NOISE ASSESSMENT

LAND AT LVS HASSOCKS, LONDON ROAD, SAYERS COMMON

Wates Developments Limited and the Licensed Trade Charity (LTC)

2062845-RSKA-RP-001-(05)

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General notes

Project Name:	Land at LVS Hassocks, London Road, Sayers Common
Title:	Noise Assessment
Client:	Wates Developments Limited and the Licence Trade Charity (LTC)
Issue Date:	23 January 2026
Report No.	2062845-RSKA-RP-001-(05)

Revision:	Description:	Author(s):	Reviewer:	Date:
01	First Issue	George Baker	Jonathan Mart	28/11/2025
02	Second issue following client comments	George Baker	Jonathan Mart	03/12/2025
03	Third issue following additional client comments	George Baker	Jonathan Mart	11/12/2025
04	Amended site boundary	George Baker	Jonathan Mart	22/12/2025
05	Amended site boundary	George Baker	Jonathan Mart	23/01/2026

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Date:	23/01/2026	Date:	23/01/2026

Contents

1 Introduction

1.1 Overview

RSK Acoustics Limited has been instructed by Wates Developments Limited and the Licensed Trade Charity (LTC) (the applicant) to undertake a noise assessment to support a hybrid planning application on Land at LVS Hassocks, London Road, Sayers Common, West Sussex.

This report describes the assessment methodology, baseline conditions currently prevailing across the application site and the effect of noise on the proposed residential development and special educational needs (SEN) school, so that an evaluation can be made on the suitability of the site for residential and teaching purposes.

Mitigation measures have been identified where necessary and practicable to achieve appropriate acoustic standards.

1.2 Objectives

The objectives of the assessment are to:

- Identify sources of noise that may impact upon the Proposed Development;
- Quantify and report the noise climate across the site to determine the suitability for the proposed use;
- Assess the suitability of the site against the design targets within local and national guidelines and policies; and
- Specify the level of noise mitigation that may be required to reduce the potential for disturbance of future residents and pupils of the Proposed Development.

1.3 Exclusions

Levels of vibration from typical free-flowing traffic would be imperceptible at nearest proposed residential locations and therefore an assessment of traffic induced vibration has been discounted.

2 Regulatory Framework

2.1 National Planning Policy Framework (NPPF): 2025 and Noise Policy Statement for England (NPSE): 2010

The National Policy Planning Framework (NPPF), as updated by the Secretary of State for the Department for Levelling Up, Housing and Communities in February 2025, has noise aims that are consistent with the Noise Policy Statement for England (NPSE).

Since its publication by the Department for Environment, Food and Rural Affairs in 2010, NPSE has been the Central Government noise policy that has been available to inform the consideration of environmental noise in relation to the consenting of everything from small scale residential development to national infrastructure.

The noise policy aims as stated in NPSE are (paragraphs 2.22 – 2.24):

- Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

In order to translate these aims into practical guidance the NPSE uses the same terminology as used by the World Health Organisation (WHO), in the Night Noise Guidelines for Europe, 2009 by referring to the Lowest Observed Adverse Effect Level (LOAEL). The NPSE extends this concept to define the level above which significant adverse effects on health and quality of life can be detected, hence the Significant Observed Adverse Effect Level (SOAEL).

The NPSE notes (paragraph 2.22), "*It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times*". The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.

Not having quantified effect thresholds in the NPSE means that relevant standards and guidance are used to put forward values for the LOAEL and SOAEL for the proposed development under consideration.

There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

<u>NOEL – No Observed Effect Level</u>

- This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

<u>LOAEL – Lowest Observed Adverse Effect Level</u>

- This is the level above which adverse effects on health and quality of life can be detected.

Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

- This is the level above which significant adverse effects on health and quality of life occur.

2.2 Planning Practice Guidance (PPG), July 2019

The Department for Levelling Up, Housing and Communities 'Planning Practice Guidance' (PPG) expands upon the NPPF and NPSE. The guidance does not include any specific noise levels but sets out further principles that should underpin a noise assessment. The PPG states in paragraph 003 (reference ID: 30-003-20190722):

"Plan-making and decision making need to take account of the acoustic environment and in doing so consider:

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved."*

It then refers to the NPSE and states that the aim is to identify where the overall effect of the noise exposure falls in relation to SOAEL, LOAEL and NOEL and presents a table, reproduced below. The implication of the final line of the table is that only the 'noticeable and very disruptive' outcomes are unacceptable and should be prevented. All other outcomes (i.e. all other lines in the table) can be acceptable, depending upon the specific circumstances and factors such as the practicalities of mitigation.

Response	Examples of outcomes	Increasing effect level	Action
NOEL *(No Observed Effect Level)*			
Not present	No effect	No observed effect	No specific measures required
NOAEL *(No Observed Adverse Effect Level)*			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No observed adverse effect	No specific measures required
LOAEL *(Lowest Observable Adverse Effect Level)*			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed adverse effect	Mitigate and reduce to a minimum

Response	Examples of outcomes	Increasing effect level	Action
***SOAEL** (Significant Observed Adverse Effect Level)*			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant observed adverse effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable adverse effect	Prevent

Table 1 Summary of noise exposure hierarchy

2.3 Planning Noise Advice Document: Sussex, November 2023

Sussex Council's Planning Noise Advice Document (September 2021) contains design criteria for new noise-sensitive developments. In particular, they have made the following statements regarding applicable criteria:

"Design control measures should aim to meet the recommended standards set out in table 4 of BS 8233:2014 and regular night time noise events such as scheduled aircraft or passing trains which can cause sleep disturbance shall be minimized and assessed as (L_{Afmax}), as recommended in the World Health Organisation's (WHO) Night Noise Guidelines for Europe (2009), unless there are particular reasons why this is not considered appropriate. In such cases, a clear explanation of the reasons should be provided."

With regards to school provision, the document references the provisions within Building Bulletin 93: Acoustic Design of School: performance standards; and Acoustic of Schools – A design guide.

2.4 British Standard 7445-1:2003 'Description and measurement of environmental noise. Guide to quantities and procedures'

The three-part standard BS 7445 provides the framework within which environmental noise should be quantified. Part 1 provides a guide to quantities and procedures and Part 2 provides a guide to the acquisition of data pertinent to land use. Part 3 provides a guide to the application of noise limits.

BS 7445 also refers to a further standard, BS EN 61672, which prescribes the equipment necessary for such measurements. Whilst BS 7445 does not prescribe the meteorological conditions under which noise measurements should or should not be taken, it does (part 2, paragraph 5.4.3.3) recommend that in order

"…to facilitate the comparison of results (measurements of noise from different sources), it may be necessary to carry out measurements under selected meteorological conditions which are reproducible and correspond to quite stable propagation conditions."

These conditions include:

- wind speed not exceeding 5 m/s (measured at a height of 3 to 11 m above the ground);

- no strong temperature inversions near the ground;
- no heavy precipitation.

2.5 British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings'

Guidance on the acceptable noise levels for living rooms and bedrooms within residential buildings is given in BS 8233:2014. Advice is given on the design range of internal noise levels, depending on the use of each room and the sensitivity to noise of the operations expected to be conducted in the rooms. An extract of the indoor ambient noise levels for dwellings is reproduced in **Table 2.**

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hr}$	---
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	---
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$
Note: Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or Lmax, F, depending on the character and number of events per night. Sporadic noise events could require separate values.			

Table 2 Indoor ambient noise levels for dwellngs (BS 8233 table 4)

BS 8233 also provides design criteria for external noise and Section 7.7.3.2 states:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."

2.6 World Health Organisation – 'Guidelines for Community Noise', 1999

The World Health Organisation (WHO) Guidelines for Community Noise was published as a response to a need for action together with a generic need for improvements in legislation at a national level. Although not legislation, this document provides general guidance and guidelines which have been set for different health effects, using the lowest noise level that produces an adverse health effect in specific human environments. The guidelines levels which are relevant to this assessment are set out in **Table 3**.

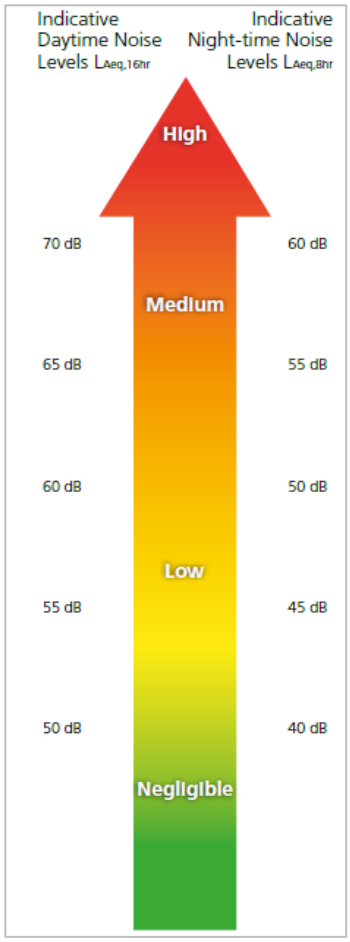
Activity	Location	L_{Aeq}, dB	Time base, 'T' hours	L_{AFmax} dB
Outdoor Living Area	Serious annoyance, daytime and evening	55	16	--
	Moderate annoyance, daytime and evening	50		
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35		
Inside bedrooms	Sleep disturbance, night-time	30	8	45[1]

Activity	Location	L_{Aeq}, dB	Time base, 'T' hours	L_{AFmax} dB
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45		60
[1]Should not exceed 45 dB L_{AFmax} more than 10-15 times a night				

Table 3 WHO guidelines for community noise

2.7 Professional Practice guidance on Planning and Noise (ProPG): 2017

The Professional Practice Guidance on Planning and Noise is written to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England. The CIEH, IOA and the ANC have worked together to produce the guidance which encourages better acoustic design for new residential development and aims to protect people from the harmful effects of noise. This Professional Practice Guidance is based on the best knowledge available at the time of publication. It does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy on which users should take their own advice as appropriate. In relation with achieving internal noise values with open windows ProPG states that:



"Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal LAeq target levels should not normally be exceeded".

ProPG provides guidance on dealing with maximum noise events and states:

"In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 decibels $L_{A,max,F}$ more than 10 times a night. However where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events.

Stage 1 – Initial Site Noise Risk Assessment

ProPG recommends practitioners to undertake an initial noise risk assessment of the proposed development site to provide an indication of the likely risk of adverse effects from noise were no subsequent mitigation to be included as part of the development proposal. **Figure 1** summarises the Stage 1 Initial Site Noise Risk Assessment providing indicative daytime and night-time noise levels associated with four categories of risk: Negligible, Low, Medium, and High.

Figure 1 Stage 1 – Initial site noise risk assessment

Figure 1 illustrates how this initial noise risk assessment is linked with an increasing risk of adverse effect from noise. The assessment should include the acoustic effect of any existing site features that will remain (e.g., retained buildings, changes in ground level) and exclude the acoustic effect of any site features that will not remain (e.g., buildings to be demolished, fences and barriers to be removed) if development proceeds.

2.8 Approved Document O (2021 Edition) – The Building Regulations: 2010

Approved Document O (AD-O), 2021 edition (under Building Regulations 2010) aims to protect the health and welfare of occupants of the building by reducing the occurrence of high indoor temperatures. The document specifies internal noise limits which should be met to ensure the overheating mitigation strategy is usable.

Based on research and guidance within the ANC guidance document 'Approved Document O: Noise guide, November 2024 Version 1.1, the resulting outside-to-inside level difference for window openings necessary to satisfy the simplified method of AD-O are expected to be approximately 5 dB for 'high' risk locations and 10 dB for 'medium' risk locations.

A summary of the recommended levels for the most noise-sensitive spaces (bedrooms) are provided below in **Table 4** for average ambient noise levels throughout a given time period (L_{Aeq}) and maximum noise levels (L_{max}) during the night.

Period	Normal condition (as per BS 8233)	Overheating condition (ADO)
Daytime (07:00 to 23:00)	35 dB $L_{Aeq,16hr}$	--
Night-time (23:00 to 07:00)	30 dB $L_{Aeq,8hr}$	40 dB $L_{Aeq,8hr}$
	45 dB L_{AFmax}	55 dB L_{Amax}*
** L_{AFmax} refers to the level not normally exceeded, and not the 10th highest level used within WHO guidelines*		

Table 4 AD-O overheating condition criteria

The lower ambient noise level thresholds in the overheating condition correspond to the recommendation within BS 8233:2014 for internal noise levels that would be considered "reasonable" under normal conditions.

2.9 Building Bulletin 93 - Acoustic design of schools: performance standards, 2015 (BB93)

Building Bulletin 93 (BB93) sets the performance standards for the acoustic design of new school buildings, many of which are required for compliance with Part E4 of the Building Regulations. BB93 standards must therefore be achieved for any new building or extension to the existing buildings.

Acoustic criteria for new and refurbished school buildings are defined by Building Bulletin 93: '*Acoustic Design of Schools*', 2015 (BB93). BB93 outlines the acoustic performance standards, including the minimum indoor ambient noise levels to be achieved in the different spaces within the school and noise levels within external teaching spaces.

The BB93 upper limit levels for various room types are presented in **Table 5**. For naturally ventilated rooms, the limits are to be applied when ventilators or windows are open as required to provide adequate ventilation. If mechanically assisted ventilation is used, the internal noise limits apply to the cumulative effect of both internal mechanical services noise and external noise ingress.

For the purposes of determining feasibility, project criteria are derived for indoor ambient noise levels (IANL) within teaching and learning spaces, and external plant noise criteria.

Room	BB93 IANL Upper Limit – New build
Art and design	≤ 40 dB $L_{Aeq,30min}$
Dining room	≤ 45 dB $L_{Aeq,30min}$

Room	BB93 IANL Upper Limit – New build
Food technology	≤ 40 dB $L_{Aeq,30min}$
General classroom	≤ 35 dB $L_{Aeq,30min}$
Interview room	≤ 40 dB $L_{Aeq,30min}$
Multi-use hall	≤ 35 dB $L_{Aeq,30min}$
Office	≤ 40 dB $L_{Aeq,30min}$
Science laboratory	≤ 40 dB $L_{Aeq,30min}$
Staff room	≤ 40 dB $L_{Aeq,30min}$
WC / Changing	≤ 50 dB $L_{Aeq,30min}$
Teaching space intended specifically for students with special hearing and communication needs (SEN)	≤ 30 dB $L_{Aeq,30min}$
SEN Calming room	≤ 35 dB $L_{Aeq,30min}$
Notes: 1. Where target IANL is 40 dB $L_{Aeq,30min}$ or lower, a +5 dB relaxation can be applied where a natural or hybrid ventilation strategy is implemented. Where there is a hybrid system, any mechanical system components should meet the IANL limits from this table. The total noise level including external noise ingress may exceed the IANL limit from this table by up to 5 dB. 2. During the hottest 200hrs of the year, noise from external sources is permitted up to 55 dB(A) provided a natural/hybrid system is installed. Noise from mechanical systems may be relaxed by +5 dB above the IANL target. This relaxation only applies where ventilation is under local control of the teacher so noise can be reduced to normal levels when needed. 3. The noise level from locally controlled intermittent boost mechanical ventilation may exceed the IANL by up to +5 dB for dilution of fumes during practical activities. If natural ventilation is utilised for this purpose, noise levels up to 55 dB(A) may be permitted. 4. To protect students from regular discrete noise events (e.g. aircraft), IANLs should not exceed 60 dB $L_{A01,30min}$. This is achieved by default for spaces with IANLs up to 40 dB $L_{Aeq,30min}$.	

Table 5 BB93 target indoor ambient levels

2.10 Calculation of Road Traffic Noise, 1988

The Calculation of Road Traffic Noise (CRTN) describes the procedures for calculating noise from Road traffic. The memorandum uses traffic flows, %HGV's and Road speed, amongst other parameters to calculate the noise level in terms of the $L_{A10,\ 18hr}$. The 18-hour period is defined between 06:00 and 24:00.

CRTN also allows provision for a shortened measurement procedure which is equally appropriate for the calculation of road traffic noise. The procedure involves obtaining traffic noise measurements throughout a representative sample period within any three consecutive hours between 10:00 and 17:00. In order to calculate an equivalent daytime noise ($L_{Aeq,\ 16hr}$), the correction of $L_{A10,\ 3hr}$ – 3 dB would be applied.

2.11 Design Manual for Roads and Bridges, LA111 Noise and Vibration, 2020

The assessment is based on the procedure set out in the Design Manual for Roads and Bridges (DMRB). The assessment covers both the magnitude and significance of any change as a result of any new or amended highway scheme however is relevant for noise assessment of other project types. DMRB refers specifically to noise impacts and as such will be discussed in these terms for the purposes of this assessment.

A significant change is defined as an increase in the 18-hour traffic flow which is equal or greater than 25%, or a decrease which is equal or greater than 20%. Changes of this magnitude are equivalent to a change in noise level of at least 1 dB.

The magnitude of noise impact is therefore assessed by comparing the increase and decrease in noise levels between both short term and long-term scenarios. DMRB defines this impact both in the short term (immediate impact; first year of operation) and long term (future impact; +15 years from opening year).

Noise change, $L_{A10, 18hr}$		
Magnitude of change	**Short term**	**Long term**
Major	Greater than or equal 5.0	Greater than or equal to 10.0
Moderate	3.0 to 4.9	5.0 to 9.9
Minor	1.0 to 2.9	3.0 to 4.9
Negligible	Less than 1.0	Less than 3.0

Table 6 DMRB magnitude of change

2.12 BS 4142: 2014 + A1: 2019 'Methods for rating and assessing industrial and commercial sound'

BS 4142: 2019 describes the methods for rating and assessing noise from industrial or commercial sources, including manufacturing processes, fixed installations and plant equipment, loading of goods and sound from mobile plant. The standard is applicable for the purpose of assessing sound at proposed new dwellings, through the determination of a rating level of an industrial or commercial noise source.

Where certain acoustic features are present at the assessment location, a character correction should be applied to the specific sound level to give the rating level to be used in the assessment.

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of adverse impact depending on the context.
- 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.

BS 8233 provides good internal design threshold for new developments, including residential. This standard is derived from the WHO Guidelines for Community Noise (see above). For the use of BS 4142 in assessing new residential development applications ProPG (Paragraph 2.43) states that:

"Professional judgement will have to be exercised in addressing these sorts of issues. One possible approach may be to apply BS 4142:2014 character corrections to the noise level guideline values in order to derive suitable effect thresholds and/ or mitigation design targets and to use the same reference time periods recommended in the standard"

2.13 Local Planning Policy

Mid Sussex District Plan 2014 – 2031 (adopted March 2018) – Policy DP29

The environment, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where:

Noise pollution:

- It is designed, located and controlled to minimise the impact of noise on health and quality of life, neighbouring properties and the surrounding area;

- If it is likely to generate significant levels of noise it incorporates appropriate noise attenuation measures;

Noise sensitive development, such as residential, will not be permitted in close proximity to existing or proposed development generating high levels of noise unless adequate sound insulation measures, as supported by a noise assessment are incorporated within the development.

In appropriate circumstances, the applicant will be required to provide:

- an assessment of the impact of noise generated by a proposed development; or
- an assessment of the effect of noise by an existing noise source upon a proposed development.

The degree of the impact of noise and light pollution from new development or change of use is likely to be greater.

Mid Sussex District Plan 2021 – 2039: Submission Draft (Regulation 19, December 2023) - Policy DPN7

People's health and quality of life and the natural environment, including wildlife, will be protected from unacceptable levels of noise.

Areas valued for tranquillity for recreation and amenity reasons, including protected landscapes and their setting and nature conservation sites, will be protected from unacceptable levels of noise.

Development will only be permitted where it:

1. Avoids significant adverse impacts on health and quality of life.
2. Mitigates and minimises adverse impacts on health and quality of life.
3. Where possible, contributes to the improvement of health and quality of life.

Development will be expected to be located, designed and controlled to avoid significant adverse impacts or minimise adverse impacts from noise. Development must have good acoustic design including orientating or organising buildings (including consideration of the internal layout of buildings) to locate more noise sensitive areas, such as the principal habitable rooms, away from potential sources of noise. Parking arrangements must be carefully considered to avoid noise.

In addition to good acoustic design, development should have regard to natural solutions for mitigating noise such as green infrastructure.

Noise sensitive development, such as residential, will not be permitted in close proximity to existing or proposed development generating high levels of noise, or other sources of high levels of noise such as commercial/industrial sites or transport sources, unless adequate sound insulation measures, as supported by a noise assessment, are incorporated within the development.

Noise generating development will be permitted where it can be demonstrated that nearby noise sensitive uses (existing or planned) will not be exposed to noise impact that will significantly adversely affect the amenity of existing and future users.

If required by the local planning authority, the applicant will be required to provide:

a) An assessment of the impact of noise generated by a proposed development; or

b) An assessment of the effect of noise by an existing noise source upon a proposed development.

Development proposals will need to take into account the Council's noise guidance such as the *Planning Noise Advice Document: Sussex.*

Mid Sussex District Plan 2021 – 2039: Submission Draft (Regulation 19, December 2023) - Policy DPB1

All new development must be designed in accordance with the Mid Sussex Design Guide Supplementary Planning Document (SPD).

All new development must be of high quality and must respond appropriately to its context, be inclusive and prioritise sustainability. This includes the design and layout of new buildings and streets, alterations to existing buildings and the design of surrounding spaces.

All development proposals will be required to demonstrate all of the following, to ensure that development:

Residential Amenity

12. Does not cause significant harm to the amenities of existing nearby residents and future occupants of new dwellings, including taking account of the impact on privacy, outlook, daylight and sunlight, and noise, air and light pollution (see Policies DPN6, DPN7, DPN8 and DPN9).

2.14 Local Authority Consultation

The noise monitoring and assessment methodology was shared by email with the Environmental Health team at Mid Sussex District Council on 18 September 2024, where it was proposed to undertake long term noise measurements at three positions along the site boundary for a minimum of 96 hours (including midweek and weekend days).

The proposed methodology included:

- A baseline noise survey carried out to establish the existing noise levels at the site. The extent of the survey would comprise of environmental noise measurements (background and ambient) aimed to characterise the existing noise environment inclusive of maximum noise levels (L_{AFmax}) during night-time hours.
- A suitability assessment of the site for residential development in line with the National Planning Policy Framework (NPPF). Consideration of internal and external noise levels against the criteria within BS 8233: 2014 '*Guidance on sound insulation and noise reduction for buildings*'. The assessment would look to incorporate the design target thresholds for internal noise levels (30 dB(A) night, 35 dB(A) daytime). In addition, the WHO guidance on maximum internal night-time levels for residential amenity of 45 dB L_{AFmax} would also be incorporated into the assessment. Any external amenity spaces should be designed to achieve 50 – 55 dB(A) daytime.
- The addition of rating penalties to the baseline noise measurements (to account for impulsive, tonal, intermittent or other identifiable characteristics) in line with the requirements of BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' should it be determined through site attendance that the baseline monitoring is affected by existing commercial/industrial sources.
- Assess noise levels in accordance with guidance discussed above with the implementation of a computer noise model.

A response was received from Mr Oliver Benson (Senior Environmental Health Officer) dated 24 September 2024. Confirmation was received stating that the approach to the monitoring and assessment was suitable for the development proposals. A link was provided to the Planning Noise Advice Document: Sussex (dated November 2023) which upon review, reiterates the approach of good acoustic design (pnads-final-v3-nov-2023.pdf (midsussex.gov.uk)).

3 Development Location

3.1 Site Location and Description

The Proposed Development is located to the north of Sayers Common, off the B2118 and approximately 4.5 km west of Burgess Hill, West Sussex. The site is a current mix of educational and agricultural use; housing the existing LVS Hassocks Special Educational Needs (SEN) School.

The site is bordered by Hickstead Park to the north, the B2118 to the east and the Sayers Meadow residential development to the south. Agricultural land borders the Proposed Development to the west.

The site is centred on National Grid Reference (NGR) 526477(E), 118764(N) and extends over 14.409 ha of land. The topography of the site slopes gently in a southerly direction, with the highest point situated at the site's northern boundary.

The primary transport route is the A23, which runs north to south, approximately 450 metres to the east of the Proposed Development. The A23 is the main arterial route between the M25 and Brighton, and is considered the primary noise source impacting the site.

3.2 Proposed Development

The applicant is submitting a hybrid application for separate and severable elements comprising:

Demolition of all existing buildings bar the chapel, to retained for use within Use Class F and:

a) *Full planning permission for the development of the north western part of the Land at LVS Hassocks so as to accommodate a new SEN School with associated access from London Road, car parking, landscaping and drainage works; and*

b) *Outline planning permission (Appearance, Landscaping, Layout and Scale Reserved) for the development of the rest of the land at LVS Hassocks so as to accommodate up to 210 dwellinghouses (including affordable housing) with associated access, car parking, landscaping, play areas, informal outdoor space and drainage works*

The total site area is 14.408 ha in total.

The Proposed Development site location plan is presented in **Figure 2**, with the illustrative site layout plan reproduced in **Appendix A**.

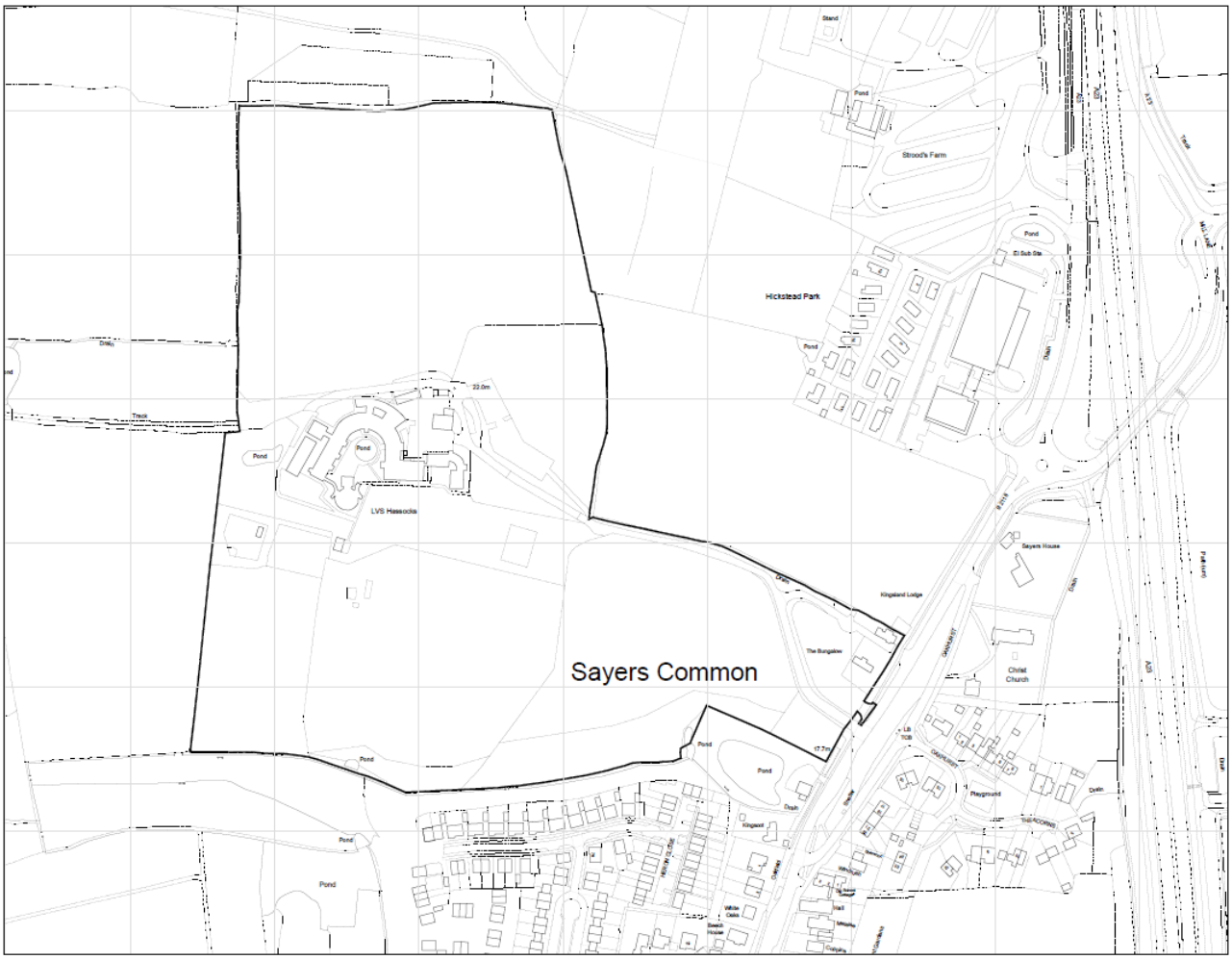


Figure 2 Proposed development boundary (document ref: SC-LP-01a, dated 19 Dec 2025)

4 Baseline Survey Methodology

4.1 Measurement Details

A baseline noise survey was undertaken between Wednesday 02 October and Wednesday 09 October 2024, with the acquisition of continuous noise data throughout daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods. Three unattended measurements (MP1 to MP3) were taken over a representative midweek and weekend period at positions along the north-east, east, south boundaries to quantify the prevailing noise environment.

A weather station capable of measuring atmospheric pressure, wind speed, wind direction, rain accumulation and temperature was installed within the site boundary and utilised for the duration of the survey. A description of the noise measurement positions and rationale is provided in **Table 7** below.

Measurement Name	Location	Rationale
MP1	North-east	To quantify the noise contribution from the A23 and potential activity from Hickstead Park and commercial premises (off B2118)
MP2	East	To quantify the noise contribution from the A23 and B2118 to the east
MP3	South	To quantify the propagation of noise from Broyle Lane to the east, and Norlington Lane to the west

Table 7 Measurement location details

A graphical representation of the monitoring positions is presented in **Figure 3**. Photographs of the measurement positions are provided in **Appendix E**.

Figure 3 Baseline noise monitoring positions

4.2 Survey Equipment

Monitoring was undertaken using the following equipment:

Equipment	Type	Serial number	Calibration date
Class 1 sound level meter	Rion NL-52	1265456	26/09/2023
	Rion NL-52	1043373	11/04/2023
	Rion NL-52	386770	23/11/2022
Acoustic calibrator	Rion NC-74	34257026	16/07/2024
Weather Station	Davies Vantage Pro2	WS-006[1]	N/A
[1]Internal reference			

Table 8 Monitoring equipment

All measurements were undertaken in free field conditions with the microphone positioned at least 3.5 metres away from reflecting surfaces and at 1.5 metres above ground height to the requirements of BS 7445.

The calibration of each sound level meter was checked before and after the measurements, using the acoustic calibrator at 94 dB at 1 kHz; no significant calibration drift (± 0.5 dB(A)) was noted. The sound level meters used conform to the requirements of BS EN 61672-1: 2013 '*Electroacoustics. Sound level meter, Specifications*'. The calibrator used conforms to the requirements of BS EN 60942: 2018

'*Electroacoustics, Sound calibrators*'. The equipment used has a calibration history that is traceable to a certified calibration institution.

Measurements were logged in continuous 15-minute integration periods (with supplementary 100-milisecond data) and obtained using broadband indices (L_{Aeq}, L_{A10}, L_{A90} and L_{Amax}).

4.3 Noise Environment

The noise environment across the site was dominated by constant vehicular movements along the A23 and intermittent vehicles along the B2118. Other audible sources of noise were attributed to light aircraft movements overhead and sporadic car movements in/out of the school.

Birdsong, vegetation and foliage movements also contributed to the prevailing noise climate. No other significant sources of noise were noted during times of attendance.

4.4 Weather Conditions

Weather conditions prevalent across the site were measured with a weather station deployed approximately 3 metres from MP2. Weather data is summarised in **Table 9**.

Date	Average Temperature (°C)	Average Wind Speed ($m.s^{-1}$)	Dominant Wind Direction	Accumulative Precipitation (mm)
Wednesday 02/10/2024[1]	15.3	1.1	NNE	1.8
Thursday 03/10/2024	11.9	0.8	NE	0.0
Friday 04/10/2024	8.5	0.2	E	0.0
Saturday 05/10/2024	11.8	0.7	ENE	0.0
Sunday 06/10/2024	14.3	1.0	ENE	1.3
Monday 07/10/2024	14.3	1.0	S	18.0
Tuesday 08/10/2024	15.1	1.9	S	12.4
Wednesday 09/10/2024[2]	13.8	1.1	SW	12.4
[1]Weather data obtained from 09:30 onwards to account for survey start time. [2]Weather data obtained until 14:15 to account for survey end time.				

Table 9 Survey weather conditions

Weather conditions were mostly calm with brief periods of precipitation noted. Noise monitoring data has been analysed throughout these periods with no significant change in noise levels noted when compared against dry periods.

The weather conditions for the full assessment period are therefore considered suitable for monitoring purposes in accordance with BS 7445.

5 Baseline Survey Results

A summary of measured noise levels at the long-term, continuous measurement locations MP1 to MP3 are presented in **Tables 10 to 12**. Graphical output of the survey data is provided in **Appendix B**. Analysis of the dataset accounting for the standard 16-hour daytime period (07:00 – 23:00) and 8-hour night-time period (23:00 – 07:00) is presented in accordance with BS 8233: 2014. Values are rounded to the nearest whole number.

Date	Time period, T	Measured noise levels (dB)(1)			
		$L_{Aeq, T}$	$L_{Amax, T}$	$L_{A90, T}$	$L_{A10, T}$
Wednesday 02/10/2024	15:15 to 23:00	56	73	53	57
	23:00 to 07:00	49	75	43	50
Thursday 03/10/2024	07:00 to 23:00	55	76	53	57
	23:00 to 07:00	49	69	46	50
Friday 04/10/2024	07:00 to 23:00	53	79	51	54
	23:00 to 07:00	51	63	48	53
Saturday 05/10/2024	07:00 to 23:00	55	72	53	56
	23:00 to 07:00	49	65	45	51
Sunday 06/10/2024	07:00 to 23:00	52	69	50	53
	23:00 to 07:00	45	66	39	45
Monday 07/10/2024	07:00 to 23:00	52	77	49	53
	23:00 to 07:00	47	68	42	48
Tuesday 08/10/2024	07:00 to 23:00	53	80	51	55
	23:00 to 07:00	50	67	44	52
Average(2)	**Daytime**	**54**	**80**	**51**	**55**
	Night-time	**49**	**75**	**44**	**50**

(1) $L_{Aeq,T}$ values are the logarithmic average of $L_{Aeq,15min}$ samples, and the $L_{A10,T}$ and $L_{A90,T}$ are the arithmetic average of $L_{A10,15min}$ and $L_{A90,15min}$ samples. L_{AFmax} accounts for the highest $L_{Afmax,15min}$ sample within the period.

(2) Arithmetic average of derived daytime 16hr and night-time 8hr values. Part-time periods on 02/10/24 and 09/10/24 are also included

Table 10 Noise monitoring data – MP1

Date	Time period, T	Measured noise levels (dB)(1)			
		$L_{Aeq, T}$	$L_{Amax, T}$	$L_{A90, T}$	$L_{A10, T}$
Wednesday 02/10/2024	15:15 to 23:00	59	81	55	59
	23:00 to 07:00	51	68	46	53
Thursday 03/10/2024	07:00 to 23:00	59	99	54	58
	23:00 to 07:00	50	75	46	51
Friday	07:00 to 23:00	62	98	52	57

Date	Time period, T	Measured noise levels (dB)[1]			
		$L_{Aeq, T}$	$L_{Amax, T}$	$L_{A90, T}$	$L_{A10, T}$
04/10/2024	23:00 to 07:00	51	69	48	53
Saturday 05/10/2024	07:00 to 23:00	56	75	54	57
	23:00 to 07:00	50	75	46	52
Sunday 06/10/2024	07:00 to 23:00	55	74	52	56
	23:00 to 07:00	49	79	42	49
Monday 07/10/2024	07:00 to 23:00	58	86	53	58
	23:00 to 07:00	51	72	46	52
Tuesday 08/10/2024	07:00 to 23:00	58	86	55	60
	23:00 to 07:00	55	71	49	57
Average[2]	**Daytime**	**58**	**99**	**54**	**58**
	Night-time	**51**	**79**	**46**	**52**

[1] $L_{Aeq,T}$ values are the logarithmic average of $L_{Aeq,15min}$ samples, and the $L_{A10,T}$ and $L_{A90,T}$ are the arithmetic average of $L_{A10,15min}$ and $L_{A90,15min}$ samples. L_{AFmax} accounts for the highest $L_{AFmax,15min}$ sample within the period.

[2] Arithmetic average of derived daytime 16hr and night-time 8hr values. Part-time periods on 02/10/24 and 09/10/24 are also included

Table 11 Noise monitoring data – MP2

Date	Time period, T	Measured noise levels (dB)[1]			
		$L_{Aeq, T}$	$L_{Amax, T}$	$L_{A90, T}$	$L_{A10, T}$
Wednesday 02/10/2024	15:15 to 23:00	55	83	52	56
	23:00 to 07:00	48	69	43	50
Thursday 03/10/2024	07:00 to 23:00	54	90	51	54
	23:00 to 07:00	48	62	44	49
Friday 04/10/2024	07:00 to 23:00	60	99	47	52
	23:00 to 07:00	48	69	44	49
Saturday 05/10/2024	07:00 to 23:00	52	68	49	53
	23:00 to 07:00	45	74	42	47
Sunday 06/10/2024	07:00 to 23:00	49	65	46	49
	23:00 to 07:00	41	72	34	39
Monday 07/10/2024	07:00 to 23:00	49	73	46	50
	23:00 to 07:00	44	61	38	44
Tuesday 08/10/2024	07:00 to 23:00	51	85	48	52
	23:00 to 07:00	46	67	40	47
Average[2]	**Daytime**	**53**	**99**	**49**	**52**

Date	Time period, T	Measured noise levels (dB)(1)			
		$L_{Aeq, T}$	$L_{Amax, T}$	$L_{A90, T}$	$L_{A10, T}$
	Night-time	**46**	**74**	**41**	**46**

(1) $L_{Aeq,T}$ values are the logarithmic average of $L_{Aeq,15min}$ samples, and the $L_{A10,T}$ and $L_{A90,T}$ are the arithmetic average of $L_{A10,15min}$ and $L_{A90,15min}$ samples. L_{AFmax} accounts for the highest $L_{AFmax,15min}$ sample within the period.

(2) Arithmetic average of derived daytime 16hr and night-time 8hr values. Part-time periods on 02/10/24 and 09/10/24 are also included

Table 12 Noise monitoring data – MP3

Measured noise levels across the site ranged between 53 – 58 dB $L_{Aeq,16hr}$ (daytime) and 46 – 51 dB $L_{Aeq,8hr}$ (night-time).

The highest average daytime noise level of 58 dB $L_{Aeq,16hr}$ was obtained at monitoring position MP2 towards the eastern portion of the site; this position was closest to the B2118 and A23. Daily 16-hour averaged noise levels measured at MP2 ranged between 55 and 62 dB $L_{Aeq,16hr}$, with night-time averaged noise levels ranging between 49 and 55 dB $L_{Aeq,8hr}$.

The lowest average daytime and night-time noise levels were measured at monitoring location MP3 along the southern boundary of the site. A daytime average noise level of 53 dB $L_{Aeq,16hr}$ and a night-time average noise level of 46 dB $L_{Aeq,8hr}$ were measured at this position.

5.1 Maximum Event Levels

The analysis of maximum noise levels during each night-time period (23:00 – 07:00) at each monitoring position has been considered. The analysis has been considered at all measurement positions, and is outlined below.

Night Period Date (23:00 – 07:00)	10th Highest L_{AFmax} (dB)		
	MP1	MP2	MP3
Wednesday 02/10/2024	58	63	58
Thursday 03/10/2024	57	58	55
Friday 04/10/2024	59	61	55
Saturday 05/10/2024	57	60	54
Sunday 06/10/2024	55	58	54
Monday 07/10/2024	57	62	54
Tuesday 08/10/2024	62	67	57
Maximum 10th Highest L_{AFmax}	**62**	**67**	**58**

Table 13 Analysis of 10th Highest L_{AFmax} during night-time hours (23:00 – 07:00)

The maximum 10-th highest night-time noise level (L_{AFmax}) has been adopted as a conservative approach for night-time assessment purposes (in accordance with the requirements of WHO guidelines).

6 Assessment Methodology

6.1 Noise Prediction Model

A computer noise model of the proposed development has been constructed using SoundPLAN v9.1. Noise levels across the proposed development site have been derived from a noise prediction model which has been calibrated against the measured levels at the baseline survey locations. The model has considered the following scenarios:

- Daytime - ambient $L_{Aeq,16hr}$ (07:00 – 23:00);
- Night-time - ambient $L_{Aeq,8hr}$ 23:00 – 07:00); and
- Night-time – individual events L_{AFmax} within period 23:00 – 07:00).

An overview of the modelling parameters is given in **Table 14**. Noise contour maps for both daytime and night-time periods are provided in **Appendices C** and **D**.

Item	Setting
Algorithms	Calculation of Road Traffic Noise (CRTN) ISO 9613-2:2024 '*Attenuation of sound during propagation outdoors – general method of calculation*'.
Ground absorption	Acoustically soft (assumed 0.8 coefficient) – grass or vegetated areas.
Meteorological conditions	10 degrees Celsius. 70% humidity. Wind from source to receiver.
Receptor height	Ground Floor 1.5 m above ground First Floor 4 m above ground
Site layout	Site layout (document ref: '24125 – C101 (Site Layout), dated December 2025'
Source modelling (residential assessment)	Existing buildings and intervening structures modelled as structures (heights identified on site or through 3D views). Calibration of the averaged daytime ($L_{Aeq,\ 16\ hour}$) and night ($L_{Aeq,8\ hour}$) model accounts for the road network acting as the primary source of noise impacting the site (line source). The night-time L_{AFmax} levels have been assumed as emanating from road pass-by events and activity at Hickstead Park. L_{max} events modelled as point source behaviour at 0.5 metres above ground level
Source modelling (LVS Hassocks Special Educational Needs (SEN) School assessment)	As above, with the inclusion of proposed dwellings modelled as solid structures at a height of 6-metres, to simulate the screening effect of the residential development on noise levels at the proposed school.
Terrain	LiDAR DTM with a 1-metre resolution has been imported into the model.

Table 14 Noise modelling parameters

6.2 Validation of Computer Noise Model

The propagation of maximum noise levels across the proposed development site have been derived from a computer noise prediction model assuming the influence of the surrounding road traffic network only. The model has been validated against the measured levels at the baseline survey locations.

Differences between measured and predicted levels are presented in **Table 15**.

Loc.	Measured Noise Level, dB			Predicted Noise Level, dB			Difference, dB		
	Day	Night	Night	Day	Night	Night	Day	Night	Night
	$L_{Aeq, T}$	$L_{Aeq, T}$	$L_{AF,max}$*	$L_{Aeq, T}$	$L_{Aeq, T}$	$L_{AF,max}$*	$L_{Aeq,T}$	$L_{Aeq, T}$	$L_{AF,max}$*
MP1	54	49	62	55	48	62	+1	-1	0
MP2	58	51	67	58	50	67	0	-1	0
MP3	53	46	58	53	45	58	0	-1	0
* 10th Highest $L_{AF,max}$									

Table 15 Noise model validation

Calibrated noise levels at all monitoring locations are within ±1 dB(A) from measured noise levels, providing an acceptable level of confidence to the modelling exercise.

6.3 Predicted Noise Levels

The assessment receptors have been positioned strategically within the indicative building areas to represent the likely noise levels across the Proposed Development. This is the result of the outline nature of the residential application and is intended to provide a conservative estimation of the noise impact (in the absence of screening provided by development buildings) to assess its suitability and to inform potential mitigation measures. It is expected that the noise predictions would be refined at the detailed design stage once the final masterplan, including internal layouts, is available in order to evaluate the noise impact at individual building plots.

The adopted evaluation plots are presented in **Figure 4**.

Figure 4 Noise evaluation points

6.4 Design Targets

For the purpose of this assessment, the acoustic design targets presented in **Table 16** below have been adopted. The design targets are based on the requirements of the appropriate guidelines for residential developments and new build schools.

Type	Condition	Criterion
Residential	Internal ambient daytime noise levels within bedroom / living room areas daytime (BS 8233)	35 dB $L_{Aeq,16hrs}$
	Internal ambient noise levels within bedrooms at night (BS 8233)	30 dB $L_{Aeq,8hrs}$
	Internal individual event levels within bedrooms during the night (>10 occurrences – WHO/ProPG)	45 dB $L_{AF,max}$
	Noise levels within external amenity areas associated with the proposed dwellings* (BS 8233)	50 to 55 dB $L_{Aeq,16hrs}$
SEN School	Teaching space intended specifically for students with special hearing and communication needs (BB 93).	30 dB $L_{Aeq,30mins}$
* 50 dB $L_{Aeq,T}$ is the desirable threshold level, 55 dB $L_{Aeq,T}$ is the upper guideline level. However, these guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels.		

Table 16 Noise design target for residential use

It is considered that these levels are the lowest observed adverse effect level (LOAEL) in line with the Noise Policy Statement for England (NPSE).

7 Site Suitability Assessment - Residential

7.1 Predicted Noise Levels

Predicted noise levels for the adopted evaluation points presented in **Figure 4** above are summarised in **Table 17**. The table includes detail of the predicted noise level at receptor heights of 1.5 metres (ground floor) and 4 metres above ground (first floor), for respective daytime and night-time levels. An indication of the level of mitigation required by the building envelope (to comply with the noise design targets outlined in **Table 16**) is also presented.

Location	Period	Predicted External Noise Level, $L_{Aeq,T}$ dB*	BS8233 Internal Ambient Noise Requirement, dB*	Attenuation Required by Building Envelope, dB**
Receiver 1	Day	63	35	28
	Night	56	30	26
		79	45 L_{AFmax}	**34**
Receiver 2	Day	58	35	**23**
	Night	51	30	21
		67	45 L_{AFmax}	22
Receiver 3	Day	55	35	**20**
	Night	49	30	19
		59	45 L_{AFmax}	14
Receiver 4	Day	55	35	**20**
	Night	48	30	18
		59	45 L_{AFmax}	14
Receiver 5	Day	56	35	**21**
	Night	47	30	17
		64	45 L_{AFmax}	19
Receiver 6	Day	54	35	**19**
	Night	46	30	16
		59	45 L_{AFmax}	14
Receiver 7	Day	53	35	**18**
	Night	46	30	16
		56	45 L_{AFmax}	11
Receiver 8	Day	51	35	**16**
	Night	45	30	15
		54	45 L_{AFmax}	9
Receiver 9	Day	54	35	**19**
	Night	48	30	18
		61	45 L_{AFmax}	16

Location	Period	Predicted External Noise Level, $L_{Aeq,T}$ dB*	BS8233 Internal Ambient Noise Requirement, dB*	Attenuation Required by Building Envelope, dB**
Note – noise levels rounded to nearest whole number, bold denotes highest level of attenuation required at boundary location * Daytime residential criteria for resting / living rooms (ground floor). Night-time criteria for bedrooms (first floor). ** Based on simple level difference.				

Table 17 Predicted noise levels

Averaged daytime noise levels predicted at ground floor level range between 51 and 63 dB $L_{Aeq,16hr}$; night-time noise levels at first floor level range between 45 and 56 dB $L_{Aeq,8hr}$. Highest noise levels are predicted towards the south-eastern area of the Proposed Development, due to the proximity to the B2118 and A23.

Noise contour maps are provided in **Appendices C** and **D**. The maps illustrate the attenuation of noise across the site, without any form of mitigation or screening due to the proposed development.

Based on the predicted noise levels, an initial noise risk assessment (Stage 1) following ProPG guidance indicates that the site is considered to pose a low to medium risk of adverse effect. The indicative noise levels are intended to provide a sense of the noise challenge at the proposed residential development site before considering any mitigation measures or other factors such as the locality, the project, and the wider context.

ProPG encourages the use of acoustic design as a means to inform the site masterplans and is key to avoiding or reducing to a minimum any adverse effects on any sensitive internal or external spaces. In considering acoustic design, consideration should be given by the developer to the management of noise through a hierarchy of potential mitigation measures which may include:

- Maximising the separation distance between source and receiver;
- Incorporate noise barriers (where applicable) to screen the development site (or individual plots) from significant sources of noise;
- Use existing features to reduce noise propagation across the site;
- Orientate the buildings in a manner which reduces the noise levels within habitable rooms (particularly bedrooms);
- Building envelope design to mitigate the noise to acceptable levels, whilst providing adequate ventilation.

7.2 Residential Internal Noise Levels – Façade Treatments

Noise level reduction can be provided through various façade treatment methods such as glazing and ventilation products; however, the final level of mitigation would be dependent on factors such as building positioning, room size and room volume. It has been assumed that the external wall build-up would be based on masonry cavity construction with cavity insulation infill or an alternative construction providing at least a weighted sound reduction index of 50 dB R_w. The acoustic performance of the roof construction has assumed a traditional pitched roof with concrete tiles and a 9 mm plasterboard ceiling, covered in thermal insulating material, providing at least a weighted sound reduction index of 43 dB Rw.

As a result of the predictions presented in **Table 17** and based on external levels dominated by road traffic noise, the level of mitigation required by the building envelope to adhere to the design targets in BS 8233/WHO is provided. The highest level of mitigation afforded by the glazing is 34 dB R_w+C_{tr} for properties positioned towards the south-eastern boundary of the site (adjacent to evaluation position R1). This can be achieved with standard glazing products accompanied by a suitable acoustically treated trickle ventilator ensuring the overall envelope acoustic performance do not diminish in the open position

(for background ventilation purposes only). The windows would remain openable at the occupant's discretion, allowing for rapid or purge ventilation. Final calculations should be determined during the detailed design stage.

The values in **Table 18** represent the highest level of attenuation required, based on a simple difference, afforded by the building envelope at indicative positions around the site. Understandably, treatments at those façades facing away from the identified road sources or those dwellings positioned within the central portion of the site can afford a lower level of specification due to likely screening effects and increased distance from dominant noise sources.

On the basis that a partially open window typically provides in the order of 13 dB attenuation, it is likely that the predicted noise levels would result in an exceedance of the recommended internal acoustic design targets across the site, with the exception of those dwellings situated adjacent to evaluation points R7 and R8 at the site's western boundary.

As a result of the outline nature of the residential land parcel, it should be noted that the above conclusions are a conservative interpretation of the predicted noise propagation across the site excluding likely screening effects from intervening buildings and structures.

7.3 Residential Internal Conditions – Overheating Risk

7.3.1 AD-O Assessment

Based upon the night-time predicted noise levels, additional calculations have been undertaken at each evaluation point to determine the risk of exceeding Approved Document O (AD-O) noise limits. Based on the calculation method within ISO 12354, the required window opening area within a single bedroom would correspond to approximately 10 dB reduction from outside to inside; in order to meet an internal ambient level of 40 dB $L_{Aeq,8hr}$ (and 55 dB L_{AFmax} more than 10 times) in line with the requirements of the published AD-O, the external noise limit for night-time hours must not exceed 50 dB $L_{Aeq,8hr}$ and 65 dB L_{AFmax}.

Location	Period	Predicted External Noise Level, dB	ADO External Night-time Noise Limit, dB	Risk of Overheating
Receiver 1	Night	56	50 $L_{Aeq,8hr}$	✓
		79	65 L_{AFmax}	✓
Receiver 2	Night	51	50 $L_{Aeq,8hr}$	✓
		67	65 L_{AFmax}	✓
Receiver 3	Night	49	50 $L_{Aeq,8hr}$	×
		59	65 L_{AFmax}	×
Receiver 4	Night	48	50 $L_{Aeq,8hr}$	×
		59	65 L_{AFmax}	×
Receiver 5	Night	47	50 $L_{Aeq,8hr}$	×
		64	65 L_{AFmax}	×
Receiver 6	Night	46	50 $L_{Aeq,8hr}$	×
		59	65 L_{AFmax}	×
Receiver 7	Night	46	50 $L_{Aeq,8hr}$	×
		56	65 L_{AFmax}	×
Receiver 8	Night	45	50 $L_{Aeq,8hr}$	×

Location	Period	Predicted External Noise Level, dB	ADO External Night-time Noise Limit, dB	Risk of Overheating
		54	65 L_{AFmax}	×
Receiver 9	Night	48	50 $L_{Aeq,8hr}$	×
		61	65 L_{AFmax}	×

Table 18 ADO overheating assessment – Simplified method

7.3.2 Predicted external night-time levels (first floor level) are likely to range between 45 and 56 dB $L_{Aeq,8hr}$ with maximum night-time levels (10-th highest) predicted between 54 and 79 dB L_{AFmax} at first floor level. Noise levels may exceed the AD-O criteria at proposed residential plots towards the south-eastern portion of the Proposed Development and as such, a suitable attenuation strategy for these areas should be developed at detailed design in conjunction with the overheating engineer to ensure suitable internal conditions can be met. This may include:

- Dynamic thermal modelling to determine if partially open windows can be used at night to control overheating. Compliance would be subject to the minimum open area required and the corresponding external to internal sound reduction, achievable alternative means of ventilation may be required for those dwellings;
- Installation of attenuated or plenum windows / louvres to affected bedrooms;
- Mechanical or comfort cooling systems. Where a mechanical solution is required, the impact of the noise generated both internally and externally should be considered to ensure BS 8233: 2014 recommended noise levels can be achieved within development dwellings.

It should be noted that the above conclusions are based on the simplified method of assessment and assume a worst-case scenario of dwellings positioned on the edge of the indicative residential areas. It is recommended during the detailed design (reserved matters) stage that input be sought from the wider design team to identify areas of overheating risk to ensure appropriate mitigation options are explored (where necessary).

Confirmation of the exact mitigation requirements and level thereof, would be provided on receipt of the masterplans during the detailed design stage of the application.

7.3.3 Cooling Hierarchy

It is recommended that as part of the ongoing design, that the cooling hierarchy, as detailed within the Sussex Planning Noise Advisory Document (page 31 - replicated below), be followed where windows are required to be closed in order to attain adequate internal sound levels:

1. Reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure;
2. Minimise internal heat generation through energy efficient design;
3. Manage the heat within the building through exposed internal thermal mass and high ceilings;
4. Provide passive ventilation;
5. Provide mechanical ventilation;
6. Provide active cooling systems.

7.4 Residential External Amenity Noise Levels

It is expected that the proposed development includes provision for outdoor amenity areas associated with the residential buildings in the form of gardens. The indicative developable areas of the site would be subject to noise levels between 51 – 63 dB $L_{Aeq,16hr}$ without any form of mitigation (e.g., boundary barriers or building screening).

It should be noted that the predictions are based on an 'open' site, without the screening properties afforded by the incorporation of buildings or potential boundary measures. The likelihood is that actual noise levels would be lower than those indicated within this assessment.

Sympathetic building orientation and the use of standard garden fencing in order to cut or disrupt the line of sight between source and receiver may reduce noise levels within the amenity areas by 10 dB(A). Assuming this can be incorporated within the final design, noise levels within external amenity areas are likely to comply with the upper design target of 55 dB $L_{Aeq,16hr}$ as specified within BS 8233: 2014.

8 Site Suitability Assessment – SEN School

8.1 Predicted External Noise Levels

Noise predictions have been undertaken as per the methods outlined in **Section 6**, with proposed dwellings (associated with the outline element of the hybrid application) modelled as intervening structures between the primary road network and proposed SEN school (detailed element of the hybrid application).

Table 19 below presents the prediction of noise at the school's eastern façade (i.e., the façade most exposed to road traffic noise), at ground floor (1.5 metres height) and first floor (4 metres height) levels. The proposed site and landscape plan is provided in **Appendix A**.

Location	Period	Predicted External Noise Level, $L_{Aeq,T}$ dB*	BB93 Internal Ambient Noise Level Target, dB $L_{Aeq,30mins}$*	Attenuation Required by Building Envelope, dB**
Ground Floor (1.5 metres)	Day	48	30	18
First Floor (4 metres)		50	30	**20**
Note – noise levels rounded to nearest whole number, bold denotes highest level of attenuation required at boundary location * Based on Table 1, *Teaching space intended specifically for students with special hearing and communication needs* criteria of BB93. ** Based on simple level difference.				

Table 19 Predicted noise levels (proposed school building)

8.2 Internal Ambient Noise

The indoor ambient noise level (IANL) is the product of external noise sources from outside of the school and internal noise from building services. Suitable indoor ambient noise levels are required for clear communication of speech between teacher and student to ensure activities requiring concentration can be carried out undisturbed.

BB93 provides an upper limit for indoor ambient noise levels in each of the different types of room typically found in a school. The acoustic design criteria will vary dependent on the ventilation condition, as defined below.

Condition	Description
Normal	Ventilation for normal teaching and learning activities.
Summertime	Ventilation under local control of teacher to prevent overheating – allowable during the 200 hottest hours that occur as per the design summer year weather file during normal daily school operating hours. 200-hour allowance includes the summer holiday period.
Intermittent boost	Ventilation systems under local control of teacher for dilution of fumes during practical activities in spaces for science, art, food technology and design and technology.
Process extract	Operational noise from local exhaust ventilation systems and boost ventilation under local control of the teacher as required for fume and dust extract. Excluded from IANL criteria.

Table 20 BB93 ventilation conditions

The BB93 upper limit levels for various room types present at the proposed development are presented in **Table 21**. For naturally ventilated rooms, the limits are to be applied when ventilators or windows are open as required to provide adequate ventilation. If mechanically assisted ventilation is used, the internal noise limits apply to the cumulative effect of both internal mechanical services noise and external noise ingress.

The noise targets are for each type of space when unoccupied and exclude noise contributions from teaching activities and associated equipment.

Room use		BB93 IANL upper limit[1],[2],[3]
Teaching space intended specifically for students with special hearing and communication needs	Classroom (SEN)	≤ 30 dB $L_{Aeq,30min}$
	Multi-use hall (SEN)	≤ 30 dB $L_{Aeq,30min}$
	Music/drama classroom (SEN)	≤ 30 dB $L_{Aeq,30min}$
	SEN break-out room	≤ 30 dB $L_{Aeq,30min}$
	SEN group room[4]	≤ 30 dB $L_{Aeq,30min}$
	SEN soft play	≤ 30 dB $L_{Aeq,30min}$
	Sensory room	≤ 30 dB $L_{Aeq,30min}$
	Art (SEN)	≤ 30 dB $L_{Aeq,30min}$
	Design and technology workshop (SEN)	≤ 30 dB $L_{Aeq,30min}$
	ICT/careers room (SEN)	≤ 30 dB $L_{Aeq,30min}$
	Food room (SEN)	≤ 30 dB $L_{Aeq,30min}$
	Science laboratory (SEN)	≤ 30 dB $L_{Aeq,30min}$
	Learning support	≤ 30 dB $L_{Aeq,30min}$
Interview / video conferencing room		≤ 40 dB $L_{Aeq,30min}$
Library		≤ 40 dB $L_{Aeq,30min}$
Fitness room		≤ 40 dB $L_{Aeq,30min}$
Food prep/kitchen		≤ 50 dB $L_{Aeq,30min}$
Office		≤ 40 dB $L_{Aeq,30min}$
Meeting room		≤ 40 dB $L_{Aeq,30min}$
Medical treatment/Sick bay		≤ 40 dB $L_{Aeq,30min}$
Dining room		≤ 45 dB $L_{Aeq,30min}$
Reception		≤ 45 dB $L_{Aeq,30min}$
Hygiene room		≤ 50 dB $L_{Aeq,30min}$
WC / Changing		≤ 50 dB $L_{Aeq,30min}$

Room use	BB93 IANL upper limit[1],[2],[3]
Notes: 1. Where target IANL is 40 dB $L_{Aeq,30min}$ or lower, a +5dB relaxation can be applied where a natural or hybrid ventilation strategy is implemented. This applies only to noise from external sources (not noise from building services). 2. During the hottest 200hrs of the year, noise from external sources is permitted up to 55dB(A) provided a natural/hybrid system is installed. Noise from mechanical systems may be relaxed by +5dB above the IANL target. This relaxation only applies where ventilation is under local control of the teacher so noise can be reduced to normal levels when needed and does not apply to classrooms intended specifically for students with special hearing and communication needs, or to speech therapy rooms. 3. The noise level from locally controlled intermittent boost mechanical ventilation may exceed the IANL by up to +5dB for dilution of fumes during practical activities. If natural ventilation is utilised for this purpose, noise levels up to 55dB(A) may be permitted.	

Table 21 BB93 target indoor ambient noise levels

8.3 External Noise Levels

To meet the internal noise criteria in different spaces, the fabric of the building envelope must provide sufficient sound reduction from external noise. Typically, the weakest point of the façade is the glazing and any ventilation openings. Based on the results of the noise prediction detailed above, it is likely that external ambient noise levels will be 48 - 50 dB $L_{Aeq,30min}$ during daytime hours, at the most exposed eastern façade. On this basis, standard double glazing meeting at minimum 20 dB R_{w+Ctr} should be sufficient to achieve BB93 requirements in teaching spaces intended specifically for students with special hearing and communication needs.

8.4 Rain Noise

Although rain impact noise is excluded from the BB93 definition of indoor ambient noise, it is an important source of noise that must be controlled. Excessive noise from rain/hail impact will occur in areas where there is a lightweight roof construction with no sealed roof space below to attenuate the noise before it radiates into the user space.

Building Regulations submissions should demonstrate that lightweight roofs and roof glazing have been designed to provide suitable control of rain noise reverberant sound pressure level in a space. Levels during 'heavy' rainfall should be no more than 25 dB above the appropriate internal ambient noise level criteria set out in **Table 21**.

8.5 Ventilation Strategy Implications

The method of ventilation, as well as the type and location of ventilation openings will affect the overall sound insulation of the building envelope.

Site drawing reference *'323_3_102*' (shown in **Appendix F**), indicates that the ventilation strategy for the main school building will comprise of three *Ventive Windhive* passive ventilation units situated on the school's north-eastern roof area, with the units' dampers, extract and bypass systems adjustable for overheating conditions for certain spaces. Based on manufacturer's specifications, the ventilation system should achieve an attenuation performance of between 14 and 21 dB R_w ($C;C_{tr}$) (shown in **Appendix F**), dependant on the units' configuration.

Based on the results of the noise predictions as detailed in **Table 19**, it is likely that external ambient noise levels will be between 48 - 50 dB $L_{Aeq,30min}$ during school opening hours. On this basis, BB93 indoor ambient noise level criteria for teaching spaces intended specifically for students with special hearing and communication needs, accounting for a +5 dB relaxation of the noise criteria as per Note 1 of **Table 21**, should be achievable through installation of the proposed passive ventilation system, without significant additional acoustic attenuation.

The performance specification and design of the building façade and ventilation strategy is still being developed, and compliance with BB93 should be finalised at Stages 3 / 4 of the development's design phase.

8.6 Reverberation Control

Suitable control of the reverberant build-up of sound is required in teaching and learning spaces to enable clear communication between teacher and student, and clear communication between students.

For ancillary and other non-teaching spaces, the reverberation time criteria are defined by the arithmetic average of the reverberation times in the 500 Hz, 1 kHz and 2 kHz octave bands, or the arithmetic average of the reverberation times in the one-third octave bands from 400 Hz to 2.5 kHz.

For teaching spaces designed specifically for students with special hearing or communication needs, the reverberation time criteria are expressed as the arithmetic average of the reverberation times in the 125 Hz to 4 kHz octave bands, or the arithmetic average of the reverberation times in the one-third octave bands from 100 Hz to 5 kHz. The extended frequency range is considered necessary as students may be more affected by reverberant noise build up, therefore the acoustic environment should be designed to suit their needs.

Standards are for unoccupied, finished rooms which are furnished for normal use. A summary of the reverberation time criteria is provided in **Table 22** below.

Room use		RT target, $T_{mf,max}$ (s)
Teaching space intended specifically for students with special hearing and communication needs	Classroom (SEN)	≤ 0.4[1]
	Multi-use hall (SEN)	≤ 0.4[1][2]
	Music/drama classroom (SEN)	≤ 0.4[1][3]
	SEN break-out room	≤ 0.4[1]
	SEN group room	≤ 0.4[1]
	SEN soft play	≤ 0.4[1]
	Sensory room	≤ 0.4[1]
	Art (SEN)	≤ 0.4[1]
	Design and technology workshop (SEN)	≤ 0.4[1]
	ICT/careers room (SEN)	≤ 0.4[1]
	Food room (SEN)	≤ 0.4[1][3]
	Science laboratory (SEN)	≤ 0.4[1]
	Learning Support	≤ 0.4[1]
Interview / video conferencing room		≤ 0.8
Library		≤ 1.0
Fitness room		≤ 1.5
Food prep/kitchen		≤ 1.5
Office		≤ 1.0
Meeting room		≤ 0.8
Medical treatment/Sick bay		≤ 1.0
Staff room		≤ 1.0
Staff work room		≤ 0.8

Room use	RT target, $T_{mf,max}$ (s)
Dining room	≤ 1.0
Reception	≤ 1.5
Hygiene room	≤ 1.5
WC	≤ 1.5
Changing	≤ 1.5
Circulation	≤ 1.5

Notes:

1. ≤ 0.4s average, ≤ 0.6s in each octave band. Alternative performance standards are often required for these spaces.
2. Acoustic Panel System (APS) likely to be required from BB93 RT requirement '*Teaching space intended specifically for students with special hearing and communication needs*' due to the probable large size of the room and hard floor finishes. Additionally, an RT of 0.4s may not be desirable if the hall is used for drama/music performances. Low to midrange of the BB93 range for multi-use hall is recommended to be more achievable.
3. APS likely to be required from BB93 RT requirement '*Teaching space intended specifically for students with special hearing and communication needs*' due to the likely use and probable large size of the room and hard floor finishes.

Table 22 BB93 reverberation time criteria

The performance specification and design of the internal building fabric is still being developed; as such, acoustic treatment recommendations to achieve compliance with BB93 should be finalised at Stages 3 / 4 of the development's design phase.

8.7 External Teaching Areas

Whilst there is no requirement within BB93 to meet specific noise levels within external teaching spaces, the following recommendations are made within the accompanying design guide:

"For new schools, 60 dB $L_{Aeq,30min}$ should be regarded as an upper limit for external noise at the boundary of external premises used for formal and informal outdoor teaching, and recreational areas.

Playgrounds, outdoor recreation areas and playing fields are generally considered to be of relatively low sensitivity to noise, and indeed playing fields may be used as buffer zones to separate school buildings from busy roads where necessary. However, where used for teaching, for example sports lessons, outdoor ambient noise levels have a significant impact on communication in an environment which is already acoustically less favourable than most classrooms. Noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed 55 dB $L_{Aeq,30min}$ and there should be at least one area suitable for outdoor teaching activities where noise levels are below 50 dB $L_{Aeq,30min}$. If this is not possible due to a lack of suitably quiet sites, acoustic screening should be used to reduce noise levels in these areas as much as practicable."

The location of any proposed external play areas has not been defined. Should these areas be positioned within the school boundary as per the site layout plan, noise levels within unoccupied playgrounds, playing fields and other outdoor areas are likely to be in line with the recommended criterion of achieving noise levels below 55 dB $L_{Aeq,30mins}$.

Figure 5 shows the predicted external noise level at 1.5 metre height, with areas anticipated to experience noise levels below 50 dB $L_{Aeq,30mins}$, in accordance with the criteria for suitability for outdoor teaching activities (highlighted in green).

Figure 5 Daytime noise contour map (1.5 metre height) for external teaching areas

8.8 Multi Use Games Areas (MUGA)

Assessment methodology

The most relevant guidance relating to the assessment of noise from the proposed multi-use games area (MUGA) is "Artificial Grass Pitch (AGP) Acoustics – Planning Implications", 2015, published by Sports England.

The document recommends a "typical free-field noise level from an AGP (at 10 metres from the side-line halfway marking) – 58 dB $L_{Aeq(1\ hour)}$" and states that "the most significant noise source from typical AGP sports sessions is voice". On this basis, the MUGA source levels are expected to be similar to those generated by an AGP.

There is no specific noise criteria against which to assess a sports pitch or MUGA, however the Sports England guidance makes reference to the World Health Organisation 'Guidelines for Community Noise' as the most relevant and commonly applied for the assessment of MUGA noise. As the nearest noise sensitive receptors to the proposed sports location are proposed residential plots, as referenced in this document, the WHO guideline levels which are most relevant to this assessment are those relating to 'Outdoor Living Areas':

Assessment results

The proposed MUGA area is located to the east of the main school building. The nearest proposed noise sensitive residential properties are located approximately 30 metres east of the MUGA, with the nearest existing residential property located within Hickstead Park, approximately 300 metres south-east of the MUGA.

Using the Sports England recommended noise level of 58 dB $L_{Aeq,1hour}$ at 10 metres from a MUGA, calculations have been undertaken following the engineering method for determining the attenuation of sound during outdoor propagation conditions detailed in BS ISO 9613-2 *'Acoustics – Attenuation of sound during propagation outdoors – Engineering method for the prediction of sound pressure levels outdoors'*.

Predicted noise levels resulting from the proposed MUGA are below the upper 55 dB $L_{Aeq,16hour}$ threshold presented above in the external amenity areas of the nearest proposed properties immediately east of the MUGA.

Noise predictions at the nearest existing residential dwelling within Hickstead Park are significantly below both external amenity area thresholds, with the predictions indicating that the property is likely to experience MUGA noise emissions of 28 dB $L_{Aeq,T}$.

It should be noted that the WHO 'Outdoor Living Area' criteria references a 16-hour averaging period (i.e., moderate / serious annoyance is expected to occur if the threshold level is exceeded over a 16-hour averaging period, between 07:00 and 23:00). It is expected that the MUGA will typically be used intermittently during school hours, noise predictions are likely to be an over-estimation of actual MUGA noise emissions over a 16-hour daytime period. As such, the lower 50 dB $L_{Aeq,16hour}$ threshold is unlikely to be exceeded at those nearest proposed dwellings to the east.

8.9 Development Noise Emissions

In order to specify a design target at receptor locations and provide flexibility for external plant, it is considered that an initial target should comply with a requirement to meet +5 dB above the representative background sound level. It is considered that this applies the first requirement of NPSE namely, to *"avoid significant adverse impacts on health and quality of life…..[ ]"*.

Rating level noise limits, as per BS 4142: 2014+A1: 2019 and based on the positions of the baseline noise monitors are provided in **Table 23**. The rating noise level from installed fixed plant should not exceed the following design targets at those nearest sensitive receptors (existing and proposed) positioned to each monitoring position as summarised below:

Receptor Location	Proposed rating noise level limit, $L_{Ar,Tr}$ (dB)	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
MP1	55	47
MP2	58	49
MP3	51	44

Table 23 Proposed rating noise level limits for fixed plant

Should it be determined that the operational regime of any proposed fixed plant is likely to occur on a 24-hour basis, the lower night-time target should be used to inform the design of any fixed plant attached to the operation of this building. Assuming the noise design targets are adhered to as part of the design, the proposed fixed plant would have a low impact on existing and proposed sensitive receptors.

Histograms for daytime and night-time periods from which the representative background levels are derived, are provided in **Appendix B**.

8.10 Impacts During Construction and Demolition

During the development of the site, the existing school would remain open whilst the new school is built out. Likewise, following occupation of the new school, the existing school would be demolished which would give rise to noise and vibration associated with the various activities and plant items. Potential impacts would occur at the new school, occupiers of the recently built residential dwellings and nearest offsite receptors.

At this stage, methodologies and proposed plant items associated with the construction and demolition phases are unknown. It is therefore recommended that a construction noise and vibration assessment be undertaken as part of the site wide Construction Environmental Management Plan (CEMP). As part of the assessment, appropriate mitigation in the form of both organisational and technical measures should be determined and employed across the site to reduce levels of noise and vibration. There are a number of organisational and technical measures, including but not limited to the following:

Control of construction and demolition activities

- Careful selection of plant and construction methods. Only plant conforming to relevant national, EU or international standards, directives and recommendations on noise and vibration emissions shall be used;
- Design and use of site enclosures, housing and temporary stockpiles, where practicable and necessary, to provide acoustic screening at the earliest opportunity;
- Careful programming so that activities which may generate significant noise are planned with regard to local occupants and sensitive receptors;
- The recommendations set out in BS 5228 (parts 1 and 2) shall be adopted with regard to noise and vibration mitigation options. Where alternative authoritative guidance and procedures are thought to be more appropriate and have been agreed in advance with the relevant local authority, these may be adopted in place of the aforementioned;
- Plant and equipment liable to create noise and/or vibration whilst in operation will, as far as reasonably practicable, be located away from sensitive receptors and away from walls reflecting towards sensitive receptors;
- Machines in intermittent use should be shut down or throttled down to a minimum during periods between work. Static noise emitting equipment operating continuously shall be housed within suitable acoustic enclosure, where appropriate. Doors on plant and equipment will be kept closed;
- All generators and compressors shall be ‘sound reduced’ models fitted with acoustic lining/sealed acoustic covers where appropriate.

Control of site vehicles

- Choice of routes and programming for the transport of materials, spoil and personnel;
- Contact shall be made with the local authority, to ensure that planned designated routes are set in place to minimise disturbance;
- Site speed limits shall be set to minimise noise and vibration levels;
- Deliveries should be carried out within the time limits set by consented conditions and local agreements;
- Lorry engines shall be switched off when vehicles are stationary.

Neighbour notification

- Occupiers of nearby receptors shall be informed in advance of the works taking place where relevant, including the duration and likely noise and vibration impacts. In the case of work required in response to an emergency, the local authority and nearest receptors (where relevant) shall be advised as soon as reasonably practicable that emergency work is taking place. Potentially affected occupiers will also be notified of the helpline number;
- The Contractor should appoint a responsible person to liaise with stakeholders in order to keep them informed of matters likely to affect them;

- It is recommended that neighbours be notified throughout the construction and demolition programme, with initial details provided prior to the commencement of site works including:
    - Start/end dates;
    - Duration and nature of the project;
    - Principal stages of the project;
    - Possible impacts; and
    - Details of contact names and numbers of appropriate site personnel.

Complaints procedure

- Any external complaint being received regarding noise or vibration disturbance arising from the construction and demolition works shall be logged and immediately investigated by the Contractor (and/or appointed Environmental and Site Manager);
- Where necessary, temporary actions will be taken in order to reduce noise and vibration levels (where necessary) until further assessment can be carried out. The investigation will look at Best Practicable Means (BPM) and the construction/demolition methodologies used at the time of complaint;
- Details of appropriate remedial actions would be logged where necessary. Any construction/demolition activities or work processes affected by the re-assessment of impacts following investigation, should be reviewed and approved by the Contractor;
- Following investigation and/or remedial action, it is recommended that feedback be provided to the complainant and local authority (as necessary).

8.11 Exclusions

At this stage, details regarding the proposed school's internal elements (walls, doors, flooring and flanking) and building services are not known.

As such, **Section 8** of this document should be used to inform site suitability (for planning purposes) and an acoustic design report during design Stages 3 / 4 only.

9 Road Traffic Noise Assessment

9.1 Traffic Count Data

In order to quantify the noise impact due to road traffic noise, two assessment scenarios (short term and long term) have been assessed. The traffic data for this assessment has been provided by the appointed traffic consultants (i-Transport LLP).

The scenarios assessed were as follows:

- Scenario 1 – 'Do-Minimum' (2025) against 'Do-Something' (2025);
- Scenario 2 – 'Do-Minimum' (2025) against 'Do-Something' (2040).

The 'do-minimum' data includes the baseline traffic counts without the Proposed Development and the 'do-something' data includes traffic counts with the Proposed Development in place, plus committed developments. Traffic count data is provided in **Table 24**.

Road link	2030 Baseline Opening Year		2030 Opening + Committed		2045 Future + Committed	
	AAWT 18hr	HGV%	AAWT 18hr	HGV%	AAWT 18hr	HGV%
1	6768	3	7187	3	7855	3
2	5695	3	6114	3	6676	3
3	7836	3	8255	3	9028	3
4	8100	5	8311	5	9110	5
5	4781	2	4826	2	5298	2
6	3103	2	3103	2	3409	2
7	4192	5	4257	5	4670	5
8	4165	3	4310	3	4721	3
9	4804	2	4814	2	5289	2

1. B2118 (North of Albourne Road)
2. B2118 (North of Furzeland Way Roundabout)
3. B2118 (North of Reeds Lane)
4. B2118 (South of Mill Lane Roundabout)
5. Albourne Road
6. Reeds Lane
7. Mill Lane
8. A23 Northbound Slip Road
9. A23 Southbound Slip Road

Table 24 Development traffic counts

9.2 Noise Level Change

The change in basic noise level (in dB) has been calculated in accordance with the CRTN methodology and assessed against the short-term and long term impact criteria set out in DMRB LA111 (**Table 6**).

Road link	Scenario 1 – Short term		Scenario 2 – Long term	
	Noise level increase, dB $L_{A10, 18hr}$	Impact	Noise level increase, dB $L_{A10, 18hr}$	Impact
1	0.3	Negligible	0.6	Negligible
2	0.3	Negligible	0.7	Negligible

Road link	Scenario 1 – Short term		Scenario 2 – Long term	
	Noise level increase, dB $L_{A10, 18hr}$	Impact	Noise level increase, dB $L_{A10, 18hr}$	Impact
3	0.2	Negligible	0.6	Negligible
4	0.1	Negligible	0.5	Negligible
5	0.0	Negligible	0.4	Negligible
6	0.0	Negligible	0.4	Negligible
7	0.1	Negligible	0.5	Negligible
8	0.1	Negligible	0.5	Negligible
9	0.0	Negligible	0.4	Negligible
1. B2118 (North of Albourne Road) 2. B2118 (North of Furzeland Way Roundabout) 3. B2118 (North of Reeds Lane) 4. B2118 (South of Mill Lane Roundabout) 5. Albourne Road 6. Reeds Lane 7. Mill Lane 8. A23 Northbound Slip Road 9. A23 Southbound Slip Road				

Table 25 DMRB assessment

Predictions indicate that the effect of the Proposed Development on traffic noise would increase levels by a maximum of 0.3 dB $L_{A10,18hr}$ in the short term and 0.7 dB $L_{A10,18hr}$ in the long term. An increase of this magnitude would be of negligible impact in accordance with DMRB.

10 Conclusions

10.1.1 RSK Acoustics Limited has been instructed by Wates Developments Limited and the Licensed Trade Charity (LTC) (the applicant) to undertake a noise assessment to support a hybrid planning application on Land at LVS Hassocks, London Road, Sayers Common, West Sussex. The applicant is seeking permission for the erection of up to 210 dwellinghouses and development of the north western part of the site to accommodate a new SEN school.

10.1.2 A noise survey has been undertaken to establish the baseline noise levels across the site, comprising of unattended measurements throughout continuous daytime and night-time periods from Wednesday 02 October to Wednesday 09 October 2024.

10.1.3 A site suitability assessment, undertaken to the requirements of BS 8233: 2014 and WHO (1999), has been undertaken to determine potential internal and external noise levels at locations across the development site.

10.1.4 Predicted noise levels within the proposed residential areas, in conjunction with highest maximum noise levels, are of a magnitude where a standard specification single glazed system to the building façade, providing a minimum sound reduction of 34 dB R_w+C_{tr} and accompanied by a suitable acoustically treated trickle ventilator ensuring the overall envelope acoustic performance do not diminish in the open position (for background ventilation purposes), would be required to meet the internal design targets within BS 8233: 2014/WHO, 1999 during daytime and night-time periods.

10.1.5 Based on the simplified method of overheating assessment within AD-O, the site would likely allow for partially open windows for ventilation purposes during a potential overheating scenario for the majority of the site. Those dwellings towards the eastern portion of the Proposed Development are likely to be at high risk of overheating. It is recommended during the detailed design (reserved matters) stage that input be sought from the wider design team to identify areas of overheating risk to ensure appropriate mitigation options are explored (where necessary) and confirmed through engagement with an overheating specialist.

10.1.6 It is considered that noise levels within amenity areas are likely to comply with the upper design target of 55 dB $L_{Aeq,16hr}$, as specified within BS 8233: 2014 assuming appropriate mitigation, such as sympathetic building orientation and the use of standard garden fencing is incorporated through design.

10.1.7 External noise levels associated with the SEN school are of a magnitude that is likely to result in compliance with the relevant teaching space design target of 30 dB $L_{Aeq,30mins}$, assuming the use of a suitable ventilation system, offering a minimum 20 dB reduction (made up of a closed window double glazed unit). MUGA noise emissions are also likely to result in compliance with external amenity noise criteria at the nearest existing and proposed residential dwellings.

10.1.8 In order to provide an indicative design target at proposed residential locations as a result of potential fixed plant associated with the SEN school, suitable design targets have been provided at the baseline monitoring positions in order to avoid significant adverse effects, in accordance with NPSE and based on the requirements of BS 4142: 2014+A1: 2019.

10.1.9 Noise predictions indicate that the effect of the development on traffic noise would increase noise levels by a maximum of 0.3 dB $L_{A10,18hr}$ in the short term and by a maximum of 0.7 dB $L_{A10,18hr}$ in the long term; the magnitude of change would be of negligible impact in accordance with DMRB.

10.1.10 In summary, predicted noise levels across the site are of a magnitude suitable for the Proposed Development. It is recommended that the principles of good acoustic design and specific mitigation measures included within this assessment be adopted within the final masterplan in order to ensure compliance with the relevant design targets.

References

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18. WHO Guidelines for Community Noise, 1999

Glossary

Term	Definition
Ambient sound	The total sound at a given place, usually a composite of sounds from many sources near and far.
Background sound, $L_{A90,T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval.
dB	Decibel. Scale for expressing sound pressure level. It is defined as 20 times the logarithm of the ratio between the root mean square pressure of the sound field and a reference pressure i.e. $2x10^{-5}$ Pascal.
dB(A)	A-weighted decibel. This provides a measure of the overall level of sound across the audible spectrum with a frequency weighting to compensate for the varying sensitivity of the human ear to sound at different frequencies. Example sound levels include: 140 dB(A) Threshold of pain 120 dB(A) Threshold of feeling 100 dB(A) Loud nightclub 80 dB(A) Traffic at busy roadside 60 dB(A) Normal speech level at 1m 40 dB(A) Quiet office 20 dB(A) Broadcasting studio 0 dB(A) Median hearing threshold (1000 Hz)
Frequency	The repetition rate of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the Hertz (Hz), which is identical to cycles per second. A thousand hertz is often denoted as kHz, e.g. 2 kHz = 2000 Hz. Human hearing ranges approximately from 20 Hz to 20kHz.
$L_{Aeq,T}$	This is defined as the notional steady sound level over a stated period of time (T), would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.
Sound absorption	Process whereby sound energy is converted in to heat. Sound absorption properties is expressed as the sound absorption coefficient α or the sound absorption class (A-E).
Sound insulation	The reduction or attenuation of airborne sound by a solid element between source and receiver.
Time Weighting	Sound level meters use various averaging times for the measurement of RMS sound pressure level. The most commonly used are fast (0.125 s averaging time), slow (1 s averaging time) and impulse (0.035 s averaging time). Variables that are measures with time weightings are expressed as L_{AFmax} etc.
Frequency Weighting Networks	Frequency weighting networks, which are generally built into sound level meters, attenuate the signal at some frequencies and amplify it at others. The A-weighting network approximately corresponds to human frequency response to sound. Sound levels measured with the A-weighting network are expressed in dB(A). Other weighting networks also exist, such as C-weighting which is nearly linear (i.e., unweighted) and other more specialised weighting networks. Variables such as Lp and Leq that can be measured using such weightings are expressed as L_{pA} / L_{pC}, L_{Aeq} / L_{Ceq} etc.
L_N - Percentile or Statistical Levels	If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time, and the L_{90} is the level exceeded for 90% of the time,

Term	Definition
Pre-existing ambient noise	Pre-existing ambient noise means the level of ambient noise, expressed as a level of L_{Aeq} determined with respect to the relevant time period and the relevant L_{Aeq} averaging time, prevailing one metre in front of relevant windows or doors in a façade of a dwelling, immediately before the placing of a contract for the construction.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally, as measured outside and away from buildings.
Façade Level	A sound field determined at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
R_w – Weighted Sound Reduction Index	Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. Value, in decibels, of the reference curve at 500 Hz after shifting it in accordance with the method specified in this part of ISO 717.
C; C_{tr} – Spectrum Adaptation Terms	Value, in decibels, to be added to the single-number rating (e.g., Rw) to take account of the characteristics of a particular sound spectra.

Glossary of terms

Appendix A – Illustrative Site Layout Plan

Figure A.1 *Proposed Site Layout (taken from document ref '24125 – C101 (Site Layout, dated* December 2025)

Figure A.2 School Landscape Masterplan Plan (document ref '403.065419.00001-SC76, dated 22 January 2026)

Appendix B – Noise Monitoring Results

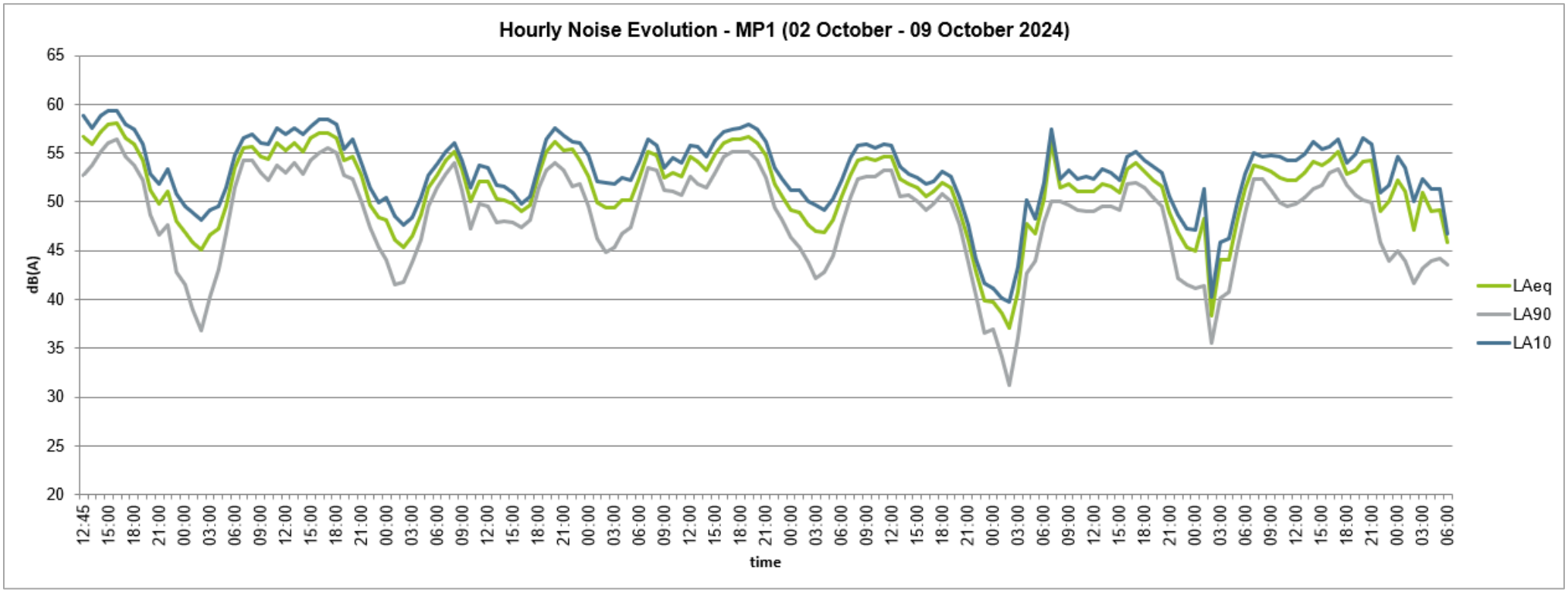


Figure B.1 Hourly noise evolution, north boundary (MP1)

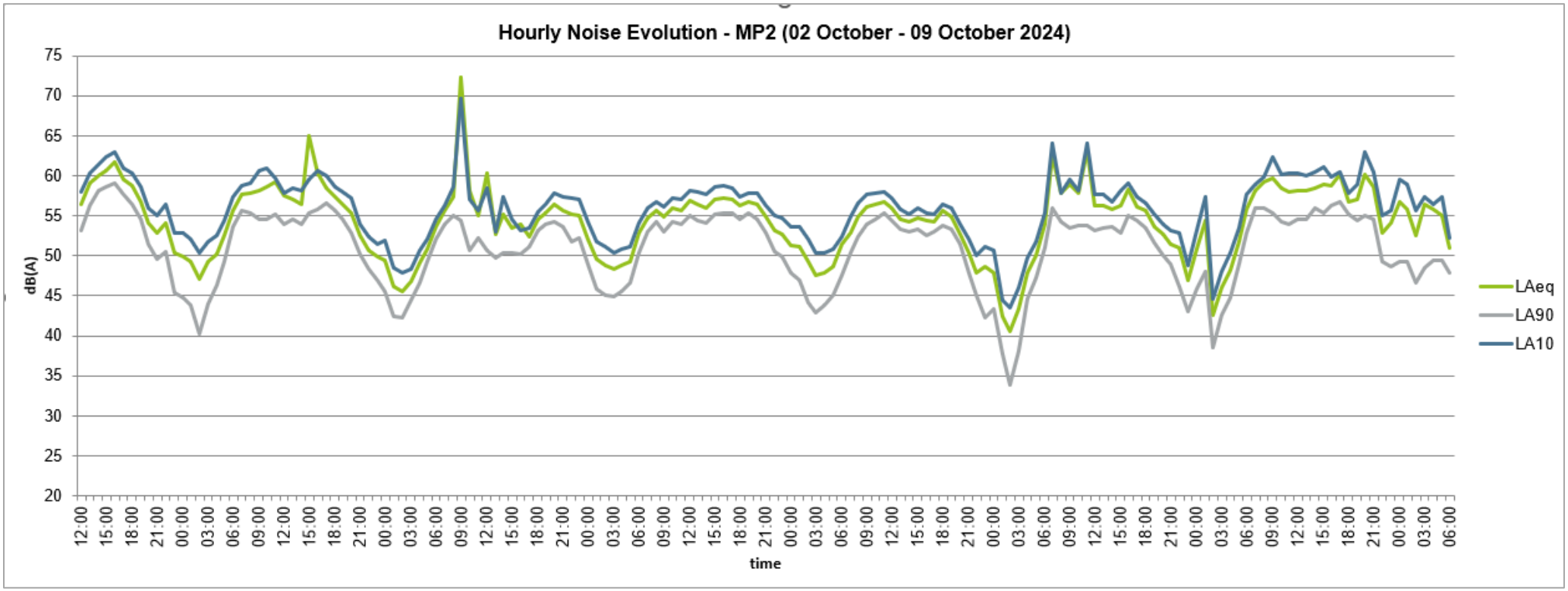


Figure B.2 Hourly noise evolution, north-east boundary (MP2)

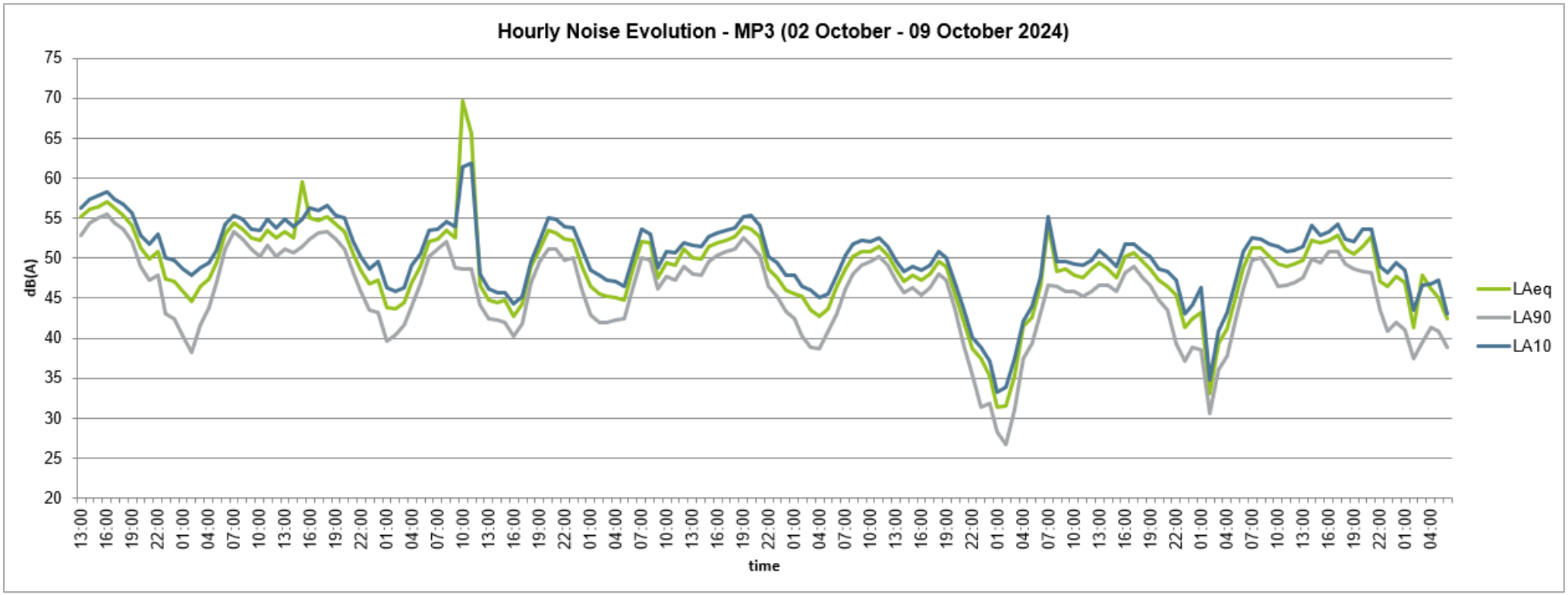
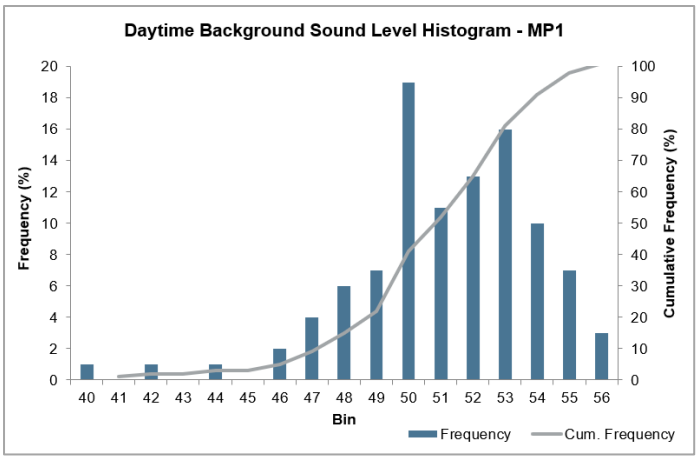


Figure B.3 Hourly noise evolution, south-west boundary (MP3)



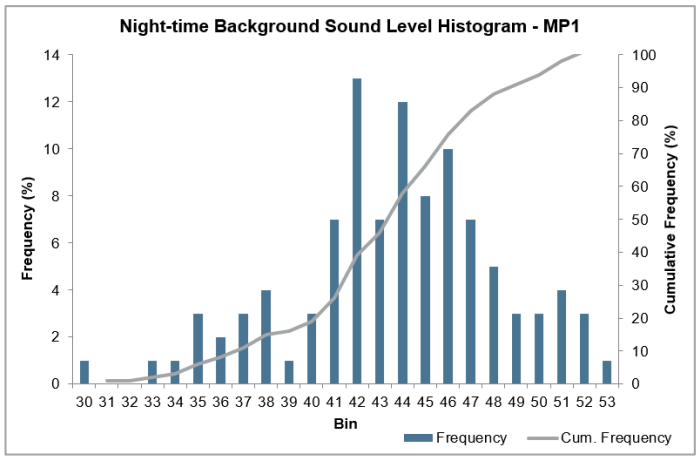
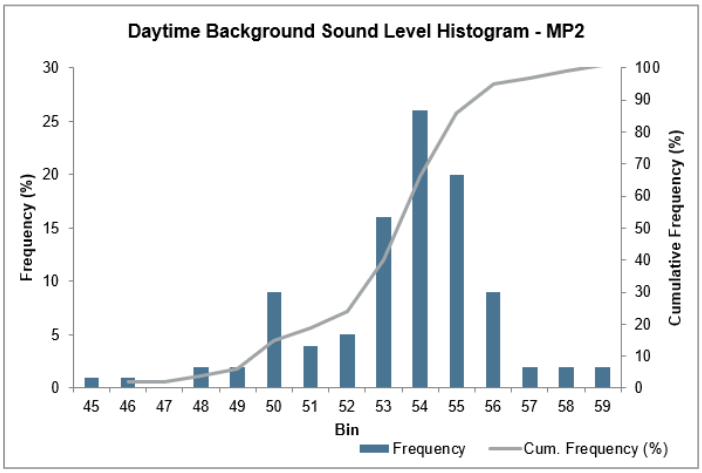


Figure B.4 Daytime and night background sound level histograms – MP1



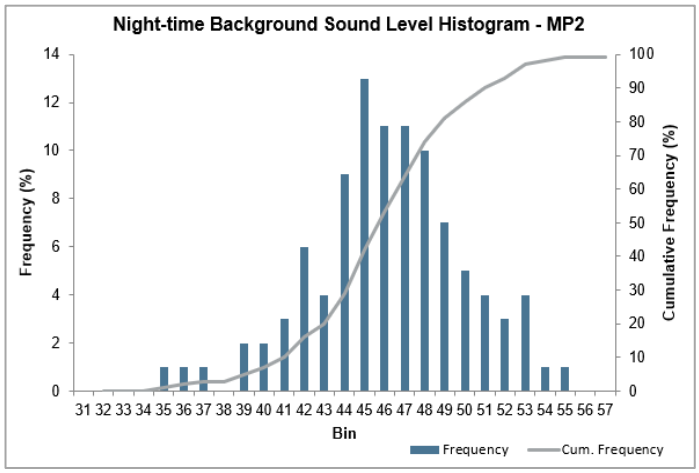
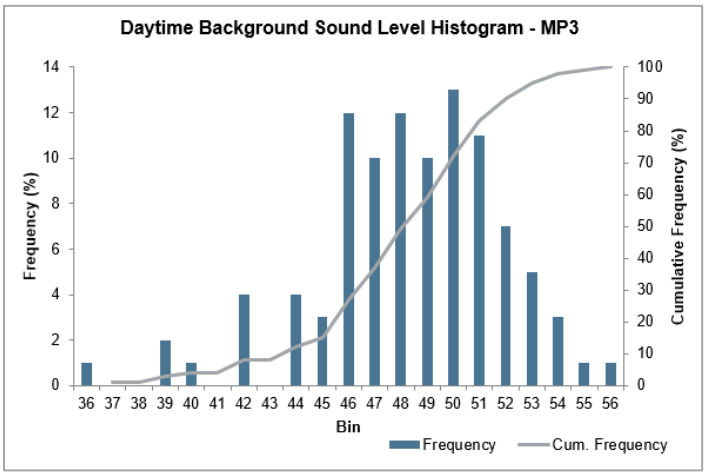


Figure B.5 Daytime and night background sound level histograms – MP2



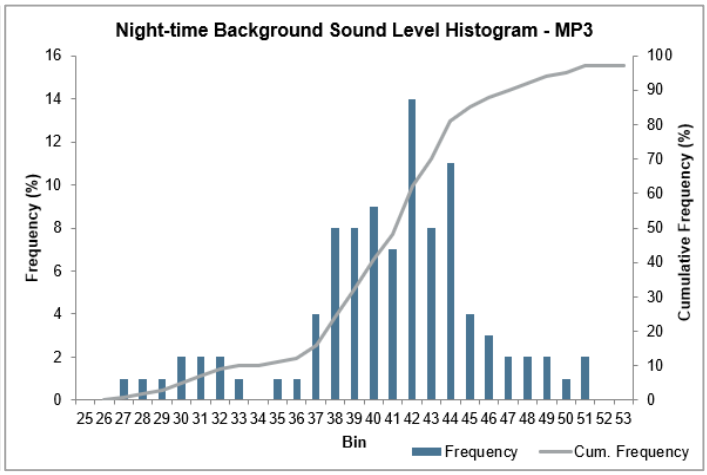


Figure B.6 Daytime and night background sound level histograms – MP3

Appendix C – Daytime Noise Contour Map (1.5 m Height)

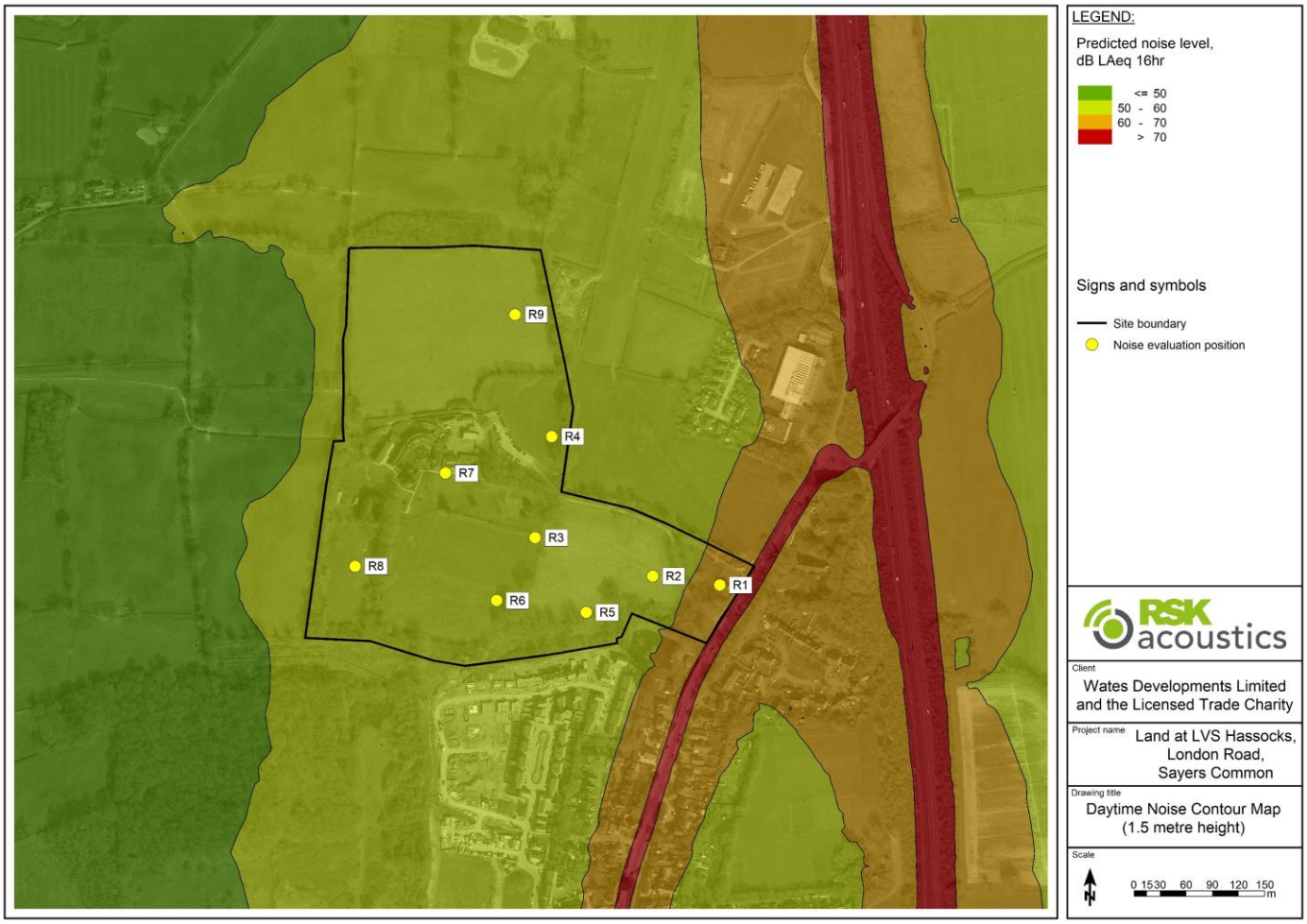


Figure C.1 Daytime noise contour map (1.5 metre height)

Appendix D – Night-time Noise Contour Map (4 m Height)

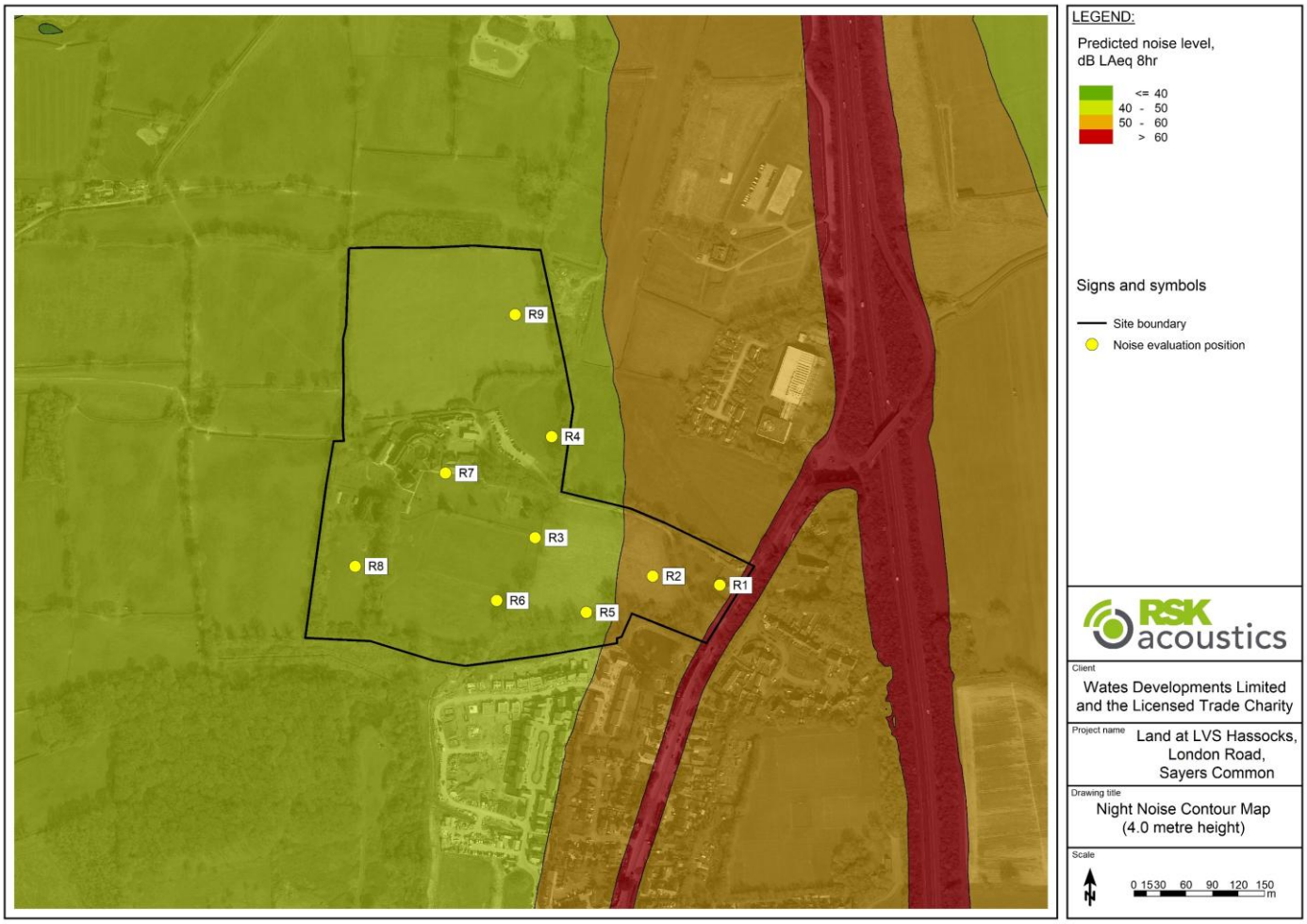


Figure D.1 Night-time noise contour map (4 metre height)

Appendix E – Photographic Report

Figure E.1 Noise monitoring location MP1

Figure E.2 Noise monitoring location MP2

Figure E.3 Noise monitoring location MP3

Figure E.4 Weather station (adjacent to MP2)

Appendix F – Ventive Windhive Acoustic Data

Test No.	Description	R_w (C;C_{tr})
2	Windhive Standard, External Diffuser Dampers: Supply Fully Open, Extract Fully Open, Bypass Fully Open	14 (-1;-2)
3	Windhive Standard, External Diffuser Dampers: Supply 50% Open, Extract 50% Open, Bypass Fully Closed	16 (0;-2)
4	Windhive Standard, 250mm Attenuator, External Diffuser Dampers: Supply 50% Open, Extract 50% Open, Bypass Fully Closed	19 (0;-2)
5	Acoustically Lined Windhive, 250mm Attenuator, External Diffuser, Attenuated Heat Exchanger Dampers: Supply 50% Open, Extract 50% Open, Bypass Fully Closed	24 (-1;-5)
6	Windhive Standard, 250mm Attenuator, External Diffuser, Attenuated Heat Exchanger Dampers: Supply 50% Open, Extract 50% Open, Bypass Fully Closed	22 (-1;-4)
7	Windhive Standard, 250mm Attenuator, External Diffuser, Attenuated Heat Exchanger Dampers: Supply Fully Open, Extract Fully Open, Bypass Fully Closed	21 (-1;-3)
8	Windhive Standard, 250mm Attenuator, External Plenum Box 400mm Spigot, Attenuated Heat Exchanger Dampers: Supply Fully Open, Extract Fully Open, Bypass Fully Open	25 (-2;-5)
9	Windhive Standard, 250mm Attenuator, External Diffuser, Attenuated Heat Exchanger Dampers: Supply Fully Open, Extract Fully Open, Bypass Fully Closed	21 (-1;-4)

Table F.1 Ventive Windhive Passive Ventilator, acoustic data

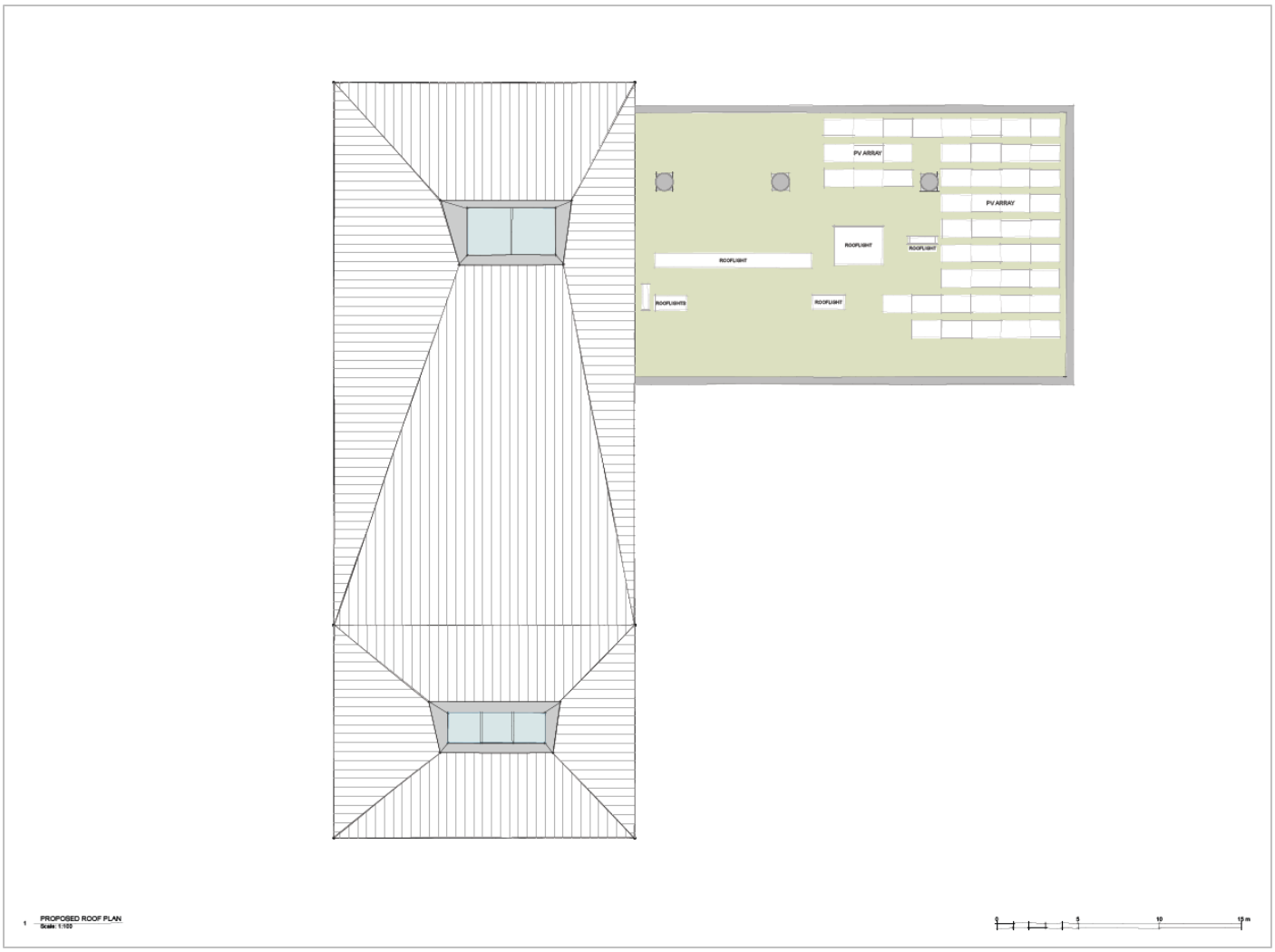


Figure F.1 Proposed Roof Plan (drawing ref :323_3_102 dated 18 December 2025)

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