



The Sizewell C Project

6.8 Volume 7 Yoxford Roundabout and Other Highway Improvements Chapter 4 Noise and Vibration

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4 Noise and Vibration

4.1 Introduction

4.1.1 This chapter of **Volume 7** of the **Environmental Statement (ES)** presents an assessment of the noise and vibration effects arising from the construction and operation of the proposed Yoxford roundabout and other highway improvements (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.

4.1.2 The proposed highway improvement works are as follows:

- a roundabout at the junction between the A12 and B1122 in Yoxford (referred to throughout as ‘Yoxford roundabout’);
- improvements at the A1094 and B1069 junction south of Knodishall;
- improvements at the A12 and A144 junction south of Bramfield; and
- improvements at the A12 and B1119 junction at Saxmundham.

4.1.3 Road safety analysis has also identified potential highway safety issues at two sites (the B1078 and B1079 junction east of Easton and Otley College and the A140 and B1078 junction west of Coddendam). Highway safety measures at these sites will be secured by an obligation in the Section 106 Agreement (see the **Section 106 Heads of Terms** appended to the **Planning Statement** (Doc. Ref. 8.4). This chapter includes an assessment of these highway safety measures.

4.1.4 Detailed descriptions of the proposed development sites (referred to throughout this volume as the ‘site’ as relevant to the location of the works), the proposed development and different construction and operation phases are provided in **Chapters 1** and **2** of this volume of the **ES**. A glossary of terms and a list of abbreviations used in this chapter are provided in **Volume 1, Appendix 1A** of the **ES**.

4.1.5 The assessment considers noise and vibration impacts from construction and operation of the proposed development on sensitive receptors around the

site. Changes in noise levels on the wider road network are considered within **Volume 2, Chapter 11** of the **ES**.

4.1.6 This assessment has been informed by data presented in the following technical appendices:

- **Volume 2, Appendix 11A:** Baseline survey report.
- **Appendix 4A:** Road traffic flow data.
- **Appendix 4B:** Construction assumptions and calculations.

4.1.7 The road traffic noise assessment has been informed by the **Transport Assessment** (Doc Ref. 8.5), in particular the road traffic data which has been used to calculate road traffic noise levels and assess the potential road traffic noise effects in the vicinity of the proposed development.

4.2 Legislation, policy and guidance

4.2.1 **Volume 1, Chapter 6G** of the **ES** identifies and describes legislation, policy and guidance of relevance to the assessment of the noise and vibration impacts associated with the Sizewell C Project.

4.2.2 This section provides an overview of the specific legislation, policy and guidance of relevance to the assessment of the proposed development.

a) International

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

b) National

4.2.4 The Overarching National Policy Statement for Energy (NPS EN-1) (Ref. 4.1), and the National Policy Statement for Nuclear Power Generation (NPS EN-6) (Ref. 4.2) 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 are discussed in detail in **Volume 1, Appendix 6G** of the **ES**.

4.2.5 Part III of the Control of Pollution Act 1974 (Ref 4.3) 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 4.4 and 4.5).

4.2.6 Other relevant policy, as described in **Volume 1, Appendix 6G** of the **ES**, comprise:

- National Planning Policy Framework 2019 (Ref. 4.6).
- Planning Practice Guidance (PPG) 2019 (Ref. 4.7).
- Noise Policy Statement for England (NPSE) 2010 (Ref. 4.8).
- Government's 25 Year Environment Plan 2018 (Ref 4.9).

c) [Regional](#)

4.2.7 No regional policy is deemed relevant to the assessment for this site.

d) [Local](#)

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

- Suffolk Coastal District Council (SCDC) Local Plan Core Strategy and Development Management Policies (2013) (Ref. 4.10); and
- SCDC Final Draft Local Plan (2013) (Ref. 4.11).

4.2.9 Further detail of the requirements outlined in these documents, as they relate to the assessment of noise and vibration is contained in **Volume 1, Appendix 6G** of the **ES**.

e) [Guidance](#)

4.2.10 In addition to these policy requirements, 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. 4.12).
- Guidance in the Design Manual for Roads and Bridges (DMRB) LA111 (Ref. 4.13).

- Calculation of Road Traffic Noise (Ref. 4.14).
- British Standard BS8233: 2014 – Guidance on sound insulation and noise reduction for buildings (Ref. 4.15).
- British Standard BS5228-1 Noise: 2009+A1: 2014 – Code of Practice for noise and vibration control at open construction sites – Noise (Ref. 4.4).
- British Standard BS5228-2 Vibration: 2009+A1: 2014 – Code of Practice for noise and vibration control at open construction sites – Vibration (Ref. 4.5).

4.2.11 Further details on this guidance, as relevant to the noise and vibration assessment for the proposed development is contained in **Volume 1, Appendix 6G** of the **ES**.

4.3 Methodology

a) Scope of the assessment

4.3.1 The generic Environmental Impact Assessment (EIA) methodology is detailed in **Volume 1, Chapter 6** of the **ES**.

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

4.3.3 This section provides specific details of the noise and vibration methodology applied to the assessment of the proposed development.

4.3.4 The scope of assessment considers the impacts of the construction and operation use of the proposed highway improvement works and safety measures. Where the highway improvement work or safety measures proposed has the potential for likely significant effects to arise, this has been assessed in further detail.

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

4.3.6 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 to 6C** of the **ES**.

4.3.7 Operational vibration has been scoped out of the assessment methodology as a maintained road surface will be free of irregularities as part of project design and under general maintenance, so operational vibration will not have the potential to lead to significant adverse effects.

b) **Consultation**

4.3.8 The scope of the assessment has also been informed by ongoing consultation and engagement with statutory consultees during the design and assessment process. Consultation on the assessment methodology and conclusions has been undertaken with Suffolk County Council, and East Suffolk Council as part of the engagement summarised in **Volume 1, Appendix 6G** of the **ES**.

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

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

c) **Environmental screening**

4.3.10 An environmental screening exercise has been undertaken to identify which of the four highway improvement works and two highway safety measures proposed may give rise to environmental effects that have the potential to be significant. The outcome of this environmental screening exercise concluded that two of the proposed highway improvement works should be taken forward to the assessment of likely effects on noise and vibration:

- the proposed Yoxford roundabout; and
- the proposed improvements at the A12/A144 junction south of Bramfield.

4.3.11 **Table 4.1** provides a summary of the environmental screening exercise, including the reasons for screening out the other two proposed highway improvement works and two highway safety measures.

Table 4.1: Summary of environmental screening exercise

Proposed Highways Improvement	Summary of Potential Effects	Screened In or Out of the Assessment
The A12/B1122 Yoxford roundabout.	Noise and vibration from construction phase has the potential to result in adverse effects in relation to site clearance, road/ground surface breaking out, and removal activities and subsequently, vibratory roller plant. Due to the proximity of the proposed noisy works to residential receptors there is the potential for significant adverse effects.	Screened in.
Operational noise for all highways improvements listed below	Operational noise (noise from road traffic) would not be increased as a result of the proposed changes as there would be no change to speeds, nor to the types of numbers of vehicles resulting from the changes. Any changes in alignment as a result of road widening would be so small as to result in no change to levels are nearby noise sensitive receptors.	Screened out.
Improvements at the A1094/B1069 junction south of Knodishall.	Only minor highway improvement works planned, including maintenance of vegetation along the highway, as well as provision of new signage and road markings. Any noisy work will be limited to short periods only (less than one month), and will be similar to routine highways maintenance.	Screened out.
Improvements at the A12/A144 junction south of Bramfield.	The widening of the road would take place at the Bramfield A12/A144 junction. Consideration is therefore given to road/ground surface breaking out, and removal activities and subsequently, vibratory roller plant. Due to the proximity of the proposed noisy works to residential receptors, there is the potential for significant adverse effects.	Screened in.

Proposed Highways Improvement	Summary of Potential Effects	Screened In or Out of the Assessment
Improvements at the A12/B1119 junction at Saxmundham.	Minor highway improvement works planned, including alteration of the B1119 at the junction with the A12, which comprises widening of the east-bound and north-bound lane and realignment of existing drainage within highway verge. The works also include maintenance of vegetation along the highway, as well as the provision of new signage and road markings. Any noisy work will be limited to short periods only (less than one month), and will be similar to routine highways maintenance.	Screened out.
Safety measures at the B1078 and B1079 junction east of Easton and Otley College.	Safety measures include maintenance of vegetation along the highway, as well as provision of new signage and road markings. Any noisy work will be limited to short periods only (less than one month), and will be similar to routine highways maintenance.	Screened out
Safety measures at the A140 and B1078 junction west of Coddenham.	Safety measures include maintenance of vegetation along the highway, as well as provision of new signage and road markings. Any noisy work will be limited to short periods only (less than one month), and will be similar to routine highways maintenance.	Screened out

d) Study area

- 4.3.12 All receptors within 300 metres (m) of the proposed development (for the highway improvement works screened in to the assessment) have been considered, where there is a potential for the level of construction noise or vibration to exceed a negligible effect.
- 4.3.13 **Figure 4.1** shows the site and surroundings with the receptors considered in the assessment for the proposed Yoxford roundabout works and **Figure 4.2** shows the site and surroundings with the receptors considered in the assessment for the proposed A12/A144 works south of Bramfield.
- 4.3.14 In many cases a receptor listed represents a single dwelling, however in some localities, the receptor assessed represents the most-affected receptor

from a group of receptors, i.e. the receptor that is likely to experience the highest levels of noise or vibration.

e) **Assessment scenarios**

4.3.15 The assessment scenarios for the proposed Yoxford roundabout development and proposed A12/A144 junction improvements are as follows:

- Yoxford roundabout:
 - Construction phase: the construction phase assessment has been broken into two sub-phases: site preparation and main phase of construction.
 - During operation of the road, noise levels are considered during the peak construction period (in 2028) when the road would be used for Sizewell C construction traffic as well as open to the public, and in 2034, when construction of the power station is complete and Sizewell C is operational.
- Improvements at the A12/A144 junction south of Bramfield:
 - Construction phase: work associated with the junction has been assessed where it may give rise to adverse noise or vibration levels.

4.3.16 The proposed improvements at the A12/A144 junction south of Bramfield will not change the existing or future forecasted traffic flows on the road, and therefore screened out of assessment.

4.3.17 Noise impacts from construction traffic associated with the Sizewell C Project on the road network are assessed and presented in **Volume 2 Chapter 11**.

f) **Assessment criteria**

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

4.3.19 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** of the **ES**. The effect of noise and vibration on a receptor or community is dependent on the magnitude of the impact, the sensitivity of the receptor and may also depend on other factors, such as the existing acoustic environment.

4.3.20 A summary of the criteria used in this assessment is presented in the following sub-sections.

i. **Sensitivity**

4.3.21 The criteria used in noise and vibration for determining the sensitivity to receptors are set out in **Table 4.2**.

Table 4.2: 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.
Low	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.
Very Low	Receptors of very low sensitivity to noise and vibration such as industrial or commercial buildings and transient or mobile receptors.

4.3.22 As far as it has been possible to establish, there are no high sensitivity receptors within 300m of the two sites. All receptors are therefore assumed to be of medium sensitivity.

ii. Magnitude

Construction noise and vibration

4.3.23 The approach taken to evaluate noise effects for all construction work associated with the Sizewell C Project on occupiers of dwellings and other permanent residential accommodation is that outlined in Part 1 of BS 5228. This recommends that, for dwellings, significant effects may occur when the site noise level, rounded to the nearest decibel, exceeds the value listed in **Table 4.3**. 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 4.3** 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 impacts.

Table 4.3: Thresholds of potential significant construction noise effect at dwellings, from Part 1 of BS 5228

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

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.

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 $L_{Aeq,T}$ sound level for the period increases by more than 3 dB due to construction activity.

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

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

4.3.25 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.

4.3.26 The values to be used to assess the magnitude of impact for construction work are as shown in **Table 4.4**.

Table 4.4: Values to assess the magnitude of noise impact for construction work

Sensitivity of Receptor	Period	Magnitude of Impact				Parameter
		Very Low	Low	Medium	High	
High	Any	Bespoke assessment method to be used.				
Medium and low.	Day	Below baseline values.	Baseline noise levels.	ABC ^{(1) (2)}	ABC ^{(1) (2)} + 10	$L_{Aeq, 12h}$, dB
	Evening					$L_{Aeq, 4h}$, dB
	Night					$L_{Aeq, 8h}$, dB
Very low.	Any	Bespoke assessment method to be used.				

Notes:

(1) ABC indicates the significance threshold from **Table 4.3** above, based on the “ABC method” from BS 5228-1.

(2) Where levels are predicted as free field values, the ABC criteria are reduced by 3dB, to account for the difference between free field and façade levels.

4.3.27 For the assessment of magnitude of construction vibration, **Table 4.5** below will be used.

Table 4.5: 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.				

4.3.28 Construction vibration will be considered significant if the magnitude of impact is medium or high at a medium or high sensitivity 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.

4.3.29 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.

Operational noise

4.3.30 The magnitudes of changes for road traffic noise are determined according to **Tables 4.6** and **4.7** for short term and long term effects respectively. As described in **Volume 1** Appendix **6G**, these terms are defined in accordance with the Design Manual for Roads and Bridges (DMRB) Document LA111 (Ref. 4.13), where short term effects are considered to be those experienced during the opening year of operation of a road and long term effects as those experienced in the future. As for both the two village bypass and Sizewell link road assessments, the opening year is considered to be 2028 and the future year is 2034.

Table 4.6: Short-term magnitude of changes in road traffic noise level

Short Term Magnitude	Short-Term Noise Change (dB L _{A10,18hr} or L _{night})
Major or high	Greater than or equal to 5.0
Moderate or medium	3.0 to 4.9
Minor or low	1.0 to 2.9
Negligible or very low	less than 1.0

Table 4.7: Long-term magnitude of changes in road traffic noise level

Long Term Magnitude	Long-Term Noise Change (dB L _{A10,18hr} or L _{night})
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

4.3.31 For noise sensitive receptors where the magnitude of change in the short-term is minor, moderate or major at noise sensitive buildings, local circumstances must also be considered to determine the final significance.

4.3.32 The assessment of the long-term effects of changes in road traffic flows on Yoxford roundabout during the operation of Sizewell C nuclear power station is assessed in the same way as the changes in level resulting from construction traffic on the existing road network, except that the magnitudes of these changes have been considered against the values for long-term effects set out in **Table 4.7**.

4.3.33 The criteria used for assessment of road traffic noise refer only to medium sensitive receptors. Where high sensitivity receptors exist, these would be considered on a case-by-case basis, dependent on the reason for the high sensitivity.

g) **Classification of effects**

4.3.34 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 4.8**.

4.3.35 Definitions of each of the different levels of effect, which can be adverse, beneficial or neutral are shown in **Table 4.9**.

Table 4.8: 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 4.9: 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.

4.3.36 Following the classification of an effect as detailed in **Tables 4.8** and **4.9**, 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.

h) Use of LOAEL and SOAEL values in the assessment

4.3.37 The NPSE, the NPSs and the PPG require the assessment of noise and vibration against the lowest observed adverse effect levels (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.

4.3.38 Each source type requires its own specific value for LOAEL and SOAEL, which depends on these factors. The method for assigning significance differs from the general methodology set out in **Volume 1 Chapter 6** of the **ES**, 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.

4.3.39 In line with the NPSE, the concept of LOAEL, and SOAEL has been established for the assessment of noise and vibration generating activities associated with the proposed main development site and associated developments. **Table 4.10** below sets out descriptions for and actions recommended in relation to these categories.

Table 4.10: Generic effect descriptions and actions recommended

Effect	Description	Action
Below LOAEL	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.
Between LOAEL and SOAEL	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.
Above SOAEL	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,	Avoid

Effect	Description	Action
	premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	

4.3.40 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.

4.3.41 The descriptions and actions recommended in **Table 4.10** 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.

4.3.42 For construction noise, the LOAEL is considered to be equal to the existing baseline ambient level. SOAEL values are as shown in **Table 4.11** below.

Table 4.11: SOAEL values for noise from all construction work associated with the development (all values are façade levels)

Day	Time (hours)	Averaging Period T	Significant Observed Adverse Effect Level $L_{Aeq,T}$ (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.

4.3.43 The LOAEL and SOAEL values for construction vibration are shown in **Table 4.12** and the derivation of these values is set out in **Volume 1, Appendix 6G, Annex 6G.1** of the **ES**.

Table 4.12: Values to use for LOAEL and SOAEL for construction vibration

LOAEL	SOAEL	Parameter
0.3	10.0	PPV mm/s

4.3.44 **Table 4.13** sets out the LOAEL and SOAEL values for road traffic noise across the project. The values are taken from LA111 (Ref. 4.13), which does not state whether the values should apply to existing roads as well as new or amended roads.

4.3.45 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. 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.

4.3.46 The derivation of these values is set out in **Volume 1, Appendix 6G Annex 6G.1** of the **ES**.

Table 4.13: Road traffic noise LOAEL and SOAEL values

Time Period	LOAEL	SOAEL
Day (06:00-24:00)	55dB LA10,18hr facade	68dB LA10,18hr façade
Night (23:00-07:00)	40dB L _{night} , outside (free-field).	55dB L _{night} , outside (free-field).

i) **Assessment methodology**

i. **Baseline**

4.3.47 Baseline noise levels against which the effects of road traffic noise from the proposed Yoxford roundabout development are assessed, have been calculated using 3D noise modelling software (SoundPLAN) implementing the methodology specified in CRTN and based on the traffic flow data which is shown in **Appendix 4A** of this volume.

4.3.48 The traffic composition and flow data has been derived from the **Transport Assessment** (Doc Ref. 8.5) for the baseline, construction and operational scenarios. This information is inherently cumulative as it includes traffic flows associated with consented developments.

ii. [Construction assessment](#)

4.3.49 For each of the highway improvement works screened in to the assessment, the anticipated construction plant and activities that have the potential to give rise to off-site noise or vibration levels have been identified.

4.3.50 The likely noise and vibration levels were calculated for each noise sensitive receptor in the vicinity of the sites and these levels compared to assessment criteria for that source.

iii. [Operation assessment](#)

4.3.51 To calculate noise effects during operation of the proposed Yoxford roundabout development, the baseline traffic flows that would occur without the Sizewell C development are used to predict noise levels on the road network in 2028 and 2034 (referred to as the 'reference case' for each year). The traffic flows anticipated with the proposed Yoxford roundabout in place and Sizewell C under construction or operational have been used to predict noise levels in the same years, i.e. 2028 and 2034. The level differences are then calculated, expressed in terms of daytime $L_{A10,18h}$ values and night-time noise L_{night} values.

4.3.52 As detailed in the **Transport Assessment** (Doc Ref. 8.5), on some days during the peak construction year, the number of heavy good vehicle (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 have been assessed.

4.3.53 Calculations to predict noise levels during operation of the proposed Yoxford roundabout are made in accordance with the methodology set out in Calculation of Road Traffic Noise (Ref. 4.14). The differences between reference case, and with development noise levels, is calculated for the peak construction year (2028), and the busiest part of that year, and the year in which construction work on the main development site is predicted to be complete (2034).

j) [Assumptions and limitations](#)

4.3.54 The following assumptions have been made in this assessment:

- Construction noise predictions have been undertaken using the activities and plant described in **Chapter 2** of this volume with further detail provided in **Appendix 4B**.
- For the purposes of the assessment, it is assumed that construction works will only take place between the hours of 07:00 and 19:00 Monday to Saturday. No evening or night-time works during construction are expected and so have not been assessed. If night-time working is required, for example for unplanned dewatering, East Suffolk Council (ESC) will be notified in advance and noise control measures agreed, as necessary.
- The temporary contractor compound at the Yoxford roundabout site is assumed to require a hard-core base (not paved or concreted), and that construction of this will involve vibratory compaction of the area.
- Traffic flows would be as set out in **Appendix 4A** of this volume.

4.4 Baseline environment

4.4.1 This section presents a summary of the baseline environmental characteristics in and around the sites screened in to the assessment. Further detail can be found in **Volume 2, Appendix 11A** of this **ES**.

4.4.2 The sound environment at the Yoxford roundabout site is dominated by road traffic on the A12 with occasional noise from road traffic on the B1122.

4.4.3 The sound environment at the A12/A144 site south of Bramfield is also dominated by road traffic on the A12, with road traffic on the A144 also prominent.

a) Current baseline

4.4.4 The baseline noise levels were measured at a total of two locations, one close to the proposed Yoxford roundabout site (Position RT2), and one close to the A12/A144 Bramfield highways improvement site (Position R16). The monitoring locations are shown in **Figure 11.3** in **Volume 2** of this **ES**.

4.4.5 At these locations, attended surveys were carried out to capture samples of typical daytime ambient and background sound levels. These levels are referred to in the assessment of construction noise; only daytime levels are

needed, as construction work is not planned for night time. A summary of measured levels at each location is shown in **Table 4.14**.

Table 4.14: Summary of baseline survey data – (free field values)

Monitoring Location	Monitoring Location Reference	Typical Measured Level, Day	
		L _{Aeq,T} (dB)	L _{A90,T} (dB)
Yoxford Junction	RT2	72	63
A12/A144 Junction	RT16	71	52-60

4.4.6 The baseline noise levels used for the assessment of road traffic noise are those predicted by modelling. Measured levels do not always match modelled values as measurements were generally made close to receptors in publicly-accessible locations rather than at the receptor itself.

4.4.7 The measured level at RT16 has been corrected for distance assuming simple hemispherical propagation to estimate noise levels at the closest receptors to the A12 / A144 junction. The estimated free field day time noise level at receptors 1 and 2 for this junction is 59dB, L_{Aeq, 12h}.

b) Future baseline

4.4.8 Future baseline noise levels for the purposes of considering road traffic noise effects around the proposed Yoxford roundabout site have been determined by modelling, using information about road surfaces, predicted road traffic flows, speeds, and Heavy Duty Vehicles (HDV) percentages. The traffic composition and flow data, as presented in **Appendix 4A** of this volume has been derived from the **Transport Assessment** (Doc Ref. 8.5) for the baseline, construction and operational scenarios. This information is inherently cumulative as it includes traffic flows associated with consented developments.

4.4.9 There is no assessment of the potential impact of changes in road traffic noise around the proposed A12/A144 Junction highway improvement works, as the assessment of operational noise has been screened out of the assessment.

4.4.10 Without the proposed development in place, future baseline road traffic noise levels (termed the ‘reference case’) have been predicted for two different scenarios:

- during peak construction traffic flows (which would occur in 2028), and
- once construction work associated with the Sizewell C power station would be complete (in 2034).

4.4.11 Future baseline ambient noise levels in the absence of Sizewell C construction traffic for each receptor considered are shown in **Table 4.15**. These are estimated from reference flows in 2028 and 2034. Daytime ambient levels have been predicted as $L_{A10, 18h}$ values, with 2dB subtracted to provide an estimate of daytime noise levels expressed as $L_{Aeq, 16h}$.

Table 4.15: Calculated baseline road traffic levels (2028) (free field values)

Receptor	Receptor Name	Daytime Ambient Level, $L_{Aeq, 16h}$, dB		Night-Time Level, L_{night} , dB	
		2028	2034	2028	2034
1	Woodlands Cottage	69	69	61	61
2	Satis House (Hotel)	64	65	58	58
3	Satis Coach House	58	58	53	53
4	White House	73	73	62	62
5	Sans Souci	68	69	60	60
6	Pinn's Piece	62	62	56	56
7	Rookery Lodge	63	64	58	58
8	The Cottage	56	56	52	52
9	Sunnypatch	61	61	54	54
10	The Limes	69	69	61	61
11	Tinkers	70	70	61	61
12	Holly House	69	69	61	61
13	Medway & White Hse Cotts	69	70	61	61
14	The Old Barn	67	68	58	58
15	Rookery Cottages	58	58	53	53
16	Wormley Bury, Rosewood, Southern	69	69	61	61
17	Kings Head PH	70	70	61	61
18	Frith House	51	51	50	50

Receptor	Receptor Name	Daytime Ambient Level, $L_{Aeq, 16h}$, dB		Night-Time Level, L_{night} , dB	
		2028	2034	2028	2034
19	Pinns Cottage	44	44	48	48
20	Garden Cottage and Clock House	44	44	39	39
21	Cavan Cottage	66	66	59	59
22	Manger Cottage	54	55	51	51
23	Meadowbarn	54	54	50	50
24	Hopton Yard East of Old Barn	58	58	52	53
25	Honeycroft	57	57	52	52

i. Future baseline

4.4.12 One new dwelling is proposed at Cavan Cottage, High Street, Yoxford (application reference DC/16/2077/OUT). This committed development is in close proximity to an existing receptor (receptor 21), and the baseline conditions presented for receptor 21 are considered representative for this potential future receptor.

4.4.13 There are no other committed developments which are likely to alter the existing noise levels or introduce receptors closer to the site than the closest existing properties.

4.5 Environmental design and mitigation

4.5.1 As detailed in **Volume 1, Chapter 6** of the **ES**, 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 developments. Tertiary mitigation measures are legal requirements, or are standard practices that would be implemented as part of the proposed developments.

a) Primary mitigation

4.5.2 Primary mitigation is often referred to as ‘embedded mitigation’ and includes modifications to the location or design to mitigate impacts. No site-specific

primary noise and vibration mitigation measures have been identified for either the Yoxford roundabout and A12/A144 junction improvement works.

b) Tertiary mitigation

4.5.3 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.

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

- selection of quiet plant and techniques in accordance with good practice in BS 5228 for all construction activities;
- switching off equipment when not required;
- use of reversing alarms that ensure proper warning whilst minimising noise impacts off-site; and
- provision of training and instruction to construction site staff on methods and techniques of working to minimise off-site noise impacts.

4.5.5 BS 5228-2 gives detailed advice on standard good practice for minimising impacts from construction vibration. The key requirements of BS 5228-2 are set out in the **CoCP** (Doc Ref. 8.11), and contractors will be required to adhere to this.

4.5.6 SZC Co. will 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.

4.5.7 In addition to the **CoCP**, during construction, a **Construction Traffic Management Plan** (Doc Ref. 8.7) and a **Construction Workforce Travel Plan** (Doc Ref. 8.8) will be implemented to help manage the effects of traffic generated by the Sizewell C Project (see **Volume 2 Chapter 10** for more detail).

c) Other Mitigation

4.5.8 A **Noise Mitigation Scheme (Volume 2 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.

4.5.9 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 to consider requiring noise mitigation through improved sound insulation to dwellings."

4.5.10 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)

4.5.11 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.

4.6 Assessment

a) Introduction

4.6.2 This section presents the findings of the noise and vibration assessment for the construction of both the proposed Yoxford roundabout and A12/A144 junction improvement works, and the findings of the assessment of operational noise and vibration for the proposed Yoxford roundabout.

4.6.3 This section identifies any likely significant effects that are predicted to occur and **section 4.7**, provided in this chapter, then highlights any secondary mitigation and monitoring measures that are proposed to minimise any adverse significant effects.

b) Construction

i. Construction noise

Yoxford Roundabout

4.6.4 A description of the construction methods is provided in **Chapter 2** of this volume. Construction of the proposed Yoxford roundabout is anticipated to take up to nine months. For the purposes of this assessment, it is assumed that the construction working hours will be Monday to Saturday between 07:00 and 19:00 hours.

4.6.5 The construction phase noise and vibration impacts are considered to be associated with the following aspects of development:

- site preparation; and
- main construction phase.

4.6.6 The construction phase noise and vibration impacts are primarily considered to be associated with the following broad aspects of development:

- Preparatory works: site set up and clearance, including removal of trees and hedgerows, the erection of temporary fencing on land required for construction and the creation of alternative access arrangements and rights of way, setting up of the temporary contractor compound including security, welfare facilities, and temporary utilities.

- Construction Works: earthworks, road construction and surfacing, construction of civil structures, utility and drainage installation, construction of pavements, kerbs, footways and paved areas, installation of permanent fencing, road signs and marking, and road lighting, permanent connections to existing road networks, and landscaping.

4.6.7 During site preparation works, the clearance operations are anticipated to last for less than the 10 consecutive days in any 15 day period and less than 40 days in 6 months.

4.6.8 **Appendix 4B** of this volume contains details of construction noise calculations for both the preparatory and main phases of construction. Levels will vary between longer-term noise from construction and shorter periods of elevated levels when construction work is at its closest to a receptor boundary with the site. Predictions for vegetation works are modelled from areas to be cleared. The temporary contractor’s compound formation works have been modelled at the notional centre of the compound. Construction works have been modelled at the notional centre of the site boundary, being approximately 30m due south of the centres of the proposed new roundabout based on the noisiest activities during the earthworks, drainage and pavement works.

4.6.9 **Table 4.16** provides a summary of predicted levels for each period for each receptor within 300m of the proposed construction works boundary which has the potential to experience noise from construction work above a negligible level.

Table 4.16: Predicted noise from construction works (free field values)

Receptor		Range of Predicted Levels, $L_{Aeq, T}$, dB.	Representative Predicted Levels, $L_{Aeq, T}$, dB.	
			Preparatory Works	Main Construction Phase
1	Woodlands Cottage	55-68	55	68
2	Satis House (Hotel)	59-71	59	71
3	Satis Coach House	57-69	57	69
4	White House	57-68	57	68

Receptor		Range of Predicted Levels, $L_{Aeq, T}$, dB.	Representative Predicted Levels, $L_{Aeq, T}$, dB.	
			Preparatory Works	Main Construction Phase
5	Sans Souci	58-69	58	69
6	Pinn's Piece	59-71	59	71
7	Rookery Lodge	60-73	60	73
8	The Cottage	67-77	70	67
9	Sunnypatch	65-74	70	65
10	The Limes	54-65	54	65
11	Tinkers	55-65	55	65
12	Holly House	55-65	55	65
13	Medway & White House Cottages	56-65	56	65
14	The Old Barn	63-70	66	63
15	Rookery Cottages	63-69	65	63
16	Wormley Bury, Rosewood, Southern	55-64	55	64
17	Kings Head PH	54-63	54	63
18	Frith House	55-64	55	64
19	Pinns Cottage	54-62	54	62
20	Garden Cottage and Clock House	49-55	52	55
21	Cavan Cottage	52-62	52	62
22	Manger Cottage	55-68	55	68
23	Meadowbarn	52-60	52	57
24	Hopton Yard E of Old Barn	62-66	63	62
25	Honeycroft	54-58	57	57

4.6.10 The predicted levels in **Table 4.16** would result in effects as set out in **Table 4.17** below, based on each receptor being of medium sensitivity.

Table 4.17: Summary of predicted construction noise effects at the nearest noise sensitive receptor locations around the site at different periods

Receptor		Mon-Fri 07:00 to 19:00 Hours and Sat 07:00 to 13:00 Hours		Saturday 13:00 to 19:00 Hours	
		Preparatory Works	Main Construction Phase	Preparatory Works	Main Construction Phase
1	Woodlands Cottage	Negligible	Negligible	Negligible	Negligible
2	Satis House (Hotel)	Negligible	Moderate adverse, significant	Negligible	Moderate adverse, significant
3	Satis Coach House	Negligible	Moderate adverse, significant	Negligible	Moderate adverse, significant
4	White House	Negligible	Negligible	Negligible	Negligible
5	Sans Souci	Negligible	Minor adverse, not significant	Negligible	Moderate adverse, significant
6	Pinn's Piece	Negligible	Moderate adverse, significant	Negligible	Moderate adverse, significant
7	Rookery Lodge	Negligible	Moderate adverse, significant	Negligible	Major adverse, significant
8	The Cottage	Moderate adverse, significant	Moderate adverse, significant	Major adverse, significant	Moderate adverse, significant
9	Sunnypatch	Moderate adverse, significant	Moderate adverse, significant	Moderate adverse, significant	Moderate adverse, significant
10	The Limes	Negligible	Negligible	Negligible	Negligible
11	Tinkers	Negligible	Negligible	Negligible	Negligible
12	Holly House	Negligible	Negligible	Negligible	Negligible

Receptor		Mon-Fri 07:00 to 19:00 Hours and Sat 07:00 to 13:00 Hours		Saturday 13:00 to 19:00 Hours	
		Preparatory Works	Main Construction Phase	Preparatory Works	Main Construction Phase
13	Medway & White House Cottages	Negligible	Negligible	Negligible	Negligible
14	The Old Barn	Negligible	Negligible	Negligible	Negligible
15	Rookery Cottages	Moderate adverse, significant	Moderate adverse significant	Moderate adverse, significant	Moderate adverse, significant
16	Wormley Bury, Rosewood, Southern	Negligible	Negligible	Negligible	Negligible
17	Kings Head PH	Negligible	Negligible	Negligible	Negligible
18	Frith House	Minor adverse, not significant	Moderate adverse, significant	Moderate adverse, significant	Major adverse, significant
19	Pinns Cottage	Minor adverse, not significant	Minor adverse, not significant	Moderate adverse, significant	Moderate adverse, significant
20	Garden Cottage and Clock House	Minor adverse, not significant	Minor adverse, not significant	Minor adverse, not significant	Moderate adverse, significant
21	Cavan Cottage	Negligible	Negligible	Negligible	Negligible
22	Manger Cottage	Minor adverse, not significant	Moderate adverse, significant	Minor adverse, not significant	Major adverse, significant
23	Meadowbarn	Negligible	Minor adverse, not significant	Negligible	Minor adverse, not significant
24	Hopton Yard E of Old Barn	Moderate adverse, significant	Minor adverse, not significant	Moderate adverse, significant	Minor adverse, not significant

Receptor		Mon-Fri 07:00 to 19:00 Hours and Sat 07:00 to 13:00 Hours		Saturday 13:00 to 19:00 Hours	
		Preparatory Works	Main Construction Phase	Preparatory Works	Main Construction Phase
25	Honeycroft	Minor adverse, not significant	Minor adverse, not significant	Minor adverse, not significant	Minor adverse, not significant

- 4.6.11 The reason for the predicted increase in adverse effects between 13:00 and 19:00 hours on a Saturday is not due to any difference in activities which would occur in this period, but due to the reduction in thresholds for significance which occurs outside of the periods of Monday to Friday 07:00 to 19:00 hours and Saturday 07:00 to 13:00 hours.
- 4.6.12 During Monday to Friday between 07:00 and 19:00 hours and Saturday 07:00 to 13:00 hours, a moderate adverse effect would be experienced due to noise during preparation work at Receptors 8, 9 15 and 24 during the formation of the temporary contractor compound and at Receptor 2, 3, 6, 7, 8, 9, 15, 18 and 22 during the main construction phase. A significant adverse effect would be experienced at these receptors at these times without mitigation.
- 4.6.13 On Saturday between 13:00 and 19:00 hours during site preparation work, a major adverse effect would occur at receptor 8 and a moderate adverse effect is predicted at Receptors 9, 15, 18, 19 and 24. During the main construction phase, a major adverse effect would occur at receptors 7, 18 and 22 and a moderate adverse effect would occur at receptors 2, 3, 5, 6, 8, 9, 15,19 and 20. A significant adverse effect would be experienced at these receptors at these times without mitigation.
- 4.6.14 At the remaining receptors, the effects are expected to be no worse than minor adverse at any time. These are considered to be **not significant**.
- 4.6.15 There is the potential for combined, project-wide effects where adverse effects predicted at some receptors during the construction work could combine with increases in construction-related road traffic noise on the A12 and B1122 during the early years of construction. However, the two different noise source types (road traffic noise and construction noise) are experienced differently and the assessment methods are not compatible so there is no recognised way to combine these effects. In the circumstances,

professional judgement must be used to determine where any combined effect might be experienced.

- 4.6.16 As described in **Volume 2, Chapter 11** of the **ES**, the noise level increase on the section of the B1122 between Yoxford and the junction with Middleton Moor would experience a significant adverse effect in early years due to Sizewell construction traffic. Although both road traffic noise and construction noise would result in some adverse effects for some receptors on the B1122, the combined effects of these two noise sources is not likely to result in a perceived worsening of effect from either of the two sources.
- 4.6.17 It can be seen from **Table 4.16** that the construction SOAEL of 75dB for the weekday daytime period of 08:00 to 18:00 hours is predicted to be exceeded at one of the assessed receptors, Rookery Lodge, when considering the representative values and when the free-field values are adjusted by +3dB to obtain façade levels. Similarly, the lower SOAELs that are adopted for the periods outside of the main weekday daytime works are predicted to be exceeded at a further 19 receptors when considering the representative values and when the free-field values are adjusted by +3dB to obtain façade levels.
- 4.6.18 It is inevitable that construction noise will vary over the course of any given day, and the predicted levels in **Table 4.16** 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 calculation.
- 4.6.19 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 (Volume 2, Appendix 11H)**.
- 4.6.20 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 Environmental Design and Mitigation section in this chapter and through the implementation of the **CoCP**.

A12/A144 Junction Works South of Bramfield

- 4.6.21 A description of the construction methods is provided in **Chapter 2** of this volume. Construction of the proposed A12/A144 junction improvement works is anticipated to take six. For the purposes of this assessment, it is assumed that the construction working hours will be Monday to Saturday between 07:00 and 19:00 hours.
- 4.6.22 The construction phase noise and vibration impacts are considered to be associated with the following aspects of development:
- site preparation; and
 - main construction phase.
- 4.6.23 The construction phase noise and vibration impacts are primarily considered to be associated with the following broad aspects of development:
- Preparatory works: site set up and clearance, including removal of trees and hedgerows, the erection of temporary fencing on land required for construction and the creation of alternative access arrangements.
 - Construction works: earthworks, road widening and surfacing, utility and drainage installation, construction of pavements, kerbs, footways and paved areas, road signs and marking and permanent connections to existing road networks.
- 4.6.24 During site preparation works, the clearance operations are anticipated to last for less than the 10 days in any 15 consecutive day period and less than 40 days in 6 months.
- 4.6.25 **Appendix 4B** of this volume contains details of construction noise calculations for both the preparatory and main phases of construction. Predictions are modelled from areas in which construction would take place.
- 4.6.26 **Table 4.18** provides a summary of predicted levels for each period for each receptor within 300 metres of the proposed construction works boundary which has the potential to experience noise from construction work above a negligible level.

Table 4.18: Predicted construction noise levels at closest receptors to A12 / A144 junction (free field values)

Receptor		Representative Predicted Levels, $L_{Aeq, T}$, dB.	
		Vegetation Clearance	Main Construction Phase
1	Stone Cottage	74	75
2	Woody End	72	66

- 4.6.27 These levels would be high in magnitude. However, these activities are unlikely to last for a duration exceeding 10 or more days or nights in any 15 consecutive days or nights or for a total number of days or nights exceeding 40 in any 6 consecutive months. The noise effect is therefore likely to be minor adverse, when taking account of the medium sensitivity of the receptors. This is considered to be **not significant**.
- 4.6.28 There is the potential for combined, project-wide effects where adverse effects predicted during the construction work could combine with increases in construction-related road traffic noise on the A12. However, the two different noise source types (road traffic noise and construction noise) are experienced differently and the assessment methods are not compatible so there is no recognised way to combine these effects. In the circumstances, professional judgement must be used to determine where any combined effect might be experienced.
- 4.6.29 As described in **Volume 2 Chapter 11** of the **ES**, the noise level increase on a significant noise effect from construction road traffic is expected on the A12 for some receptors in 2023. The combined effect of road traffic and construction noise is not likely to result in a perceived worsening of effect from either of the two sources.
- 4.6.30 It can be seen from **Table 4.18** that the construction SOAEL of 75dB for the weekday daytime period of 0800 to 1800 hours is predicted to be exceeded at one of the two assessed receptors, 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 both of the assessed receptors, when the free-field values are adjusted by +3dB to obtain façade levels.
- 4.6.31 However, the works are expected to last at the levels shown in **Table 4.18** for less than 10 days in any 15 consecutive day period and less than 40 days

in a six month period. On this basis, the construction SOAEL is not expected to be exceeded.

4.6.32 It is inevitable that construction noise will vary over the course of any given day, and the predicted levels in **Table 4.18** 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 calculation.

4.6.33 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 Environmental Design and Mitigation section in this chapter and through the implementation of the **CoCP**.

ii. Construction vibration

Yoxford Roundabout and the A12 / A144 junction

4.6.34 The approach taken for predicting vibration levels is described in **Volume 1, Chapter 6, Annex 6G.2** of the **ES**. Using **Figures 1 and 2** from **Annex 6G.2**, it can be seen, that for earthmoving, including bulldozers; breakers, crushers and small twin drum vibratory rollers, there would be a negligible vibration effect beyond a distance of 40 metres from the activity. For plant which produces higher vibration levels (such as large single drum compactors), there would be a negligible vibration effect beyond a distance of 90 metres from the activity.

4.6.35 As a result of proposed construction work, vibration producing plant potentially affecting vibration sensitive premises within these distances would be as shown in **Table 4.19**. All other vibration levels would be below 0.3mm/s and would, thus have a negligible effect.

Table 4.19: Predicted vibration levels and impact magnitudes

Receptor	Plant	Distance	Level, PPV.	Impact Magnitude
The Cottage	Large vibratory roller during temporary contractors compound construction baseworks.	50m	1.0mm/s	Medium
Sunnypatch		70m	0.5mm/s	Low

Receptor	Plant	Distance	Level, PPV.	Impact Magnitude
Satis House and Rookery Lodge	Earthworks (bulldozer).	70m	0.1mm/s	Negligible
Satis House and Rookery Lodge	Use of small roller compactor during pavements construction work.	70m	0.1mm/s	Negligible
Stone Cottage (A12 / A144 junction)	Use of small roller compactor during pavements construction work.	25m	0.6mm/s	Low

4.6.36 The use of a large vibratory roller to compact the ground for the temporary contractors compound is expected to result in a short term medium magnitude impact at The Cottage which is likely to last for less than 10 days in any 15 consecutive day period and less than 40 days in total. Although the impact magnitude would be medium, it would not constitute a significant effect, as it would occur only for a relatively short period.

4.6.37 Other receptors would experience either low or negligible vibration effects which would be **not significant**.

4.6.38 There are predicted to be no exceedances of the SOAEL of 10mm/s during any of the assessed vibration-generating works.

4.6.39 The LOAEL of 0.3mm/s is predicted to be exceeded at three of the receptors considered in **Table 4.19**. This will be mitigated and minimised through the measures described later in this chapter, which will be secured through the **CoCP**.

iii. **Inter-relationship effects**

4.6.40 The potential for noise impacts on ecological receptors is considered in **Chapter 7**, on amenity and recreational receptors in **Chapter 8**, and on heritage receptors is considered in **Chapter 9** of this volume.

c) **Operation**

i. **Operational noise**

4.6.41 Road traffic noise levels were predicted using the calculation method described in Calculation of Road Traffic Noise to assess the potential impact of the proposed Yoxford roundabout.

- 4.6.42 Road traffic flow data have been used to predict levels at each receptor, or receptor group for reference cases occurring during peak construction, and once all construction work at the main development site is complete (2028 and 2034, respectively). The road traffic flow data used is shown in **Appendix 4A**.
- 4.6.43 The recommended approach for the assessment of noise from a new road scheme is set out in Document LA111 (part of DMRB, Ref 4.13). This document recommends that the noise level resulting from the use of a new road scheme is considered against the level which would exist in the absence of the scheme. It recommends that the opening year and a future year are considered, where the future year is generally taken to be 15 years after opening, but is intended to represent the year with the greatest increase after opening.
- 4.6.44 In the case of this proposed Yoxford roundabout, the highest flows are likely to occur soon after the roundabout is completed, in 2028, as the baseline flows along the road would be increased as a result of the additional construction traffic for Sizewell. In the future year 2034, approximately ten years after the opening year, traffic flows would be reduced as construction traffic would cease at this time. Therefore, for this assessment, these two years have been assessed using the criteria recommended in LA111 for short term and long term noise level changes for 2028 and 2034, respectively.
- 4.6.45 Noise level predictions were made of the daytime and night-time road traffic noise levels, in terms of the LA_{10,18h} (façade) and L_{night} (free field) parameters respectively, with the development operational for 2028, for 2028, busiest period and for 2034. Predicted levels along with the effects of these levels are shown in **Tables 4.20, 4.21 and 4.22**.

Table 4.20: Predicted level differences and effects for the peak construction year (in 2028)

Receptor		Baseline 2028		With Development 2028		Difference, dB		Effect	
		Day, LA _{10,18h} , dB	Night, L _{night} , dB	Day, LA _{10,18h} , dB	Night, L _{night} , dB	Day	Night	Day	Night
1	Woodlands Cottage	73.7	60.5	73.6	60.6	-0.1	0.1	Negligible	Negligible

Receptor		Baseline 2028		With Development 2028		Difference, dB		Effect	
		Day, LA10, 18h, dB	Night, Lnight, dB	Day, LA10, 18h, dB	Night, Lnight, dB	Day	Night	Day	Night
2	Satis House (Hotel)	68.9	57.8	69.3	58.2	0.4	0.4	Negligible	Negligible
3	Satis Coach House	62.4	53.3	62.9	53.3	0.5	0.0	Negligible	Negligible
4	White House	77.1	62.0	76.7	62.0	-0.4	0.0	Negligible	Negligible
5	Sans Souci	72.8	60.1	72.4	59.9	-0.4	-0.2	Negligible	Negligible
6	Pinn's Piece	66.0	56.3	66.4	56.5	0.4	0.2	Negligible	Negligible
7	Rookery Lodge	67.8	57.7	68.6	57.9	0.8	0.2	Negligible	Negligible
8	The Cottage	60.6	51.8	62.6	53.9	2.0	2.1	Minor adverse.	Minor adverse.
9	Sunnypatch	65.6	54.1	67.8	56.9	2.2	2.8	Minor adverse.	Minor adverse.
10	The Limes	73.7	60.7	73.5	60.9	-0.2	0.2	Negligible	Negligible
11	Tinkers	74.2	60.9	74.2	61.2	0.0	0.3	Negligible	Negligible
12	Holly House	73.5	60.5	73.4	60.7	-0.1	0.2	Negligible	Negligible
13	Medway & White House Cottages	73.8	60.6	73.7	60.8	-0.1	0.2	Negligible	Negligible
14	The Old Barn	71.8	57.5	73.8	60.2	2.0	2.7	Minor adverse.	Minor adverse.
15	Rookery Cottages	62.3	53.0	64.3	55.4	2.0	2.4	Minor adverse.	Minor adverse.
16	Wormley Bury, Rosewood, Southern	73.8	60.9	73.7	61.1	-0.1	0.2	Negligible	Negligible
17	Kings Head PH	74.4	60.9	74.3	61.0	-0.1	0.1	Negligible	Negligible
18	Frith House	55.5	49.5	56.7	50.2	1.2	0.7	Minor adverse.	Negligible

Receptor		Baseline 2028		With Development 2028		Difference, dB		Effect	
		Day, LA10, 18h, dB	Night, Lnight, dB	Day, LA10, 18h, dB	Night, Lnight, dB	Day	Night	Day	Night
19	Pinns Cottage	48.8	47.5	49.3	47.6	0.5	0.1	Negligible	Negligible
20	Garden Cottage and Clock House	48.7	39.1	50.9	41.7	2.2	2.6	Minor adverse.	Minor adverse.
21	Cavan Cottage	70.1	58.7	70.0	58.9	-0.1	0.2	Negligible	Negligible
22	Manger Cottage	58.9	50.7	59.5	50.4	0.6	-0.3	Negligible	Negligible
23	Meadowbarn	58.4	50.0	59.4	50.4	1.0	0.4	Minor adverse.	Negligible
24	Hopton Yard E of Old Barn	62.7	52.4	64.7	54.8	2.0	2.4	Minor adverse.	Minor adverse.
25	Honeycroft	61.1	52.1	63.1	54.5	2.0	2.4	Minor adverse.	Minor adverse.

Table 4.21: Predicted level differences and effects during the busiest period for the peak construction year (in 2028)

Receptor		Baseline 2028		With development 2028 (busiest period)		Difference, dB		Effect	
		Day, LA10, 18h, dB	Night, Lnight, dB	Day, LA10, 18h, dB	Night, Lnight, dB	Day	Night	Day	Night
1	Woodlands Cottage	73.7	60.5	73.6	60.6	-0.1	0.1	Negligible	Negligible
2	Satis House (Hotel)	68.9	57.8	69.3	58.2	0.4	0.4	Negligible	Negligible
3	Satis Coach House	62.4	53.3	62.9	53.3	0.5	0.0	Negligible	Negligible

Receptor		Baseline 2028		With development 2028 (busiest period)		Difference, dB		Effect	
		Day, LA10, 18h, dB	Night, Lnight, dB	Day, LA10, 18h, dB	Night, Lnight, dB	Day	Night	Day	Night
4	White House	77.1	62.0	76.7	62.0	-0.4	0.0	Negligible	Negligible
5	Sans Souci	72.8	60.1	72.4	59.9	-0.4	-0.2	Negligible	Negligible
6	Pinn's Piece	66.0	56.3	66.4	56.5	0.4	0.2	Negligible	Negligible
7	Rookery Lodge	67.8	57.7	68.6	57.9	0.8	0.2	Negligible	Negligible
8	The Cottage	60.6	51.8	62.6	53.9	2.0	2.1	Minor adverse.	Minor adverse.
9	Sunnypatch	65.6	54.1	67.8	56.9	2.2	2.8	Minor adverse.	Minor adverse.
10	The Limes	73.7	60.7	73.5	60.9	-0.2	0.2	Negligible	Negligible
11	Tinkers	74.2	60.9	74.2	61.2	0.0	0.3	Negligible	Negligible
12	Holly House	73.5	60.5	73.4	60.7	-0.1	0.2	Negligible	Negligible
13	Medway & White House Cottages	73.8	60.6	73.7	60.8	-0.1	0.2	Negligible	Negligible
14	The Old Barn	71.8	57.5	73.8	60.2	2.0	2.7	Minor adverse.	Minor adverse.
15	Rookery Cottages	62.3	53.0	64.3	55.4	2.0	2.4	Minor adverse.	Minor adverse.
16	Wormley Bury, Rosewood, Southern	73.8	60.9	73.7	61.1	-0.1	0.2	Negligible	Negligible
17	Kings Head PH	74.4	60.9	74.3	61.0	-0.1	0.1	Negligible	Negligible
18	Frith House	55.5	49.5	56.7	50.2	1.2	0.7	Minor adverse.	Negligible
19	Pinns Cottage	48.8	47.5	49.3	47.6	0.5	0.1	Negligible	Negligible

Receptor		Baseline 2028		With development 2028 (busiest period)		Difference, dB		Effect	
		Day, LA10, 18h, dB	Night, Lnight, dB	Day, LA10, 18h, dB	Night, Lnight, dB	Day	Night	Day	Night
20	Garden Cottage and Clock House	48.7	39.1	50.9	41.7	2.2	2.6	Minor adverse.	Minor adverse.
21	Cavan Cottage	70.1	58.7	70.0	58.9	-0.1	0.2	Negligible	Negligible
22	Manger Cottage	58.9	50.7	59.5	50.4	0.6	-0.3	Negligible	Negligible
23	Meadowbarn	58.4	50.0	59.5	50.4	1.1	0.4	Minor adverse.	Negligible
24	Hopton Yard E of Old Barn	62.7	52.4	64.7	54.8	2.0	2.4	Minor adverse.	Minor adverse.
25	Honeycroft	61.1	52.1	63.1	54.5	2.0	2.4	Minor adverse.	Minor adverse.

Table 4.22: Predicted level differences and effects for the operational year (in 2034)

Receptor		Baseline 2028		With development 2034.		Difference, dB		Effect	
		Day, LA10, 18h, dB	Night, Lnight, dB	Day, LA10, 18h, dB	Night, Lnight, dB	Day	Night	Day	Night
1	Woodlands Cottage	73.7	60.5	73.7	60.4	0.0	-0.1	Negligible	Negligible
2	Satis House (Hotel)	68.9	57.8	69.4	58.0	0.5	0.2	Negligible	Negligible
3	Satis Coach House	62.4	53.3	62.7	53.2	0.3	-0.1	Negligible	Negligible
4	White House	77.1	62.0	76.8	61.8	-0.3	-0.2	Negligible	Negligible
5	Sans Souci	72.8	60.1	72.4	59.7	-0.4	-0.4	Negligible	Negligible

Receptor		Baseline 2028		With development 2034.		Difference, dB		Effect	
		Day, LA10, 18h, dB	Night, Lnight, dB	Day, LA10, 18h, dB	Night, Lnight, dB	Day	Night	Day	Night
6	Pinn's Piece	66.0	56.3	66.4	56.4	0.4	0.1	Negligible	Negligible
7	Rookery Lodge	67.8	57.7	68.6	57.7	0.8	0.0	Negligible	Negligible
8	The Cottage	60.6	51.8	60.4	51.7	-0.2	-0.1	Negligible	Negligible
9	Sunnypatch	65.6	54.1	65.3	54.5	-0.3	0.4	Negligible	Negligible
10	The Limes.	73.7	60.7	73.6	60.7	-0.1	0.0	Negligible	Negligible
11	Tinkers	74.2	60.9	74.3	61.0	0.1	0.1	Negligible	Negligible
12	Holly House.	73.5	60.5	73.5	60.5	0.0	0.0	Negligible	Negligible
13	Medway & White House Cottages	73.8	60.6	73.8	60.6	0.0	0.0	Negligible	Negligible
14	The Old Barn	71.8	57.5	71.3	57.5	-0.5	0.0	Negligible	Negligible
15	Rookery Cottages	62.3	53.0	61.8	52.9	-0.5	-0.1	Negligible	Negligible
16	Wormley Bury, Rosewood, Southern	73.8	60.9	73.8	61.0	0.0	0.1	Negligible	Negligible
17	Kings Head PH	74.4	60.9	74.4	61.0	0.0	0.1	Negligible	Negligible
18	Frith House	55.5	49.5	56.6	50.1	1.1	0.6	Negligible	Negligible
19	Pinns Cottage	48.8	47.5	49.2	47.6	0.4	0.1	Negligible	Negligible
20	Garden Cottage and Clock House	48.7	39.1	49.8	39.9	1.1	0.8	Negligible	Negligible
21	Cavan Cottage	70.1	58.7	70.1	58.7	0.0	0.0	Negligible	Negligible
22	Manger Cottage	58.9	50.7	59.3	50.4	0.4	-0.3	Negligible	Negligible
23	Meadowbarn	58.4	50.0	58.9	50.4	0.5	0.4	Negligible	Negligible

Receptor		Baseline 2028		With development 2034.		Difference, dB		Effect	
		Day, L _{A10, 18h} , dB	Night, L _{night} , dB	Day, L _{A10, 18h} , dB	Night, L _{night} , dB	Day	Night	Day	Night
24	Hopton Yard E of Old Barn	62.7	52.4	62.2	52.3	-0.5	-0.1	Negligible	Negligible
25	Honeycroft	61.1	52.1	60.7	52.1	-0.4	0.0	Negligible	Negligible

4.6.46 In 2028 there would be nine receptors (or groups of receptors) which would experience a minor adverse effect as a result of the additional Sizewell C construction road traffic using the roundabout. These properties are The Cottage, Sunnypatch, The Old Barn, Rookery Cottages, Frith House, Garden Cottage / Clock House, Meadowbarn, Hopton Yard E of Old Barn and Honeycroft. The same outcome occurs in the busiest period of 2028. All other receptors would experience a negligible effect. There would be no significant effects.

4.6.47 In 2034, once Sizewell construction traffic is no longer present, all receptors would experience a negligible change in road traffic noise. The effect would be **not significant**.

4.6.48 The identification of locations where the SOAEL might be exceeded as a result of the proposed development has been approached in a proportionate manner, taking account of the effect of the scheme and existing conditions.

4.6.49 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 to either, but it should be recognised that the proposed scheme or development-generated traffic would need to be a substantial cause of any exceedances, and that exceedances of the SOAEL that pre-date the project are not considered to result from the project.

4.6.50 The road traffic noise levels set out in **Tables 4.20, 4.21 and 4.22** have been assessed against the daytime and night time SOAEL values, and for those receptors where the SOAEL is predicted to be exceeded, the change has

been considered to determine whether the proposed development is the substantial cause, which is defined in this instance as causing a change of at least +1dB.

4.6.51 It can be seen from **Tables 4.20, 4.21 and 4.22** that the SOAEL is exceeded in at least one period at the following receptors, and the cause of that exceedance is considered to be the proposed development, i.e. the change in road traffic is at least 1dB:

- Sunnypatch (both 2028 scenarios);
- The Old Barn (both 2028 scenarios);
- Rookery Cottages (2028 busiest day only);
- Hopton Yard East of Old Barn (2028 busiest day only).

4.6.52 The SOAEL is not expected to be exceeded in the long term, i.e. once the Sizewell C project is operational.

4.6.53 This assessment will be repeated as part of the **Noise Mitigation Scheme (Volume 2, Appendix 11H)**. Where exceedances of the SOAEL are confirmed, the provisions set out in the **Noise Mitigation Scheme** will apply and exceedances of the SOAEL will be avoided.

4.6.54 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.

4.6.55 The assessment that will be carried under the **Noise Mitigation Scheme** will have the benefit of more accurate information on vehicle numbers and vehicle routing strategies, once a contractor is appointed.

ii. Inter-relationship effects

4.6.56 The potential for noise impacts on ecological receptors is considered in **Chapter 7** of this volume, on amenity and recreational receptors in **Chapter 8** of this volume, and on heritage receptors is considered in **Chapter 9** of this volume.

4.7 Mitigation and monitoring

4.7.1 Where possible, mitigation measures have been proposed where a significant effect is predicted to occur. Primary and tertiary mitigation measures which have been accounted for as part of the assessment are summarised in **section 4.5** of this chapter. Where other mitigation is required to reduce or avoid a significant effect, this is referred to as secondary mitigation.

4.7.2 This section describes the proposed secondary mitigation measures for the noise and vibration.

a) Mitigation

i. Construction

4.7.3 Exact working methods and plant to be used will not be determined until a contractor is appointed, and therefore precise details of additional mitigation measures cannot yet be given. Some reduction in levels may be achieved by the use of screening. The exact location and height of screening would be dependent on a number of factors, including:

- the detailed construction programme and equipment specifications;
- on-site constraints (space, topography or other ecological or geographical feature which may prevent or limit screening);
- the dis-benefit arising from visual impact of screening;
- the environmental impact from the construction of screening; and
- the amount of time over which the reduction would be required.

4.7.4 A balance will need to be struck between the above factors to decide on the extent of screening in each set of circumstances. It is likely that some reduction would be possible in some locations during the construction phase, but the benefit of screening in relation to noise impact in many circumstances may be outweighed by the dis-benefit in relation to visual impacts.

4.7.5 Reductions in noise levels at receptors may also be achieved by altering working methods, such as phased working, reduced complement of plant in close proximity, and reducing or avoiding noisier activities during Saturday between 13:00 and 19:00 hours.

4.7.6 Since exact construction working methods to be used would not be decided until after approval of the development consent order application, it is not possible to provide precise details of additional mitigation measures which may be possible or necessary. However, it is envisaged that the following measures may be required for the construction at the proposed Yoxford roundabout site:

- during site set-up and clearance, acoustic screening around the temporary contractor compound, installed prior to the works. This could include a solid 2.4m high acoustic-grade barrier/hoarding, which would reduce noise levels by 5 dB, and reduce the impact at nearby receptors;
- during the use of wood chippers, the chipper could be located at least 10m from the tree-line (and away from the receptors), and a tow vehicle or similar would need to be parked immediately alongside to act as a partial screen/sound barrier orientated to the benefit of the closest receptor. The potential benefit of the extra 10m, and the partial barrier would be approximately 7 dB $L_{Aeq,12hr}$;
- during the main construction phase works noise levels could be reduced at nearby receptors using acoustic covers applied to mesh fencing erected around the percussion works area. This would result in a 5dB $L_{Aeq,T}$ reduction in level, to these receptors; and
- for work occurring between 13:00 and 19:00 hours on a Saturday, measures may include screening and changing working methods and times, including limiting noisy activities on Saturday afternoons.

4.7.7 It is envisaged that the following measures may be required for the construction at the proposed A12/A144 junction improvements site:

- localised screening during road breaking works.

ii. Operation

4.7.8 There are no significant adverse effects expected during the operational phase. No mitigation is therefore proposed for the operational phase.

b) Monitoring

4.7.9 Routine monitoring of noise and vibration will be carried during construction out as proposed in the **CoCP** (Doc Ref. 8.11). Provision will be made as necessary for monitoring of noise and vibration levels in the event of complaints being received from occupiers of noise sensitive receptors, or on request of the local authorities.

4.8 Residual Effects

4.8.1 The following tables (**Tables 4.23, 4.24, 4.25** and **4.26**) present a summary of the noise and vibration assessment.

4.8.2 Tables **4.23** and **4.25** identify the receptor(s) 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 4.23** and **4.25** are as per **Table 4.15**

4.8.3 Tables **4.24** and **4.26** also relate to the construction and operational phases respectively, identifying the assessment outcomes against LOAEL and SOAEL.

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Table 4.23: Summary of effects for the construction phase

Receptor	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
Yoxford roundabout construction.					
8, 9, 15, 24	Noise from site preparation works, Monday to Friday 07:00 to 19:00 hours and Saturday 07:00 to 13:00 hours.	The standard of good practice outlined in BS 5228-1 and BS 5228-2 will be followed, as set out in the CoCP (Doc Ref. 8.11).	Moderate adverse.	Screening, working methodology to be considered – to designed once details of construction approach has been further developed.	Minor adverse (not significant)
18, 19, 20, 22, 25			Minor adverse.		Minor adverse (not significant)
All other receptors.			Negligible		Negligible (not significant)
8	Noise from site preparation works, Saturday 13:00 to 19:00 hours.	The standard of good practice outlined in BS 5228-1 and BS 5228-2 will be followed, as set out in the CoCP (Doc Ref. 8.11).	Major adverse	Screening, working methodology to be considered – to designed once details of construction approach has been further developed.	Minor adverse (not significant)
9, 15, 18, 19, 24			Moderate adverse.		Minor adverse (not significant)
20, 22, 25			Minor adverse.	Minimising noisy activities between 13:00 and 19:00 on Saturdays.	Minor adverse (not significant)
All other receptors.			Negligible		Negligible (not significant)
2, 3, 6, 7, 8, 9, 15, 18, 22	Noise from main construction works, Monday to Friday 07:00 to 19:00 hours and Saturday 07:00 to 13:00 hours.	The standard of good practice outlined in BS 5228-1 and BS 5228-2 will be followed, as set	Moderate adverse.	Screening, working methodology to be considered – to designed once details of construction	Minor adverse (not significant)
5, 19, 20, 23, 24, 25			Minor adverse.		Minor adverse (not significant)

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Receptor	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
All other receptors.		out in the CoCP (Doc Ref. 8.11).	Negligible	approach has been further developed.	Negligible (not significant)
7, 18, 22	Noise from main construction works, Saturday 13:00 to 19:00 hours.	The standard of good practice outlined in BS 5228-1 and BS 5228-2 will be followed, as set out in the CoCP (Doc Ref. 8.11).	Major adverse	Screening, working methodology to be considered – to designed once details of construction approach has been further developed.	Minor adverse (not significant)
2, 3, 5, 6, 8, 9, 15, 19, 20			Moderate adverse.		Minor adverse (not significant)
23, 24, 25			Minor adverse.	Minimising noisy activities between 13:00 and 19:00 on Saturdays.	Minor adverse (not significant)
All other receptors.			Negligible		Negligible (not significant)
9	Vibration during compaction of temporary constructors compound.	The standard of good practice outlined in BS 5228-2 will be followed, as set out in the CoCP (Doc Ref. 8.11).	Minor adverse	None	Minor adverse, (not significant)
8	Vibration during earthworks.		Minor adverse		Minor adverse (not significant)
All other receptors.	Vibration during all phases of construction.		Negligible		Negligible (not significant)
Proposed A12/A144 Junction Improvement Works South of Bramfield.					
1 and 2	Noise from construction works	The standard of good practice outlined in BS 5228-1 and BS 5228-2 will be followed, as set	Minor adverse	Screening, working methodology to be considered – to designed once details of construction	Minor adverse or negligible (not significant)

NOT PROTECTIVELY MARKED

Receptor	Impact	Primary or Tertiary Mitigation	Assessment of Effects	Additional Mitigation	Residual Effects
		out in the CoCP (Doc Ref. 8.11).		approach has been further developed.	
All other receptors			Negligible	None	Negligible (not significant)
1	Vibration during use of a small (twin-drum) vibratory roller compactor	The standard of good practice outlined in BS 5228-2 will be followed, as set out in the CoCP (Doc Ref. 8.11).	Minor adverse	None	Minor adverse (not significant)
All other receptors			Negligible		Negligible (not significant)

Table 4.24: Summary of assessment against LOAEL / SOAEL for construction

Phase of Works or Activity	Assessment Against SOAEL/LOAEL	Comment
Noise from construction works – Yoxford Roundabout	<p>SOAEL expected to be exceeded at one receptor during main weekday daytime works, with exceedances of the lower SOAELs outside the main weekday daytime works at a further 19 receptors.</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 section 4.5 on Environmental Design and Mitigation, and through the implementation of the CoCP.</p>

NOT PROTECTIVELY MARKED

Phase of Works or Activity	Assessment Against SOAEL/LOAEL	Comment
Vibration from construction works – Yoxford Roundabout	<p>No exceedances of SOAEL expected.</p> <p>LOAEL likely to be exceeded at four receptors when works undertaken at shortest separation distances.</p>	<p>No actions required to avoid significant adverse effects on health or quality of life.</p> <p>Exceedances of the LOAEL will be mitigated and minimised through the adoption of the measures detailed in section 4.5 on Environmental Design and Mitigation, and through the implementation of the CoCP.</p>
Noise from construction works – Bramfield Improvements	<p>SOAEL expected to be exceeded at two receptors during main weekday daytime works and periods outside the main weekday daytime works. 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 section 4.5 on Environmental Design and Mitigation, and through the implementation of the CoCP.</p>
Vibration from construction works – Bramfield Improvements	<p>No exceedances of SOAEL expected.</p> <p>LOAEL likely to be exceeded at four receptors when works undertaken at shortest separation distances.</p>	<p>No actions required to avoid significant adverse effects on health or quality of life.</p> <p>Exceedances of the LOAEL will be mitigated and minimised through the adoption of the measures detailed in section 4.5 on Environmental Design and Mitigation, and through the implementation of the CoCP.</p>

NOT PROTECTIVELY MARKED

Table 4.25: Summary of effects for the operational phase –Yoxford Roundabout

Receptor	Impact	Primary or Tertiary Mitigation	Assessment effects	of	Additional Mitigation	Residual Effects
The Cottage, Sunnypatch, The Old Barn, Rookery Cottages, Frith House, Garden Cottage / Clock House, Meadowbarn, Hopton Yard E of Old Barn and Honeycroft.	Noise from operation of the road in 2028 and in 2028, busiest period	None	Minor adverse.		None	Minor adverse (not significant)
All other receptors.			Negligible			Negligible (not significant)
All receptors.			Negligible			Negligible (not significant)
	During operation in 2034.					

NOT PROTECTIVELY MARKED

Table 4.26: Summary of assessment against LOAEL / SOAEL for operation

Phase of Works or Activity	Assessment Against SOAEL/LOAEL	Comment
Noise from operation of the proposed development – Yoxford Roundabout	<p>SOAEL expected to be exceeded at four locations in short term, with no exceedances in the long term.</p> <p>LOAEL likely to be exceed at most locations</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>Adverse effects on health and quality of life will be mitigated and minimised through the measures set out in section 4.5 on Environmental Design and Mitigation.</p>

NOT PROTECTIVELY MARKED

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- 4.13 Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration <http://www.standardsforhighways.co.uk/ha/standards/dmr/vol11/section3/LA%20111%20Noise%20and%20vibration-web.pdf> [Accessed Jan 2020]
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