Marketing Suite
N.O.M.A, Manchester

Condition Discharge Report

30004/RP1

21 July 2022

For:
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Merchant Exchange
17-19 Whitworth Street West
Manchester
M1 5WG

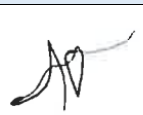
Hann Tucker Associates
Consultants in Acoustics Noise & Vibration

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Document Control

Issue	Date	Comment	Prepared by	Authorised by
0	21/07/2022	-		
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Attachments

Appendix A – Acoustic Terminology

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1.0 Introduction

A new marketing suite, as part of the N.O.M.A development, was granted planning on 5 May 2021 subject to a number of conditions (ref: 129631/FO/2021). The scheme is now close to practical completion and the “pre-occupation” conditions need to be discharged prior to the first use of the building.

One of these conditions (Condition 12b) relates to noise egress from the newly installed building services plant and states that a verification report is required to validate the work undertaken as part of Condition 12a.

As such, Hann Tucker Associates has been appointed undertake a post completion plant noise impact assessment, now that the plant has been installed and commissioned, with the aim of discharging Condition 12b set by Manchester City Council.

2.0 Objectives

To visit site to carry out noise measurements of the operational plant installation and surrounding background noise levels.

Calculate the cumulative noise levels of the operational plant items at the nearest affected premises.

Based on the calculated cumulative noise levels of the operational plant items, determine whether the installation is in-line with the approved scheme and the requirements of Planning Condition 12b.

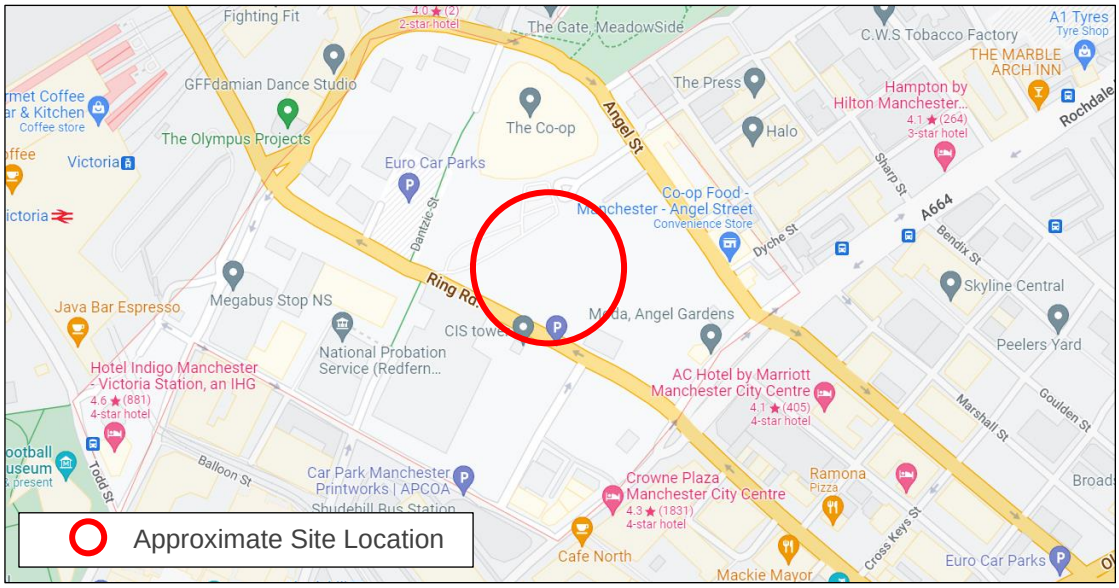
3.0 Acoustic Terminology

Please refer to Appendix A for an explanation of acoustic terminology used herein.

4.0 Site Description

4.1 Location

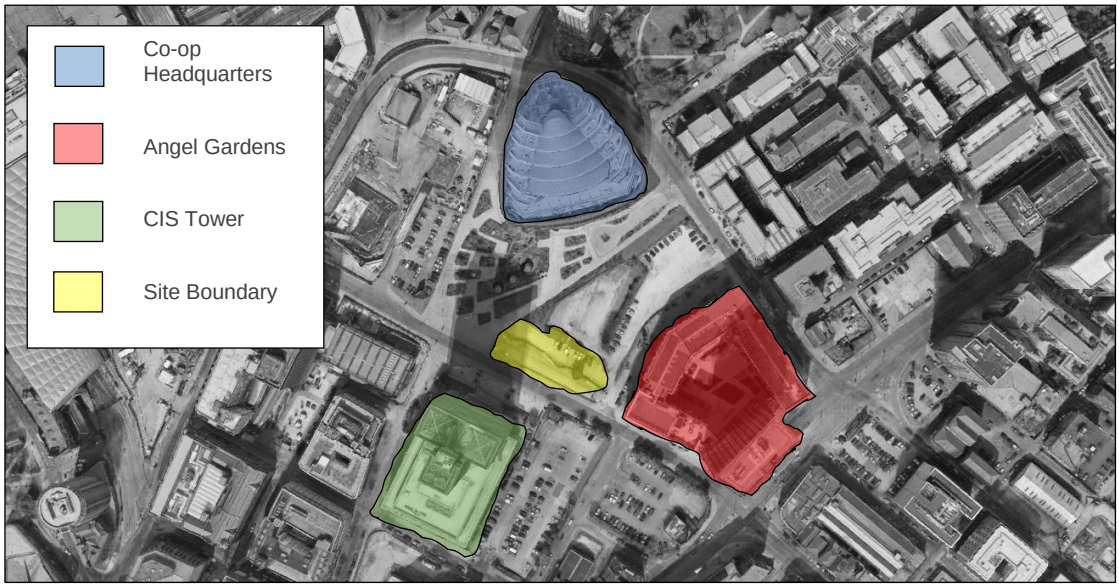
The development is located along Ring Road in Manchester. See site location below.



Site Location (© maps.google.co.uk)

4.2 Description

The site, highlighted in yellow, is just off Ring Road and Angel Street. The surrounding area consists of the Co-op Headquarters, highlighted in blue, the Co-operative College, highlighted in green, and Angel Place, highlighted in red. See site plan below.



Site Location (© maps.google.co.uk)

The worst affected nearby noise sensitive premises are the 3 buildings described in the table below.

Receptor	Location
R1	The south façade on the Co-op Headquarters. (@ 58m)
R2	The north façade on the CIS . (@ 52m)
R3	The north-west façade on the Angel Place building. (@ 55m)

5.0 Project Installation

The plant consisted of 2 MVHR units located inside the building, ducted externally to the roof, and 3 external VRF condenser units. A detailed description of the units are shown in the table below.

Plant Type	Manufacturer/Model
MVHR Units	Zehnder ComfoAir Q 600
Outdoor VRF Condenser Unit	Mitsubishi Condensers

6.0 Planning Condition 12b

The application for external alterations and plant equipment has been approved for the development. The Local Authority have included a condition relating to noise from building services plant in Condition 12b, as detailed below:

> *"The approved scheme shall be implemented and prior to the first use of the development, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met. In instances of non-conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. Any mitigation measures shall be implemented in accordance with a time scale to be agreed with the City Council, as Local Planning Authority, and thereafter retained and maintained in situ. Reason - To minimise the impact of plant on the surrounding residential area in the interest of residential amenity pursuant to policies SP1 and DM1 of the Manchester Core Strategy (2012) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995)."*

7.0 Established Plant Noise Emission Limits

A previous noise impact assessment was undertaken by BuroHappold Engineering in 2021. During their assessment, they had measured the baseline background sound level to be 56 dB L_{A90} during the hours the plant will operate.

Therefore, the plant should achieve a cumulative plant noise egress level of 51 dB L_{ArTr}.

8.0 Plant Noise Survey

8.1 Procedure

A fully attended noise survey was undertaken by Michael Hartley MEng(Hons) and Alex Jang BEng(Hons) from approximately 10:30 to 11:45 on Tuesday 19 July 2022.

All measurements were collated in general accordance with BS 7445-1:2003 *Description and Measurement of Environmental Noise*.

Weather conditions were considered suitable for obtaining representative readings of plant noise, with low winds.

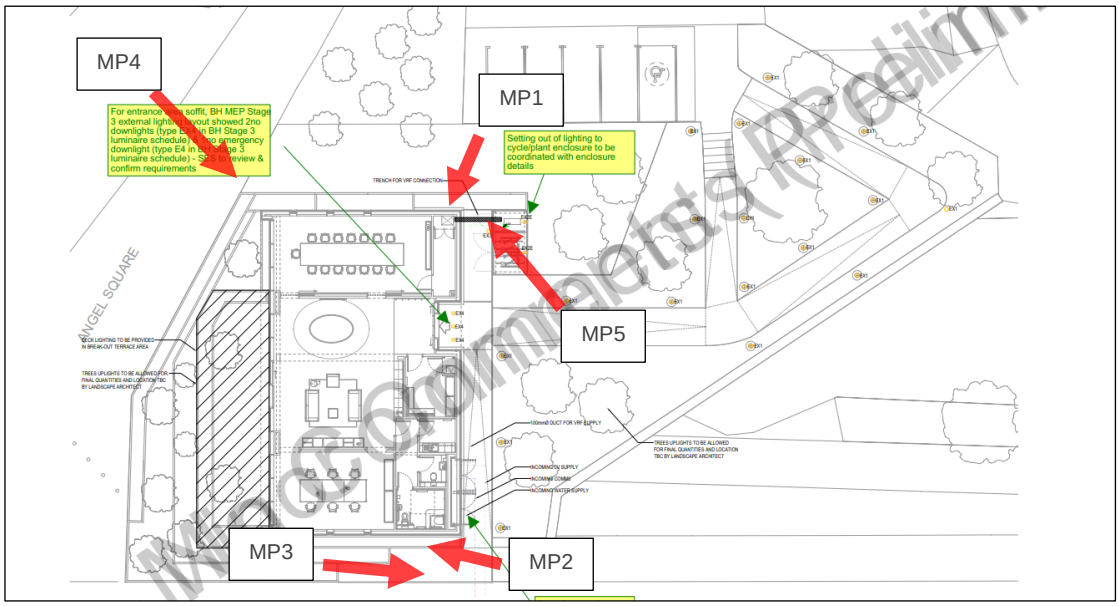
8.2 Measurement Locations

The location of each measurement location is indicated on the plan shown overleaf.

Noise measurements were taken at the MVHR Intake/Extract on both the north (MP1) and south (MP2) sides of the building, approximately 1m from the roof, as access to the roof was unavailable.

Noise measurements were taken at the external VRF Condenser Units (MP5), approximately 1m from the plant. All 3 condensers were running at the time of measurement.

Measurements were also taken with the plant not operating at both the southern (MP3) and northern (MP4) sides of the building with a view to establishing the residual noise level in the area (i.e., the noise levels without any contributions from the plant).



Measurtment Locations

8.3 Instrumentation

During the testing, the following equipment was used.

Equipment	Model	Type	Serial Number	Calibration
Sound Level Meter	Brüel and Kjær	2250	3025397	28/10/2020
Calibrator	Brüel and Kjær	4231	2271905	02/11/2021

8.4 Survey Results

The following table summarises noise levels recorded at each of the measurement positions along with notes detailing the purpose of each measurement.

Pos	Time Period	Sound Pressure Level (dB)			Notes
		$L_{Aeq,T}$	$L_{A90,T}$	$L_{Amax,T}$	
1	1 minute	56	52	62	MVHR Measurement
2	1 minute	68	54	76	MVHR Measurement
3	5 minutes	68	53	78	Residual Noise Measurement
4	5 minutes	58	60	65	Residual Noise Measurement
5	1 minute	59	56	70	External Condenser measurement

8.5 Discussion of Noise Climate

During the survey there was on-going construction works and consistent traffic along adjacent roads. As such, noise contributions from extraneous sources affected the measurements.

Subjectively the MVHR units were not audible externally. This is reinforced by comparing the measured noise levels in Position 1 and Position 4. Position 1 was a measurement of the MVHR atmosphere grilles and Position 4 was a measurement in a similar position with the MVHR not operating. The noise levels measured between the 2No positions are similar which leads us to the conclusion that the MVHR noise levels were not significantly affecting the noise climate in Position 1 and the majority of noise being measured as from extraneous sources. This above is also true for Positions 2 and 3.

In Position 5 the condensing units were audible, however, did not completely dominate the noise levels measured.

9.0 Plant Noise Impact Assessment

9.1 Assessment

Due to the nature of the site (i.e., dominated by traffic noise) calculating the specific noise level from each plant item is not possible. This is due to the fact the ambient noise and residential noise measurements detailed in 8.4 did not change when the plant was operating or not operating.

Where the above occurs, for example for the MVHR units, the specific level is considered to be at least 10 dB below the measured ambient noise level.

Based on the above, the cumulative noise level at the worst affected noise sensitive receptor, CIS Tower, has been calculated The calculations account for attenuating factors such as distance attenuation and barrier attenuation where present.

The calculations are detailed below:

	Sound Pressure Level (dBA)		
	MP1	**MP2**	**MP5**
Measured Ambient Noise Level, L_{Aeq} at 1m	56	68	59
Residual Sound Level, L_{Aeq}	58	68	58

	Sound Pressure Level (dBA)		
	MP1	**MP2**	**MP5**
Specific Sound Level, L_{Aeq}	46	58	50
Distance Correction	-33	-30	-29
Barrier Correction	0	0	0
Façade Reflection	0	0	0
BS4142:2014 Corrections	0	0	0
Calculated Noise Level at Receptor, L_{ArTr}	13	28	21
Calculated Cumulative Rating Level, L_{ArTr}	29		
Plant Noise Emission Limit, L_{ArTr}	56		
Difference	-27		

Our assessment indicates that plant noise levels are 27 dB below the plant noise limit during the operational period, which is in line with Manchester City Council's plant noise emission criteria at the worst affected noise sensitive receptor.

On this basis, our assessment indicates that the plant items are in line with Manchester City Council's plant noise emission requirements and no further mitigation measures should be required.

10.0 Conclusion

Plant noise measurements were undertaken of the completed building services plant installation.

A subsequent assessment has been carried out to determine the plant noise emissions at the nearest noise sensitive receptor.

The assessment indicates that the installed plant achieves the agreed plant noise criteria at the worst affected noise sensitive receptor.

The installed plant should therefore be considered in-line with the requirement of Planning Condition 12b.

Appendix A

The acoustic terms used in this report are defined as follows:

dB — Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).

dBA — The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The A-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The $_A$ subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted

It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

L_{10} — L_{10} is the noise level exceeded for 10% of the period (i.e., the quietest 90% of the measurement).

L_{90} — L_{90} is the noise level exceeded for 90% of the period (i.e., the quietest 10% of the measurement) and is often used to describe the background noise level.

L_{Aeq} — L_{Aeq} is the equivalent continuous A-weighted sound pressure level. It is an average of the total sound energy measured over a specified time period.

L_{max} — L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

Sound Pressure Level (L_p) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).