
MR. ADRIAN JONES

NOISE IMPACT ASSESSMENT REPORT

35 - 39 BRIDGE STREET, WREXHAM LL13 7DD.

Client: Mr Adrian Jones.

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CONTENTS

1	INTRODUCTION	1
2	ASSESSMENT METHODOLOGY AND SCOPE OF WORKS.....	2
3	ACOUSTIC SURVEY	9
4	3D SOUND MODEL.....	16
5	TAN 11 NOISE EXPOSURE CATEGORY ASSESSMENT.....	19
6	BS 8233:2014 ASSESSMENT	20
7	SOUND INSULATION SCHEME	24
8	CONCLUSIONS	26

APPENDICES

APPENDIX A - REPORT LIMITATIONS

APPENDIX B – METER READINGS

APPENDIX C – 3D SOUND MODEL – NOISE CONTOURS

APPENDIX D - GLOSSARY

1 INTRODUCTION

- 1.1.1 By instruction from Mr. Adrian Jones ('the client') NoiseAir was commissioned to conduct a noise impact assessment (NIA) to accompany a planning application (Ref: P/2022/1020) at the location: 35 – 39 Bridge Street, Wrexham LL13 7DD, herein referred to as the 'proposed development site'.
- 1.1.2 The proposals have the potential to subject future occupants to adverse noise impacts and as such, a noise impact assessment has been requested by the Local Planning Authority (LPA) to accompany the application.
- 1.1.3 This noise report has been prepared to accompany a planning application and assesses the results of a noise survey carried out in accordance with current guidance and includes recommendations and mitigation as appropriate.
- 1.1.4 General limitations with respect to this NIA are presented in **Appendix A**.

1.2 Site Description

- 1.2.1 At the time of writing, it is understood that the proposed development is a former commercial premises, located within the jurisdiction of Wrexham County Borough Council.
- 1.2.2 The site is located adjacent to Bridge Street, which accommodates regular traffic flow and is considered the dominant source of noise.
- 1.2.3 The area surrounding the proposed development site is described as mixed commercial/residential.
- 1.2.4 The closest commercial premises in relation to the proposed development site are Identified as an off-licence and vehicle tyre garage to the opposite (north-west) side of Bridge Street, as well as a public house to the south-side of Chapel Street, which is understood to now be permanently closed.
- 1.2.5 Residential accommodation exists directly to the rear of the proposed development site and directly behind the aforementioned off-licence.
- 1.2.6 **Figure 1** presents an aerial photograph of the proposed development site with respect to the local area and its context.

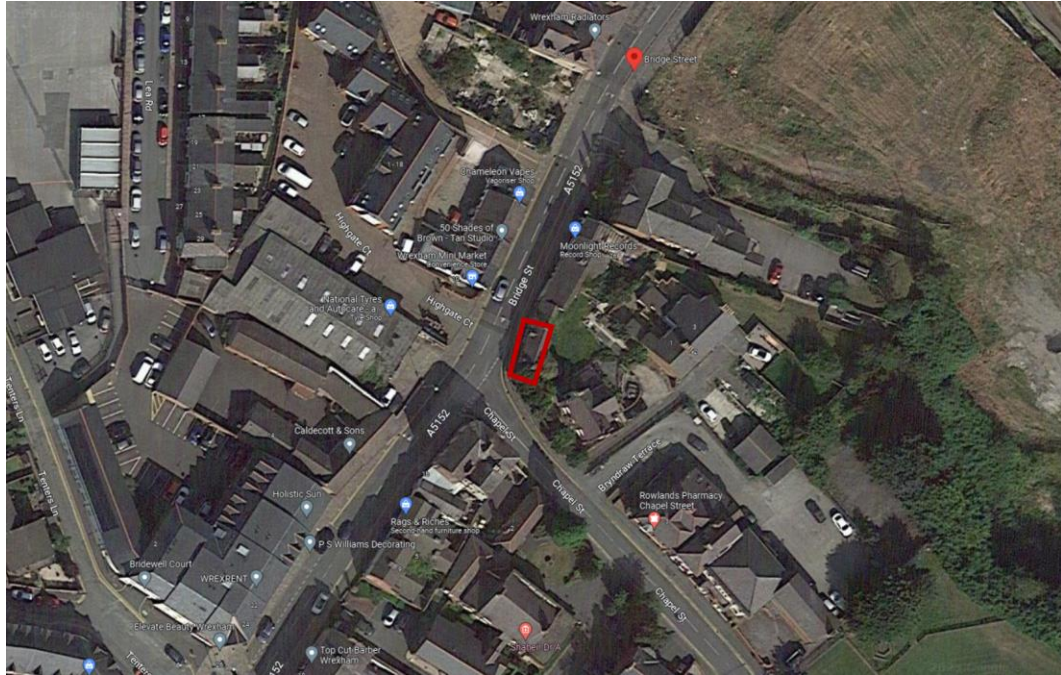


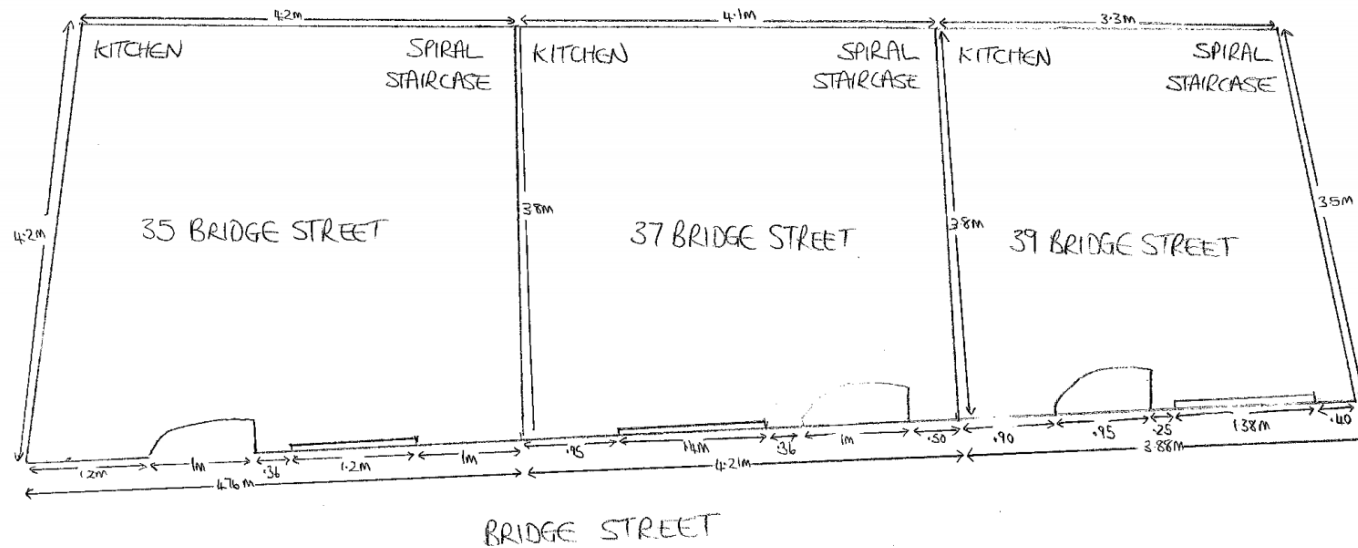
Figure 1: Site aerial photograph.

1.3 Proposed Development

1.3.1 At the time of writing, client proposals are for:

“Renovation of Properties to Residential Use.”

1.3.2 It is understood that a suite of drawings is to accompany the planning application, however, for reference the proposed ground floor plan (provided at the time of writing) is presented below within **Figure 2**.



GROUND FLOOR

SCALE 1:150

Figure 2: Proposed Ground-Floor Plan

2 ASSESSMENT METHODOLOGY AND SCOPE OF WORKS

2.1 Planning Guidance and Noise

2.1.1 This acoustic report has been prepared to accompany a planning application and therefore it is considered that reference should be made to the appropriate planning guidance documentation, specifically:

- Planning Policy Wales – Edition 10 (PPW), 2018; and,
- Planning Guidance (Wales) – Technical Advice Note 11 – Noise (TAN11), 1997.

2.1.2 A summary of the relevant planning documentation and its relevance with respect to noise is provided below.

2.2 Planning Policy Wales [PPW 2018]

2.2.1 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales.

2.2.2 The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales, as required by the Planning (Wales) Act 2015, the Well-being of Future Generations (Wales) Act 2015 and other key legislation.

2.2.3 Section 6.7 of the PPW outlines planning policy with respect to Air Quality and Noise. PPW outlines that the planning system should maximise its contribution to achieving the well-being goals, and in particular a healthier Wales, by aiming to reduce average population exposure to air and noise pollution alongside action to tackle high pollution hotspots. In doing so, it should consider the long-term effects of current and predicted levels of air and noise pollution on individuals, society and the environment and identify and pursue any opportunities to reduce, or at least, minimise population exposure to air and noise pollution, and improve soundscapes, where it is practical and feasible to do so.

2.2.4 PPW also aligns with the agent of change principle which says that a business or person responsible for introducing a change is responsible for managing that change. In practice, for example, this means a developer would have to ensure that solutions to address air quality or noise from nearby pre-existing infrastructure, businesses or venues can be found and implemented as part of ensuring development is acceptable.

2.2.5 In proposing new development, planning authorities and developers must, therefore:

- address any implication arising as a result of its association with, or location within, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors
- not create areas of poor air quality or inappropriate soundscape; and
- seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes.

2.2.6 Furthermore, PPW states that the potential impacts of noise pollution arising from existing development (be this commercial, industrial, transport related or cultural venues i.e. music venues, theatres or arts centres), must be fully considered to ensure the effects on new development can be adequately controlled to safeguard amenity. Any necessary measures and controls should be incorporated as part of the proposed new development. This will help to prevent the risk of restrictions or possible closure of existing premises or adverse impacts on transport infrastructure due to noise and other complaints from occupiers of new developments. It will be important that the most appropriate level of information is provided and assessment undertaken.

Technical Advice Note (Wales) – Noise [TAN 11 1997]

2.2.7 TAN 11 was introduced in 1997 and sets out guidance on the assessment of noise in Wales. It should be noted however that this document is currently under review.

2.2.8 TAN 11 sets out a series of Noise Exposure Categories (NECs) which have been derived to assist local planning authorities in their consideration of planning applications for residential development near transport related noise sources. The NECs are set out in Annex A of TAN 11.

2.2.9 Measures introduced to control the source of, or limit exposure to, noise should be proportionate and reasonable, and may include:

- engineering: reduction of noise at point of generation (e.g., using quiet machines and/or quiet methods of working); containment of noise generated (e.g., insulating buildings which house machinery and/or providing purpose-built barriers around sites); protection of surrounding noise-sensitive buildings (e.g., improving sound insulation in these buildings and/or screening them by purpose-built barriers);
- layout: adequate distance between noise source and noise-sensitive building or area; screening by natural barriers, other buildings, or non-critical rooms in a building;

- administrative: limiting operating time of noise source; restricting activities allowed on the site; specifying an acceptable noise limit.

2.2.10 TAN 11 states the following regarding noise exposure categories for dwellings:

*“When assessing a proposal for residential development near a source of noise, local planning authorities should determine into which of the four noise exposure categories (NECs) (**Table 1**) the proposed site falls, taking account of both day and night-time noise levels. Local planning authorities should then have regard to the advice in the appropriate NEC, as below:“*

Table 1: TAN 11 Noise Exposure Categories	
Category	
A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example, because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

2.2.11 TAN 11 goes on to provide recommended noise exposure categories for new dwellings near existing noise sources. These are reproduced in **Table 2** below.

Table 2: Recommended Noise Exposure Categories for New Dwellings Near Existing Noise Sources

Noise Source	Noise Exposure Category			
	A	B	C	D
Road Traffic: 0700-2300 2300-0700	<55 <45	55-63 45-57	63-72 57-66	>72 >66
Rail Traffic: 0700-2300 2300-0700	<55 <45	55-66 45-59	66-74 59-66	>74 >66
Air Traffic: 0700-2300 2300-0700	<57 <48	57-66 45-57	66-72 57-66	>72 >66
Mixed Sources: 0700-2300 2300-0700	<55 <45	55-63 45-57	63-72 57-66	>72 >66

- 2.2.12 Annex B of TAN 11 outlines guidance of assessment of noise from different sources. When considering noise from industrial and commercial developments TAN 11 outlines the following guidance.
- 2.2.13 The likelihood of complaints about noise from industrial development can be assessed, where the Standard is appropriate, using guidance in BS 4142: 1990. Tonal or impulsive characteristics of the noise are likely to increase the scope for complaints and this is taken into account by the "rating level" defined in BS 4142. This "rating level" should be used when stipulating the level of noise that can be permitted. The likelihood of complaints is indicated by the difference between the noise from the new development (expressed in terms of the rating level) and the existing background noise. The Standard states that, 'A difference of around 10 dB or higher indicates that complaints are likely. A difference of around 5 dB is of marginal significance'. Since background noise levels vary throughout a 24 hour period it will usually be necessary to assess the acceptability of noise levels for separate periods (e.g., day and night) chosen to suit the hours of operation of the proposed development. Similar considerations apply to developments that will emit significant noise at the weekend as well as during the week. In addition, general guidance on acceptable noise levels within buildings can be found in BS 8233:1987
- 2.2.14 It should be noted that the British standard documents referenced in TAN 11 have been superseded, specifically BS 4142:2014 the latest main issue being in 2014, BS 4142:2014 is therefore considered the appropriate assessment document for assessment of noise from commercial and industrial sites.

2.3 Consultation and Scope of Works

2.3.1 Potential noise impact along with the general principles regarding assessment have been reviewed by NoiseAir and as such, this NIA provides information relevant to the local planning authority (LPA) and their consultees to inform the decision making process regarding the associated planning application.

2.3.2 Prior to conducting the survey, LPA memorandum comments were provided directly by the client and are reproduced below:

“Due to the presence of commercial properties such as, but not limited to, garages, night clubs and pubs near to the proposal, this section is unable to make any recommendation without an noise assessment. The noise survey shall determine noise levels for both Day (07:00 – 23:00 hours) and Night (23:00 – 07:00 hours), having regard to Planning Policy Wales (PPW) guidance, Technical Advice Note (TAN) 11 – Noise. The report of the noise survey findings shall include: a) Noise levels arising from day / night time activities in the vicinity of the proposed development site and the impact upon the proposed accommodation, and b) A detailed scheme of noise insulation and / or attenuation measures so designed to safeguard the amenity of future occupants of the proposed accommodation.”

2.3.3 It is considered that this NIA should assess cumulative environmental noise levels measured across the proposed development site, along with specific noise breakout from the vehicle tyre garage opposite the proposed development site.

2.3.4 Cumulative noise levels shall be obtained across weekday and weekend periods, such that noise levels are representative of the daytime and night-time economy that currently exists.

2.3.5 Although this report makes regard to Technical Advice Note (TAN) 11, it is reasoned that report this report also takes into account the most up to date British Standard, Specifically British Standard BS 8233:2014 ‘Guidance on Sound Insulation and Noise Reduction for Buildings’, which is widely adopted throughout the UK.

2.3.6 It is noted that as previously detailed, the public house, (which have a history of live music) is currently understood to be permanently closed. As such, specific assessment of this premises could not be conducted and is therefore outside the scope of this report.

2.3.7 The scope of this assessment is based upon noise at sensitive areas of the proposed development, i.e., proposed residential areas/ bedroom.

2.4 Assessment Criteria

2.4.1 To achieve noise levels which are considered to be in alignment with the planning approaches and policies discussed in Section 2.1, it is considered that all efforts are made to ensure that future occupants are unlikely to be exposed to noise levels which might breach the NEC category A.

2.4.2 It is therefore considered that the noise assessment and subsequent sound insulation scheme should also make reference to BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings (BS 8233:2014) and BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound, a summary of which is provided below.

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

2.5.1 BS8233: 2014 sets out the following internal sound levels which are considered suitable to protect residential amenity which have been reproduced in **Error! Reference source not found..**

Table 3: 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} 45 dB L _{AMax}

2.5.2 The guidelines presented in **Error! Reference source not found.** reflect and extend current practice contained in BS 8233:2014.

2.5.3 BS 8233:2014 states that “the acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB L_{Aeq,16hr}”. The standard continues... “These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces but should not be prohibited.”

British Standard 4142:2014 (BS 4142:2014)

2.5.4 British Standard 4142:2014 - 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.

- 2.5.5 In BS 4142:2014, 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.
- 2.5.6 BS 4142:2014 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”.
- 2.5.7 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 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.
- 2.5.8 Therefore, a BS 4142:2014 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 To inform the assessment, NoiseAir conducted fixed position noise monitoring at two locations (ML1 and ML2) at the proposed development site, between the dates 8th of June 2023 and 12th of June 2023.

3.1.2 The approximate location of both monitoring positions are presented within **Figure 3** and summarised within **Table 4**.



Figure 3: Site layout plan and approximate position of measurement locations

Table 4: Summary of Noise Monitoring Locations				
Monitoring Location Number	Location Description	Time Period Monitored		Attended or Unattended Monitoring
		Start	End / Duration	
ML1	Positioned to the front of the proposed development site. The microphone was approx. 6.5 m above ground level.	14:30 08/06/23	09:15 12/06/23	Unattended
ML2	Positioned to the rear of the proposed development site. The microphone was approx. 1.5 m above ground level.	14:15 08/06/23	09:15 12/06/23	Unattended

- 3.1.3 ML1 and ML2 were positioned to record cumulative environmental noise levels around the site, to be adopted within 3D sound propagation modelling, and subsequent BS 4142:2014 assessment.
- 3.1.4 The noise measurements were made using two Class 1, integrating sound level meters (SLM's).
- 3.1.5 The acoustic equipment was calibrated to comply with Section 4.2 of BS 7445-1:2003¹, before and after the noise monitoring periods.
- 3.1.6 Details of the SLM's and associated field calibration are presented in **Table 5**.

Table 5: Summary of the SLM used for survey and associated field calibration					
SLM (Serial Number)	Preamp (Serial Number)	Microphone (Serial Number)	Start Calibration	End Calibration	Drift, dB
NOR140 (1402826)	NOR1209 (15455)	NOR1225 (168289)	-25.7	-25.7	0.0
NOR140 (1405015)	NOR1209 (14517)	NOR1225 (42327)	-26.1	-25.7	0.4

- 3.1.7 The weather conditions were noted to be as presented in **Table 6** during the site visits at the start and end of the monitoring period.

Table 6: Summary of weather conditions noted at the start and end of the monitoring duration.		
Parameter	8th June 2023	12th June 2023
Roads (Wet / Dry)	Dry	Dry
Temperature (°C)	18	19
Wind speed (ms-1)	<5	<5
Cloud Cover (Approx. %)	20	80
Humidity (%)	57	80

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

- 3.1.8 A-weighted² L_{eq}^3 and L_{Fmax}^4 environmental noise levels were measured at ML1 and ML2 to comply with the requirements of BS 8233:2014. A-weighted⁵ L_{90}^6 background sound levels were also measured to comply with the requirements of BS 4142:2014.
- 3.1.9 Measured noise levels are presented in full within **Appendix B**.
- 3.1.10 Attending the development site at the start and end of the survey monitoring period provided opportunity for observations and detailed notes to be made of the significant noise sources, which contribute to the measured levels.

Noise Climate

ML1

- 3.1.11 The primary source of noise observed at ML1 included: Road traffic noise from the adjacent Bridge Street and connecting Chapel Street. Secondary sources of noise included: Human voice from passing pedestrians, birdsong, church bells and breakout noise from the vehicle tyre garage located opposite (including tools and human voice).

ML2

The primary sources of noise observed at ML2 were consistent with ML1 but at a diminished level. In addition, some distant, low-level noise was observed from children playing externally at St Giles School.

3.2 Measured Sound Levels

- 3.2.1 Data presented in **Figure 4** and **Figure 5** details level vs time graphs of the recorded $L_{Aeq,T}$, L_{AFMax} and $L_{A90,T}$ sound levels over 15-minute time periods for the entire monitoring duration at ML1 and ML2 respectively.

² An electronic filter in a sound level meter which mimics the human ear's response to sounds at different frequencies under defined conditions.

³ Equivalent continuous noise level; the steady sound pressure which contains an equivalent quantity of sound energy as the time-varying sound pressure levels.

⁴ The instantaneous maximum noise level recorded for a measurement period.

⁵ An electronic filter in a sound level meter which mimics the human ear's response to sounds at different frequencies under defined conditions.

⁶ The noise level which is exceeded for 90% of the measurement period.

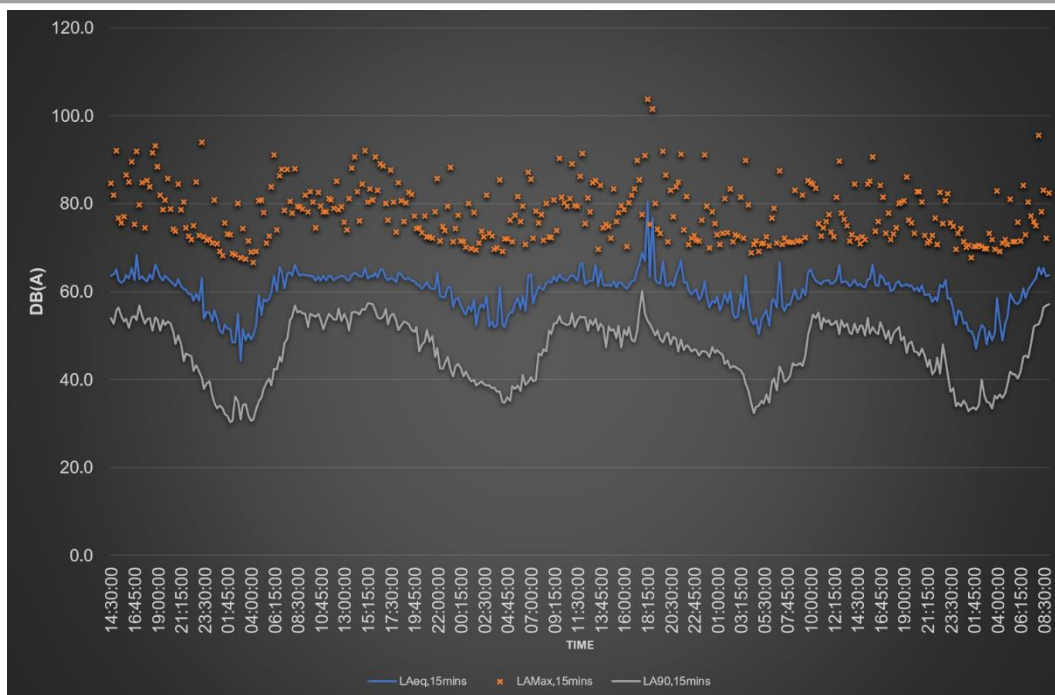


Figure 4: Level vs. time graph presenting $L_{Aeq,T}$, L_{A90} and L_{AFMax} sound levels – ML1.

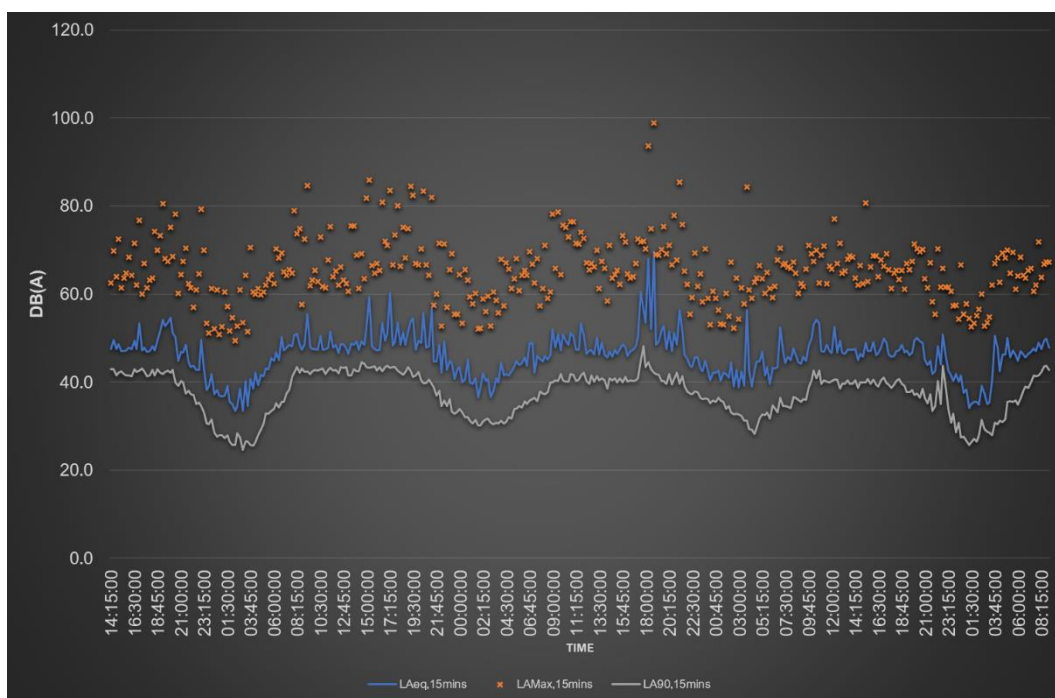


Figure 5: Level vs. time graph presenting $L_{Aeq,T}$, L_{A90} and L_{AFMax} sound levels – ML2.

3.2.2 Measured noise levels at ML1 and ML2 are presented in **Table 7**.

Table 7: Range of Average Measured Daytime/ Night-time Noise Levels			
Monitoring Location	Time	Range of Measured Noise Level	
		dB $L_{Aeq,16hour}$ / $L_{Aeq,8hour}$	dB $L_{A90,1hour}$ / $L_{A90,15 mins}$
ML1	07:00-23:00	61.8 – 66.6	41.0 – 56.9
	23:00-07:00	56.0 – 57.8	30.3 – 47.3
ML2	07:00-23:00	48.1 – 55.4	35.0 – 43.6
	23:00-07:00	42.5 – 45.0	24.6 – 39.1

- 3.2.3 The maximum noise level exceeded more than 10 times recorded during a single night-time period, is presented in **Table 8**.

Table 8: Summary of the Maximum Night-time Noise Levels Exceeded More than 10 times in one Night-Time Period	
Monitoring Location	Measured Maximum Noise Level Exceeded More than 10 times in one night-time period dB (L_{AFmax})
ML1	78
ML2	65

3.3 Background Sound Levels

- 3.3.1 A BS 4142: 2014 assessment is required as part of this NIA and as such, data analysis has been undertaken on background dB L_{A90} sound levels recorded at the proposed development site during respective daytime. It is noted that as the vehicle tyre garage operates during daytime hours, only daytime dB L_{A90} has been provided and is restricted to the hours 08:00 – 18:00, understood to be the operational business hours.
- 3.3.2 **Figure 6** details the results of data analyses in terms of the frequency of occurrence of each value at measuring location ML1.

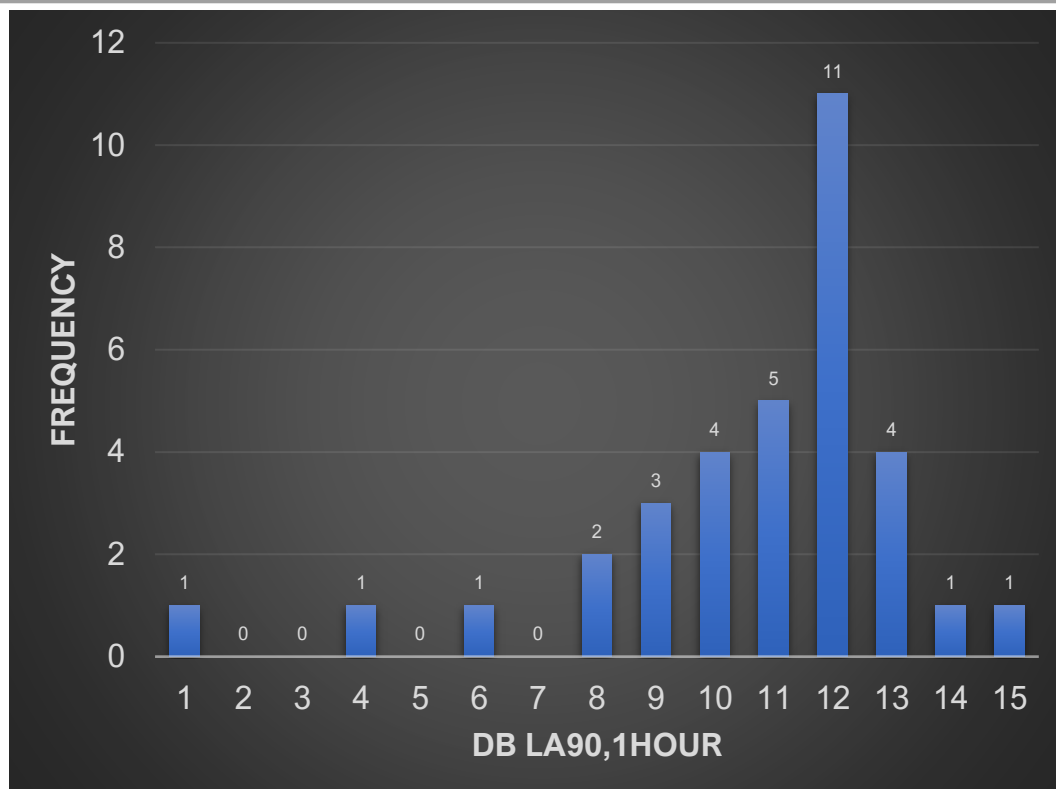


Figure 6: Data analysis of background dB LA90,1hr sound levels at ML1 – Daytime

- 3.3.3 **Figure 6** demonstrates that daytime background sound levels range between 43 and 57 dB LA90,1hr. 54 dB LA90,1hr has been selected as representative, being the most typical value within the re-occurring range (50 – 55 dB LA90,1hr).
- 3.3.4 **Figure 7** details the results of data analyses in terms of the frequency of occurrence of each value at measuring location ML2.

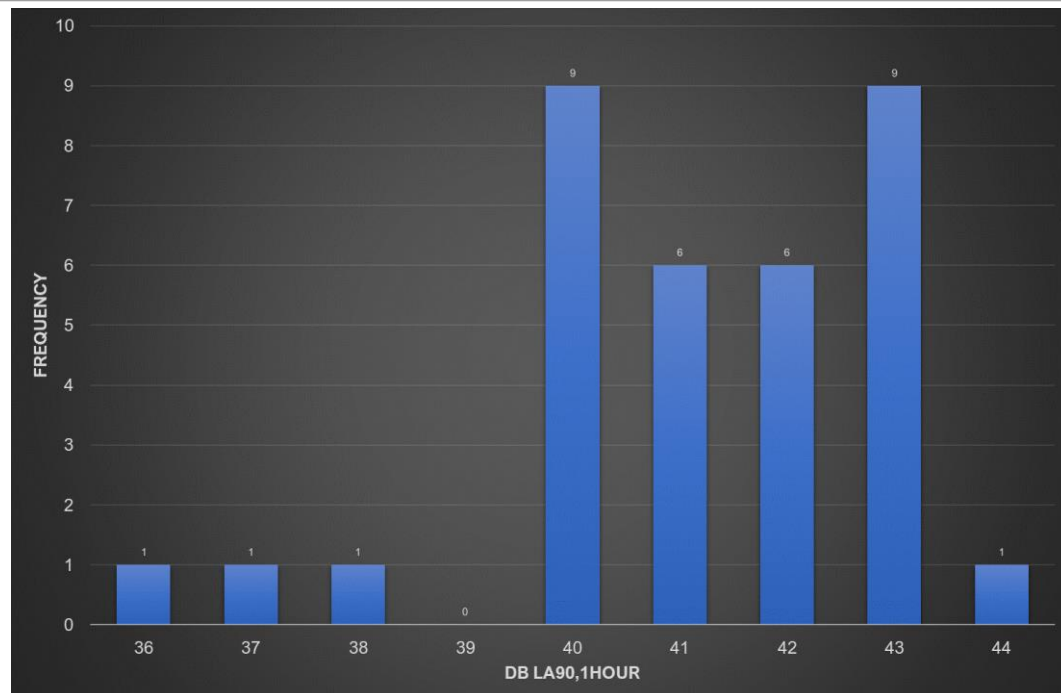


Figure 7: Data analysis of background dB LA90,1hr sound levels at ML2- Daytime

- 3.3.5 **Figure 7** demonstrates that daytime background sound levels range between 36 and 44 dB LA90,1hr. 40 dB LA90,1hr has been selected as representative, being the lowest in the most re-occurring range (40 – 43dB LA90,1hr).
- 3.3.6 Based on the results obtained, a robust assessment can be made of the noise levels at the site and of the mitigation necessary to achieve the required noise levels at the development.

4 3D SOUND MODEL

- 4.1.1 To inform the assessment, A 3D sound model has been constructed in SoundPLAN™ to calculate the predicted sound pressure levels at various receptor locations across the development site. The model uses the calculation method from ISO 9613-2:1996⁷ to account for the distance between the source and receiver and any screening or reflections provided by the surrounding buildings. To represent local topographical conditions, the model incorporates LiDAR data purchased from bluesky Map shop.
- 4.1.2 To reflect the local ground cover, ground absorption was set to 0 (representing hard coverage).
- 4.1.3 By default, the 3D sound model calculates the noise level that would be generated downwind from the source in question (wind direction within an angle of +/- 45 degrees of the direction connecting the source and receiver, with wind blowing from the source).
- 4.1.4 The 3D noise model specifically includes the following:
- **Local Road Traffic Noise** – Road traffic noise has been modelled as a line source and calibrated to survey data obtained onsite at the approximate location of ML1 and ML2.
- Vehicles have been modelled at 0.5 m from ground level.
- **Commercial Noise Breakout from the Vehicle Tyre Garage** – During the time of the survey, noise breakout was audible on occasion from the premises and as such is inclusive within cumulative measurement data recorded across the survey period. Due to access limitations at the time of assessment, it was not possible to obtain noise measurements directly specific to the site. As such, the 3D sound model adopts noise data previously recorded by NoiseAir at a representative location and is considered typical of noise generated at similar premises. Breakout noise has been modelled as an area source assigned to the location of the the main egress point (Front entrance) and calibrated to a sound pressure level of 75 dB (A) at 1m.
- 4.1.5 Noise contour plots illustrating the propagation of sound from source are provided within **Appendix C**.
- 4.1.6 Receptor locations adopted for assessment are identified below within **Figure 8**.

⁷ ISO9613-2:1996 "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation"

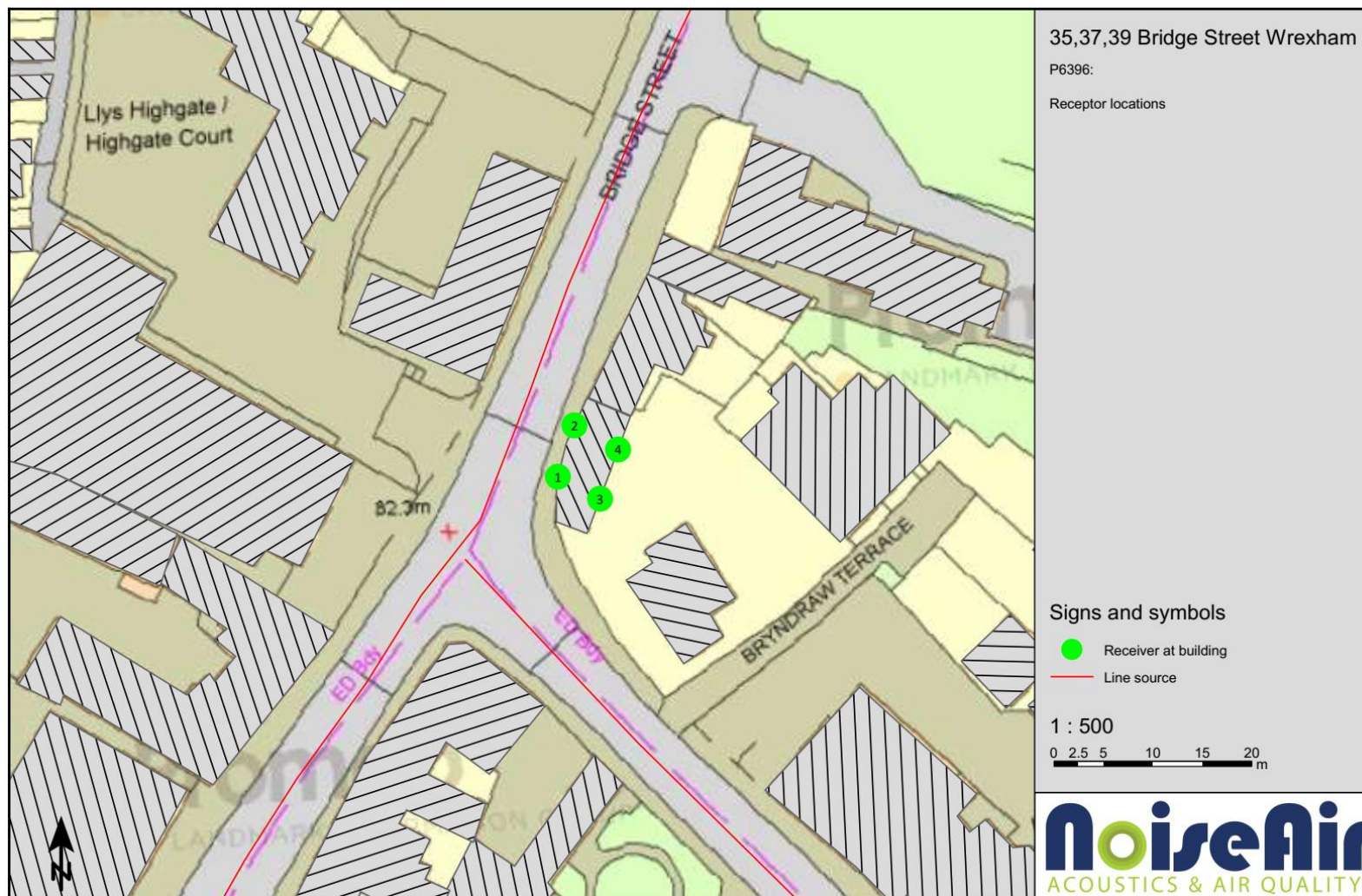


Figure 8: Illustration of Receiver Locations Adopted for Assessment.

4.2 Calculated Noise Levels

- 4.2.1 Based on the 3D sound model results, the worst-case noise levels calculated for each receptor across all proposed residential floors are presented in **Table 9**.

Table 9: Worst-Case predicted noise level across all floors.			
Receptor	dB L _{Aeq,16hour} Daytime	dB L _{Aeq,8hr} Night-Time	dB L _{Amax} , Night-Time
1	65.6	56.8	77.9
2	64.6	56.3	78.5
3	58.5	48.1	67.1
4	55.6	45.2	65.1

5 TAN 11 NOISE EXPOSURE CATEGORY ASSESSMENT

5.1.1 Based on the results of the 3D sound model and in accordance with the TAN 11, a Noise Exposure Category Assessment (NECA) has been conducted.

5.1.2 Results for daytime and night-time periods are presented in **Table 10**, and have been compared to the information provided in **Table 1** and **Table 2**.

Table 10: Stage 1 Risk Assessment of Noise Levels					
Receptor	Façade	Daytime Noise Level (dB L _{Aeq})	Noise Exposure Category	Night-time Noise Level (dB L _{Aeq})	Noise Exposure Category
1	Front	66	C	57	B
2	Front	65	C	56	B
3	Rear	59	C	48	B
4	Rear	56	C	45	B

5.1.3 **Table 10** indicates that during the daytime and night-time periods, proposed receptors of the development fall into categories C and B as per the guidance presented in TAN 11.

5.1.4 TAN 11 states that:

Noise levels in category B should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection. The Site Noise Risk Assessment shows that local noise mitigation and good acoustic design will be required to ensure that the potential risk of the noise impact is minimised, and guideline internal and external noise levels are achieved.

Where noise levels are within category C, planning permission should not normally be granted. Where it is considered that permission should be given, for example, because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.

5.2 Acoustic Design Statement

5.2.1 The results of the TAN11 NECA shows that receptors at the proposed development are likely to be exposed to noise levels that are in both categories B and C as per the guidance presented in TAN 11. Therefore, an assessment against the criteria in BS 8233:2014 has been undertaken with reference to the general sound levels at the site.

6 BS 8233:2014 ASSESSMENT

6.1 Assessment of Noise Levels in Living Rooms and Bedrooms

- 6.1.1 The worst-case calculated facade noise levels across all floors of the proposed development site for the daytime and night-time period, together with the level of attenuation required in accordance with BS 8233: 2014 are presented in **Table 11**.

Table 11: Minimum Level of Attenuation Required to Achieve the Internal Noise Guideline Levels.				
Daytime ($L_{Aeq,16hours}$) / Night-Time ($L_{Aeq,8hours}$ / L_{AFmax})	Facade	Calculated Worst-case Noise Level Across all Facades and Floors	BS 8233:2014 Target Internal Level dB A	Minimum Level of Attenuation Required
Daytime	Front Facade	66	35	31
Night-Time	Front Facade	57	30	27
Night-Time L_{AFmax}	Rear Facade	79	45	34
Daytime	Rear Facade	59	35	24
Night-Time	Rear Facade	48	30	18
Night-Time L_{AFmax}	Rear Facade	67	45	22

6.2 Building Envelope Performance – Windows Partially Open

- 6.2.1 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 6.1.
- 6.2.2 However, with windows partially open, the attenuation provided by the façade will be approximately 15 dB(A).
- 6.2.3 It should be noted that BS 8233:2014 advises that where development is desirable the recommended internal noise levels can typically be relaxed by up to 5 dB(A).
- 6.2.4 **Table 12** presents a summary of the calculated internal noise level when relying on partially open windows across the proposed development site.

Table 12: Summary of Internal Noise Levels with Windows Partially Open (based on a Partially Open Window Providing up to 15 dB(A) Attenuation).

Rec#	Room Type	Day / Night	Calculated Internal Level (dB) ($L_{Aeq,16hours}$ / $L_{Aeq,8hours}$)	Calculated Internal Level (dB) (L_{AFmax})	Excess (dB(A))	Required Internal Levels Achieved (Yes / No)
1	Living/ Dining/ Kitchen Room	Day	51	N/A	+16	No
	Bedroom	Night	42	63	+18	No
2	Living/ Dining/ Kitchen Room	Day	50	N/A	+15	No
	Bedroom	Night	41	64	+19	No
3	Living/ Dining/ Kitchen Room	Day	44	N/A	+9	No
	Bedroom	Night	33	52	+7	No
4	Living/ Dining/ Kitchen Room	Day	41	N/A	+6	No
	Bedroom	Night	30	50	+5	No

6.2.5 Given the above, results demonstrate that internal noise criteria will generally be exceeded across the development during respective daytime and night-time periods when relying on a partially open window.

6.2.6 Based on the results, the development should incorporate a sound insulation scheme which accommodates windows in the closed position, while not compromising required ventilation or overheating requirements to habitable areas.

6.3 BS 4142:2014 Assessment – Neighbouring Vehicle Tyre Garage

Specific Sound Level

6.3.1 In order to conduct assessment, the specific sound level at each receptor has been adopted based upon the results of the 3D sound model. A full list of results across all receptors is presented within **Appendix C**.

Background Sound Level

6.3.2 As detailed within section 3.3, the background sound levels adopted within subsequent assessment are:

- 54 dB L_{A90,1hr} (front façade); and,
- 40 dB L_{A90,15hr} (rear facade).

6.4 Character Corrections

6.4.1 As part of the assessment, the character of the of the specific sound should be considered. The following character corrections have been applied based on subjective assessment of noise breakout observed from the neighbouring commercial premises during the survey period:

- **Tonality** – +2 dB (A);
- **Impulsivity** – N/A; and,
- **Intermittency** – +3 dB (A);

6.5 BS 4142:2014 Assessment

6.5.1 Based on the aforementioned, a BS 4142:2014 assessment of commercial noise has been conducted, and is presented below within **Table 13**.

6.5.2 It should be highlighted that assessment is based on worst-case calculated noise levels at each residential plot.

Rec#	Facade	Background Sound Level	Specific Sound Level	Character Correction	Rating Level	Excess Rating over Background Sound Level
1	Front	54	55	+5	60	+6
2	Front	54	54	+5	59	+5
3	Rear	40	34	+5	39	-1
4	Rear	40	32	+5	37	-8

6.6 BS 4142:2014 Assessment – Context

6.6.1 Results indicate an initial impact rating level of Adverse on occasion at the external front façade of the development and a potential impact rating level Low at the rear façade.

6.6.2 It is generally considered that a rating level above +5 dB(A) over the background sound level is indicative of an adverse impact within increasing likelihood and magnitude as the rating level and background level difference becomes larger. It is noted however that context should be carefully considered when undertaking a BS 4142:2014 assessment.

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- 6.6.3 Given the noise levels that have been measured at the respective façades, it is considered that internal ambient sound levels are likely to be reliant on windows being in the closed position. In such cases the resident is typically subject to the full acoustic sound insulation offered by the window which would reduce the internal noise levels to significantly below the typically accepted guideline levels recommended in BS 8233:2014.
- 6.6.4 Additionally, the dominating noise source at the site was measured in excess of the rated sound level and it is considered that a significant degree of masking will be provided. As such, a diminished sensitivity to the commercial noise breakout is likely.
- 6.6.5 Taking the above into consideration, the outcome at the front façade is considered to demonstrate a potential impact level of Low with levels approaching Adverse on occasion. With all elements considered, while it is noted that at the external façade the specific noise source is likely to present a low impact with levels approaching adverse, with windows in the closed position internal noise levels are likely to present a **low impact** across the proposed development site.

6.7 Uncertainty

- 6.7.1 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.
- 6.7.2 The SLM's used were 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
- 6.7.3 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.
- 6.7.4 It is therefore considered that in this instance the uncertainty of the calculations may have minimal influence on the outcome of the assessment.

7 SOUND INSULATION SCHEME

7.1 Building Envelope Requirements – Windows Closed

- 7.1.1 Proposals for the development site at the time of writing outline residential use across all floors and therefore, internal noise levels are required to not exceed 35 dB $L_{Aeq,16hours}$ during the daytime hours in all rooms and 30 dB $L_{Aeq,8hours}$ and 45 dB L_{AFmax} during the night-time hours in bedrooms.
- 7.1.2 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, i.e., trickle ventilation.
- 7.1.3 Façade attenuation calculations in accordance with BS EN ISO 12354-3:2017 have been conducted based on plans provide by the client at the time of writing.
- 7.1.4 Calculations indicate 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 achieve the sound reduction index (SRI) values presented in **Table 14**.

Table 14: Summary of Building Envelope Performance Requirements – All Rooms		
Roof	39 dB R_w+C_{tr}	Typical Example: Tiled/slatted roof, 25mm plasterboard ceiling, 100mm quilt above ceiling
Walls	47 dB R_w+C_{tr}	Typical Example: Double leaf, 112mm brickwork, 50mm cavity, rigid wall ties
Glazing	40 dB R_w+C_{tr}	Typical Example: 10 mm Pane/ (20 mm Argon) 8.8 mm Pilkington Optiphon. Other supplier may be used, must achieve minimum 40 R_w+C_{tr} .
Acoustic Ventilator	46 Dne,w+Ctr (Up to 4 no. wall vents per room)	Typical Example: Greenwoods MA3051 Other supplier may be used, must achieve minimum 46 Dne,w+Ctr.
Option 2		
Roof	39 dB R_w+C_{tr}	Typical Example: Tiled/slatted roof, 25mm plasterboard ceiling, 100mm quilt above ceiling
Walls	47 dB R_w+C_{tr}	Typical Example: Double leaf, 112mm brickwork, 50mm cavity, rigid wall ties
Glazing	34 dB R_w+C_{tr}	Typical Example: 8 mm Pane/ (16 mm Argon) 8.8 mm Pilkington Optiphon. Other supplier may be used, must achieve minimum 34 R_w+C_{tr} .

Table 14: Summary of Building Envelope Performance Requirements – All Rooms

Mechanical Ventilation	N/A	Mechanical ventilation outlets to habitable rooms, measured at approx. seating / bed location, not to exceed noise criterion NR25.
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- 7.1.5 Building envelope performance elements outlined in **Table 14** are based on the information provided at the time of writing. 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.

7.2 Ventilation Requirements

- 7.2.1 It is recommended that the acoustic ventilation proposed at the site should, as a minimum, comply with Building Regulations 2022 Approved Document F1 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.
- 7.2.2 It should be further noted that the glazing and ventilation 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.
- 7.2.3 The requirement to have closed windows may also introduce overheating considerations, and measures would need to be put in place to ensure that thermal comfort is maintained such that residents are not forced to open their windows to experience comfortable living conditions. A TM59 Overheating assessment may be required.
- 7.2.4 Should mechanical ventilation be chosen as an option then no passive window or wall vents should be included in the final design, and cumulative ambient noise breakout within any habitable area should not exceed the noise rating curve NR25.
- 7.2.5 It should be noted that general ventilation requirements for future occupants of the proposed development are outside the scope of this report.

8 CONCLUSIONS

- 8.1.1 NoiseAir Limited has carried out a noise assessment for the proposed residential development located at: 35-39 Bridge Street, Wrexham LL13 7DD.
- 8.1.2 Results of an initial TAN 11 assessment shows that receptors at the proposed development are likely to be exposed to noise levels that are in both categories C and B during daytime and night-time periods respectively. As such, a sound insulation scheme should be implemented at the site to ensure internal noise levels satisfy the guidance presented with BS 8233:2014.
- 8.1.3 When solely relying on noise reduction offered by a partially open window, the recommended internal noise limits are likely to be exceeded across the proposed development site.
- 8.1.4 To achieve a reasonable internal acoustic environment as specified within BS 8233:2014, a sound insulation scheme should be selected to meet the sound reduction index (SRI) presented in **Table 14**.
- 8.1.5 The recommended scheme includes installing glazing capable of achieving 40 dB R_w+C_{tr} , coupled with passive acoustic ventilation capable of achieving 46 $D_{ne,w+C_{tr}}$. Should a form of mechanical ventilation be adopted then the recommended reduction attributed to windows can be relaxed to 34 dB R_w+C_{tr} ; however; no passive window or wall vents should be included within the final design and cumulative ambient noise breakout within any habitable area should not exceed the noise rating curve NR25.
- 8.1.6 A BS4142:2014 assessment has also been undertaken as part of the survey. An initial estimate indicates a potential rating level Adverse Impact and across the front façade and Low Impact across the Rear façade. Given the contextual considerations detailed within section 5.8, and by implementing the recommended sound insulation scheme, with windows in the closed position internal noise levels are considered to present a **low impact**.

APPENDIX A - REPORT LIMITATIONS

This Report is presented to Mr. Adrian Jones 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. Adrian Jones 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.

This report has been prepared by NoiseAir Limited. No individual is personally liable in connection with the preparation of this report. By receiving this report and acting on it, the client or any other person accepts that no individual is personally liable whether in contract, tort, for breach of statutory duty or otherwise.

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.

DISCLAIMER- This report was prepared by NoiseAir Limited. The material in it contains NoiseAir Limited best judgment in light of the information available at the time of preparation of this report. Any use which a third party makes of this report, or any reliance on, or decisions based on it are the responsibility of such third parties. NoiseAir Limited accept no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

APPENDIX B – METER READINGS

ML1

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
08/06/2023	14:30:00	00:15:00	63.6	84.7	54.0
08/06/2023	14:45:00	00:15:00	63.9	81.9	52.8
08/06/2023	15:00:00	00:15:00	65.0	92.0	55.8
08/06/2023	15:15:00	00:15:00	62.7	76.7	56.3
08/06/2023	15:30:00	00:15:00	62.0	75.7	54.4
08/06/2023	15:45:00	00:15:00	62.5	77.1	53.2
08/06/2023	16:00:00	00:15:00	63.8	86.6	53.8
08/06/2023	16:15:00	00:15:00	63.0	84.9	51.8
08/06/2023	16:30:00	00:15:00	65.3	89.5	54.2
08/06/2023	16:45:00	00:15:00	62.7	75.3	54.4
08/06/2023	17:00:00	00:15:00	68.3	91.9	53.6
08/06/2023	17:15:00	00:15:00	62.8	79.8	56.9
08/06/2023	17:30:00	00:15:00	63.5	84.8	54.5
08/06/2023	17:45:00	00:15:00	62.7	74.5	52.8
08/06/2023	18:00:00	00:15:00	62.3	85.3	53.7
08/06/2023	18:15:00	00:15:00	63.9	83.9	54.0
08/06/2023	18:30:00	00:15:00	62.9	91.6	51.2
08/06/2023	18:45:00	00:15:00	66.1	93.2	54.2
08/06/2023	19:00:00	00:15:00	65.0	88.4	53.7
08/06/2023	19:15:00	00:15:00	63.3	81.9	51.1
08/06/2023	19:30:00	00:15:00	62.5	78.6	53.5
08/06/2023	19:45:00	00:15:00	63.6	80.8	52.4
08/06/2023	20:00:00	00:15:00	63.0	85.7	53.2
08/06/2023	20:15:00	00:15:00	62.3	78.8	52.7
08/06/2023	20:30:00	00:15:00	61.8	74.2	50.9
08/06/2023	20:45:00	00:15:00	61.3	73.7	48.2
08/06/2023	21:00:00	00:15:00	62.8	84.4	50.1
08/06/2023	21:15:00	00:15:00	61.3	78.7	48.1
08/06/2023	21:30:00	00:15:00	60.7	80.4	44.2
08/06/2023	21:45:00	00:15:00	60.5	74.6	46.0
08/06/2023	22:00:00	00:15:00	59.5	72.7	45.6
08/06/2023	22:15:00	00:15:00	59.3	71.9	45.3
08/06/2023	22:30:00	00:15:00	58.0	75.0	42.0
08/06/2023	22:45:00	00:15:00	59.6	85.0	43.2
08/06/2023	23:00:00	00:15:00	57.9	72.8	41.8
08/06/2023	23:15:00	00:15:00	63.0	94.0	40.4
08/06/2023	23:30:00	00:15:00	53.9	72.4	37.9
08/06/2023	23:45:00	00:15:00	55.5	71.7	39.2
09/06/2023	00:00:00	00:15:00	55.2	72.0	39.7
09/06/2023	00:15:00	00:15:00	53.2	71.0	36.5
09/06/2023	00:30:00	00:15:00	55.7	80.8	34.8
09/06/2023	00:45:00	00:15:00	53.8	70.9	33.5
09/06/2023	01:00:00	00:15:00	51.1	69.2	34.1
09/06/2023	01:15:00	00:15:00	50.6	68.2	33.4
09/06/2023	01:30:00	00:15:00	52.6	75.7	32.2
09/06/2023	01:45:00	00:15:00	51.7	73.1	31.8
09/06/2023	02:00:00	00:15:00	51.4	72.9	30.3

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
09/06/2023	02:15:00	00:15:00	48.5	68.7	30.7
09/06/2023	02:30:00	00:15:00	48.4	68.4	36.2
09/06/2023	02:45:00	00:15:00	55.0	80.1	35.0
09/06/2023	03:00:00	00:15:00	44.3	67.8	30.9
09/06/2023	03:15:00	00:15:00	51.5	74.4	34.3
09/06/2023	03:30:00	00:15:00	49.0	67.5	34.4
09/06/2023	03:45:00	00:15:00	50.5	71.6	31.9
09/06/2023	04:00:00	00:15:00	49.1	69.0	30.6
09/06/2023	04:15:00	00:15:00	50.1	66.6	30.9
09/06/2023	04:30:00	00:15:00	52.2	69.2	33.2
09/06/2023	04:45:00	00:15:00	59.2	80.7	35.0
09/06/2023	05:00:00	00:15:00	54.7	80.8	36.0
09/06/2023	05:15:00	00:15:00	58.3	78.0	37.9
09/06/2023	05:30:00	00:15:00	57.8	71.0	39.3
09/06/2023	05:45:00	00:15:00	58.4	72.6	40.2
09/06/2023	06:00:00	00:15:00	59.8	83.8	38.7
09/06/2023	06:15:00	00:15:00	63.6	91.1	42.4
09/06/2023	06:30:00	00:15:00	60.1	74.0	42.3
09/06/2023	06:45:00	00:15:00	65.6	86.4	45.2
09/06/2023	07:00:00	00:15:00	64.6	87.8	44.0
09/06/2023	07:15:00	00:15:00	60.8	78.4	48.3
09/06/2023	07:30:00	00:15:00	64.1	87.8	49.3
09/06/2023	07:45:00	00:15:00	64.5	80.6	53.6
09/06/2023	08:00:00	00:15:00	63.6	77.8	54.3
09/06/2023	08:15:00	00:15:00	66.2	87.9	56.9
09/06/2023	08:30:00	00:15:00	64.5	79.5	55.2
09/06/2023	08:45:00	00:15:00	63.7	79.3	55.6
09/06/2023	09:00:00	00:15:00	63.9	78.8	55.1
09/06/2023	09:15:00	00:15:00	63.8	82.0	54.9
09/06/2023	09:30:00	00:15:00	63.6	78.1	52.0
09/06/2023	09:45:00	00:15:00	63.6	82.7	55.0
09/06/2023	10:00:00	00:15:00	63.4	80.3	54.7
09/06/2023	10:15:00	00:15:00	62.5	74.6	54.3
09/06/2023	10:30:00	00:15:00	63.5	82.6	54.9
09/06/2023	10:45:00	00:15:00	62.6	79.5	53.7
09/06/2023	11:00:00	00:15:00	63.7	78.2	51.5
09/06/2023	11:15:00	00:15:00	62.6	78.1	53.3
09/06/2023	11:30:00	00:15:00	63.7	81.2	54.9
09/06/2023	11:45:00	00:15:00	63.4	80.9	54.4
09/06/2023	12:00:00	00:15:00	62.6	78.9	53.7
09/06/2023	12:15:00	00:15:00	63.1	85.1	53.7
09/06/2023	12:30:00	00:15:00	63.3	78.6	56.2
09/06/2023	12:45:00	00:15:00	63.6	79.2	53.4
09/06/2023	13:00:00	00:15:00	63.4	75.8	55.0
09/06/2023	13:15:00	00:15:00	62.7	74.1	53.6
09/06/2023	13:30:00	00:15:00	62.6	81.2	51.2
09/06/2023	13:45:00	00:15:00	63.8	88.1	55.3
09/06/2023	14:00:00	00:15:00	64.2	90.6	55.5
09/06/2023	14:15:00	00:15:00	64.0	82.8	55.2

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
09/06/2023	14:30:00	00:15:00	63.4	76.1	54.8
09/06/2023	14:45:00	00:15:00	63.4	84.4	56.0
09/06/2023	15:00:00	00:15:00	65.3	92.0	55.9
09/06/2023	15:15:00	00:15:00	63.0	80.4	57.3
09/06/2023	15:30:00	00:15:00	63.5	83.3	57.3
09/06/2023	15:45:00	00:15:00	63.5	80.9	57.1
09/06/2023	16:00:00	00:15:00	64.2	90.6	55.6
09/06/2023	16:15:00	00:15:00	63.1	83.0	54.1
09/06/2023	16:30:00	00:15:00	65.0	89.1	53.9
09/06/2023	16:45:00	00:15:00	64.9	88.6	54.3
09/06/2023	17:00:00	00:15:00	63.2	80.0	56.1
09/06/2023	17:15:00	00:15:00	62.7	76.3	52.6
09/06/2023	17:30:00	00:15:00	63.2	87.7	54.6
09/06/2023	17:45:00	00:15:00	62.9	80.4	55.0
09/06/2023	18:00:00	00:15:00	62.2	73.6	53.3
09/06/2023	18:15:00	00:15:00	64.2	84.8	51.3
09/06/2023	18:30:00	00:15:00	64.0	80.7	52.3
09/06/2023	18:45:00	00:15:00	63.0	76.0	53.2
09/06/2023	19:00:00	00:15:00	62.8	80.2	53.1
09/06/2023	19:15:00	00:15:00	63.1	82.6	52.6
09/06/2023	19:30:00	00:15:00	62.5	82.1	51.3
09/06/2023	19:45:00	00:15:00	62.4	77.2	50.8
09/06/2023	20:00:00	00:15:00	61.8	74.3	51.9
09/06/2023	20:15:00	00:15:00	61.5	74.6	46.5
09/06/2023	20:30:00	00:15:00	60.7	73.4	48.0
09/06/2023	20:45:00	00:15:00	61.5	77.2	48.7
09/06/2023	21:00:00	00:15:00	62.2	72.4	51.3
09/06/2023	21:15:00	00:15:00	61.0	72.4	48.7
09/06/2023	21:30:00	00:15:00	60.6	72.1	49.9
09/06/2023	21:45:00	00:15:00	60.6	78.1	45.1
09/06/2023	22:00:00	00:15:00	64.3	85.8	47.2
09/06/2023	22:15:00	00:15:00	59.1	71.6	42.7
09/06/2023	22:30:00	00:15:00	58.7	74.9	42.5
09/06/2023	22:45:00	00:15:00	58.8	73.9	43.7
09/06/2023	23:00:00	00:15:00	61.0	79.5	45.1
09/06/2023	23:15:00	00:15:00	61.1	88.2	42.3
09/06/2023	23:30:00	00:15:00	56.6	71.4	40.8
09/06/2023	23:45:00	00:15:00	58.3	74.3	42.9
10/06/2023	00:00:00	00:15:00	58.6	77.3	43.6
10/06/2023	00:15:00	00:15:00	56.8	71.5	42.7
10/06/2023	00:30:00	00:15:00	55.6	71.4	40.8
10/06/2023	00:45:00	00:15:00	54.8	70.1	41.8
10/06/2023	01:00:00	00:15:00	56.7	80.1	40.6
10/06/2023	01:15:00	00:15:00	55.6	69.8	39.7
10/06/2023	01:30:00	00:15:00	58.3	78.0	39.9
10/06/2023	01:45:00	00:15:00	52.5	69.5	38.7
10/06/2023	02:00:00	00:15:00	56.1	71.0	39.1
10/06/2023	02:15:00	00:15:00	57.2	73.8	39.6
10/06/2023	02:30:00	00:15:00	56.2	72.4	39.0

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
10/06/2023	02:45:00	00:15:00	59.0	81.9	38.7
10/06/2023	03:00:00	00:15:00	52.1	73.2	38.7
10/06/2023	03:15:00	00:15:00	53.2	72.6	38.0
10/06/2023	03:30:00	00:15:00	51.9	69.7	38.2
10/06/2023	03:45:00	00:15:00	52.5	70.0	37.2
10/06/2023	04:00:00	00:15:00	61.1	85.5	37.3
10/06/2023	04:15:00	00:15:00	52.4	69.1	34.9
10/06/2023	04:30:00	00:15:00	51.9	72.0	34.8
10/06/2023	04:45:00	00:15:00	54.2	72.0	36.0
10/06/2023	05:00:00	00:15:00	55.4	76.2	35.2
10/06/2023	05:15:00	00:15:00	55.3	71.3	38.6
10/06/2023	05:30:00	00:15:00	57.3	77.3	37.9
10/06/2023	05:45:00	00:15:00	58.6	81.6	38.7
10/06/2023	06:00:00	00:15:00	56.0	76.0	37.5
10/06/2023	06:15:00	00:15:00	59.1	79.4	41.0
10/06/2023	06:30:00	00:15:00	55.6	70.7	38.8
10/06/2023	06:45:00	00:15:00	63.5	87.2	39.4
10/06/2023	07:00:00	00:15:00	64.0	85.6	40.6
10/06/2023	07:15:00	00:15:00	57.3	72.1	39.6
10/06/2023	07:30:00	00:15:00	59.6	78.3	40.0
10/06/2023	07:45:00	00:15:00	61.3	75.7	46.0
10/06/2023	08:00:00	00:15:00	60.7	77.6	45.5
10/06/2023	08:15:00	00:15:00	60.5	71.7	46.9
10/06/2023	08:30:00	00:15:00	62.0	80.0	46.5
10/06/2023	08:45:00	00:15:00	62.3	72.4	51.2
10/06/2023	09:00:00	00:15:00	62.0	72.3	50.4
10/06/2023	09:15:00	00:15:00	63.5	80.9	52.7
10/06/2023	09:30:00	00:15:00	62.4	73.9	52.9
10/06/2023	09:45:00	00:15:00	63.9	90.3	54.5
10/06/2023	10:00:00	00:15:00	63.1	81.5	53.1
10/06/2023	10:15:00	00:15:00	62.7	80.2	52.8
10/06/2023	10:30:00	00:15:00	62.6	79.5	52.4
10/06/2023	10:45:00	00:15:00	63.5	81.2	52.8
10/06/2023	11:00:00	00:15:00	63.8	89.1	55.1
10/06/2023	11:15:00	00:15:00	63.3	79.6	52.0
10/06/2023	11:30:00	00:15:00	62.6	79.5	53.6
10/06/2023	11:45:00	00:15:00	66.3	86.2	54.3
10/06/2023	12:00:00	00:15:00	66.5	91.4	54.2
10/06/2023	12:15:00	00:15:00	61.8	75.5	54.2
10/06/2023	12:30:00	00:15:00	62.4	81.3	51.1
10/06/2023	12:45:00	00:15:00	62.5	78.1	53.6
10/06/2023	13:00:00	00:15:00	62.6	84.8	52.4
10/06/2023	13:15:00	00:15:00	66.2	85.2	53.9
10/06/2023	13:30:00	00:15:00	61.2	69.6	51.2
10/06/2023	13:45:00	00:15:00	64.7	84.1	52.7
10/06/2023	14:00:00	00:15:00	61.6	74.5	52.0
10/06/2023	14:15:00	00:15:00	61.5	75.3	47.4
10/06/2023	14:30:00	00:15:00	61.6	74.9	52.1
10/06/2023	14:45:00	00:15:00	61.3	72.2	51.1

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
10/06/2023	15:00:00	00:15:00	62.3	83.4	51.4
10/06/2023	15:15:00	00:15:00	60.9	75.9	49.5
10/06/2023	15:30:00	00:15:00	62.1	78.0	52.2
10/06/2023	15:45:00	00:15:00	62.0	79.6	47.4
10/06/2023	16:00:00	00:15:00	61.2	78.7	51.3
10/06/2023	16:15:00	00:15:00	60.7	70.3	50.1
10/06/2023	16:30:00	00:15:00	61.5	80.2	52.0
10/06/2023	16:45:00	00:15:00	62.4	81.9	49.1
10/06/2023	17:00:00	00:15:00	62.5	83.4	48.6
10/06/2023	17:15:00	00:15:00	65.1	89.8	51.2
10/06/2023	17:30:00	00:15:00	66.1	85.4	55.6
10/06/2023	17:45:00	00:15:00	68.8	77.5	60.1
10/06/2023	18:00:00	00:15:00	66.9	91.0	55.1
10/06/2023	18:15:00	00:15:00	80.6	103.7	53.3
10/06/2023	18:30:00	00:15:00	63.3	75.3	52.7
10/06/2023	18:45:00	00:15:00	76.8	101.6	51.5
10/06/2023	19:00:00	00:15:00	62.9	80.0	50.1
10/06/2023	19:15:00	00:15:00	62.1	74.2	51.1
10/06/2023	19:30:00	00:15:00	61.9	73.2	49.3
10/06/2023	19:45:00	00:15:00	66.9	91.9	48.5
10/06/2023	20:00:00	00:15:00	61.6	86.6	50.2
10/06/2023	20:15:00	00:15:00	61.2	71.3	50.7
10/06/2023	20:30:00	00:15:00	62.1	83.1	48.0
10/06/2023	20:45:00	00:15:00	61.3	77.1	49.7
10/06/2023	21:00:00	00:15:00	63.8	83.8	49.2
10/06/2023	21:15:00	00:15:00	64.9	85.0	46.4
10/06/2023	21:30:00	00:15:00	67.1	91.2	49.1
10/06/2023	21:45:00	00:15:00	62.1	74.1	46.7
10/06/2023	22:00:00	00:15:00	62.2	81.6	47.8
10/06/2023	22:15:00	00:15:00	60.3	70.7	47.5
10/06/2023	22:30:00	00:15:00	59.3	72.2	46.5
10/06/2023	22:45:00	00:15:00	60.1	72.8	46.9
10/06/2023	23:00:00	00:15:00	60.5	71.7	46.7
10/06/2023	23:15:00	00:15:00	58.1	71.5	45.5
10/06/2023	23:30:00	00:15:00	59.2	76.2	46.4
10/06/2023	23:45:00	00:15:00	62.3	91.1	46.4
11/06/2023	00:00:00	00:15:00	58.9	79.5	46.3
11/06/2023	00:15:00	00:15:00	56.4	70.0	45.1
11/06/2023	00:30:00	00:15:00	58.0	78.1	47.3
11/06/2023	00:45:00	00:15:00	57.4	75.4	46.1
11/06/2023	01:00:00	00:15:00	58.9	72.9	46.8
11/06/2023	01:15:00	00:15:00	55.7	70.7	46.1
11/06/2023	01:30:00	00:15:00	57.7	73.3	45.7
11/06/2023	01:45:00	00:15:00	59.5	81.2	43.6
11/06/2023	02:00:00	00:15:00	57.5	73.5	44.3
11/06/2023	02:15:00	00:15:00	60.1	83.3	42.6
11/06/2023	02:30:00	00:15:00	55.0	71.3	43.1
11/06/2023	02:45:00	00:15:00	54.0	72.9	43.0
11/06/2023	03:00:00	00:15:00	54.4	72.6	42.4

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
11/06/2023	03:15:00	00:15:00	59.6	81.4	42.2
11/06/2023	03:30:00	00:15:00	56.1	72.1	41.1
11/06/2023	03:45:00	00:15:00	63.6	89.8	39.1
11/06/2023	04:00:00	00:15:00	57.0	79.7	37.6
11/06/2023	04:15:00	00:15:00	53.5	68.9	34.7
11/06/2023	04:30:00	00:15:00	52.6	70.7	32.3
11/06/2023	04:45:00	00:15:00	53.9	71.6	33.8
11/06/2023	05:00:00	00:15:00	50.3	69.1	34.1
11/06/2023	05:15:00	00:15:00	53.8	70.9	35.2
11/06/2023	05:30:00	00:15:00	54.7	71.1	34.6
11/06/2023	05:45:00	00:15:00	55.7	72.5	36.7
11/06/2023	06:00:00	00:15:00	52.3	70.5	34.8
11/06/2023	06:15:00	00:15:00	57.9	76.7	39.5
11/06/2023	06:30:00	00:15:00	58.3	79.0	40.3
11/06/2023	06:45:00	00:15:00	56.3	71.1	37.6
11/06/2023	07:00:00	00:15:00	66.7	87.4	42.9
11/06/2023	07:15:00	00:15:00	56.7	70.8	41.6
11/06/2023	07:30:00	00:15:00	55.6	72.1	39.5
11/06/2023	07:45:00	00:15:00	57.2	71.4	39.9
11/06/2023	08:00:00	00:15:00	57.0	71.2	40.9
11/06/2023	08:15:00	00:15:00	59.1	71.2	43.8
11/06/2023	08:30:00	00:15:00	60.5	83.1	43.2
11/06/2023	08:45:00	00:15:00	58.2	71.5	43.4
11/06/2023	09:00:00	00:15:00	58.6	71.6	43.8
11/06/2023	09:15:00	00:15:00	60.7	81.9	43.1
11/06/2023	09:30:00	00:15:00	59.2	72.3	45.4
11/06/2023	09:45:00	00:15:00	64.5	85.2	50.2
11/06/2023	10:00:00	00:15:00	65.0	84.8	52.6
11/06/2023	10:15:00	00:15:00	63.7	84.5	54.8
11/06/2023	10:30:00	00:15:00	62.6	83.5	54.0
11/06/2023	10:45:00	00:15:00	62.1	75.5	55.3
11/06/2023	11:00:00	00:15:00	61.8	72.6	51.4
11/06/2023	11:15:00	00:15:00	62.4	74.6	54.0
11/06/2023	11:30:00	00:15:00	62.6	75.9	53.0
11/06/2023	11:45:00	00:15:00	62.5	77.5	53.5
11/06/2023	12:00:00	00:15:00	61.8	73.6	52.5
11/06/2023	12:15:00	00:15:00	62.1	72.4	52.7
11/06/2023	12:30:00	00:15:00	62.9	81.5	53.4
11/06/2023	12:45:00	00:15:00	66.0	89.7	50.3
11/06/2023	13:00:00	00:15:00	62.1	77.8	53.5
11/06/2023	13:15:00	00:15:00	62.4	76.5	51.9
11/06/2023	13:30:00	00:15:00	62.2	75.0	52.8
11/06/2023	13:45:00	00:15:00	61.3	71.5	50.7
11/06/2023	14:00:00	00:15:00	61.7	72.9	50.3
11/06/2023	14:15:00	00:15:00	62.7	84.5	52.7
11/06/2023	14:30:00	00:15:00	61.4	72.1	50.7
11/06/2023	14:45:00	00:15:00	61.7	70.9	52.2
11/06/2023	15:00:00	00:15:00	61.3	72.4	52.2
11/06/2023	15:15:00	00:15:00	61.0	71.9	50.0

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
11/06/2023	15:30:00	00:15:00	62.8	84.4	54.0
11/06/2023	15:45:00	00:15:00	62.9	85.1	50.5
11/06/2023	16:00:00	00:15:00	66.1	90.7	51.9
11/06/2023	16:15:00	00:15:00	61.6	73.7	50.8
11/06/2023	16:30:00	00:15:00	61.2	75.9	50.4
11/06/2023	16:45:00	00:15:00	63.8	84.2	53.0
11/06/2023	17:00:00	00:15:00	63.1	81.5	51.5
11/06/2023	17:15:00	00:15:00	61.6	73.3	49.3
11/06/2023	17:30:00	00:15:00	62.1	77.8	51.1
11/06/2023	17:45:00	00:15:00	60.2	71.9	48.3
11/06/2023	18:00:00	00:15:00	60.5	73.1	50.6
11/06/2023	18:15:00	00:15:00	62.0	74.5	51.3
11/06/2023	18:30:00	00:15:00	62.3	80.0	52.0
11/06/2023	18:45:00	00:15:00	61.2	80.4	49.0
11/06/2023	19:00:00	00:15:00	61.4	80.7	49.7
11/06/2023	19:15:00	00:15:00	61.7	86.1	46.1
11/06/2023	19:30:00	00:15:00	61.3	76.2	48.1
11/06/2023	19:45:00	00:15:00	61.5	75.6	48.6
11/06/2023	20:00:00	00:15:00	60.3	73.2	46.5
11/06/2023	20:15:00	00:15:00	61.0	82.8	46.3
11/06/2023	20:30:00	00:15:00	60.0	82.7	45.5
11/06/2023	20:45:00	00:15:00	61.4	80.4	47.0
11/06/2023	21:00:00	00:15:00	59.2	72.8	45.4
11/06/2023	21:15:00	00:15:00	59.4	71.0	43.0
11/06/2023	21:30:00	00:15:00	59.4	71.6	44.5
11/06/2023	21:45:00	00:15:00	57.6	72.8	41.2
11/06/2023	22:00:00	00:15:00	58.8	76.8	42.1
11/06/2023	22:15:00	00:15:00	57.8	70.8	45.0
11/06/2023	22:30:00	00:15:00	61.6	82.6	41.4
11/06/2023	22:45:00	00:15:00	61.0	75.4	48.0
11/06/2023	23:00:00	00:15:00	62.7	80.7	44.3
11/06/2023	23:15:00	00:15:00	58.5	82.3	41.3
11/06/2023	23:30:00	00:15:00	58.4	75.6	37.3
11/06/2023	23:45:00	00:15:00	56.1	74.8	38.1
12/06/2023	00:00:00	00:15:00	52.5	69.7	34.0
12/06/2023	00:15:00	00:15:00	55.7	73.2	34.8
12/06/2023	00:30:00	00:15:00	55.2	74.4	33.9
12/06/2023	00:45:00	00:15:00	52.7	71.3	35.2
12/06/2023	01:00:00	00:15:00	53.0	70.1	34.2
12/06/2023	01:15:00	00:15:00	51.2	70.6	32.8
12/06/2023	01:30:00	00:15:00	51.0	67.7	33.4
12/06/2023	01:45:00	00:15:00	49.8	70.3	33.6
12/06/2023	02:00:00	00:15:00	47.1	70.3	33.2
12/06/2023	02:15:00	00:15:00	50.5	70.6	34.2
12/06/2023	02:30:00	00:15:00	52.5	70.2	39.9
12/06/2023	02:45:00	00:15:00	51.6	69.8	36.3
12/06/2023	03:00:00	00:15:00	48.0	69.8	35.1
12/06/2023	03:15:00	00:15:00	51.0	73.2	34.8
12/06/2023	03:30:00	00:15:00	48.9	71.9	33.5

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
12/06/2023	03:45:00	00:15:00	50.7	69.7	36.3
12/06/2023	04:00:00	00:15:00	58.6	82.9	35.7
12/06/2023	04:15:00	00:15:00	53.2	69.2	36.7
12/06/2023	04:30:00	00:15:00	49.0	71.0	35.8
12/06/2023	04:45:00	00:15:00	52.9	71.9	36.9
12/06/2023	05:00:00	00:15:00	54.2	70.8	38.8
12/06/2023	05:15:00	00:15:00	59.5	81.0	41.9
12/06/2023	05:30:00	00:15:00	58.2	71.3	41.2
12/06/2023	05:45:00	00:15:00	57.5	71.4	41.2
12/06/2023	06:00:00	00:15:00	57.1	75.8	40.2
12/06/2023	06:15:00	00:15:00	58.1	71.5	41.8
12/06/2023	06:30:00	00:15:00	60.8	84.2	45.2
12/06/2023	06:45:00	00:15:00	58.6	72.9	45.4
12/06/2023	07:00:00	00:15:00	60.5	80.3	45.0
12/06/2023	07:15:00	00:15:00	61.4	77.2	48.1
12/06/2023	07:30:00	00:15:00	62.4	76.0	52.0
12/06/2023	07:45:00	00:15:00	63.0	75.0	52.4
12/06/2023	08:00:00	00:15:00	65.6	95.6	52.6
12/06/2023	08:15:00	00:15:00	63.9	78.1	54.2
12/06/2023	08:30:00	00:15:00	65.3	83.1	56.3
12/06/2023	08:45:00	00:15:00	63.5	72.1	56.9
12/06/2023	09:00:00	00:15:00	63.8	82.4	57.2

ML2

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
08/06/2023	14:15:00	00:15:00	47.6	62.6	43.0
08/06/2023	14:30:00	00:15:00	49.6	69.8	43.0
08/06/2023	14:45:00	00:15:00	47.6	64.0	41.6
08/06/2023	15:00:00	00:15:00	48.7	72.5	42.2
08/06/2023	15:15:00	00:15:00	47.0	61.4	42.5
08/06/2023	15:30:00	00:15:00	47.0	63.7	41.9
08/06/2023	15:45:00	00:15:00	47.2	64.8	41.5
08/06/2023	16:00:00	00:15:00	47.8	68.4	41.5
08/06/2023	16:15:00	00:15:00	47.5	64.3	41.3
08/06/2023	16:30:00	00:15:00	49.5	71.5	43.0
08/06/2023	16:45:00	00:15:00	47.6	62.1	42.3
08/06/2023	17:00:00	00:15:00	53.3	76.8	42.7
08/06/2023	17:15:00	00:15:00	47.2	60.0	43.1
08/06/2023	17:30:00	00:15:00	47.9	66.9	42.4
08/06/2023	17:45:00	00:15:00	46.9	61.5	41.4
08/06/2023	18:00:00	00:15:00	47.0	63.1	41.6
08/06/2023	18:15:00	00:15:00	48.1	63.7	42.8
08/06/2023	18:30:00	00:15:00	47.2	74.2	41.6
08/06/2023	18:45:00	00:15:00	49.5	70.0	42.9
08/06/2023	19:00:00	00:15:00	51.6	73.2	42.1

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
08/06/2023	19:15:00	00:15:00	54.1	80.5	41.8
08/06/2023	19:30:00	00:15:00	52.8	68.0	42.3
08/06/2023	19:45:00	00:15:00	53.6	67.5	42.6
08/06/2023	20:00:00	00:15:00	54.7	75.1	42.2
08/06/2023	20:15:00	00:15:00	51.1	68.6	42.8
08/06/2023	20:30:00	00:15:00	50.2	78.1	39.9
08/06/2023	20:45:00	00:15:00	44.9	60.1	39.1
08/06/2023	21:00:00	00:15:00	46.9	64.5	40.3
08/06/2023	21:15:00	00:15:00	46.8	67.5	39.9
08/06/2023	21:30:00	00:15:00	48.4	70.4	37.5
08/06/2023	21:45:00	00:15:00	44.5	62.3	38.0
08/06/2023	22:00:00	00:15:00	43.4	61.4	37.3
08/06/2023	22:15:00	00:15:00	43.7	57.0	37.1
08/06/2023	22:30:00	00:15:00	42.8	61.0	35.0
08/06/2023	22:45:00	00:15:00	42.8	64.6	35.3
08/06/2023	23:00:00	00:15:00	49.6	79.3	34.5
08/06/2023	23:15:00	00:15:00	43.1	70.0	33.1
08/06/2023	23:30:00	00:15:00	38.2	53.4	30.6
08/06/2023	23:45:00	00:15:00	39.0	51.1	30.5
09/06/2023	00:00:00	00:15:00	41.8	61.3	31.6
09/06/2023	00:15:00	00:15:00	37.2	52.1	28.6
09/06/2023	00:30:00	00:15:00	38.2	61.0	27.7
09/06/2023	00:45:00	00:15:00	37.0	50.8	28.0
09/06/2023	01:00:00	00:15:00	36.8	52.6	28.0
09/06/2023	01:15:00	00:15:00	37.0	60.4	27.3
09/06/2023	01:30:00	00:15:00	39.1	57.1	28.0
09/06/2023	01:45:00	00:15:00	35.6	51.7	26.6
09/06/2023	02:00:00	00:15:00	35.0	54.6	25.8
09/06/2023	02:15:00	00:15:00	33.5	49.5	25.7
09/06/2023	02:30:00	00:15:00	34.6	52.7	28.4
09/06/2023	02:45:00	00:15:00	38.5	60.9	27.4
09/06/2023	03:00:00	00:15:00	33.5	53.5	24.6
09/06/2023	03:15:00	00:15:00	40.2	64.3	26.5
09/06/2023	03:30:00	00:15:00	34.5	51.4	26.6
09/06/2023	03:45:00	00:15:00	40.7	70.6	25.7
09/06/2023	04:00:00	00:15:00	38.5	60.5	25.6
09/06/2023	04:15:00	00:15:00	42.2	60.0	26.4
09/06/2023	04:30:00	00:15:00	39.3	61.3	28.0
09/06/2023	04:45:00	00:15:00	41.7	59.8	29.2
09/06/2023	05:00:00	00:15:00	41.4	60.4	30.7
09/06/2023	05:15:00	00:15:00	43.1	62.1	32.9
09/06/2023	05:30:00	00:15:00	43.0	63.3	32.9
09/06/2023	05:45:00	00:15:00	45.5	64.4	33.4
09/06/2023	06:00:00	00:15:00	44.9	62.4	34.0
09/06/2023	06:15:00	00:15:00	46.7	70.2	35.2
09/06/2023	06:30:00	00:15:00	45.0	68.2	34.2
09/06/2023	06:45:00	00:15:00	50.3	69.3	35.5
09/06/2023	07:00:00	00:15:00	47.2	65.0	35.6
09/06/2023	07:15:00	00:15:00	47.9	64.2	37.5

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
09/06/2023	07:30:00	00:15:00	48.5	65.5	38.4
09/06/2023	07:45:00	00:15:00	48.2	64.8	41.2
09/06/2023	08:00:00	00:15:00	50.7	79.0	42.1
09/06/2023	08:15:00	00:15:00	51.0	73.7	43.4
09/06/2023	08:30:00	00:15:00	48.5	74.8	42.2
09/06/2023	08:45:00	00:15:00	47.3	57.6	43.1
09/06/2023	09:00:00	00:15:00	48.6	72.4	42.3
09/06/2023	09:15:00	00:15:00	55.4	84.7	42.4
09/06/2023	09:30:00	00:15:00	48.0	61.9	41.8
09/06/2023	09:45:00	00:15:00	47.5	63.1	42.5
09/06/2023	10:00:00	00:15:00	47.6	65.4	42.8
09/06/2023	10:15:00	00:15:00	47.3	62.9	42.7
09/06/2023	10:30:00	00:15:00	50.6	72.9	43.0
09/06/2023	10:45:00	00:15:00	47.3	61.8	43.1
09/06/2023	11:00:00	00:15:00	47.5	61.5	41.8
09/06/2023	11:15:00	00:15:00	47.9	67.7	42.8
09/06/2023	11:30:00	00:15:00	51.4	75.3	43.2
09/06/2023	11:45:00	00:15:00	47.8	64.0	42.7
09/06/2023	12:00:00	00:15:00	48.4	65.2	42.8
09/06/2023	12:15:00	00:15:00	46.6	62.0	42.0
09/06/2023	12:30:00	00:15:00	48.7	66.2	43.5
09/06/2023	12:45:00	00:15:00	48.7	63.1	43.3
09/06/2023	13:00:00	00:15:00	47.7	62.3	43.5
09/06/2023	13:15:00	00:15:00	46.5	60.6	41.5
09/06/2023	13:30:00	00:15:00	48.8	75.5	41.6
09/06/2023	13:45:00	00:15:00	48.4	75.5	42.9
09/06/2023	14:00:00	00:15:00	49.2	68.8	42.5
09/06/2023	14:15:00	00:15:00	47.4	61.3	42.5
09/06/2023	14:30:00	00:15:00	49.2	69.1	44.5
09/06/2023	14:45:00	00:15:00	48.5	63.5	44.2
09/06/2023	15:00:00	00:15:00	52.5	81.8	43.5
09/06/2023	15:15:00	00:15:00	59.4	85.9	43.3
09/06/2023	15:30:00	00:15:00	48.2	66.4	43.4
09/06/2023	15:45:00	00:15:00	47.5	64.7	43.6
09/06/2023	16:00:00	00:15:00	47.2	67.0	42.7
09/06/2023	16:15:00	00:15:00	47.4	65.3	43.5
09/06/2023	16:30:00	00:15:00	53.6	80.9	42.5
09/06/2023	16:45:00	00:15:00	49.4	72.0	43.5
09/06/2023	17:00:00	00:15:00	51.0	71.1	43.7
09/06/2023	17:15:00	00:15:00	60.3	83.5	43.2
09/06/2023	17:30:00	00:15:00	48.3	66.6	43.4
09/06/2023	17:45:00	00:15:00	49.1	73.4	43.4
09/06/2023	18:00:00	00:15:00	53.6	80.1	42.6
09/06/2023	18:15:00	00:15:00	48.5	66.3	42.1
09/06/2023	18:30:00	00:15:00	51.3	75.1	41.7
09/06/2023	18:45:00	00:15:00	48.4	68.2	42.3
09/06/2023	19:00:00	00:15:00	51.4	74.8	43.4
09/06/2023	19:15:00	00:15:00	54.0	84.5	42.5
09/06/2023	19:30:00	00:15:00	54.5	82.5	41.2

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
09/06/2023	19:45:00	00:15:00	47.4	67.0	41.6
09/06/2023	20:00:00	00:15:00	49.5	66.7	42.3
09/06/2023	20:15:00	00:15:00	49.0	70.2	40.4
09/06/2023	20:30:00	00:15:00	55.7	83.4	39.8
09/06/2023	20:45:00	00:15:00	47.9	66.6	39.8
09/06/2023	21:00:00	00:15:00	48.1	64.3	40.6
09/06/2023	21:15:00	00:15:00	56.7	82.0	39.6
09/06/2023	21:30:00	00:15:00	44.7	57.5	38.8
09/06/2023	21:45:00	00:15:00	44.7	60.0	36.9
09/06/2023	22:00:00	00:15:00	48.5	71.5	38.0
09/06/2023	22:15:00	00:15:00	42.1	52.7	34.6
09/06/2023	22:30:00	00:15:00	49.3	71.4	35.8
09/06/2023	22:45:00	00:15:00	42.8	57.0	34.6
09/06/2023	23:00:00	00:15:00	44.8	65.5	36.1
09/06/2023	23:15:00	00:15:00	44.3	69.1	33.3
09/06/2023	23:30:00	00:15:00	40.7	55.4	32.8
09/06/2023	23:45:00	00:15:00	43.0	55.4	33.3
10/06/2023	00:00:00	00:15:00	43.4	64.4	33.9
10/06/2023	00:15:00	00:15:00	40.0	53.3	33.1
10/06/2023	00:30:00	00:15:00	40.6	65.5	32.0
10/06/2023	00:45:00	00:15:00	45.2	63.2	32.1
10/06/2023	01:00:00	00:15:00	40.0	59.3	31.2
10/06/2023	01:15:00	00:15:00	39.7	57.8	30.7
10/06/2023	01:30:00	00:15:00	40.9	60.1	31.4
10/06/2023	01:45:00	00:15:00	36.7	52.1	30.1
10/06/2023	02:00:00	00:15:00	38.7	52.2	30.2
10/06/2023	02:15:00	00:15:00	42.0	58.9	31.1
10/06/2023	02:30:00	00:15:00	40.2	56.1	31.5
10/06/2023	02:45:00	00:15:00	40.7	59.5	31.7
10/06/2023	03:00:00	00:15:00	36.7	52.7	30.8
10/06/2023	03:15:00	00:15:00	38.0	60.4	30.5
10/06/2023	03:30:00	00:15:00	40.9	58.6	30.8
10/06/2023	03:45:00	00:15:00	40.0	55.8	30.7
10/06/2023	04:00:00	00:15:00	44.5	67.9	31.2
10/06/2023	04:15:00	00:15:00	41.5	57.3	30.7
10/06/2023	04:30:00	00:15:00	41.9	67.1	30.9
10/06/2023	04:45:00	00:15:00	41.6	65.7	32.0
10/06/2023	05:00:00	00:15:00	42.4	61.3	31.8
10/06/2023	05:15:00	00:15:00	43.6	63.5	33.9
10/06/2023	05:30:00	00:15:00	44.9	68.0	34.0
10/06/2023	05:45:00	00:15:00	43.9	60.8	34.6
10/06/2023	06:00:00	00:15:00	44.3	64.3	34.3
10/06/2023	06:15:00	00:15:00	45.7	65.3	35.7
10/06/2023	06:30:00	00:15:00	43.7	64.3	35.1
10/06/2023	06:45:00	00:15:00	48.8	69.7	35.9
10/06/2023	07:00:00	00:15:00	48.9	66.8	36.2
10/06/2023	07:15:00	00:15:00	42.1	62.5	36.5
10/06/2023	07:30:00	00:15:00	45.9	68.0	35.7
10/06/2023	07:45:00	00:15:00	45.3	57.3	37.9

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
10/06/2023	08:00:00	00:15:00	44.7	61.2	37.4
10/06/2023	08:15:00	00:15:00	45.9	71.0	37.3
10/06/2023	08:30:00	00:15:00	45.2	59.0	37.7
10/06/2023	08:45:00	00:15:00	46.2	60.4	39.9
10/06/2023	09:00:00	00:15:00	52.0	78.2	40.0
10/06/2023	09:15:00	00:15:00	47.9	65.8	40.4
10/06/2023	09:30:00	00:15:00	50.8	78.6	40.3
10/06/2023	09:45:00	00:15:00	47.2	64.5	41.8
10/06/2023	10:00:00	00:15:00	50.8	75.7	40.5
10/06/2023	10:15:00	00:15:00	49.5	75.2	40.1
10/06/2023	10:30:00	00:15:00	48.4	73.0	40.1
10/06/2023	10:45:00	00:15:00	51.1	76.4	41.8
10/06/2023	11:00:00	00:15:00	50.5	76.4	41.7
10/06/2023	11:15:00	00:15:00	47.3	71.5	40.3
10/06/2023	11:30:00	00:15:00	47.3	71.3	40.6
10/06/2023	11:45:00	00:15:00	53.3	74.1	41.5
10/06/2023	12:00:00	00:15:00	50.7	72.7	42.2
10/06/2023	12:15:00	00:15:00	46.4	67.1	40.2
10/06/2023	12:30:00	00:15:00	47.2	65.6	39.7
10/06/2023	12:45:00	00:15:00	47.2	66.9	41.5
10/06/2023	13:00:00	00:15:00	46.3	66.2	40.1
10/06/2023	13:15:00	00:15:00	50.2	69.9	41.4
10/06/2023	13:30:00	00:15:00	46.3	61.3	40.4
10/06/2023	13:45:00	00:15:00	49.0	67.5	40.9
10/06/2023	14:00:00	00:15:00	46.2	65.8	40.4
10/06/2023	14:15:00	00:15:00	45.6	58.4	38.5
10/06/2023	14:30:00	00:15:00	46.9	71.1	40.9
10/06/2023	14:45:00	00:15:00	45.8	63.7	40.4
10/06/2023	15:00:00	00:15:00	47.4	64.4	40.9
10/06/2023	15:15:00	00:15:00	46.4	65.3	40.0
10/06/2023	15:30:00	00:15:00	47.6	62.2	40.9
10/06/2023	15:45:00	00:15:00	48.6	73.2	40.0
10/06/2023	16:00:00	00:15:00	48.0	71.9	41.2
10/06/2023	16:15:00	00:15:00	45.9	64.6	40.1
10/06/2023	16:30:00	00:15:00	47.0	63.6	40.5
10/06/2023	16:45:00	00:15:00	47.3	63.9	40.3
10/06/2023	17:00:00	00:15:00	48.2	67.0	40.5
10/06/2023	17:15:00	00:15:00	50.3	72.4	40.9
10/06/2023	17:30:00	00:15:00	60.5	71.8	44.9
10/06/2023	17:45:00	00:15:00	56.5	72.0	48.1
10/06/2023	18:00:00	00:15:00	53.6	70.2	43.5
10/06/2023	18:15:00	00:15:00	68.1	93.6	44.5
10/06/2023	18:30:00	00:15:00	52.1	74.9	42.9
10/06/2023	18:45:00	00:15:00	69.7	98.8	42.1
10/06/2023	19:00:00	00:15:00	48.5	69.0	41.8
10/06/2023	19:15:00	00:15:00	49.3	68.9	41.7
10/06/2023	19:30:00	00:15:00	51.8	70.1	40.3
10/06/2023	19:45:00	00:15:00	52.7	75.3	40.2
10/06/2023	20:00:00	00:15:00	47.6	69.2	39.7

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
10/06/2023	20:15:00	00:15:00	51.5	71.0	41.8
10/06/2023	20:30:00	00:15:00	47.1	66.7	39.5
10/06/2023	20:45:00	00:15:00	51.1	77.9	40.8
10/06/2023	21:00:00	00:15:00	48.5	67.8	42.2
10/06/2023	21:15:00	00:15:00	56.3	85.4	39.6
10/06/2023	21:30:00	00:15:00	51.7	75.8	41.4
10/06/2023	21:45:00	00:15:00	46.3	65.2	39.2
10/06/2023	22:00:00	00:15:00	45.3	62.2	37.9
10/06/2023	22:15:00	00:15:00	43.8	55.5	37.5
10/06/2023	22:30:00	00:15:00	43.4	59.2	37.2
10/06/2023	22:45:00	00:15:00	45.6	69.3	37.9
10/06/2023	23:00:00	00:15:00	45.7	61.8	37.7
10/06/2023	23:15:00	00:15:00	43.1	64.6	36.5
10/06/2023	23:30:00	00:15:00	42.5	58.2	36.1
10/06/2023	23:45:00	00:15:00	44.8	70.2	36.3
11/06/2023	00:00:00	00:15:00	42.4	59.1	36.1
11/06/2023	00:15:00	00:15:00	40.4	53.1	35.2
11/06/2023	00:30:00	00:15:00	42.1	60.6	35.8
11/06/2023	00:45:00	00:15:00	42.1	59.1	35.6
11/06/2023	01:00:00	00:15:00	42.6	56.3	36.5
11/06/2023	01:15:00	00:15:00	40.2	53.2	35.8
11/06/2023	01:30:00	00:15:00	42.1	53.0	35.5
11/06/2023	01:45:00	00:15:00	41.8	60.1	34.0
11/06/2023	02:00:00	00:15:00	41.1	55.0	34.6
11/06/2023	02:15:00	00:15:00	44.6	67.2	33.2
11/06/2023	02:30:00	00:15:00	39.0	52.3	32.7
11/06/2023	02:45:00	00:15:00	42.8	63.7	32.8
11/06/2023	03:00:00	00:15:00	38.8	54.3	32.7
11/06/2023	03:15:00	00:15:00	42.4	61.5	32.3
11/06/2023	03:30:00	00:15:00	39.1	57.8	31.3
11/06/2023	03:45:00	00:15:00	56.3	84.3	31.3
11/06/2023	04:00:00	00:15:00	42.8	60.9	29.3
11/06/2023	04:15:00	00:15:00	39.0	59.0	29.2
11/06/2023	04:30:00	00:15:00	42.8	62.7	28.3
11/06/2023	04:45:00	00:15:00	44.7	63.7	29.7
11/06/2023	05:00:00	00:15:00	44.7	66.5	31.7
11/06/2023	05:15:00	00:15:00	46.9	63.4	32.7
11/06/2023	05:30:00	00:15:00	41.6	60.1	32.6
11/06/2023	05:45:00	00:15:00	43.4	64.9	33.1
11/06/2023	06:00:00	00:15:00	39.7	61.3	31.7
11/06/2023	06:15:00	00:15:00	43.3	59.2	34.7
11/06/2023	06:30:00	00:15:00	43.1	61.7	34.1
11/06/2023	06:45:00	00:15:00	43.5	67.7	33.1
11/06/2023	07:00:00	00:15:00	52.5	70.4	36.4
11/06/2023	07:15:00	00:15:00	47.0	66.7	34.6
11/06/2023	07:30:00	00:15:00	44.4	66.9	34.6
11/06/2023	07:45:00	00:15:00	45.8	66.1	34.4
11/06/2023	08:00:00	00:15:00	45.0	65.8	34.1
11/06/2023	08:15:00	00:15:00	47.7	67.3	36.7

Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
11/06/2023	08:30:00	00:15:00	46.2	64.7	36.4
11/06/2023	08:45:00	00:15:00	44.5	60.1	36.0
11/06/2023	09:00:00	00:15:00	44.2	62.3	35.6
11/06/2023	09:15:00	00:15:00	45.8	61.8	36.2
11/06/2023	09:30:00	00:15:00	44.8	65.7	36.0
11/06/2023	09:45:00	00:15:00	48.3	71.0	38.8
11/06/2023	10:00:00	00:15:00	49.9	69.2	40.4
11/06/2023	10:15:00	00:15:00	53.0	67.4	42.6
11/06/2023	10:30:00	00:15:00	54.2	69.9	40.9
11/06/2023	10:45:00	00:15:00	53.3	62.5	42.7
11/06/2023	11:00:00	00:15:00	47.0	68.8	39.6
11/06/2023	11:15:00	00:15:00	46.9	70.9	40.4
11/06/2023	11:30:00	00:15:00	48.4	62.3	40.1
11/06/2023	11:45:00	00:15:00	47.1	66.3	40.0
11/06/2023	12:00:00	00:15:00	46.6	65.7	40.3
11/06/2023	12:15:00	00:15:00	52.6	77.0	40.6
11/06/2023	12:30:00	00:15:00	46.8	66.9	40.6
11/06/2023	12:45:00	00:15:00	49.4	71.6	38.6
11/06/2023	13:00:00	00:15:00	46.8	64.7	39.6
11/06/2023	13:15:00	00:15:00	46.5	65.2	39.7
11/06/2023	13:30:00	00:15:00	47.4	67.9	40.4
11/06/2023	13:45:00	00:15:00	47.3	68.7	39.7
11/06/2023	14:00:00	00:15:00	47.3	68.3	39.6
11/06/2023	14:15:00	00:15:00	47.5	63.7	40.5
11/06/2023	14:30:00	00:15:00	45.0	62.1	38.7
11/06/2023	14:45:00	00:15:00	46.5	66.4	40.0
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11/06/2023	16:15:00	00:15:00	46.1	68.7	39.4
11/06/2023	16:30:00	00:15:00	46.6	63.9	39.0
11/06/2023	16:45:00	00:15:00	47.8	67.7	40.4
11/06/2023	17:00:00	00:15:00	49.9	66.3	41.1
11/06/2023	17:15:00	00:15:00	48.9	69.2	39.8
11/06/2023	17:30:00	00:15:00	46.2	65.5	39.5
11/06/2023	17:45:00	00:15:00	45.8	61.2	38.7
11/06/2023	18:00:00	00:15:00	45.9	64.8	39.5
11/06/2023	18:15:00	00:15:00	47.1	65.4	40.2
11/06/2023	18:30:00	00:15:00	47.2	63.3	40.8
11/06/2023	18:45:00	00:15:00	48.5	65.3	39.7
11/06/2023	19:00:00	00:15:00	46.7	61.1	39.2
11/06/2023	19:15:00	00:15:00	47.2	67.0	37.8
11/06/2023	19:30:00	00:15:00	46.1	65.6	37.7
11/06/2023	19:45:00	00:15:00	46.7	67.5	38.2
11/06/2023	20:00:00	00:15:00	49.4	71.3	37.1
11/06/2023	20:15:00	00:15:00	50.1	70.2	37.4
11/06/2023	20:30:00	00:15:00	49.2	69.7	36.5

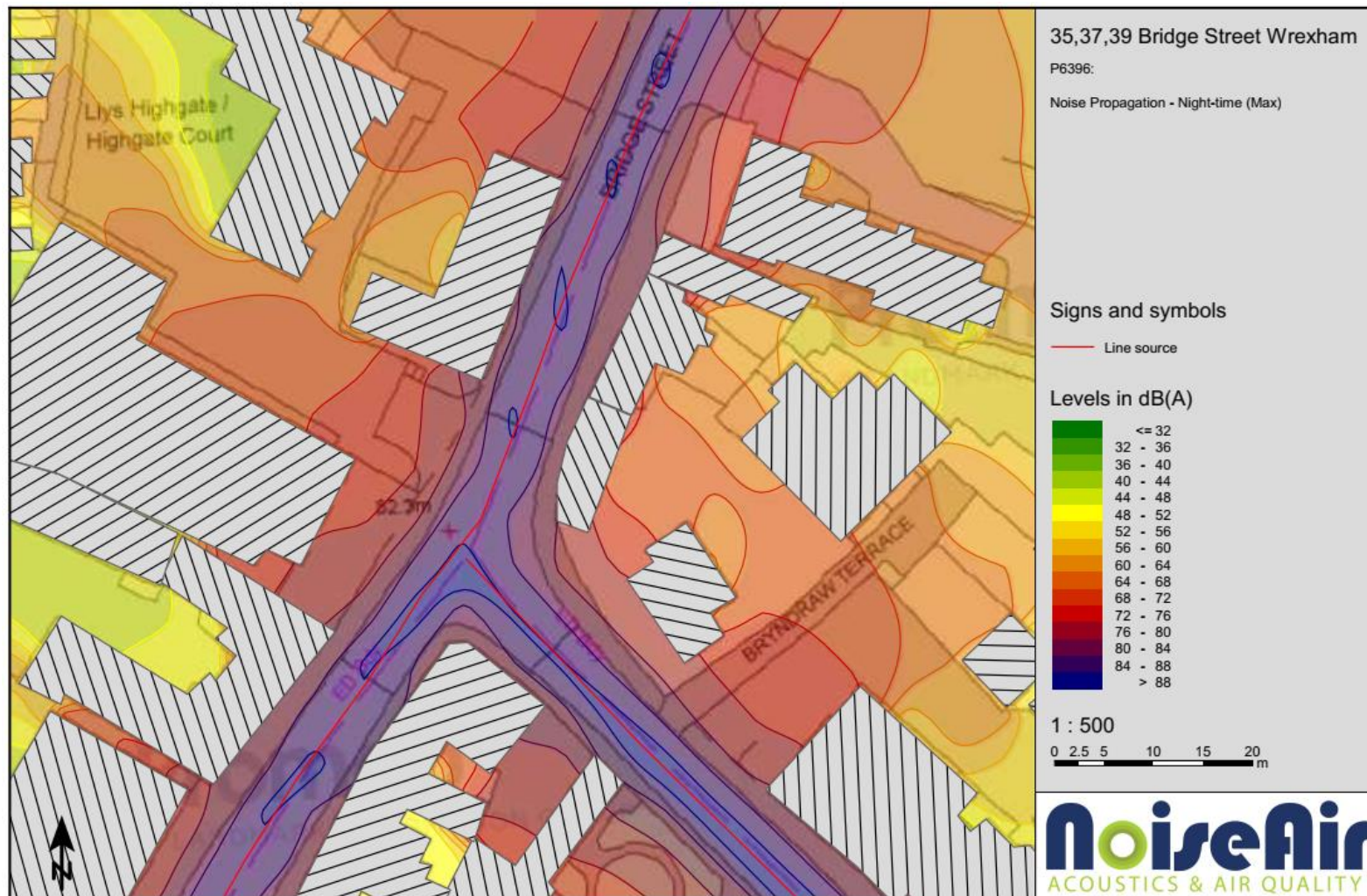
Start Date	Start Time	Duration	LAeq	LAFMax	LA90
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11/06/2023	21:00:00	00:15:00	45.2	63.5	36.4
11/06/2023	21:15:00	00:15:00	43.9	61.4	35.2
11/06/2023	21:30:00	00:15:00	44.8	67.1	37.2
11/06/2023	21:45:00	00:15:00	41.8	58.3	33.5
11/06/2023	22:00:00	00:15:00	42.5	55.5	34.5
11/06/2023	22:15:00	00:15:00	48.1	70.2	40.2
11/06/2023	22:30:00	00:15:00	44.1	61.6	35.0
11/06/2023	22:45:00	00:15:00	50.9	65.8	43.8
11/06/2023	23:00:00	00:15:00	46.3	61.6	39.1
11/06/2023	23:15:00	00:15:00	42.7	61.6	33.9
11/06/2023	23:30:00	00:15:00	41.5	60.7	30.8
11/06/2023	23:45:00	00:15:00	40.3	57.3	32.8
12/06/2023	00:00:00	00:15:00	41.8	57.4	28.5
12/06/2023	00:15:00	00:15:00	40.1	54.3	30.8
12/06/2023	00:30:00	00:15:00	41.6	66.7	27.5
12/06/2023	00:45:00	00:15:00	37.6	55.5	27.6
12/06/2023	01:00:00	00:15:00	38.3	57.8	26.7
12/06/2023	01:15:00	00:15:00	34.1	54.5	25.8
12/06/2023	01:30:00	00:15:00	35.1	52.6	26.3
12/06/2023	01:45:00	00:15:00	35.5	53.4	27.1
12/06/2023	02:00:00	00:15:00	35.5	55.1	26.6
12/06/2023	02:15:00	00:15:00	34.9	56.6	27.9
12/06/2023	02:30:00	00:15:00	39.2	60.0	31.4
12/06/2023	02:45:00	00:15:00	37.5	52.8	29.4
12/06/2023	03:00:00	00:15:00	35.0	53.6	28.7
12/06/2023	03:15:00	00:15:00	35.3	54.8	28.5
12/06/2023	03:30:00	00:15:00	40.5	62.1	28.0
12/06/2023	03:45:00	00:15:00	50.5	67.0	30.8
12/06/2023	04:00:00	00:15:00	47.9	68.2	30.4
12/06/2023	04:15:00	00:15:00	42.4	62.7	31.2
12/06/2023	04:30:00	00:15:00	46.2	69.3	31.0
12/06/2023	04:45:00	00:15:00	46.2	68.2	31.6
12/06/2023	05:00:00	00:15:00	50.0	70.0	35.6
12/06/2023	05:15:00	00:15:00	45.6	64.7	35.7
12/06/2023	05:30:00	00:15:00	47.2	69.4	35.6
12/06/2023	05:45:00	00:15:00	46.1	61.1	35.8
12/06/2023	06:00:00	00:15:00	44.8	64.1	34.9
12/06/2023	06:15:00	00:15:00	47.0	68.3	36.3
12/06/2023	06:30:00	00:15:00	46.2	64.3	38.1
12/06/2023	06:45:00	00:15:00	45.7	63.6	39.0
12/06/2023	07:00:00	00:15:00	46.5	65.4	38.7
12/06/2023	07:15:00	00:15:00	46.9	65.9	39.9
12/06/2023	07:30:00	00:15:00	47.7	60.7	41.6
12/06/2023	07:45:00	00:15:00	47.1	62.0	41.3
12/06/2023	08:00:00	00:15:00	48.9	71.8	41.5
12/06/2023	08:15:00	00:15:00	47.5	63.8	42.3
12/06/2023	08:30:00	00:15:00	49.4	66.8	43.6
12/06/2023	08:45:00	00:15:00	49.9	67.2	43.8

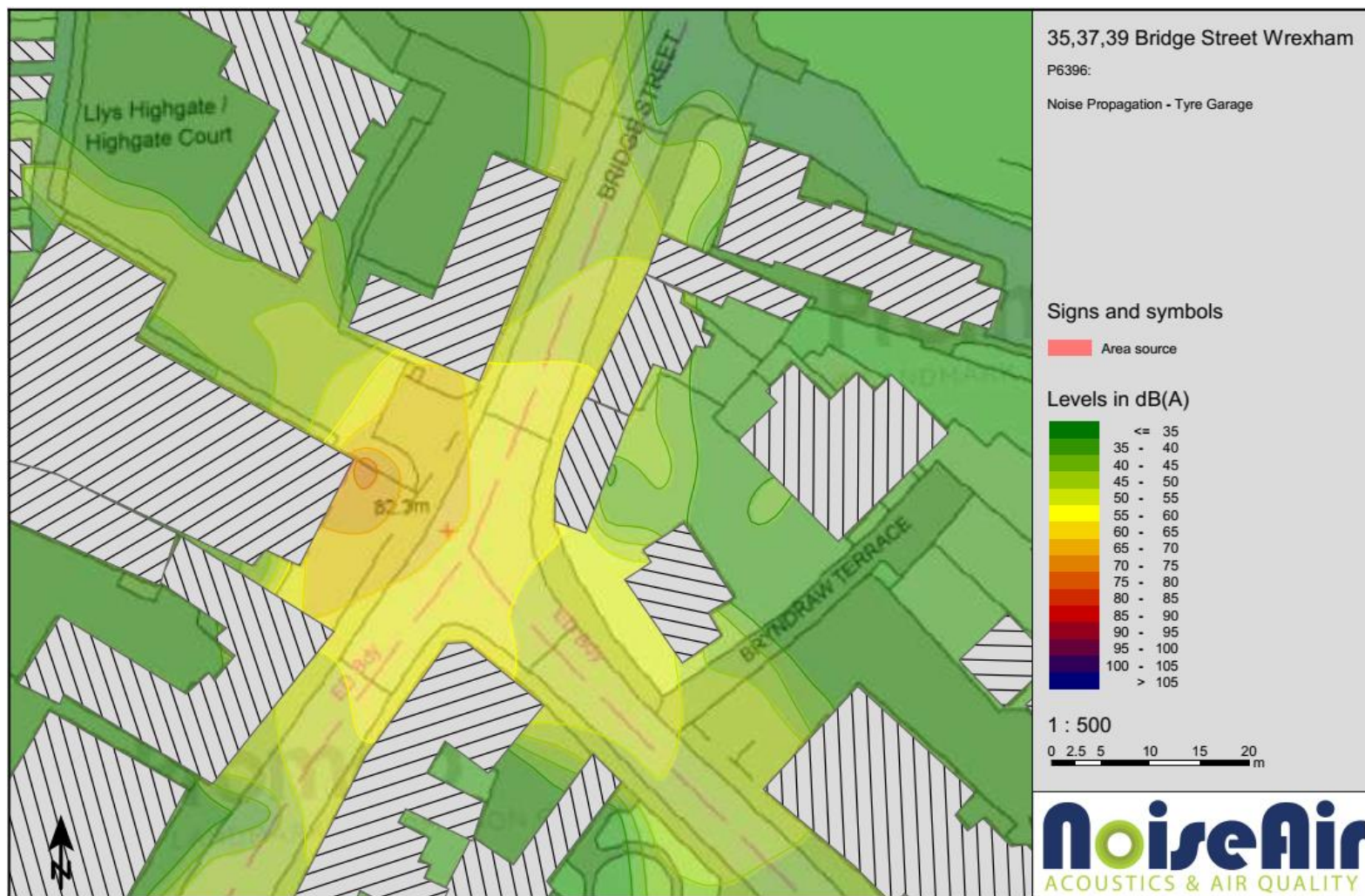
Start Date	Start Time	Duration	LAeq	LAFMax	LA90
dd/mm/yyyy	hh:mm:ss	hh:mm:ss	dB	dB	dB
12/06/2023	09:00:00	00:15:00	47.8	67.2	42.8

APPENDIX C – 3D SOUND MODEL – NOISE CONTOURS









APPENDIX D - 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)	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)	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)	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 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)	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)	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)	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)	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, $L_s = L_{Aeq,T_r}$ (BS 4142:2014)	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)	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,T_r}	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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