

Noise Assessment

Bendish Stables, Hitchin



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Non-Technical Summary

What is Proposed?	A planning application for a singular residential property development pursuant to demolition is proposed on land near Bendish Stables, Hertfordshire.
What is the Problem?	The development land is within a busy flightpath for London Luton Airport to the west and as such, the proposed dwelling / garden could be adversely impacted by aircraft flyover noise.
What is the Result?	The assessment has demonstrated that adequate internal noise levels in line with relevant guidance can be achieved, albeit with closed windows. External amenity area noise levels (including future expansion) are expected to slightly exceed upper BS 8233 external amenity area guidance noise limit. However, the underlying noise conditions easily comply with BS 8233:2014 noise guidance. To summarise, internal acoustic conditions in line with the Local Planning Authority's requirements can be achieved, so the risk of aircraft noise can be adequately controlled. Nevertheless, it is recommended that noise is further considered as part of the detailed design stage.

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Contents

1.0	Introduction	4
2.0	Assessment Methodology	8
3.0	Baseline Survey Results	14
4.0	Acoustic Appraisal	18
5.0	Conclusions & Next Steps.....	23

Figures

Figure 1	Site Location	5
Figure 2	Proposed Development	6
Figure 3	Approximate Noise Survey Location	12
Figure 4	Aircraft Eastern Take-offs Flight Path Map	14
Figure 5	Aircraft Western Take-offs Flight Path Map ²	15

Tables

Table 1	Site Details	5
Table 2	BS 8233 Indoor Ambient Noise Levels for Dwellings	10
Table 3	Summary of Measured Noise Levels at the LT Survey Location	16
Table 4	Summary of Sound Insulation Level Front Bedroom.....	18
Table 5	Spectral Noise Data for Building Envelope Assessment (Façade).....	19
Table 6	Building Envelope Specifications	20

Appendices

APPENDIX A:	Acoustic Terminology
APPENDIX B:	Planning Policy and Guidance
APPENDIX C:	Noise Survey Data and Analysis



1.0 Introduction

- 1.1 A new residential development comprising a single bungalow is proposed on land adjacent to Bendish Stables in Hertfordshire, alongside the demolition of an existing building. The site of the proposed development is located in a rural setting away from busy roads but is, however, in the flightpath for London Luton Airport.
- 1.2 The proposed development could therefore be exposed to elevated levels of noise. For this reason, it is also understood that the Local Planning Authority has sought for a noise assessment to be undertaken in support of the planning application.
- 1.3 In light of the above, a noise assessment has been conducted to evaluate the risk of excessive noise. The findings of this assessment are presented in this report.

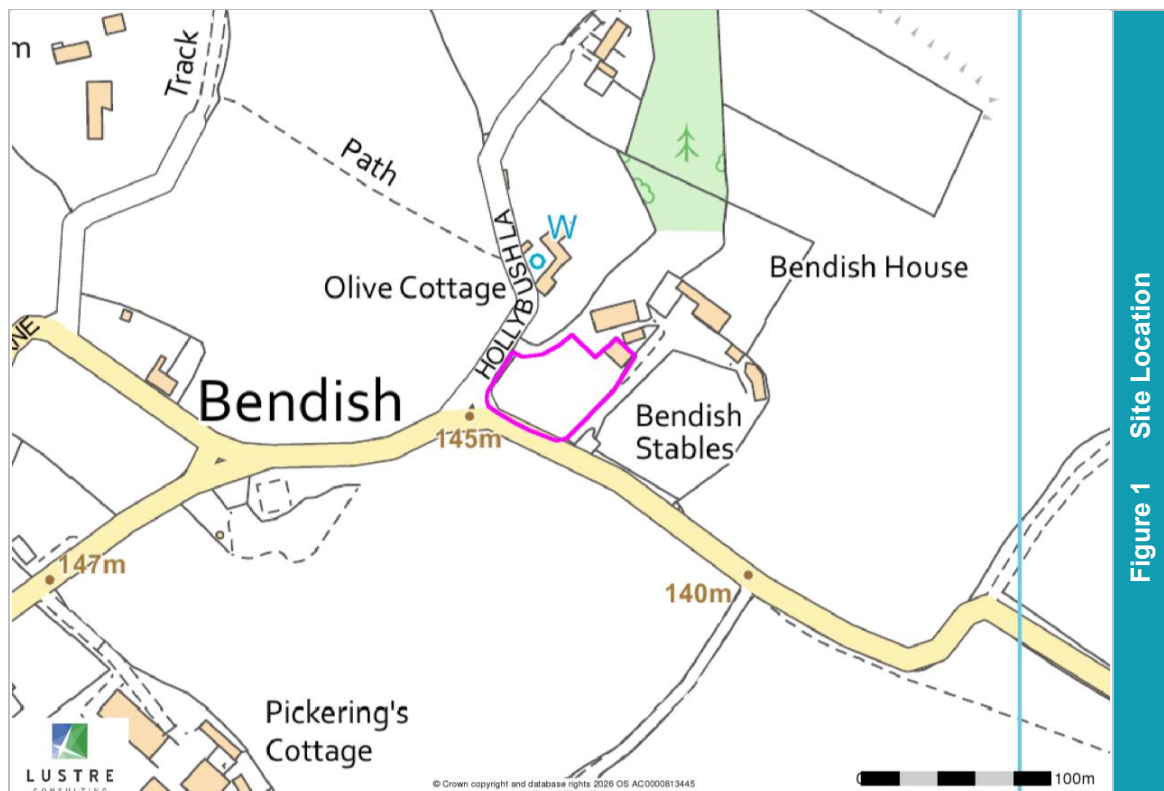
What is a Noise Assessment?

- 1.4 A Noise Assessment will determine if and to what extent existing or future noise sources could affect noise-sensitive receptors, and importantly, if those noise sources could have an adverse impact. If the Noise Assessment finds that the level of risk or impact is unacceptable, mitigation measures will need to be applied to the development.
- 1.5 The Noise Assessment will consider the prevailing sound environment to determine potential noise sources including traffic, aircraft or other noise generating activities, such as mechanical plant, generators etc. The report will provide an impact assessment and give actionable recommendations. Recommendations may include solutions involving changes to design, layout and construction methods, so that the impacts from noise can be reduced to acceptable levels. Often these mitigation measures can be incorporated into standard construction practices. Find out more about how we undertake Noise Assessments including FAQ [here](#).
- 1.6 Understanding and reducing the impacts ensures that you have a safe and compliant site. When dealing with planning, the National Planning Policy Framework (NPPF) and associated policies require an appropriate noise assessment at the initial planning stage, whilst the ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise New Residential Development May 2017 requires delivery of sustainable development by promoting good health and wellbeing through the effective management of noise.

The Subject Site

Table 1 Site Details	
Address	Land adjacent to Bendish Stables, Hertfordshire, Hitchin, SG4 8JA
Eastings, Northings	516751, 221668
Local Planning Authority	North Hertfordshire District Council

- 1.7 The site currently comprises a rundown kitchen garden alongside constructed features such as a workshop building, vegetable patch, chicken coops, a glasshouse, various wooden sheds and disused pigpens.
- 1.8 To the north, west and south of the site is Bendish Stables adjacent to the site redline boundary, Hollybush Lane linked to the existing access gate and Bendish Lane correspondingly. Both nearby lanes road traffic from on-site observation was characterised as infrequent.
- 1.9 Further afield to the southwest of the site boundary, and at around 3.5km away, the runway to London Luton Airport is located.
- 1.10 The site application area is shown in Figure 1 below:



The Proposed Development

- 1.11 The proposal involves the construction of a singular timber frame energy saving residential bungalow ("The Willows" template- Scania Hus website) with a link to the existing gate along Hollybush Lane to provide access.
- 1.12 To facilitate the residential construction, existing structures such as the workshop, greenhouses, sheds and pig sties are set for demolition and clearing.
- 1.13 The floorplan for the bungalow is understood to be constituted of three bedrooms (including one en-suite), a bathroom and an open plan dining, living and kitchen area. Other elements of the layout include study and utility rooms.
- 1.14 An illustrative plan of the described development can be seen below in Figure 2.

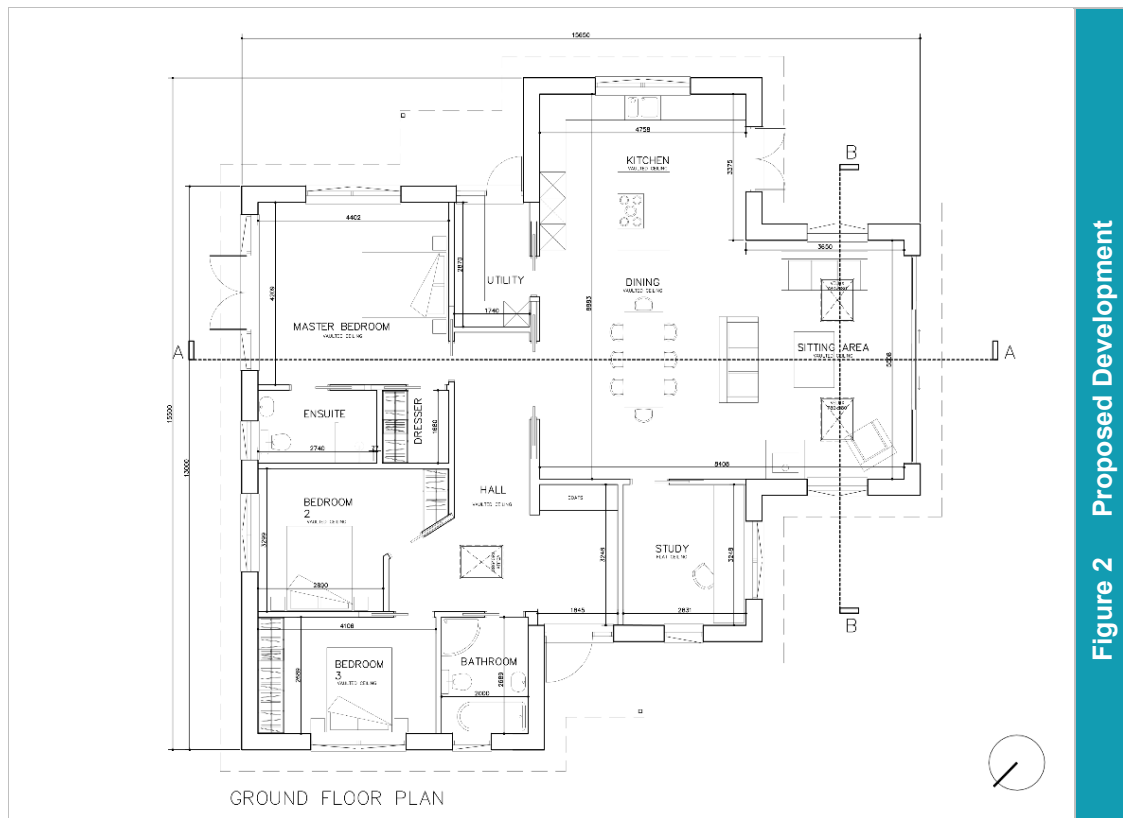


Figure 2 Proposed Development



Report Structure, Limitations & Changes

- 1.15 Chapter 2 of the report sets out the assessment methodology. Chapter 3 discusses the baseline noise survey results; Chapter 4 relates to the noise model and Chapter 5 details an acoustic design appraisal. Report conclusions and next steps are set out in Chapter 6.
- 1.16 There are a lot of technical terms in this report and definitions are provided in Appendix A. Appendix B details some of the relevant guidance that this assessment is based on as well as acoustic criteria/thresholds. Extracts of survey data and analysis are provided in Appendix C.
- 1.17 This assessment has been undertaken in accordance with our Terms & Conditions. Full details on limitations and reliance are provided in those Terms. Third party information which has been reviewed and used to inform the assessments presented herein, including public records held by various regulatory authorities and environmental database data has been assumed to be true and accurate.
- 1.18 This assessment has been carried out to determine the potential risks posed to future end users, along with other key receptors, based on the current development. Should revisions in the development proposals result in a change in any assessment parameters detailed in this report, a re-assessment of the risk should be carried out.



2.0 Assessment Methodology

Introduction

- 2.1 This chapter lists the target noise sources identified from a review of Google Earth / Street View, from any client or regulator information and from observations made during deployment of monitoring equipment / site visits. In addition, this section details the methodology for the noise monitoring equipment deployment and survey standards.

Acoustic Criteria

- 2.2 Reference has been made to a number of design requirements/guidance to determine the acoustic design criteria for the proposed development. In summary, these include:

- ▶ North Hertfordshire District Council Pre-Application Comments,
- ▶ Development Consent Order (DCO) – Approved April 3rd, 2025
- ▶ North Hertfordshire Local Plan 2011 – 2031 (Adopted 8th November 2022),
- ▶ Professional Practice Guidance & Planning Guidance (ProPG),
- ▶ British Standard 8233:2014 (internal conditions/building envelope specification),

- 2.3 The above are discussed in more detail below.

North Hertfordshire District Council Pre-Application Comments

- 2.4 During the pre-planning application process the Local Planning Authority has commented on the potential for aircraft flyover noise affecting the site and requesting that a noise assessment be undertaken particularly in relation to the Luton Airport flight paths.

- 2.5 For ease of reference, the most relevant parts of the comments have been reproduced below:

“Noise: The Environmental Protection and Housing Team main concern relates to the living conditions of any future occupants, and the noise impacts due to the proximity of the site to London Luton Airport and flightpaths. We would expect to see a noise assessment submitted in accordance with current standards and guidelines to demonstrate that the site is suitable for residential development. Any noise assessment should consider the impact of aircraft noise on future residential dwellings (meeting standards for outdoor amenity areas, building construction and requirements for sound insulation to roofs). It should be noted that

London Luton Airport has a current application for expansion and that a further very large expansion in traveller numbers is proposed in the coming years. The Applicant / Acoustic Consultant should contact Luton Borough Council for further details. It would be appropriate



for any noise assessment to be submitted at the application stage rather than at a later stage following a decision and a Condition to be imposed requiring a noise assessment.”

- 2.6 Following the above comments, Luton Borough Council was contacted regarding the proposed noise survey and assessment methodology in reference to the London Luton Airport expansion. An email reply was received on Monday the 16th March 2026 where Lustre Consulting Ltd was advised to refer to the DCO information on the expansion of operations at the airport.

London Luton Airport DCO

- 2.7 The Development Consent Order (DCO) for London Luton Airport was approved on April 3rd 2025 allowing an increase passenger per annum capacity from 18 million to 32 million.
- 2.8 Given the proposed expansion and the potential noise implications at receptors in the Luton Airport area, existing aircraft noise levels have been considered in this assessment with an additional margin to protect against (potential) increases in future aircraft noise levels.

North Hertfordshire Local Plan 2011 – 2031 (November 2022) – Policy D3

- 2.9 As part of the North Hertfordshire Adopted Local Plan, Policy D3: Protecting living conditions has been produced to help guide planning decisions in the district and safeguard the amenity space of existing and future residents from environmental factors such as adverse noise. The Policy has reproduced below for ease of reference:

Policy D3: Protecting living conditions

Planning permission will be granted for development proposals which do not cause unacceptable harm to living conditions

Where the living conditions of proposed developments would be affected by an existing use or the living conditions of an existing development would be affected by a proposed use, the Council will consider whether there are mitigation measures that can be taken to mitigate the harm to an acceptable level. If the Council is not satisfied that mitigation proposals would address the identified harm, development proposals will not be permitted.

- 2.10 Also noted in paragraph 9.24 of the local plan (under policy D3) is a reference for the need to consider adequate mitigation measures to be incorporated at any new development potentially affected by aircraft flyover noise within the vicinity of London Luton Airport.

Professional Practice Guidance on Planning & Noise (ProPG) – New Residential Development

- 2.11 Professional Practice Guidance on Planning & Noise (ProPG) is guidance for new residential development that aims to protect people from noise through encouraging better acoustic design. The guidance has been jointly prepared by the Institute of Acoustics (IOA), Chartered Institute of Environmental Health (CIEH), and the Association of Noise Consultants (ANC).
- 2.12 ProPG draws upon legislation and other guidance and standards such as WHO and BS 8233:2014 (discussed above). In terms of the BS 8233:2014 guidance, ProPG provides supplementary advice with respect to night-time maximum noise levels stating:

“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 45dB LA_{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”

BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

- 2.13 BS 8233 ‘Guidance on sound insulation and noise reduction for buildings’ provides guidance on indoor ambient noise levels for various situations.
- 2.14 The relevant guideline limits for dwellings are shown in Table 2.

Table 2 BS 8233 Indoor Ambient Noise Levels for Dwellings			
Activity	Location	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Resting	Living room	35 dB L _{Aeq,16h}	—
Dining	Dining room/area	40 dB L _{Aeq,16h}	—
Sleeping (daytime resting)	Bedroom	35 dB L _{Aeq,16h}	30 dB L _{Aeq,8h}

- 2.15 It is important to note that the above guideline noise level limits are applicable to ‘anonymous’ noise sources such as steady traffic and general distant urban noise.



- 2.16 In terms of the guideline noise limits, BS 8233 guidance does state that a 5 dB relaxation may be applied where a development is necessary or desirable:

Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

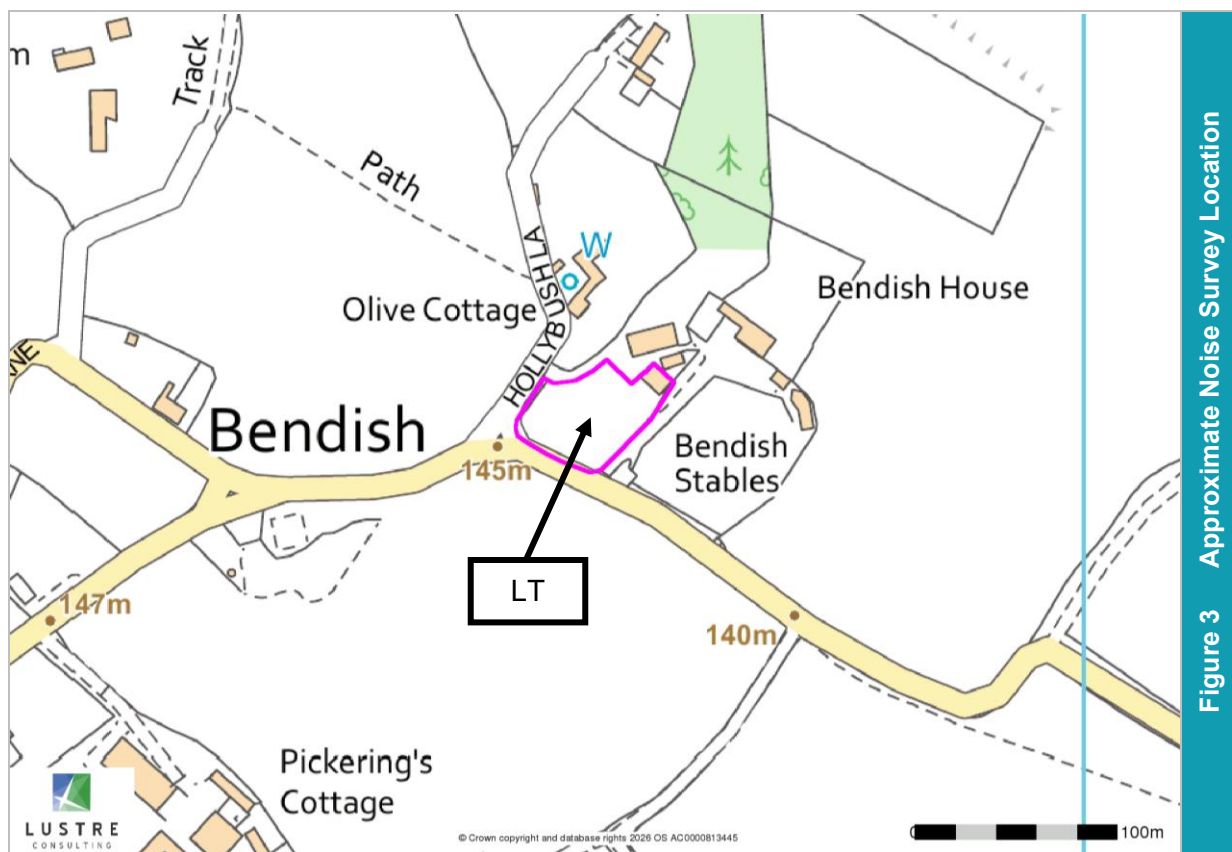
- 2.17 In terms of outdoor amenity spaces, BS 8233:2014 offers the following guidance:

“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 50dB LAeq, with an upper guideline value of 55dB LAeq which would be acceptable in noisier environments. However, it is also recognised that these 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.”

Baseline Noise Survey

Methodology

- 2.18 A long-term (LT) unattended baseline noise survey was undertaken from around 16:55 pm 18th March 2026 to 10:50 am 23rd March 2026. LT noise level measurements were taken within the site boundary at a position representative of the proposed residential plot.
- 2.19 The survey was conducted using a Norsonic Nor-140 precision Class I sound level meter (serial no. 1405197). The meter was set to log sound levels in contiguous 5-minute periods. Along the broadband noise levels, spectral data was also collected, as were audio recordings for any 'events' above 65 dB(A) L_p .
- 2.20 The microphone was mounted on a tripod at a height of approximately 1.5 m in a free-field position. The approximate noise monitoring position is shown in Figure 3.



- 2.21 The photos overleaf show the LT noise survey setup within the development site:



LT monitoring position (north facing)



LT monitoring position (south facing)

- 2.22 Pre- and post-survey calibration checks were carried out which confirmed that no significant drift (+0.1 dB) had occurred during the survey. The calibration checks were undertaken using a Norsonic Nor1255 calibrator (serial no. 125525497).
- 2.23 All equipment used for the baseline noise survey had valid calibration certificates at the time of the survey, which are available upon request. The survey also conformed to the best practice data acquisition methodologies as set out in BS 7445¹.

Meteorological Conditions

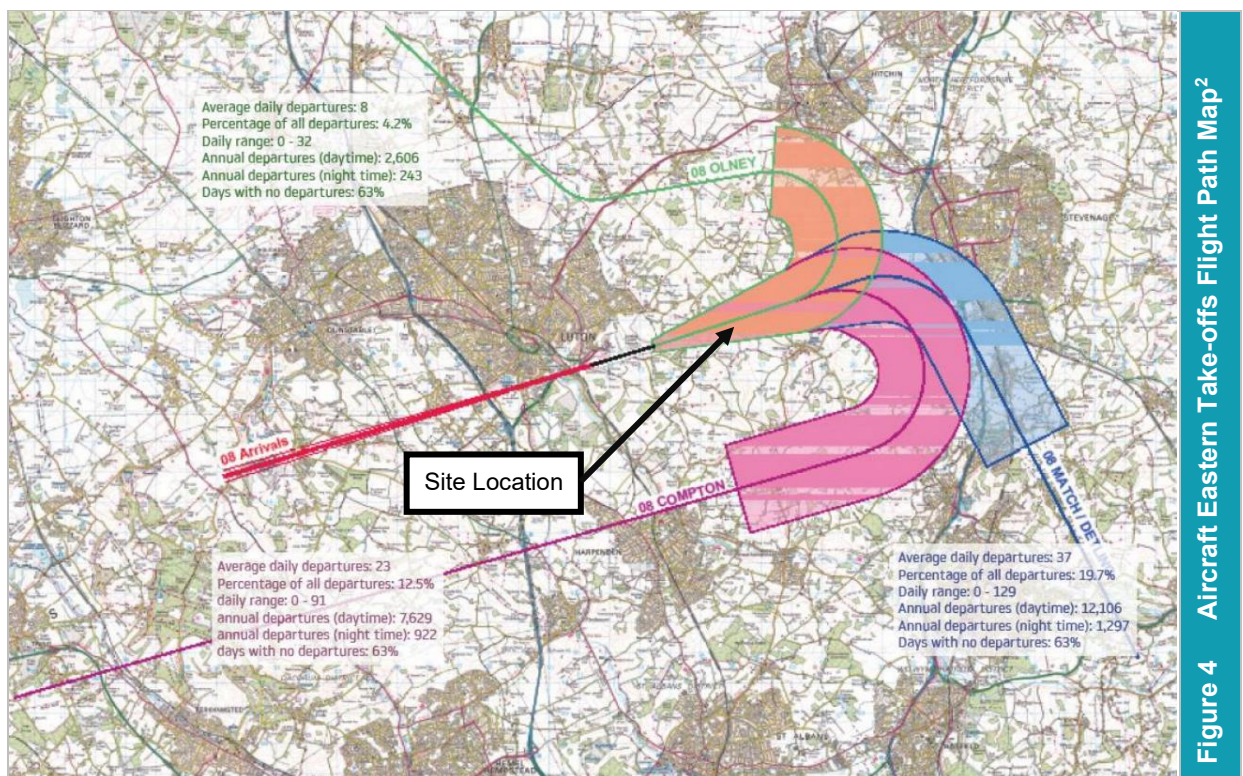
- 2.24 Meteorological conditions during the measurement period were in line with recommendations for environmental noise surveys, with an air temperature generally between -1°C and 17°C noted during the survey and conditions noted as mostly dry, overcast and partly sunny. Wind was within minimal windspeed levels (<5m/s).

¹ British Standard 7445 – Description and measurement of environmental noise

3.0 Baseline Survey Results

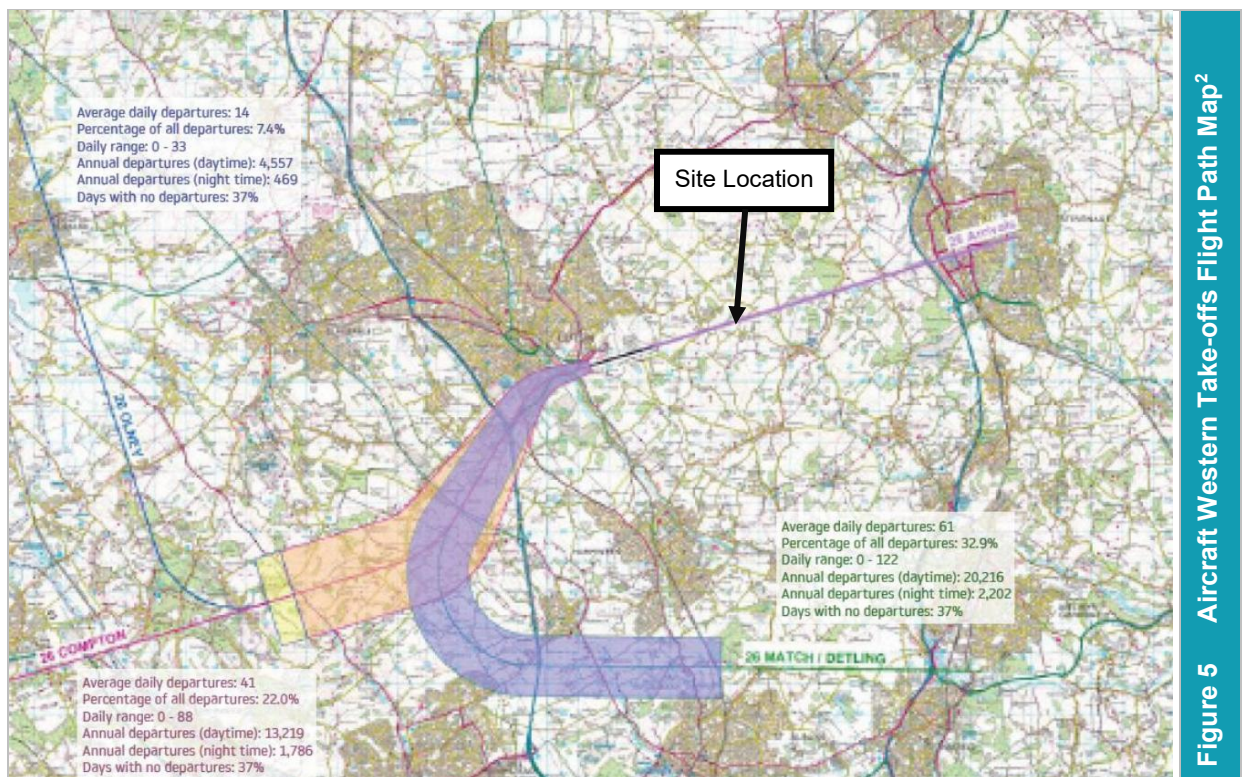
Existing Environment

- 3.1 At the time of setting up and collecting the noise survey, the main noise source affecting the site was observed to be aircraft flyover noise departing from and arriving at London Luton Airport.
- 3.2 Other sources of noise included occasional birdsong and rustling leaves from the surrounding greenery. Only very faint distant road traffic noise was observed at the time of setup and collection, which is expected, given the remoteness of the site location. All these noise sources are considered minimal in comparison to the aircraft flyover noise.
- 3.3 A flightpath diagram taken from the DCO related document “Explanatory Note on Airspace Modernisation” has been used to assess the existing flightpaths for London Luton Airport. The diagram for eastern take-offs and western arrivals (expected as worst case from a noise perspective) has been reproduced below in Figure 4:



² FutureLuToN - Making Best Use of Our Runway - Explanatory Note on Airspace Modernisation, Appendix A, October 2019

- 3.4 An existing flightpath diagram for western take-offs and eastern arrivals has also been reproduced below in Figure 5.



- 3.5 Both of the above figures clearly confirm (as observed on site) that the development site is located within the arrival and departure flightpaths.

Luton Airport Expansion

- 3.6 Given the Development Consent Order (DCO) for London Luton Airport was approved on April 3rd 2025 to increase passenger per annum capacity from 18 million to 32 million, a consideration for the changes in aircraft flyover noise has been included below.
- 3.7 Environmental Statement (Volume 5) for the London Luton Airport Expansion, January 2024 (Planning Inspectorate Scheme Ref: TR020001) details the noise surveys taken of the existing environment used as a baseline to model changes in noise for 2029, 2039 and 2049.
- 3.8 A segment of the above DCO document, Chapter 16 Noise and Vibration Figures 16.43a - 16.48 details modelled noise contours surrounding London Luton Airport that span over the proposed development area. From inspection of these contours, it can be seen that an increase between 1 – 2 dB is expected from 2029 to 2049 due to increased air traffic from the proposed expansion.



- 3.9 This increase relates to the ambient day and nighttime noise level and not maximum discrete events although with more flights the frequency of maximum events is set to also increase.

Noise Survey Results Summary

- 3.10 The baseline and attended noise level measurement results and derived values are presented below in Table 3 correspondingly. An overview of the survey results in graphical format is also available in Appendix C, with full data available if required upon request.

Table 3 Summary of Measured Noise Levels at the LT Survey Location				
Location	Period	Noise Levels (dB)		
		Ambient, $L_{Aeq}^{[1]}$	Maximum, L_{AFmax}	Background, $L_{A90}^{[4]}$
LT (Overall)	Daytime (07:00 – 23:00)	57	77 ^[2]	31
	Night-time (23:00 – 07:00)	48	64 ^[3]	26
LT (Weekend)	Daytime (07:00 – 23:00)	59	78	30
	Night-time (23:00 – 07:00)	47	67	26
LT (Aircraft Flyover Noise)	Night-time (23:00 – 07:00)	55	72	35
LT (Loudest Aircraft Flyover Noise Period)	Night-time (05:25 – 07:00) 19 th March 2026	59	77	38

Notes to Table 3:

[1] Logarithmic average, [2] Arithmetic average of the 5-minute values, [3] Arithmetic average of the 10th highest 5-minute values, [4] Arithmetic average of the 5-minute values

- 3.11 As can be seen from the noise survey results in the above table, the overall daytime (07:00 – 23:00) and night-time (23:00-7:00) ambient noise levels are in the region of 57 and 48 dB L_{Aeq} respectively. The averages for 5-minute maximum noise levels are around 77 dB L_{Amax} during



the daytime period and 64 dB L_{Amax} during the night-time period. The average background daytime and night-time sound levels are correspondingly 31 and 26 dB(A).

- 3.12 For the weekend period within the LT survey, daytime and nighttime ambient noise levels are in the region of 59 and 47 dB L_{Aeq} correspondingly. The average day and nighttime background noise levels were recorded as around 30 and 26 dB L_{A90} respectively whilst the same periods for the 5-minute maximum noise levels are about 78 and 67 dB L_{Amax} accordingly.
- 3.13 Lastly, consideration during the early morning nighttime periods (around 5:00 to 7:00am with short periods at 2:00am also included), when noise levels were dominated by plane noise, have also been considered, as shown in Table 3. As can be seen, nighttime noise levels are higher across all metrics compared to the overall / weekend periods with an ambient and background noise level of around 55 dB L_{Aeq} and 35 dB L_{A90} . For the 5-minute maximum noise levels during this period, 72 dB L_{Amax} can be seen.
- 3.14 Building upon the above, the noisiest nighttime period of frequent aircraft flyover on the 19th March has also been considered. The result is an ambient and background noise level of 58 dB L_{Aeq} and 38 dB L_{A90} . For the 5-minute maximum noise levels during this period, 77 dB L_{Amax} can be seen.



4.0 Acoustic Appraisal

- 4.1 This chapter sets out the minimum acoustic mitigation measures (if needed) which will be required to ensure that the site is compliant with the criteria set out in Section 2 of this report.
- 4.2 The project is still at a relatively early design stage and therefore it is expected that the design will be developed accordingly through the various RIBA stages. This assessment is therefore considered preliminary in this regard.

Building Envelope Assessment

- 4.3 This section sets out the octave spectrum data, interpreted from the measured noise levels detailed in Chapter 3, and the resultant recommended building exterior make-up or external building envelope specification to mitigate the observed noise levels. The information in this Chapter regarding mitigation represents both the preliminary and **minimum** building envelope specification, i.e. the minimum design criteria for glazing, walls and roof build-ups.

Design Assumptions

- 4.4 A number of values and parameters have been used as the basis of this appraisal. Building fabric build-ups and bedroom sizes have been adopted based on the provided Scania Hus construction details for the development, as detailed in the Table 4 below.

Table 4 Summary of Sound Insulation Level Front Bedroom	
Element	Properties/ Parameters
Façade Wall	Line connected timber cladding outer layer, OSB layer, cavity with wooden timber frame and plasterboard layer
Roof	Slate tiles roof, OSB layer, cavity with wooden timber frame and plasterboard layer
Floor Areas (approximate)	Bedroom: 12 m ² Living room: 62 m ²
Glazing Area (approximate)	Bedroom: 8 m ² Living room: 26 m ²
Ventilation	MVHR System
Reverberation Time	Bedroom 0.5 s / Living Room 0.8 s



Design Appraisal Noise Data

- 4.5 Although overall period noise levels are similar to weekend period noise levels, being typically within 3 dB or less, the highest day and nighttime noise levels have been chosen across both periods to conduct a conservative assessment.
- 4.6 To mitigate the potential uncertainty around 5-minute resolution data maximum noise levels and to consider future airport expansion flyover increases, the noisiest early morning aircraft flyover period has been selected. This has been considered representative as it matches the daytime maximum noise level which is dominated by frequent aircraft flyover noise.
- 4.7 Furthermore, and due to the proposed expansion plans, any noise levels measured below (and applied to BS 8233 break in calculations) have been used to assess/specify the building fabric components with a minimum acoustic performance margin of 3 dB for all noise sensitive rooms to take into account noise level increases due to the airport expansion.
- 4.8 Spectral L_{Aeq} daytime and night noise levels along with the night $L_{AF,max}$ data used for the building envelope calculations are presented in Table 5.

Table 5 Spectral Noise Data for Building Envelope Assessment (Façade)									
Façade	Period	Noise level (dB) per octave band centre frequency (Hz)							Overall, dB(A)
		63	125	250	500	1k	2k	4k	
All Facades	Day L_{Aeq} , (Weekend)	58	60	60	58	54	47	37	59
	Night L_{Aeq} , (Overall)	46	48	48	48	43	36	30	48
	Night $L_{AF,max}$, (19 th March early morning)	71	76	76	76	72	64	61	77

Building Envelope Appraisal

- 4.9 A partially open window is generally taken to provide around 13 dB sound reduction. When considering this and the noise levels in Table 5, average internal noise levels in the region of 46 dB and 35 dB can be expected with partially open windows during the day and night respectively. These noise levels would, as expected, exceed guidance levels of 35 dB and 30 dB L_{Aeq} for 'reasonable' acoustic conditions during the day and night respectively by a reasonable margin.



- 4.10 In terms of maximum noise levels from discrete events, with a partially open window it is estimated that noise levels of around 64 dB would occur more than 10 times per night. This would significantly exceed the generally accepted limit of 45 dB $L_{AF,max}$.
- 4.11 In light of the above, it is evident that windows and doors will have to remain closed at all times across all façades of the proposed development to ensure satisfactory acoustic conditions in rooms.
- 4.12 Notwithstanding the above, calculations indicate that suitable internal noise levels would be achievable in the worst affected bedroom with windows closed and an adequate building envelope specification as mitigation.
- 4.13 Noise break-in calculations in line with the 'more rigorous' BS 8233:2014 methodology and taking into consideration the proposed design have been undertaken.
- 4.14 The following Table 6 (see below) illustrates the initial example façade specifications to provide sufficient resistance against external noise with a margin accounting for future airport expansion of use increasing day and night ambient noise levels. Alternative build-ups could be considered but they generally should meet the recommended minimum performance requirements as detailed in this report.

Table 6 Building Envelope Specifications									
Façade type	Element	Minimum sound insulation (dB) per octave band centre frequency (Hz)							Overall sound Insulation
		63	125	250	500	1k	2k	4k	
All Facades	Fenestration	18	22	29	37	44	40	53	39 (-6) dB $R_w(C_{tr})$
	Ventilation	MVHR system							
	Walls	Standard Scandia Hus wall construction should be suitable							
	Roof	Standard Scandia Hus roof construction should be suitable							

- 4.15 It shall be noted that the acoustic specification values for the glazing elements apply to the combined glass pane, window/door frame, spandrels (where applicable) and the like.
- 4.16 Suitable example glazing specifications overleaf for the façade would include:



- ▶ Acoustic triple glazing, e.g. 8 / 12 / 4 / 12 / 6

4.17 Notwithstanding the above, alternative glazing and building envelope specifications may also be acoustically feasible to achieve BS 8233:2014 indoor amenity noise levels and can be considered as part of the detailed design process. Any updated acoustic specifications should be forwarded to Lustre Consulting for review to ensure they are acoustically suitable.

Approved Document O

- 4.18 The requirement for having closed windows to achieve satisfactory acoustic conditions within the development could have ramifications on other aspects of the design, such as the interdependent nature of acoustics, ventilation and overheating.
- 4.19 With reference to Approved Document O (ADO) of the Building Regulations, the noise level limits (ADO paragraph 3.3) at which windows are likely to be closed during sleeping hours for thermal comfort considerations are exceeded at the plot.
- 4.20 Therefore, a mechanical heat and recovery system is proposed as ventilation to enable windows to remain closed.

Ventilation

- 4.21 Approved Document F (ADF) of the Building Regulations stipulates the requirement for rapid intermittent ventilation for occupants to have the ability to quickly expel fumes in dwellings.

Whilst windows at some locations would have to remain closed to ensure adequate acoustic conditions, the use of open windows for rapid ventilation is considered acceptable as any increase in noise would be for a short period only and expected by the occupant. The overall exposure to noise would therefore be relatively small.



Noise within External Amenity Areas

- 4.22 Calculations show that conditions in the garden would be expected to exceed the upper bound guidance for BS 8233 (55 dB(A)) with an overall daytime ambient noise level of 57 dB(A).
- 4.23 From analysis of a 2016 noise contour on the noise monitoring page³ of London Luton Airport's website, the site location sits between the 55 and 60 dB(A) noise contour curves. Considering the above overall measured noise level of 57 dB(A) was measured at the plot / garden location and that this is in line with the above produced noise contours by London Luton Airport, the noise levels can be considered representative of proposed ambient garden conditions.
- 4.24 Whilst outdoor noise levels are expected to exceed upper BS 8233 external amenity guidelines (by around 2 dB), the exceedance is relatively small. Moreover, the underlying noise conditions (other than the short periods of elevated aircraft noise) are arguably better represented by the prevailing daytime background noise level, which is 31 dB L_{A90} . This is quite low and in keeping with on-site observations (excluding aircraft flyover intervals) where conditions were noted as very tranquil.

³ <https://www.london-luton.co.uk/corporate/community/noise/noise-monitoring>



5.0 Conclusions & Next Steps

- 5.1 This report has presented the findings of a Noise Assessment, which identified key sources of noise, monitored noise levels, and assessed conditions against Local and British guidance with respect to the site's suitability in terms of noise.
- 5.2 Assessment of the prevailing environmental noise level has been undertaken over what is deemed to have been a representative period. The main noise source across the proposed site was observed to aircraft flyover noise from London Luton Airport.
- 5.3 The assessment has shown that adequate internal noise levels in line with British Standard 8233:2014 guidance can be reasonably comfortably achieved, albeit with closed windows across all noise-sensitive rooms and acoustically uprated fenestration, as detailed in this report.
- 5.4 External amenity area noise levels are expected to slightly exceed the upper BS 8233:2014 noise guidance of 55 dB(A). However, the underlying noise conditions easily comply with BS 8233:2014 noise guidance.
- 5.5 To summarise, acoustic conditions in line with the Local Planning Authority's requirements can be achieved, so the risk of excessive noise can be controlled through suitably specified building fabric.



APPENDIX A: Acoustic Terminology

Parameter	Description
Sound	A sound wave can be viewed as small pressure fluctuations in an elastic medium such as air. When the frequencies of the pressure fluctuations are within the audible range, the human ear responds to sound waves which produces the sensation of hearing. There are two basic characteristics of sound: amplitude and frequency. Amplitude relates to the perceived loudness of a sound whereas the pitch of a sound corresponds to the frequency.
Noise	Noise, a subjective term, is essentially unwanted sound . It is very much dependent on the receptor's perception of the sound.
Decibel (dB)	The sound pressure is measured in Pascals. The human ear responds to a wide range of sound pressures, from 0.00002 to 20 Pascals. Given this wide range of values, it is convenient to express these in a logarithmic scale, the decibel (dB). The decibel is a logarithmic scale representing the measurement unit of sound pressure levels or noise levels relative to the threshold of hearing (20×10^{-6} Pascals). Zero decibel represents the threshold of hearing. The higher the value the louder the sound, with the value around 110 decibel being the level at which hearing becomes uncomfortable. Around 130 decibel is the threshold of pain at which hearing becomes painful.
Frequency (Hz)	The pitch of a sound relates to the frequency, which is expressed in Hertz (Hz). The audible range for human hearing typically ranges from 20 Hz to 20 kHz, but this tends to decrease with age. A pure tone, e.g. as produced by a tuning fork, contains sound of a single frequency (440 Hz). In real life, most sound consists of complex waves containing sound waves of multiple frequencies.
A-weighting	Human hearing is not linear, i.e. the perceived loudness of sound varies with both frequency and amplitude. To better represent the human hearing response, frequency 'weightings' are applied to sound. There are various weighting networks best suited to specific conditions. However, in practice, the A-weighting network has become the generally accepted 'correction' for representing loudness. When a weighting filter has been applied to a value, the weighting type is added to the descriptor, L_{Aeq}, L_{pA}, etc, or just after the decibel, dBA or dB(A)
Octave Bands or 1/3-Octave Bands	Whilst single figure values are useful, often spectral data is required for analysis and/or acoustic specification. To represent the frequency content, sound level or acoustic properties are presented in specific frequency bands, also known as octave bands. The frequencies of octave bands have been internationally standardised. For example, the 500 Hz octave band (500 Hz being the centre frequency) has a range from 354 Hz to 707 Hz. Where finer spectral detail is required, 1/3-octave band data can be used. Each octave band is divided into three 1/3-octave bands.

Parameter	Description
Sound Pressure Level (SPL or L_p)	The sound pressure level is indicative of the sound wave strength and has good correlation with perceived loudness. Sound pressure is expressed in Pascals and, for convenience, is expressed
Sound Power Level (SWL or L_w)	The sound power is the overall acoustic energy radiated by a source over a specific period and is expressed in Watts. It is an inherent property of the source and, unlike sound pressure, does not depend on the distance to the source. As sound power values vary greatly, it is convenient to express these as a level in decibels, the sound power level, SWL or L_w (referenced to 10^{-12} Watts).
$L_{Aeq,T}$	The A-weighted equivalent continuous sound level over the period T. Often also referred to as the ambient noise level. This is the sound level that is equivalent to the total average energy of noise recorded over a given period.
L_{Amax}	The A-weighted maximum instantaneous noise level.
L_{A10}	The A-weighted statistical sound level which is exceeded 10% of the given measurement period. In the UK, this level is usually used to describe road traffic noise .
L_{A90}	The A-weighted statistical sound level which is exceeded 90% of the given measurement period. This level is usually synonymous with the background sound level and generally describes the underlying level of sound that is experienced when specific events are not taking place.
R_w	The weighted (w) sound reduction index (R), a single figure rating of the laboratory airborne sound insulation performance of a construction, usually measured across the frequency range 100-3150Hz. The higher the value, the greater the sound insulation, and the more onerous the requirement.
$D_{nT,w}$	The weighted (w) sound insulation (D), a single figure rating of the in-situ airborne sound insulation performance of a construction. The sound insulation value is standardised (nT) to a reference reverberation time for typical conditions. The higher the value, the greater the sound insulation.
$L'_{nT,w}$	The weighted (w) impact sound pressure level (L), a single figure rating of the in-situ impact sound insulation performance of a construction. The sound insulation value is standardised (nT) to a reference reverberation time for typical conditions. The lower the value, the greater the sound insulation.
C or C_{tr}	These are spectrum adaptation terms for taking into account the effect of different sound spectra. C and C_{tr} are corrections for pink noise and traffic noise respectively and are added to single figure quantities, e.g. $R_w + C_{tr}$

Parameter	Description
$D_{n,ew}$	The weighted (w) element (e) normalised (n) level difference (D), an indicator of the ability of a small building element (such as a trickle ventilator) to reduce sound in a particular frequency band. The higher the value, the greater the sound reduction, and vice versa.
Reverberation Time (RT60 or T60)	Reverberation time relates to the echoing decay of sound in a room. More specifically, the reverberation time (RT60) is the time it takes for the sound pressure level to drop by 60 dB after excitation. The value is expressed in seconds. In many situations, conditions do not allow for the entire 60 dB decay time to be measured. Where this is the case, a reduced part of the decay can be measured and the results extrapolated; typically these are the T20 or T30. The higher the value, the more reverberant a space is.



APPENDIX B: Planning Policy and Guidance

NATIONAL PLANNING POLICY FRAMEWORK, 2024 (NPPF)

The National Planning Policy Framework (NPPF) includes the following statements relating to noise and the requirement to take it into account in the planning process.

Section 15, paragraph 187 (e) of NPPF states:

- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.*

Section 15, paragraph 198 of NPPF states:

- *(a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.*
- *(b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;*

Paragraph 200 of NPPF further elaborates on the consideration of existing businesses, as follows:

- *Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.*

The NPPF does not provide absolute limits on noise that are acceptable or unacceptable in a given situation. It does, however, set out the “need to ensure that developments do not give rise to significant adverse impacts on health and the quality of life”. In addition, the operations of existing businesses are also protected, with reference to ensuring new developments do not have an adverse effect on their operations.

NOISE POLICY STATEMENT FOR ENGLAND, 2010 (NPSE)

The Noise Policy Statement for England (NPSE) applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise but does not apply to noise in the workplace. The Government recognizes that the effective management of noise requires a coordinated and long-term approach that encompasses many aspects of modern society.

The long-term vision of Government noise policy is set out to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by three aims:

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

The NPSE introduces the concept of NOEL, LOAEL and SOAELs, which are described below:

- ▶ NOEL – No Observed Effect Level – This is the level below which no observable effect can be detected.
- ▶ LOAEL – Lowest Observed Adverse Effect Level – This is the level above which adverse effects on health and quality of life can be detected.
- ▶ SOAEL – Significant Observed Adverse Effect Level - This is the level above which significant effects on health and quality of life can be detected.

PLANNING POLICY GUIDANCE – NOISE, 2014

This guidance is provided online within the UK Government Planning System. The guidance expands upon the concepts of Observed Effect Levels and the following table is provided.

Planning Policy Guidance - Noise exposure hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Outcome
No Observed Effect Level			
Not Noticeable	No Effect	No Observable Effect	No specific measures required
Noticeable but not Intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area, but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, 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 perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, 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
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

ProPG: PLANNING & NOISE PROFESSIONAL PRACTICE GUIDANCE ON PLANNING & NOISE NEW RESIDENTIAL DEVELOPMENT MAY 2017

The primary goal of ProPG is to assist the delivery of sustainable development by promoting good health and wellbeing through the effective management of noise. It seeks to do that through encouraging a good acoustic design process in and around proposed new residential development having regard to national policy on planning and noise.

ProPG advocates a systematic, proportionate, risk based, 2-stage, approach. The approach encourages early consideration of noise issues, facilitates straightforward accelerated decision making for lower risk sites, and assists proper consideration of noise issues where the acoustic environment is challenging. It is envisaged that following the guidance contained in this document will increase the likelihood of success of planning applications for new residential development, yet it also provides a clear basis for recommending refusal of new housing development on noise grounds where necessary.

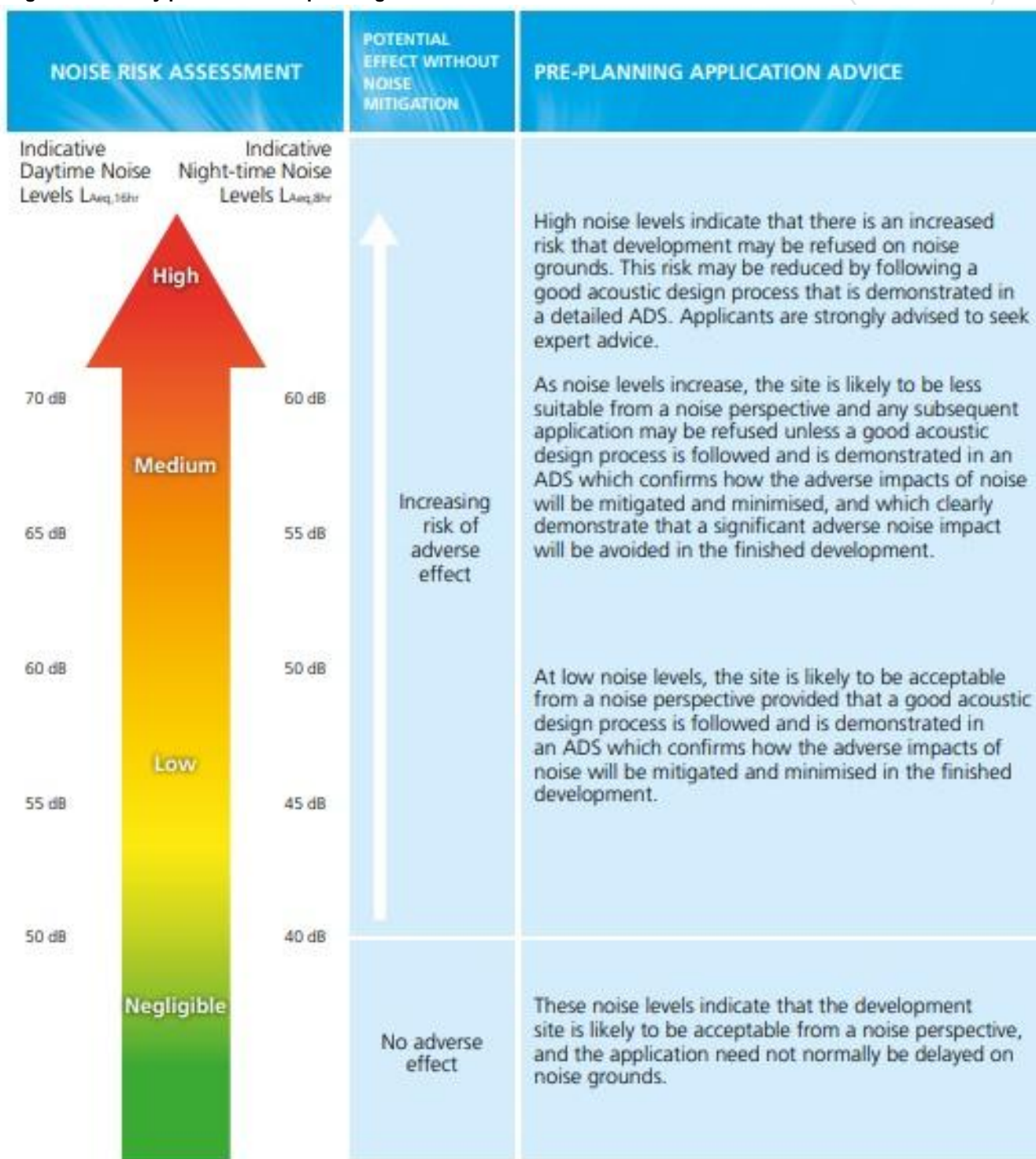
Stage 1: Initial Site Noise Risk Assessment

An initial noise risk assessment of the proposed development site should be conducted by a competent noise practitioner at the earliest opportunity, before any planning application is submitted. The noise risk assessment should 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. It should indicate whether the proposed site is considered to pose a negligible, low, medium or high risk from a noise perspective.

Stage 2: Full Assessment – the four key elements

- ▶ Element 1 – Good Acoustic Design Process Stage 2:
- ▶ Element 2 – Internal Noise Level Guidelines Stage 2:
- ▶ Element 3 – External Amenity Area Noise Assessment Stage 2:
- ▶ Element 4 – Assessment of Other Relevant Issues

Figure: Summary plan for ProPG planning advice



The following British Standards and Building Regulations have been considered for this assessment.

BS 8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’

This standard provides information and guidance on sound insulation and noise reduction for buildings. It deals with the control of external noise and outlines recommendations for occupied rooms.

The following table is taken from the document outlining requirements for internal noise levels in residential accommodation.

Indoor Ambient Noise Levels for Dwellings (BS 8233:2014)

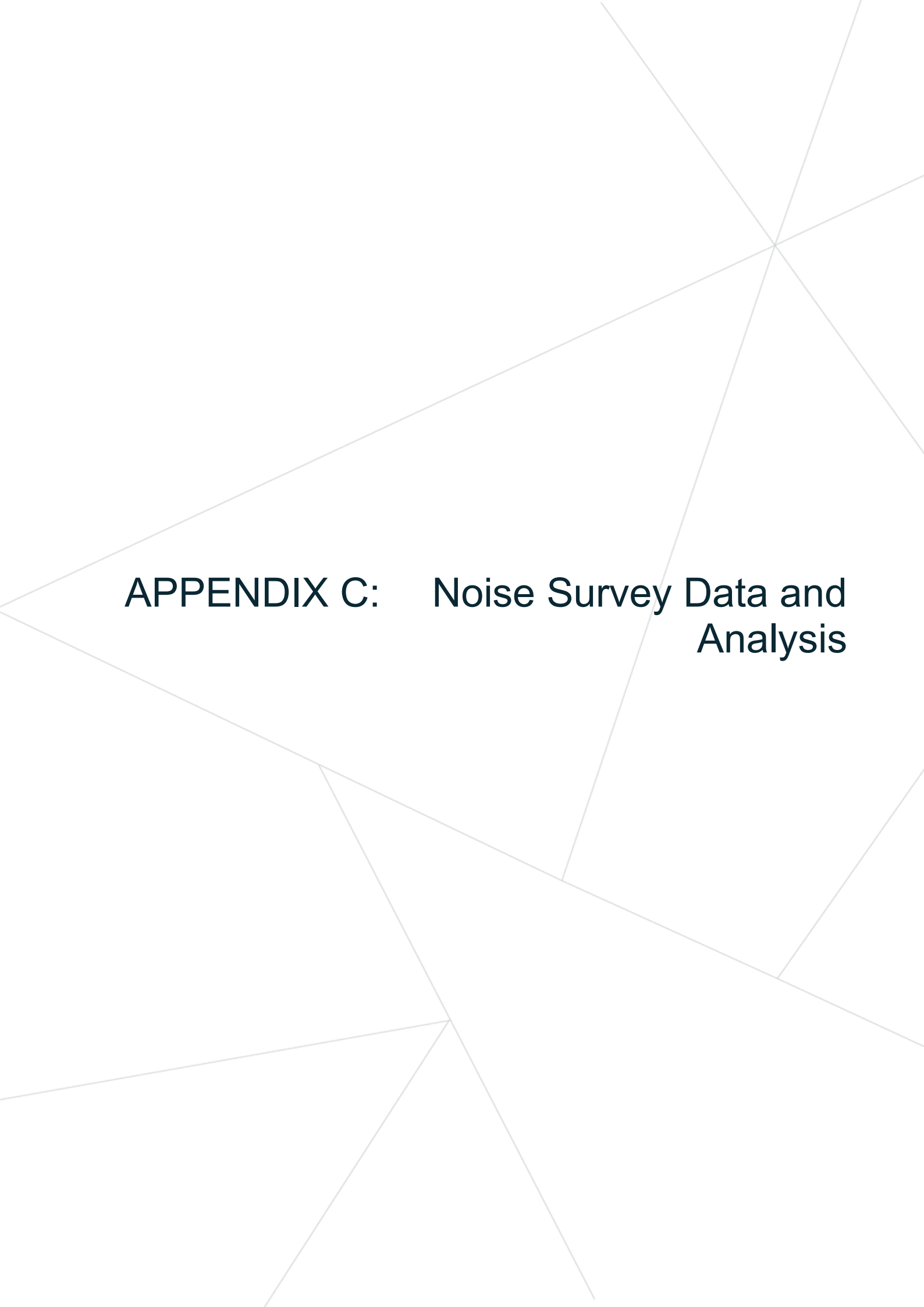
Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35dB $L_{Aeq,16Hr}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16Hr}$	-
Sleeping	Bedroom	35dB $L_{Aeq,16Hr}$	30dB $L_{Aeq,8Hr}$

The noise levels presented are based on existing WHO guideline values. The document further recommends that guideline value may be set in terms of SEL or $L_{Amax,F}$, if systematic individual noise events are happening. The values are depending on the character and number of events per night. Sporadic noise events could require separate values. In this instance a target value of 45 dB L_{Amax} has been established as the average L_{Amax} level not to be exceeded in bedrooms at night.

External Amenity Space

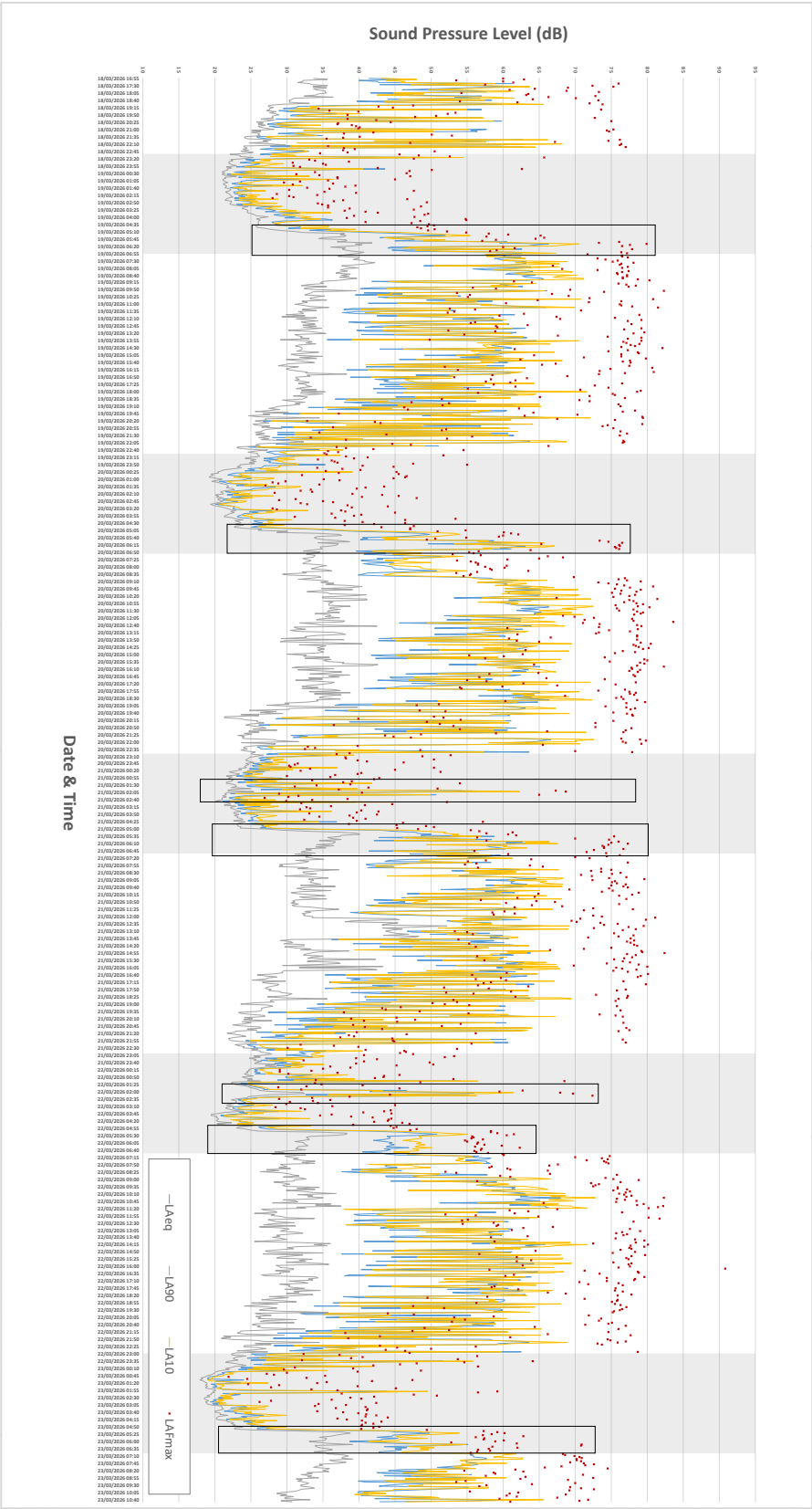
BS 8233:2014 offers the following guidance regarding outdoor amenity space:

“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 50dB L_{Aeq} , with an upper guideline value of 55dB L_{Aeq} which would be acceptable in noisier environments. However, it is also recognised that these 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.”



APPENDIX C: Noise Survey Data and Analysis

Long Term Noise Survey (LT)



periods of aircraft flyover noise during the nighttime (23:00 – 07:00) can be seen within the black outlined rectangles.



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