



Residential Noise Assessment

Site Address: 65 Grimshaw Lane, Manchester, M40 2AX

Client Name: Jel 8 Limited

Project Reference No: NP-013028



Authorisation and Version Control

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Delivering sustainable development by promoting good health and well-being through effective management of noise.

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1. Introduction

NOVA Acoustics Ltd has been commissioned to prepare a noise assessment for a proposed development at 65 Grimshaw Lane, Manchester, M40 2AX ('the site'). The development involves the change of use from a former pub into a mixed-use building comprising a public house on the ground floor and six guestrooms, a staff accommodation area and ancillary areas on the first floor. The site is subject to noise from road traffic noise and noise and commercial activity from the nearby City Council Depot.

The applicant is preparing to submit a planning application to (Manchester City Council. This report has been prepared to accompany the planning application to be submitted to the Local Planning Authority ('LPA').

A noise survey has been undertaken to establish the prevailing sound levels at the proposed development. The findings have been subsequently used to assess the suitability of the site for rooms for residential purpose use. Measures required to mitigate noise impacts for the proposed development have been assessed in accordance with the relevant performance standards, legislation, policy, and guidance.

This noise assessment is necessarily technical in nature; therefore, a glossary of terms is included in Appendix A to assist the reader.

1.1 Standards, Legislation, Policy & Guidance

The following performance standards, legislation, policy, and guidance have been considered to ensure good acoustic design in the assessment:

- National Planning Policy Framework (2024).
- Noise Policy Statement for England (2010).
- British Standard BS8233:2014 – 'Guidance on sound insulation and noise reduction for buildings'.

Further information on the legislation can be found in Appendix B.

1.2 Proposal Brief

The proposal is for the change of use from a public house into a mixed-use building comprising a public house on the ground floor and six guestrooms, a staff accommodation area and ancillary areas on the first floor.

The figure below shows the proposed development.

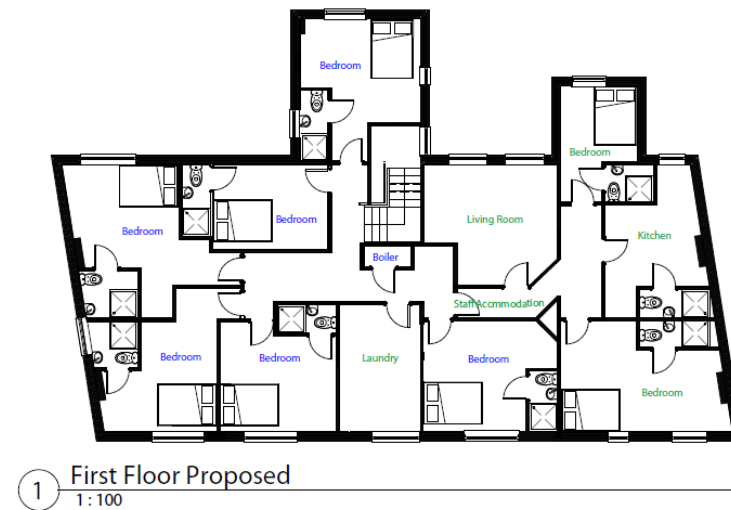
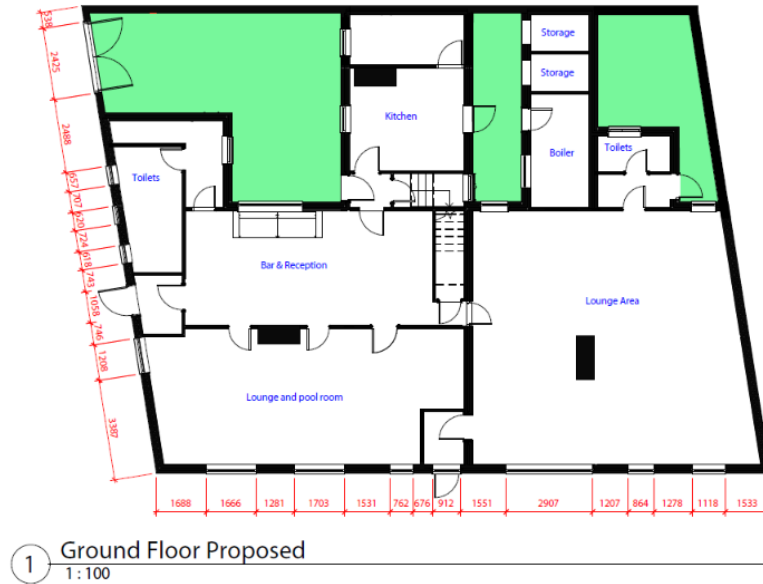


Figure 1 – Proposed Development Floor Plans

2. Environmental Noise Survey

2.1 Measurement Methodology

The following table outlines the measurement dates and particulars.

Location	Survey Dates	Measurement Particulars
MP1	28/07/2025 – 30/07/2025	Equipment mounted protruding out of a first-floor window on the front façade overlooking Grimshaw Lane.
MP2	28/07/2025 – 30/07/2025	Equipment mounted protruding out of a first-floor window on the rear façade overlooking the commercial properties and Bower Street.

Table 1 – Measurement Methodology

The figure below outlines the site surroundings and measurement locations:



Imagery ©2025 Airbus, Maxar Technologies, Map data ©2025

Figure 2 – Measurement Locations and Site Surroundings

2.2 Context & Subjective Impression

The proposed development site is located on Grimshaw Lane, Manchester. The surrounding area is mixed of residential dwellings and commercial units. The dominant road source at the front of the proposed property was road traffic noise from Grimshaw Lane which was observed to be busy with a combination of cars and HGV vehicles which serve the surrounding commercial units.

Towards the rear of the site the dominant source remains as road traffic noise from vehicle movements on Bower Street and distant road traffic noise from the A62 to the north. In absence of the road traffic movements on Bower Street, commercial noise is audible towards the rear of the site, particularly from the Manchester City Council depot where road sweepers were observed to be coming and going with a tonal noise quality. Noise from the commercial units was noted to be impulsive clanging, banging and shouting rather than constant operational noise. A vehicle workshop is noted on the above plan, however observations on site showed that this looked to be inactive.

2.3 Environmental Noise Survey Results

The following section outlines the measured sound levels during the survey. Full time history results can be found in Appendix D.

At MP1, the ambient noise remains at a consistent and at a slightly elevated level between 07:00 to 17:00 hours. At MP2, the loudest period occurred between 09:15 and 11:15 hours on 29th July, this is likely to have been a result of activity within the council depot.

The levels between 05:00 to 07:00 hours were determined as the loudest night-time periods at both locations. This is likely due to increase road traffic and commercial/industrial activity.

Accordingly, noise levels during the above periods are also provided and utilised in the assessment, accounting for higher periods of potential activity along the road network and nearby commercial/industrial premises.

The 'typical' $L_{AFmax,1min}$ level is determined as the level not exceeded more than ten times during the night.

Location	Measurement Period ('T')	Octave Frequency Band (Hz, $L_{eq,T}$, dB)							$L_{Aeq,T}$ (dB)	'Typical' $L_{AFmax,1min}$ (dB)
		63	125	250	500	1k	2k	4k		
MP1	Average $L_{eq,16hr}$ (Day)	70	62	60	60	62	59	51	65	--
	Loudest Day Period (L_{eq})	71	64	62	62	63	60	53	67	--
	Average $L_{eq,8hr}$ (Night)	64	58	56	56	58	55	49	61	82
	Loudest Night Period (L_{eq})	69	64	61	60	63	60	56	67	--
MP2	Average $L_{eq,16hr}$ (Day)	58	52	55	55	51	48	44	56	--
	Loudest Day Period (L_{eq})	60	57	63	63	59	55	54	64	--
	Average $L_{eq,8hr}$ (Night)	50	44	43	41	42	40	37	47	63
	Loudest Night Period (L_{eq})	53	47	48	47	47	45	43	52	--

Table 2 – Sound Level Results Summary

3. Noise Break-in Assessment and Sound Insulation Scheme

3.1 Internal Noise Level Criteria

BS8233 provides the following internal ambient noise level ranges for hotel bedrooms. Given the development is for guesthouse spaces, these criteria are considered the most appropriate for the assessment.

Period	Noise Level
Daytime (07:00 – 23:00 hours)	30 – 40 dB $L_{Aeq,1hr}$
Night-time (23:00 – 07:00 hours)	25 – 35 dB $L_{Aeq,1hr}$
	30 – 40 dB L_{AFmax}

Table 3 – Internal Acoustic Design Criteria for Hotel Bedrooms (BS8233)

The above criteria apply to any hotel bedroom, with windows closed, from all external sources, including road, rail and air traffic and noise from activities outside the hotel and any adjacent premises.

3.2 Glazing and Background Ventilation Specification

The following section provides a glazing and background ventilation specification that achieves the relevant internal noise criteria. The calculations considering the following sound insulation scheme can be found in Appendix E.

Description	Octave Frequency Band (Hz, dB)							Overall (dB)
	63	125	250	500	1k	2k	4k	
Front Bedrooms								
6mm / 16mm argon / 6.8mm Optiphon	21	21	28	37	48	48	54	40 R _w (-6 C _{tr})
Greenwood 2500EA.AC1 (2 No. Trickle)	31	41	40	37	47	43	46	42 D _{ne,w} (-2 C _{tr})
Rear Bedrooms								
6mm Glass / 16mm Air Cavity / 4mm Glass	20	21	20	26	38	37	39	32 R _w (-4 C _{tr})
Titon Standard Vent + C25 (2 No. Trickle)	--	36	38	36	32	37	40	35 D _{ne,w} (-1 C _{tr})

Table 4 – Glazing & Background Ventilation Specification

Any other window or ventilation specification capable of providing this attenuation will be suitable provided the glazing suppliers can provide an acoustic test report in accordance with BS EN ISO 10140-2:2010 or an evidence-based calculation.

Due to potential elevated noise levels associated with nearby commercial premise, it is recommended that a mechanical ventilation/cooling strategy is adopted to remove the requirement for occupants to open windows at the site.

4. Approved Document E (ADE) Criteria

Requirement E1 States:

“Dwelling-houses, flats and rooms for residential purposes shall be designed and constructed in such a way that they provide reasonable resistance to sound from other parts of the same building and from adjoining buildings.”

Requirement E1 sets out the minimum sound insulation performance that should be achieved under pre-completion testing for separating walls and floors, as shown in Table 0.1a and b of ADE. The relevant criteria are shown in the table below:

Table 0.1B – Rooms for residential purposes – performance standards for separating walls, separating floors, and stairs that have a separating function		
Purpose built dwelling houses and flats	Airborne sound insulation $D_{nT,w} + C_{tr}$ dB (min. value)	Impact sound insulation $L'_{nT,w}$ dB (max. value)
Walls	≥ 43	--
Floors and Stairs	≥ 45	≤ 62
Dwelling houses and flats formed by material change of use	Airborne sound insulation $D_{nT,w} + C_{tr}$ dB (min. value)	Impact sound insulation $L'_{nT,w}$ dB (max. value)
Walls	≥ 43	--
Floors and Stairs	≥ 43	≤ 64

Table 5 – ADE Rooms for residential purposes performance standards

Requirement E2 States:

‘Dwelling-houses, flats and rooms for residential purposes shall be designed and constructed in such a way that: (a) internal walls between a bedroom or a room containing a water closet, and other rooms; and (b) internal floors provide reasonable resistance to sound.’

Requirement E2 does not apply to:

- (a) an internal wall which contains a door.*
- (b) an internal wall which separates an en suite toilet from the associated bedroom.*
- (c) existing walls and floors in a building which is subject to a material change of use.*

New internal walls and floors within dwellings are required to meet minimum construction standards, these will not however be tested. Section 0.0 of the Building Regulations Part E states that internal walls and floor need to provide a minimum of R_w 40 dB.

Requirement E3 States:

‘The common internal parts of buildings which contain flats or rooms for residential purposes shall be designed and constructed in such a way as to prevent more reverberation around the common parts than is reasonable.’

Reverberation within communal spaces is required to meet minimum standards, but this is not subject to testing. ADE outlines two calculation methods to assist in the acoustic design to achieve the requirements of requirements E.3, as follows:

- Method A to BS EN ISO 11654:1997 detailed in Approved Document E Sections 7.10 - 7.12, or
- Method B in accordance with Approved Document E Sections 7.13 - 7.25.

It is recommended that the proposed internal partitions for the proposed development are reviewed by an acoustic consultant and that a final schedule of pre-completion testing is agreed with the building control body prior to testing being completed.

5. Conclusion and Action Plan

The proposed development has been assessed against the acoustic design criteria and a sound insulation scheme has been provided to ensure the criteria has been achieved.

The following 'Action Plan' is outlined to ensure the design considerations and specifications from this report are duly implemented:

1. The proposed glazing and background ventilation system, or a suitable alternative, should be installed as shown in Section 3.2. This includes enhanced glazing and trickle ventilation along the front façade. Due to potential elevated noise levels associated with nearby commercial premise, it is recommended that a mechanical ventilation/cooling strategy is adopted to remove the requirement for occupants to open windows at the site across the site.
2. Internal partitions for the proposed development should be reviewed by an acoustic consultant to ensure they achieve the ADE criteria. In addition, a final schedule of pre-completion testing should be agreed with the building control body prior to testing being completed.

The findings of this report will require written approval from the Local Authority prior to work commencing.

Appendix A – Acoustic Terminology

A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure given by the following formula in decibels (dBA). $L_{pA} = 10 \log_{10} (pA/p_0)^2$. Where: pA is the A-weighted sound pressure in pascals (Pa) and p_0 is the reference sound pressure (20 μ Pa)
Background Sound	Underlying level of sound over a period, T , which might in part be an indication of relative quietness at a given location
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
Facade level	Sound pressure level 1 m in front of the facade
Free-field level	Sound pressure level away from reflecting surfaces
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
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
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
Rating Level, $L_{Ar,Tr}$	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise
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 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), given by the formula: $L_p = 10 \log_{10}(p/p_0)^2$. Where: p is the root-mean-square sound pressure in pascals (Pa) and p_0 is the reference sound pressure (20 μ Pa)
Weighted sound reduction index, R_w	Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies

Appendix B – Standards, Legislation, Policy, and Guidance

This report is to be primarily based on the following standards, legislation, policy, and guidance.

B.1 – National Planning Policy Framework (2024)

Government policy on noise is set out in the National Planning Policy Framework (NPPF), published in 2024. This replaced all earlier guidance on noise and places an emphasis on sustainability. In section 15, Conserving and enhancing the natural and local environment, paragraph 187e, it states:

Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.

Paragraph 198 states:

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:

- a) Mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- b) Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- c) Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes, and nature conservation.*

B.2 – Noise Policy Statement for England (2010)

Paragraph 198 of the NPPF also refers to advice on adverse effects of noise given in the Noise Policy Statement for England (NPSE). This document sets out a policy vision to:

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

To achieve this vision the Statement identifies the following three aims:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- Avoid significant adverse impacts on health and quality of life:
- Mitigate and minimise adverse impacts on health and quality of life:
- Where possible, contribute to the improvement of health and quality of life.

In achieving these aims the document introduces significance criteria as follows:

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur. It is stated that “significant adverse effects on health and quality of life should be avoided while also considering the guiding principles of sustainable development”.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected. It is stated that the second aim above lies somewhere between LOAEL and SOAEL and requires that: “all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.”

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise. This can be related to the third aim above, which seeks: “where possible, positively to improve health and quality of life through the pro-active management of noise while also considering the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.”

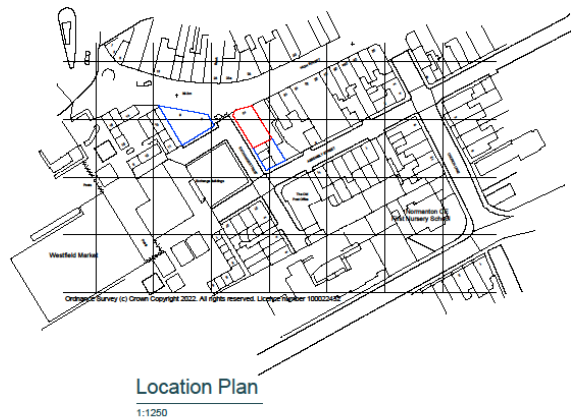
This is further expanded using the updated “Noise Exposure Hierarchy Table” which includes an additional level of impact referred to as the ‘No Observed Adverse Effect Level’ (‘NOAEL’). It is stated that at this level: *“noise can be heard, but does not cause any change in behaviour, attitude or other physiological response”*. In addition, noise at this level *“can slightly affect the acoustic character of the area but not such that there is a change in the quality of life”*.

The NPSE recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations and provides no guidance as to how these criteria should be interpreted. It is clear, however, that there is no requirement to achieve noise levels where there are no observable adverse impacts but that reasonable and practicable steps to reduce adverse noise impacts should be taken in the context of sustainable development and ensure a balance between noise sensitive and the need for noise generating developments.

Any scheme of noise mitigation outlined in this report will, therefore, aim to abide by the above principles of the NPPF and NPSE whilst recognizing the constraints of the site.

Appendix C – Location Plans

PLEASE REFER TO ALL DORMER AND CO DRAWINGS IN CONJUNCTION WITH THE STRUCTURAL ENGINEERS CALCULATIONS FOR FURTHER DETAILS



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PLANNING

Rev	Date	Reason	NPJ	NPD
0	31.03.22	First Issue		

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LOCATION PLAN

Scale	Alt.	Proj.	Rev.	Date
1:1250	A1	1840.LPD1	0	MARCH'22
Drawn by:	NPJ	Checked by:	NPD	Status:
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ALL DIMENSIONS ARE ANTICIPATED
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Figure 3 – Location Plans

Appendix D – Environmental Survey

D.1 – Time History Noise Data

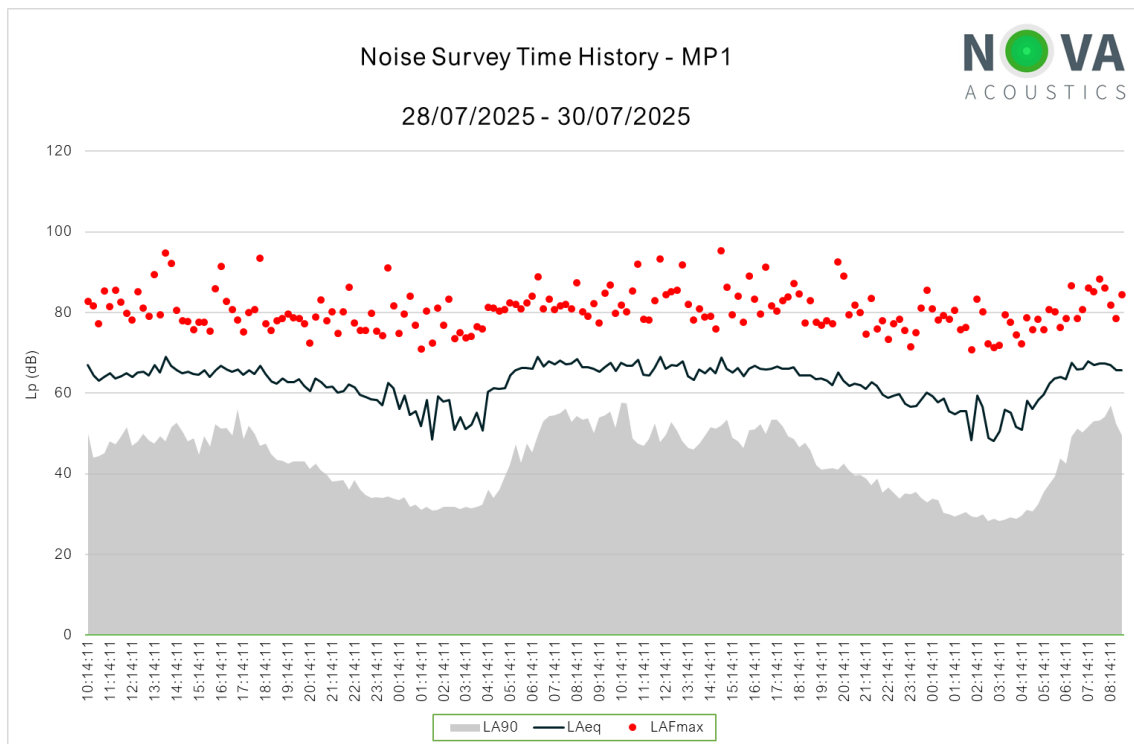


Figure 4 – MP1 Noise Survey Time History

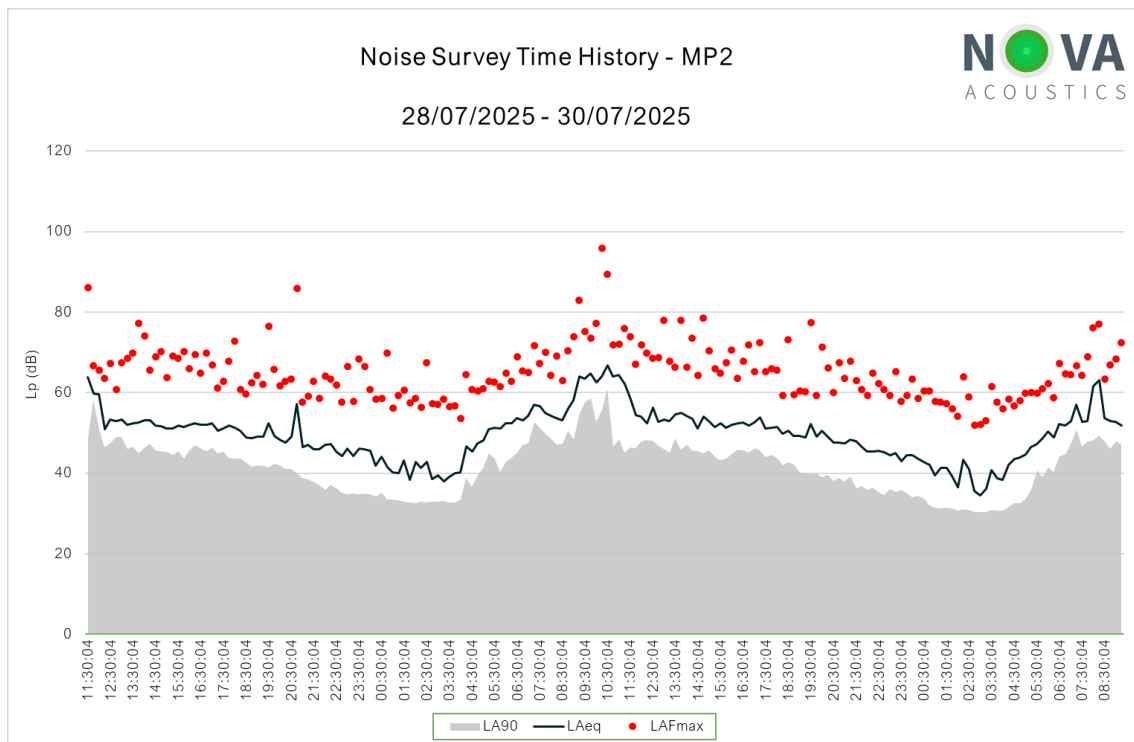


Figure 5 – MP2 Noise Survey Time History

D.2 – Surveying Equipment

Piece of Equipment	Serial No.	Calibration Deviation
Svantek SV971A Class 1 Sound Level Meter	143564	≤0.2
Svantek SV36 Class 1 Calibrator	106876	
Svantek SV971A Class 1 Sound Level Meter	143581	≤0.2
Svantek SV36 Class 1 Calibrator	106876	

Table 6 – Surveying Equipment

All equipment used during the survey was field calibrated at the start and end of the measurement period with negligible deviation noted. All sound level meters are calibrated every 24 months and all calibrators are calibrated every 12 months, by a third-party calibration laboratory. All microphones were fitted with a protective windshield for the entire measurements period. Calibration certificates can be provided upon request.

D.3 – Meteorological Conditions

As the environmental noise survey was carried out over a long un-manned period no localised records of weather conditions were taken. However, all measurements have been compared with met office weather data of the area, specifically the closest weather station, and the data from the weather station is outlined in the table below. When reviewing the time history of the noise measurements, any scenarios that were considered potentially to be affected by the local weather conditions have been omitted. The analysis of the noise data includes statistical and percentile analysis and review of minimum and maximum values, which aids in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

Weather Conditions – Booth Hall (Approx. 3km NNW of Site)				
Time Period	Air Temp (°C)	Rainfall (mm/h)	Prevailing Wind Direction	Wind Speed (m/s)
28/07/25 – 00:00 – 23:59	12.9 – 19.9	0.0 – 1.2	ENE	0.3 – 4.5
29/07/25 – 00:00 – 23:59	12.6 – 20.2	0.0 – 0.8	NNE	0.8 – 4.9
30/07/25 – 00:00 – 23:59	16.3 – 17.4	0.0 – 0.0	ENE	0.8 – 1.1

Table 7 – Weather Conditions

Appendix E – Noise Break-in Calculations

E.1 – Façades with Background Ventilation

The façade sound reduction and predicted internal noise levels are calculated assuming the following:

- The calculation method for façade sound reduction is in accordance with BS8233:2014 and BS EN 12354-3.
- The reverberation time is typically 0.5 seconds across the relevant frequency range for a furnished living room in the UK. This value is used for both living rooms and bedrooms.
- Based on the technical drawings provided to NOVA Acoustics, window areas of 2m² and room volumes of 33m³ are used in the calculations for bedrooms on the front façade as a worst-case scenario. For bedrooms on the rear façade, the calculations are based on a window area of 1.3m² and room volume of 18m³ as a worst-case scenario.
- The acoustic performance of the façade elements is taken from the relevant manufacturer's technical information, or the sound reduction has been predicted using INSUL 9.0.
- For background trickle ventilation a total Equivalent Area of 5000mm² per habitable room has been used in the calculations, which equates to 2 No. trickle vents (2500mm² each).

Front Façade Bedroom Day Time Leq

Item / Description	dB(A)	63	125	250	500	1k	2k	4k	8k
Measured Leq,T	67	71	64	62	62	63	60	53	47
Glazing Noise Ingress	20	39	32	23	14	5	1	-12	-17
Ventilation Noise Ingress	24	39	22	21	24	16	16	6	1
Wall Noise Ingress	5	24	12	8	-2	-2	-5	-12	-17
Roof Noise Ingress	26	47	36	25	19	15	11	3	-2
Room Absorption Correction		4	4	4	3	3	3	2	0
Total Noise Ingress	35	56	45	35	32	25	23	13	6
NR35	40	63	52	44	38	35	32	29	28
Exceedance of Criteria	-5	-7	-7	-9	-6	-10	-9	-16	-22

Front Façade Bedroom Night Time Leq

Item / Description	dB(A)	63	125	250	500	1k	2k	4k	8k
Measured Leq,T	67	69	64	61	60	63	60	56	54
Glazing Noise Ingress	20	37	33	22	13	4	2	-8	-10
Ventilation Noise Ingress	24	37	22	20	23	15	17	10	7
Wall Noise Ingress	5	22	12	7	-4	-2	-5	-8	-11
Roof Noise Ingress	25	45	37	24	18	14	12	7	5
Room Absorption Correction		4	4	4	3	3	3	2	0
Total Noise Ingress	35	54	45	34	30	24	24	16	13
NR30	35	59	48	39	33	30	26	24	22
Exceedance of Criteria	0	-5	-3	-5	-3	-6	-2	-8	-9

Front Façade Bedroom Night Time Max

Item / Description	dB(A)	63	125	250	500	1k	2k	4k	8k
Corrected Lmax Spectrum	80	81	72	73	74	76	73	69	66
Glazing Noise Ingress	31	49	41	35	27	18	15	5	2
Ventilation Noise Ingress	37	49	31	33	37	29	30	23	20
Wall Noise Ingress	17	34	20	19	10	11	8	4	1
Roof Noise Ingress	37	57	45	37	32	28	25	20	17
Room Absorption Correction		4	4	4	3	3	3	2	0
Total Noise Ingress	47	66	53	47	45	38	37	29	25
NR50	55	74	65	58	53	50	47	45	43
Exceedance of Criteria	-8	-8	-12	-11	-8	-12	-10	-16	-18

Rear Façade Bedroom Day Time Leq

Item / Description	dB(A)	63	125	250	500	1k	2k	4k	8k
Measured Leq,T	65	60	57	63	63	59	55	54	54
Glazing Noise Ingress	27	30	25	32	27	10	8	4	4
Ventilation Noise Ingress	31		22	26	28	28	20	15	15
Wall Noise Ingress	4	14	6	10	0	-5	-8	-10	-10
Roof Noise Ingress	22	36	29	26	20	9	6	4	4
Room Absorption Correction		5	5	4	4	4	4	2	1
Total Noise Ingress	40	45	39	41	38	35	27	21	20
NR35	40	63	52	44	38	35	32	29	28
Exceedance of Criteria	0	-18	-13	-3	0	0	-5	-8	-8

Rear Façade Bedroom Night Time Leq

Item / Description	dB(A)	63	125	250	500	1k	2k	4k	8k
Measured Leq,T	52	53	47	48	47	47	45	43	40
Glazing Noise Ingress	12	23	16	17	10	-2	-2	-6	-9
Ventilation Noise Ingress	18		13	11	12	16	10	5	2
Wall Noise Ingress	-9	8	-3	-5	-16	-17	-18	-20	-23
Roof Noise Ingress	9	29	19	11	3	-3	-4	-7	-10
Room Absorption Correction		5	5	4	4	4	4	2	1
Total Noise Ingress	27	38	29	26	22	23	17	11	6
NR30	35	59	48	39	33	30	26	24	22
Exceedance of Criteria	-8	-21	-19	-13	-11	-7	-9	-13	-16

Rear Façade Bedroom Night Time Max

Item / Description	dB(A)	63	125	250	500	1k	2k	4k	8k
Corrected Lmax Spectrum	63	67	58	59	56	57	57	55	50
Glazing Noise Ingress	23	37	26	28	20	9	10	5	0
Ventilation Noise Ingress	29		23	22	22	27	22	16	11
Wall Noise Ingress	3	21	7	6	-7	-7	-6	-9	-14
Roof Noise Ingress	21	43	29	21	13	8	8	5	-1
Room Absorption Correction		5	5	4	4	4	4	2	1
Total Noise Ingress	37	52	40	37	31	34	29	22	16
NR55	60	78	69	63	58	55	52	50	48
Exceedance of Criteria	-23	-26	-29	-26	-27	-21	-23	-28	-32



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