

SPRATT+HAMER



Noise Impact Report

Project Details

Client	Eleanor Charles Group Limited
Client Address	5 Greenside House Portal Business Park Eaton Lane Tarporley CW6 9DL
Site Address	Victorian Buildings 9-13 Silver Street Bury BL9 0EU
Reference	12717

Quality Assurance

Prepared by	Justyna Lubas MSc AMIOA
Reviewed by	Alejo Garcigoy MSc MIOA
Authorised by	Ben Bielicki BSc (Hons) MIOA
Issue date	05/06/2024

Revision History

Version	Date	Editor	Notes
V1	08/08/2019	Ben Bielicki	First issue
V2	05/06/2024	Justyna Lubas	Second issue - New noise break-in assessment



SPRATT+HAMER

Contents

1	Summary.....	5
2	Introduction.....	6
2.1	Noise Impact Assessment.....	6
3	Assumptions, Limitations & Uncertainty.....	7
4	Planning Policies, Guidance and Criteria.....	8
4.1	National Planning Policy.....	8
4.2	Criteria.....	10
4.2.1	Local Planning Authority Criteria.....	10
4.2.2	BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings.....	10
4.2.3	WHO Guidelines for Community Noise.....	11
4.3	Criteria Summary.....	11
5	Site Description.....	12
5.1	Subjective Observations.....	12
5.2	Weather.....	12
6	Noise Measurement Procedure.....	13
6.1	Survey Date(s).....	13
6.2	Personnel Present.....	13
6.3	Survey Equipment Used.....	13
6.4	Calibration.....	13
6.5	External Ambient Sound Measurements.....	13
6.5.1	Monitoring Position 1.....	13
6.5.2	Monitoring Position 2.....	13
6.6	Location Plan of Measurement Positions.....	14
7	Results and Analysis.....	15
7.1	External Ambient Sound Measurement Analysis in Accordance with BS 8233:2014.....	15
7.2	Night Time L_{AFmax} Analysis.....	16
7.2.1	Night Time L_{AFmax} at Monitoring Position 1.....	16
7.2.2	Night Time L_{AFmax} at Monitoring Position 2.....	16
8	Recommendations.....	18
8.1	Glazing Specification 1.....	18
8.2	Glazing Specification 2.....	18



8.3 Habitable Room Ceilings in Loft Space..... 19

8.4 Ventilation..... 19

8.5 Specification Guide..... 20

9 Calculation Methodology.....21

10 Example of Estimated Performance22

11 Conclusion.....23

12 References 24

12.1 Drawing References..... 24

Appendix.....25

Figure 1: Photograph Showing Monitoring Position 1.....25

Figure 2: Photograph Showing Monitoring Position 2..... 26

Proposed Site Plans.....27

Measurement Results..... 30



1 Summary

A noise assessment has been conducted for a proposed residential development comprising conversion of the first to third floor into 15 no. apartments located at 9-13 Silver Street, Bury, BL9 0EU.

The assessment is to be submitted as part of a pre-planning application for the development site to Bury Council.

Spratt and Hamer have previously attended the site and carried out a noise survey in June 2019, with a technical noise impact report being issued in August 2019. Since then, the scheme has progressed, and a new noise survey was required to provide client with new glazing and ventilation strategy.

The assessment considers the impact of traffic, entertainment noise, including patrons and amplified music coming from the neighbouring late-night establishments on the proposed residential development in comparison with BS 8233: 2014 and World Health Organisation guideline criteria.

All results and recommendations are within the BS 8233:2014 and WHO guidelines for noise within a residential dwelling provided the proposed mitigation is implemented, including glazing and ventilation.



2 Introduction

Eleanor Charles Group Limited has instructed Spratt and Hamer Limited to undertake an environmental noise survey in order to assess the impact from entertainment noise and nearby road, as well as other general noise within the local environment, which may have an impact on future residents of the proposed development.

The proposed development site is an existing four-storey building that currently comprises of ground floor bar space, first, second and third floor office space. It is proposed change of use of the existing buildings upper floors into 15no. self-contained residential apartments while retaining bar use of ground floor.

Spratt and Hamer have previously attended the site and carried out a noise survey in June 2019, with a technical noise impact report being issued in August 2019. Since then, the scheme has progressed, and a new noise survey was required to assess a new glazing and ventilation strategy. The sound isolation assessment between commercial and residential was carried out in previous report (21717 *Environmental Noise Report - Victoria Buildings, 9-13 Silver Street, Bury, Rev1*).

This report is prepared solely for Eleanor Charles Group Limited. Spratt and Hamer Limited accepts no responsibility for its use by any third party.

This document has been prepared using the various documents listed within the appendices of this report, together with drawings, technical information and additional verbal representations made by third parties. We have not audited nor independently verified the content or accuracy of any of the documents and information provided to us in the preparation of this report.

If additional information comes to light subsequent to the production of this report, we reserve the right to revise our opinions and the conclusions reached within this report.

2.1 Noise Impact Assessment

Spratt and Hamer Limited has undertaken an environmental noise impact assessment at the above site with noise levels measured externally over a 96-hour period, consisting of 16-hour days (07:00 – 23:00) and eight-hour nights (23:00 – 07:00). The measurements were carried out during weekdays and over a weekend from Thursday to Monday.

This report will state the measured noise levels and will refer to guidance relevant to the nature of this survey whilst considering Local Planning Authority guidance and conditions.



3 Assumptions, Limitations & Uncertainty

- a. All suggested specifications require a good level of workmanship and for materials to be installed as the manufacture intends. Any poor workmanship may lead to weaknesses in the sound attenuation provided by the building elements.
- b. It is assumed that the sound pressure levels measured on site during the environmental noise survey are typical of the site.
- c. It is assumed that the technical data provided by glazing and ventilation manufacturers is up to date and correct.
- d. It is assumed that drawings and information supplied Eleanor Charles Group Limited and Four Architects are up to date and correct.
- e. It should also be noted that building elements modelled in INSUL are only an approximation of the proposed specifications due to the limitation of materials available within the software.



4 Planning Policies, Guidance and Criteria

The planning policies and criteria listed below are taken from associated relevant guidance documents, all of which should be considered for the internal and external noise levels.

4.1 National Planning Policy

The National Planning Policy Framework (NPPF) December 2023 set out the Government's planning policies for England and how they are expected to be applied. It provides a framework within which the Local Authorities are to prepare local plans and use their planning powers to minimise the adverse impact of noise. It should contain the following in relation to noise impacts.

174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

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

185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

'mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life'

NPPF previously characterised noise by grading and recommending actions and different effect levels as reproduced in Table 1.



SPRATT+HAMER

Perception	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 1: Noise exposure hierarchy based on likely average response



4.2 Criteria

4.2.1 Local Planning Authority Criteria

At the time of writing the report, the consultant is unaware of any conditions or specific criteria provided by the Local Planning Authority; therefore, the following noise impact assessment will be undertaken in order to meet the criteria of BS 8233:2014 and WHO *Guidelines for Community Noise*.

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

The British Standard BS 8233:2014, Guidance on Sound Insulation and noise reduction for buildings, provides appropriate internal levels of noise within dwellings, flats and rooms in residential use when unoccupied.

Section 7.2.2 'Internal ambient noise levels in dwellings' of BS 8233: 2014 states that 'In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values in Table 4'.

Activity	Location	07:00 to 23:00	23:00 to 07:00
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 $L_{Aeq,8hour}$

Table 2: Table 4 of BS 8233:2014 Indoor ambient levels for dwellings

Note 7 of section 7.7.2 states 'Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed up to 5 dB and reasonable internal conditions still achieved'.

In addition, Note 4 of section 7.7.2 states, 'Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ (SIC), depending on the character and number of events per night. Sporadic noise events could require separate values'.

In the absence of a specific performance criterion within BS 8233 for short-term noise maxima, reference can be made to guidance published by the WHO. In particular, the WHO publication 'Guidelines for Community Noise' (1999), from which the guidance given in BS 8233: 2014 is itself derived, states that 'for a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than ten to fifteen times per night'.

The WHO publication 'Guidelines for Community Noise' (1999) has since been updated in 2018; however, it is widely accepted by Local Authorities that L_{AFmax} 45 dB is the target level for short-term noise maxima between 23:00–07:00.



4.2.3 WHO Guidelines for Community Noise

In 1999, the WHO (World Health Organisation) published Guidelines for Community Noise, stating the following internal noise levels are applicable within dwellings.

Specific Requirement	Critical Health Effect (s)	$L_{Aeq,T}$ (dB)	Time base, T (hours)	L_{AFmax} (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

Table 3: A Summary of the Guidance Noise Levels

4.3 Criteria Summary

In order to meet the anticipated requirements of Bury Council, the assessment and recommendations will be made in accordance with *BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings* and *WHO Guidelines for Community Noise*.



5 Site Description

The proposed development at Victoria Buildings, 9 – 13 Silver Street is an existing three storey building situated in Bury city centre. The proposed building has an existing skylight situated above hallways and non-habitable spaces. The front façade of the building faces west onto Silver Street, which is a main high street consisting of commercial properties and one-way traffic flowing on a south direction. The north façade is joined to further commercial properties down the high-street; the east façade faces Broad Street consisting of single lane traffic and parking. To the south of the development is Back Broad Street, a single lane road allowing access to the rear of surrounding commercial properties.

The proposed development is situated within a commercially vibrant area known for its active nightlife, including nearby bars and entertainment venues that operate into the late night hours. The closest bar is located directly below the proposed development, the Society on Silver Street operates until 4:30am in the morning with an exception to Thursday where the bar closes at 3:30 am and Sunday where bar closes at 4am. To the north is located The House of Bridget that operates until 3am from Wed. to Sun. To the southwest, approximately 14 metres away, we find the Earl of Derby which operates until 2am. Other surrounding bars and pubs are located further away with operational times till 11pm.

Subjectively, the main source of noise likely will be from traffic. To the rear of the property the main source of noise will be mechanical plant and traffic. However, at night the main noise source likely will be patrons' activity.

5.1 Subjective Observations

During site attendance, subjectively the main source of noise was road traffic as there was no entertainment establishments open at the time of the visit.

5.2 Weather

18-22/04/2024	Thursday	Friday	Saturday	Sunday	Monday
Temperature (°C)	-0.4 – 10.2	2.3 – 13.9	-0.4 – 14.5	6.8 – 15.9	6.4 – 10.7
Wind Speed (m/s)	0.0 – 4.1	0.0 – 2.4	0.0 – 2.4	0.0 – 2.0	0.0 – 1.2
Wind Direction	SSE	S	S	WNW	SW
Precipitation (mm/h)	0.0 – 3.0	0.0 – 3.0	0.0	0.0	0.0 – 4.2
Damp road/ wet ground	Yes	Yes	No	No	Yes
Fog/snow/ice	No	No	No	No	No

Table 4: Measuring Weather Conditions

All weather data taken from wow.metoffice.gov.uk. Weather data has been taken from the 'bolton-Arcanekand' weather station, located at approximately 5km southwest of the proposed development.



6 Noise Measurement Procedure

6.1 Survey Date(s)

18/04/2023 – 22/04/2024

6.2 Personnel Present

Ben Bielicki BSc (Hons) MIOA

6.3 Survey Equipment Used

Manufacturer	Model	Serial No.	Description
Rion	NL-52	01054205	Integrating Sound Level Meter and Real Time Analyser
Pulsar	Model 105	59964	Acoustic Calibrator
Rion	NL-52	00392484	Integrating Sound Level Meter and Real Time Analyser
Bruel & Kjaer	Type 4231	3564329	Acoustic Calibrator

Table 5: Survey Equipment Used

6.4 Calibration

The sound level meters were calibrated with the field calibrator to a level of 94.0 dB @ 1 kHz prior to and on completion of the survey. No significant drift in calibration was observed. The meters used during the survey are precision grade Class 1.

Calibration certificates are available on request.

6.5 External Ambient Sound Measurements

The measurement locations chosen during the survey were deemed suitable for the determination of the noise levels able to impact upon the façades of the proposed development.

The sound level meters were set to measure broadband and 1:1 octave centre frequency bands L_{Aeq} , L_{A90} , L_{A10} and L_{AFmax} in 5-minute periods.

6.5.1 Monitoring Position 1

A microphone was placed protruding through the window at first-floor level 1m from the front façade. The sound level meter was set to record WAV file audio recordings for all maximum sound level events above 80 dBA. The meter was set to measure the complete survey period.

6.5.2 Monitoring Position 2

A microphone was placed out of the window at first-floor level 1m from the rear façade. The meter was set to measure the complete survey period.



6.6 Location Plan of Measurement Positions

The location plan below shows the proposed development and positions of the monitoring equipment as well as the location of the nearest entertainment noise sources.

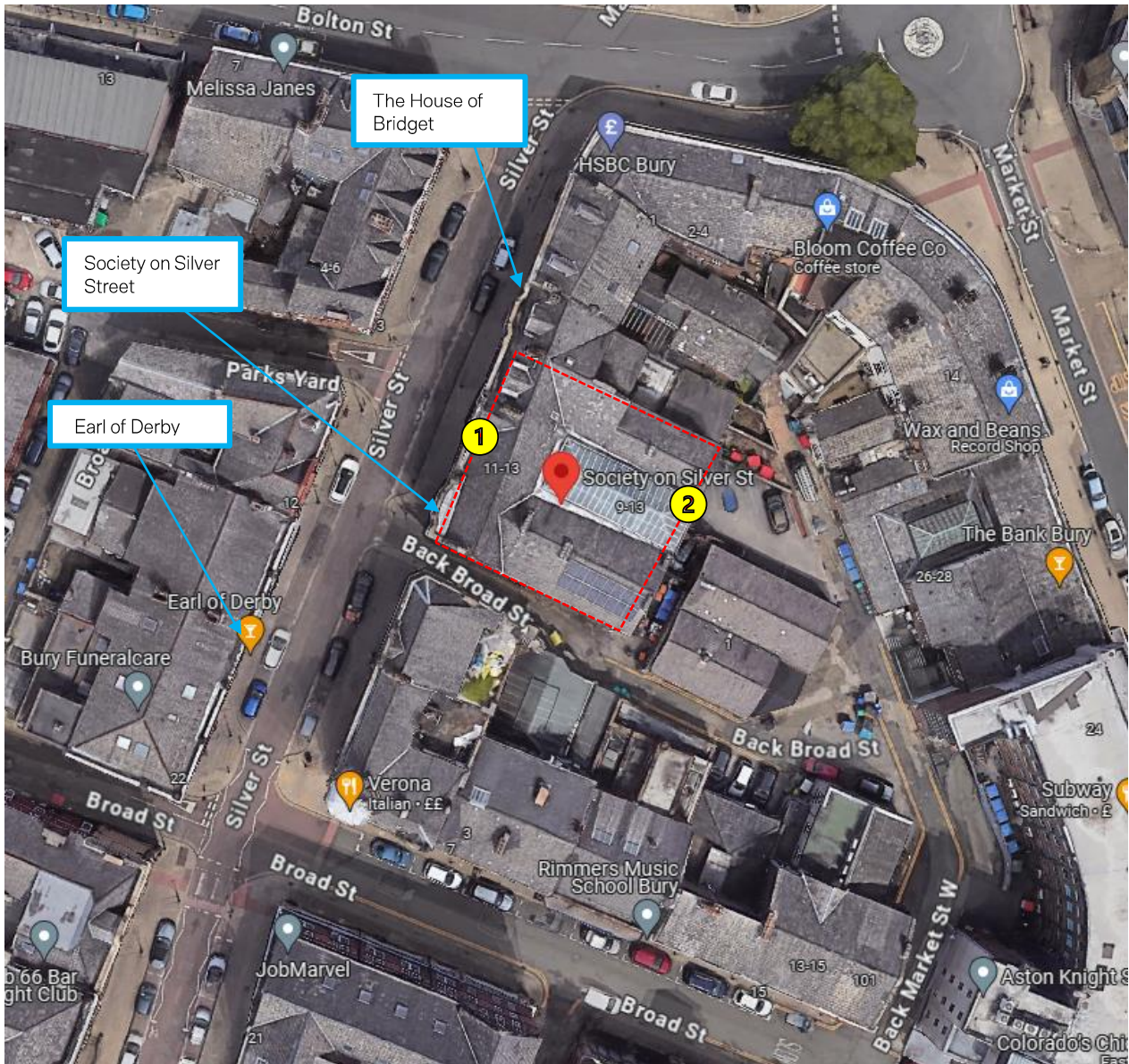


Figure 1: Site location. Image taken from www.google.co.uk/maps



7 Results and Analysis

7.1 External Ambient Sound Measurement Analysis in Accordance with BS 8233:2014

The following table presents the measured results from all monitoring positions.

The measurement results at positions 1 & 2 have had a façade correction of 3dB applied in order to adjust the result so that it is comparable to a free-field sound pressure level.

Monitoring position	Day	Time Period	Time Base T (hours)	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	L_{A90} (dB)	L_{A10} (dB)
1	Thursday	Daytime	11hr	61.0	-	50.2	63.1
		Night-time	8hr	61.5	48.8 - 86.6	39.3	64.9
	Friday	Daytime	16hr	62.4	-	50.7	65.0
		Night-time	8hr	68.4	63.7 - 91.2	50.5	70.9
	Saturday	Daytime	16hr	62.2	-	51.6	65.8
		Night-time	8hr	67.6	60.6 - 90.5	51.1	70.0
	Sunday	Daytime	16hr	61.5	-	44.4	66.1
		Night-time	8hr	59.0	52.0 - 85.1	35.2	63.2
	Monday	Daytime	4h	62.6	-	46.3	64.0
Monitoring position	Day	Time Period	Time Base T (hours)	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	L_{A90} (dB)	L_{A10} (dB)
2	Thursday	Daytime	11hr	53.1	-	47.3	54.4
		Night-time	8hr	48.8	43.6 - 78.2	40.4	51.5
	Friday	Daytime	16hr	52.5	-	46.3	54.8
		Night-time	8hr	58.2	44.0 - 88.9	41.4	62.2
	Saturday	Daytime	16hr	52.5	-	45.2	55.2
		Night-time	8hr	57.0	44.2 - 83.3	38.3	61.3
	Sunday	Daytime	16hr	49.8	-	44.4	52.0
		Night-time	8hr	50.8	42.5 - 89.8	39.4	52.9
	Monday	Daytime	4h	49.8	-	44.6	51.2

Table 6: Measurement Results

Data charts can be found in the appendix.



SPRATT+HAMER

The table below outlines the highest measured $L_{Aeq,t}$ in 1-hour intervals during the daytime.

Monitoring position	Day	Period	Time	Highest $L_{Aeq,t}$ (dB)
1	Thursday	Daytime	17:00	63.1
	Friday		22:00	66.7
	Saturday		22:00	66.5
	Sunday		22:00	67.0
	Monday		09:00	63.9
2	Thursday	Daytime	15:00	57.0
	Friday		22:00	57.9
	Saturday		17:00	55.5
	Sunday		15:00	52.6
	Monday		08:00	51.5

Table 7: Daytime 1-hour Measurement Results

The highest measured hourly equivalent $L_{Aeq,1h}$ of 67dB was measured on Sunday at 22:00. This specific time coincides with the start of entertainment activity in the area. In order to protect the amenity of future residents, this value will be used as the basis for the noise assessment during the daytime.

Unlike the daytime, nighttime noise levels are elevated through the majority of the measuring period. Therefore, the average $L_{Aeq,8hr}$ will be used to assess the internal noise levels, as it is considered to be a conservative scenario.

7.2 Night Time L_{AFmax} Analysis

The L_{AFmax} measured during the night time (23:00-07:00) has been analysed. WHO Community Noise Guidelines states "For a good night sleep it is believed that indoor sound pressure should not exceed approximately 45 dB L_{AFmax} more than 10 – 15 times per night (Vallet & Vernet 1991).

7.2.1 Night Time L_{AFmax} at Monitoring Position 1

The WAV file recordings and frequency spectrum data indicate that the L_{AFmax} 91.2 dB and subsequent events were from car pass-bys and patrons.

It has been found that the L_{AFmax} of 86.6 dB events has not been exceeded by more than 5 times on night two (Friday) and no more than 4 exceedances on night three (Saturday) with no exceedances throughout the rest of the nights. As such, it will be used for the assessment at this monitoring position as this is considered representative of other L_{AFmax} events during the night time period.

7.2.2 Night Time L_{AFmax} at Monitoring Position 2

The frequency spectrum data indicate that the L_{AFmax} 89.8 dB and subsequent events likely to be from car horns.

After analysis of frequency spectrum, it has been found that the L_{AFmax} 82.8 dB has only been exceeded twice on the second night of the survey, and once on the third and fourth night of the survey. As such, it



will be used in the assessment as its data suggests that noise is produced by patrons of nearby bars/restaurants.



8 Recommendations

In order to provide a robust assessment, the noisiest period occurring during the daytime i.e. 22:00 – 23:00 will be considered. As such, the highest $L_{Aeq,1hour}$ will be used in order to assess the internal noise levels during the daytime period. For the nighttime, the estimated internal noise levels attributed by the external noise sources have been assessed over the 8-hour average $L_{Aeq,T}$ ambient noise levels and the L_{AFmax} values from the night time. This, along with the building element evaluation provide the basis for the following recommendations.

The proposed development is located in a conservation area. However, it has been advised that the existing glazing can be replaced.

8.1 Glazing Specification 1

The glazing specification in bedrooms should consist of at least 6mm glass / 16mm void / 10mm glass double-glazed unit, 200mm air gap and a secondary 12mm glass window; in well-sealed frames or any other glazing capable of meeting the minimum performance outlined in the table below.

Bedrooms	R_w ($C;C_{tr}$) (dB)	Octave Centre Frequencies (Hz)						
		63	125	250	500	1k	2k	4k
6mm/ 16mm/ 10mm/ 200mm/ 6mm	50 (-2;-5)	27	35	42	48	46	52	61

Table 8: Recommended Min. Glazing SRI for Bedrooms – Spec. 1

The glazing specification in living rooms should consist of at least 6mm glass / 200mm void / 10mm glass double glazed unit; in well-sealed frames or any other glazing capable of meeting the minimum performance outlined in the table below.

Living Rooms	R_w ($C;C_{tr}$) (dB)	Octave Centre Frequencies (Hz)						
		63	125	250	500	1k	2k	4k
6mm/ 200mm/ 10mm	49 (-1; -4)	18	35	46	46	46	56	65

Table 9: Recommended Min. Glazing SRI for Living Rooms – Spec. 1

8.2 Glazing Specification 2

The glazing specification in both bedrooms and living rooms should consist of at least 8mm glass / 16mm void / 6mm glass double glazed unit; in well-sealed frames or any other glazing capable of meeting the minimum performance outlined in the table below.

All Areas	R_w ($C;C_{tr}$) (dB)	Octave Centre Frequencies (Hz)					
		125	250	500	1k	2k	4k
8mm (16) 6mm	35 (-2;-6)	20	21	33	40	36	48

Table 10: Recommended Min. Glazing SRI – Spec. 2



The selected units or products described have been used as a guide to form part of the specification. Other similar units or products can be used provided they can achieve the given minimum acoustic performance.

8.3 Habitable Room Ceilings in Loft Space

It is assumed that the loft space will be void and will not be used as habitable space. This layout should be capable of meeting the minimum required sound reduction.

8.4 Ventilation

NOTE 5 in section 7.7.2 of BS 8233:2014 states “if relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.”

It is our understanding that all dwellings will require to be mechanically ventilated. The system is to be designed by a suitably qualified engineer or M&E consultant. The system shall be designed so the sound levels from any external plant or inlet/outlets do not exceed the background noise level at any noise receptor, i.e., outside a neighbouring window. This may require further assessment once the type and location of system has been specified.

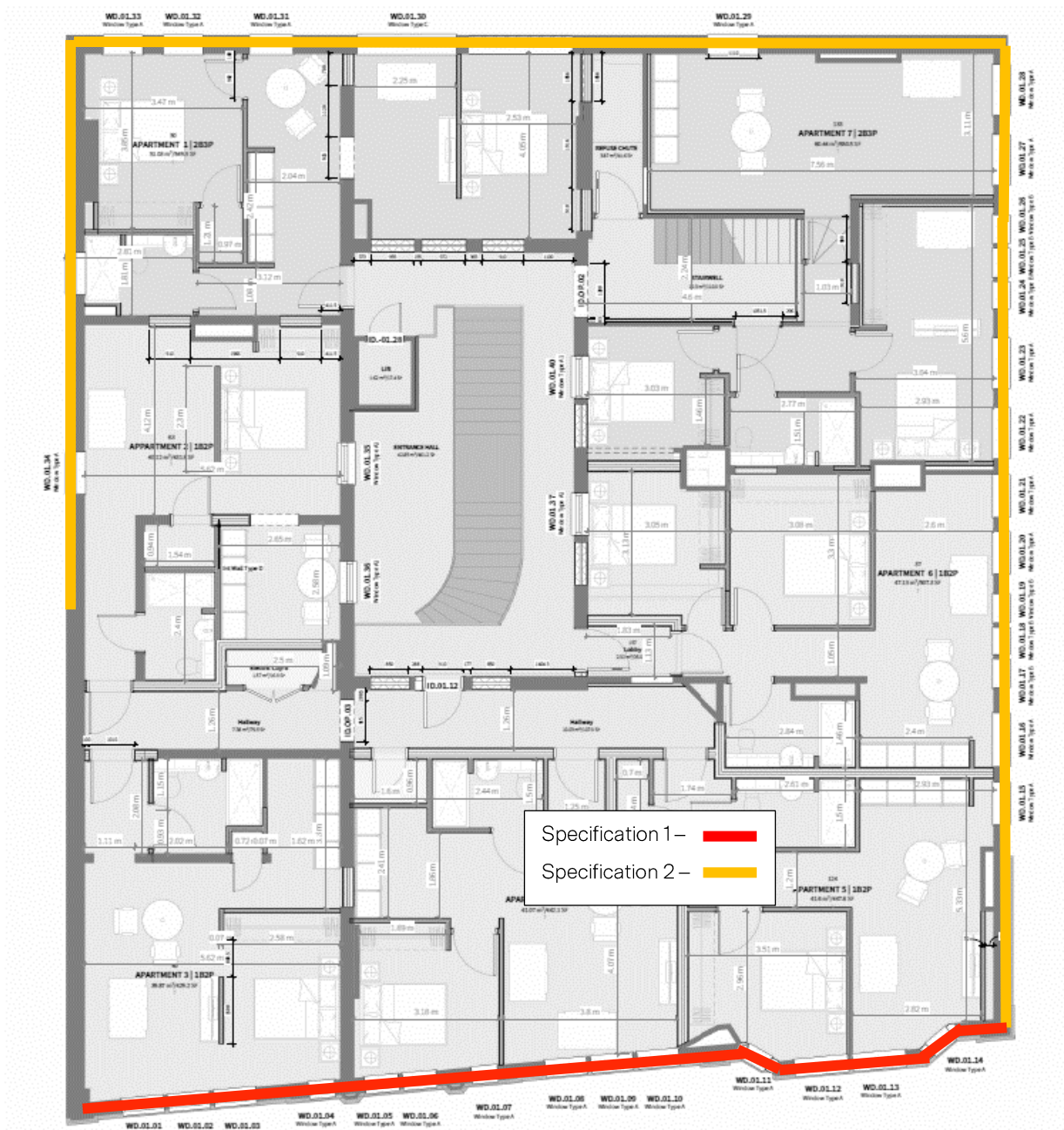
The glazing and ventilation suggestions have been calculated assuming the windows are tightly closed. However, it must be noted that windows are suggested to be openable to provide rapid or purge ventilation or means of escape.

It should be noted that it's the responsibility of the applicant to ensure that the ventilation strategy is sufficient to meet the requirements of Building Regulations Parts F and O.



8.5 Specification Guide

Below is a visual aid to identify the location of the glazing specifications as described above for all floors.



9 Calculation Methodology

Calculations for the BS 8233:2014 assessment have been based on the rigorous calculation method of BS 8233:2014 and BS EN 12354-3.

The calculations assume the external walls to be 400mm solid masonry comprising stone and brick. This has been modelled in INSUL Acoustic Prediction Software.

All room dimensions used in calculations are based on drawings provided by the architect. See appendix – Site plans.

The calculations assume each room has a reverberation time of 0.5 seconds in living rooms and 0.4 seconds in bedrooms.

The predictions also have been calculated assuming all windows are tightly closed.



10 Example of Estimated Performance

The following table compares the estimated performance values with the measured values at the most exposed habitable rooms.

Location	Time period	Measured Level		Estimated Internal	
		$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)
Front Façade – Bedroom	Daytime (07:00 – 23:00)	62.4	-	20.2	-
	Night time (23:00 – 07:00)	68.4	86.6	28.0	38.5
Rear Façade – Bedroom	Daytime (07:00 – 23:00)	62.4	-	26.1	-
	Night time (23:00 – 07:00)	58.4	86.6	22.3	42.7

Table 11: Estimated performance



11 Conclusion

When installing the glazing and ventilation detail as discussed in the recommendations section, the internal noise levels described in BS 8233:2014 can be achieved for internal noise levels in all habitable rooms.



12 References

National Planning Policy Framework (NPPF)

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

World Health Organisation Guidelines for Community Noise

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

BS EN 12758:2011 Glass in building – Glazing and airborne sound insulation

BS 6262-4 – Glazing for buildings

www.google.co.uk/maps

12717 Environmental Noise Report – Victoria Buildings, Silver Street, Bury, Rev 1 dated 5th August 2019

12.1 Drawing References

22-006-FA-DR-04-803_P3_SettingOut_Plan_Proposed_01-First

22-006-FA-DR-04-804_P3_SettingOut_Plan_Proposed_02- Second

22-006-FA-DR-04-805_P2_SettingOut_Plan_Proposed_03-Third



Appendix

Figure 1: Photograph Showing Monitoring Position 1



Figure 2: Photograph Showing Monitoring Position 2



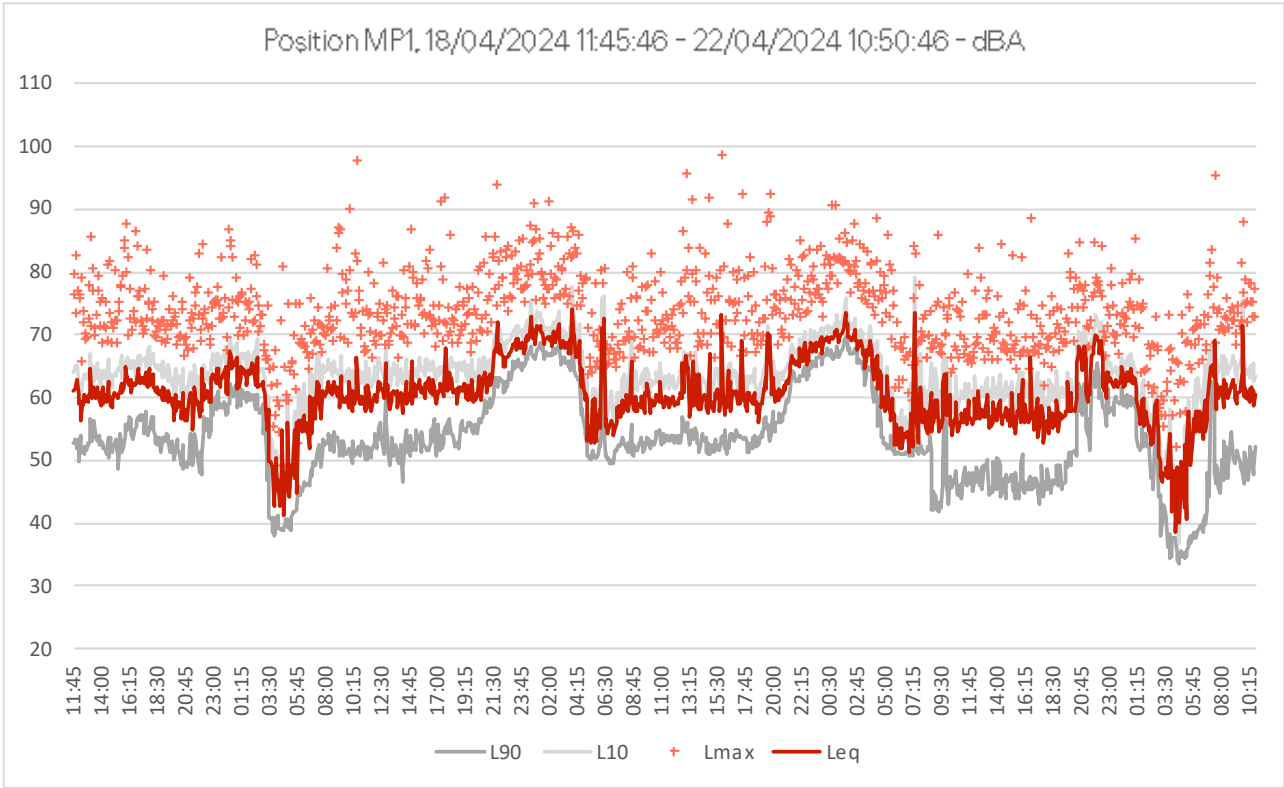
Proposed Site Plans



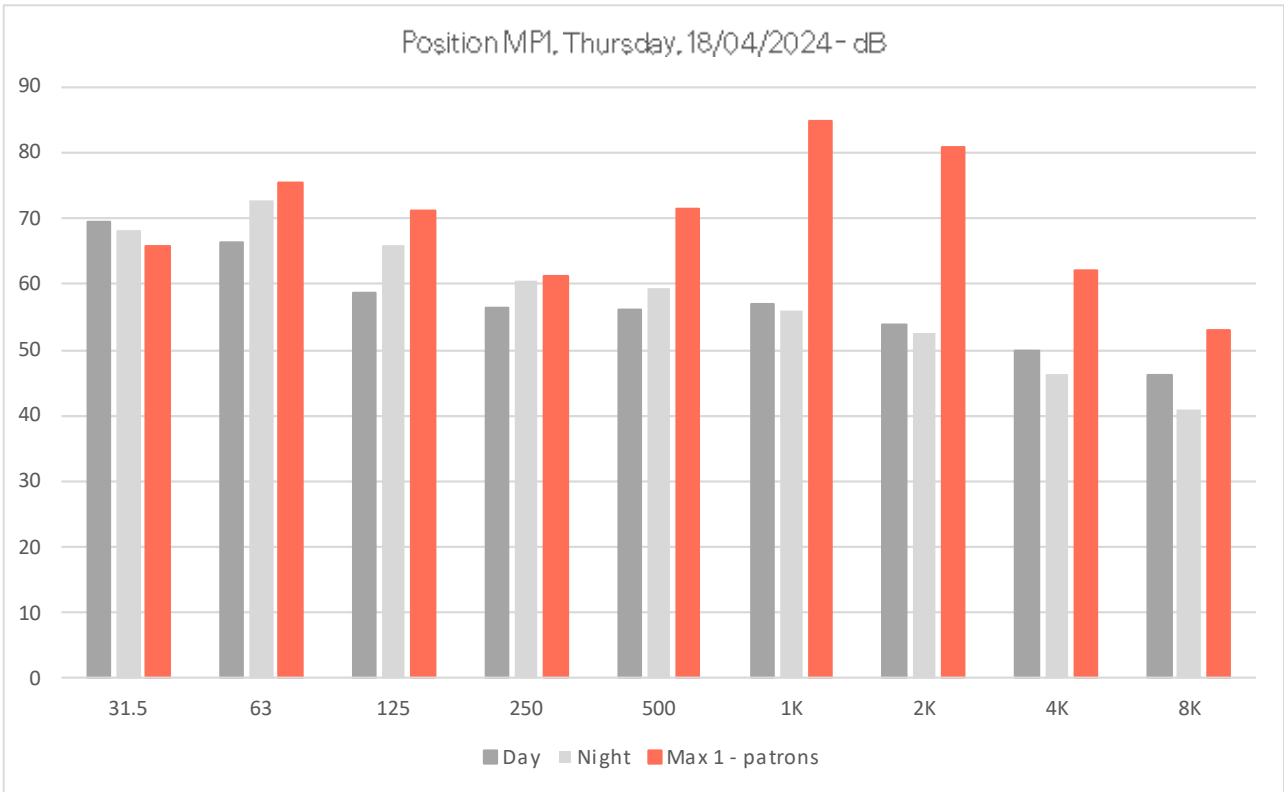


Measurement Results

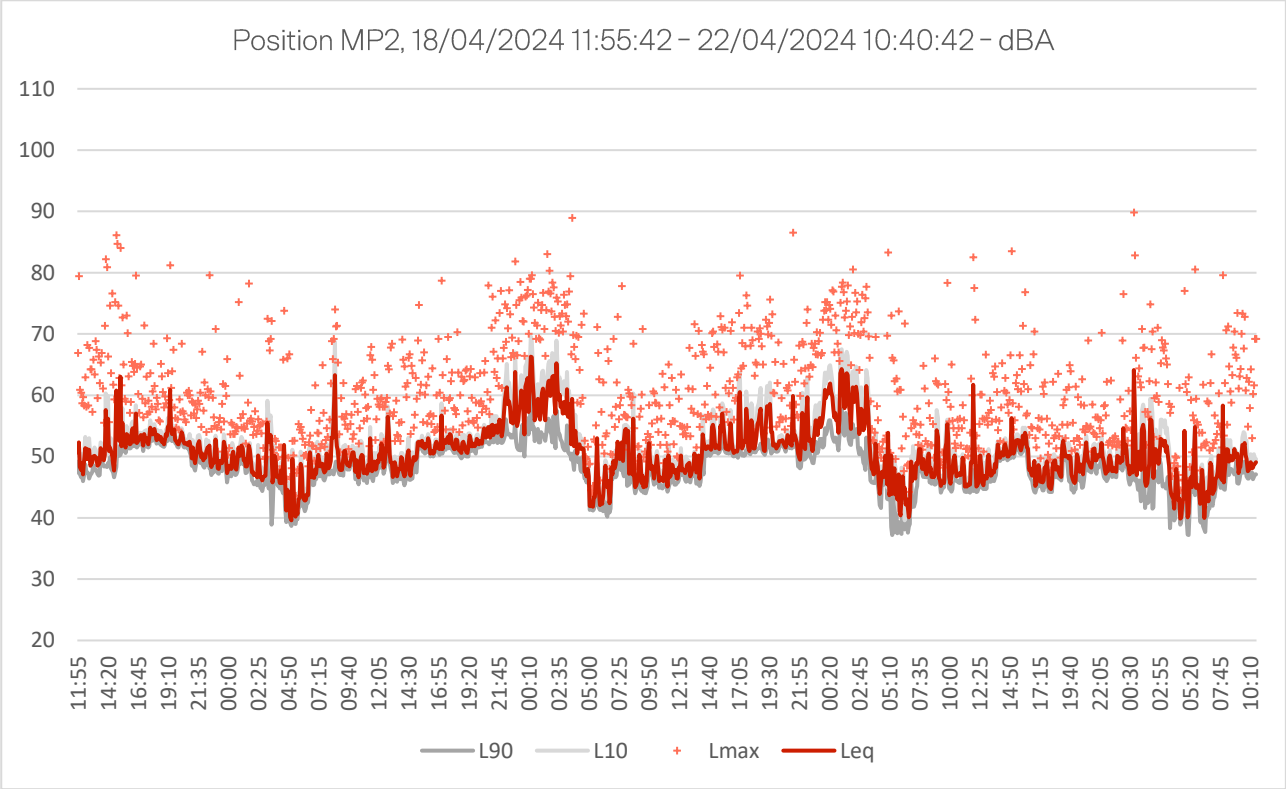
Monitoring Position 1



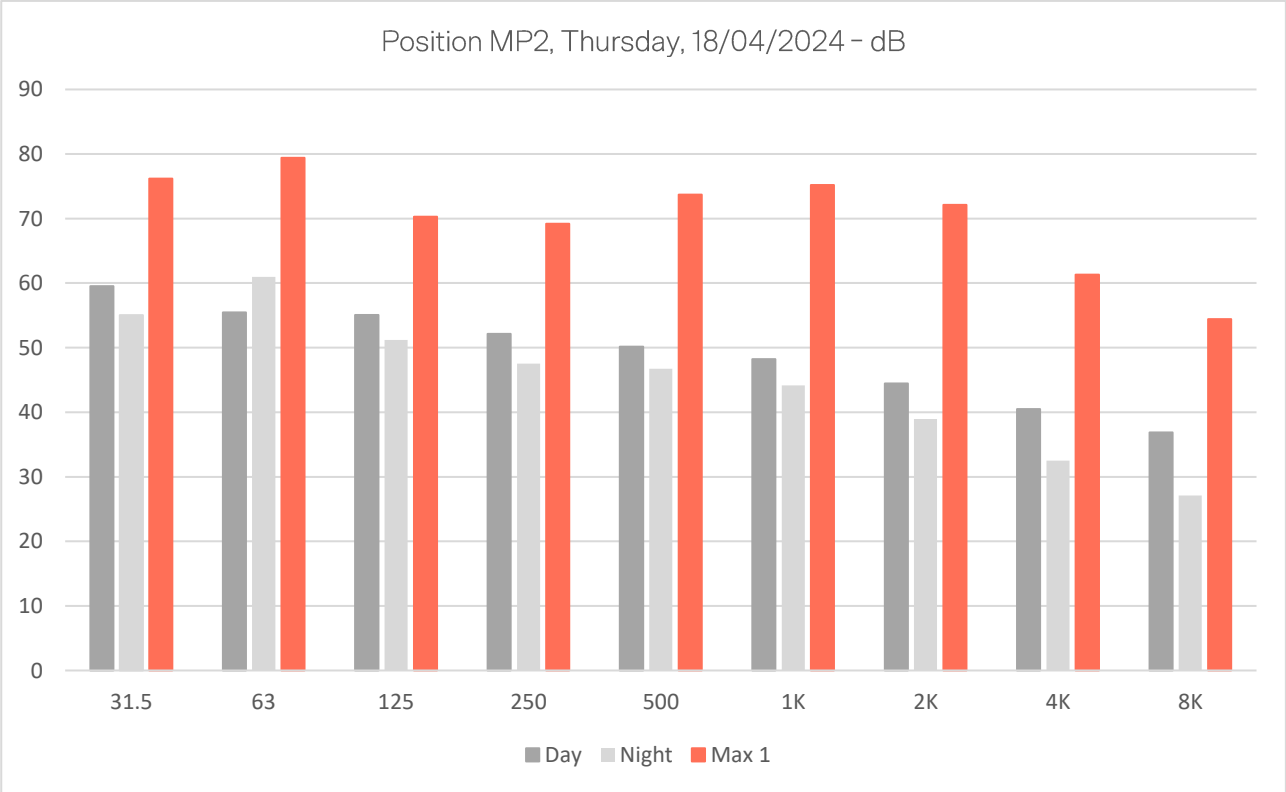
Un-weighted 1:1 Octave Results



Monitoring Position 2



Un-weighted 1:1 Octave Results



Glossary of Acoustical Terms

A-weighting

Noise levels are corrected to represent human response to sound.

L_{Aeq}

This is a continuous equivalent of time varying noise, or effectively the average measured (A weighted) noise level over a defined period of time.

$L_{Aeq,16hour}$

A 16 hour long measurement of the L_{Aeq} over the period between 07:00 and 23:00, also known as a daytime measurement.

$L_{Aeq,8hour}$

An 8 hour long measurement of the L_{Aeq} over the period between 23:00 and 07:00, also known as a night time measurement.

L_{AFmax}

The highest, or maximum A-weighted sound pressure level measured over a specified time period. The 'F' defines a time weighting in Fast.

L_{A90}

The A-weighted noise level or average level which is exceeded for 90 percent of the measured time period. Also known as a background level.

L_{A10}

The A-weighted noise level or average level which is exceeded for 10 percent of the measured time period.

1:1 & 1:3 octave spectrum analysis

A single measurement that is separated into frequency bands to allow for a more detailed analysis of the noise source in question.

R_w

The weighted sound reduction index of a partition or facade. A single number value based on the performance of a partition between two rooms across the frequency range 100Hz to 3150Hz. The level is adjusted for the effects of reverberation and background noise.

$D_{n,e,w}$



The weighted level difference of a partition or façade which takes into account a small element such as a grill or vent.

SEL (sound exposure level)

A measure of A-weighted sound energy used to describe a particular event, such as a train pass. It is the sound energy, which, if occurring over one second would contain the same energy as the event.

Free field sound pressure

Is where the radiation or spread of sound is completely unaffected by the presence of any reflecting surfaces or boundaries.

Low Frequency Noise

A term generally used for sound below a frequency of 100 to 150Hz.





SPRATT+HAMER

Online

sprattandhamer.co.uk

Email

info@sprattandhamer.co.uk

Birmingham

Lewis Building, Bull Street
Birmingham, B4 6AF
0121 828 3120

London

100 Borough High Street,
London, SE1 1LB
0203 286 2019

Liverpool

23 Roscoe Street, Liverpool
L1 2SX
0151 933 6186

Manchester

Peter House, Oxford Street
Manchester, M1 5AN
0161 521 9383