Noise and Sound Services

Inclinator Noise Assessment

At:-
8 Hope Avenue,
North Manly,
NSW 2100

May 2019

Report No. nss 23031 - Final

Prepared at the request of:-

Alluvial Studios
Level 4, 10-14 Waterloo Street,
Surry Hills, NSW 2010

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1. INTRODUCTION

Noise and Sound Services was requested by Tyler Christian of Alluvial Studios of Level 4, 10-14 Waterloo Street, Surry Hills, NSW 2010, on behalf of Bretton and Jen Pack to carry out noise measurements of an inclinator proposed for a residential house at 8 Hope Avenue, North Manly, NSW 2100.

The purpose of the noise measurements is to provide an independent and accurate assessment of noise level emissions from the inclinator to establish compliance with Council conditions.

2. SITE AND INCLINATOR DESCRIPTION

2.1 Site Description

The site at 8 Hope Avenue, North Manly is in a residential area approximately 100 metres east of the Pittwater Road. The nearest neighbour to the location of the proposed inclinator is at 10 Hope Avenue as shown in Figure 1 below.

Figure 1 Site Plan. Source: Google Earth.

2.2 Inclinator Description

The proposed single rail system inclinator lift at 8 Hope Avenue, North Manly has not been provided but assumed is a system similar to the type manufactured

by *'Homelift'* using the *'RailGlider'* model. This model utilises a cable and winch mechanism which is to be located in a sound controlled enclosure at the bottom of the elevation, similar to the one pictured in Figure 2 below.

Figure 2. Example of the 'Homelift' Cable and Winch System Located in a Sound Controlled Enclosure.

The full designs and inclinator location are given Alluvial Studios drawings AL 18 004 Rev D dated 20.02.2019. A sample is given in Figure 3 below.

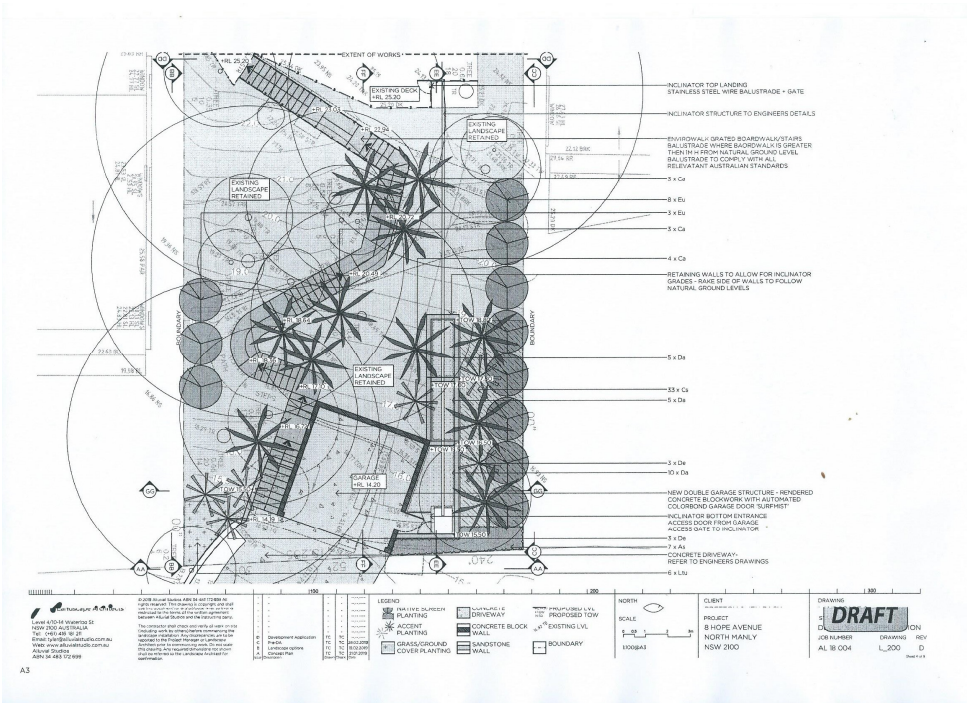


Figure 3. Draft Proposed Inclinator Location. Site Plan. Source: Alluvial Studios.

3. CRITERIA

The inclined lift must not be the cause of offensive noise. Offensive noise is defined in the NSW Protection of the Environment Operations Act 1997 (POEO Act) as being noise:-

'a) that, by reason is of its level, nature, character or quality, or the time at which it is made, or other circumstances:

i. Is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or

ii. interferes unreasonably with (or is likely to Interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

b) that, is of a level, nature, character or quality prescribed by the regulations or that is made at a time or in other circumstances, prescribed by the regulations.'

In a Land and Environment Court judgement, (Appeal No. 11502 of 2004) the condition of consent for an inclinator at residential premises was given as the following:- *"The maximum noise level LAmax "fast response" from the inclinator is not to exceed 60 dB(A), when measured at the boundary of adjoining premises."*

On this basis, we make the assumption that the noise from inclinators is not regarded as offensive if the maximum noise level at the nearest residential boundary is below 60 dBA and it is not used excessively at times of day when it is usual for people at neighbouring premises to be sleeping.

The NSW Noise Policy for Industry (2017) specifically states that sources that are not dealt with by the policy include domestic/neighbourhood noise.

4. NOISE MEASUREMENTS

This section describes the instrumentation used for the noise measurements, the measurement procedure and the results.

4.1 Instrumentation

The instrumentation used for the background is an 'ARL' - Type 2 Environmental Noise Logger, (serial number 194550) was used. This instrument conforms to Australian Standard 1259 "Acoustics - Sound Level Meters", (1990) and have an accuracy suitable for both field and laboratory use.

The calibration of the 'ARL' - Type 2 environmental noise logger was checked before and after the measurement period with a Brüel and Kjær acoustical calibrator model 4230 (serial no. 2445349). No significant system drift occurred over the measurement period. The noise logger have been checked, adjusted and aligned to conform to ARL factory specifications and issued with conformance certificates within the last 24 months as required by the regulations.

The calibrator has been checked, adjusted and aligned to conform to the Brüel and Kjær factory specifications and issued with conformance certificates within the last 24 months as required by the regulations. The internal test equipment used is traceable to the National Measurement Laboratory at C.S.I.R.O., Lindfield, NSW, Australia.

4.2 Measurement Procedure

The acoustical measurements were carried out in accordance with Australian Standards AS 1055. "*Acoustics –Description and measurement of environmental Noise"*, (1997) and the NSW Noise Policy for Industry (2017). Background and ambient noise measurements were taken at the site at a height of approximately 1.5 metres and 2 metres from the boundary with 10 Hope Avenue (see the star symbol in Figure 1 above). This was in the free field and the 'A' frequency weighting and the 'fast' time weighting were used exclusively. Noise measurements were carried out between 12 noon Tuesday 30th April 2019 and 12 noon Tuesday 7th May 2019.

4.3 Measurement Results.

4.3.1 Background and Ambient Noise Measurement Results

The existing, on-site, background and ambient noise level measurement results are shown in Table 1 below.

TABLE 1 – EXISTING ON-SITE BACKGROUND AND AMBIENT NOISE LEVEL MEASUREMENT RESULTS.

Time of Day	Rating Background Noise Levels (L_{A90}) dBA	Log Average Existing Ambient Noise Levels (L_{Aeq}) dBA
Day (07:00 – 18:00)	44	55
Evening (18:00 – 22:00)	41	52
Night (22:00 – 07:00)	34	48

Note 1- All levels rounded to the nearest whole decibel.

4.3.2 Source Noise Measurements

Source noise measurements were carried out at another site with an existing, inclinator winch system in operation (see Figure 1 above). The results are shown in Table 2 below.

TABLE 2 – THE HOMELIFT 'RAILGLIDER' NOISE LEVEL MEASUREMENT RESULTS.

Distance from Cable and Winch Enclosure	Inclined lift Direction and Load	Measured Sound Pressure Level dBA	
		$L_{Aeq, sample}$	L_{AFmax}
2 metres	Down - Empty	56	58
2 metres	Up - Empty	56	58
4 metres	Down - Empty	54	57
4 metres	Up - Empty	53	56
4 metres	Down – 1 Person	51	54
4 metres	Up - 1 Person	51	54

Note: All levels rounded to the nearest whole decibel.

5. ASSESSMENT AND RECOMMENDATIONS

The noise level (L_{AFmax}) from a proposed cable and winch enclosed system similar to the Homelift *'RailGlider'* inclinator is expected to exceed the existing background noise level ($L_{A90, 15\ minute}$). However it is not predicted to exceed the previous Land and Environment Court's condition of consent of 60 dBA. This is when measured at the nearest residential boundary which is approximately 2 metres in this case. The noise level from the movement of the car/carriage is generally less than the noise level from the cable and winch within the enclosure. It is recommended that the inclinator is to be well maintained to ensure unusual noise levels do not occur.

6. CONCLUSION

The noise measurement results show that the noise emissions from a proposed inclinator (similar to a Homelift *'RailGlider')* at 8 Hope Avenue, North Manly, is not predicted to exceed a maximum noise level ($L_{AF, max}$) goal of 60 dBA when located at the nearest neighbouring premises. This is providing that the proposed

inclinator is not used excessively at the times when it is usual for people at neighbouring premises to be sleeping and that the system is well maintained.

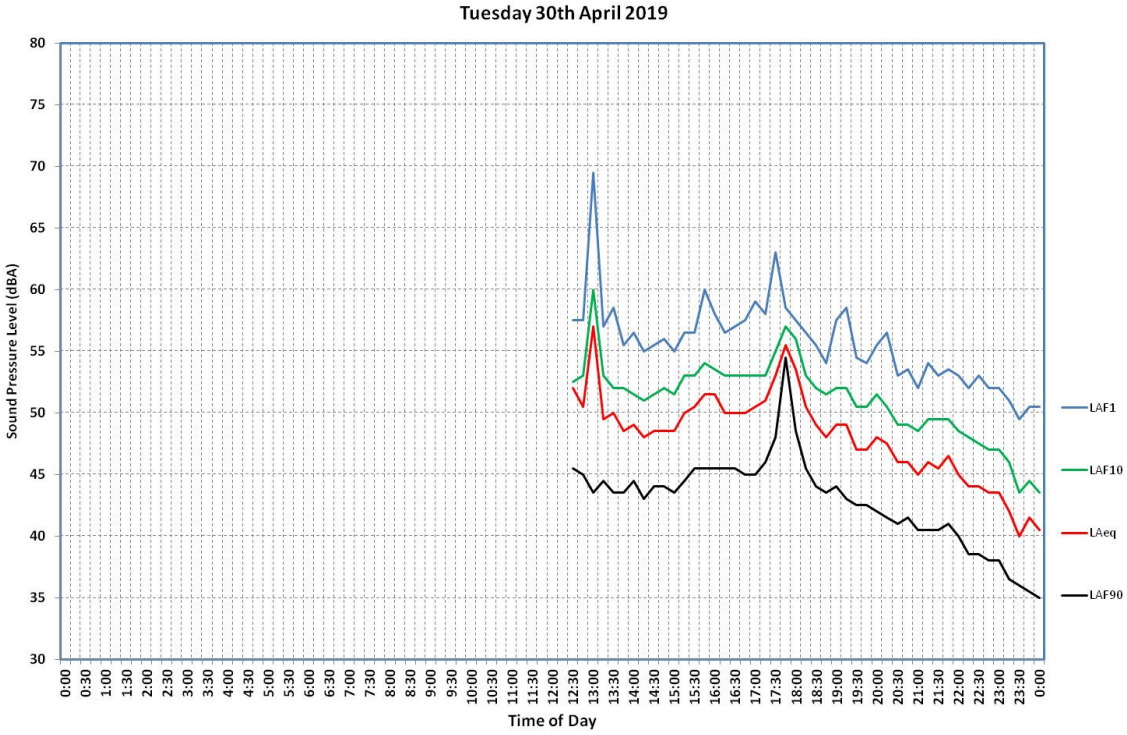
Status	**Date**	**Prepared by:**
Draft	8th May 2019	Mark Scannell B.A. MAAS
Status	**Date**	**Cheeked by:**
Draft	9th May 2019	Ken Scannell MSc MAAS
Status	**Date**	**Issued by:**
Final	14th May 2019	Ken Scannell MSc MAAS

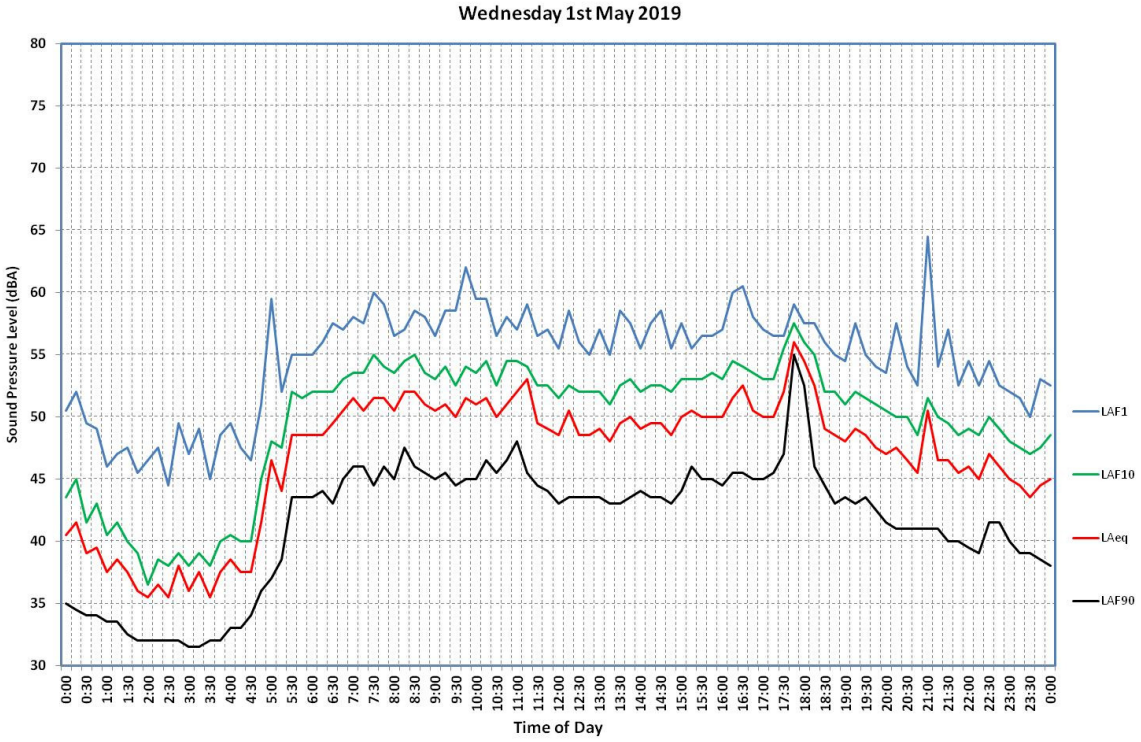
Important Note. *All products and materials suggested by 'Noise and Sound Services' are selected for their acoustical properties only. All other properties such as airflow, aesthetics, chemical, corrosion, combustion, construction details, decomposition, expansion, fire rating, grout or tile cracking, loading, shrinkage, smoke, ventilation, etc are outside of 'Noise and Sound Services' field of expertise and* ***must be*** *checked with the supplier or suitably qualified specialist before purchase.*

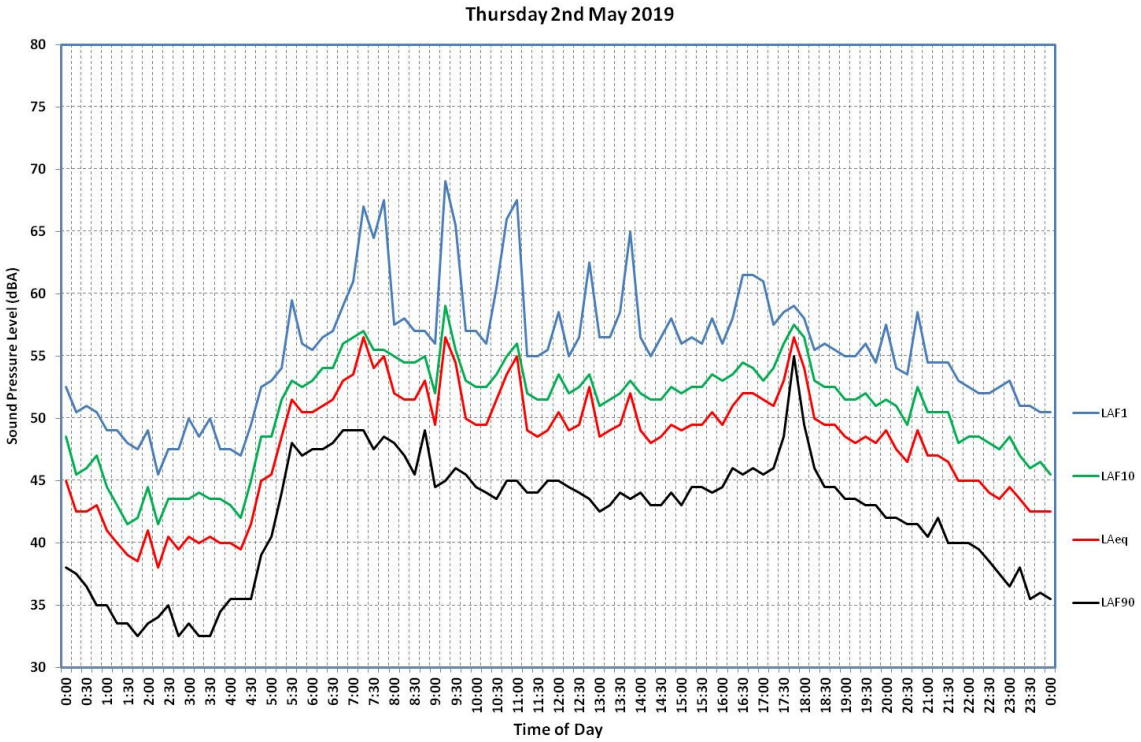
APPENDIX A – MEASURED SOUND PRESSURE LEVELS

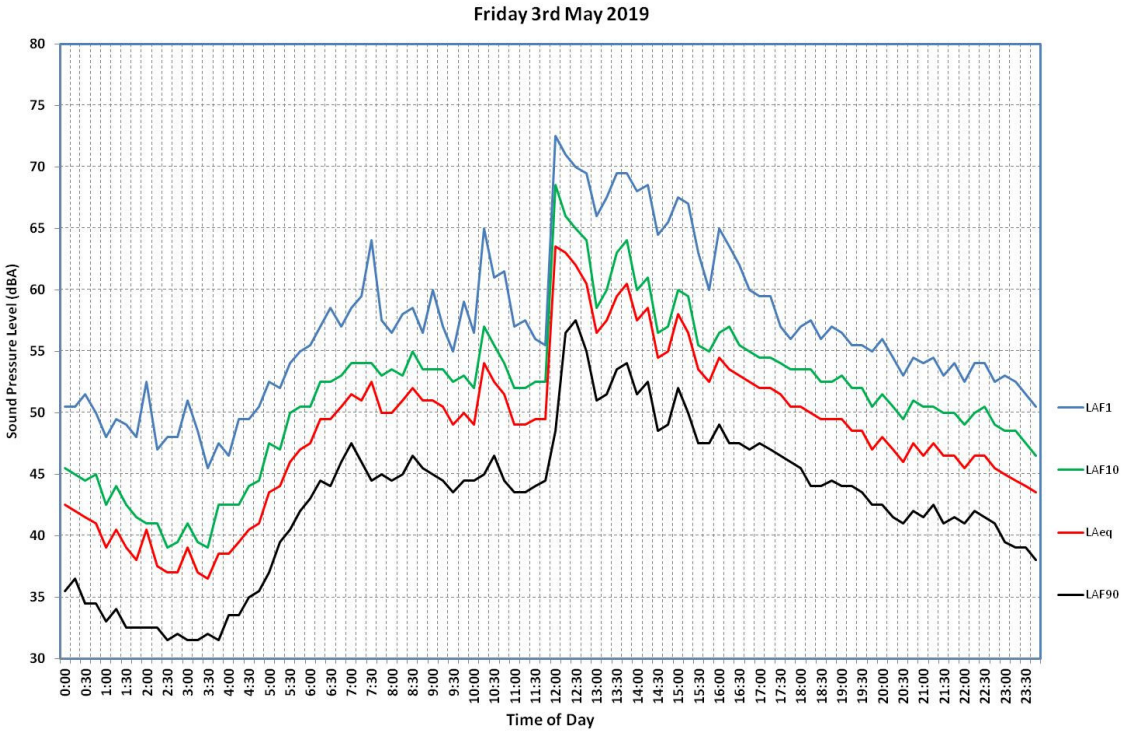
Environmental noise levels can vary considerably with time; therefore it is not adequate to use a single number to fully describe the acoustic environment. The preferred, and now generally accepted, method of recording and presenting noise measurements is based upon a statistical approach. For example, the L_{A10} noise level is the level exceeded for 10% of the time, and is approximately the average maximum noise level. The L_{A90} level is the noise level that is exceeded for 90% of the time, and is considered to be approximately the average of the minimum noise level recorded. This level is often referred to as the "background" noise level. The L_{Aeq} level represents the average noise energy during the measurement period. This level is often referred to as the 'ambient' noise level.

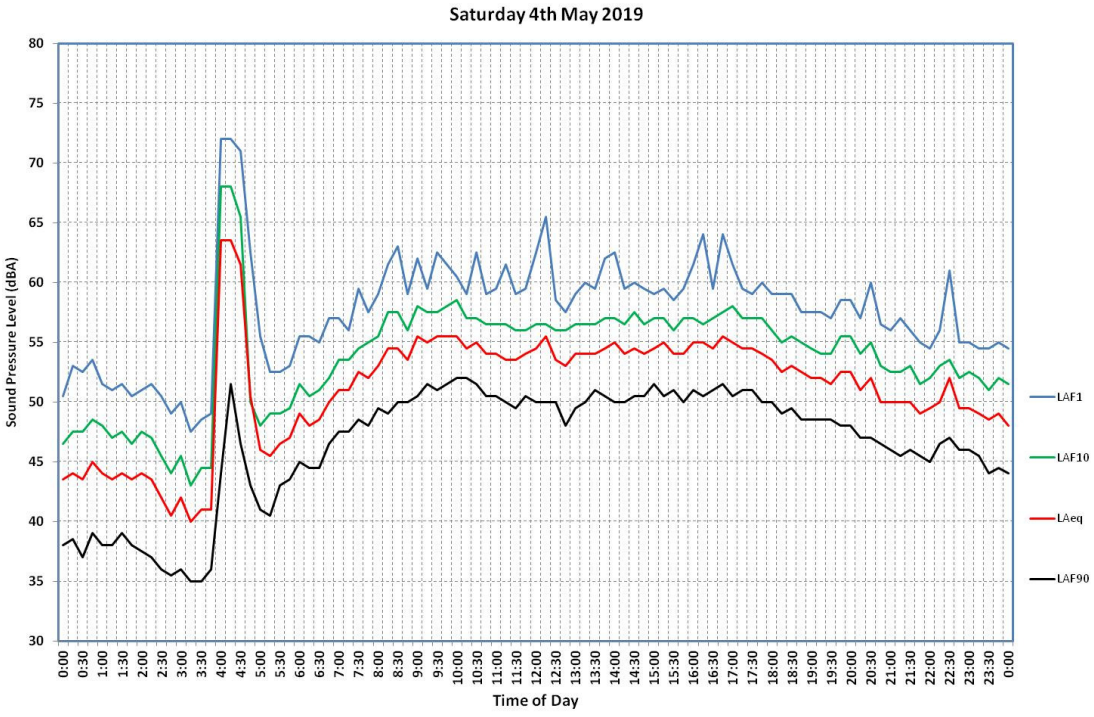
The measurements results from ambient noise monitoring are shown below.

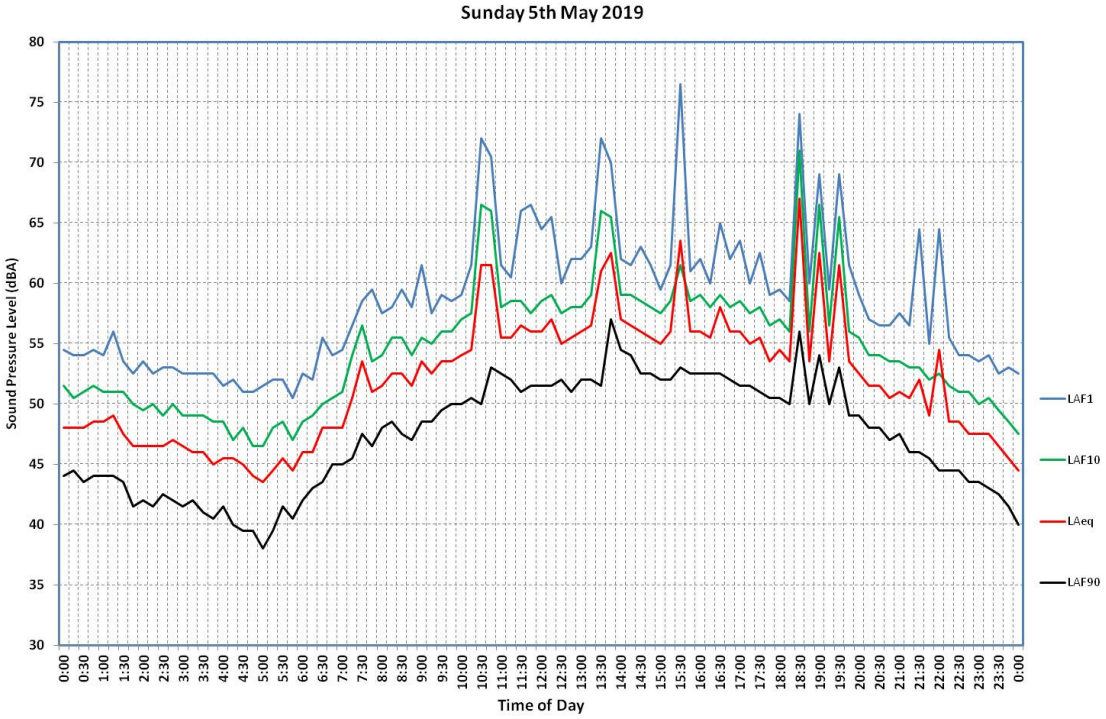


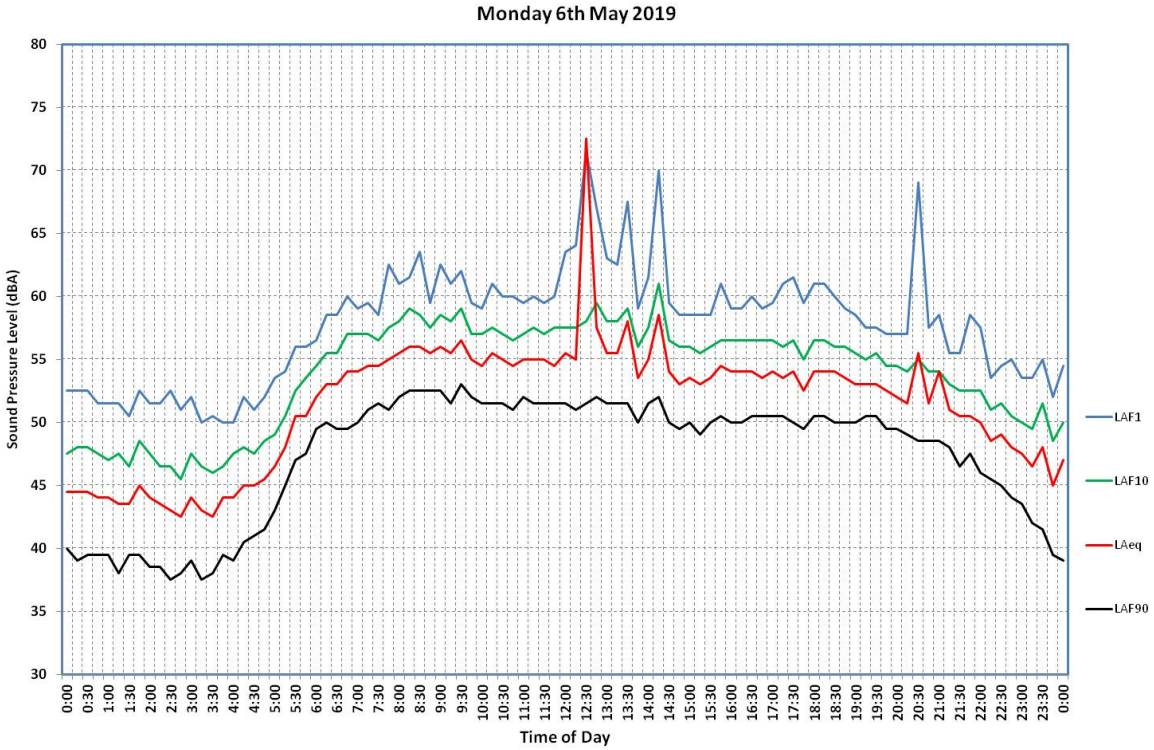

Wednesday 1st May 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90

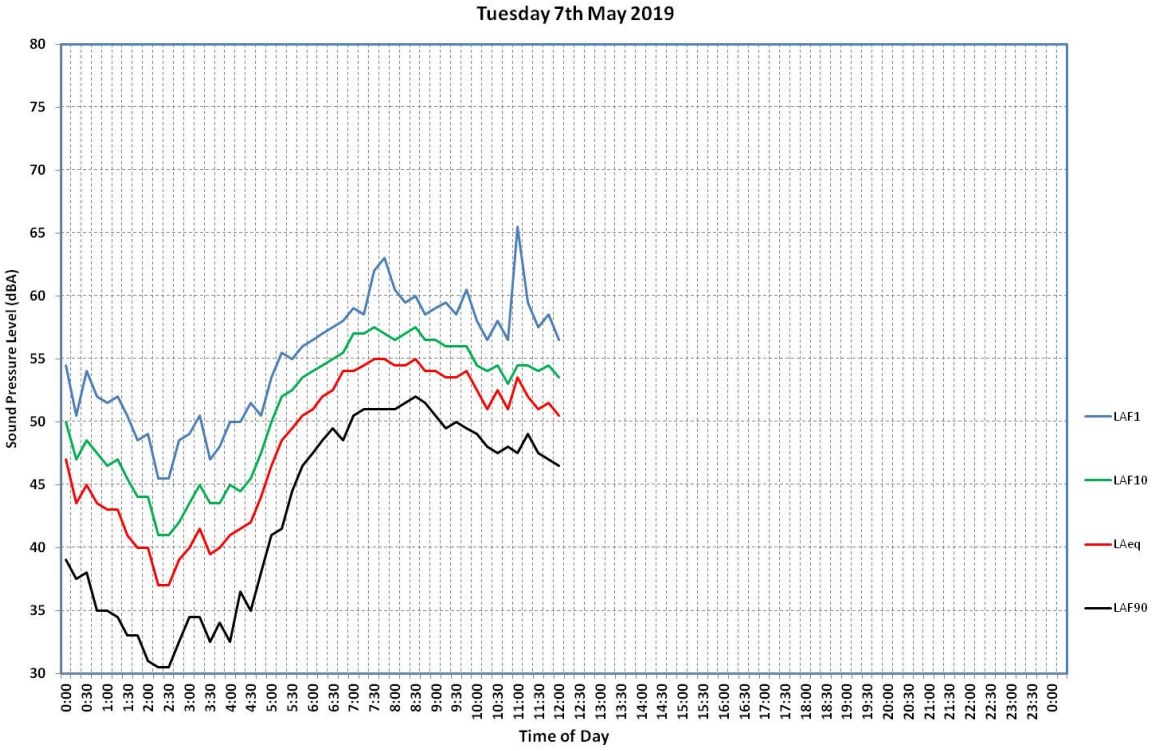

Thursday 2nd May 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90


Friday 3rd May 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90


Saturday 4th May 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90


Sunday 5th May 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90


Monday 6th May 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90


Tuesday 7th May 2019
Sound Pressure Level (dBA)
80
75
70
65
60
55
50
45
40
35
30
0:00
0:30
1:00
1:30
2:00
2:30
3:00
3:30
4:00
4:30
5:00
5:30
6:00
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7:00
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23:00
23:30
0:00
Time of Day
LAF1
LAF10
LAeq
LAF90