



# The Sizewell C Project

## 6.3 Volume 2 Main Development Site Chapter 11 Noise and Vibration

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## 11. Noise and Vibration

### 11.1 Introduction

11.1.1 This chapter of **Volume 2** of the **Environmental Statement (ES)** presents an assessment of the noise and vibration effects arising from the construction and operation (including maintenance) of the Sizewell C Project at the main development site (referred to throughout this volume as the ‘proposed development’). This includes an assessment of potential impacts, the significance of effects, the requirements for mitigation and the residual effects.

11.1.2 Detailed descriptions of the main development site (referred to throughout this volume as the ‘site’), the proposed development and the different phases of development are provided in **Chapters 1 to 4** of this volume of the **ES**. A description of the anticipated activities for the decommissioning of the Sizewell C power station, including a summary of the types of environmental effects likely to occur is provided in **Chapter 5** of this volume. A glossary of terms and list of abbreviations used in this chapter is provided in **Volume 1, Appendix 1A** of the **ES**.

11.1.3 This assessment has been informed by data presented in the following technical appendices of this **ES**:

- **Appendix 11A:** Noise and vibration baseline report.
- **Appendix 11B:** Construction noise assessment.
- **Appendix 11C:** Operational Phase: Sound Level Assessment.
- **Appendix 11D:** Sound level assessment of the creation of fen meadow compensation areas.
- **Appendix 11E:** Sound level assessment of the proposed sports facilities.
- **Appendix 11F:** Road traffic flow data.
- **Appendix 11G:** Predicted road traffic noise on existing roads.
- **Appendix 11H:** Noise Mitigation Scheme.

11.1.4 The results of underwater noise assessment are reported in **Chapter 22 Marine Ecology and Fisheries** of this volume. Furthermore, the effects of noise on terrestrial ecology and ornithology are assessed in **Chapter 14** of this volume.

11.1.5 A standalone ES was prepared for the Sizewell B relocated facilities works for submission with the hybrid planning application under the Town and Country Planning Act 1990 (East Suffolk Council application ref. DC/19/1637/FUL). Chapter 11 of the Sizewell B relocated facilities ES (refer to **Volume 1, Appendix 2A**) included an assessment of likely significant effects associated with noise and vibration and identified mitigation specific to Sizewell B relocated facilities works. However, as the Sizewell B relocated facilities works form part of the Sizewell C Project and consent is sought for these works through the Development Consent Order (DCO), the conclusions of the assessment are also summarised in this chapter.

## 11.2 Legislation, policy and guidance

11.2.1 **Volume 1, Appendix 6G** of this ES identifies and describes legislation, policy and guidance of relevance to the assessment of the potential noise and vibration impacts associated with the Sizewell C Project across all ES volumes.

11.2.2 This section provides a brief summary of the specific legislation, policy and guidance of relevance to the noise and vibration assessment for the proposed development.

### a) International

11.2.3 There is no international legislation or policy that is relevant to the noise and vibration assessment of the proposed development.

### b) National

11.2.4 The Overarching National Policy Statement for Energy (NPS EN-1) (Ref. 11.1), and the National Policy Statement for Nuclear Power Generation (NPS EN-6) (Ref. 11.2) include requirements that are relevant to the noise and vibration assessment. A summary of the relevant NPS EN-1 and NPS EN-6 requirements, together with consideration of how these requirements have been taken into account is discussed in detail in **Volume 1, Appendix 6G**.

11.2.5 Part III of the Control of Pollution Act 1974 (Ref. 11.3) gives local authorities powers to control noise from construction sites, and enable developers to apply for prior consent for construction works. Section 72 of that Act defines what is meant by "best practicable means" and requires that regard be had to relevant codes of practice, one of which is British Standard BS5228 (parts 1 and 2) (Ref. 11.4 and 11.5).

11.2.6 The Environmental Protection Act 1990 (Ref. 11.6) deals with noise and vibration as a statutory nuisance (but does not directly apply to construction works), and sets out requirements for certain prescribed industrial processes

to be controlled (by environmental permits), primarily to control pollution other than noise and vibration.

11.2.7 The Environmental Permitting Regulations 2016 (Ref. 11.7) relate to the permitting of certain industrial processes for the purposes of pollution control.

11.2.8 The Noise Insulation Regulations 1975 (as amended 1988) (Ref. 11.8) set out requirements for provision of sound insulation or a grant for sound insulation when noise levels are altered as a result of changes to or the construction of a new road.

11.2.9 Other relevant policy, as described in **Volume 1, Appendix 6G**, comprise:

- National Planning Policy Framework (NPPF) 2019 (Ref. 11.9).
- Planning Practice Guidance (PPG) 2019 (Ref. 11.10).
- Noise Policy Statement for England (NPSE) 2010 (Ref. 11.11).
- Government's 25 Year Environment Plan 2019 (Ref. 11.12).

c) **Regional**

11.2.10 No regional policy is deemed relevant to the noise and vibration assessment for this site.

d) **Local**

11.2.11 Local policy relating to noise and vibration assessment is found in:

- Suffolk Coastal District Council Local Plan Core Strategy and Development Management Policies 2013 (Ref. 11.13).
- Suffolk Coastal District Council Final Draft Local Plan 2013 (Ref. 11.14).

11.2.12 A detailed consideration of the requirements of these documents, as they relate to the assessment of noise and vibration is contained in **Volume 1, Appendix 6G**.

e) **Guidance**

11.2.13 This assessment has been undertaken in accordance with the following guidance documents:

- World Health Organisation Regional Office for Europe Environmental Noise Guidelines for the European Region 2018 (Ref. 11.15).

- Guidance in the Design Manual for Roads and Bridges LA111 (DMRB) (Ref. 11.16).
- Calculation of Road Traffic Noise (CRTN) (Ref 11.17).
- British Standard BS 8233:2014 – Guidance on sound insulation and noise reduction for buildings (Ref. 11.18).
- British Standard BS 5228-1 Noise: 2009+A1: 2014 – Code of Practice for noise and vibration control at open construction sites – Noise (Ref. 11.4).
- British Standard BS5228-2 Vibration: 2009+A1: 2014 – Code of Practice for noise and vibration control at open construction sites – Vibration (Ref. 11.5).
- British Standard BS 4142: 2014+A1: 2019 – Methods for rating and assessing industrial and commercial sound (Ref. 11.19).
- International Standard ISO 9613-2:1996 - Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation Ref. (Ref 11.20)
- British Standard BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting (Ref. 11.21)
- Association of Noise Consultants (ANC) Measurement and assessment of groundborne noise and vibration 2012 (Ref. 11.22)
- British Standard BS 7385-2: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from groundborne vibration (Ref 11.23)
- TRL Project report PR/SE/451/02 Converting the UK traffic noise index LA<sub>10,18h</sub> to EU noise indices for noise mapping (Ref 11.24)
- World Health Organisation Night noise guidelines for Europe 2009 (Ref 11.25)

### 11.3 Methodology

#### a) Scope of the assessment

11.3.1 The generic EIA methodology is detailed in **Volume 1, Chapter 6** of this ES.

11.3.2 The full method of assessment for noise and vibration that has been applied for the Sizewell C Project is provided in **Volume 1, Appendix 6G** of this ES.



11.3.3 This section provides specific details of the noise and vibration methodology applied to the assessment of the proposed development and a summary of the general approach to provide appropriate context for the assessment that follows. The scope of the assessment includes the impacts of the construction and operational phases of the proposed development.

11.3.4 The scope of this assessment has been established through a formal EIA scoping process undertaken with the Planning Inspectorate. A request for an EIA Scoping Opinion was initially issued to the Planning Inspectorate in 2014, with an updated request issued in 2019 (see **Volume 1, Appendix 6A**) of this ES.

11.3.5 Comments raised in the EIA Scoping Opinions received in 2014 and 2019 have been taken into account in the development of the assessment methodology. These are detailed in **Volume 1, Appendices 6A and 6C** of this ES.

11.3.6 Underwater noise is not considered in this chapter and is addressed under **Chapter 22 Marine Ecology and Fisheries**; the assessment of noise effects on ecological receptors is presented in **Chapter 14 Terrestrial Ecology and Ornithology** of this ES.

#### b) Consultation

11.3.7 The scope of the assessment has also been informed by ongoing consultation and engagement with statutory consultees throughout the design and assessment process. Details of the consultation have been provided in **Volume 1, Appendix 6G** of this ES.

11.3.8 The following matters have been developed in consultation with local authorities:

- monitoring locations;
- assessment criteria;
- noise source data; and
- assessment approach (both noise and vibration).

#### c) Study area

11.3.9 All human noise sensitive receptors within the study area are shown in **Figure 11.1**. This includes human receptors identified around the site that have the potential to be affected by noise on account of their proximity to the proposed development. It also includes areas potentially important for the assessment of effects on ecological receptors. The exception to this is Upper

Abbey, which would not be occupied during the construction phase, so has not been included in this assessment of construction noise and vibration.

11.3.10 In relation to noise from road traffic on the surrounding network, all road links where there is the potential for an adverse effect to occur have been examined. The study area extends to Lowestoft to the north, Ipswich to the south and the A140 to the west, including the A12, A14 and key routes envisaged to be used by Sizewell C traffic. Dwellings within 50m of any road have been considered.

d) [Assessment scenarios](#)

i. [Construction activities](#)

11.3.11 The assessment of noise and vibration impacts during the construction of Sizewell C on the main development site is presented in **section 11.6** and full details are presented in **Appendix 11B**.

11.3.12 In summary, the assessment scenarios for the main development site are based on the proposed construction activities detailed in **Chapter 3** of this volume. Noise or vibration-generating construction activities associated with the day and night shifts respectively could occur during the following times:

- double day and/or single shift between 07:00–23:00hrs; and
- night shift between 23:00–07:00hrs.

11.3.13 Most construction activities generating significant noise levels would be undertaken during the double day and/or single shift, with the night shift generally limited to maintenance and logistics support. Assessment scenarios have therefore been defined separately for daytime (07:00–23:00hrs) and night-time (23:00–07:00hrs) construction.

[Daytime assessment scenarios \(07:00–23:00hrs\)](#)

11.3.14 The assessment scenarios for daytime (07:00–23:00hrs) construction noise or vibration are based on the indicative main development site construction programme and phasing described in **Volume 2, Chapter 3** of this ES. Construction would be undertaken in five main phases, with some overlap, as follows:

- **Phase 1:** Site establishment and preparation for earthworks (Years 1–2).
- **Phase 2:** Main earthworks (Years 1–4).
- **Phase 3:** Main civils (Years 3–9).

- **Phase 4:** Mechanical and electrical (M&E) fit out, instrumentation and commissioning (Years 4–11).
  - **Phase 5:** Removal of temporary facilities/restoration of the land (Years 10–12).
- 11.3.15 Initial predictions of noise from construction activities associated with the five main phases were undertaken to determine appropriate assessment scenarios. These indicated that the highest noise levels are likely to occur for a relatively short period at the very start of construction, before reducing slightly for the rest of Phases 1 and 2, then reducing further for most of the overall construction during Phases 3 and 4.
- 11.3.16 Initial predictions for Phase 5 indicate that the highest noise levels during Phase 5 are likely to be similar to those during Phase 1 (refer to **Appendix 11B** for further details). Daytime main development site construction noise during Phase 5 has, therefore, been assessed on the basis that the works are similar to Phase 1.
- 11.3.17 Taking the above into account, the following assessment scenarios have been adopted for daytime (07:00–23:00hrs) main development site construction noise and vibration assessment:
- **Phase 1a:** initial site stripping/levelling and concurrent noisy activities. Based on a typical day in the busiest month of activity and presented as dB  $L_{Aeq, 0700-2300hrs}$ .
  - **Phase 1b/2:** construction of site infrastructure and earth moving. These works may span more than three years and the levels assessed are the predicted average for the period, presented as dB  $L_{Aeq, 0700-2300hrs}$ .
  - **Phase 3/4:** construction of above ground power station buildings. These works may span more than eight years and the levels assessed are the predicted average for the period, presented as dB  $L_{Aeq, 0700-2300hrs}$ .
  - **Phase 5:** land restoration and removal of temporary facilities. These works may be ongoing for around two years and the levels assessed are the predicted average for the period, presented as dB  $L_{Aeq, 0700-2300hrs}$ .
- 11.3.18 The Land East of Eastlands Industrial Estate (LEEIE) is part of the main development site, but the phasing of daytime (07:00–23:00hrs) construction activities in this area will differ from the wider main development site. Predicted daytime construction noise emissions from the LEEIE have therefore been assessed according to the following assessment scenarios:

- **Initial Strip/Levelling:** initial site stripping/levelling and concurrent noisy activities at the start of Phase 1. Based on a typical day in the busiest of activity and presented as dB L<sub>Aeq, 0700–2300hrs</sub>.
- **Site Preparation:** preparation of the LEEIE for use as construction support area, including construction of a new rail spur into LEEIE. It is estimated that these works would take around nine months to complete during Phases 1 and 2 and the levels assessed are the predicted average for the period, presented as dB L<sub>Aeq, 0700–2300hrs</sub>.
- **Early Years Operations:** rail spur at LEEIE operational and LEEIE operating as a terminal for incoming freight. This period is estimated to span around nine months during Phases 1 and 2 and the levels assessed are the predicted average for the period, presented as dB L<sub>Aeq, 0700–2300hrs</sub>.
- **Later Years Operations:** rail spur in LEEIE no longer in use. LEEIE still in use as a construction support area, largely for materials storage. This is currently estimated to start approximately half way through Phase 2 and continuing through Phases 3 and 4, a period potentially spanning more than 8.5 years and the levels assessed are the predicted average for the period, presented as dB L<sub>Aeq, 0700–2300hrs</sub>.

11.3.19 The assessment scenario for Phase 1b/2 also encompasses the three main work stages for the LEEIE where these combine. The Later Years Operations at the LEEIE have been assessed in combination within the Phase 3/4 assessment scenario.

11.3.20 The proposed works associated with the Sizewell B relocated facilities are included within the Sizewell C DCO application as part of the main development site proposals. The assessment of potential impacts associated with the Sizewell B relocated facilities are presented in Chapter 11 of the Sizewell B relocated facilities ES (**Volume 1, Appendix 2A**). A summary of the assessment conclusions is provided in this chapter. Further detail on the proposed programme of works are provided in **Chapter 3** of this volume.

11.3.21 The assessment method adopted in the Sizewell B relocated facilities assessment made a direct correlation between SOAEL and EIA significance that has not been retained in the Sizewell C noise assessments.

11.3.22 The approach in the Sizewell C assessment is based on recent updated guidance, specifically the November 2019 revision of DMRB contained in LA111 (Ref 11.16), which made it clear that the SOAEL for road traffic noise was aligned with the threshold for noise insulation, or a grant for insulation, as set out in the Noise Insulation Regulations 1975 (as amended 1988).

- 11.3.23 This recent clarification of the SOAEL for road traffic noise has resulted in a wider review of the approach adopted in the Sizewell C noise assessment to align it with the approach set out in LA111 across all noise sources.
- 11.3.24 The rationale for the approach adopted in the Sizewell C noise assessment is set out in **Volume 1, Appendix 6G**. The separation of SOAEL and EIA significance in the Sizewell C noise assessment means that the assessment method in respect of SOAELs and in respect of EIA significance in the Sizewell C noise assessment differs from that presented in the Sizewell B relocated facilities ES.
- 11.3.25 Notwithstanding the differences in assessment method between the two assessments, the result of this revised approach is that effects that were described in the Sizewell B relocated facilities assessment as being ‘*significant*’ would still be considered as ‘*significant*’ in EIA terms in the Sizewell C assessment, but ‘*significant*’ effects would not necessarily exceed the SOAEL as a matter of course. In the Sizewell B relocated facilities assessment, any significant effect was a de facto exceedance of the SOAEL because significant effects in EIA terms were directly aligned with the SOAEL.
- 11.3.26 The Sizewell B relocated facilities assessment concluded that there were no exceedances of the SOAEL and that would still be the case, if the updated assessment method were applied, and the mitigation measures required to avoid exceeding the SOAEL have been retained as part of the Sizewell C DCO submission.

#### Night-time assessment scenarios (23:00–07:00hrs)

- 11.3.27 Night-time construction would generally be limited to the works described in **Chapter 3** of this volume. Noise from construction works at night-time has therefore been assessed based on the following two assessment scenarios:
- **Green rail route and associated activities only:** Green rail route, temporary construction areas and LEEIE are established, and rail freight arrivals, unloading and transportation at night are likely to generate noise. This period may span 8.5 years including 24 months of Phase 2 and all of Phases 3 and 4. The assessment is based on a typical night during this period and presented as dB L<sub>Aeq</sub>, 2300-0700hrs.
  - **Green rail route, excavation, all associated activities:** For approximately 15 months during Phase 3 (based on current estimates) when night-time tunnelling and excavation activities would be ongoing, including direct transportation of excavated materials to stockpile. During this period noise associated with first scenario, above, may also

be present. The assessment is based on a typical night during this period and presented as dB L<sub>Aeq, 2300-0700hrs</sub>.

11.3.28 This assumes all of the noise sources associated with these scenarios would, on average, be present to a consistent level every night for the duration of each scenario and are therefore considered to represent a typical worst-case night-time assessment scenario in each case.

ii. Operational noise

11.3.29 The assessment of impact from the operational phase is presented in **section 11.6** and further detail is provided in **Appendix 11C**. In summary, noise from the operation of Sizewell C was assessed in two scenarios:

- Operational power station (typical).
- Operational power station and testing of the back-up diesel generators at the end of an outage.

iii. Road traffic noise

11.3.30 The impact of traffic from the Sizewell C Project on existing roads is assessed in **section 11.6** and further details are provided in **Appendices 11F** and **11G**. As detailed in the **Transport Assessment** (Doc Ref. 8.5), the assessment of road traffic is based on two representative construction years and an operational year as follows:

- **Early years (2023)** – represents the early years peak in construction traffic when the main development site and associated development sites are under construction;
- **Peak year (2028)** – represents the peak year of construction on the Sizewell C Project and when the associated development sites are constructed and operational; and
- **Operational year (2034)** – represents an early operational year for Sizewell C when all construction works are complete and temporary development removed and reinstated.

11.3.31 On some days during the peak construction year (2028), the number of HGV deliveries would be higher than on a typical day, so two scenarios have been assessed for the peak construction phase, representing a ‘typical day’ and a ‘busiest day’ with the only difference being the number of Sizewell C HGVs. Therefore, for 2028 a change in the level for a ‘typical’ day and ‘busiest’ day has been assessed.

iv. Other sound sources during construction and operational phases

11.3.32 Mechanical services have been assessed for both the construction and operational phases.

11.3.33 The accommodation campus is proposed to be served by either a Combined Heat and Power unit (CHP), or an Air Source Heat Pump network (ASHP). If the CHP unit is the final system selected, there is potential for it to be retained on site during the operational phase as a supplementary, or back-up source of heat and power.

11.3.34 An electrical sub-station is also proposed to be constructed near Lower Abbey Farm to provide power locally during the construction phase. The facility is also proposed to be retained and remain in use during the operational phase of the station.

e) Assessment criteria

11.3.35 As described in **Volume 1, Chapter 6**, the EIA methodology considers whether impacts of the proposed development would have an effect on any resources or receptors. The assessments broadly consider the magnitude of impacts and value/sensitivity of resources/receptors that could be affected to classify effects.

11.3.36 A detailed description of the assessment methodology used to assess the potential effects on noise and vibration arising from the proposed development is provided in **Volume 1, Appendix 6G**. A summary of the assessment criteria used in this assessment is presented in the following sub-sections.

i. Sensitivity

11.3.37 The criteria used in noise and vibration assessment for determining the sensitivity of receptors are set out in **Table 11.1**.

**Table 11.1: Assessment of the value or sensitivity of receptors for noise and vibration**

Sensitivity	Description
High	Receptors that are highly sensitive to noise or vibration such as theatres, auditoria, recording studios, concert halls and highly vibration sensitive structures or uses such as certain laboratories medical facilities or industrial processes.
Medium	Noise and vibration sensitive receptors such as permanent residential buildings, hospitals and other buildings in health/community use, buildings in educational use, hotels and hostels.

Sensitivity	Description
<b>Low</b>	Receptors with limited sensitivity to noise and vibration such as offices, libraries buildings in religious use, and other workplaces with a degree of sensitivity due to the need to concentrate.
<b>Very low</b>	Receptors of very low sensitivity to noise and vibration such as industrial or commercial buildings and transient or mobile receptors.

11.3.38 There is one receptor that would fall into the ‘high sensitivity’ category for noise, which is the Pro Corda Music School at Leiston Abbey. Specifically, the school runs courses for children with special educational needs and disabilities, including residential courses. In addition, Pro Corda host festivals, music courses, theatre workshops and concerts at Leiston Abbey. SZC Co. is committed to further liaison with Pro Corda to take account of their specific needs relating to noise impacts and any required mitigation.

11.3.39 Other than Pro Corda Music School at Leiston Abbey, the majority of receptors that are considered in this chapter are considered to be of ‘medium’ sensitivity.

ii. Magnitude

Construction noise

11.3.40 The values to be used to assess the magnitude of impact for construction work from construction and other sources within the main development site during the construction period, other than mechanical services, are as shown in **Table 11.2** below. Effects occur when the level, rounded to the nearest decibel, exceeds the values listed in **Table 11.2** below.

**Table 11.2: Values to be used to assess the magnitude of impact for construction noise and other sources (other than mechanical services) at the main development site during construction (all values are free field)**

Sensitivity receptor	of	Period	Magnitude of impact				Parameter
			Very low	Low	Medium	High	
High		Any	Bespoke assessment method to be used				
Medium		Day	Below baseline noise levels	Baseline noise levels	60	70	L <sub>Aeq, 16h</sub> , dB,
		Night			45	55	L <sub>Aeq, 8h</sub> , dB,
			<60	60	65	70	L <sub>Amax</sub> , dB,
Low		Day	Below baseline noise levels	Baseline noise levels	60	70	L <sub>Aeq, 16h</sub> , dB,
		Night			45	55	L <sub>Aeq, 8h</sub> , dB,
Very low		Any	No assessment normally required				



- 11.3.41 The assessment criteria adopted for the main development site, as shown in **Table 11.2**, are different from those adopted elsewhere on the project due to the complexity of the works, the sensitivity of the surrounding area in ecological terms, and the 24 hour nature of the construction works. A full explanation is set out in **Volume 1, Appendix 6G**.
- 11.3.42 The approach taken to evaluate noise levels from the construction works at the fen meadow compensation areas and sports pitches at Leiston sports centre on residential receptors is that outlined in Part 1 of BS 5228. This recommends that, for residential receptors, significant effects may occur when the site noise level, rounded to the nearest decibel, exceeds the values listed in **Table 11.3**. The table is used as follows: for the appropriate period (daytime, evening, night-time, weekends), the pre-construction ambient noise level is determined and rounded to the nearest 5dB. This rounded value is compared to the Category A criteria in **Table 11.3** and depending on whether the rounded values are below, equal to, or above the Category A values, the Category A, B or C criteria will apply to the construction works as an indicator of significant effects.

**Table 11.3: Thresholds of potential significant construction noise effects at dwellings, from Part 1 of BS 5228<sup>1</sup>**

Period	Assessment Category		
	A	B	C
Day: Weekdays, 0700-1900, Saturday, 0700-1300	65 dB LAeq,T	70 dB LAeq,T	75 dB LAeq,T
Evenings and weekends: Weekdays 1900-2300, Saturdays 1300-2300, Sundays 0700 - 2300	55 dB LAeq,T	60 dB LAeq,T	65 dB LAeq,T
Every day 2300 - 0700	45 dB LAeq,T	50 dB LAeq,T	55 dB LAeq,T

<sup>1</sup> Notes: Assessment Category A: impact criteria to use when baseline ambient sound levels (rounded to the nearest 5 dB) are less than these values ;Assessment Category B: impact criteria to use when baseline ambient sound levels (rounded to the nearest 5 dB) are the same as category A values; and Assessment Category C: impact criteria to use when baseline ambient sound levels (rounded to the nearest 5 dB) are higher than category A values. If the ambient sound level exceeds the Assessment Category C threshold values given in the table (i.e. the ambient sound level is higher than the above values), then an impact is deemed to occur if the total LAeq,T sound level for the period increases by more than 3 dB due to construction activity.

11.3.43 The way in which this approach is used is explained in the fen meadow and Sports Pitch assessments.

11.3.44 A significant effect is deemed to occur where the relevant criteria are exceeded for the following periods of time:

- 10 or more days or nights in any 15 consecutive days or nights; or
- a total number of days or nights exceeding 40 in any 6 consecutive months.

11.3.45 Where an assessment conclusion identifies a significant effect, it is on the basis that the effect is assumed to meet both the noise level criteria and the duration criteria, unless otherwise stated. Where there is uncertainty as to whether the duration criteria will be met, a precautionary approach has been adopted and it is assumed that the works will continue for a sufficient period to meet the duration criteria.

**Construction vibration**

11.3.46 The assessment of magnitude of construction vibration uses the criteria in **Table 11.4**.

**Table 11.4: Values to assess the magnitude of vibration impact from all construction sources (day or night)**

Sensitivity of receptor	Magnitude of impact				Parameter
	Very low	Low	Medium	High	
High	Bespoke assessment method to be used				
Medium and low	<0.3	0.3	1	>10	PPV mm/s
Very low	No assessment normally required				

11.3.47 Construction vibration will be considered significant, if the magnitude of impact is medium or high at a low or medium sensitive receptor, and occurs for a duration exceeding:

- 10 or more days or nights in any 15 consecutive days or nights; or
- a total number of days or nights exceeding 40 in any 6 consecutive months.

11.3.48 As with the assessment of construction noise, where an assessment conclusion identifies a significant effect, it is on the basis that the effect is assumed to meet both the vibration level criteria and the duration criteria, unless otherwise stated. Where there is uncertainty as to whether the

duration criteria will be met, a precautionary approach has been adopted and it is assumed that the works will continue for a sufficient period to meet the duration criteria.

Road traffic noise

11.3.49 The assessment of impacts from traffic noise on existing roads during construction of Sizewell C is considered using the values in **Table 11.5**.

**Table 11.5: Magnitude of changes in road traffic noise level on existing roads due to Sizewell C construction traffic**

Magnitude of impact	Magnitude of change in road traffic noise level due to construction traffic (dB L <sub>A10,18hr</sub> or L <sub>night</sub> )
Major or high	Greater than or equal to 5.0
Moderate or medium	Greater than or equal to 3.0 and less than 5.0
Minor or low	Greater than or equal to 1.0 and less than 3.0
Negligible or very low	Less than 1.0

11.3.50 The assessment of the long term effects of changes in road traffic flows on the existing road network during the operation of Sizewell C nuclear power station (2034) is assessed in the same way as the change caused by construction traffic, except that the magnitudes of these changes have been considered against the values for long term effects set out in **Table 11.6**.

**Table 11.6: Long term magnitude of changes in road traffic noise level – new road schemes**

Long term magnitude	Long term noise change (dB L <sub>A10,18hr</sub> or L <sub>night</sub> )
Major or high	Greater than or equal to 10.0
Moderate or medium	5.0 to 9.9
Minor or low	3.0 to 4.9
Negligible or very low	less than 3.0

11.3.51 No high sensitivity receptors have been identified within the study area for the assessment of road traffic noise. The receptors assessed in this chapter are considered to be of medium sensitivity, or less.

Operation

11.3.52 To assess noise from the operational power station, mechanical ventilation plant, and chillers and heating systems associated with the operation of campus facilities, guidance within BS 4142 has been used to determine significance.

11.3.53 BS 4142 states that, to consider the effects of noise from such plant, subtracting the background sound level from the rating noise level, where both are determined in accordance with the procedures set out in that standard, will give the following initial outcomes:

*“A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.”*

*“A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.”*

*“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 impact 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.”*

11.3.54 Once the level difference is established, this must be considered in context, as described in BS 4142, to decide the overall significance.

11.3.55 Based on this approach, the initial magnitude of effect is defined by the difference between the rating and background sound levels as shown in **Table 11.7**, prior to any consideration of context. Day is taken to be 07:00 to 23:00 hours and night is 23:00 to 07:00 hours.

**Table 11.7: Values to be used to assess the magnitude of impact for operational power station and other mechanical services, all values are free field.**

Sensitivity of receptor	Period	Magnitude of impact				Parameter
		Very low	Low	Medium	High	
High	Any	Bespoke assessment method to be used				
Medium or Low	Day	<BG+0*	BG+0*	BG+5*	BG+10*	L <sub>Ar</sub> 1 hour, dB
	Night					L <sub>Ar</sub> 15 mins, dB
Very low	Any	No assessment normally required				

BG – background sound level, L<sub>A90</sub>, dB, quantified in accordance with BS 4142: 2014+A1: 2019.

\* All assessments of significance must be considered in the context in which the sound occurs, in accordance with the guidance in BS 4142: 2014+A1: 2019.

11.3.56 The scope of BS 4142 states that it is to be used:

*“to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident”.*

11.3.57 No guidance is available for the assessment of sound from these types of noise source on receptors with other sensitivities. Since high sensitivity receptors would be so due to specific and potentially unique circumstances, the assessment of this type of noise source on these receptors is considered using a bespoke method, relevant to local circumstances.

11.3.58 Since people in low sensitivity receptors, such as offices, may be adversely affected by these sound sources and there are no alternative criteria that would apply, a precautionary approach has been taken and the same assessment criteria used for the assessment of magnitude of impacts for both medium and low sensitivity receptors.

11.3.59 Operational noise from the power station is unlikely to have an adverse effect on receptors with very low sensitivity, such as industrial and commercial buildings.

11.3.60 In general, background and ambient noise levels in the vicinity of the main development site are low, and the absolute level of sound needs to be considered when looking at context in this situation. BS 4142 advises that:

*“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.”*

11.3.61 Where background noise levels are at or below 30dB,  $L_{A90}$ , an adverse effect is not expected to occur below an absolute threshold that represents the onset of an adverse impact. Since this would only occur in locations where the existing levels are low, it is appropriate to select a level below which there is a very little likelihood of sleep disturbance at night.

11.3.62 According to the WHO’s Night Noise Guidelines for Europe (Ref 11.25), there is *“no sufficient evidence that the biological effects observed at the level below 40 dB  $L_{night, outside}$  are harmful to health”*. On this basis, a value of 40 dB,  $L_{night}$  is considered to represent a level below which adverse effect will not occur in locations with low background sound levels at night.

### iii. Classification of effects

11.3.63 Following the classification of the magnitude of the impact and the value/sensitivity of the receptor/feature, the effect is classified as shown in

**Table 11.8** below. Definitions for each of the different levels of effect, which can be adverse, beneficial or neutral are shown in **Table 11.9**.

**Table 11.8: Classification of effects**

		Value/Sensitivity of Receptor			
		Very Low	Low	Medium	High
Magnitude	Very low	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Minor	Minor	Moderate
	Medium	Minor	Minor	Moderate	Major
	High	Minor	Moderate	Major	Major

**Table 11.9: Effect definitions**

Effect	Description
Major	The noise causes a material change in behaviour attitude or other physiological response. Adverse change may result in the potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished or improved due to change in acoustic character of the area.
Moderate	Effects that may result in moderate changes in behaviour, attitude or other physiological response. Adverse effects may result in some reported sleep disturbance. Changes to the acoustic character of the area such that there is a perceived change in the quality of life.
Minor	Effects that may result in small changes in behaviour attitude or other physiological response. Adverse effects may result in some minor reported sleep disturbance. Small changes to the acoustic character of the area such that there is a low perceived change in the quality of life.
Negligible	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.

**11.3.64** Following the classification of an effect, as detailed in **Tables 11.8** and **11.9**, a clear statement is made as to whether the effect is ‘significant’ or ‘not significant’. As a general rule, major and moderate effects are considered to be significant and minor and negligible effects are considered to be not significant. However, professional judgement is also applied, where appropriate. In addition to considering these tables, other project-specific factors, such as the number of receptors affected and the duration and character of the impact need to be considered where these have a potential bearing on significance.

iv. Use of LOAEL and SOAEL values in the assessment

- 11.3.65 The NPSE, the NPS and the PPG require the assessment of noise and vibration against the lowest observed adverse effect level (LOAEL) and the significant observed adverse effect level (SOAEL). These will differ dependent on variables such as the level and character of the noise or vibration source, timings of when it would occur, its duration, existing sounds present and the frequency of the occurrence of the source.
- 11.3.66 Each different source type requires its own specific value for LOAEL and SOAEL, which depends on these factors. The methodology for assigning significance differs from the general methodology set out in **Volume 1, Chapter 6**, as it does not allow for these variables to be properly considered. Each source has therefore been considered separately and values for LOAEL and SOAEL defined for different sensitivities.
- 11.3.67 **Table 11.10** sets out descriptions for LOAEL and SOAEL and actions recommended by NPSE and PPG in relation to these categories.

**Table 11.10: Generic effect descriptions and actions recommended**

Effect	Description	Action
<b>Below LOAEL</b>	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No specific measures required.
<b>Between LOAEL and SOAEL</b>	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Mitigate and reduce to a minimum.
<b>Above SOAEL</b>	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Avoid

- 11.3.68 Actual values for the noise and vibration sources assessed vary, dependent on the source of noise, as recommended in the various noise assessment standards and sources of guidance.
- 11.3.69 The descriptions and actions recommended in **Table 11.10** are based on the guidance in the NPSE and associated guidance in the PPG. This approach was discussed in meetings with the local authorities between 2015 and 2019.
- 11.3.70 For construction noise, the LOAEL is considered to be equal to the existing baseline ambient level. SOAEL values are shown in **Table 11.11**.

**Table 11.11: SOAEL values from noise from all construction work (all values are façade levels).**

Day	Time (hours)	Averaging Period T	Significant Observed Adverse Effect Level <sup>1</sup> L <sub>Aeq,T</sub> (dB)
Mondays to Fridays	0700 – 0800	1 hour	70
	0800 – 1800	10 hours	75
	1800 – 1900	1 hour	70
	1900 – 2300	4 hours	65
Saturdays	0700 – 0800	1 hour	70
	0800 – 1300	5 hours	75
	1300 – 1400	1 hour	70
	1400 - 2300	1 hour	65
Sundays & Public Holiday	0700 – 2300	1 hour	65
Any night	2300 – 0700	1 hour	55

Note: (1) Duration of exceedance must occur for 10 or more days or nights in any 15 consecutive days or nights; or for a total number of days exceeding 40 days or nights in any 6 consecutive months.

- 11.3.71 **Table 11.12** sets out the LOAEL and SOAEL values adopted for construction vibration and the derivation of these values is detailed in **Volume 1, Appendix 6G** and **Annex 6G.1**.



**Table 11.12: LOAEL and SOAEL values for construction vibration**

LOAEL	SOAEL	Parameter
0.3	10.0	PPV mm/s

11.3.72 **Table 11.13** sets out the LOAEL and SOAEL values that have been adopted for road traffic noise across the project. The values are taken from LA111, which does not state whether the values should apply to existing roads as well as new or amended roads.

11.3.73 Adopting a precautionary approach, it is considered that the SOAELs and LOAELs could be applied to both existing and new or amended roads, but it should be recognised that development-generated traffic would need to be a substantial cause of any exceedances, and that exceedances that pre-date the project are not considered to result from the project. To test whether the proposed development is a substantial cause of the exceedance, or to measure whether the proposed development is the cause of an existing exceedance becoming greater, a change in traffic noise of at least +1dB must occur as a result of the development-generated traffic.

11.3.74 The derivation of these values is detailed in **Volume 1, Appendix 6G** and **Annex 6G.1**.

**Table 11.13: LOAEL and SOAEL values for road traffic noise**

Time Period	LOAEL	SOAEL
Day (06:00-24:00)	55dB LA10,18hr facade	68dB LA10,18hr façade
Night (23:00-07:00)	40dB L <sub>night</sub> , outside (free-field)	55dB L <sub>night</sub> , outside (free-field)

11.3.75 **Table 11.14** sets out the LOAEL and SOAEL values adopted for the operational power station and other mechanical services. The derivation of these values is detailed in **Volume 1, Appendix 6G** and **Annex 6G.1**.

**Table 11.14: LOAEL and SOAEL values for the operational power station and other mechanical services (all values are free field values)**

Period	Sensitivity of receptor	LOAEL	SOAEL
Day	Medium	BG+0dB, L <sub>Ar</sub> , dB	BG+10, L <sub>Ar</sub> or Above 60dB, L <sub>Aeq, 16h</sub> , whichever is the higher
	Low		65dB, L <sub>Aeq, 16h</sub>
Night	Medium	BG+0dB, L <sub>Ar</sub> , dB or 40dB L <sub>night</sub> , whichever is the higher <sup>1</sup>	BG+10, L <sub>Ar</sub> or Above 55dB, L <sub>night</sub> , dB, whichever is the higher

Period	Sensitivity of receptor	LOAEL	SOAEL
	Low (if occupied at night)		65dB, L <sub>Aeq, 8h</sub>

Note: (1) The 40dB L<sub>night</sub> threshold is stated as a lower cut-off for the LOAEL at night as there is unlikely to be an adverse effect below this level. This is part of the contextual consideration required by BS 4142, embedded in the definition of the night-time LOAEL.

11.3.76 **Table 11.15** sets out the LOAEL and SOAEL values for operational activities associated with the off-site works, specifically those at the Alde Valley School in Leiston. The derivation of these values is detailed in **Volume 1 Appendix 6G** and **Annex 6G.1**.

**Table 11.15: LOAEL and SOAEL values for operational use of the sports facilities at Alde Valley School.**

Time Period	LOAEL	SOAEL
Day (07:00-23:00)	50dB L <sub>Aeq, 16h</sub> , free field level	60dB L <sub>Aeq, 16h</sub> , free field level
Night (23:00-07:00)	40dB L <sub>night</sub> , outside (free-field)	55dB L <sub>Aeq, 8h</sub> , free field level
	60dB, L <sub>Amax</sub> , free field	70dB, L <sub>Amax</sub> , free field

f) Assessment methodology

i. Establishing baseline

11.3.77 Baseline noise and vibration surveys within the study area were undertaken between 2010 and 2019. Details of the baseline survey locations and results are presented in **Appendix 11A**.

ii. Construction noise

11.3.78 Full details of the assessment methodology for main development site construction noise specifically are presented in **Appendix 11B**.

11.3.79 In summary, a combination of 3D computer noise modelling and statistical post-processing was utilised to produce representative predictions of main development site construction noise levels. SoundPLAN 3D™ noise modelling software was used to create a 3D model of the main development site and the surrounding environs. The construction phasing plans presented in **Chapter 3** of this volume were then used to create variations representing the changing landscape and noise levels during each assessment scenario, based on the indicative construction programme and the five main construction phases as described in **section 11.2d)** of this chapter.

11.3.80 The main development site construction noise levels were assessed at the representative noise sensitive receptors/groups of receptors set out in **Table 11.16**. The dominant source of main development site construction noise is

also indicated, that being either main development site (the entire main development site excluding the LEEIE), LEEIE (activities on the LEEIE specifically) or main development site / LEEIE (noise from the LEEIE and the wider main development site significantly contribute to combined noise exposure).

11.3.81 Worker accommodation provided within the main development site (accommodation campus), and within the LEEIE have not been considered as independent receptors in the same manner as separately owned and occupied residential dwellings around the development site. Nonetheless, it is considered important that workers resting and sleeping at the various accommodations within the development site are protected from construction noise, as far as is reasonably practicable. It is expected that this will be achieved through screening the caravans and the suitable design of the building envelope of the accommodation campus, including appropriate ventilation strategy, with a view to achieving BS 8233 internal sound level criteria in habitable rooms.

**Table 11.16: Noise-sensitive receptors / groups of receptors for main development site construction noise assessment**

Receptor Reference	Receptor Name	Dominant Source of Construction Noise
1	Abbey Cottages	MDS (excluding the LEEIE)
2	Abbey Farm	MDS (excluding the LEEIE)
3	Abbey Road, Leiston	MDS (excluding the LEEIE)
4	Ash Wood Cottage	MDS (excluding the LEEIE)
5	Barley Rise	LEEIE
6	Common Cottages	MDS (including the LEEIE).
7	Crown Lodge	LEEIE
8	Eastbridge	MDS (including the LEEIE)
9	Grimseys Lane	LEEIE
10	Heath View	LEEIE
11	Keepers Cottage	MDS (including the LEEIE).
12	King George's Avenue	LEEIE
13	Leiston Abbey	MDS (excluding the LEEIE)
14	Lovers Lane/Sandy Lane Junction	MDS (including the LEEIE).
15	Old Abbey Farm/Care Home	MDS (excluding the LEEIE)
16	Plantation Cottages	MDS (excluding the LEEIE)
17	Potters Farm	MDS (excluding the LEEIE)

Receptor Reference	Receptor Name	Dominant Source of Construction Noise
18	Potters Street	MDS (excluding the LEEIE)
19	Rosery Cottages	MDS (excluding the LEEIE)
20	Roundhouse	MDS (excluding the LEEIE)
21	Sizewell Sports & Social Club	LEEIE
22	Sizewell Village	MDS (excluding the LEEIE)
23	The Studio	MDS (including the LEEIE).
24	Valley Road North <sup>1</sup>	LEEIE
25	Valley Road South <sup>1</sup>	LEEIE

Notes:

(1) Valley Road North and South covered as a single assessment.

(2) MDS for the purpose of this table refers to the main platform and the temporary construction area.

11.3.82 The locations of the noise sensitive receptors set out in **Table 11.16** are indicated in **Figure 11.1** and **Appendix 11B** of this chapter.

iii. Main development site construction vibration

11.3.83 As described in **Appendix 11B**, the level of vibration from construction was predicted by obtaining source data and calculating the decay of vibration energy with distance. Account was taken of typical ground attenuation mechanisms, and the expectation for energy transfer from the ground in to the foundations of a building. The vibration amplitude in the building foundation was then used to estimate the response of people to that vibration.

iv. Construction road traffic noise

11.3.84 The assessment of road traffic noise effects was carried out by using road traffic flow data for links identified as having the potential to result in an adverse effect. Traffic flow data was used to calculate the future “baseline” (‘reference case’) and the future “with development” noise levels for 2023, 2028 (including the ‘typical’ and ‘busiest’ day) and 2034. Daytime noise levels were calculated using the calculation method in CRTN (Ref. 11.17). Night time levels were calculated using Method 1 (the “preferred method”) from TRL Report PR/SE/451/02 (TRL for DEFRA) (Ref. 11.24). Details on the road traffic flow data are in **Appendices 11F** and **11G**.

#### v. Operational noise

- 11.3.85 The assessment methodology for operational noise is described in detail in **Appendix 11C**. Operational noise has been assessed using the approach set out in BS4142: 2014+A1: 2019. This requires the rating level of all noise sources at the site to be predicted and compared to the background noise level at receptors and then this level difference to be considered in context of the character, level and other relevant factors found around the site.
- 11.3.86 A three dimensional model was created (using the SoundPLAN software package) and details of the site, the building dimensions, local topography and other relevant features were input along with sound power levels of every noise source, including, where appropriate, noise breaking out of buildings themselves.
- 11.3.87 The model calculated the noise propagation in the area using the methodology set out in ISO9613 (Ref 11.20) and predicted noise levels at each of the receptors or groups of receptors. These predicted levels were then compared to the assessment criteria, as appropriate.

#### vi. Off-site developments

- 11.3.88 Off-site development, as described in full within **Chapters 2** and **3** of this volume and assessed in this chapter, include:
- Fen meadow compensation areas to the south of Benhall and to the east of Halesworth; and
  - Sports facilities at the Alde Valley School in Leiston.
- 11.3.89 An environmental screening exercise was undertaken to identify which of the off-site development works may give rise to environmental effects that could potentially be significant. This screening concluded that the construction of proposed fen meadow compensation areas and the construction and operation of sports facilities should be taken forward to the assessment as there was the potential for adverse noise impacts. The description of these proposed developments and sound level assessments are detailed in **Appendices 11D** and **11E** to this chapter.
- 11.3.90 The proposed marsh harrier habitat improvement area (Westleton) has been screened out from the assessment as no construction works are proposed, and activities will be no different in noise terms from normal agricultural activities likely to be experienced at that site in the absence of the development.

## g) Assumptions and limitations

## i. Construction

11.3.91 The assumptions made in the construction noise assessment are listed in **Appendix 11B** and the most significant of these are as follows:

- The noise prediction methodology described in full in **Appendix 11B** assumes works would progress at a steady rate across the defined area or path.
- The noise prediction methodology also adopts the conservative approach that each activity lasts the for the full duration of the phase and that all sub-phases occur simultaneously, largely because phase overlaps and sub-phase duration cannot be fully accounted for until construction proposals are developed by contractors.
- The SoundPLAN model incorporates terrain data provided by EDF Energy and the BlueSky Map Shop (Nextmap 5m digital terrain model, 2017).
- Appropriate on-times for activities, plant and machinery were primarily derived from **Chapter 3** of this volume. The adoption of worst-case assumptions in most cases means that some may be an over-estimate.
- Material haulage and/or vehicle movements along a defined route were modelled as moving point sources with source level, speed and number of movements per hour/day.
- Activities in a fixed location were modelled as discrete point sources.
- Ground/first floor assumed to be 1.5m and 4.5m above ground respectively.
- The night-time assessments assume all of the noise sources would, on average, be present to a consistent level every night for the duration of each of the defined scenarios and this was considered to represent a robust night-time assessment scenario in each case.

11.3.92 The main limitations of this construction noise assessment are listed in **Appendix 11B** of this chapter and the most significant of these are as follows:

- The construction chapter (**Chapter 3** of this volume) sets out the basic methodology for the removal of temporary facilities and land restoration during Phase 5; the detail of the restoration proposals will be developed once the contractor has been appointed. The Plant Assessment

Scenarios (**Chapter 3, Appendix 3A**) therefore do not contain any details or data for specific activities and/or processes during this phase.

- The main development site construction noise levels during Phase 5 are therefore based on the highest noise levels predicted during Phase 1, which would be similar due to the types of activities and/or processes expected during Phase 5.

ii. **Operational assumptions**

**11.3.93** The assumptions made in the operational noise assessment are listed in **Appendix 11C** of this chapter and the most significant of these are as follows:

- The main platform would include key operational elements for each of the two UK EPR™ reactor units (Unit 1 and Unit 2) including a reactor building and associated buildings, including emergency diesel generators; turbine halls and electrical buildings; and cooling water pump houses and associated buildings. These key operational components of the main development site and associated infrastructure are described in greater detail and shown in the illustrative site layout plan in **Appendix 11C**.
- The main power station buildings would be located on the main platform at an elevation of 7.3 metres (m) Above Ordnance Datum (AOD).
- All sound source data embedded in the predictive sound level model is set out in **Appendix 11C**. Some sound sources associated with the station may be in intermittent use, however these have all been assumed to be operational at the same time in the predictive sound level model.
- During the operational life of the proposed power station (operational life of 60 years), outages would be planned lasting up to 2 months, on a cycle of every 18 months. During these periods, the station would undergo a range of planned maintenance tasks as well as refuelling of the reactors. During an outage, typical sound emissions are expected to be at lower levels than those from the fully operational station.
- The generators will only operate for routine testing purposes in accordance with a prescribed testing program or during emergency situations where there is a Loss Of Off-site Power (LOOP).
- The annual run-time for each diesel generator during routine testing will be approximately 60 hours and that this would only take place during daytime hours (07:00–23:00hrs). In addition to this, the back-up

generators will be tested sequentially and each for a continuous 24 hour period immediately following an outage.

iii. Traffic assumptions

11.3.94 For the purposes of modelling noise from the additional road traffic resulting from construction and operation of the proposed development, it is assumed that the early years peak construction traffic flows would occur in 2023; that the later years peak would occur in 2028; and that 2034 would be the first year of operation of the power station.

11.3.95 Traffic flows would be as shown in **Appendix 11F** of this chapter.

11.4 Baseline environment

11.4.1 This section presents a description of the baseline environmental characteristics within the footprint of the proposed development and in the surrounding area.

11.4.2 Further detail can be found in **Appendix 11A**.

a) Current baseline

11.4.3 **Appendix 11A** of this chapter provides details of the baseline survey work carried out in monitoring locations. The survey methodology, details of monitoring locations and detailed results are provided within the appendix.

11.4.4 **Figure 11.2** shows the locations of all monitoring locations used for the main development site assessment of noise on human and ecological receptors. The effects of noise on terrestrial ecology and ornithology are assessed in **Chapter 14** of this volume.

11.4.5 **Figure 11.3** shows the roadside noise monitoring locations relevant to the assessment of noise on existing roads.

11.4.6 A summary of the results at each location is shown in **Table 11.17**.

**Table 11.17: Summary of baseline noise survey results**

Receptor Name	Receptor Reference	Typical Noise Level DAY*		Typical Noise Level NIGHT*	
		L <sub>Aeq,T</sub> (dB)	L <sub>A90,T</sub> (dB)	L <sub>Aeq,T</sub> (dB)	L <sub>A90,T</sub> (dB)
Eastbridge South	MS1	50	32	38	26
Lower Abbey Farm	MS2	55	34	38	28
Leiston Old Abbey	MS3	38	35	40	35



**NOT PROTECTIVELY MARKED**

Receptor Name	Receptor Reference	Typical Noise Level DAY*		Typical Noise Level NIGHT*	
		L <sub>Aeq,T</sub> (dB)	L <sub>A90,T</sub> (dB)	L <sub>Aeq,T</sub> (dB)	L <sub>A90,T</sub> (dB)
Land East of Potters Farm	MS4	43	35	30	25
Land South and West of Minsmere	MS5	36	29	31	28
The Roundhouse	MS6	41	35	38	35
Ash Wood Cottages	MS7	45	40	39	35
Abbey Marshes	MS8	45	40	35	33
Coast Path North	MS9	43	39	41	39
Bridleway Centre	MS10	45	35	35	28
Hill Farm	MS11	45	37	33	25
Leiston Abbey, rear	MS12	42	38	30	27
Old Abbey Farm Lodge	MS13	71	42	50	28
Abbey Cottage	MS14	56	41	40	30
Old Abbey Care Home	MS15	47	43	34	30
Sizewell Marshes West	MS16	45	36	34	27
Sizewell Marshes East	MS17	40	39	40	39
Cakes and Ale Caravan Site	MS18	50	42	40	33
Leiston North	MS19	70	40	60	30
Coastal Path at Site	MS20	50	48	48	47
The Gatehouse, Saxmundham Road	MS21	70	40	50	30
Leiston Station	MS22	65	45	45	30
Leiston Centre	MS23	47	40	40	30
Valley Road, Leiston	MS24	45	40	35	28
Sandy Lane West	MS25	50	45	45	30
Keepers Cottage	MS26	42	35	30	28
Rosery Cottages	MS27	47	45	47	45
Sizewell Village	MS28	48	43	43	40
Leiston Rail Crossing, King George's Avenue	MS29	65	45	50	35
Crown Lodge	MS30	60	45	45	30
Sandlings	MS31	40	35	32	30
Sizewell Campsite	MS32	50	48	50	48

Receptor Name	Receptor Reference	Typical Noise Level DAY*		Typical Noise Level NIGHT*	
		L <sub>Aeq,T</sub> (dB)	L <sub>A90,T</sub> (dB)	L <sub>Aeq,T</sub> (dB)	L <sub>A90,T</sub> (dB)
Leiston West	MS33	45	38	33	30
Minsmere (Bittern Hide)	MS34	35	30	33	27
Minsmere (Post N)	MS35	38	30	32	25
Minsmere (South Hide)	MS36	40	37	40	37
Leiston Abbey Courtyard	MS38	43	35	30	26
Leiston Abbey Residential Block	MS39	45	37	35	26
Cakes and Ale Entrance	MS40	53	36	40	26
Sizewell Gap	MS41	54	45	45	40
Halfway Cottages (Sizewell Gap Road)	MS42	53	45	40	35
Heath View, Eastern end	MS45	46	40	40	35
Heath View, Southern end	MS46	42	37	30	28

Note: \* The typical sound levels have been established on the basis of survey data collected between 2010 and 2019, as further described in **Appendix 11A**.

11.4.7 Using the values in **Table 11.17**, representative baseline ambient noise levels have been determined at each receptor, either by adopting values measured close to that receptor, or by adjusting measured levels in the area to correct for distance, where a particular receptor is set back from a dominant road close to the measurement location.

11.4.8 The representative ambient levels are shown in **Table 11.18**.

**Table 11.18: Representative ambient noise levels at each receptor or receptor group**

Receptor number	Receptor / receptor group name	Representative ambient level, L <sub>Aeq,T</sub> dB		Rationale
		Day	Night	
1	Abbey Cottage	56	40	As measured at MS14
2	Abbey Farm	36	31	As measured at MS5

Receptor number	Receptor / receptor group name	Representative ambient level, L <sub>Aeq,T</sub> dB		Rationale
		Day	Night	
3	Abbey Road Leiston	65	55	Measured at MS19 and corrected for distance
4	Ash Wood Cottages	45	39	As measured at MS7
5	Barley Rise	53	40	As measured at MS42
6	Common Cottages	42	30	As measured at MS26
7	Crown Lodge	57	45	As measured at MS30 and corrected for distance
8	Eastbridge	50	38	As measured at MS1
9	Grimseys lane	40	30	As measured at MS46
10	Heath View	46	40	As measured at MS45
11	Keepers Cottage	42	30	As measured at MS26
12	King George's Avenue	50	40	As measured at MS29, corrected for distance and screening
13	Leiston Abbey	43	30	As measured at MS38
14	Lovers Lane/Sandy Lane	50	45	As measured at MS25
15	Old Abbey Farm/Care Home	47	34	As measured at MS15
16	Plantation Cottages	38	31	As measured at MS5 for night, but 2dB higher than MS5 for daytime to account for being closer to the road
17	Potters Farm	43	30	As measured at MS4
18	Potters Street	43	30	As measured at MS4
19	Rosery Cottages	47	47	As measured at MS27
20	Roundhouse	41	38	As measured at MS6
21	Sizewell S & SC	46	40	As measured at MS45
22	Sizewell Village	48	43	As measured at MS28
23	The Studio	42	30	As measured at MS26
24	Valley Road Leiston N	45	35	As measured at MS24
25	Valley Road Leiston S	45	35	As measured at MS24
26	Upper Abbey	35	28	As measured at MS10

## b) Future baseline

11.4.9 The traffic composition and flow data arises from the Transport Assessment work for the baseline, construction and operation scenarios. This information is inherently cumulative as it includes traffic flows associated with consented developments and therefore accounts for future baseline noise levels. There are no other committed development(s) or forecasted changes that would materially alter the baseline conditions during the construction and operational phases of the proposed development or introduce receptors closer to the site than the closest existing properties.

## 11.5 Environmental design and mitigation

11.5.1 As explained in **Volume 1, Chapter 6**, a number of primary mitigation measures have been identified through the iterative EIA process and have been incorporated into the design and construction planning of the proposed development. Tertiary mitigation measures are legal requirements or are standard practices that would be implemented as part of the proposed development.

11.5.2 The assessment of likely significant effects of the proposed development assumes that primary and tertiary mitigation measures are in place. For noise and vibration, these measures are identified below, with a summary provided on how the measures contribute to the mitigation and management of potentially significant environmental effects.

11.5.3 Primary mitigation for off-site development areas is required for the off-site sports pitches only. The assessment and noise mitigation required is set out in **Appendix 11E**.

### a) Environmental design and mitigation for the Sizewell B relocated facilities works in Phase 0

11.5.4 In line with the project programme set out in **Chapter 3** of this volume, it is anticipated that the first phase of the Sizewell B relocated facilities works, which is referred to as 'Phase 0', would be carried out pursuant to the planning permission granted by East Suffolk Council on 13 November 2019 (application ref. DC/19/1637/FUL). The second phase of the Sizewell B relocated facilities works would take place in Phases 1 and 2 in parallel with other DCO works due to take place at this time and would be carried out pursuant to the DCO.

11.5.5 Under the existing planning permission, mitigation measures for noise and vibration effects that occur as a result of Phase 0 of the Sizewell B relocated facilities works include the following:

- Tertiary mitigation, including the implementation of measures set out in the Outline Construction Environmental Management Plan submitted with the planning application, including methods for noise management and noise control for all activities and operations, such as the selection of quieter plant, working practices and techniques in accordance with good practice set out in BS 5228. Where possible, noisy works within Coronation Wood and Pillbox field will be avoided on Saturday afternoons. In addition, there will be regular liaison with local residents who may be affected by construction noise, and a system for responding to complaints will be adopted.
- Secondary mitigation:
  - once details of the construction approach have been developed, noise screening and working methodologies will be designed, so that no significant noise effects occur, in compliance with the Outline Construction Environmental Management Plan;
  - during operation, noise levels from operational plant will be restricted by careful selection, siting and orientation of the plant and the provision of additional localised screening, if required, to meet specified noise limits.

11.5.6 Details of these measures are provided in Chapter 11 of the Sizewell B relocated facilities ES (refer to **Volume 1, Appendix 2A**).

11.5.7 It is anticipated that the mitigation measures summarised above will be in place or under way by the end of Phase 0. However, to allow for this mitigation to be implemented in Phases 1 and 2, if required (or if the works are instead carried out entirely under the DCO – see **Volume 2, Appendix 6A** of the ES), these measures have also been incorporated within the DCO.

#### b) Environmental design and mitigation for the DCO

##### i. Primary mitigation

11.5.8 Primary mitigation is often referred to as ‘embedded mitigation’ and includes modifications to the location or design to mitigate impacts. These measures become an inherent part of the proposed development.

#### Construction

11.5.9 The site layout will incorporate noise barriers in the form of landscape bunds and/or acoustic screens to reduce, as far as practicable, the spread of construction noise from the main development site towards identified noise-sensitive receptors (NSRs). The following barriers are proposed as primary

mitigation, as shown on the indicative boundary treatments cross-section drawings in **Chapter 3** of this volume:

- Barrier #4 (B4) – 5m high acoustic fence.
- Barrier #6 (B6) – 3m high earth bund.
- Barrier #7 (B7) – 3m high earth bund with a 2m high acoustic fence on top of the ridge (5m total height).

11.5.10 The locations of these primary mitigation measures are shown in **Figure 11.4** and also in **Appendix 11B** of this volume.

11.5.11 The predictive construction noise modelling that is reported in **section 11.6** included the screening effects of these primary mitigation measures in all assessment scenarios.

#### *Other sound sources during construction and operational phases*

11.5.12 Sizewell C will be designed to minimise noise breakout during operations, including the diesel generators.

#### *Accommodation Campus – Mechanical services*

11.5.13 The proposed Combined Heat and Power unit (CHP) or Air Source Heat Pump network (ASHP) selected to serve the accommodation campus during construction will be designed to ensure sound levels from the plant are kept low at night, and also provide adequate protection of receptors during the daytime period.

11.5.14 The final system selection and design is to be determined, and therefore sound levels from the final proposal would be controlled during the construction phase for the ASHP and for both the construction and operational phases for the CHP only, by ensuring the sound rating level does not exceed a free-field level of 35dB  $L_{Ar,15\text{minute}}$  outside the nearest residential receptor. This may therefore require a system specific mitigation scheme to meet this target sound rating level.

11.5.15 A level of 35dB  $L_{Ar,15\text{minutes}}$  has been adopted as a target for these plant items, as it is considered a robust target that is below the 40dB  $L_{\text{night}}$  threshold that has been identified as the level below which there is no prospect of an adverse impact.

#### *Electrical substation*

11.5.16 The final design for the proposed electrical sub-station, is to be determined, and therefore sound levels from the final proposal would be controlled during the construction phase and operational phase by ensuring that the sound

rating level does not exceed a free-field level of 35 dB  $L_{Ar,15\text{minute}}$  outside the nearest residential receptor. This may therefore require a system specific noise mitigation scheme to ensure this target sound rating level is met.

### Road Traffic

11.5.17 For the scheme as a whole, the following design measures will result in an overall reduction in noise exposure:

- Use of two off-site park and ride facilities to reduce construction worker traffic to site, and a park and ride facility at LEEIE, as well as the use of an accommodation campus and caravan park to further reduce travel to site, reduced car parking and public rights of way improvements, which help reduce transport-related emissions.
- Use of an off-site freight management facility, which will help manage freight arrivals and reduce on-site queuing and engine idling.
- Minimising freight movements on roads through the provision of the beach landing facility, Saxmundham to Leiston branch line upgrades, rail siding at LEEIE, and the green rail route.

### ii. Tertiary mitigation

11.5.18 Tertiary mitigation will be required regardless of any EIA assessment, as it is imposed, for example, as a result of legislative requirements and/or standard sectoral practices.

11.5.19 The standard of good practice outlined in BS 5228-1 will be followed, as set out in the **Code of Construction Practice (CoCP)** (Doc Ref. 8.11). Tertiary mitigation for the control of construction noise will include, but not be restricted to, the following measures:

- Selection of quiet plant and techniques in accordance with good practice in BS5228 for all construction, demolition and earth moving activities.
- Switching off equipment when not required.
- Use of reversing alarms that ensure proper warning whilst minimising noise impacts off site.
- Provision of training and instruction to construction site staff on methods and techniques of working to minimise off-site noise impacts.

11.5.20 BS 5228-2 gives detailed advice on standard good practice for minimising impacts from construction vibration. The key requirements of BS5228-2 are

set out in the **CoCP** and it will be a requirement of the contractors to adhere to this.

11.5.21 During construction, a **Construction Worker Travel Plan** and **Construction Traffic Management Plan** will be implemented to reduce and manage the effects of traffic generated by the proposed development (see **Volume 2 Chapter 10** for more detail).

11.5.22 If the Sizewell B relocated facilities works are completed under the powers granted by the Sizewell C DCO, the mitigation measures and controls set out within the **CoCP** will be applied to the Sizewell B relocated facilities works. The **CoCP** includes all measures set out within the Outline Construction Environmental Management Plan submitted with the Sizewell B relocated facilities application. The construction working hours associated with Sizewell B relocated facilities works will remain as set out within the Sizewell B relocated facilities planning application, i.e. Monday – Saturday 07:00-19:00, except for continuous periods of construction, such as concrete pours and erection of steel, unless otherwise agreed with East Suffolk Council.

iii. **Other Mitigation**

11.5.23 A **Noise Mitigation Scheme** (refer to **Appendix 11H**) is proposed as part of the DCO Section 106 Obligations, so that noise insulation or temporary rehousing may be provided where specified noise criteria are exceeded.

11.5.24 NPS EN-1 indicates that noise insulation is a valid form of mitigation, as part of a package of noise mitigation measures, stating at paragraph 5.11.13:

*“In certain situations, and only when all other forms of noise mitigation have been exhausted, it may be appropriate for the IPC [now Planning Inspectorate] to consider requiring noise mitigation through improved sound insulation to dwellings.”*

11.5.25 Similarly, paragraph 010 of the PPG for noise refers to the use of insulation when seeking to address noise impacts:

*“In general, for developments that are likely to generate noise, there are 4 broad types of mitigation:*

- *engineering: reducing the noise generated at source and/or containing the noise generated;*
- *layout: where possible, optimising the distance between the source and noise-sensitive receptors and/or incorporating good design to minimise noise*



*transmission through the use of screening by natural or purpose built barriers, or other buildings;*

- *using planning conditions/obligations to restrict activities allowed on the site at certain times and/or specifying permissible noise levels differentiating as appropriate between different times of day, such as evenings and late at night, and;*
- *mitigating the impact on areas likely to be affected by noise including through noise insulation when the impact is on a building.* (emphasis added)

11.5.26 Offering temporary rehousing where short term construction noise is forecast to exceed specified levels is also commonly regarded as best practice for projects involving significant construction activity.

c) Monitoring

11.1.1 Routine monitoring would be carried out during construction in accordance with the **CoCP** (Doc Ref. 8.11) and SZC Co. would have a system for the receipt, and recording of any noise or vibration complaints from occupiers of noise sensitive receptors, and procedures for investigating and acting appropriately as necessary upon those complaints.

11.6 Assessment

a) Introduction

11.6.1 This section presents the findings of the noise and vibration assessment for the construction and operation of the proposed development.

11.6.2 This section identifies any likely significant effects that are predicted to occur and **section 11.7** highlights any secondary mitigation and monitoring measures that are proposed to minimise any adverse significant effects.

11.6.3 The assessment of effects associated with off-site developments, including fen meadow compensation areas and off-site sports pitches are set out in **Appendices 11D** and **11E** respectively.

b) Construction

i. Sizewell B relocated facilities

11.6.4 An assessment of noise and vibration effects that would occur due to Sizewell B relocated facilities works is presented in Chapter 11 of the Sizewell B relocated facilities ES (which is provided in full at **Volume 1, Appendix 2A**). The assessment considered the potential for likely significant

noise and vibration effects to occur due to construction and demolition works and construction traffic associated with the Sizewell B relocated facilities works. The assessment also accounted for the anticipated noise generated by construction and demolition activities and by construction traffic associated with the concurrent Sizewell C early works during Phases 1 and 2.

11.6.5 The Sizewell B relocated facilities ES concludes that with the proposed mitigation in place, all construction noise and vibration effects would be **not significant** (refer to **section 11.8** of this chapter for a summary of the effects).

ii. **Construction noise**

11.6.6 The assessment scenarios for the construction noise assessment are summarised in **section 11.3** of this chapter. Full details of the assessment scenarios are presented in **Appendix 11B** of this volume.

[Daytime \(07:00–23:00hrs\) main development site construction noise assessment](#)

11.6.7 The methodology for the assessment of daytime (07:00–23:00hrs) construction noise is summarised in **section 11.3** of this chapter. Full details of the technical and assessment methodologies are presented in **Appendix 11B** of this chapter.

11.6.8 Construction noise levels have been predicted for receptors where these would be dictated either by construction noise from the main development site (excluding the LEEIE) or from the entire main development site including the LEEIE for daytime (07:00–23:00hrs). Assessment scenarios considered are:

- **Phase 1a:** Initial site stripping/levelling and concurrent noisy activities;
- **Phase 1b/2:** Construction of site infrastructure and earth moving;
- **Phase 3/4:** Construction of above ground power station buildings; and
- **Phase 5:** Removal of temporary facilities and restoration of the land.

11.6.9 The predicted daytime (07:00–23:00hrs) main development site construction noise levels account for the effects of noise barriers in the form of landscape bunds and/or acoustic screens, which are embedded in the construction proposals as primary mitigation. The locations of and reasoning for these barriers is described in **section 11.5** of this chapter.

11.6.10 The predicted construction noise levels at each receptor, or group of receptors, are set out in **Table 11.19**. The levels set out in **Table 11.19** are

for the situation where the main development site, or a combination of the main development site and the LEEIE, are the dominant sources.

**Table 11.19: Daytime main development site construction noise predictions for receptors where the entire main development site or a combination of the main development site and LEEIE are dominant (free field values).**

Receptor		Predicted Daytime MDS Construction Noise Level, dB L <sub>Aeq,T</sub>				
Ref.	Name	Phase 1a	Phase 1b/2	Phase 3/4	Phase 5 Average day for Phase	Phase 5 short-term busiest month
1	Abbey Cottage	70	58	52	57	70
2	Abbey Farm	62	48	46	45	62
3	Abbey Road, Leiston	67	50	42	56	69
4	Ash Wood Cottages	67	62	54	53	67
6	Common Cottages	53	54	51	49	56
8	Eastbridge	54	46	42	42	54
11	Keepers Cottage	70	54	52	50	70
13	Leiston Abbey	60	53	46	52	60
14	Lovers Lane/Sandy Lane Junction	70	54	49	53	70
15	Old Abbey Farm/Care Home	70	64	51	60	69
16	Plantation Cottages	64	48	48	56	64
17	Potters Farm	61	54	49	54	61
18	Potters Street	58	50	50	45	58
19	Rosery Cottages	50	48	48	36	50
20	Roundhouse	69	60	58	60	69
22	Sizewell Village	46	44	44	36	46
23	The Studio	66	53	50	56	66

11.6.11 The magnitude of the predicted daytime (07:00–23:00hrs) main development site construction noise impacts in **Table 11.19** are presented in **Table 11.20**, determined in accordance with the main development site construction noise assessment criteria presented in **Table 11.2** of this chapter.

**Table 11.20: Magnitude of daytime construction noise impacts for receptors where the entire main development site or a combination of the main development site and LEEIE are dominant.**

Receptor		Predicted Magnitude of Impact				
Ref.	Name	Phase 1a	Phase 1b/2	Phase 3/4	Phase 5 Average day for Phase	Phase 5 short-term busiest month
1	Abbey Cottage	Medium	Low	Very low	Low	Medium
2	Abbey Farm	Medium	Low	Low	Low	Medium
3	Abbey Road, Leiston	Medium	Very low	Very low	Very low	Medium
4	Ash Wood Cottages	Medium	Medium	Low	Low	Medium
6	Common Cottages	Low	Low	Low	Low	Low
8	Eastbridge	Low	Very low	Very low	Very low	Low
11	Keepers Cottage	Medium	Low	Low	Low	Medium
13	Leiston Abbey	Low	Low	Low	Low	Low
14	Lovers Lane/Sandy Lane Junction	Medium	Low	Very low	Low	Medium
15	Old Abbey Farm/Care Home	Medium	Medium	Low	Low	Medium
16	Plantation Cottages	Medium	Low	Low	Low	Medium
17	Potters Farm	Medium	Low	Low	Low	Medium
18	Potters Street	Low	Low	Low	Low	Low
19	Rosery Cottages	Low	Low	Low	Very low	Low
20	Roundhouse	Medium	Low	Low	Low	Medium
22	Sizewell Village	Very low	Very low	Very low	Very low	Very low
23	The Studio	Medium	Low	Low	Low	Medium

- 11.6.12 **Phase 1a** represents a typical day in a busy month of activity early during Phase 1, when construction noise levels are predicted to be at their highest. The assessment of daytime main development site construction noise impact in **Table 11.20** identifies that the noise levels at eleven receptors are predicted to have a medium magnitude of impact. This represents a moderate adverse effect from noise to these medium sensitivity receptors, which is considered to be **significant**. Further secondary mitigation, including additional screening, will therefore be required as set out in the **CoCP**.
- 11.6.13 The remaining six receptors are predicted to have a ‘low’, or ‘very low’ magnitude of noise impact, representing a minor adverse effect and therefore considered to be **not significant**.
- 11.6.14 **Phase 1b/2** is assumed to span more than three years and the levels assessed represent the predicted average on a typical day during that phase. **Table 11.20** identifies that the noise levels at two receptors are predicted to have a medium magnitude of impact. This represents a moderate adverse effect from noise to these medium sensitivity receptors, which is considered to be **significant**. Further secondary mitigation, including additional screening, will therefore be required as set out in the **CoCP**.
- 11.6.15 The remaining fifteen receptors are predicted to have a ‘low’, or ‘very low’ magnitude of impact from noise, representing a minor adverse effect and therefore considered to be **not significant**.
- 11.6.16 **Phase 3/4** is assumed to span more than eight years and the levels assessed represent the predicted average on a typical day during Phases 3 and 4. All sixteen receptors are predicted to have a ‘low’, or ‘very low’ magnitude of impact from noise, which when combined with the medium sensitivity of the receptors, gives rise to minor adverse effects. This is considered to be **not significant**.
- 11.6.17 **Phase 5** restoration is assumed to span more than two years and the levels assessed represent the predicted average on a typical day during Phase 5. **Table 11.20** identifies that the noise levels at all receptors are predicted to have a ‘low’, or ‘very low’ magnitude of impact from noise, representing a minor adverse effect, which is considered to be **not significant**.
- 11.6.18 The highest noise levels during Phase 5 are currently expected to be similar to those predicted during Phase 1a and therefore for a short duration when works are closest to the receptor, daily sound levels are predicted to have a medium magnitude of impact at eleven receptors, representing a moderate adverse effect, which is considered to be **significant**. All reasonable steps

should be taken to mitigate and minimise significant effects through the implementation of measures set out in the **CoCP**.

- 11.6.19 Low impacts are predicted at the residential elements of Leiston Abbey, which would be a minor adverse effect. SZC Co. will liaise further with the occupants, who include Pro Corda, to take account of the potentially more sensitive activities that include, amongst other things, indoor and outdoor music performance and tuition. As a high sensitivity receptor, a higher category of effect is possible, which could be moderate adverse or major adverse, depending on the timing of the works relative to the activities at Leiston Abbey. This is considered to be **significant**.
- 11.6.20 It can be seen from **Table 11.19** that the construction SOAEL of 75dB for the weekday daytime period of 0800 to 1800 hours will not be exceeded at any of the assessed receptors, even when the free-field values are adjusted by +3dB to obtain façade levels. The lower SOAELs that are adopted for the periods outside of the main weekday daytime works are predicted to be exceeded at nine receptors in both Phase 1a and the noisiest month in Phase 5, at one receptor in Phase 1b/2, and at no receptors in the other phases.
- 11.6.21 It is inevitable that construction noise will vary over the course of any given day, and the predicted levels in **Table 11.19** are considered to be a reasonable representation of the likely construction noise levels for time periods other than the 16 hour period used in the calculations.
- 11.6.22 Exceedances of the SOAEL will be avoided by managing the works in a way that avoids the noisiest activities at the most sensitive parts of the day, secured through the **CoCP**. Where such works cannot be managed in this manner, exceedances of the SOAEL will be avoided through the provision of noise insulation under the **Noise Mitigation Scheme** (refer to **Appendix 11H**).
- 11.6.23 The LOAEL, which for construction noise is taken to be equal to the existing baseline sound levels, is likely to be exceeded at all of the receptor locations for at least some of the time during the construction works. This will be mitigated and minimised through the measures described in the **section 11.5** on Environmental Design and Mitigation and through the implementation of the **CoCP**.
- 11.6.24 The predicted construction noise levels for receptors where daytime main development site construction noise levels would be dictated by construction from the LEEIE specifically, are presented in **Table 11.21** for the following daytime (07:00–23:00hrs) scenarios:
- **Initial Strip/Level:** Initial site stripping/levelling and concurrent noisy activities.

- **Preparation:** Preparation of the LEEIE for use as construction support area, including completion of rail branch line extension into LEEIE and construction of new rail spur.
- **Early Years Operations:** Rail branch line extension and rail spur on LEEIE operational and LEEIE operating as a terminal for incoming freight. Green rail route (GRR) extension currently under construction.
- **Later Years Operations:** GRR extension operational and the rail spur in LEEIE no longer in use. LEEIE still in use as a construction support area, largely for materials storage.
- **Removal and Reinstatement:** LEEIE no longer in use as a construction support area and is restored to a predominantly natural landscape.

11.6.25 The predicted daytime (07:00–23:00hrs) main development site construction noise levels include the effects of noise barriers in the form of landscape bunds and/or acoustic screens which are embedded in the construction proposals as primary mitigation. The locations of and reasoning for these barriers is described in **section 11.5** of this chapter.



**Table 11.21: Daytime main development site construction noise predictions for receptors where noise from the LEEIE dominates (free field values).**

Receptor		Predicted Daytime MDS Construction Noise Level, dB L <sub>Aeq,T</sub>					
Ref	Name	Initial Site Strip/Level	Preparation	Early Years Operations	Later Years Operations	Removal and Reinstatement Average day for Phase	Removal and Reinstatement Typical day busiest month
5	Barley Rise	60	47	42	46	45	60
7	Crown Lodge	65	51	50	49	47	60
9	Grimseys Lane	53	46	42	42	47	54
10	Heath View	62	56	50	48	47	62
12	King George's Avenue	67	61	53	53	54	70
21	Sizewell S&SC	63	56	51	50	49	64
24	Valley Road North	62	51	42	42	51	62
25	Valley Road South	60	51	43	42	54	60

- 11.6.26 The magnitude of the predicted daytime (07:00–23:00hrs) main development site construction noise levels in **Table 11.21** are presented in **Table 11.22**, determined in accordance with the main development site construction noise assessment criteria presented in **Table 11.2** of this chapter.

**Table 11.22: Daytime main development site construction noise impacts for receptors where noise from the LEEIE dominates.**

Receptor		Predicted Magnitude of Impact					
Ref	Name	Initial Strip/Level	Preparation	Early Years Operations	Later Years Operations	Removal and Reinstatement Average day for Phase	Removal and Reinstatement Typical day busiest month
5	Barley Rise	Low	Very low	Very low	Very low	Very low	Low
7	Crown Lodge	Medium	Very low	Very low	Very low	Very low	Low
9	Grimseys Lane	Low	Low	Low	Low	Low	Low
10	Heath View	Medium	Low	Low	Low	Low	Medium
12	King George's Avenue	Medium	Medium	Low	Low	Low	Medium
21	Sizewell S&SC	Medium	Low	Low	Low	Low	Medium
24	Valley Road North	Medium	Low	Very low	Very low	Low	Medium
25	Valley Road South	Medium	Low	Very low	Very low	Low	Medium

- 11.6.27 The Initial Strip/Level represents a typical day in a busy month of activity at the very start of construction on the LEEIE, when noise levels are predicted to be at their highest. The assessment of daytime construction noise impacts in **Table 11.22** identifies that the noise levels at five receptors are predicted to have a medium magnitude of impact. This represents a moderate adverse effect from noise to these medium sensitivity receptors and therefore the effect is considered to be **significant**.
- 11.6.28 For the remaining three receptors, the predicted noise levels would result in a low or very low magnitude impact, resulting in a minor adverse effect at these medium sensitivity receptors, which is considered to be **not significant**.
- 11.6.29 These works will be of relatively short duration compared to the overall construction programme. Where significant effects are predicted to occur during these initial works, some mitigation will be required through implementation of measures set out in the **CoCP**.
- 11.6.30 Preparation of the LEEIE is assumed to take around nine months to complete during Phases 1 and 2 and the levels assessed represent the predicted average on a typical day during this period. **Table 11.22** identifies one receptor area (King George's Avenue) where noise levels are predicted to have a medium magnitude of impact. This represents a moderate adverse effect to this medium sensitivity receptor, which is considered to be **significant**. All reasonable steps should be taken to mitigate and minimise significant effects through the implementation of measures set out in the **CoCP**.
- 11.6.31 The remaining seven receptors are predicted to have a 'low', or 'very low' magnitude of impact from noise, representing a minor adverse effect; this is considered to be **not significant**.
- 11.6.32 Early years operations are assumed to be around nine months during Phases 1 and 2 and the levels assessed represent the predicted average on a typical day during this period. **Table 11.22** identifies that at all receptors during this phase, a 'low', or 'very low' magnitude of impact is predicted representing a minor adverse or negligible effect, which is considered to be **not significant**.
- 11.6.33 Later years operations would start approximately half-way through Phase 2 and continue through Phases 3 and 4. It is assumed this will last more than 8.5 years. The levels assessed represent the predicted average on a typical day during this period and **Table 11.22** identifies that at all receptors during this phase, a 'low', or 'very low' magnitude of impact is predicted representing a minor adverse or negligible effect; this is considered to be **not significant**.
- 11.6.34 Removal and reinstatement may span more than two years and the levels assessed represent the predicted average on a typical day during this period,

followed by predicted level in the worst case month when works are closest to the receptor position for a short period of time. Phase average levels predicted in **Table 11.22** above identifies that to all receptors during this phase, a 'low' or 'very low' magnitude impact is predicted representing a minor adverse or negligible effect; this is considered to be **not significant**.

- 11.6.35 The highest noise levels during this phase are currently expected to be similar to those predicted during the first phase and therefore for a short duration when works are at their closest to the receptor, daily sound levels at five receptors are predicted to have a medium magnitude of impact, representing a moderate adverse effect. This is considered to be **significant**. Where significant effects are predicted, mitigation will be required through implementation of measures set out in the **CoCP**.
- 11.6.36 It can be seen from **Table 11.21** that the construction SOAEL of 75dB for the weekday daytime period of 08:00 to 18:00 hours will not be exceeded at any of the assessed receptors, even when the free-field values are adjusted by +3dB to obtain façade levels. The lower SOAELs that are adopted for the periods outside of the main weekday daytime works are predicted to be exceeded at two receptors in each of the initial site strip and levelling works and the removal/reinstatement works, and at not at any other receptors in the other phases.
- 11.6.37 It is inevitable that construction noise will vary over the course of any given day, and the predicted levels in **Table 11.21** are considered to be a reasonable representation of the likely construction noise levels for time periods other than the 16 hour period used in the calculations.
- 11.6.38 Exceedances of the SOAEL will be avoided by managing the works in a way that avoids the noisiest activities at the most sensitive parts of the day, secured through the **CoCP**. Where such works cannot be managed in this manner, exceedances of the SOAEL will be avoided through the provision of noise insulation under the **Noise Mitigation Scheme** (refer to **Appendix 11H**).
- 11.6.39 The LOAEL, which for construction noise is taken to be equal to the existing baseline sound levels, is likely to be exceeded at all of the receptor locations for at least some of the time during the construction works. This will be mitigated and minimised through the measures described in **section 11.5** on Environmental Design and Mitigation and through the implementation of the **CoCP**.

### Night-time (23:00–07:00hrs) main development site construction noise assessment

11.6.40 The predicted average night-time (23:00–07:00hrs) main development site construction noise levels are presented in **Table 11.23** for the following representative assessment scenarios:

- **Green rail route and associated activities only:** The entire period when the green rail route and main development site are operational, when rail freight arrivals, and specifically unloading and transportation of materials to stockpiles at night will generate noise. This may span a period of around 8.5 years including 24 months of Phase 2 and the entirety of Phases 3 and 4.
- **Green rail route, excavation, all associated activities:** For approximately 15 months during Phase 3 (based on current estimates) when night-time tunnelling and excavation activities would be ongoing, including direct transportation of excavated materials to stockpiles four and five. During this period, noise associated with unloading and hauling of materials to stockpiles from train arrivals into the main development site via the green rail route (as per the first scenario, above) may also be present.

11.6.41 Note that there are other night-time activities that are likely to occur during the (predominantly) maintenance and logistics support shift. These are detailed in **section 1.3** of **Appendix 11B**. When contractors are appointed and detailed construction plans are developed, there may be further detailed noise assessments required of these activities to ensure that there are no significant impacts at specific receptors.

11.6.42 The predicted night-time maximum noise levels from main development site construction are also presented, representing the highest maximum noise level at each receptor from all sources associated with the two assessment scenarios.

11.6.43 The predicted night-time (23:00–07:00hrs) main development site construction noise levels include the effects of noise barriers in the form of landscape bunds and/or acoustic screens which are embedded in the construction proposals as primary mitigation. The locations of, and reasoning for, these barriers is described in **section 11.5** of this chapter.

11.6.44 The numbers presented represent a single point at each receptor or group of receptors which was identified to be a reasonable worst-case in terms of exposure to main development site construction noise levels over the project duration.

**Table 11.23: Night-time main development site construction noise predictions (free field values)**

Receptor		Predicted Night-Time Average MDS Construction Noise Level, dB L <sub>Aeq,T</sub>		Predicted Night-Time Maximum, MDS Construction Noise Level, dB L <sub>Amax</sub>
Ref	Name	GRR – Materials unloading and hauling to stockpiles	GRR materials unloading and hauling PLUS Excavation and tunnelling with hauling to stockpiles	
1	Abbey Cottage	43	43	52
2	Abbey Farm	38	40	46
3	Abbey Road, Leiston.	37	37	44
4	Ash Wood Cottage	46	49	60
5	Barley Rise	32	33	42
6	Common Cottages	43	44	50
7	Crown Lodge	34	36	47
8	Eastbridge	36	38	44
9	Grimseys Lane	34	36	46
10	Heath View	35	36	46
11	Keepers Cottage	38	41	55
12	King George's Avenue	34	36	47
13	Leiston Abbey	40	41	48
14	Lovers Lane/Sandy Lane Junction	41	42	51
15	Old Abbey Farm/Care Home	47	47	56
16	Plantation Cottages	39	41	50
17	Potters Farm	44	45	55
18	Potters Street	37	38	47
19	Rosery Cottages	34	37	52
20	Roundhouse	52	52	67
21	Sizewell S&SC	36	37	47
22	Sizewell Village	31	38	54
23	The Studio	43	44	52
24	Valley Road North	36	37	43
25	Valley Road South	32	34	43

11.6.45 The magnitude of impacts as a result of the predicted night-time (23:00–07:00hrs) main development site construction noise levels in **Table 11.23** are presented in **Table 11.24**, determined in accordance with the main development site construction noise assessment criteria and thresholds of significant effects presented in **section 11.3** of this chapter.

**Table 11.24: Night-time main development site construction noise impacts.**

Receptor		Predicted Night-Time Average MDS Construction Noise Magnitude of Impact		Predicted Night-Time Maximum, MDS Construction Noise Effect
Ref	Name	GRR – Materials unloading and hauling to stockpiles	GRR materials unloading and hauling PLUS Excavation and tunnelling with hauling to stockpiles	
1	Abbey Cottage	Low	Low	Very low
2	Abbey Farm	Low	Low	Very low
3	Abbey Road, Leiston	Very low	Very low	Low
4	Ash Wood Cottage	Medium	Medium	Very low
5	Barley Rise	Very low	Very low	Very low
6	Common Cottages	Low	Low	Very low
7	Crown Lodge	Very low	Very low	Very low
8	Eastbridge	Very low	Low	Very low
9	Grimseys Lane	Low	Low	Very low
10	Heath View	Very low	Very low	Very low
11	Keepers Cottage	Low	Low	Very low
12	King George's Avenue	Very low	Very low	Very low
13	Leiston Abbey	Low	Low	Very low
14	Lovers Lane/Sandy Lane Junction	Very low	Very low	Very low
15	Old Abbey Farm/Care Home	Medium	Medium	Very low
16	Plantation Cottages	Low	Low	Very low
17	Potters Farm	Low	Low	Very low
18	Potters Street	Low	Low	Very low
19	Rosery Cottages	Very low	Very low	Very low
20	Roundhouse	Medium	Medium	Medium
21	Sizewell S&SC	Very low	Very low	Very low



**NOT PROTECTIVELY MARKED**

Receptor		Predicted Night-Time Average MDS Construction Noise Magnitude of Impact		Predicted Night-Time Maximum, MDS Construction Noise Effect
Ref	Name	GRR – Materials unloading and hauling to stockpiles	GRR materials unloading and hauling PLUS Excavation and tunnelling with hauling to stockpiles	
22	Sizewell Village	Very low	Very low	Very low
23	The Studio	Low	Low	Very low
24	Valley Road North	Low	Low	Very low
25	Valley Road South	Low	Low	Very low

- 11.6.46 At 22 of the 25 receptors, the predicted night-time noise levels (both nightly average and maximum levels) would be ‘low’ or ‘very low’ in magnitude. These receptors would therefore experience a minor adverse or negligible noise effect, which is considered to be **not significant**. For the fifteen months when tunnelling, excavation and material haulage would occur at the same time as the main development site, the assessment outcomes are predicted to be the same.
- 11.6.47 At three receptors, Ash Wood Cottage, Old Abbey Farm/Care Home, and Roundhouse, a medium magnitude impact is predicted during the 8.5 year night-time construction period. At these receptors, which are all of medium sensitivity, a moderate adverse effect is predicted, which is considered to be **significant**.
- 11.6.48 Maximum night-time construction noise levels during the entire 8.5 year period when the green rail route is operational would be either ‘low’ or ‘very low’ in magnitude at all receptors except one, which will result in a minor adverse or negligible effect; this is considered to be **not significant**.
- 11.6.49 At the single receptor where a greater impact is predicted, Roundhouse, the night-time maximum noise levels are predicted to be medium in magnitude, which when combined with the medium sensitivity of the receptor, will give rise to a moderate adverse effect. This is considered to be **significant**. Where significant effects are predicted, mitigation will be required through implementation of measures set out in the **CoCP**.
- 11.6.50 Low or very low impacts are predicted at the residential elements of Leiston Abbey, which is either a minor adverse or negligible effect. While the Pro Corda Music School at Leiston Abbey is considered a high sensitivity receptor, it is understood that there are no music or tuition related activities, or similar, after 23:00 hours, so no impact is expected. This is considered to be a negligible effect, which is **not significant**.

- 11.6.51 It can be seen from **Table 11.23** that the construction SOAEL of 55dB for the night time period between 23:00 and 07:00 hours will not be exceeded at any of the assessed receptors, even when the free-field values are adjusted by +3dB to obtain façade levels.
- 11.6.52 It is inevitable that construction noise will vary over the course of any given day, and the predicted levels in **Table 11.23** are considered to be a reasonable representation of the likely construction noise levels for time periods other than the 8 hour period used in the calculations.
- 11.6.53 Should there be identified exceedances of the night time SOAEL once a contractor is appointed and the construction methods developed, exceedances of the SOAEL will be avoided by managing the works in a way that avoids the noisiest activities at the most sensitive parts of the night, secured through the **CoCP**. Where such works cannot be managed in this manner, exceedances of the SOAEL will be avoided through the provision of noise insulation under the **Noise Mitigation Scheme** (refer to **Appendix 11H**).
- 11.6.54 The LOAEL, which for construction noise is taken to be equal to the existing baseline sound levels, is likely to be exceeded at all of the receptor locations for at least some of the time during the construction works. This will be mitigated and minimised through the measures described in **section 11.5** on Environmental Design and Mitigation and through the implementation of the **CoCP**.
- iii. **Main development site construction vibration**
- 11.6.55 The primary sources of vibration during construction would be sheet piling, vibratory roller/compaction plant, surface breaking and bulldozer movements. Other sources of vibration would be present but are likely to generate lower levels of vibration.
- 11.6.56 Early during Phase 1, otherwise known as Phase 1a, vegetation will be cleared and initial soils stripping/levelling/stock-piling would be undertaken. The tracking back and forth of a bulldozer is considered the most likely source of vibration during these works.
- 11.6.57 The main sources of vibration during construction work during the rest of Phases 1 and 2, otherwise known as Phase 1b/2, would be works at the main access road, main site office, entrance plaza. Sheet piling may be required for building foundations within the Entrance Plaza. Piling would take place on other parts of the main development site to the east, but at a much greater distance from sensitive receptors and of no significance. Sheet piling may potentially be driven by hydraulic press rather than by percussive hammer, depending on ground conditions, which would result in lower vibration levels.

- 11.6.58 During Phases 3 and 4, the main vibration sources, which have any potential to impact off-site receptors, will be from soil compaction associated with borrow pits and stockpiles on the western and northern fringes of the site. It is likely that bulldozers and vibratory roller/compactors will undertake the work.
- 11.6.59 Receptors in close proximity to proposed workings could potentially experience some vibration.
- 11.6.60 Activities that have the potential to result in vibration levels at or above a low magnitude are shown in **Table 11.25** along with the closest distances to sensitive receptors and the predicted vibration level. These levels have been estimated using the approach described in detail in **Volume 1, Appendix 6G, Annex 6G.2**.

**Table 11.25: Predicted vibration levels and impact magnitudes from vibration producing activities which have the potential to produce adverse effects.**

Receptor	Activity	Distance between source and receptor (m)	Predicted level, mm/s, PPV	Magnitude
Keepers Cottage	Liner compaction of detention basin using large vibratory roller	70	0.5	Low
Crown Lodge	Base compaction of LEEIE compound / parking areas using large vibratory roller	80	0.3	Low
Eastlands Industrial Estate buildings		70	0.5	Low
King George’s Avenue		80	0.3	Low
Abbey Cottage		Compaction of entrance road and plaza using large vibratory roller	60	0.7
Roundhouse	Large vibratory roller on borrow pits and possible compaction of stockpile / storage using large vibratory roller	80	0.3	Low
Plantation Cottages	Compaction of basin for WMZ5 using large vibratory roller	80	0.3	Low
Ash Wood Cottages	Base compaction of compound and haul road using large vibratory roller	60	0.7	Low

- 11.6.61 Vibration effects at all receptors listed in **Table 11.25** are predicted to result in low magnitude impacts, which when combined with the medium sensitivity of the receptors, will result in minor adverse effects. All other receptors would experience negligible effects from vibration during construction. These outcomes are considered to be **not significant**.
- 11.6.62 There are predicted to be no exceedances of the SOAEL of 10mm/s during any of the assessed vibration-generating works.
- 11.6.63 The LOAEL of 0.3mm/s is predicted to be exceeded at all eight of the receptors considered in **Table 11.25**. This will be mitigated and minimised through the measures described later in this chapter, which will be secured through the **CoCP**.
- 11.6.64 During the final removal and reinstatement stage, the most significant vibration-generating activities are likely to occur during breaking-out and soil spreading/levelling. Referring to the vibration calculation and source levels information in **Annex 6G.2 of Volume 1, Appendix 6G**, the highest source vibration during this work would be at approximately 1.5mm/s, PPV at a distance of 10 metres from breakers or crushers. Figure 1 of **Annex 6G.2 of Volume 1, Appendix 6G** suggests that this will reduce to a vibration level of 0.3mm/s, PPV at a distance of 40 metres from the activity.
- 11.6.65 Since there will be no breaking-out or soil spreading activities that require the use of breakers or crushers within 40m of a vibration sensitive receptor, vibration levels will be below 0.3mm/s, PPV.
- 11.6.66 Vibration levels of less than 0.3mm/s, PPV will lead to no more than low magnitude impacts, which even with medium sensitivity receptors, would result in no more than minor adverse effects. This is considered to be **not significant**.
- 11.6.67 There are predicted to be no exceedances of the SOAEL of 10mm/s nor of the LOAEL of 0.3mm/s as a result of these works.

iv. [Construction of the Fen Meadow Compensation Areas](#)

- 11.6.68 The fen meadow compensation areas have been assessed as detailed in **Appendix 11D**. These works are likely to require an excavator, but also soft landscaping works conducted by hand using hand tools. The period of time that an excavator may be in the vicinity of any residential receptors is likely to be very short, in the region of one or two days only. Other works are not likely to differ from the management activities that may already take place in these areas.

- 11.6.69 The noise effects that are predicted to occur at noise sensitive receptors as a result of the Benhall or Halesworth fen meadow areas are considered to be **not significant**.
- 11.6.70 The construction noise levels, which are set out in **Appendix 11D** will be below the SOAEL at all receptors for the main daytime working hours between 08:00 and 18:00 hours, even when the free-field values are adjusted by +3dB to obtain façade levels. The lower SOAELs that are adopted for the periods outside of the main weekday daytime works are predicted to be exceeded at four receptors for the works at Benhall, but not elsewhere, when the free-field values are adjusted by +3dB to obtain façade levels. However, the works are expected to generate noise at the levels predicted for no more than one or two days, and so the SOAEL will not be exceeded.
- 11.6.71 It is inevitable that construction noise will vary over the course of any given day, and the predicted levels in **Appendix 11D** are considered to be a reasonable representation of the likely construction noise levels for time periods other than the 12 hour period used in the calculations.
- 11.6.72 The LOAEL, which for construction noise is taken to be equal to the existing baseline sound levels, is likely to be exceeded at all of the receptor locations for at least some of the time during the construction works. This will be mitigated and minimised through the measures described in **section 11.5** on Environmental Design and Mitigation and through the implementation of the **CoCP**.

v. [Construction of sports facilities at Alde Valley School](#)

- 11.6.73 The new sports facilities at Alde Valley School have been assessed as detailed in **Appendix 11E**.
- 11.6.74 Two new areas will be created; one for a full-size 3G facility and one for a pair of MUGA (mixed-use games area) pitches side-by-side. The two new areas will be provided with surfaces requiring prior groundworks, which will include excavation, drainage installation, and aggregate base layer formation.
- 11.6.75 It is assumed that all construction works will take place between 07:00 and 19:00 hours on a Monday to Friday or between 07:00 and 13:00 hours on a Saturday.
- 11.6.76 The existing Leiston School sports field has residential receptors on its eastern boundary, school buildings to the north, and Leiston Leisure Centre to the west. Open agricultural land lies to the south, beyond Grimsey's Lane. Of these, the school and the leisure centre buildings are in the closest proximity to the pitches requiring groundworks. Typically, the pitch centres

are 40m and 20m respectively, to the façades of the school and the leisure centre.

- 11.6.77 Groundworks plant is likely to include an excavator, dumper truck, small dozer for spreading and levelling of materials, and a roller. Given the small scale of the groundworks, a twin-drum ‘ride-on’ roller is likely to be more practicable than a full-size/large roller.
- 11.6.78 It is assumed the construction plant will operate across the full area of each set of new pitches but only briefly and in a phased manner at the fringe areas. The free-field noise levels at the nearest façade lines of the school and leisure centre are predicted to be 70dB,  $L_{Aeq,T}$  and 76dB,  $L_{Aeq,T}$  respectively.
- 11.6.79 The level of vibration entering the building foundations is predicted to be approximately 0.3mm/s PPV, which results in a low magnitude of vibration impact during operation of the small vibratory roller at the closest point to the boundary.
- 11.6.80 The closest building of the leisure centre is a sports hall, with a fully clad elevation and no windows on the gable end that would face the new MUGA pitches. Accordingly, the level of sound break-in would be less than that of a windowed façade. Such a facility is ordinarily considered to be of low sensitivity to construction noise and vibration. The predicted external free-field level of 76dB,  $L_{Aeq,12hr}$ , is considered a high magnitude of impact.
- 11.6.81 Leiston School has buildings to the north of the proposed works. The predicted free-field level of 70dB,  $L_{Aeq,12hr}$  during the noisiest construction works would also be a high magnitude impact.
- 11.6.82 The creation of the MUGA pitches is not expected to last beyond 40 days and so the noise and vibration effects at these receptors is considered to be **not significant**.
- 11.6.83 The construction noise levels set out above may exceed the adopted 75dB SOAEL for the main daytime working hours between 0800 and 1800 hours at Leiston School, depending on the duration of the works, when the free-field value is adjusted by +3dB to obtain façade levels. The lower SOAELs that are adopted for the periods outside of the main weekday daytime works are predicted to be exceeded at the leisure centre as well, depending on the duration of the works, when the free-field value is adjusted by +3dB to obtain façade levels.
- 11.6.84 It is inevitable that construction noise will vary over the course of any given day, and the predicted levels set out above are considered to be a reasonable representation of the likely construction noise levels for time periods other than the 12 hour period used in the calculations.

- 11.6.85 Exceedances of the SOAEL will be avoided by managing the works in a way that avoids the noisiest activities at the most sensitive parts of the day, for example avoiding teaching hours or periods where exams are in progress at the school, secured through the **CoCP**. For the lower sensitivity leisure centre, the measures implemented in the **CoCP** will avoid exceeding the SOAEL.
- 11.6.86 The LOAEL, which for construction noise is taken to be equal to the existing baseline sound levels, is likely to be exceeded at all of the receptor locations for at least some of the time during the construction works. This will be mitigated and minimised through the measures described in **section 11.5** on Environmental Design and Mitigation and through the implementation of the **CoCP**.
- vi. [Changes to road traffic flows on existing network during construction](#)
- 11.6.87 The assessment of noise from construction road traffic was carried out by first identifying roads with the potential for an adverse effect (a level change of greater than 1dB,  $L_{A10, 18h}$  during the day or 1dB,  $L_{night}$ ) might occur. A total of 134 road links were identified as requiring further analysis.
- 11.6.88 For each of these roads, the noise level was predicted at a reference distance during the following scenarios:
- In 2023, without Sizewell C construction traffic (the 2023 reference case) and in 2023 with Sizewell C construction traffic at its peak during early years;
  - In 2028, without Sizewell C construction traffic (the 2028 reference case) and in 2028 with Sizewell C construction traffic at its peak during construction; and
  - In 2028, without Sizewell C construction traffic (the 2028 reference case) and in 2028 with Sizewell C construction traffic at its busiest during the during peak construction.
- 11.6.89 All traffic flow data used for this assessment is shown in **Appendix 11F**. Predicted level differences were calculated using the calculation method in CRTN (Ref. 11.17) for daytime. Night time levels were calculated using Method 1 (the “preferred method”) from TRL Report PR/SE/451/02 (TRL for DEFRA) (Ref. 11.24). Output from calculations carried out using CRTN where road traffic flows are below 50 vehicles per hour are beyond the scope of that standard and have therefore not been assessed.
- 11.6.90 Tables of results for each scenario for each of the 134 links are shown in **Tables 11G.1, 11G.2 and 11G.3** in **Appendix 11G**.

11.6.91 In these tables, some of the changes are negative, which indicates that the change in noise level is expected to be beneficial. This occurs where, for example, a road is bypassed. Where presented in these tables, the results should be regarded as indicative only and a more detailed analysis of the beneficial (and adverse) changes in level is contained in **Volume 4, Chapter 4** and **Volume 5, Chapter 4**, where the effects of the proposed new roads schemes are considered.

11.6.92 **Table 11.26** provides details of each link where a medium magnitude impact has been predicted, which, for medium sensitivity receptors, will give rise to a moderate adverse effect. Adjacent road links are grouped together here, where appropriate to describe a single road.

**Table 11.26: Predicted significant adverse noise levels from road traffic.**

Scenario	Location	Effect	Level difference	Period
2023	Lovers Lane	Moderate adverse	3.2 to 3.9dB	Day
	B1122 between Yoxford junction and B1125 junction	Moderate adverse	3.4 to 3.8dB	Day
2028	B1122 between eastern junction of Sizewell Link Road and Sizewell C Site Access Road	Moderate adverse	3.4dB	Day
	A12 slip road, west of Wickham Market Park and Ride	Moderate adverse	4.0dB	Day
			4.9dB	Night
Kings Road, Leiston	Moderate adverse	4.3dB	Day	
2028 (busiest period)	B1122 between eastern junction of Sizewell Link Road and Sizewell C Site Access Road	Moderate adverse	3.9dB	Day
	A12 slip road, west of Wickham Market Park and Ride	Moderate adverse	4.0dB	Day
			4.9dB	Night
Kings Road, Leiston	Moderate adverse	4.3dB	Day	

11.6.93 According to the advice in LA111 (Ref. 11.16) significant effects may occur within 50 metres of roads affected by construction traffic. Reviewing the outputs in **Table 11.26**, significant adverse effects are predicted for occupiers of:

- properties within 50m of the kerb on B1122 between Yoxford and the B1125 junction in 2023;



- properties within 50m of the kerb on Lovers Lane in Leiston in 2023; and
  - properties within 50m of the kerb on Kings Road in Leiston in 2028.

11.6.94 There are no properties within 50 metres of the other roads where significant level increases are predicted.

11.6.95 The identification of locations where the SOAEL might be exceeded as a result of the proposed development should be approached in a proportionate manner, taking account of the effect of the scheme and in the case of road traffic noise, the existing conditions.

11.6.96 As noted previously, the assessment method for road schemes set out in LA111 is not clear as to whether the SOAELs and LOAELs for road traffic noise are to be applied to existing roads as well as new or amended roads. Adopting a precautionary approach, it is considered that the SOAELs and LOAELs could be applied, but it should be recognised that development-generated traffic would need to be a substantial cause of any exceedances, and that exceedances that pre-date the project are not considered to result from the project.

11.6.97 Road traffic noise levels have been determined at noise-sensitive receptors along each of the roads identified in **Table 11.26** as having a moderate adverse effect as a result of traffic generated by the proposed development. In the case of each of these roads, traffic generated by the proposed development is considered to be a substantial cause of the identified increase in road traffic noise.

11.6.98 Assessing the absolute levels of road traffic noise at sensitive receptors along the roads identified in **Table 11.26** is considered to provide a proportionate and indicative assessment at this stage of whether the SOAEL or LOAEL are exceeded as a result of the proposed development.

11.6.99 Noise contours have been produced to identify properties which would be exposed to noise levels above the SOAEL for each of the roads where a significant increase in noise has been identified (as shown in **Table 11.26**) and where there are any properties within 50 metres of the kerb. **Figures 11.5 to 11.8** show contours as follows:

  - **Figure 11.5:** Road traffic noise contours – B1122 between Yoxford and B1125 junction, 2023.
  - **Figure 11.6:** Road traffic noise contours – Lovers Lane, Leiston, 2023.
  - **Figure 11.7:** Road traffic noise contours – B1122 between Sizewell Link Road and main development site entrance, 2028.

- **Figure 11.8:** Road traffic noise contours – King’s Road, Leiston, 2028.
- 11.6.100 With reference to the noise contour plots in **Figures 11.5 to 11.8**, it has been found that the SOAELs for the relevant daytime or night-time periods are likely to be exceeded at:
- 1 no. property along Lovers Lane during the daytime; and
  - 11 no. properties along the B1122 between Yoxford junction and B1125 junction during the daytime.
- 11.6.101 No properties are expected to exceed the SOAEL along Kings Road, Leiston, the B1122 between eastern junction of Sizewell Link Road and Sizewell C main development site access road, or the A12 slip road, west of Wickham Market Park and Ride.
- 11.6.102 This assessment will be updated when the detailed construction programme is known in order to inform the **Noise Mitigation Scheme** (refer to **Appendix 11H**), which forms part of the Section 106 agreement. Where exceedances of the SOAEL are identified, the provisions set out in the **Noise Mitigation Scheme** will apply and exceedances of the SOAEL will be avoided.
- 11.6.103 The mitigation that has been incorporated into the overall project strategy mitigates and minimises adverse effects on health and quality of life, including the use of rail to move substantial construction loads, and the construction of new roads to minimise the impacts along roads with significant residential population.
- 11.6.104 The assessment that will be carried under the **Noise Mitigation Scheme** (refer to **Appendix 11H**) will have the benefit of more accurate information on vehicle numbers and vehicle routing strategies, once a contractor is appointed.
- vii. [Other sound sources during construction](#)
- 11.6.105 The proposed Combined Heat and Power unit (CHP) or Air Source Heat Pump network (ASHP) selected to serve the accommodation campus have been assessed as mechanical services against the criteria established in **Table 11.7** and **Table 11.14**. Baseline sound surveys have established low background sound levels at night near to residential receptors in these areas and therefore setting design target sound rating levels for these mechanical services to not exceed a value below the established LOAEL in **Table 11.14** is considered appropriate.
- 11.6.106 Ensuring sound levels from these mechanical services plant are kept low at night, will also provide adequate protection of receptors during the daytime period.

- 11.6.107 The final system selection and design is to be determined, and therefore sound levels from the final proposal would be controlled during the construction phase for the ASHP and for both the construction and operational phases for the CHP only, by ensuring the sound rating level does not exceed a free-field level of 35dB  $L_{Ar,15\text{minute}}$  outside the nearest residential receptor. This may therefore require a system specific mitigation scheme to meet this target sound rating level.
- 11.6.108 A level of 35dB  $L_{Ar,15\text{minutes}}$  has been adopted as a target for these plant items, as it is considered a robust target that is below the 40dB  $L_{\text{night}}$  threshold that has been identified as the level below which there is no prospect of an adverse impact.
- 11.6.109 The final design for the proposed electrical sub-station, including component parts and sound power data, is not available at this time. Sound levels from this proposed facility would be controlled during the construction phase and operational phase by ensuring that the sound rating level does not exceed a free-field level of 35 dB  $L_{Ar,15\text{minute}}$  outside the nearest residential receptor. This may therefore require a system specific noise mitigation scheme to ensure this target sound rating level is met.
- 11.6.110 The final system to serve the accommodation campus, and the proposed electrical sub-station would be located reasonably close to each other in the study area. The cumulative sound rating level therefore of the two systems should not exceed a free-field level of 35dB  $L_{Ar,15\text{minute}}$  outside the nearest residential receptor, if that receptor could experience a contribution from both sources.
- 11.6.111 By designing the plant to achieve a free-field level of 35 dB  $L_{Ar,15\text{minute}}$  outside the nearest residential receptor, the adopted SOAEL values will not be exceeded and therefore, the effect is considered **not significant**.
- 11.6.112 The adopted LOAEL will be met at all receptors at night and will be met at all locations during the day, unless their background sound levels are below 35dB  $L_{A90}$ . For those locations where the background sound level is below 35dB  $L_{A90}$ , designing the plant to achieve the design target is considered to meet the requirement to mitigate and minimise adverse effects on health and quality of life.

#### viii. Inter-relationship effects

- 11.6.113 Inter-relationship effects with noise and vibration for amenity and recreation, ecological and heritage receptors are considered within **Chapters 14, 15 and 16** of this volume respectively. Inter-relationship effects on human health receptors are considered further in **Chapter 28 Health and Wellbeing** of this volume and in **Volume 10, Chapter 2**.

## c) Operation

## i. Operational noise from power station

- 11.6.114 The proposed Sizewell C station will comprise two reactor units (UK EPR™ units) and associated supporting infrastructure. A detailed noise assessment report is appended as **Appendix 11C**. This provides information about baseline levels, standards used, source data, 3D noise modelling, results and conclusions.
- 11.6.115 Each reactor will be served by a pair of back-up generator buildings, with two Emergency Diesel Generators (EDGs) and one Ultimate Diesel Generator (UDG) housed in each building. A total of six back-up generators will be installed per reactor.
- 11.6.116 During the 60 year operational life of the proposed power station, outages will be planned lasting typically two months, on an 18 month cycle. During these periods, the station will undergo a range of planned maintenance tasks as well as refuelling of the reactors. During an outage, typical sound emissions are expected to be at lower levels than those from the fully operational station.
- 11.6.117 The generators will only operate for routine testing purposes in accordance with a prescribed testing program. The main purpose of the generator facilities is to deal with emergency situations where there is a Loss Of Off-site Power (LOOP).
- 11.6.118 Following commissioning of the generators, routine testing hours would be much reduced. It is expected that the annual run-time for each diesel generator during routine testing will be approximately 60 hours and that this would only take place during daytime hours (07:00–23:00hrs). The back-up generators will be tested sequentially and each for a continuous 24 hour period immediately following an outage. This worst case period post-outage has been assessed.
- 11.6.119 Since routine back-up generator testing will take place during the operational life of the power station, this scenario is considered in combination with the operational station. Hence, there are two sets of outputs in relation to noise from the operational power station: typical station operation, and typical station operation plus testing of generators (day and night) in the brief period post-outage.
- 11.6.120 To consider the rating level of the noise from the operational power station, predicted levels may need to have a correction applied to account for acoustic features which may make the sound more noticeable, such as tones or impulses, in accordance with British Standard BS 4142: 2014+A1: 2019 (Ref 11.19).

- 11.6.121 The operational Sizewell B station has a characteristic tonal ‘hum’ in the near vicinity of the site and it is anticipated that the proposed Sizewell C station will exhibit a similar sound characteristic during its operation. Although, it is not possible at this stage to determine whether such a hum from the proposed Sizewell C station would be distinguishable from the existing Sizewell B station, the operational life of Sizewell C will extend beyond that of Sizewell B station and therefore, it is considered appropriate to apply an acoustic correction to the predicted sound levels at receptor locations to account for this tonality.
- 11.6.122 The operation of the station and back-up generators during their routine testing would be continuous, and therefore sound emissions are not expected to exhibit any intermittency or impulsivity, as described within BS 4142.
- 11.6.123 It is therefore considered appropriate to add a rating level correction to the operational sound emissions from the station for tonality only.
- 11.6.124 In accordance with Section 9.2 of BS 4142: 2014+A1: 2019, the subjective method has been applied based on observations of the similar characteristics exhibited by the operational Sizewell B power station.
- 11.6.125 Weather conditions, and sea conditions where receptors are close to the coast, will influence the perception of the tonality at each receptor location on a daily and seasonal basis. There may be locations where the tonality will perhaps be clearly perceptible, and locations further away within the study area where at times that tonality might be barely perceptible, if at all.
- 11.6.126 A precautionary approach has therefore been adopted and an assumption that at times during the course of a year, tonality may be clearly perceptible at all the receptors described in this assessment. On that basis, a +4dB penalty has been added to the predicted or specific sound levels at all receptor locations to derive the sound rating levels ( $L_{A,T}$ ) for comparison with the assessment criteria in the assessments that follow.

#### Noise effects during typical station operation

Daytime (07:00 to 23:00hrs)

- 11.6.127 The predicted rating levels from typical operational noise during the daytime from typical operational noise are shown in **Table 11.27**, with the magnitude of noise impact that would result at each receptor or receptor group.

**Table 11.27: Predicted rating levels (free-field external) from the operational phase of proposed Sizewell C power station - Day**

Receptor	Predicted (Free-Field) Sound Rating Level at ground floor ( $L_{Ar}$ dB)	Typical background sound level Day ( $L_{A90}$ dB)	$L_{Ar}$ minus $L_{A90}$ dB	Magnitude of Impact
Abbey Farm.	31	29	+2	Low
Abbey Road Leiston.	27	40	-13	Very low
Ash Wood Cottages.	35	40	-5	Very low
Barley Rise.	34	45	-11	Very low
Common Cottages.	32	35	-3	Very low
Crown Lodge.	29	45	-16	Very low
Halfway Cottages.	31	45	-14	Very low
Home Farm.	37	43	-6	Very low
Keepers Cottage.	38	35	+3	Low
King George's Avenue, Leiston.	35	45	-10	Very low
Leiston Abbey.	28	38	-10	Very low
Lovers Lane/Sandy Lane junction.	34	45	-11	Very low
Old Abbey.	31	43	-12	Very low
Old Abbey Farm.	31	43	-12	Very low
Plantation Cottages.	32	29	+3	Low
Potters Farm.	29	35	-6	Very low
Potters Road.	26	35	-9	Very low
Reckham Lodge.	36	35	+1	Low
Rosery Cottage.	40	45	-5	Very low
Roundhouse.	30	35	-5	Very low
Sizewell Village.	34	43	-9	Very low
The Studio.	34	35	-1	Very low
Upper Abbey	34	35	-1	Very low
Valley Road North.	30	40	-10	Very low
Vulcan Arms.	38	43	-5	Very low

11.6.128 The predicted sound rating levels ( $L_{Ar}$ ) at all receptors represent a 'low' or 'very low' magnitude of impact. The predicted sound levels for normal station

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operation during daytime hours is therefore predicted to result in a minor adverse effect, which is considered to be **not significant**.

11.6.129 A very low impact is predicted at the residential elements of Leiston Abbey, which is a negligible effect. SZC Co. will liaise further with the occupants, who include Pro Corda, to take account of the potentially more sensitive activities that involve, amongst other things, indoor and outdoor music performance. Even though the activities at Leiston Abbey are regarded as being of high sensitivity, this would still be regarded as a negligible effect, and therefore **not significant**.

Night-time (23:00 to 07:00hrs)

11.6.130 The predicted rating levels from typical operational noise during the night time from typical operational noise are shown in **Table 11.28**, with the magnitude of noise impact that would result at each receptor or receptor group.

**Table 11.28: Predicted rating levels (free-field external) from the operational phase of proposed Sizewell C power station - Night**

Receptor	Predicted (Free-Field) Sound Rating Level ( $L_{Ar}$ dB)		Typical background sound level at night ( $L_{A90}$ dB)	$L_{Ar}$ minus $L_{A90}$ dB		Magnitude of Impact	
	GF	FF		GF	FF	GF	FF
Abbey Farm.	31	34	28	+3	+6	Low	Medium
Abbey Road Leiston.	27	29	30	-3	-1	Very low	Very low
Ash Wood Cottages.	35	39	35	0	+4	Low	Low
Barley Rise.	34	35	35	-1	0	Very low	Low
Common Cottages.	32	36	28	+4	+8	Low	Medium
Crown Lodge.	29	33	30	-1	+3	Very low	Low
Halfway Cottages.	31	35	35	-4	0	Very low	Low
Home Farm.	37	40	40	-3	0	Very low	Low
Keepers Cottage.	38	-	28	+10	-	Medium	<i>No upper floor</i>
King George's Avenue, Leiston.	35	-	35	0	-	Low	<i>No upper floor</i>
Leiston Abbey.	28	31	27	+1	+4	Low	Low
Lovers Lane/Sandy Lane junction.	34	38	30	+4	+8	Low	Medium
Old Abbey.	31	35	30	+1	+5	Low	Medium

Receptor	Predicted (Free-Field) Sound Rating Level ( $L_{Ar}$ dB)		Typical background sound level at night ( $L_{A90}$ dB)	$L_{Ar}$ minus $L_{A90}$ dB		Magnitude of Impact	
	GF	FF		GF	FF	GF	FF
Old Abbey Farm.	31	34	30	+1	+4	Low	Low
Plantation Cottages.	32	35	28	+4	+7	Low	Medium
Potters Farm.	29	33	25	+4	+8	Low	Medium
Potters Road.	26	29	25	+1	+4	Low	Low
Reckham Lodge.	36	39	28	+8	+11	Medium	High
Rosery Cottage.	40	43	45	-5	-2	Very low	Very low
Roundhouse.	30	33	35	-5	-2	Very low	Very low
Sizewell Village.	34	36	40	-6	-4	Very low	Very low
The Studio.	34	-	28	+6	-	Medium	<i>No upper floor</i>
Upper Abbey	34	38	28	-1	+10	Very low	High
Valley Road North.	30	34	28	+2	+6	Low	Medium
Vulcan Arms.	38	39	40	-2	-1	Very low	Very low

11.6.131 At fourteen of the receptor areas assessed, the predicted sound rating level ( $L_{Ar}$ ) represents a ‘low’ or ‘very low’ magnitude of impact. The predicted sound levels for normal station operation during night-time hours is therefore predicted to result in a minor adverse or negligible effect at these locations, which is considered to be **not significant**.

11.6.132 At nine receptors, the predicted sound rating level ( $L_{Ar}$ ) is predicted to give rise to a medium magnitude of impact, and at Reckham Lodge and Upper Abbey, to a high magnitude of impact. These are based on the initial numerical outcomes using BS 4142, and in accordance with that standard, these initial impact magnitudes must be considered in context to conclude whether the predicted sound levels represent a significant effect or not.

11.6.133 In general, background and ambient sound levels in the vicinity of the main development site are low. The absolute level of sound predicted from the operational station needs to be considered in context in this situation. BS 4142 advises that:

*“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.”*



- 11.6.134 A significant effect may not occur unless the overall noise level exceeds an absolute level which represents a significant level, and it is appropriate to select a level below which there is very little likelihood of sleep disturbance at night. According to the WHO’s ‘*Night Noise Guidance for Europe (NNGE)*’, there is “*no sufficient evidence that the biological effects observed at the level below 40dB L<sub>night, outside</sub> are harmful to health*”. On this basis, a value of 40dB, L<sub>night</sub> represents a level below which an adverse effect is unlikely to occur, even in locations with low background sound levels at night.
- 11.6.135 The predicted L<sub>night</sub> is predicted to be below 40dB at all receptors where a medium or high magnitude of impact is predicted and therefore the overall effect is considered to be **not significant**.
- 11.6.136 In summary, there would be no significant adverse noise effects resulting from the night-time operation of the proposed development.
- 11.6.137 A low impact is predicted at the residential elements of Leiston Abbey. While the Pro Corda Music School at Leiston Abbey is considered a high sensitivity receptor, it is understood that there are no music or tuition related activities, or similar, after 23:00 hours, so no impact is expected. This is considered to be a negligible effect, which is **not significant**.

Noise effects during typical station operation plus routine testing of backup generators post-outage

Daytime (07:00 to 23:00hrs)

- 11.6.138 The predicted rating levels from typical operational noise during the daytime, in combination with back-up generator testing post-outage are shown in **Table 11.29**, with the magnitude of noise impact that would result at each receptor or receptor group.

**Table 11.29: Predicted rating levels (free-field external) from the operational phase of proposed Sizewell C power station combined with the back-up generators during testing – Day.**

Receptor	Predicted (Free-Field) Sound Rating Level at ground floor (L <sub>Ar</sub> dB)	Typical background sound level Day (L <sub>A90</sub> dB)	L <sub>Ar</sub> minus L <sub>A90</sub> dB	Magnitude of Impact
Abbey Farm	34	29	+5	Medium
Abbey Road Leiston	29	40	-11	Very low
Ash Wood Cottages	39	40	-1	Very low
Barley Rise	35	45	-10	Very low
Common Cottages	34	35	-1	Very low

Receptor	Predicted (Free-Field) Sound Rating Level at ground floor ( $L_{Ar}$ dB)	Typical background sound level Day ( $L_{A90}$ dB)	$L_{Ar}$ minus $L_{A90}$ dB	Magnitude of Impact
Crown Lodge	32	45	-13	Very low
Halfway Cottages	34	45	-11	Very low
Home Farm	39	43	-4	Very low
Keepers Cottage	41	35	+6	Medium
King Georges Avenue, Leiston	36	45	-9	Very low
Leiston Abbey	30	38	-8	Very low
Lovers Lane/Sandy Lane junction	35	45	-10	Very low
Old Abbey	34	43	-9	Very low
Old Abbey Farm	33	43	-10	Very low
Plantation Cottages	34	29	+5	Medium
Potters Farm	32	35	-3	Very low
Potters Road	28	35	-7	Very low
Reckham Lodge	39	35	+4	Low
Rosery Cottage	43	45	-2	Very low
Roundhouse	33	35	-2	Very low
Sizewell Village	35	43	-8	Very low
The Studio	36	35	+1	Low
Upper Abbey	36	35	+1	Low
Valley Road North	32	40	-8	Very low
Vulcan Arms	41	43	-2	Very low

11.6.139 With the exception of Abbey Farm, Keepers Cottage and Plantation Cottages, the predicted sound rating level ( $L_{Ar}$ ) at all receptors represents a ‘low’ or ‘very low’ magnitude of impact. Since all of the receptors are considered to be medium sensitivity receptors, the predicted sound levels for normal station operation and occasional routine generator testing during daytime hours are therefore predicted to result in negligible to minor adverse effects at the majority of receptors, which are considered to be **not significant**.

11.6.140 At Abbey Farm, Keepers Cottage and Plantation Cottages, a medium magnitude of impact is predicted during testing of backup generators. These are the initial numerical outcomes from a BS 4142 assessment, and the

standard requires context to be taken into account to arrive at the final assessment conclusion.

- 11.6.141 One of the principal contextual considerations is the limited duration of the routine back-up generator testing. The back-up generators will be subject to testing for 60 hours per year (assumed to be approximately 5 days per year), per generator during daytime hours. The predicted values set out in **Table 11.29** are based on the generator building that leads to the highest sound level at each receptor. The predicted sound levels will therefore be lower from generators tested in the buildings that are further away, or more screened from these receptors.
- 11.6.142 At Abbey Farm and Plantation Cottages, routine testing from two of the generator buildings only would result in the levels predicted in **Table 11.29**, therefore the outcome is expected to occur on approximately ten days per year at each of these receptors. At Keepers Cottage, only one of the generator buildings under test is predicted to result in the levels set out in **Table 11.29**, therefore that level is expected to occur on five days per year.
- 11.6.143 When generators are tested post-outage, which will occur every 18 months, the levels predicted in **Table 11.29** are expected to occur for two days at Abbey Farm and Plantation Cottages, and for a single day at Keepers Cottage.
- 11.6.144 All of the calculations assume downwind propagation and it is not likely that these receptors would be downwind of the station on all days when generator testing is undertaken. A precautionary +4dB acoustic correction for tonality has been applied to the predicted sound levels on that basis that a hum may be audible at the receptors. The perception of that acoustic characteristic will vary according to, inter alia, the prevailing weather conditions of which wind direction is one consideration.
- 11.6.145 It is possible that under conditions that are not downwind, the expected rating levels may be lower as a result of both the differing wind characteristics, and a reduced perception of the acoustic character.
- 11.6.146 The predicted rating levels in **Table 11.29** are considered to represent the worst-case outcomes, and given the relatively infrequent generator testing, it is not considered that the combination of the operational station and daytime back-up generator testing will represent a significant effect from noise to these receptors.
- 11.6.147 The overall effect during the daytime therefore is considered to be **not significant**.
- 11.6.148 A very low impact is predicted at the residential elements of Leiston Abbey, which is a negligible effect. SZC Co. will liaise further with the occupants,

who include Pro Corda, to take account of the potentially more sensitive activities that involve, amongst other things, indoor and outdoor music performance. Even though the activities at Leiston Abbey are regarded as being of high sensitivity, this would still be regarded as a negligible effect, and therefore **not significant**.

*Night-time (23:00 to 07:00hrs)*

11.6.149 The predicted rating levels from typical operational noise during the daytime, in combination with back-up generator testing post-outage are shown in **Table 11.30**, with the magnitude of noise impact that would result at each receptor or receptor group.

**Table 11.30: Predicted rating levels (free-field external) from the operational phase of proposed Sizewell C power station combined with the back-up generators during testing – Night-time.**

Receptor	Predicted (Free-Field) Sound Rating Level (L <sub>Ar</sub> dB)		Typical background sound level at night (L <sub>A90</sub> dB)	L <sub>Ar</sub> minus L <sub>A90</sub> dB		Magnitude of Impact	
	GF	FF		GF	FF	GF	FF
Abbey Farm	34	36	28	+6	+8	Medium	Medium
Abbey Road Leiston	29	31	30	-1	+1	Very low	Low
Ash Wood Cottages	39	41	35	+4	+6	Low	Medium
Barley Rise	35	37	35	0	+2	Low	Low
Common Cottages	34	37	28	+6	+9	Medium	Medium
Crown Lodge	32	35	30	+2	+5	Low	Medium
Halfway Cottages	34	37	35	-1	+2	Very low	Low
Home Farm	39	41	40	-1	+1	Very low	Low
Keepers Cottage	41	-	28	+13	-	High	No upper floor
King Georges Avenue, Leiston	36	-	35	+1	-	Low	No upper floor
Leiston Abbey	30	32	27	+3	+5	Low	Medium
Lovers Lane/Sandy Lane junction	35	39	30	+5	+9	Medium	Medium
Old Abbey	34	38	30	+4	+8	Low	Medium
Old Abbey Farm	33	36	30	+3	+6	Low	Medium
Plantation Cottages	34	37	28	+6	+9	Medium	Medium
Potters Farm	32	34	25	+7	+9	Medium	Medium

Receptor	Predicted (Free-Field) Sound Rating Level ( $L_{Ar}$ dB)		Typical background sound level at night ( $L_{A90}$ dB)	$L_{Ar}$ minus $L_{A90}$ dB		Magnitude of Impact	
	GF	FF		GF	FF	GF	FF
Potters Road	28	31	25	+3	+6	Low	Medium
Reckham Lodge	39	41	28	+11	+13	High	High
Rosery Cottage	43	45	45	-2	0	Very low	Low
Roundhouse	33	35	35	-2	0	Very low	Low
Sizewell Village	35	37	40	-5	-3	Very low	Very low
The Studio	36	-	28	+8	-	Medium	No upper floor
Upper Abbey	36	39	28	+8	+11	Medium	High
Valley Road North	32	35	28	+4	+7	Low	Medium
Vulcan Arms	41	42	40	+1	+2	Low	Low

11.6.150 First floor heights (4.5m) have been considered for the night-time assessment period with the exception of Keepers Cottage and The Studio which are known to be single storey dwellings, and the bungalows at the end of King George’s Avenue. For those receptors, the ground floor values have been assessed.

11.6.151 Note that the impact magnitudes have been considered against the existing background sound levels measured at ground floor, which may under-represent the background sound level at a height of 4.5m for two storey dwellings. The impact may therefore be overstated.

11.6.152 At ten of the assessed receptors, the predicted sound rating levels ( $L_{Ar}$ ) represent a ‘low’ or ‘very low’ magnitude of impact. Since the receptors are all of medium sensitivity, the predicted sound levels at these receptors during night-time operation of the station combined with post-outage back-up generator testing will result in negligible or minor adverse effects, which are considered to be **not significant**.

11.6.153 At twelve receptors, the predicted sound rating level ( $L_{Ar}$ ) represents a medium magnitude of impact, and at Keepers Cottage, Reckham Lodge and Upper Abbey, a high magnitude of impact at night.

11.6.154 In accordance with the BS 4141: 2014+A1: 2019 methodology, these initial impact magnitudes must be considered in context to conclude whether predicted sound levels represent a significant impact or not.

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- 11.6.155 In this case, the predictions are based on the generator building that leads to the highest sound level at each receptor. The predicted sound levels will therefore be lower from generators tested in the buildings that are further away, or more screened from these receptors.
- 11.6.156 Noise at Rosery Cottages at night would be at the threshold at which a low magnitude of impact would be predicted and hence would result in a minor adverse effect which is considered **not significant**.
- 11.6.157 For all receptors, the  $L_{\text{night}}$  value is predicted to be below 40dB and therefore the overall effect at night would be negligible and therefore **not significant**.
- 11.6.158 It is noted that the values predicted at Ash Wood Cottages, Keepers Cottage, and Reckham Lodge set out in **Table 11.30** are shown as 41dB,  $L_{\text{Ar}}$ , which appear to be greater than the 40dB  $L_{\text{night}}$  threshold. However, the values in **Table 11.30** are rating levels, which include a +4dB correction to account for the specific acoustic characteristics likely to be perceptible at the receptor. When the predicted values at Ash Wood Cottages, Keepers Cottage, and Reckham Lodge are compared with the  $L_{\text{night}}$  threshold, that +4dB corrections are removed, since they are only relevant to a BS 4142 assessment. The uncorrected values of 37 and 38dB  $L_{\text{Aeq,15minutes}}$  are below the 40dB  $L_{\text{night}}$  threshold.
- 11.6.159 There are predicted to be no significant adverse effects resulting from the operation of the proposed development.
- 11.6.160 A low impact is predicted at the residential elements of Leiston Abbey at ground floor level and a medium impact at first floor. While the Pro Corda Music School at Leiston Abbey is considered a high sensitivity receptor, it is understood that there are no music or tuition related activities, or similar, after 23:00 hours, so no impact is expected. This is considered to be a negligible effect, which is **not significant**.
- 11.6.161 Across all four of the operational scenarios assessed, the adopted SOAEL is not expected to be exceeded at any location during the daytime or night time.
- 11.6.162 The adopted LOAEL will be met across all four of the operational scenarios assessed at all receptors at night and will be met at all locations during the day, unless their background sound levels are low. Where the background sound level is low during the daytime, the measures set out in **section 11.5** on Environmental Design and Mitigation are considered to meet the requirement to mitigate and minimise adverse effects on health and quality of life.

ii. Other sound sources during Operational phase

CHP, electrical sub-station and back-up generator

- 11.6.163 If selected to serve the accommodation campus, the proposed Combined Heat and Power Unit (CHP) would be retained for back-up heat and power during the operational phase. The CHP, along with the proposed back-up generator and proposed electrical sub-station are assessed as mechanical services against the criteria set out in **Table 11.7**. Baseline sound surveys have established low background sound levels at night near to residential receptors in these areas and therefore setting target sound rating levels for these mechanical services to not exceed a “low rating level”, being 35dB,  $L_{Ar}$  is considered appropriate.
- 11.6.164 Ensuring sound levels from these mechanical services plant are kept low at night, would protect receptors during the daytime period.
- 11.6.165 The final designs for the proposed CHP, electrical sub-station and back-up generator (including component parts and sound power data) are not available at this time. Therefore, sound levels from these proposed facilities would be controlled during the construction phase and operational phase by ensuring that cumulatively the sound rating level does not exceed a free-field level of 35dB  $L_{Ar,15minutes}$  outside the nearest residential receptor. This may therefore require system-specific noise mitigation schemes to meet this target level.
- 11.6.166 By designing the plant to achieve a free-field level of 35 dB  $L_{Ar,15minute}$  outside the nearest residential receptor, the adopted SOAEL values will not be exceeded and therefore, the effect is considered **not significant**.
- 11.6.167 An assessment of operational noise associated with the permanent Sizewell B relocated facilities buildings is presented in **Chapter 11** of the Sizewell B relocated facilities ES (see **Volume 1, Appendix 2A**). The effects of operational plant were found to be **not significant**. With the careful selection, siting and orientation of operational plant and additional localised screening, if necessary, the operational noise of effects can be reduced further. Operational noise from the proposed outage car park at Pillbox field was found to be **not significant**.

iii. Road traffic from the site access road

- 11.6.168 Noise from traffic on the site access road during construction was considered as part of the overall construction noise from the main development site. Noise from traffic on the site access road during the operation of the site in 2034 (and after) has been considered against the criteria for long term effects of road schemes set out in **Table 11.6**.

11.6.169 The predicted traffic flows along the access road, once the power station is operational are as shown in **Table 11.31**.

**Table 11.31: Predicted flows on site access road in 2034**

Time	HGVs per hour	Cars per hour	Total	Avg Speed (kph)
0000-0100	0	0	0	-
0100-0200	0	0	0	-
0200-0300	0	0	0	-
0300-0400	0	0	0	-
0400-0500	0	0	0	-
0500-0600	0	0	0	-
0600-0700	0	4	4	48
0700-0800	1	131	132	47
0800-0900	4	612	616	48
0900-1000	4	3	7	48
1000-1100	3	3	6	48
1100-1200	2	3	5	48
1200-1300	2	3	5	48
1300-1400	2	44	46	48
1400-1500	1	44	45	48
1500-1600	1	3	4	48
1600-1700	0	658	658	48
1700-1800	0	3	3	48
1800-1900	0	3	3	48
1900-2000	0	0	0	-
2000-2100	0	0	0	-
2100-2200	0	41	41	48
2200-2300	0	41	41	48
2300-0000	0	0	0	-

11.6.170 The noise sensitive premises closest to the proposed access road are Abbey Cottages. Using the traffic flow figures in **Table 11.31**, the predicted daytime and night time noise levels would be 44dB,  $L_{A10, 18h}$  and 32dB,  $L_{night}$ .

11.6.171 According to measurements of baseline levels undertaken adjacent to this location (at measurement location MS14), the existing daytime and night time levels are typically 56dB,  $L_{Aeq, 1hour}$  and 40dB,  $L_{Aeq, 1hour}$ , respectively, which



are considered to be reasonable approximations of the daytime  $L_{A10, 18 \text{ hour}}$  and night-time  $L_{\text{night}}$  values.

11.6.172 The changes in noise level from the existing situation, as represented by measured levels, to the future situation where the existing baseline levels are combined with the calculated road traffic noise levels, would be less than +1dB in both daytime and night time periods.

11.6.173 Considering this change against the impact magnitude thresholds in **Table 11.6** results in a very low impact, which would be regarded as a negligible effect, when the medium sensitivity of the receptors is taken into account. This is considered to be **not significant**.

11.6.174 The predicted road traffic noise levels are below both the SOAEL and LOAEL for road traffic noise at the closest receptor. This will also be the case for receptors that are further away.

iv. Use of the Fen Meadow Compensation Areas

11.6.175 There will be no artificial noise sources associated with the fen meadow compensation areas during operation, so there is no requirement for a noise assessment.

v. Use of the sports facilities at Alde Valley School

11.6.176 The operation or use of the proposed sports facilities at the Alde Valley School has the potential to give rise to a significant noise effect on residential receptors to the east of the school site off Grimseys Lane. A detailed assessment is contained **Appendix 11E**. The assessment assumes worse case operations and the proposals have since been refined.

11.6.177 Based on Sport England guidance (Ref. 11.26) for artificial grass pitches, the sound levels likely to be generated by the use of the sports pitches have been predicted at the receptors closest to the site. These predictions demonstrate that the Sport England suggested threshold of 50dB  $L_{Aeq,1hr}$  will be achieved at the receptors to the west and south of the proposed sports pitches.

11.6.178 With the installation of a 2m high acoustic fence along the eastern side of the site will sufficiently reduce the sound levels so that the 50dB threshold is achieved at the receptors to the east as well.

11.6.179 Further measures that could be considered as part of the detailed design, to further reduce the impact on nearby receptors include:

- Any entrance to a sports pitch should be placed on the side of the pitch furthest from nearby receptors, so any users congregating near the access points do so away from the receptors.

- Spectators should be encouraged to stand on the side of the pitch furthest from the nearby receptors, to reduce noise levels at the receptors.
- Any lightweight shelters should be placed back from the side-lines of a pitch and not near a goal to reduce the chance of impact noise from a ball.
- Users of the facilities should be encouraged to leave the facility as quickly as possible once use has finished.

11.6.180 It is concluded that the use of the sports pitches could generate noise levels that are likely to be higher than experienced at present, however, the nature of these sounds is in keeping with the current sound climate of the area. It is expected that adverse effects will not occur and this is considered to be **not significant**.

11.6.181 The predicted sound levels from use the use of the sports pitch are predicted to be below the 50dB Sport England guideline value at all receptors; this will result in no exceedances of the adopted SOAEL or LOAEL.

vi. [Changes to road traffic flows on existing network during operation of power station](#)

11.6.182 The assessment of noise from road traffic during the operation of the power station (in 2034) was carried out for the same 134 road links as were identified as requiring further analysis for construction traffic. The level difference was calculated, using predicted traffic flows for 2034 without Sizewell C operational traffic present and then with Sizewell C operational traffic.

11.6.183 All traffic flow data used for this assessment is shown in **Appendix 11F**. The predicted level differences were calculated using the calculation method in CRTN (Ref. 11.17) for day time and night time levels were calculated using Method 1 (the “preferred method”) from TRL Report PR/SE/451/02 (TRL for DEFRA) (Ref. 11.24). Output from calculations carried out using CRTN are less reliable when overall flows are low and road traffic flows below 50 vehicles per hour are beyond the scope of that standard and have therefore not been assessed.

11.6.184 Results for each of the 134 links are shown in **Table 11G.4** in **Appendix 11G**.

11.6.185 All level differences were either beneficial or negligible, so adverse effects are not expected. This is considered to be **not significant**.

## vii. Inter-relationship effects

11.6.186 Inter-relationship effects with noise and vibration for amenity and recreation, heritage and ecological receptors are considered within **Chapters 14, 15 and 16** of this volume respectively. Inter-relationship effects on human health receptors are considered further in **Chapter 28 Health and Wellbeing** of this volume and in **Volume 10, Chapter 2**.

## 11.7 Mitigation and monitoring

### a) Introduction

11.7.2 Where possible, mitigation measures have been proposed where a significant effect is predicted to occur. Primary and tertiary mitigation measures which have already been incorporated within the design of the proposed development are detailed in **section 11.5** of this chapter.

11.7.3 Where other mitigation is required to reduce or avoid a significant effect, this is referred to as secondary mitigation. This section describes the proposed secondary mitigation measures for noise and vibration as well as describing any monitoring required of specific receptors/resources or for the effectiveness of a mitigation measure.

### b) Mitigation

#### i. Construction noise

11.7.4 The **CoCP** also includes a commitment that contractors will install solid noise barriers of adequate surface density and/or landscaping, where required and practicable, to provide additional acoustic screening and reduce construction noise levels at relevant noise sensitive receptors. Such barriers would be secondary/additional mitigation for the purposes of assessment and would be installed for the duration of the noisy works requiring mitigation.

11.7.5 The construction noise modelling outputs, presented in **Appendix 11B** of this chapter, were used to identify where barriers and/or screens could be installed by comparing the predictions for each receptor with the assessment criteria for the main development site construction noise. Where predicted construction noise levels during any phase had the potential to exceed the LOAEL, barrier and screening options were explored, and where effective incorporated into the model to reduce construction noise levels as far as reasonably achievable.

11.7.6 Determining what can ‘reasonably be achieved’ was based on considerations including the expected height of noise sources (particularly mobile plant), the topography between source and receiver, and in many cases a combination of the two. Limiting most screens to a height of 3m above ground is

considered to represent a reasonable balance between effective screening and ensuring that screens are practical, i.e. that they could be constructed safely and securely and that the height would not be visually intrusive. Taller screens have been identified where circumstances dictate these to be appropriate.

- 11.7.7 The additional barriers identified on this basis are as follows:
- Barrier #1 (B1) – 5m above ground;
  - Barrier #2 (B2) – 3m above ground;
  - Barrier #3 (B3) – 3m above ground;
  - Barrier #5 (B5) – 3m above ground; and
  - Barrier #8 (B8) – 5m above ground.
- 11.7.8 Possible locations for the additional barriers are shown in in **Figure 11.4** and **Appendix 11B**.
- 11.7.9 Predictive construction noise modelling was completed with and without the effects of the additional barriers for all assessment scenarios.
- 11.7.10 Should the Development Consent Order (DCO) be granted and it is identified post-DCO, once contractors are appointed and detailed construction methodology is confirmed, that the barriers (or others) are necessary to mitigate noise effects, then contractors would need to provide appropriate screening for as long as required to mitigate those effects. This would be secured through the **CoCP** as described above.
- 11.7.11 All listed receptors are considered to be of medium sensitivity, except the Pro Corda Music School at Leiston Abbey which is a high sensitivity receptor. As indicated in **section 11.6**, this could lead to higher categories of effect than would otherwise occur in respect of Leiston Abbey as a receptor. These effects are considered significant. SZC Co. will undertake a further, bespoke assessment of impacts from the Sizewell C Project on the Pro Corda Music School at Leiston Abbey. The results of this assessment would inform any additional mitigation requirements which will be secured through further planning obligations. SZC Co. is committed to further liaison with Pro Corda to take account of their specific needs relating to noise impacts and any required mitigation.
- 11.7.12 As described in **section 11.5**, the provisions of the **Noise Mitigation Scheme** will apply to avoid any exceedances of the SOAEL.

ii. Construction vibration during construction and re-instatement works

11.7.13 Given the short duration and the levels of vibration predicted, no vibration mitigation measures are considered necessary.

iii. Changes to road traffic flows on existing network during construction

11.7.14 The assessment will be updated when the detailed construction programme is known in order to inform the **Noise Mitigation Scheme** (refer to **Appendix 11H**), which forms part of the Section 106 agreement. Where exceedances of the SOAEL for road traffic noise on existing roads are identified, the provisions of the **Noise Mitigation Scheme** will apply and exceedances of the SOAEL will be avoided.

iv. Operational noise

11.7.15 No significant adverse effects are predicted from operational noise from the power station at any receptor and no additional mitigation is considered necessary.

11.7.16 With respect to off-site developments, additional mitigation is required for the proposed sports facilities at Alde Valley School in Leiston. A 2 metre high acoustic barrier will mitigate noise levels to receptors to the east of the site when the pitches are in use, details of which are set out in **Appendix 11E**.

## 11.8 Residual effects

11.8.1 The following tables (**Tables 11.32, 11.33, 11.34, and 11.35**) present a summary of the noise and vibration assessment.

11.8.2 Tables **11.32** and **11.34** relate to the construction and operational phases respectively, identifying the receptors likely to be impacted, the level of effect and, where the effect is deemed to be significant, the tables include the mitigation proposed and the resulting residual effect. Receptor numerical coding for **Tables 11.32** and **11.34** are as per **Table 11.16**.

11.8.3 **Tables 11.33** and **11.35** also relate to the construction and operational phases respectively, identifying the assessment outcomes against LOAEL and SOAEL.

**Table 11.32: Summary of effects for the construction phase**

Receptor / Receptor Group	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
<b>Sizewell B relocated facilities effects<sup>2</sup></b>					
All noise and vibration sensitive receptors	Construction and demolition noise	Best practice measures set out within the Outline Construction Environmental Management Plan submitted with the Sizewell B relocated facilities planning application.	No significant effects identified	Screening, working methodology to be designed once details of the construction approach have been developed in compliance with the Outline Construction Environmental Management Plan.	No significant effects identified.
	Construction and demolition vibration		No significant effects identified	None required, but liaison with impacted properties under the Outline Construction Environmental Management Plan is important.	No significant effects identified.
	Traffic noise during construction	None required	No significant effects identified.	None	No significant effects identified

<sup>2</sup> The assessment for the Sizewell B relocated facilities is contained within **Volume 1, Appendix 2A**, as discussed in **section 11.3** of this chapter.

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Receptor / Receptor Group	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
<b>Main Development Site construction during the day, where noise dictated by MDS (including activities on LEEIE)</b>					
22	Phase 1a	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
6, 8, 13, 18, 19			Minor adverse		Minor adverse ( <b>not significant</b> )
1, 2, 3, 4, 11, 14, 15, 16, 17, 20, 23			Moderate adverse		Minor adverse, ( <b>not significant</b> ): 16, 17
					Moderate adverse ( <b>significant</b> ): 1, 2, 3, 4, 11, 14, 15, 20, 23
3, 8, 22	Phase 1b/2	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
1, 2, 6, 11, 13, 14, 16, 17, 18, 19, 20, 23			Minor adverse		Minor adverse ( <b>not significant</b> )
4, 15			Moderate adverse		Minor adverse ( <b>not significant</b> ): 15
					Moderate adverse ( <b>significant</b> ): 4
1,3,8,14,22	Phase 3 & 4	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b>	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> .	Negligible ( <b>not significant</b> )
2, 4, 6, 11, 13, 15, 16, 17, 18, 19, 20, 23			Minor adverse		Minor adverse ( <b>not significant</b> )

NOT PROTECTIVELY MARKED

Receptor / Receptor Group	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
		Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).			
3, 8, 19, 22	Phase 5 (average day in phase)	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
1, 2, 4, 6, 11, 13, 14, 15, 16, 17, 18, 20, 23			Minor adverse		Negligible ( <b>not significant</b> ): 1 Minor adverse ( <b>not significant</b> ): 2, 4, 6, 11, 13, 14, 15, 16, 17, 18, 20, 23
22	Phase 5 (busiest period short duration)	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
6, 8, 13, 18, 19			Minor adverse		Minor adverse ( <b>not significant</b> )
1, 2, 3, 4, 11, 14, 15, 16, 17, 20, 23			Moderate adverse		Minor adverse ( <b>not significant</b> ): 16, 17 Moderate adverse ( <b>significant</b> ): 1, 2, 3, 4, 11, 14, 15, 20, 23
Pro Corda Music School at Leiston Abbey	Construction noise, all phases	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b>	Moderate or major adverse	Mitigation will be subject to further dialogue to tailor it to Pro Corda's particular requirements. The agreed mitigation will be	Moderate or major adverse, ( <b>significant</b> ) although further mitigation may reduce



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Receptor / Receptor Group	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
		Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).		incorporated into the Noise Monitoring and Management Plan under the CoCP (Doc Ref. 8.11)	this to negligible. ( <b>not significant</b> )
<b>Main Development Site construction during the day, where noise dictated by LEEIE</b>					
5, 9	Initial stripping/levelling of the LEEIE	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> . Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Minor adverse	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Minor adverse ( <b>not significant</b> )
7, 10, 12, 21, 24, 25			Moderate adverse		Minor adverse ( <b>not significant</b> ): 7, 10, 24, 25 Moderate adverse ( <b>significant</b> ): 12, 21
5,7	During preparation of the LEEIE	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> . Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
9, 10, 21, 24, 25			Minor adverse		Minor adverse ( <b>not significant</b> )
12			Moderate adverse		Minor adverse ( <b>not significant</b> )
5, 7, 24, 25	During early years operations on the LEEIE	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> .	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
9, 10, 12, 21			Minor adverse		Negligible ( <b>not significant</b> ): 12 Minor adverse ( <b>not significant</b> ): 9, 10, 21

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Receptor / Receptor Group	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
		Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).			
5, 7, 24, 25	During later years operations on the LEEIE	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> . Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
9, 10, 12, 21			Minor adverse		Negligible ( <b>not significant</b> ): 12 Minor adverse ( <b>not significant</b> ): 9, 10, 21
5,7,	During restoration and reinstatement (average day in phase)	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> . Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
9, 10, 12, 21, 24, 25			Minor adverse		Negligible ( <b>not significant</b> )
5, 7, 9	During restoration and reinstatement (busiest period – short duration)	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> . Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Minor adverse	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Minor adverse ( <b>not significant</b> )
10, 12, 21, 24, 25			Moderate adverse		Minor adverse ( <b>not significant</b> ): 24, 25 Moderate adverse ( <b>significant</b> ): 10, 12, 21

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Receptor / Receptor Group	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
<b>Main Development Site construction noise during the night</b>					
3, 5, 7, 8, 10, 12, 14, 19, 21, 22 and Pro Corda Music School at Leiston Abbey	Average noise levels during period when material unloading from green rail route and hauling to stockpiles	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> . Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
1, 2, 6, 9, 11, 13, 16, 17, 18, 23, 24, 25			Minor adverse		Minor adverse ( <b>not significant</b> )
4,15,20			Moderate adverse		Moderate adverse ( <b>significant</b> )
3, 5, 7, 10, 12, 14, 19, 21, 22 and Pro Corda Music School at Leiston Abbey	Average noise levels during period when material unloading from green rail route and hauling to stockpiles and, continuous excavation and tunnelling	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> . Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
1, 2, 6, 8, 9, 11, 13, 16, 17, 18, 23, 24, 25			Minor adverse		Minor adverse ( <b>not significant</b> )
4,15,20			Moderate adverse		Moderate adverse ( <b>significant</b> )
1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25 and Pro Corda Music School at Leiston Abbey	Maximum noise levels during period when material unloading from green rail route and hauling to stockpiles and, continuous excavation and tunnelling	Embedded landscape bunds and/or acoustic screens as described in <b>section 11.5</b> and listed in <b>Appendix 11B</b> . Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	Secondary acoustic screens as described in <b>section 11.7</b> and <b>Appendix 11B</b> . Noise mitigation scheme to be applied as appropriate.	Negligible ( <b>not significant</b> )
3			Minor adverse		Minor adverse ( <b>not significant</b> )

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Receptor / Receptor Group	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
20			Moderate adverse		Moderate adverse ( <b>significant</b> )
<b>Vibration during construction and restoration / removal</b>					
Keepers Cottage, Crown Lodge, Eastlands Industrial Estate buildings, King George's Avenue, Abbey Cottage, Roundhouse, Plantation Cottages, Ash Wood Cottages	Vibration during compaction work in Phases 1 and 2 and during preparation of LEEIE	Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Minor adverse	None	Minor adverse ( <b>not significant</b> )
All other receptors			Negligible	None	Negligible ( <b>not significant</b> )
All receptors	Vibration during Phase 5 (restoration) – soil spreading and breaking out hardstanding		Negligible	None	Negligible ( <b>not significant</b> )
<b>Road traffic on surrounding network</b>					
Noise sensitive receptors within 50 metres of the B1122 between Yoxford and the B1125 junction and Lovers Lane, Leiston	Construction road traffic noise during 2023.	Southern and northern park and ride facilities Freight management facility Beach landing facility Green rail route Accommodation campus Caravan park at the LEEIE	Moderate adverse	Noise mitigation scheme to be applied as appropriate.	Moderate adverse ( <b>significant</b> )
All other receptors.			Negligible or minor adverse		None

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Receptor / Receptor Group	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
		Highway improvement works Construction Traffic Management Plan Construction Workforce Travel Plan Delivery management system			
Kings Road, Leiston	Construction road traffic noise during 2028, both typical and busiest periods.	Southern and northern park and ride facilities Freight management facility Beach landing facility Green rail route Accommodation campus Caravan park at the LEEIE Two village bypass Sizewell link road Yoxford roundabout Highway improvement works Construction Traffic Management Plan Construction Workforce Travel Plan Delivery management system	Moderate adverse,	Noise mitigation scheme to be applied as appropriate	Moderate adverse ( <b>significant</b> )
All other receptors			Negligible or minor adverse. Some beneficial effects which are considered in detail in <b>Chapter 4</b> of <b>Volumes 4</b> and <b>5</b> .	None	Negligible or minor adverse ( <b>not significant</b> )

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Receptor / Receptor Group	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
All receptors	Use of fixed plant (including CHP or ASHPs)	Selection and siting of plant, as necessary to meet the specified design criteria.	Negligible	None	Negligible ( <b>not significant</b> )
All receptors	Construction noise at fen meadow compensation areas	Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	None	Negligible ( <b>not significant</b> )
All receptors	Construction noise from Alde Valley School	Best practice measures set out within the <b>CoCP</b> (Doc Ref 8.11).	Negligible	None	Negligible ( <b>not significant</b> )

**Table 11.33: Summary of assessment against LOAEL / SOAEL for construction**

Phase of Works or Activity	Assessment Against with SOAEL/LOAEL	Comment
Daytime construction noise from main site where MDS or MDS and LEEIE are dominant	<p>No exceedances of main weekday daytime SOAEL, but possible exceedances of lower SOAELs outside main weekday daytime hours at nine receptors during both Phase 1a and the busiest month in Phase 5, and at one further receptor during Phase 1b/2.</p> <p>LOAEL likely to be exceeded at some points during construction works at all receptors.</p>	<p>Any exceedance of the SOAELs will be avoided by managing the works in a way that avoids the noisiest activities at the most sensitive parts of the day, secured through the <b>CoCP</b>. Where such works cannot be managed in this manner, exceedances of the SOAEL will be avoided through the provision of noise insulation under the Noise Mitigation Scheme.</p> <p>Exceedances of the LOAEL will be mitigated and minimised through the adoption of the measures detailed in <b>section 4.5</b> (Environmental Design and Mitigation) and through the implementation of the <b>CoCP</b>.</p>

**NOT PROTECTIVELY MARKED**

Phase of Works or Activity	Assessment Against with SOAEL/LOAEL	Comment
<p>Daytime construction noise from main site where LEEIE is dominant</p>	<p>No exceedances of main weekday daytime SOAEL, but possible exceedances of lower SOAELs outside main weekday daytime hours at two receptors during both the site strip/levelling works and the removal/reinstatement works.</p> <p>LOAEL likely to be exceeded at some points during construction works at all receptors.</p>	<p>Any exceedance of the SOAELs will be avoided by managing the works in a way that avoids the noisiest activities at the most sensitive parts of the day, secured through the CoCP. Where such works cannot be managed in this manner, exceedances of the SOAEL will be avoided through the provision of noise insulation under the Noise Mitigation Scheme.</p> <p>Exceedances of the LOAEL will be mitigated and minimised through the adoption of the measures detailed in <b>section 4.5</b> (Environmental Design and Mitigation) and through the implementation of the <b>CoCP</b>.</p>
<p>Night time construction noise from main site</p>	<p>No exceedances of night time SOAEL.</p> <p>LOAEL likely to be exceeded at some points during construction works at all receptors.</p>	<p>Any exceedance of the SOAELs will be avoided by managing the works in a way that avoids the noisiest activities at the most sensitive parts of the day, secured through the <b>CoCP</b>. Where such works cannot be managed in this manner, exceedances of the SOAEL will be avoided through the provision of noise insulation under the Noise Mitigation Scheme.</p> <p>Exceedances of the LOAEL will be mitigated and minimised through the adoption of the measures detailed in <b>section 4.5</b> (Environmental Design and Mitigation) and through the implementation of the <b>CoCP</b>.</p>

**NOT PROTECTIVELY MARKED**

Phase of Works or Activity	Assessment Against with SOAEL/LOAEL	Comment
Construction vibration from main site	<p>No exceedances of SOAEL.</p> <p>LOAEL likely to be exceeded at eight receptors when works undertaken at shortest separation distances.</p>	<p>No actions required to avoid significant observed adverse effects on health and quality of life.</p> <p>Exceedances of the LOAEL will be mitigated and minimised through the adoption of the measures detailed in <b>section 4.5</b> (Environmental Design and Mitigation) and through the implementation of the <b>CoCP</b>.</p>
Noise from construction traffic	<p>Exceedances of the SOAEL are expected. An indicative assessment indicates exceedances at 12 no. properties as a result of the proposed development; one property on Lovers Lane and 11 no. properties on the B1122 between Yoxford junction and B1125 junction.</p> <p>The LOAEL is likely to be exceeded at a number locations on the existing road network, many of which will occur before the proposed development commences.</p>	<p>Where the SOAEL is exceeded as a result of the proposed development, the Noise Mitigation Scheme will apply to avoid such outcomes.</p> <p>Where the LOAEL is exceeded as a result of the proposed development, the effects have been mitigated and minimised (in accordance with noise policy) by the mitigation that has been incorporated into the overall project strategy, including the use of rail to move substantial construction loads, the construction of new roads to minimise the impacts along roads with significant residential population.</p>
Use of fixed plant, such as CHP or ASHPs	<p>No exceedances of the SOAEL expected.</p> <p>The LOAEL is expected to be achieved at all locations, unless the background sound levels are below 35dB, L<sub>A90</sub> during the daytime.</p>	<p>No action required to avoid significant adverse effects on health and quality of life.</p> <p>For those locations with low daytime background sound levels, the measures taken to achieve the 35 dB L<sub>Ar,15minute</sub> design target mitigate and minimise effects.</p>



Phase of Works or Activity	Assessment Against with SOAEL/LOAEL	Comment
Daytime construction noise at fen meadow compensation areas	No exceedances of the SOAEL expected.  LOAEL likely to be exceeded at some points during construction works at all receptors.	No action required to avoid significant adverse effects on health and quality of life.  Exceedances of the LOAEL will be mitigated and minimised through the implementation of appropriate mitigation, secured through the <b>CoCP</b> .
Daytime construction noise from Alde Valley School	Main weekday daytime SOAEL likely to be exceeded at one receptor, with lower SOAEL outside main weekday daytime hours likely to be exceeded at one further receptor, depending on the duration of the works.  LOAEL likely to be exceeded at some points during construction works at all receptors.	Any exceedance of the SOAELs will be avoided by managing the works in a way that avoids the noisiest activities at the most sensitive parts of the day, secured through the <b>CoCP</b> .  Exceedances of the LOAEL will be mitigated and minimised through the implementation of appropriate mitigation, secured through the <b>CoCP</b> .

Table 11.34: Summary of effects for the operational phase

Receptor	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
<b>Normal operation of power station – noise</b>					
Abbey Farm, Keepers Cottage, Plantation	Noise during day	Building design to minimise noise breakout.	Minor adverse	None	Minor adverse ( <b>not significant</b> )

**NOT PROTECTIVELY MARKED**

Receptor	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
Cottages and Reckham Lodge	Noise during the night		Negligible		Negligible ( <b>not significant</b> )
Other receptors	Noise during day and night		Negligible		Negligible ( <b>not significant</b> )
<b>Power Station operation plus back-up generator testing – noise</b>					
Abbey Farm, Keepers Cottage, Plantation Cottages, Reckham Lodge, The Studio and Upper Abbey	Noise during day	Building design to minimise noise breakout.	Minor adverse	None	Minor adverse ( <b>not significant</b> )
	Noise during the night		Negligible		Negligible ( <b>not significant</b> )
Rosery Cottages	Noise during day		Negligible		Negligible ( <b>not significant</b> )
	Noise during the night		Minor adverse		Minor adverse ( <b>not significant</b> )
Other receptors	Noise during day and night		Negligible		Negligible ( <b>not significant</b> )
<b>Sizewell B relocated facilities effects</b>					
All noise sensitive receptors	Noise from operation of mechanical services plant	None available – all mitigation considered as secondary.	Not significant.	Restriction of noise levels by careful selection, siting and orientation of plant. Additional localised	<b>Not significant</b>

**NOT PROTECTIVELY MARKED**

Receptor	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
				screening, if necessary. Measures will need to meet design criterion specified.	
	Noise from the outage car park at Pillbox field	None required	Not significant	None required	<b>Not significant</b>
<b>Operational road traffic</b>					
All receptors	Operational road traffic noise during 2034	Two village bypass Sizewell link road Yoxford roundabout	Negligible. Some beneficial effects which are considered in detail in <b>Chapter 4</b> of <b>Volumes 4</b> and <b>5</b> .	None	Negligible ( <b>not significant</b> )
Receptors adjoining eastern boundary with pitches	Use of sports pitches at Alde Valley Academy	Layout of pitches	Minor adverse	2m screen	Negligible ( <b>not significant</b> )
All other receptors			Negligible	None	Negligible ( <b>not significant</b> )

**Table 11.35: Summary of assessment against LOAEL / SOAEL for operation**

Phase of Works or Activity	Assessment Against SOAEL/LOAEL	Comment
Operation of power station only	<p>No exceedances of the SOAEL expected.</p> <p>The LOAEL is expected to be achieved at all locations, unless the background sound levels are low during the daytime.</p>	<p>No action required to avoid significant adverse effects on health and quality of life.</p> <p>For those locations with low daytime background sound levels, exceedances of the LOAEL will be mitigated and minimised through the adoption of the measures detailed in <b>section 4.5</b> (Environmental Design and Mitigation).</p>
Operation of power station with back-up generators	<p>No exceedances of the SOAEL expected.</p> <p>The LOAEL is expected to be achieved at all locations, unless the background sound levels are low during the daytime.</p>	<p>No action required to avoid significant adverse effects on health and quality of life.</p> <p>For those locations with low daytime background sound levels, exceedances of the LOAEL will be mitigated and minimised through the adoption of the measures detailed in <b>section 4.5</b> (Environmental Design and Mitigation).</p>
Noise from site access road	<p>No exceedances of SOAEL or LOAEL expected.</p>	<p>No action required to avoid significant adverse effects on health and quality of life.</p> <p>No requirement for further mitigation to mitigate and minimise adverse effects on health and quality of life.</p>
Use of facilities at Alde Valley School	<p>No exceedances of SOAEL or LOAEL expected.</p>	<p>No action required to avoid significant adverse effects on health and quality of life.</p>

Phase of Works or Activity	Assessment Against SOAEL/LOAEL	Comment
		No requirement for further mitigation to mitigate and minimise adverse effects on health and quality of life.

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