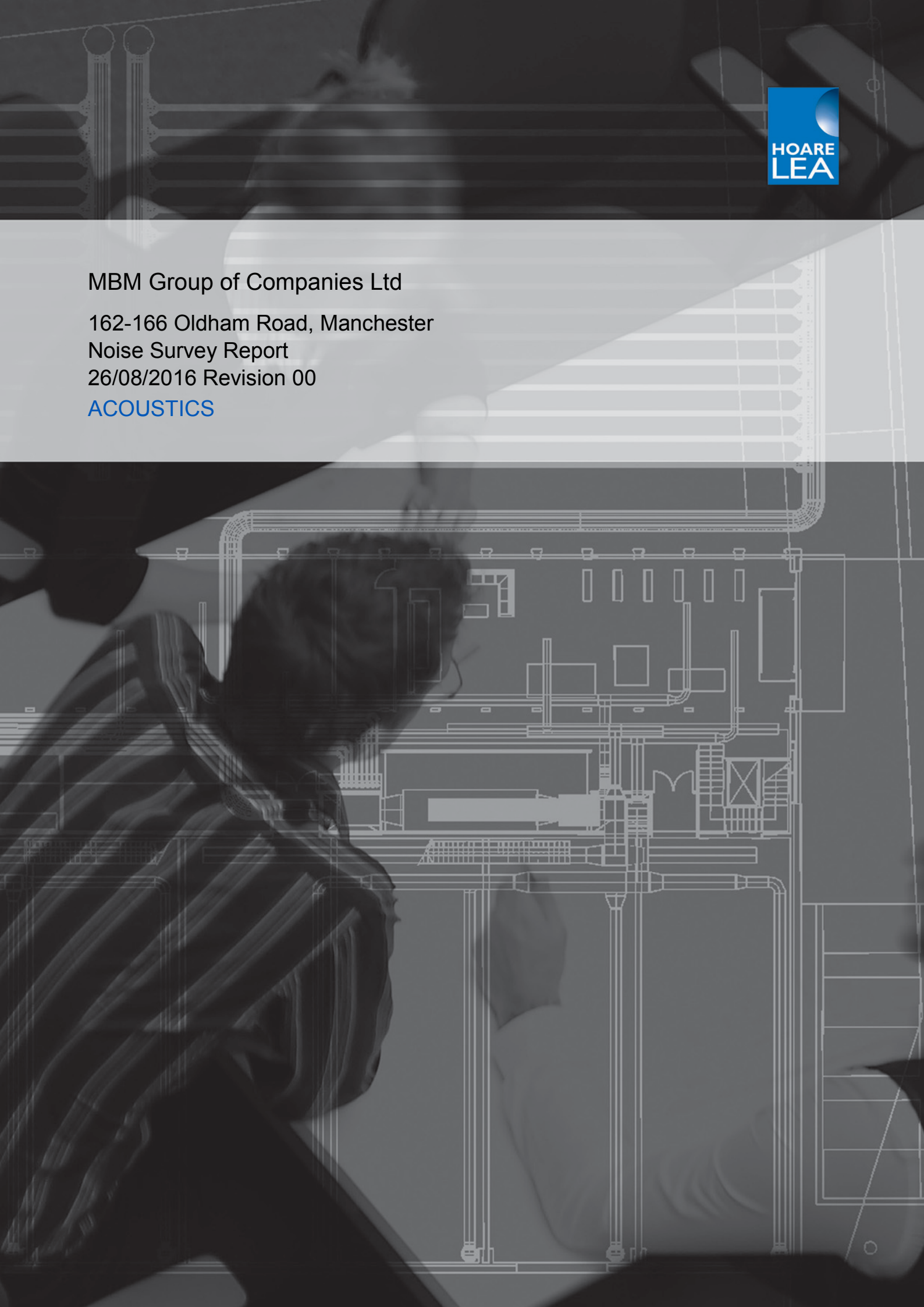


MBM Group of Companies Ltd

162-166 Oldham Road, Manchester
Noise Survey Report
26/08/2016 Revision 00

ACOUSTICS

Audit sheet

Rev.	Date	Description	Prepared	Verified
00	26/08/2016	Original Issue	BMD	JS

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Executive summary

Hoare Lea have been appointed by the MBM Group of Companies Ltd to provide an environmental noise assessment of the proposed new residential development on Oldham Road, Manchester.

Baseline noise measurements have been taken to establish existing ambient noise levels at the proposed development site. These measurements have identified that the site currently experiences relative high levels of noise during both daytime and night-time, with the main source of noise affecting the site being road traffic.

Based on the measured noise levels, indicative façade sound insulation performances have been given that are expected to result in appropriate internal noise levels within the proposed apartments.

In addition, it has been identified that noise from building services plant and equipment will need to be controlled to no more than 44 dB $L_{Aeq,}$ during the daytime and 42 dB L_{Aeq} during the night-time, without exhibiting tonal or impulsive characteristics, in order to comply with Manchester City Council's planning criteria.

1. Introduction

Hoare Lea have been appointed by MBM Group of Companies Ltd to carry out a noise assessment in relation to the proposal of a new build residential development with retail unit on Oldham Road, Manchester.

This report sets out the results of baseline noise measurements taken in the vicinity of the proposed development, provides outline advice in relation to the recommended sound insulation performance of the façade of the proposed residential and sets out environmental noise limits which must be met to control noise from building services plant and equipment that would be required to serve the proposed new development.

To aid in the understanding of the assessment, definitions of technical terms used have been included in Appendix A at the end of this report.

2. Site Description

The proposed site is located on Oldham Road, the primary vehicular link between Oldham and Manchester, in Ancoats, Manchester. It is understood that the development is to consist of 30 residential units and 1 retail unit.

A site plan showing the site location, indicated in yellow, and environmental noise survey measurement position is provided in Figure 1

The site is opposite a Royal Mail depot, with the other surrounding existing buildings primarily consisting of commercial properties and other residential properties. The closest noise sensitive receptor to the site is likely to be considered to be the apartment block located to the south of the site on Portugal Street.



Figure 1: Site plan indicating location of the development site and environmental noise survey position. Image courtesy of Google Maps

3. Standards and Guidance

The assessment contained within this report has been made with reference to the following standards and guidance documents.

3.1 British Standard BS 8233

British Standard BS 8233, Guidance on sound insulation and noise reduction for buildings, 2014, provides general advice and recommendations for controlling noise within buildings. The criteria that are applicable to the proposed development are reproduced for convenience in Table 1 below.

Table 1: BS 8233:2014 Indoor ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	$L_{Aeq16hrs}$ 35 dB	-
Dining	Dining room / area	$L_{Aeq16hrs}$ 40 dB	-
Sleeping (daytime resting) *	Bedroom	$L_{Aeq16hrs}$ 35 dB	$L_{Aeq8hrs}$ 30 dB

**Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values.*

3.2 British Standard BS 4142

British Standard BS 4142, Methods for rating and assessing industrial and commercial sound, 2014, sets out a methodology for assessing noise from commercial and industrial premises affecting residential properties. This methodology is based on comparing the level of noise from the noise source being assessed, with penalties applied to account for tonal or impulsive character if necessary (the “rating level”, measured as an L_{Aeq}), with the underlying background noise level without any influence from the noise source being assessed (measured as an L_{A90}). The following criteria are given in the standard in relation to determining the magnitude of the noise impact:

- Typically, the greater the difference between the rating level and the background noise level, the greater the impact.
- A difference of +10 dB or more between the rating level and background noise level is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around + 5 dB or more between the rating level and background noise level is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the background noise level, the less likely it is that an adverse noise impact (significant or otherwise) will occur. Where the rating level does not exceed the background noise level, this is an indication of the noise source being assessed having a low impact, depending on context.

3.3 Manchester City Council Planning Requirements

In addition to the above British Standards, Manchester City Council apply their own criteria to the assessment of noise from building services plant and equipment. These criteria are set out in the Manchester City Council Planning and Noise Technical Guidance (dated December 2015). The Manchester City Council criteria require that the rating level of noise from building service plant and equipment (measured as an L_{Aeq} and including any relevant penalties for tonality or impulsivity) is at least 5 dB below the typical background noise level (measured as an L_{A90}) at the nearest noise sensitive location.

Manchester City Council outline a criteria within the Manchester City Council Planning and Noise Technical Guidance (dated December 2015). It defines noise as being any unwanted sound, whether it is music, road traffic or industrial machinery and is an unavoidable part of everyday. Noise is considered harmful when it can lead to being a source of stress, irritation and can affect a person's quality of life.

Manchester City Council gives the following criteria for bedrooms, living rooms and gardens/ terraces.

Room Type	Night Time (23:00 – 7:00)	Daytime (7:00 – 23:00)
Bedroom*	30 dB L_{Aeq}	-
Living Room	-	35 dB L_{Aeq}
Gardens/ Terraces	-	55 dB L_{Aeq}

*Individual noise events should not normally exceed 45 dB $L_{Amax,F}$ more than 15 times a night.

4. Baseline Noise Survey

Baseline noise measurements were undertaken in the vicinity of the proposed development site between 16:30 on the 11th August 2016 and 9:30 on the 15th August 2016. These measurements covered a typical working day and night time and a typical weekend day and night time.

4.1 Measurement Position

Unattended noise monitoring equipment was installed on site at the position referenced in Figure 1. A microphone was placed through a second floor window of the existing building, overlooking the adjacent Oldham Road, and extending roughly half a meter from the building's façade.

The measurement position was chosen to capture the typical ambient noise levels to be experienced by the front façades of the proposed residential units as well as the minimum background levels experienced by the closest residential receptor. A photo showing the unattended monitoring equipment is provided in Figure 2.

The equipment at was set to record contiguous 15 minute octave band sound pressure levels between 16:30 Thursday 11th August 2016 and 09:30 Monday 15th August 2016.



Figure 2: Unattended Monitoring Position

4.2 Equipment Details

The monitoring equipment used for the survey was a Svantek SVAN 949 Sound Level Meter. This sound level meter complies with the requirements of IEC 61672-1:2013 for a Class 1 monitoring system. A windshield was fitted to the microphone of the sound level meter during all measurements, which is stated by the manufacturer of the monitoring equipment to maintain the Class 1 performance of the measurement system when fitted. The particular sound level meter used had a current laboratory calibration at the time of the survey and the sensitivity of the monitoring system was checked on site using an acoustic calibrator, which also had a current laboratory calibration at the time of the survey. Full details of the monitoring equipment used during the survey can be found in Appendix B.

4.3 Weather Conditions

Weather conditions over the course of the weekend were mainly dry and overcast with a minimum temperature of 11°C and a maximum temperature of 21°C with wind speeds between 7 and 19 km/h. These meteorological conditions are considered unlikely to have significantly affected the results obtained from the noise monitoring survey.

4.4 Noise Source

The dominant source of existing ambient noise in the vicinity of the site is primarily caused by traffic movement on Oldham Road (A62), which is a main road between Manchester and Oldham.

4.5 Results

The existing noise levels measured during the baseline survey are summarised in Table 2 and Table 3 below. Full results are presented in Appendix C.

Table 2: Summary of Daytime (07:00 - 23:00) measured noise levels

Date	Sound Pressure Level (dB)		
	$L_{Aeq,16hr}$	90th Percentile L_{Amax}	Minimum $L_{A90,1hr}$
Thurs 11/08/2016	71	95	56
Fri 12/08/2016	72	101	57
Sat 13/08/2016	71	94	55
Sun 14/08/2016	70	90	49
Mon 15/08/2016	72	100	61

Table 3: Summary of Night time (23:00 - 07:00) measured noise levels

Date	Sound Pressure Level (dB)		
	$L_{Aeq,16hr}$	90th Percentile L_{Amax}	Minimum $L_{A90,15min}$
Thurs 11/08/2016	68	86	48
Fri 12/08/2016	68	84	51
Sat 13/08/2016	69	94	48
Sun 14/08/2016	67	86	47

4.6 Comments

No measurements were taken between 06:30 and 10:30 on the 12th August 2016 due to a failure with the electrical supply to the measurement system.

The results of the environmental noise survey indicate that the levels experienced by the site are relatively high; this is to be expected though as the site sits directly on the busy Oldham Road (A62). It should also be noted that Manchester Central Community Fire Station is just down the road from the site, on Thompson Street. It is expected that some of the high L_{Amax} level measured are the result of emergency vehicles associate with the fire station.

5. Recommendations

5.1 Ventilation Strategy

It is understood that the scheme is considering the use of natural ventilation. Typically it is expected that approximately 10 - 15 dB attenuation would be achieved from an open window, depending on the position and configuration of the openings.

The ambient noise levels measured at the site were between L_{Aeq} 70 – 72 dB during the daytime and L_{Aeq} 68 – 69 dB during the night-time. Based on the expected attenuation levels through an open windows, the resultant internal noise levels in the rooms would be well above those required by MCC's criteria. As such natural ventilation is not an option for this development and a full mechanical ventilation system should be employed to provide adequate ventilation for the apartments without the need for opening windows.

5.2 Façade Performance

Based on the results from the environmental noise survey, calculations have been carried out to determine the minimum recommended facade sound insulation requirements for the development. These calculations have assumed the development will be fully mechanically ventilated and as such will not require openable windows for ventilation.

Table 4 provides recommended indicative sound insulation performances of the different façade elements in order to comply with MCC requirements.

Table 4: Indicative facade sound insulation requirements

Façade Performance Required		Example constructions
Element	Performance	
Glazing	R_w 38 dB	Double Glazing consisting of a 10 mm pane and a 12 mm panel separated by a 12 mm cavity.
Wall	R_w 50 dB	Cavity Masonry Brick / Block wall / High Performance Cladding System

NOTE: It should be noted that the acoustic rating of glazing systems varies from manufacturer to manufacturer; the sound reduction performance of selected glazing systems should therefore be confirmed as suitable with the manufacturer.

5.3 Control of Noise from Building Services

The minimum background noise levels measured during the survey were 49 dB L_{A90} during the daytime and 47 dB L_{A90} during the night-time. Therefore in order to comply with the MCC criteria for the control of building services noise, noise from plant and equipment associated with the proposed development must be controlled to levels no higher than presented in Table 5 and must not exhibit any tonal or impulsive characteristics.

Table 5 Maximum sound pressure level at 1 m from the nearest residential facade

Time of day	Maximum sound pressure level at 1 m from the nearest residential window (L_{Aeq} dB)*
Daytime (07:00 to 23:00 hrs)	44
Night-time (23:00 to 07:00 hrs)	42

At this stage, the services plant design is conceptual; a detailed assessment of plant noise level emissions will need to be undertaken at a later date when final selections have been made, however plant items and appropriate noise control measures will be selected in order to comply with the criteria set out in Table 5.

It is reasonable to expect that the above criteria could be readily achieved provided the following guidance is observed;

- Low noise plant items (where possible)
- Enclosures to plant items
- Atmosphere side attenuators
- Acoustic louvres

Any future contractor will need to ensure the above noise criteria with regard to plant noise emissions are met in order to satisfy Manchester City Council's noise requirements, which are anticipated as a planning condition.

6. Conclusion

Hoare Lea have been appointed by MBM Group of Companies Ltd to carry out a noise assessment in relation to the proposal of a new build residential development with retail unit on Oldham Road, Manchester.

Baseline noise measurements have been taken to establish existing ambient noise levels at the proposed development site. These measurements have identified that the site currently experiences relatively high levels of noise during both daytime and night-time, with the main sources of noise affecting the site being road traffic and occasional rail traffic.

Based on the measured noise levels, indicative façade sound insulation performances have been given that are expected to result in appropriate internal noise levels within the proposed apartments.

In addition, it has been identified that noise from building services plant and equipment will need to be controlled to no more than 44 dB $L_{Aeq,}$ during the daytime and 42 dB L_{Aeq} during the night-time, without exhibiting tonal or impulsive characteristics, in order to comply with Manchester City Council's planning criteria.

Appendix A – Glossary of Terms

Decibel (dB)

The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

Octave and Third Octave Bands

The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band below. For example two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example third octave bands would be 160 Hz, 250 Hz, 315 Hz for the same 250 Hz octave band.

A-Weighting

The 'A' weighting is a correction term applied to the frequency range in order to mimic the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies. An 'A' weighted value would be written as dB(A).

$L_{eq,T}$

The $L_{eq,T}$ is a parameter defined as the equivalent continuous sound pressure level. Over a defined time period 'T', it is the sound pressure level equivalent to the acoustic energy of the fluctuating sound signal. The $L_{eq,T}$ can be seen to be an "average" sound pressure level over a given time period (although it is not an arithmetic average). Typically the $L_{eq,T}$ will be an 'A' weighted noise level in dB(A). It is commonly used to describe all types of environmental noise sources.

$L_{10,T}$

The $L_{10,T}$ is a parameter defined as the sound pressure level exceeded for 10% of the measurement period 'T'. It is a statistical parameter and can not be directly combined to other acoustic parameters. It is generally used to describe road traffic noise.

$L_{90,T}$

The $L_{90,T}$ is a parameter defined as the sound pressure level exceeded for 90% of the measurement period 'T'. It is a statistical parameter and can not be directly combined to other acoustic parameters. It is generally used to describe the prevailing background noise level or underlying noise level.

$L_{max,T}$

The $L_{max,T}$ is a parameter defined as the maximum sound pressure level that occurred during the time period 'T'. It is commonly used to describe the highest noise level that occurred during an event such as a vehicle pass-by.

Appendix B – Survey Equipment

Item	Make	Model	Serial Number	Calibration Date
Sound Level Meter	Svantek	SVAN 949	6749	24/12/2015
Microphone	GRAS	40AE	236391	
Preamplifier	Svantek	SV 12	5916	
Calibrator	Brüel & Kjær	4231	2205734	02/08/2015

Appendix C – Environmental Noise Survey Results

A graph showing the results from the unattended environmental monitoring survey are provided below in Figure 3.

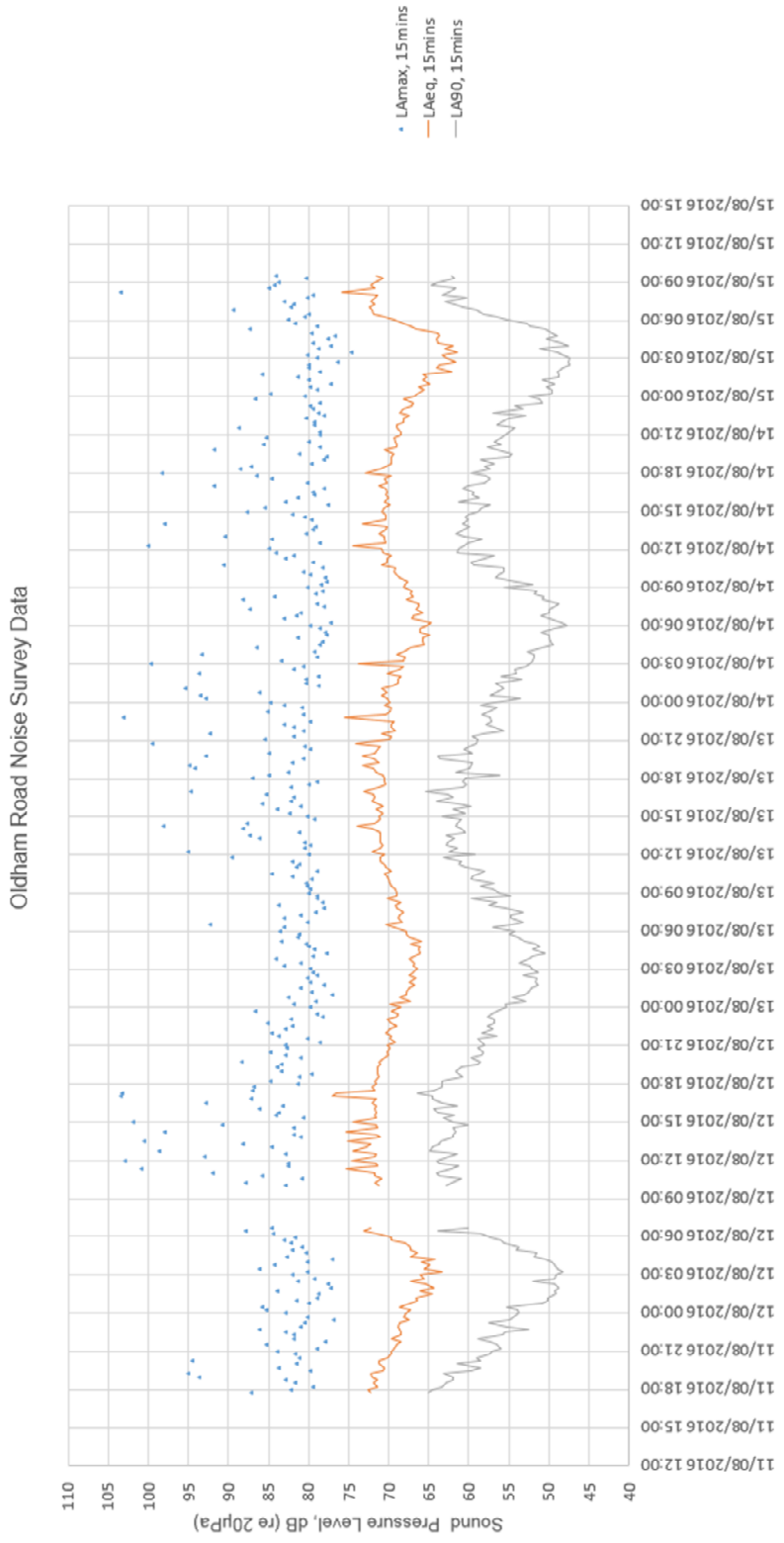


Figure 3: Results of the unattended monitoring

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