



To:	Paul Mills	of:	T & M Real Estate
Cc:	As per email distribution list	of:	

Dear Paul,

34 Charlotte Street, Manchester – Noise Assessment

1.0 INTRODUCTION

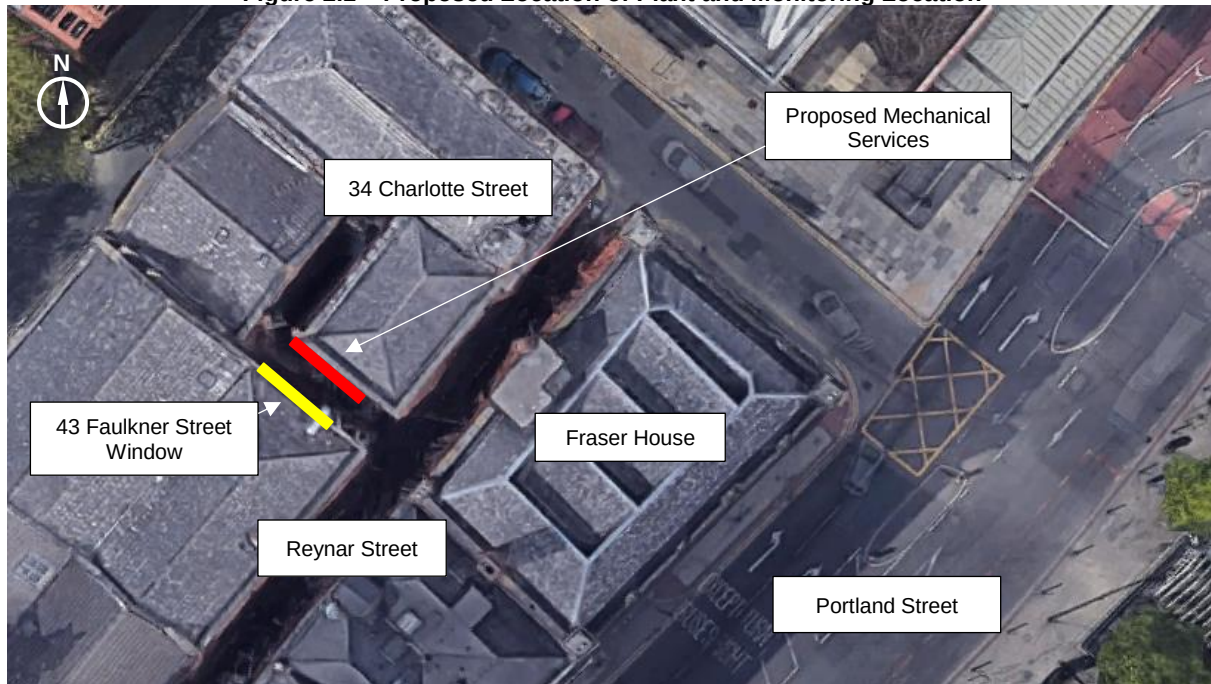
- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by T & M Real Estate to undertake a noise assessment in relation to the proposed external mechanical services plant items to be installed externally down a small alleyway at 34 Charlotte Street, Manchester.
- 1.2 This assessment has been undertaken to demonstrate compliance with the requirements of Manchester City Council (MCC), as outlined below:

“a) 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 (LAeq) below the typical background (LA90) level at the nearest noise sensitive location. Prior to commencement of the use hereby approved the scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.”
- 1.3 In order to ensure the above criteria is met, this report assesses the existing noise climate external to the nearest noise sensitive receptors, and discusses the implications of the proposed development on the nearest noise sensitive receptor in line with the guidance from the Local Authority.
- 1.4 Acoustic terminology is discussed in brief in Appendix A.

2.0 BACKGROUND & SITE DESCRIPTION

- 2.1 The proposals include for nine items of external mechanical services plant to be installed externally to the offices located at 34 Charlotte Street.
- 2.2 All of the plant items will be installed on the Reyner Street elevation of the building and their locations are identified on Figure 2.1, below. Currently, this street contains numerous items of plant that serve existing restaurants and takeaways in the area, as identified in Appendix B.
- 2.3 The nearest noise sensitive receptor to the proposed items of plant is understood to be at the rear of 43 Faulkner Street which is approximately 3m away from the proposed items of plant.

Figure 2.1 – Proposed Location of Plant and Monitoring Location



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- 2.4 As the proposed mechanical services plant items will serve offices, it is understood that they will only be operational during daytime hours, understood to be 0800 – 1800h, Monday to Friday.
- 2.5 The model numbers of the nine items of plant are presented in Table 2.1, below.

Table 2.1 – External Plant Model Numbers

Quantity	Model	Noise Level, dB at 1m
4	PUZ-ZM200KA	60
4	PUZ-ZM100KA2	51
1	PUMY-SP112VKM	54

3.0 BASIS OF ASSESSMENT

- 3.1 As stated in Section 1.0, MCC require that noise emitted from any external mechanical services plant should be designed so as to achieve a rating level that is 5dB below the typical background noise level at the nearest noise sensitive receptor.
- 3.2 The term '*rating level*' is defined in BS4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS4142) which describes a method for determining the potential impact of sound from an industrial and/or commercial source on a noise sensitive receptor.
- 3.3 The term '*rating level*' is defined in BS4142 paragraph 9.1, which states:

“Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where

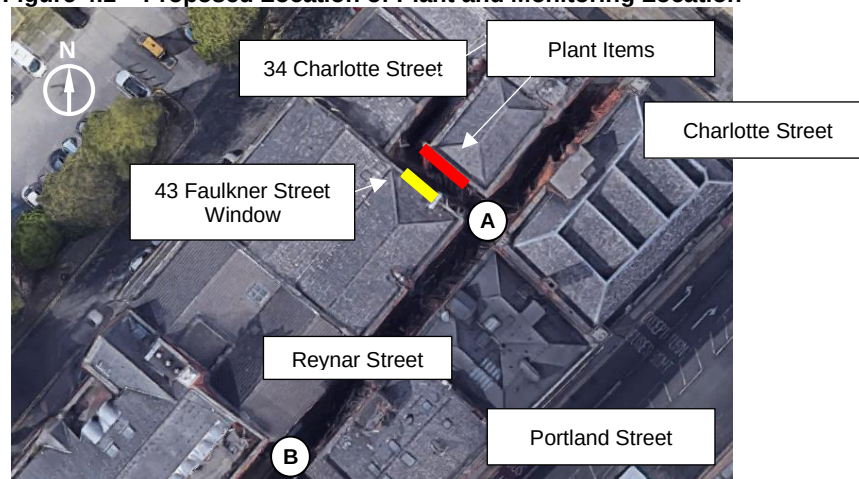
such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:

- a) Subjective method;
- b) Objective method for tonality;
- c) Reference method.”

4.0 NOISE CLIMATE

- 4.1 Following discussions with Laura Miller, an Environmental Health Officer at MCC, it has identified that 36 Charlotte Street, (Fraser House) is being converted in to a residential property. There is a request that noise level data measured in the noise assessment for that development is considered in this assessment.
- 4.2 As part of the development of the scheme, a noise assessment and accompanying survey was carried out by dBx Acoustics Ltd (dBx) in April 2023 (ref: 22101-R01D-BT).
- 4.3 The noise survey included spot check measurements at Location A, as per Figure 4.1, below which was located on Reynar Street. Daytime ambient noise levels were no lower than 66 $\text{dBL}_{\text{Aeq,T}}$. As the main noise source was existing mechanical services plant in the area, it has been assumed that the background noise levels would be similar.
- 4.4 Prior to this survey, an attended noise level survey was undertaken by AEC between 1019 and 1100h on Tuesday 22 November 2022. Measurements were undertaken at a single location on Reynar Street, identified as B on Figure 4.1, below.
- 4.5 All measurements were undertaken under free-field conditions and in general accordance with BS7445-1: 2003 ‘Description and measurement of environmental noise. Guide to quantities and procedures’. A full measurement procedure for the survey is presented in Table C.1 of Appendix C and the measured data is presented in Table C.2.
- 4.6 During the survey, the noise climate was solely affected by plant noise from the mechanical services plant located along Reynar Street. The background noise level throughout the survey was typically 69 $\text{dBL}_{\text{A90,T}}$.

Figure 4.1 – Proposed Location of Plant and Monitoring Location



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- 4.7 As both AEC's and dBx's background noise levels are within 3dB of one another, it can be confirmed that the noise climate along Reynar Street is consistent.

- 4.8 As the receptor to the rear of 43 Faulkner Street is partially screened to the existing plant on Reynar Street, background noise levels could be 3dB lower than those measured at Locations A and B. Therefore, the background noise climate would be expected to be 63dBL_{A90,T}.

5.0 ASSESSMENT

- 5.1 Based on the background noise level of 63dBL_{A90,T}, in order to comply with the MCC criteria, the rating level from the proposed mechanical services plant should be designed to achieve a rating level of no greater than 58dBL_{A_r,T_r} external to the rear of 43 Faulkner Street.
- 5.2 Table 5.1 below provides the calculations in relation to noise emitted from the items of plant.

Table 5.1 – Plant Noise Breakout

Plant Model	Plant Noise Level, dB @ 1m	Total Plant Noise from all Units, dB @ 1m	Distance Attenuation, dB	Resultant Specific Noise Level, dBL _{Aeq,T_r}
PUZ-ZM200KA (4 Units)	60	66	-10 (=20*log(1/3))	53
PUZ-ZM100KA2 (4 Units)	51	57		47
PUMY-SP112VKM	54	54		44
			Total Combined	54

- 5.3 As identified, the specific noise level from all items of plant operating simultaneously would be 54dBL_{Aeq,T_r}.
- 5.4 As the existing noise climate is already dominated by plant noise, it would not be appropriate to add any character corrections to this figure.
- 5.5 Therefore, the determined rating level from the proposed items of plant would be 54dBL_{A_r,T_r}, which is around 4dB below the proposed rating level limit.
- 5.6 Based on the above, the requirements of Manchester City Council have been achieved.

I hope the above is clear and of assistance at this stage.

Yours sincerely



Ross Chamberlain

Checked by:



APPENDIX A – Acoustic Terminology in Brief

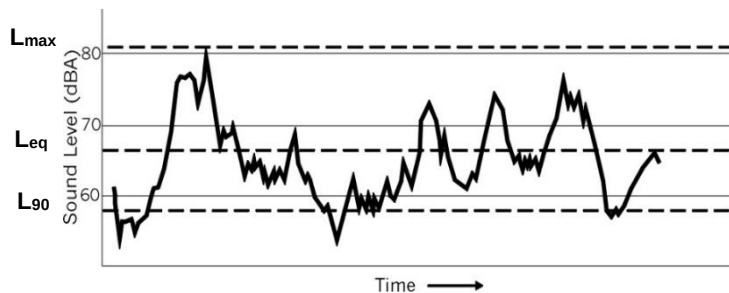
General

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (*Hz*), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discrete frequency - a 'pure tone' - most noise is made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA*, normally used to assess the effect of noise on people. The dBA weighting emphasizes or reduces the importance of certain frequencies within the audible range

Sound / Noise Units

The figure below shows an example of sound level varying with time. Because of this variation over time the same period of noise can be described by several different levels. The most common of these are described below.



Commonly Used Descriptors for Sound / Noise

Free-field Level	This refers to the sound level measured outside, away from reflecting surfaces.
Background Sound Level, L_{A90}	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting, F, and quoted to the nearest whole number of decibels.
Rating Level, $L_{A,r,T,r}$	Specific sound level plus any adjustment for the characteristic features of the sound

APPENDIX B – Reyner Street – Mechanical services plant Items

