

**Hawke Ridge Business Park Ltd and Bellway
Homes Ltd**

Land at Hawke Ridge Business Park

Environmental Statement: Volume 1, Main Text

Chapter 9: Noise and Vibration





9. NOISE AND VIBRATION

INTRODUCTION

9.1 This Chapter of the ES assesses the likely environmental effects of the Proposed Development, with respect to noise and vibration. The existing and likely future ambient noise levels are considered in order to demonstrate site suitability and to allow consideration of potential effects at existing noise sensitive receptors in the surrounding area.

9.2 In the context of this assessment, noise is defined as unwanted or undesirable sound derived from sources such as road traffic, or construction works that interfere with normal activities, including conversation, sleep or recreation. Vibration is defined as the transmission of energy through the medium of ground or air resulting in small movements of the transmitting medium, such as a building, which can cause discomfort or even damage to structures if the movements are large enough.

9.3 Described within this Chapter is the relevant legislative and policy framework; the assessment methodology; the baseline conditions at the Application Site and surroundings; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed.



ASSESSMENT METHODOLOGY

Construction Phase Methodology

9.4 The impact of noise and vibration during construction of the Proposed Development requires calculation and assessment in accordance with the guidance presented in BS 5228 1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Noise' (Ref. 9.1).

9.5 The following elements are considered to have the potential to give rise to significant effects during the construction stage of the Proposed Development and have, therefore, been considered within this ES chapter:

- Noise from development related construction activities affecting nearby existing sensitive receptors; and
- Vibration from on-site construction activities affecting nearby existing sensitive receptors.

Changes in Road Traffic Flows

9.6 The impact at existing residential receptors due to changes in noise level resulting from changes in traffic flow as a result of the operational development has been assessed in accordance with the guidance presented in the Design Manual for Roads and Bridges (DMRB) (Ref. 9.2).

9.7 The future 'with development' scenario has been considered against the future 'without development' scenario based on the traffic flow data for the year 2031, as provided by the transport consultants, in order to identify the impact of the introduction of the Proposed Development.

Noise at Proposed Residential Properties

Ambient Noise

9.8 Computer noise modelling has been used to calculate the ambient noise levels across the Application Site. The ambient noise at residential dwellings is assessed against the guidance provided by BS 8233:2014 (Ref. 9.3) for both the day and night-time period. Night-



time maximum noise levels are assessed against the guideline noise level for the onset of sleep disturbance provided by the WHO Guidelines for Community Noise (Ref. 9.4).

9.9 The ambient noise levels for the year 2031 have been calculated to ensure future noise levels are appropriately considered.

Music Noise

9.10 Noise arising from the Venom night club within the West Wilts trading estate is unlikely to give rise to significant effects due to the intervening distance of nearly ½ km. However, to ensure suitable noise levels are attained the average ambient noise levels measured during a Saturday night period are assessed against an appropriate noise rating (NR) curve adopted from the DEFRA report *Noise from Pubs and Clubs* (Ref. 9.5).

Assumptions and Limitations

9.11 The adopted construction noise levels are representative of continuous activity and therefore are likely to provide a cautious assessment of the likely impacts. The calculated noise levels are therefore likely to be higher than those observed in practice. Construction noise levels have been calculated based on typical noise levels for construction activities.

9.12 The road noise levels were calculated using the traffic data provided within this ES and measurements obtained during the noise survey. The calculations used within this chapter are considered suitably representative of the ambient environment at the Proposed Development.

9.13 The assessment of the change in noise levels across existing road links is based on the provided traffic flow data. The data includes future committed development within the surrounding area. Any changes to the calculated traffic flows may provide a material change to this assessment. Any decrease in flows related to the Proposed Development may change the calculated effect significance due to road traffic flows.



METHODOLOGY FOR DEFINING EFFECTS

Sensitivity

9.14 The criteria set out in Table 9.1 below have been applied to identify noise/vibration sensitive receptors either on or adjacent to the Application Site.

Table 9.1 Noise and Vibration Receptors

Sensitivity	Description	Receptor
High	Receptors that are especially susceptible to noise/vibration	Residential dwellings, Schools, Hospitals, Care Homes
Moderate	Receptors where a reasonable degree of noise disturbance is acceptable	Offices
Low	Receptors where noise is tolerable	Retail shops, restaurants
Negligible	Receptors where noise is not likely to be a factor	Sports Grounds, commercial and industrial environments

Construction Noise

9.15 Noise levels generated by construction activities have the potential to impact upon nearby noise-sensitive receptors. However, the magnitude of the potential impact will depend upon a number of variables, such as:

- the noise generated by plant or equipment used on site;
- the period of time that construction plant is operational;
- the distance between the noise source and the receptor; and
- the level of likely attenuation due to ground absorption and barrier effects.

9.16 The construction noise impact considers the noise magnitude and adverse effect levels as provided in the Noise Policy Statement for England (NPSE) (Ref. 9.6) and the Planning Policy Guidance (PPG) (Ref. 9.7) provided by the Department for Communities & Local Government in its on-line planning guidance to assist with interpretation of the NPPF (Ref. 9.8) as shown in Table 9.2.



Table 9.2 Construction Noise Magnitude

Day	Time (hours)	Averaging Period T	LOAEL $L_{Aeq,T}$ (dB)	SOAEL $L_{Aeq,T}$ (dB)*
Mondays to Fridays	0700 - 0800	1 hour	60	70
	0800 - 1800	10 hours	65	75
	1800 - 1900	1 hour	60	70
	1900 - 2200	1 hour	55	65
Saturdays	0700 - 0800	1 hour	60	70
	0800 - 1300	5 hours	65	75
	1300 - 1400	1 hour	60	70
	1400 - 2200	1 hour	55	65
Sundays & Public Holidays	0700 - 2200	1 hour	55	65
Any night	2200 - 0700	1 hour	45	55

* The measured levels should be monitored in order to ensure that the levels presented in the table are not exceeded for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months.

9.17 Threshold values for the onset construction impacts are required to allow quantitative assessment of construction noise levels and the above table has been used to inform derivation of threshold criteria. The adopted values used to define the magnitude of change for construction noise impacts are based on the values presented in Table 9.3.

Table 9.3 Weekday Threshold Ranges for Construction Levels

Impact	Negligible	Low	Medium	High
Construction Noise Level, $L_{Aeq,T}$ dB	< 65	65 – 70	70 - 75	> 75

9.18 It is worth noting that the purpose of the target construction noise criteria is to control the impact of construction noise insofar as is reasonably practicable, whilst recognising that it is unrealistic for developments of this nature to be constructed without causing some degree of disturbance in the locality. Hence, even if the criteria adopted for this assessment is achieved, noise from construction activities is likely to be readily noticeable. It is further noted that the local authority may restrict the hours of construction and construction related traffic on the Application Site.

Construction Vibration

9.19 Vibration may be impulsive, such as that due to hammer-driven piling; transient, such as that due to vehicle movements along a railway; or continuous, such as that due to vibratory driven piling. The primary cause of community concern generally relates to building damage



from both construction and operational sources of vibration, although, the human body can perceive vibration at levels which are substantially lower than those required to cause building damage.

9.20 Damage to buildings associated solely with ground-borne vibration is not common and although vibration may be noticeable, there is little evidence to suggest that they produce cosmetic damage such as a crack in plaster unless the magnitude of the vibration is excessively high. The most likely impact, where elevated levels of vibration do occur during the construction phase, is associated with perceptibility.

9.21 BS 5228 indicates that the threshold of human perception to vibration is around 0.15mm/s, although it is generally accepted that for the majority of people vibration levels in excess of between 0.15 and 0.3 mm/s peak particle velocity (PPV) are just perceptible. A PPV of above 1.0 mm/s is identified as likely to cause complaint, but can be tolerated if early warning and explanation is given to residents.

9.22 Accordingly 1 mm/s ppv has been selected as the target criteria to control the impact of construction vibration, with the criteria for assessing the magnitude of vibration impacts according to the margin by which this target criterion is achieved or exceeded presented in Table 9.4.

9.23 This target criterion is based on the guidance contained within BS 5228, experience from previous sites and accepted vibration policy criteria across a range of enforcing authorities elsewhere in the UK. The limits are presented in terms of peak particle velocity (PPV) as it is the simplest indicator for both perceptibility and building damage.

Table 9.4 Ground-vibration impact levels for permanent residential buildings

Vibration		
Lowest Observed Adverse Effect Level	PPV mm/s	1
Significant Observed Adverse Effect Level	PPV mm/s	10

9.24 Again, it is worth noting that the purpose of the target construction vibration criteria is to control the impact of construction vibration insofar as is reasonably practicable and is entirely based on the likelihood of the vibration being perceptible, rather than causing damage to property. Hence, although vibration levels in excess of 1 mm/s ppv would be considered a Moderate Adverse impact in respect of the likelihood of perceptibility, they would not be



considered significant in terms of the potential for building damage, which would require levels of at least 15 mm/s ppv to result in minor cosmetic damage in light / unreinforced buildings.

9.25 There are currently no British Standards that provide a methodology to predict levels of vibration from construction activities, other than that contained within BS 5228 which relates to percussive or vibratory piling only. Therefore, it is not possible to accurately calculate levels of vibration during the site preparation and construction phases of the Proposed Development.

9.26 Notwithstanding the above, the empirical predictors for groundborne vibration arising from mechanized construction works provided within BS 85228 have been adapted to provide an indication of the distances where impacts may begin to occur. The adopted calculation is based on vibratory piling and is considered to constitute a cautious consideration when applied to all construction activity.

9.27 The resultant thresholds for identification of vibration impacts at residential dwellings, and calculated distances for the likely onset of these values, are presented in Table 9.5.

Table 9.5 Thresholds for ground-vibration effects at permanent residential buildings

Effect Significance	PPV Threshold	Indicative Distance, m
Negligible	< 0.3	> 185.1
Minor	0.3 - 1	73.3 - 185.1
Moderate	1 – 10	12.5 – 73.3
Major	> 10	< 12.5

Effect Magnitude: Completed Development

Ambient Noise

9.28 The aim of noise policy within the UK is to protect individuals from excessive noise levels both in the workplace and within their homes. It has been recognised that severe annoyance to individuals due to noise can lead to sleep disturbance and adverse health effects.

9.29 The NPPF does not give a set of criteria for external noise assessment and therefore guidance within contemporary British Standards and other internationally published documents has been considered.



9.30 For the purposes of this assessment, external noise levels for residential use have been applied to the residential accommodation and derived on the basis of internal noise criteria outlined in British Standard 8233 and World Health Organisation (WHO) guidance.

9.31 BS 8233 makes recommendations for the control of noise in and around buildings. It suggests appropriate criteria for different situations, and is primarily intended to guide the design of new or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate. The guidance provides desirable indoor ambient noise levels for dwellings which are summarised in Table 9.6 below.

Table 9.6 - Noise Criteria for Residential Use Buildings

Activity	Location	0700 to 2300	2300 to 0700
Resting	Living room	35 dB L _{Aeq,16 hour}	-
Dining	Dining room/area	40 dB L _{Aeq,16 hour}	-
Sleeping (daytime resting)	Bedroom	35 dB L _{Aeq,16 hour}	30 dB L _{Aeq,8 hour}

9.32 To allow a quantitative assessment of significant effects, impacts have been assigned based on the excess of the BS 8233 criteria and the typical façade reductions, as provided within BS 8233. Reductions of 15 dB and 33 dB are typically afforded for partially open and closed windows, respectively.

9.33 Accordingly, where a reduction of 15 dB is required to achieve the BS 8223 criteria this is an indication that no mitigation is required. The effect is therefore considered as Negligible.

9.34 A 3 dB increase in noise level is considered to constitute a perceptible change, with a 10 dB increase resulting in a perceived doubling in sound level. A Minor effect is considered to be present in instances up to 9 dB above the Negligible criteria, where a sound may be perceived as no more than twice as loud as noise levels at the Negligible threshold value. This results in a Minor effect significance where the criteria is exceeded by more than 15 dB and up to 24 dB.

9.35 Based on the 33 dB reduction provided within BS 8233 for closed windows, noise levels up to 33 dB above the BS 8233 criteria are controllable with typical insulated double glazing and adequate ventilation. A required façade reduction between 25 and 33 dB is therefore considered a Moderate Adverse effect.



9.36 Where the required façade reduction exceeds 33 dB, a Major Adverse effect is identified. Sufficient glazing and ventilation would be likely for habitable rooms that are subject to these effects in order to suitably reduce internal noise levels.

Table 9.7 Thresholds for Noise at Residential Dwellings

Impact	Negligible	Low	Medium	High
Reduction Required to Achieve BS 8233 Criteria	< 15	15 - 24	25 – 33	> 33

9.37 For all identified effects, the significance could be considered as Negligible with the installation of typical glazing and ventilation options. Where suitable glazing and ventilation options are required, windows may remain openable to allow for purge ventilation or to be used at the occupants' discretion.

9.38 BS8233:2014 states that for traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable.

9.39 In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

9.40 The internal noise levels recommended in BS 8233 are almost identical to those presented in WHO guidelines for community noise (internal to buildings). Internally, the WHO guidance is that in order to avoid sleep disturbance the period noise level (LAeq,T) should not exceed 30 dB and individual noise events should not exceed 45 dB L_{Amax}. Section 3.4 of the WHO Guidelines states that for good sleep, indoor noise levels should not exceed approximately 45 dB L_{Amax} more than 10-15 times a night. On the basis of the WHO's 15 dB façade insulation for windows partly open; this equates to external L_{Amax} of 60 dB that should not be exceeded more than 10-15 times per night.

9.41 It is also noted that typically, where a new commercial source is introduced, an assessment would be required in accordance with the methodology as provided within BS 4142.



Conversely however, BS 4142 states that “where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it ought to be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation.”

9.42 Further to the above, extant commercial activity would be suitably covered within the assessment of the completed development. Accordingly, internal ambient noise levels at residential properties, inclusive of any extant commercial activity, should remain below the threshold criteria provided in BS 8233.

Music Noise

9.43 The average 15-minute octave band noise level measured during a Saturday night-time period (club opening, 23:00-04:00) will be compared against the NR curves to identify the potential for significant effects. The weakest element of a façade is typically the glazing element, with the walls providing a greater level of attenuation. Accordingly, the reduction required to meet the NR curves will be considered against sample glazing units to identify whether the adopted music noise level is likely to give rise to adverse effects within habitable rooms during the night-time. The NR25 curve is adopted for the onset of effects, based on the DEFRA limits. The NR 35 curve is adopted as indicative of a Major effect, with an effect doubling in noise level over NR 25. The threshold criteria for night-time music noise are presented in Table 9.8.

Table 9.8 Noise Ratings Curves, Night-time

Effect	Criteria
Negligible	$\leq \text{NR25}$
Minor	$< \text{NR25} + 5$
Moderate	$< \text{NR25} + 10$
Major	$> \text{NR35}$

Changes in Road Traffic Noise Due to the Introduction of the Proposed Development

9.44 The impact of any changes in road traffic noise levels has been considered against the principles and guidance presented within the Design Manual for Roads and Bridges (DMRB) Document LA111 Noise and Vibration, 2020. DMRB presents an impact significance matrix for assessing the magnitude of changes in noise level for the short and long term and can be used as criteria for assessing the impact of any changes in road traffic noise levels, as shown in Tables 9.9 and 9.10.



9.45 In order to determine whether changes in traffic noise levels are likely to occur as a result of the Proposed Development noise levels have been calculated in accordance with the methodology contained within the Calculation of Road Traffic Noise (CRTN) (Ref. 9.9). Calculations are based on traffic flow data for the local road network both with and without the Proposed Development.

Table 9.9 Semantic Descriptors for Traffic Noise in the Short Term

Change in Noise Level $L_{A10,18hr}$ dB	Magnitude of Impact
0	No Change
0.1 to 0.9	Negligible
1 to 2.9	Minor
3 to 4.9	Moderate
5+	Major

Table 9.10 Semantic Descriptors for Traffic Noise in the Long Term

Change in Noise Level $L_{A10,18hr}$ dB	Magnitude of Impact
0	No Change
0.1 to 2.9	Negligible
3 to 4.9	Minor
5 to 9.9	Moderate
10+	Major

Effect Significance Matrix

9.46 The significance matrix has been adopted to guide the quantitative identification of significant effects. The sensitivity of the receptor is used in conjunction with the calculated magnitude of impact to identify a likely significant effect. The matrix presented in Table 9.11 does not allow for consideration of additional context and is therefore used as a guide. Professional judgement may be applied where necessary due to additional factors.

Table 9.11 Quantitative Derivation of Effect Significance

Derivation of Effect Significance		Magnitude of Impact			
		Negligible	Minor	Moderate	Major
Sensitivity	High	Negligible	Minor	Moderate	Major
	Moderate	Negligible	Negligible	Minor	Moderate
	Low	Negligible	Negligible	Negligible	Minor
	Negligible	Negligible	Negligible	Negligible	Negligible

9.47 Effects that are identified as being 'moderate' or 'major' adverse / beneficial are classified as significant effects.

BASELINE CONDITIONS

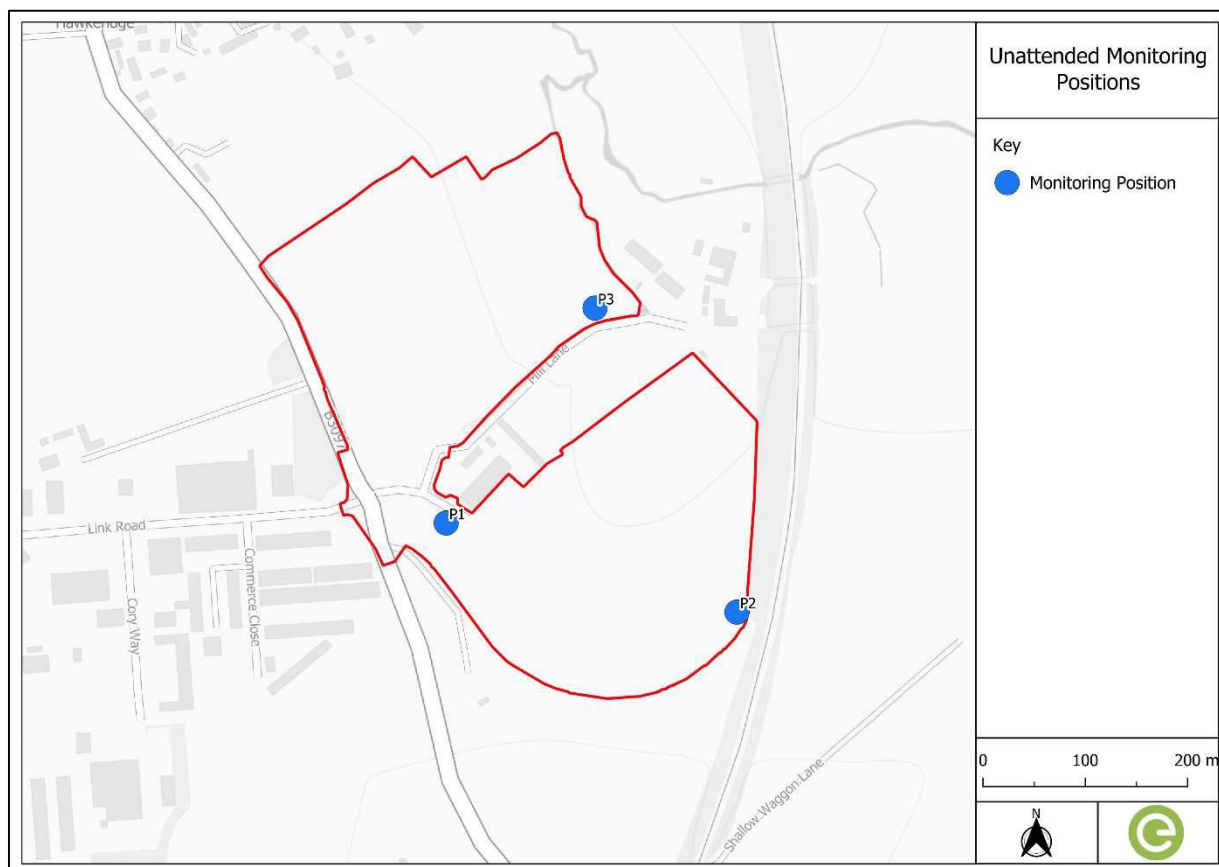
9.48 The baseline conditions across the Application Site have been determined by environmental noise measurements and subjective observations. The survey of baseline noise conditions at the Application Site was carried out between 26th February and 5th March 2026.

9.49 The primary purpose of the noise survey was to gather acoustic information on the sound levels at the Application Site during daytime and night-time periods. The ambient noise data is used to validate the computer model of noise levels for calculation of ambient noise levels.

9.50 Monitoring equipment was situated at positions overlooking existing commercial/industrial, Hawkeridge Road, and the Wessex Main Line.

9.51 Microphones were positioned approximately 1.8m above local ground and fitted with a protective windshield and all measurement equipment used during the noise surveys conformed to relevant Type 1 specifications. The noise measurement locations are shown in Figure 9.1.

Figure 9.1 Survey Positions





9.52 A summary of the unattended noise measurements is presented in Table 9.12.

Table 9.12 Summary of Unattended Noise Levels

Position	Measured Sound Pressure Level, dB re. 2×10^{-5} Pa.					
	Day Time (07:00 - 23:00)			Night-time (23:00 - 07:00)		
	$L_{Amax,F}$	$L_{Aeq,T}$	$L_{A90,T}$	$L_{Amax,F}$	$L_{Aeq,T}$	$L_{A90,T}$
P1	90.1	54.2	47.4	86.2	50.9	36.8
P2	91.3	54.7	43.1	83.0	50.9	37.4
P3	81.5	50.1	43.5	77.2	45.2	37.7

9.53 Measured noise data between the hours of 23:00 – 04:00 during the survey period are presented in Table 9.13. The average ambient level during a Saturday night has been adopted, with the residual sound level logarithmically subtracted to obtain a representative Music Noise Level. The residual sound level is adopted from the lowest measured octave band sound level measured across all equivalent night-time periods.

Table 9.13 Measured $L_{Aeq,15min}$ Noise Levels and Calculated Music Noise Level

Derivation of Indicative Music Noise Level (23:00 – 04:00)	Octave Band Sound Level, dB						
	63	125	250	500	1k	2k	4k
Period Average (28 th February)	53.0	50.7	44.3	38.5	40.8	38.0	43.8
Residual (lowest across survey)	54.7	49.8	41.9	38.2	40.5	35.5	42.4
Resultant Music Noise Level	53.0	43.5	40.4	25.8	28.9	34.4	38.1

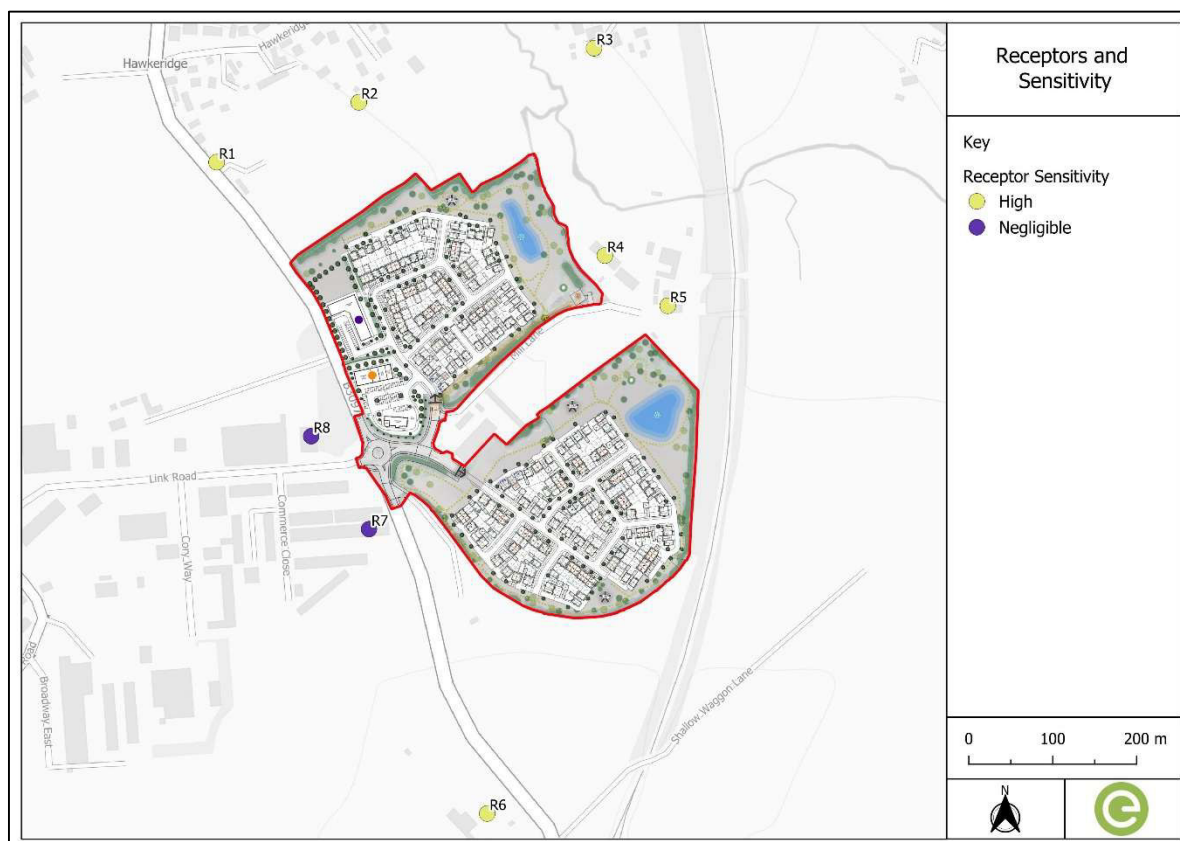
9.54 All noise measurements were undertaken by consultants competent in environmental noise monitoring, and, in accordance with the principles of BS 7445:2003 (Ref. 9.10). The broadband noise parameters of $L_{Aeq,T}$, $LA_{10,T}$, $LA_{90,T}$, and $L_{Amax,F}$ were recorded at each location.

9.55 On-site vibration levels were qualitatively assessed during the noise survey and no vibration was observed to be perceptible. It is therefore considered that a vibration survey was not required for the purpose of this assessment.

RECEPTORS AND RECEPTOR SENSITIVITY

9.56 Existing receptors identified for the assessment of construction activities and their respective sensitivities are presented in Figure 9.2. The proposed residential receptors are high sensitivity.

Figure 9.2 Construction Assessment Receptor Locations



9.57 The change in road traffic flows due to the Proposed Development is considered for the residential receptors on surrounding road links, which are high sensitivity.



IDENTIFICATION AND EVALUATION OF POTENTIALLY SIGNIFICANT EFFECTS

Construction Noise

9.58 The operation of equipment associated with site preparation and construction of the Proposed Development has the potential to result in noise effects at existing noise sensitive receptors in the vicinity.

9.59 The construction noise calculations have been undertaken for the noisiest construction phases to provide assessment levels at the nearest high sensitivity receptors. The highest noise levels are from plant usually associated with earthworks, piling, concreting, road pavement and general construction site activities. Typical facade noise levels have been adopted based on measurements of similar activities and are presented below. These are representative of continuous activity and are considered a worse-case consideration.

- Enabling works - 84 dB(A) at 10m
- CFA Piling - 85 dB(A) at 10m
- Sub Structure - 80 dB(A) at 10m
- Road pavement - 81 dB(A) at 10m
- Super Structure - 85 dB(A) at 10m

9.60 With regard to barrier attenuation effects, acoustic screening may be provided by any existing permanent structures on the intervening land between the proposed construction areas and receptor locations, in addition to the natural screening that may be afforded by the topography of the area. To provide a robust assessment however, the construction noise calculations assume no attenuation from site hoardings at receptor locations.

9.61 Construction noise levels have been calculated at the closest existing representative noise sensitive receptor locations. The calculations have been undertaken for both minimum and typical distances between the construction locations and the identified receptors. The construction noise levels therefore provide both a worse case consideration of temporary effects and indicative typical effects.

9.62 The identified separation distances are presented in Table 9.14.



Table 9.14 Separation Distances Between Construction Activities and Receptors, m

Receptor	Separation Distance, m	
	Closest Activity	Typical Distance
R1	135	400
R2	110	340
R3	145	380
R4	30	180
R5	50	210
R6	245	550
R7	50	250
R8	60	240

9.63 The calculated noise levels are shown in Table 9.15.

Table 9.15 Calculated Façade Construction Noise Levels

Receptor	Façade Noise Level at Nearest Receptors During Likely Phases of Construction, dB(A), $L_{Aeq,16hr}$				
	Enabling Works	Piling	Sub-structure	Roads	Super-structure
Closest Activity					
R1	60	59	54	55	59
R2	62	61	56	57	61
R3	60	56	51	52	56
R4	73	64	59	60	64
R5	69	61	56	57	61
R6	55	56	51	52	56
R7	69	67	62	63	67
R8	67	68	63	64	68
Typical Distance					
R1	51	52	47	48	52
R2	52	53	48	49	53
R3	51	52	47	48	52
R4	58	59	54	55	59
R5	57	58	53	54	58
R6	48	49	44	45	49
R7	55	56	51	52	56
R8	55	56	51	52	56

9.64 The resultant noise impacts are shown in Table 9.16.



Table 9.16 Calculated Construction Noise Impacts

Receptor	Calculated Noise Impacts During Likely Phases of Construction				
	Enabling Works	Piling	Sub-structure	Roads	Super-structure
Closest Activity					
R1	Negligible	Negligible	Negligible	Negligible	Negligible
R2	Negligible	Negligible	Negligible	Negligible	Negligible
R3	Negligible	Negligible	Negligible	Negligible	Negligible
R4	Medium	Negligible	Negligible	Negligible	Negligible
R5	Low	Negligible	Negligible	Negligible	Negligible
R6	Negligible	Negligible	Negligible	Negligible	Negligible
R7	Low	Low	Negligible	Negligible	Low
R8	Low	Low	Negligible	Negligible	Low
Typical Distance					
R1	Negligible	Negligible	Negligible	Negligible	Negligible
R2	Negligible	Negligible	Negligible	Negligible	Negligible
R3	Negligible	Negligible	Negligible	Negligible	Negligible
R4	Negligible	Negligible	Negligible	Negligible	Negligible
R5	Negligible	Negligible	Negligible	Negligible	Negligible
R6	Negligible	Negligible	Negligible	Negligible	Negligible
R7	Negligible	Negligible	Negligible	Negligible	Negligible
R8	Negligible	Negligible	Negligible	Negligible	Negligible

9.65 The resultant effect significance, with consideration to the sensitivity of the nearby receptors, is presented in Table 9.17.

Table 9.17 Calculated Construction Noise Effects

Receptor	Calculated Noise Effects During Likely Phases of Construction				
	Enabling Works	Piling	Sub-structure	Roads	Super-structure
Closest Activity					
R1	Negligible	Negligible	Negligible	Negligible	Negligible
R2	Negligible	Negligible	Negligible	Negligible	Negligible
R3	Negligible	Negligible	Negligible	Negligible	Negligible
R4	Moderate	Negligible	Negligible	Negligible	Negligible
R5	Minor	Negligible	Negligible	Negligible	Negligible
R6	Negligible	Negligible	Negligible	Negligible	Negligible
R7	Negligible	Negligible	Negligible	Negligible	Negligible
R8	Negligible	Negligible	Negligible	Negligible	Negligible
Typical Distance					
R1	Negligible	Negligible	Negligible	Negligible	Negligible
R2	Negligible	Negligible	Negligible	Negligible	Negligible
R3	Negligible	Negligible	Negligible	Negligible	Negligible
R4	Negligible	Negligible	Negligible	Negligible	Negligible
R5	Negligible	Negligible	Negligible	Negligible	Negligible
R6	Negligible	Negligible	Negligible	Negligible	Negligible
R7	Negligible	Negligible	Negligible	Negligible	Negligible
R8	Negligible	Negligible	Negligible	Negligible	Negligible



9.66 Close proximity works are calculated to result in short-term Minor to Negligible (not significant) effects. Activities at further distances are calculated to give rise to Negligible effects.

Construction Vibration

9.67 The likely worse case vibration impacts at the identified separation distances have been calculated based on the methodology provided within BS 5228-2. The calculated impacts are presented in Table 9.18.

Table 9.18 Calculated Construction Vibration Impacts

Receptor	Calculated Vibration Impacts During Likely Phases of Construction				
	Enabling Works	Piling	Sub-structure	Roads	Super-structure
Closest Activity					
R1	Low	Low	Low	Low	Low
R2	Low	Low	Low	Low	Low
R3	Low	Negligible	Negligible	Negligible	Negligible
R4	Medium	Low	Low	Low	Low
R5	Medium	Low	Low	Low	Low
R6	Negligible	Negligible	Negligible	Negligible	Negligible
R7	Medium	Low	Low	Low	Low
R8	Medium	Medium	Medium	Medium	Medium
Typical Distance					
R1	Negligible	Negligible	Negligible	Negligible	Negligible
R2	Negligible	Negligible	Negligible	Negligible	Negligible
R3	Negligible	Negligible	Negligible	Negligible	Negligible
R4	Low	Low	Low	Low	Low
R5	Negligible	Negligible	Negligible	Negligible	Negligible
R6	Negligible	Negligible	Negligible	Negligible	Negligible
R7	Negligible	Negligible	Negligible	Negligible	Negligible
R8	Negligible	Negligible	Negligible	Negligible	Negligible

9.68 The resultant effect significance, with consideration to the sensitivity of the nearby receptors, is presented in Table 9.19.

**Table 9.19 Calculated Construction Vibration Effects**

Receptor	Calculated Vibration Effects During Likely Phases of Construction				
	Enabling Works	Piling	Sub-structure	Roads	Super-structure
Closest Activity					
R1	Minor	Minor	Minor	Minor	Minor
R2	Minor	Minor	Minor	Minor	Minor
R3	Minor	Negligible	Negligible	Negligible	Negligible
R4	Moderate	Minor	Minor	Minor	Minor
R5	Moderate	Minor	Minor	Minor	Minor
R6	Negligible	Negligible	Negligible	Negligible	Negligible
R7	Negligible	Negligible	Negligible	Negligible	Negligible
R8	Negligible	Negligible	Negligible	Negligible	Negligible
Typical Distance					
R1	Negligible	Negligible	Negligible	Negligible	Negligible
R2	Negligible	Negligible	Negligible	Negligible	Negligible
R3	Negligible	Negligible	Negligible	Negligible	Negligible
R4	Minor	Minor	Minor	Minor	Minor
R5	Negligible	Negligible	Negligible	Negligible	Negligible
R6	Negligible	Negligible	Negligible	Negligible	Negligible
R7	Negligible	Negligible	Negligible	Negligible	Negligible
R8	Negligible	Negligible	Negligible	Negligible	Negligible

9.69 The effect significance is classed as up to Moderate in the short term at R4 and R5. Such effects may be perceived when activities take place within close proximity to a given receptor. However, any effects would be short term and effects during activities at typical distances are calculated as Minor to Negligible (not significant) at all receptor locations. Mitigation measures to further minimise the likelihood of adverse impact are discussed later in this Chapter.

Operational Phase

Ambient Noise

9.70 The future suitability of the Application Site for residential accommodation has been confirmed by considering the calculated noise contours and the guidance adopted for this Chapter.

9.71 Noise emission levels affecting the Proposed Development have been calculated using predictive computer noise modelling. Ambient noise levels have been calculated across the Application Site for both the day and night-time periods.



9.72 The primary noise source affecting the Proposed Development is identified as road traffic on Hawkrigde Road and the surrounding road network and rail traffic on the Wessex Main Line.

9.73 Road traffic has been modelled using the traffic data as provided within the ES and presented within **Appendix 9.3**.

9.74 Rail traffic has been modelled such that calculated noise levels are equal to the measured ambient daytime and night-time noise levels at position P2. This worst-case consideration assumes that all measured noise at P2 is attributable to rail movements and therefore provides a suitably cautious account for rail noise.

9.75 No significant noise was observed within the nearby West Wilts Trading Estate and Northacre Business Park ; however these have been modelled such that calculated noise levels are equal to the measured ambient daytime noise level at Position P1. This worst-case consideration assumes that all measured noise is attributable to commercial activity and therefore provides an overly cautious account for these sources.

9.76 The results of the ambient noise survey have been used to validate the noise emissions from the nearby sources. Following calculation based on the above, the modelled noise levels are in excess of the measured noise levels at all measurement/calculation positions. Accordingly, the model is suitable for assessment of ambient noise at the Application Site.

9.77 Following modelling of the existing scenario, the proposed road traffic flows for the year 2031 have been modelled. The 'with development' scenario includes the likely increased traffic due to the Proposed Development. Traffic flows adopted for completion of the computer noise model are presented in **Appendix 9.3**.

9.78 The resultant noise contours have been calculated at 1.5m above ground level for day and night-time periods. Calculated daytime and night-time noise contours are presented in **Appendix 9.4 and 9.5**.

9.79 Based on the noise contour values, residential effects at proposed houses are calculated as Minor to Negligible prior to consideration of any mitigation. Effects at the care home site would be Moderate, prior to consideration of mitigation. The level of attenuation required to attain the threshold criteria at proposed residential dwellings is presented in **Appendix 9.6**.



9.80 Based on the calculated noise contours and attenuation requirements, typical insulated double glazing and attenuated trickle ventilation is likely to be suitable. However, it would be prudent to specify glazing appropriately at facades overlooking Hawkeridge Road.

9.81 Where glazing/ventilation is selected based on the required level of attenuation, items should be selected such that R_w values take account of possible low frequency noise; the sound reduction index of each element should achieve the identified reduction after correction for the C_{tr} urban traffic noise spectrum. Ventilation should achieve this value when operational, to allow ventilation to the dwelling. Additionally, the glazing and ventilation installation must maintain the integrity of the façade with regards to noise insulation.

9.82 All effects are considered Negligible with the incorporation of appropriate façade glazing and ventilation, provided it does not compromise the façade with regards to noise reduction.

9.83 The daytime ambient noise contour shows that calculated ambient noise levels fall below the BS 8233 desirable level guideline noise level of 50 dB $L_{Aeq,T}$ across the proposed residential area.

9.84 Residential effects due to ambient noise levels are calculated to be Negligible (not significant).

Potential Music Noise

9.85 Octave band noise levels have been considered based on measurements undertaken at a position representative of the nearest proposed residential dwellings. Noise levels have been considered against the NR curves to allow for consideration of potential noise within residential rooms.

9.86 The club is understood to be open until as late as 04:00 and therefore noise levels during the night-time period 23:00 – 04:00 has been considered. The resultant level is not significantly high and based on the survey data it is unlikely that noise from the night club would be readily perceptible at ½ km from the venue.

9.87 Calculation of the level of attenuation required to attain NR25 is provided in Table 9.20. Sample glazing has been included to demonstrate whether suitable attenuation can be attained.



Table 9.20 Consideration of Music Noise

Calculation	Octave Band Sound Level, dB						
	63	125	250	500	1k	2k	4k
Derived Music Noise Level	53.0	43.5	40.4	25.8	28.9	34.4	38.1
NR35 Noise Rating Curve	55	44	35	29	25	22	20
Requirement	-0.3	-4.3	-8.9	-5.9	-13.9	-16.2	-21.8
<i>Pilkington 6-16-6.8 Optiphon Double Glazing</i>	0.0	0.0	-5.4	0.0	-3.9	-12.4	-18.1

9.88 The octave band $L_{eq,15min}$ levels indicate that the level of reduction required to mitigate the unlikely worst case noise levels can be attained by commercially available glazing and that internal levels can be attenuated to below the NR25 curve. Given the minimal required reduction, it is likely that music noise may even be adequately controlled with partially open windows and would be readily controlled by the level of attenuation required for typical ambient noise levels, as indicated in **Appendix 9.6**.

9.89 Effects would therefore be Negligible (not significant).

Changes in Road Traffic Noise – Existing Residential Receptors

9.90 The traffic flow data provided within the Transport Assessment has been used as the basis for the road traffic noise assessment. The 18-hour Annual Average Weekday Total (AAWT) flows were provided for the year 2031 both with and without the Proposed Development.

9.91 Traffic noise has been calculated using the CRTN methodology. The DMRB assessment criteria has been used to quantify the magnitude of any change in noise level resulting from the Proposed Development at the roadside of the existing road network for the year 2031.

9.92 The calculated changes in noise level on existing road links, identified with respect to the road traffic noise impact assessment criteria, are presented in Table 9.21.



Table 9.21 Change in Noise Level on Local Road Network in, 2031

Road Link	Calculated BNL, 2031		BNL Change
	Without Dev	With Dev	
A363 WHBP	68.7	69.2	0.5
B3097 North of HRBP	71.9	71.7	-0.1
B3097 Philips Way	70.5	71.2	0.6
B3097 South of HRBP	67.9	69.0	1.1
Link Road (WWTE)	67.8	67.9	0.0
Station Road (North)	68.1	68.8	0.7
A350 Haynes Road	69.0	69.3	0.3
A350 Warminster Road	70.1	70.3	0.2

9.93 Calculated effects due to changes in road traffic noise levels are Minor to Negligible (not significant).

INTER-RELATIONSHIP EFFECTS

9.94 There are inter-relationships with the transport chapter as identified through the use of traffic data within the assessment. These effects are considered as part of the assessment and the traffic flows are included within the computer noise model. No other inter-relationships with other topics are identified.

MITIGATION

Construction Mitigation

9.95 To control the impact of noise during construction of the Proposed Development, contractors will ensure that works are carried out in accordance with best practicable means (BPM) as described in BS 5228 comprising of the following:

- Where possible, 'silenced' plant and equipment will be used;
- Where vehicles are standing for a significant period of time, engines will be switched off;
- Acoustic enclosures will be fitted where possible to suppress noisy equipment;
- Plant will operate at low speeds, where possible, and incorporate automatic low speed idling;
- Where possible, electrically driven equipment will be selected in preference to internal combustion powered, hydraulic power in preference to pneumatic and wheeled in lieu of tracked plant;



- All plant will be properly maintained (greased, blown silencers replaced, saws kept sharpened. Teeth set and blades flat, worn bearings replaced etc);
- Consideration will be given to temporary screening or enclosures for static noisy plant to reduce noise emissions and plant should be certified to meet any relevant EC Directives;
- All contractors will be made familiar with the guidance in BS 5228 (Parts 1 & 2) which will form a pre-requisite of their appointment; and
- Early and good public relations with the adjacent tenants and occupants of buildings will also reduce the likelihood of complaints.

9.96 These general measures to control construction noise should be incorporated within the Construction Environmental Management Plan (CEMP) and/or detailed in construction method statements. By adopting the recommended best practicable means, construction noise levels can typically be reduced by 10 dB(A).

Residential Dwellings

9.97 Typical insulated double glazing and attenuated ventilation is likely to suitably reduce noise levels to attain the residential criteria. Where windows are required to be closed to achieve the criteria, ventilation should allow for sufficient airflow whilst maintaining the integrity of the façade with regard to noise insulation.

9.98 Examples of façade mitigation include acoustic air bricks, trickle ventilation and mechanical ventilation. As above, any passive or mechanical system must allow for sufficient airflow whilst maintaining the integrity of the façade with regard to noise insulation.

9.99 Garden areas are calculated to fall below the BS 8233 desirable level for external amenity and no mitigation requirements are identified.



RESIDUAL EFFECTS

Construction Phase

9.100 Typical construction noise levels are calculated to remain below the 75 dB LAeq,T criterion noise level and identified effects are not significant.

9.101 Construction noise and vibration effects are likely to be Negligible during the majority of activities. Moderate short term effects are calculated at R4 and R5 during close proximity works and BPM measures should be adopted to ensure the likelihood of effects is reduced as far as practicable.

Operational Phase - Site Suitability

9.102 Noise levels within the residential area would fall below the BS 8233 criteria, following consideration of typical glazing and ventilation. The residual noise effect is considered to be Negligible (not significant).

9.103 The calculated Music Noise Level is readily controllable with level of attenuation required to control typical ambient noise and effects are therefore not significant.

Operational Phase - Road Traffic Noise

9.104 The calculated noise changes indicate that effects would be Minor to Negligible (not significant).



CUMULATIVE EFFECTS

9.105 Nearby developments that may potentially give rise to cumulative effects are identified below. Consideration of potential noise related cumulative effects are presented below.

Construction

9.106 The construction activity at future committed development sites has the potential to cause localised noise disturbance around each development site. However, it is not known whether the construction activities from each development will occur at the same time as those on the Application Site.

9.107 Construction activities may give rise to cumulative effects in instances where construction activity takes place in close proximity to an identified receptor at both the Application Site and a nearby development site. The nearest sites to the Proposed Development are:

- Hawkeridge Road; and
- Glenmore Farm

9.108 With consideration to the short-term nature of the identified effects and the nature of effects during typical distances it is unlikely that combined activities would give rise to cumulative effects higher than those already identified.

9.109 There are therefore unlikely to be any cumulative effects from construction noise at other development.

Completed Development

9.110 The noise and vibration assessment has considered the combined road traffic movements from these future committed developments as part of the calculated future baseline conditions. Noise effects from changes in road traffic are identified to be not significant. Accordingly, there are no identified additional cumulative effects at proposed residential receptors.



SUMMARY

9.111 This chapter has considered the likely significant environmental effects of the Proposed Development with respect to noise and vibration. These include the effects of existing conditions on the Proposed Development and the effects of noise and vibration generated by the Proposed Development on surrounding properties, during both construction and operational phases.

9.112 The assessment has been based on a computer noise model, informed and validated using environmental noise measurements and traffic data provided for the surrounding road links.

9.113 The impact of noise and vibration during construction of the Proposed Development has been calculated and assessed in accordance with BS 5228. Generic mitigation measures have been recommended, which when implemented are capable of ensuring that the impact of noise and vibration during the construction of the Proposed Development is adequately controlled.

9.114 An assessment has been carried out in accordance with the adopted criteria to determine the likely residential effects at proposed dwellings. Ambient noise levels are identified as readily controllable with typical insulated double glazing and attenuated trickle ventilation, and effects are identified as not significant.

9.115 The impact of the increase in road traffic associated with the Proposed Development has been assessed. Likely effects due to any increase in road traffic are identified as Minor to Negligible for all calculated road links.

9.116 A summary of the noise significance and residual effects for the Application Site are presented in Table 9.22.



Table 9.22 Noise Summary Table

Potential Effect	Nature of Effect (Permanent or Temporary)	Significance	Mitigation/ Enhancement Measures	Residual Effects
Construction				
Construction Noise at surrounding receptors	Direct, Temporary Short-Term Local	Negligible (Minor to Negligible Temporary)	Implementation of Best Practicable Means to control noise emissions	Negligible (Minor to Negligible Temporary)
Construction Vibration at surrounding receptors	Direct, Temporary Short-Term Local	Minor to Negligible (Moderate to Negligible Temporary)	Implementation of Best Practicable Means to control vibration	Minor to Negligible (Moderate to Negligible Temporary)
Completed Development				
Ambient noise at proposed residential receptors	Direct, Permanent Long-Term Local	Moderate to Negligible	Incorporation of suitable glazing and attenuated ventilation	Negligible
Noise from changes in road traffic noise at existing residential receptors	Direct, Permanent Long-Term Local	Minor to Negligible	None	Minor to Negligible



REFERENCES

Ref. 9.1: British Standard 5228:-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise

Ref. 9.2: Design Manual for Roads and Bridges (DMRB) Document LA111 Noise and Vibration, 2020

Ref. 9.3: British Standard 8233: 2014 Sound Insulation and Noise Reduction for Buildings

Ref. 9.4: World Health Organisation (WHO): 1999, 'Guidelines for Community Noise', WHO, Geneva

Ref. 9.5: Noise from Pubs and Clubs, DEFRA, 2005

Ref. 9.6: Noise Policy Statement for England, 2010 (NPSE)

Ref. 9.7: Planning Policy Guidance PPG24 'Planning and Noise'. 1994 The Stationary Office, 1994

Ref. 9.8: The National Planning Policy Framework, December 2024, Ministry of Housing, Communities & Local Government

Ref. 9.9: The Department for Transport, 1988, 'Calculation of Road Traffic Noise (CRTN)', The Stationary Office

Ref. 9.10: British Standard 7445: 2003: Description and measurement of environmental noise. BSI, 2003