

NOISE IMPACT ASSESSMENT

10 Warburton Street, Didsbury

REPORT REFERENCE NO. J004386-7039-ECE-03

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Document Control Sheet

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	Name	Position
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This report has been prepared based upon a scope of works and associated resources agreed between the client and Philip Dunbavin Acoustics Ltd (PDA). This report has been prepared with all reasonable skill, care and diligence and has been based upon the interpretation of data collected. This has been accepted in good faith as being accurate and valid at the time of the collection. This report has been based solely on the specific design assumptions and criteria stated herein.

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APPENDIX A – DEFINITION OF ACOUSTIC TERMS



1.0 SUMMARY

At the request of Debra Pope, c/o Kershaw Surveyors, Philip Dunbavin Acoustics Ltd have conducted an assessment of the ambient noise and building envelope assessment for the residential conversion proposal to convert the existing development into 1 no. residential dwelling over two floors at 10 Warburton Street, Didsbury.

The assessment has been undertaken for compliance with the requirements of the Condition 3a of Planning Permission 135006/FO/2022

Based on the measured noise levels, recommendations are given for the glazing, ventilation and building façade elements that will be required to achieve the internal noise level requirements.

Our calculations suggest that with the glazing and ventilation specification recommended in this report the criteria of BS8233:2014, WHO Guidelines can be achieved. Therefore, in-line with the National Planning Policy Framework and Noise Policy Statement for England on the grounds of noise we would deem this site suitable for residential development.

2.0 SITE DESCRIPTION

The site consists of a two storey building with windows to the front facing onto Warburton Street. The rear wall forms a party wall with an existing restaurant and the west wall is connected to a gift shop.

To the north of the application property is a public pay and display car park with the Didsbury metrolink line beyond, the Didsbury Village tram stop is approximately 150 metres to the south-east of the property.

The proposals are a change of use of the property to a residential use in the form of a two bedroom two storey cottage accommodation.

The site location is highlighted in red in figure 1 below.



Figure 1. Site Location

3.0 ASSESSMENT CRITERIA

3.1 Planning Conditions

Planning condition 3 of the planning approval 135006/FO/2022 provides the following requirements:

“3) a) Before the development commences a scheme for acoustically insulating the proposed residential accommodation against noise the local traffic network, including the tramline shall be submitted to and approved in writing by the City Council as local planning authority. There may be other actual or potential sources of noise which require consideration on or near the site, including any local commercial/industrial premises such as the nearby restaurants and bars. The approved noise insulation and ventilation scheme shall be completed before any of the dwelling units are occupied.

b) Prior to first occupation of the residential units, a verification report shall be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that the internal noise criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the internal noise criteria.”

The planning permission also provides the following information:

“In order to discharge the acoustic insulation condition attached to this decision the following should be included within any submitted scheme:

Noise survey data shall include measurements taken during a rush-hour period and night time to determine the appropriate sound insulation measures necessary. The following noise criteria shall be required to be achieved:

Bedrooms (night time - 23.00 - 07.00) 30 dB LAeq (individual noise events shall not exceed 45 dB L_{Amax,F} by more than 15 times)

Living Rooms (daytime - 07.00 - 23.00) 35 dB LAeq

Gardens and terraces (daytime) 55 dB LAeq

Additionally, where entertainment noise is a factor in the noise climate the sound insulation scheme shall be designed to achieve internal noise levels in the 63Hz and 125Hz octave centre frequency bands so as not to exceed (in habitable rooms) 47dB and 41dB (Leq,5min), respectively”

4.0 EXTERNAL SURVEY DETAILS

An ambient environmental noise surveys was carried out at one location on the site. The measurements were taken 1m from the first floor façade of the front of the building, representative of the sound level outside the bedroom windows of the proposed development.

4.1 Measurement Procedure

4.1.1 Survey times

The ambient noise survey measurements taken outside the window were made between 10:50 on Wednesday 19th April 2023 and 14:40 on Thursday 20th April 2023; and 15:00 on Friday 15th November to 8:20 18th November. Measurements were taken using a sound level meter fitted with an ‘all-weather’ windshield, set-up by Joseph Meadows (initial measurements) and Jason Craig (second set of measurements) of PDA Ltd. The second ambient noise survey measurements were made between 13:00 on Friday 27th September 2024 and 12:52 Saturday 28th September 2024.

4.1.2 Measurement Equipment

The noise survey was conducted using one NTi XL2 sound level meter.

The XL2 sound level meter is a Class 1 sound level meter in accordance with IEC 61672-1:2002 capable of operating as an integrating sound level meter with frequency analysis and statistical functions.

The meter was set to measure broadband sound pressure levels, octave frequency band sound pressure levels and statistical parameters. Audio recordings were also taken throughout the duration of the survey.

4.1.3 Measurement Locations

Measurements were taken across one measurement position, 1m from the 1st floor façade overlooking Warburton Street Road, as shown in Figure 2 below.



Figure 2. Equipment Setup

See Figure 3 below for the measurement location.



Figure 3. Survey Measurement Location

4.2 Subjective Description of Noise Sources

Subjectively, the dominant noise source at the development is train noise from the tramline to the north of the site and distant traffic. It was noted however that there were some noise from people speaking on the road on the measurements undertaken on Saturday evening. This consisted people talking and laughing. There was no significant music or entertainment noise due to pubs, clubs or restaurants in the area.

It is noted that there are some plant and equipment located on the wall behind the Proposed Development. It is noted however that this plant was not audible during the numerous visits to the site. In addition no other plant and equipment was audible during the surveys.

4.3 Measured Survey Results

The noise survey results are summarised in Figure 4 below.

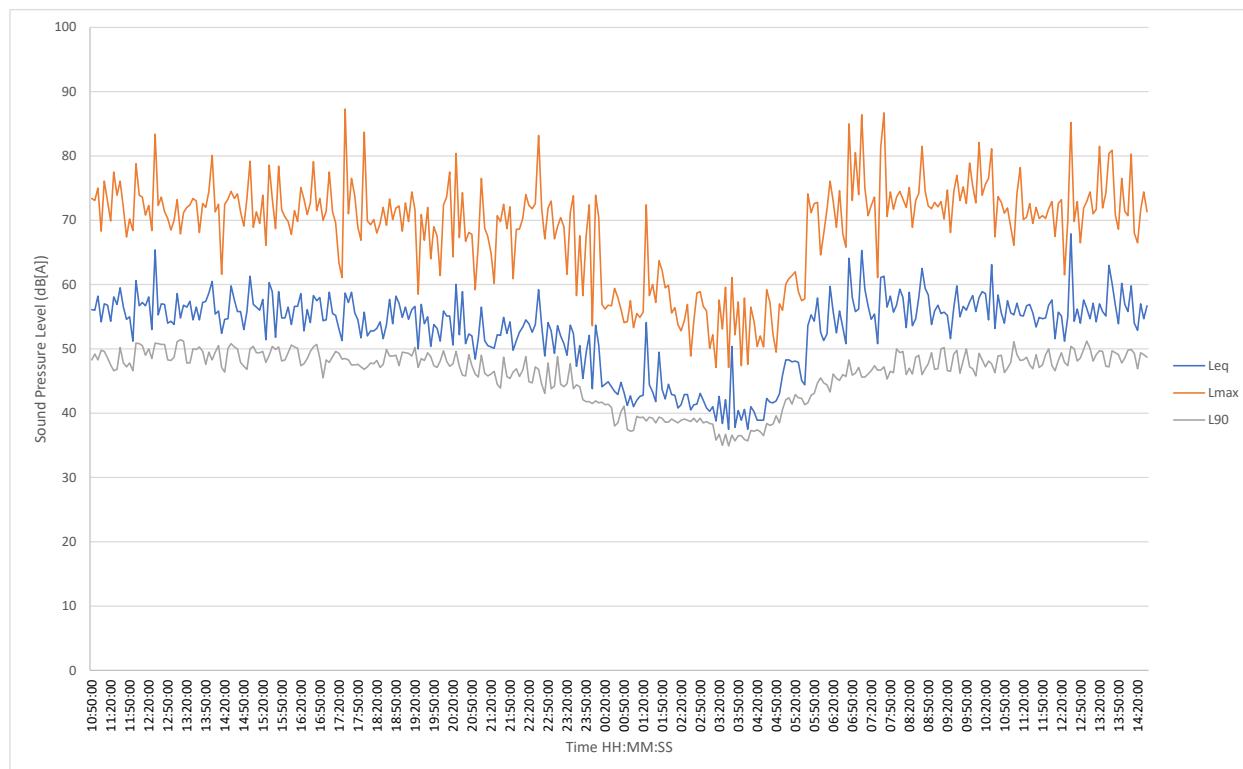


Figure 4. Survey Results: 19 – 20th April 2023

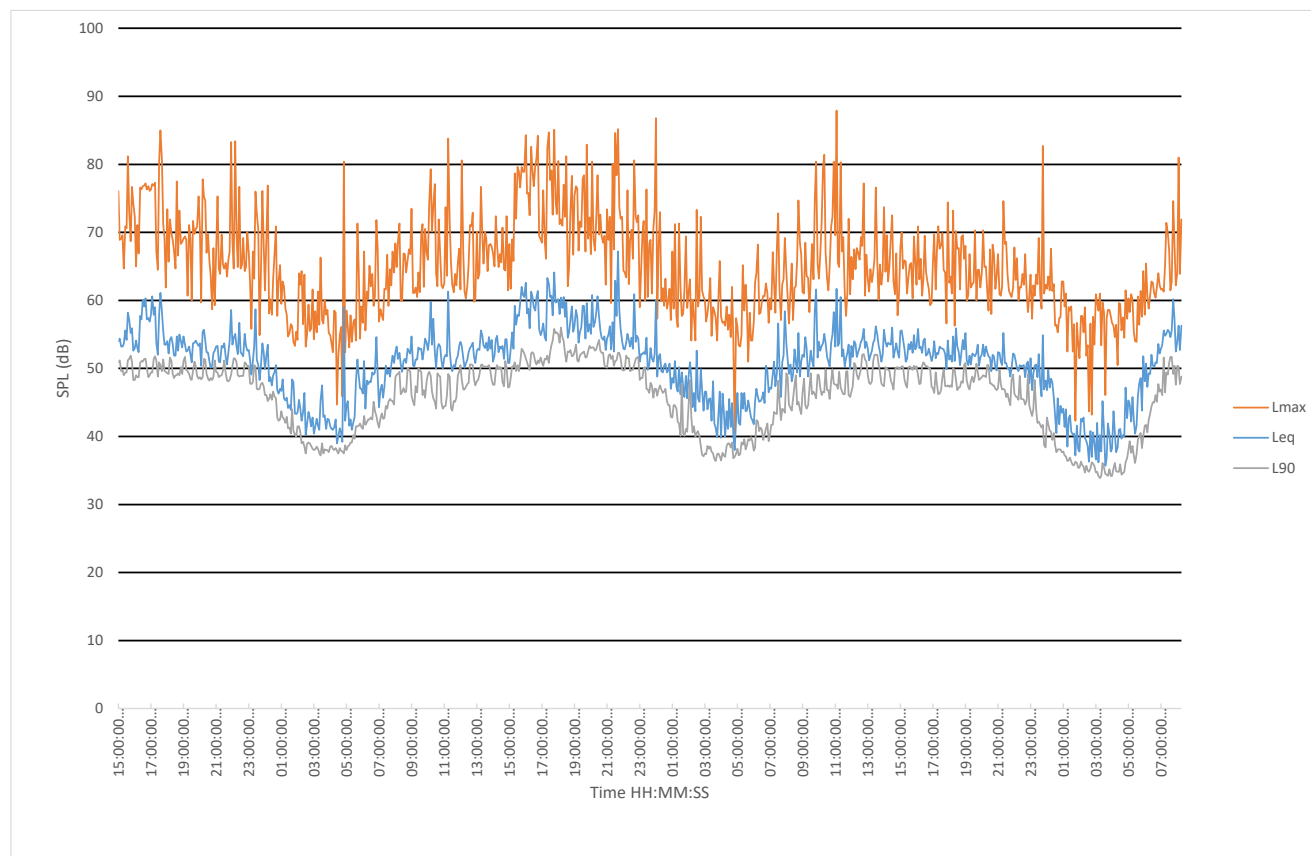


Figure 5. Survey Results: 15 – 18th November 2024

4.4 Survey results

Please note that the measurements were façade measurements and have been corrected by subtracting 3dB to obtain equivalent free field sound pressure levels at the façade for the purposes of calculating noise ingress to the proposed dwelling.

The equivalent free-field sound pressure levels at the façade are as follows:

Table 1. Noise levels at developed façade

Date	Daytime noise level L_{Aeq}	Night-time noise level L_{Aeq}	Typical Night-time L_{Amax}^1
19 – 20 Apr 2023 (Tue – Wed)	57	51	73
15 – 16 Nov 2024 (Fri – Sat)	55	49	70
16 – 17 Nov 2024 (Sat – Sun)	57	49	71
17 – 18 Nov 2024 (Sun – Mon)	53	47	63

Notes:

- 1 Typical L_{Amax} noise levels are those not exceeded more than 10 times over the whole night-time period.
- 2 Night-time is defined as the hours between 23:00 – 07:00.

Based upon the above measurements would indicate that there is no increase in noise between mid-week in comparison to weekend activity. In addition it is noted that the measurements undertaken between 19 – 20th April 2023 during the mid-week resulted in higher noise levels.

4.5 Noise Break-In Calculations and Mitigation

4.5.1 Building Envelope Elements

Noise ingress calculations are based on room dimensions taken from Williams Architecture drawings of the proposed dwelling. The following construction elements have been used to model the external building envelope of the proposed residential development:

4.5.2 Design Assumptions

Assessment and specification of the acoustic performance of the building envelope and suitable glazing and ventilation, has been undertaken based on achieving the internal ambient acoustic conditions, specified in Section 3 above.

Information on the sound insulation properties for specific element details have been obtained from manufacturers test data.

For the purposes of the noise break-in calculations room dimensions have been taken from Williams Architecture drawings of the dwelling.

4.5.3 Calculated noise levels

Noise break-in through the proposed building façades have been calculated in octave frequency bands using the detailed method of BS 8233:2014 taking into account the octave band sound reduction of the façade elements, façade element areas, room volume and reverberation time in the finished rooms. For the purposes of calculation the finished reverberation time has been assumed to be 0.5 seconds in all frequencies in habitable rooms.

The calculated octave frequency band internal noise levels have then been used to determine the overall A-weighted noise level in the habitable rooms which has been compared to the criteria of Section 3

Glazing and ventilation specifications have been selected to ensure that the criteria of Section 3 are achieved within the proposed dwellings.

Table 2 – Glazing and ventilator schedule for habitable rooms

Room	Minimum Glazing Rating R_w dB	Minimum combined Ventilator Rating $D_{n,e,w}$ dB	Internal Noise Level Target $L_{Aeq,T}$ dB Day/Night	Calculated Internal Noise Level $L_{Aeq,T}$ dB Day/Night ¹	Internal Noise Level target L_{Amax} dB Night	Calculated Internal Noise Level L_{Amax} dB Night ^{1 2}
Bedrooms	29	36	35/30	25/19	45	44
Living Room/Kitchen	29	29	35/-	24/-	-	-

Notes

1 Calculated noise levels assuming closed windows and allowing for an inlet vent of specification detailed.

2 Calculated L_{Amax} noise level typically not exceeded more than 10 times per night.

4.5.4 Walls

It has been assumed that the external wall is solid masonry and estimated to have a performance of 49 dB R_w .

4.5.5 Glazing

Table 3 below gives the required glazing sound insulation performance in octave frequency bands, together with typical glazing products which achieve the required sound insulation. Any alternative products should meet the given sound insulation performance in each octave frequency band to ensure that the internal noise levels specified in Table 4 are achieved.

Table 3 – Required glazing performance (minimum)

Position	R_w	Typical example (mm glass / mm cavity / mm glass)	Frequency band [Hz]						
			63	125	250	500	1000	2000	4000
All rooms	29	4/12/4mm	16	21	17	25	37	42	37

4.5.6 Ventilation

Ventilation indicated in Table 4 will be required as an alternative to open windows in order to achieve the design criterion. Our calculations have allowed for 2 of the specified vent types to each habitable room. Where more than 1 vent is installed per room the combined performance of the vents should achieve the sound insulation criteria of Table 6 which will require each individual vent to have a higher sound insulation. Please contact PDA or vent manufacturers for advice in this case.



Table 4 gives the required acoustic performance of the specified vents in octave frequency bands, together with typical products which achieve the required sound insulation. Any alternative vent should achieve the same performance or greater in each octave band. Where more than 1 vent is installed per room the combined performance of the vents should achieve the sound insulation criteria of Table 6 which will require each individual vent to have a higher sound insulation. Please contact PDA or vent manufacturers for advice in this case.

Table 4 – Required ventilator performance (minimum)

Position	D _{n,e,w}	Typical example vent	Frequency band [Hz]					
			125	250	500	1000	2000	4000
Bedrooms	36	Greenwood 2500EA (no acoustic modules)	45	44	40	35	34	34
Living Room/Kitchen	29	Simon Airstrip 300	28	26	26	29	29	29

Please note that the specification of vents is in terms of acoustic performance only. It should be checked by others that the ventilation requirements of the Building Regulations are also met.

Bear in mind that with any fan-assisted ventilation systems it should be ensured that the fan itself does not exceed the noise criteria as specified in Section 3.

4.5.7 Purge Ventilation

The sound insulation of the façade relies on the windows remaining closed with ventilation provided by means of the attenuated vents specified in Section 6.5, Table 6 above. During times when windows are open internal noise levels may exceed the criteria of Section 3.

With regard to purge ventilation BS 8223:2014 states:

“The Building Regulations’ supporting documents on ventilation recommend that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation, trickle ventilators can be used and sound attenuating types are available. However, windows may remain openable for rapid or purge ventilation, or at the occupant’s choice.”

5.0 INTERNAL SURVEY DETAILS

The measurements described within Section 4.0 above are in relation to the measurements undertaken external to the site. It is noted that there the existing site is attached to an existing commercial property that is currently being operated as a restaurant. Please note that during our initial survey in April 2023, the restaurant was not in operation. This has since re-opened and further measurements have been conducted to establish the potential internal sound transfer in the proposed development from the attached commercial use.

5.1 Measurement Procedure

5.1.1 Survey times

The ambient noise survey measurements taken within one of the existing rooms were made between 13:00 on Friday 27th September 2024 and 12:52 Saturday 28th September 2024.

5.1.2 Measurement Equipment

The noise survey was conducted using one NTi XL2 sound level meter.

The XL2 sound level meter is a Class 1 sound level meter in accordance with IEC 61672-1:2002 capable of operating as an integrating sound level meter with frequency analysis and statistical functions.

The meter was set to measure broadband sound pressure levels, octave frequency band sound pressure levels and statistical parameters. Audio recordings were also taken throughout the duration of the survey.

5.1.3 Measurement Locations

The measurements were undertaken at the following locations:

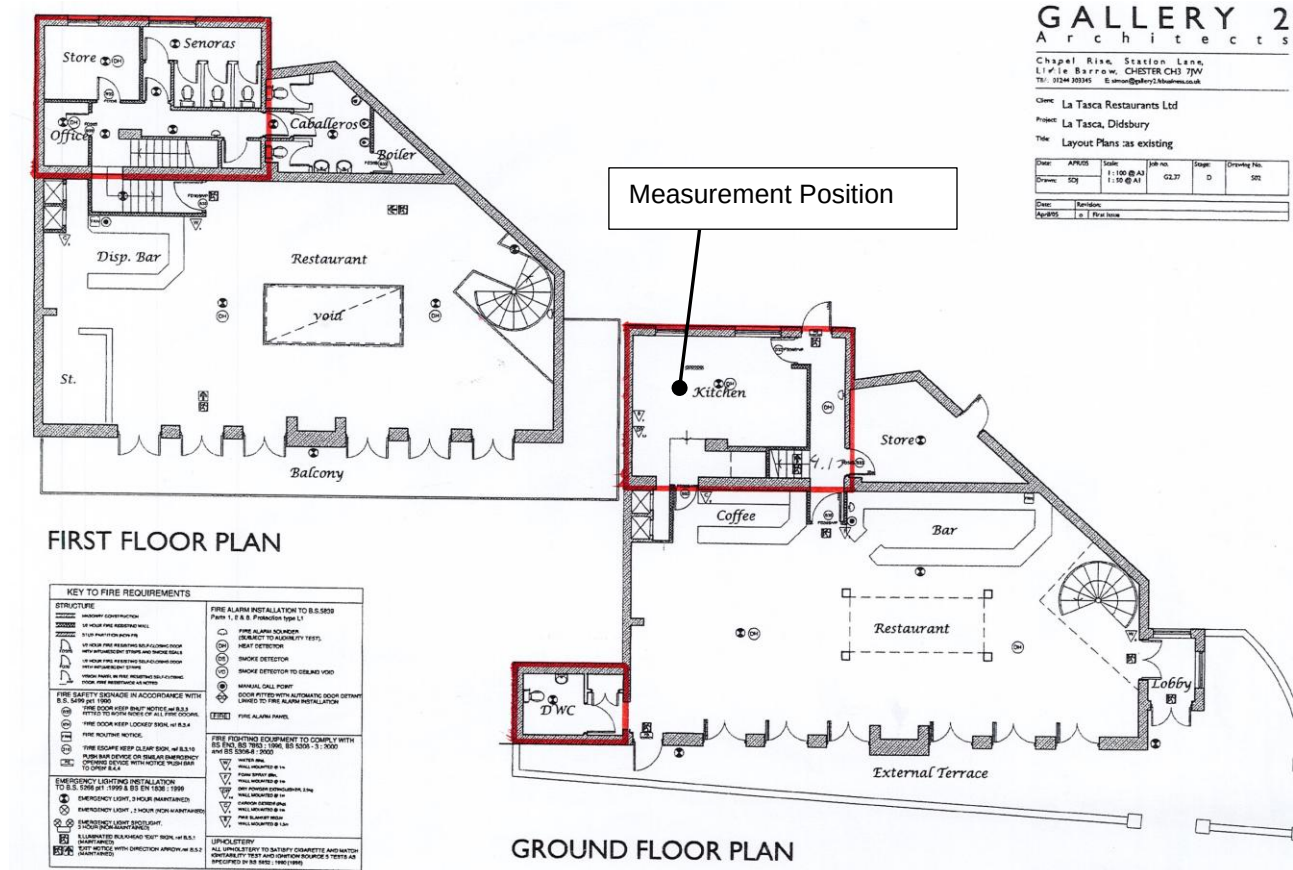


Figure 6. Internal Survey Measurement Location

It should be noted that measurements were undertaken on the ground floor as this was the only part of the proposed scheme where the room was on the party wall party. On the upper floors the proposed layout indicates that the rooms adjacent to the party wall are a corridor / stair and a bathroom and are therefore not noise sensitive.

Measurements were undertaken with a sound level meter mounted on a tripod at 1.4m height.

5.2 Subjective Description of Noise Sources

Subjectively, the dominant noise source at the development is train noise from the tramline to the north of the site and distant traffic. It was noted however that there were some noise from people speaking on the road on the measurements undertaken on Saturday evening. This consisted people talking and laughing. There was no significant music or entertainment noise due to pubs, clubs or restaurants in the area.

5.3 Measured Survey Results

The noise survey results are summarised in Figure 4 below.

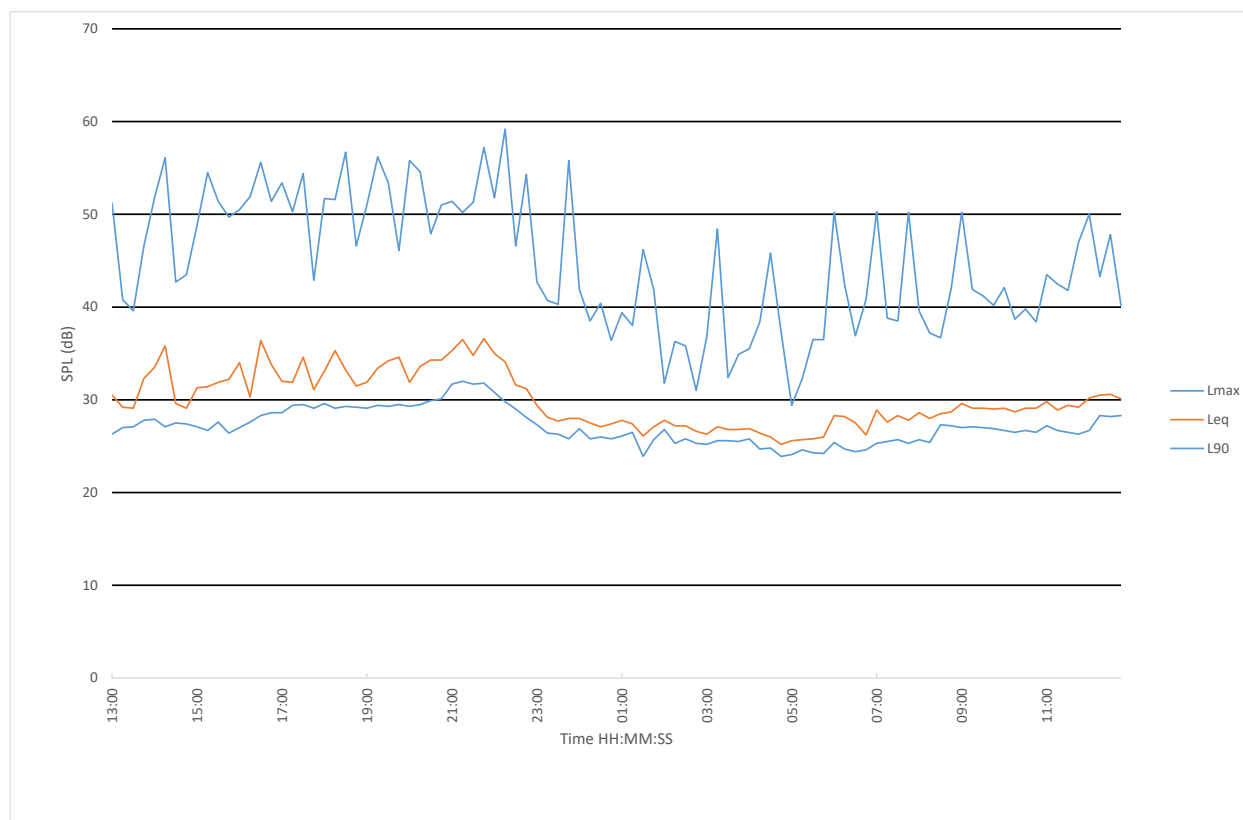


Figure 7. Internal Survey Results: 27 – 28 September 2024

5.4 Survey results

The internal measurements are summarised as follows:

Table 5. Noise levels at developed façade

Date	Daytime noise level L_{Aeq}	Night-time noise level L_{Aeq}	Typical Night-time L_{Amax}^1
27 – 28 Sep 2024 (Fri – Sat)	32	27	42

Notes:

- 1 Typical L_{Amax} noise levels are those not exceeded more than 10 times over the whole night-time period.
- 2 Night-time is defined as the hours between 23:00 – 07:00.

Based upon the above measurements would indicate that the current internal noise levels comply with the requirements described within the Planning Permissions. This therefore indicates that there is no significant noise transfer between the adjacent restaurant and the proposed residential development.

6.0 CONCLUSION

At the request of Debra Pope, c/o Kershaw Surveyors, Philip Dunbavin Acoustics Ltd have conducted an assessment of the ambient noise and building envelope assessment for the residential conversion proposal to convert the existing development into 1 no. residential dwelling over two floors at 10 Warburton Street, Didsbury.

The assessment has been undertaken for compliance with the requirements of the Condition 3a of Planning Permission 135006/FO/2022



Based on the measured noise levels, recommendations are given for the glazing, ventilation and building façade elements that will be required to achieve the internal noise level requirements.

Our calculations suggest that with the glazing and ventilation specification recommended in this report the criteria of BS8233:2014, WHO Guidelines can be achieved. Therefore, in-line with the National Planning Policy Framework and Noise Policy Statement for England on the grounds of noise we would deem this site suitable for residential development.

APPENDIX A – DEFINITION OF ACOUSTIC TERMS

The decibel

This is the basic unit of noise, denoted dB.

A Weighting

This is a weighting process which simulates the human ear's different sensitivity at different frequencies. A weighting can be shown two typical ways, 50 dB(A) L_{eq} or 50 dB L_{Aeq} . Both mean the same thing. (See below for a definition of L_{eq}). The dB(A) level can be regarded as the overall level perceived by human beings.

L_{eq} and $L_{eq(s)}$

This is the equivalent continuous noise level which contains the same acoustic energy as the actual time-varying sound. In other words it is a kind of average noise level. It is denoted dB L_{eq} or, for A-weighted figures dB(A) L_{eq} or dB L_{Aeq} . It can also be expressed in terms of frequency analysis (see later). $L_{eq(s)}$ is the sample L_{eq} level.

L_n

This is the level exceeded for n% of the time. It is denoted dB L_n or, for A-weighted figures dB(A) L_n or dB L_{An} . It can be expressed in terms of frequency analysis (see later). L_{90} is the level exceeded for 90% of the time and is a measure of the lowest level typically reached. L_{10} is the level exceeded for 10% of the time and is the highest level typically reached. L_{50} is the level exceeded for 50% of the time and, mathematically, it is the median.

L_{max}

This is the maximum level reached during a measurement period. The “time constant”, or the ability of the equipment to respond to impulses is usually expressed along with it, e.g. “Fast”, “Slow”, etc. It is denoted dB L_{max} or, for A-weighted figures dB(A) L_{max} , dB L_{Amax} , etc. It can also be expressed in terms of frequency analysis.

Frequency Analysis

Whereas dB(A) gives a very useful overall figure, it has its limitations in that it cannot be used to model or predict the effect of noise control and mitigation as this nearly always has radically different performance at different frequencies.

Frequency analysis expresses an overall noise level at each frequency or band of frequencies in the audible range. Octave band analysis divides the audible range into 10 bands from 31.5 Hz to 16 kHz and the noise level in each band can be expressed in any form e.g. L_{eq} , L_{90} , L_{max} etc. One third octave band analysis uses 30 bands.

Narrow band analysis takes the process to resolutions of less than 1 Hz. This is useful for identifying the existence of tones (whines, hums, etc.) and in pin-pointing the sources.