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Acoustic Assessment Report

Proposed Bar:
Ground Floor, 58 Dale Street
Manchester M1 2HN

Prepared for: China Lane Developments Ltd
Ashton House
196 Corporation Street
Manchester
M4 4DU

Report ref: A1551

Report Date: 21/10/2013

Prepared by: Stratton Barrett
BA (Hons), AMIOA

Signed:

Acoustic Assessment Report

Proposed bar at 58 Dale Street
Manchester M1 2HN

Report date: 21st October 2013

1.0 Introduction

Azymuth Acoustics is appointed by China Lane Developments Ltd to provide an acoustic assessment of a proposed bar at 58 Dale Street in Manchester city centre. The bar is part of a hotel development and would cover the front ground floor area of the premises with access from Dale Street. The proposed operating times of the business are understood to be 11:00 – 01:30hrs seven days a week.

This report addresses the potential noise impact of entertainment noise from the premises on nearby residences, along with analysis / recommendations on the specifications of the building envelope to reduce noise egress to comply with local authority target criteria. It is understood that no new or altered external plant is proposed as part of the application.

This acoustic assessment includes sections covering the following aspects:

- The results of a baseline noise survey at the site in the vicinity of the nearest residences on Dale Street.
- Criteria developed to set acceptable noise levels at sensitive receptors in nearby properties.
- Assessment of the likely internal noise levels in the venue along with recommendations on noise limits based on building upgrades proposed in this document.
- Recommendations on management of entertainment noise break-out etc. in order to comply with limit criteria.

2.0 Baseline Noise Survey

2.1 Measurement Procedures

The instrumentation used for the environmental noise survey consisted of a SvanTek 945 Type 1 precision sound level meter. The equipment was calibrated before and after the noise measurements. The sound level meter measured A-weighted (fast response) noise levels as well as octave band noise levels for all measurements recorded.

The ambient noise level survey was undertaken in the early hours of Tuesday morning 15th October 2013. In addition, measurement data from a previous Azymuth Acoustics survey at 56-58 Dale Street has been used; this survey was undertaken on 4th December 2012.

The ambient noise measurements were undertaken by Stratton Barrett using the sound level meter microphone at the locations shown in Figure 1 below.

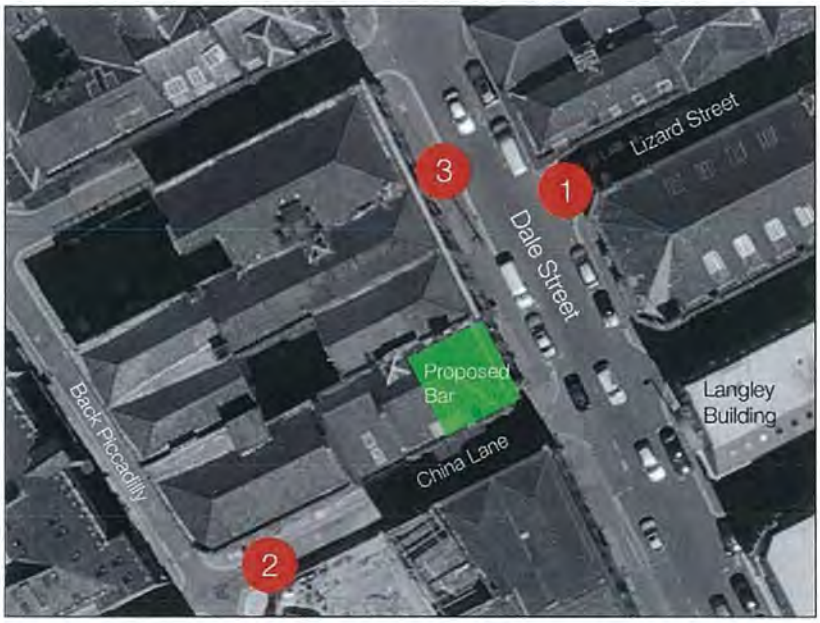


Figure 1: Measurement locations marked in red on aerial photograph

2.2 Summary of Measured Ambient Noise Levels

Full results of the noise levels recorded by Azymuth Acoustics during the course of the night time noise survey are included in Appendix B of this report.

The following table summarises the results of the noise measurements undertaken at the proposed site in terms of averaged night time statistical noise levels.

Location	Period	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A90}
1: End of Lizard Street (gated) >3.5m from façade	Night time 00:25 – 00:30	84.4	59.7	71.0	60.1	45.1
2: China Lane (façade level)	Night time 23:30 – 00:10	67.4	52.1	60.8	54.5	47.4
3: Dale Street (façade level)	Night time 23:30 – 00:10	82.4	61.8	72.8	63.4	46.6

Table 1: Summary of averaged noise measurement results (dBA)

2.3 Description of the Noise Climate / Receptors

The noise climate in the area is dominated by road traffic using Dale Street and other surrounding routes. Noise from public passers-by also made a contribution to the measured levels.

The nearest noise sensitive receptor to the proposed bar is understood to be apartments at Langley Building, diagonally opposite 58 Dale Street at a distance approx. 18m.

3.0 Noise Assessment Criteria

In order to assess the extent of any measures which might be necessary in order to comply with suitable conditions relating to entertainment noise break-out / through, Azymuth Acoustics has reviewed the following guidance documents and standards:

- BS 8233: 1999
- World Health Organisation Guidelines on Community Noise
- Manchester City Council Policy Document GD03: Environmental and Public Protection Information for Developers

3.1 BS 8233: 1999

BS 8233 provides a code of practice for the sound insulation of a variety of building types affected by general environmental noise. It provides recommendations for control of noise in and around buildings and suggests appropriate internal ambient noise level criteria / limits for a variety of different situations including residential properties.

The following table summarises the noise limits suggested by BS 8233 applying to residential properties.

Criterion	Room	Design Range $L_{Aeq,\ T}$ dB	
		Good	Reasonable
Reasonable resting / sleeping conditions	Living rooms	30	40
	Bedrooms at night[1]	30	35
[1] For a reasonable standard in bedrooms at night, individual noise events should not regularly exceed 45 dB L_{Amax}			

Table 2: Noise Limits for Residential Properties Suggested in BS 8233

3.2 W.H.O Guidelines on Community Noise

In 1980 the World Health Organisation proposed environmental health criteria for community noise including consideration of noise levels at which sleep disturbance may take place. These guidelines were amended by the World Health Organisation in 1999. The guidance suggests that an internal L_{Aeq} below 30dB is required to preserve the restorative process of sleep. This is equivalent to a free-field level of around 42 to 45dB L_{Aeq} or a façade level of 45 to 48dB L_{Aeq}, assuming open windows.

3.3 Manchester City Council Policy Document GD03

The GD03 guidance document provides developers with information related to Manchester City Council policy on discharging planning conditions imposed by the City Wide Environmental and Public Protection Team. The document has specific sections covering policy on noise from entertainment venues, fixed plant and equipment etc. The document states, 'A planning application for an entertainment venue should demonstrate that music noise from the proposal will not be audible inside residential properties nearby assuming that the residential properties in question have their windows open. The target noise criteria here should be 10dB (L_{Aeq}) below the existing L_{A90} in each octave band.'

3.4 Recommended Noise Assessment Criteria

Based on the guidance above it is recommended that the following criteria would be reasonable with the aim of minimising the impact of the proposed operation:

- A predicted external level due to entertainment noise from the venue 10dB below the lowest measured Background Level ($L_{A90, 5min}$) at the nearest receptor.
- A predicted external level due to entertainment noise from the venue ≥5dB below the lowest measured Background Level $L_{90, 5min}$ in the 63Hz and 125Hz octave bands at the receptor.

4.0 Noise Assessment

4.1 Typical Noise Levels in Restaurants and Bars

The following noise levels would typically be expected within entertainment venues (based on Azymuth Acoustics historical survey data and Noise from Pubs and Clubs Phase 1 document):

- Bars and restaurants during quiet periods, approx. 65-70dB L_{Aeq}
- Bars and restaurants during busy periods, no music (customer noise only), up to approx. 88dB L_{Aeq}
- Bars playing music (including customer noise), approx. 90-95dB L_{Aeq}
- Dance floor of large night club, up to approx. 105dB L_{Aeq}

Based on the size and scope of the proposed bar it would be assessed that the operation should not be described as a 'night club' in terms of the potential noise levels shown above. As such, it would be expected that internal levels up to approx. 95dB L_{Aeq} could be expected during busy periods with a DJ based sound system.

4.2 Review of the Building Envelope

4.2.1 Separating Floor

It is understood that the 1st floor and above is unoccupied at present and as such this report does not include assessment of the building fabric re potential noise transmission through floors / internal structure etc.

4.2.2 Existing Building Envelope

It is understood that the windows to the ground floor bar are standard double glazed units (e.g. 4/12/4mm) with the addition of 6.8mm Pilkington Optiphon secondary internal glazing set to form ≥200mm cavity with external glass.

The existing external wall construction is substantial masonry and as such would not require up-rating.

The main front door to the bar has a lobby to the proposed ground floor bar space.

The basement space has existing windows to street level which will be fully blocked as part of the refurbishment.

4.3 Recommendations on the Building Envelope

The following items would be recommended with the aim of compliance with target criteria:

- All access doors should be min. 43mm thickness solid core with threshold and perimeter seals to provide as good an airtight seal as possible when closed. More information / specifications provided on request.
- Ventilation where required should be provided by means of a mechanical system to preclude the need to open windows. There should be no ventilation penetrations on the Dale Street or China Lane elevations. Any ducts serving the main bar areas should exhaust within the central light well and have suitable silencers fitted. More information / specifications provided on request.

4.4 Noise Limits and Break-out Calculation

Based on the existing building envelope as described above, the table below provides octave band noise limits for activity noise inside the ground floor bar with the aim of compliance with targets described in Section 3.4. The limits would apply to noise from all sources combined including background music, chatting, customer / staff activity etc.

Parameter	Period	Octave Band Centre Frequency (Hz)								Total dBA
		63	125	250	500	1k	2k	4k	8k	
Maximum Sound pressure level $L_{Aeq,30sec}$	11:00 – 01:30	89	90	90	90	90	90	88	84	96

Table 3: Daytime and night time internal noise level limits

Incorporation of the noise limits detailed above would result in compliance with target criteria described in Section 3.4 above.

The following table provides an assessment of calculated noise break-out from the venue for night time (23:00 – 01:30 hrs) operation compared with background levels in the vicinity.

Parameter	Location	Octave Band Centre Frequency (Hz)							Total dBA
		63	125	250	500	1k	2k	4k	
Sound pressure level limit $L_{Aeq,30sec}$	Inside bar	89	90	90	90	90	90	88	96
Specific sound pressure level (calculated)	Outside @1m façade	62	62	57	53	41	25	27	53
Specific sound pressure level (calculated)	Residence @18m	43	43	38	34	22	6	8	34
Lowest overall measured Background Noise Level $L_{A90,5min}$ 00:25-00:30	Residence @18m	48	48	44	42	39	34	29	44
Specific level compared with BNL	Residence @18m	-5	-5	-6	-8	-17	-28	-21	-10

Table 4: Assessment of predicted entertainment noise levels: receptor at Langley Building

5.0 Conclusions and Recommendations

Azymuth Acoustics has undertaken an acoustic assessment of potential noise impact from the proposed bar at 58 Dale Street, Manchester. Night time noise levels until 01:30 hours in the vicinity of the nearest residences are in the range 55-64dB $L_{Aeq, 5min}$ and 44-48dB $L_{A90, 5min}$. Noise from road traffic in the vicinity made the largest contribution to the noise climate at the time of survey.

The existing building envelope would allow music levels to operate up to the limits shown in Table 3 above with no additional sound insulation measures than those already put in place.

In addition to the recommendations in Section 4.3, the following operational strategies would be recommended in order to control noise break-out from the premises:

- A tamper proof sound level limiter should be installed to the proposed sound system, to be set to comply with the limits shown in Table 3 above (either by Azymuth Acoustics or professional installer). Suitable devices assuming a fixed sound system would be the Formula Sound AVC2, Lime Technologies VCX or similar, see **www.noiselimiters.co.uk** for more information.
- The front door to the premises should be kept closed when not in use during night time periods. This may be managed by door staff attending the ground floor entrance.
- No loudspeakers should be mounted close to external doors, in lobbies or outside the venue.

Appendix A

Glossary of Acoustic Terms

Decibel (dB)
This is the unit used to measure sound. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro Pascal to 100 Pascal.)

dB(A)
This is a measure of the overall noise level of sound across the audible spectrum with a frequency weighting (i.e. A-weighting) to compensate for the sensitivity of the human ear to sound of different frequencies. The A-weighting curve is implemented in sound level meters using an electronic filter that approximately corresponds to the frequency response of the ear.

Octave Band Noise Level
The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz. The ear is also generally more sensitive to medium and high frequencies than to low frequencies. In order to define the frequency content of a noise, the spectrum can be divided into frequency bands. The most commonly used frequency bands are octave bands, in which the mid-frequency of each band is twice that of the band below it.

L_{Aeq}
This is the equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over a given time period.

Reverberation Time (RT or sometimes T_{30} or T_{60})
This is the time taken for the reverberant sound energy in an enclosure to decay one millionth of its equilibrium value, i.e. by 60 dB, after the source has been switched off, is known as the reverberation time. The reverberation time is frequency dependent and it is customary to measure its value in octave or one-third octave bands. Reverberation occurs when sound waves are repeatedly reflected from each surface of the room.

Sound Reduction Index (SRI)
Difference measured between the amount of energy flowing towards the wall in the source room and the total amount of energy flowing towards the wall in the source room and the total amount of energy entering the receiving room (usual range 100 - 3150 Hz for one third octave band values). The SRI varies with frequency and is measured in a laboratory in either octave or one-third octave bands.

$SRI = L1 - L2 + 10 \log (S/A)$

Where: L1 = Noise level in the source room
L2 = Noise levels in the receiving room
S = Surface area of test specimen
A = Equivalent acoustic absorption area in the receiving room

Weighted Sound Reduction Index (R_w)
This is a weighted single figure descriptor of the sound insulation performance of a partition measured under laboratory conditions. The procedure used to quantify the R_w is to compare the sound reduction index (SRI) in each of the one-third octave bands from 100Hz to 3150Hz against a set of standard reference curves.

Appendix B

Full Results of Noise Survey

Start	Location	Time	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A90}	Octave Band Centre Frequency (Hz)									Total (dBA)
								63	125	250	500	1000	2000	4000	8000	16000	
00:25	1	00:05'00	79.1	62.1	74.9	65.3	43.7	64.0	62.0	58.5	56.6	59.2	54.9	48.1	40.4	32.9	62.1
00:30	1	00:05'00	81.9	59.8	72.0	60.4	45.1	58.7	59.1	56.0	54.9	55.6	52.7	50.3	39.6	35.1	59.8
00:35	1	00:05'00	84.4	60.4	72.4	55.4	44.2	58.4	55.2	54.5	54.5	58.1	52.7	45.3	37.0	32.1	60.4
00:40	1	00:05'00	82.0	63.7	75.2	67.2	47.6	66.9	62.8	59.2	58.7	60.7	56.1	50.7	45.0	35.6	63.7
00:45	1	00:05'00	72.9	55.2	67.0	58.6	44.8	60.9	54.3	52.1	51.2	52.3	47.3	39.0	33.5	31.7	55.2
00:50	1	00:05'00	76.5	59.4	72.6	61.7	45.4	63.7	60.9	58.2	55.1	55.3	52.1	47.8	40.3	32.5	59.4
00:55	1	00:05'00	72.9	54.6	67.7	54.2	44.2	56.3	53.8	50.9	49.0	52.3	46.6	37.2	30.6	31.5	54.7
01:00	1	00:05'00	75.3	59.6	71.5	62.6	45.6	57.0	56.1	54.9	54.0	56.8	52.4	44.6	37.1	32.0	59.6
01:16	1	00:05'00	72.8	53.8	66.4	54.5	46.1	53.6	51.1	49.1	48.0	50.9	46.8	40.0	31.5	31.6	53.8
01:21	1	00:05'00	76.2	57.8	69.8	60.8	44.5	58.5	53.9	52.9	52.3	55.4	50.2	40.9	32.4	31.6	57.8

Appendix B1: Full results of noise survey, 58 Dale Street 14/10/13 (dB, fast response time, free field)

Start	Location	Time	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A90}	Octave Band Centre Frequency (Hz)									Total (dBA)
								63	125	250	500	1000	2000	4000	8000	16000	
23:28	2	00:05'00	67.2	52.6	60.8	55.5	47.8	60.2	54.3	50.2	49.1	49.1	44.7	35.7	28.2	29.9	52.6
23:33	2	00:05'00	63.5	50.9	58.6	53.3	47.3	56.8	50.7	47.2	47.4	47.6	43.4	34.1	27.4	30.0	50.9
23:38	2	00:05'00	67.4	52.5	63.1	54.8	47.1	60.4	52.6	48.7	48.8	49.1	45.3	35.7	27.6	29.9	52.5
23:56	3	00:05'00	77.7	58.0	69.9	59.0	45.5	62.5	57.9	52.9	52.8	55.1	50.9	42.8	32.3	30.3	58.0
00:01	3	00:05'00	82.4	64.0	75.7	66.9	49.2	68.9	62.6	59.0	58.9	61.1	57.0	49.5	41.2	32.2	64.1
00:06	3	00:05'00	81.2	61.5	72.8	64.4	45.2	68.6	60.2	57.7	56.8	58.2	54.5	47.6	39.1	31.2	61.5

Appendix B2: Full results of noise survey, 56-58 Dale Street 04/12/12 (dB, fast response time, façade)

APPENDIX B

Waste Management Strategy

PA Number:	TBC
Development description:	New Cafe Bar
Development location:	Eleska House, 58 Dale Street, Manchester
Strategy prepared by:	Cube Architecture and Design
Date Prepared:	10 October 2013

All waste storage and collection guidance for Manchester City Council is currently under review and as such there is no current written guidance available at present. All information contained within this Waste Management Strategy has derived from consultation with an approved waste management company based in Manchester

Contact:	Cheryl c/o New Look Waste Disposal
Date:	9th October 2013

1 Number of Bins Proposed

No bins are to provided.
The strategy is to provide waste bags to cater for different waste types including general waste, mixed daily perishables and bags for glass, paper/card, plastics/cans etc

2 Waste Storage Area

Please refer to Cube Architecture and Design drawing No. AS396-12 Proposed Basement
Staff will access the refuse store within the loading bay from the rear of the bar.
During construction works to the Hotel access is to be from China Lane via the existing gates

3 Waste Collection Arrangements

Refuse collection will be from China Lane, the refuse store offers direct access from the road via the existing large double gates. The refuse store behind offers adequate manoeuvrable space for the storage of refuse sacks
Collections are daily, twice a day, 7 days a week.
Collections are before 10am and after 5.30pm including all bank holidays
A Duty of Care transfer note will be provided to confirm dosposal is within envoironmental regulations

APPENDIX A

Listing Description

MANCHESTER

ELESKA HOUSE, No.58 DALE STREET

List entry Number: 1200842

Grade: II

Date first listed: 06-Jun-1994

Clothing warehouse, now wholesalers' premises and offices. Probably early C20. Red brick in English garden wall bond with sandstone plinth and dressings (roof concealed). Rectangular plan on corner site, with chamfered corner, loading bay to rear. Basement, 3 storeys and attic, 3 bays (the 1st canted back) with 2+3+2 windows; sandstone bands to sills and heads, brick cornice and parapet over attic. The canted corner has a round-headed doorway with stone imposts and cavetto-moulded head with keystone, panelled door and lettered fanlight, 2 narrow sashed windows on 2 floors above; the front has tall basement windows, narrow sashes at ground, 1st and 2nd floors (all these grouped 3+2), and smaller sashes at attic level grouped 4+3; the windows of the 1st and 2nd floors are set back slightly in their bays, and those at 2nd floor have brick corbelling to segmental heads, and linked hoodmoulds. The left side wall, 5 windows, mostly set in full-height slots, with large attached fire-escapes; and a 2-storey rear extension containing the loading bay (shared with 3 China Lane to rear). Interior not inspected. Item is attached to left side of No.56 (q.v.). Included for group value.

Listing NGR: SJ8463198241