

Internal Noise Assessment

Site Address:	Land at Broadfield Road and Moss Lane, East Manchester, M14 4LZ
Project Reference No:	NP-010488
Subject:	Internal Noise Assessment for Discharge of Planning Conditions
Client:	MAI Construction
Reported By:	R. Whitfield, MSc, AMIOA
Date:	17/01/2024

Introduction

NOVA Acoustics Ltd has been commissioned to undertake a post-completion internal noise survey at the above address. The aim of the assessment is to ascertain whether the installed sound insulation scheme achieves the requirements of BS8233:2014 and Condition 12b of the approved planning application. Further to this, Condition 11, which relates specifically to noise from external fixed plant is also addressed.

Local Planning Authority – Condition Requirements

The planning application title and relevant conditions are reproduced below.

Planning application ref: 131985/FO/2021 – *“Erection of four no. 3 storey 4-bedroom terraced dwellinghouses together with amenity space and associated car parking.”*

Condition 11

“a) Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location. Prior to commencement of the use hereby approved the scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.

b) Prior to the operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the 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 agreed noise criteria.

Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around the site pursuant to Core Strategy policy DM1 and Saved Unitary Development Plan policy DC26".

Condition 12b

"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.

Reason: To secure a reduction in noise from traffic or other sources in order to protect future residents from noise disturbance and to reduce the potential for overheating pursuant to Core Strategy policy DM1 and saved Unitary Development Plan policy DC26."

British Standard BS8233:2014 – Internal Noise Level Criteria

It is stated in BS8233 that the following internal noise levels should be achieved in order to allow for appropriate levels of residential amenity:

- Noise levels in living rooms and bedrooms should not exceed 35 dB ($L_{Aeq,16hr}$) during the daytime.
- Noise levels in bedrooms should not exceed 30 dB ($L_{Aeq,8hr}$) during the night-time.
- Noise levels in bedrooms due to maximum noise events should not regularly exceed 45 dB (L_{AFmax}).

Survey Particulars

- The survey was undertaken in general accordance with the Association of Noise Consultants' publication "ANC Guidelines: Measurement of Sound Levels in Buildings 2020".
- Noise levels were measured at a single location within each room, with the measurement microphone positioned at a height of 1.3m above floor level and at least 1.5m from any external wall / window.
- The measurement equipment used was Type 1, as defined in BS EN 61672:2003. The equipment was calibrated at the start and end of the survey using a handheld calibrator compliant with BS EN 60942:2003 (Class 1). Negligible deviation was noted. All sound level meters are calibrated

every 24 months, and all calibrators are calibrated every 12 months, by a third-party calibration laboratory.

- The sound levels meters were configured to measure $L_{Aeq,T}$, $L_{Amax,F}$ and 1/3 octave $L_{Zeq,T}$ sound levels over consecutive 10 seconds intervals for the duration of the survey.
- The noise levels were measured within the most exposed rooms with the windows closed [1].
- The following measurement positions were used:
 - Plot 4: 1st Floor – Front Bedroom (MP1)
 - Plot 4: Ground Floor – Rear Lounge / Kitchen (MP2)
- Two sound level meters were used for the internal noise monitoring carried out over a 1-day period during the week, from 15/01/24 to 16/01/24.
- Anomalous measurements have been removed from the results as they are not believed to be 'typical' for the surrounding area. This includes construction activities within the development on 16/01/24.
- The rooms where the measurements were taken were furnished.

A summary of the equipment used during the survey is outlined below:

Piece of Equipment	Serial No.	Calibration Deviation (dB)
CESVA SC420 Class 1 Sound Level Meter	T246458	≤0.1
CESVA CB006 Class 1 Calibrator	901927	
CESVA SC420 Class 1 Sound Level Meter	T250681	≤0.3
CESVA CB006 Class 1 Calibrator	901927	

Table 1 – Equipment

Note [1]: During the site visit it was noted that trickle vents have not been installed in the rooms. As such, it was not possible to take measurements whilst background ventilation was provided. It must be ensured that the appropriate background ventilation requirements are achieved in line with the criteria given in Approved Document F.

Long Term Internal Noise Levels Assessment

The following section analyses the ambient sound levels measured inside the development compared with the internal noise level criteria presented within BS8233:2014. Measurement locations were within the most sensitive spaces at the front and rear façade. The measured levels in each area have been compared with both the daytime and night-time criteria to ensure compliance.

Plot 4: 1 st Floor – Front Bedroom	
Description	L _{Aeq,t} (dB)
Measured L _{Aeq,16hour} (Day)	29
Local Authority Criteria	35
Exceedance above Criteria	-6
Measured L _{Aeq,8hour} (Night)	25
Local Authority Criteria	30
Exceedance above Criteria	-5

Table 2 – Internal Noise Level Analysis – Plot 4 Bedroom

Plot 4: Ground Floor – Rear Lounge / Kitchen	
Description	L _{Aeq,t} (dB)
Measured L _{Aeq,16hour} (Day)	26
Local Authority Criteria	35
Exceedance above Criteria	-9
Measured L _{Aeq,8hour} (Night)	21
Local Authority Criteria	30
Exceedance above Criteria	-9

Table 3 – Internal Noise Level Analysis – Plot 4 Lounge / Kitchen

Regarding L_{AFmax} noise events, the following is stated in the ProPG guidance:

“...in noise sensitive rooms at night (e.g., bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB L_{Amax,F} more than 10 times a night.”

The following table indicates the number of times 45 dB L_{AFmax,15min} was exceeded per night during the internal noise survey in both the bedroom and the lounge / kitchen.

Location	Measurement Period ('t')	No. Exceedances of 45 dB L _{AFmax,15min}
Plot 4: Front Bedroom	Night 1	4
Plot 4: Rear Lounge / Kitchen	Night 1	10

Table 4 – Maximum Sound Level Summary Results

The table above shows that the L_{AFmax} noise level criteria has not been exceeded more than 10 times in the bedroom or the lounge / kitchen. As such, the maximum noise level requirement has been achieved.

Conclusion

The internal noise level measurements outlined above achieve the criteria presented in BS8233:2014 for both average and maximum noise levels. As such, it is thought that Condition 12b can be discharged.

Regarding Conditions 11a and 11b, the applicant has informed NOVA Acoustics that no noise generating external fixed plant is (or will be) installed. Solar panels have been utilised for the development; however, these are not noise generating, and as such are not a cause for concern. Given this, it is thought that Conditions 11a and 11b can also be discharged.

Appendix A – Environmental Survey

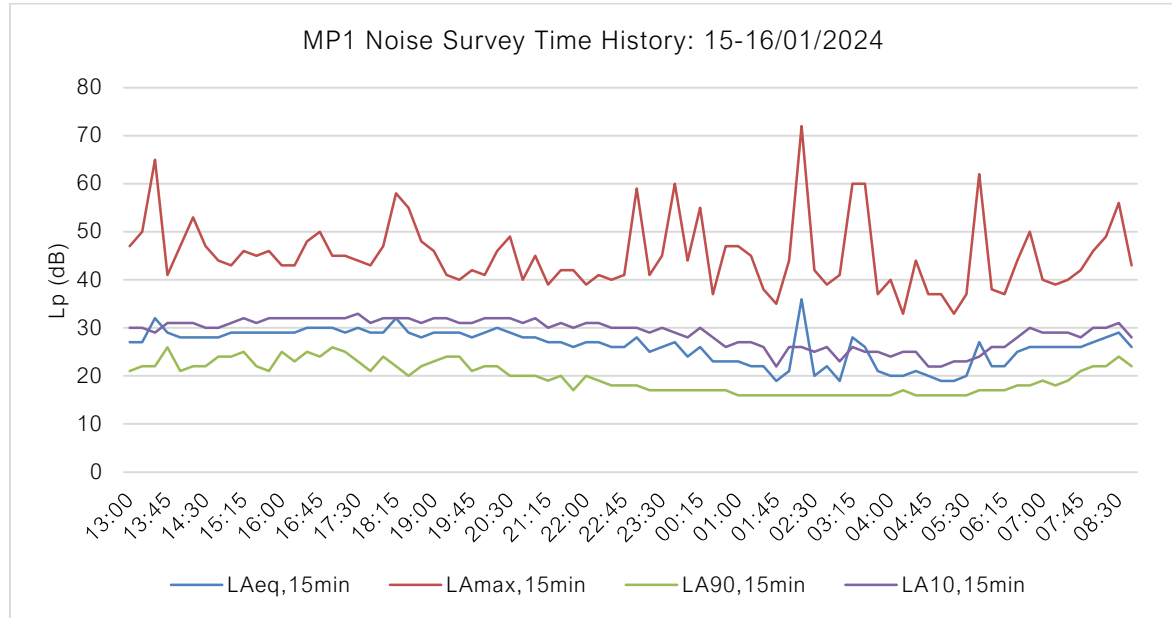


Figure 1 – MP1 Noise Survey Time History

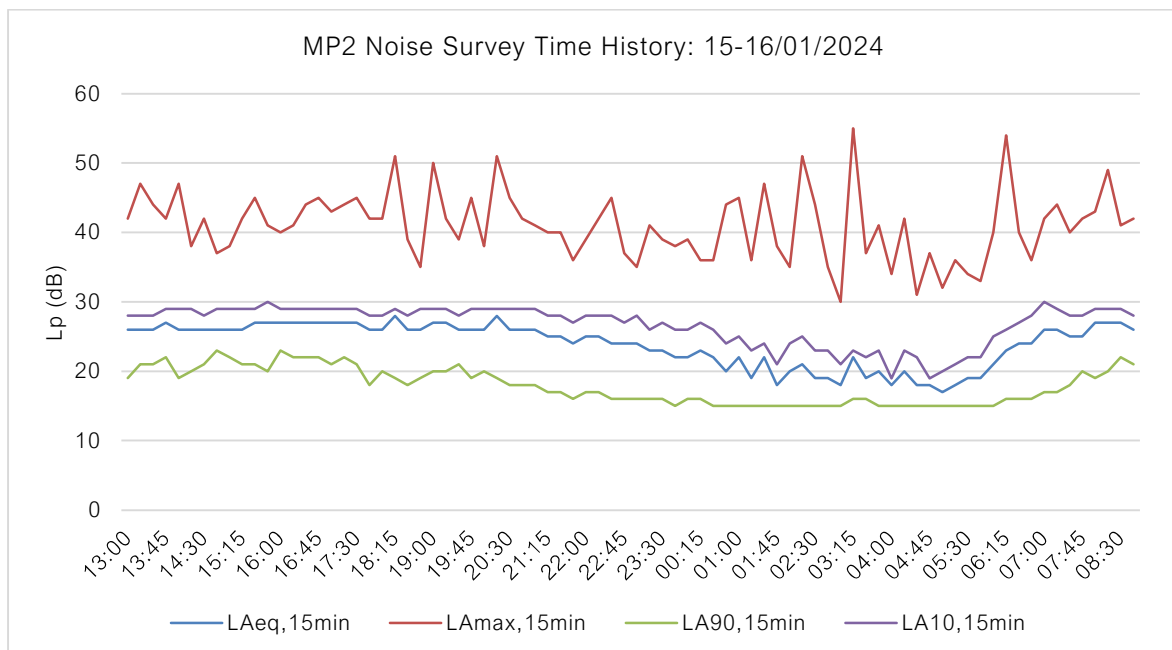


Figure 2 – MP1 Noise Survey Time History

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