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CORD BAR,
DORSEY STREET, MANCHESTER

NOISE IMPACT ASSESSMENT

Report **9804-NIA-02**

Prepared on 25 February 2015

Issued For:

The House of Adventure Ltd

Unit 14 Sovereign Enterprise Park

King William Street

Salford

M50 3UP

committed to CSCS Platinum award

ISO 17025

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Institute of Acoustics sponsoring organisation

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1.0 INTRODUCTION

Clement Acoustics has been commissioned by The House of Adventure Ltd to measure existing background noise levels at Cord Bar, Dorsey Street, Manchester. The measured noise levels will be used to determine noise emission criteria for operation of an existing plant unit during proposed extended hours, in agreement with the planning requirements of Manchester City Council.

This report presents the results of the environmental survey followed by noise impact calculations and outlines any necessary mitigation measures.

2.0 SITE DESCRIPTION

Current proposals are to extend weekend opening hours of an existing bar venue during weekend hours. The proposed hours of extension are as follows:

- Friday to Saturday: 23:00-01:00

One result of the bar being open during these hours would be the potential need for operating an installed air conditioning unit.

Following an onsite inspection, the closest noise sensitive residential window to the installed external condenser unit is as shown in attached site plan 9804-SP2. The window is approximately 8m from the plant location, with noise impact calculations undertaken as described below.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Procedure

In order to assess existing background noise levels in the area, an environmental noise survey was undertaken from Friday to Monday at the position marked on indicative site plan 9804-SP2.

Continuous automated monitoring was undertaken for the duration of the survey between 16:00 on Friday 16 January 2015 and 11:00 on Monday 19 January 2015. Weather during the survey was dry with light winds, therefore suitable for measurement of environmental noise.

Noise levels at the noise monitoring position were predominately influenced by road traffic noise from surrounding roads and activity due to surrounding commercial premises on Tib Street and Cord Bar itself. Cord Bar was not operational during the proposed hours of extension, meaning background noise levels during this period are unaffected by existing activity.

The measurement procedure generally complied with BS7445:1991. Description and measurement of environmental noise, Part 2- Acquisition of data pertinent to land use.

3.2 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed.

The equipment used was as follows.

- 1 No. Svantek Type 971 Class 1 Sound Level Meter
- Norsonic Type 1251 Class 1 Calibrator

4.0 RESULTS

The $L_{Aeq: 5min}$, $L_{Amax: 5min}$, $L_{A10: 5min}$ and $L_{A90: 5min}$ acoustic parameters were measured and are shown as a time history in Figure 9804-TH1.

In order to protect the amenity of nearby noise sensitive receivers, minimum existing background noise levels were calculated for daytime, night-time and proposed extended operational hours during the period of the survey.

Minimum measured background levels for these periods are shown in Table 4.1.

	Minimum background noise level $L_{A90: 5min}$ dB(A)
Daytime (07:00 - 23:00)	39
Night-time (23:00 - 07:00)	37
Proposed Extended Hours (Friday & Saturday 23:00-01:00)	49

Table 4.1: Minimum background noise levels

5.0 NOISE CRITERIA

In order to present a robust assessment, we would propose criteria for noise emissions as follows:

> *"The 'A' weighted sound pressure level from the plant, when operating at its noisiest, shall not at any time exceed a value of 10 dB below the minimum external background noise, at a point 1 metre outside any window of any residential property."*

We propose to set the noise criteria at 39 dB(A), the value 10 dB below the minimum measured background noise during the proposed hours of extended operation.

Further requirements of the City of Manchester are as follows:

> *"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 noise level of 5dB below the existing background (LA90) in each octave band at the nearest noise sensitive location."*

6.0 DISCUSSION

6.1 Proposed Installation

The proposed plant installation is comprised of the following:

- 1 No. Mitsubishi SRC71ZK-S Condenser Unit.

Noise emissions for the proposed plant unit, as provided by the manufacturer, are shown in Table 6.1. Loudest modes of operation have been used in order to present a robust assessment.

	Sound Pressure Level (dB) in each Frequency Band, at 1m							
Unit	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Mitsubishi SRC71ZK-S Condenser Unit	58	55	51	51	48	44	41	34

Table 6.1 Manufacturer Noise Emissions Levels

The plant location is on the side facade of the bar venue at high level, in the location shown on indicative site plan 9804-SP2.

6.2 Noise Impact Assessment

The closest identified residential window is to a property located on Dorsey Street, at a distance of 8m.

Taking into account all necessary acoustic corrections, the resulting noise level at the closest noise sensitive window would be as shown in Table 6.2. Detailed calculations are shown in Appendix B.

Receiver	Extended Hours Criterion	Noise Level at Receiver (due to proposed plant)
Noise Sensitive Window	39 dB(A)	38 dB(A)

Table 6.2: Noise levels and criteria at Receiver

As shown in Table 6.2 and Appendix B, the proposed plant installation would be expected to meet the set overall criterion, without the need for particular mitigation measures.

Spectral levels of the calculated noise emission level and background noise are shown in Appendix B, demonstrating that receiver levels are at least 5dB below the background noise levels in accordance with the requirements of Manchester City Council.

6.3 British Standard Requirements

Further calculations have been undertaken to assess whether the noise emissions from the proposed plant unit would be expected to meet recognised British Standard recommendations, in order to further ensure the amenity of nearby noise sensitive receivers.

British Standard 8233:2014 '*Sound insulation and noise reduction for buildings – Code of Practice*' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS8233:2014 recommends 30dB(A) as being acceptable internal resting/sleeping conditions during night-time hours.

With loudest external levels of 38 dB(A), the window itself would need to provide 8 dB attenuation in order for acceptable conditions to be achieved. According to BS8233:2014, a typical facade with an open window provides 15 dB attenuation.

It can therefore be predicted that, in addition to meeting the requirements of Manchester City Council, the emissions from the proposed plant would be expected to meet the recommendations

of the relevant British Standard, with neighbouring windows partially open. Predicted levels are shown in Table 6.3.

Receiver	Design Range – *For resting/sleeping conditions in a bedroom, in BS8233:2014*	Noise Level at Receiver (due to plant installation)
Inside Residential Window	30 dB(A)	23 dB(A)

Table 6.3 Noise levels and criteria inside nearest residential space

7.0 CONCLUSION

An environmental noise survey has been undertaken at Cord Bar, Dorsey Street, Manchester. The results of the survey have enabled criteria to be set for noise emissions from an existing plant unit during proposed extended hours, in accordance with the requirements of Manchester City Council.

A noise impact assessment has then been undertaken using manufacturer noise data to predict the noise levels due to the current proposal at the nearby noise sensitive receivers.

Calculations show that noise emissions from the plant unit would meet the requirements of Manchester City Council and the recommendations of the relevant British Standard, without the need for particular mitigation measures.

Report by

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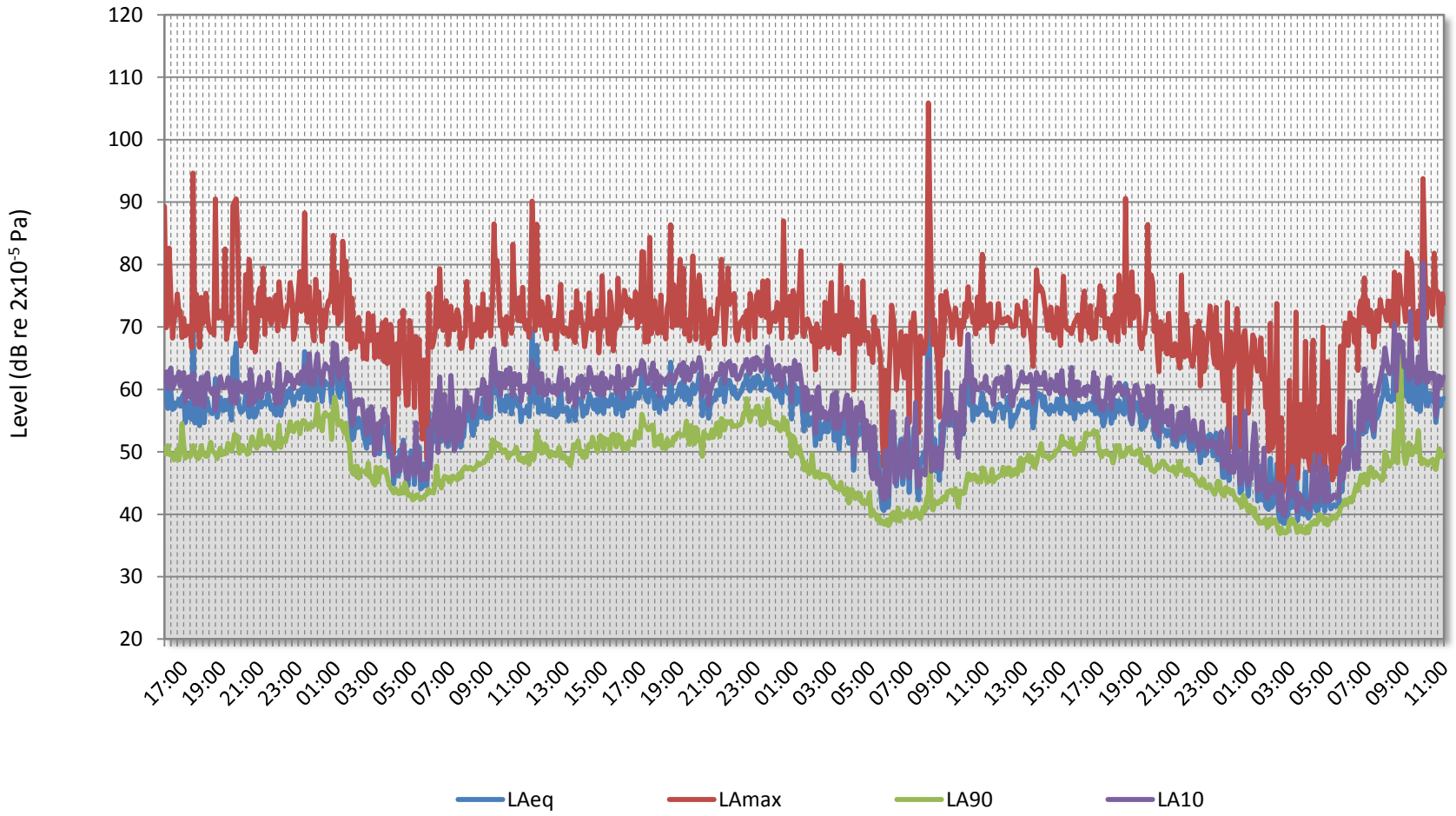


9804-SP2 Indicative site plan showing noise monitoring position and nearest noise sensitive receiver **Date:** 25 February 2015

Cord Bar, Dorsey Street, Manchester

Environmental Noise Time History

16 January 2015 to 19 January 2015



9804-TH1

APPENDIX A

GLOSSARY OF ACOUSTIC TERMINOLOGY

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq}. The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for not more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise

L_{90}

This is the level exceeded for not more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 10 sources produce a 10dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.

APPENDIX B

9804

Cord Bar, Dorsey Street, Manchester

EXTERNAL PLANT NOISE EMISSIONS CALCULATION

Receiver: Nearest Noise Sensitive Window
Source: Existing Plant Installation

	Frequency, Hz								
	63	*125*	*250*	*500*	*1k*	*2k*	*4k*	*8k*	*dB(A)*
Manufacturer provided sound pressure level at 1m									
Mitsubishi SRC71ZK-S Condenser Unit	58	55	51	51	48	44	41	34	53
Correction for reflections, dB	3	3	3	3	3	3	3	3	
Distance correction to receiver, dB (8m)	-18	-18	-18	-18	-18	-18	-18	-18	
Cumulative sound pressure level at Receiver due to units	**43**	**40**	**36**	**36**	**33**	**29**	**26**	**19**	**38**
							Design Criterion		**39**
Minimum Background Noise Levels	**54**	**56**	**47**	**45**	**44**	**38**	**35**	**26**	**49**

BS 8233 ASSESSMENT CALCULATION

Receiver: Inside Receiver Window
Source: Existing Plant Installation

	Frequency, Hz								
	63	*125*	*250*	*500*	*1k*	*2k*	*4k*	*8k*	*dB(A)*
Sound pressure level outside window	43	40	36	36	33	29	26	19	38
Minimum attenuation from facade with open window, dB	-15	-15	-15	-15	-15	-15	-15	-15	
Sound pressure level inside Receiver window	**28**	**25**	**21**	**21**	**18**	**14**	**11**	**4**	**23**
							Design Criterion		**30**