

Environmental Noise Report

Proposed Residential Development
Workshop
King Cliff Road
Huddersfield
HD2 2RR

Date of Report: Wednesday 30th April 2019

Reference: 12455 Rev 0

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1 General Information

1.1 Site Address

Proposed Residential Development
Workshop
King Cliff Road
Huddersfield
SW16 3QF

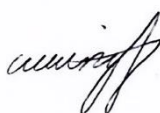
1.2 Client Instructing Survey

Ms Roheena Akhtar
6 King Cliff Road
Huddersfield
HD2 2RR

1.3 Date of Noise Survey

Tuesday 16th to Wednesday 17th April 2019

1.4 Report Author

	Name	Position	Signature	Date
Prepared by	Will Wright BSc AMIOA	Acoustic Consultant		30/04/2019
For and on behalf of: Soundtesting.co.uk Ltd				

1.5 Report Checked

	Name	Position	Signature	Date
Report Checked	M S Hamer MSc MIOA	Acoustic Consultant		30/04/2019
For and on behalf of: Soundtesting.co.uk Ltd				



2 Introduction

Ms Roheena Akhtar has instructed Soundtesting.co.uk Limited to undertake an environmental noise survey in order to assess the impact of sound on the proposed residential apartment from the nearby commercial units as well as general noise within the local environment.

The proposed development is the change of use of an existing workshop into a one residential dwelling.

This report is prepared solely for Ms Roheena Akhtar. Soundtesting.co.uk Limited accepts no responsibility for its use by any third party.

This document has been prepared using the various documents listed within the appendices of this report, together with drawings, technical information and additional verbal representations made by third parties. We have not audited nor independently verified the content or accuracy of any of the documents and information provided to us in the preparation of this report.

If additional information comes to light subsequent to the production of this report, we reserve the right to revise our opinions and the conclusions reached within this report.

2.1 An Environmental Noise Assessment

Soundtesting.co.uk Ltd has undertaken an environmental noise assessment at the above site with noise levels measured externally over a 24-hour period, consisting of a sixteen-hour day (07:00 – 23:00) and eight-hour night (23:00 – 07:00). The measurement was carried out during a weekday. Any noise from the nearby auto-repair garage operational noise will be included in the overall sound measured.

This report will state the measured noise levels and will refer to guidance relevant to the nature of this survey whilst considering Local Planning Authority guidance and conditions.



3 Assumptions & Limitations

- a. All suggested specifications require a good level of workmanship and for materials to be installed as the manufacture intends. Any poor workmanship may lead to weaknesses in the sound attenuation provided by the building elements.
- b. It is assumed that the sound pressure levels measured on site during the environmental noise survey are typical of the site.
- c. It is assumed that the technical data provided by glazing and ventilation manufacturers is up to date and correct.
- d. It is assumed that drawings and information supplied by the architect are up to date and correct.



4 Planning Policies, Guidance and Criteria

The planning policies and criteria listed below are taken from associated relevant guidance documents, all of which should be considered for the internal and external noise and vibration levels.

4.1 Planning Policy

4.1.1 Noise Policy Statement for England (NPSE)

In March 2010 the Government issued a Noise Policy Statement for England (NPSE). The aim of this document is to “provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion.”

The NPSE sets out the long term vision for Government noise policy.

Noise Policy Vision

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

The NPSE includes three primary aims: all interpreted by having regard to a set of shared UK principles that underpin the Government’s sustainable development strategy. The Government’s sustainable development strategy is provided in NPSE paragraph 1.8.

Noise Policy Aims

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life*

The NPSE aims include the terms “significant adverse” and “adverse”

The World Health Organisation is currently applying the following established concepts from toxicology to noise impacts:

- *NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.*
- *LOAEL – Lowest Observed Adverse Effect Level This is the level above which adverse effects on health and quality of life can be detected.*

The NPSE expands these terms leading to the concept of a Significant Observed Adverse Effect Level.

- *SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.*

The NPSE goes on to state that it is not possible to have a single objective noise-based measure that defines SOAEL that will be applicable to all sources of noise in all situations. Consequently, the



SOAEL is likely to be different for different noise sources, for different receptors and at different times.

4.1.2 National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) July 2018 set out the Government's planning policies for England and how they are expected to be applied. It provides a framework within which the Local Authorities are to prepare local plans and use their planning powers to minimise the adverse impact of noise. It should contain the following in relation to noise impacts.

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.'

180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

'mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life'

4.2 Criteria

4.2.1 BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

The British Standard BS 8233:2014, Guidance on Sound Insulation and noise reduction for buildings, gives guidance on internal noise levels within dwellings, flats and rooms in residential use when unoccupied. The following criteria are for Living and Dining Rooms for daytime use and Bedrooms for night time.

Table 1: BS 8233:2014 Recommended Internal Noise Levels			
Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

In addition, BS 8233 suggests, "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".



4.2.2 WHO Guidelines for Community Noise

In 1999, the WHO (World Health Organisation) published Guidelines for Community Noise, stating the following internal noise levels are applicable within dwellings.

Table 2: A Summary of the Guidance Noise Levels				
Specific Environment	Critical Health Effect (s)	L_{Aeq} (dB)	Time base (hours)*	L_{AFmax} (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

* Typically taken to be daytime/evening - 07:00 – 23:00 and night time 23:00 – 07:00.

4.2.3 BS4142:2014 Method for rating and assessing industrial and commercial sound

The British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature.

The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background level and the context in which it occurs.

- Typically, the greater the difference, the greater the magnitude of the impact.
- A difference of around +10dB or more is likely to be an indication of significant adverse impact, depending on context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or significant impact. Where the rating does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on context.



4.3 Local Authority Criteria

The Local Planning Authority have put forward the following criteria, in regard to noise, to which the development must adhere to.

Condition 4 :

Before development commences to construct the superstructure of the hereby approved extension a report specifying the measures to be taken to protect the development from noise from adjacent commercial/industrial premises shall be submitted to and approved in writing by the Local Planning Authority. The report shall:

- (i) Determine the existing noise climate.
- (ii) Predict the noise climate in garden (daytime) bedrooms (night-time) and other habitable rooms of the development.
- (iii) details of the proposed attenuation/design (including ventilation if required) to protect the amenity of the future occupants of the approved dwelling.

Thereafter the development shall be carried out in accordance with the approved details and verified as complete in writing to the Local Planning Authority before occupation of any of the dwelling.

Reason: So as to protect the residential amenity of the future occupants of the approved dwelling and to avoid potential prejudicing of the continued operations of the adjacent businesses, in accordance with Policy EP4 of the Kirklees Unitary Development Plan, Policy PLP52 of the Publication Draft Local Plan and Chapter 15 of the National Planning Policy Framework

4.4 Criteria Summary

All recommendations will be made in order to meet the criteria of BS8233:2014 and BS4142:2014; with reference to WHO Community Noise Guidelines in order to satisfy Local planning Authorities requirements.



5 Site Description

The proposed development site at off King Cliff Road is an existing two storey building which was previously a barn or similar storage building and is proposed to be converted to a residential dwelling. Adjacent to the building to the north is an auto repair commercial premise which was not observed to be operating during site attendance. Adjacent east of the property is the access driveway which comes off King Cliff Road, beyond which are residential dwellings. To the south of the development is a derelict bowling green. To the west is Jack Hill, beyond a 20m stretch of woodland.

The development is currently underway and 4mm glass / 12mm void / 4mm glass double glazing has been installed along the northern façade at ground and first floor level. These are the only proposed windows and they have no trickle vents installed. The client has informed us that ventilation is provided by mechanical vents in the bathrooms and there are no plans for passive ventilation throughout the dwelling. We must assume therefore that purge ventilation will rely on the opening of windows.

During site attendance, subjectively the main source of noise was road traffic. Builders were clearing site refuse into a skip during site attendance and so an effort will be made to omit this from the measured data.



6 Noise Measurement Procedure

6.1 Personnel Present

William Wright BSc AMIOA

6.2 Survey Equipment Used

Table 3: Survey Equipment Used			
Manufacturer	Model	Serial No.	Description
Rion	NL52	1032413	Real Time Analyser Sound Level Meter
Pulsar	Model NC - 74	34678495	Acoustic Calibrator

6.3 Calibration

The sound level meter was calibrated with the field calibrator to a level of 94.0 dB @ 1 kHz prior to and on completion of the survey. No significant drift in calibration was observed. The meter used during the survey is precision grade class 1.

Calibration certificates are available on request.

6.4 Weather Conditions

During the daytime measurement periods the temperature averaged around 7°C, the sky was mostly cloudy with some broken sun. The wind speeds averaged approximately 2 m.s⁻¹ with occasional gusts which may have exceeded 5 m.s⁻¹, blowing in various directions. During the night time period, the temperature averaged around 4°C, with cloudy skies.



6.5 External Ambient Sound Measurements

The sound level meters were set to measure L_{A90} , L_{A10} , L_{Aeq} and L_{AFmax} in 5 minute periods, as well as A-weighted 1:1 octave spectrum analysis.

Data charts can be found in the appendix.

6.5.1 Monitoring Position 1

A microphone was positioned at first floor level on the northern façade of the property out of the window closest to the driveway. The meter was on a pole approximately 4m above the ground and was 1.5m away from the façade.



7 Results and Analysis

7.1 External Ambient Sound Measurement Analysis in Accordance with BS8233:2014

The following table presents the measured results from all monitoring positions.

Table 4: Measurement Results						
Monitoring position	Time Period	Time Base T (hours)	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	L_{A90} (dB)	L_{A10} (dB)
1	Daytime	16	52.5	-	41.7	50.4
	Night time	8	49.5	34.8-85.0	31.9	40.8

7.2 Night-time L_{AFmax} Analysis

At position 1; the L_{AFmax} measured during the night time (23:00-07:00) has been analysed. It is noted that the maximum measured L_{AFmax} is 85.0 dB, which occurred at 06:55 during the night-time period. 85.0 L_{AFmax} dB is exceeded once during the night time period.

The WAV file recordings indicate that the L_{AFmax} 85.0 dB event was from an idle vehicle. The next highest L_{AFmax} event of 83.3 dB occurred at 06:50 and audio recordings indicate this was from an idle vehicle also. The other L_{AFmax} events were a mixture of vehicle noise and predominately birdsong during the early hours of the morning. Site clearing work started at approximately 06:45 hours and the associated L_{AFmax} levels will not be used for specification of glazing. The L_{AFmax} event of 85.0 dB will be used for the assessment and specification of glazing and ventilation.

WHO Community Noise Guidelines states “For a good night sleep it is believed that indoor sound pressure should not exceed approximately 45dB L_{AFmax} more than 10 – 15 times per night (Vallet & Vernet 1991).

7.3 Auto Repair Garage

Noise from the auto repair garage could not be measured whilst the consultant was attending site as the premises was not being used. It is therefore the consultant’s view that the noise mitigation recommendations will account for any auto repair garage noise which occurred during the unmanned part of the survey and will cover the general noise in the area.



8 Recommendations

The estimated internal noise levels attributed by the external noise sources have been assessed over an average of $L_{Aeq,T}$ from the daytime and night-time survey periods and L_{AFmax} values from the night time. This provides the basis for the following recommendations.

8.1 Glazing Specification for all Habitable Rooms

The glazing specification in all rooms should remain the original 4mm / 12mm void / 4mm glass double glazed unit; in well-sealed frames and without trickle vents.

8.2 Gardens/ External Amenity Space

Given the façade corrected measured daytime $L_{Aeq,16hour}$ of 49.5dB(A) it is understood that noise levels in the external amenity spaces during the daytime will be below the WHO Guidelines level of moderate annoyance with no need for additional noise mitigation measures.

8.3 Ventilation

The client has informed Soundtesting.co.uk Ltd. that ventilation is to be provided by the mechanical vents in the bathrooms. For ambient ventilation, windows are required to be open. BS8233:2014 contains a statement to the effect that partially open windows provide 10 to 15dB noise attenuation. In this instance the daytime $L_{Aeq, 16 \text{ hour}}$ would result in internal levels of 37.5dB, night time $L_{Aeq, 8 \text{ hour}}$ would result in internal levels of 34.5dB and night time L_{AFmax} levels of 70dB. This would need to be up to the discretion of the inhabitant whether to prioritise ventilation over good internal noise levels.

8.4 Calculation Methodology

The BRE Building Envelope Insulation calculator has been used for the noise break in calculations for the BS8233:2014 assessment.

In order to calculate the glazing recommendation, the values have had a façade correction of 3dB applied In order to adjust the measurement so that it is comparable to a free-field sound pressure level.

All room dimensions used in calculations are based on drawings provided by the architect.

The calculations assume the external walls to be brick and block as stated in BS8233:2014.

The calculations assume each room has a reverberation time of 0.5 seconds.

The predictions also have been calculated assuming all windows are tightly closed.



8.5 Building Elements

The following table shows the expected performance of the glazing and ventilation.

Table 8: Table showing suggested Glazing & Ventilation								
Element	Description#	$R_w/D_{n,e,w}$ (dB)	Octave Centre Frequencies (Hz) $SRI / D_{n,e}$ (dB)					
			125	250	500	1k	2k	4k
Glazing	4mm/(12)/4mm BS6262-2:2005	29	21	15	25	36	39	31

**The selected units or products described have been used as a guide to form part of the specification. Other similar units or products can be used provided they can achieve the given minimum acoustic performance.*

8.6 Example of Estimated Performance

The following table compares the estimated performance values with the measured values.

Table 9: Estimated performance					
Specification	Time period	Measured External		Predicted Internal	
		Average $L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)
All Habitable Areas	Night time (23:00 – 07:00)	49.5	85.0	12.3	44.0*
	Daytime (07:00 – 23:00)	52.5	-	13.6	-

**The L_{AFmax} level used in the assessment of internal noise levels at night in bedrooms contains a high level of low frequency noise. The highest L_{AFmax} 85.0dB spectrum data shows that the event contained a high level of low frequency noise which the BRE calculation does not account for as it only takes into consideration 125Hz to 2KHz.*



9 Conclusion

The glazing detail that is currently installed as discussed in the recommendations section ensures that the recommended internal and external noise levels described in BS8233:2014 and World Health Organisation Guidelines for Community Noise can be achieved for internal noise levels in all habitable rooms. This will also account for the auto repair garage adjacent north of the site and should satisfy condition 4 as presented in section 4.3 of this report.



10 References

Noise Policy Statement for England (NPSE)

National Planning Policy Framework (NPPF)

BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

World Health Organisation Guidelines for Community Noise

BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures

BS EN 12758:2011 Glass in building – Glazing and airborne sound insulation

BS 6262-2:2005 Glazing in buildings – Part 2: Code of practice for energy, light and sound

www.google.co.uk/maps

10.1 Drawing References

1503/03E – Proposed Elevations

1503/02C – Proposed Layouts

1503/01 – Existing Layouts and Elevations



Appendix

Figure 1: Overview of Development Showing Monitoring Position

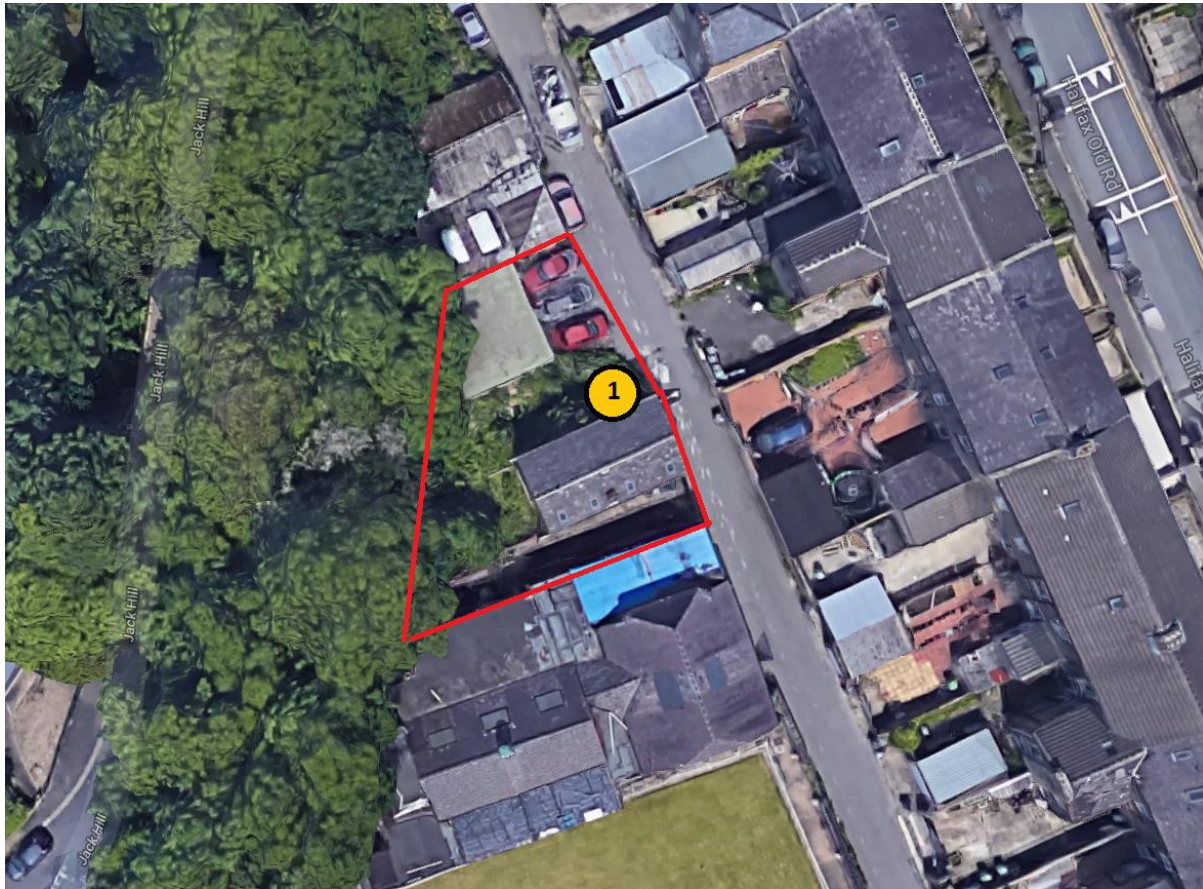




Figure 2: Picture of Monitoring Position

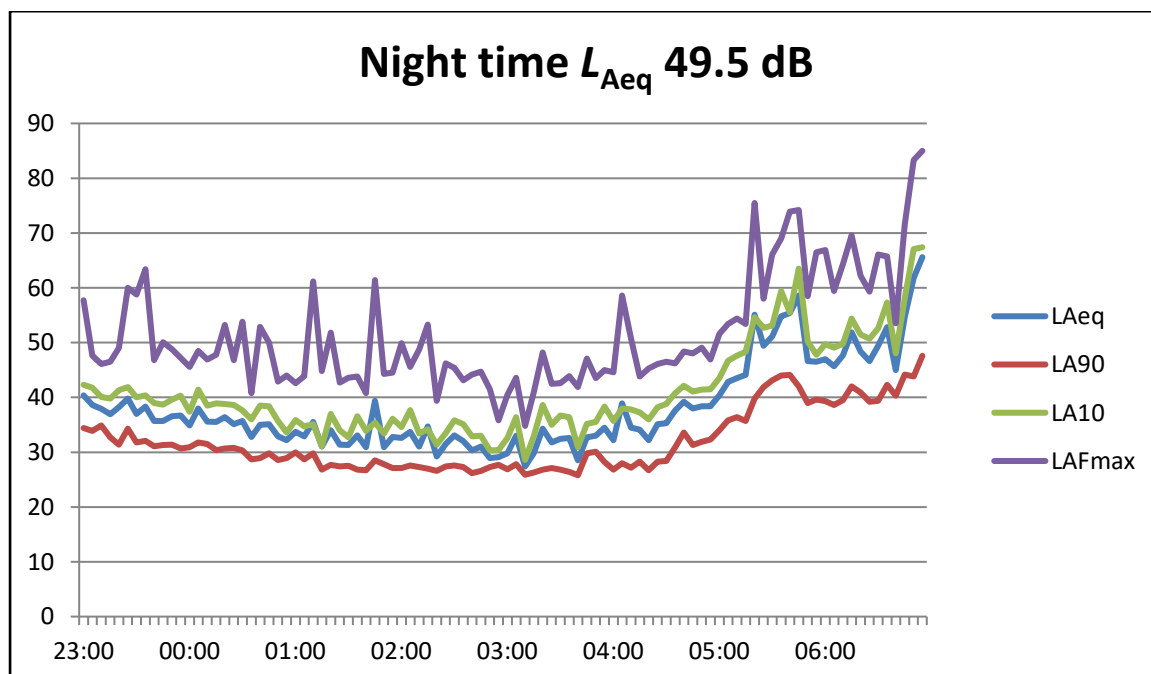
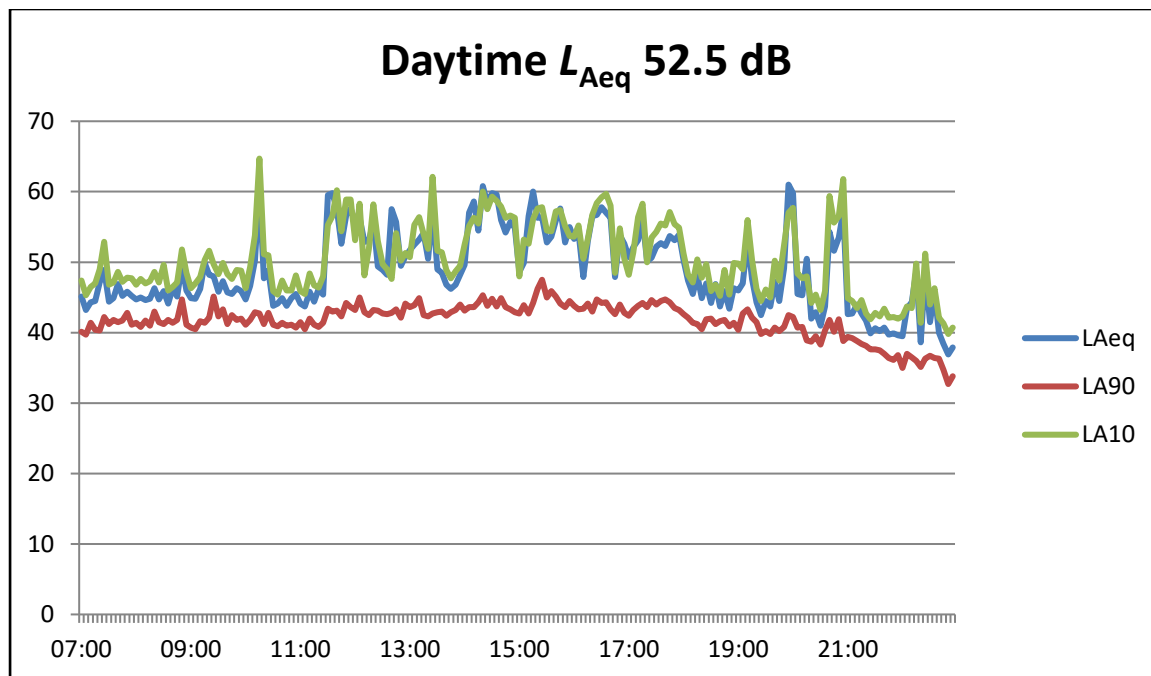




Measurement Results

Monitoring Position 1

Tuesday-Wednesday



**Un-weighted 1:1 Octave Results**