

E1.12

ES Chapter 12 - Noise and Vibration

Authored by Savills

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THE CROWN
 ESTATE

East Hemel

12. Noise and Vibration

12.1 Introduction

12.1.1 This Chapter sets out the likely significant effects of the Development upon 'noise sensitive receptors' (NSRs). It has been prepared by the Acoustics, Noise and Vibration Team at Savills.

12.1.2 This Chapter is supported by further detailed assessment contained within:

- **ES Volume 3: Appendix 12.1: Site Suitability Noise Assessment**, which provides a site suitability 'Acoustic Design Statement' (ADS), i.e. how the existing environment affects the Development, regarding the proposed residential and educational uses;
- **ES Volume 3, Appendix 12.2: Construction Noise Assessment**, which provides a construction noise assessment; and
- **ES Volume 3, Appendix 12.3: Road Traffic Noise Assessment**, which provides an operational and cumulative development road traffic noise change assessment.

12.2 Assessment Methodology and Significance Criteria

Assessment Methodology

12.2.1 This section sets out the legislative context, planning policy and guidance, and methodology for assessing receptor sensitivity and the works and operational phase impacts.

Legislative Context

Control of Pollution Act 1974

12.2.2 Sections 60 and 61 of the Control of Pollution Act 1974¹ (CoPA) give the local authority special powers to deal with noise and vibration arising from construction and demolition works, regardless of whether a statutory nuisance has been caused or is likely to be caused. The powers may be exercised either before works start or after they have started. Additionally, the CoPA grants the Secretary of State powers to approve Codes of Practice for the minimisation of noise (e.g. construction noise), and these may be used as evidence in legal proceedings.

¹ The Stationery Office Limited. Control of Pollution Act, Chapter 40, Part III. 1974.

Environmental Protection Act 1990

12.2.3 Section 79 of the Environmental Protection Act 1990² (EPA) (as amended by the Noise and Statutory Nuisance Act 1993) provides the principal controls over so-called “statutory nuisances”, and declares a number of items as statutory nuisance. Under the provisions of the EPA, local authorities have a duty to periodically inspect their areas to detect any nuisance and, where a complaint of statutory nuisance is made, to take such steps as are reasonably practicable to investigate the complaint. Should a local authority be satisfied of the existence of a statutory nuisance, it is obliged to serve an Abatement Notice on the person responsible. Though businesses have a defence of “best practicable means”, failure to comply with a Notice is a criminal offence.

Planning Policy and Guidance

Noise Policy Statement for England

12.2.4 The Noise Policy Statement for England³ (NPSE), published in March 2010 by Defra, aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion.

12.2.5 Paragraph 1.6 of the NPSE sets out the long term aims of Government noise policy:

“Noise Policy Aims

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.”*

12.2.6 When discussing the meaning of “significant adverse” and “adverse”, within an Explanatory Note, the NPSE referred to two established concepts from toxicology that are currently being applied to noise impacts, namely ‘No Observed Effect Level’ (NOEL) and the ‘Lowest Observed Adverse Effect Level’ (LOAEL). For the purposes of the NPSE, the Government added the related concept ‘Significant Observed Adverse Effect Level’ (SOAEL).

² The Stationery Office Limited. Environmental Protection Act, Chapter 43, Part III. 1990.

³ Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. Defra. 2010.

National Planning Policy

12.2.7 The National Planning Policy Framework⁴ (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. The emphasis of the Framework is to allow development to proceed where it can be demonstrated to be sustainable. In relation to noise, Paragraph 198 of the Framework states:

"Planning policies and decisions should ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from the development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

Local Planning Policy

St Albans City and District Council (SADC)

12.2.8 The current St Albans City and District Council adopted Local Plan⁵ is The District Local Plan Review 1994. In 2007, a Direction was made saving specified policies of the District Local Plan Review 1994, i.e. they are still part of the development plan for St Albans. The policies listed in the List of Saved Policies are therefore the remaining operational policies within the District Local Plan Review 1994.

12.2.9 No policies relating directly to noise have been saved.

12.2.10 SADC is currently developing a new Local Plan which is planned for adoption in March 2026⁶. Policy HW1 'Air and Noise Pollution' of the Draft Local Plan 2041 relates to noise and new development, stating:

"Development proposals, including those for new residential dwellings, schools, nurseries and care homes and other uses which are noise and pollution sensitive, or in areas which may exceed national legislative air quality pollution limits, must carry out suitable assessments for noise / air pollution.

⁴ Ministry of Housing, Communities and Local Government. National Planning Policy Framework: HMSO. December 2024.

⁵ St Albans City and District Council. City and District of St Albans District Local Plan Review 1994). Saved and Deleted Policies Version. July 2020

⁶ St Albans City and District Council. Draft Local Plan 2041. Regulation 19 Publication. September 2024.

Proposals which are found to be affected by noise or air pollution must demonstrate suitable mitigation, including as required:

a) Maintaining distances between road and other sources of noise and air pollution (including odour pollution) and people;

b) Using green infrastructure, in particular trees, where this can create a barrier or maintain separation between sources of pollution and receptors;

c) Appropriate means of filtration, ventilation and soundproofing on affected buildings;

d) Effective control of dust and emissions from construction, operation and demolition;

e) Use of optimal layout and orientation to promote avoidance of elevated pollution without mitigation which will reduce the level of mitigation where necessary;

f) Air quality and / or noise assessments at the earliest stage of development.

Development proposals that would generate new noise and air pollution in proximity to residential and other noise-sensitive uses must demonstrate and put in place measures to avoid or mitigate any such impacts."

Dacorum Borough Council

12.2.11 Many of the policies within the Dacorum Borough Council Local Plan⁷ have been 'saved' and will continue to inform planning policy until they are formally superseded or cancelled.

12.2.12 No policies relating directly to noise have been saved.

12.2.13 DBC is currently developing a new Local Plan which is currently in review⁸. Policy CC6 - Protection from Environmental Pollution relates to noise and new development, stating:

"1. Any development proposals which would cause harm to the environment or neighbouring land or properties from a significant increase in pollution (into the air, soil or any water body) by virtue of the emissions of fumes, particles, effluent, radiation, smell, heat, light, noise or noxious substances, will not be permitted.

2. Development must ensure that neighbouring land, properties and uses are not adversely affected by environmental pollution, including cumulative effects, in accordance with the 'agent of change' principle. Appropriate mitigation must be demonstrated for any remaining adverse impacts.

3. The design of development must locate environmentally vulnerable or sensitive groups, and associated key facilities and services, in areas that minimise exposure to emissions.

⁷ Dacorum Borough Council. The Local Plan 1991-2011. 2004

⁸ Dacorum Borough Council. Dacorum Local Plan to 2041. Pre-Submission Version. November 2024.

...

7. Development will be expected to minimise the impact of noise on the surrounding environment and noise sensitive receptors. This will be achieved by:

a. Developments that are noise sensitive and in locations where surrounding existing lawful land uses are likely to have an adverse effect on the occupants of new development, must submit an appropriate noise impact assessment including mitigation measures to address the identified impacts;

b. Where it is achievable to offset the adverse impact of noise and to protect existing / future sensitive receptors, applications for new development shall be supported by an assessment of the typical worst case noise impact and consideration of achievable mitigation measures to ensure adequate protection of those sensitive receptors. Where the impact cannot be offset then development should be avoided;

c. Good design must be used to improve and enhance the acoustic environment and reduce the impact of noise on and generated by the development, in accordance with Dacorum design guidance; and

d. The development of land for noisy countryside sports will only be permitted where:

i. It is located outside of the Chilterns National Landscape and the most sensitive parts of Landscape Regions;

ii. The activity would not adversely affect noise sensitive receptors nearby;

iii. There would be no adverse impacts on wildlife and areas of ecological value;

iv. The scale and nature of the activity respects the countryside setting and surrounding area;

v. The safety of adjoining users is not prejudiced; and

vi. The enjoyment of users of public rights of way/the countryside would not be significantly adversely affected.”

12.2.14 Policy CS32: Air, Soil and Water Quality of the DBC ‘Core Strategy’ document⁹ relates to noise stating:

“...Any development proposals which would cause harm from a significant increase in pollution (into the air, soil or any water body) by virtue of the emissions of fumes, particles, effluent, radiation, smell, heat, light, noise or noxious substances, will not be permitted....”

Consultation

12.2.15 Prior to undertaking this assessment, an EIA Scoping Report was submitted to SADC and DBC (a copy of which is provided in **ES Volume 3, Appendix 2.1**). EIA Scoping Opinions were provided by SADC and DBC on 31st and 29th January 2025 respectively (copies of the EIA Scoping Opinions are provided in **ES Volume 3, Appendices 2.2** and

⁹ Dacorum Borough Council. Core Strategy 2006-2031. September 2013.

2.3). Key issues raised during scoping and consultation to date specific to noise and vibration are listed in **Table 12.1** below, together with how details of how these issues have been considered in the production of this ES and cross-references to where this information may be found.

Table 12.1: Key Comments Raised During Scoping and Consultation to Date

Consultee	Comment Raised	How and Where Comment is Addressed within the ES
SADC	The scope is broadly acceptable subject to agreeing a detailed assessment methodology with the Council prior to the assessment being carried out.	A Proposed Baseline Sound Surveys for EIA document was submitted to SADC and DBC via email prior to the assessment being carried out. Following this it was agreed to include an additional long term survey.
SADC	The detailed comments made by Lockwood Environment, Assessment & Management on behalf of the Council must be fully taken into account.	Throughout the assessment
DBC	Regarding operational use of the site, significant effects include operational road traffic movements and the use of mechanical plant items and other industrial or commercial sources that are likely to be part of the development.	A road traffic noise assessment has been undertaken and a high level assessment of mechanical plant items and other industrial or commercial sources that are likely to be part of the development.
DBC	AY note that, whilst not strictly an EIA consideration, acoustic assessments will be undertaken for the proposed residential and educational development. These will be produced as standalone reports that will accompany the planning application.	Site Suitability Assessment report provided in ES Volume 3, Appendix 12.1
DBC	Inclusion of the aforementioned potential significant noise effects and standalone acoustic reports. The conclusions of these reports may have 'fundamental impacts on design' such as inherent (primary) mitigation (e.g. site layout, including the location of noise sensitive residential areas). Further, the screening of significant noises such as the M1 may require mitigation measures such as bunding or re-profiling of site levels. Therefore, ECP [Environmental and Community Protection] therefore seem to suggest that these acoustic assessments are intrinsically part of the EIA process, should be discussed in the ES and should be used to shape the layout of the scheme	An extensive design process has been undertaken with regard to proposed mitigation that will be included inherently as part of the overall scheme design. This mitigation is in the form of a noise bund and barrier combination that will be formed along the majority of the eastern boundary of the Site with the M1 motorway. The bund/barrier combination has been designed to reduce noise levels across the proposed Development Site to be as low as practicable, and ideally below 55 dBA in all areas allocated for external amenity or educational use.
DBC	Regarding construction vibration, it is suggested that this aspect could be scoped out from assessment of significant effects, on the assumption that appropriate mitigation measures would be secured via the CEMP to be submitted with the ES.	A Construction Environmental Management Plan (CEMP) is provided in ES Volume 3, Appendix 6.1 .
DBC	It is noted that SADC's Scoping Opinion does not scope out vibration.	As above construction vibration has been scoped out, as indicated by SADC comment that the proposed scope is acceptable.

Guidance and Best Practice

BS 5228-1:2009+A1:2014. Code of Practice for Noise and Vibration Control on Construction and Open Sites.

Noise

12.2.16 BS 5228-1:2009+A1:2014¹⁰ provides recommendations for basic methods of noise control relating to construction and open sites where work activities/operations generate significant noise levels, including industry-specific guidance.

12.2.17 The legislative background to noise control is described and recommendations are given regarding procedures for the establishment of effective liaison between developers, site operators and local authorities.

12.2.18 This part of the standard also provides guidance concerning methods of predicting and measuring noise and assessing its impact on those exposed to it.

Calculation of Road Traffic Noise

12.2.19 The current national method for predicting road traffic noise is described in the publication Calculation of Road Traffic Noise¹¹ (CRTN). The noise index prescribed by this method is the $L_{A10,18hr}$, which is derived by calculation from information on two-way traffic flows, % of Heavy Goods Vehicle (HGV) movements, road gradient, vehicle speed, ground conditions and screening, reflection effects etc.

Design Manual for Roads and Bridges (DMRB) Sustainability and Environment Appraisal LA 111 Noise and Vibration (May 2020)

12.2.20 The LA 111¹² document sets out the requirements for noise and vibration assessments from road projects, applying a proportionate and consistent approach using best practice and ensuring compliance with relevant legislation.

12.2.21 The environmental assessment method describes the likely significant effects of proposed projects on the environment resulting from the emissions of noise and vibration from; construction noise, construction vibration, and operational noise.

BS 4142:2014+A1:2019. Methods for Rating and Assessing Industrial and Commercial Sound

12.2.22 BS 4142:2014+A1:2019¹³ provides a method of assessing the impact of a source of industrial or commercial sound.

¹⁰ 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.

¹¹ Department of Transport. Calculation of Road Traffic Noise. HMSO. 1988.

¹² Highways England. Design Manual for Roads and Bridges. Sustainability and Environment Appraisal LA 111 Noise and Vibration.

¹³ British Standards Institution. British Standard 4142:2014+A1:2019. Methods for rating and assessing industrial and commercial sound.

12.2.23 The Standard can be used to assess sound, including a change of sound, as a response to a complaint or as part of a planning application. The assessment of sound from passing vehicles on public roads or public railways is beyond the scope of the Standard.

Study Area

12.2.24 There is no national government guidance or legislation on the extent of the study area to adopt for the assessment of noise effects from the Works or operation of mixed-use developments on NSRs. The study area in this Chapter has therefore been chosen on the basis of professional judgment of the distances over which significant noise effects may occur and consideration of the likely magnitude and duration of impact and the sensitivity of receptors.

12.2.25 In the case of noise emissions from the Works phase of the Development, the study area has been selected to include the nearest potentially affected NSRs to the north, south and west of the Site boundary, as determined from Ordnance Survey and other mapping data together with site visits. The sensitivity of all NSRs within the chosen study area has been determined and predictions made at the most affected receptors. The nearest NSRs are where Site noise levels would be highest.

12.2.26 The works and operational phase road traffic noise levels have been considered for all road links provided by the transport consultants working on the scheme.

12.2.27 In the case of vibration emissions, given that levels of vibration attenuate very rapidly through the ground within a few metres and the approximate distance to the nearest receptors to significant construction work is circa 20 to 25 m, it is considered that the construction works and operation of plant items will be very unlikely to cause significant adverse effect at any receptor due to vibration.

12.2.28 Based on the above, it is considered appropriate to scope vibration effects out of further assessment. As such, study areas for vibration have not been assigned. This has been agreed through the EIA scoping process, as set out in **Table 12.1**.

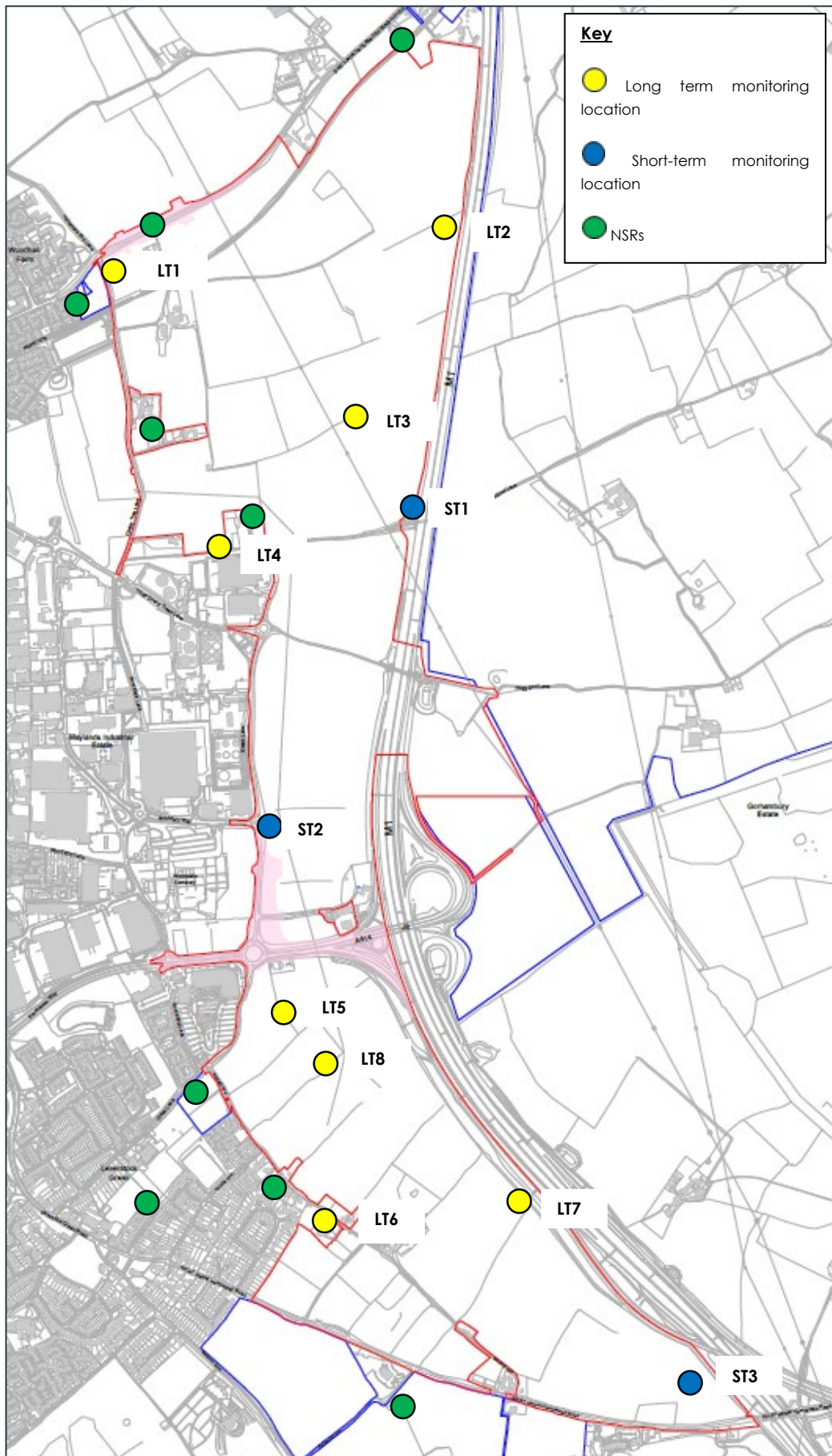
12.2.29 The locations of NSRs identified in the construction and operational assessments are shown in **Figure 12.1**.

Site-Specific Surveys

12.2.30 In order to inform the noise assessment, the Site-specific surveys, listed in **Table 12.2** below, were undertaken in 2025 to establish baseline sound levels on the Site and in the vicinity of the Development. Survey locations and results are summarised below.

12.2.31 **Figure 12.1** below shows the survey locations.

Figure 12.1: Baseline Noise Survey Locations



12.2.32 Details of the proposed survey scope and methodology were included as part of the EIA Scoping Report submitted for review and the Proposed Baseline Sound Surveys for EIA document submitted to SADC and DBC. The scope, methodology, results of the survey, and figures showing survey locations are set out in detail in **ES Volume 3, Appendix 12.1**.

Table 12.2: Summary of Site-Specific Surveys Undertaken

Extent	Overview	Provider	Year	Reference
Representative locations for the nearest existing NSRs to the Development and locations representative of proposed NSRs	Unattended surveys at eight locations between Tuesday 3 June 2025 and Friday 18 June 2025.	Savills	2025	ES Volume 3, Appendix 12.1

Impact Assessment Criteria

Construction Noise

12.2.33 The magnitude of construction noise impacts has been determined in accordance with Annex E of BS 5228-1. The criteria for assessing noise impact from construction works have been based on Example Method 2 contained within Annex E.3.3 of BS 5228-1; this indicates that:

“Noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq,T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant effect.”

12.2.34 **Table 12.3** summarises the criteria that have been used for the assessment of construction noise impacts for residential dwellings and other NSRs of medium sensitivity, based on the guidance in BS 5228-1. Determination of impact also includes consideration of duration, absolute noise levels and management of the noise sources, all of which make up the context.

12.2.35 The calculation method of BS 5228-1:2009 takes account of the duration of an activity per hour, the ‘on-time’ (as noted in **ES Volume 3, Appendix 12.2**); and the attenuation of sound due to distance, ground attenuation and barrier effects. The assessment is based on reasonably expected construction phases as summarised in **ES Volume 2, Chapter 6: The Works**, as well as plant items and on-times based on the information provided within BS 5228-1. The average percentage on-time comes from estimates of the time that the plant will be operating at full power.

12.2.36 Where predicted construction noise levels are below ambient noise level or are 5 dB below the lower cut-off values for the relevant time period, or of short duration (<1 month), which is not applicable in this case as works would be ongoing for longer time periods, there is considered to be ‘no change’ or a negligible magnitude of impact.

12.2.37 For works of significant duration (>1 month) where predicted noise levels are up to 5 dB above ambient or are less than the lower cut-off values, this is considered to result in a minor magnitude of impact depending on the context and duration of the works. Where predicted noise levels are equal to the lower cut-off values or exceed them by up to 10 dB, this is considered to be a moderate magnitude of impact depending on the context and duration of the works. Predicted noise levels greater than 10 dB above the lower cut-off values are considered to result in a major magnitude of impact depending on the context and duration of the works.

Table 12.3: Adopted Thresholds for the Evaluation of Magnitude of Construction Noise

Assessment Category and Threshold Value Period (L _{Aeq})	Threshold Value*				
	No change	Negligible	Minor	Moderate	Major
Night-time (23:00 to 07:00 hours)	>10 dB below baseline ambient noise level	<40 dB or ≤ baseline ambient noise level	>40 dB – <45 dB or <5 dB above baseline ambient noise level	≥45 dB – <55 dB	≥55 dB
Evenings (19:00 to 23:00 hours weekdays) Weekends (13:00 to 23:00 hours Saturdays and 07:00 to 23:00 hours Sundays)	>10 dB below baseline ambient noise level	<50 dB or ≤ baseline ambient noise level	>50 dB – <55 dB or <5 dB above baseline ambient noise level	≥55 dB – <65 dB	≥65 dB
Daytime (07:00 to 19:00 hours) weekdays Saturdays (07:00 to 13:00 hours)	>10 dB below baseline ambient noise level	<60 dB or ≤ baseline ambient noise level	>60 dB – <65 dB or <5 dB above baseline ambient noise level	≥65 dB – <75 dB	≥75 dB

Median line for receptors of medium sensitivity

*Subject to duration and where ambient noise levels are low

Construction Traffic

12.2.38 The noise changes identified in **Table 12.4** have been used in the assessment of noise impacts associated with construction traffic on the local road network from the construction of the Development. These are based on the guidance in DMRB LA 111 for the classification of magnitude of noise impacts in the short term. These DMRB criteria best reflect the temporary nature of the construction traffic impacts; and allow for a robust, worst case assessment of response to construction traffic noise.

Table 12.4: Adopted Thresholds for Evaluation of Magnitude of Construction Traffic Noise

Short Term Magnitude	Short Term Noise Change (dB L_{A10} or L_{night})
Major	Greater than or equal to 5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	Less than 1.0

Operational Traffic

12.2.39 The noise changes identified in **Table 12.5** have been used in the assessment of noise impacts associated with operational traffic on the local road network from the operation of the Development. These are based on the guidance in DMRB LA 111 for the classification of magnitude of noise impacts in the long term. These DMRB criteria best reflect the permanent nature of the operational traffic impacts; and allow for a robust, worst case assessment of response to operational traffic noise.

Table 12.5: Adopted Thresholds for Evaluation of Magnitude of Operational Traffic Noise

Long Term Magnitude	Long Term Noise Change (dB L_{A10} or L_{night})
Major	Greater than or equal to 10.0
Moderate	5.0 to 9.9
Minor	3.0 to 4.9
Negligible	Less than 3.0

Operational Noise from Mechanical Plant

12.2.40 Following the general principles of the assessment methodology presented in BS 4142:2014+A1:2019, the determination of magnitude criteria for the effects of any noise from fixed mechanical plant items (or similar) are generally based on the categories described in the BS, i.e.

- A 'negligible' magnitude is likely where the Rating Level does not exceed the existing background sound level;
- A 'minor' magnitude is likely where the Rating Level exceeds the existing background sound level by less than 5 dB;
- A 'moderate' magnitude is likely where the Rating Level is more than 5 dB but lower than 10 dB above the background sound level; and
- A 'major' magnitude is likely where the Rating Level is more than 10 dB or more above the background sound level.

Significance Criteria

12.2.41 The predicted level of effect is based on the consideration of magnitude of impact and sensitivity of the resource / receptor to come to a professional judgement as to how important this effect is using **Table 12.6** as a guide.

Table 12.6: Matrix Used for the Assessment of the Significance of an Effect

Receptor Sensitivity	Magnitude of Impact				
	No change	Negligible	Minor	Moderate	Major
Negligible	Insignificant	Insignificant	Insignificant or minor	Insignificant or minor	Minor
Low	Insignificant	Insignificant or minor	Insignificant or minor	Minor	Minor or moderate
Medium	Insignificant	Insignificant or minor	Minor	Moderate	Moderate or major
High	Insignificant	Minor	Minor or moderate	Moderate or major	Major

12.2.42 Accounting for the above, the full range of significance criteria to be defined is as follows:

- Major adverse / beneficial significance;
- Moderate adverse / beneficial significance;
- Minor adverse / beneficial significance; and
- Insignificant.

12.2.43 For the purposes of this assessment the level of impact is considered 'significant' in circumstances when the overall significance of effect is moderate adverse / beneficial or above. In addition to the significance of the impact, the nature of the impact, being either beneficial, negligible, or adverse, has also been considered accordingly. Effects can either be beneficial or adverse.

12.3 Relevant Baseline Conditions

12.3.1 The baseline survey locations and measured baseline data are presented in **ES Volume 3, Appendix 12.1**. A summary of the adopted sound levels for the daytime (07:00 to 23:00 hours) and night-time (23:00 to 07:00 hours) periods at each survey location are presented in **Table 12.7** with locations shown in **Figure 12.1** above. The baseline sound survey locations were positioned to inform levels at potentially sensitive development such as residential properties and schools but also to calibrate the noise model associated with the M1 and the bund/barrier mitigation along the M1 boundary in the east of the Development.

Table 12.7: Baseline Sound Levels

Location	Daytime (07:00 to 23:00 hours)		Night-time (23:00 to 07:00 hours)		
	$L_{Aeq,16h}$ (dB)	$L_{A90,T}$ (dB) ¹	$L_{Aeq,8h}$ (dB)	$L_{A90,T}$ (dB) ¹	L_{AFmax} (dB) ²
LT1	59	45	51	38	62
LT2	67	65	65	61	70
LT3	60	55	59	55	76
LT4	48	43	42	40	55
LT5	53	50	48	45	57
LT6	48	43	39	37	56
LT7	57	55	54	52	65
LT8	48	45	45	43	63

Based on the 25th percentile of all 15-minute $L_{A90,T}$ data within each period.

The highest L_{AFmax} not exceeded more than 10 times, is based on 5-minute period data

- 12.3.2 At the time of deployment and collection of the long term surveys and undertaking the short-term surveys, the following noise sources were noted as affecting the acoustic environment: continuous road traffic movements on the M1 and general ambient noise (bird song, rustling trees etc.).
- 12.3.3 With regard to areas of the Site closest to the existing commercial / industrial land uses located to the west of Green Lane (for e.g. Buncefield Oil Depot), some associated noise was noted as being audible, including HGV movements on Green Lane, but not considered significant and largely masked by distant road traffic noise.
- 12.3.4 Construction activity is not anticipated to occur outside of daytime working hours, save for any specific exceptions to be agreed in advance. Baseline (residual) sound levels are below 60 dB L_{Aeq} during the day and are therefore subject to the criteria set within the lower cut-off values for the assessment of construction noise impacts (i.e. the most stringent limits).
- 12.3.5 For assessment of operational noise impacts, BS 4142 requires that the background sound levels adopted for the assessment be representative of the period being assessed. The Standard recommends that the background sound level should be derived from continuous measurements of normally not less than 15-minute intervals, which can be contiguous or disaggregated. However, the Standard also states that there is no 'single' background sound level that can be derived from such measurements.
- 12.3.6 The 25th percentile value (lower quartile) from the unattended monitoring has been used as a starting point in order to characterise the daytime baseline sound environment. This value is not the lowest sound level

encountered but is usually lower than that obtained using the average. It therefore represents somewhere in the range of lower sound levels that are likely to be encountered and thus represents a precautionary assessment. Use of the 25th percentile also ensures that any periods during which higher wind speeds could have affected the measured baseline noise levels do not unduly affect the analysis.

12.3.7 The adopted representative survey locations for the nearest affected NSRs during the Works phase of the Development are presented in **Table 12.9** below. These receptors have been identified as the likely most affected receptors during the Works phase of the Development.

12.3.8 There is no nationally adopted guidance on how the sensitivities of NSRs should be determined. Therefore, for this Chapter, the sensitivity of classes of receptor is defined through consideration of the vulnerability, recoverability and value / importance of that receptor class. The criteria for defining sensitivity in this Chapter are outlined in **Table 12.8**.

Table 12.8: Criteria for Receptor Sensitivity

Receptor Sensitivity	Description
High	Schools, churches and concert halls etc.
Medium	Residential properties, hotels, hospitals, nursing homes and care homes and sites of historic or cultural importance.
Low	Area used primarily for leisure activities, including Public Rights of Way (PROW), sports facilities, offices and retail businesses.
Negligible	All other areas such as those used primarily for industrial or agricultural purposes.

Table 12.9: Adopted Representative Survey Locations for NSRs and Sensitivity

NSRs	Sensitivity	Representative Survey Location
Dwellings close to Redbourn Road / Hemel Hempstead Road (B487)	Medium	LT1
Bayford Close	Medium	
Dwellings off Punchbowl Lane	Medium	LT4
Kingcup Avenue	Medium	LT5
Dwellings close to / on Westwick Road	Medium	
Leverstock Green CofE Primary School	High	LT6
Plymouth Brethren Christian Church	High	

12.3.9 At the operational phase the likely most affected receptors would be new dwellings or other noise sensitive development, such as the proposed educational development.

12.4 Likely Effects of the Development and their Significance

The Works

Construction Road Traffic

Magnitude of Impact

- 12.4.1 The potential noise change on the surrounding highway network, occurring as a result of increased traffic flow during the operation of the Development, has been predicted and assessed against the noise change criteria as given in **Table 12.4**. This assessment is provided in **ES Volume 3, Appendix 12.2**.
- 12.4.2 The highest noise change occurs on road link #54 'Green Lane (S of Boundary Way)', which has a noise change of 2.8 dB, which, with reference to **Table 12.4**, is of **minor** magnitude.

Sensitivity of the Receptor

- 12.4.3 The NSRs identified within the operational assessment have a sensitivity considered to be **medium** or **high**.

Significance of Effect

- 12.4.4 It is predicted that a minor impact of road traffic noise increase on the medium and high sensitivity NSRs would result in a **direct, temporary short-term** and **local** effects of **minor adverse significance**, which are not significant.

Construction Activity

Magnitude of Impact

- 12.4.5 The noise modelling assumptions, predictions and results of the assessment are presented in **ES Volume 3, Appendix 12.2**. A summary of the assessment outcome is provided below.
- 12.4.6 Predictions have shown that noise levels from the construction activity at all existing and proposed NSRs (e.g. those NSRs introduced in earlier completed phases of Development) associated with the Development will be below the lower weekday / Saturday morning cut-off values of 65 dB L_{Aeq} respectively, as given in Method 2 within Annex E of BS 5228-1.
- 12.4.7 The highest predicted noise levels are predicted at façades of dwellings to the west of the Development, with levels of 64 dB $L_{Aeq,T}$ during initial site clearance stages. In accordance with the magnitude of impact criteria as detailed in **Table 12.3**, this is representative of a minor magnitude of impact at these receptors for the weekday / Saturday morning, albeit a moderate impact if works occurred in the evening or Saturday afternoons (construction timings can be controlled via CEMP or CTMP). It should be noted that this is based on construction activity occurring in closest proximity to the existing and future NSRs.

12.4.8 Based on the above, it is considered that noise from construction activity associated with the Development will result in an impact of **minor** magnitude at all NSRs.

12.4.9 Notwithstanding the above, a Construction Environmental Management Plan (CEMP) will be implemented during the Works which will detail good practice techniques to minimise noise and prevent impact. An Outline CEMP is provided at **ES Volume 3, Appendix 6.1**.

Sensitivity of the Receptor

12.4.10 The NSRs identified within the construction assessment have a sensitivity considered to be **medium** or **high**.

Significance of Effect

12.4.11 It is predicted that a negligible impact of construction activity noise on the medium or high sensitivity NSRs would result in a **direct, temporary short-term** and **local** effects of **minor or moderate adverse significance**, which is not significant.

The Completed and Operational Development

Operational Road Traffic

Magnitude of Impact

12.4.12 The potential noise change on the surrounding highway network, occurring as a result of increased traffic flow during the operation of the Development, has been predicted and assessed against the noise change criteria as given in **Table 12.5**. This assessment is provided in **ES Volume 3, Appendix 12.3**.

12.4.13 The highest noise change occurs on road link #54 'Green Lane (S of Boundary Way)', which has a noise change of 2.6 dB, which, with reference to **Table 12.5**, is of **negligible** magnitude.

Sensitivity of the Receptor

12.4.14 The NSRs identified within the operational assessment have a sensitivity considered to be **medium** or **high**.

Significance of Effect

12.4.15 It is predicted that a negligible impact of road traffic noise increase on the medium and high sensitivity NSRs would result in a **direct, permanent long term** and **local** effects of **insignificant** or **minor adverse significance**, which are not significant.

Operational Mechanical Plant and Equipment

12.4.16 At this stage the location, type and operational periods of any mechanical plant or other noise generating activity that may be installed / undertaken is not known. Furthermore, following completion of the Development,

background sound levels would likely differ from those measured today, as a result of newly constructed buildings and noise mitigation measures (bunds and barriers) along the most eastern part / boundary of the Site close to the M1. As such, it is not possible to undertake a detailed assessment of operational mechanical plant and equipment.

12.4.17 Nevertheless, any mechanical plant or equipment that may be included as part of the Development will be attenuated such that the Rating Level does not exceed the representative background sound level over the plant operational period, or as otherwise required by the local planning authority's policy. Given the proximity of the M1 motorway, background sound levels are currently relatively high across the Site and it is likely that this would still be the case in future, albeit likely somewhat lower due to constructed buildings and noise bunds / barriers.

12.4.18 As such, noise impacts from operational mechanical equipment would be no greater than of negligible magnitude, resulting in insignificant or minor adverse effects at medium and high sensitivity NSR locations, which are not considered to be significant in EIA terms.

12.4.19 It is predicted that a negligible impact of operational plant noise on the medium or high sensitivity NSRs would result in a **direct, permanent, long term** and **local** effects of **insignificant** or **minor adverse significance**, which is not significant.

Site Suitability

12.4.20 **ES Volume 3, Appendix 12.1** provides the Site Suitability Assessment for the proposed residential and educational development.

12.4.21 It should be noted that an extensive design process has been undertaken with regard to proposed mitigation that will be included inherently as part of the design of the Development.

12.4.22 This mitigation is in the form of a noise bund and barrier combination that will be formed along the majority of the eastern boundary of the Site with the M1 motorway.

12.4.23 The bund / barrier combination has been designed to reduce noise levels across the Site to be as low as practicable, and ideally below 55 dBA in all areas allocated for external amenity or educational use.

12.4.24 This has not been possible for all areas, despite the bund / barrier combination being up to 11m in height. However, it demonstrates that the design of the Development has been directly influenced by the principles of good acoustic design.

12.4.25 Furthermore, areas of proposed residential use would be located as far from the motorway as practicable and with gardens orientated away from the motorway; further examples of good acoustic design that have been and will be employed.

12.4.26 The Site Suitability Assessment report concludes that:

- the proposed residential development would be subject to satisfactory internal and external acoustic environments with respect to British Standard (BS) 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' through standard design practices with no specific façade design requirements (i.e. standard double glazing and passive through-frame trickle ventilators); and
- the proposed educational development would be subject to satisfactory internal and external acoustic environments with respect to Building Bulletin 93, Acoustic Design of Schools: A Design Guide (BB93) through standard design practices (i.e. standard double glazing and passive through-frame trickle ventilators.)

12.4.27 Consequently, no additional noise mitigation measures would be required.

12.5 Additional Mitigation / Enhancement and Likely Residual Effects of the Development and their Significance

The Works

12.5.1 Construction and construction traffic noise effects would be **insignificant** or of **minor adverse significance (not significant)**, and therefore no additional mitigation is required in respect of this particular issue.

The Completed and Operational Development

Operational Road Traffic Noise

12.5.2 Operational traffic noise effects would be **insignificant** or of **minor adverse significance (not significant)**, and therefore no additional mitigation is required in respect of this particular issue.

Operational Fixed Plant / Commercial Noise

12.5.3 The proposed noise design criteria aim to appropriately minimise the likelihood of adverse impacts. Compliance with these criteria would be ensured through an appropriately worded planning condition. It is predicted that a negligible impact of operational plant noise on the medium or high sensitivity NSRs would result in a **direct, permanent, long term** and **local** effects of **insignificant** or **minor adverse significance**, which is not significant.

12.6 Likely Residual Cumulative Effects and their Significance

12.6.1 A full list of Cumulative Schemes and their locations relative to the Site is provided in **ES Volume 2, Chapter 2: EIA Methodology**.

12.6.2 Following a desktop review of the Cumulative Schemes identified, the risk for either the construction or operation of the identified Cumulative Schemes to result in noise effects at NSRs increasing from insignificant or minor adverse significance to moderate adverse significance is considered to be negligible.

- 12.6.3 This is on the basis that the nearest Cumulative Schemes to the Site and the existing/proposed NSRs is similar to that proposed by the Development, i.e. mixed-use and residential-led, which has a low risk for adverse noise effects, as demonstrated above for the Development alone. It is also reasonably assumed that construction works at the Cumulative Schemes would be required to adopt similar best practice noise mitigation secured by way of a CEMP.
- 12.6.4 Notwithstanding the above, a cumulative development road traffic noise change assessment has been undertaken, which considers all relevant cumulative development for the transport assessment.

The Completed and Operational Development

Operational Road Traffic

Magnitude of Impact

- 12.6.5 The potential noise change on the surrounding highway network, occurring as a result of increased traffic flow during the operation of the Development including the Cumulative Schemes, has been predicted and assessed against the noise change criteria as given in **Table 12.3**. This assessment is provided in **ES Volume 3, Appendix 12.3**.
- 12.6.6 The highest noise change occurs on road link #54 'Green Lane (S of Boundary Way)', which has a noise change of 2.6 dB, which, with reference to **Table 12.4** is of negligible magnitude.

Sensitivity of the Receptor

- 12.6.7 The NSRs identified within the operational assessment have a sensitivity considered to be **medium or high**.

Significance of Effect

- 12.6.8 It is predicted that a negligible impact on the medium or high sensitivity NSRs would result in a **negligible** or **minor** adverse effect, which is not significant.
- 12.6.9 It is predicted that a negligible impact of cumulative road traffic noise increase on the medium sensitivity NSRs would result in a **direct, permanent long term** and **local** effects of **insignificant** or **minor** adverse significance, which are not significant.

12.7 Conclusions

- 12.7.1 An assessment of the potential effects of noise during the Works and operational (occupation) phases of the Development has been undertaken. The results have been summarised and the significance of effects has been described in this Chapter.

The Works

12.7.2 Predictions have shown that noise from construction activity and road-traffic would result in, at worst, temporary insignificant or minor adverse effects.

The Completed and Operational Development

12.7.3 Operational road traffic would result in negligible increases in road traffic noise levels at NSRs resulting in permanent insignificant or minor adverse effects.

12.7.4 Noise associated with any operational fixed plant and / or noise generating commercial activity would be designed and controlled such that resultant direct, permanent, long term and local effects would be no greater than of insignificant or minor adverse significance, which is not significant.

12.7.5 The Site Suitability Assessment report concludes that:

- the proposed residential development would be subject to satisfactory internal and external acoustic environments with respect to British Standard (BS) 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' through standard design practices with no specific façade design requirements (i.e. standard double glazing and passive through-frame trickle ventilators); and
- the proposed educational development would be subject to satisfactory internal and external acoustic environments with respect to Building Bulletin 93, Acoustic Design of Schools: A Design Guide (BB93) through standard design practices (i.e. standard double glazing and passive through-frame trickle ventilators.)