

# SANDY BROWN

*Consultants in Acoustics, Noise & Vibration*

**16080-R01-B**

**22 March 2016**

## 67-75 Mosley Street, Manchester

*Environmental noise survey report*

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## Summary

Sandy Brown Associates LLP (SBA) has been commissioned by OBI Property to provide acoustic advice in relation to the proposed office development at 67-75 Mosley Street, Manchester.

The proposed project consists of refurbishment works to the offices and the addition of new plant items.

An environmental noise survey has been carried out to determine the existing background sound levels in the area and setting appropriate plant noise limits in line with the requirements of Manchester City council.

An environmental noise survey was performed between 11:07 on 25 February 2016 and 12:07 on 29 February 2016.

The typical background noise levels measured during the survey were  $L_{A90,15min}$  58 dB during the daytime,  $L_{A90,15min}$  55 dB during the evening, and  $L_{A90,15min}$  48 dB at night.

Based on the requirements of Manchester City Council and on the results of the noise survey, the cumulative noise level from plant at 1m from the worst affected window of the nearby noise sensitive premises is to be at least 5 dB below the typical background noise level measured.

If plant items contain tonal or attention catching features, the limits should not exceed 5 dB below the typical external noise level in octave bands.

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## 1 Introduction

Sandy Brown Associates LLP (SBA) has been commissioned by OBI Property to provide acoustic advice in relation to the proposed office development at 67-75 Mosley Street, Manchester.

As part of this, an environmental noise survey is required, the purpose of which is to establish the existing background sound levels in the vicinity of nearby noise sensitive premises and to set appropriate limits for noise egress from building services plant.

The background noise levels measured during the survey are used as the basis for setting limits for noise emission from building services plant. These limits are set in accordance with the requirements of Manchester City Council.

## 2 Site description

### 2.1 The site and its surrounding

The site location in relation to its surroundings is highlighted in pink in Figure 1. The site is located in Manchester City Centre, and currently contains 6 floors of office accommodation. It is bounded by Back George Street to the east, Nicholas Street and Manchester Art Gallery to the south, Mosley Street to the west, and 69 Mosley Street office building accommodation to the north.



Figure 1 Site map indicating unattended (L) measurement location (courtesy of Google Earth Pro)

## 2.2 Adjacent premises

The area is predominantly commercial and office accommodation. The nearest office accommodation is the adjoining 65 Mosley Street to the north, 80 Mosley Street and Abbey House to the west and Manchester Art Gallery to the south. These are highlighted in yellow, red, blue and green respectively in Figure 1.

It is understood that the nearest hotel accommodation is Arora Hotel located approximately 95 m to the south on 18-24 Princess Street, this is highlighted in orange in Figure 1. The hotel is screened from the development site by Manchester Art Gallery building.

## 3 Method

Details of the equipment used, the noise indices and the weather conditions during the survey are provided in Appendix A. Further information on the specific survey method is provided in this section.

### 3.1 Unattended measurements

Unattended noise monitoring was undertaken at the site over 5 days to determine the existing background sound levels in the vicinity of nearby noise sensitive premises.

The unattended measurements were performed over 15 minute periods between 11:07 on 25 February 2016 and 12:07 on 29 February 2016. The equipment was installed and collected by Jose M. Gonzalez.

The measurement position used during the survey is indicated in Figure 1, denoted by the letter 'L'.

The monitoring microphone was positioned out of a window on the fifth floor of the building approximately 1 m from the facade of the building and approximately 15 m above local ground level and had an unobstructed view of Mosley Street.

The microphone location was chosen to be reasonably representative of the noise levels experienced by the nearest noise sensitive premises.

## 4 Measurement results

### 4.1 Observations

The dominant noise sources observed at the site during the survey consisted of

- Metrolink tram pass bys.
- Screened generator on Nicholas Street approximately 2.5 m to the south of 80 Mosley Street.

Less significant noise sources included distant road traffic and pedestrians passing by.

### 4.2 Unattended measurement results

The results of the unattended noise measurements are summarised in the following tables. A graph showing the results of the unattended measurements is provided in Appendix B.

The day and night time ambient noise levels measured during the unattended survey are presented in Table 1.

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Table 1 Ambient noise levels measured during the survey

Date	Daytime (07:00 – 19:00)	Evening (19:00 – 23:00)	Night (23:00 – 07:00)
	$L_{Aeq,12h}$ (dB)	$L_{Aeq,4h}$ (dB)	$L_{Aeq,8h}$ (dB)
Thursday 25 February 2016	65 <sup>1</sup>	63	59
Friday 26 February 2016	65	64	62
Saturday 27 February 2016	65	66	62
Sunday 28 February 2016	64	62	57
Monday 29 February 2016	65 <sup>1</sup>	-	-
Average	65	64	60

<sup>1</sup>Measurement not made over full period due to monitoring start and end time, the measurement on 25 February 2016 was over 7.5 hours, and on 29 February 2016 over 4.5 hours; not included in the average

The minimum background sound levels measured during the unattended survey are given in Table 2.

Table 2 Minimum background sound levels measured during the survey

Date	Daytime (07:00 – 23:00)	Evening (19:00 – 23:00)	Night (23:00 – 07:00)
	$L_{A90,15min}$ (dB)	$L_{A90,15min}$ (dB)	$L_{A90,15min}$ (dB)
Thursday 25 February 2016	57 <sup>1</sup>	54	47
Friday 26 February 2016	56	56	49
Saturday 27 February 2016	54	55	48
Sunday 28 February 2016	54	53	47
Monday 29 February 2016	56 <sup>1</sup>	-	-

<sup>1</sup>Measurement not made over full period due to monitoring start and end time, the measurement on 25 February 2016 was over 7.5 hours, and on 29 February 2016 over 4.5 hours.

In line with BS 4142:2014, for the purpose of analysis and establishing representative background sound levels, day, evening and night time typical levels have been quantified using statistical analysis from the continuous logging measurements.

Daytime, evening and night time statistical analyses of representative values for the site are given in Figure 2 to Figure 4.



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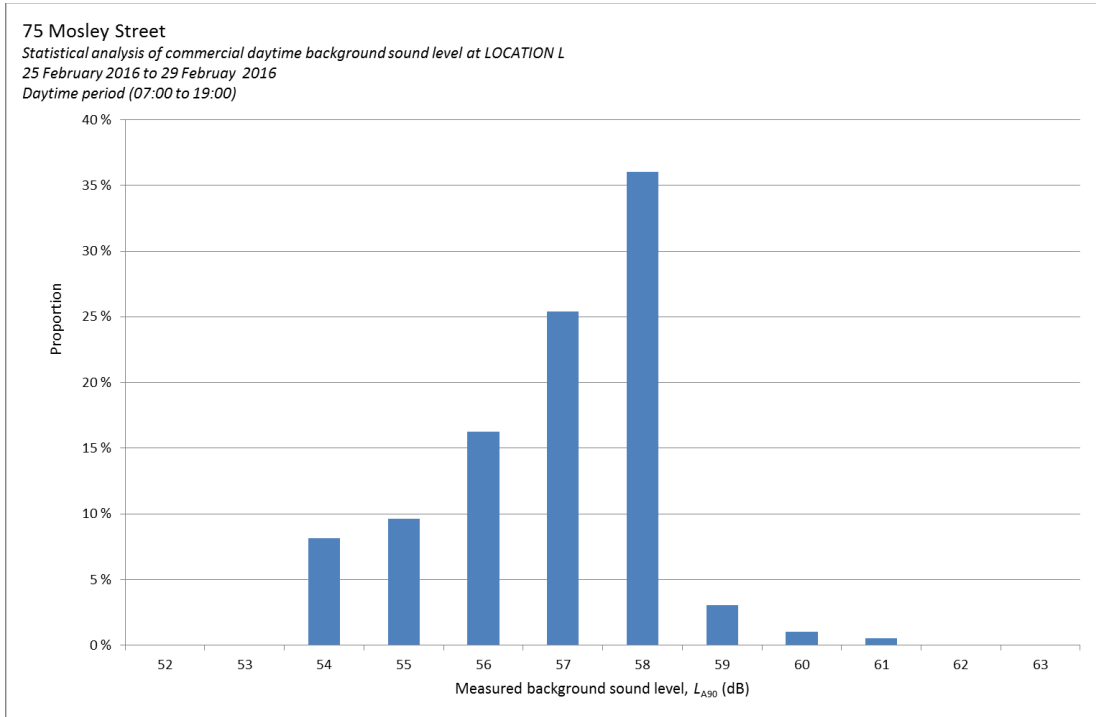


Figure 2 Day-time statistical analysis for 75 Mosley Street to determine representative background sound level.

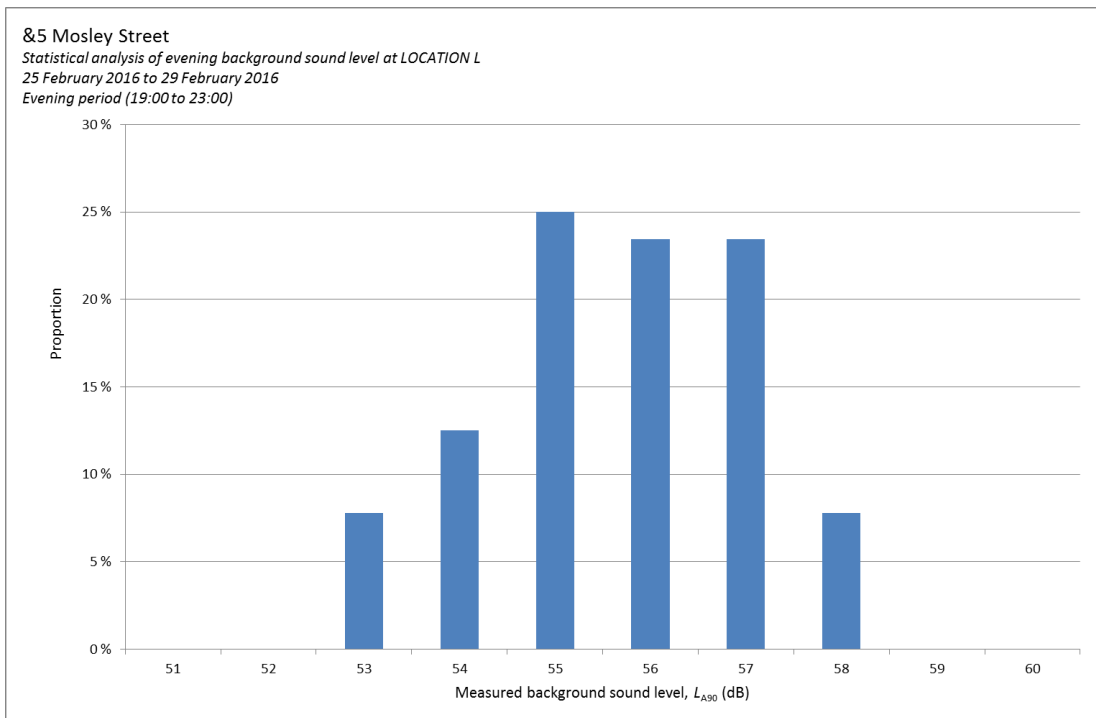


Figure 3 Evening-time statistical analysis for 75 Mosley Street to determine representative background sound level.

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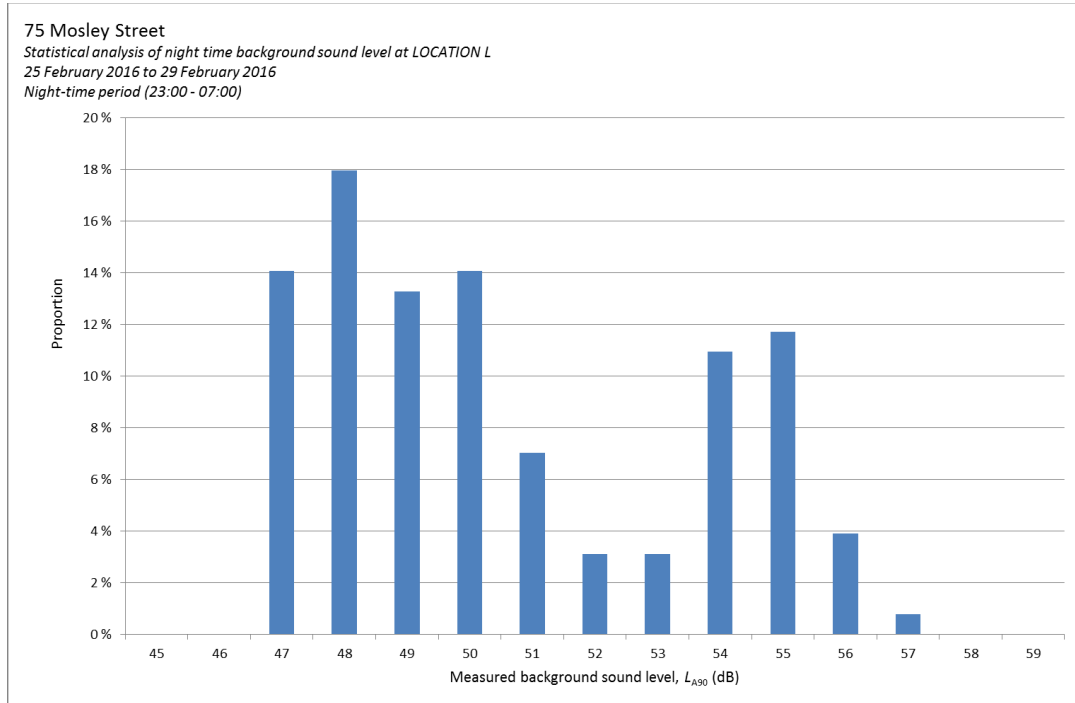


Figure 4 Night-time statistical analysis for 75 Mosley Street to determine representative background sound level.

From this analysis, the representative background sound levels measured during the survey were  $L_{A90,10min}$  58 dB during the daytime,  $L_{A90,10min}$  55 dB during the evening and  $L_{A90,10min}$  48 dB at night

The corresponding octave band levels are provided in Table 3.

Table 3 Typical measured background noise levels in octave bands

	Typical measured background noise levels (dB)						
	Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
Daytime (07:00 – 19:00)	65	60	58	55	52	47	39
Evening (19:00 – 23:00)	62	58	55	53	48	43	35
Night time (23:00 – 07:00)	54	51	49	45	40	35	26

## 5 Assessment criteria

### 5.1 Noise egress

#### 5.1.1 Local Authority criteria

Manchester City Council (MCC) stipulates the following criteria in regards to plant noise emissions:

- a) achieve a noise level ( $L_{Aeq}$ ) of at least 5 dB below the typical background noise levels ( $L_{A90}$ ) at the nearest noise sensitive location at the quietest time the equipment will be in operation; and
- b) not contain any discernible tonal characteristics at the nearest noise sensitive location at the quietest time the equipment will be in operation.

Where the product data suggests there may be a tonal element to the noise (i.e. the octave band noise data shows a peak at a particular frequency) it will be required to demonstrate that noise from the equipment will be at least 5 dB below the typical background noise level ( $L_{90}$ ) in each octave band at the nearest noise sensitive location at the quietest time the equipment will be in operation.

#### 5.1.2 Plant noise limits

Based on the above criteria and the measurement results, the cumulative noise level resulting from the operation of all new plant at 1 m from the most affected windows of the nearest noise sensitive premises should not exceed 5 dB below the typical broadband ( $L_{A90}$ ) external noise level.

Where an item of plant contains tonal characteristic, the limits should not exceed 5 dB below the typical external noise level in octave bands. These limits are set out in Table 4.

Table 4 Plant noise limits at 1m from the nearest noise sensitive premises

	Maximum sound pressure level at 1m from noise sensitive premises (dB)						
	Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
Daytime (07:00 – 19:00)	60	55	53	50	47	42	34
Evening (19:00 – 23:00)	57	53	50	48	43	38	30
Night time (23:00 – 07:00)	49	46	44	40	35	30	21

## 5.2 Noise egress assessment

At this stage, no information is available in relation to the proposed installation of building services plant, and this will need to be assessed in detail as the design progresses. However, all plant items will be designed to achieve the plant noise limits set out above, including any corrections for attention catching features.

## 6 Conclusion

A noise survey has been carried out to determine the existing background sound levels in the vicinity of the site and surrounding noise sensitive premises. The typical background sound levels were  $L_{A90,15min}$  58 dB during the day,  $L_{A90,15min}$  55 dB during the evening and  $L_{A90,15min}$  48 dB at night.

Based on the requirements of Manchester City Council and on the results of the noise survey, the cumulative noise level from plant at 1m from the worst affected window of the nearby noise sensitive premises is to be at least 5 dB below the typical background noise level measured.

These limits are cumulative, and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features the limits should not exceed 5 dB below the typical external noise level in octave bands. These limits are set out in Table 4.

At this stage, no detailed information is available in relation to the proposed installation of building services plant, and this will need to be assessed in detail as the design progresses.

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## Appendix A

### Survey details

## Equipment

A Rion NL-52 sound level meter was used to undertake the unattended measurements. The calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	NL-52/00242704	Rion	20 May 16	1405274
Microphone	UC-59/06187	Rion	20 May 16	1405274
Pre-amp	NH-25/32732	Rion	20 May 16	1405274
Calibrator	CAL200/4501	Larson Davis	20 May 16	1405270

Calibration of the sound level meters used for the tests is traceable to national standards. The calibration certificates for the sound level meter used in this survey are available upon request.

The sound level meters and microphones were calibrated at the beginning and end of the measurements using their respective sound level calibrators. No significant deviation in calibration occurred.

## Noise indices

The equipment was set to record a continuous series of broadband sound pressure levels. Noise indices recorded included the following:

- $L_{Aeq,T}$  The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$  The A-weighted maximum sound pressure level that occurred during a given period with a fast time weighting.
- $L_{A90,T}$  The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

The  $L_{A90}$  is considered most representative of the background sound level for the purposes of complying with any local authority requirements.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg  $L_{A90}$ ) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures.*

## Weather conditions

During the unattended noise measurements between 25 February 2016 and 29 February 2016, weather reports for the area indicated that temperatures varied between -3°C at night and 7°C during the day, and the wind speed was less than 3.6 m/s.

These weather conditions are considered suitable for obtaining representative measurements.

## Appendix B

### Results of unattended measurements at Location L



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**75 Mosley Street**  
*Results of noise logging survey at LOCATION L*  
**25 February 2016 to 29 February 2016**

