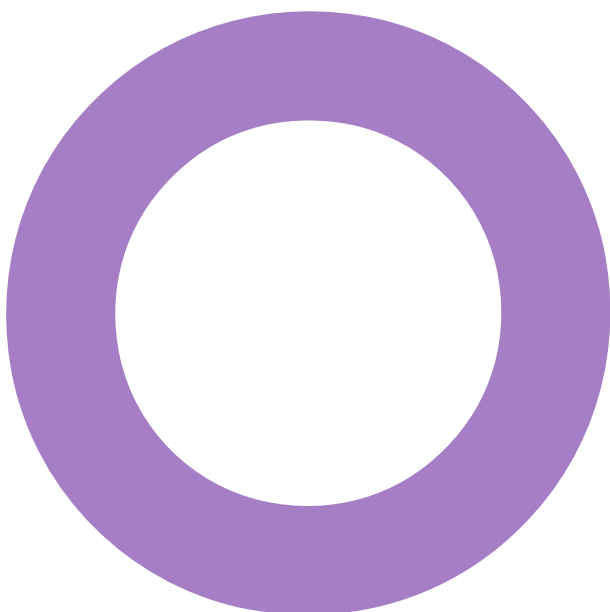


**40 Swan Street.
Manchester.**
Swan Street Firehouse Ltd.

ACOUSTICS
ACOUSTIC PLANNING ASSESSMENT

REVISION 02 – 22 FEBRUARY 2022



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
00	25/09/2020	Initial issue for comment	LR/PM	PM/AP	PM
01	29/09/2020	Formal issue	LR	PM	PM
02	22/02/2022	Update to reflect changes to proposed operating times and activities	LR	PM	PM

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Project number: 10-12486

Document reference: REP-1012486-5A-LR-20200925-Planning noise assessment-Rev02

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Executive summary

Hoare Lea Acoustics have been appointed by Swan Street Firehouse Ltd to provide acoustic advice for the proposed development at 40 Swan Street, Manchester. The site is located within the jurisdiction of Manchester City Council (MCC).

An environmental noise survey has been carried out between 3 September and 7 September 2020 and a noise egress assessment undertaken in accordance with the requirements of Manchester City Council (MCC).

Based on the results of the noise survey, the typical existing background noise levels experienced at the worst affected sensitive receptors are:

- $L_{Aeq,5min}$ 47 dB during the daytime (07:00 to 19:00),
- $L_{Aeq,5min}$ 45 dB during the evening (19:00 to 23:00) and
- $L_{Aeq,5min}$ 39 dB at night (23:00 to 07:00).

Based on the MCC requirements, all plant, equipment and machinery associated with the development shall be controlled to ensure that the overall sound pressure levels at 1m from the façade of the nearest noise sensitive premises do not exceed

- L_{Aeq} 42 dB during the daytime (07:00 to 19:00 hrs),
- L_{Aeq} 40 dB during the evening (19:00 to 23:00 hrs) and
- L_{Aeq} 34 dB during the night (23:00 to 07:00 hrs).

If the plant contains any tonal or attention catching characteristics, a further correction will be required. In-duct attenuation is understood to be proposed on all external terminations of the wall and roof mounted fans serving the scheme.

Recommended noise limits for proposed amplified music at the nearest noise sensitive receptor have been provided.

1. Introduction.

Hoare Lea Acoustics have been appointed by Firehouse Ltd to provide acoustic advice for the proposed restaurant and bar development at 40 Swan Street, Manchester. The site is located within the jurisdiction of Manchester City Council (MCC).

The proposed development comprises the redevelopment of two existing buildings into restaurant premises with additional external dining / drinking areas and semi-enclosed structures served by an external bar.

An environmental noise survey has been carried out on site between 3 September and 7 September 2020. The aim of the survey was to determine the existing noise levels in the vicinity of the site, including ambient, background and maximum noise levels. From this, appropriate noise egress limits for plant and entertainment noise associated with the development have been determined.

This report presents the findings of the noise survey and sets out the permissible maximum plant noise and entertainment noise in accordance with MCC requirements.

2. Site description.

2.1 Site location.

The proposed development site is located at 40 Swan Street in central Manchester. The site is bounded by Swan Street (i.e. the inner ring road) to the west and minor local roads Mason Street, Cable Street and Cross Keys Street to the north, east, and south respectively. The site location is indicated in Figure 1. The site is currently unoccupied with partial car parking use at the front along Swan Street.



Figure 1 3D rendered image showing development location and context (courtesy of Google Earth)

2.2 Surrounding area.

The site is located within a primarily commercial area just across from the Northern Quarter along Swan Street. The worst affected sensitive premises are considered to be the Staycity Northern Quarter located on the corner of Mason Street and Cable Street approximately 15 m to the north of the site and the Swan Street facing elevations of the residential flats on the upper levels of the Swan Buildings along Swan Street approximately 30 m to the south of the site.

2.3 Local noise climate.

The existing local noise climate is currently dominated by a regular and constant flow of road traffic including HGVs and buses along Swan Street. Partially screened road traffic along the Addington Street / Ring Road to the north east and Rochdale Road to the north are also audible.

2.4 Proposed development.

The proposed development comprises the redevelopment of two existing buildings into restaurant premises with additional external dining / drinking areas and semi-enclosed structures served by an external bar.

3. Local Authority planning context.

Criteria for plant noise egress and entertainment noise egress is provided in the Manchester City Council (MCC) "Planning & Noise Technical Guidance (December 2015)" document. This is referenced in the subsequent sections.

3.1 Plant noise egress.

With regards to noise from fixed plant/equipment, MCC refers to BS 4142:2014 and also states the following:

"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 (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location."

3.1.1 BS 4142:2014.

The MCC "Planning & Noise Technical Guidance (December 2015)" document refers to BS 4142:2014 'Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas'. The general principle of the BS 4142 assessment criteria is that noise nuisance can be avoided provided there is no significant change in the prevailing background noise conditions at any surrounding noise sensitive premises once the new equipment is operational.

Where the assessment indicates that the noise rating level of new plant would be 10 dB or greater above the background noise level, the standard judges that sound to be of significant adverse impact. A difference of 5dB is considered to result in adverse impact. Where the rating noise level of the plant is equal to or below background noise, there is likely to be low impact.

Further corrections should be applied if the plant noise contains tonal, intermittent and/or impulsive characteristics. The magnitude of these corrections is dependent upon the subjective perceptibility of the tones/impulses present.

3.2 Entertainment noise egress.

With regards to entertainment noise, MCC stipulates the following:

"Entertainment noise (L_{Aeq}) should be controlled to 10dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location."

4. Environmental noise survey.

The environmental noise survey was carried out on site over a period of 4 days between 3 September 2020 and 7 September 2020. During this time, long-term unattended measurements were carried out. Full details of the method and equipment used, as well as weather information are provided in Appendix A.

The survey measurement position at site is indicated in the annotated 3D render image presented in Figure 2. Position L1 indicates the unattended measurement position.

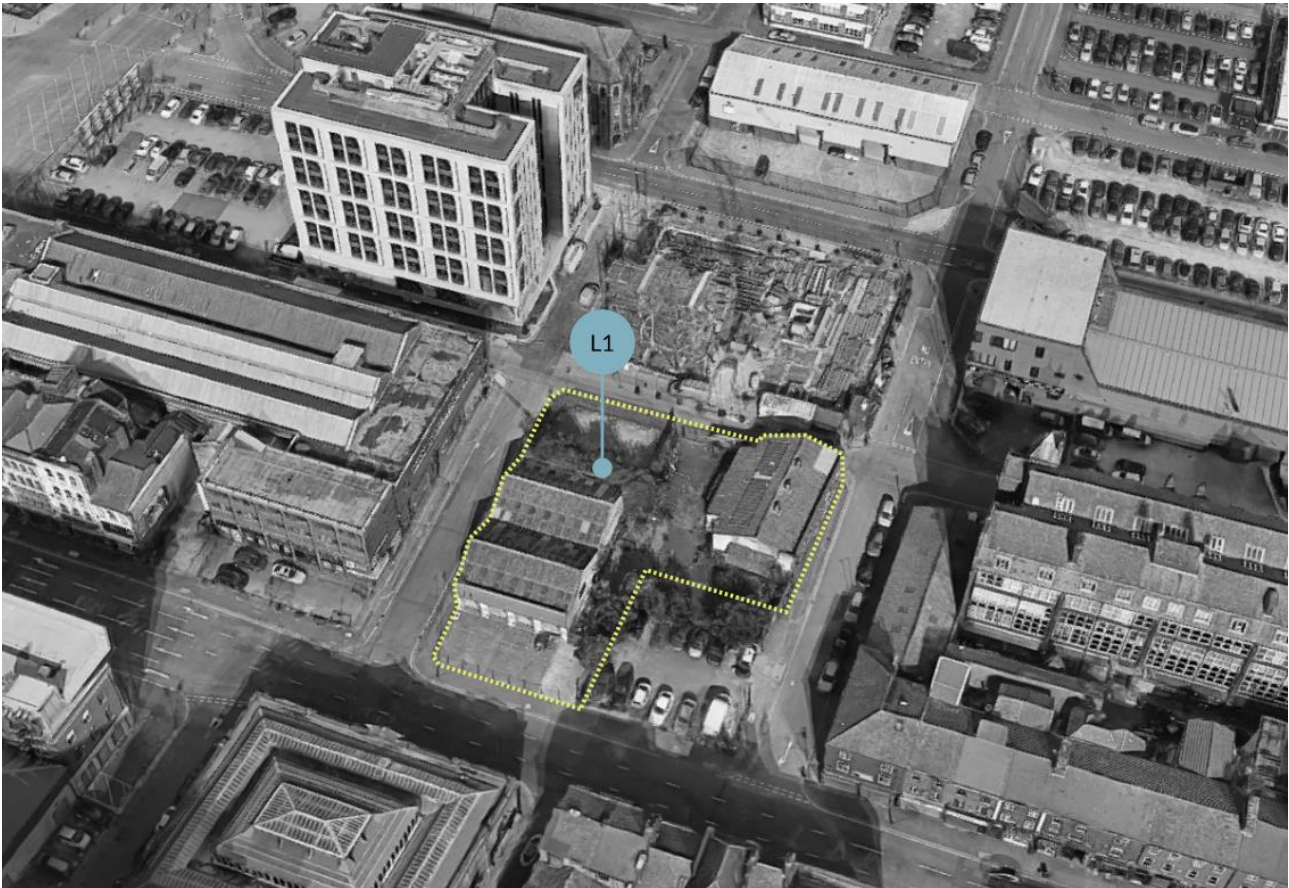


Figure 2 Annotated 3D render image indicating measurement position (courtesy of Google Earth)

4.1 Observations.

As set out in Section 2.3, the noise climate during the attended survey was driven by road traffic along the local roads, including regular bus and HGV events.

4.2 Results.

The results of the unattended noise measurements are presented to follow. A graph showing the results from the unattended logging survey are provided in Appendix B.

Table 1 Ambient noise levels measured during unattended measurements at Position L1

Date	Ambient sound pressure levels measured (dB) at position L1		
	Daytime (07:00 - 19:00) L _{Aeq} , 12hr	Evening (19:00 - 23:00) L _{Aeq} , 4hr	Night (23:00 - 07:00) L _{Aeq} , 8hr
03/09/2020	62 ^[1]	53	50
04/09/2020	60	54	53
05/09/2020	54	55	52
06/09/2020	53	53	51
07/09/2020	61 ^[1]	-	-
Average	58	54	51

[1] - Measurement not made over full period but considered representative of daytime conditions due to the relatively constant character of noise sources in the area (road traffic along ring road and Rochdale Road).

In line with BS 4142:2014, for the purpose of analysis and establishing representative background noise levels during the periods of interest, the background noise levels have been quantified using statistical analysis from the continuous logging measurements. These are presented in Appendix C.

From the analysis carried out, the representative background noise levels measured during the survey were as follows:

- Daytime (07:00 - 23:00) - L_{A90,5min} 47 dB
- Evening (19:00 - 23:00) - L_{A90,5min} 45 dB
- Night-time (23:00 - 07:00) - L_{A90,5min} 39 dB.

These levels are based on the 30th percentile of measured background noise levels. The octave band values for these levels are presented in Appendix C.

5. Plant noise egress.

5.1 Plant noise.

5.1.1 Plant noise limits.

Based on the MCC criterion set out in Section 3.1 and the survey results, the cumulative maximum sound pressure levels for fixed plant, equipment and machinery associated with the development shall not exceed the levels presented in Table 2 at 1m from the nearest noise sensitive premises.

Table 2 Maximum permissible sound pressure levels at 1m from the nearest noise sensitive premises from plant and equipment noise

Time of day	Maximum allowable sound pressure level at 1m from the nearest noise sensitive premises (L_{Ar} , dB) *
Daytime (07:00 to 19:00)	42
Evening (19:00 to 23:00)	40
Night (23:00 to 07:00)	34

*If plant noise contains any tonal or impulsive characteristics, a further correction shall be applied to the levels set out above, see Section 3.1.1 for details.

5.1.2 Attenuation measures.

In accordance with the Mechanical Engineer's ventilation statement received via email on 28/09/2020, and the mechanical ventilation drawings received on 29/09/2020 the proposed ventilation scheme is as follows:

- **Front of house spaces (4no. fans total)**

2no. wall mounted fans are proposed to each enclosed trading area to provide supply and extract air into the front of house spaces.

- **Kitchen exhausts (2no. fans total)**

Dedicated kitchen exhaust systems will be provided to the main food preparation areas within the enclosed spaces with ducted terminations at roof level.

- **Back of house spaces (2no. fans total)**

1no. extract fan to wash-up area and 1no. extract fan to accessible WC.

Acoustic mitigation is understood to be incorporated within the proposed ventilation scheme in the form of in-duct attenuators on all extract fan outlets.

The above mitigation measures shall be sufficiently designed against the final selections of plant to comply with the limits set in Table 2. On this basis the above mitigation measures would be capable of controlling plant noise break-out from the proposed ventilation scheme.

6. Entertainment noise egress limits.

6.1 Summary of proposed activities.

Planning permission is sought for operational times from 08:00 to 01:00 throughout the week inclusive of amplified reproduced music externally between the hours of 08:00 to 23:00 and amplified reproduced music internally between the hours of 08:00 to 01:00.

No live music is understood to be proposed as part of the entertainment activities envisaged.

6.2 External noise limits.

Based on the criteria set out in Section 3.2 and the survey results, external noise limits are presented in Table 3 for entertainment noise egress from the proposed development at 1m from the nearest noise sensitive premises. These limits have been derived from the typical octave band background noise levels presented in Appendix C.

Table 3 Maximum permissible sound pressure levels due to entertainment noise at 1m from the nearest noise sensitive premises

Time of day	Maximum octave band sound pressure level at 1m from the nearest noise sensitive premises (Leq, dB)								
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	L _{Aeq}
Daytime (07:00 to 19:00)	46	40	35	33	33	27	18	9	37
Evening (19:00 to 23:00)	44	38	34	32	31	25	15	6	35
Night (23:00 to 07:00)	38	33	29	26	25	18	9	5	29

6.3 Recommendations.

Given the quiet nature of the area around the development site along Cable Street and the close proximity to the nearest noise sensitive premises, the following measures are recommended for consideration as the design of the amplified sound systems develops:

- Favouring the location of external amplified sound activities along the front of the site facing onto Swan Street
- Use of noise limiters and sound level meters on house PA internally and external equipment to control amplified music levels within the venue and at the nearest noise sensitive receptor
- On-site noise levels should be routinely monitored along with synchronised measurements at the hotels across Cable Street to ensure the calibration of the noise limiters is adequate to meet the limits set out above;
- Use of smaller, directional loudspeakers to provide coverage across outdoor area and limiting noise spill outside of the site boundary
- Limiting reproduced and live music to the daytime and evening hours (up to 22:00).

6.4 Patron and anti-social behaviour noise.

It should be noted that conversation noise from patrons is assumed to fall with the 'Security and Crowd Management Plan' and not part of the typical entertainment noise.

Appendix A: Survey and equipment details.

Unattended noise measurements were carried out between 13:10 on 3 September 2020 and 13:30 on 7 September 2020.

Prior to commencement of the unattended survey, a subjective assessment of the noise climate was undertaken and compared to that of the immediate vicinity of the nearby residential premises. The chosen logger position at position L1 was deemed to be representative of the noise levels at the nearest noise sensitive premises.

The microphone was fitted with a windshield. The meter was calibrated before and after the survey and no significant drift was noted. A photo of the equipment is provided in Figure 3.

Equipment details.

Table B1 summarises the details of the equipment used during the environmental noise survey. All equipment used was within dates of calibration and calibration certificates are available on request.

Table B1 Equipment used during environmental noise survey

Item	Description	Serial Number	Calibration Date
Attended sound level meter	Rion - Microphone: UC-59 Rion - Pre-amplifier: NH-25 Rion - Sound Level Meter: NL-52	16798 32190 00732162	02/03/2020

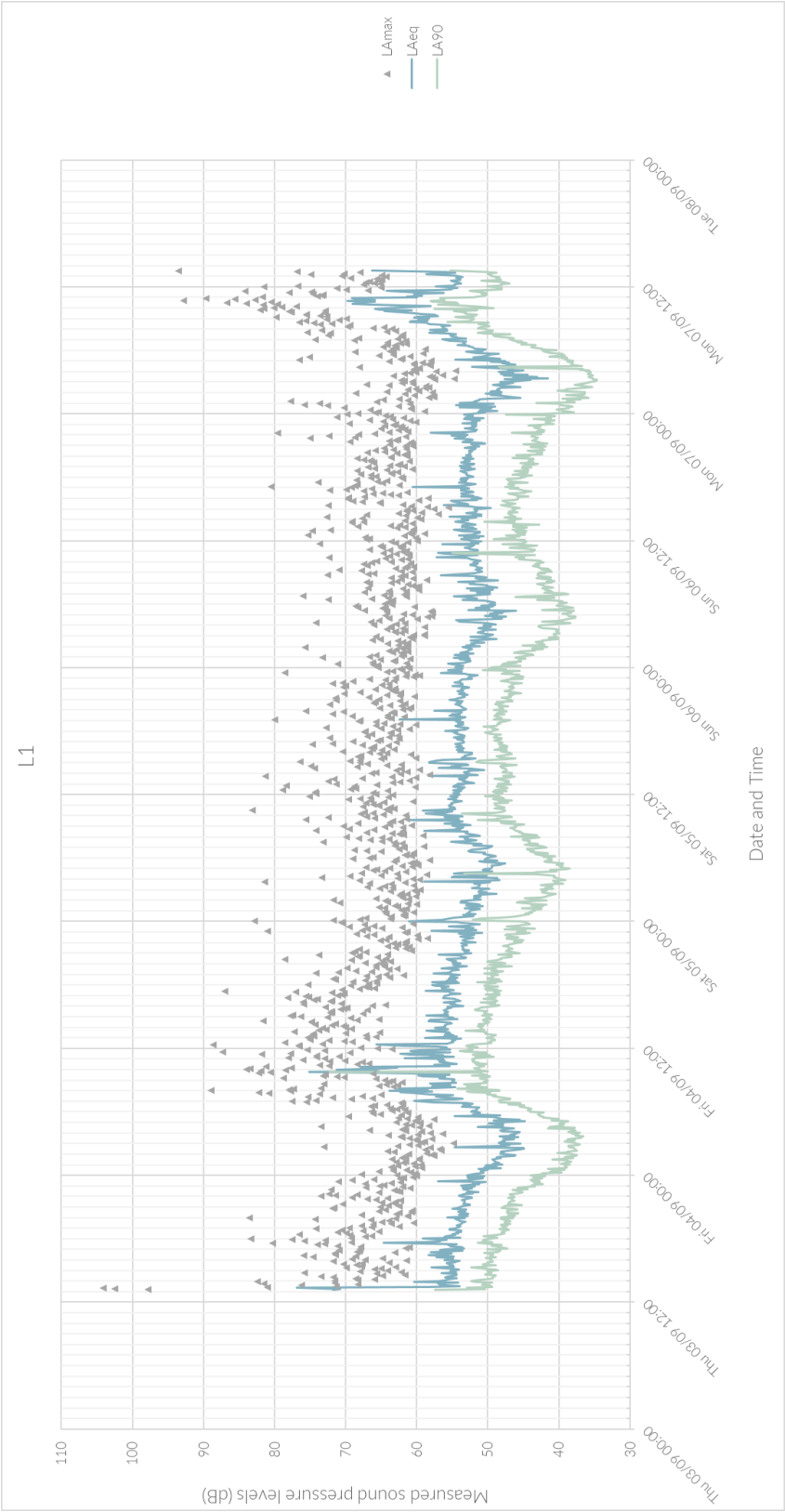
Weather information.

Weather reports for the area indicate that temperatures ranged between 9 °C to 22 °C. Wind speeds and rain were minimal and not expected to contribute adversely, therefore the measured data is considered suitable as being representative of typical conditions.



Figure 3 Photo showing noise monitoring position

Appendix B: Time history of unattended measurements.



Appendix C: Representative octave band background noise levels.

Table C1 Results of typical octave band background levels during attended noise measurements at position L1

Period	LA90,5min (dB)	Measured octave band background levels (L ₉₀ , dB)							
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Daytime (07:00 – 19:00)	47	56	50	45	43	43	37	28	19
Evening (19:00 – 23:00)	45	54	48	44	42	41	35	25	16
Night (23:00 – 07:00)	39	48	43	39	36	35	28	19	15



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