



Noise Impact Assessment

Wyvols Court Farm, Swallowfield

Wyvols Court Farm Ltd

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Noise Impact Assessment

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1 Introduction

1.1 Project Introduction

- 1.1.1 Enzygo Limited has been commissioned by Wyvols Court Farm Ltd to undertake a noise impact assessment to support a planning application for 3no. commercial units at Wyvols Court Farm, Swallowfield, Reading, RG7 1WY.
- 1.1.2 The noise assessment has been undertaken to assess the potential impacts, in accordance with the relevant standards and guidance, at the nearest noise-sensitive properties to the site and to provide outline mitigation advice if considered necessary.
- 1.1.3 Details of the assessment methodology employed, together with the results of the surveys, predictions, assessment, and conclusions are presented in this report.

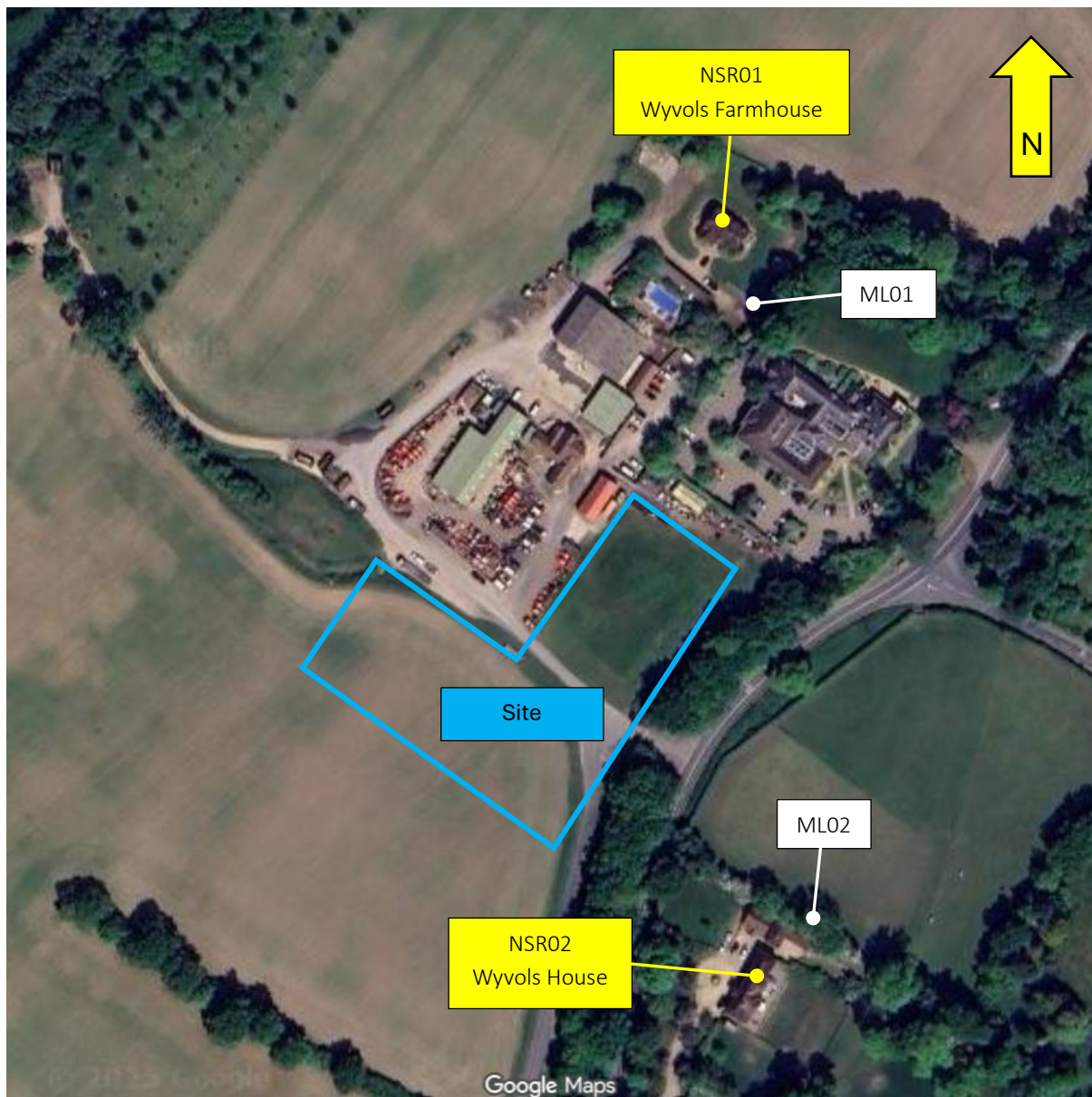
1.2 Site Location

- 1.2.1 The proposed commercial development site is located on land at Wyvols Court Farm, Swallowfield, Reading, RG7 1WY.
- 1.2.2 To the north is the Wyvols Court Business Centre. To the west and south is open arable land and to the east the site adjoins the Basingstoke Road, with a mixture of open/arable land and sparse residential properties leading to the village of Swallowfield. The site is located within the landholdings of Wyvols Court Farm which extends to approximately 167 acres (67.7 hectares). Wyvols Court Farm is a diversified farm business with three main activities, these being commercial real estate operations and agricultural and forestry operations. Wyvols Court Farm currently hosts a number of commercial units providing approximately 30,000sq ft of employment floor space for light industrial and storage and distribution uses supporting 120 jobs.
- 1.2.3 The site and monitoring locations, alongside the nearest identified noise-sensitive residential properties to the proposed development site are shown in are shown in Figure 1-1 overleaf.
- 1.2.4 The noise sensitive receptors are listed in Table 1-1 below:

Table 1-1: Noise Sensitive Receptors

Reference	Location	Distance and Direction from Proposed Development
NSR01	Wyvols Farmhouse	75m Northeast
NSR02	Wyvols House	110m Southeast

Figure 1-1: Site Location & Layout Plan



1.3 Proposed Development

- 1.3.1 The proposed development includes 3no. commercial units. Each unit has a HGV loading bay.
- 1.3.2 The main source of noise from the proposed development is from HGV traffic to and from the new commercial units. Traffic data, provided by Abley Letchford and presented with the submitted Transport Statement, forms the basis of this noise assessment.
- 1.3.3 Other sources of noise, including equipment operation by future tenants may be possible, however, at this stage of the development, it is not possible to predict and assess noise from potential future operations without specific information. Therefore, limits are provided for additional future noise sources.
- 1.3.4 The proposed site layout, on which this noise assessment is based, is shown in Figure 1-2 below.

Figure 1-2: Proposed Development Layout



1.4 Noise Assessment Methodology

- 1.4.1 A noise assessment for the current proposals has been undertaken in accordance with the guidance contained in British Standard 4142:2014+A1:2019 *Method for rating and assessing industrial and commercial sound* (BS4142) with reference made to the internal noise criteria outlined in British Standard 8233:2014 *Guidance on sound insulation and noise reduction for buildings* (BS8233).
- 1.4.2 Noise levels generated by the proposed development have been predicted to the nearest noise-sensitive receptors, using the calculation methodology outlined in ISO9613:2024 '*Acoustics – Attenuation of sound during propagation outdoors – Part 2: Engineering methods of the prediction of sound pressure levels outdoors*' (ISO9613) using the proprietary noise modelling software CadnaA.
- 1.4.3 The assessment is based upon the results of baseline noise surveys undertaken at locations representative of the nearest residential receptors to the site over representative daytime and night-time periods.

2 Standards and Guidance

2.1 Planning Practice Guidance: Noise

- 2.1.1 The Planning Practice Guidance: Noise is the Government's online guidance on managing potential noise impacts from new developments.
- 2.1.2 The guidance includes a noise exposure hierarchy table which relates noise and example outcomes to effect levels. The hierarchy table also identifies actions required for each effect level.
- 2.1.3 Particularly relevant to this assessment are the No Observed Effect Level and the No Observed Adverse Effect Level (NOAEL) to which the guidance states:

Table 2-1: Noise Hierarchy Table Excerpt

Response	Example of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No effect	No Observed Effect	No specific measures required
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

2.2 British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

- 2.2.1 BS4142 provides a methodology for rating and assessing sound associated with both industrial and commercial premises. The purpose of the Standard is clearly outlined in the opening section where it states that the method is appropriate for the consideration of:
- Sound from industrial and manufacturing processes;
 - Sound from fixed installations which comprise mechanical and electrical plant and equipment;
 - Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and,
 - Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

2.2.2 The Standard is based around the premise that the significance of the noise impact of an industrial/commercial facility can be derived from the numerical subtraction of the background noise level (not necessarily the lowest background level measured, but the typical background of the receptor) from the measured/calculated rating level of the specific sound under consideration. This comparison will enable the impact of the specific sound to be concluded based upon the premise that typically *“the greater this difference, the greater the magnitude of the impact”*. This difference is then considered as follows:

- 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 +5 dB is likely to be an indication of an adverse impact, depending upon context; and,
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact.

2.2.3 BS4142 further states that “where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact” again depending upon the specific context of the site. The Standard further qualifies the assessment protocol by outlining conditions to the comparative assessment and stating that “not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact”, thus implying that all sites should be assessed on their own merits and specifics.

2.2.4 The Standard quantifies the typical reference periods to be used in the assessment of noise, namely:

Typical Daytime	07:00 – 23:00	1-hr assessment period
Typical Night-time	23:00 – 07:00	15-min assessment period

2.2.5 The Standard outlines methods for defining appropriate *“character corrections”* within the rating levels to account for tonal qualities, impulsive qualities, other sound characteristics and/or intermittency. These are a) the Subjective Method, b) the Objective Methods for tonality and c) the Reference Method. It is noted by the Standard that where multiple features are present the corrections should be added in a linear fashion to the specific level.

2.2.6 The Subjective Method is based on the following corrections:

Table 2-2: BS4142 Subjective Method Rating Corrections

Level of Perceptibility	Tonal Correction	Impulsivity Correction	Correction for “Other sound characteristics”	Intermittency Correction
No Perceptibility	+0 dB	+0 dB	Where neither tonal nor Impulsive but clearly identifiable +3 dB	If intermittency is readily identifiable +3 dB
Just Perceptible	+2 dB	+3 dB		
Clearly Perceptible	+4 dB	+6 dB		
Highly Perceptible	+6 dB	+9 dB		

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

2.3.1 BS8233 provides guidance and recommendations for the control of noise from outside sources to maintain an internal acoustic environment appropriate for the intended use. The Standard suggests appropriate criteria and limits for differing situations which are, primarily, intended to guide the design of new or refurbished buildings undergoing a change of use rather than to assess the effect of changes to the external noise climate. However, it is considered that the guidance provides suitable criteria for the assessment of internal noise levels in this instance.

2.3.2 The Standard suggests suitable guidance values for residential dwellings shown in Table 2-3.

Table 2-3: BS8233 Indoor Ambient Noise Levels for Dwellings

Activity	Location	07:00 to 23:00 Hours	23:00 to 07:00 Hours
Resting	Living room	35dB $L_{Aeq,16hr}$	-
Dining	Dining room/area	40dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hr}$	30dB $L_{Aeq,8hr}$

2.3.3 Whilst it is considered desirable to achieve these internal noise levels with the windows open, it is not stipulated within the Standard which states:

"If relying on closed windows to meet the guide values, there needs to be appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level."

2.3.4 The Standard suggests that the level of noise reduction provided by a partially open window would be approximately 15dB.

2.3.5 BS8233 also sets out a design-criteria for external noise in external amenity spaces such as gardens and patios stating:

"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."

2.3.6 These guideline design-criteria values are meant for new residential development rather than for assessing new noisy development being introduced into a residential area. However, the guideline values provide good noise limits to attain in this instance.

2.4 ISO9613 Acoustics – Attenuation of sound during propagation outdoors – Part 2: Engineering method for the prediction of sound pressure levels outdoors

2.4.1 The noise levels generated by the operation of the proposed development have been predicted using the calculation methodology set out in ISO9613-2. The methodology considers the distance between the sources and the receptors and applies the amount of attenuation due to atmospheric absorption and other site-specific characteristics.

2.4.2 The methodology assumes downwind propagation, i.e., a wind direction that assists the propagation of noise from the source to all receptors.

3 Baseline Survey Information

3.1 Introduction

- 3.1.1 The baseline noise survey was undertaken on Thursday 16th and Friday 17th October 2025 to gather background and ambient noise levels at locations representative of the nearest noise-sensitive receptors to the proposed development site.
- 3.1.2 The monitoring locations used for the survey are shown in Figure 1-1 and detailed in Table 3-1 below. The measurement microphone was mounted on a tripod with a windshield approximately 1.5m above the ground in free-field conditions.

Table 3-1: Noise Monitoring Locations

Monitoring Location	Approx. Distance from Site	Reflecting Surfaces between Source & Receptor	Topography of Intervening Ground	Justification for Choice of Measurement Location
ML01	75m	None	Open ground	Nearest safe and accessible location representative of NSR01
ML02	110m	None	Open ground	Nearest safe and accessible location representative of NSR02

3.2 Weather Conditions

- 3.2.1 Weather conditions during the survey periods were noted and are detailed in Table 3-2.

Table 3-2: Weather Conditions

Period	Wind Speed & Direction	Rain	Ground Conditions	Cloud Cover	Temperature
Daytime	0.8 m/s NE	None	Dry	100%	16 °C

3.3 Measuring Equipment

- 3.3.1 The noise monitoring equipment used during the surveys is shown in Table 3-1 and was set to record the $L_{Aeq,T}$, L_{A90} , L_{A10} and L_{Amax} parameters.
- 3.3.2 The following set-up parameters were used on the sound level meter during all the noise measurements undertaken:
- Time Weighting: Fast
- Frequency Weighting: "A"
- 3.3.3 The sound level meters were field calibrated, using the acoustic calibrator, prior to commencement and upon completion of the overall survey. No drifts in calibration were noted.

Table 3-3: Noise Monitoring Equipment

Location	Equip. Make & Model	Class	Calibration Level, dB	Serial No.	Calibration Date Prior to Survey
ML01	RION NL-53 Sound Level Meter	1	94.0	351948	16/10/2025
	RION NC-75 Calibrator	1	-	34356635	16/10/2025
ML02	RION NL-53 Sound Level Meter	1	94.0	351949	16/10/2025
	RION NC-75 Calibrator	1	-	34456696	16/10/2025

The external calibration documentation for the equipment used is available upon request.

3.4 Survey Details and Results

3.4.1 The results of the baseline surveys are summarised in Table 3-4 below and can be found in full in Appendix A.

Table 3-4: Summary of Baseline Survey Results

Location	Period	Duration hh:mm:ss	Average L _{Aeq,T} , dB	Average L _{A90} , dB	Average L _{A10} , dB
ML01 Wyvols Farmhouse	Day	16:00:00	45.4	35.5	45.8
	Night	08:00:00	42.0	25.6	37.2
ML02 Wyvols House	Day	16:00:00	53.4	41.2	56.1
	Night	08:00:00	43.5	25.9	38.6

3.5 Existing Context

3.5.1 The daytime noise climate at location ML01 is dominated by foot traffic and on-site operations at Wyvols Court Farm. At ML02, Basingstoke Road is the most dominant noise source during the daytime with no other dominant noise factors. Birdsong was audible at both locations.

3.5.2 The night-time noise climate at both locations was dominated by road traffic noise from Basingstoke Road.

4 Noise Modelling

4.1 Introduction

- 4.1.1 The noise levels from the proposed equipment have been used to inform a noise modelling assessment, demonstrate noise propagation across the site and provide an indication of likely façade noise levels at the worst affected noise sensitive receptors.
- 4.1.2 The noise model has been constructed using the proprietary noise modelling software package CadnaA utilising Google Earth geo-referenced 1:1 scaled aerial photography, openstreetmap.org mapping data and the latest iteration of the site layout plan.

4.2 Foundations of the Noise Model

- 4.2.1 To predict noise levels from the proposed development to the nearest noise-sensitive receptors the following factors were used in the modelling:

Table 4-1: CadnaA Noise Model Parameters

CadnaA Noise Model Parameters	
Calculation Methodology	ISO 9613-2 (2024) Calculation of Road Traffic Noise (CRTN)
Noise Model Configuration	Ground Absorption set to $G = 0.5$ (Areas of arable land or open grassland $G = 1.0$) Order of Reflection = 2
Meteorological Conditions	Temperature 10°C Relative Humidity 70% Wind and temperature gradient assisted sound propagation has been assumed to all receptors.

5 Assessment of Impacts

5.1 Introduction

- 5.1.1 Specific sound levels generated by the development proposals have been predicted to the site facing façade or site facing outdoor amenity space of the nearest noise-sensitive receptors identified using the calculation methodology outlined in ISO9613.
- 5.1.2 The resulting predicted specific sound levels have then been assessed in accordance with the guidance contained in BS4142 with reference made to daytime resting conditions in bedrooms in accordance with the guidance contained in BS4142 and BS8233.

5.2 Sources Being Assessed

- 5.2.1 The current proposal, as stated in Section 1, includes 3no. commercial units. Each unit has a HGV loading bay. The main source of noise from the development is seen to be HGV traffic and associated delivery and loading activity.
- 5.2.2 The noise source data advised by the client, or their agent, British Standards or taken from Enzygo library data, and used in the assessment is shown in Table 5-1. The figures are shown in either sound power levels or sound pressure levels at a given distance.

Table 5-1: Noise Source Information

Sound Source	Data Source	Overall
HGV Movement Sound power level L_w	BS 5228-1:2009+A1:2014 - Table D.7 121	98 dB(A)
HGV Load/Unload Activity Sound power level L_w	BS 5228-1:2009+A1:2014 - Table D.7 122	112 dB(A)

5.3 Hours of Operation

- 5.3.1 The hours of operation currently permitted under existing consents (and associated conditions) are Monday to Friday 8am – 6pm and Saturday 8am to 1.30pm. No operations are currently permitted on Sundays or Bank Holidays. Similar controls on hours of operations will apply to the proposed development and controlled by way of a planning condition.
- 5.3.2 Hence, the noise assessment will be contained to the daytime period (07:00-23:00).

5.4 Noise Source Time Parameters

- 5.4.1 As per the Abley Letchford Transport Statement (document reference: HD215 – R001) “Across the full day the combined development is anticipated to generate in the region of 37no. two-way heavy goods vehicle movements”.
- 5.4.2 The noise model assumes 1-minute per journey either in or out of the development, i.e. 74-minutes of HGV travel across the day. This is seen to be onerous and provide a robust assessment.

5.4.3 Each arrival (37no.) is also modelled with a delivery activity noise event for 1-minute per event, to account for tailgate operations, etc.

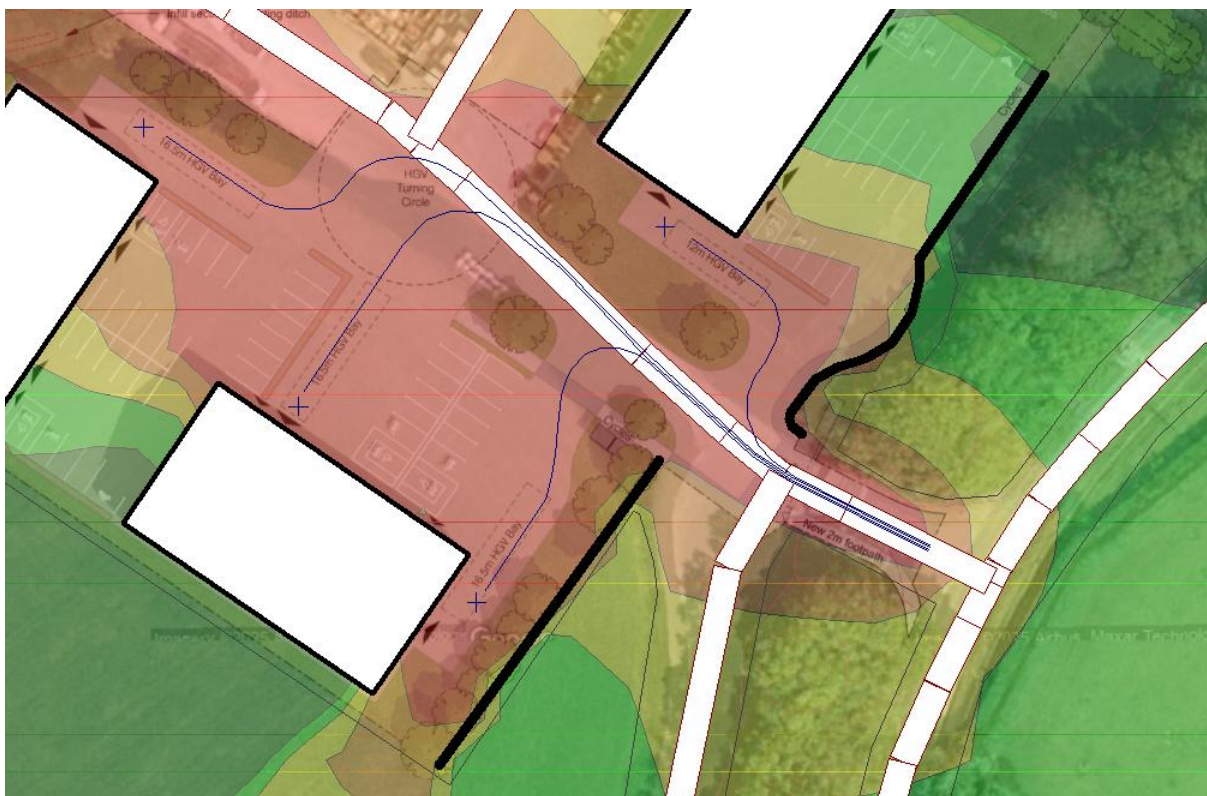
5.4.4 All noise sources and time parameters are distributed evenly between the proposed units.

5.5 Mitigation Requirements

5.5.1 Mitigation measures are seen to be required to ensure noise levels from the proposed development are suitable at the nearest noise sensitive receptors.

5.5.2 Two noise barriers are required to the southeast edge of the development site, either side of the entrance in the locations shown below in Figure 5-1.

Figure 5-1: Mitigation Requirements – Noise Barriers



5.5.3 These barriers should be close-boarded fences or walls with a surface mass of at least 10kg/m^2 and with a minimum height of 3m.

5.5.4 The below assessments assumed the inclusion of these barriers.

5.6 Predicted Sound Levels

5.6.1 For the purposes of this assessment the predicted sound levels assume that all equipment would be operating simultaneously.

5.6.2 Predicted specific sound levels during the day have been made to a height of 1.5m to represent outdoor amenity spaces, and 4.0m for first-floor bedroom windows. The results are shown in Table 5-2.

Table 5-2: Predicted Specific Sound Levels at the Receptors

Receptor	Period (hrs)	Location	Receptor Height (m)	Predicted Specific Sound Level, dB $L_{Aeq,T}$
NSR01 Wyvols Farmhouse	07:00 – 23:00 (Day)	Outdoor Amenity	1.5	28.4
	07:00 – 23:00 (Day)	Ext. 1 Floor Bedroom	4.0	25.8
NSR02 Wyvols House	07:00 – 23:00 (Day)	Outdoor Amenity	1.5	40.8
	07:00 – 23:00 (Day)	Ext. 1 Floor Bedroom	4.0	39.8

5.7 Subjective Impressions at the Receptors

5.7.1 As the development proposals are in the planning stage there are currently no specific noise sources at site, the ambient sound level and residual sound level are considered equal and are taken as the measured $L_{Aeq,T}$. There have been no corrections applied to the measured sound levels. The specific sound level will be predicted using the proprietary noise modelling software CadnaA.

5.8 Sound Rating Levels

Existing Context

5.8.1 The identified nearest noise-sensitive receptors are sited close to transport infrastructure, including the B3349 Basingstoke Road. Both noise sensitive receptors will also be subject to commercial and industrial noise from the existing units at Wyvols Court Farm and Wyvols Court Business Centre.

Derived Sound Rating Levels

5.8.2 It is considered that any tonal feature generated by the proposed development would be masked by nearby road, industrial, commercial and other power generation-related infrastructure therefore no acoustic feature corrections for tonality have been included within the predictions.

5.8.3 Under normal operating conditions the facility would not generate any impulsive noise or 'other' sound characteristics. Therefore, no corrections for these characteristics have been made for these acoustic features.

5.9 Assessment of the Impacts

5.9.1 BS4142 states:

"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs."

5.9.2 A comparative assessment has been undertaken to determine the potential impact of the predicted sound rating levels at the nearest residential receptors on the measured background noise levels. The background noise level measured at ML01 are considered representative of those present at NSR01 Wyvols Farmhouse, and those measured at ML02 are considered representative of those present at NSR02 Wyvols House. Table 5-3 summarises the results of the assessment. Measured background levels and predicted noise levels have been rounded to the nearest whole decibel.

Table 5-3: BS4142 Assessment

Receptor	Period	Location	Rating Level dB $L_{Aeq,T}$	Background Noise Level dB L_{A90}	Difference dB
NSR01 Wyvols Farmhouse	Day	Outdoor Amenity	28	36	-8
	Day	Ext. 1 Floor Bedroom	26	36	-10
NSR02 Wyvols House	Day	Outdoor Amenity	41	41	Equal
	Day	Ext. 1 Floor Bedroom	40	41	-1

5.9.3 Table 5-3 shows that the predicted rating levels during the day are equal to or below the measured background noise levels at all locations indicating that the specific sound level generated by the proposed development would have a low impact, depending on the context.

5.10 Context

5.10.1 BS4142 states that where the initial estimate of impact needs to be modified due to the context, all pertinent factors should be taken into consideration.

The Absolute Level of Sound

5.10.2 The specific sound levels generated by the development proposals are predicted to be below the existing prevailing average ambient $L_{Aeq,1hr}$ noise levels at the receptors assessed during the day.

Sensitivity of the Receptors

5.10.3 The nearest receptors identified are residential in nature and as such are sensitive to noise impact during the day. However, the receptors are already subject to noise generated by transport infrastructure and other power generation infrastructure in the area.

Summary of Context

5.10.4 During the day, the predicted rating levels are below the existing background noise levels and considerably below the existing ambient noise levels and therefore would be masked by other environmental sounds in the area.

5.10.5 During the day, an assessment of internal noise levels using the guidance contained in BS8233, as suggested by BS4142, has been made, specifically those relating to daytime resting conditions in bedrooms.

5.11 BS8233 Assessment

5.11.1 BS8233 states that a window partially open for ventilation would give a sound reduction of approximately 15dB. An assessment has been made against the guideline values for internal ambient noise levels for daytime resting in bedrooms at night, i.e., 35dB $L_{Aeq,16hr}$.

5.11.2 Table 5-4 details the results of the assessment based on the worst-case predicted noise level outside the bedroom windows of the nearest properties to the site.

Table 5-4: BS8233 Assessment of Internal Noise Levels at Night - Residential

Location	Predicted External Noise Level, dB $L_{Aeq,T}$	Predicted Internal Noise Level, dB $L_{Aeq,T}$	Guidance Levels dB $L_{Aeq,8hr}$	Difference, dB
NSR01 Wyvols Farmhouse	26	11	35	-24
NSR02 Wyvols House	40	25		-10

5.11.3 Table 5-4 shows that predicted internal noise levels, with the windows left partial open for ventilation, would achieve the guidance values for daytime resting in bedrooms at all receptors assessed.

5.11.4 Based on the findings of the assessments above, assuming the mitigation measured detailed in Section 5.5 are installed, the impact is seen to be low.

5.12 Limits for Future Sources

5.12.1 As stated in Section 1, other sources of noise, including equipment operation by future tenants may be possible, however at this stage of the development it is not possible to predict and assess this noise. Therefore, limits are provided for additional future noise sources.

5.12.2 BS4142 suggest that if the noise levels resultant from a development are equal to or below the existing background noise level (L_{A90}), then the likely impact will be low. Levels have been rounded to the nearest whole decibel.

5.12.3 The derived noise limit would include any adjustments made to the specific sound level for acoustic features of the source such as tonality, intermittency or impulsivity.

Table 5-5: Summary of Baseline Survey Results

Location	Period	Measured Background Noise Level, dB L_{A90}	Derived Noise Limit at Receptor dB $L_{Ar,T}$
ML01 Wyvols Farmhouse	Day (07:00-23:00)	36	36
	Night (23:00-07:00)	26	26
ML02 Wyvols House	Day (07:00-23:00)	41	41
	Night (23:00-07:00)	26	26

6 Conclusion

- 6.1.1 Enzygo Limited has been commissioned by Wyvols Court Farm Ltd to undertake a noise impact assessment to support a planning application for 3no. commercial units at Wyvols Court Farm, Swallowfield.
- 6.1.2 The noise assessment has been undertaken to assess the potential impacts, in accordance with the relevant standards and guidance, at the nearest noise-sensitive properties to the site and to provide outlined mitigation advice if considered necessary.

6.2 Noise Assessment

- 6.2.1 Sound levels generated by the proposed development have been predicted using CadnaA and assessments have been made in accordance with the guidance contained in BS4142:2014+A1:2019.
- 6.2.2 The BS4142 assessment also shows that the daytime predicted sound rating level, assuming the mitigation measured detailed in Section 5.5 are installed, are below the measured background noise levels. This would indicate that the rating sound level would have a **low impact** depending on the context and fall into the NOEL effect level when assessed in accordance with the Planning Policy Guidance for noise.
- 6.2.3 For daytime resting, the BS8233 assessment, made in accordance with the guidance outlined in BS4142 has shown that, with the windows left partially open for ventilation, assuming the mitigation measured detailed in Section 5.5 are installed, internal noise levels would achieve the guidance value of 35dB $L_{Aeq,8hr}$ for daytime in bedrooms and therefore fall into the NOEL effect level when assessed in accordance with the Planning Policy Guidance for noise.
- 6.2.4 Given the above, it has been demonstrated that, there are no reasons on noise grounds why planning consent for the proposed development cannot be granted.

Glossary of Terminology

Noise is defined as unwanted sound. The range of audible sound is known to be from 0dB (threshold of hearing) to 140dB (threshold of pain). Examples of typical noise levels relating to ‘everyday’ occurrences are given in Table G-1 below.

Table G-1: Typical Noise Levels

Source	Sound Pressure Level in dB(A)	Subjective Level
Gun shot	160	Perforation of eardrum
Military Jet take-off	140	Threshold of pain
Jet Aircraft at 100m	120	Very Loud
Rock Concert, front seats	110	Threshold of Sensation
Pneumatic Drill at 5m	100	Very Loud
Heavy goods vehicle from pavement	90	
Traffic at kerb edge	70 – 85	Loud
Vacuum Cleaner, Hair Dryer	70	
Normal conversation at 1m	60	Moderate
Typical Office	50 – 60	
Residential area at night	40	Quiet
Rural area at night, still air	30	
Leaves Rustling	20	
Rubbing together of fingertips	10	
	0	Threshold of hearing

The frequency response of the human ear to noise is usually taken to be around 18Hz (number of oscillations per second) to 18,000Hz. However, the human ear does not respond equally to different frequencies at the same level; it is more sensitive in the mid-frequency range than lower and higher frequencies and, because of this when undertaking the measurement of noise, the low and high frequency components of any given sound are reduced in importance by applying a filtering (weighting) circuit to the noise measuring instrument. The weighting which is widely accepted to correlate best with the subjective nature of human response to noise and is most widely used to quantify this is the A-weighted filter set. This is an internationally accepted standard for noise measurement.

For variable noise sources within an area an increase of 3dB(A) would be the minimum perceptible to the human ear under normal conditions. It is generally accepted that an increase/decrease of 10dB(A) corresponds to a doubling or halving in perceived loudness. The ‘loudness’ of a noise is a purely subjective parameter, dependant not only upon the sound pressure of the event but also on the dynamics of the listener’s ear, the time of the day and the general mood of the person.

With regards to environmental noise levels (in the open air), these are rarely steady but rise and fall according to the activities being undertaken within the surrounding area at any given time. Attempting to produce a figure that relates this variable nature of noise to human subjective response, various statistical noise metrics have been developed. These and other useful terminology and descriptors are presented in Table G-2 below.

Table G-2: Terminology

Term	Definition
Sound	Pressure fluctuations in a fluid medium within the audible range of amplitudes and frequencies which stimulate the organs of hearing.
Noise	Unwanted sound emitted from a source and received by the sensitive receptor.
Decibel (dB)	Unit most often used to describe the sound pressure level. A logarithmic number, it correlates closely to the way in which humans perceive sound. Its wide range of values helps quantify sound pressures from a large variety of magnitudes.
A-Weighting (dB(A))	Human perception of sound is frequency dependant. A-weighting applies a range of corrections at each frequency to provide a 'human-averaged'. Can be frequency band or broadband values.
Frequency (Hz)	The number of cycles per second, for sound this is closely related (and often mistaken for) pitch.
Frequency Spectrum	A more detailed analysis of the frequency components that comprise a sound source.
L_{A10,T}	The 10 th statistical percentile of a measurement period, i.e., the level that is exceeded for 10% of the measurement duration. Closely correlates with traffic sources, A-weighted.
L_{A90,T}	The 90 th statistical percentile of a measurement period, i.e., the level that is exceeded for 90% of the measurement duration. Used to describe background sound levels, as this value is affected less by short, transient sound sources, A-weighted.
L_{Amax}	The root mean square (RMS) maximum sound pressure level within a measurement period, A-weighted.
Ambient Sound	The total sound climate of all noise sources incident at one location, both in the near- and far-field (<i>The ambient sound comprises the residual sound and the specific sound when present</i>).
Ambient Sound Level L_a = L_{Aeq,T}	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T.
Background Sound Level 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, T, measured using time weighting F and quoted to the nearest whole number of decibels.
Equivalent Continuous A-weighted Sound Pressure Level L_{Aeq,T}	Value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, T = t ₂ – t ₁ , has the same mean-squared sound pressure as a sound that varies with time, and is given by the following equation:

Term	Definition
	$L_{Aeq,T} = 10 \lg_{10} \left\{ \left(\frac{1}{T} \right) \int_{t_1}^{t_2} \left[p_A \frac{(t)^2}{p_0^2} \right] dt \right\}$ Where p_0 is the reference sound pressure (20μPA); and $p_A(t)$ is the instantaneous A-weighted sound pressure level at time t.
Measurement Time Interval T_m	Total time over which measurements are taken (<i>This may consist of the sum of several non-contiguous, short-term measurement time intervals</i>)
Rating level $L_{Ar,Tr}$	Specific sound level plus any adjustment for the characteristic features of the sound, over time, T .
Reference Time Interval, T_r	Specified interval over which the specific sound level is determined (This is 1hr during the day from 07:00 to 23:00 hours and a shorter period of 15-min at night from 23:00 to 07:00 hours).
Residual Sound	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
Residual sound level $L_r = L_{Aeq,T}$	Equivalent continuous A-weighted sound pressure level of the residual sound in a given situation at the assessment location over a given time interval, T .
Sound Pressure Level	The level of fluctuation in air pressure, caused by airborne sound sources. Measured in Pascals (Pa).
Sound Power Level	The rate at which sound is radiated by a source. This parameter is useful as it describes sound energy before environmental or decay factors. Quantified in dB and notated usually as L_w or SWL.
Specific sound level $L_s = L_{Aeq,Tr}$	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given time interval, T .
Specific Sound Source	Sound source being assessed.

Statement of Uncertainty

This report is based upon a range of measurements, a system of calculations and noise predictions. As such, this report attempts to quantify fluctuations in air pressure and is subject to the effects of meteorology, physical and perceived anomalies, tolerances within the measuring and monitoring equipment and accuracy margins within the noise modelling software. In the interests of repeatability, this report must be considered as being affected by common factors involved in the measurement and calculation of noise propagation.

All measurement values, outcomes and assumptions are subject to a margin of uncertainty. This has been quantified and assessed as follows:

- Rounding errors – systemic tolerance of $\pm 1\text{dB}$;
- Meteorology – allowance of $\pm 1.9\text{dB}$; and
- CadnaA noise propagation modelling software – operational accuracy of $\pm 2.1\text{dB}$

The most influential uncertainty factors for the assessment of noise are deemed to be equipment tolerances, meteorology and software accuracy. A root-sum-square statistical average has been used to provide an overall margin of uncertainty of $\pm 3\text{dB}$.

APPENDICES

Appendix A Baseline Survey Data

Table A-1: Baseline Measurements – ML01 Daytime

Date & Time	L _{Aeq} (dB)	L _{AFmax} (dB)	L _{A90} (dB)	L _{A10} (dB)
16/10/2025 10:00	42.9	63.1	36.7	45.5
16/10/2025 10:15	45.5	60.7	37.2	49.4
16/10/2025 10:30	46.3	67.5	37.5	48.3
16/10/2025 10:45	47.9	71.9	37.7	52.5
16/10/2025 11:00	49.9	67.6	37.4	54.5
16/10/2025 11:15	49.7	69.0	38.9	54.0
16/10/2025 11:30	42.5	60.3	34.5	44.7
16/10/2025 11:45	43.3	60.6	37.5	45.9
16/10/2025 12:00	46.2	59.9	38.0	49.6
16/10/2025 12:15	42.6	60.8	36.3	45.8
16/10/2025 12:30	47.7	68.3	36.3	49.3
16/10/2025 12:45	41.9	57.3	37.1	44.4
16/10/2025 13:00	41.8	61.6	35.0	43.0
16/10/2025 13:15	47.9	69.4	37.0	46.9
16/10/2025 13:30	43.7	60.2	34.7	46.7
16/10/2025 13:45	46.9	61.3	37.1	51.2
16/10/2025 14:00	42.6	60.6	35.1	44.6
16/10/2025 14:15	45.7	66.1	35.7	48.8
16/10/2025 14:30	42.8	64.3	34.6	45.8
16/10/2025 14:45	43.9	64.3	36.6	46.0
16/10/2025 15:00	47.0	63.4	37.4	50.8
16/10/2025 15:15	46.3	62.6	35.9	50.7
16/10/2025 15:30	45.5	64.9	38.0	49.0
16/10/2025 15:45	45.0	61.5	36.6	49.2
16/10/2025 16:00	44.3	65.8	37.7	45.5
16/10/2025 16:15	43.5	59.0	38.6	45.8
16/10/2025 16:30	43.3	57.0	38.0	46.0
16/10/2025 16:45	54.0	68.6	40.3	58.0
16/10/2025 17:00	43.5	59.8	38.7	45.2
16/10/2025 17:15	43.8	66.8	37.6	44.5
16/10/2025 17:30	44.0	66.4	37.5	46.9
16/10/2025 17:45	46.4	66.6	38.5	48.9
16/10/2025 18:00	43.7	63.0	36.9	46.0
16/10/2025 18:15	47.5	66.8	37.3	51.1
16/10/2025 18:30	42.5	62.5	37.0	43.9
16/10/2025 18:45	39.2	51.3	35.3	41.4
16/10/2025 19:00	41.6	57.0	35.7	42.1
16/10/2025 19:15	37.9	49.7	34.2	40.3
16/10/2025 19:30	37.4	48.5	33.0	39.7
16/10/2025 19:45	39.2	55.8	33.0	40.9
16/10/2025 20:00	36.4	50.8	31.4	38.6
16/10/2025 20:15	37.5	51.8	33.4	39.7

Date & Time	L _{Aeq} (dB)	L _{AFmax} (dB)	L _{A90} (dB)	L _{A10} (dB)
16/10/2025 20:30	43.5	62.3	31.8	40.2
16/10/2025 20:45	36.1	48.9	29.8	39.4
16/10/2025 21:00	33.9	45.3	28.9	36.4
16/10/2025 21:15	39.7	56.5	31.1	41.0
16/10/2025 21:30	33.7	48.9	29.2	36.2
16/10/2025 21:45	32.7	43.7	26.2	35.8
16/10/2025 22:00	33.7	41.8	27.2	36.7
16/10/2025 22:15	38.8	64.9	26.7	37.2
16/10/2025 22:30	31.9	51.1	25.9	34.4
16/10/2025 22:45	31.5	51.0	24.8	34.7
17/10/2025 07:00	46.3	63.6	37.5	50.2
17/10/2025 07:15	51.0	70.4	39.4	55.1
17/10/2025 07:30	46.9	63.4	39.4	50.8
17/10/2025 07:45	49.3	69.2	39.9	52.9
17/10/2025 08:00	45.0	66.1	38.5	47.1
17/10/2025 08:15	46.7	70.0	38.6	49.4
17/10/2025 08:30	48.2	66.9	37.5	52.2
17/10/2025 08:45	46.1	63.0	38.0	49.9
17/10/2025 09:00	44.7	65.3	37.4	47.0
17/10/2025 09:15	44.0	64.3	36.3	46.3
17/10/2025 09:30	45.1	62.2	38.0	47.3
17/10/2025 09:45	46.9	69.1	36.4	48.9
Summary	45.4	71.9	35.5	45.8

Table A-2: Baseline Measurements – ML01 Night-time

Date & Time	L _{Aeq} (dB)	L _{AFmax} (dB)	L _{A90} (dB)	L _{A10} (dB)
16/10/2025 23:00	32.2	48.4	24.8	35.7
16/10/2025 23:15	30.8	47.6	23.4	34.2
16/10/2025 23:30	31.5	49.4	23.5	34.9
16/10/2025 23:45	29.1	38.1	22.5	33.3
17/10/2025 00:00	29.5	37.9	22.5	33.7
17/10/2025 00:15	29.5	41.2	23.0	33.5
17/10/2025 00:30	29.6	39.0	22.1	33.8
17/10/2025 00:45	28.8	36.0	21.9	33.2
17/10/2025 01:00	29.8	39.2	22.7	33.6
17/10/2025 01:15	28.9	43.3	22.6	33.4
17/10/2025 01:30	28.5	36.0	22.4	33.3
17/10/2025 01:45	28.2	39.7	22.7	31.3
17/10/2025 02:00	29.5	44.0	21.0	33.5
17/10/2025 02:15	29.8	50.6	21.8	33.8
17/10/2025 02:30	28.2	43.2	22.1	33.5
17/10/2025 02:45	22.8	38.0	22.1	23.3
17/10/2025 03:00	22.8	35.3	22.0	23.3
17/10/2025 03:15	25.2	49.9	21.8	26.5
17/10/2025 03:30	24.7	37.8	22.7	25.7
17/10/2025 03:45	25.7	44.6	22.4	24.7
17/10/2025 04:00	37.6	55.9	23.3	41.9
17/10/2025 04:15	36.0	57.4	23.3	36.4
17/10/2025 04:30	40.9	62.7	24.8	41.8
17/10/2025 04:45	45.9	67.6	24.7	46.5
17/10/2025 05:00	46.3	64.0	27.6	49.7
17/10/2025 05:15	45.9	64.2	33.7	49.0
17/10/2025 05:30	43.7	59.1	34.1	47.5
17/10/2025 05:45	42.8	63.1	33.5	43.0
17/10/2025 06:00	45.7	64.2	32.7	49.0
17/10/2025 06:15	44.3	64.3	35.1	47.3
17/10/2025 06:30	49.4	65.7	36.4	53.5
17/10/2025 06:45	51.9	68.0	38.5	56.6
Summary	42.0	59.1 (10th Highest)	25.6	37.2

Table A-3: Baseline Measurements – ML02 Daytime

Date & Time	L _{Aeq} (dB)	L _{AFmax} (dB)	L _{A90} (dB)	L _{A10} (dB)
16/10/2025 10:00	52.9	63.5	43.0	56.7
16/10/2025 10:15	52.6	61.3	40.8	57.0
16/10/2025 10:30	53.4	64.8	43.0	57.1
16/10/2025 10:45	51.9	63.1	41.0	56.0
16/10/2025 11:00	54.1	66.2	42.8	58.2
16/10/2025 11:15	53.8	73.3	44.1	57.0
16/10/2025 11:30	52.0	63.9	41.2	56.1
16/10/2025 11:45	53.3	64.8	41.5	57.2
16/10/2025 12:00	53.5	64.1	41.8	57.6
16/10/2025 12:15	53.5	63.2	43.6	57.1
16/10/2025 12:30	53.8	67.4	43.0	57.3
16/10/2025 12:45	52.3	62.6	42.9	56.1
16/10/2025 13:00	52.4	66.3	41.7	56.1
16/10/2025 13:15	53.7	68.3	42.7	57.1
16/10/2025 13:30	52.2	64.0	42.1	56.2
16/10/2025 13:45	53.3	67.2	39.5	57.0
16/10/2025 14:00	53.0	65.4	42.6	57.0
16/10/2025 14:15	53.1	63.2	41.2	57.2
16/10/2025 14:30	52.5	63.2	40.2	56.6
16/10/2025 14:45	53.1	64.7	40.3	57.0
16/10/2025 15:00	53.8	66.7	43.9	57.5
16/10/2025 15:15	53.0	61.4	41.4	56.9
16/10/2025 15:30	53.3	62.5	42.2	57.4
16/10/2025 15:45	53.9	62.5	45.4	57.5
16/10/2025 16:00	54.3	63.0	47.1	57.8
16/10/2025 16:15	54.3	64.0	46.4	57.8
16/10/2025 16:30	55.8	66.3	48.6	58.9
16/10/2025 16:45	58.3	72.1	50.8	60.4
16/10/2025 17:00	56.8	63.8	50.3	59.9
16/10/2025 17:15	56.4	66.8	48.2	59.3
16/10/2025 17:30	56.3	72.3	45.9	59.0
16/10/2025 17:45	54.9	66.6	45.5	58.5
16/10/2025 18:00	57.3	76.2	44.5	58.9
16/10/2025 18:15	54.3	62.0	45.1	58.1
16/10/2025 18:30	54.2	61.7	46.7	57.9
16/10/2025 18:45	52.7	62.9	42.7	56.8
16/10/2025 19:00	51.9	63.6	40.1	56.1
16/10/2025 19:15	52.2	66.3	41.3	56.3
16/10/2025 19:30	49.8	61.9	36.0	54.7
16/10/2025 19:45	51.7	67.9	37.0	55.0
16/10/2025 20:00	48.5	60.2	34.9	53.2
16/10/2025 20:15	52.6	71.3	37.3	55.8
16/10/2025 20:30	49.6	61.9	34.5	54.4
16/10/2025 20:45	47.6	60.5	33.6	52.0

Date & Time	L _{Aeq} (dB)	L _{AFmax} (dB)	L _{A90} (dB)	L _{A10} (dB)
16/10/2025 21:00	46.5	61.8	32.3	49.9
16/10/2025 21:15	47.8	61.6	33.1	51.7
16/10/2025 21:30	45.8	59.7	32.1	50.1
16/10/2025 21:45	39.6	55.4	28.6	40.8
16/10/2025 22:00	44.4	57.2	30.0	48.5
16/10/2025 22:15	44.4	57.8	30.0	49.4
16/10/2025 22:30	47.1	65.6	28.2	49.6
16/10/2025 22:45	42.8	57.6	27.4	46.5
17/10/2025 07:00	54.0	63.4	42.5	58.2
17/10/2025 07:15	54.8	65.6	46.1	58.3
17/10/2025 07:30	55.1	66.1	47.0	58.4
17/10/2025 07:45	55.0	66.1	45.6	58.4
17/10/2025 08:00	55.9	71.5	44.6	59.3
17/10/2025 08:15	54.3	66.8	44.4	58.0
17/10/2025 08:30	53.8	62.5	43.0	57.9
17/10/2025 08:45	54.4	66.2	45.1	58.2
17/10/2025 09:00	53.4	63.4	43.2	57.5
17/10/2025 09:15	52.6	63.4	41.4	56.8
17/10/2025 09:30	52.2	60.9	40.9	56.3
17/10/2025 09:45	54.7	70.8	44.6	57.8
Summary	53.4	76.2	41.2	56.1

Table A-4: Baseline Measurements – ML02 Night-time

Date & Time	L _{Aeq} (dB)	L _{AFmax} (dB)	L _{A90} (dB)	L _{A10} (dB)
16/10/2025 23:00	45.5	59.7	28.8	49.2
16/10/2025 23:15	41.1	56.5	26.5	45.3
16/10/2025 23:30	43.2	62.1	24.5	43.9
16/10/2025 23:45	37.1	52.4	24.3	37.5
17/10/2025 00:00	32.9	48.9	23.1	31.3
17/10/2025 00:15	44.5	66.2	24.3	43.9
17/10/2025 00:30	44.6	64.6	24.3	40.4
17/10/2025 00:45	27.4	44.4	21.9	27.2
17/10/2025 01:00	38.3	56.6	23.5	33.7
17/10/2025 01:15	41.1	59.9	23.9	38.0
17/10/2025 01:30	26.7	46.2	23.1	27.6
17/10/2025 01:45	25.3	42.8	22.8	26.6
17/10/2025 02:00	36.8	55.4	20.8	34.6
17/10/2025 02:15	40.1	55.6	22.9	39.1
17/10/2025 02:30	24.7	35.9	22.3	26.8
17/10/2025 02:45	24.5	35.2	23.1	25.5
17/10/2025 03:00	24.2	42.1	22.7	25.3
17/10/2025 03:15	35.8	51.6	22.0	35.2
17/10/2025 03:30	27.8	44.5	22.9	27.8
17/10/2025 03:45	37.6	54.6	22.8	30.4
17/10/2025 04:00	32.7	49.1	23.7	28.0
17/10/2025 04:15	28.6	45.8	24.5	27.1
17/10/2025 04:30	46.2	66.7	26.0	46.4
17/10/2025 04:45	40.8	56.2	27.2	42.2
17/10/2025 05:00	38.2	53.5	27.3	41.1
17/10/2025 05:15	45.2	61.9	28.0	48.1
17/10/2025 05:30	44.9	59.7	29.3	48.8
17/10/2025 05:45	44.0	59.6	30.8	47.4
17/10/2025 06:00	47.4	61.1	32.4	51.8
17/10/2025 06:15	48.9	62.2	35.4	52.7
17/10/2025 06:30	50.2	64.0	35.4	54.5
17/10/2025 06:45	51.9	63.1	38.2	56.3
Summary	43.5	59.9 (10th Highest)	25.9	38.6

Appendix B Noise Contour Plots

Figure B-1: Daytime L_{Aeq} Noise Contour Plot





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