made up of the land required both temporarily and permanently to allow for the construction, operation and maintenance, and decommissioning of the Proposed Scheme. All onshore parts of the Proposed Onshore Scheme are located within England and offshore parts of the Proposed Offshore Scheme are located within English territorial waters to 12 Nautical

Term	Description
	Miles and then up to the United Kingdom (UK) Exclusive Economic Zone (EEZ) boundary at sea.
Dutch Offshore Components	Is the term used when referring to the offshore elements of the Project within Dutch waters.
Eastern Route Option	As part of the Underground HVDC cable corridor, the Eastern Route Option would facilitate a degree of co-location with the Sizewell Link Road (SLR) scheme.
Environmental Impact Assessment (EIA)	The EIA is a systematic regulatory process that assesses the potential likely significant effects of a proposed project or development on the environment.
EIA Scoping Report	An EIA scoping report defines the proposed scope and methodology of the EIA process for a particular project or development. The EIA Scoping Report for the Proposed Scheme was submitted to the Planning Inspectorate with a request for the Secretary of State to adopt a scoping opinion in relation to the Proposed Scheme on 6 March 2024.
Environmental Statement (ES)	The ES is a document that sets out the likely significant effects of the project on the environment. The ES is the main output from the EIA process. The ES is published as part of the DCO application.
Exclusive Economic Zone (EEZ)	The zone in which the coastal state exercises the rights under Part V of the United Nations Convention on the Law of the Sea. These rights relate principally to the water column and may extend to 200 nautical miles from baselines. This is distinct from territorial waters, which for the UK extend 12 nautical miles from the coast.
Full Build Out of Kiln Lane Substation Scenario	The scenario if the Proposed Scheme was brought forward first, then it would be responsible for developing Kiln Lane Substation for the Proposed Scheme, with sufficient additional capacity for other projects.
Joint Bay	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Kiln Lane Substation	The proposed connection point for the Project to the British National Electricity Transmission System, located to the north of Friston. Formerly known as Friston Substation. The new name has recently been adopted by NGET. The substation is of the same footprint and in the same location. Friston Substation will, hereafter, be referred to as Kiln Lane Substation.
Landfall	The proposed Landfall is where the proposed offshore HVDC Submarine Cables are brought ashore and meets with the onshore proposed Underground HVDC Cables. This includes the Transition Joint Bay (TJB). The proposed Landfall will be located at Walberswick, and there will be no permanent above ground infrastructure at the proposed Landfall.
Landfall Site	The area where the Landfall may be located.

Term	Description
Limit of Deviation	A maximum distance or measurement of variation within which the works must be constructed. These are lateral (i.e. on the ground) and vertical limits (in relation to height).
Link Box Chamber	Link boxes are used at joint bays to facilitate grounding connections to ensure safety and enable maintenance. Link boxes can either be installed below ground, in a link box chamber, or in an above ground link pillar
Multi-purpose interconnector (MPI)	A project where GB interconnection is combined with transmission of offshore generation within GB (and optionally within a connecting state).
National Grid Electricity Distribution (NGED)	The local distribution network operator for the Midlands, the southwest of England and south Wales.
National Grid Electricity Transmission (NGET)	Operators of the national electricity transmission network across Great Britain and own and maintain the network in England and Wales, providing electricity supplies from generating stations to local distribution companies. National Grid does not distribute electricity to individual premises, but its role in the wholesale market is vital to ensuring a reliable, secure and quality supply to all.
National Grid Lion Link Limited (NGLLL)	The Applicant, a joint venture between National Grid Ventures and TenneT. NGLLL is a business within the wider National Grid Ventures portfolio.
National Grid Strategic Infrastructure (NGSI)	Part of NGET and responsible for delivering major strategic UK electricity transmission projects, focussed on connecting more clean, low-carbon power to England and Wales.
National Grid Ventures (NGV)	Operates and invests in energy projects, technologies and partnerships to accelerate the development of a clean energy future. This includes interconnectors (such as the LionLink Project), allowing trade between energy markets and the efficient use of renewable energy resources.
Nationally Significant Infrastructure Projects (NSIP)	Major infrastructure developments in England and Wales for which development consent is required, as defined within Section 14 of the Planning Act 2008 (as amended). This includes any development which is subject to a direction by the relevant Secretary of State pursuant to Section 35 of the Planning Act 2008.
Non-standard interconnector (NSI)	A project where GB interconnection is combined with transmission of offshore generation outside of GB.
Northern Route Option	A northern cable corridor option that would allow Underground HVAC Cable delivery for Proposed Scheme only.
Offshore Hybrid Asset (OHA)	A project that combines cross-border interconnection with the transmission of offshore generation, this is an overarching term which covers both multi-purpose interconnectors (MPI) and non-standard interconnectors (NSI).
Order Limits	The maximum extent of land within which the Proposed Scheme may take place, as consented.

Term	Description
Outline Offshore Construction Environmental Management Plan (Outline Offshore CEMP)	Describes the control measures and standards proposed to be implemented to provide a consistent approach to the environmental management of the construction activities of the Proposed Offshore Scheme.
Outline Onshore Code of Construction Practice (Outline Onshore CoCP)	Describes the control measures and standards proposed to be implemented to provide a consistent approach to the environmental management of the construction activities of the Proposed Onshore Scheme.
Overhead Lines (OHL)	Conductors (wires) carrying electric current, strung from Tower to Tower.
Planning Act 2008	The Planning Act 2008 being the relevant primary legislation for national infrastructure planning.
Planning Inspectorate (PINS)	The Planning inspectorate review DCO applications and make a recommendation to the Secretary of State, who will then decide whether to approve the DCO.
Preliminary Environmental Information Report (PEIR)	The PEIR is a document, compiled by the Applicant, which presents preliminary environmental information, as part of the statutory consultation process. This is defined by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 as containing information which "is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)" (Section 12 2. (b)). This PEIR describes the Proposed Scheme, sets out preliminary findings of the EIA undertaken to date, and the mitigation measures proposed to reduce effects. The PEIR is published at Statutory Consultation stage for information and feedback.
Project (the)	The LionLink Project (hereafter referred to as the 'Project') is a proposal by National Grid Lion Link Limited (NGLLL) and TenneT. The Project is a proposed electricity link between Great Britain (GB) and the Netherlands with a capacity of up to 2.0 gigawatts (GW) of electricity and will connect to Dutch offshore wind via an offshore platform in Dutch waters. The Project is the collective term used to refer to the proposal for all aspects (onshore and offshore) of the proposed interconnector between GB and the Netherlands.
Proposed Offshore Scheme	The term used when referring to the offshore elements of the Proposed Scheme, seaward of the mean high-water springs to the EEZ boundary at sea.
Proposed Onshore Scheme	The term used when referring to the onshore elements of the Proposed Scheme, landward of the mean low water springs. Proposed Onshore Scheme components include:

Term	Description
	a) Kiln Lane Substation. b) Underground High Voltage Alternating Current (HVAC) Cables; c) Converter Station. d) Underground High Voltage Direct Current (HVDC) Cables; and e) Landfall.
Proposed Scheme	Used when referring to the GB scheme components of the Project, not including Dutch components. This includes both the onshore and offshore scheme components which are within UK territorial waters and up to the UK EEZ boundary at sea.
Rochdale Envelope	The Rochdale Envelope or Design Envelope approach is employed where the nature of a proposed development means that some details of a project are not available in advance of, or at the time of submitting the DCO application. The Rochdale Envelope approach defines a design envelope and parameters within which the final design will sit and ensures a robust and reliable EIA can be undertaken.
Scoping Opinion	A scoping opinion is requested from the Planning Inspectorate on behalf of the Secretary of State, to inform the requirements of EIA process and ultimately the ES which will be submitted as part of the application for development consent. Through the scoping process, the views of the statutory consultees and other relevant organisations on the proposed scope of the EIA are sought. A Scoping Opinion for the Proposed Scheme was issued by the Planning Inspectorate (on behalf of the Secretary of State) on 16 April 2024. The Applicant received a separate EIA Scoping Opinion from the Marine Management Organisation (MMO) (Reference DCO/2024/00005, dated 04 September 2024) as the MMO were unable to provide opinion to the Planning Inspectorate in time for the April 2024 deadline.
Scottish Power Renewables (SPR) East Anglia One North (EA1N) and East Anglia 2 (EA2) Consents (SPR EA1N and EA2 Consents)	The Orders made following the Scottish Power Renewables applications for development consent for the following projects: a) The East Anglia ONE North Offshore Wind Farm Order 2022; and b) East Anglia TWO Offshore Wind Farm Order 2022
Southern Route Option	A southern cable corridor option that would allow: a) Underground HVAC Cable delivery for Proposed Scheme only, or b) Underground HVAC Cable delivery for Proposed Scheme and ducting for Sea Links Underground HVAC and HVDC cables in that section.
Statutory Consultation	Consultation undertaken with the community and stakeholders in advance of the application for development consent being submitted

Term	Description
	to the Planning Inspectorate, on behalf of the Secretary of state, in accordance with the PA 2008.
Substation	Substations are used to control the flow of power through the electricity system. They are also used to change (or transform) the voltage from a higher to lower voltage to allow it to be transmitted to local homes and businesses.
TenneT	Operator of the electricity transmission network across the Netherlands.
Tower	A structure used to carry overhead electrical conductors, insulators, and fittings. Often described as a pylon.
Transition Joint Bay (TJB)	An underground structure at the Landfall Site that house the joints between the offshore cables and the onshore cables.
Underground Cable Corridors	Collective term for the corridors within which HVAC and HVDC cables are planned.
Underground High Voltage Alternating Current (HVAC) Cable Corridor	A corridor in which the underground HVAC cables are planned to be installed.
Underground High Voltage Alternating Current (HVAC) Cables	Transmission cables which connect between the Converter Station and Substation. HVAC cables are designed to manage fluctuating flow of current.
Underground High Voltage Direct Current (HVDC) Cable Corridor	A corridor in which the underground HVDC cables are planned to be installed.
Underground High Voltage Direct Current (HVDC) Cables	Transmission cables which connect the Converter Station to the Landfall Site and then offshore. HVDC cables are designed to manage current flowing in one direction.
Visibility Splay	An area of land at a road junction that ensures drivers have an unobstructed view of oncoming traffic allowing them to safely join or cross the road.
Western Route Option	As part of the Underground HVDC cable corridor, the Western Route Option would deliver the Scheme within its own corridor with no co-location with the Sizewell Link Road (SLR) scheme.

15 Noise and Vibration

15.1 Introduction

15.1.1 This chapter provides a preliminary assessment of the potential likely significant effects in relation to noise and vibration from the construction, operation and maintenance, and decommissioning of LionLink (hereafter referred to as 'the Proposed Scheme').

15.1.2 This chapter outlines legislation, policy and guidance that is relevant to noise and vibration, summarises the engagement undertaken to date, sets out the scope and methodology of assessment, and describes the baseline environment. Following this, the likely significant effects of the Proposed Onshore Scheme on noise and vibration are assessed taking account of mitigation measures within the design and control measures. The need for any additional mitigation is then considered along with any proposals for monitoring and/or enhancement. The chapter concludes with a summary of residual effects.

15.1.3 Noise and vibration aspects considered within this chapter for the Proposed Scheme are:

a. Construction noise and vibration from construction activities and construction traffic
b. Operational noise and vibration from operation of the proposed Converter Station and proposed Kiln Lane Substation
c. Decommissioning

15.1.4 This chapter should be read in conjunction with **Chapter 2 Description of the Proposed Scheme** of this Preliminary Environmental Information Report (PEIR), which describes the development parameters against which the effects considered in this chapter have been assessed and **Chapter 5 Approach and Methodology** which describes the approach to the preliminary Environmental Impact Assessment (EIA) including the approach to the assessment scenarios considered.

15.1.5 In addition, there may be interrelationships related to the potential effects of noise and vibration and other disciplines. Therefore, this chapter should be read alongside relevant parts of other chapters of this PEIR, namely:

a. **Chapter 8: Ecology and Biodiversity** of this PEIR, which considers the potential for impacts upon ecological receptors;
b. **Chapter 10: Health and Wellbeing** of this PEIR, which considers the impacts on human health and wellbeing; and
c. **Chapter 17: Traffic and Transport** of this PEIR, which considers the impacts of Traffic and Transport from the construction, operation and maintenance and decommissioning of the Proposed Scheme.

15.1.6 This chapter is supported by the following appendices and figures:

a. **Appendix 15.1 Environmental sound survey**;
b. **Appendix 15.2 Construction noise and vibration assumptions and results**;
c. **Appendix 15.3 Operational noise modelling assumptions**;
d. **Figure 15.1 Construction and operational noise and vibration study areas;**
e. **Figure 15.2 Environmental sound survey locations**; and
f. **Figure 15.3 Operational noise modelling results**.

15.2 Legislation, and policy framework

15.2.1 This section identifies the legislation, policy and guidance that has informed the preliminary assessment of the likely significant effects of noise and vibration.

15.2.2 **Table 15.1** lists the legislation relevant to the preliminary assessment of the likely significant effects of noise and vibration.

Table 15.1: List of relevant legislation for noise and vibration

Legislation	Relevance to assessment
Control of Pollution Act 1974 Part III Noise (Ref 1)	Relevant for the assessment and mitigation of construction and operational noise and vibration. • Section 60 allows local authorities to regulate noise from construction sites by serving notices specifying requirements on how the works should be carried out; • Section 61 allows individuals intending to carry out construction works to apply for prior consent from the local authority, detailing the works and noise mitigation measures, with the authority having the power to attach conditions and applicants having the right to appeal decisions; • Section 71 defines the Secretary of State's authority to issue or approve codes of practice for minimising noise, including the use of specific types of equipment. These codes can be prepared by the Secretary of State or approved if issued by others. Additionally, the Secretary of State must approve a code of practice for works covered by section 60 of the Act. • Section 72 defines "best practicable means" as methods that are reasonably practicable considering local conditions, technical knowledge and financial implications, and includes design, installation, and maintenance of plant, machinery, buildings, and acoustic structures, while ensuring compatibility with legal duties, safety, and emergency circumstances.
The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015 (Ref 2)	Section 71 of the Control of Pollution Act 1974 allows the Secretary of State to approve codes of practice for minimising noise, including vibration, on construction and open sites. The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015, effective from 6 April 2015, approves parts 1 and 2 of BS 5228 as a statutory code of practice.
Environmental Protection Act 1990 (Ref 3)	• Relevant for the assessment of construction and operation noise and vibration.

Legislation	Relevance to assessment
	• Section 79 states that statutory nuisance includes noise (including vibration) emitted from premises so as to be prejudicial to health or a nuisance. Section 79 also defines best practicable means (BPM) which will be required for construction activities

National Policy

15.2.3 The primary policy consideration for the Secretary of State when deciding whether to grant a Development Consent Order (DCO) for the Proposed Scheme are the National Policy Statements (NPSs). Of particular relevance to the Proposed Scheme are the Overarching National Policy Statement for Energy (NPS EN-1) (Ref 36), and the NPS for Electricity Networks Infrastructure (NPS-EN-5) (Ref 37). These set out a policy framework to guide how DCO applications for energy infrastructure should be decided and how the effects of such infrastructure are considered.

15.2.4 **Table 15.2** lists the paragraphs from the NPS and other national policy that are relevant to the noise and vibration assessment. It also sets out where these policy requirements are addressed within this chapter.

Table 15.2: List of relevant national policy for noise and vibration

Relevant paragraph reference	Summary of policy requirement	Where addressed in PEIR
Overarching National Policy Statement for Energy (NPS EN-1), 2024 (Ref 4)		
4.12.1-4.12.8 Pollution Control and Other Environmental Regulatory Regimes	Applicants should assess and address emissions and discharges from their projects, including noise and vibration, which may fall under separate regimes such as pollution control or local planning. They are required to consult relevant regulators early and, where possible, submit permit and licence applications alongside their development consent application. Compliance with Environmental Permitting Regulations are required to be demonstrated, including the use of Best Available Techniques (BAT) where applicable.	The assessment of potential noise and vibration impacts is included in this PEIR. It identifies likely impacts arising from the proposed development and sets out mitigation measures where necessary. Consultation with relevant stakeholders, including regulators, has also been undertaken as part of the PEIR process and is detailed in section 15.3 Consultation and engagement.
4.15.1-4.15.6 Common Law Nuisance and Statutory Nuisance	Applicants should identify potential sources of statutory nuisance such as noise and vibration, under section 79(1) of the Environmental Protection Act 1990 and demonstrate how these will be mitigated. This is necessary so that	The assessment of potential noise and vibration impacts is included in this PEIR. It identifies likely impacts arising from the proposed development and sets out mitigation measures where necessary.

Relevant paragraph reference	Summary of policy requirement	Where addressed in PEIR
	appropriate requirements can be included in the Development Consent Order.	Consideration to the Environmental Protection Act 1990 (EPA) has been given as part of the EIA work. The EPA is applicable to noise and vibration assessment, and it notes that local authorities have a duty to investigate noise complaints from premises, machinery or equipment. A Statement of Statutory Nuisance will be developed as part of the ES.
5.12.1-5.12.18 Noise and Vibration	Applicants should carry out a noise and vibration impact assessment identifying noise sources, proximity to sensitive receptors, characteristics of the noise source and predicted impacts during construction and operation. They should include mitigation measures and consult relevant regulators and stakeholders. The Secretary of State will grant consent only if satisfied that noise impacts are avoided or minimised and may impose specific noise limits and mitigation in the Development Consent Order.	The noise impact assessment the Proposed Onshore Scheme is detailed within this PEIR, considering sensitive receptors which include human and ecology receptors. Mitigation measures have been investigated to minimise adverse impacts, with assessments conducted in line with industry practice guidance and relevant standards.
National Policy Statement for Renewable Energy Infrastructure (NPS EN-3), 2024 (Ref 5)		
3.5.2 Consideration of good design for energy infrastructure	Proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of landscape and visual amenity, opportunities for co-existence/co-location with other marine uses, and in the design of the project to mitigate impacts such as noise and effects on ecology and heritage.	Evidence of good design for the Proposed Scheme is presented as part of the **Design Principles** (Ref 6). Mitigation measures to minimise noise from operation and construction of the Proposed Onshore Scheme are presented as part of this PEIR in **Section 15.7**, which is evidence of good design.
National Policy Statement for Electricity Networks Infrastructure (NPS EN-5), 2023 (Ref 7)		
2.9.19-2.11.8 Applicant assessment (Noise and Vibration)	The policy requires applicants to keep noise and other environmental effects to a reasonably practicable minimum. For high voltage transmission lines, applicants should assess noise from corona discharges and other sources, considering both dry and wet weather conditions and must use an appropriate method. Noise from substations should be assessed using relevant British	The noise and vibration impact assessment for the operation of the Proposed Onshore Scheme is presented in this PEIR as part of the ongoing EIA. It includes noise modelling of new sources (as presented in **Section 15.8**), to analyse emissions to environment and assess necessary mitigation measures (as presented in

Relevant paragraph reference	Summary of policy requirement	Where addressed in PEIR
	Standards. Applicants should use appropriate noise modelling methods and consider the impact on sensitive receptors, including background noise variations due to rainfall. The Secretary of State expects applicants to adopt methodologies that adequately address these factors.	**Section 15.7**) to minimise adverse impacts. Consideration has been given to noise emissions from overhead transmission lines (OHL) for dry and wet weather conditions, as well as maintenance activities. The preliminary assessments presented in this PEIR are conducted in line with industry practice guidance and relevant standards.
National Planning Policy Framework (NPPF) (Ref 8)		
187e Conserving and enhancing the natural environment and 198 Ground conditions and pollution	Planning policies and decisions should ensure that new development avoids contributing to unacceptable levels of noise pollution. Proposals should be appropriate for their location, taking into account the likely effects of noise on human health, living conditions, and the natural environment including any cumulative impacts. Applicants are expected to mitigate and reduce noise impacts to a minimum and avoid significant adverse effects on health and quality of life. Consideration should be given to protecting tranquil areas that are relatively undisturbed by noise and valued for their amenity and recreational use.	The PEIR presents the preliminary assessment of noise and vibration likely significant effects arising from the Proposed Onshore Scheme. It identifies sensitive receptors, considers the appropriateness of the development in relation to its surroundings, and includes proposed mitigation measures to minimise adverse effects on health, quality of life, and amenity. Cumulative noise and vibration effects will be assessed as part of the Environmental Statement.
Noise Policy Statement for England (NPSE) (Ref 9)		
Throughout	Applicants should demonstrate that their proposed developments will: • Avoid significant adverse effects on health and quality of life; • Mitigate and minimise adverse effects on health and quality of life; and • Where possible, contribute to the improvement of health and quality of life These objectives align with the overarching policy vision of the NPSE, and proposals should reference and comply with this framework in line with planning guidance.	The Proposed Onshore Scheme has been designed to avoid significant adverse impacts from noise and vibration by incorporating embedded mitigation measures from the outset e.g. selection of cable centrelines alignments, defined Limits of Deviation and the Draft Order Limits, etc. The **Design Principles** further support this approach by setting out a commitment to good design, including those specifically relevant to noise and vibration. Where potential noise or vibration impacts have been identified, the

Relevant paragraph reference	Summary of policy requirement	Where addressed in PEIR
		PEIR presents mitigation measures to minimise these effects as far as practicable. These measures are described in **Section 15.7** and are designed to ensure compliance with the NPSE aim to mitigate and minimise adverse impacts on health and quality of life. In support of the NPSE's third aim, to contribute to improvements in health and quality of life where possible, the Design Principles, which sets out a commitment to minimise adverse effects on the health and wellbeing of communities and provide enhancement measures that have the potential to benefit health as far as possible.

15.2.5 In April 2025, the Department for Energy Security and Net Zero (DESNZ) published the consultation on the revised energy NPS's, with draft updates made to NPS EN-1, NPS EN-3 and NPS EN-5. The Applicant recognises the clarifications that are proposed in the draft NPS's, including specific reference to Offshore Hybrid Asset's directed into the NSIP regime under Section 35 of the Planning Act 2008 (draft NPS EN-1 paragraph 4.2.18 and draft NPS EN-3 paragraph 1.6.3).

15.2.6 The Applicant acknowledges that the draft policy is subject to change and therefore all potentially relevant references that apply to the Proposed Scheme are not recorded within this PEIR.

15.2.7 The Applicant will continue to monitor the progress of the designation of the draft NPS's and their applicability to the Proposed Scheme, as it progresses through Statutory Consultation and towards the submission of the application for development consent.

Local Policy

15.2.8 The local policies listed in **Table 15.3** are considered relevant to the noise and vibration assessment of the Proposed Onshore Scheme.

Table 15.3: List of relevant local policy for noise and vibration

Local planning authority	Relevant local policy	Relevance to assessment
East Suffolk Council	Suffolk Coastal Local Plan (Ref 10) • SCLP9.1: Low Carbon & Renewable Energy. Development proposals for low carbon and renewable energy developments should demonstrate that proposals will not result in significant adverse noise impacts on residential amenity, the landscape, or designated areas such as the National Landscape, unless such impacts can be appropriately mitigated. Noise and vibration effects must be carefully considered during site selection and design, and effective mitigation should be embedded where required. Where developments are decommissioned, any remaining noise-generating infrastructure are required to be removed and the site restored to its original condition. • SCLP10.3: Environmental Quality. Development proposals will be expected to protect the quality of the environment and to minimise and, where possible, reduce all forms of pollution and contamination. Development proposals will be considered in relation to impacts on noise pollution. Proposals should seek to secure improvements in relation to noise. • SCLP11.2 Residential Amenity. The policy requires development to avoid unacceptable noise and disturbance impacts on residential amenity, ensuring adequate living conditions for both future and existing residents.	The Proposed Onshore Scheme has been designed to minimise noise and vibration impacts in line with policies SCLP9.1, SCLP10.3, and SCLP11.2. Through embedded mitigation and control measures the Proposed Onshore Scheme minimise adverse impacts on sensitive receptors including amenity spaces. The PEIR identifies potential noise impacts and sets out measures to reduce them as far as practicable as noted in **Section 15.7**. Further information about the assessment of AONB and residential amenity is contained within **Chapter 13 Landscape and visual** and **Chapter 16 Socioeconomics, Recreation and Tourism.**
Suffolk County Council	**Public Rights of Way and Green Access Supplementary Guidance Document (Ref 11)** The purpose of the document is to set expectations for the treatment of PRoW in infrastructure projects. The document states that the EIA methodology should consider the combination of effects, and the effects to be considered are:	Noise and vibration impacts on PRoWs are presented in **Section 15.8**. Further consideration to impacts upon PRoWs are presented in **Chapter 10 Health and Wellbeing** of this PEIR. The in-combination effects assessment will be presented as part of the Cumulative Effects Assessment in the subsequent ES.

Local planning authority	Relevant local policy	Relevance to assessment
	- physical changes to PRoW (eg diversion) - changes to the quality of the experience - creation of user stress - changes to the experience - impacts on ambience The Appendix to the document includes a detailed methodology for the assessment of effects. The document states that it is the Council's preference that adverse impacts on PRoW should be fully mitigated with embedded mitigation.	

15.3 Consultation and engagement

15.3.1 This section describes the outcome of, and response to, the **EIA Scoping Opinion** (Ref 12) in relation to the noise and vibration assessment.

15.3.2 It also provides details of the ongoing technical engagement that has been undertaken with key stakeholders and provides a brief overview of the non-statutory public consultation undertaken to date.

15.3.3 Feedback from engagement and consultation are used to define the assessment approach and to ensure that appropriate baseline information is used.

15.3.4 It should be noted that feedback is also used to drive the design of the Proposed Scheme to avoid, prevent and reduce any likely environmental effects. **Chapter 3 Alternatives and Design Evolution** of this PEIR reports how the Proposed Scheme's design has evolved in response to feedback. **Chapter 2 Description of the Proposed Scheme** details the proposed embedded design (Primary) mitigation measures. The mitigation and control measures relevant to the noise and vibration assessment are presented **in Section 15.7** and **Table 15.17**.

Consultation

Non-statutory consultation

15.3.5 Feedback received from stakeholders during the 2022 and 2023 Consultations is outlined within the **Interim Non-Statutory Consultation Feedback Summary Report 2023** (Ref 13) and **Supplementary Non-Statutory Consultation Summary Report 2024** (Ref 14).

15.3.6 **Table 15.4** below includes a summary of key non statutory consultation feedback received to date and how this has been addressed within the PEIR or will be

within the subsequent ES. All feedback received has been considered as part of the ongoing EIA.

Table 15.4: Key non-statutory consultation feedback for noise and vibration

Stakeholder	Comment general theme	Applicant response
• East Suffolk Council (ESC); • Suffolk County Council (SCC); • Historic England; • Parish and Town Councils: Alderburgh Town Council, Southwold Town Council, Aldringham-cum-Thorpe Parish Council, Dunwich Parish Council, Reydon Parish Council, Walberswick Parish Council; and Friston Parish Council.	• Concerns about noise and vibration impacts associated with the construction of the proposed Onshore Scheme including construction of the proposed Landfall, proposed High Voltage Direct Current (HVDC) Underground Cable Corridors, and the proposed Converter Station; • Concerns about noise disturbance to ecology sensitive receptors; • Concerns about operational noise impacts associated from substations and switchgear; • Concerns about noise and vibration impacts associated with construction and operation of the proposed Onshore Scheme upon quiet areas of the country and Areas of Outstanding Natural Beauty (AONB); • Concerns about noise and vibration impacts associated with construction traffic and congestion due to construction works; • Concerns about the impact of noise on businesses such as campsites; • Concerns about cumulative noise from various projects in the area	The PEIR presents the assessment of noise and vibration potential impacts and effects arising from the construction and operation of the Proposed Onshore Scheme. It includes the assessment of all relevant components of the Proposed Scheme including proposed Underground High Voltage Direct Current (HVDC) Cables and proposed Underground High Voltage Alternating Current (HVAC) Cables, Landfall, Converter Station and Substation. Non-statutory consultation feedback with regards to ecology receptors is presented in **Chapter 8 Ecology and Biodiversity.** Non-statutory consultation feedback about impacts upon AONB is presented in **Chapter 13 Landscape and Visual.**
• East Suffolk Council (ESC)	• ESC indicated via Scoping Opinion the following "*Noise from fixed plant or machinery can be annoying and disruptive.*	The operational noise assessment presented in this PEIR gives

Stakeholder	Comment general theme	Applicant response
	This is particularly the case when noise is impulsive or has tonal characteristics. A noise assessment should therefore be submitted to include all plant and machinery and be based on BS4142:2014. A rating level ($L_{Aeq,T}$) of at least 5dB below the typical background ($L_{A90,T}$) should be achieved. Where the rating level cannot be achieved, the noise mitigation measures considered should be explained and the achievable noise level should be identified and justified'. Due to the size of these types of project, the 5dB below background is an aspirational target and one we ask developers to consider as the appropriate limit, deviation from this level will require robust justification and the aim in all cases should be to achieve the lowest possible reasonable noise level which we will also require robust justification for, this should be in line with all relevant standards, guidance and policy."	consideration to the East Suffolk Council criterion, and will also be considered for the ES.

EIA Scoping Opinion

15.3.7 An **EIA Scoping Opinion** was adopted by the Planning Inspectorate on behalf of the Secretary of State on 16 April 2024. Comments received from the Planning Inspectorate in relation to noise and vibration are provided in **Table 15.5**.

Table 15.5: Preliminary response to Planning Inspectorate Scoping Opinion comments on noise and vibration

Scoping Opinion ID	Scoping Opinion Comment	How this is addressed
3.9.1	Noise and vibration effects from underground cables during operation, including maintenance. The Scoping Report states that significant effects are unlikely as the equipment is unlikely to give rise to vibration levels that would cause annoyance or disturbance. No justification is presented for noise. Based on the nature of the infrastructure, which would be buried, together with the small scale and temporary nature of operational maintenance activities described in	The Planning Inspectorate's agreement that this matter can be scoped out of the assessment is acknowledged.

Scoping Opinion ID	Scoping Opinion Comment	How this is addressed
	paragraphs 2.3.93 to 2.3.102 of the Scoping Report, the Inspectorate agrees that operation of the underground cables is unlikely to generate noise and/or vibration on a scale that would result in significant effects and this matter can be scoped out of the assessment.	
3.9.2	Traffic noise and vibration effects during operation. The Scoping Report states that operational traffic movements are likely to be infrequent and unlikely to result in significant effects. On the basis that there will be minimal levels of additional road traffic during operation, as described at paragraphs 2.3.93 to 2.3.97 of the EIA Scoping Report, the Inspectorate agrees that there are unlikely to be significant effects arising in relation to noise and vibration and this matter can be scoped out of the ES. The ES should define the anticipated number of operational road vehicle movements.	**Section 15.8** Assessment of effects (paragraph 15.8.102 to 15.8.104) defines the anticipated number of operational road vehicle movements and demonstrates that operational traffic noise is unlikely to result in significant effects. No further assessment of any resulting noise change is reported.
3.9.3	Vibration effects from the proposed Converter Station and Kiln Lane Substation during operation. Limited justification is presented for the proposed scoping out of this matter in the Scoping Report. The Inspectorate does not agree to scope this matter out given the uncertainties regarding the chosen location of the proposed Converter Station and the proximity to sensitive receptors. The Scoping Report provides limited information regarding anticipated operational vibration levels. The ES should provide an assessment of operational vibration or information demonstrating the absence of likely significant effects, with evidence of any agreement with relevant consultation bodies.	The assessment of Operational vibration is included in **Section 15.8** Assessment of effects (paragraphs 15.8.105-15.8.107), to demonstrate that it is unlikely vibration levels from proposed Converter Station or Full Build Out of Kiln Lane Substation Scenario would result in significant effects.
3.9.4	Study areas.	The study areas for construction and operational noise, which include the

Scoping Opinion ID	Scoping Opinion Comment	How this is addressed
	The Scoping Report states that the operational phase study area will be defined when the locations of operational noise and vibration sources are known. The ES should describe the basis on which the final study area is selected, including reference to relevant industry guidance and agreement with relevant consultation bodies. The ES should include figures to illustrate the final study area(s) adopted for noise and vibration impacts, including construction traffic noise, and the receptors within the defined study area.	location of assessed receptors, is presented as part of the PEIR in **Figure 15.1 Construction and operational noise and vibration study areas** and **Figure 15.2 Environmental sound survey locations.** The study areas are based on relevant standards and industry guidance.
3.9.5	Mitigation. The Scoping Report refers to noise mitigation measures which include screening and enclosures. The ES should address the potential for mitigation for an aspect giving rise to significant effects for another aspects, such as noise bunds resulting in a landscape and visual effect.	Mitigation measures to minimise any potential impacts are presented in **Section 15.7** Embedded design mitigation and control measures of this chapter. Consideration to wider environmental impacts arising from the implementation of the mitigation measure, e.g. enclosure barriers, is given as part of the PEIR in **Chapter 13 Landscape and Visual**.
3.9.6	Determining significance of effect The Scoping Report describes that there is a Noise Important Area (NIA) at Blythburgh. The ES should explain what receptor sensitivity is assigned to receptors within the NIA to determine effect significance.	There are currently no Noise Important Areas (NIAs) within the construction or operational study areas. The NIA identified at Blythburgh was associated with the Landfall Option at Southwold, which has now been discounted since EIA Scoping was undertaken. At the Environmental Statement stage, when a construction traffic noise assessment is available, any NIAs potentially impacted by the construction of the Proposed Onshore Scheme will be considered and assessed accordingly.

Engagement

15.3.8 This section provides details of the ongoing technical engagement that has been undertaken with stakeholders in relation to noise and vibration and is outlined below.

Key stakeholders

15.3.9 Key stakeholders with views and concerns regarding noise and vibration have been identified as including:

a. East Suffolk Council;
b. Suffolk County Council; and
c. Environment Agency

15.3.10 Engagement was undertaken with SCC and ESC in August 2023. The key points of discussion included:

a. Agreement on the proposed methodology for the EIA, including the methodology to determine existing baseline and extent of study areas;
b. The potential impacts associated with construction and operation of the scheme; and
c. Potential mitigation measures.

15.3.11 Further engagement was undertaken with SCC and ESC in March 2025 to agree on the methodology of assessment and locations for the environmental sound survey. They key outcomes of the conversations with ESC included:

a. The council broadly agreed with the proposed methodologies and survey locations for PEIR. It was noted that further surveying may be required if the assessment identifies the requirement to do so;
b. The council expect assessment to adhere to the ABC methodology for construction noise and vibration; and
c. The council expect a thorough consideration of cumulative effects in particular with regards to the proposed Converter Station and proposed Kiln Lane Substation.

15.4 Assessment methodology

15.4.1 This section outlines the methodology followed to assess the potential likely significant effects of the Proposed Onshore Scheme in relation to noise and vibration including:

a. Scope of the assessment;
b. Study area;
c. Methodology;
d. Assessment criteria; and
e. Assessment of cumulative effects.

15.4.2 This section provides a description of how the significance of effects is identified and assigned to the assessment.

15.4.3 The Proposed Scheme-wide approach to the assessment methodology is set out in **Chapter 5 EIA Approach and Methodology** of this PEIR.

Scope of the assessment

15.4.4 Potential likely significant effects requiring assessment may be temporary or permanent and may occur during construction, operation and maintenance, and

decommissioning. Potential likely significant effects on noise and vibration receptors within the scope of the assessment are summarised in **Table 15.6**. The scope of the assessment has responded to feedback received from the Planning Inspectorate as detailed in **Section 15.3.**

Table 15.6: Summary of the scope for noise and vibration assessment

Proposed Scheme phase	Receptor	Impact	Proposed to be scoped in
Construction	All noise sensitive receptors	Construction activity noise	Scoped in
Construction	All vibration sensitive receptors	Construction activity vibration	Scoped in
Construction	All noise sensitive receptors	Construction traffic noise	Scoped in
Construction	All vibration sensitive receptors	Construction traffic vibration	Scoped in
Operation	All noise sensitive receptors	Operational noise of proposed Converter Station and proposed Kiln Lane Substation (including overhead lines within the Draft Order Limits)	Scoped in
Operation	All vibration sensitive receptors	Operational vibration	Scoped in
Operation	All noise and vibration sensitive receptors	Operational road traffic noise and vibration	Scoped out
Decommissioning	All noise and vibration sensitive receptors	Decommissioning noise and vibration, including road traffic	Scoped in

Study area

15.4.5 This section describes the spatial scope (the area which may be impacted) for the assessment as it applies to noise and vibration.

15.4.6 The study area for noise and vibration is based on the extent of the Draft Order Limits and the type of impact as set out below.

15.4.7 The study areas for the construction and operational preliminary noise and vibration assessment are presented in:

a. **Figure 15.1a Construction noise and vibration study area for Proposed Full Build Out scenario**
b. **Figure 15.1b Operational noise and vibration study area for Proposed Full Build Out Scenario.**

Direct impacts

15.4.8 For construction noise, a study area of 300m around the Draft Order Limits is considered sufficient to assess impacts, based on precedent from other projects and the limitations of prediction methods beyond this distance, as noted in British Standard BS 5228. For construction vibration, a study area of 100m is considered sufficient since it is unlikely that significant effects from vibration would occur at greater distances.

15.4.9 For operational noise, a study area of 1km around the Draft Order Limits of the proposed Converter Station and Full Build Out of Kiln Lane Substation Site plus 300m around the overhead lines within the Draft Order Limits, is adopted to assess impacts arising from operational sources of the Proposed Onshore Scheme. This study area is considered sufficient as sound levels are expected to be well below those likely to cause a risk of a significant effect at or beyond 1km.

15.4.10 There are no proposed operational plant items at the proposed Converter Station or Full Build Out of Kiln Lane Substation Scenario expected to generate significant levels of vibration that could not be effectively managed through appropriate equipment selection, installation (including anti-vibration mounts/pads) and maintenance. The 1km operational study area is considered sufficient to identify any potential operational vibration impacts.

Indirect impacts

15.4.11 Indirect impacts of road traffic noise and vibration are those arising at greater distances from the direct impact study area. Indirect impacts result from changes in traffic flows on existing roads that are subject to a traffic noise change of more than 1dB(A).

15.4.12 Construction traffic routes, diversions or road closures resulting from the construction will be considered where a traffic noise change of more than 1dB(A) is indicated, with assessments conducted up to 50m from the affected road in line with DMRB LA 111.

15.4.13 The study area for assessing indirect operational road traffic noise impacts extends along all affected roads within the surrounding network which are outlined in **Chapter 17 Traffic and Transport**. In line with DMRB LA 111, the study area would extend 50m around such affected roads.

Assessment scenarios

15.4.14 **Chapter 5 EIA Approach and Methodology** of this PEIR provides an overview of the general approach to the temporal scope (the time scales over which impacts may occur) of the EIA. This section describes the temporal scope for the assessment as it applies to noise and vibration.

15.4.15 The assessment scenarios and options to be considered are set out within **Section 5.6 Assessment Scenarios and Options** of **Chapter 5 EIA Approach and Methodology** of this PEIR.

15.4.16 This noise and vibration chapter presents the results for the worst-case scenario of the Full Build Out of Kiln Lane Substation Scenario described in **Chapter 5 EIA Approach and Methodology**.

15.4.17 Both options (Northern Route Option and Southern Route Option) with regards to the proposed Underground High Voltage Alternating Current (HVAC) Cable Corridor as described in **Chapter 5 EIA Approach and Methodology** have been assessed. For the HVAC Cable Southern Route Option, the HVAC Cable Route LionLink Infrastructure and ducting for Sea Link Scenario has been assessed as the worst case.

15.4.18 Both options with regards to the proposed Underground High Voltage Direct Current (HVDC) Cable Corridor as described in **Chapter 5 EIA Approach and Methodology have** been assessed.

Baseline methodology

Data collection

15.4.19 Baseline data collection has been undertaken to obtain information over the study area. This section provides the approach to collecting baseline data.

15.4.20 The following sources of data have been utilised to inform the baseline with respect to noise and vibration (**Table 15.7**). In addition to these data sources, the noise and vibration assessment draws on results gathered for the environmental sound survey as presented in **Appendix 15.1 Environmental sound survey**.

Table 15.7: Data sources used to inform the noise and vibration assessment

Source of data	Baseline data
Strategic noise mapping on Extrium England Noise and Air Quality Viewer website (Ref 16)	Location and description of NIA
Strategic noise mapping of road sources across England Round 4 (Ref 17)	Data indicating the level of noise according to the strategic noise mapping of road and rail sources across England.
Ordnance Survey Address Base dataset	Geospatial information about location of receptors and their type e.g. residential, non-residential
Ordnance Survey datasets including Mastermap Topographic layer	Geospatial information about existing structures and location of sensitive buildings and their layout
Google Maps website	Additional information about nearby sensitive receptors
Environmental sound survey	Information about prevailing conditions and existing sound levels within and around the Proposed Onshore Scheme site

15.4.21 The Campaign to Protect Rural England (CPRE): the Countryside Charity (Ref 18) defines tranquillity as "*the quality of calm experienced in places with mainly*

natural features and activities, free from disturbance from manmade ones". CPRE uses a 'national relative tranquillity' scale as a measure of the various positive and negative factors contributing to or detracting from the tranquillity character of area. The relative scale ranges from -141 (least tranquil) to 149 (most tranquil), with the arithmetic average at around -1.3 and median at around 1.0.

15.4.22 Consideration to the CPRE tranquillity scale is therefore given to the description of the baseline, in order to identify areas with relatively high tranquillity character.

Site surveys

15.4.23 The baseline site surveys for noise and vibration were undertaken at a number of discrete locations representative of the nearby noise sensitive receptors. Such locations are in proximity to the proposed Converter Station site, Full Build Out of Kiln Lane Substation site and proposed Landfall site. This is to establish baseline sound levels of the receptors most likely to be impacted by the construction and operation of the Proposed Onshore Scheme.

15.4.24 A summary of these locations is presented in **Section 15.6 Baseline conditions** and in **Appendix 15.1 Environmental sound survey**. The environmental sound survey approach was agreed with the ESC as set out in the Engagement (**Section 15.3**) in paragraphs 15.3.9 - 15.3.11.

15.4.25 The environmental sound surveys were undertaken in accordance with BS 7445-1:2003 and follow the guidance presented in the Association of Noise Consultants (ANC) Environmental Noise Measurement Guide (Ref 33). Meteorological measurements have been taken in parallel with sound level measurements to verify that appropriate conditions prevailed during the surveys.

Assessment methodology

Construction noise

15.4.26 The assessment of construction noise is undertaken in line with the methodologies presented in BS5228-1 (Ref 20). The assessment is carried out for the construction works that may cause the greatest impact within each phase of works at the closest sensitive receptors.

15.4.27 The assessment is based on information available at the time of writing, including the likely sound power level of construction plant items, percentage of on-time operation, number of items and any partial noise screening that could be implemented. In the absence of detailed information, assumptions are made based on benchmarking and experience from other similar projects. This information has been input into a 3D noise prediction model to determine construction noise levels at receptors. For further details on the noise model, please refer to the **operational noise from stationary sources section** below.

15.4.28 Construction noise has been assessed based on the method set out in Annex E of BS 5228 Part 1 (Ref 20), described as the 'ABC' method, which defines

thresholds of potentially significant noise effects at dwellings. Under this approach, the potentially significant effect threshold is determined using the existing ambient sound level, rounded to the nearest 5dB and evaluated in relation to the thresholds set out in **Table 15.8**.

Table 15.8: BS5228 Part 1 – ABC method for determining the threshold of potential significant effect of construction noise at dwellings

Assessment category and threshold value period	Threshold values in decibels (dB), $L_{Aeq,T}$		
	Category A	Category B	Category C
Night-time 23:00-07:00	45	50	55
Daytime 07:00-19:00 Saturdays 07:00-13:00	65	70	75
Other: Weekday evenings 19:00-23:00 Saturdays 13:00-23:00 Sundays 07:00-23:00	55	60	65
Where: Category A: threshold values to use when ambient sound levels (rounded to the nearest 5dB) are less than these values. Category B: threshold values to use when ambient sound levels (rounded to the nearest 5dB) are the same as category A values. Category C: threshold values to use when ambient noise levels (rounded to the nearest 5dB) are higher than category A values.			

15.4.29 In the absence of environmental sound survey information at receptors, Category A of the standard is assumed to be the threshold for construction noise impact as a worst-case scenario. This is because surveying all receptors near the Draft Order Limits is impractical due to its scale.

15.4.30 BS 5228-1 notes that a potentially significant effect is indicated where the construction site noise ($L_{Aeq,T}$) level exceeds the threshold level for the category appropriate to the ambient sound level. The standard also notes that if the ambient sound level exceeds the Category C threshold values given in **Table 15.8** i.e. the ambient sound level is higher than the Category C values, then a potential significant effect is identified if the total $L_{Aeq,T}$ level for the period increases by more than 3dB due to site noise.

15.4.31 Noise from construction activities would constitute a potential significant effect where the impact occurs for a duration exceeding 10 or more days or nights in any 15 consecutive days or nights, or a total number of days exceeding 40 in any 6 consecutive months.

15.4.32 Having established whether there is a potential significant effect using the 'ABC' method, the final assessment of significance is made by considering the following:

a. Exceedance over the established thresholds of potential significant effect;
b. The levels of noise exposure and character of the existing sound environment;
c. Combined exposure to construction noise and vibration;

d. The duration of the construction impact;
e. Effectiveness of mitigation measures that may be provided; and
f. Professional judgement.

15.4.33 Additionally, the effect levels have been defined in Government policy terms, that is Lowest Observed Adverse Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL), defined in NPSE (Ref 9). These criteria are based upon the ABC method described above and are presented in **Table 15.9**.

Table 15.9: Thresholds of potential effects for construction noise in policy terms

Level of effect	Time period	Threshold value ($dBL_{Aeq,T}$)
LOAEL	Daytime Evening Night-time	65 55 45
SOAEL	Daytime Evening Night-time	75 65 55

Note: Day is 07:00 to 19:00, evening is 19:00 to 23:00 and night is 23:00 to 07:00

Construction vibration

15.4.34 Vibration from construction activities is predicted according to established empirical calculation methods described in BS 5228-2 (Ref 20). A preliminary assessment of likely significance of vibration is based on Table B.1 of this standard and is presented in **Table 15.10**. A first indication of a significant effect occurs when predicted vibration levels are above 0.3mm/s peak particle velocity (PPV).

Table 15.10: Guidance for the effect of vibration levels

Vibration level (PPV)	Effect
0.3mm/s	Vibration might be just perceptible in residential environments
1.0mm/s	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
10mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

15.4.35 Where potential significant effects are identified, further assessment is undertaken using British Standard 6472-1:2008 (Ref 23) for potential disturbance of people and British Standard 7385-2:1993 (Ref 24) to assess risk of building damage.

15.4.36 Standard BS 5228-2 (Ref 20), which refers to BS7385-2 (Ref 24) and BS ISO 4866:2010 (Ref 25), differentiates between transient and continuous vibration. For transient vibration, the standard notes that the risk of cosmetic damage to

residential buildings starts at a PPV of 15mm/s at 4Hz (see **Table 15.11** below). The standard also notes that below 12.5mm/s PPV, the risk of damage diminishes towards zero. When considering continuous vibration, the standard recommends that the guide values are reduced by 50%.

15.4.37 BS7385-2 (Ref 24) highlights that the criteria for very old buildings may need to be lowered if the buildings are structurally unsound. However, the standard also notes that criteria should not be set lower simply because a building is important or historic.

Table 15.11: Transient vibration guide values for cosmetic damage

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15Hz	15 Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	50mm/s at 4 Hz and above	50mm/s at 4 Hz and above
Unreinforced or light framed structures Residential or light commercial buildings	15mm/s at 4Hz increasing to 20mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above

From BS 5228-2 (Ref 20) section B.4.4, for underground services, conservative criteria are recommended as follows:
- Maximum PPV for intermittent or transient vibration of 30mm/s.
- Maximum PPV for continuous vibration of 15mm/s.

For older and/or dilapidated brickwork sewers, these values should be halved

15.4.38 Vibration from construction activities would constitute a potential significant effect where the impact occurs for a duration exceeding 10 or more days or nights in any 15 consecutive days or nights, or a total number of days exceeding 40 in any 6 consecutive months.

15.4.39 The identification of likely significant effects is based upon:

a. Likelihood of exceedance over the established thresholds of significant effect;
b. The duration of the construction vibration impact; and
c. Professional judgement.

15.4.40 In Government policy terms, for residential receptors the LOAEL is defined as a PPV of 0.3mm/s and the SOAEL is defined as a PPV of 1 mm/s.

Construction traffic noise

15.4.41 Construction traffic noise predictions are undertaken in accordance with the methodology defined in Calculation of Road Traffic Noise (CRTN) (Ref 24) and in DMRB LA 111 (Ref 26). The results of the predictions are used to determine whether changes in traffic flow and composition during construction works are

likely to give rise to a noise level change of more than 1dB(A), this being the lowest perceptible change in road traffic noise.

15.4.42 The magnitude of impact from noise of construction traffic on the public highways is determined using **Table 15.12**. The Basic Noise Level (BNL) is calculated using CRTN (Ref 24) as required by DMRB LA 111 (Ref 26).

Table 15.12: Magnitude of impact from construction traffic noise (from DMRB LA 111)

Magnitude of impact	Increase in BNL of closest public road used for construction traffic (dB)
Major	Greater than or equal to 5.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Minor	Greater than or equal to 1.0 and less than 3.0
Negligible	Less than 1.0

15.4.43 A potential impact is taken as an increase of 1dB or more in the $L_{A10,18hr}$ predicted between 06:00 and 00:00 hours. This being the lowest perceptible change in road traffic noise.

15.4.44 As defined in DMRB LA 111 (Ref 26), for diversion routes used at night, a major magnitude of impact for construction noise is determined to be the case at any noise sensitive receptor within the diversion route study area. This is because as noted in the standard, the sudden change of traffic levels on diversion routes, as a result of nighttime closures, is highly likely to cause disturbance to receptors next to the road.

15.4.45 Noise from construction traffic would constitute a potential significant effect where the impact is major or moderate and the impact occurs for a duration exceeding 10 or more days or nights in any 15 consecutive days or nights, or a total number of days exceeding 40 in any 6 consecutive months. Where a major or moderate impact has been predicted the absolute noise level has also been compared to the LOAEL and SOAEL values set out in **Table 15.9**.

15.4.46 The identification of likely significant effects is based upon:

a. The change in traffic noise levels resulting at assessed receptors;
b. The levels of noise exposure and character of existing sound environment;
c. The duration of the construction traffic impact; and
d. Professional judgement.

Construction traffic vibration

15.4.47 As noted in DMRB LA 111 (Ref 26), a maintained road surface would be free of irregularities and under general maintenance, vibration is unlikely to lead to significant adverse effects.

15.4.48 It is assumed that the Proposed Onshore Scheme will ensure that road surfaces are well maintained throughout the programme. It is therefore concluded that

construction traffic vibration is unlikely to result in significant effects and is scoped out from further assessment.

Operational noise from stationary sources

15.4.49 The Proposed Onshore Scheme's plant items most likely to give rise to adverse impacts upon nearby sensitive receptors have been input into a 3D noise prediction model. These noise sources are listed in **Section 15.8** and in **Appendix 15.3 Operational noise modelling assumptions**. The noise model includes details of the proposed building massing, intervening structures, ground attenuation and topography of the site and its surroundings.

15.4.50 Information on the topography of the site and its surroundings is taken from the National LiDAR Programme 2024 published by Defra Survey open data. Details such as building layout, type of ground (reflective or absorptive), location of receptors and other geo-spatial information, are taken from OS OpenData, OS MasterMap Topography Layer, OS Address Base and from site visits. The proprietary noise modelling software calculates the attenuation of noise emissions of the plant items in accordance with ISO 9613-2 (Ref 28).

15.4.51 An assessment of the potential impacts arising from operational noise sources has been undertaken in line with BS4142:2014+A1:2019 (Ref 19) at the residential receptors closest to the Draft Order Limits within the operational noise study area. The standard assesses the impact of industrial noise based upon the difference between the measured background sound level without the sound of the Proposed Onshore Scheme, and the 'rating level' of the Proposed Onshore Scheme at the receiver location.

15.4.52 The 'background sound level' ($L_{A90,T}$) is defined in BS4142 (Ref 19) as the typical sound level existing in the absence of the 'specific sound level' at the receiver location. The 'specific sound level' ($L_{Aeq,T}$) from the industrial source can be subject to a certain weighting (penalty) where it displays an identifiable character (such as tonality, impulsivity, intermittency or otherwise distinctive character) to provide a 'rating level' ($L_{Ar,T}$). The 'background sound level' is subtracted from the rating level and the difference used to inform the assessment of the effects.

15.4.53 BS4142 also states that:

> *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs".*

15.4.54 An initial estimate of the impact of the specific sound is conducted by subtracting the measured background sound level from the rating level. As noted in BS4142, the assessment also considers the following:

> *"Typically, the greater this difference, the greater the magnitude of the impact;*
>
> *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;*

A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."

15.4.55 Importantly BS4142 (Ref 19) advises that where the initial estimate of the impact needs to be modified due to the context, all pertinent factors should be taken into consideration, including the absolute level of sound:

"For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night".

15.4.56 The assessment considers normal operation of the Proposed Onshore Scheme and short-term effects due to maintenance. The assessment also considers the potential impacts and effects of low frequency sound which may be associated with the proposed Converter Station and the Full Build Out of Kiln Lane Substation Scenario.

15.4.57 The significance of effects has been determined based on the methodology presented above and other factors including the acoustic context of the area, magnitude of exceedance, predicted rating levels, time of the day where impact occurs and professional judgement. Reference to the relevant guidance as presented in **Section 15.4** has been provided in particular to World Health Organisation (WHO) guidance (Ref 29, Ref 30, and Ref 31) and BS 8233:2014 (Ref 22) for outdoor areas and the appropriate indoor spaces respectively. Where appropriate, reference will also be made to NANR45 for the assessment of low frequency noise.

15.4.58 Consideration has been given to the relatively tranquil areas within the study area, as outlined in the Tranquillity Map: England presented in the CPRE (Ref 18).

15.4.59 Additionally, ESC has indicated via the **EIA Scoping Opinion** and in correspondence with the Applicant that the aspirational target rating noise level of all plant and machinery should be at least 5dB below the typical background. This is presented in **Table 15.4.**

15.4.60 In terms of assessment relating to Government policy, depending on the absolute sound levels in consideration, the SOAEL has been defined as a rating level of 10dB above representative background sound level (except where baseline

sound levels are very low) and the LOAEL as 5dB above representative background sound level (except where baseline sound levels are very low).

Consideration of context and absolute sound levels

15.4.61 The WHO Environmental Noise Guidelines for the European Region 2018 (Ref 30) provides recommendations to protect human health from noise from transportation, wind turbines and leisure. The guidelines also recommend external daytime and evening environmental noise limits, and internal night-time limits to avoid sleep disturbance. These guidelines do not cover industrial noise, however, recommend that Guidelines for Community Noise 1999 (Ref 29) should remain valid. **Table 15.13** presents a summary of the guidelines, which are also referred to in BS8233 (Ref 22).

Table 15.13: Extract from WHO Guidelines for Community Noise

Specific environment	Critical health effect(s)	L_{Aeq}	Time base (hours)	$L_{Amax,F}$
Outdoor living area	Serious annoyance, daytime and evening Moderate annoyance, daytime and evening	55 50	16 16	- -
Dwelling, indoor Inside bedrooms	Speech intelligibility and moderate annoyance, daytime and evening Sleep disturbance, night-time	35 30	16 8	- 45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

15.4.62 Additionally, the WHO Night Noise Guidelines for Europe 2009 (Ref 31) recommend guidelines on night-time noise limits to avoid sleep disturbance. These guidelines indicate that the lowest observed adverse effect level (LOAEL) is 40dB$L_{night,outside}$.

15.4.63 While the WHO guidelines are primarily based on research into transportation noise sources and may therefore have limited direct applicability to industrial noise, they provide a useful benchmark for assessing absolute noise levels in the absence of more specific guidance for determining likely significant adverse effects.

15.4.64 For the purposes of this assessment, the predicted rating levels from the Proposed Onshore Scheme, which account for identifiable acoustic character, are compared against the criteria of **Table 15.13** to determine significance of effects.

Operational road traffic noise and vibration

15.4.65 Operational road traffic noise and vibration has been scoped out from further assessment. Section 15.8 (paragraph 15.8.102 to 15.8.104) defines the anticipated number of operational road vehicle movements to demonstrate that operational traffic noise is unlikely to result in significant effects as requested by the Planning

Inspectorate's **EIA Scoping Opinion** (**Table 15.5**) and in line with the guidance presented in DMRB LA 111 (Ref 27).

Operational vibration

15.4.66 Information about the proposed Converter Station and Full Build Out of Kiln Lane Substation Scenario is presented in **Section 15.8** and **Appendix 15.3 Operational noise modelling assumptions**. A qualitative assessment of operational vibration is presented in **Section 15.8**.

Cumulative assessment

15.4.67 **Chapter 28 Cumulative Effects** of this PEIR defines the methodology for the assessment of cumulative effects. The noise and vibration assessment of intra- and inter-project cumulative effects will be carried out and reported within the ES.

15.4.68 The Zone of Influence for the inter-project cumulative effects assessment of noise and vibration is defined as 300m around the Draft Order Limits for construction noise and vibration and 1km around the proposed Converter Station and Fill Build Out of Kiln Lane Substation for operational noise.

Decommissioning noise and vibration

15.4.69 The works which take place during decommissioning of the Proposed Onshore Scheme are expected to be similar in magnitude (or less extensive) than those required for construction. It is unlikely that decommissioning activities at the Landfall would need to take place during the night-time; therefore, associated impacts are anticipated to be of a lesser magnitude.

15.4.70 The assessment presented for construction noise and vibration impacts is therefore representative of the decommissioning phase.

Guidance

15.4.71 The noise and vibration assessment has been undertaken in accordance with relevant guidance and has been compiled in accordance with professional standards. The guidance and standards which relate to this assessment are:

a. BS 5228 Parts 1 and 2, code of practice for noise and vibration control on construction and open sites – Part 1: Noise and Part 2: Vibration, 2014 (Ref 20);
b. BS 7445-1 Description and measurement of environmental noise – Part 1; Guide to quantities and procedures, 2003 (Ref 21);
c. BS 4142 Methods for rating and assessing industrial and commercial sound, 2019 (Ref 19);
d. BS 8233 Guidance on sound insulation and noise reduction for buildings, 2014 (Ref 22);
e. BS 6472-1 Guide to evaluation of human exposure to vibration in buildings – vibration sources other than blasting, 2008 (Ref 23);

f. BS 7385-2 Evaluation and measurement for vibration in buildings - Guide to damage levels from groundborne vibration, 1993 (Ref 24);
g. BS ISO 4866 Mechanical vibration and shock. Vibration of fixed structures. Guidelines for the measurement of vibrations and evaluation of their effects on structures, 2010 (Ref 25);
h. BS ISO 9613-2 Acoustics-Attenuation of sound during propagation outdoors
i. Guidelines for community noise. World Health Organization (WHO), 1999 (Ref 29);
j. Night noise guidelines for Europe, WHO, 2009 (Ref 30);
k. Environmental noise guidelines for the European Region, WHO 2019 (Ref 31);
l. BS 8233 Guidance on sound insulation and noise reduction for buildings, 2014 (Ref 22);
m. Calculation of road traffic noise (CRTN), 1988 (Ref 26);
n. Design Manual for Road and Bridges (DMRB) LA 111 – Noise and Vibration (Ref 27);
o. Proposed criteria for the assessment of low frequency noise disturbance, DEFRA NANR45, 2005 (Ref 34);
p. Institute of Sustainability and Environmental Professionals - Guidelines for Environmental Noise Impact Assessment (Ref 32);
q. Environmental sound measurement guide – ANC (Ref 33); and
r. BS4142 ANC Technical note , 2019 (Ref 35).

15.5 Assessment assumptions and limitations

15.5.1 This section provides a description of the assumptions and limitations to the preliminary noise and vibration assessment.

15.5.2 The environmental sound survey was conducted at a number of locations representative of nearby sensitive receptors. It is assumed that baseline sound levels at the measurement locations are comparable to those at the nearby receptors, as surveying every receptor individually is not practicable (due to the scale of the Draft Order Limits), nor proportionate. Regarding the uncertainty of the environmental sound survey, typical sound levels were obtained through attended measurements conducted on different days and at various times of the day. Furthermore, continuous sound level logger data was recorded over several days at five logger locations.

15.5.3 As a worst-case scenario, the construction noise assessment assumes the most stringent threshold under the ABC methodology by applying Category A to identify potential significant effects at all receptors.

15.5.4 At this stage of the EIA for the Proposed Scheme, detailed information regarding increases in traffic on the existing public road network due to construction works is not yet available. The assessment of construction traffic noise will be presented in the Environmental Statement.

15.5.5 The construction and operational noise modelling of the sources associated with the Proposed Onshore Scheme is based on manufacturer data available at the

time of writing and is supplemented by information gathered from relevant literature (see **Appendix 15.2 Construction noise and vibration assumptions and results** and **Appendix 15.3 Operational noise modelling assumptions** for further details) and experience in other similar projects. Where design details are unavailable to inform the assessment, professional judgement has been applied to assess a realistic worst-case scenario. There is a possibility that there is variation in the noise from similar facilities, however this is unlikely to change the outcomes presented in this assessment. Information about operational noise sources will be reviewed and updated as necessary for the ES.

15.5.6 For the construction noise assessment of the cable corridor options in Section B-2, a qualitative assessment is presented for the Eastern Route Option of the proposed Underground HVDC Cable Corridor. This reflects the fact that detailed design information was not available to input into the construction noise model for this PEIR. Information about construction noise sources will be reviewed and updated as necessary for the ES.

15.6 Baseline conditions

15.6.1 To provide an assessment of the likely significance of the Proposed Onshore Scheme (in terms of noise and vibration), it is necessary to identify and understand the baseline conditions in the study area. This provides a reference point against which potential changes in noise and vibration can be assessed

Current baseline

Full Build Out of Kiln Lane Substation Scenario

15.6.2 The sound environment around the Full Build Out of Kiln Lane Substation Site is of a rural nature with ambient sound levels dominated by road traffic noise from Grove Road to the east and the B1121 (Saxmundham Road) to the south. Other sound sources in the area include farming operations in adjacent fields, farm animals including cockerels, birds and a bird scarer sounding between sunrise and sunset.

15.6.3 The closest sensitive receptors around the Full Build Out of Kiln Lane Substation site include:

a. Little Moor Farm to the north (residential dwelling), represented by measurement location L8;C
b. Fareacre (residential dwelling) and Caravan Park to the north east by Grove Road, represented by measurement location L9; and
c. Woodside Farm to the south (residential dwelling), represented by measurement location L10.

15.6.4 There are ten Public Rights of Way (PRoW) within and around the Full Build Out of Kiln Lane Substation site.

15.6.5 The summary of baseline environmental sound survey results for the Full Build Out of Kiln Lane Substation site is presented in **Table 15.14**. Further details are presented in **Appendix 15.1 Environmental sound survey**.

Table 15.14: Summary of measured baseline sound levels around the Full Build Out of Kiln Lane Substation Site

Location	Description	Measured sound level, dB					
		$L_{A90,T}$		$L_{Aeq,T}$		$L_{Amax,F}$	
		Day	Night	Day	Night	Day	Night
L8	Little Moor Farm	33	24	49	44	50-96	31-96
L9	Fareacre Farm and Caravan Park	34	23	50	46	36-92	31-82
L10	Woodside Farm	33	24	49	44	50-96	31-96

15.6.6 According to the national relative tranquillity mapping, the Full Build Out of Kiln Lane Substation Site ranks around the tranquillity average score (i.e., ~-1.3).

Underground High Voltage Alternating Current Cable Corridor

15.6.7 The sound environment around the proposed Underground HVAC Cable Corridor site is of a rural nature with ambient sound levels dominated by road traffic noise from the B1121 (Saxmundham Road) to the south. Other sound sources in the area included farming operations, and a bird scarer sounding every 7 minutes during daylight hours.

15.6.8 The closest receptors around the proposed Underground HVAC Cable Corridor site include:

a. Owls Hall and Red House Farm to the south (residential dwellings);
b. Red House Barns to the south (holiday let); and
c. Hill Farmhouse to the south (residential dwelling).

15.6.9 There are 22 PRoWs across and around the proposed Underground HVAC Cable Corridor.

15.6.10 No environmental sound surveys have been undertaken around the proposed Underground HVAC Cable Corridor. This is because the only potential impacts from this component of the Proposed Onshore Scheme occur during construction phase. The preliminary assessment of construction noise is based on Category A of the ABC methodology which are the most onerous criteria for the assessment of construction noise i.e. lower criteria would not be applied, irrespective of the baseline ambient sound level.

15.6.11 According to the national relative tranquillity mapping, the proposed Underground HVAC Cable Corridor site ranks around the tranquillity average score (i.e., ~-1.3).

Converter Station

15.6.12 The sound environment around the proposed Converter Station site is of a rural nature with ambient sound dominated by road traffic noise from the B1119 to the north, B1121 to the west and the railway line running through Saxmundham to the north-west. Other sound sources in the area include farming operations in surrounding fields, a small wind turbine on Wardspring Farm, light building works to the escape rooms at Wardspring Farm, and a bird scarer sounding between sunrise and sunset.

15.6.13 The closest receptors around the proposed Converter Station site include:

a. Community in Manor Gardens to the north west with about 27 receptors (residential dwellings), represented by measurement location L3;
b. Wood Farm to the west (residential dwelling), represented by measurement location L4;
c. Hill Farmhouse to the south (residential dwelling), represented by measurement location L5;
d. Trust Farm to the east (residential dwelling), represented by measurement location L6; and
e. Wardspring Farm to the north east (residential dwelling), represented by measurement location L7.

15.6.14 The summary of environmental sound survey results for the proposed Converter Station site is presented in **Table 15.15**. Further details are presented in **Appendix 15.1 Environmental sound survey**.

Table 15.15: Summary of measured baseline sound levels around the proposed Converter Station site

Location	Description	Measured sound level, dB					
		$L_{A90,T}$		$L_{Aeq,T}$		$L_{Amax,F}$	
		Day	Night	Day	Night	Day	Night
L3	Manor Gardens	32	21	46	33	39-90	33-86
L4	Wood Farm	32	21	46	33	39-90	33-86
L5	Hill Farmhouse	32	19	49	36	40-78	33-78
L6	Trust Farm	32	20	46	41	41-82	26-78
L7	Wardspring Farm	30	20	42	41	37-87	28-77

15.6.15 There are six PRoW across and around the proposed Converter Station site.

15.6.16 According to the national relative tranquillity mapping, the proposed Converter Station site ranks around the tranquillity average score (i.e., ~-1.3).

Underground High Voltage Direct Current Cable Corridor

15.6.17 Due to the length of the proposed Underground HVDC Cable Corridor, sectioning has been used to describe the routes more clearly (Sections A to D) which are shown in **Figure 2.1** of this PEIR.

15.6.18 The sound environment around the proposed Underground HVDC Cable Corridor is of a rural nature with ambient sound levels assumed to be dominated by road traffic noise from the B1122, Yoxford Road, Lymballs Lane, the B1125 (Dunwich Road) and the B1387 (The Street). Other sound sources in the area are assumed to include the Saxmundham to Leiston railway line, the sea, birds and farming operations.

15.6.19 There are a number of sensitive receptors around the proposed Underground HVDC Cable Corridor. Within 300m of the Limit of Deviation, there are approximately 130 residential receptors and 21 non-residential receptors.

15.6.20 The residential receptors are located within and around the following areas:

a. Grove Road south of the Saxmundham to Leiston railway line (Section B-2);
b. Theberton (Section B-3);
c. Middleton (Section B-4);
d. Middleton Moor (by Yoxford Road around Norwood House) (Section B-4);
e. East side of Darsham and west side of Westleton (Section C-1 and C-2);
f. Hinton Corner (Section C-2 and C-3); and
g. Walberswick (Section D).

15.6.21 Across all sections the non-residential receptors include holiday let establishments, campsites and offices.

15.6.22 There are 140 PRoW across and around the proposed Underground HVDC Cable Corridor.

15.6.23 No environmental sound surveys have been undertaken around the proposed Underground HVDC Cable Corridor. This is because the only potential impacts from this component of the Proposed Onshore Scheme occur during construction. The preliminary assessment of construction noise is based on Category A of the ABC methodology which are the most onerous criteria for the assessment of construction noise i.e. lower criteria would not be applied, irrespective of the baseline ambient sound level.

15.6.24 There are number of ecological designations in the vicinity of the proposed Underground HVDC Cable Corridor, which are described in detail in **Chapter 8 Ecology and Biodiversity**.

15.6.25 According to the national relative tranquillity mapping, the proposed Underground HVDC Cable Corridor site ranks around the tranquillity average score (i.e., ~-1.3).

Landfall Site

15.6.26 The sound environment around the proposed Landfall Site is of a rural and maritime nature, with ambient sound levels dominated by road traffic noise from the B1384 (The Street), general sound from the Walberswick community and sound from the sea. Other sound sources in the area included farming operations in the adjacent fields, waves breaking on the shore and seagulls.

15.6.27 There are a number of sensitive receptors around the proposed Landfall Site located within the community of Walberswick. Within 300m of the proposed Landfall Site, there are approximately 239 residential receptors and 34 non-residential receptors.

15.6.28 The closest residential receptors around the proposed Landfall Site are located on Stocks Lane, The Street and Millfield Road. The non-residential receptors include holiday establishments, campsites, village halls, a church and various shops.

15.6.29 There are 24 PRoW across and around the proposed Landfall Site.

15.6.30 There are number of ecological designations in the vicinity Proposed Landfall Site, which are described in detail in **Chapter 8 Ecology and Biodiversity**.

15.6.31 Measurement locations reference A1, L1 and L2 describe the sound levels around the site and are summarised in **Table 15.16**. Further details are presented in **Appendix 15.1 Environmental sound survey**.

15.6.32 For this location, the $L_{Aeq,T}$ has been estimated for the day, evening and night, to inform the construction noise assessment.

Table 15.16: Summary of measured baseline sound levels around the proposed Landfall site

Location	Description	Measured sound level, dB						
		$L_{A90,T}$		$L_{Aeq,T}$			$L_{Amax,F}$	
		Day	Night	Day	Evening	Night	Day	Night
A1	The Street (attended measurements)	37	-	59	-	-	78	-
L1	Stocks Lane	31	31	45	41	45	34-80	31-85
L2	Walberswick Caravan Park	35	36	46	45	46	38-87	38-76

15.6.33 According to the national relative tranquillity mapping, the proposed Landfall Site ranks around the tranquillity average score (i.e., ~-1.3).

Future baseline

15.6.34 The future baseline sound environment is expected to change in the absence of the Proposed Onshore Scheme due to the construction and operation of nearby committed developments including NSIPs that include substantial noise sources. Additionally, changes in road and railway traffic resulting from other local committed developments may also influence the future sound baseline. However, this is not anticipated to alter the outcomes of the EIA.

15.6.35 As a conservative worst-case approach, the noise impact thresholds for both construction and operational phases have been established based on the existing baseline sound levels. These do not account for any potential increases associated with committed developments in the vicinity of the scheme components.

15.6.36 This assumption ensures a robust assessment by maintaining a precautionary basis for determining potential impacts.

15.6.37 The planned Sizewell Link Road, located near Theberton and Annesons Corner (Section B-4), is expected to change the overall sound environment by increasing noise levels in proximity to the new road while reducing noise levels along the routes it bypasses. The assessment of construction noise for the Proposed Development assumes that a worst-case Category A threshold will apply, under the ABC methodology for construction noise. Therefore, with the presence of the planned Sizewell Link Road in a future baseline scenario, the impacts would not be greater than those presented in this report.

15.6.38 There are no climate change variables that would, in any reasonable timescales, materially affect the assessments as currently detailed within this topic section. Climate variables that have may have relevance to the noise and vibration assessment are mean temperature, mean daily maximum temperature, and mean daily minimum temperature. These variables do not directly affect the levels of noise predicted in the assessment but have an indirect effect on the average internal noise level if windows are open more frequently (as a result of mean changes in temperature due to climate change). However, the assessment of operational noise is based on noise level change rather than simply absolute noise levels. Therefore, the reported noise effects associated with the Proposed Onshore Scheme do not alter when extreme temperature increase is considered.

15.6.39 Changes to temperature or other meteorological conditions may slightly influence the baseline noise and vibration climate over a long period of time, though not within any ranges that could be quantified within the framework of this assessment.

15.7 Embedded design mitigation and control measures

Design and embedded mitigation measures

15.7.1 The Proposed Onshore Scheme has been designed to minimise construction and operational noise impacts on sensitive receptors. As presented in **Chapter 3 Alternatives and Design Evolution**, noise and vibration has been considered for the environmental design of the Proposed Onshore Scheme. This includes, for example, the location of the cable corridor routes and centrelines to avoid impacts upon sensitive receptors, the extent of the Limits of Deviation and Draft Order Limits and proposed Converter Station site location to minimise impacts.

15.7.2 Preliminary control measures are set out in **Appendix 2.1 Outline Onshore Code of Construction Practice (CoCP)** which will manage the effects of construction. The measures of particular relevance to noise and vibration are listed in **Table 15.17.**

15.7.3 At this stage of the design of the Proposed Onshore Scheme, no specific additional mitigation measures are expected or proposed beyond those identified within **Appendix 2.1 Outline Onshore CoCP**.

Control measures

15.7.4 Control measures are set out in the **Appendix 2.1 Outline Onshore CoCP** which would manage the effects of construction. The measures of particular relevance to noise and vibration are listed in **Table 15.17**.

Table 15.17: Design and embedded mitigation and control measures relevant to noise and vibration

Commitment reference code	Design and embedded mitigation and control measure	Compliance mechanism
Measures to control construction noise and vibration		
NV01	To minimise the level of noise to which sensitive receptors will be exposed, the construction work will be conducted in accordance with an Outline Onshore CoCP which will be included within the DCO Application and secured through DCO requirements. The appointed contractor will also conduct works in line with best practicable means (BPM) as defined in CoPA.	Outline Onshore CoCP
NV02	The Outline Onshore CoCP will contain established control measures for noise and vibration that will be adopted during construction and will be informed by feedback provided by relevant stakeholders in the **EIA Scoping Opinion**. Mitigation measures, based upon BS 5228-1, include the commitment references below.	Outline Onshore CoCP

Commitment reference code	Design and embedded mitigation and control measure	Compliance mechanism
NV03	Careful selection of plant and construction methods. Only plant conforming to relevant national, EU or international standards, directives and recommendations on noise and vibration emissions should be used.	Outline Onshore CoCP
NV04	Design and use of site enclosures, housing and temporary stockpiles, where practicable and necessary, to provide acoustic screening at the earliest opportunity.	Outline Onshore CoCP
NV05	Where practicable, doors and gates should not be located opposite occupied noise sensitive buildings. The mechanisms and procedures for opening doors or gates will minimise noise, as far as reasonably practicable.	Outline Onshore CoCP
NV06	When considering the choice of routes, construction traffic noise and vibration impacts will be considered.	Outline Onshore CoCP
NV07	Careful programming so that activities are planned with regard to local occupants and sensitive receptors. Where possible, programme works to avoid having noisy activities close to receptors during sensitive times.	Outline Onshore CoCP
NV08	All vehicles and mechanical plant shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order and operated to minimise noise emission.	Outline Onshore CoCP
NV09	All compressors and generators shall be ‘sound reduced’ models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers.	Outline Onshore CoCP
NV10	All machines in intermittent use shall be shut down in the intervening periods between works or throttled down to a minimum. Lorry engines will be switched off, as soon as practicable, when vehicles are stationary.	Outline Onshore CoCP
NV11	Noise emitting equipment which is required to run continuously shall be housed in a suitable acoustic enclosure (see BS5228 Part 1, Figures B.1, B.2 and B.3).	Outline Onshore CoCP
NV12	Temporary noise barriers will be used to reduce noise levels where appropriate and practicable, to provide at least partial screening to nearby sensitive receptors. For receptors reference ALID_74, ALID_75 and ALID_76, which are representative of residential receptors in Walberswick, noise barriers should aim to achieve full screening. This may require barriers of approximately 5m height, although the detailed geometry will be developed for the ES when more information	Outline Onshore CoCP

Commitment reference code	Design and embedded mitigation and control measure	Compliance mechanism
	about night-time works at the proposed Landfall Site are developed. Barriers should be located as close to the plant as possible and, in order to provide adequate attenuation, should have a mass per unit area of at least 12kg/$m^{2.}$	
NV13	Plant and equipment liable to create noise and/or vibration whilst in operation will, as far as reasonably practicable, be located away from sensitive receptors and away from walls reflecting towards sensitive receptors.	Outline Onshore CoCP
NV14	Materials for night-time working will be delivered, where practicable, during normal hours of working and be placed as close as possible to the work area for which they are required.	Outline Onshore CoCP
NV15	Where reasonably practicable, fixed items of construction plant shall be electrically powered in preference to combustion engine driven.	Outline Onshore CoCP
NV16	To minimise potential vibration impacts, where necessary compaction could be achieved without using a vibratory system, however there may be a resulting increase in the duration of the compaction works.	Outline Onshore CoCP
NV17	The Outline Onshore CoCP will also include a communication strategy for prior warning of activities with the potential to cause disturbance. During construction, appropriate mechanisms to communicate with local residents will be set up to highlight potential periods of disruption for both noise and vibration. These mechanisms are for example web-based, newsletters, newspapers, radio announcements, letter drop, social media or dedicated internet page.	Outline Onshore CoCP
NV18	The communication strategy will include a point of contact for the Principal Contractor for any queries or complaints. Any noise or vibration complaints will be investigated and appropriate action taken as required.	Outline Onshore CoCP
NV19	A Noise and Vibration Management Plan shall be developed prior to the start of construction works on site. This plan would explore potential mitigation measures including: • Construction noise control measures to minimise impacts at receptors where a significant effect is predicted in this PEIR; • Noise and vibration monitoring to identify when limits have been exceeded and stop work protocols should be implemented; • Plans for engagement with the identified receptors to lessen the potential impacts of noise and vibration impacts, including discussions around timing of certain works and activities; and • Other offsite mitigation measures as presented in BS5228.	Outline Onshore CoCP

Commitment reference code	Design and embedded mitigation and control measure	Compliance mechanism
Measures to control operational noise		
NV20	Noise from operational noise sources will be controlled through design to ensure compliance with BS4142 and local authority criteria, as far as practicable. Mitigation measures which may be implemented as part of the design include: • Placing plant items as far as possible from nearby sensitive receptors; • Orienting plant within the site to use buildings and structures as noise barriers or positioning noise emitting items such as fans and air inlets away from sensitive receptors; • Reducing breakout noise from plant by using acoustic enclosures or housing them within a building (subject to ventilation requirements for plant); • Minimising air inlet noise emissions with additional in-line attenuation; • Reducing noise emissions associated with ventilation with screening, resizing, low-noise fans, acoustic louvres or attenuation; • Using screening or bunding to shield receptors from noise sources.	Embedded mitigation by design
NV21	Subject to the design of the Proposed Scheme, the proposed Converter Station transformers are likely to require acoustic enclosure with a sound reduction index of approximately R_w43dB. Ventilation for the enclosure needs to be considered in the design to minimise noise break-out from the enclosure	Embedded mitigation by design
NV22	Subject to Proposed Onshore Scheme design, Air Handling Units (AHUs) serving the proposed Converter Station are likely to require attenuation in the form of fan attenuator of around R_w25dB	Embedded mitigation by design
NV23	Subject to the design of the Proposed Scheme, air cooling towers serving the proposed Converter Station transformers are likely to require attenuation in the form of fan attenuators/silencer of around R_w22dB	Embedded mitigation by design
NV24	The proposed Converter Station's buildings, including the transformers building, AC Yard and Filter Hall and DC Hall are likely to require a minimum sound reduction index of approximately R_w25dB which is achievable with insulated wall panels	Embedded mitigation by design
NV25	The mitigation of operational plant noise can be secured by a DCO requirement so that the operator will be required to demonstrate that operational noise sources do not result in likely adverse significant effects.	DCO requirement

15.8 Assessment of effects

15.8.1 This section presents the preliminary assessment of likely significant effects of noise and vibration resulting from the construction, operation and maintenance, and decommissioning of the Proposed Scheme. The likely significant effects of the Proposed Scheme are identified taking into account the embedded design mitigation and control measures.

15.8.2 Following assessment, further mitigation is proposed as required which is presented in **Section 15.9**.

Construction noise

15.8.3 The construction activities with the potential to result in temporary adverse impacts at existing receptors are listed below. These include discrete works of relatively long duration, such as construction activities associated with the proposed Converter Station, proposed Kiln Lane Substation and the proposed Landfall. They also include linear works, such as those along the proposed Underground Cable Corridor, which are expected to be of relatively short duration as they progress along the route. Details on the type and number of plant, likely on-time periods and sound power levels are presented in **Appendix 15.2 Construction noise and vibration assumptions and results**.

a. Activity A - Enabling works and site preparation;
b. Activity B - Trenched excavation works;
c. Activity C - Horizontal Directional Drilling (HDD) activities;
d. Activity D - Cable installation;
e. Activity E – Demobilisation works;
f. Activity F – Compound construction and demobilisation;
g. Activity G – proposed Converter Station construction works;
h. Activity H – Full Build Out of Kiln Lane Substation Scenario construction works which include construction, demolition and modification of pylons);
i. Activity I – proposed Landfall construction works;
j. Activity J – Haul roads; and
k. Activity K – Bridge erection.

15.8.4 The construction noise prediction represents a reasonable typical scenario for each stage of works, assuming that the construction equipment is situated at a typical/standard location. However, noise levels may vary over shorter durations. Specifically, when construction activities are in proximity to receptors, noise levels are expected to be higher than when the same works are taking place further away and they gradually decrease as the construction works progress.

15.8.5 The sequence of works for all stages of the Proposed Onshore Scheme, and the indicative construction programme used for this assessment are presented in **Paragraphs 2.5.6** to **2.5.8** within **Chapter 2 Description of the Proposed Scheme**. The construction noise assessment includes the total noise from

various different construction activities when they are anticipated to occur concurrently and would impact the same receptor.

15.8.6 The proposed construction core working hours (unless otherwise approved by the Local Planning Authority) are Monday to Friday from 07:00 to 19:00 and Saturday, Sunday and Bank Holidays from 07:00 to 17:00.

15.8.7 Further information about construction working hours and activities during start up and close down are presented in **Section 2.5 Indicative Construction Activities** within **Chapter 2 Description of the Proposed Scheme.**

15.8.8 In the absence of detailed information about the timing of specific construction works, particularly those which could occur during the evening and night, the preliminary assessment is undertaken for the daytime period (07:00 to 19:00) as a standard basis. Activities at the Landfall Site which will require 24-hour working include drilling, reaming, duct pulling and cable pulling. The Landfall Site would require up to four HDDs. Each HDD is expected to take up to 6 weeks to complete subject to site conditions. It is not anticipated that 24-hour working will be required to be continuous for the entire period of these construction activities. In most cases, continuous 24-hour construction activities at the Landfall Site are expected to be limited to a maximum of 10 consecutive days per HDD. However, longer periods may be necessary in exceptional circumstances, such as unforeseen delays or emergencies. The construction approach will be developed further, assessed as part of the EIA and reported in more detail in the ES.

15.8.9 As a worst-case scenario, a specific night-time assessment based on the assumptions presented in **Appendix 15.2 Construction noise and vibration assumptions**, is presented for the proposed Landfall Site. The assessment considers the embedded mitigation measures presented in **Section 15.7** of this chapter. There is potential for work outside core hours in other parts of the Proposed Onshore Scheme beyond the proposed Landfall site. However, at the time of writing there is insufficient information about the locations and type of works to feed into the preliminary assessment. These will be assessed as part of the ES when more detailed information becomes available.

15.8.10 As a worst-case scenario, the assessment adopts the most stringent threshold under the ABC methodology by applying Category A to identify potential significant effects at all receptors.

Full Build Out of Kiln Lane Substation Scenario

15.8.11 The predicted construction noise levels for activities associated with the Full Build Out of Kiln Lane Substation Scenario are presented in **Section 2.2** and **Section 2.3** of **Appendix 15.2 Construction noise and vibration assumptions and results**. Both the Northern and Southern proposed Underground HVAC Cable Corridor options have been assessed. **Appendix 15.2 Construction noise and vibration assumptions and results** presents the assessments for the sensitive receptors located closest to the construction works, along with the applicable noise impact thresholds (Category A for all receptors, as defined in BS 5228) and the predicted construction noise levels per quarter of each year (i.e. Q1-Q4). Construction activities, associated sound power levels and the assumptions used in the assessment are detailed in **Section 1.2** of the same appendix.

15.8.12 At receptor reference ALID_7, which represents a group of residential properties near Manor Farm, Category A (equivalent to the LOAEL) is predicted to be exceeded for both the north and south proposed Underground HVAC Cable Corridor options described in **Chapter 2 Description of the Proposed Scheme**. A predicted noise level of approximately 67dB$L_{Aeq,T}$ exceeds the adopted criterion by 2dB, primarily due to haul road activity expected between Q2 2029 and Q4 2031. This prediction is based on a worst-case scenario, assuming the maximum number of daily construction vehicle movements (approximately 335) during the peak construction period. Under these conditions, noise levels are expected to marginally exceed the threshold, resulting in a temporary adverse effect. However, this peak activity near the receptor is expected to be limited in duration. Noise levels are unlikely to exceed the threshold for more than 40 days within any six consecutive months, which means the temporal criterion for significance (as defined in BS 5228 and outlined in paragraph 15.4.31) is not expected to be triggered.

15.8.13 Over the course of the works, daily construction traffic is expected to vary, with the arithmetic average of approximately 79 daily vehicle movements considered more representative of typical conditions. Based on this typical rate, the predicted noise level reduces to 62dB$L_{Aeq,T}$, which falls below the Category A threshold.

15.8.14 The SOAEL for construction noise is not predicted to be exceeded at any receptor.

15.8.15 The appointed contractor shall conduct construction works in line with the **Appendix 2.1 Outline Onshore CoCP** as presented in **Table 15.17** which will ensure BPM are employed throughout to minimise noise impacts.

15.8.16 Overall, considering the nature and scale of the proposed construction works and the anticipated typical daily vehicle movements, construction noise effects from the Full Build out of the Kiln Lane Substation Scenario are assessed as **not significant**.

High Voltage Alternating Current Underground Cable Corridor

15.8.17 The predicted construction noise levels for activities associated with the proposed Underground HVAC Cable Corridor are presented in **Section 2.4** and **2.5** of **Appendix 15.2 Construction noise and vibration assumptions and results**. This appendix presents the assessments for sensitive receptors located closest to the construction works, along with the applicable noise impact thresholds (Category A for all receptors, as defined in BS 5228) and the predicted construction noise levels per quarter for each year (i.e. Q1-Q4). Construction activities, associated sound power levels and the assumptions used in the assessment are detailed in **Section 1.2** of the same appendix.

Option 1 – Southern Route Option

15.8.18 Construction noise from the Southern Route Option of the proposed Underground HVAC Cable Corridor is not predicted to exceed Category A at nearby sensitive receptors, which is an indication of impacts not resulting in a significant effect.

15.8.19 The highest predicted noise levels of about 59dB$L_{Aeq,T}$ are caused by construction vehicles using haul roads (associated with the proposed Underground Cable Corridor i.e., HVAC and HVDC) and site enabling works, which occur simultaneously from Q2 2029 to Q4 2029.

15.8.20 Construction noise levels are not predicted to exceed either the SOAEL or the LOAEL at any receptor.

15.8.21 Based on the above, it is concluded that noise effects from the construction of the Southern Route Option of the proposed Underground HVAC Cable Corridor are **not significant**.

Option 2 – Northern Route Option

15.8.22 Construction noise from the Northern Route Option of the proposed Underground HVAC Cable Corridor is not predicted to exceed Category A at nearby sensitive receptors, which is an indication of impacts not resulting in a significant effect.

15.8.23 The highest predicted noise levels of about 64dB$L_{Aeq,T}$ are caused by construction vehicles using haul roads (associated with the proposed Underground Cable Corridor i.e., HVAC and HVDC) which occur simultaneously from Q2 2029 to Q3 2031.

15.8.24 Construction noise levels are not predicted to exceed either the SOAEL or the LOAEL at any receptor.

15.8.25 Based on the above, it is concluded that construction noise effects from the construction of proposed Underground HVAC Cables Northern Route Option are **not significant**.

Converter Station

15.8.26 The predicted construction noise levels for activities associated with the proposed Converter Station are presented in **Section 2.6** of **Appendix 15.2 Construction noise and vibration assumptions and results**. This appendix presents the assessments for the sensitive receptors located closest to the construction works, along with the applicable noise impact thresholds (Category A for all receptors, as defined in BS 5228) and the predicted construction noise levels per quarter of each year (i.e. Q1-Q4). Construction activities, associated sound power levels and the assumptions used in the assessment are detailed in **Section 1.2** of the same appendix.

15.8.27 The highest predicted noise levels of about 62dB$L_{Aeq,T}$ are associated with construction traffic using the haul road, enabling works and construction compound activities related to the proposed Converter Station.

15.8.28 Construction noise from the proposed Converter Station is not predicted to exceed Category A at nearby sensitive receptors, which is an indication of impacts not resulting in a significant effect.

15.8.29 Construction noise levels are not predicted to exceed either the SOAEL or the LOAEL at any receptor.

15.8.30 Based on the above, it is concluded that noise effects from construction of the proposed Converter Station are **not significant**.

Underground High Voltage Direct Current Cable Corridor

15.8.31 The predicted construction noise levels for activities associated with the proposed Underground HVDC Cable Corridor are presented in **Section 2.7** of **Appendix 15.2 Construction noise and vibration assumptions and results**. This appendix presents the assessments for the sensitive receptors located closest to the construction works, along with the applicable noise impact thresholds (Category A for all receptors, as defined in BS 5228) and the predicted construction noise levels per quarter of each year (i.e. Q1-Q4). Construction activities, associated sound power levels, and the assumptions used in the assessment are detailed in **Section 1.2** of the same appendix.

15.8.32 The noise modelling predictions include the optionality that occurs within Section B-2 for the Western Route. As noted in **Section 15.5**, a qualitative assessment is presented for the Eastern Route Option of the proposed Underground HVDC Cable Corridor since at the time of writing, detailed design information was not yet available.

15.8.33 Category A (which is equivalent to the LOAEL) is predicted to be exceeded at receptor reference ALID_44, ALID_49, ALID_51, ALID_52, ALID_65, ALID_66 ALID_72, and ALID_74. ALID_44 represents a group of receptors at Trust Farm to the south-west of Middleton in Section B-4. ALID_65 and ALID_66 represent receptors by Lymballs Lane to the north of Darsham in Section C-2. The

predicted highest noise levels and respective exceedances are presented in in **Section 2.7** of **Appendix 15.2 Construction noise and vibration assumptions and results.**

15.8.34 The exceedances are caused by construction vehicles using the haul roads associated with this component of the Proposed Onshore Scheme and occur from Q2 2029 to Q3 2031. This prediction is based on a worst-case scenario, assuming the maximum number of daily construction vehicle movements (approximately 335) during the peak construction period. Under these conditions, noise levels are expected to marginally exceed the threshold, resulting in a temporary adverse effect. However, this peak activity near the receptor is expected to be limited in duration. Noise levels are unlikely to exceed the threshold for more than 40 days within any six consecutive months, which means the temporal criterion for significance (as defined in BS 5228 and outlined in paragraph 15.4.31) is not expected to be triggered.

15.8.35 Over the course of the works, daily construction traffic is expected to vary, with the arithmetic average of approximately 79 daily vehicle movements considered more representative of typical conditions. Based on this typical rate, the predicted noise level reduces to 64-68dB$L_{Aeq,T}$ which falls below the Category A threshold except ALID_44 for which noise levels are predicted to be approximately 70dB$L_{Aeq,T}$.

15.8.36 The SOAEL for construction noise is not predicted to be exceeded at any receptor.

15.8.37 The appointed contractor will be required to carry out works in accordance with the **Appendix 2.1 Outline Onshore CoCP**, as outlined in **Table 15.17**, ensuring that BPMs is employed throughout to minimise noise impacts. With these measures in place, construction noise levels are expected to be controlled to an acceptable level. If necessary, noise monitoring at the nearest receptor could be undertaken during the works to confirm that levels remain within acceptable limits.

15.8.38 Overall, considering the nature and scale of the proposed construction works and the anticipated typical daily vehicle movements, construction noise effects from the proposed Underground HVDC Cable Corridor are assessed as **not significant**.

Section B-2 - Western Route Option

15.8.39 Construction noise from the Section B-2 – Western Route option is not predicted to exceed Category A at nearby sensitive receptors.

15.8.40 The highest predicted noise levels of about 55dB$L_{Aeq,T}$ are caused by construction vehicles using haul roads (associated with the proposed Underground Cable Corridor i.e., HVDC) and site enabling works, which occur simultaneously from Q2 2029 to Q4 2029.

15.8.41 The SOAEL for construction noise is not predicted to be exceeded at any receptor.

15.8.42 Based on the above, it is concluded that construction noise effects from the construction of the HVDC Western Route option are **not significant**.

Section B-2 - Eastern Route Option

15.8.43 The Eastern Route Option, which passes closer to receptors at Annesons Corner (ALID_38, ALID_42, ALID_43, ALID_45 and ALID_46 in Section B-4), has the potential to result in adverse construction noise impacts. Details of the proposed trenching for this route option are not available at this stage of design. If open trench construction is used, receptors ALID_42 and ALID_43 could experience temporary adverse impacts. Noise emissions from construction vehicles using haul roads close to ALID_46 and ALID_45 may also result in temporary adverse impacts. However, with the implementation of the **Appendix 2.1 Outline Onshore CoCP** and by limiting works to daytime hours only, these impacts are expected to be controlled.

15.8.44 Where trenchless techniques are required e.g. for crossings of public roads, noise levels are likely to be lower than open trench construction but these activities may need to take place at night. In all cases, the **Appendix 2.1 Outline Onshore CoCP** would still be required to ensure noise impacts are appropriately managed. The scale of impact will also depend on whether the Sizewell Link Road has been completed, as trenching works in the road, if needed, could temporarily generate high noise levels. However, with the implementation of the measures set out in the Outline Onshore CoCP, the preliminary assessment of effects associated with the Eastern Route Option are assessed as **not significant**.

Landfall Site

15.8.45 The predicted construction noise levels for activities associated with the proposed Landfall Site are presented in **Section 2.8** and **2.9** of **Appendix 15.2 Construction noise and vibration assumptions and results**. This appendix presents the assessments for the sensitive receptors located closest to the construction works, along with the applicable noise impact thresholds (Category A for all receptors, as defined in BS 5228) and the predicted construction noise levels per quarter of each year (i.e. Q1-Q4). Construction activities, associated sound power levels and the assumptions used in the assessment are detailed in Section 1.2 of the same appendix.

Daytime construction noise assessment

15.8.46 Category A is predicted to be exceeded at receptors reference ALID_75 and 76, which are the locations that represent the residential receptors within Walberswick. These receptors are the closest to the construction works for the proposed Landfall site and the Landfall section of the proposed Underground HVDC Cable Corridor. The exceedance is caused by noise emissions from

enabling works, construction of joint bays and trench works, which are located at the HVDC Cable Corridor section about 50-60m away from the receptors. The enabling works and trench works do not overlap, however the construction of joint bays is likely to overlap with these activities from Q2 2029 to Q4 2031.

15.8.47 The construction works which cause the predicted exceedance are linear in nature, meaning that the activity at any one location is relatively short in duration. As such, it is unlikely that noise levels will exceed the relevant thresholds for more than 40 days within any six-month period. This suggests that the temporal criterion for significance, as defined in BS 5228 and presented in paragraph 15.4.28, is unlikely to be exceeded.

15.8.48 The appointed contractor will be required to carry out works in accordance with the **Appendix 2.1 Outline Onshore CoCP**, as outlined in **Table 15.17**, ensuring that BPMs is employed throughout the works to minimise noise impacts.

15.8.49 The SOAEL for construction noise is not predicted to be exceeded at any receptor.

15.8.50 Based on the above, construction noise effects from the proposed Landfall Site works during the daytime are assessed as **not significant**.

Night-time construction noise assessment

15.8.51 Night-time construction works at the proposed Landfall Site are likely to be required as the HDD drill rigs need to be in constant operation until the cable duct drilling operations are completed. Details of the plant assumed for Landfall construction activities at night are presented in **Section 2.11** of **Appendix 15.2 Construction noise and vibration assumptions and results**.

15.8.52 Category A for the night-time is predicted to be exceeded at receptors reference ALID_75, ALID_76, ALID_77, ALID_78, ALID_80, and ALID_81. These locations are representative of the receptors within Walberswick that are most exposed to the proposed Landfall Site.

15.8.53 The exceedance is caused by the operation of the HDD drill rigs and associated infrastructure such as generators, excavators and mount supports, and it is assumed 3-5m acoustic barriers around the platform will be implemented. The landfall activities are programmed to run from Q1 2030 to Q1 2031.

15.8.54 As shown in **Table 2.9** of **Appendix 15.2 Construction noise and vibration assumptions**, exceedances of up to 14dB are predicted with a 5m barrier. The exceedance may occur for a period of ten or more days in any 15 consecutive days and is therefore assessed as a **significant effect**.

15.8.55 Further, the SOAEL is predicted to be exceeded at receptors ALID_75 and ALID_76.

15.8.56 The appointed contractor will be required to carry out works in accordance with the **Appendix 2.1 Outline Onshore CoCP**, as outlined in **Table 15.17**, ensuring that BPMs are employed throughout the works to minimise noise impacts.

Additional mitigation measures for this stage of the EIA are presented in **Section 15.9**, which are required to minimise the identified significant effect.

Construction vibration

15.8.57 The activities with the potential to generate significant levels of vibration are:

a. Percussive or vibratory driven piling; and
b. Vibratory rollers and compactors.

15.8.58 Vibration levels have been calculated in accordance with the procedures in BS 5228-2 Table E.1. Details of the assumptions associated with these calculations are shown in **Section 1.3** of **Appendix 15.2 Construction noise and vibration assumptions and results**. For assessing risk of building damage, the vibration on the ground or at the base of the building is used; for risk of disturbance to people, a worst-case first floor level has been calculated.

15.8.59 Predicted maximum PPV levels for distance bands up to 100m are shown in **Table 15.18**.

Table 15.18: Predicted maximum PPV levels from vibration generating activities

Distance (m)	Maximum PPV (mms^{-1})					
	Percussive piling		Vibratory compaction (steady state)		Vibratory compaction (start-up/run down)	
	Ground	First floor	Ground	First floor	Ground	First floor
10	2.3	9.2	4.0	> 10	5.7	> 10
20	0.9	3.8	1.6	6.5	2.6	> 10
30	0.6	2.2	0.9	3.7	1.6	6.4
40	0.4	1.5	0.6	2.5	1.1	4.5
50	0.3	1.1	0.5	1.8	0.9	3.4
60	0.2	0.9	0.3	1.4	0.7	2.7
70	0.2	0.7	0.3	1.1	0.6	2.3
80	0.2	0.6	0.2	0.9	0.5	1.9
90	0.1	0.5	0.2	0.8	0.4	1.6
100	0.1	0.5	0.2	0.7	0.4	1.4

Human receptors

15.8.60 Distances have been calculated at which PPV levels from each vibration generating construction activity exceed the OAEL thresholds, set out in **Table 15.10**, to identify where potential significant effects may occur. The number of ALIDs within each effect level are presented in **Table 15.19**.

Table 15.19: Number of receptors exceeding vibration OAELs

Significance	Percussive piling	Vibratory compaction (steady state)	Vibratory compaction – (start up/run down)
Below LOAEL	82	53	21
Above LOAEL and below SOAEL	0	22	36
Above SOAEL	0	7	25

15.8.61 For human receptors, percussive piling, which is required for the construction of the Proposed Full Build Out of the Kiln Lane Substation Scenario, the proposed Converter Station and the proposed bridge over the River Fromus, is not predicted to exceed the LOAEL and therefore vibration effects associated with this activity are assessed as **not significant**.

15.8.62 Vibratory compaction, which is anticipated to be required for construction of haul roads as well as reinstating of soils, is predicted to exceed the SOAEL at seven receptors during steady state and 25 receptors during startup/run-down. As noted in BS5228, it is likely that vibration levels of 1.0mm/s (equivalent to SOAEL) will cause complaint but can be tolerated if prior warning and explanation has been given to residents. Vibration of 10mm/s is likely to be intolerable. At the impacted receptors located throughout the study area, the **Appendix 2.1 Outline Onshore CoCP** shall include provisions for giving prior notice to the impacted receptors before commencing works and operating compaction plant without the vibratory mechanism operating, where necessary and practicable.

15.8.63 With these measures in place, vibration effects are assessed as **not significant**.

15.8.64 Receptor represented by ALID_44 (Trust Farm within Section B-4) is located approximately 15m away from the Draft Order Limits (Section B-4). For this receptor, vibrating compaction activities should be limited and avoid vibratory generating equipment e.g. implementing compaction without vibratory mechanisms active.

15.8.65 Based on the above and with the implementation of the **Appendix 2.1 Outline Onshore CoCP**, vibration effects are overall assessed as **not significant**.

Building damage

15.8.66 For building damage risk assessment for continuous vibration, which is relevant to vibratory compaction, a criterion of 6mm/s PPV on the ground/base of the building is used. No exceedances are predicted at ground floor. Nevertheless, particularly where vibration could be clearly perceptible, the **Appendix 2.1 Outline Onshore CoCP** shall make provision to engage with residents to provide reassurance that properties will not be at risk of damage. Pre-condition surveys should also be considered.

Construction traffic noise and vibration

15.8.67 At this stage of the EIA for the Proposed Scheme, a quantitative assessment of construction traffic on the existing public road network has not been undertaken. The assessment of construction traffic noise will be presented in the Environmental Statement.

15.8.68 **Chapter 17 Traffic and Transport**, presents a preliminary and qualitative assessment of the construction traffic routes identified at this stage of the design of the Proposed Onshore Scheme. The communities with the potential to be impacted by construction traffic noise of the preferred construction traffic routes include:

a. Saxmundham;
b. Carlton;
c. Kelsale;
d. Benhall Green;
e. Church Common;
f. Friston;
g. Sternfield;
h. Coldfair Green;
i. Theberton;
j. Middleton;
k. Westleton; and
l. Blythburgh.

15.8.69 At this stage, it is not anticipated that construction of the Proposed Onshore Scheme would result in a volume of HGV movements sufficient to cause significant adverse noise effects that cannot be managed through the implementation of an appropriate Construction Traffic Management Plan (CTMP). This plan will assist in minimising construction vehicle noise impacts as far as practicable and may include measures such as restricting the hours during which HGVs operate on the public road network and identifying suitable access routes and diversion options.

15.8.70 It is assumed that the Proposed Onshore Scheme will maintain the condition of road surfaces throughout the construction programme. On this basis, construction traffic-related vibration is considered unlikely to result in significant effects.

Operational noise from stationary sources

15.8.71 The impacts from stationary sources during operation of the Proposed Onshore Scheme have been assessed using the procedures described in BS4142 (Ref 19). This compares the rating levels from the plant with the representative background sound level.

15.8.72 A statistical analysis of the sound levels measured for the environmental sound survey has been undertaken in line with BS4142 to determine the representative

background sound level at the closest receptors for the day, evening and night-time. The results are presented in **Appendix 15.1 Environmental sound survey** and are summarised in **Table 15.20** to **Table 15.21** for each component of the Proposed Onshore Scheme.

15.8.73 **Appendix 15.3 Operational noise modelling assumptions** presents the noise sources with the potential to cause an adverse impact at the closest receptors. For these sources, sound power levels and spectral information are based on manufacturer equipment specifications from similar schemes.

15.8.74 At this stage of the Proposed Scheme's design, the number and exact location of noise sources is not known. For the purpose of this assessment, each source has been assumed to be located at a typical location based on **Figure 2.3 Proposed Onshore Scheme** as well as the **Design Principles.**

15.8.75 In the absence of detailed information about operating times and operating modes, the assessment assumes a worst-case scenario that all plant items operate simultaneously and at full capacity during the night. In practice, this is unlikely to be the case due to periods with reduced load, which depends on usage.

15.8.76 The assessment is presented only for the night-time as this is the most sensitive period because background sound levels (and hence noise impact thresholds) are the lowest. By ensuring noise levels are controlled for the night-time, compliance with daytime thresholds is also expected to be achieved.

15.8.77 A +3dB feature correction has been applied to the specific sound level to determine the rating level. The last column of **Table 15.20** to **Table 15.21** presents the level difference between the rating level and the representative background sound level.

15.8.78 The results presented in this section are based on the assumption that embedded mitigation measures for operational noise sources, as outlined in **Table 15.17**, are implemented.

15.8.79 For details about the locations of the assessed receptors please refer to **Figure 15.3 Operational noise modelling results**.

Full Build out of Kiln Lane Substation Scenario

15.8.80 The predicted noise levels from the Full Build out of Kiln Lane Substation Scenario are presented below.

Table 15.20: Preliminary operational noise assessment – Full Build out of Kiln Lane Substation Scenario

ALID Reference	Baseline measurement location	Representative background sound level ($dBL_{A90,T}$)	Specific sound level ($dBL_{Aeq,T}$)	Rating sound level ($dBL_{Aeq,T}$)	Level relative to background (dB)
ALID_1	L10	23	11	14	-9
ALID_2	L10	23	13	16	-7
ALID_3	L10	23	18	21	-2
ALID_5	L9	23	17	20	-3
ALID_6	L8	24	17	20	-4
ALID_7	L9	23	22	25	2
ALID_10	L9	23	22	25	2
ALID_11	L8	24	18	21	-3
ALID_12	L8	24	15	18	-6

15.8.81 For receptors where there is no exceedance of the rating level over the typical background sound level, there is an indication that the Full Build out of Kiln Lane Substation Scenario will have a low impact. For these receptors, the preliminary assessment concludes that operational effects are **not significant**.

15.8.82 For receptors ALID_7 and ALID_10, a marginal exceedance is predicted, primarily due to noise emissions from the overhead line (OHL) corona discharge located within the Draft Order Limits. As a worst-case scenario, the assessment assumes the occurrence of wet corona discharge, which arises during rainfall. This exceedance is not expected to occur under dry weather conditions.

15.8.83 The highest predicted rating level at any receptor is approximately $25dBL_{Ar,Tr}$ outdoors, which is well below the WHO Night Noise Guidelines for Europe 2009 LOAEL of $40dBL_{night,outside}$. As for internal noise levels, assuming a 12-15dB(A) attenuation factor for a partially open window, the predicted internal noise level at the receptor would be approximately $10\text{-}13dBL_{Ar,Tr}$. These levels are well below WHO internal criteria of $30dBL_{Aeq,8hr}$ (as presented in **Table 15.13**), which indicate that impacts are unlikely to result in a significant effect.

15.8.84 Given the small exceedance over the threshold and the low absolute level, effects are assessed as **not significant**.

15.8.85 In Government policy terms, neither the SOAEL nor the LOAEL is expected to be exceeded during the operational phase of the Full Build out of Kiln Lane Substation Scenario.

15.8.86 As presented in **Table 15.4**, the ESC's aspirational criterion of achieving a rating level 5dB below the typical background level may not be practicable for all receptors. It is noted that the predicted exceedance occurs only when wet

corona discharge takes place. Although the local authority criterion is predicted to be exceeded under these conditions, the effect is assessed as not significant due to the small exceedance of the background sound level and its low absolute level.

15.8.87 As part of the Proposed Onshore Scheme, diesel generators will be provided at the Full Build Out of Kiln Lane Substation. These generators are expected to operate only during testing, maintenance or commissioning activities, or in the event of an emergency. Testing and maintenance works can be scheduled during daytime hours, when the potential for noise impacts is lower, and would typically be of short duration. Given their infrequent and limited use, effects associated with the operation of these generators is assessed as **not significant**.

15.8.88 Wind-induced noise may occur under certain wind conditions from pylons and associated components such as conductors, support structures, insulators, fixtures and fittings. Insulators, fixtures and fittings used for the works to the OHL within the Draft Order Limits must comply with National Grid Type Registration technical specifications for use on the transmission network. Such noise is likely to be localised and temporary, and provided that components meet the required specifications, noise impacts are unlikely to result in significant effects.

Low frequency assessment

15.8.89 The predicted noise level spectra at the assessed receptors have been compared against the NANR45 criterion curve. The reference curve is not exceeded, indicating that with mitigation measures in place, low frequency noise is unlikely to result in an adverse impact.

Underground High Voltage Alternating Current Cable Corridor

15.8.90 There are no noise emissions associated with operation of the proposed Underground HVAC Cable Corridor, as this component is buried underground. As such, **no significant** operational noise effects are identified.

Converter Station

15.8.91 The predicted noise levels from the proposed Converter Station are presented in **Table 15.21** below.

Table 15.21: Preliminary operational noise assessment – proposed Converter Station

ALID Reference	Baseline measurement location	Representative background sound level (dBL_{A90})	Specific sound level (dBL_{Aeq})	Rating sound level (dBL_{Aeq})	Level relative to background (dB)
ALID_15	L5	19	18	21	2
ALID_16	L5	19	9	12	-7

ALID Reference	Baseline measurement location	Representative background sound level (dBL_{A90})	Specific sound level (dBL_{Aeq})	Rating sound level (dBL_{Aeq})	Level relative to background (dB)
ALID_17	L5	19	16	19	0
ALID_21	L4	21	24	27	6
ALID_23	L6	20	20	23	3
ALID_24	L6	20	20	23	3
ALID_25	L3	21	21	24	3
ALID_26	L7	20	23	26	6

15.8.92 For receptor ALID_16 and ALID_17, there is no exceedance of the rating level over the typical background sound level and as such there is an indication that the proposed Converter Station will have a low impact.

15.8.93 For the other receptors, exceedances of approximately 2-6dB are predicted, caused by the combination of the contributions from all modelled noise sources within the proposed Converter Station.

15.8.94 The highest predicted rating level at any receptor is approximately $27dBL_{Ar,Tr}$ outdoors, which is well below the WHO Night Noise Guidelines for Europe 2009 LOAEL of $40dBL_{night,outside}$. The predicted internal noise level at the receptor would be approximately 12-$15dBL_{Ar,Tr}$. This is based on a 12-15dB(A) attenuation factor for a partially open window. These levels are well below WHO internal criteria of $30dBL_{Aeq,8hr}$ (as presented in **Table 15.13**), which indicate that impacts are unlikely to result in a significant effect, despite the exceedance of the low background sound level.

15.8.95 As presented in **Table 15.4**, the ESC's aspirational criterion of achieving a rating level 5dB below the typical background level may not be practicable for the all receptors during night-time operation (which is assessed and presented because it is the worst case). However, the embedded mitigation measures outlined in **Table 15.17**, along with the possible additional mitigation examples presented below, ensure that noise impacts are minimised as far as reasonably practicable. Although the local authority criterion is predicted to be exceeded, as presented above the effect is assessed as not significant due to predicted levels being well below WHO internal and external criteria.

15.8.96 The design of the Proposed Onshore Scheme is expected to continue to be developed and if necessary and where appropriate, opportunities to incorporate mitigation measures to minimise any risk of noise disturbance will be explored and implemented. To support further design development, **Table 15.22** provides examples of potential mitigation measures and indicative levels of noise reduction. Based on the current assessment of the operational phase, no additional mitigation is proposed, beyond the embedded mitigation identified in

Table 15.17 the additional examples are intended to demonstrate the potential effectiveness of mitigation options.

Table 15.22: Examples of operational noise mitigation measures

Mitigation measure	Approximate attenuation dB(A)	Description
Plant selection	Depends on plant type	Lower-noise plant or plant with a low-noise mode may be specified if economically and practically viable.
Acoustic enclosures	25-45dB	Solid enclosures containing noisy plant, with any access doors or panels sealed. Additional ventilation equipment may be required if plant is enclosed
Acoustic barriers	Up to 5dB for partial screening Up to 10dB for total screening	Solid acoustic barriers breaking line of sight between sources and receptors. Attenuation level is dependent on geometry: the efficacy reduces with increasing distance to receptors
Attenuators	15-25dB	Attenuators installed to decrease noise emissions from cooling fans
Acoustic louvres	15-17dB	Where airflow requirements preclude continuous solid enclosures, acoustic louvres may be included.

15.8.97 In Government policy terms, the SOAEL is not expected to be exceeded during the operational phase of the Proposed Onshore Scheme. The LOAEL, defined by a 5dB exceedance of background sound level, may be exceeded at a number of receptors, although the absolute levels are expected to be well below those levels normally associated with an observed adverse effect on health and quality of life.

15.8.98 As part of the Proposed Onshore Scheme, diesel generators will be provided at the proposed Converter Station. These generators are expected to operate only during testing, maintenance or commissioning activities, or in the event of an emergency. Testing and maintenance works can be scheduled during daytime hours, when the potential for noise impacts is lower, and would typically be of short duration. Given their infrequent and limited use, the operation of these generators is not anticipated to result in a significant adverse effect.

Low frequency assessment

15.8.99 The predicted noise level spectra at the assessed receptors have been compared against the NANR45 criterion curve. The reference curve is not

exceeded, indicating that low frequency noise is unlikely to result in an adverse effect.

Underground High Voltage Direct Current Cable Corridor

15.8.100 No noise emissions are associated with operation of the proposed Underground HVDC Cable Corridor, as this component is buried underground. As such, no significant operational noise effects are identified.

Landfall Site

15.8.101 There are no noise emissions associated with operation of the proposed Landfall Site as the cables are buried underground. As such, no significant operational noise effects are identified.

Operational road traffic noise

15.8.102 As noted in **Chapter 17 Traffic and Transport**, during operation of the Proposed Onshore Scheme, the Full Build Out of Kiln Lane Substation Scenario, proposed Landfall and proposed Underground Cable Corridor, are not anticipated to generate substantial traffic movements. The proposed Converter Station is anticipated to generate approximately 12 staff car movements per day.

15.8.103 During scheduled maintenance or outages, the largest number of anticipated HGVs for the proposed Converter Station and Full Build Out of Kiln Lane Substation is approximately four and LGVs is approximately 20.

15.8.104 This increase is minimal and would not noticeably change the existing sound levels at sensitive receptors. Road traffic noise effects during operation is therefore assessed as **not significant**.

Operational vibration

15.8.105 There are no proposed operational plant items at the proposed Converter Station or Full Build Out of Kiln Lane Substation Scenario expected to generate significant levels of vibration that could not be effectively managed through appropriate equipment selection, installation (including anti-vibration mounts/pads) and maintenance. Additionally, the shortest distance between these sites and the nearest sensitive receptor is approximately 230m, at which any residual adverse vibration impacts are highly unlikely.

15.8.106 No vibration-generating plant is associated with the proposed Underground Cable Corridor, nor the proposed Landfall.

15.8.107 On this basis, operational vibration effects are assessed as **not significant**.

Impacts upon Public Rights of Way

15.8.108 As noted in **Section 15.6**, a number of Public Rights of Way (PRoW) are located within the construction and operational study area. During construction, people using those sections of the PRoW closest to the works are likely to experience

temporary adverse impacts due to noise emissions from construction plant. However, noise levels are expected to decrease progressively with distance from the works.

15.8.109 For PRoWs located in close proximity to the Converter Station and Full Build Out of Kiln Lane Substation, it is anticipated that only a relatively small portion would be exposed to elevated noise levels. These routes could be designed at the detailed stage to be located as far as reasonably practicable from the main sources of noise. Further information about the approach to the design of the Converter Station and Kiln Lane Substation is presented in the **Design Principles**.

15.8.110 Further information about the impacts of the Proposed Onshore Scheme upon users of PRoW is presented in **Chapter 10 Health and Wellbeing**.

15.9 Mitigation, monitoring and enhancement

15.9.1 Mitigation measures are defined in **Chapter 5 EIA Approach and Methodology** of this PEIR, with embedded control measures for noise and vibration being presented in **Section 15.7** of this chapter.

Additional mitigation and enhancement

15.9.2 A significant effect for the construction phase has been identified at the closest sensitive receptors to the Landfall site. Thus, a Noise and Vibration Management Plan (NVMP) shall be developed prior to the start of construction works on site. This plan would explore potential mitigation measures such as:

a. Construction noise control measures to minimise impacts at receptors where a significant effect is predicted;
b. Noise and vibration monitoring to identify when noise levels have been exceeded and stop work protocols should be implemented;
c. Plans for engagement with the identified receptors to lessen the potential impacts of noise and vibration impacts, including discussions around timing of certain works and activities; and
d. Other offsite mitigation measures as presented in BS5228.

15.9.3 There is the potential for additional mitigation measures to reduce or avoid the residual effects at the identified receptors arising from construction at the Landfall site, and these will be considered further when more detailed information on night-time activities at the Landfall is available.

15.9.4 However, at this stage the assessment presents precautionary approach with no additional mitigation included. Additional mitigation measures will be further defined and included in the assessment in the ES.

15.9.5 Therefore, at this stage no other additional mitigation measures beyond the embedded mitigation and measures presented in **Section 15.7** (under **Table 15.17**) and in **Table 15.22** have been included in the assessment.

Monitoring

15.9.6 As part of the **Appendix 2.1 Outline Onshore CoCP** , which includes a NVMP, a noise and vibration monitoring scheme will be developed to ensure construction noise and vibration limits are complied with. Details of a monitoring scheme are presented in **Appendix 2.1 Outline Onshore CoCP**.

15.9.7 For operational noise, monitoring measures will ensure that embedded mitigation measures are included (or an equivalent performance is achieved with an alternative design), and any plant selection and/or noise mitigation measures are verified to ensure they meet the design specifications.

15.10 Summary of residual effects

15.10.1 **Table 15.23, Table 15.24** and **Table 15.25** provide a summary of the residual effects relating to the construction, operation and maintenance, and decommissioning of the Proposed Scheme with regard to noise and vibration receptors.

15.10.2 Noise impacts associated with construction traffic noise and vibration will be undertaken and presented in the subsequent ES.

Table 15.23: Summary of assessment of likely significant effects during construction

Receptor	Environmental effect without further mitigation	Additional mitigation	Residual effect
Noise and vibration sensitive receptors	Construction noise daytime - not significant	None required	Not significant
Noise and vibration sensitive receptors	Construction noise night-time around Landfall site – significant adverse	At this stage the assessment presents a worst-case scenario with no additional mitigation included. Additional mitigation measures will be further defined and included in the assessment in the ES	Significant
Noise and vibration sensitive receptors	Construction vibration – not significant	None required	Not significant

Table 15.24: Summary of assessment of likely significant effects during operation

Receptor	Environmental effect without further mitigation	Additional mitigation	Residual effect
Noise sensitive receptors	Operational noise from stationary sources - not significant	None required	Not significant
Noise sensitive receptors	Operational road traffic noise – not significant	None required	Not significant

Table 15.25: Summary of assessment of likely significant effects during decommissioning

Receptor	Environmental effect without further mitigation	Additional mitigation	Residual effect
Noise and vibration sensitive receptors	Not significant	None required	Not significant

References

Ref 1 Government of the United Kingdom of Great Britain and Northern Ireland, “Control of Pollution Act,” 1974. (Online). Available: https://www.legislation.gov.uk/ukpga/1974/40. (Accessed September 2025).

Ref 2 Government of the United Kingdom of Great Britan and Northern Ireland, “The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015”. (Online). Available: https://www.legislation.gov.uk/uksi/2015/227. (Accessed May 2025).

Ref 3 Government of the United Kingdom of Great Britan and Northern Ireland, “Environmental Protection Act 1990,” 1990. (Online). Available: https://www.legislation.gov.uk/ukpga/1990/43/contents. (Accessed September 2025).

Ref 4 Government of United Kingdom of Great Britain and Northern Ireland, “Overarching National Policy Statement for energy (EN-1),” March 2023. (Online). Available: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1. (Accessed September 2025).

Ref 5 Government of the United Kingdom of Great Britain and Northern Ireland, “National Policy Statement for Renewable Energy Infrastructure (EN-3),” March 2023. (Online). Available: https://assets.publishing.service.gov.uk/media/64252f5f2fa848000cec0f52/NPS_EN-3.pdf. (Accessed September 2025).

Ref 6 National Grid Ventures (2025) Design Principles – LionLink

Ref 7 Government of the United Kingdom of Great Britain and Northern Ireland, “National Policy Statement for Renewable Energy Infrastructure (EN-5),” March 2023. (Online). Available: https://assets.publishing.service.gov.uk/media/64252f852fa848000cec0f53/NPS_EN-5.pdf. (Accessed September 2025).

Ref 8 Ministry of Housing, Communities & Local Government (2024) National Planning Policy Framework. Available at https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf (Accessed March 2025).

Ref 9 Government of the United Kingdom of Great Britain and Northern Ireland, “Noise policy statement for England,” March 2010. (Online). Available: https://www.gov.uk/government/publications/noise-policy-statement-for-england. (Accessed September 2025).

Ref 10 Suffolk Coastal Local Plan (England), East Suffolk Council. September 2020. Available at: https://www.eastsuffolk.gov.uk/assets/Planning/Planning-Policy-and-Local-Plans/Suffolk-Coastal-Local-Plan/Adopted-Suffolk-Coastal-Local-Plan/East-Suffolk-Council-Suffolk-Coastal-Local-Plan.pdf (Accessed 21 April 2025)

Ref 11 Suffolk County Council (2024). Public Rights of Way ad Green Access. Supplementary Guidance Document. Available at: https://www.suffolk.gov.uk/asset-library/green-access-prow-guidance.pdf (Accessed 21 April 2025)

Ref 12 Planning Inspectorate Scoping Opinion. Proposed LionLink Multi-purpose interconnector https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN020033/EN020033-000103-LION%20-%20Scoping%20Opinion.pdf (Accessed 3 Jun 25)

Ref 13 LionLink Multi-Purpose Interconnector (August 2023) Interim Non-Statutory Consultation Feedback Summary Report [online] Available at: https://www.nationalgrid.com/national-grid-ventures/lionlink/library#230548828-3684997351 (Accessed July 2025)

Ref 14 LionLink (March 2024) Supplementary Non-Statutory Consultation Summary Report [online] Available at: https://www.nationalgrid.com/national-grid-ventures/lionlink/library#230548828-3684997351

Ref 15 Ministry of Housing, Communities and Local Government, “Guidance, Noise,” 22 July 2019. (Online). Available: https://www.gov.uk/guidance/noise--2. (Accessed November 2024).

Ref 16 England Noise and Air Quality Viewer. Department for Environment, Food and Rural Affairs (Defra). Accessed via: http://www.extrium.co.uk/noiseviewer.html [Accessed April 2024]

Ref 17 Defra (2025) Strategic noise mapping of road sources across England. Road Noise - All Metrics - England Round 4. Available at: https://www.data.gov.uk/dataset/38b1444f-47a0-42ca-a358-0d145fcf7d5c/road-noise-all-metrics-england-round-4 [Accessed April 2025]

Ref 18 CPRE, “Campaign to Protect Rural England,” (Online). Available: https://www.cpre.org.uk/. (Accessed 2nd April 2025)

Ref 19 British Standards, BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution (BSI), 2019. (Accessed July 2025)

Ref 20 British Standards, BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise (Part 1) and Vibration (Part 2), British Standard Institution, 2014. (Accessed July 2025)

Ref 21 British Standard, BS 7445-1:2003 Description and measurement of environmental noise - Guide to quantities and procedures, British Standard Institution, 2003. (Accessed July 2025)

Ref 22 British Standard, BS 8233:2014 Guidance on sound insulation and noise reduction for buildings, British Standard Institution, 2014. (Accessed July 2025)

Ref 23 British Standard, BS6472-1:2008 Guide to evaluation of human exposure to vibration in buildings – vibration sources other than blasting, 2008. (Accessed July 2025)

Ref 24 British Standard, BS 7385-2:1993 Evaluation and measurement for vibration in buildings - Guide to damage levels from groundborne vibration, British Standard Institution, 1993. (Accessed July 2025)

Ref 25 British Standard ISO 4866:2010 Mechanical vibration and shock. Vibration of fixed structures. Guidelines for the measurement of vibrations and evaluation of their effects on structures. British Standard Institution, 2010.

Ref 26 Department of Transport, Calculation of Road Traffic Noise (CRTN), Department of Transport, 1988. (Accessed July 2025)

Ref 27 Standards for Highways, "Design Manual of Roads and Bridges LA 111 - Noise and vibration," May 2020. (Online). Available: https://www.standardsforhighways.co.uk/tses/attachments/cc8cfcf7-c235-4052-8d32-d5398796b364?inline=true. (Accessed September 2024).

Ref 28 ISO, ISO 9613-2:2024 Acoustics — Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors, International Organization for Standarization, 2024. (Accessed July 2025)

Ref 29 World Health Organization (WHO), Guidelines for community noise, World Health Organization (WHO), 1999. (Accessed July 2025)

Ref 30 World Health Organization (WHO), Environmental Noise Guidelines for the European Region, World Health Organization (WHO), 2018. (Accessed July 2025)

Ref 31 World Health Organization (WHO), Night Noise Guidelines for Europe, World Health Organization (WHO), 2009. (Accessed July 2025)

Ref 32 Institute of Sustainability and Environmental Professionals, Guidelines for Environmental Noise Impact Assessment, ISEP, 2014. (Accessed July 2025)

Ref 33 Acoustics & Noise Consultants (ANC), Green Book: Environmental Noise Measurement Guide, Acoustics & Noise Consultants (ANC), 2021. (Accessed July 2025)

Ref 34 A. W. D. a. A. M. Moorhouse, "Procedure for the assessment of low frequency noise disturbance," 2005. (Online). Available: https://images.reading.gov.uk/2021/10/CD-6.26-NANR45-procedure_rev1_23_12_2011.pdf. (Accessed May 2025). (Accessed July 2025)

Ref 35 Acoustics & Noise Consultants (ANC), BS 4142:2014+A1:2019 Technical Note, March 2020, Version 1.0 (Online). Available: https://www.association-of-noise-

consultants.co.uk/wp-content/uploads/2020/07/ANC-BS-4142-Guide-March-2020.pdf (Accessed May 2025)

Ref 36 Department for Energy Security and Net Zero (2024). Overarching National Policy Statement for Energy (EN-1). Available at: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1 (Accessed 10 June 2025).

Ref 37 Department for Energy Security and Net Zero (2025). National Policy Statement for electricity networks infrastructure (EN-5), Available at: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5 (Accessed 10 June 2025).

Topic Glossary and Abbreviations

Term	Definition
AHU	Air Handling Unit
Decibel (dB)	The ratio of sound pressures which people can hear is a ratio of 10^6:1 (one million: one). For convenience, therefore, a logarithmic measurement scale is used. The resulting parameter is called the 'sound pressure level' (L) and the associated measurement unit is the decibel (dB). As the decibel is a logarithmic ratio, the laws of logarithmic addition and subtraction apply.
dB(A)	The unit used to define a weighted sound pressure level, which correlates well with the subjective response to sound. The 'A' weighting follows the frequency response of the human ear, which is less sensitive to low and very high frequencies than it is to those in the range 500Hz to 4kHz. In some statistical descriptors the 'A' weighting forms part of a subscript, such as L_{A10}, L_{A90}, and L_{Aeq} for the 'A' weighted equivalent continuous noise level.
Frequency	Frequency is the rate of repetition of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the hertz (Hz), which is identical to cycles per second. A 1000Hz is often denoted as 1kHz, e.g. 2kHz = 2000Hz. Human hearing ranges approximately from 20Hz to 20kHz. For design purposes, the octave bands between 63Hz to 8kHz are generally used. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it. For more detailed analysis, each octave band may be split into three one-third octave bands or narrow frequency bands.
Maximum noise level	The maximum noise level identified during a measurement period. Experimental data has shown that the human ear does not generally register the full loudness of transient sound events of less than 125ms duration and fast time weighting (F) has an exponential time constant of 125ms which reflects the ear's response. Slow time weighting (S) has an exponential time constant of 1s and is used to allow more accurate estimation of the average sound level on a visual display. The maximum level measured with fast time weighting is denoted as $L_{Amax,\,F}$. The maximum level measured with slow time weighting is denoted $L_{Amax,\,S}$.
Sound pressure level	The sound power emitted by a source results in pressure fluctuations in the air, which are heard as sound. The sound pressure level (L) is ten times the logarithm of the ratio of the measured sound pressure (detected by a microphone) to the reference level of 2 x 10^{-5}Pa (the threshold of hearing). Thus L (dB) = 10 log $(P_1/P_{ref})^2$ where Pref, the lowest pressure detectable by the ear, is 0.00002 pascals (i.e. 2x10-5 Pa). The threshold of hearing is 0dB, while the threshold of pain is approximately 120dB. Normal speech is approximately 60dBL_A and a

Term	Definition
	change of 3dB is only just detectable. A change of 10dB is subjectively twice, or half, as loud.
Statistical noise levels	For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation. The L_{p10}, the level exceeded for 10% of the time period under consideration and can be used for the assessment of road traffic noise (note that L_{pAeq} is used in BS 8233 for assessing traffic noise). The L_{90}, the level exceeded for 90% of the time, has been adopted to represent the background noise level. The L_1, the level exceeded for 1% of the time, is representative of the maximum levels recorded during the sample period. A weighted statistical noise levels are denoted L_{A10}, dBL_{A90} etc. The reference time period (T) is normally included, e.g. $dBL_{A10, 5min}$ or $dBL_{A90, 8hr}$.

National Grid Lion Link Limited

Company number 14722364

1-3 Strand

London

WG2N-5EH

United Kingdom

nationalgrid.com/lionlink