
MR SHANE WEST

NOISE IMPACT ASSESSMENT REPORT

**DOG AND GUN INN, 28 THE BOROUGH, HINCKLEY,
LEICESTERSHIRE LE10 1NL**

Client: Mr Shane West

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1 INTRODUCTION

1.1 Overview

1.1.1 By instruction from Mr Shane West ('the client'), NoiseAir was commissioned to undertake a Noise Impact Assessment (NIA) in order to discharge planning condition 3 for a conditionally approved residential conversion at the location: Dog and Gun Inn, 28 The Borough, Hinckley, Leicestershire LE10 1NL, herein referred to as the 'development site'.

1.1.2 The planning application 22/00331/FUL was approved by Hinckley & Bosworth Borough Council with conditions on 9th September 2022.

1.1.3 Planning condition 3 relates to Noise and states:

"3. a) No flat shall be occupied until a scheme for protecting the proposed dwellings from noise from the road and nearby commercial premises has been submitted to and approved by the Local Planning Authority.

b) All works which form part of the scheme shall be completed before any of the permitted dwellings are first occupied.

Reason: To ensure that the future occupiers of the development are not unduly affected by road noise and noise from nearby commercial premises and receive an appropriate level of amenity in accordance with Policy DM10 of the adopted Site Allocations and Development Management Policies Development Plan Document (2016)."

1.1.4 General limitations with respect to this NIA are outlined in **Appendix A**.

1.2 Site Description

1.2.1 At the time of writing, the development site is a 4no. storey mixed use property comprising a ground floor public house (Dog and Gun) with associated basement, and residential properties on the first and second floor, located within a wider mixed-use area of Hinckley Town Centre.

1.2.2 The development site is bound to the north-east by The Borough, a single carriageway road restricted to buses and cycle use and limited to 20 miles per hour (mph). Beyond The Borough are further mixed-use properties and Stockwell Head (B590), a single carriageway one way B-road trafficked by vehicles restricted to 30 mph.

- 1.2.3 To the south-east, the development site is bound by mixed use properties. To the west and south-west, the development site is bound by a service yard beyond which, to the south, is a car park associated with a commercial property. To the north-west, the development site is bound by Mansion Street/ Lower Bond Street (B4667), a single carriageway B-road trafficked by vehicles restricted to 30 mph beyond which are residential properties.
- 1.2.4 **Figure 1** shows the development site boundary with respect to the local area and its context.



Figure 1: Development site redline boundary.

1.3 Development Proposals

- 1.3.1 Proposals for the development site outline the conversion of the ground floor public house into 2 no. self-contained one-bedroom flats with associated refuse/ recycling facilities.
- 1.3.2 This assessment is based on the proposed site layout as presented in **Figure 2** and **Figure 3**.

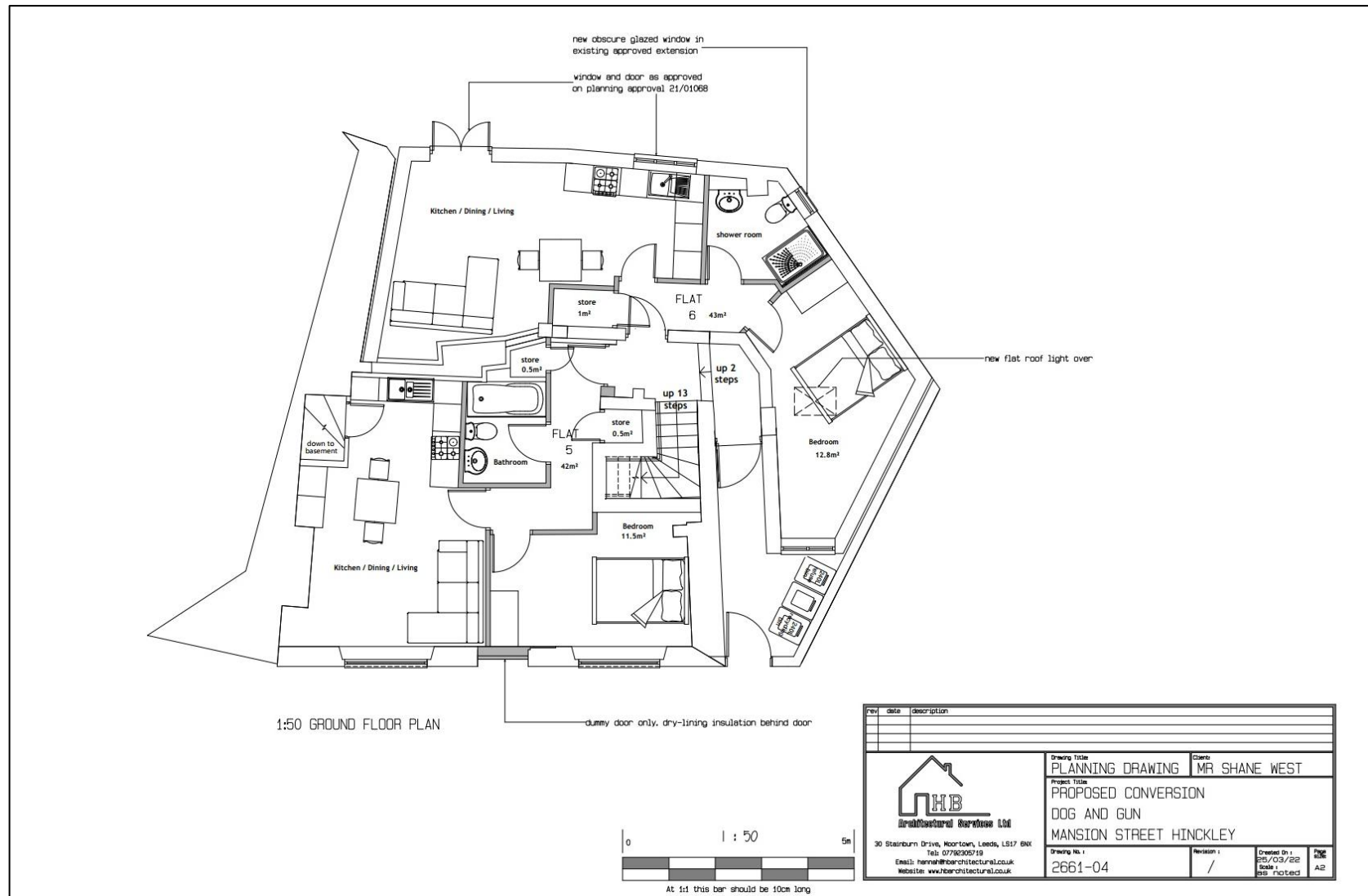


Figure 2: Proposed development site layout – Ground Floor Plan.



Figure 3: Proposed development site layout – Elevations.

2 SCOPE OF WORKS AND RELEVANT GUIDANCE

2.1 Scope of Works

- 2.1.1 The location of the development site is in close proximity to Mansion Street/Lower Bond Street (B4667) and The Borough. Additionally, there is mechanical plant associated with commercial use properties to the south-east of the development site which have the potential to impact on proposed residential amenity through their operations. Therefore, it is considered that the NIA should consider noise primarily from traffic noise sources and secondarily from commercial operations.
- 2.1.2 The scope of this assessment includes consideration of noise at each facade of the development where noise sensitive areas might be located in terms of the potential impact of local noise sources. No external amenity has been proposed as part of this development; therefore, it has not been considered within this assessment.
- 2.1.3 As the residential development proposed is formed via conversion, it is considered that the noise assessment and subsequent criteria should be undertaken in reference to British Standard 8233:2014 - Guidance on sound insulation and noise reduction for buildings (BS 8233:2014).
- 2.1.4 Additionally, the noise assessment has followed the methodology detailed within BS 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound (BS 4142:2014+A1:2019) to assess any potential adverse impact from existing mechanical plant at the development site.
- 2.1.5 A summary of the above documentation is provided below.

2.2 British Standard 8233:2014 (BS 8233:2014)

- 2.2.1 British Standard 8233:2014 – Guidance on sound insulation and noise reduction for buildings (BS 8233:2014) provides guidance on internal ambient noise levels, resulting from break-in of external environmental noise that should not be exceeded in various locations within dwellings.
- 2.2.2 Guidelines for buildings in terms of internal noise level are reported in **Table 1**.

Table 1: Summary of Internal Noise Guidelines.

Activity	Location	0700 – 2300 hours	2300 – 0700 hours
Resting	Living Room	35 dB L _{Aeq,16hour}	-
Dining	Dining room / area	40 dB L _{Aeq,16hour}	-
Sleeping (daytime resting)	Bedroom	35 dB L _{Aeq,16hour}	30 dB L _{Aeq,8hour}

- 2.2.3 The standard clarifies that these values are based on the existing guidelines issued by the World Health Organisation (WHO). In addition, it states that the internal noise levels may be relaxed by up to 5 dB whilst maintaining a reasonable living condition. Conversely, in terms of internal maximum levels to be achieved during the night, the standard does not recommend any limits for individual noise events. However, a guideline value may be set in terms of SEL or L_{AFmax}, depending on the type and the number of events per night.

2.3 British Standard 4142:2014+A1:2019 (BS 4142:2014+A1:2019)

- 2.3.1 British Standard 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound, sets the methodology for rating and assessing sound of an industrial and commercial nature, which includes sound from fixed installations such as mechanical and electrical plant and equipment.
- 2.3.2 In BS 4142:2014+A1:2019, a noise rating is determined and compared with the existing local background sound level based on several more cumulative acoustic feature corrections to apply where appropriate. For example, if the noise includes a distinguishable tone, impulse, intermittency or other readily distinguishable sound characteristic, then additional cumulative penalties individually ranging from 0 to 9 dB may be applied depending on the type of noise.
- 2.3.3 BS 4142:2014+A1:2019 seeks to determine a “representative” background sound level, stating that “...the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”.
- 2.3.4 The assessment of the impact depends upon the margin by which the rating level of the specific sound source exceeds the background sound level but also promotes a consideration of the context in which the sound occurs when making an assessment. BS 4142:2014+A1:2019 states that an initial estimate of the impact of the specific sound is made by subtracting the measured background sound level from the rating level, while considering the following points:

- Typically, the greater this difference, the greater the magnitude of the impact;

-
- 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 on the 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. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

2.3.5 Therefore, a BS 4142:2014+A1:2019 assessment may deduce a low impact where the specific sound level is below the background sound level.

3 ACOUSTIC SURVEY

3.1 Acoustic Survey Details

- 3.1.1 NoiseAir conducted unattended noise monitoring between 11th July 2025 and 15th July 2025 at the development site.
- 3.1.2 Noise monitoring was undertaken at two monitoring locations (ML1 and ML2), the positions of which are shown in **Figure 4** below.



Figure 4: Approximate noise monitoring location.

- 3.1.3 The noise measurements were made using Class 1, integrating sound level meters (SLMs).
- 3.1.4 The acoustic equipment was calibrated to comply with Section 4.2 of BS 7445-1:2003¹, before and after the noise monitoring periods.
- 3.1.5 Details of the SLMs and associated field calibrations can be found in **Table 2**.

Table 2: Summary of SLMs Used for Survey and Associated Field Calibration						
SLM (Serial No.)	Preamp (Serial No.)	Microphone (Serial No.)	Calibrator (Serial No.)	Start Calibration	End Calibration	Drift
NOR140 (1403328)	NOR1209 (12694)	NOR1225 (72914)	B&K-4231 (2699086)	-26.3	-26.2	0.1 dB
NOR140 (1405677)	NOR1209 (12308)	NOR1225 (33192)		-26.0	-26.0	0.0 dB

¹ BS 7445-2003 "Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.

- 3.1.6 The weather conditions were noted to be as outlined in **Table 3** at the start and end of the monitoring period.

Table 3: Summary of Weather Conditions Noted at the Start and End of the Monitoring Duration		
	11 th July 2025	15 th July 2025
Roads	Dry	Dry
Temperature (°C)	30	17
Wind speed (ms ⁻¹)	1.1 WSW	< 0.5
Cloud Cover (Approx. %)	0	70
Humidity (%)	39	76

3.2 Measured Sound Levels

- 3.2.1 Data is shown in **Figure 5** detailing a level vs time graph of the recorded L_{Amax} , L_{Aeq} and L_{A90} sound levels over 15-minute time periods for the entire measurement duration for ML1.
- 3.2.2 Data is shown in **Figure 6** detailing a level vs time graph of the recorded L_{Amax} , L_{Aeq} and L_{A90} sound levels over 15-minute time periods for the entire measurement duration for ML2.
- 3.2.3 The background sound levels measured at ML2 were impacted by mechanical plant operating during the daytime and part of the night-time as shown within **Figure 6**.
- 3.2.4 The results summary for the monitoring locations during the daytime and night-time periods are presented in **Table 4** below.

Table 4: Average Measured Daytime and Night-time Noise Levels			
Monitoring Location	Time	Measured Noise Level	
		dB $L_{Aeq,16hour}$ / dB $L_{Aeq,8hour}$ / dB $L_{AF(max)}$	dB $L_{Aeq,1hour}$ / dB $L_{Aeq,15mins}$
ML1	07:00-23:00	65.3 – 67.5	60.8 – 72.2
	23:00-07:00	57.5 – 59.2	46.9 – 67.5
	23:00-07:00	77.1*	-
ML2	07:00-23:00	61.1 – 63.1	57.7 – 65.8
	23:00-07:00	53.6 – 55.5	43.6 – 61.0
	23:00-07:00	74.2*	-
* Maximum night-time noise levels exceeded more than 10 times in a single night-time period.			

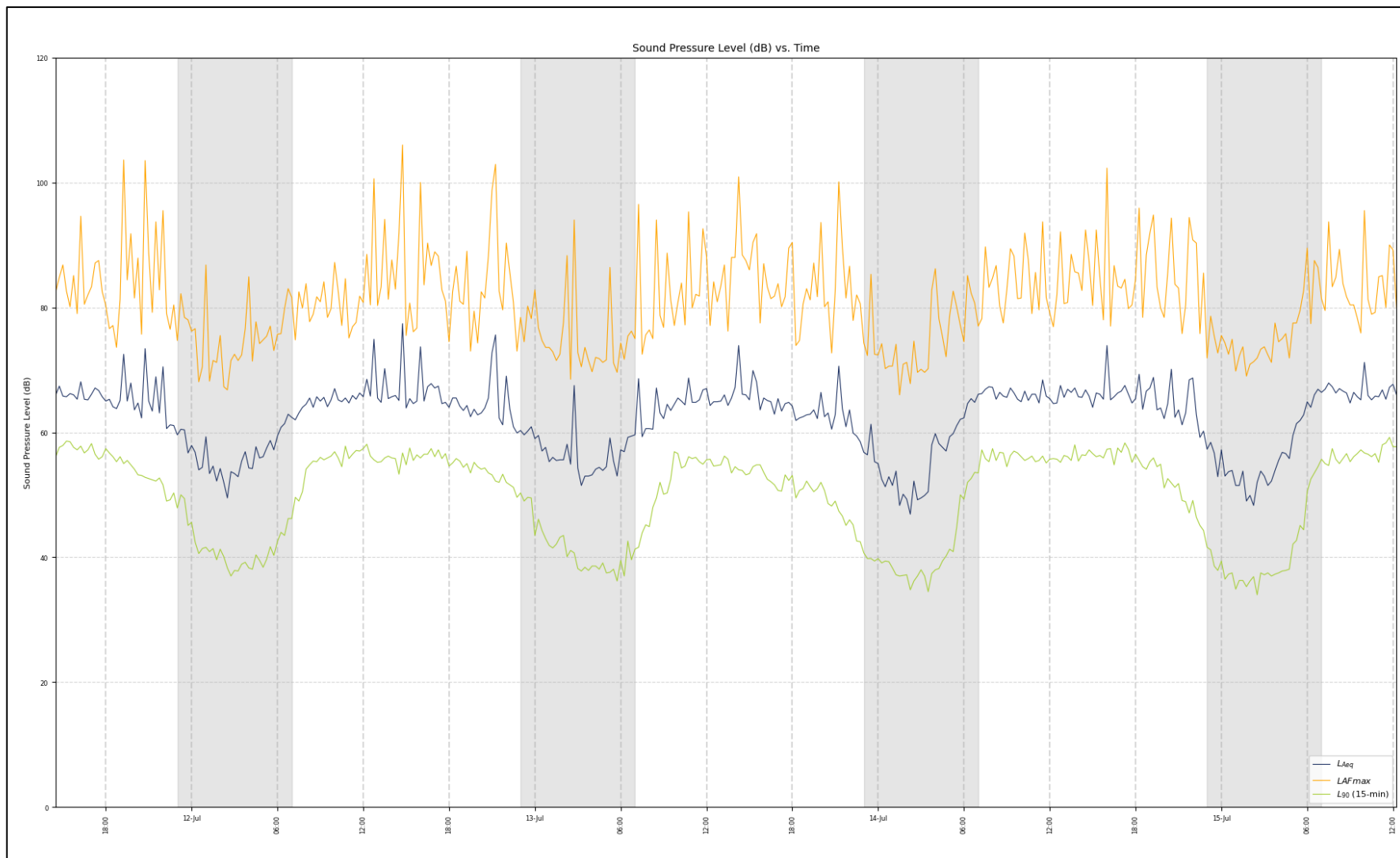


Figure 5: Level vs. time graph showing L_{Amax} , L_{Aeq} and L_{A90} sound levels – ML1.

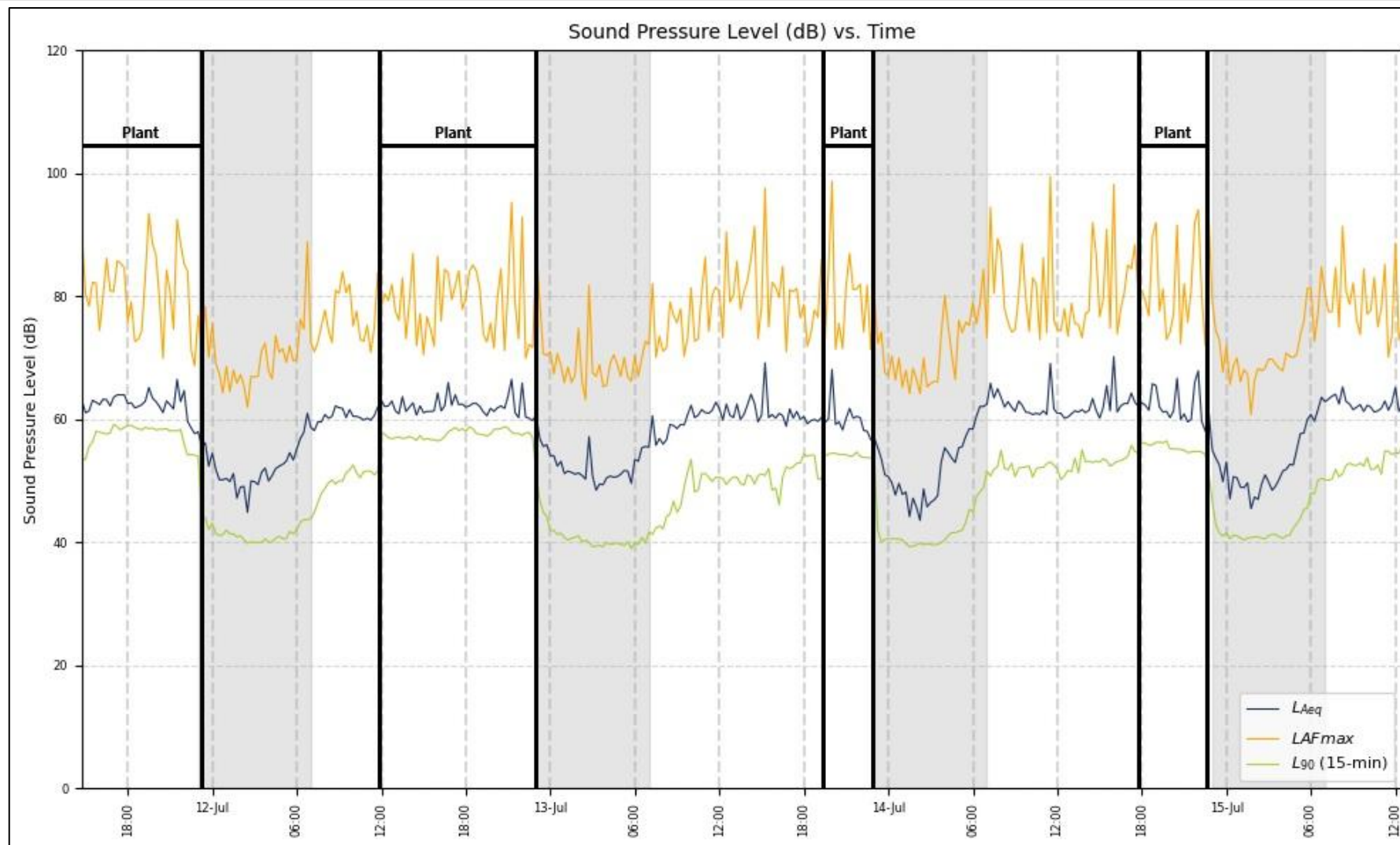


Figure 6: Level vs. time graph showing $L_{A_{max}}$, L_{Aeq} and L_{A90} sound levels – ML2.

3.3 Ambient and Residual Sound Levels

- 3.3.1 The mechanical plant noise emissions from nearby commercial developments, observed within the data set at ML2, is understood to be predominantly from the discharge flue associated with the adjacent restaurant.
- 3.3.2 To determine the potential impact of existing mechanical plant noise emissions upon the future NSRs, the ambient and residual sound levels have been calculated from the data set measured at ML2. These sound levels will then be used to calculate the specific sound level for the assessment.
- 3.3.3 The ambient and residual sound levels adopted for this assessment are presented in **Table 5** below for both the daytime and night-time periods.

Table 5: Ambient and Residual Noise Levels			
Monitoring Location	Period	Measured Noise Level dB $L_{Aeq,1hour}$ / dB $L_{Aeq,15mins}$	
		Ambient	Residual
ML2	07:00-23:00	64 (11 th July 17:00 – 18:00)	61 (14 th July 10:00 – 11:00)
	23:00-07:00	61 (12 th July 23:00 – 23:15)	51 (12 th July 01:30 – 01:45)

3.4 Background Sound Levels

- 3.4.1 The background sound levels measured at ML2 were impacted by existing mechanical plant associated with the south-east adjacent restaurant, however, mechanical plant noise was not distinguishable within the data set measured at ML1. Therefore, the representative background sound levels have been determined from the data set measured at ML2 with identifiable periods of operational plant removed.
- 3.4.2 A histogram showing the distribution of existing $L_{A90,15mins}$ sound levels for the daytime and night-time for ML2 are presented in **Figure 7** and **Figure 8** respectively.

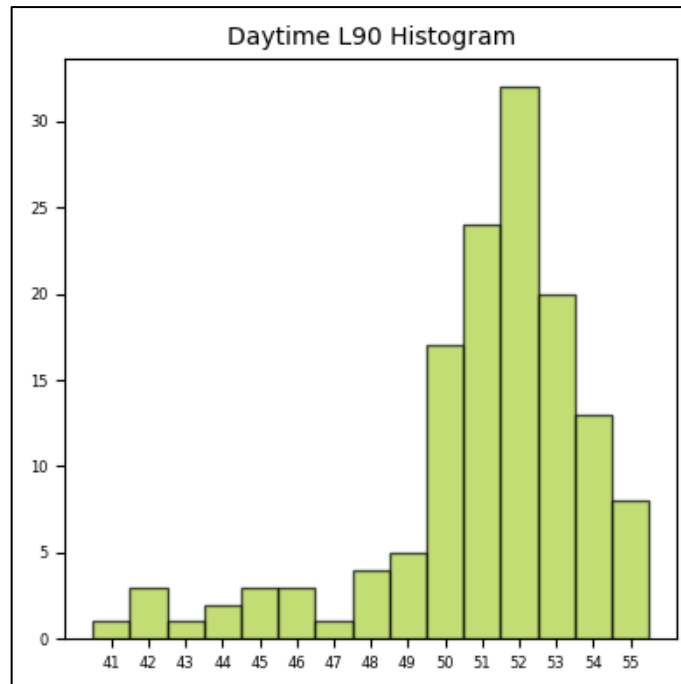


Figure 7: Frequency distribution of $L_{A90,15mins}$ noise readings at ML2 - Daytime.

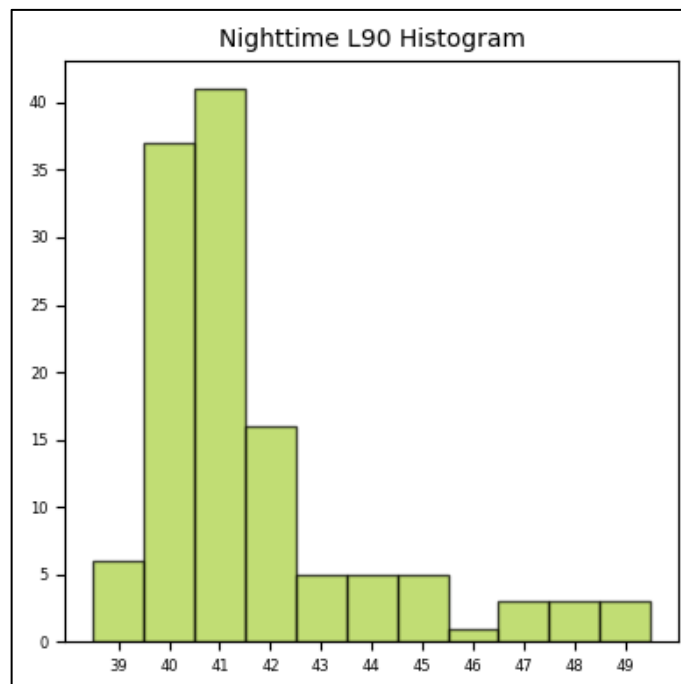


Figure 8: Frequency distribution of $L_{A90,15mins}$ noise readings at ML2 – Night-time.

3.4.3 Conservative background sound levels of 49 dB(A) and 40 dB(A) have been adopted for the daytime and night-time assessments respectively.

4 NOISE IMPACT ASSESSMENT

4.1 Overview

4.1.1 The development site is in close proximity to road traffic noise sources. Therefore, the predicted internal noise levels of the development have been assessed against the criteria stated in BS 8233:2014.

4.2 Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

4.2.1 The development has been divided into two façade zones - Zone 1 and Zone 2 - shown in **Figure 9** below.

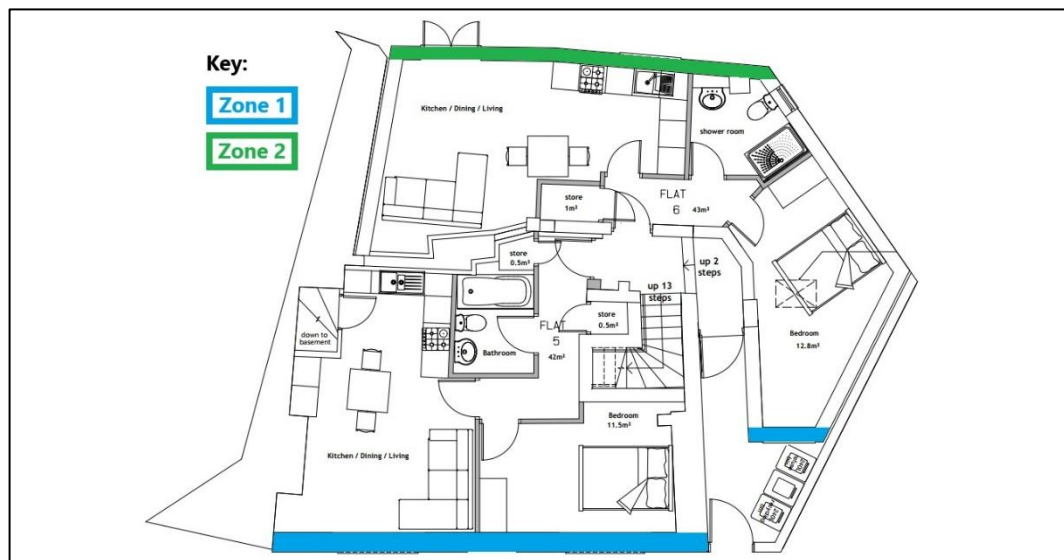


Figure 9: Image showing façade zones across development site.

4.2.2 The predicted noise levels at the façades of the proposed building structures, for the daytime and night-time period, together with the level of attenuation required in accordance with BS 8233:2014, are presented in **Table 6**.

Façade	Daytime ($L_{Aeq,16hours}$) / Night-Time ($L_{Aeq,8hours}$ / L_{Amax})	Worst Case Noise Level at the Façade of the Property (dB(A))	BS 8233:2014 Target Internal Level (dB(A))	Worst Case Level of Attenuation Required (dB(A))
Zone 1	Daytime $L_{Aeq,16hours}$	68	35	33
	Night-Time $L_{Aeq,8hours}$	59	30	29
	Night-Time L_{Amax}	77	45	32
Zone 2	Daytime $L_{Aeq,16hours}$	63	35	28
	Night-Time $L_{Aeq,8hours}$	56	30	26
	Night-Time L_{Amax}	74	45	29

4.3 Building Envelope Performance – Windows Open

- 4.3.1 With windows open, the attenuation provided by the façade will be approximately 10-15 dB(A). Given the incident noise levels, the noise level break-in at the development site facades would likely result in the recommended internal noise limit being exceeded in most rooms at the development during certain parts of a typical day/ night. It is therefore considered that acceptable noise levels within habitable rooms to all facades will rely on windows being in the closed position. This is typical of most development near transport noise sources.
- 4.3.2 The sound performance requirements for bedrooms, living and dining rooms at the development during the daytime and night-time in rooms with windows closed are summarised in Section 5.1 of this report.
- 4.3.3 Requirements for a sound insulation scheme are presented in **Section 6**. However, in this assessment the impact of plant noise also influences the sound insulation scheme, so the following section of this report presents a BS 4142 assessment prior to determining a sound insulation scheme.
- 4.3.4 It must be noted that any ventilation requirements are to be designed by others and comply with the requirements of Approved Document F.

4.4 BS 4142:2014+A1:2019 Assessment for Existing Mechanical Plant Noise Emission

- 4.4.1 At the time of writing, there exists – in the immediate vicinity of the development site – mechanical plant which has the potential to cause adverse impact upon the future residents. It is therefore considered that a BS 4142:2014+A1:2019 assessment should be undertaken.

Specific Sound Level

- 4.4.2 The specific sound level for the daytime and night-time has been calculated as 61 dB(A) based upon the measured ambient and residual sound levels detailed in **Table 5**.

Background Sound Level

- 4.4.3 Background sound levels of 49 dB(A) and 40 dB(A) have been adopted for the daytime and night-time respectively.

Character Corrections

- 4.4.4 Based upon observations from the measurement data, the following character corrections have been applied:

- **Tonality** – Tonal components were observed in the low-mid frequency bands within the measurement data. Therefore, a +4 dB correction has been applied for clearly perceptible tones.
- **Impulsivity** – Noise emissions from mechanical plant were not noted to contain any impulsive component, therefore no correction for impulsivity has been applied; and,
- **Intermittency** – The noise emissions from mechanical plant were not noted to have intermittent characteristics, therefore no correction for intermittency has been applied.

BS 4142:2014+A1:2019 Initial Assessment

- 4.4.5 A BS 4142:2014+A1:2019 assessment is presented in **Table 7** to determine the potential impact level of noise emission from the existing mechanical plant.

Table 7: BS 4142:2014+A1:2019 Assessment to Determine the Likelihood of Adverse Impacts at the Future Residential Receptors		
Quantity	Sound Level dB(A)	
	Daytime	Night-time
Typical Background Sound Level, dB L _{A90}	49	40
Specific Sound Level	61	
Acoustic feature correction for Tonality	+4	
Rating Level	65	
Excess of Rating Level over Background Sound Level	+16	+25
Initial Impact	Significant Adverse (without context)	

BS 4142:2014+A1:2019 Assessment and Context

- 4.4.6 The initial assessment indicates that during the daytime and night-time periods, the excess of rating level above the existing background sound level is likely to be +16 dB(A) and +25 dB(A) respectively. The initial assessment therefore indicates that during the daytime and night-time, a significant adverse impact is likely at the worst affected future NSR (habitable rooms along the south-western façade).
- 4.4.7 The context of the assessment is the proposed residential conversion of the ground floor of an existing public house located within a mixed-use area of Hinckley Town Centre, surrounded by road traffic, commercial and mechanical plant noise sources.
- 4.4.8 When considering absolute levels, given the proximity to a main town centre thoroughfare, the typical residual daytime sound levels measured at the worst affected future NSR are

between 58 dB(A) – 66 dB(A) ($L_{Aeq,1hour}$). In comparison, the worst-case specific sound level calculated is 61 dB(A). While the character of the noise would likely be identifiable, the magnitude of the specific sound level is low and the sound level increase while the mechanical plant is operational is likely to be non-perceptible at the worst affected future NSR.

- 4.4.9 Where noise levels calculated at the façades are elevated and internal ambient sound levels will be reliant on windows being in the closed position, the resident is typically subject to the full acoustic sound insulation offered by the building envelope. For residential developments, the building envelope can typically be designed to minimise noise break in and reduce the internal noise levels. This can form part of the context of a BS 4142:2014+A1:2019 assessment.
- 4.4.10 However, the internal noise criteria as detailed in BS 8233:2014 is for noise without character such as road traffic noise. The character associated with the mechanical plant noise has been established to contain tonal characteristics, for which BS 8233:2014 states lower internal criteria may need to be achieved.
- 4.4.11 The provision of mechanical ventilation, cooling measures to reduce the need to open windows and uprated façade and glazing performance for habitable rooms along the south-western facade, can help to control the estimated impact and reduce the distinguishability of noise characteristics internally.
- 4.4.12 With a minimum glazing performance of 37 dB R_w+C_{tr} , and mechanical ventilation, the likely internal noise level would reduce from 61 dB to approximately 24 dB with some acoustically distinguishing characteristics indoors. This may be appropriate given that it would represent a 'lower target' for noise with some character when compared with BS 8233:2014 guidance for internal noise levels.
- 4.4.13 When viewed in the context of sleep purposes, given that the extract does not operate for most of the night-time, this would mean an internal noise level of approximately 24 dB with some acoustically distinguishing characteristics for approximately the first 30 mins of the night-time period with no internal plant noise for the majority of the night-time period, including the waking hours of the morning.
- 4.4.14 The noise impact to the external façade is unlikely to reduce to low but could be reduced to 'adverse' and be interpreted to be between LOAEL and SOAEL. It would be reasonable to consider that the applicant would have taken all reasonable steps to mitigate and minimise noise at the south-western facade.

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- 4.4.15 To the external façade, the noise impact is likely to be adverse during the daytime and night-time periods with windows partially open. However, in light of the contextual considerations, when considering the internal noise levels with windows closed and the provision of system 4 MVHR, the internal noise impact during the daytime and night-time periods is likely to be low.

Uncertainty

- 4.4.16 Uncertainty of measurements can have a significant effect on the outcome and findings of an assessment and therefore such constraints are documented and discussed below.
- 4.4.17 The SLM used was a Norsonic Class 1 SLM's, it is generally recognised that Class 1 SLM's offer an uncertainty of ± 1.0 dB. The instrumentation used for the survey has been calibrated by UKAS approved laboratories.
- 4.4.18 The sound levels measured (which include busier and quieter periods) are considered typical for an urban area.
- 4.4.19 Wind speeds during the survey visits were typically less than 5 ms^{-1} and the effect of wind generated noise is not considered to have a significant impact on this assessment.
- 4.4.20 The specific noise level and therefore rated noise levels have been calculated based upon measured data.
- 4.4.21 It is therefore considered that, in this instance, the uncertainty of the calculations is likely to have minimal influence on the outcome of the assessment.

5 SOUND INSULATION SCHEME

5.1 Building Envelope Requirements – Windows Closed

- 5.1.1 Proposals for the development site at the time of writing outline residential use with noise sensitive rooms proposed to all facades of the property. Therefore, internal noise levels are required to not exceed 35 dB L_{Aeq} during the daytime hours in all rooms and 30 dB L_{Aeq} and 45 dB L_{Amax} during the night-time hours in bedrooms. Internal noise levels arising from mechanical plant should comply with lower limits.
- 5.1.2 When assessing sound levels in habitable areas of the proposed development, the sound attenuation provided by the overall building facade should be considered. To mitigate sound levels, the composition of the building facade can be designed to provide the level of attenuation required. Glazing is generally the building element which attenuates noise the least, so the proportion of glazing in a building facade is an important consideration when assessing overall sound attenuation. Additionally, any façade penetrations should also be considered such as for ventilation, e.g., trickle ventilation.
- 5.1.3 Based on the design details forwarded, worst case façade attenuation calculations have been undertaken in accordance with BS EN ISO 12354-3:2017.
- 5.1.4 Given that a minimum glazing performance of 37 dB R_w+C_{tr} and use of mechanical ventilation is recommended for all habitable rooms along the south-western façade of the development, calculations assuming passive and active ventilation strategies for the relevant facades have been undertaken and a summary of the proposed elements presented in **Table 8**.

Façade	Ventilation Strategy	Room Type	Wall R_w+C_{tr} (dB)	Glazing R_w+C_{tr} (dB)	Ventilation $D_{n,e,w}+C_{tr}$
Zone 1	Passive	Living Room	50	37	42
		Bedroom	50	41	50
	Active	Living Room	50	35	-
		Bedroom	50	37	-
Zone 2	Active	All	50	37	-
Note: If a greater mm ² EA is required then the acoustic ventilation performance will have to increase, or mechanical ventilation may be more appropriate.					

- 5.1.5 We would recommend that any mechanical ventilation system is ducted to the north-eastern or north-western façades, away from the nearby mechanical plant.

- 5.1.6 It should be noted that the acoustic performance values stated are for guidance and based on information provided at the time of writing. Changes to location, size and orientation of rooms/ facades can have impacts on the calculated internal noise levels and subsequently the required acoustic performance criteria.
- 5.1.7 The ventilation performance specified is a cumulative performance value for the room where passive ventilation is used. For the living room, 2 trickle ventilators have been assumed per room. For the bedroom, 1 acoustic wall ventilator has been assumed.
- 5.1.8 The final specification needs to comply with Approved Document F and will need to be checked by a qualified and competent acoustic consultant to ensure it meets the design requirements for noise. As a general rule of thumb, if the number of ventilators (or ventilated area) in a room doubles, the cumulative ventilator performance will decrease by 3 dB. Inversely, if the number of ventilators (or ventilated area) in a room halves, the cumulative ventilator performance will increase by 3 dB.
- 5.1.9 **Table 9** below provides a typical example summary for each element type outlined in **Table 8** and **Table 9** above.

Table 9: Summary of Building Element Type Typical Examples		
Element Type	Acoustic Performance	Typical Example
Wall	50 dB R_w+C_{tr}	Concrete / Brick exterior wall with min. 100 mm insulated (60 kg / m ³ rockwool) cavity constructed with timber studwork and resilient bars with min. 10 mm plasterboard lining
Window	Up to 35 dB R_w+C_{tr}	10.8mm Pilkington Optilam Phon
Window	Up to 37 dB R_w+C_{tr}	12.8mm Pilkington Optilam Phon
Window	Up to 41 dB R_w+C_{tr}	16.8 mm Pilkington Optiphon™ pane : 6-20 mm air gap : 16.8 mm Pilkington Optiphon™ pane
Acoustic Slot Vent (Window)	Up to 42 dB $D_{n,e,w} + C_{tr}$	Greenwood 2500EAW.AC2
Acoustic Slot Vent (Wall)	Up to 50 dB $D_{n,e,w} + C_{tr}$	Titon Sonair F+ (G2 Filter)

- 5.1.10 It should be noted that the examples provided in **Table 9** are for guidance only, however any adopted solution must achieve the acoustic performance values presented in **Table 8**.

- 5.1.11 The glazing elements outlined in **Table 8** are based on the performance of the glazing panes only. Advice should be sought from the manufacturer at detailed design stage to ensure that the window framing does not undermine the overall performance requirement recommended.
- 5.1.12 The building envelope final design should be confirmed through detailed design at the appropriate stage including the consultation of specialist manufacturers to confirm individual building element performance.

5.2 Ventilation Requirements

- 5.2.1 It is recommended that the acoustic ventilation proposed at the site should, as a minimum, comply with Building Regulations Approved Document F1 2021 Means of Ventilation and British Standard BS5925 1991: "Code of Practice for Ventilation Principles and Designing for Natural Ventilation". Acoustic ventilation is only recommended for noise sensitive rooms, which are bedrooms and living/dining rooms.
- 5.2.2 The implementation of the recommended glazing would ensure that the required internal daytime and night-time noise limits are achieved.
- 5.2.3 It should be further noted that the glazing configurations within this report are for guidance only. Similar products to those used in NoiseAir calculations may achieve a similar level of sound reduction, however this should be verified by the manufacturer.
- 5.2.4 As detailed in Section 4.3, it is likely that noise levels in the noise sensitive rooms of the proposed dwelling will likely rely on the windows being in the closed position and therefore appropriate ventilation design should be completed.
- 5.2.5 This report recommends the use of an active ventilation system for habitable rooms located along the south-western façade due to the impact of external plant noise.
- 5.2.6 Consideration could also be given to the inclusion of an active ventilation system for habitable rooms located along the north-eastern façade, however, as demonstrated in **Table 8**, adequate internal noise levels can be achieved with passive ventilation.
- 5.2.7 Where a passive ventilation system is incorporated into the design, ventilators should be acoustically treated for habitable rooms to all facades.
- 5.2.8 Mechanical ventilation adopted for noise sensitive rooms should have a noise output which complies with NR20 noise rating curve.

6 CONCLUSIONS

6.1 Overview

- 6.1.1 By instruction from Mr Shane West, NoiseAir was commissioned to undertake a NIA in order to discharge planning condition 3 for a conditionally approved residential conversion at the location: Dog and Gun Inn, 28 The Borough, Hinckley, Leicestershire LE10 1NL.
- 6.1.2 Proposals for the development site outline the conversion of the ground floor public house into 2 no. self-contained one-bedroom flats with associated refuse/recycling facilities.
- 6.1.3 Unattended noise monitoring was conducted at the development site between 11th July 2025 and 15th July 2025.

6.2 Conclusions

- 6.2.1 A BS 4142:2014 assessment has been undertaken considering noise breakout from the existing mechanical plant during the daytime and night-time. The initial assessment indicates a significant adverse impact is likely.
- 6.2.2 In light of contextual considerations, the noise impact at the external façade is likely to reduce to adverse with windows partially open. However, with the inclusion of a minimum glazing performance of 37 dB R_w+C_{tr} , and mechanical ventilation for habitable rooms along the south-western façade, with windows closed, the noise impact on internal noise levels during the daytime and night-time periods is likely to be low.
- 6.2.3 Calculations show that to achieve a reasonable internal acoustic environment in habitable rooms as specified within BS 8233:2014, the building envelope constructions should be selected to meet the sound reduction index (SRI) values presented in **Table 8**.
- 6.2.4 With windows open, the recommended internal noise limit is likely to be exceeded within the development site and alternative ventilation will be required. Mechanical ventilation is recommended for habitable rooms along the south-western façade and could be considered for the north-eastern façade. However, a passive ventilation strategy would be suitable for achieving the required internal noise levels along the north-eastern façade provided that the ventilation complies with the performance requirements set out in this report.
- 6.2.5 Given the levels at the proposed development exceed the external levels detailed in Approved Document O and acceptable internal noise levels will likely rely on windows being closed, dynamic thermal modelling is required for the development site and the windows will need to be considered as closed within any overheating assessment.

APPENDIX A - REPORT LIMITATIONS

This Report is presented to Mr Shane West and may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this report.

Notwithstanding anything to the contrary contained in the report, NoiseAir Limited is obliged to exercise reasonable skill, care and diligence in the performance of the services required by Mr Shane West and NoiseAir shall not be liable except to the extent that it has failed to exercise reasonable skill, care and diligence, and this report shall be read and construed accordingly.

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The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from who it has been requested and that such information is accurate. Information obtained by NoiseAir Limited has not been independently verified by NoiseAir Limited unless otherwise stated in the report and should be treated accordingly.

Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

Where / if estimates and projects are made within this report, are made based on reasonable assumptions as of the date of this report, such statements however by their very nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. NoiseAir Limited specifically does not guarantee or warrant any estimates or projects contained in this report.

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APPENDIX B - GLOSSARY

A-weighted sound pressure, p_A	Value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network. <i>NOTE: The A-weighting network modifies the electrical response of a sound level meter with frequency in approximately the same way as the sensitivity of the human hearing system.</i>
A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure in decibels (dBA).
Acoustic environment	Sound from all sound sources as modified by the environment [BS ISO 12913-1:2013].
Ambient sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. <i>NOTE: The ambient sound comprises the residual sound and the specific sound when present.</i>
Ambient sound level, $L_a = L_{Aeq,T}$ (BS 4142:2014 +A1:2019)	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 <i>NOTE: The ambient sound level is a measure of the residual sound and the specific sound when present.</i>
Background sound	Underlying level of sound over a period, T, which might in part be an indication of relative quietness at a given location.
Background sound level, $L_{A90,T}$ (BS 4142:2014 +A1:2019)	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.
Break-in	Noise transmission into a structure from outside.
Break-out	Noise transmission from inside a structure to the outside.
Cross-talk	Noise transmission between one room and another room or space via a duct or other path.
C_{tr}	Correction term applied against the sound insulation single-number values (R_w , D_w , and $D_{nT,w}$) to provide a weighting against low frequency performance. <i>NOTE: The reference values used within the C_{tr} calculation are based on urban traffic noise.</i>
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, T, has the same mean-squared sound pressure as the sound under consideration that varies with time.
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ (BS 4142:2014 +A1:2019)	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.
Equivalent sound absorption area of a room, A	Hypothetical area of a totally absorbing surface without diffraction effects, expressed in square metres (m ²), which, if it were the only absorbing element in the room, would give the same reverberation time as the room under consideration
Facade level	Sound pressure level 1 m in front of the façade. <i>NOTE: Facade level measurements of L_{pA} are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the facade.</i>
Free-field level	Sound pressure level away from reflecting surfaces. <i>NOTE: Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e., not 3.5 m from the reflecting surface in the direction of the</i>

	<i>source). Estimates of noise from aircraft overhead usually include a correction of 2 dB to allow for reflections from the ground.</i>
Impact sound pressure level, L_i	Average sound pressure level in a specific frequency band in a room below a floor when it is excited by a standard tapping machine or equivalent.
Indoor ambient noise	Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants. <i>NOTE: The location(s) within the room at which the ambient indoor noise is to be measured or calculated ought to be considered.</i>
Measurement time interval, T_m (BS 4142:2014 +A1:2019)	Total time over which measurements are taken. <i>NOTE: This may consist of the sum of a number of non-contiguous, short-term measurement time intervals.</i>
Noise criteria	Numerical indices used to define design goals in a given space.
Noise rating, NR	Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves.
Normalised impact sound pressure level, L_n	Impact sound pressure level normalized for a standard absorption area in the receiving room. <i>NOTE: Normalised impact sound pressure level is usually used to characterize the insulation of a floor in a laboratory against impact sound in a stated frequency band.</i>
Octave band	Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.
Percentile level, $L_{AN,T}$	A-weighted sound pressure level obtained using time-weighting "F", which is exceeded for N% of a specified time interval.
Reference time interval, T_r (BS 4142:2014 +A1:2019)	Specified interval over which the specific sound level is determined. <i>NOTE: This is 1 h during the day from 07:00 h to 23:00 h and a shorter period of 15 min at night from 23:00 h to 07:00 h.</i>
Residual sound (BS 4142:2014 +A1:2019)	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, $L_r = L_{Aeq,T}$ (BS 4142:2014 +A1:2019)	Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T.
Rating level, L_{A,r,T_r}	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise. <i>NOTE: This is used in BS 7445 and BS 4142 for rating industrial noise, where the noise is the specific noise from the source under investigation.</i>
Reverberation time, T	Time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped.
Sound exposure level, L_{AE}	Level of a sound, of 1 s duration, that has the same sound energy as the actual noise event considered.
Sound level difference, D	Difference between the sound pressure level in the source room and the sound pressure level in the receiving room.
Sound pressure, p	Root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound.

Sound pressure level, L_p	Quantity of sound pressure, in decibels (dB).
Sound reduction index, R	Laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.
Specific sound level, $L_s = L_{Aeq,Tr}$ (BS 4142:2014 +A1:2019)	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .
Specific sound source (BS 4142:2014 +A1:2019)	Sound source being assessed.
Standardised impact sound pressure level, L_{nT}	Impact sound pressure level normalized to a reverberation time in the receiving room of 0.5 s.
Standardised level difference, D_{nT}	Difference in sound level between a pair of rooms, in a stated frequency band, normalized to a reference reverberation time of 0.5 s for dwellings.
Groundborne noise	Audible noise caused by the vibration of elements of a structure, for which the vibration propagation path from the source is partially or wholly through the ground. <i>NOTE Common sources of ground-borne noise include railways and heavy construction work on adjacent construction sites.</i>
Structure-borne noise	Audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements. <i>NOTE Common sources of structure-borne noise include building services plant, manufacturing machinery and construction or demolition of the structure.</i>
Third octave band	Band of frequencies in which the upper limit of the band is 2% times the frequency of the lower limit.
Weighted level difference, D_w	Single-number quantity that characterizes airborne sound insulation between rooms, but which is not adjusted to reference conditions. <i>NOTE Weighted level difference is used to characterize the insulation between rooms in a building as they are. Values cannot normally be compared with measurements made under other conditions (see BS EN ISO 717-1).</i>
Weighted normalised impact sound pressure level, $L'_{n,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted sound reduction index, R_w	Single-number quantity which characterizes the airborne sound insulating properties of a material or
Weighted standardised impact sound pressure level $L'_{nT,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted standardised level difference, $D_{nT,w}$	Single-number quantity that characterizes the airborne sound insulation between rooms.

Symbols

D_w	Weighted level difference (dB)
D_{nT}	Standardized level difference (dB)
$D_{nT,w}$	Weighted standardized level difference (dB)
L_{Amax}	Maximum noise level (dB)
$L_{Ar,Tr}$	Rating level (dB)
L_n	Normalised impact sound pressure level (dB)
L'_{nT}	Standardised impact sound pressure level (dB)
$L'_{nT,w}$	Weighted standardised impact sound pressure level (dB)
$L'_{n,w}$	Weighted normalised impact sound pressure level (dB)
L_p	Sound pressure level (dB)
L_{pA}	A-weighted sound pressure level (dB)
$L_{AN,T}$	Percentile level (dB)
L_{AE}	Sound exposure level (dB)
$L_{Aeq,T}$	Equivalent continuous A-weighted sound pressure level (dB)
p	Sound pressure (Pa)
p_A	A-weighted sound pressure (dB)
$p_{A(t)}$	Instantaneous A-weighted sound pressure (Pa)

R	Sound reduction index (dB)
R_w	Weighted sound reduction index (dB)
T	Time interval (also used for reverberation time) (s)
t_0	Reference time interval (s)

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