

Technical Memo

Site Address:	Land Adjacent No 20 Chorlton Villas, Hardy Lane, Manchester, M21 8DN
Project Reference No:	NP-009405
Subject:	Internal Noise Assessment
Client:	Simon Casey - Bluechip Architecture
Reported By:	R Whitfield, MSc, AMIOA
Checked By:	S Chesney, MSc, MIOA
Date:	24/05/2023

Introduction

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 5 of the approved planning application.

App Number: 127696/FO/2020

Condition: Manchester City Council have requested that:

"Before the development commences a scheme for acoustically insulating the proposed residential accommodation against noise and vibration from tram lines 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. The approved noise insulation scheme shall be completed before any of the dwelling units are occupied. Noise survey data must include measurements taken during a rush-hour period and night-time to determine the appropriate sound insulation measures necessary. The following noise criteria will be required to be achieved: Bedrooms (night time - 2300 - 0700) 30 dB LAeq (individual noise events shall not exceed 45 dB LAmax,F by more than 15 times) Living Rooms (daytime - 0700 - 2300) 35 dB LAeq Gardens and terraces (daytime) 55 dB LAeq Upon completion of the development and before first occupation of the residential units, a verification report will 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 has 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. Due to the proximity of the development to the tram line, it will be necessary for vibration criteria to apply which can

be found in BS 6472: 2008 "Guide to evaluation of human exposure to vibration in buildings". Groundborne noise/reradiated noise should also be factored into the assessment and design."

Considering the requirements of the condition, the purpose of this technical letter is to ascertain whether the installed sound insulation scheme achieves the noise criteria specified in BS8233:2014 and calculate the noise impact from the neighbouring premises to assess whether further mitigation is required in order to achieve appropriate conditions for adequate residential amenity.

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 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 307 Class 1 Sound Level Meter	87871	≤0.1
Svantek SV36 Class 1 Calibrator	125695	
Svantek 307 Class 1 Sound Level Meter	101030	≤0.1
Svantek SV36 Class 1 Calibrator	125695	

Table 1 - Equipment

- The sound levels meters were configured to measure $L_{Aeq,T}$, $L_{Amax,F}$ and 1/3 octave $L_{eq,T}$ 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:
 - Bedroom 1
 - Living Room
- Two sound level meters were used for the internal noise monitoring carried out over a 1-day period during the week, from 18/05/23 to 19/05/23.
- The rooms measured were unfurnished.
- External noise monitoring was carried out on 18/05/23 within both the garden and terrace areas.

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. Both measurement locations were within bedrooms at the front and rear façade. The measured levels in the bedrooms have also been compared to the living room criteria to ascertain compliance during the daytime.

Plot 20: Ground Floor – Living Room	
Description	$L_{Aeq,T}$ (dB)
Measured $L_{Aeq,16hour}$ (Day)	33
Local Authority Criteria	35
Exceedance above Criteria	-2

Table 2 –Internal Noise Level Analysis – Plot 20: Ground Floor Living Room

Plot 20: 1 st Floor – Bedroom 1	
Description	$L_{Aeq,T}$ (dB)
Measured $L_{Aeq,16hour}$ (Day)	28
Local Authority Criteria	35
Exceedance above Criteria	-7
Measured $L_{Aeq,8hour}$ (Night)	23
Local Authority Criteria	30
Exceedance above Criteria	-7

Table 3 –Internal Noise Level Analysis – Plot 20: Ground Floor Bedroom 1

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 45dB $L_{AFmax,15min}$ was exceeded per night during the internal noise survey.

L_{AFmax} Analysis		
Location	Measurement Period ('T')	No. Exceedances of 45 dB $L_{AFmax,15min}$
Plot 20: Bedroom 1	Night 1	0

Table 4 – Maximum Sound Level Summary Results – Bedroom

The table above shows that the L_{AFmax} noise level criteria has not been exceeded more than 15 times in the bedroom. As such, the maximum noise level requirement has been achieved.

External Noise Level Assessment

The following section analyses the external amenity area noise levels across the proposed development. The external amenity area sound levels are summarised in the table below.

External Amenity Area Noise Level Assessment			
Location	$L_{Aeq,16hr}$ Noise Level (dB)	BS8233:2014 Criteria (dB)	Exceedance (dB)
Garden	47	50 – 55 $L_{Aeq,16hr}$	-8
Rooftop Terrace	50		-5

Table 5 – BS8233:2014 External Amenity Area Noise Level Assessment

Conclusion:

The internal and external 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 5 of the planning approval.

Appendix A – Tabulated Noise Data

MP1: Living Room Tabulated Data				
Time	$L_{Aeq,T}$	L_{AFmax}	L_{A90}	L_{A10}
15:00	31	41	21	33
15:15	30	40	26	32
15:30	29	39	22	30
15:45	27	41	21	30
16:00	30	39	29	32
16:15	29	49	22	33
16:30	32	54	28	32
16:45	29	39	27	30
17:00	31	60	23	31
17:15	33	61	23	33
17:30	27	46	21	30
17:45	32	44	29	33
18:00	29	45	27	32
18:15	30	57	21	31
18:30	29	54	21	32
18:45	30	49	21	32
19:00	29	46	22	31
19:15	30	38	27	32
19:30	31	40	29	32
19:45	27	47	19	30
20:00	29	41	21	30
20:15	27	46	18	29
20:30	29	43	28	31
20:45	31	46	27	32
21:00	27	39	17	30
21:15	29	37	28	29
21:30	30	62	17	29
21:45	32	62	18	30
22:00	30	47	27	32
22:15	29	46	17	31
22:30	28	47	17	29
22:45	26	40	17	29
23:00	28	47	27	29
23:15	26	38	16	31
23:30	30	48	29	31
23:45	25	36	17	28
00:00	27	42	16	29
00:15	26	47	16	28

00:30	25	38	16	29
00:45	30	47	16	31
01:00	28	39	25	31
01:15	29	43	28	30
01:30	24	46	17	29
01:45	28	37	17	30
02:00	27	47	17	30
02:15	29	37	26	32
02:30	30	36	26	31
02:45	25	46	17	30
03:00	29	35	28	30
03:15	22	46	17	24
03:30	23	43	18	26
03:45	31	44	31	32
04:00	31	46	29	33
04:15	29	39	28	30
04:30	31	61	22	30
04:45	29	39	22	30
05:00	28	51	22	29
05:15	31	46	31	32
05:30	27	36	22	30
05:45	29	39	25	32
06:00	30	40	24	32
06:15	30	40	25	32
06:30	30	43	24	32
06:45	30	36	27	32
07:00	30	42	27	32
07:15	29	42	23	31
07:30	31	41	29	33
07:45	28	43	22	32
08:00	34	49	29	38
08:15	33	44	27	38
08:30	29	40	24	31
08:45	28	38	22	30
09:00	29	42	18	30
09:15	29	45	20	32
09:30	31	51	28	33
09:45	32	61	28	31
10:00	36	62	19	35
10:15	34	53	19	33
10:30	28	45	20	29
10:45	34	65	26	34

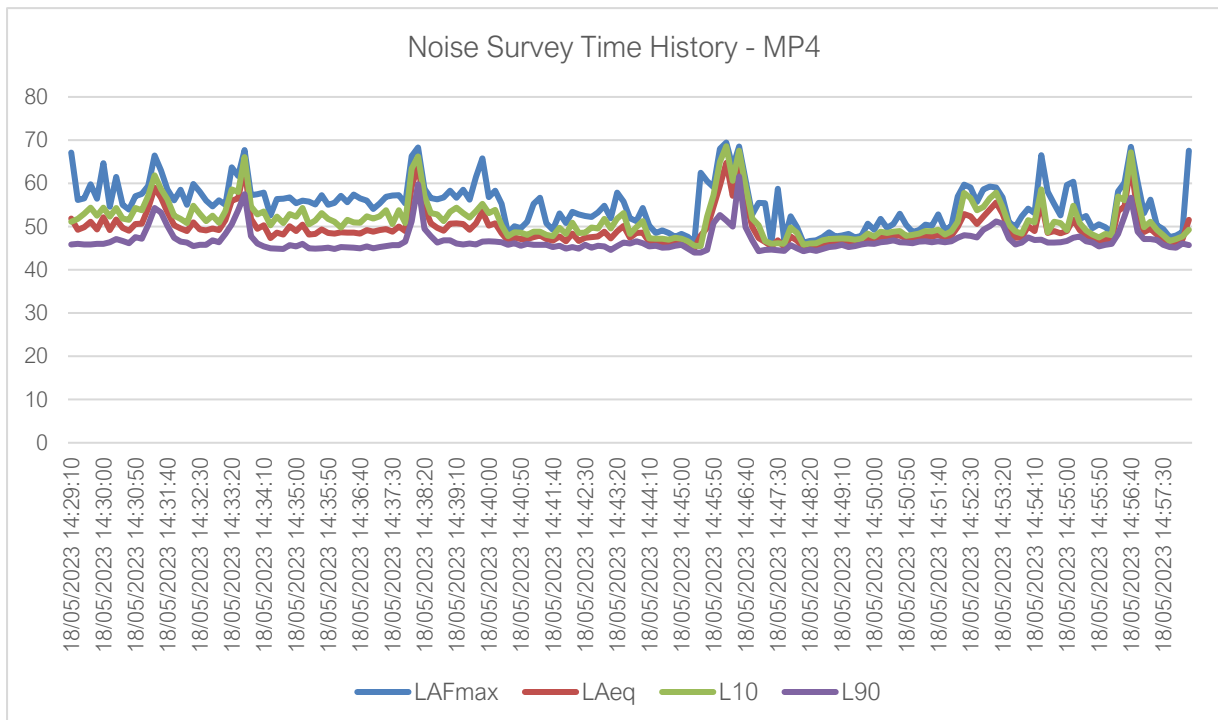
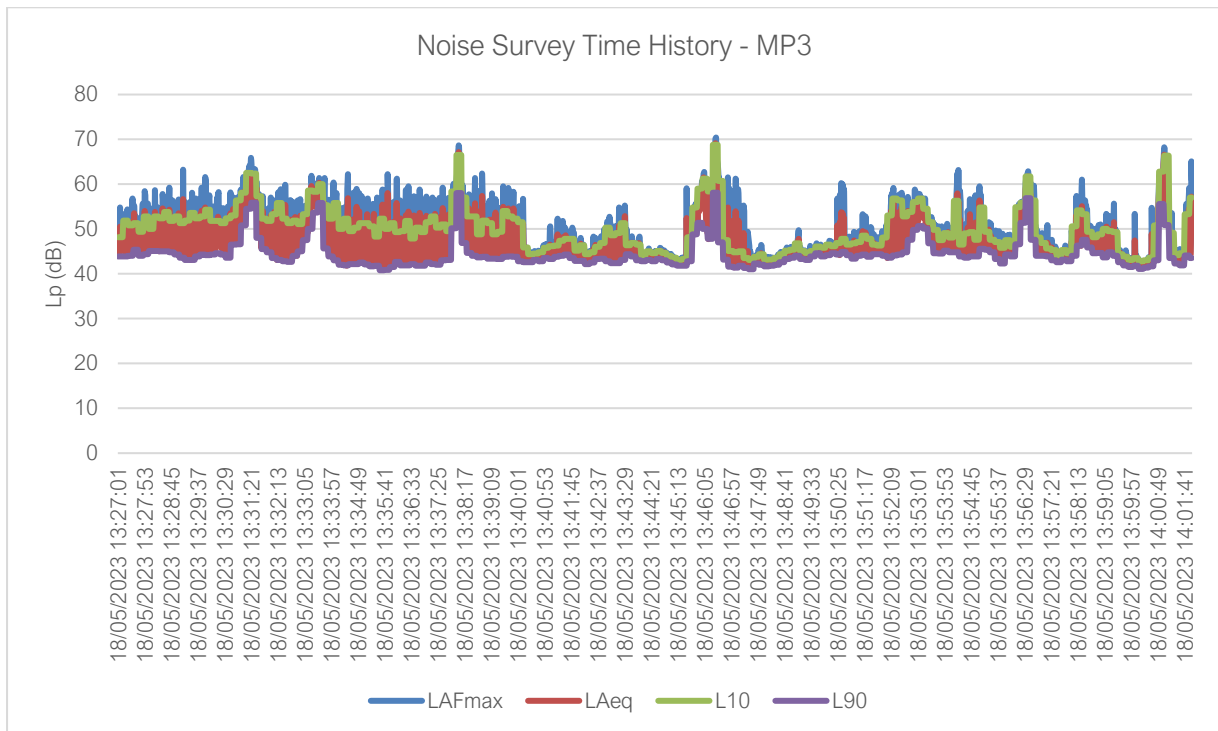
11:00	39	64	26	44
11:15	35	59	30	38
11:30	35	61	23	39
11:45	29	54	27	30
12:00	32	51	17	35
12:15	34	50	25	38

MP2: Bedroom 1 Tabulated Data				
Time	$L_{Aeq,T}$	L_{AFmax}	L_{A90}	L_{A10}
15:00	27	41	22	31
15:15	26	42	21	29
15:30	25	41	21	26
15:45	25	41	21	26
16:00	26	41	21	30
16:15	26	43	21	28
16:30	26	41	21	30
16:45	25	43	21	28
17:00	25	41	21	27
17:15	27	46	21	30
17:30	25	42	21	25
17:45	27	50	21	31
18:00	25	40	21	28
18:15	24	42	20	26
18:30	27	46	20	31
18:45	26	42	20	29
19:00	25	47	20	26
19:15	23	40	20	24
19:30	25	40	20	27
19:45	26	42	21	28
20:00	24	41	21	26
20:15	24	39	22	25
20:30	24	40	21	25
20:45	26	42	20	29
21:00	24	40	20	27
21:15	23	39	20	23
21:30	22	39	20	22
21:45	24	43	20	25
22:00	24	40	20	28
22:15	23	40	20	24
22:30	23	40	20	23
22:45	23	40	19	25
23:00	22	39	19	20

23:15	21	39	19	20
23:30	22	41	19	21
23:45	19	27	19	20
00:00	19	30	19	19
00:15	19	26	19	19
00:30	19	33	19	19
00:45	19	30	19	19
01:00	20	29	19	20
01:15	19	25	19	19
01:30	19	27	19	20
01:45	19	38	19	19
02:00	19	25	19	19
02:15	20	28	19	20
02:30	19	34	19	20
02:45	20	33	19	20
03:00	20	32	19	20
03:15	20	31	20	21
03:30	20	31	20	21
03:45	21	35	20	24
04:00	23	41	20	24
04:15	24	40	20	25
04:30	23	36	20	25
04:45	25	39	21	26
05:00	23	37	21	24
05:15	25	42	22	27
05:30	25	41	22	26
05:45	27	41	23	31
06:00	29	40	24	31
06:15	27	39	25	29
06:30	26	39	24	27
06:45	25	42	21	26
07:00	26	41	22	31
07:15	26	40	21	30
07:30	29	40	25	30
07:45	27	43	23	29
08:00	27	40	23	29
08:15	26	39	20	30
08:30	27	40	23	29
08:45	26	42	21	27
09:00	25	42	20	29
09:15	27	41	20	30
09:30	25	41	20	27
09:45	25	42	20	26

10:00	28	47	20	31
10:15	31	52	20	30
10:30	27	44	20	29
10:45	26	41	20	29
11:00	26	44	21	28
11:15	32	45	21	37
11:30	28	42	22	31
11:45	23	38	20	23
12:00	30	49	21	33
12:15	32	46	21	36

Appendix B – Time History



DOCUMENT END

Disclaimer

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