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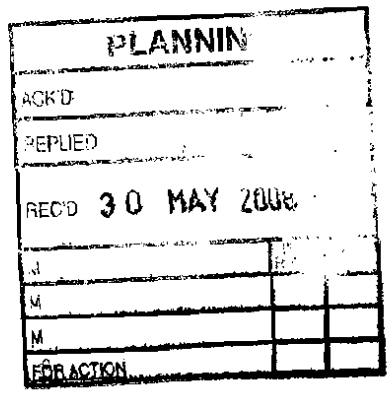

Acoustic Assessment Report

Proposed Bar / Restaurant:

310 Wilmslow Road,
Fallowfield, Manchester

Prepared for: Bluetree Estates Ltd
Market Court
20-24 Church Street
Altrincham
WA14 4DW

Report ref: A1297

Report Date: 08/05/08

Prepared by: Dominic McCann
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Signed:

ACOUSTIC ASSESSMENT REPORT FOR A PROPOSED BAR:

310 WILMSLOW ROAD, MANCHESTER

Report date: 8th May 2008

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ACOUSTIC ASSESSMENT REPORT FOR A PROPOSED BAR:

310 WILMSLOW ROAD MANCHESTER

1.0 Introduction

Azymuth Acoustics is appointed by Bluetree Estates to provide an acoustic assessment of 310 Wilmslow Road, Manchester. The project involves refurbishment of the existing premises into a café bar with proposed operating times of 11:00-01:00hrs and a final closing time of 01:30hrs to allow for a 30 minute 'clearing out' period.

This report is intended to provide the information required in order to comply with general environmental noise criteria for this type of development. This includes an assessment of the current noise climate in the vicinity in the building with the aim of establishing noise limits for both inside the premises and external plant installed as part of the fit out work of the empty retail unit. In particular the report sets out the following details:

- The results of a baseline noise survey undertaken at the Wilmslow Road site.
- The appropriate assessment criteria and guidance relating to noise in the environment as associated with this kind of project.
- An assessment to establish maximum noise levels for any externally mounted mechanical plant installed as part of the development.
- An assessment to establish maximum internal noise levels for periods when the bar and restaurant is proposed to operate.

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 and a 01dB Cal 01 SL sound calibrator. The sound level meter was set to record noise levels over a period representative of the operating times of the venue, with a nominal sample time of 5 minutes. The equipment was calibrated before and after the noise measurements.

The noise measurements were undertaken on 1st May 2008 by Dominic McCann, using the sound level meter at measurement locations detailed in Table 1 below.

Measurement Position
1. In car park belonging to Morris Court (off Wynnstay Grove) to the rear of the premises
2. On the pavement outside the proposed premises, approx 12m from Wilmslow Road

Table 1: Summary of noise measurement locations

2.2 Summary of Measured Noise Levels

Full results of the noise levels recorded by Azymuth Acoustics during the course of the 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 the average daytime (07:00 to 23:00 hours) and night-time (23:00 to 07:00 hours) statistical noise levels.

Measurement Location	Period	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A90}
1	Day	79.2	54.7	62.5	56.7	49.2
1	Night	80.9	52.2	58.9	53.5	46.0
2	Day	93.6	69.5	78.4	71.0	61.1
2	Night	87.8	65.2	75.7	69.0	55.2

Table 2: Summary of noise survey results (dBA)

2.3 Description of the Noise Climate

During both day and night time periods, the principal source of noise in the vicinity of the site is road traffic using Wilmslow Road. Wilmslow Road is a busy arterial road connecting Manchester city centre with Rusholme, Fallowfield and Didsbury. The route is used by a frequent bus services which run throughout the day and well into the early hours of the morning. Road traffic on Wynnstay Grove is light and is generally restricted to vehicles gaining access to the residential properties along this quiet cul-de-sac.

The nearest residential properties are located in an apartment building to the rear of the premises and separated by a distance of 28m. Residential properties may also be located (as upstairs flats) in the building adjoining 310 Wilmlsow Road.

The 1st floor accommodation is known as Pandora's and is understood to be a commercial massage parlour.

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 noise from the proposed bar / restaurant, Azymuth Acoustics has reviewed the following guidance documents and standards:

- PPG24 - Planning and Noise
- BS 4142: 1997
- World Health Organisation Guidelines on Community Noise

3.1 Planning Policy Guidance Note PPG24

PPG24 establishes Noise Exposure Categories that are applicable in the case of new residential developments affected by transport noise or by mixed noise sources in which industrial noise does not dominate. In the case of a proposed noise-producing development affecting existing noise-sensitive premises, PPG24 advises that British Standard BS 4142 can be used, within its own terms of reference, to predict the likelihood of complaints. PPG24 draws attention to the greater potential for complaints to arise if industrial noise has tonal or impulsive characteristics.

3.2 BS 4142: 1997

The test that is generally applied to assess the potential for noise from fixed installations to give rise to community response is contained in British Standard BS 4142: 1997. This standard predicts the likelihood of complaint due to noise from a new or modified source.

BS 4142 describes a method for determining industrial and background noise levels outside residential buildings and for assessing whether the industrial noise is likely to give rise to complaints from the occupants.

BS 4142 assessment methodology involves comparing the existing background level with the predicted noise from the new development. This predicted level is adjusted to allow for any tonal or impulsive characteristics, and is called the rating level. The difference between the two levels can be used to indicate the likelihood of complaints arising, e.g. a predicted level 10 dB greater than the background level indicates that complaints are likely; an increase of around 5 dB is of marginal significance and a predicted level of 10 dB less than the background level is a positive indication that complaints are unlikely.

3.3 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 in 1999. The guidance suggests that an internal L_{Aeq} below 30 dB is required to preserve the restorative process of sleep. This is equivalent to a free-field level of around 42 to 45 dB L_{Aeq} or a façade level of 45 to 48 dB L_{Aeq} assuming open windows.

4.0 Externally Mounted Plant

Based on guidance set out in BS 4142 and measured background (L_{A90}) levels it is recommended that the following criteria represent suitable targets for noise levels from plant installed anywhere on the outside of the premises.

Location	Noise Limit
Noise from individual externally mounted air-conditioning / chilled food condenser units.	38dB L_{Aeq} (all periods) @10m Or 45dB L_{Aeq} (all periods) @ 5m

Table 3: Noise limits for externally mounted plant (dBA)

The noise levels set out above have been developed so as to ensure that noise from all external sources associated with the development do not significantly affect the ambient noise levels in the area.

5.0 Internal Noise Levels

In order to assess the extent of any measures which might be necessary in order to comply with suitable conditions relating to noise break-out from the development, Azymuth Acoustics has reviewed layout plans and specifications of the existing building.

5.1 Review of Building Envelope

The separating floor between the ground floor premises at 310 Wilmslow Road and the 1st floor is of unknown construction, but is understood to be a fairly standard domestic type separating floor. It is estimated that the floor structure will give an airborne sound insulation equivalent to between R_w 50 - 55dB. This is likely to be adequate for the separating floor between 2 commercial premises.

5.2 Proposed Sound System

See section 6.2 for recommendations on suitable noise limits from the sound system.

5.3 Recommended Noise Assessment Criteria

Based on guidance set out in Section 3 of this report and measurements made on site it is recommended that the following criteria represent suitable targets for maximum noise levels within the bar / restaurant during periods of operation.

Table 4 below details calculated maximum internal noise levels for the premises in conjunction with parameters described in BS 4142: 1997.

Parameter	Octave Band Centre Frequency (Hz)								Total (dBA)
	63	125	250	500	1k	2k	4k	8k	
Maximum internal level ($L_{Aeq,\ 10\ seconds}$) inside ground floor bar	79	78	76	76	76	76	74	69	**82**
Calculated specific level 1m from the glazing at the front of the unit	60	57	52	46	41	43	38	30	50
Measured residual level $L_{Aeq,4hr}$	75	66	62	62	63	58	50	45	66
Level above residual $L_{Aeq,4hr}$	-15	-10	-11	-16	-22	-15	-12	-16	-16
Background level $L_{A90,4hr}$ on Wilmslow Road									55
Rating level (specific level +5dB)									55
Level above background $L_{A90,4hr}$									**+0**

Table 4: Maximum calculated night time (22:00-01:30hrs) internal levels for 310 Wilmslow Road.

Based on the existing glazing specifications, the maximum internal level of 82dBA shown in Table 4 would result in an external noise level of 50dBA immediately outside the venue. The rating level of 55dB includes an addition of 5dB to allow for the likely tonal / intermittent nature of the noise, i.e. amplified music. This is equal to or just below the background noise level at street level and as such is likely to acceptable up to a closing time of 01:00hrs (as proposed).

6.0 Recommendations for Noise Mitigation

This section sets out the recommended minimum noise mitigation measures which need to be employed in order to satisfy the requirements of the noise assessment criteria.

6.1 Fit-out of Bar / Restaurant

The layout of the ground floor should be designed so that the rear (single storey) part of the premises is used for toilets and a quiet seating area (i.e. no loudspeakers in this part of the premises.

It is recommended that $5m^2$ of acoustic absorption should be fitted to the walls of the premises so as to reduce the build up of reverberant sound in the bar / restaurant. Suitable products include: F/G type absorber from Custom Audio Designs (Tel: 01730 269572), Tufsound Panels from H&H Group (Tel: 01664 821810) or Wallsorba Panels (Tel: 01494 536888).

6.2 Sound System

The size and number of the loudspeakers installed in the premises should be limited in order to ensure that the internal sound pressure levels do not exceed 82dBA $L_{eq,\ 10\ seconds}$ during all periods of operation in the ground floor bar areas and not more than 85dBA $L_{eq.\ 10\ seconds}$ in the basement.

The internal noise limit implies that the sound system should likely be restricted to 6 number 50 to 100 Watts compact loudspeakers and not more than 200 Watts of stereo amplification. Ceiling mounted loudspeakers should be avoided in all areas.

7.0 Conclusions

Azymuth Acoustics has undertaken an environmental noise assessment of the proposed bar at 310 Wilmslow Road, Manchester.

Existing night-time noise levels at the rear of the premises are typically in the range of 49 to 59dB L_{Aeq} during the majority of daytime and night time periods. Background noise levels in the vicinity of the premises are generally around 46dB L_{A90}.

An internal noise limit (on the ground floor) of 82dBA or less has been put forward so as to ensure that future noise from the premises does not have a significant effect on nearby residences.

The noise levels from any fixed plant associated with the development should be limited to a 5 metre level of not greater than 45dBA L_{Aeq}.

The potential internal noise levels suggest that some minor noise mitigation measures should be put in place to achieve suitable sound insulation of the building envelope. Hence it is recommended to install $5m^2$ of acoustic absorption on the walls inside the premises in order to attenuate the build up of reverberant sound.

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

PLANNING
ACK'D
REPLIED
REC'D 30 MAY 2008

	INIT REC'D	DATE
M		
M		
M		
FOR ACTION		

Appendix B: Full results of noise survey at 310 Wilmslow Rd. Fallowfield

Filename	Start time	Loc.	Time (m)	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A50}	L_{A90}	Comments	Octave Band Centre Frequency (Hz)										Total (dBA)
											31	63	125	250	500	1000	2000	4000	8000	16000	
GIN1	23:03	1	5.00	74.1	51.7	57.5	54.1	49.5	47.0		70.2	66.9	55.1	51.1	48.1	47.5	42.9	34.9	30.3	30.3	51.7
GIN2	23:08	1	5.00	64.6	52.2	59.1	54.7	50.8	48.3		69.8	65.8	54.3	50.9	49.1	48.7	43.2	34.8	27.6	29.9	52.2
GIN3	23:13	1	5.00	60.7	51.5	58.5	54.6	49.8	47.2		66.0	65.2	54.8	51.2	49.0	47.1	42.7	34.8	28.1	29.9	51.5
GIN4	23:18	1	5.00	80.9	59.6	72.5	58.8	50.4	46.7	Police sirens	63.4	61.9	50.8	48.7	48.6	58.0	52.5	35.7	27.9	30.0	59.6
GIN5	23:23	1	5.00	74.5	51.4	57.9	53.6	49.2	46.3	Car pulls up, car doors slam	68.3	65.2	54.6	50.4	48.0	47.4	42.4	36.0	29.4	30.3	51.4
GIN6	23:28	1	5.00	59.8	50.2	56.5	52.7	49.1	46.4		64.7	62.7	53.9	49.3	46.6	46.6	41.4	33.4	27.7	30.0	50.3
GIN7	23:34	1	5.00	74.3	53.4	61.5	56.5	50.1	46.4		70.1	64.0	54.9	51.9	49.9	49.1	45.6	40.5	34.0	30.8	53.4
GIN8	23:39	1	5.00	63.4	50.0	58.6	52.3	48.5	45.8		62.1	62.9	51.3	49.3	48.3	45.5	40.6	31.4	27.7	30.6	50.0
GIN9	23:44	1	5.00	73.6	52.0	58.3	53.0	48.7	45.7		65.7	64.8	52.9	53.5	49.4	47.3	43.4	36.1	28.3	30.0	52.0
GIN10	23:49	1	5.00	60.6	51.1	57.8	53.6	50.1	46.7		66.5	65.1	53.1	51.2	47.7	46.9	42.9	34.5	28.0	30.0	51.1
GIN11	23:54	1	5.00	72.5	51.4	59.8	52.9	49.2	46.4		69.0	65.4	54.8	50.1	48.1	47.4	42.5	35.1	30.3	30.5	51.4
GIN12	00:00	1	5.00	74.0	51.6	60.3	53.6	49.2	46.6		66.4	65.4	55.0	49.9	47.6	47.9	42.9	34.8	29.2	30.4	51.6
GIN13	00:05	1	5.00	58.3	50.7	57.0	53.6	49.4	47.0		68.9	66.9	55.0	49.6	46.8	46.3	42.3	34.1	28.0	30.1	50.7
GIN14	00:10	1	5.00	60.9	49.5	57.9	51.8	48.0	44.7		62.7	66.5	54.9	48.8	45.4	45.3	40.1	33.1	27.6	30.1	49.6
GIN15	00:15	1	5.00	60.5	49.9	56.0	52.2	49.0	45.4		62.8	65.2	52.9	49.4	45.5	46.1	41.7	33.5	27.7	30.0	49.9
GIN16	00:20	1	5.00	62.2	50.6	57.6	53.4	49.0	46.1		62.7	63.9	53.5	50.6	46.1	46.6	42.8	35.7	29.5	30.2	50.6
GIN17	00:25	1	5.00	74.1	50.1	56.1	51.7	48.3	44.9		66.7	63.8	53.7	50.1	46.9	45.9	41.4	34.0	29.6	30.5	50.1
GIN18	00:30	1	5.00	61.9	50.1	58.0	52.7	48.6	45.0		64.3	64.1	53.8	49.3	45.7	46.2	41.9	34.5	33.4	30.3	50.1
GIN19	00:35	1	5.00	61.6	50.1	57.4	52.9	48.6	44.7		64.3	64.4	53.9	49.7	46.3	46.2	41.5	32.6	28.5	30.1	50.2
GIN20	00:40	1	5.00	59.7	49.2	56.6	52.0	47.2	45.0		60.7	62.1	52.9	49.8	45.2	45.6	40.4	31.5	27.1	30.0	49.2
GIN21	00:45	1	5.00	67.7	52.2	62.9	53.8	48.5	44.4		67.7	62.9	54.7	51.0	48.5	49.0	42.7	33.0	27.6	30.1	52.2
GIN41	13:36	1	5.00	79.2	55.2	62.9	57.5	52.4	49.5		70.2	68.1	59.0	54.7	53.4	49.7	46.5	41.0	35.7	41.5	55.2
GIN42	13:41	1	5.00	67.4	52.9	61.5	54.9	51.1	48.7		69.9	67.7	56.6	50.6	48.1	47.7	44.2	44.0	40.3	31.0	52.9
GIN43	13:46	1	5.00	61.5	52.4	58.2	54.7	51.6	49.3		69.6	67.7	56.9	51.6	48.6	47.6	44.3	38.2	35.5	31.1	52.4
GIN44	13:51	1	5.00	71.9	56.7	67.2	59.7	51.8	49.4		67.9	67.1	56.7	51.0	49.2	47.9	45.2	51.7	51.0	31.2	56.7
GIN45	14:01	2	5.00	93.6	71.9	83.8	72.1	65.9	60.7		75.1	79.2	68.4	64.9	66.4	70.3	62.0	53.3	45.9	40.9	71.9
GIN46	14:06	2	5.00	76.8	66.5	74.0	69.7	64.8	60.8		76.5	76.3	67.1	64.6	63.3	62.9	58.1	51.8	44.8	46.6	66.6
GIN47	14:11	2	5.00	81.9	67.9	76.8	70.9	65.7	60.1		77.6	77.8	69.5	65.8	65.3	63.3	58.4	55.6	53.7	41.9	67.9
GIN48	14:16	2	5.00	91.6	70.9	79.7	72.2	65.9	62.5		75.7	79.3	70.4	67.7	65.8	68.4	62.6	54.7	49.9	43.1	70.9
GIN49	14:21	2	5.00	81.0	67.8	77.5	70.2	65.8	61.6		77.0	77.5	68.3	66.9	64.4	63.8	59.7	54.3	48.2	44.0	67.8
GIN60	23:38	2	5.00	87.8	66.6	74.8	68.7	64.2	57.8	Noise from passers by	73.8	77.4	66.4	63.6	62.9	63.5	58.1	50.7	45.9	34.8	66.6
GIN61	23:43	2	5.00	87.3	65.6	73.6	68.5	62.2	54.5		70.3	71.3	71.4	62.9	62.6	62.0	56.4	49.2	45.0	37.3	65.6
GIN62	23:48	2	5.00	78.9	66.2	75.4	70.0	63.2	57.0		77.5	77.4	68.3	62.7	63.0	62.7	57.2	50.2	45.0	40.0	66.2
GIN63	23:53	2	5.00	74.6	64.3	71.5	68.1	62.1	52.9		73.7	71.2	64.2	62.1	60.4	61.3	55.7	48.2	41.3	36.4	64.3
GIN64	23:58	2	5.00			90.3	72.1	64.8	55.8	Ambulance	74.1	77.4	69.3	63.4	61.6	72.4	70.7	53.1	51.1	40.2	75.4
GIN65	00:03	2	5.00	77.6	64.7	73.8	68.1	62.1	54.7		70.5	76.4	65.1	62.5	61.1	61.6	55.5	48.9	41.2	36.2	64.7
GIN66	00:08	2	5.00	79.2	64.7	74.6	68.7	60.4	54.6	Noise from passers by	70.8	73.1	62.6	61.6	63.0	60.4	55.8	49.5	43.7	36.5	64.7