



Union, Manchester

Union Building Noise Impact Assessment

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22080-R01 Union Building

Client: Bruntwood

Date: 25/10/2022

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REVISION HISTORY

Revision	Date	Revision Details	Author	Checked
R01	25/10/2022	Original Issue	Luke Hine Luke Hine Bsc AMIOA	<i>Ben Tomlin</i> Ben Tomlin BSc MIOA

1 INTRODUCTION

- 1.1 dBx Acoustics has been appointed by Bruntwood to carry out a verification noise survey and noise impact assessment of the plant installed at the rear of the Union office building on Albert Square, Manchester, M2 6LW.
- 1.2 The intention of this report is to present the results of the noise survey carried out at the site, and to assess the impact of plant on the nearby noise sensitive receptors.
- 1.3 A glossary of acoustic terminology has been supplied in Appendix A in order to assist the reader.

2 MANCHESTER CITY COUNCIL PLANNING CONDITON

- 2.1 The noise impact assessment within this report is intended to satisfy the relevant planning conditions contained within planning application: 129272/FO/2021. The relevant conditions within this planning application, are outlined below.
- 2.2 This report aims to verify that the plant installed meets the agreed noise criterion.
- 2.3 '4) Noise - external equipment insulation

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.

b) Prior to occupation of the development a verification report shall be submitted to and approved in writing by 129272/FO/2021 Page 4 of 7 the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of nonconformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.'

Site Description

- 2.4 Union is a 4-storey mixed purpose space comprising restaurants, office and retail units, the building overlooks Albert Square and Brazenose Street. The surrounding premises across Tasle Alley consist of retail and commercial at ground floor level, and accommodation on the storeys above; these residential premises are the nearest noise sensitive receptors.
- 2.5 To the rear is a car park, bounded by Tasle Alley.

Figure 1: Site location and nearby noise sensitive receptors



3 ENVIRONMENTAL NOISE SURVEY

Methodology

- 3.1 A noise survey was carried out on Friday 14th October 2022, the intent of which was to assess the noise impact of Retail and Office plant installed at the rear of Maray.
- 3.2 The nearby noise sensitive receptors are the flats on Tasle Alley.
- 3.3 Measurements were taken from a third storey office space representative of the height and distance of the NSRs with the plant both running and switched off.
- 3.4 Local measurements were also taken at ground floor level close to the plant.

Weather Conditions

- 3.5 Weather conditions during the measurement periods were generally cloudy and dry; there was rainfall briefly, but this did not affect any measurements. Wind speeds were within suitable parameters for the measurement of environmental noise (i.e., generally under 5 ms⁻¹). All microphones were protected with a windshield for the duration of the survey.

Equipment

- 3.6 The equipment used in the survey is detailed in Table 1, below;

Table 1: Equipment Used in the Survey

Equipment	Manufacturer & Part No. (Internal/External)	Serial Number (Internal/External)
Window Logger		
Sound Level Meter	NOR 140	1405619
Microphone	NOR 1209	168247
Pre-Amplifier	NOR 1225	15526
Local Measurements		
Sound Level Meter	NOR 140	1403443
Microphone	NOR 1209	2967
Pre-Amplifier	NOR 1225	18437

- 3.7 The sound level meters were calibrated before and after measurements, with no significant drift recorded. An accredited laboratory calibrated the equipment not more than two years prior to the measurements being made, except for the calibrators, which had been calibrated not more than one year prior to the survey.

4 ENVIRONMENTAL NOISE SURVEY RESULTS

- 4.1 A summary of the measurements taken at 1m outside the office window are displayed in Table 2, below;
- 4.2 The noise levels measured were facade measurements, and have therefore been corrected by -3dB to obtain the free field noise level, as shown in Table 3, below;

Table 2: Free Field Noise Levels

Plant On or Off	Time ,h	Duration	Ambient Noise Level (dBL _{Aeq,T})	Background Noise Level (dBL _{A90,T})
ON	13:45	15:00	56	54
OFF	14:38	15:00	56	54

- 4.3 The ambient noise levels measured at the façade are the same with plant both on and off and plant is therefore not affecting the noise levels.
- 4.4 The measured background noise levels from the office window were dominated by the general ambience expected within the centre of the city.
- 4.5 A measurement was also taken within the noise barrier at 1m from the plant, with the barrier door closed and all plant operating. The results of this measurement are presented in Table 3, below.

Table 3: Summary of Measurements Within the Noise Barrier

Time	Duration	Ambient Noise Level (dBL _{Aeq,T})	Background Noise Level (dBL _{A90,T})
13:54	07:34	62	60

- 4.6 The data presented in Table 3 was used to determine the impact of the plant on the NSRs on Tasle Alley.
- 4.7 Measurements were also taken of the extract fan on the side of the building as shown in Table 4, below;

Table 4: Noise Levels of the Extract Unit

Time	Duration	Sound Pressure Level at 1m (dBL _{Aeq,T})	Background Noise Level (dBL _{A90,T})
14:25	00:33	69	62

- 4.8 The background noise levels used to evaluate the impact of the plant measured at the office window are similar to the background noise levels measured previously (Report Ref: 20084 Union Plant Noise Assessment R01A dated 12th March 2020).

5 BUILDING SERVICE NOISE EMISSIONS

Manchester City Council Requirements

- 5.1 Planning condition 4 detailed within planning application 129272/FO/2021 requires that external plant items should be designed to a rating noise level of no higher than 5db below existing background noise levels.
- 5.2 Therefore, based on a background level of 54 dBL_{A90} it is required that cumulative plant noise levels should not exceed 49dBL_{Ar,Tr}.

Calculations

- 5.3 Table 6, below, presents the predicted plant noise levels at the nearest noise sensitive receptors.
- 5.4 There is no screening or tonality correction.

Table 6: Summary of Calculations to Determine Predicted Noise Levels at NSR Facades

Plant	Unit SPL at 1m	Approximate Distance to NSRs (m)	Distance Attenuation (dB)	Rating Noise Level at NSRs (dB L _{Ar,Tr})
Condensers	62	26	28	34
Extract Fan	68	26	28	40
Cumulative rating noise level at NSRs				41

- 5.5 It can therefore be seen that cumulative rating noise level at the façade of residences on Tasle Alley is comfortably within the limits required by MCC.

6 CONCLUSIONS

- 6.1 dBx Acoustics have been appointed by Bruntwood to undertake a plant noise verification survey at Commercial Union Building, Albert Square, Manchester.
- 6.2 A noise survey measuring background noise levels at a representative location of Tasle Alley NSRs and of the plant units themselves was undertaken on Friday 14th of October 2022.
- 6.3 The assessment of operational plant noise confirms that the plant noise levels at the Tasle Alley NSRs are more than 5dB below the existing background noise levels; as such plant noise levels installed at the rear of Union on Albert Square meet the requirements of MCCs planning condition 4. This condition can therefore be discharged.

APPENDIX A – GLOSSARY OF ACOUSTIC TERMINOLOGY

Decibel, dB	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. For sound pressure level (L_p) the reference quantity is 2×10^{-5} N/m ² . The sound pressure level existing when microphone measured pressure is 2×10^{-5} N/m ² is 0 dB, the threshold of hearing.
L	Instantaneous value of Sound Pressure Level (L_p) or Sound Power Level (L_w).
Frequency	Number of cycles per second, measured in hertz (Hz), related to sound pitch.
A weighting	Arithmetic corrections applied to values of L_p according to frequency. When logarithmically summed for all frequencies, the resulting single "A weighted value" becomes comparable with other such values from which a comparative loudness judgement can be made, then, without knowledge of frequency content of the source.
$L_{eq,T}$	Equivalent continuous level of sound pressure which, if it actually existed for the integration time period T of the measurement, would possess the same energy as the constantly varying values of L_p actually measured.
$L_{Aeq,T}$	Equivalent continuous level of A weighted sound pressure which, if it actually existed for the integration time period, T, of the measurement would possess the same energy as the constantly varying values of L_p actually measured.
$L_{n,T}$	L_p which was exceeded for n% of time, T.
$L_{An,T}$	Level in dBA which was exceeded for n% of time, T.
$L_{max,T}$	The instantaneous maximum sound pressure level which occurred during time, T.
$L_{Amax,T}$	The instantaneous maximum A weighted sound pressure level which occurred during time, T.

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22080-R01-LH - Union Plant Noise Verification Assessment

Final Audit Report

2022-10-25

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