

ACOUSTIC TECHNICAL NOTE



Reference:	11427.ATN01.PCA.0
Revision:	0
To:	Fortis Vision
From:	James Melville
Date:	24 October 2022
Project:	UNITE, New Medlock House
Subject:	Plant Noise Commissioning Assessment

1.0 INTRODUCTION

RBA Acoustics have been commissioned to measure noise levels from the installed plant items at UNITE, New Medlock House, Manchester, prior to occupation in order to discharge Planning Conditions under application numbers 132696/FO/2022 and 131883/FO/2021.

In our Plant Noise Assessment Report 11427.RP01.PNA.1.30032022 limits were set for plant noise emissions in order to comply with the planning conditions relating to application 132696/FO/2022 which refers to ASHP plant located on the roof of the development.

Measurements have now been taken of the noise emitted from the various items of plant installed in order to determine their impact on the nearest residential receptor to each plant area and to compare against the relevant limits previously set.

2.0 PLANT NOISE LIMITS

In order for the plant items to be considered compliant, noise limits were set in our report reference 11427.RP01.PNA.1.30032022. This report only covered noise from the rooftop ASHP items, however the criteria outlined in the report are applicable to the additional plant items associated with the non-residential areas within the courtyard of the development.

3.0 MEASUREMENT PROCEDURE

Measurements were undertaken on Wednesday 5th October 2022. Weather conditions were dry with only light wind speeds less than 5m/s. The following instrumentation was used for the surveys – see Table below.

Table 1 – Survey Instrumentation

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Valid Until
Norsonic Type 1 Sound Level Meter	Nor140	1406007	U41328	22 June 2024
Norsonic Pre Amplifier	1209	20043		
Norsonic ½" Microphone	1225	208146	41327	22 June 2024
Norsonic Sound Calibrator	1251	34127	U41326	22 June 2023

The sound level meter was calibrated both prior to and on completion of the surveys with no calibration drifts observed.

We understand that during our visit that all plant items were operating at their normal daytime operation duty.

It was not possible to take measurements of ASHP5+6 on the roof of Block B as the items of plant were not in operation. Given they are proposed to operate at the same duty as the other ASHPs, for the purpose of this assessment, we will assume the noise levels from the other measured ASHPs are the same as ASHP5+6.

Additionally, the ducted systems terminating within the courtyard area were subjectively inaudible when in operation and not possible to distinguish the noise emissions from the prevailing background noise level.

Therefore, in order to provide a worst-case assessment, we will assume that the noise emissions from the ducted systems are equal to the existing background noise level in our assessment.

4.0 RESULTS

Table 1 presents the results of our measurements.

Table 1 – Measured Levels

Ref.	Plant Description	Measurement	Measured Sound Pressure Level (dB re 20x10 ⁻⁶ Pa.) @ Octave Band Centre Frequency (Hz)							
			63	125	250	500	1k	2k	4k	8k
ASHP1-2	Air Source Heat Pumps	SPL @ 1m	65	59	57	57	59	54	48	40
ASHP3-4	Air Source Heat Pumps	SPL @ 1m	68	59	59	57	61	56	50	42
CON1-3	VRV Condensers	SPL @ 1m	63	59	56	54	53	48	40	31

Table 3 presents the results of our background noise level measurements, with no plant in operation.

Table 3 – Measured Residual Levels

Measurement	Measured Sound Pressure Level (dB re 20x10 ⁻⁶ Pa.) @ Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Residual Sound Level (Roof Level)	68	59	60	57	58	56	50	41
Courtyard Level	62	58	59	58	59	53	48	39

In correcting the ambient sound level measurements of the plant for residual sound, the following specific sound levels of the plant are obtained:

Table 4 – Specific Levels

Ref.	Location	Plant Description	Specific Sound Pressure Level (dB re 20x10 ⁻⁶ Pa.) @ Octave Band Centre Frequency (Hz)							
			63	125	250	500	1k	2k	4k	8k
ASHP1-2	Roof	Air Source Heat Pumps	65	59	57	57	61	52	46	34
ASHP3-4	Roof	Air Source Heat Pumps	68	59	53	57	61	56	50	42
ASHP5-6*	Roof	Air Source Heat Pumps	68	59	53	57	61	56	50	42
CON1-3	Courtyard	VRV Condensers	63	59	56	56	58	51	47	38
EF1 [!]	Music Room Toilet	Extract Fan	62	58	59	58	59	53	48	39
MVHR1 [!]	Music Room (Inlet)	Mechanical Ventilation with Heat Recovery	62	58	59	58	59	53	48	39
	Music Room (Outlet)		62	58	59	58	59	53	48	39
MVHR2 [!]	Common Room (Inlet)	Mechanical Ventilation with Heat Recovery	62	58	59	58	59	53	48	39
	Common Room (Outlet)		62	58	59	58	59	53	48	39
MVHR3 [!]	Common Room (Inlet)	Mechanical Ventilation with Heat Recovery	62	58	59	58	59	53	48	39
	Common Room (Outlet)		62	58	59	58	59	53	48	39
MVHR4 [!]	Common Room (Inlet)	Mechanical Ventilation with Heat Recovery	62	58	59	58	59	53	48	39
	Common Room (Outlet)		62	58	59	58	59	53	48	39

* Assumed to be same noise level as ASHP3-4

[!] Assumed to be equal to background noise level

Finally, correcting the above specific sound levels of plant for distance and screening, the following cumulative sound levels are predicted at the façade of the nearest affected noise sensitive properties, assuming all plant operating simultaneously. The receptors outlined below are as per our initial plant noise assessment 11427.RP01.PNA.1.30032022 with the addition of Receptor 4 which is located within the courtyard.

Given the location of Receptor 4 we would expect the pre-installation background noise level to be as per Receptor 2.

Table 5 – Predicted Noise Levels

Operating Period	Noise Level (dB) at Receptor 1		Noise Level (dB) at Receptor 2		Noise Level (dB) at Receptor 3		Noise Level (dB) at Receptor 4	
	Predicti on	Criterio n	Predictio n	Criterio n	Predictio n	Criterio n	Predictio n	Criterio n
Daytime (07:00 – 23:00)	41	65	41	56	41	58	45	56
Night-time (23:00 – 07:00)	41	51	41	46	41	47	45	46

5.0 DISCUSSION AND ANALYSIS

As can be seen from Section 4, noise emissions from the installed plant fall within the limits previously set in our design report and, as such, should therefore be considered acceptable and in line with the requirements of the planning conditions and Manchester City Council's Noise and Planning Guidance.