

Bracken House Manchester

Internal Noise Level Report

27924/RP1

27 February 2025



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Noise Impact assessment 27924/RP1

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Internal Noise Level Test Report 27924/RP1

Document Control

Rev	Date	Comment	Prepared by	Checked by	Authorised by
2	27/02/2025	Inclusion of additional noise survey and attended survey			
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1	07/01/2025	Inclusion of additional noise survey and attended survey			
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0	08/11/2024	-			
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1.0 Introduction

The glazing in 1No penthouse apartment at Bracken House has been replaced as part of the on-going refurbishment works. The intent of the refurbishment works are to improve the internal noise environment within Bracken House to meet MCC's noise criteria for residential spaces and Hann Tucker provided a specification for new windows across the scheme in "27924-RP-NIA2-Rev1-WR" and reviewed some glazing selections in "27924-PTM2-JH-Rev0".

It is understood the existing window frames to the penthouse apartments could not accept the installation of high-specification glazing due to the frame not being wide enough and an alternative has been installed.

With the current glazing now installed, Hann Tucker Associates has been commissioned to conduct an internal noise surveys on-site. The surveys aim to assess the effectiveness of the current installation in meeting MCC's internal noise standards and to determine if additional noise mitigation measures or design changes are needed to achieve full compliance.

Noise surveys have been carried out between the following dates:

- 29 November 2024 and 1 December 2024
- 21 February 2025 and 25 February 2025.

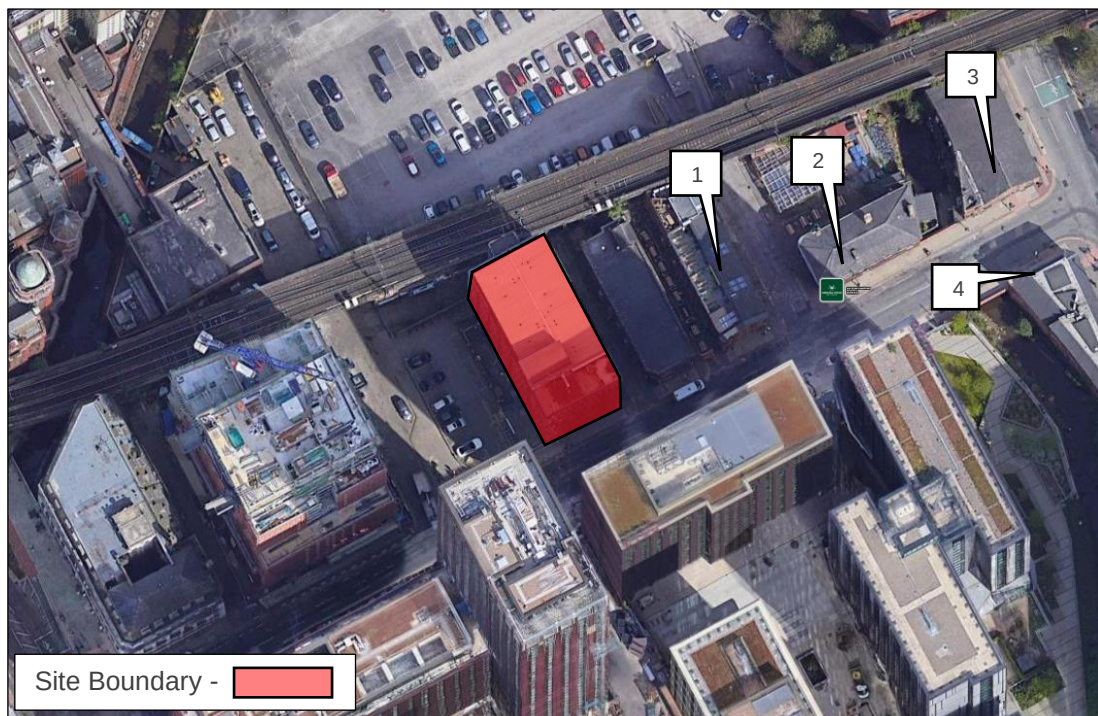
This Report has been updated to include the survey carried out between 21 February 2025 and 25 February 2025 and to discuss the findings.

2.0 Site Description

Bracken House is located on Charles Street in Manchester. Oxford Road is located approximately 90m to the west of the site and a train viaduct is located approximately 10m from the nearest façade of Bracken House.

The site in relation to its surroundings is shown overleaf. The surrounding area is a mix of residential, and pubs and clubs, which are highlighted in the table and image below:

Reference	Venue
1	YES
2	Lass O'Gowrie
3	Joshua Brooks
4	Factory 521

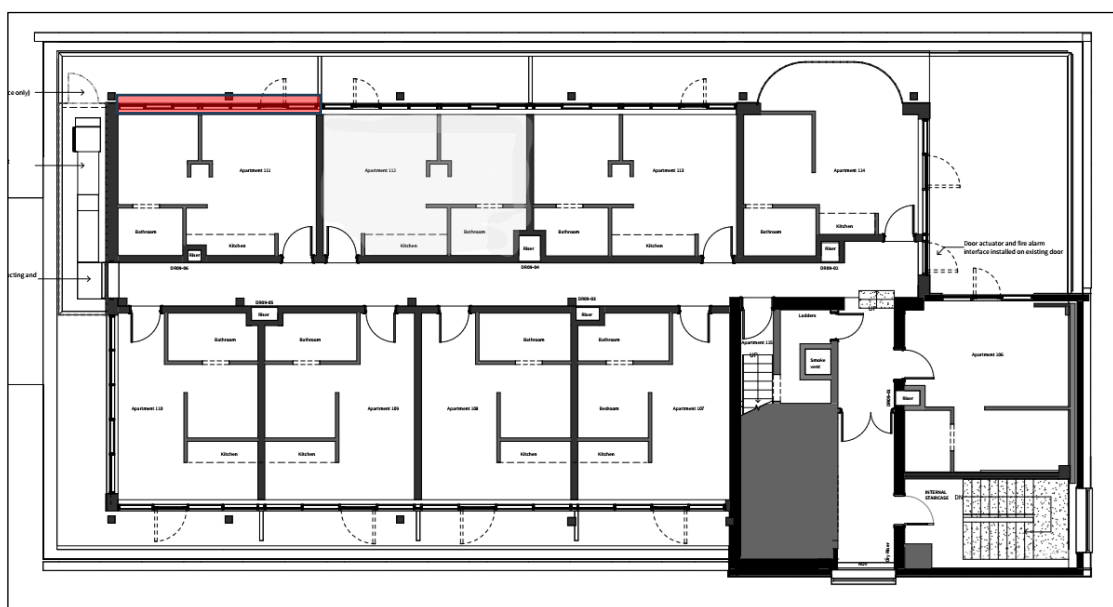


Site Plan (Imagery © 2023 Infoterra Ltd & Bluesky, Maxar Technologies, The GeoInformation Group, Map Data © 2023 Google)

3.0 On-site Installations

3.1 Initial Work

New glazing, installed within an existing frame, has been provided to Apartment 111. The markup below highlights the extent of the new glazing.





The glass installed is understood to be:

- 8.8mm Silence Laminated Glass
- 14mm cavity
- 6mm Heat-treated Glass.

We have received the glass only test data for the above and presented this below:

Sound Reduction Index at each Octave Band Centre Frequency (dB)						
63	125	250	500	1000	2000	4000
29	25	27	38	48	48	59

The above glass does comply with the recommended window specification set out in “27924-RP-NIA2-Rev1-WR”. However, the specification provided by Hann Tucker is for a complete window system rather than the glass only. Given that the glass has been installed in an existing frame of unknown construction the overall performance with windows would likely be below the glass only performance.

3.2 Further Enhancements

Further to the issue of R01 of this Report, it was concluded that the primary weakness was noted to be above the ceiling within the apartment, at the junction between the external wall/glazing frame and the slab above. Upon further investigation, there appeared to be profiles that may not be fully sealed and an open cavity present above the ceiling.

As such, the following works were carried out to the Apartment following completion of the November 2024 noise survey (R01 of this Report).

- Cladding panels & flashings fully stripped back.
- Internal ceiling void filled with Rockwool insulation were possible.
- Cementitious board installed to head of curtain wall & will gaps with pyrocoustic sealant.
- Soffit void filled with a mixture of 100mm & 50mm Rockwool DuoSlab.
- Cladding panels & flashings reinstated.
- New seals to glazing & frames.

Photographs showing the installation are presented overleaf.



Photographs showing Remedial Works undertaken to Profiled Roof

4.0 Planning Policy, Standards & Guidance

4.1 Local Planning Guidance

Manchester City Council requirements are outlined in Section 3.0 of Manchester City Council's Planning & Noise Technical Guidance document (October 2022).

Achieving Suitable Internal Noise Levels

Section 3.7.1.1 sets out the following noise levels to be achieved for residential developments:

- *Bedrooms (Night time - 23:00 to 07:00): 30dB L_{Aeq} and individual noise events should not normally exceed 45 dB (L_{Amax}).*
- *Living Rooms (Day time 07:00 to 23:00): 35 dB (L_{Aeq}).*

NB We understand there are no gardens or terraces associated with Bracken House and as such external noise levels at the site have not been assessed with respect to the final point above.

Section 5.3.1.6 of the Planning & Noise – Technical Guidance October 2022 document states the following with regards to maintaining internal ambient noise levels when it is desired to keep windows closed but provide adequate ventilation:

“Occupants should be provided with a supply of fresh air in habitable rooms without having to open windows (whilst also having the option to do this for purge ventilation, or at the occupant’s discretion.



Where ambient noise levels are high a scheme of ventilation will need to be provided that does not compromise the acoustic attenuation afforded by glazing. This may come in the form of individual window trickle vents or acoustic trickle vents.”

4.1.1 Music Noise

Section 3.7.1.2 offers the following guidance regarding entertainment noise, which may be applicable for the retail/ commercial spaces within the proposed development.

“Noise from entertainment venues e.g. noise from recorded music, live bands, or karaoke, can be particularly annoying for local residents and businesses if it is not adequately contained within the venue. When considering the potential impact of a proposal for an entertainment venue consultants should consider the overall noise level (Leq) and the 63 Hz and 125 Hz octave band noise levels (Leq).”

The document then proposes the following assessment criteria for structurally connected uses, however, this criteria is often adopted for non-structurally connected dwellings also:

“Music noise levels in the 63Hz and 125Hz octave centre frequency bands (Leq) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (Leq) respectively”.

5.0 Noise Level Commissioning

5.1 Measurement Procedure

Upon arrival to site the attending engineer was present within the apartment to make subjective observations of the acoustic weaknesses of the external facade. The following engineers were on-site during each survey:

- Tom Bonnert, BEng(Hons) MIOA, Senior Associate on 29 November 2024.
- Jake Howarth, BEng(Hons), MIOA, Senior Associate on 21 February 2024.

Attended noise monitoring was carried out on 21 February 2024 to establish the time-synchronised external noise levels during the time periods for which Hann Tucker was on site.



Following the initial attended observations and measurements, unattended noise monitoring was undertaken on site for the remainder of the weekend period to establish full daytime and night-time noise levels covering a period of time where nearby entertainment venues, namely YES, were in operation.

The monitoring was carried out between the following:

- 01:30 hours on Friday 29 November 2024 and 12:00 hours on Monday 2 December 2024, and;
- 01:00 hours on Friday 21 February 2025 and 12:00 hours on Tuesday 25 February 2025.

During both surveys the equipment set up to record broadband and spectral (octave band) sound pressure levels over discrete 2, 5 and 15-minute periods.

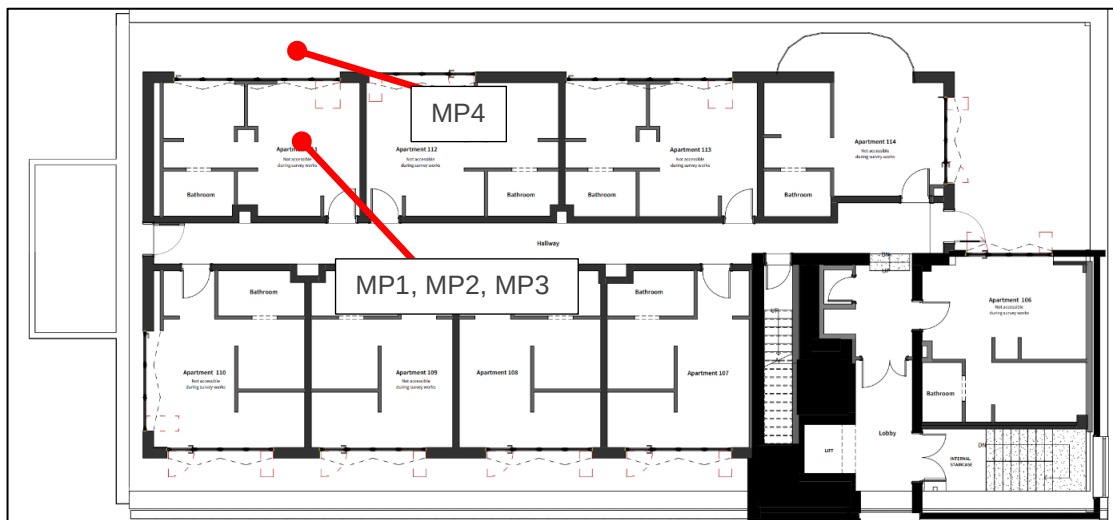
The following pre-requisites were requested in order to aid in ensuring representative measurements were obtained:

- Test rooms to be locked off for the duration of the measurement (no access for trades).
- Windows to be closed.
- Trickle ventilators, where present, put in open position.
- Mechanical ventilation systems (understood to be) balanced and operating at design duty.

5.2 Measurement Locations

The details of the measurements described in Section 5.1 are provided below for clarity:

Test Ref.	Measurement Type	Floor	Room	Test Date(s)
MP1	Unattended	9	Living Kitchen Dining	29/11/2024 – 01/12/2024
MP2	Unattended			21/02/2025 – 25/02/2025
MP3	Attended		Balcony	21/02/2025
MP4	Attended		Living Kitchen Dining	21/02/2025



Mark-up Showing Unattended Measurement Locations – Ninth Floor Apartment 111

5.3 Equipment

The equipment used, as detailed below, was calibrated prior to and on completion of the survey. No significant calibration drift occurred (not more than 0.3 dB).

Location	Description	Manufacturer	Type	Serial Number	Calibration
MP1	Type 1 Precision Sound Level Meter	Larson Davis	LxT	6490	30/05/2024
	Microphone	PCB	377B02	347391	
	Pre Amp	PCB	PRML x TL1	070074	
	Calibrator	Larson Davis	Cal200	3083	27/03/2024
MP2	Type 1 Precision Sound Level Meter	Svantek	958	28447	08/10/2024
	Microphone	Svantek	SV 12L	30240	08/10/2024
	Pre Amp	PCB	377A02	51311	08/10/2024
	Calibrator	Brüel and Kjær	4231	2271905	22/08/2024
MP3 & 4	Type 1 Precision Sound Level Meter	Brüel & Kjaer	2250	3007292	25/01/2024
	Microphone	PCB	7052E	106753	25/01/2024
	Pre Amp	Brüel & Kjaer	ZC0032	27782	25/01/2024
	Calibrator	Brüel and Kjær	4231	2271905	22/08/2024



5.4 Results

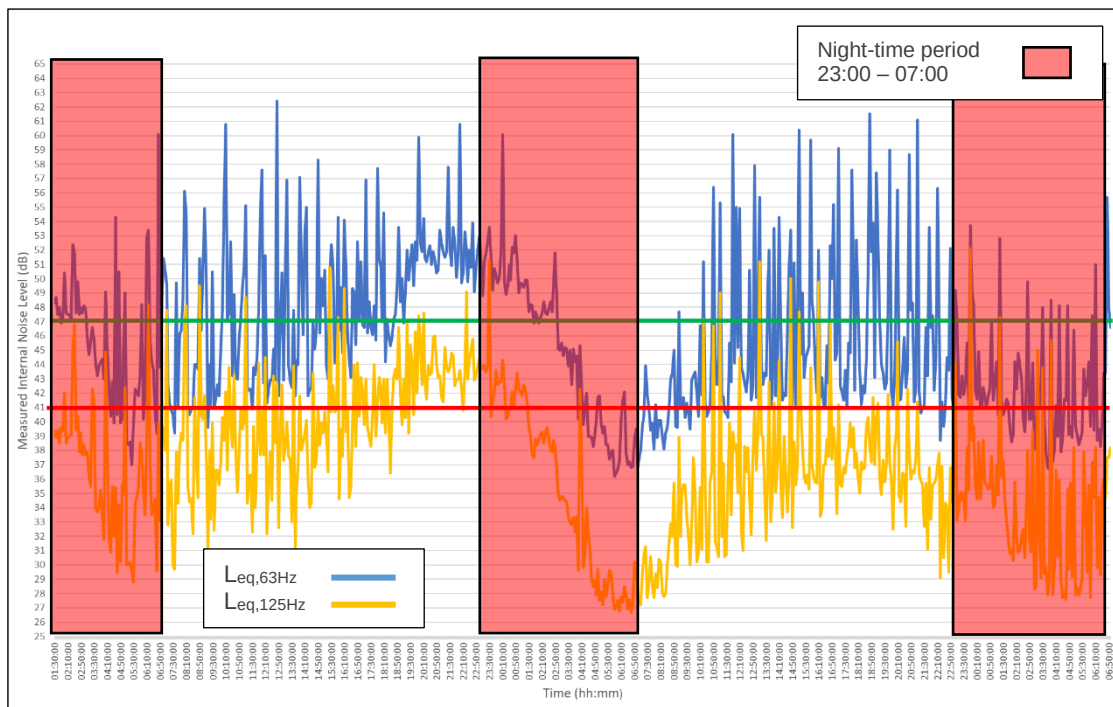
5.4.1 Unattended Results

The results of the internal noise level surveys have been plotted on a Time History Graph 27924/TH1 and 27924/TH2 for measurement MP1 and MP2 respectively. The graphs present the 15-minute A-weighted (dBA) L_{eq} , L_{90} and L_{max} levels at the measurement position.

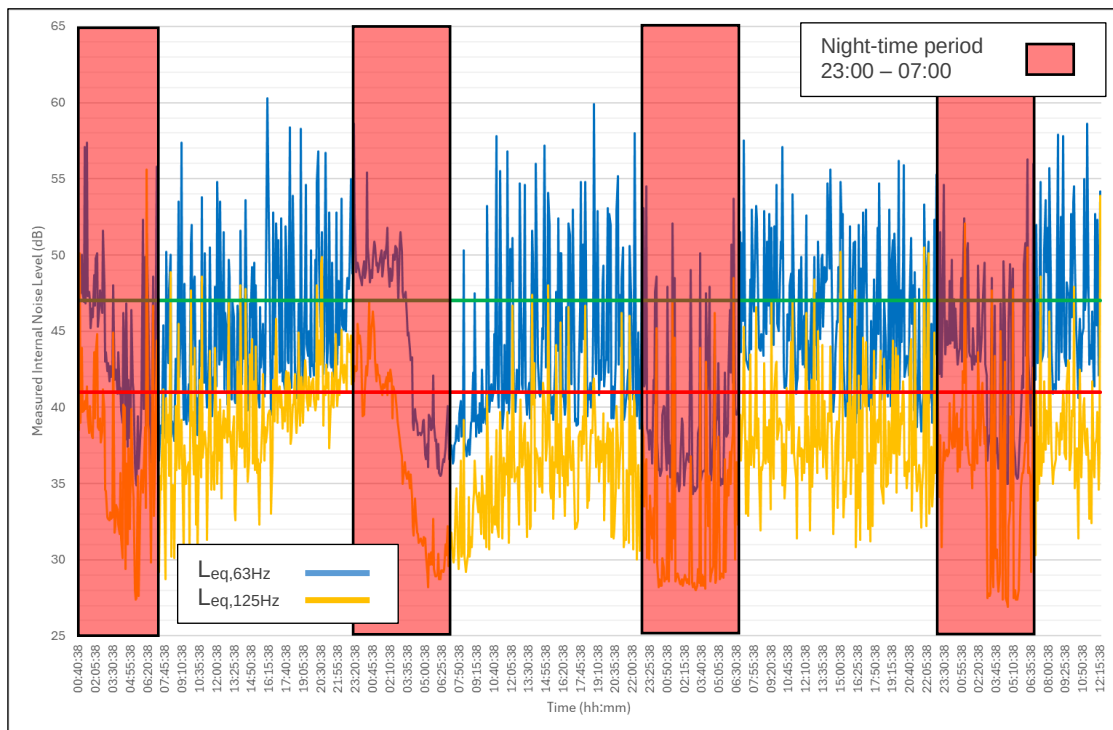
The table below shows the day and night-time L_{Aeq} over 16hr and 8hr periods as well as the 10th highest $L_{Amax,2min}$ over the night-time period.

Measurement	Period	Daytime (07:00 – 23:00 hrs)	Night-time (23:00 – 07:00 hrs)	
		$L_{Aeq,16hr}$	$L_{Aeq,8hr}$	10 th Highest L_{Amax}
MP1	29/11/2024	-	31	45
	30/11/2024	33	32	47
	01/12/2024	30	28	45
MP2	21/02/2025	-	31	50
	22/02/2025	33	35	48
	23/02/2025	30	28	46
	24/02/2025	32	29	46
	25/02/2025	32	-	-

The graph below shows the L_{eq} noise levels at 63 Hz and 125 Hz for both MP1 and MP2 and also highlights the internal noise limits set out in Section 4.1.1 and the night-time periods.



MP1 – Leq,5min Time History at 63Hz and 125Hz



MP2 – Leq,5min Time History at 63Hz and 125Hz



5.4.2 Attended Results

The noise levels measured during the attended measurements are provided below with the time synchronised noise levels in MP2 also provided.

Position	Time	Measured Sound Pressure Level (dB)		
		L_{Aeq}	$L_{eq,63Hz}$	$L_{eq,125Hz}$
MP3	23:17 to 23:24	32	45	40
MP4	23:30 to 23:32	66	61	60
MP2		33	42	34
MP4	23:33 to 23:34	66	64	68
MP2		34	44	43
MP4	23:34 to 23:35	64	62	61
MP2		31	43	35

5.5 Discussion

5.5.1 29 November 2024 and 1 December 2024

The night-time average sound pressure level ($L_{Aeq,8hours}$) can be seen to exceed the MCC criterion by approximately 2 dB during the weekend. However, the night-time criterion was achieved during the weekday periods.

This is also the case for the night-time maximum noise levels (L_{Amax}), which on the Saturday night was measured up to 47 dB.

Considering the low frequency noise levels at 63Hz and 125Hz, during the Saturday night the level at 63Hz can be seen to exceed the MCC criterion by around 5 dB, however, this is only present for the first part of the night-time period before noise can be seen to fall from being marginally above to marginally below the target. This is similar for the 125Hz octave band, however, it can be seen to fall below the MCC target sooner than the 63Hz octave band.

During the engineers time on-site, the primary weakness was noted to the above the ceiling, at the junction between the external wall/glazing frame and the slab above. Subsequent works have been carried out to remediate these weaknesses as detailed in Section 3.2.

5.5.2 21 February 2025 and 25 February 2025

A noise survey was conducted between 21 February 2025 and 25 February 2025 following the works outlined in Section 3.1 and Section 3.2. The purpose of the survey was to assess the effectiveness of the façade upgrades in reducing noise break-in. Analysis of the survey data indicates:



- Daytime Noise Levels ($L_{Aeq,16h}$): The measured average sound pressure levels comply with Manchester City Council (MCC) criteria in all cases.
- Night-time Noise Levels ($L_{Aeq,8h}$): Compliance with MCC criteria was achieved on weekday nights. However, on Friday and Saturday nights, exceedances of 1 dB and 5 dB, respectively, were recorded.
- Maximum Night-time Noise Levels ($L_{Amax,2min}$): The 10th highest L_{Amax} values exceeded the MCC criterion on Friday and Saturday nights but remained within 1 dB of the criterion during weekday nights.
- Low-Frequency Noise Levels (63 Hz & 125 Hz):
 - Exceedances of approximately 3 dB were observed on Friday and Saturday nights. However, noise levels typically reduced after 02:40 on Friday night and 03:30 on Saturday night, thereafter complying with MCC criteria.
 - During weekday nights, low-frequency noise levels generally complied with the MCC criteria.

On-site investigations indicated that the windows were the weakest acoustic element and based on the above, the further works as detailed in Section 3.2 have not resulted in an improvement over the initial survey. However, although the low frequency noise levels were measured to be above the criteria, subjectively, little to no audible music was noted within the apartment. The internal noise levels were primarily influenced by the occupants of the YES terrace, traffic noise, and passing trains.

Due to structural constraints, the currently installed glazing system represents the heaviest and most robust solution the building can accommodate without significant structural enhancements and a completely new upper level (ie a complete replacement of all building elements on the upper level of the building). Given this limitation, some level of dispensation may be required to account for the measured marginal exceedances. This may be acceptable to MCC considering that:

- Daytime $L_{Aeq,16h}$ levels comply with MCC criteria on both weekdays and weekends.
- Night-time $L_{Aeq,8h}$ levels comply with MCC criteria on weekdays.
- Weekend night-time $L_{Aeq,8h}$ levels are typically only 1-2 dB above the MCC criteria, with three out of the four weekends surveyed nearly achieving compliance.
- Maximum night-time noise events ($L_{Amax,2min}$) are generally within 1-2 dB of the MCC criteria, with five out of seven nights surveyed either compliant or within 2 dB.



- Low-frequency noise levels largely comply with MCC criteria on weekdays.
- Subjective assessments found that music was not clearly audible within the apartment during the times Hann Tucker was on-site.

Based on the above and given that this is an existing building undergoing refurbishment rather than a new-build, and that the most robust feasible glazing system has already been installed, further discussions with Manchester City Council will be necessary to determine an appropriate course of action.

6.0 Conclusion

Internal noise surveys have been undertaken over full weekend periods to establish the currently prevailing internal noise levels of entertainment venues in operation. Based on the measured levels an assessment has been carried out to determine whether current façade and glazing installation is capable of achieving the requirements of MCC.

The results indicate that daytime noise levels comply with Manchester City Council (MCC) criteria in all cases. While night-time noise levels meet the criteria on weekdays, exceedances of up to 5 dB were recorded on Friday and Saturday nights. Similarly, maximum night-time noise levels and low-frequency noise levels exceeded the criteria on weekends but remained within or close to compliant during weekdays.

On-site investigations identified windows as the remaining weakest acoustic element, with further works yielding no measurable improvement over the initial survey.

Subjective assessments found little to no audible music within the apartment, with internal noise levels primarily influenced by external sources such as terrace occupants, traffic, and passing trains.

Due to structural constraints of the building, the installed glazing system is the most robust solution the building can accommodate without major structural modifications. Given the relatively minor exceedances and the refurbishment nature of the project, some level of dispensation could be acceptable to MCC and it is advised that discussions to determine the most appropriate course of action are had with MCC.



Appendix A

Bracken House

Position 1

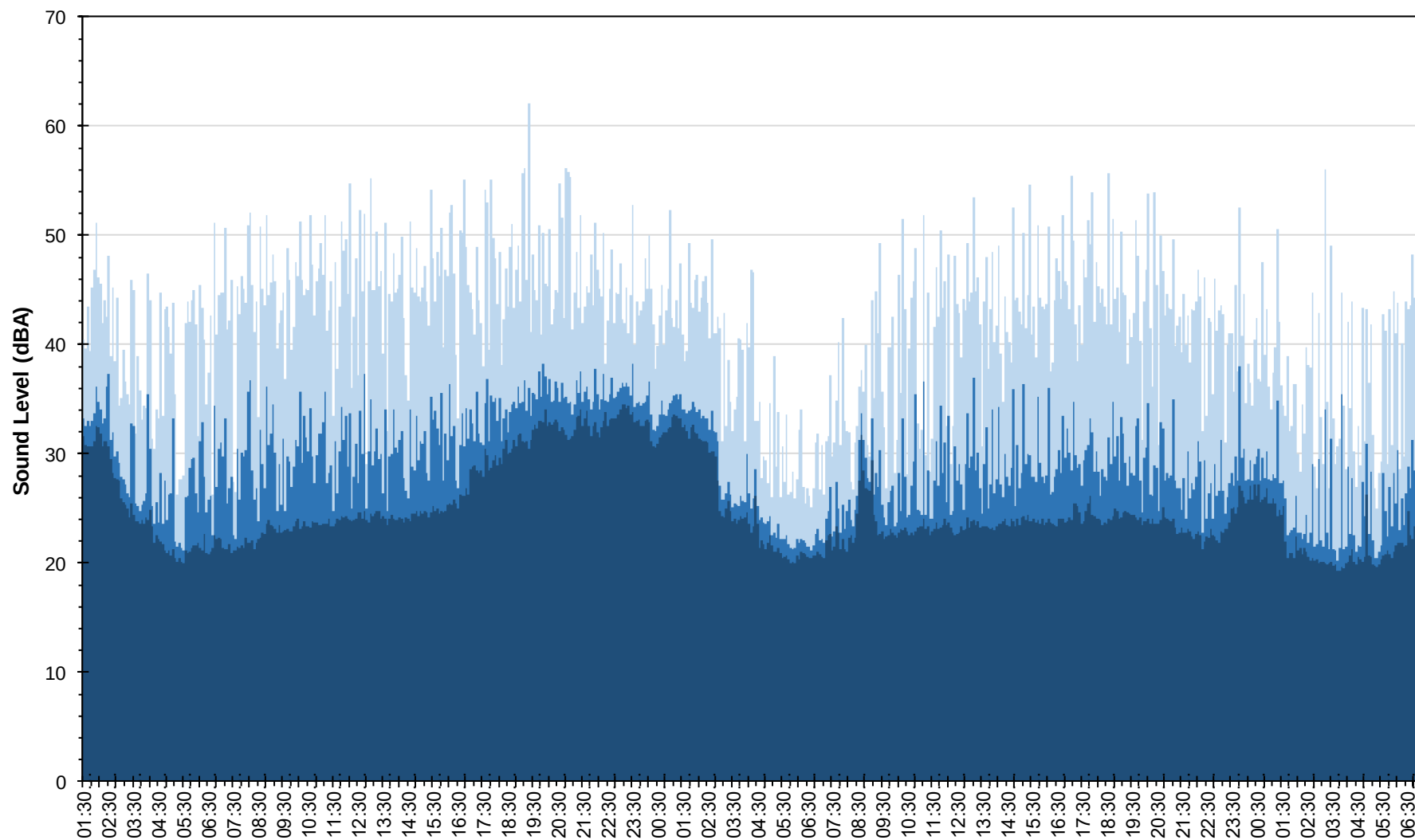
L_{eq} , L_{max} and L_{90} Noise Levels

Friday 29 November 2024 to Monday 2 December 2024

■ L_{Amax}

■ L_{Aeq}

■ L_{A90}



Date and Time

27924/TH1

Bracken House

Position 2

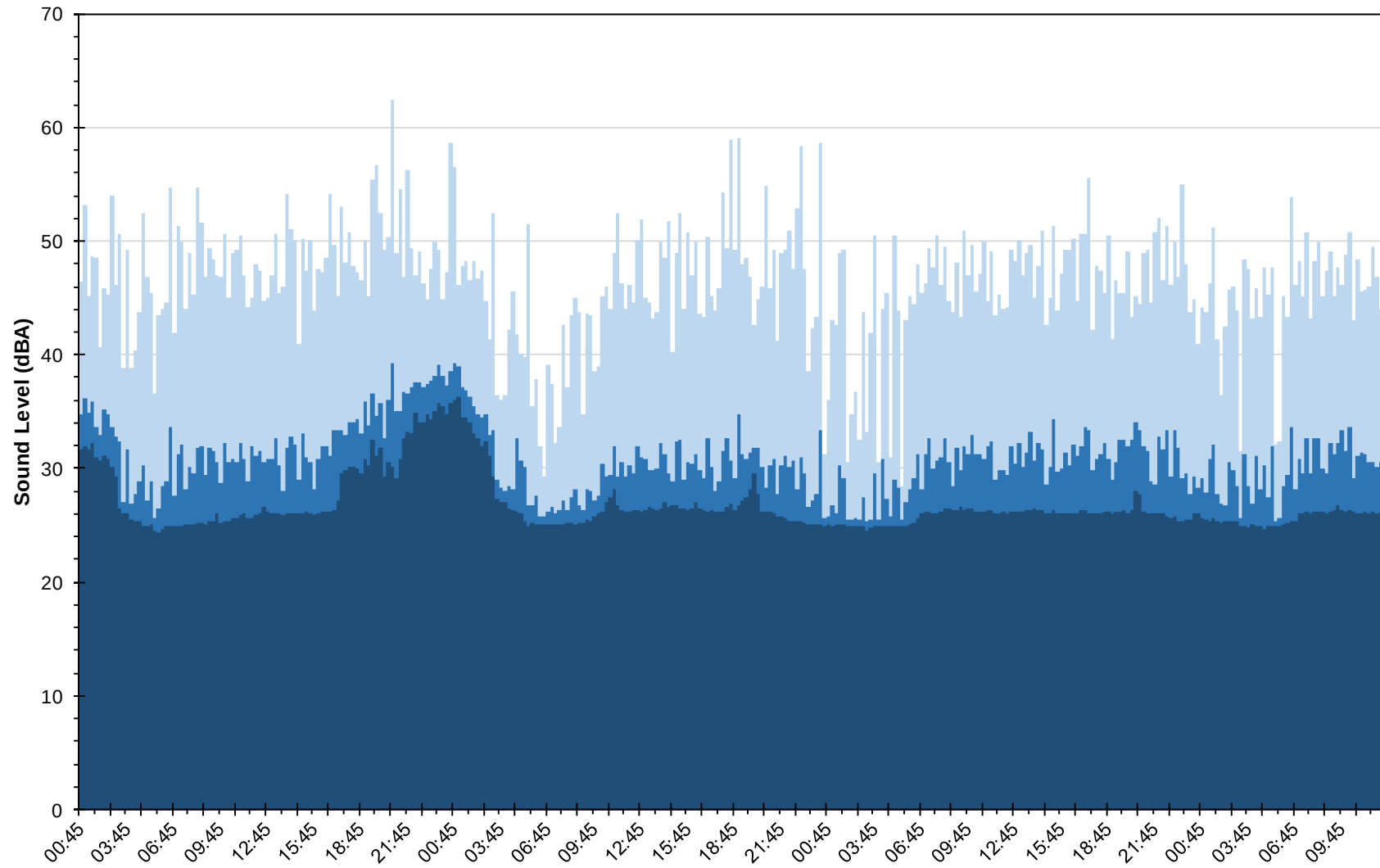
L_{eq} , L_{max} and L_{90} Noise Levels

Friday 21 February 2025 to Tuesday 25 February 2025

■ L_{Amax}

■ L_{Aeq}

■ L_{A90}



Date and Time

27924/TH2