24032-L01-SW

Jordan King

Estates Projects

Manchester Metropolitan University

Bridgewater House, 7th Floor

58-60 Whitworth Street

Manchester M1 6LT

17/06/2024

Dear Jordan,

GEOFFREY MANTON BUILDING – SERVICES NOISE VERIFICATION

dBx Acoustics Ltd attended site on Wednesday 5th June 2024 to measure noise arising from the recent installation of 2no. external air source heat pumps (ASHPs) and 2no. externally discharging MVHR units at the Geoffrey Manton Building, Rosamond St West, Manchester M15 6EB.

Manchester City Council, as the local planning authority, requires that;

> *'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 (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.'*

A desktop assessment of noise from the proposed plant has previously been carried out by dBx Acoustics Ltd, presented in report reference *23037-SW-R01 Plant Noise Impact Assessment,* dated 24th April 2023.

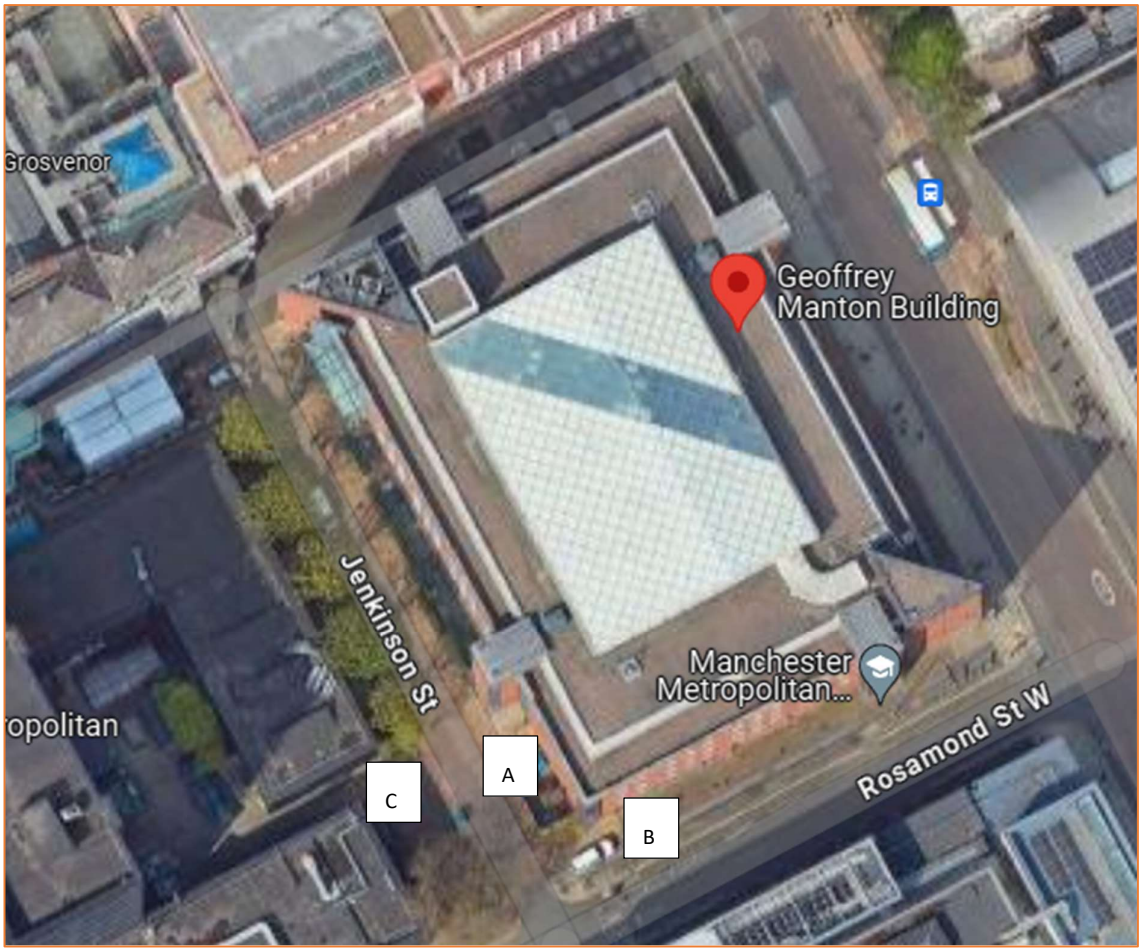
Methodology and Observations

Measurements were made at three locations, as indicated in Figure 1 on the following page.

- Location A was at 1m from the ASHPs;
- Location B was at 1m from the MVHR louvre;
- Location C was at the nearest noise sensitive receptor, the Benzie & Chatham Building.

The ASHPs are located in a close-boarded timber enclosure which blocks the line of sight to the receptors. Measurements at Location A were made within the enclosure.

Figure 1: Measurement Locations



Noise from the new plant was not considered subjectively audible by the surveyor at the nearest noise sensitive receptor (Location C, Benzie & Chatham Building), or at the façade of RNCM on the far side of Rosamond St W. The noise climate at these locations was dominated by road traffic, and by plant associated with the Benzie & Chatham Building.

Noise measurements were therefore made in close proximity to the ASHPs and MVHR louvre to allow the specific sound level arising at the receptors to be assessed.

At each location, measurements were made over a 15-minute period with the new plant both operational, and switched off. Measurements were made in octave bands using the following equipment:

Table 1: Equipment Used During Verification Measurements

Equipment	Manufacturer & Part No.	Serial Number	Calibration Date	Certificate Number
Meter	NOR 140	1403443	24/05/2023	06256/2
Pre-Amp	NOR 1209	12967		
Microphone	NOR 1225	18437		
Calibrator	B&K 4231	1821323	24/05/2023	06256/1

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The sound level meter was calibrated before and after measurements, with no significant drift recorded. An accredited laboratory calibrated the equipment not more than two years prior to the measurements being made, with the exception of the calibrator, which had been calibrated not more than one year prior to the survey.

Weather conditions during the measurement period were cool and dry.

Wind speeds were within suitable parameters for the measurement of environmental noise (i.e. generally under 5 ms^{-1}). The microphone was protected with a windshield for the duration of the survey.

Measurement Results

The results of the measurements made at each location are summarised in Table 2, below.

Table 2: Measurement Results, $dBL_{eq,15min}$

Location	Condition	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dBA
A	Plant on	68	57	58	55	50	44	45	40	**56**
	Plant off	68	55	54	49	47	42	40	30	**53**
B	Plant on	69	60	59	56	54	48	41	33	**58**
	Plant off	69	60	59	56	53	47	41	32	**58**
C	Plant on	68	59	59	53	50	48	41	36	**57**
	Plant off	69	61	60	55	51	51	47	39	**58**

At location B, it can be seen that there was no difference in the ambient noise level measured with plant on and plant off. Noise from the MVHR units was inaudible at this location, and is therefore not considered further within this assessment.

At location C, the ASHPs were subjectively inaudible; in fact, the ambient noise level due to road traffic increased during the measurement period when plant was switched off. The measurements made at 1m from the units (Location A) have therefore been used to derive the specific sound level at 1m from the units by performing a logarithmic subtraction of the ambient noise level with, and without, the plant in operation.

The calculated specific sound level at 1m for the ASHPs in operation is shown in Table 3, below.

Table 3: Specific Sound Level at 1m, ASHPs ($dBL_{eq,T}$)

Plant Item	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dBA
ASHP	55	52	55	53	47	41	43	40	**54**

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BS4142 Assessment

The measured background sound level at the Benzie & Chatham Building during the typical daytime period, as measured in April 2023 and used in the submitted planning noise impact assessment, was 53dB$L_{A90,1hr}$.

Based on the specific sound level of the ASHPs at 1m as presented in Table 3, above, the specific sound level at the Benzie & Chatham Building can be derived as shown in Table 4, below.

Table 4: Derivation of Specific Sound Level at NSR

Item	Calculation	Correction
Specific sound level at 1m	Table 3	54dB$L_{Aeq,T}$
Distance correction, r=16m	-20 log (r/1)	-24dB
Screening due to enclosure	Full screening, no line of sight	-10dB
Specific sound level at Benzie & Chatham		**20dB$L_{Aeq,T}$**

On this basis, a BS4142 assessment for the plant as installed is presented in Table 5, below.

Table 5: BS4142 Assessment

Item	Calculation	Relevant Clause	Comments
Measured background sound level – daytime	53dB$L_{A90,1hr}$	8.3	The typical background sound level measured during the daytime period.
Specific sound level	20dB$L_{Aeq,1hr}$	7.3.3	Based on measurements made at 1m from plant, with corrections for distance and screening.
Assessment made during the daytime period so reference period is 1 hour		7.2	-
Acoustic Feature Correction	0dB	9.2	No acoustically distinct characteristics
Rating Level	20dB$L_{Ar,Tr}$	9.2	The Rating Level during the daytime period.
Excess of Rating Level over background sound level	-33dB	11	-
Assessment indicates low likelihood of adverse impact		11	The measured rating level is over 5dB below the background sound level at the NSR.
Uncertainty of the assessment	Minor	10	Background sound level and rating level based on repeatable measurements.

It is demonstrated that the rating level of the installed plant is 33dB lower than the typical daytime background sound level, and is therefore compliant with the requirements of Manchester City Council.

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Yours Sincerely,



Susan Witterick

Director, dBx Acoustics Ltd

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