

10 Noise and Vibration

10.1 Introduction

10.1.1 This chapter was prepared by Professional Consult and presents an assessment of the likely significant noise and vibration effects during construction and operation of the Development upon the proposed residential receptors and existing residential receptors within the vicinity of the Development. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any significant adverse effects identified and / or enhance likely beneficial effects. The nature and significance of the likely residual effects are then reported.

10.1.2 An assessment of the cumulative effects of the project with other cumulative developments (as identified in Chapter 3: EIA Methodology and Appendix 3.4: Schedule of Cumulative Schemes) is also presented.

10.1.3 The chapter is supported by the following Figures:

- Figure 10.1: Noise Measurement Locations;
- Figure 10.2: Noise & Vibration Sensitive Receptors;
- Figure 10.3.1: Noise Modelling Output – Road Traffic Noise Impact on Residential Development (Daytime);
- Figure 10.3.2: Noise Modelling Output – Road Traffic Noise Impact on Residential Development (Night-time);
- Figure 10.4.1: Noise Modelling Output – Commercial Noise Impact on Residential Development (Daytime);
- Figure 10.4.2: Noise Modelling Output – Commercial Noise Impact on Residential Development (Night-time);
- Figure 10.5: Noise Modelling Output – Sports Pitch Noise Impact on Residential Development;
- Figure 10.6: Noise Modelling Output – Road Traffic Noise Impact on Primary School;
- Figure 10.7: London Luton Airport 2027, Do Something LAeq,16hr Noise Contour Plot; and
- Figure 10.8: London Luton Airport 2035, Do Something LAeq,16hr Noise Contour Plot.

10.1.4 The chapter is supported by the following appendices:

- Appendix 10.1: Legislation, Policy & Guidance;
- Appendix 10.2: Measured Noise Level Data;
- Appendix 10.3: Noise Survey Methodology; and
- Appendix 10.4: SADC Correspondence.

Competence

- 10.1.5 This chapter has been produced by John Goodwin who is corporate member of the Institute of Acoustics and is a member of the Institute of Environmental Science. John has 23 years' experience in acoustic consultancy and currently supports developers across the UK with a range of developments in the residential, commercial and energy sectors.

10.2 Legislation, Planning Policy and Guidance

- 10.2.1 The following sections provide a summary of the legislation, planning policy and guidance that is of relevance to this assessment and the Development. For a detailed review, please refer to Appendix 10.1.

Legislation Context

- 10.2.2 The following legislation is relevant to the Development:

- Environmental Protection Act 1990¹; and
- Control of Pollution Act 1974².

Planning Policy Context

National

- 10.2.3 The following national planning policy is relevant to the Development:

- National Planning Policy Framework (2025)³.

Local

- 10.2.4 The following local planning policy is relevant to the Development:

- Draft SADC Local Plan – Draft Local Plan 2041 ('Emerging Local Plan')⁴.

Guidance & Standards

- 10.2.5 The following guidance is relevant to the Development:

- BS4142:2014+A1:2019: 'Methods for rating and assessing industrial and commercial sound'⁵;
- BS8233:2014: Sound insulation and noise reduction for buildings⁶;
- Design Manual for Roads and Bridges (DMRB) LA111⁷;
- Calculation of Road Traffic Noise⁸;
- British Standard (BS) 5228 Part 1 Noise⁹;
- British Standard (BS) 5228 Part 2 Vibration¹⁰;
- Artificial Grass Pitches Acoustics Planning Implications Guide – Sport England¹¹; and
- Institute of Environmental Management & Assessment 'Guideline for Environmental Noise Impact Assessment'¹².

10.3 Assessment Methodology

Consultation

EIA Scoping Opinion

- 10.3.1 A request for a Scoping Opinion was submitted by the Applicant to SADC on 27 March 2025. The Scoping Report accompanied the request (Appendix 3.2). The Scoping Opinion (Appendix 3.3) was issued by SADC on 23rd May 2025 which included comments from statutory consultees. Table 10.1 summarises key comments raised by consultees of relevance to this assessment during the EIA Scoping study and how the assessment responded to them.

Table 10.1: EIA Scoping Response Summary

Consultee and Comment	Response
<i>SADC – Scoping Opinion (23 May 2025)</i>	
With regards specifically to the noise and vibration chapter of the 'Environmental Impact Assessment (EIA) Scoping Report, North Hemel Hempstead, March 2025 prepared by Quod, the scope of the proposed noise assessments appear appropriate for the development, as does the overview of the proposed assessment methodologies.	The scope and assessment approach is in line with that presented in the EIA Scoping Report.
The comments from [the SADC] Environmental Health Manager must be taken into consideration.	See below response.
<i>SADC Environmental Health (30 April 2025)</i> <i>Noise and Vibration</i>	
1. It is noted that an assessment of operational vibration has been scoped out due to the likely absence of new sources of significant vibration. It is also noted that the Scoping Report explicitly identifies future noise sensitive receptors within the Development, including residential properties, as sensitive receptors to be assessed as part of the EIA. This is welcomed as the EIA process and design development should inform each other in order to avoid and mitigate any potential significant effects, especially during these important formative early stages. At this early stage of the EIA process proposed assessment of effects is deemed appropriate.	Noted.
2. It is noted that baseline noise surveys of varying duration have already been undertaken at a number of locations around the proposed site. In carrying out the EIA, the adequacy of this data should be confirmed - in consultation with SADC - considering whether the time periods and locations are suitably representative of the potential impacts and effects. Where necessary additional, baseline surveys may be required.	Baseline surveys undertaken at the Site are considered suitably representative. Professional Consult consulted with the Environmental Health Department at SADC via email on 20 January 2025. The purpose of the consultation was to agree the approach to the

Consultee and Comment	Response
	noise survey and assessment methodology. SADC responded to agree with the proposed approach to noise surveys and methodology. Further details are provided in 'Assessment Methodology'.
3. The proposed summary of assessment methodology submitted within the noise and vibration chapter appears sound in principle. A more detailed noise assessment methodology report is required to be submitted and agreed in advance to ensure clarity of process and the specific assessment criteria to be adopted. The report should cover assessment of impact magnitude, classification of receptor sensitivity and effect levels and subsequent overall assessment of significance. The report should include the proposed methodologies of the Noise Impact Assessment and take account of the following comments:	Relevant correspondence with SADC is provided in Appendix 10.4.
a. The Scoping Report states that construction noise and vibration impacts will be evaluated in line with the methodologies set out in BS5228-1:2009+A1:2014 and BS5228-2:2009+A1:2014, respectively. Construction traffic and operational traffic noise will be evaluated in accordance with the method identified in Design Manual for Roads and Bridges, LA111 'Noise and Vibration' (DMRB). These methods are considered appropriate for the relevant assessments. It is noted that in relation to construction traffic noise, DMRB suggests that significant observed adverse effect levels (SOAELs) are based on threshold levels determined as per BS5228-1, Section E3.2 and Table E.1.	Construction noise and vibration impacts at the closest existing residential dwellings have been considered in the assessment in line with the stated methodology. A construction traffic assessment is provided.
b. The Scoping Report states the suitability of the Site for the proposed residential uses will <i>be "assessed in accordance with the NPPF, the associated PPG and the Noise Policy Statement for England. The Development will be designed in line with BS8233:2014. BS4142:2014 is the appropriate standard for assessing any commercial noise effects upon the closest proposed dwellings. Predicted noise effects at the proposed residential dwellings due to pupils at the adjacent school will be assessed against the existing ambient noise climate"</i>. Further clarification is required regarding the significance of effects, with no specific criteria having been set out at this stage. Significance levels corresponding to the adverse effect levels (NOEL, LOAEL, SOAEL, as defined in the Noise Policy Statement	The 'Assessment of Effects' section provides an assessment of site suitability in line with NPPF and PPG. An explanation of the criteria applied to the assessment of significance is provided in Table 10.15.

Consultee and Comment	Response
for England, 2010), should be defined for each of the various sensitive receptor classes or source types. A matrix representation of each of the effect levels should be derived, along with discussion of other contextual factors that may be considered in assessing the overall significance of effects (e.g. magnitude and number of receptors affected, particular character or features of the specific sound or baseline sound climate etc).	
c. In the context of national planning policy to which the Scoping Report refers, the statement that <i>“the Development will be designed in line with BS8233:2014”</i> provides some concern. It is essential that a ‘Good Acoustic Design Process’ is followed from the outset and not just compliance with recommended internal and external noise exposure standards. The recommended approach detailed in the ‘Professional Practice Guidance on Planning and Noise - New Residential Development’ (ANC, IOA, CIEH, May 2017) and its extended guidance relating to BS8233 should be followed.	An example of good acoustic design has been assessed as part of the road traffic noise impact upon proposed residential amenity and as exemplified in ProPG Planning & Noise.
d. Design Criteria of the educational NSR (proposed primary schools) is required to be based on ‘Acoustic design of schools: performance standards, Building bulletin 93, February 2015.’	Noise levels across the proposed school site will be assessed and comparisons made against the external and internal noise criteria levels presented in the stated guidance (Acoustic design of schools: performance standards, BB93).
4. It is noted that mitigation for construction of the scheme will be addressed in an Outline CEMP, with related construction traffic impacts considered in the Framework CTMP. This is welcomed and the CEMP should include adoption of best practicable means in line with BS5228-1/2, as appropriate. The CTMP should also address the control of potential vibration arising from construction traffic, including remedy of road defects on the construction traffic route, which might give rise to elevated levels of vibration.	Mitigation measures for construction noise and vibration of the Development are included in the Outline CEMP (Appendix 6.1) and include the adoption of best practicable means in line with BS5228-1/2, as appropriate. Measures to manage construction traffic impacts are set out in the Framework Construction Traffic Management Plan (CTMP) (Appendix 9.5).
5. It is noted that in consideration of permanent effects, the EIA process will be used to inform primary mitigation measures, such as the siting of new noise sensitive uses and inform design principles for secondary mitigation. This	Noise mitigation will be recommended, where required, is in line with the guidance provided in Professional Practice

Consultee and Comment	Response
approach is considered in line with the principles of a ‘Good Acoustic Design Process’ and is essential to complying with the requirement of the NPPF to <i>“mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life”</i>. In this regard, the Applicant is pointed towards the Professional Practice Guidance on Planning and Noise - New Residential Development’ (ANC, IOA, CIEH, May 2017) and its extended guidance.	Guidance on Planning and Noise - New Residential Development and the noise criteria limits presented in BS8233:2014 will be adhered to.

SADC – Design and Conservation Officer – Scoping Response

[Internal inspections of Great Revel End Farm should be included], together with a noise assessment in relation to the existing heritage assets.	Heritage assets closest to the Site have been considered as receptors.
---	---

Pre-Application Consultation

- 10.3.2 In addition to the consultation undertaken via the EIA Scoping process, consultation was also undertaken with the Environmental Health Department at SADC via email on 20 January 2025. The purpose of the consultation was to agree the approach to the noise survey and assessment methodology and the correspondence can be viewed in Appendix 10.4. No response was received.

Proposed Site Work

Summary of Assessment Scope

- 10.3.3 The scope of the construction assessment within this chapter is limited to the following potential impacts and assessment of effects:

Construction

- 10.3.4 For the construction phase of the Development, the following potential effects have been assessed:
- Noise and vibration effects from construction activities, including earthworks; and.
 - Noise and vibration effects from construction traffic.

Completed Development

- 10.3.5 For the completed Development, the following potential effects have been assessed:
- Noise effects to existing and future receptors from surrounding off-Site and on-Site commercial, educational and other uses;
 - Noise effects to existing and future receptors from road traffic movements, including those generated by the Development;
 - Noise impacts due to operations at the neighbouring supermarket service yard and on-Site electricity substation; and

- Noise impacts due to school pupils at the nearby primary school.

Cumulative Assessment:

- 10.3.6 The cumulative assessment will consider the same potential likely significant effects (where possible and where the necessary information is available) as identified for the Development (outlined above).

Non-Significant Effects

- 10.3.7 All other noise and vibration effects were scoped out of further assessment within this ES. This includes:
- Completed Development Vibration – the new uses will not introduce any new sources of vibration that could lead to significant effects on nearby receptors. An assessment of operational vibration from proposed new uses during the completed Development stage is scoped out of this assessment.

Study Area

Construction Noise & Vibration

- 10.3.8 To assess the effects of construction noise and vibration, the spatial extents of the study area are:
- 300m from the Site boundary: noise from construction activities, such as material movements, earthworks, ground improvement and piling, crushing and breaking;
 - 100m from the Site boundary: ground-borne vibration effects from high energy construction activities, including piling works and vibratory compaction; and
 - 50m from the kerb line of any public roads likely to experience a 1 dB(A) increase in road traffic noise level for construction traffic noise effects.

Completed Development Noise

- 10.3.9 To assess the effects of operational sound from commercial noise, the extents of the assessment include the nearest proposed noise sensitive receptors (NSRs) and existing noise environment.
- 10.3.10 For operational road traffic, the study area incorporates the key major road links, defined in conjunction with the project transport consultant, within approximately 1.5km from the Site boundary. Specific receptors are identified within 50m of an assessed road which is likely to experience a 1 dB(A) change in road traffic.
- 10.3.11 The study area for the assessment of construction noise includes a number of existing residential dwellings which lie within 300m of the Site boundary based on guidance in BS5228-1.
- 10.3.12 The study area for the assessment of changes in traffic noise levels during the operation of the Development is determined from the roads on which there is an anticipated increase in traffic flow of a sufficient magnitude to result in a potentially significant noise effect. These links will be based on traffic data provided by the project's transport consultant and clearly stated in the ES.

Baseline Characterisation Approach

Existing Baseline

- 10.3.13 The approach to defining the baseline conditions within the study area for the assessment involved a combination of desk-based research and site surveys, as set out below.

Desk Study

- 10.3.14 The baseline conditions for the study area were informed by a review of the following information sources:
- An overview of available aerial satellite photography was used to identify potential noise sources surrounding the Site, and in the locality, which may produce adverse noise impacts upon the noise-sensitive residential elements of the Development. Neighbouring residential receptors within the study area were also identified which may be subject to adverse noise and vibration impacts during the construction and operational phases of the Development.

Field Study

- 10.3.15 To determine the prevailing noise conditions, a series of baseline noise surveys were undertaken, and further details can be found in Appendix 10.3. The noise measurement locations are shown on Figure 10.1.

Future Baseline

- 10.3.16 The future baseline conditions have been determined by analysing the supplied road traffic data and predictions made for any future changes in road traffic noise levels upon existing residential receptors around the Site.
- 10.3.17 To aid in the assessment of the prediction of likely significant effects from construction and operational sources of noise, a 3D model of the site has been constructed in CadnaA noise modelling software. The models use the prediction methodology contained in ISO 9613 - 2:1996 which assumes moderate downwind propagation from the source.
- 10.3.18 The assumptions that have been applied to the modelling of the various sources are set out below. It is estimated that the model has an uncertainty of $\pm 3\text{dB}$.

Assessment Method

Construction

Construction Traffic Noise

- 10.3.19 The impact arising from construction traffic on the highway network is determined from the change in the Basic Noise Level (BNL) caused by the additional construction traffic on the road network compared to the reference case scenario. The BNL corrected for flow, speed and percentage of HGVs for the worst-case link has been predicted following the principles of the CRTN methodology and the relevant advice in DMRB.

Construction Noise and Vibration

- 10.3.20 With regards to the construction phase, this assessment will consider construction noise and vibration effects upon the closest existing residential receptors surrounding the Development.

- 10.3.21 The appropriate British Standards and the adopted noise and vibration criteria levels have been used to assess construction noise and vibration impacts at surrounding residential dwellings. In the assessment of construction noise and vibration impacts, assessment has used supplied construction plant and corresponding appropriate noise level data from BS5228-1.

Construction Vibration

- 10.3.22 Vibration level data has been adopted for vibration generating plant, as detailed in BS5228-2 and the known distances at which vibration levels produce varying magnitudes of impact.

Completed Development

- 10.3.23 With regards to road traffic noise this assessment will consider noise effects from surrounding road traffic movements on local roads which generate discernible noise impacts at the Site.
- 10.3.24 With regards to commercial noise, this assessment will consider noise from surrounding existing noise sources which generate commercial or industrial-type noise which have the potential to be discernible across the Site.
- 10.3.25 With regards to noise from the existing school to the west, noise impacts from school pupils using the external areas will be considered for the change in ambient noise level on the Site.
- 10.3.26 With regards to road traffic noise impacts upon the proposed school site, noise level predictions will be made from vehicles using the surrounding road network and in-combination with vehicles using the proposed link road.
- 10.3.27 With regards to noise from the proposed sports pitch, noise impacts will be predicted at the closest proposed residential dwellings.
- 10.3.28 Changes in road traffic noise levels, due to operation of the Development, will be made for existing residential dwellings on the local highway network. Changes in noise level will be made for the baseline year (2024) and the future year 2041 as detailed in the supplied road traffic data.

Cumulative Effects

- 10.3.29 The cumulative schemes that have been agreed with SADC for assessment have been reviewed to determine their potential to interact cumulatively with the Development during the construction and completed development phases. Table 10.2 presents a summary of this screening exercise and identifies those that have been taken forward within this assessment, as they are located within 300m of the Site, for the construction and completed Development cumulative assessment.

Table 10.2: List of Cumulative Schemes

No.	Planning Ref.	Location
St Albans City and District Council		
1	5/2016/2845	Land Between Three Cherry Trees Lane and Cherry Tree Lane, Hemel Hempstead Phase 2 - Spencers Park Phase 2 West Outline planning application to include up to 600 dwellings (C3), land for primary school (D1), land for local centre uses (A1, A3, A4, A5, D1, D2), land for up to 7,500 square metres of employment uses (B1, B2, B8), landscaping, open space and play area.
Development Consent Order		
DCO	London Luton Airport Expansion	
Dacorum Borough Council Site Allocations (draft DBC Local Plan)		
Hm01	North Hemel Hempstead Growth Area	Around 1,500 dwellings by 2041, with up to 3,500 additional homes (to include provision for older people) to be delivered beyond the plan period subject to masterplanning; three 3FE and one 2FE primary schools (including nursery provision on three); and one 8FE secondary school. Gypsy and Traveller site for 8 pitches

Assessment Criteria

Sensitivity of Receptor

- 10.3.30 Sensitive receptors are identified as locations where humans could be exposed to increased levels of noise and / or vibration due to the Development. Table 10.3 summarises the sensitivity of different types of receptors to noise and vibration applied in the assessment.

Table 10.3: Receptor Sensitivity Descriptors

Value (Sensitivity)	Descriptor
High	Receptors where people or operations are particularly sensitive to noise / vibration. For example, internal and external living areas associated with residential dwellings, quiet outdoor areas used for recreation, conference facilities, auditoria / studios, schools in the daytime, hospitals / residential care homes.
Medium	Receptors moderately sensitive to noise / vibration where it may cause some distraction or disturbance. For example, offices, community facilities, scheduled monuments / listed buildings. Receptors with a low sensitivity to noise / vibration where it may in extreme cases cause some disturbance. For example, restaurants or commercial installations.
Low	Receptors moderately sensitive to noise / vibration where it may cause some distraction or disturbance. For example, offices, community facilities, scheduled Ancient Monuments / Listed Buildings.

Magnitude of Impact – Construction Phase

10.3.31 Table 10.4 sets out the magnitude of impact descriptors typically used in the construction noise assessment.

Table 10.4: Criteria for Magnitude of Impact for Construction Noise

Impact Magnitude	Noise Level (dB)
Negligible	<75
Low	75 – 77.9*
Medium	78 - 80
High	>80

*Changes in noise level up to +2.9dB are not perceptible to the human ear

10.3.32 Table 10.5 sets out the magnitude of impact descriptors typically used in the construction vibration assessment which are derived from BS5228-2 and the various levels of human perception and the relationship to human disturbance.

Table 10.5: Criteria for Magnitude of Impact for Construction Vibration

Impact Magnitude	Vibration Level (mm/s)
Negligible	0.14mm/s
Low	0.3mm/s
Medium	1.0mm/s
High	10mm/s

Magnitude of Impact – Operational Phase

Road Traffic Noise

10.3.33 DMRB LA 111 provides two classifications for the magnitude of the traffic noise effect of a proposed road scheme, or changes in road traffic flows on existing roads, which relate to both short-term changes in noise levels (i.e. comparing traffic noise levels in the opening year with and without the scheme) and long-term changes in noise levels (i.e. comparing traffic noise levels in the opening year without the scheme with levels 15 years after opening with the scheme in operation).

10.3.34 Tables 10.6 and 10.7 indicate the short-term and long-term thresholds for changes in road traffic noise levels and the corresponding magnitudes of impact.

Table 10.6: DMRB Short-term Thresholds

Impact Magnitude	Noise Level (dB $L_{A10,18hr}$)
High	Greater than or equal to 5.0
Medium	3.0 to 4.9
Low	1.0 to 2.9
Negligible	Less than 1.0

Table 10.7: DMRB Long-term Thresholds

Impact Magnitude	Noise Level (dB L _{A10,18hr})
High	Greater than or equal to 10.0
Medium	5.0 to 9.9
Low	3.0 to 4.9
Negligible	Less than 3.0

10.3.35 In considering noise effects at the proposed residential dwellings for external areas, the noise criteria levels presented in BS8233:2014 have been adopted. Discussions with the client have taken place and in-line with the requirements of the Environmental Health Department at SADC, the principles of good acoustic design will be followed for garden areas benefiting from screening afforded by the dwelling envelope. An example illustration of this design principle has been used in the assessment.

10.3.36 For noise levels in garden areas, BS8233:2014 states that the 50dB L_{Aeq,16hr} noise criteria level is appropriate for quieter areas and the 55dB L_{Aeq,16hr} noise criteria level is appropriate for noisier areas. Given that road traffic noise is currently clearly audible across the majority of the Site and given the context of the locality, the 55dB L_{Aeq,16hr} noise criteria limit is considered reasonable for setting noise limits in garden areas of proposed dwellings.

Table 10.8: Criteria for Magnitude of Impact in Garden Areas

Impact Magnitude	Noise Level (dB L _{Aeq,16hr})
High	>55
Negligible	≤55

10.3.37 In considering noise effects at the proposed primary school, BB93 does not provide a noise criteria limit for external teaching spaces and so the same noise criteria level for residential gardens, as presented in BS8233:2014, has been adopted.

Table 10.9: Criteria for Magnitude of Impact in School External Teaching Areas

Impact Magnitude	Noise Level (dB L _{Aeq,30mins})
High	>55
Negligible	≤55

10.3.38 In considering noise effects from the proposed sports pitches upon the proposed residential dwellings, the noise criteria level presented in Artificial Grass Pitches Acoustics Planning Implications Guide¹⁴ has been adopted.

Table 10.10: Criteria for Magnitude of Impact of Proposed All-weather Pitch

Impact Magnitude	Noise Level (dB $L_{Aeq,30mins}$)
High	>50
Negligible	≤50

10.3.39 Section 11 of BS4142:2014 provides a commentary on the assessment of noise impacts, from commercial and industrial noise sources, upon noise-sensitive residential dwellings and states:

“a) Typically, the greater this difference, the greater the magnitude of the impact;

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context”.

10.3.40 Table 10.11 details the magnitude of impact for the predicted rated level of noise against the measured typical background sound level.

Table 10.11: Criteria for Magnitude of Noise Impact for Predicted Rating Level

Impact Magnitude	Noise Level (dB)
High	$LA_{r} \geq LA_{90} + 10dB$
Medium	$LA_{r} \geq LA_{90} + 5 - 9.9dB$
Low	$LA_{r} \geq LA_{90} + 0.1 - 4.9dB$
Negligible	$LA_{r} \leq LA_{90}$

10.3.41 The IEMA (now ISEP) 'Guideline for Environmental Noise Impact Assessment', addresses the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. The guidelines provide specific support on how noise impact assessment fits within the EIA process.

10.3.42 Although the guidance states that it is only applicable for use in an EIA, in the absence of any other relevant guidance for assessing changes in ambient noise levels, it is the most appropriate document for establishing significance of effect.

10.3.43 Table 10.12 categorises the change in noise level for a noise sensitive receptor such as a residential dwelling.

Table 10.12: Criteria for Magnitude of Noise Impact for Change in Ambient Noise Level

Magnitude of Impact	Noise Level (dB)
High	≥ 10.0
Medium	5.0 – 9.9
Low	3.0 – 4.9
Negligible	≤ 2.9

Magnitude of Impact & Appropriate Definition According to NPSE

10.3.44 The criteria for defining magnitude in this chapter are outlined in Table 10.15. The magnitude of the impacts are defined through consideration of the spatial extent, duration, frequency and reversibility of that impact.

10.3.45 The descriptions in Table 10.13 inform professional judgement to pull together the disparate magnitudes of impact for construction and operation into a single magnitude of impact table and relate to the observed effect levels defined in the NPPG.

Table 10.13: Criteria for Magnitude of Impact & NPPG Definition

Magnitude of Impact	Impact Description Relative to NPPG Definition
High	A noise or vibration impact where a criteria limit is exceeded by a significant margin. At or above the SOAEL.
Medium	An impact around the accepted limits and standards. Moderate impacts may cover a broad range, although the emphasis is on demonstrating that the effect has been reduced to a level that is as low as reasonably practical, such effects should be recognised and addressed in consultation with particular stakeholders. Between the LOAEL and SOAEL.
Low	An impact considered sufficiently small (with or without mitigation) to be well within accepted standards. No action is required if it can be controlled by adopting normal good working practices. At or below the LOAEL.
Negligible	An impact that is found not to be significant in the context of the stakeholder / regulator objectives or legislative requirements. Below the LOAEL.

Assessing Significance

10.3.46 Table 10.16 sets out the approach to determining the scale of effect. Determining the scale of noise and vibration effects require professional judgement therefore the matrix includes a degree of flexibility when considering the magnitude of an impact in the context of the sensitivity of the receptor.

10.3.47 Effects classified as moderate or major in scale are considered 'Significant.' Effects classified as minor or negligible in scale are considered 'Not Significant.'

Table 10.14: Significance of Effect Matrix

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

Assumptions and Limitations

10.3.48 The following assumptions and limitations have informed this assessment:

- The noise survey undertaken was completed using best-practice methods and in-line with prescribed guidance, where available. The measured noise sources, particularly commercial-type noise, have the ability to fluctuate and vary over time. Nevertheless, reasonable effort has been made to ensure that measured noise levels are accurate and robust to inform the respective assessments;
- Whilst basic information regarding proposed construction activities has been supplied, reasonable worst-assumptions have been made for plant items used during construction. Accordingly, the calculations performed are accurate to a reasonable level, based on knowledge of other commercial schemes completed in the past;
- The calculated noise impacts at the proposed noise-sensitive receptors have been undertaken using noise modelling software CadnaA which incorporates the latest updates issued by the manufacturer. The software, whilst it may not be 100% accurate, does provide predicted noise impacts which are accurate, as far as reasonably possible;
- The noise model has incorporated existing site topography in predicting noise levels at Receptors and there may be a variation in the actual noise levels incident at the Receptors; and
- The change in road traffic noise level assessment is based on traffic flow data from the transport model (with further details on the traffic modelling set out in Appendix 5.1: Transport Assessment.

10.4 Baseline Conditions

Existing Baseline

- 10.4.1 The sound climate across the Site is comprised predominantly of noise from road traffic vehicles using the surrounding road network. There is also intermittent noise audible from school pupils using the outdoor areas of Brockwood Primary School, and also low levels of noise associated with operation of an electricity sub-station on-site.
- 10.4.2 Baseline noise conditions have been determined through a baseline noise measurement survey which was carried out from 7 January 2025 to 8 January 2025. The survey was designed to capture noise levels across the Site using monitoring locations which are representative of the assessed receptors. Figure 10.1 presents the noise monitoring locations.

Road Traffic Noise – B487 Hemel Hempstead Road

10.4.3 Professional Consult has completed noise measurements as follows:

- **Noise Measurement Position 1:** Located 13.5m from the centre of the B487 Hemel Hempstead Road from 12:45 - 15:45 on 8 January 2025 in free-field conditions and in line with the procedure set out in CTRN. The noise climate at the measurement position was dominated by road traffic vehicles using Hemel Hempstead Road.

10.4.4 Table 10.15 details the measured road traffic noise levels at this location.

Table 10.15: Calculation of Road Traffic Noise Levels

Measurement Position	Period Start	Measured Sound Pressure Level (dB)		
		$L_{Aeq,1hr}$	$L_{A10,1hr}$	$L_{Amax,fast}$
1	08/01/2025 12:44	69.2	72.6	78.3
	08/01/2025 13:44	69.6	72.8	
	08/01/2025 14:44	70.2	73.2	

*10th highest maximum noise level

Road Traffic Noise – M1 Motorway

10.4.5 Professional Consult has completed noise measurements as follows:

- **Noise Measurement Position 2:** Located 22m from the centre of the M1 motorway from 12:30 on 7 January – 12:30 on 8 January 2025 in free-field conditions. The noise climate at the measurement position was dominated by road traffic vehicles using the motorway.

10.4.6 Table 10.16 details the measured road traffic noise levels at this location.

Table 10.16: Calculation of Road Traffic Noise Levels

Measurement Position	Period	Measured Sound Pressure Level, dB		Measurement Distance to Centre of Road (m)
		$L_{Aeq,T}$	$L_{Amax,fast}$	
2	Daytime	78.0	-	22
	Night-time	74.3	84.2	

*10th highest $L_{Amax,fast}$

Commercial Noise

10.4.7 Professional Consult has completed noise measurements as follows:

- **Noise Measurement Position 3:** Located 34m from the Site boundary with the supermarket service yard from 13:00 on 7 January - 13:00 on 8 January 2025 in free-field conditions. The noise climate at the measurement position was comprised of

distant road traffic noise and intermittent noise from school pupils using the outdoor area of the nearby primary school. There was no discernible noise associated with activity at the service yard. This noise measurement position was also used for the measurement of background noise levels; and

- **Noise Measurement Position 4:** Located 4m from the electricity sub-station between 13:25 – 13:27 on 8 January 2025 in free-field conditions. The noise level from the substation was a constant and steady-state and a short-term noise measurement was considered acceptable to obtain a representative noise measurement.

10.4.8 During the noise survey there was no discernible noise associated with activities at the service yard. Table 10.17 details the measured noise levels from the substation.

Table 10.17: Measured Noise Levels from Electricity Substation

Noise Level, $L_{Aeq,T}$ (dB)	Noise Measurement Distance (m)
68.1	2.5

Primary School Noise

10.4.9 Noise measurements have been taken for primary school pupil noise, as detailed below:

- **Noise Measurement Position 3:** Located 34m from the Site boundary with the supermarket service yard from 13:00 on 7 January - 13:00 on 8 January 2025 in free-field conditions. The noise climate at the measurement position was comprised of distant road traffic noise and intermittent noise from school pupils using the outdoor area of the nearby primary school. There was no discernible noise associated with activity at the service yard. This noise measurement position was also used for the measurement of background noise levels.

10.4.10 During the noise survey there was no discernible noise associated with activities at the service yard. Table 10.18 details the measured noise levels from school pupils using the outdoor area of the school.

Table 10.18: Measured School Noise Levels

Period	Measured Noise Level from School Pupils, $L_{Aeq,T}$ (dB)	Measured Ambient Noise Level Prior to Noise from School Pupils, $L_{Aeq,T}$ (dB)
07/01/2025, 14:00 – 14:15	45.8	48.1
08/01/2025, 12:15 – 12:45	59.8	58.2

Background Noise

10.4.11 Professional Consult has completed noise measurements as follows:

- **Noise Measurement Position 3:** Located 34m from the boundary with the supermarket service yard from 13:00 on 7 January - 13:00 on 8 January 2025 in free-field conditions. The noise climate at the measurement position was comprised of

distant road traffic noise and intermittent noise from school pupils using the outdoor area of the nearby primary school. There was no discernible noise associated with activity at the service yard. The noise measurement position was deemed suitable for the analysis of background sound levels given the lack of commercial noise.

10.4.12 Table 10.19 details the measured background noise levels.

Table 10.19: Measured Background Noise Levels

Measurement Position	Period	Measured Background Sound Level, $L_{A90,T}$ (dB)	
		Range	Typical (Mode Average)
2	Daytime (07:00 – 23:00)	35 - 59	38
	Night-time (23:00 – 07:00)	34 - 50	38

Future Baseline

10.4.13 The future sound climate across the Site is likely to remain similar to the existing baseline sound climate and will be comprised predominantly of noise from road traffic vehicles using the surrounding road network.

10.4.14 In support of the proposed London Luton Airport Expansion, a Digital Preliminary Environmental Information Report (PEIR) is available to view online¹³. Chapter 16 of Volume 2 of the PEIR presents a preliminary assessment of the effects of the proposed expansion due to noise and vibration.

10.4.15 Analysis of the 2027 and 2035 'Do Something' Daytime $L_{Aeq,16hr}$ Noise Contour Plots, as detailed in Figures 10.7 and 10.8, as shown in the PEIR indicate that the Site lies outside of the 51dB $L_{Aeq,16hr}$ noise contour and so the future baseline noise climate will not be adversely affected by the expansion of London Luton Airport.

Summary of Receptors and Sensitivity

10.4.16 Table 10.20 provides a summary of the sensitive receptors, and their location is shown on Figure 10.2.

Table 10.20: Summary of Receptor Sensitivity

Receptor	Sensitivity (Value)	Rationale
<i>Existing</i>		
Receptor A – Wood End Farm Cottages	High	Highly noise sensitive residential receptor
Receptor B – 1-31 Nightingale Walk	High	Highly noise sensitive residential receptor
Receptor C – The Cottage, Holtsmere End Lane	High	Highly noise sensitive residential receptor

Receptor	Sensitivity (Value)	Rationale
Receptor D – Little Revel End Farm (Heritage Asset)	High	Highly noise sensitive residential receptor
Receptor E – Barn at Great Revel End Farm (Heritage Asset)	High	Highly noise sensitive residential receptor
Receptor F – Traveller Site (Tullochside Farm)	High	Highly noise sensitive residential receptor
Receptor G – North Barn	High	Highly noise sensitive residential receptor

Future

Receptor 1 – Notional proposed receptor located close to B487 Hemel Hempstead Road	High	Highly noise sensitive residential receptor
Receptor 2 – Notional proposed residential receptor located in western part of Site which may be impacted by noise from school / service yard	High	Highly noise sensitive residential receptor
Receptor 3 – Notional proposed residential receptor located close to electricity substation	High	Highly noise sensitive residential receptor
Receptor 4 – Notional proposed worst-case residential receptor located close to the sports pitch broad location	High	Highly noise sensitive residential receptor
Receptor 5 – Proposed school receptor	High	Highly noise sensitive school receptor

10.5 Embedded Mitigation (Scheme Design and Management)

10.5.1 Table 10.21 summarises the embedded mitigation measures that have been accounted for within this assessment. As set out in Chapter 3: EIA Methodology, and in line with IEMA guidance, this includes both primary and tertiary mitigation measures.

Table 10.21: Summary of Embedded Mitigation

Embedded Mitigation Measure	Description	How Secured
Construction		
Outline CEMP	The Applicant has committed to implementing a CEMP during construction activities for the Development. An Outline CEMP is provided as Appendix 6.1. The Outline CEMP defines the key construction activity principles that will be adhered to and developed during construction activities, where practicable, including:	Planning condition.

Embedded Mitigation Measure	Description	How Secured
	▪ Substitution of construction plant with quieter or lower vibration options; ▪ Equipment siting away from NSRs; ▪ Screening NSRs from noisy activities through the use of site hoardings, site cabins, material stores, or other localised acoustic screens / enclosures; ▪ Working methods including reducing the number of concurrent noisy activities, completing activities close to NSRs quickly and efficiently, shutting down noisy equipment when not in use, minimising startup / rundown of vibratory compactors close to NSRs; ▪ Adhering to hours of work agreed with SADC, or otherwise seeking prior agreement for any work requirement outside of those hours with reasonable notice; ▪ Incorporating noise and vibration control into risk assessments and method statements at an early stage; ▪ Providing proactive links between noise management activities and community relations activities to keep local residents informed of periods of likely intensive construction activities, including changes to hours of work, and appointing a site contact to whom complaints / queries about noise and vibration can be directed, investigated and acted upon; and ▪ Developing a noise and vibration monitoring protocol to ensure compliance with any acoustic commitments and consents and enable action upon potential breaches quickly and efficiently. The Outline CEMP will act as the basis for detailed CEMPs and will be agreed with SADC once contractors are appointed.	
Framework CTMP	HGVs are expected to access the Site via B487 Hemel Hempstead Road. The two accesses proposed to serve the Development offer the opportunity for flexibility during construction. The anticipated routing from the access to the strategic road network is east along the B487, then north along the A5183 to junction 9 of the M1 as shown on Figure 9.4 (Chapter 9: Transport and Access). Traffic routing will be controlled by the CTMP. A Framework CTMP is provided in Appendix 9.5.	Planning condition.
<i>Completed Development</i>		
Residential Development	Development Zones are located furthest from the M1 motorway and therefore in the quietest part of the Site.	Parameter Plans (siting of built

Embedded Mitigation Measure	Description	How Secured
Zones Positioning		development zones)
Good acoustic design of dwellings	Appropriate design of new dwellings in close proximity to the B487 Hemel Hempstead Road and STC which accords with the principles of good acoustic design as advocated in ProPG Planning and Noise.	Development Specification (Key Design Principle)

10.6 Assessment of Effects - Construction

Construction Noise

- 10.6.1 It is inevitable with any proposed development that there will be some disturbance caused to those nearby during the construction phase(s). However, disruption due to construction is only temporary, limited to the Site and is of short-term duration. It should be noted that the Development will be phased over approximately 13 years and could affect both existing and future receptors.
- 10.6.2 The predictions have followed the methodology contained within BS 5228-1 and are in terms of the average noise level ($L_{Aeq,T}$) over the core working day, which is assumed to be 07:30 to 18:00 hours Monday to Friday and 08:00 to 13:00 on Saturdays. The predictions assume all plant being located on the Site boundary at the approximate centre of the Site, to represent an average case scenario.
- 10.6.3 Table 10.22 sets out the typical plant type, number and assumed utilisation (percentage 'on-time') used in the prediction of noise levels during the key construction activities.

Table 10.22: Construction Plant Details

Plant	Sound Pressure Level at 10m ($L_{Aeq,T}$)	No. Plant	Assumed % On-time
<i>Enabling Works & Foundations</i>			
360° Excavator	92.0	1	50%
Breaker	83.0	1	30%
Compressor & Air Tools	93.0	1	30%
Drills / Cutters	84.0	1	50%
Piling Rigs	79.0	1	20%
Compacter / Roller	86.0	1	3%
Concrete Pumps	90.0	1	50%
Generators	83.0	1	30%
Concrete Vibration Equipment	96.0	1	30%
Scaffolding	85.0	1	50%
Forklift Truck	79.0	1	20%
Mechanical Road Sweeper	83.0	1	3%
Floodlights	91.0	1	50%
Hydraulic benders and cutters	88.0	1	30%
Lorries and Vans	83.0	1	30%
Ready mix concrete trucks	84.0	1	50%
<i>Structures & Fit-out</i>			
Tower / Mobile Crane	79	1	50
Breaker	83.0	1	30%
Compressor & Air Tools	93.0	1	30%
Drills / Cutters	84.0	1	50%
Compacter / Roller	86.0	1	3%
Concrete Pumps	90.0	1	50%
Generators	83.0	1	30%
Concrete Vibration Equipment	96.0	1	30%
Scaffolding	85.0	1	50%
Forklift Truck	79.0	1	20%
Mechanical Road Sweeper	83.0	1	3%
Floodlights	91.0	1	50%
Lorries and Vans	83.0	1	30%
Ready mix concrete trucks	84.0	1	50%

Internal Access Roads & External Works & Landscaping

Plant	Sound Pressure Level at 10m ($L_{Aeq,T}$)	No. Plant	Assumed % On-time
360deg. Excavator	92.0	1	50%
Breaker	83.0	1	30%
Compressor & Air Tools	93.0	1	30%
Drills / Cutters	84.0	1	50%
Compacter / Roller	86.0	1	3%
Generators	83.0	1	30%
Concrete Vibration Equipment	96.0	1	30%
Forklift Truck	79.0	1	20%
Mechanical Road Sweeper	83.0	1	3%
Floodlights	91.0	1	50%
Hydraulic benders and cutters	88.0	1	30%
Lorries and Vans	83.0	1	30%
Ready mix concrete trucks	84.0	1	50%

Access onto B487

360deg. Excavator	92.0	1	50%
Breaker	83.0	1	30%
Compressor & Air Tools	93.0	1	30%
Drills / Cutters	84.0	1	50%
Compacter / Roller	86.0	1	3%
Generators	83.0	1	30%
Concrete Vibration Equipment	96.0	1	30%
Forklift Truck	79.0	1	20%
Mechanical Road Sweeper	83.0	1	3%
Floodlights	91.0	1	50%
Hydraulic benders and cutters	88.0	1	30%
Lorries and Vans	83.0	1	30%
Ready mix concrete trucks	84.0	1	50%

10.6.4 Predictions have been carried out to determine noise levels likely to be generated during each construction phase. For the purpose of these predictions, it was assumed that the intervening ground between the construction noise sources and the receivers will be acoustically hard such that there will be no additional attenuation of sound due to ground absorption, and that no acoustic barriers such as local buildings will be present, thus informing a worst-case assessment.

10.6.5 Noise predictions have been undertaken for the seven noise sensitive receptors A - previously identified. Receptors are shown on Figure 10.2.

- 10.6.6 Table 10.23 sets out the average predicted unmitigated earthworks and construction noise levels for the construction stage of the works. A 75dB assessment criterion has been adopted in accordance with guidance contained in BS 5228 for suburban areas which are impacted predominantly by road traffic noise. Any exceedances are highlighted in bold.
- 10.6.7 With regards to the assessment of construction noise for the access road onto the B487 Hemel Hempstead Road, this has been undertaken for Receptor A only as it is the only closest receptor.

Table 10.23: Predicted Construction Noise Levels

Receptor	Worst-case Unmitigated Earthworks Noise Level, $L_{Aeq,10hr}$ (dB)	Noise Criteria Level	Magnitude of Impact
<i>Enabling Works & Foundations</i>			
Receptor A – Wood End Farm Cottages	72.0	75	Negligible
Receptor B – 1-31 Nightingale Walk	70.0	75	Negligible
Receptor C – The Cottage, Holtsmere End	65.8	75	Negligible
Receptor D – Little Revel End Farm	64.0	75	Negligible
Receptor E – Barn at Great Revel End Farm (Heritage Asset)	69.4	75	Negligible
Receptor F – Traveller Site	70.4	75	Negligible
Receptor G – North Barn	64.7	75	Negligible
<i>Structures & Fit-out</i>			
Receptor A – Wood End Farm Cottages	68.3	75	Negligible
Receptor B – 1-31 Nightingale Walk	74.7	75	Negligible
Receptor C – The Cottage, Holtsmere End	70.5	75	Negligible
Receptor D – Little Revel End Farm	68.7	75	Negligible
Receptor E – Barn at Great Revel End Farm (Heritage Asset)	74.1	75	Negligible
Receptor F – Traveller Site	75.0	75	Negligible
Receptor G – North Barn	69.4	75	Negligible
<i>Internal Access Roads & External Works & Landscaping</i>			
Receptor A – Wood End Farm Cottages	73.6	75	Negligible
Receptor B – 1-31 Nightingale Walk	69.5	75	Negligible
Receptor C – The Cottage, Holtsmere End	64.8	75	Negligible
Receptor D – Little Revel End Farm	74.5	75	Negligible

Receptor	Worst-case Unmitigated Earthworks Noise Level, $L_{Aeq,10hr}$ (dB)	Noise Criteria Level	Magnitude of Impact
Receptor E – Barn at Great Revel End Farm (Heritage Asset)	68.9	75	Negligible
Receptor F – Traveller Site	73.5	75	Negligible
Receptor G – North Barn	75.0	75	Negligible
<i>Internal Access Road onto B487 Hemel Hempstead Road</i>			
Receptor A – Wood End Farm Cottages	70.6	75	Negligible

10.6.8 Table 10.23 indicates that the magnitude of impact at all receptors for all phases of construction, is negligible. Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such consideration of mitigation measures is not considered necessary.

10.6.9 The sensitivity of the residential receptors is categorised as high, and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of short-term, local and temporary duration.

Construction Vibration

10.6.10 Ground-borne vibration calculations have been performed for typical construction activities / machinery based on the empirical prediction procedures and historical measurement data presented within BS 5228-2. Such predictions have been performed in order to determine the possible distances at which the adopted significance criteria may be registered based on a specified confidence limit (where applicable). In this regard, the ground-borne vibration levels and associated distances have been identified for a sample of typical construction vibration sources as shown in Table 10.24.

Table 10.24: Predicted Ground-borne Vibration Levels Applicable to Typical Vibration Generating Construction Activities

Operation	Confidence Limit	Distance (m)	Vibration Level (PPV) (mm/s)
Vibratory rollers – start & end	95	60	0.3
	95	23	1.0
Vibratory rollers – steady state ¹	95	3.3	10
Rotary bored piling - Augering	N/A	20	≤0.3
	N/A	6	≤1.0
	N/A	0.6	≤10
Rotary bored piling – Auger hitting base	N/A	45	≤0.3

Operation	Confidence Limit	Distance (m)	Vibration Level (PPV) (mm/s)
	N/A	14	≤1.0
	N/A	1.4	≤10
Rotary bored piling – Driving casing	N/A	75	≤0.3
	N/A	23	≤1.0
	N/A	2.3	≤10
HGV's ²	N/A	50	≤0.3
	N/A	17	≤1.0
	N/A	2.5	≤10.0

1. Assumes 2 rollers, 0.4mm amplitude, drum width of 1.3m, e.g. heavy-duty ride on roller

2. Assumes max height / depth of surface defect of 50mm, max speed of 30km/h, and that surface defect occurs at both wheels.

Note: Where alluvium soils are present, higher vibration levels can be expected.

10.6.11 It should be noted that the data presented within Table 10.24 is general in nature and is not specific to the Site, however the vibration levels and associated distances can be used to determine the typical distances at which specific impacts are likely to be registered.

10.6.12 Table 10.25 presents the predicted magnitude of impact at each receptor. It should be noted that the magnitude ratings presented within the table, in some cases, have been generated based on a 95% confidence limit. In reality, it is likely that lower vibration levels will prevail for the majority of activities. Given the similar distances for certain receptors to the closest Site, these have been grouped where possible.

Table 10.25: Predicted Magnitude of Effects at Receptors - Ground-borne Vibration

Activity	Receptors			
	R1	R2	R3	R4
Distance from Closest Activity	100	65	106	130
Vibratory rollers – start & end	negligible	negligible	negligible	negligible
Vibratory rollers – steady state ¹	negligible	negligible	negligible	negligible
Rotary bored piling - Augering	negligible	negligible	negligible	negligible
Rotary bored piling – Auger hitting base	negligible	negligible	negligible	negligible
Rotary bored piling – Driving casing	negligible	negligible	negligible	negligible
HGV's ²	negligible	negligible	negligible	negligible

1. Assumes 2 rollers, 0.4mm amplitude, drum width of 1.3m, e.g. heavy-duty ride on roller

2. Assumes max height / depth of surface defect of 50mm, max speed of 30km/h, and that surface defect occurs at both wheels.

Note: Where alluvium soils are present, higher vibration levels can be expected.

- 10.6.13 Table 10.25 indicates that all receptors will experience a negligible magnitude of impact from all vibration-producing activities.
- 10.6.14 With regards to proposed receptors which may experience vibration impacts as part of the phased nature of the Development, the precise location of these receptors is unknown and so the use of vibratory rollers or piling machinery should not be used within 75m of an occupied dwelling, in order for negligible magnitude of impact to be observed. Where the dwelling is unoccupied, then use of such machinery could be operated below this distance.
- 10.6.15 The sensitivity of the residential receptors is categorised as high, and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of short-term, local and temporary duration.

Construction Generated Road Traffic Noise

- 10.6.16 As part of the preparation and construction phases of the Development, there will be a number of construction generated road traffic movements.
- 10.6.17 It should be noted that relatively large increases in road traffic movements would need to prevail in order for noticeable increases in road traffic noise levels to occur as a result of construction generated road traffic. As a general guide, although not accounting for changes in the percentage of HGV's, a 25% increase in traffic movements will only result in a 1dB increase in noise levels. Similarly, a 58% increase would be required for 2dB and 100% increase for a 3dB increase. It should be noted that a 3dB increase in noise levels is generally barely perceptible to the average human.
- 10.6.18 Given that any traffic entering the Site will use the main roads surrounding the Site the impact on existing, high traffic levels is considered negligible. Indeed, analysis of the traffic data indicates that the road with the greatest predicted increase in HGVs due to construction traffic is Piccotts End Road (N of Link Road) which is forecast to experience a 60% increase in HGVs. Analysis of the traffic data indicates that such an increase will increase the L_{A10hr} noise level by +0.6dB which is a negligible magnitude of impact for changes in noise level in the short term.
- 10.6.19 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such consideration of mitigation measures is not considered necessary.
- 10.6.20 Accordingly, the sensitivity of the residential receptors are categorised as high and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of short-term, local and temporary duration.

Additional Mitigation, Monitoring and Residual Effects

- 10.6.21 No significant adverse effects were identified and therefore no additional mitigation is required, and the residual effects remain as presented above.

10.7 Assessment of Effects - Completed Development

Changes in Road Traffic Noise

- 10.7.1 Upon completion of the proposals, it is anticipated that local road traffic noise levels may change as a result of development generated vehicle movements. Therefore, it is appropriate to consider the effects of any noise impacts, at existing residential dwellings off the local highway network, that might arise.
- 10.7.2 The results of the Transport Assessment have been used as the basis for the road traffic noise assessment. This focuses on roads immediately surrounding the Site before the Development generated traffic is dispersed across the wider network. The traffic data supplied in the form of 18-hour Average Annual Weekday Traffic (AAWT) flows was used in the calculations.
- 10.7.3 Where road traffic route alignments are to remain unchanged, road traffic noise calculations have been carried out in accordance with Calculation of Road Traffic Noise (CRTN), being undertaken for a notional receptor location 10m from the edge of the carriageway of each road considered and 0.5m above ground level. A notional receptor has been used because the change in noise level adjacent to any given road will be the same at all locations, where noise from this route is dominant.
- 10.7.4 Table 10.26 assesses the change in road traffic noise levels in the short-term for the roads closest to the Development.

Table 10.26: Change in Road Traffic Noise Levels in the Short Term

Link	Road	L _{A10,18hr} Noise Level for 2024 Base Year + Committed Developments, dB	L _{A10,18hr} Noise Level for 2024 Base Year + Committed Developments + Development, dB	Change in Noise Level, dB	Magnitude of Impact
17	B487 Redbourn Road (btwn A4147 / Shenley Road)	72.3	72.5	+0.2	negligible
18	B487 Redbourn Road (btwn Shenley Road W and E)	71.8	72.1	+0.3	negligible
19	B487 Hemel Hempstead Road	70.5	70.9	+0.4	negligible
31	Three Cherry Trees Lane (E of Admiral Avenue)	66.9	66.9	+0.0	negligible

Link	Road	L _{A10,18hr} Noise Level for 2024 Base Year + Committed Developments, dB	L _{A10,18hr} Noise Level for 2024 Base Year + Committed Developments + Development, dB	Change in Noise Level, dB	Magnitude of Impact
32	Cherry Tree Lane	60.7	61.4	+0.7	negligible
33	Holtsmere End Lane	51.1	50.7	-0.4	negligible
121	Scheme Road North Central	0.0	0.0	0.0	negligible
122	Scheme Road North N	0.0	0.0	0.0	negligible

10.7.5 Table 10.26 indicates that the magnitude of impact, for changes in road traffic noise in the short term is negligible for all receptors.

10.7.6 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is not considered necessary.

10.7.7 Accordingly, the sensitivity of the residential receptors are categorised as high and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of long-term, local and permanent duration.

10.7.8 Table 10.27 assesses the change in road traffic noise levels in the long-term for the roads closest to the Development.

Table 10.27: Change in Road Traffic Noise Levels in the Long Term

Link	Road	L _{A10,18hr} Noise Level for 2041 + Committed Developments, dB	L _{A10,18hr} Noise Level for 2041 + Committed Developments + Development, dB	Change in Noise Level, dB	Magnitude of Impact
17	B487 Redbourn Road (btw A4147 / Shenley Road)	71.7	71.8	+0.1	negligible
18	B487 Redbourn Road (btw Shenley Road W and E)	72.7	72.9	+0.2	negligible
19	B487 Hemel Hempstead Road	72.4	72.6	+0.2	negligible
31	Three Cherry Trees Lane (E	67.6	67.6	0.0	negligible

Link	Road	$L_{A10,18hr}$ Noise Level for 2041 + Committed Developments, dB	$L_{A10,18hr}$ Noise Level for 2041 + Committed Developments + Development, dB	Change in Noise Level, dB	Magnitude of Impact
	of Admiral Avenue)				
32	Cherry Tree Lane	0.0	0.0	0.0	negligible
33	Holtsmere End Lane	0.0	0.0	0.0	negligible
121	Scheme Road North Central	60.7	62.4	+1.7	negligible
122	Scheme Road North N	60.6	62.6	+2.0	negligible

10.7.9 Table 10.27 indicates that the magnitude of impact, for changes in road traffic noise in the long term, is negligible for all receptors.

10.7.10 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is not considered necessary.

10.7.11 The sensitivity of the residential receptors are categorised as high and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of long-term, local and permanent duration.

Road Traffic Noise Impact upon Residential Amenity

10.7.12 With regards to B487 Hemel Hempstead Road and for the purposes of this assessment, the daytime and night-time average ($L_{Aeq,T}$) noise levels have been calculated based on the shortened measurement procedure detailed in CRTN. The respective daytime and night-time noise levels have been calculated using the following formulas:

- Calculation of the $L_{A10,18hr}$ noise level by using the following formula:

$$L_{10,18hr} = L_{10,3hr} - 1dB$$

- Calculation of the $L_{Aeq,16hr}$ noise level by using the following formula:

$$L_{eq,16hr} = L_{10,18hr} - 2dB$$

- Calculation of the night-time $L_{Aeq,8hr}$ noise level by using the following formula:

$$L_{night} (L_{eq,8hr}) = (0.90 \times L_{10,18hr}) - 3.77dB$$

10.7.13 Table 10.28 calculates the daytime and night-time noise levels on the B487. The M1 motorway road traffic noise levels do not require calculation as the full $L_{Aeq,16hr}$ daytime and $L_{Aeq,8hr}$ night-time noise levels have been measured.

Table 10.28: Calculation of Daytime & Night-time Noise Levels for B487

Measurement Position	Period	Calculated Road Traffic Noise Level $L_{Aeq,t}$ (dB)	10th Highest Measured $L_{Amax,fast}$ (dB)	Distance from Centre of Road (m)
1	Daytime (07:00 – 23:00)	69.9	-	13.5
	Night-time (23:00 – 07:00)	60.9	78.3	

*10th highest maximum noise level assessed using 10-second periods from dataset, ordered from highest to lowest.

10.7.14 It is understood that the B487 Hemel Hempstead Road will have a decreased speed limit from 60mph to 40mph and so the calculated daytime and night-time road traffic noise levels require speed-correction and the following corrections have been calculated and applied to the daytime and night-time noise levels:

- Daytime: -2.9dB; and
- Night-time: -2.6dB.

10.7.15 For the purposes of this assessment, Professional Consult has used noise modelling software CadnaA to determine the impact of road traffic noise across the residential area from B487 Hemel Hempstead Road and the M1 motorway. The following inputs have been included in the model:

- Illustrative masterplan;
- Existing Site elevations in the form of 2m contours from a Digital Terrain Model (DTM);
- Existing buildings that provide shielding from any of the noise sources or result in reflections have been included in the model;
- A reflection order of 2 has been used in all calculations; and
- Noise levels generated using ISO 9613-1 and ISO 9613-2 *“Acoustics – Attenuation of sound during propagation outdoors”* as incorporated into CadnaA software.

10.7.16 Figures 10.3.1 shows the grid noise map for the daytime period within the proposed garden areas and it shows that daytime noise levels fall below the 55dB $L_{Aeq,16hr}$ noise criteria level. It should be noted that acoustic fences are included within the illustrative proposed layout to prevent noise from flanking around the side of the end dwellings.

10.7.17 Figure 10.3.2 details the grid noise map for the night-time period, however noise levels in garden areas during the night-time period are not required to be considered, instead internal noise levels within bedrooms require assessment. Any required noise mitigation measures to control noise levels within bedrooms will take the form of upgraded glazing and alternative ventilation, where required, and the precise specification can be determined at the detailed design stage.

10.7.18 Such a magnitude of impact is considered to be at or below the SOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is unnecessary.

10.7.19 The sensitivity of the receptor is categorised as high, and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of long-term, local and permanent duration.

Existing Commercial Noise Impact upon Residential Amenity

10.7.20 During the noise survey there was no discernible noise associated with activity in the supermarket service yard and so library noise level data, recently acquired for another service yard has been adopted to inform the assessment.

10.7.21 Table 10.29 details the measured noise levels for HGV manoeuvring and unloading before calculation of the daytime and night-time sound power levels for inclusion in the noise model.

Table 10.29: Calculation of HGV Sound Power Levels

Period	Operation	Measured Noise Level, $L_{Aeq,T}$ (dB)	On-time Duration (mins)	Calculated Noise Level for Period $L_{Aeq,T}$ (dB)	Calculated Combined Noise Level for Period $L_{Aeq,T}$	Measurement Distance (m)	Sound Power Level, L_{WA} (dB)
Daytime	Lorry reverses	68.1	4.25	56.6	66.2	2.5	78.2
	Unloading / loading	67.1	31	64.2			
	Departure	66.4	15	60.4			
Night-time	Lorry reverses	68.1	4.25	62.6	72.3	2.5	84.2
	Unloading / loading	67.1	31	70.3			
	Departure	66.4	15	66.4			

10.7.22 In addition to noise from the service yard, noise is also discernible in close proximity to the electricity substation, and its location can be viewed in Figure 10.4.1

10.7.23 Table 10.30 details the measured noise levels from the substation and calculates the daytime and night-time sound power levels for inclusion in the noise model.

Table 10.30: Calculation of Electricity Substation Sound Power Levels

Measured Noise Level, $L_{Aeq,T}$ (dB)	Measurement Distance (m)	Sound Power Level, L_{WA} (dB)
68.1	2.5	78.2

10.7.24 For the purposes of this assessment, Professional Consult has used noise modelling software CadnaA to determine the impact of commercial noise across the residential area. The following inputs have been included in the model:

- Illustrative masterplan;
- Existing Site elevations in the form of 2m contours from a Digital Terrain Model (DTM);
- Existing buildings that provide shielding from any of the noise sources or result in reflections have been included in the model;
- A reflection order of 2 has been used in all calculations; and
- Noise levels generated using ISO 9613-1 and ISO 9613-2 *“Acoustics – Attenuation of sound during propagation outdoors”* as incorporated into CadnaA software.

10.7.25 Figures 10.3.1 and 10.3.2 shows the grid noise map for the daytime and night-time periods across the residential area. The receiver locations have been placed at the locations of the closest proposed dwellings.

Table 10.31: Predicted Specific Noise Levels

Receptor Location	Period	Calculated Sound Pressure Level, $L_{Aeq,T}$ (dB)
G (1)	Daytime	25.6
	Night	29.9
G (2)	Daytime	26.0
	Night	26.0

10.7.26 The following has been considered in determining if any acoustic features exist in the predicted noise level at the closest residential receptor:

- Tonality: In determining if any tones exist in the measured noise levels, the methodology set out in BS4142:2014 has been followed using the subjective method;
- Impulsivity: In determining if any impulsiveness is evident in the measured noise levels, the methodology set out in BS4142:2014 has been followed using the subjective method;
- Intermittency: Whether or not the measured operations turn on or off during the assessment reference periods; and
- Other sound characteristics: Where no penalties are allocated for the above features, but there will be an audible noise at the closest receptor.

10.7.27 Table 10.32 applies the character corrections.

Table 10.32: Application of Character Corrections

Noise Source	Tonality	Impulsivity	Intermittency	Other Sound Characteristics	Comments
Service Yard	0	3	3	0	Potential for impulsive and intermittent noise.
Electricity Substation	2	0	0	0	Potential for just perceptible tonality
Highest Correction for	+2	+3	+3	0	
Overall Correction to be added to Specific Noise	6dB for service yard noise & 2dB for substation				

Table 10.33 completes the BS4142 Assessment.

Table 10.33: BS4142 Assessment

Receptor	Period	Calculated Specific Noise Level at Receptor, $L_{Aeq,T}$ (dB)	Total Overall Character Correction (dB)	Calculated Rated Level, $L_{A,r}$ (dB)	Typical Background Sound Level $L_{A90,15mins}$ (dB)	Difference +/- (dB)
G (1)	Daytime	25.6	+6	31.6	38	-6.4
	Night-time	29.9	+6	35.9	38	-2.1
G (2)	Daytime	26	+2	28	38	-10
	Night-time	26	+2	28	38	-10

10.7.28 A review of Table 10.33 indicates that the rated level of noise falls below the typical background sound level and BS4142:2014+A1:2019 provides the following advice for this outcome:

'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.'

10.7.29 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is not considered necessary.

10.7.30 Accordingly, the sensitivity of the receptor is categorised as high, and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of long-term, local and permanent duration.

Proposed Commercial Noise Impact upon Residential Amenity

10.7.31 There may be commercial-type noise associated with the proposed Care Home (Use Class C2) and Flexible non-residential uses (Class E, Class F1, Use Class F2) (Local Centre), in the form of air handling units and electrical plant or similar. At this outline stage, details of plant are not available and so it is appropriate to set electrical plant noise emission limits, which are applicable for the closest existing or proposed residential dwellings to these uses.

10.7.32 Table 10.34 calculates the plant noise emission limits based on the measured typical background sound level and the criteria presented in BS4142:2014+A1:2019.

Table 10.34: Calculation of Electrical Plant Noise Emission Limits

Period	Measured Typical Background Sound Level, $L_{A90,T}$ (dB)	Noise Criteria (dB)	Electrical Plant Noise Emission Limit, $L_{A,r}$ (dB)
Daytime	38	$L_{A,r} = L_{A90,T}$	38
Night-time	38		38

10.7.33 Table 10.37 presents the maximum noise rating level from any electrical plant which should not be exceeded at the closest existing or proposed residential dwelling to the proposed uses.

10.7.34 It should be noted that the rated noise levels may contain acoustic character corrections for impulsivity, tonality and intermittency and so the specific noise level (the actual measured noise level) may need to be lower than the presented noise levels.

10.7.35 Where the rated noise level does not exceed the background sound level, the magnitude of impact will be negligible.

10.7.36 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is not considered necessary.

10.7.37 The sensitivity of the receptor is categorised as high, and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of long-term, local and permanent duration.

School Noise Impact upon Residential Amenity

10.7.38 Table 10.35 calculates the change in ambient noise level at Receptor 2 which is shown in Figure 10.2.

Table 10.35: Calculation of Change in Ambient Noise Level

Period	Measured Noise Level from School Pupils, LAeq,T (dB)	Measured Ambient Noise Level Prior to Noise from School Pupils, LAeq,T (dB)	Change in Ambient Noise Level, LAeq,T (dB)
07/01/2025, 14:00 – 14:15	45.8	48.1	-2.3
08/01/2025, 12:15 – 12:45	59.8	58.2	+1.6

10.7.39 Table 10.35 indicates that the highest change in ambient noise level is +1.6dB.

10.7.40 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is not considered necessary.

10.7.41 The sensitivity of the nearest residential receptor is categorised as high, and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of long-term, local and permanent duration.

Proposed Sports Pitch Noise Impact upon Residential Amenity

10.7.42 A sound pressure level of 58dB at 10m, as detailed in the AGP '*Planning Implications Guide*', has been used to inform the assessment. An area source has been included in the noise model and calibrated to produce a noise level of 58dB LAeq,60mins at 10m from the halfway line.

10.7.43 For the purposes of this assessment, Professional Consult has used noise modelling software CadnaA to determine the impact of noise at Receptor I. A noise model has therefore been constructed in order to calculate noise levels.

10.7.44 The following inputs have been included in the model:

- Illustrative masterplan;
- Existing Site elevations in the form of 2m contours from a Digital Terrain Model (DTM);
- Existing buildings that provide shielding from any of the noise sources or result in reflections have been included in the model;
- The Parameter Plan indicates the general location of the sports pitches and the assessment has used the closest possible location of a sports pitch to a residential dwelling (indicated as Receptor 4 as shown in Figure 10.2);
- A reflection order of 2 has been used in all calculations; and
- Noise levels generated using ISO 9613-1 and ISO 9613-2 '*Acoustics – Attenuation of sound during propagation outdoors*' as incorporated into CadnaA software.

10.7.45 Figure 10.5 shows the grid noise map for the daytime period and analysis of the grid noise map indicates a calculated sound pressure level of 32.3dB at Receptor 2.

10.7.46 Table 10.36 calculates the change in ambient noise level due to noise from the sports pitch at Receptor 2.

Table 10.36: Calculation of Change in Ambient Noise Level

Receptor	Calculated Sound Pressure Level, $L_{Aeq,1hour}$ (dB)	Typical Measured Ambient Sound Level Between 08:00 – 22:00 $L_{Aeq,15mins}$ (dB)	Combined Noise Level, $L_{Aeq,T}$ (dB)	Calculated Change in Ambient Noise Level +/- $L_{Aeq,T}$ (dB)	Permitted Highest Change in Ambient Noise Level $L_{Aeq,T}$ (dB)	Exceedance Relative to Permitted Highest Change in Ambient Noise Level $L_{Aeq,T}$ (dB)
2	32.3	53	53	0	+2.9	-2.9

10.7.47 Table 10.36 indicates that the change in ambient noise level is 0dB which is 2.9dB below the permitted change in ambient noise level before noise mitigation is required.

10.7.48 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is not considered necessary.

10.7.49 The sensitivity of the receptor is categorised as high and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of long-term, local and permanent duration.

Road Traffic Noise Impact upon Indicative Primary School Site

10.7.50 With regards to the B487 Hemel Hempstead Road and for the purposes of this assessment, the daytime average ($L_{Aeq,T}$) noise level has been calculated based on the shortened measurement procedure detailed in CRTN. The respective daytime noise levels have been calculated using the following formulas:

- Calculation of the $L_{A10,18hr}$ noise level by using the following formula:

$$L_{10,18hr} = L_{10,3hr} - 1dB$$

- Calculation of the $L_{Aeq,16hr}$ noise level by using the following formula:

$$L_{eq,16hr} = L_{10,18hr} - 2dB$$

10.7.51 Table 10.37 calculates the daytime noise levels for Redbourn Road. The M1 motorway road traffic noise levels do not require calculation as the full 16hr daytime noise level has been measured.

Table 10.37: Calculation of Daytime Noise Levels for B487 Hemel Hempstead Road

Measurement Position	Period	Calculated LAeq,t (dB)	10th Highest Measured LAmax,fast (dB)	Distance from Centre of Road (m)
1	Daytime (07:00 – 23:00)	69.9	-	13.5

*10th highest maximum noise level assessed using 10-second periods from dataset, ordered from highest to lowest.

10.7.52 It is understood that the B487 Hemel Hempstead will have a decreased speed limit from 60mph to 40mph and so the calculated daytime road traffic noise levels require speed-correction, and the following correction has been calculated and applied to the daytime noise level:

- Daytime: -2.9dB.

10.7.53 In addition to noise from the B487 Hemel Hempstead and the M1 motorway, traffic data has been used in the noise model to predict noise levels at the Primary School site from vehicles using the through road / STC. The traffic data states that the proposed through road / STC will have a total of 1,079 vehicles AAWT with 0.6% HGV content.

10.7.54 For the purposes of this assessment, Professional Consult has used noise modelling software CadnaA to determine the impact of road traffic noise across the indicative primary school location from the B487 Hemel Hempstead and the M1 motorway. The following inputs have been included in the model:

- Illustrative masterplan;
- Existing Site elevations in the form of 2m contours from a Digital Terrain Model (DTM);
- Existing buildings that provide shielding from any of the noise sources or result in reflections have been included in the model;
- The through road / STC has been modelled using the above AAWT traffic data with a speed of 30mph;
- A reflection order of 2 has been used in all calculations; and
- Noise levels generated using ISO 9613-1 and ISO 9613-2 *“Acoustics – Attenuation of sound during propagation outdoors”* as incorporated into CadnaA software.

10.7.55 Figure 10.6 shows the grid noise map for the daytime period across the illustrative primary school location, and it shows daytime noise levels marginally exceeding the adopted 55dB LAeq,16hr noise criteria level by up to +2.3dB. It should be noted that the noise model has adopted an open layout in predicting these noise levels and the surrounding built form of the wider development, including the proposed dwellings between the school and Redbourn Road and any school buildings, it is expected that noise levels will fall below the adopted 55dB noise criteria level. In addition, acoustic fences can be incorporated around part of the outdoor teaching spaces where further noise level reductions are required so 55dB is not exceeded.

10.7.56 School buildings and associated playing fields will be sited and designed to provide a suitable noise environment in line with the guidance noise levels provided in BB93.

- 10.7.57 With regards to internal noise levels within teaching spaces, the most stringent internal noise criteria level within a new build classroom is 35dB LAeq,30mins. The highest calculated external noise level for the open site, before any surrounding development is included, is 57.3dB and so the required sound insulation performance of glazing is 22.5dB. Typical standard thermal double glazing affords approximately 30dB of sound reduction performance and so standard thermal double glazing will be adequate. With regards to ventilation, a partially open window affords approximately 13dB of sound reduction which is below the required 22.5dB sound reduction performance and so an appropriate scheme of alternative ventilation may be required.
- 10.7.58 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is not considered necessary.
- 10.7.59 The sensitivity of the receptor is categorised as high, and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of long-term, local and permanent duration.

Additional Mitigation, Monitoring and Residual Effects

Road Traffic Noise Impact upon Residential Amenity

- 10.7.60 The previous section determined that there would be a negligible significance of effect of long-term, permanent duration, due to road traffic noise on the residential amenity.
- 10.7.61 In order to reduce noise levels so they do not exceed the noise criteria limit of 55dB LAeq,16hr, it will be necessary to adopt principles of good acoustic design in the residential layout close to the B487 Hemel Hempstead. Indeed, gardens should face away from the B487 Hemel Hempstead, and the dwellings should have a minimal gap between them in order to reduce amount of noise which passes between them. Figure 10.3.1 shows an example of good acoustic design and the noise level in garden areas.
- 10.7.62 Following implementation of good acoustic design and installation of an acoustic barrier for certain gardens, which must have a minimum mass of 10kg/m² and be free from holes, it can be seen that noise levels in garden areas would not exceed 55dB LAeq,T. Figure 10.3.1 shows the illustration of good acoustic design with acoustic garden fences.
- 10.7.63 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is not considered necessary.
- 10.7.64 Accordingly, following implementation of appropriate noise mitigation measures, the sensitivity of the receptor is categorised as high, and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of long-term, local and permanent duration.

Table 10.38: Summary of Additional Mitigation – Completed Development

Additional Mitigation Measure	Description	How Secured
<i>Completed Development</i>		

Additional Mitigation Measure	Description	How Secured
Acoustic barrier for proposed residential are adjacent to B487 Hemel Hempstead Road	Inclusion of good acoustic design into the residential dwelling layout and orientation with gardens to face away from the B487 Hemel Hempstead. A number of acoustic fences may also be required for end garden areas, or gardens which do not benefit from screening afforded by the building envelope. Any acoustic fences must have a minimum mass of 10kg/m ² and be free from holes.	Mitigation scheme at detailed design / reserved matters

10.7.65 There are no significant effects identified with regards to proposed commercial noise and no additional noise mitigation is considered necessary. At the detailed design it will be necessary to ensure that building services plant is correctly specified with regards to noise emissions and the identified noise criteria limits.

10.7.66 With regards to the sports pitches, at the detailed design stage further assessment work should be undertaken to ensure noise impacts at any residential dwellings remain insignificant.

10.8 Cumulative Effects

Construction Noise

Assessment

10.8.1 Cumulative noise effects during construction and operation phases may occur when developments are located nearby to a common receptor. Based on professional judgement, at distances of greater than 300m, any interaction of noise emissions from multiple developments would be attenuated such that there would normally be no combined effect.

10.8.2 A full list of cumulative schemes is presented in Appendix 3.4. The schemes listed in Table 10.39 are located within 300m of the Development.

Table 10.39: Summary of Additional Mitigation – Completed Development

No.	Planning Ref.	Location
<i>St Albans City and District Council</i>		
1	5/2016/2845	Land Between Three Cherry Trees Lane and Cherry Tree Lane, Hemel Hempstead Phase 2 - Spencers Park Phase 2 West Outline planning application to include up to 600 dwellings (C3), land for primary school (D1), land for local centre uses (A1, A3, A4, A5, D1, D2), land for up to 7,500 square metres of employment uses (B1, B2, B8), landscaping, open space and play area.

Dacorum Borough Council Site Allocations (draft DBC Local Plan)

No.	Planning Ref.	Location
Hm0 1	North Hemel Hempstead Growth Area	Around 1,500 dwellings by 2041, with up to 3,500 additional homes (to include provision for older people) to be delivered beyond the plan period subject to masterplanning; three 3FE and one 2FE primary schools (including nursery provision on three); and one 8FE secondary school. Gypsy and Traveller site for 8 pitches

Potential cumulative construction effects could occur should construction occur at the same time on the schemes identified. However, significant cumulative effects are unlikely to occur as each development is anticipated to have a CEMP in place, such that the individual construction phase effect is not significant, alone or in combination.

10.8.3 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is not considered necessary.

10.8.4 Accordingly, the sensitivity of the receptor is categorised as high and the likely magnitude of impact is categorised as negligible. Accordingly, there is predicted to be a negligible significance of effect of short-term, local and temporary duration.

Mitigation, Monitoring and Residual Effects

10.8.5 The precise scale of additional noise effects will be dependent on the exact works taking place at each location at any one time; however, compliance with the mitigation measures detailed within the CEMP will reduce these effects as far as possible. It has been assumed that the other developments will also be required to adopt Best Practicable Means (BPM) as standard working practices during their construction phases and that noise and vibration levels will comply with set limits in accordance with guidance in BS 5228-1 and BS 5228-2.

10.8.6 Based on the distances from key project components to cumulative developments and requirements to implement BPM, it is considered that any overlapping of construction phases between the Scheme and the other nearby development schemes would not result in any in-combination cumulative effects at common noise-sensitive receptors. Predicted construction noise impacts the Development are negligible magnitude of impact and it is considered that cumulative effects of construction noise will remain unchanged from the residual effects and, therefore, remain a negligible significance of effect of short-term, local and temporary duration.

Completed Development

Changes in Road Traffic Noise

10.8.7 The baseline (2024) and future year (2041) traffic data includes all relevant committed developments. It is considered this includes all schemes which are likely to have a material impact on road traffic noise on the surrounding highway network.

10.8.8 The cumulative schemes may contain noise sources, such as commercial elements, which can generate noise impacts at the closest residential dwellings. Nevertheless, at the detailed design stage for any of the cumulative schemes identified, it is expected that detailed assessments of noise impacts will be required to ensure no significant noise impacts are predicted at any noise-sensitive receptor.

- 10.8.9 It should also be noted that any proposed noise mitigation will be included within the Development, such as acoustic fences, to reduce any cumulative noise impacts where they may exist.
- 10.8.10 Furthermore, the nearest Cumulative Schemes to the Site and the existing / proposed NSRs are similar to those proposed by the Development, i.e. mixed-use and residential led, which has a low risk for adverse noise effects.
- 10.8.11 Such a magnitude of impact is considered to not exceed the LOAEL, as detailed in the NPPG and as such, consideration of mitigation measures is not considered necessary.
- 10.8.12 It has been identified that all magnitudes of impact for the base year and future year are negligible and as such there is predicted to be a negligible significance of effect of long-term, local and permanent duration.

Mitigation, Monitoring and Residual Effects

- 10.8.13 The assessment has not identified the need for any mitigation measures and as such the residual effects are predicted to be of negligible significance of effect of long-term, local and permanent duration.

10.9 Summary

- 10.9.1 A summary of the residual effects is provided in Table 10.40.

Table 10.40: Summary of Residual Effects

Effect	Receptor (Sensitivity)	Magnitude of Impact	Significance of Effect	Additional Mitigation and Monitoring	Residual Effect
<i>Construction</i>					
Construction Noise	High	Negligible	Negligible short-term, temporary duration	None required	Negligible short-term, local and temporary duration
Construction Vibration	High	Negligible	Negligible short-term, temporary duration	None required	Negligible short-term, local and temporary duration
Construction Generated Road Traffic	High	Negligible	Negligible short-term, temporary duration	None required	Negligible short-term, local and temporary duration
<i>Completed Development</i>					
Changes in Road Traffic Noise	High	Negligible	Negligible long-term, temporary duration	None required	Negligible long-term, local and permanent duration
Road Traffic Noise Impact upon Residential Amenity	High	Negligible	Negligible long-term, permanent duration	Good acoustic design for dwellings close to B487, in combination with localised acoustic fences for certain gardens	Negligible long-term, local and permanent duration
Existing Commercial Noise Impact upon Residential Amenity	High	Negligible	Negligible long-term, permanent duration	None required	Negligible significance of effect of long-term, local and permanent duration
Proposed Commercial Noise Impact upon Residential Amenity	High	Negligible	Negligible long-term, permanent duration	None required	Negligible long-term, local and permanent duration
School Noise Impact upon Residential Amenity	High	Negligible	Negligible long-term, permanent duration.	None required	Negligible long-term, local and permanent duration

Effect	Receptor (Sensitivity)	Magnitude of Impact	Significance of Effect	Additional Mitigation and Monitoring	Residual Effect
Sports Pitch Noise Impact upon Residential Amenity	High	Negligible	Negligible long-term, permanent duration.	None required	Negligible long-term, local and permanent duration
Road Traffic Noise Impact upon School Site	High	Negligible	Negligible long-term, permanent duration.	None required	Negligible long-term, local and permanent duration
Cumulative Assessment					
Construction					
Construction Noise	High	Negligible	Negligible short-term, temporary duration.	None required	Negligible short-term, local and temporary duration
Completed Development					
Changes in Road Traffic Noise	High	Negligible	Negligible long-term, permanent duration	None required	Negligible long-term, local and permanent duration

References

- ¹ His Majesty's Stationary Office (1990) Environmental Protection Act 1990. London
- ² His Majesty's Stationary Office (1974) Control of Pollution Act 1974. London
- ³ Ministry of Housing, Communities & Local Government (2025) National Planning Policy Framework.
- ⁴ Draft SADC Local Plan – Draft Local Plan 2041 ('Emerging Local Plan')
- ⁵ British Standards Institution (BSI) (2019) British Standard 4142:2014+A1:2019. Methods for rating and assessing industrial and commercial sound. London, BSI.
- ⁶ British Standards Institute (2014) BS 8233 – Guidance on sound insulation and noise reduction for buildings.
- ⁷ The Highways Agency, Transport Scotland, Welsh Government and the Department for Regional Development Northern Ireland (2019) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7: Noise and Vibration (LA 111).
- ⁸ Department of Transport / Welsh Office (1998) Calculation of Road Traffic Noise (CRTN).
- ⁹ British Standards Institute (2014) BS 5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 1: Noise.
- ¹⁰ British Standards Institute (2014) BS 5228-2:2009+A1:2014 – 'Code of practice for Noise and Vibration control on construction and open sites. Part 2: Vibration.'
- ¹¹ Sport England (2015) 'Artificial Grass Pitches (AGP) Acoustics' Planning Implications Guide
- ¹² Department for Education (2003) 'BB93: acoustic design of schools - performance standards'
- ¹³ <https://virtualengage.arup.com/luton-airport-expansion/pei-report/assessments/noise-and-vibration/>

Site boundary

Figure 10.1 -
Noise Measurement Locations

NMP2

NMP3

NMP4

NMP1

Noise Measurement Key

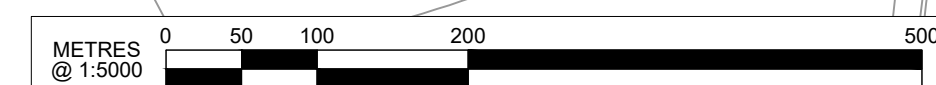
- Unattended Road Traffic Noise
- Attended Substation Noise
- Attended Road Traffic Noise
- Delivery Yard Noise /
School Noise / Background Noise



Project
North Hemel Hempstead

Drawing Title
Site Location Plan

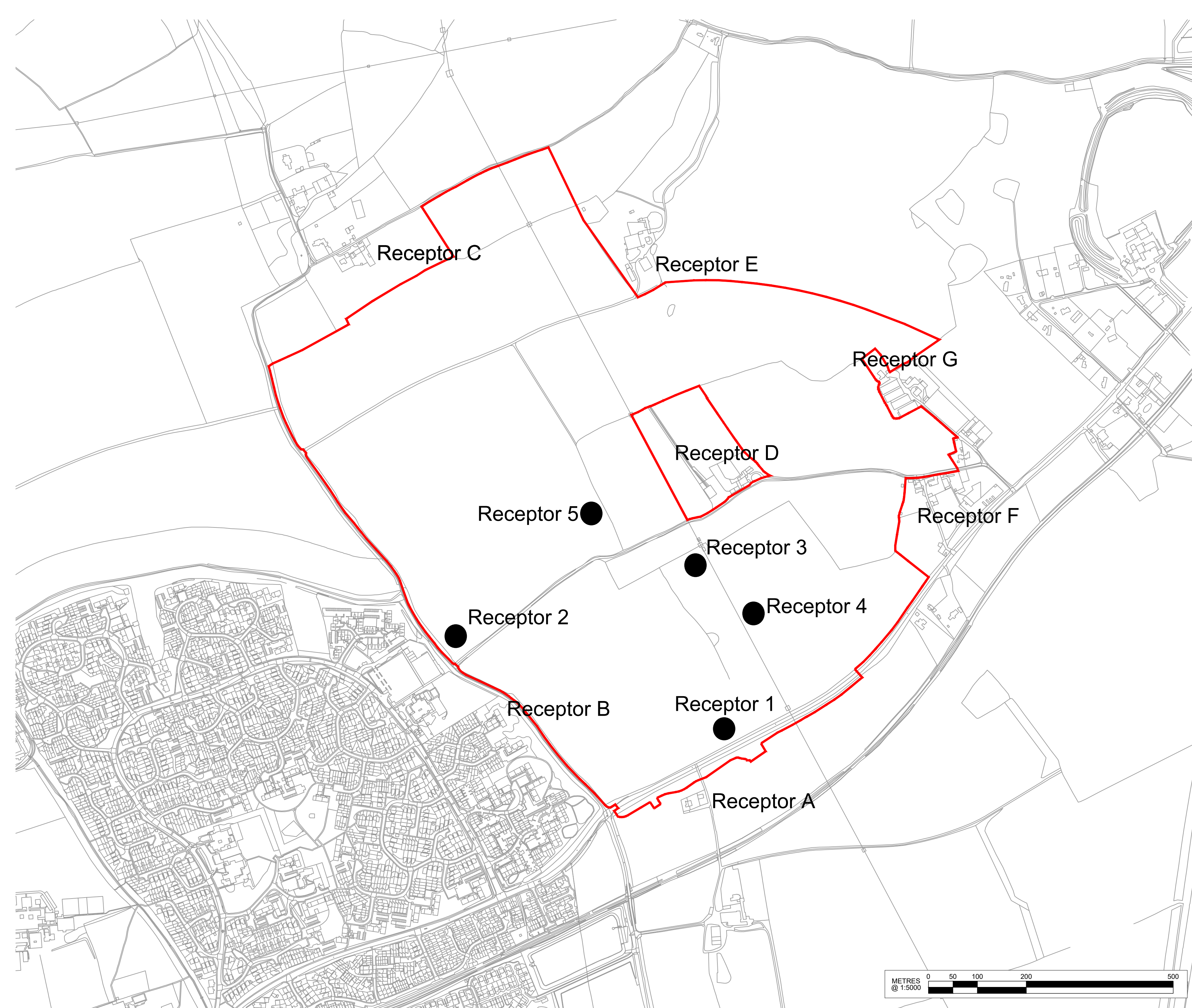
Date	Scale	Drawn by	Check by
03/11/2025	1:5,000 at A2	MR	SR
Project No	Drawing No	Revision	
1117	006	D	



Mosaic

Site boundary

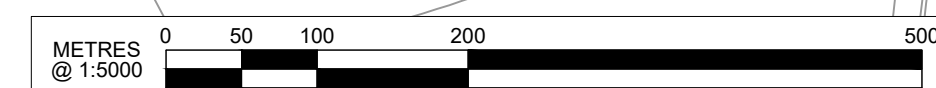
Figure 10.2 - Noise & Vibration Sensitive Receptors



Project
North Hemel Hempstead

Drawing Title
Site Location Plan

Date 03/11/2025	Scale 1:5,000 at A2	Drawn by MR	Check by SR
Project No 1117	Drawing No 006	Revision D	



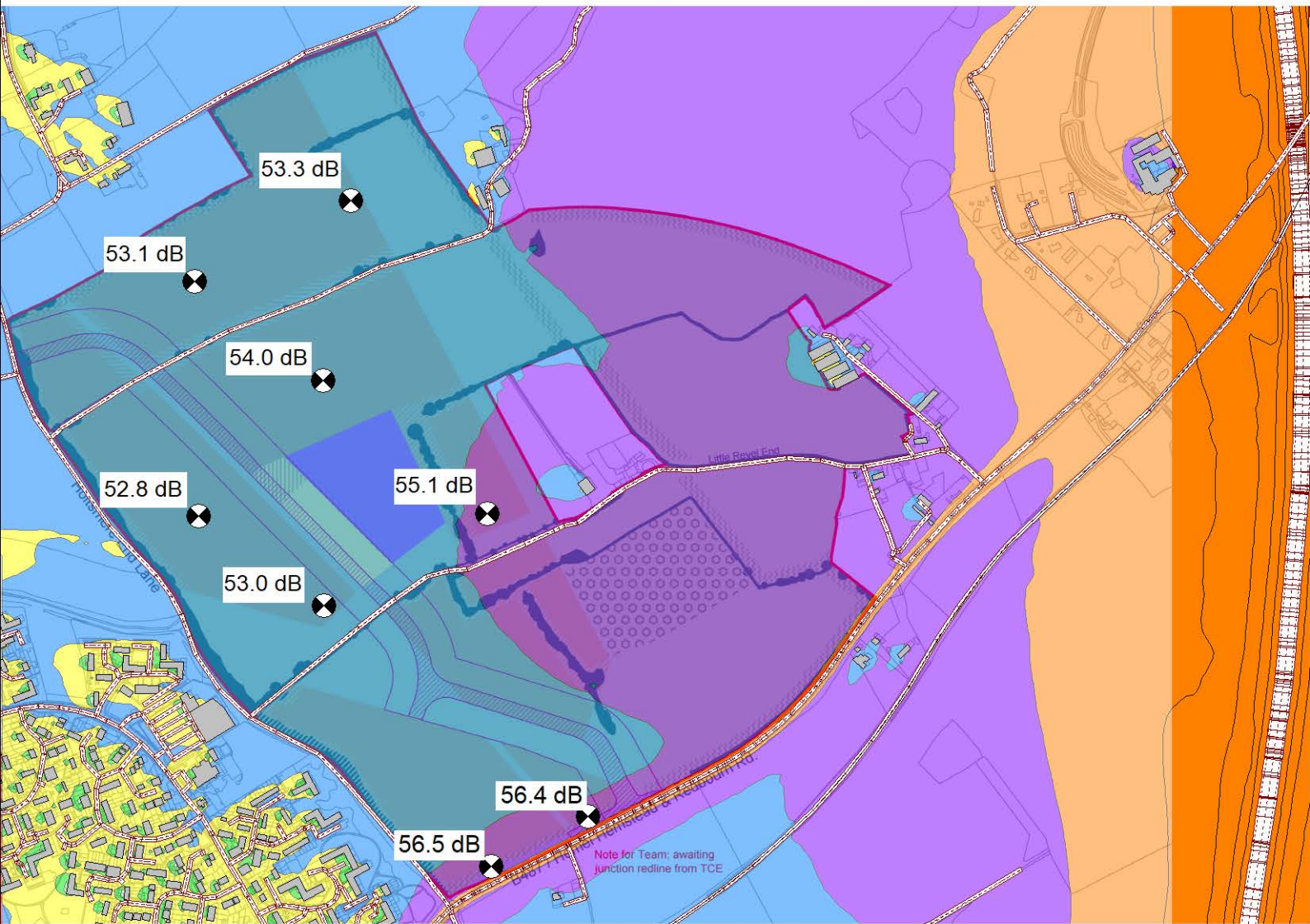
Mosaic

Figure 10.3.1 - Grid Noise Map Residential (Daytime)



Noise Map Objects + Point Source Area Source Road Railway Building Barrier Receiver Calculation Area	Level LAeq 16hr in dB(A) < 50.0 Negligible 50.0 - 55.0 Low 55.0 - 60.0 Low 60.0 - 65.0 Medium 65.0 - 70.0 Medium > 70.0 High	Title : Daytime Grid Noise Map 1.5m above ground level Road Traffic Noise	Built by: SR
			Checked by: JG
		Date : 11/11/2025	PROFESSIONAL CONSULT FUTURE ENVIRONMENTS

Figure 10.3.2 - Grid Noise Map Residential (Night-time)



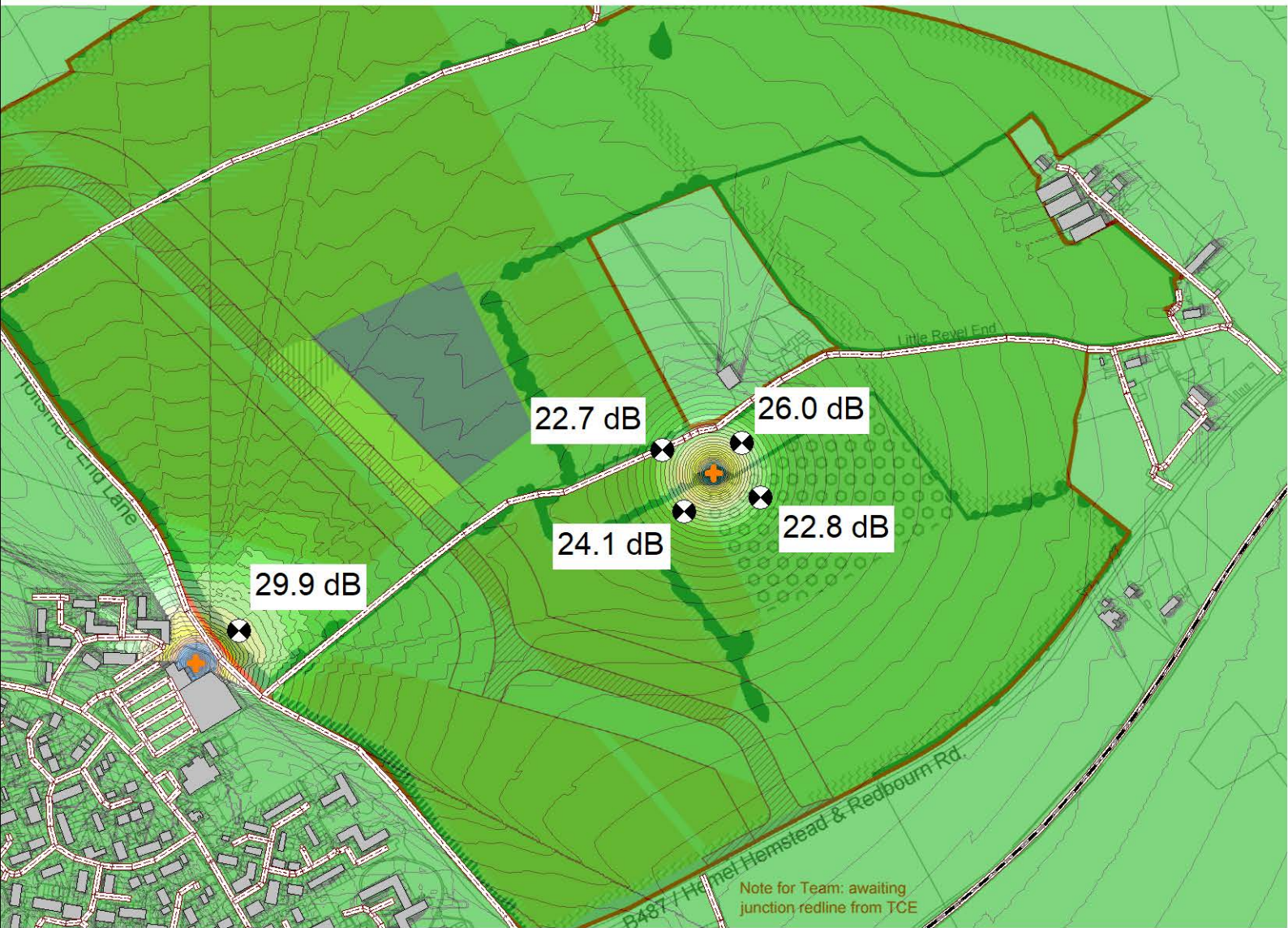
Noise Map Objects Point Source Area Source Road Railway Building Barrier Receiver Calculation Area	Level LAeq 8hr in dB(A) < 40.0 Negligible 45.0 - 45.0 Low 45.0 - 50.0 Low 50.0 - 55.0 Medium 55.0 - 60.0 Medium > 60.0 High	Title : Night-Time Grid Noise Map 4.5m above ground level Road Traffic Noise	Built by: SR
			Checked by: JG
		Date : 11/11/2025	PROFESSIONAL CONSULT FUTURE ENVIRONMENTS

Figure 10.4.1 - Grid Noise Map Commercial (Daytime)



Noise Map Objects - Point Source - Area Source - Road - Railway - Building - Barrier - Receiver - Calculation Area	Level LAeq 1hr in dB(A) ... < 22.0 22.0 <= ... < 25.0 25.0 <= ... < 27.0 27.0 <= ... < 30.0 30.0 <= ... < 33.0 33.0 <= ... < 36.0 36.0 <= ... < 39.0 39.0 <= ... < 42.0 42.0 <= ... < 45.0 45.0 <= ... < 48.0 48.0 <= ... < 51.0 51.0 <= ... < 54.0 54.0 <= ...	Title : Daytime Grid Noise Map 1.5m above ground level Commercial Noise	Built by: SR Checked by: JG
		Date : 11/11/2025	PROFESSIONAL CONSULT FUTURE ENVIRONMENTS

Figure 10.4.2 - Grid Noise Map Commercial (Night-time)

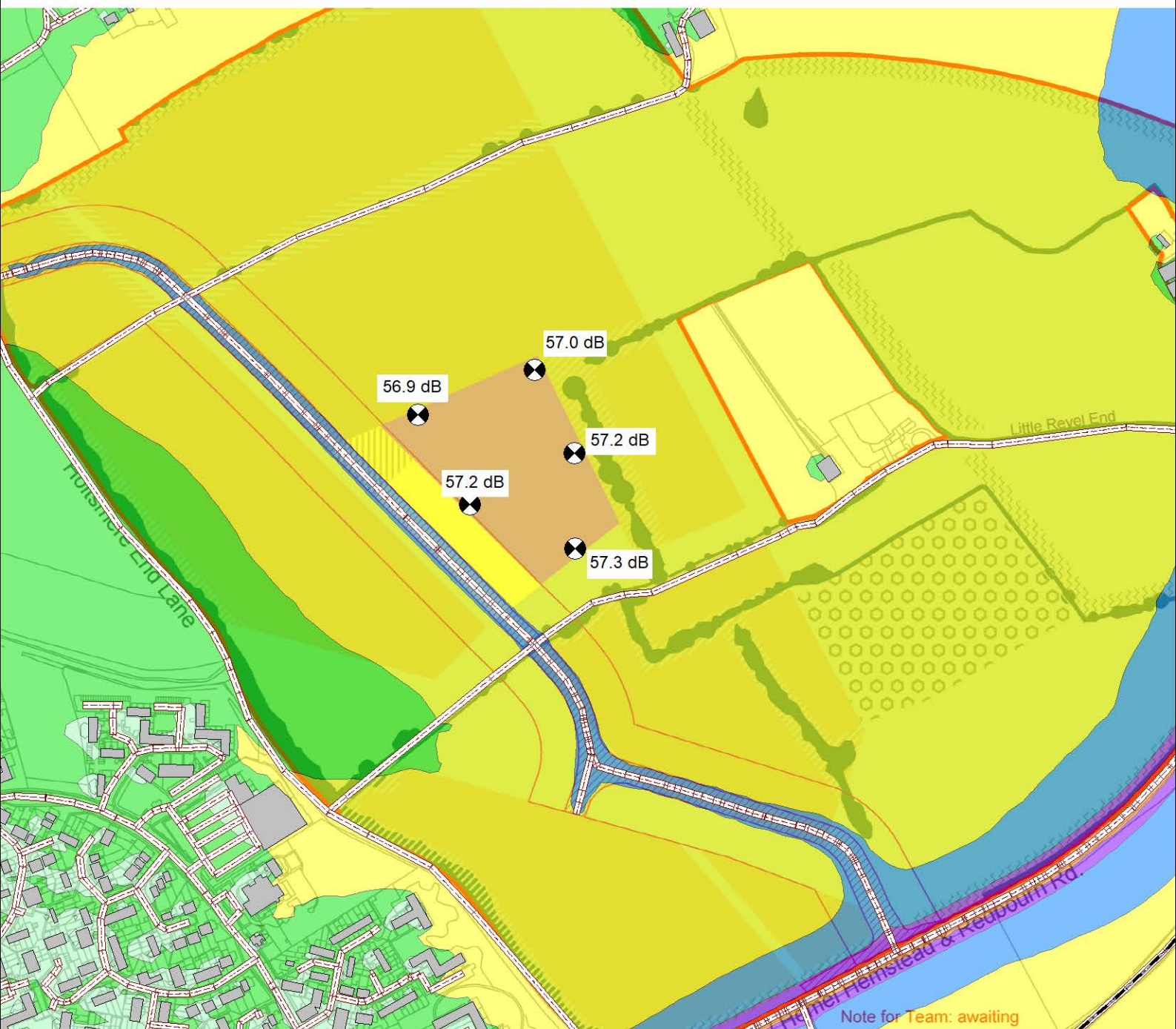


Noise Map Objects + Point Source Area Source Road Railway Building Barrier Receiver Calculation Area	Level LAeq 15min in dB(A) ... < 22.0 22.0 <= ... < 25.0 25.0 <= ... < 27.0 27.0 <= ... < 30.0 30.0 <= ... < 33.0 33.0 <= ... < 36.0 36.0 <= ... < 39.0 39.0 <= ... < 42.0 42.0 <= ... < 45.0 45.0 <= ... < 48.0 48.0 <= ... < 51.0 51.0 <= ... < 54.0 54.0 <= ...	Title : Night-Time Grid Noise Map 4.5m above ground level Commercial Noise	Built by: SR
			Checked by: JG
		Date : 11/11/2025	PROFESSIONAL CONSULT FUTURE ENVIRONMENTS

Figure 10.5 - Grid Noise Map Sports Pitch (Daytime)



Noise Map Objects  Point Source  Area Source  Road  Railway  Building  Barrier  Receiver  Calculation Area	Level LAeq 1hr in dB(A)  ... < 37.5  37.5 <= ... < 40.0  40.0 <= ... < 42.5  42.5 <= ... < 45.0  45.0 <= ... < 47.5  47.5 <= ... < 50.0  50.0 <= ... < 52.5  52.5 <= ... < 55.0  55.0 <= ... < 57.5  57.5 <= ... < 60.0  60.0 <= ... < 62.5  62.5 <= ... < 65.0 65.0 <= ...	Title : Daytime Grid Noise Map 1.5m above ground level Sports Pitch Noise	Built by: SR	
			Checked by: JG	
			Date : 11/11/2025	 PROFESSIONAL CONSULT FUTURE ENVIRONMENTS



Noise Map Objects

-  Point Source
-  Area Source
-  Road
-  Railway
-  Building
-  Barrier
-  Receiver
-  Calculation Area

Level LAeq 16hr in dB(A)

-  < 50.0 Negligible
-  50.0 - 55.0 Low
-  55.0 - 60.0 Low
-  60.0 - 65.0 Medium
-  65.0 - 70.0 Medium
-  > 70.0 High

Title :
Daytime Grid Noise Map
1.5m above ground level
Road Traffic Noise

Date : 11/11/2025

Built by: SR

Checked by: JG

**PROFESSIONAL
CONSULT**
FUTURE ENVIRONMENTS

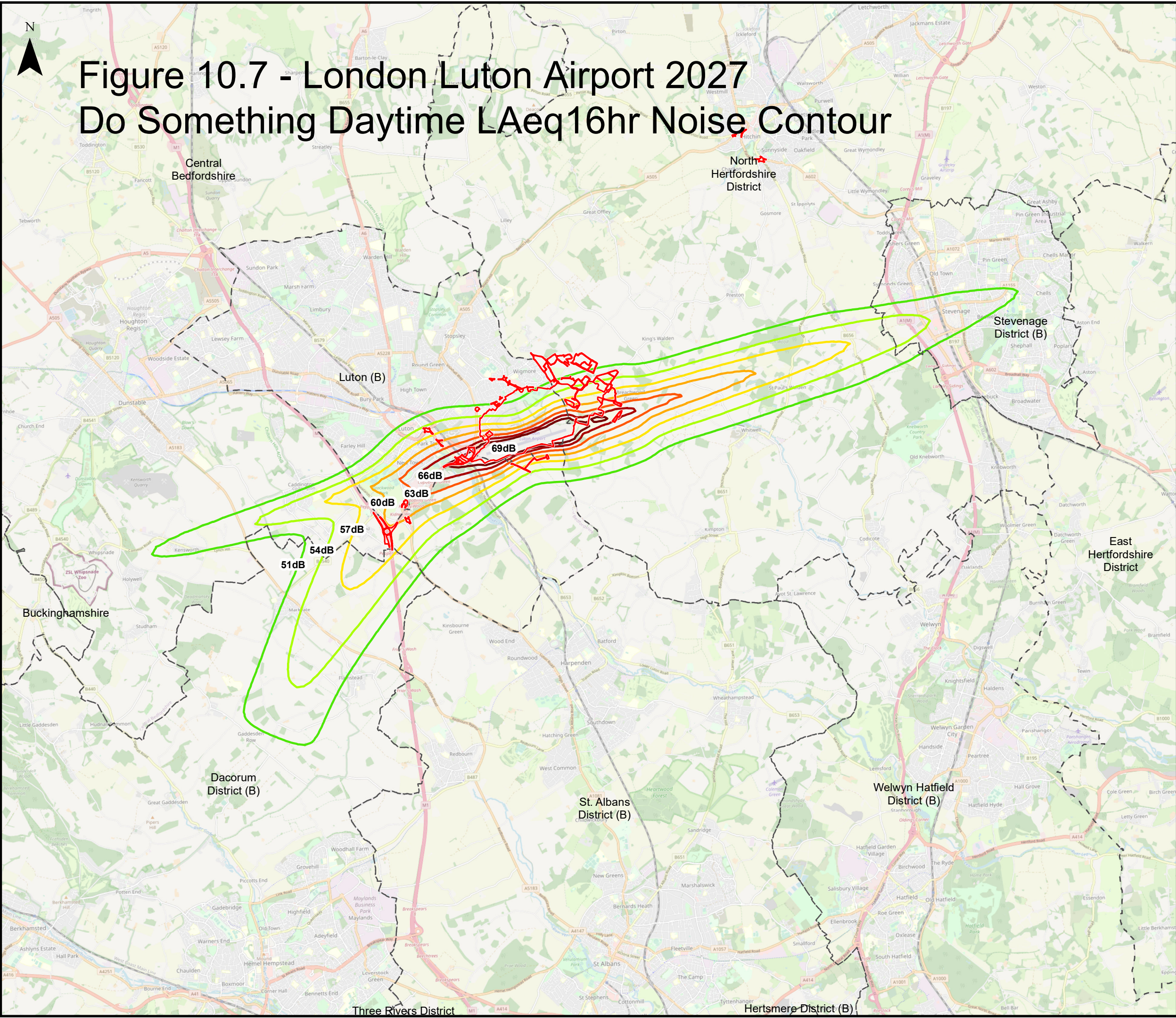


Figure 10.7 - London Luton Airport 2027
Do Something Daytime LAeq16hr Noise Contour

This drawing may contain mapping by permission of Ordnance Survey on behalf of HMSO © Crown Copyright and database rights 2019 Ordnance Survey 0100031673

All structure positions are indicative. The proposed works will be subject to detailed design development. The changes will be within limits of deviation specified in the Development Consent Order.

Legend

Proposed Development Boundary

Local Authority Boundary

Noise Contours (2027 do-something (DS) LAeq, 16h)

- 51dB
- 54dB
- 57dB
- 60dB
- 63dB
- 66dB
- 69dB

Contains OS data (c) Crown copyright and database right 2021.
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA

First Issue	MAB	ER	CS	15/12/21	P01
Revision History	Drawn	Checked	Approved	Date	Rev.

Luton Rising

Our airport.
Our community.
Our planet.

Luton Rising
Hart House Business Centre
Kimpton Road, Luton, LU2 0LA
www.lutonrising.org.uk

**London Luton Airport
Development Consent Order**

Drawing Title

Figure 16.9
Extent of 2027 do-something (DS) 16h
Noise Contours

Purpose of issue				Suitability	
SUITABLE FOR INFORMATION				S2	
Drawn	Checked	Approved	Date	Scale	Size
MAB	ER	CS	15/12/21	1:95,000	A3

DCO Application Ref.	APFP Regulation	DCO Document Ref.
TR020001		

Drawing Number	Revision
LLADCO-3C-AEC-00-00-DR-YE-0017	P01
Project - Phase - Originator - Asset/Zone - Sub Asset - Type- Discp. - Number	

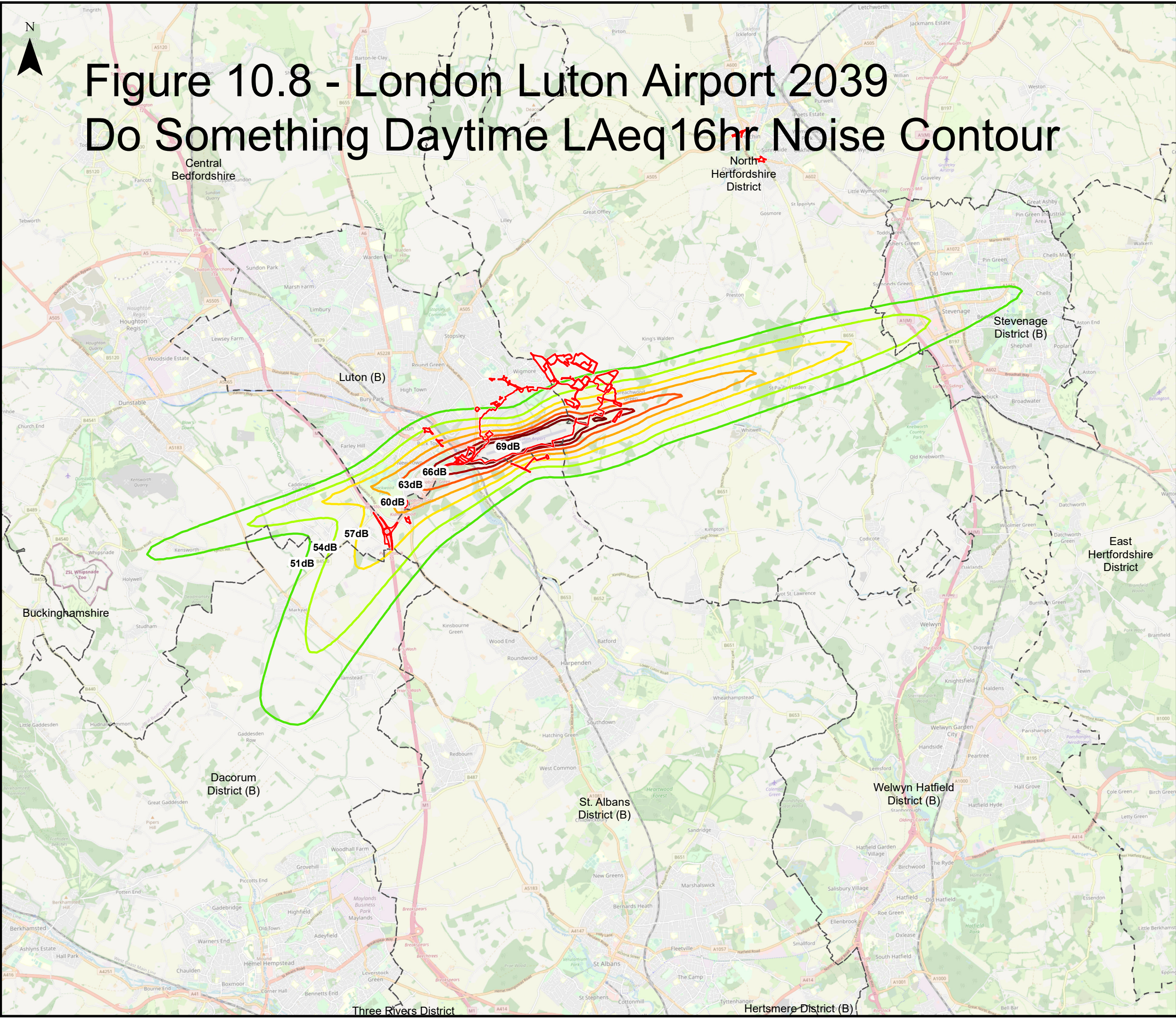


Figure 10.8 - London Luton Airport 2039
Do Something Daytime LAeq16hr Noise Contour

This drawing may contain mapping by permission of Ordnance Survey on behalf of HMSO © Crown Copyright and database rights 2019 Ordnance Survey 0100031673

All structure positions are indicative. The proposed works will be subject to detailed design development. The changes will be within limits of deviation specified in the Development Consent Order.

Legend

Proposed Development Boundary

Local Authority Boundary

Noise Contours (2039 do-something (DS) LAeq, 16h)

- 51dB
- 54dB
- 57dB
- 60dB
- 63dB
- 66dB
- 69dB

Contains OS data (c) Crown copyright and database right 2021.
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA

First Issue	MAB	ER	CS	15/12/21	P01
Revision History	Drawn	Checked	Approved	Date	Rev.

Luton Rising

Our airport.
Our community.
Our planet.

Luton Rising
Hart House Business Centre
Kimpton Road, Luton, LU2 0LA
www.lutonrising.org.uk

**London Luton Airport
Development Consent Order**

Drawing Title

Figure 16.15
Extent of 2039 do-something (DS) 16h
Noise Contours

Purpose of issue				Suitability	
SUITABLE FOR INFORMATION				S2	
Drawn	Checked	Approved	Date	Scale	Size
MAB	ER	CS	15/12/21	1:95,000	A3

DCO Application Ref.	APFP Regulation	DCO Document Ref.
TR020001		

Drawing Number	Revision
LLADCO-3C-AEC-00-00-DR-YE-0023	P01
Project - Phase - Originator - Asset/Zone - Sub Asset - Type- Discp. - Number	