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Dear Jonathan

2 PICCADILLY PLACE, MANCHERSTER NOISE VERIFICATION REPORT

Further to our site visit on 27 July 2022 to undertake measurements of atmospheric plant noise emissions we present the results and assessment as detailed below.

1.0 Introduction

The installation of 9No. VRF units to serve the building has been completed. Lighthouse Acoustics has been commissioned to undertake measurements of atmospheric plant noise emissions in order to determine whether or not the requirements of the Local Authority are achieved. This report presents the methodology and results of our measurements.

2.0 Objectives

To visit site upon completion of the building services installation in order to undertake measurements of atmospheric plant noise emissions from the 9No. VRF units.

To undertake an assessment of atmospheric noise emissions from the 9No. VRF units to the nearest noise sensitive receptor based on the results of the measurements and the previous environmental noise survey.

To assess the measured noise levels and provide comments on the acceptability in terms of achieving the requirements of the Local Authority.

If required, to propose mitigation measures for atmospheric noise emissions in order to achieve the requirements of the Local Authority.

3.0 LA₉₀ Background Sound Levels

The lowest representative daytime and night-time LA_{90,15min} background sound levels are taken from Section 5.5.2 of the Plant Sound Assessment Report 0922/4/PSA1 Revision 1 dated 10 March 2022 and are presented in the table below.

Position	Lowest Representative LA _{90,15min} Background Sound Levels (dB)	
	Daytime (07:00–23:00)	Night-time (23:00–07:00)
A	51	48

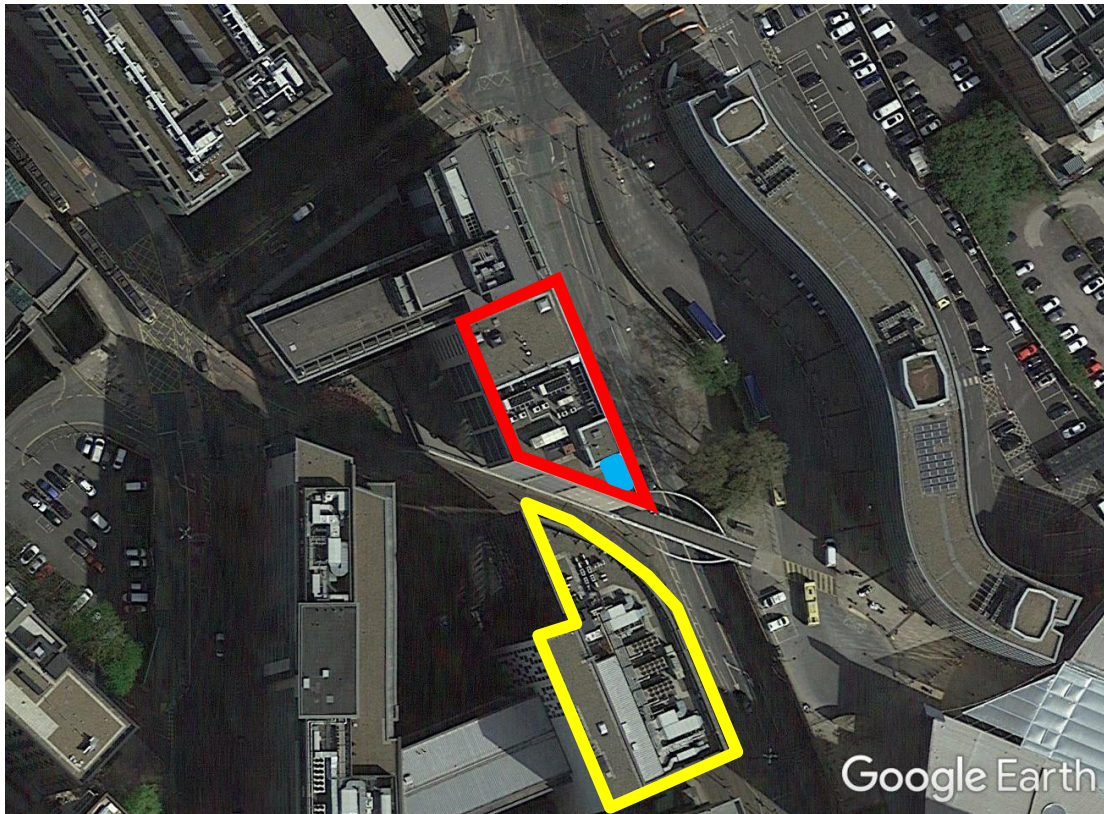
4.0 Site Description

The TFGM 2 Piccadilly Place offices are situated at Piccadilly Place, Manchester. The site is bound by 1 Piccadilly Place to the north, London Road to the east, tramlines to the south west.

The proposed 9No. VRF units are to be situated at 9th floor roof level towards the south east corner of the plant area.

The nearest noise sensitive receptors to the installed 9No. VRF units are the windows of the commercial premises (3 Piccadilly Place) situated to the south of the site opposite the tramlines which overlook the rooftop plant area.

The site plan below indicates the extent of the site (red line), location of the installed 9No. VRF units (blue line), location of the nearest noise sensitive receptor (yellow line) and the surrounding environment.



Site plan indicating the extent of the site and the surrounding environment

5.0 Atmospheric Plant Noise Emission Measurements

5.1 Measurements

Since access was not available to the façade of the commercial premises (3 Piccadilly Place) situated approximately 18m to the south of the site opposite the tramlines it was not possible to undertake measurements of atmospheric plant noise emission levels at the nearest noise sensitive receptor. Measurements were therefore undertaken at a distance of 1m from 1No. VRF unit in order to obtain the individual contribution per unit since it is understood that up to 9No. VRF units have the potential to operate during the daytime period whilst up to 4No. VRF units have the potential to operate during the night-time period. This data will subsequently be used to calculate the cumulative atmospheric plant noise emission levels at the nearest noise sensitive receptor.

The measurements were undertaken between 17:00 and 18:00 hours on 27 July 2022. The 1No. VRF unit was understood to be operating at design duty for the duration of the measurements. The measurements were undertaken of the L_{Aeq} sound pressure levels over periods of 5 minutes (due to steady noise). Atypical noises were excluded as far as reasonably possible.

5.2 Weather Conditions

During the survey period the wind conditions were calm (<1m/s) and the sky was scattered cloud. There was no rainfall and road surfaces were dry. The temperature was approximately 20°C.

The weather conditions during the survey period are therefore considered to be suitable for undertaking measurements of sound levels.

5.3 Equipment

The following equipment was used to undertake the atmospheric plant noise emission level measurements.

Equipment	Manufacturer	Model	Serial No.	Calibration Date
Class 1 Sound Level Meter	Bruel & Kjaer	2250	2626230	26/10/2020
Preamplifier	Bruel & Kjaer	ZC-0032	21309	26/10/2020
Microphone	Bruel & Kjaer	4189	2621208	26/10/2020
Class 1 Sound Calibrator	Casella	120/1	3864878	02/11/2021

Field calibration checks were performed on the sound level meter prior to and on completion of the survey and were found to be within acceptable tolerance limits.

6.0 Results

The results of the atmospheric plant noise emission level measurements are presented in the table below.

Plant Item	Location	Measured L_{Aeq} at 1m (dB)
1No. VRF Unit 1x Samsung AM140KXMD	Roof Level	61

A review of the one third octave band noise data for the above measurement indicates that it is unlikely to be considered to emit tonal noise.

7.0 Local Authority Requirements

It is understood that Manchester City Council require that proposed building services items are assessed in accordance with BS 4142:2014 "Methods for rating and assessing industrial and commercial sound" and that the rating level at the nearest noise sensitive receptor should achieve 5dB below the existing background noise level during the period which the proposed building services items are proposed to operate.

8.0 Assessment

The tables below detail the calculated L_{Ar} rating levels at the nearest noise sensitive receptor based on the measured L_{Aeq} levels at 1m along with the lowest representative daytime and night-time $L_{A90,15min}$ background sound levels and the difference between them.

Daytime Assessment

Descriptor	Plant Item
	1No. VRF Unit 1x Samsung AM140KXMD
Measured Sound Pressure Level $L_{Aeq,T}$ at 1m (dB)	61
Percentage on-time (%)	100
On time correction (dB)	0
Number of Units (#)	9
Correction (dB)	+9
Distance to Receptor (m)	18
Distance Attenuation (dB)	-25
Specific Sound Level $L_{Aeq,Tr}$ at Receptor (dB)	45
Character Correction (dB)	0
Rating Level $L_{Ar,Tr}$ at Receptor (dB)	45
Lowest Representative Background Sound Level $L_{A90,Tr}$ at Receptor (dB)	51
Difference (dB)	-6
Local Authority's Requirements Achieved	Yes

Night-time Assessment

Descriptor	Plant Item
	1No. VRF Unit 1x Samsung AM140KXMD
Measured Sound Pressure Level $L_{Aeq,T}$ at 1m (dB)	61
Percentage on-time (%)	100
On time correction (dB)	0
Number of Units (#)	4
Correction (dB)	+6
Distance to Receptor (m)	18
Distance Attenuation (dB)	-25
Specific Sound Level $L_{Aeq,Tr}$ at Receptor (dB)	42
Character Correction (dB)	0
Rating Level $L_{Ar,Tr}$ at Receptor (dB)	42
Lowest Representative Background Sound Level $L_{A90,Tr}$ at Receptor (dB)	48
Difference (dB)	-6
Local Authority's Requirements Achieved	Yes

The calculated L_{Ar} rating levels for the proposed 9No. VRF units at the nearest noise sensitive receptors are 6dB and 6dB below the lowest representative daytime and night-time L_{A90} background sound levels respectively.

The assessment therefore indicates that atmospheric plant sound emissions from the proposed 9No. VRF units are likely to have a low impact at the nearest noise sensitive receptors and achieve the requirements of the Local Authority.

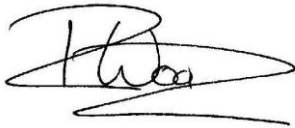
9.0 Conclusions

A site visit has been undertaken upon completion of the building services installation in order to undertake measurements of atmospheric plant noise emissions from the 9No. VRF units.

An assessment of atmospheric noise emissions from the 9No. VRF units has been undertaken to the nearest noise sensitive receptor based on the results of the measurements and the previous environmental noise survey.

The assessment indicates that the 9No. VRF units are likely to have a low impact at the nearest noise sensitive receptor and achieve the requirements of the Local Authority.

Yours sincerely
for LIGHTHOUSE ACOUSTICS

A handwritten signature in black ink, appearing to read 'Robin Wood', with a stylized flourish underneath.

Robin Wood