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Dear Jonathan

TFGM, QUEENS ROAD DEPOT NOISE VERIFICATION REPORT

Further to our site visit on 5 May 2022 to undertake measurements of atmospheric plant noise emissions we present the results and assessment as detailed below.

1.0 Introduction

The installation of 3No. ASHPs 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 3No. ASHPs.

To undertake an assessment of atmospheric noise emissions from the 3No. ASHPs 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 **L_{A90} Background Sound Levels**

The lowest representative daytime and night-time L_{A90,15min} background sound levels are taken from Section 5.5.2 of the Plant Sound Assessment Report 0922/3/PSA1 dated 26 January 2022 and are presented in the table below.

Position	Lowest Representative L _{A90,15min} Background Sound Levels (dB)	
	Daytime (07:00–23:00)	Night-time (23:00–07:00)
A	48	41

4.0 **Site Description**

The TFGM Queens Road Depot is situated on Queens Road, Cheetham Hill, Manchester. The site is bound by Queens Road to the north, tramlines to the east and south and the Irish World Heritage Centre to the west.

The proposed 3No. ASHPs are to be situated towards the western end of the north facade of the tram shed building.

The nearest noise sensitive receptors to the installed 3No. ASHPs are the façades of the residential properties situated approximately 110m to the east of the site opposite the tramlines along Smeaton Street.

The site plan below indicates the extent of the site (red line), location of the installed 3No. ASHPs (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 façades of the residential properties situated approximately 110m to the east of the site opposite the tramlines along Smeaton Street 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 the 3No. ASHPs in order to obtain the individual contributions. 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 11:00 and 12:00 hours on 5 May 2022. The 3No. ASHPs were 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 there was a light westerly breeze (<3m/s) and the sky was scattered cloud. There was no rainfall and road surfaces were dry. The temperature was approximately 15°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	Casella	633C	0721320	26/10/2020
Preamplifier	Casella	495	001414	26/10/2020
Microphone	Casella	251	1025	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)
3No. ASHPs 3x Samsung AM140KXMDGH	Ground Level	69

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 table below details 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
	3No. ASHPs 3x Samsung AM140KXMDGH
Measured Sound Pressure Level $L_{Aeq,T}$ at 1m (dB)	69
Percentage on-time (%)	100
On time correction (dB)	0
Sound Pressure Level $L_{Aeq,T}$ at 1m (dB)	69
Distance to Receptor (m)	110
Distance Attenuation (dB)	-41
Specific Sound Level $L_{Aeq,Tr}$ at Receptor (dB)	28
Character Correction (dB)	0
Rating Level $L_{Ar,Tr}$ at Receptor (dB)	28
Lowest Representative Background Sound Level $L_{A90,Tr}$ at Receptor (dB)	48
Difference (dB)	-20
Local Authority's Requirements Achieved	Yes

Night-time Assessment

Descriptor	Plant Item
	3No. ASHPs 3x Samsung AM140KXMDGH
Measured Sound Pressure Level $L_{Aeq,T}$ at 1m (dB)	69
Percentage on-time (%)	100
On time correction (dB)	0
Sound Pressure Level $L_{Aeq,T}$ at 1m (dB)	69
Distance to Receptor (m)	110
Distance Attenuation (dB)	-41
Specific Sound Level $L_{Aeq,Tr}$ at Receptor (dB)	28
Character Correction (dB)	0
Rating Level $L_{Ar,Tr}$ at Receptor (dB)	28
Lowest Representative Background Sound Level $L_{A90,Tr}$ at Receptor (dB)	41
Difference (dB)	-13
Local Authority's Requirements Achieved	Yes

The calculated L_{Ar} rating levels for the proposed 3No. ASHPs at the nearest noise sensitive receptors are 20dB and 13dB 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 3No. ASHPs are likely to have a low impact at the nearest noise sensitive receptors and achieve the requirements of the Local Authority.

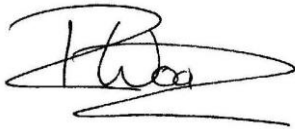
9.0 Conclusions

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 3No. ASHPs.

An assessment of atmospheric noise emissions from the 3No. ASHPs 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 3No. ASHPs 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 large, sweeping horizontal stroke underneath.

Robin Wood