

INTERNAL NOISE ASSESSMENT

Our Ref: 8789JD



To: Whitworth Park Properties Ltd, Suite 9b Turner Business Centre, Greengate, Middleton, Manchester, M24 1RU

Prepared By: Richard Whitfield, MSc, AMIOA

Approved By: Adam Martin, MSc, MIOA, MCIEH, MIET, MInstSCE

Date: 22/05/2023

Version: Revision C

Site Address: Whitworth Park Mansions, Moss Lane East, Manchester, M14 4LU

Brief: NOVA Acoustics Ltd has been commissioned to undertake a post-completion internal noise survey. The aim of the assessment is to ascertain whether the installed sound insulation scheme achieves the noise criteria specified in BS8233:2014 and in doing so will also satisfy the requirements given in Condition 11 of the approved planning application.

App Number: 108496/FO/2015/S1

Condition: Manchester City Council have requested that:

"11. Before the development commences a scheme for acoustically insulating the residential accommodation against noise from Moss Lane East and the vehicle repair workshop shall be submitted to and approved in writing by the City Council as local planning authority. The approved noise insulation scheme shall be completed before any of the dwelling units are occupied.

Reason - To secure a reduction in noise from Moss Lane East and the vehicle repair workshop in order to protect future residents from noise nuisance, pursuant to policies SP1, H1 and DM1 of the Core Strategy."

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 walls / windows.
- The measurement equipment used was Type 1 as defined in BS EN 61672:2003. The equipment was calibrated at the start and at the 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.

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

Piece of Equipment	Serial No.	Calibration Deviation (dB)
Svantek 971 Class 1 Sound Level Meter	77796	≤0.2
Svantek SV33B Class 1 Calibrator	116639	
CESVA SC420 Class 1 Sound Level Meter	T246458	≤0.2
CESVA CB006 Class 1 Calibrator	901927	

Table 1.0 - Equipment

- The sound levels meters were configured to measure $L_{Aeq,T}$, $L_{Amax, Fast}$ 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 and trickle ventilation opened. The following measurement positions were used:
 - Flat 22: 1st Floor – Front Kitchen/ Living Room
 - Flat 22: 1st Floor – Rear Bedroom
- Two sound level meters were used for long-term noise monitoring carried out over a 1-day period during the week, from 30/11/22 to 01/12/22.
- The noise profile was dominated by road noise at the front façade. The vehicle repair shop was operating as normal during the measurement period and during the site visits was inaudible at the rear façade.
- Some anomalous measurements have been removed from the results as they are not believed to be 'typical' for the surrounding area.
- Where rooms were furnished and considered normal reverberant conditions, no corrections have been applied to the measured sound level. Where rooms were unfinished and unfurnished, the internal noise levels within the rooms have been corrected to account for expected absorption using the following formula. The reference reverberation time has been taken from BS140-4 which denotes that the average reverberation time of a furnished room within a dwelling will be 0.5 seconds.
 - $LP = 10 \cdot \log(T/T_0)$
 - LP = Measured sound pressure level
 - T_0 = Reference reverberation time for ordinary rooms: 0.5 seconds
 - T = Predicted Reverberation Time*

**The reverberation time was not measured onsite. As such the reverberation time has been predicted for based upon the interior finishes in the test room.*

- Based upon the interior finishes the predicted reverberation for the kitchen/ living room is 1.5 seconds. Once furniture and other furnishings are installed within the room, we would expect reverberation times to be no more than 1 second. This equates to a correction of - 2.0 dB, which we consider to be a conservative estimate.

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.

The client has informed NOVA Acoustics that a background ventilation system is not required within the development. It is thought that windows will not need to be left open in order to provide background ventilation and will only need to be opened occasionally to provide purge ventilation. As such, the measurements taken on site with the windows closed are thought to be representative of typical conditions. The ventilation requirements have been agreed between the client and Stroma Building Control and email evidence can be provided by the client upon request.

The tables below show the measured internal noise levels.

Flat 22: 1st Floor – Front Kitchen/ Living Room	
Description	L_{Aeq,t} (dB)
Measured L _{Aeq,16hour} (Day)	35.0
Local Authority Criteria	35.0
Exceedance above Criteria	0.0
Measured L _{Aeq,8hour} (Night)	30.0
Local Authority Criteria	30.0
Exceedance above Criteria	0.0

Table 2.0 – Internal Noise Level Analysis – Flat 22 Kitchen / Living Room

Although, kitchen/ living rooms do not have a night-time criterion, the level has been presented as it is believed to be representative of the level for a bedroom on this façade.

Flat 22: 1st Floor – Rear Bedroom	
Description	L_{Aeq,t} (dB)
Measured L _{Aeq,16hour} (Day)	26.0
Local Authority Criteria	35.0
Exceedance above Criteria	-9.0
Measured L _{Aeq,8hour} (Night)	22.0
Local Authority Criteria	30.0
Exceedance above Criteria	-8.0

Table 3.0 – Internal Noise Level Analysis – Flat 22 Bedroom

Regarding L_{Amax} noise events, it is stated in the W.H.O. and ProPG guidance that L_{AFmax} events would need to occur more than ten times per night in order to have a detrimental effect on the sleep and health of the occupants. ProPG states the following:

"...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.

$L_{AFmax,t}$ Analysis		
Location	Measurement Period ('t')	No. Exceedances of 45 dB $L_{AFMax,15min}$
Plot 22: Front Kitchen/ Living Room	Night 1	8
Plot 22: Rear Bedroom	Night 1	0

Table 4.0 – Maximum Sound Level Summary Results – Bedroom

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

Conclusion:

The internal noise level measurements outlined above meet the standard criteria presented in BS8233:2014 for both average and maximum noise levels. It is considered that the installed noise insulation scheme complies with condition 11 of the planning approval.

Appendix 1 – Tabulated Noise Data

MP1 Tabulated Data				
Time	LAEQ	LAMAX	LA90	LA10
14:00	Anomalous			
14:15				
14:30	37.0	47.0	30.0	41.0
14:45	37.0	51.0	32.0	40.0
15:00	36.0	44.0	31.0	39.0
15:15	38.0	53.0	33.0	40.0
15:30	37.0	55.0	32.0	41.0
15:45	37.0	47.0	31.0	40.0
16:00	37.0	53.0	32.0	40.0
16:15	38.0	53.0	33.0	41.0
16:30	37.0	54.0	31.0	40.0
16:45	36.0	46.0	31.0	39.0
17:00	37.0	51.0	32.0	40.0
17:15	43.0	65.0	31.0	42.0
17:30	37.0	58.0	30.0	40.0
17:45	39.0	61.0	31.0	40.0
18:00	38.0	58.0	30.0	40.0
18:15	37.0	47.0	31.0	40.0
18:30	37.0	50.0	32.0	40.0
18:45	38.0	54.0	31.0	40.0
19:00	38.0	50.0	31.0	41.0
19:15	37.0	45.0	29.0	40.0
19:30	36.0	44.0	30.0	39.0
19:45	38.0	62.0	30.0	40.0
20:00	37.0	46.0	31.0	40.0
20:15	36.0	43.0	29.0	39.0
20:30	37.0	61.0	30.0	40.0

20:45	37.0	53.0	29.0	40.0
21:00	37.0	55.0	30.0	40.0
21:15	36.0	48.0	29.0	40.0
21:30	38.0	55.0	31.0	41.0
21:45	36.0	48.0	28.0	39.0
22:00	37.0	50.0	29.0	40.0
22:15	37.0	46.0	29.0	40.0
22:30	36.0	47.0	26.0	40.0
22:45	36.0	45.0	28.0	39.0
23:00	35.0	44.0	25.0	39.0
23:15	35.0	51.0	24.0	39.0
23:30	33.0	44.0	23.0	37.0
23:45	34.0	51.0	23.0	38.0
00:00	34.0	46.0	22.0	40.0
00:15	Anomalous			
00:30	34.0	46.0	20.0	38.0
00:45	32.0	44.0	20.0	36.0
01:00	33.0	46.0	20.0	38.0
01:15	31.0	46.0	18.0	36.0
01:30	34.0	58.0	18.0	36.0
01:45	31.0	48.0	18.0	36.0
02:00	31.0	45.0	18.0	36.0
02:15	29.0	42.0	17.0	34.0
02:30	29.0	45.0	17.0	34.0
02:45	29.0	44.0	18.0	35.0
03:00	30.0	53.0	17.0	34.0
03:15	29.0	44.0	17.0	34.0
03:30	26.0	41.0	17.0	30.0
03:45	26.0	42.0	18.0	31.0
04:00	28.0	43.0	17.0	32.0

04:15	24.0	39.0	17.0	27.0
04:30	27.0	41.0	17.0	32.0
04:45	29.0	43.0	18.0	34.0
05:00	29.0	47.0	17.0	34.0
05:15	28.0	43.0	18.0	34.0
05:30	27.0	42.0	18.0	31.0
05:45	30.0	49.0	18.0	35.0
06:00	32.0	45.0	19.0	36.0
06:15	31.0	44.0	20.0	35.0
06:30	34.0	47.0	25.0	38.0
06:45	35.0	50.0	25.0	39.0
07:00	36.0	51.0	27.0	39.0
07:15	37.0	52.0	30.0	39.0
07:30	37.0	51.0	31.0	40.0
07:45	37.0	50.0	31.0	40.0
08:00	36.0	46.0	31.0	39.0
08:15	37.0	47.0	31.0	40.0
08:30	37.0	53.0	31.0	40.0
08:45	38.0	56.0	32.0	42.0
09:00	37.0	50.0	31.0	40.0
09:15	40.0	62.0	29.0	42.0
09:30	36.0	47.0	29.0	39.0
09:45	37.0	53.0	29.0	41.0
10:00	37.0	49.0	28.0	40.0

MP2 Tabulated Data				
Time	LAEQ	LAMAX	L90	L10
14:00	23.0	32.0	20.0	26.0
14:15	24.0	37.0	20.0	27.0
14:30	26.0	40.0	20.0	28.0
14:45	24.0	37.0	20.0	26.0
15:00	26.0	48.0	20.0	28.0
15:15	24.0	34.0	20.0	26.0
15:30	24.0	40.0	20.0	27.0
15:45	35.0	54.0	22.0	38.0
16:00	32.0	45.0	24.0	36.0
16:15	24.0	41.0	21.0	27.0
16:30	25.0	41.0	21.0	28.0
16:45	25.0	37.0	21.0	28.0
17:00	25.0	43.0	21.0	26.0
17:15	25.0	43.0	22.0	28.0
17:30	24.0	41.0	20.0	26.0
17:45	25.0	40.0	21.0	28.0
18:00	26.0	45.0	20.0	28.0
18:15	25.0	40.0	21.0	27.0
18:30	24.0	35.0	20.0	26.0
18:45	24.0	47.0	20.0	27.0
19:00	25.0	36.0	21.0	27.0
19:15	24.0	40.0	19.0	26.0
19:30	24.0	37.0	21.0	26.0
19:45	24.0	42.0	20.0	27.0
20:00	23.0	33.0	20.0	25.0
20:15	24.0	38.0	20.0	27.0
20:30	25.0	44.0	20.0	27.0
20:45	24.0	36.0	20.0	26.0

21:00	23.0	33.0	20.0	25.0
21:15	23.0	40.0	18.0	26.0
21:30	23.0	38.0	19.0	25.0
21:45	24.0	35.0	20.0	27.0
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23:15	23.0	36.0	19.0	25.0
23:30	24.0	41.0	20.0	26.0
23:45	23.0	38.0	19.0	25.0
00:00	23.0	45.0	19.0	25.0
00:15	23.0	34.0	18.0	26.0
00:30	22.0	32.0	19.0	24.0
00:45	22.0	35.0	18.0	24.0
01:00	22.0	36.0	18.0	25.0
01:15	21.0	33.0	17.0	24.0
01:30	22.0	37.0	18.0	26.0
01:45	23.0	44.0	18.0	25.0
02:00	22.0	34.0	17.0	25.0
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03:15	21.0	36.0	17.0	23.0
03:30	21.0	33.0	17.0	24.0
03:45	20.0	31.0	17.0	23.0
04:00	20.0	36.0	17.0	23.0
04:15	20.0	36.0	17.0	23.0

04:30	20.0	36.0	17.0	22.0
04:45	20.0	31.0	17.0	22.0
05:00	19.0	32.0	17.0	21.0
05:15	23.0	40.0	17.0	25.0
05:30	19.0	30.0	17.0	21.0
05:45	18.0	29.0	17.0	20.0
06:00	19.0	30.0	17.0	21.0
06:15	18.0	33.0	17.0	21.0
06:30	21.0	36.0	17.0	23.0
06:45	19.0	31.0	17.0	22.0
07:00	18.0	32.0	17.0	21.0
07:15	19.0	30.0	17.0	21.0
07:30	23.0	38.0	17.0	25.0
07:45	22.0	35.0	17.0	24.0
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12:30	23.0	38.0	20.0	25.0
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13:00	25.0	45.0	22.0	27.0
13:15	26.0	43.0	21.0	30.0
13:30	27.0	43.0	22.0	30.0
13:45	25.0	37.0	22.0	27.0
14:00	25.0	40.0	21.0	27.0
14:15	24.0	42.0	21.0	26.0
14:30	24.0	43.0	21.0	27.0
14:45	27.0	51.0	21.0	29.0
15:00	26.0	40.0	22.0	28.0
15:15	28.0	50.0	21.0	31.0
15:30	25.0	44.0	21.0	28.0
15:45	23.0	34.0	20.0	26.0
16:00	24.0	40.0	21.0	27.0
16:15	25.0	38.0	20.0	27.0
16:30	32.0	59.0	21.0	29.0
16:45	24.0	41.0	21.0	27.0
17:00	24.0	37.0	21.0	26.0
17:15	29.0	49.0	22.0	34.0
17:30	24.0	43.0	19.0	26.0
17:45	23.0	33.0	20.0	26.0
18:00	24.0	45.0	20.0	26.0
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04:00	20.0	34.0	17.0	24.0
04:15	19.0	36.0	17.0	22.0
04:30	20.0	37.0	17.0	24.0
04:45	19.0	32.0	17.0	21.0
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09:45	23.0	34.0	19.0	26.0
10:00	23.0	39.0	18.0	25.0
10:15	23.0	37.0	18.0	25.0

10:30	22.0	33.0	19.0	25.0
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16:45	23.0	32.0	19.0	25.0
17:00	24.0	40.0	20.0	27.0
17:15	24.0	40.0	19.0	27.0
17:30	24.0	39.0	21.0	27.0
17:45	26.0	47.0	20.0	26.0

18:00	25.0	40.0	21.0	28.0
18:15	24.0	43.0	20.0	25.0
18:30	24.0	35.0	20.0	26.0
18:45	25.0	40.0	20.0	27.0
19:00	24.0	38.0	20.0	26.0
19:15	24.0	35.0	20.0	26.0
19:30	23.0	35.0	19.0	26.0
19:45	24.0	39.0	20.0	27.0

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