15 Noise & Vibration

15.1 Introduction

15.1.1 This Chapter of the ES has been produced by RPS Consulting Services Ltd.

15.1.2 This chapter presents the assessment of the likely significant noise and vibration effects resulting from the Proposed Development.

15.1.3 The assessment has been undertaken based on appropriate information on the Proposed Development provided by the Applicant and its project team. RPS is a member of the Association of Noise Consultants (ANC), the representative body for acoustics consultancies, having demonstrated the necessary professional and technical competence. The assessment has been undertaken with integrity, objectivity and honesty in accordance with the Code of Conduct of the Institute of Acoustics (IOA) and ethically, professionally and lawfully in accordance with the Code of Ethics of the ANC.

15.1.4 The technical content of this assessment has been provided by RPS personnel, all of whom are corporate (MIOA) or non-corporate, associate members (AMIOA) of the IOA, the UK's professional body for those working in acoustics, noise and vibration. This chapter has been peer reviewed within the RPS team to ensure that it is technically robust and meets the requirements of the company's Quality Management System.

15.1.5 The chapter details the methodology followed, a review of the baseline conditions in the defined study area, and the results of the assessment to establish whether any likely significant noise and vibration effects would arise. The assessment has been carried out in accordance with legislation and industry applicable guidance, of which further details are provided in Appendix 15.1.

15.1.6 An assessment of site suitability, which assesses the effects of the existing environment on the Proposed Development (both residential and educational), is provided in Appendix 15.2.

15.1.7 The following Appendices are to be read in conjunction with this Chapter;

- Appendix 15.1 – Legislation and Guidance
- Appendix 15.2 – Acoustic Design Statement & Site Suitability Assessment
- Appendix 15.3 – Baseline Sound Survey
- Appendix 15.4 – Traffic Data and Assessment
- Appendix 15.5 – Construction Traffic Data and Assessment

15.2 Assessment methodology

Predicting effects

Scoping Exercise

15.2.1 A Scoping Report was submitted to Wokingham Borough Council (WBC) in December 2024 (Appendix 5.1). This included the following with regard to Noise and Vibration:

- Legislation and guidance considered

- Assessment methodology
- Proposed Noise Sensitive Receptors (NSRs) to be considered in the assessment
- Proposed baseline noise monitoring locations
- An overview of the baseline noise environment
- Potential impacts and effects

15.2.2 The Scoping Report stated construction noise and vibration, and operational noise, would be considered as part of the ES. It was proposed that an assessment of operational vibration impacts be scoped out of the ES.

15.2.3 An EIA Scoping Opinon was received from WBC in February 2025 (Appendix 5.2) in which the following comments, dated 20th December 2024, were received from the Environmental Health Department at WBC to the Scoping Opinion and have been considered within this assessment: :

"Noise.

A noise impact assessment is to be carried out to identify any mitigation measures required to ensure that the amenity of the proposed properties as well as neighbouring properties are not adversely affected by noise.

The noise assessment shall be carried out by a suitably qualified acoustic consultant/engineer and shall take into account the provisions of ProPG: Planning & Noise Professional Practice Guidance 2017 on Planning & Noise and mitigate to achieve BS8233: 2014 and World Health Organisation guidelines for Community Noise standards.

This report is to identify a clear scheme of recommended works, to minimise the effects of noise associated with the proposed development, both on nearby noise sensitive receptors and on future occupants of the development.

The scheme shall be submitted for approval to the local authority and implemented prior to the first occupation and be permanently maintained thereafter.

Reason - To protect the occupiers of nearby premises from unreasonable noise levels. Relevant policy: NPPF Section 15 (Conserving and Enhancing the Natural Environment), Core Strategy policies CP1 and CP3 and Managing Development Delivery Local Plan policy CC06

Plant/Machinery to be attenuated.

All fixed plant/machinery installed or operated in connection with the carrying out of this permission shall be enclosed and/or attenuated so that noise output does not exceed at any time a level of 5dB[A] below the existing background noise level when measured at a point one metre external to the nearest residential or noise sensitive property.

Any recommended noise mitigation measures should be retained and maintained thereafter.

Reason - To ensure that no nuisance or disturbance is caused to the occupiers of properties. Relevant policy: NPPF Section 15 (Conserving and Enhancing the Natural Environment), Core Strategy policies CP1 and CP3 and Managing Development Delivery Local Plan policy CC06."

Receptor Sensitivity

15.2.4 The sensitivity of each receptor to noise and vibration has been evaluated based on a review of its relative status against benchmark definitions, in line with those set out in Table 15.1.

Table 15.1 Value/sensitivity assessment

Receptor value / sensitivity	Receptor type
High	Receptors where noise/vibration may critically affect their function, e.g. hospital operating theatres. For vibration, receptors with highly sensitive processes such as electron microscopes and some micro-electronic manufacturing equipment.
Medium	Receptors where noise may affect their function, e.g. houses, schools, rest homes and hotels. For vibration, receptors with moderately sensitive processes such as laboratories and some micro-electronic manufacturing equipment.
Low	Receptors where noise minimally affects their function, e.g. offices and shops.
Negligible	Receptors where noise negligibly affects their function, e.g. workshops and factories.

Magnitude of Impact

15.2.5 The magnitude of impact has been determined by considering the estimated change resulting from the Proposed Development compared to the baseline conditions. The magnitude of impact criteria differs depending on the scenario being assessed. The criteria for each scenario are set out in the following paragraphs.

Construction Noise

15.2.6 The full quanta and types of construction plant and activities required for the construction of the Proposed Development will not be known until a construction contractor has been appointed. Therefore, a qualitative assessment of the potential significance of noise and vibration effects on noise sensitive receptors (NSRs) during the construction of the Proposed Development has been undertaken. The assessment follows the guidance contained within BS 5228-1:2009+A1:2014[1] (BS 5228 Part 1) and DMRB LA 111[2].

15.2.7 In the context of the assessment methodology adopted for this ES, the sensitivity of NSRs to noise from construction sites is based on the use and/or activity that takes place at the receptor, and the existing levels of ambient noise. Typically, NSRs are less sensitive to construction noise in areas where existing ambient levels are high.

15.2.8 The magnitude of construction noise impacts is based on their levels relative to baseline conditions and the duration over which the impacts occur. Levels of construction noise at an individual NSR will vary throughout the construction of the Proposed Development and depend upon what activities are being carried out and how close they are to the NSR. Whilst accepting that levels may be higher or lower on individual days, the impact magnitudes described in the following tables are, in general, to be interpreted based on the long-term average noise levels.

[1] British Standards Institution. British Standard 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites - Part 1: Noise
[2] Highways England. Design Manual for Roads and Bridges. LA 111 Noise and vibration. 2020

15.2.9 DMRB LA 111[2] provides the following guidance for determining the Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL) [3]for construction noise and for determining the magnitude of impacts. These are summarised in Table 15.2 and Table 15.3.

Table 15.2 Construction Time Period – LOAEL and SOAEL

Time Period	LOAEL	SOAEL
Weekdays (07:00 – 19:00 hours) **Saturday (07:00 – 13:00 hours)**	Baseline sound levels, $L_{Aeq,T}$	Threshold level determined as per BS 5228 Part 1
Evenings (19:00 – 23:00 hours) **Saturdays (13:00 – 23:00 hours)** **Sundays (07:00 – 23:00 hours)**		
Night (23:00 – 07:00 hours)		

Table 15.3 Magnitude of impact – Construction Noise

Magnitude	Description
High	$L_{Aeq,T} \geq$ SOAEL + 5 dB
Medium	SOAEL $\leq L_{Aeq,T} <$ SOAEL + 5 dB
Low	LOAEL $\leq L_{Aeq,T} <$ SOAEL
Negligible	$L_{Aeq,T} \leq$ LOAEL

Construction Traffic Noise

15.2.10 A temporary change in noise level may occur due to contributions from construction related traffic during construction of the Proposed Development.

15.2.11 DMRB LA111[2] has been used to define the methodology to assess any potential impact of construction related traffic and determine its impact.

15.2.12 The change in the Basic Noise Level (BNL) due to the introduction of additional vehicles onto local highways as part of the construction of the Proposed Development has been calculated using the method outlined in the CRTN[4] which considers:

- the change in traffic flow due to construction traffic;
- vehicle speed; and
- the percentage of Heavy Duty Vehicles (HDVs).

15.2.13 The CRTN[3] methodology is suitable only for traffic flows of over 1,000 vehicles per 18-hour day, hereafter referred to as 'standard roads'.

15.2.14 The 18-hour BNL $L_{A10,18h}$ for 'standard roads' is calculated using the linear equation for Chart 3 of CRTN[3], reproduced in Equation 1 below. This equation is empirically derived and depends upon the traffic flow *Q*:

Equation 1: $L_{10,18hr} = 29.1 + 10 \log_{10} Q$

[3] Further information on LOAEL and SOAEL is provided in Appendix 1
[4] Department of Transport. Calculation of Road Traffic Noise. HMSO. 1988

15.2.15 This BNL is adjusted by a correction *C* to account for variations in mean traffic speed (*V)* and the percentage of HDVs (*p)* using the empirically derived equation in Chart 4 of CRTN[3], as given by Equation 2 below.

$$\text{Equation 2: } C = 33\log_{10}\left(V + 40 + \frac{500}{V}\right) + 10\log_{10}\left(1 + \frac{5p}{V}\right) - 68.8$$

15.2.16 Where the traffic flow *Q* is between 1,000 and 4,000 vehicles per day, this level is subject to further correction *K*, calculated for an assumed slant distance *d'* = 10 m, using Equation 3:

$$\text{Equation 3: } K = -16.6\left(\log_{10}\left(\frac{30}{d'}\right)\right)\left(\log_{10}\left(\frac{Q}{4000}\right)\right)$$

15.2.17 The table to Section 14.2 of CRTN presents a range of traffic speeds in km/h to be used for different road classifications, and these have been used as appropriate for the assessment of standard roads presented in this Chapter.

15.2.18 The magnitude of impact presented in Table 15.4 below has been applied in this assessment. This presents different levels of impact based on the change in construction traffic Basic Noise Level (BNL) $L_{A10,18hour}$.

Table 15.4 Magnitude of Impact – Construction Traffic Noise

Magnitude	Increase in BNL of closest public road used for construction traffic (dB)
High	BNL ≥ 5
Medium	3 ≤ BNL < 5
Low	1 ≤ BNL < 3
Negligible	BNL < 1

Construction Vibration

15.2.19 A qualitative assessment of the potential significance of vibration effects on NSRs during the construction of the Proposed Development has been undertaken. The assessment follows the guidance of BS 5228 2:2009+A1:2014[5] (BS 5228 Part 2) and DMRB LA111[2].

15.2.20 As discussed previously, the full quanta and types of construction plant and activities required for the construction of the Proposed Development will not be known until a construction contractor has been appointed. The magnitude of construction vibration impacts is based on the human response to vibration in buildings, measured as Peak Particle Velocity (PPV). The following PPV values, as taken from BS 5228 Part 2[4] has been used to determine the significance of any construction vibration effects within this assessment.

[5] British Standards Institution. British Standard 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration

Table 15.5 Construction Vibration PPV Effect

Vibration Level, PPV, mm/s	Effect
PPV ≥ 10	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments
1 ≤ PPV < 10	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
0.3 ≤ PPV < 1	Vibration might be just perceptible in residential environments.
PPV < 0.3	Vibration might be just perceptible in the most sensitive situations for most vibration frequences associated with construction. At lower frequencies, people are less sensitive to vibration.

15.2.21 DMRB LA 111[2] provides the following guidance for determining the LOAEL and SOAEL for construction vibration, with reference to BS 5228 Part 2[4], to determine the magnitude of impacts. There are summarised in Table 15.6 and Table 15.7.

Table 15.6 Construction Time Period – LOAEL and SOAEL

Time Period	LOAEL	SOAEL
All time periods	0.3 mm/s PPV	1.0 mm/s PPV

Table 15.7 Magnitude of impact – Construction Vibration

Magnitude	Description
High	PPV ≥ 10 mm/s
Medium	SOAEL ≤ PPV < 10 mm/s
Low	LOAEL ≤ PPV < SOAEL
Negligible	PPV ≤ LOAEL

Operational Noise

15.2.22 Once constructed, residential developments do not inherently generate any noise other than traffic, unless the development includes other significant sources of noise. In this case the Proposed Development does include some aspects of employment development, outdoor sports facilities, and schools.

15.2.23 At this stage, the exact end use of these areas is unknown, although it is understood that this would comprise of Class E, F and Sui Generis uses, which can be carried out in a residential area without detriment to its amenity. As such, it is not possible to undertake a detailed assessment of potential noise impacts or the requirement for any mitigation to avoid significant, or unacceptable, impacts.

15.2.24 However, Class E, F and Sui Generis uses are typically located close to residential areas and, through appropriate design of the employment land uses, it would be readily achievable for these areas to operate without causing significant adverse noise impact at proposed or existing NSRs and for an appropriate level of residential amenity to be provided.

15.2.25 The main noise source of concern with Class E, F and Sui Generis uses is plant noise for heating / ventilation of the building, as well as potentially refrigeration units for food premises. This also applies to the proposed schools which will have plant associated with their use.

15.2.26 Once specific details are known regarding the proposed use, including plant details, it is recommended that a noise impact assessment is undertaken in accordance with BS 4142:2014+A1:2019[6]. This should form part of the subsequent detailed/reserved matters applications, in order to demonstrate that noise emissions would not result in significant impact and detail any mitigation measures that may be required.

15.2.27 In general, following the guidance in BS 4142:2014+A1:2019[5], Table 15.8 can be used to define the magnitude of impact associated with commercial/industrial noise.

Table 15.8 Operational Noise - Determination of Magnitude Of Impact

Magnitude	Difference Between Rating Level and Background Sound Level	BS 4142 Semantic Description
High	> 10 dB	A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
Medium	5 to 10 dB	A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
Low	0 to 5 dB	Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.
Negligible	-10 to 0 dB	

15.2.28 On the basis of the above, medium or high noise impacts associated with commercial/industrial activity/operation of the schools, would only be expected when the difference between the Rating Level and Background Sound Level is at least 5 dB.

15.2.29 It is acknowledged that in their Scoping Opinion response dated 20th December 2024, WBC have requested operational plant noise from the Proposed Development is not to exceed 5 dB below the background sound level, 1 m from the façade of the nearest NSR (see paragraph

[6] British Standards Institution. British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

15.2.3). In accordance with BS 4142:2014+A1:2019[5], an assessment of plant noise should be undertaken on free-field noise levels (i.e. 3.5 m away from reflective surfaces). As background sound levels have been captured in free-field locations, it is appropriate to correct these to façade levels, to ensure the correct limit is applied.

Operational Traffic Noise

15.2.30 In addition to the operational noise from the Proposed Development, vehicle movements to and from the Proposed Development have the potential to generate additional noise at NSRs located in the immediate vicinity of the local road network.

15.2.31 The methodology within DMRB LA111[2] has been used to assess any potential impact of operational related traffic noise on NSRs. Traffic data has been provided by the appointed transport consultant within the Project Team, to allow this assessment to be undertaken.

15.2.32 DMRB LA111[2] considers the traffic noise change in the short term and long term. These terms are calculated as follows:

- Short term: Do Minimum Opening Year (DMOY) compared against Do Something Opening Year (DSOY); and
- Long-term: DMOY compared against Do Something Future Year (DSFY)

15.2.33 This potential noise impact has been considered using the calculated road traffic noise levels, without and with the Proposed Development. The magnitude of any change in noise levels at NSRs has been determined in accordance with the criteria in Table 15.9. This replicates Table 3.54a and 3.54b from DMRB LA111[2].

Table 15.9 Magnitude of Impact – Operational Traffic

Magnitude	Change in Noise Level	
	Short-term	Long-term
High	> 5 dB	> 10 dB
Medium	3.0 – 4.9 dB	5.0 – 9.9 dB
Low	1.0 – 2.9 dB	3.0 – 4.9 dB
Negligible	0.1 – 0.9 dB	0.1 – 2.9 dB

15.2.34 DMRB LA111[2] also requires the consideration of LOAELs and SOAELs associated with road traffic noise which are set out in Table 15.10 below.

Table 15.10 Traffic noise LOAEL and SOAEL

Time period	SOAEL	LOAEL
Daytime	68 dB $L_{A10,18h}$ (façade) 63 dB $L_{Aeq,16h}$ (free-field)	55 dB $L_{A10,18h}$ (façade) 50 dB $L_{Aeq,16h}$ (free-field)
Night	55 dB $L_{night,outside}$ (free-field)	40 dB $L_{night,outside}$ (free-field)

15.2.35 The noise assessment for changes in road traffic on site access routes follows guidance of DMRB LA111. The assessment considers the significance of noise level changes using criteria

based on the classification of impact and noise levels with respect to the LOAEL and SOAEL as follows:

- a potential significant adverse effect arises for moderate or major impacts (i.e. an increase of 3 dB or more in the short-term) where noise levels are above LOAEL; or for minor, moderate or major impacts (i.e. an increase of 1 dB or more in the short-term) where noise levels are above SOAEL; and
- in all cases professional judgement is used to determine if a significant adverse effect arises that includes consideration of the sources of noise, the causes of the change in noise levels, the magnitude of the impact and noise levels relative to LOAEL and SOAEL.

15.2.36 Further discussion of LOAELs and SOAELs is provided in Appendix 15.1.

Significance of Effect

15.2.37 The overall significance of effects, detailed in Table 15.11, has been determined taking into account sensitivity and magnitude of impact, as set out above.

Table 15.11 Level of effect

Receptor Sensitivity	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Substantial	Major	Moderate	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

15.2.38 A ‘Moderate’ or greater effect is considered to result in a significant effect, with ‘Minor’ or ‘Negligible’ effects considered not significant.

15.2.39 DMRB LA 111 states the following with regard to durations to be considered in the assessment of significant effects associated with construction:

‘Construction noise [and vibration] and construction traffic noise [and vibration] shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

1) 10 or more days in any 15 consecutive days or nights;

2) a total number of days exceeding 40 in any 6 consecutive months’

15.2.40 Due to the scale of the Proposed Development, these criteria are assumed to be exceeded for all construction activities.

15.2.41 Further comment is provided in Note C of Table B.1 in Annex B of BS 5228 Part 2[4] which states the following with regard to construction vibration:

‘Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6475-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.’

15.2.42 In line with BS 5228 Part 2[4], professional judgement has been used to assess whether a significant effect occurs, based on the occurrence of any vibration generating events, to determine if it is significant in line with EIA terminology.

Geographic Scope

Construction excluding traffic

15.2.43 The geographical scope of the construction noise and vibration assessment has been defined based on guidance within DMRB LA 111[2]. Note 1 of paragraph 3.5 of DMRB LA111[2] states the following regarding construction NSRs:

'A study area of 300 m from the closest construction activity is normally sufficient to encompass noise sensitive receptors.'

15.2.44 Similarly, Note 1 of paragraph 3.29 of DMRB LA111[2] states the following regarding construction vibration sensitive receptors:

'A study area of 100 m from the closest construction activity with the potential to generate vibration is normally sufficient to encompass vibration sensitive receptors.'

15.2.45 The NSRs selected for the construction noise and vibration assessments are based on their sensitivity in line with Table 15.1, and proximity to the works. The NSRs are representative of the impact at their location, but also that of neighbouring properties. By selecting the closest NSRs, the predicted impacts are typical of the worst affected receptors. Receptors further away will experience an impact lesser to that reported within this assessment.

Construction traffic

15.2.46 In regard to construction traffic, a study area of 50 m from any existing roads that are predicted to be subject to an increase in traffic noise level of at least 1.0 dB as a result of the construction of the Proposed Development, has been adopted, as required by DMRB LA111[2].

Operational Noise

15.2.47 There is no available guidance to define the study area associated with all operational noise sources within the scope of this assessment. Therefore, in the absence of such guidance, the study area for the assessment of all operational noises has been defined based on guidance within DMRB LA 111[2], which is specific to operational road traffic noise. Note 1 of paragraph 3.44 states:

'An operational study area defined as the following can be sufficient for most projects, but it can be reduced or extended to ensure it is proportionate to the risk of likely significant effects:

1) the area within 600 m of new road links or road links physically changed or bypassed by the project;

2) the area within 50 m of other road links with potential to experience a short term BNL change of more than 1.0dB(A) as a result of the project.'

15.2.48 As stated above, the NSRs have been selected based on their proximity to the noise source, with those closest being indicative of the worst case impact. Those receptors further away will experience a lesser impact to that reported within this assessment.

Temporal Scope

15.2.49 The construction assessment will consider noise and vibration impacts for the whole duration of the construction works. For operation, traffic noise impacts have been considered in the opening year of the first occupation of the Proposed Development (2028), as well as a future year (2040). For all other operational noise impacts, these will be considered at the opening year, and assumed to have minimal change during the lifetime of the development.

Consultation

15.2.50 No further consultation in addition to the EIA scoping exercise has been undertaken for this assessment.

Assumptions and Limitations

15.2.51 All sound surveys are limited by the instrumentation used to undertake the measurements. Uncertainty may arise as a result of the internal processes within the sound level meter to measure and process the measured data into the relevant noise indices. However, modern sound level meters are precision instruments. The equipment used for the baseline sound survey were Class 1 instruments according to BS EN 61672-1:2003, with a sampling cycle of 100 ms and a minimum measurement range of A-weighted levels between 20 dB and 100 dB. The uncertainty due to fluctuations in temperature and humidity is ≤ 0.5 dB. The accuracy of the equipment used has been monitored via calibration both prior to and upon completion of the survey at each position.

15.2.52 Any influence due to human error has been minimised by ensuring that all sound monitoring equipment was installed safely and securely. All measurements were undertaken at height of 1.2 to 1.5 m above local ground level and 3.5 m from other reflective surfaces to minimise interference from reflected sound waves.

15.2.53 At the time of assessment, specific details on construction of the development were unavailable. Therefore, it was not possible to undertake a quantitative construction noise assessment as part of this ES Chapter. With the implementation of mitigation measures, such as those detailed within a Construction Environmental Management Plan, noise and vibration can be suitably controlled to prevent an adverse impact at sensitive receptors.

15.3 Baseline conditions

Current Baseline

Sound Survey

15.3.1 In order to understand the current acoustic environment at both existing and proposed NSRs, a baseline sound survey was undertaken at several locations across the Site.

15.3.2 Between the 25th February and 18th March 2025, a long-term unattended sound survey was undertaken at seven locations (as shown on Figure 15.1), capturing sound levels during the daytime, evening and night-time periods. Details of these locations are in 0 below:

Table 15.12 Baseline Survey Locations

Position	Description	Representative Receptors
LT1	Set up on the side of Cutbush Lane	Background sound levels of residential areas on Cutbush Lane
LT2	Northern section of site, approximately 220 m south of M4	To quantify noise levels from road traffic on M4 as well as background noise levels for this section of the Proposed Development
LT3	North-eastern corner of site, approximately 150 m from nearest NSR	Background sound levels of this section of the Proposed Development as well as the nearby NSRs on Betty Grove Lane
LT4	On southern edge of site boundary, adjacent to Church Lane	To quantify noise levels from road traffic on M4 as well as background sound levels of nearby NSRs on Church Lane and this section of the Proposed Development
LT5	On south-western corner of site, adjacent to the A327	To quantify noise levels from road traffic on the A327 as well as background sound levels of nearby NSRs on the A327 and this section of the Proposed Development
LT6	In the middle of the proposed development site	Background sound levels for this section of the proposed development
LT7	On north-eastern edge of site, adjacent to Mole Road	To quantify noise levels due to road traffic on Mole Road as well as background sound levels of the nearby NSRs on Mole Road and this section of the Proposed Development

15.3.3 There were no significant sources of vibration impacting the nearest noise-sensitive receptors which require consideration. As such, no vibration survey was deemed necessary.

15.3.4 On site observations, and a review of the sound data, identified that the acoustic climate is mainly influenced by road traffic noise from the M4, Church Lane, A327 and Mole Road. Other sources of influence include occasional overhead aircraft, wind noise and bird song.

15.3.5 Further details on the baseline sound survey are provided in Appendix 15.3.

Sensitive Receptors

15.3.6 The existing NSRs listed below (and as shown on Figure 15.1) have the potential to be impacted by both the construction and operation of the Proposed Development. The NSRs have been selected based on their proximity to the Proposed Development, being the closest and consequently likely to experience the highest impacts. Those receptors co-located with NSRs, or located further away, will experience an impact equal to, or less, than that identified within this Chapter.

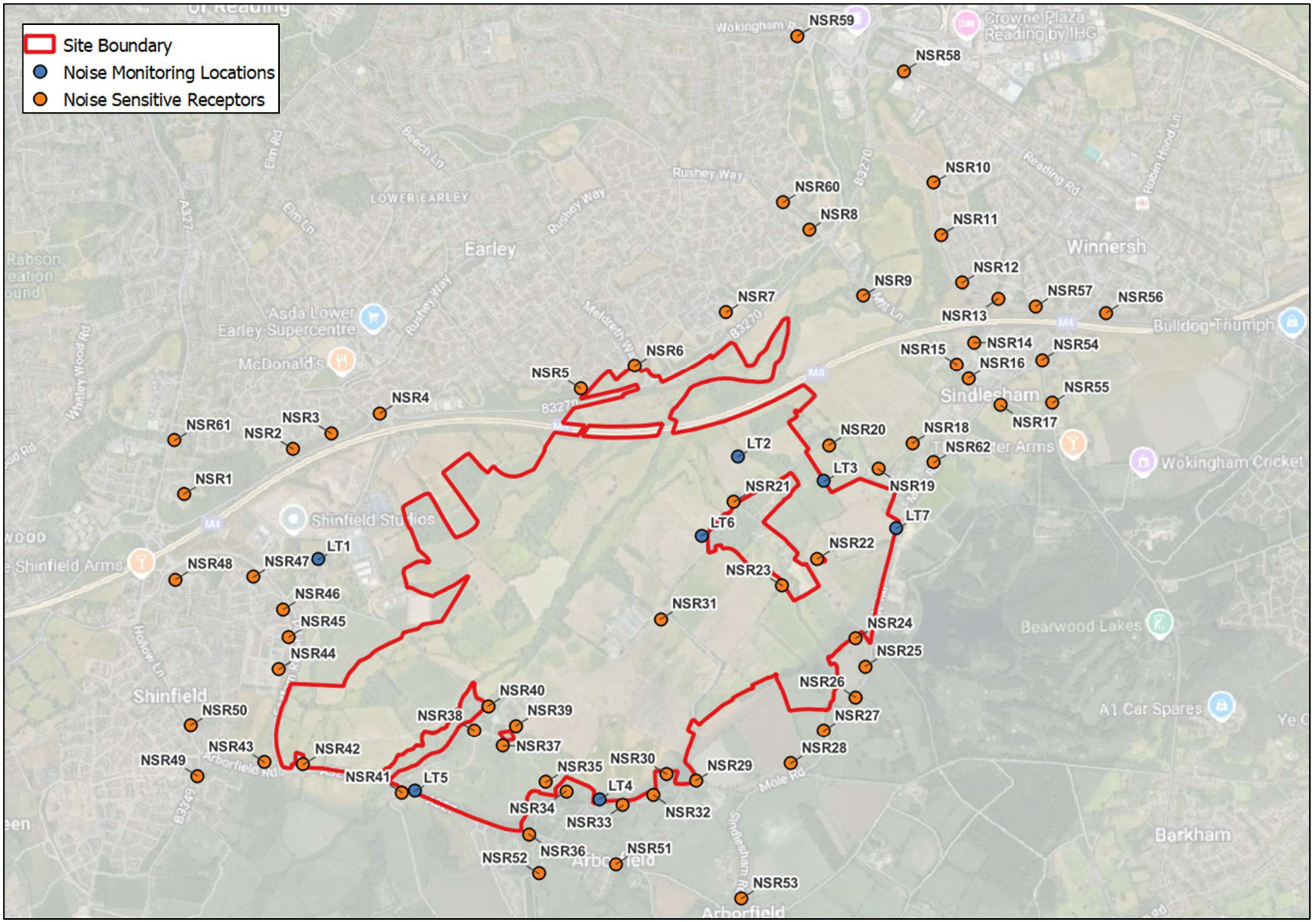
15.3.7 The sensitivity of the NSRs has been assigned based on guidance in Table 15.1. The type of NSR has also been defined, based on whether they have been considered in the construction, operation, or construction/operational traffic assessment.

Table 15.13 Noise Sensitive Receptors

Receptor	Description	Sensitivity	Type		
			Construction	Operation	Traffic
NSR1	Ducketts Mead	Medium	-	-	✓
NSR2	Notton Way	Medium	-	-	✓
NSR3	Finbeck Way	Medium	-	-	✓
NSR4	Rainworth Close	Medium	-	-	✓
NSR5	Bassett Close	Medium	✓	✓	✓
NSR6	Witcham Close	Medium	✓	✓	✓
NSR7	Barn Croft Drive	Medium	✓	✓	✓
NSR8	Mill Lane (N)	Medium	-	-	✓
NSR9	Mill Lane (S)	Medium	-	-	✓
NSR10	Rhodes Close	Medium	-	-	✓
NSR11	Duffet Drive	Medium	-	-	✓
NSR12	Glasspool Road	Medium	-	-	✓
NSR13	Budd Grove	Medium	-	-	✓
NSR14	Lark Rise	Medium	-	-	✓
NSR15	Mill Lane	Medium	-	-	✓
NSR16	Summer Court	Medium	-	-	✓
NSR17	New Road	Medium	-	-	✓
NSR18	Harrow Way	Medium	-	-	✓
NSR19	Gipsy Lane	Medium	✓	✓	✓
NSR20	Betty Grove Lane	Medium	✓	✓	✓
NSR21	Julkes Lane	Medium	✓	✓	✓
NSR22	Parkcorner Lane	Medium	✓	✓	✓
NSR23	Carters Hill Arborfield	Medium	✓	✓	✓
NSR24	Copse Barnhill Lane	Medium	✓	✓	✓
NSR25	Mole Park Cottage	Medium	✓	✓	✓
NSR26	Sindlesham Road	Medium	✓	✓	✓
NSR27	Mole Bridge Farm	Medium	✓	✓	✓
NSR28	Mole Road	Medium	✓	✓	✓
NSR29	Arborfield Church	Medium	✓	✓	✓
NSR30	St Bartholomew's Church	Medium	✓	✓	✓
NSR31	Carters Hall Lane	Medium	✓	✓	✓
NSR32	Longcroft	Medium	✓	✓	✓
NSR33	Phyllena	Medium	✓	✓	✓
NSR34	The Old Rectory	Medium	✓	✓	✓
NSR35	Church Lane	Medium	✓	✓	✓
NSR36	Greensward Cottage	Medium	✓	✓	✓
NSR37	Hall Farm (S)	Medium	✓	✓	✓
NSR38	Hall Farm (W)	Medium	✓	✓	✓
NSR39	Hall Farm (E)	Medium	✓	✓	✓
NSR40	Hall Farm (N)	Medium	✓	✓	✓
NSR41	The Bridge House	Medium	✓	✓	✓
NSR42	Reading Road (W)	Medium	✓	✓	✓

Receptor	Description	Sensitivity	Type		
			Construction	Operation	Traffic
NSR43	Parrot Farm	Medium	✓	✓	✓
NSR44	Alexandra Walk	Medium	✓	✓	✓
NSR45	Phillips Drive	Medium	✓	✓	✓
NSR46	Cutbush Lane	Medium	✓	✓	✓
NSR47	Hawthorn	Medium	✓	✓	✓
NSR48	Chrysanthemum Drive	Medium	-	-	✓
NSR49	Hyde End Road	Medium	-	-	✓
NSR50	Hollow Lane	Medium	-	-	✓
NSR51	Walden Avenue	Medium	-	-	✓
NSR52	Greensward Lane	Medium	-	-	✓
NSR53	Sindlesham Road	Medium	-	-	✓
NSR54	King Street Lane	Medium	-	-	✓
NSR55	Bearwood Road	Medium	-	-	✓
NSR56	Longdon Road	Medium	-	-	✓
NSR57	Hatch Farm Way	Medium	-	-	✓
NSR58	A329 Reading Road	Medium	-	-	✓
NSR59	Wokingham Road	Medium	-	-	✓
NSR60	Rushey Way	Medium	-	-	✓
NSR61	Shinfield Road	Medium	-	-	✓
NSR62	Toad Cottage	Medium	-	-	✓

Figure 15.1 Noise Monitoring and Noise Sensitive Receptor Locations (© Google Earth)



Future Baseline

15.3.8 Similarly to the current baseline, the future baseline noise level is likely to be dominated by noise from road traffic. Traffic data provided by the Project Traffic Consultant has been used to calculate noise levels for the daytime and night-time periods for Current (2025) and Future (2040) years, as indicated in **Table 15.14**.

Table 15.14 Change in Future Baseline

Link Ref	WSTM ID	Current Year 2025		Future Year 2040		Future Baseline Change	
		$L_{A10,18h}$ dB	L_{night} dB	$L_{A10,18h}$ dB	L_{night} dB	$L_{A10,18h}$ dB	L_{night} dB
1	103	79	67	80	68	1	1
2	105	79	67	80	68	1	1
3	262	71	60	71	60	0	0
4	264	66	56	67	56	0	0
5	268	66	56	67	56	0	0
6	269	68	58	69	59	1	1
7	310	73	61	73	62	1	1
8	447	62	52	63	53	1	1
9	460	69	58	69	58	1	0
10	461	62	52	63	53	1	1
11	10425	66	56	67	56	1	1
12	10772	66	55	67	57	1	1
13	10774	71	60	72	61	1	1
14	10775	62	52	63	53	1	1
15	10775	62	52	63	53	1	1
16	10781	62	52	63	53	0	0
17	10787	70	59	71	60	1	1
18	10788	69	58	70	59	1	1
19	10789	61	51	62	52	0	0
20	11671	72	61	72	61	1	1
21	11676	61	51	61	51	0	0
22	11851	62	52	62	52	0	0
23	12105	61	51	61	51	0	0
24	12106	60	50	61	51	0	0
25	12107	62	52	63	53	1	1
26	12108	62	52	63	53	1	1
27	12109	63	53	63	53	0	0

15.3.9 It is evident from **Table 15.14** that there is no predicted increase in baseline noise level greater than 1 dB, which is insignificant in terms of this assessment, and has in any case been built into the long-term operational noise assessment.

15.4 Inherent design mitigation

Construction

15.4.1 In regard to construction, a Construction Environmental Management Plan (CEMP) will be adhered to, which will include measures to control noise and vibration emissions as far as practical. Measures to be included within the CEMP include:

- Noise and vibration monitoring is undertaken throughout the works, with appropriate trigger levels set to ensure threshold values within BS 5228 Part 1 and Part 2 are not exceeded. These are discussed below;
- All vehicles, plant and equipment working within the site shall be fitted with efficient silencers. Position plant as far away from sensitive receptors as possible;
- Intermittently operating plant will be shut down in the intervening periods between operations. Start-up plant and vehicles sequentially rather than simultaneously. Avoid unnecessary revving of engines;
- Where possible low noise and vibration emitting plant would be selected;
- Where reasonably practicable, low vibration working methods should be employed. Isolate equipment using resilient mountings if vibration levels are deemed high;
- New plant would be used where practical and regular maintenance undertaken, including maintenance related to noise emissions;
- Consideration should be given to use of the most suitable plant, reasonable hours of working for operations which might give rise to perceptible noise and vibrations, and economy and speed of operations;
- Care will be taken when erecting or striking Heras fencing to avoid impact noise from banging steel. All operatives undertaking such activities will be instructed on the importance of handling the fencing to reduce noise to a minimum;
- Use rubber linings in, for example, chutes and dumpers to reduce impact noise;
- Reduce drop heights of materials. Load and unload as far away from sensitive receptors as possible;
- Wherever possible, the use of hydraulic attachments or other means of crushing concrete and hard materials will be used in preference to pneumatic breakers;
- Regular liaison with local residents to inform them of operations on site, including periods of temporary operations when noise levels would exceed those normally defined for the site; and
- Where vehicle reversing alarms are required, they should be designed to cause the lowest practical environmental impact; preferably they should be directional broadband noise emitters or automatically adjusted to ambient noise levels.

15.4.2 These measures are considered to be good/best practice and are accordingly regarded as inherent mitigation. The CEMP will be secured by way of condition attached to the planning permission.

15.4.3 Trigger levels should be based on the criteria in Table 15.3 and Table 15.7, to avoid exceedance of the SOAEL and a potential significant adverse effect. In regard to noise, BS5228 Part 1

Annex E Table E.1 presents a range of threshold values assigned according to the ambient sound level at the receptor, categorised from A to C, with Category A featuring the lowest thresholds for construction noise.

15.4.4 Based on the ambient noise levels measured in proximity to the NSRs, the following Category and associated threshold value has been considered appropriate at the NSR.

Table 15.15 Construction Noise Threshold Values

Receptor	Representative Monitoring Location	Category	Threshold Value (dB $L_{Aeq,16hr}$ facade)
NSR5	LT6	A	65
NSR6	LT6	A	65
NSR7	LT6	A	65
NSR19	LT6	A	65
NSR20	LT6	A	65
NSR21	LT6	A	65
NSR22	LT6	A	65
NSR23	LT6	A	65
NSR24	LT6	A	65
NSR25	LT6	A	65
NSR26	LT6	A	65
NSR27	LT6	A	65
NSR28	LT6	A	65
NSR29	LT4	A	65
NSR30	LT4	A	65
NSR31	LT6	A	65
NSR32	LT4	A	65
NSR33	LT4	A	65
NSR34	LT4	A	65
NSR35	LT4	A	65
NSR36	LT5	B	70
NSR37	LT6	A	65
NSR38	LT6	A	65
NSR39	LT6	A	65
NSR40	LT6	A	65
NSR41	LT5	A	65
NSR42	LT5	A	65
NSR43	LT5	A	65
NSR44	LT1	A	65
NSR45	LT1	A	65
NSR46	LT1	A	65
NSR47	LT1	A	65

15.4.5 In regard to vibration, a limit of 1.0 mm/s PPV is considered appropriate at all NSRs to avoid significant adverse effects, in line with the SOAEL set out in Table 15.5.

15.4.6 In regard to proposed NSRs who may be in occupation during other phases of development, a threshold value of 65 dB $L_{Aeq,16hr}$ (façade) in regard to noise, and 1.0 mm/s PPV in regard to vibration, is considered appropriate to avoid significant adverse effects.

15.4.7 At times when the threshold value is being approached, the activity taking place will be reviewed and additional control measures will be implemented as above. When the threshold value has been exceeded, work on site will cease and the activity taking place will be reviewed. Control measures in place will be reviewed and works will be amended as necessary, to ensure noise and vibration levels are below the set trigger level. This will be secured through a CEMP.

15.4.8 A procedure for complaints will also be included within the final CEMP:

- The site manager (or equivalent) will record the details of the complaint, in a log held at the site office;
- Any noise or vibration complaint will be immediately investigated, and where necessary, measures will be implemented by the site manager to reduce noise or vibration levels associated with the construction activities responsible for the complaint;
- In the event of a noise or vibration complaint, consideration will be given to the nature of the operations which were taking place at the time. As necessary, the relevant operational procedures which caused the complaint will be reviewed and improvements implemented by the site manager. In addition, the wind speed and direction at the time of the complaint will be noted, as this might have contributed to the level of noise received by the complainant;
- Complaints will be dealt with immediately, and the timeframe for resolving noise or vibration issues will be 24 hours. Works will be ceased where suitable controls cannot be implemented within 24 hours;
- Within 48 hours of receiving the complaint, the complainant will be informed by the Site Manager of the results of the investigation and of what remedial actions have been taken;
- Details of all noise or vibration complaints, and any actions undertaken as a result of investigations, will be recorded by the site manager in the log; and,
- If justified noise or vibration complaints persist, the site manager will arrange for independent noise or vibration monitoring to be carried out at the location of the complainant to determine the scale and nature of noise or vibration levels received. The results of the noise or vibration monitoring will be independently evaluated to determine if permitted noise or vibration limits have been breached. Based on the findings of the noise or vibration monitoring results, appropriate actions will be taken by the site manager to reduce noise or vibration emissions as appropriate.

Operation

15.4.9 As part of the indicative masterplan produced for the Proposed Development, the northern most residential development is separated from the M4 by a Suitable Alternative Natural Greenspace (SANG) and the Eco Valley, which is an area of land designated for recreational purposes. This area of separation will reduce the influence of noise on proposed future residential receptors.

15.5 Potential effects prior to additional mitigation

Construction Phase

Construction Noise Excluding Traffic

15.5.1 Construction of the Proposed Development would be phased, occurring over a number of years. The residential areas constructed earlier in the programme will likely have occupation in parallel with construction of the later phases. The developers will operate in such a manner to both protect the residents of the newly constructed housing and the surrounding residential areas. Construction noise effects would be temporary.

15.5.2 Construction works, as required by the CEMP, would be carried out in accordance with Best Practicable Means (BPM) of Section 72 of the Control of Pollution Act[7] (CoPA) to minimise noise and vibration effects. The effects considered below follow guidance provided in BS 5228 Part 1 and Part 2.

15.5.3 Construction activities would be undertaken during typical construction working hours (generally 07.00 to 19.00 hours Monday to Friday, 07.00 to 13.00 hours Saturdays, with no working on Sundays or Bank/Public holidays). Activities would therefore be limited to the weekday daytimes and Saturday mornings. Any exception to this would only be with prior agreement with WBC, likely through the Section 61 process of the CoPA[6].

15.5.4 During the construction phase, on-site plant would generally comprise various diesel mechanised construction plant including excavators (with various tool attachments depending upon the task being undertaken), dump trucks, concrete wagons and pumps or an on-site batching plant, mobile cranes, delivery lorries and fork-lift trucks.

15.5.5 Construction noise emissions would vary spatially throughout the programme as work is undertaken in different areas. In general, construction noise emissions would be highest during initial site clearance and earthworks and decrease as the buildings are constructed. Noise emissions during the fit-out as buildings are completed would be very low as work would be undertaken mostly with hand-tools within the completed structures.

15.5.6 In regard to vibration, possible sources from construction activities include piling rigs, vibratory rollers and ground improvement tampers. Given the nature of the Proposed Development it is unlikely that piling will be required. However, if piling is required then bored/Continuous-Flight Auger (CFA) piling should be used. Bored/CFA piling does not generate significant vibration emissions and is not significantly nosier than other mechanised construction plant, such as excavators and dump trucks.

15.5.7 In general, construction activities do not generate vibration at levels likely to damage buildings or be disruptive to occupants thereof beyond the boundaries of the development. Whilst some NSRs are located immediately adjacent with the Site boundary it is very unlikely that any significant vibration activity would occur on the immediate boundary of the Site.

15.5.8 For example, surface plant such as cranes, compressors and generators are not recognised as sources of high levels of environmental vibration. Even at a distance of 10 m, 'peak particle velocity' (PPV) levels significantly less than 1 mm/s are generated by such plant. From BS 5228-Part 2, a tracked excavator may generate a PPV of approximately 0.6 mm/s and a heavy lorry on poor road surface a PPV of less than 0.1 mm/s at 10 m distance. These levels are well

[7] The Stationery Office Limited. Control of Pollution Act, Chapter 40, Part III. 1974

below limits at which even cosmetic building damage becomes likely. Similarly, whilst vibration from impact piling might result in higher vibration levels at source, vibration levels would be insignificant beyond the immediate development area.

15.5.9 As works will be carried out in line with the CEMP, including the imposing of threshold values not to be exceeded, noise and vibration can be suitably managed as not to cause a significant adverse impact.

15.5.10 With reference to Table 15.1, the sensitivity of all receptors is Medium. With reference to the magnitude of impact, construction noise and vibration would be Negligible to Low, with inherent mitigation in place. Therefore, with reference to Table 15.11, the significance of noise and vibration effects during construction would be **Negligible to Minor adverse**. Overall, the effects are considered to be **not significant**.

15.5.11 With reference to the Planning Practice Guidance - Noise (PPGN)[8], construction noise and vibration effects are likely to vary between the NOEL and below SOAEL. This is the expected outcome for a phased construction site of this size; effects are likely to occur for only a proportion of the temporary works, affecting any individual resident for only a fraction of the construction process.

Construction Traffic Noise

15.5.12 Traffic flow prediction data as presented in Appendix 15.5 has been received from the Project Traffic Consultants and processed using the CRTN methodology to determine the change in Basic Noise Level (BNL) on existing traffic routes due to construction traffic.

15.5.13 The results for each link are summarised in Table 15.16. Full details of the assessment are reported in Appendix 15.5.

15.5.14 With reference to Table 15.1, the sensitivity of all receptors is Medium. With reference to Table 15.16, worst-case predicted short-term impact magnitudes on all links are no higher than Negligible Adverse.

15.5.15 Therefore, with reference to Table 15.11, the significance of noise effects due to construction traffic would be **Negligible Adverse**. Overall, the effects are considered to be **not significant**.

[8] Further information regarding Planning Practice Guidance – Noise (PPGN) is provided in Appendix 15.1

Table 15.16 Construction traffic noise Impact

Link	WSTM ID	Reference H - Baseline Traffic Flow 2028 + UoR Development			Reference H - Baseline Traffic Flow 2028 + UoR Development + Construction Traffic Flows			Change in BNL of Closest Public Road used for Construction Traffic (dB)	Impact
		Total Vehicles	HDVs	BNL+C, dB(A)	Total Vehicles	HDVs	BNL+C, dB(A)		
1	103	47872	2464	78.7	47891	2469	78.7	0.0	Negligible Adverse
2	105	48856	1856	78.3	48875	1861	78.3	0.0	Negligible Adverse
3	262	17403	150	67.5	17403	150	67.5	0.0	Negligible Adverse
4	264	10500	112	65.7	10500	112	65.7	0.0	Negligible Adverse
5	268	10585	146	65.9	10585	146	65.9	0.0	Negligible Adverse
6	269	17428	217	67.4	17428	217	67.4	0.0	Negligible Adverse
7	310	17829	197	70.7	17906	216	70.7	0.0	Negligible Adverse
8	447	3935	26	61.7	3935	26	61.7	0.0	Negligible Adverse
9	460	8336	125	68.3	8336	125	68.3	0.0	Negligible Adverse
10	461	4042	16	61.9	4042	16	61.9	0.0	Negligible Adverse
11	10425	9531	6	66.1	9531	6	66.1	0.0	Negligible Adverse
13	10774	16676	424	69.3	16830	463	69.4	0.1	Negligible Adverse
17	10787	12243	141	69.4	12243	141	69.4	0.0	Negligible Adverse
25	12107	3327	61	62.1	3327	61	62.1	0.0	Negligible Adverse
26	12108	3327	61	62.1	3327	61	62.1	0.0	Negligible Adverse
27	12109	2829	57	62.8	2829	57	62.8	0.0	Negligible Adverse
28	12110	158	0	28.5	158	0	28.5	0.0	Negligible Adverse
29	12111	154	0	28.5	154	0	28.5	0.0	Negligible Adverse
30	12112	75	0	20.8	75	0	20.8	0.0	Negligible Adverse
31	12113	75	0	21.3	75	0	21.3	0.0	Negligible Adverse

Operational Phase

Operational Noise Excluding Traffic

Plant Noise

15.5.16 As part of the Proposed Development, mechanical plant may be required for heating / ventilation associated with the proposed employment areas, schools and outdoor sports facilities. Such plant would very likely be typical of that used on similar development located in otherwise residential environment.

15.5.17 At this outline stage, the exact end use of these employment areas is unknown, although it is understood that the intention is that this would comprise of Class E and Sui Generis use, which can be carried out in a residential area without detriment to its amenity. As such, it is not possible to undertake a detailed assessment of potential noise impacts or the requirement for any mitigation to avoid significant, or unacceptable, impacts.

15.5.18 However, facilities of this nature are typically located close to residential areas and, through appropriate design of the facilities, it would be readily achievable for these areas to operate without causing a significant adverse impact at proposed or existing NSRs, i.e. Rating Levels no greater than 5 dB above the background sound level, and for an appropriate level of residential amenity to be provided. However, as noted in paragraph 15.2.3, that WBC have requested a limit of 5 dB below the background sound level 1 m from the façade of the NSR, which has been considered in this assessment.

15.5.19 On the basis of the above, the following Rating Level limits are appropriate at the NSRs to ensure that significant adverse noise effects associated with operational commercial/industrial noise would be unlikely. As discussed previously, the background sound levels have been corrected to façade levels to ensure the correct Rating Level limit is applied.

Table 15.17 Operational Noise Limits

Receptor	Representative Monitoring Location	Measured Background Sound Level		Measured Background Sound Level, Façade Level		Rating Level Limit	
		Day $L_{A90,1hr}$	Night $L_{A90,15min}$	Day $L_{A90,1hr}$	Night $L_{A90,15min}$	Day $L_{A90,1hr}$	Night $L_{A90,15min}$
NSR5	LT6	53	48	56	51	51	46
NSR6	LT6	53	48	56	51	51	46
NSR7	LT6	53	48	56	51	51	46
NSR19	LT6	53	48	56	51	51	46
NSR20	LT6	53	48	56	51	51	46
NSR21	LT6	53	48	56	51	51	46
NSR22	LT6	53	48	56	51	51	46
NSR23	LT6	53	48	56	51	51	46
NSR24	LT6	53	48	56	51	51	46
NSR25	LT6	53	48	56	51	51	46
NSR26	LT6	53	48	56	51	51	46
NSR27	LT6	53	48	56	51	51	46
NSR28	LT6	53	48	56	51	51	46
NSR29	LT4	43	38	46	41	41	36
NSR30	LT4	43	38	46	41	41	36

Receptor	Representative Monitoring Location	Measured Background Sound Level		Measured Background Sound Level, Façade Level		Rating Level Limit	
		Day $L_{A90,1hr}$	Night $L_{A90,15min}$	Day $L_{A90,1hr}$	Night $L_{A90,15min}$	Day $L_{A90,1hr}$	Night $L_{A90,15min}$
NSR31	LT6	53	48	56	51	51	46
NSR32	LT4	43	38	46	41	41	36
NSR33	LT4	43	38	46	41	41	36
NSR34	LT4	43	38	46	41	41	36
NSR35	LT4	43	38	46	41	41	36
NSR36	LT5	59	39	62	42	57	37
NSR37	LT6	53	48	56	51	51	46
NSR38	LT6	53	48	56	51	51	46
NSR39	LT6	53	48	56	51	51	46
NSR40	LT6	53	48	56	51	51	46
NSR41	LT5	59	39	62	42	57	37
NSR42	LT5	59	39	62	42	57	37
NSR43	LT5	59	39	62	42	57	37
NSR44	LT1	48	42	51	45	46	40
NSR45	LT1	48	42	51	45	46	40
NSR46	LT1	48	42	51	45	46	40
NSR47	LT1	48	42	51	45	46	40

15.5.20 In regard to future NSRs, a Rating Level limit of 41 dB (A) during the daytime, and 36 dB(A) during the night-time, 1 m from the façade, is deemed appropriate to ensure a significant adverse effect is avoided. This is based on the lowest measured background sound levels (LT4) across the Site.

15.5.21 Based on the limits above, with reference to Table 15.1, the sensitivity of all receptors is Medium. With reference to the magnitude of impact, operational plant noise would be Negligible. Therefore, with reference to Table 15.11, the significance of noise and vibration effects during operation would be **Negligible**. Overall, the effects are considered to be **not significant**.

15.5.22 Once specific details are known regarding the proposed use, including location and type of noise generating plant/activity, etc., it is recommended that a noise impact assessment is undertaken in accordance with BS 4142:2014+A1:2019. This should form part of the subsequent detailed/reserved matters applications, in order to demonstrate that noise emissions would not result in significant impact and detail any mitigation measures that may be required.

Sport Noise

15.5.23 As part of the scheme, land is allocated for outdoor sports facilities, which will likely include Artificial Grass Pitches (AGPs). Noise from use of these facilities, separate from plant noise, could impact existing (NSRs 29 – 40 are in closest proximity) and future NSRs.

15.5.24 At this outline stage, the location of the sports pitches has been defined, and therefore guidance from Sport England[9] can be used to estimate the likely associated noise level at the nearest NSRs. A free-field noise level of 58 dB LAeq,1hr, 10 m away, in line with the halfway marking, is found to be representative of the typical noise level from an AGP. The document also states an upper noise limit of 50 dB LAeq,1hr should be considered external to residential properties and within external living areas.

15.5.25 Based on an AGP in an open location, with no buildings in the immediate area, a setback distance of 40 m without mitigation is required from the edge of the pitch in order to meet 50 dB LAeq,1hr. With buildings in close proximity to the AGP, the setback distance to meet the upper noise limit increases, due to reflections.

15.5.26 On the basis of the above, provided a setback distance of at least 40 m is designed into the layout, and localised mitigation is considered, then significant adverse noise effects associated with operational sport noise would be unlikely.

15.5.27 Once the location of the sport pitches and future NSRs is finalised, it is recommended that a noise impact assessment is undertaken in accordance with Sport England[7] guidance. This should form part of the subsequent detailed/reserved matters applications, in order to demonstrate that noise emissions would not result in significant impact and detail any mitigation measures that may be required.

Operational Traffic Noise

15.5.28 Traffic flow prediction data as presented in Appendix 15.4 has been received from the Project Traffic Consultants and processed using the CRTN methodology to determine the short-term and long-term change in Basic Noise Level (BNL) on existing traffic routes. Other parameters including the effect of the road surfacing on noise levels are assumed to be unchanged between ‘with’ and ‘without’ operational traffic scenarios.

15.5.29 The worst-case results from the day- or night-time period for each link are summarised in Table 15.18. Full details of the assessment are reported in Appendix 15.4

[9] Sport England, Artificial Grass Pitch (AGP) Acoustics – Planning Implications. 2015

Table 15.18 Summary Traffic Noise Results

Link Ref	WSTM ID	Short Term Impact			Long Term Impact		
		Level	Max Change dB	Magnitude	Level	Max Change dB	Magnitude
1	103	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
2	105	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	1.1	Negligible Adverse
3	262	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.0	Negligible Adverse
4	264	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
5	268	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.4	Negligible Adverse
6	269	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
7	310	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	0.1	Negligible Adverse
8	447	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	1.4	Negligible Adverse
9	460	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
10	461	Between LOAEL and SOAEL	0.1	Negligible Adverse	Between LOAEL and SOAEL	0.5	Negligible Adverse
11	10425	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	1.1	Negligible Adverse
12	10772	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	2.4	Negligible Adverse
13	10774	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	1.4	Negligible Adverse
14	10775	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	1.3	Negligible Adverse
15	10775	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	1.3	Negligible Adverse
16	10781	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	0.4	Negligible Adverse
17	10787	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
18	10788	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
19	10789	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	0.1	Negligible Adverse
20	11671	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	1.5	Negligible Adverse
21	11676	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	-0.3	Negligible Beneficial

Link Ref	WSTM ID	Short Term Impact			Long Term Impact		
		Level	Max Change dB	Magnitude	Level	Max Change dB	Magnitude
22	11851	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	0.1	Negligible Adverse
23	12105	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	0.3	Negligible Adverse
24	12106	Between LOAEL and SOAEL	0.0	Negligible Adverse	Above SOAEL	6.3	Significant Adverse
25	12107	Between LOAEL and SOAEL	0.0	Negligible Adverse	Above SOAEL	4.9	Significant Adverse
26	12108	Between LOAEL and SOAEL	0.0	Negligible Adverse	Above SOAEL	4.9	Significant Adverse
27	12109	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	0.3	Negligible Adverse
28	12110	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	-0.6	Negligible Beneficial
29	12111	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	-0.7	Negligible Beneficial
30	12112	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	0.2	Negligible Adverse
31	12113	Above SOAEL	0.1	Negligible Adverse	Between LOAEL and SOAEL	-0.4	Negligible Beneficial

15.5.30 With reference to paragraph Table 15.1, the sensitivity of all receptors is Medium. With reference to Table 15.18, worst-case predicted short-term impact magnitudes on all links after consideration of LOAEL and SOAEL are no higher than Negligible.

15.5.31 Significant Adverse long-term impacts are predicted on links 12106, 12107 and 12108, however there are no sensitive receptors in this area and therefore there will be no adverse effect. Impacts on all other links range between Negligible Adverse and Negligible Beneficial.

15.5.32 Therefore, with reference Table 15.11, the significance of noise effects due to development led road traffic during operation would be **Negligible**. Overall, the effects are considered to be **not significant**.

15.6 Additional Mitigation

Construction Phase

15.6.1 No further mitigation is deemed necessary during construction of the Proposed Development, provided the measures contained within the CEMP are adhered to.

Operational Phase

15.6.2 No further mitigation is deemed necessary during operation of the Proposed Development, provided the limits outlined in the Section 'Potential effects prior to additional mitigation' are adhered to.

15.7 Residual Effects

Construction Phase

15.7.1 With no additional mitigation proposed, residual effects would be the same as the initial effect.

Operational Phase

15.7.2 With no additional mitigation proposed, residual effects would be the same as the initial effect.

15.8 Implications of Climate Change

15.8.1 In regard to climate change, with rising temperatures there may be a desire for future NSRs to open windows for additional ventilation, due to potential overheating risk. This may lead to increased exposure to high noise levels. It is however acknowledged in line with Overheating: Approved Document O[10], the implications for noise are to be consideration for all future development.

15.8.2 The Proposed Development will be adequately designed to prevent an overheating risk, which in turn will reduce the likelihood of NSRs exposing themselves to higher noise levels. It can therefore be considered that climate change will have minimal influence when considering both noise and vibration.

[10] HM Government. The Building Regulations 2010. Overheating Approved Document O. Requirement O1: Overheating mitigation. Regulations: 40B

15.9 Cumulative effects

Loddon Valley Garden Village Strategic Development Location

Construction

15.9.1 The Loddon Valley Garden Village Strategic Development Location and the Proposed Development will be required to implement Best Practicable Means (BPM), as defined by Section 72 of the Control of Pollution Act (1974), to reduce noise and vibration impacts as far as practically possible. This will include ensuring that for any construction works which are concurrent, the appropriate noise limit at the relevant receptors are not exceeded. BPM and details on mitigation to reduce noise and vibration to ensure the limit at the relevant receptor is not exceeded would be detailed within the CEMP for the relevant development. Measures which are to be included within the Proposed Development CEMP include the requirement for the contractors on the relevant project to liaise at the earliest opportunity, to understand the respective program of works and discuss ways to minimise any cumulative noise impacts.

Operation

15.9.2 The Loddon Valley Garden Village Strategic Development Location have been included in the traffic model that was used to inform this Chapter.

15.9.3 Traffic data including predictions for the Loddon Valley Garden Village Strategic Development Location considered within the cumulative assessment were provided by the Project Traffic Consultants as detailed in Appendix 15.4.

15.9.4 The worst-case results from the day- or night-time period for each link are summarised in Table 15.19. Full details of the assessment are reported in Appendix 15.4.

Table 15.19 Summary Cumulative Traffic Noise Results

Link No.	WSTM ID	Short Term Impact			Long Term Impact		
		Level	Max Change dB	Magnitude	Level	Max Change dB	Magnitude
1	103	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
2	105	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	1.1	Negligible Adverse
3	262	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.0	Negligible Adverse
4	264	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
5	268	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.4	Negligible Adverse
6	269	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
7	310	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	0.1	Negligible Adverse
8	447	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	1.4	Negligible Adverse

Link No.	WSTM ID	Short Term Impact			Long Term Impact		
		Level	Max Change dB	Magnitude	Level	Max Change dB	Magnitude
9	460	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
10	461	Between LOAEL and SOAEL	0.1	Negligible Adverse	Between LOAEL and SOAEL	0.5	Negligible Adverse
11	10425	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	1.1	Negligible Adverse
12	10772	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	2.4	Negligible Adverse
13	10774	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	1.4	Negligible Adverse
14	10775	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	1.3	Negligible Adverse
15	10775	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	1.3	Negligible Adverse
16	10781	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	0.4	Negligible Adverse
17	10787	Above SOAEL	0.0	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
18	10788	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	0.6	Negligible Adverse
19	10789	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	0.1	Negligible Adverse
20	11671	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	1.5	Negligible Adverse
21	11676	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	-0.3	Negligible Beneficial
22	11851	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	0.1	Negligible Adverse
23	12105	Between LOAEL	0.0	Negligible Adverse	Between LOAEL	0.3	Negligible Adverse

Link No.	WSTM ID	Short Term Impact			Long Term Impact		
		Level	Max Change dB	Magnitude	Level	Max Change dB	Magnitude
		and SOAEL			and SOAEL		
24	12106	Between LOAEL and SOAEL	0.0	Negligible Adverse	Above SOAEL	6.3	Significant Adverse
25	12107	Between LOAEL and SOAEL	0.0	Negligible Adverse	Above SOAEL	4.9	Significant Adverse
26	12108	Between LOAEL and SOAEL	0.0	Negligible Adverse	Above SOAEL	4.9	Significant Adverse
27	12109	Between LOAEL and SOAEL	0.0	Negligible Adverse	Between LOAEL and SOAEL	0.3	Negligible Adverse
28	12110	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	-0.6	Negligible Beneficial
29	12111	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	-0.7	Negligible Beneficial
30	12112	Above SOAEL	0.1	Negligible Adverse	Above SOAEL	0.2	Negligible Adverse
31	12113	Above SOAEL	0.1	Negligible Adverse	Between LOAEL and SOAEL	-0.4	Negligible Beneficial

Wider Committed Development

Construction

15.9.5 In the event that the construction programmes for other schemes coincide with the construction programme for the Proposed Development, the most significant issue in relation to noise effects is likely to be the temporary adverse effects caused by the coinciding earthworks during the construction phases.

15.9.6 As evidenced from the guidance within BS 5228-1:2009+A1:2014 which scopes only for distances within 300 m of construction activity, developments more than 600 m from the Site boundary are considered most unlikely to result in cumulative impacts.

15.9.7 With regard to the above the following cumulative developments are considered relevant (see Chapter 5 – Approach to Assessment for full details):

- Map Reference I - Land to the North of Arborfield Road west of Shinfield Eastern Relief Road (Planning Ref. 242484)
- Map Reference J - Land North of Reading Road, Arborfield (Planning Ref. 243099)

15.9.8 The wider committed developments and the Proposed Development will be required to implement BPM, as defined by Section 72 of the Control of Pollution Act (1974), to reduce noise and vibration impacts as far as practically possible. This will include ensuring that for any construction works which are concurrent, the appropriate noise limit at the relevant receptors are not exceeded. BPM and details on mitigation to reduce noise and vibration to ensure the limit at the relevant receptor is not exceeded would be detailed within the CEMP for the relevant development. Measures which are to be included within the Proposed Development CEMP include the requirement for the contractors on the relevant project to liaise at the earliest opportunity, to understand the respective program of works and discuss ways to minimise any cumulative noise impacts.

Operation

15.9.9 Wider Committed Developments considered within the cumulative assessment for the ES are included in the traffic model that was used to inform this Chapter. In addition, the transport assessment implements growth rates applied to existing traffic levels to forecast the future traffic environment. Therefore, this Chapter has taken into account operational phase cumulative effects as part of the above assessment.

15.9.10 With reference to Table 15.1 the sensitivity of all receptors is Medium. With reference to Table 15.19, worst-case predicted short-term impact magnitudes on all links after consideration of LOAEL and SOAEL are no higher than Negligible.

15.9.11 Significant Adverse long-term impacts are predicted on links 12106, 12107 and 12108, however there are no sensitive receptors in this area and therefore there will be no adverse effect. Impacts on all other links range between Negligible Adverse and Negligible Beneficial.

15.9.12 Therefore, with reference to Table 15.11, the significance of cumulative noise effects due to development led road traffic during operation would be **Negligible**. Overall, the effects are considered to be **not significant**.

15.10 Summary

15.10.1 This Chapter assesses the likely significant noise and vibration effects resulting from the Proposed Development, during both construction and operational phases.

15.10.2 To establish baseline noise levels an unattended noise survey has been carried out.

15.10.3 The potential noise impacts affecting NSRs with regard to construction and operation of the Proposed Development have been considered and have been assessed using appropriate guidance.

Construction Noise and Vibration

15.10.4 During construction, noise and vibration has the potential to cause impacts at nearby NSRs. However, with implementation of mitigation outlined within the CEMP, the likelihood of significant adverse effects can be avoided.

15.10.5 Examples of best practice measures which will be required to avoid significant adverse construction noise impacts are set out in paragraph 15.4.1.

Operational Noise

15.10.6 Based on the Proposed Development meeting the limits set at the NSRs, there are **no predicted significant adverse effects** once the project is operational.

Development Generated Road Traffic Noise

15.10.7 The assessment of development generated road traffic noise has confirmed that, on all existing road links provided by the Project Traffic Consultant, there are **no predicted significant adverse effects** from the increase in road traffic.

15.10.8 A summary of the assessment is set out in Table 15.21 below.

15.11 References

- The Stationery Office Limited. Control of Pollution Act, Chapter 40, Part III. 1974
- Statutory Instruments. No. 227. The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015
- British Standards Institution. British Standard 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites - Part 1: Noise
- British Standards Institution. British Standard 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration
- British Standards Institution. British Standard 7445-2:1991 Description and measurement of environmental noise - Part 2: Guide to the acquisition of data pertinent to land use.
- British Standards Institution. British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound
- The Stationery Office Limited. Environmental Protection Act, Chapter 43, Part III. 1990
- Statutory Instrument No. 1763. The Noise Insulation Regulations 1975. Statutory Instrument No. 2000. The Noise Insulation (Amendment) Regulations 1988. HMSO. 1975 Amended 1988
- Ministry of Housing, Communities and Local Government. National Planning Policy Framework: HMSO. December 2024
- Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. Defra. 2010
- Wokingham Borough Council. Wokingham Borough Core Strategy. 2010
- Ministry of Housing, Communities and Local Government. National Planning Practice Guidance – Noise. March 2019
- Department of Transport. Calculation of Road Traffic Noise. HMSO. 1988
- Highways England. Design Manual for Roads and Bridges. LA 111 Noise and vibration. 2020
- Sport England, Artificial Grass Pitch (AGP) Acoustics – Planning Implications. 2015

- HM Government. The Building Regulations 2010. Overheating Approved Document O. Requirement O1: Overheating mitigation. Regulations: 40B

15.12 Assessor information

Table 15.20 Assessor Information

Chapter	Responsibility	Name	Qualifications	Assessor information
Noise and Vibration	RPS	Emily Forster	BSc (Hons) AMIOA	Emily has over seven years' experience undertaking noise and vibration assessments for a variety of developments within the residential, commercial, industrial, waste, mineral and renewable sections, covering both construction and operation. Emily is involved with all aspects of the assessment including noise surveys, data analysis, modelling and calculations, and reporting. Emily have prepared several noise assessments as technical reports or as Chapters for inclusion with Environmental Impact Assessments.
		Pam Lowery	MEng MSc MIOA PIEMA	Pam has over 23 years' experience in environmental acoustics. She has provided both technical and policy support in the construction and operational assessments of major road, rail and energy projects for both public and private sector clients in the UK and Ireland. Pam is experienced in data analysis and modelling, as well as preparing submission documents for and participating in the examination of proposed projects. She has also worked with UK government departments in developing noise policies and procedures, including the development of environmental noise assessment procedures.

Table 15.21 Summary of effects

Receptor	Receptor sensitivity	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
Construction Phase					
NSRs	Medium	Noise from construction	Adherence to a CEMP and good construction practice with regards to noise and vibration.	Negligible to Minor Adverse	Not Significant
NSRs	Medium	Noise from construction traffic	Following the construction traffic data assessment, it is determined that mitigation would not be necessary to protect NSRs from road traffic noise.	Negligible Adverse	Not Significant.
Operation Phase					
NSRs	Medium	Noise from operation of plant/outdoor sport facilities	Appropriate design, selection of plant and physical mitigation, if required	Negligible to Minor Adverse	Not Significant
NSRs	Medium	Noise from operational traffic	No requirement for mitigation identified	Negligible Adverse	Not Significant

15.13 Mitigation commitments Summary

Table 15.22 Summary for Securing Mitigation

Identified receptor	Type and purpose of additional mitigation measure (prevent, reduce, offset, enhance)	Means by which mitigation may be secured (e.g. planning condition / legal agreement)	Delivered by	Auditable by
Construction Phase				
NSRs	CEMP, to prevent and reduce noise and vibration impacts	Planning Condition / S.106 Agreement	Applicant/Contractor	Applicant / Contractor / LPA
Operation Phase				
NSRs	Appropriate design, selection of plant and physical mitigation, if required, to prevent loss of amenity	Planning Condition	Applicant/Contractor	Applicant / Contractor / LPA