Noise and Sound Services

Proposed Development Noise Assessment

At:-

91 to 93 McIntosh Road, Narraweena, NSW 2076.

March 2019

Report No. nss 23001 – Final

Prepared at the request of:-

DREAMBUILD Pty Ltd
6/37A King Road
Hornsby
NSW 2099

Prepared by:-

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C O N T E N T S

EXECUTIVE SUMMARY

This report assesses the likely effect on adjoining residential occupancies of the driveway access, mechanical ventilation, and noise transmission/vibration from the proposed development.

Existing ambient and background noise levels have been measured at 91-93 McIntosh Road, Narraweena, NSW 2099. This was continuous for a period of at least 7 days of good weather prior to commencing building construction and prior to the installation or operation of any mechanical equipment. The noise measurements have been used to set noise goals ($L_{Aeq,\ 15\ minute}$) for mechanical plant which are 49 dBA, 46 dBA and 37 dBA for day time, evening time and night time respectively.

Noise emissions from mechanical plant have been calculated for the proposed development at 91-93 McIntosh Road, Narraweena, based on data as given by HVAC, an equipment maintenance services company for the project - Dynatech Industries Pty Ltd.

All mechanical plant is predicted to meet the day time noise goals; however, using a typical worst-case scenario the night time noise goal could be exceeded at the nearest residential premises at 89 McIntosh Road. Hence, noise mitigation in the form of attenuators giving a 10 dB reduction will ensure 24 hour compliance.

It is recommended that the bedroom window of 89 McIntosh Road (see Figure 2 above) is upgraded with thick laminated glass to minimise vehicle noise from the driveway access. The driveway should not be rigidly connected to the neighbouring slab and be completed with a smooth finish concrete (or similar) without any humps or irregularities to minimise vehicle vibration.

1. INTRODUCTION

Noise and Sound Services was requested by Dreambuild Pty Ltd of 6/37A King Road, Hornsby, NSW 2077, to carry out a mechanical plant noise assessment at the proposed development at 91 to 93 McIntosh Road, Narraweena, NSW 2099. Vibration from mechanical plant and noise from vehicle movements are also considered.

2. SITE AND PLANT DESCRIPTION

This section describes the location of the site and provides a description of the proposed mechanical plant on the site.

2.1 Site Description

The proposed site is at the corner of Alfred Street and 91-93 McIntosh Road, Narraweena, NSW 2099. McIntosh Road is a busy road with constant day and evening time traffic, including buses. Narraweena Public School is adjacent to the site (see Figure 1). Alfred Road is less busy but still has a constant flow of day and evening time traffic to the shops and school. The nearest neighbouring residential premises include 89 McIntosh Road, the top floor of 103 Alfred Street and a new dwelling at 103A Alfred Street also shown in Figure 1.

Figure 1. Site Plan. Source: Google Earth.

2.2 Project Description

It is proposed to demolish the existing block of small shops on the site at the corner of Alfred Street and 91-93 McIntosh Road, Narraweena, NSW 2099 and construct nine residential units above three ground floor retail units and two com spaces. Full details are shown in the architectural drawings by Benson McCormack Architecture of Studio 5, 505 Balmain Road, Lilyfield NSW 2040 for Project 1816A, Rev B, dated 02.19.

2.3 Mechanical Plant

The proposed mechanical plant includes a car park exhaust fan (CPE), three kitchen exhaust fans (KEF) all roof mounted, outdoor air conditioner condensers and apartment toilet exhaust fans (EF).

3. NOISE CRITERIA

3.1 Northern Beaches Council.

Northern Beaches Council have requested, as part of the DA, an acoustic report specifically addressing the following:

"Due to the increased intensity of site use, noise implications to adjoining residences needs to be taken into consideration. This issue relates to mechanical ventilation particularly from the commercial occupancies, car park area ventilation and the proximity of the driveway to number 89 McIntosh Road where potentially increased vehicle numbers will be accelerating uphill beside a dwelling. Historically the site originally operated 9-5pm and vehicle access will now be potentially 24 hours.

It is clear that intended use of some of the commercial occupancies will be for food businesses which will require cooking and mechanical ventilation and a separate DA will be required, but these noise issues need addressing generally at DA stage.

It is recommended before approval is given that the applicant submit an acoustic engineers report assessing the likely effect on adjoining residential occupancies of the driveway access, mechanical ventilation, and noise transmission/vibration to the residential components of the building".

3.2 Protection of the Environment Operations (Noise Control) Regulation

The NSW State legislation which is the Protection of the Environment Operations (Noise Control) Regulation 2008, Section 52 states:-

"Air conditioners and heat pump water heaters:-

(1) A person must not cause or permit an air conditioner or heat pump water heater to be used on residential premises in such a manner that it emits noise that can be heard within a habitable room in any other residential premises (regardless of whether any door or window to that room is open):

(a) before 8 am or after 10 pm on any Saturday, Sunday or public holiday or:

(b) before 7 am or after 10 pm on any other day.

Maximum penalty: 100 penalty units in the case of a corporation, 50 penalty units in the case of an individual.

(2) A person is not guilty of an offence under subclause (1) in relation to a heat pump water heater if the conduct alleged to give rise to the offence occurs within 6 months after the commencement of this Regulation.

(3) A person is not guilty of an offence under subclause (1) unless:

(a) the person has, within 7 days after causing or permitting an air conditioner or heat pump water heater to be used in such a manner, been warned by an authorised officer or enforcement officer not to cause or permit the air conditioner or heat pump water heater to be used in that manner, and

(b) the person causes or permits an air conditioner or heat pump water heater to be used in that manner within 28 days after the warning has been given.

(4) In this clause: heat pump water heater means a device that heats water using the energy generated from the compression of a gas."

4. BACKGROUND AND AMBIENT NOISE LEVELS

Existing ambient noise levels have been measured continuously for a period of at least 7 days of good weather prior to operation of any equipment. The following sections describe the measurement procedure, instrumentation and results.

4.1 Background and Ambient Noise Monitoring Procedure

Free field continuous noise monitoring was carried out from Tuesday 5th March 2019 through to Tuesday 12th March 2019. The noise logger was located at the side of 89 McIntosh Road, Narraweena facing the proposed site. Background and ambient noise levels are dominated by road traffic using McIntosh Road.

The noise logger was set for the 'A' frequency weighting and 'fast' time weighting. The weather conditions were consistent with little or no rain or adverse weather conditions. Noise monitoring was completed during typical representative conditions and no unusual circumstances or activities were likely to have affected the noise monitoring results.

4.2 Background and Ambient Noise Monitoring - Instrumentation

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

The calibration of the 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 periods.

The environmental noise logger and calibrator have been checked, adjusted and aligned to conform to the Brüel and Kjær or ARL 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 2070.

4.3 Background and Ambient Noise Monitoring Results

Measured ambient noise levels are assessed according to the NSW Noise Policy for Industry in terms of ambient noise (L_{Aeq}) and background noise (L_{AF90}) for the time periods defined as: Day: 7:00 am – 6:00 pm, Evening: 6:00 pm – 10:00 pm and Night: 10:00 pm – 7:00 am.

The recorded $L_{AF90,\ 15\ minute}$ levels determine the Rating Background Level (RBL). The RBL is defined as the median value of the tenth percentile value for the recorded $L_{AF90,\ 15\ minute}$ levels for the complete monitoring period. The tenth percentile is also referred to as the Assessment Background Level (ABL).

The resultant RBL (L_{AF90}) and ambient (L_{Aeq}) levels for each period are summarised below in Table 1. The full statistical noise measurement results are shown in graphical form in Appendix A below.

TABLE 1 – SUMMARY OF EXISTING LOGGED NOISE LEVELS.

Time of Day	Rating Background Noise Levels - RBL (L_{AF90}) dBA	Log Average Existing Ambient Noise Levels (L_{Aeq}) dBA
Day (07:00 – 18:00)	44	56
Evening (18:00 – 22:00)	41	57
Night (22:00 – 07:00)	32	49

Note - All levels rounded to the nearest whole decibel.

4.4 Noise Goals for Mechanical Plant

For permanent operational mechanical plant, the project specific noise goals as shown in Table 2 below apply. This is based on the measured (typical worst-case) background noise levels plus 5 dB.

TABLE 2 – SUMMARY OF NOISE LEVELS GOALS.

Time of Day	Rating Background Noise Levels - RBL (L_{AF90}) dBA	Noise Level Goals (L_{Aeq}) dBA
Day (07:00 – 18:00)	44	49
Evening (18:00 – 22:00)	41	46
Night (22:00 – 07:00)	32	37

In addition the Protection of the Environment Operations (Noise Control) Regulation 2008 criteria (see Section 3.2 above) will apply for night time use of outdoor air conditioner condensers.

5. PLANT NOISE LEVELS

The following sections describes details of the proposed mechanical plant as given by Dynatech Industries Pty Ltd of 27 King Street, Rockdale NSW 2216, dated 12.02.2019 summarized in Table 3 below. The calculated noise levels are at the nearest residential dwellings.

TABLE 3 – SUMMARY OF PROPOSED MECHANICAL PLANT AND NOISE LEVELS AS GIVEN BY DYNATECH INDUSTRIES.

Plant	Location	Sound Pressure level (dBA)
CPE	Roof	69 @ 3 metres
KEF-1	Roof	69 @ 3 metres
KEF-2	Roof	67 @ 3 metres
KEF-2	Roof	67 @ 3 metres
3-phase AC units	Balconies of Apartments	Day Mode 55 @ 1 metre
3-phase AC units	Balconies of Apartments	Night Mode 49 @ 1 metre
EFs	Top walls of Apartments	38 @ 3 metres

The data above has been used to calculate the typical worst-case at the nearest residential properties.

TABLE 4 – ESTIMATED NOISE LEVELS OF PROPOSED MECHANICAL PLANT AT THE NEAREST RESIDENTIAL NEIGHBOURING PROPERTIES.

Plant	Location	Estimated Distance to Nearest Residence	Sound Pressure level (dBA) at Residence	Compliance
CPE	Roof	30 metres	47	Day Time only[1]
KEF-1	Roof	30 metres	47	Day Time only[1]
KEF-2	Roof	32 metres	45	Day Time only[1]
KEF-2	Roof	32 metres	45	Day Time only[1]
3-phase AC unit	Apartment 1 POS[2] (shielded)	25 metres	35	Yes
3-phase AC unit	Apartment 2 POS[2] (shielded)	35 metres	25	Yes
3-phase AC unit	Apartment 6 POS[2] (part shielded)	20 metres	38 Day 32 Night	Yes Yes
3-phase AC unit	Apartment 7 POS[2] (shielded)	35 metres	25	Yes
EFs	Apartments	20 metres	22	Yes

Notes: POS = Private Outside Space Area. The proposed POS of Apartments 3, 4, 5, 8 and 9 are on the west side of the building and hence will not affect any residential neighbouring properties.

6. MECHANICAL PLANT MITIGATION.

To ensure compliance with the night time noise goal ($L_{Aeq,\ 15\ minute}$) of 37 dBA, the roof top fans should be fitted with two attenuators (silencers), one on each side of each fan. to provide a noise reduction of at least 10 dB. These should be readily available from the manufacturer or supplier of the fans.

7. DRIVEWAY NOISE TO NUMBER 89 MCINTOSH ROAD

The proximity of the proposed driveway to number 89 McIntosh Road, where potentially increased vehicle numbers will be accelerating uphill at the side of a dwelling, could lead to unacceptable internal noise levels. There is only one window on the west side of 89 McIntosh Road, as shown in Figure 2, which is understood to be a bedroom window. To minimise internal noise levels from vehicles using the driveway it is recommended at this window is replaced with an awning window with 10.38 mm thick laminated glass, giving a weighted sound reduction index (R_w) of 36 dB.

Figure 2. Photograph of the Area Proposed to be a driveway and the bedroom window of Number 89 McIntosh Road.

8. VIBRATION

All mechical plant should be fitted with the manufacturers standard vibration isolation mounts. The driveway between the proposed site and number 89 McIntosh Road should not be rigidly connected to the neighbouring slab and be completed with a smooth finish concrete (or similar) without any humps or irregularities to minimise vehicle vibration.

9. CONCLUSIONS

Due to the proposed increased intensity of use of the site, noise implications to adjoining residences have been addressed. This includes all proposed mechanical ventilation and the 24 hours use of the driveway adjacent to number 89 McIntosh Road.

This report recommends noise and vibration mitigation methods to minimise the likely effect on adjoining residential occupancies of driveway access, mechanical ventilation, and noise transmission/vibration to the neighbouring residential dwellings.

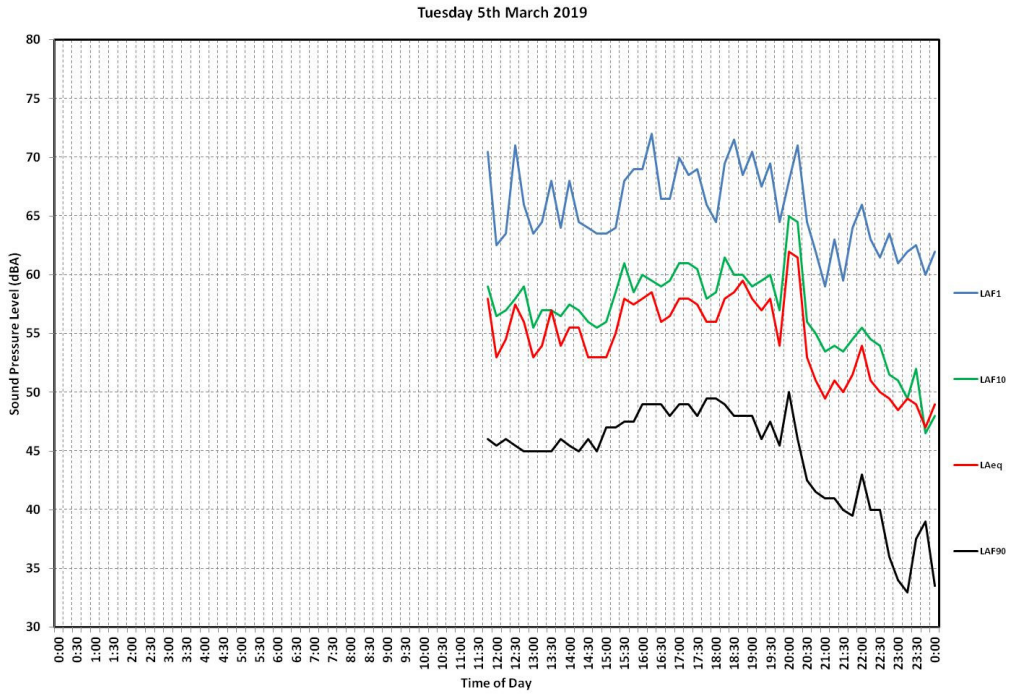
Date	**Prepared by:**	**Status**
13th March 2019	Mark Scannell BA MAAS	Draft
Date	**Checked by:**	**Status**
18th March 2019	Ken Scannell MSc MAAS	Draft
Date	**Issued by:**	**Status**
18th March 2019	Ken Scannell MSc MAAS	Final

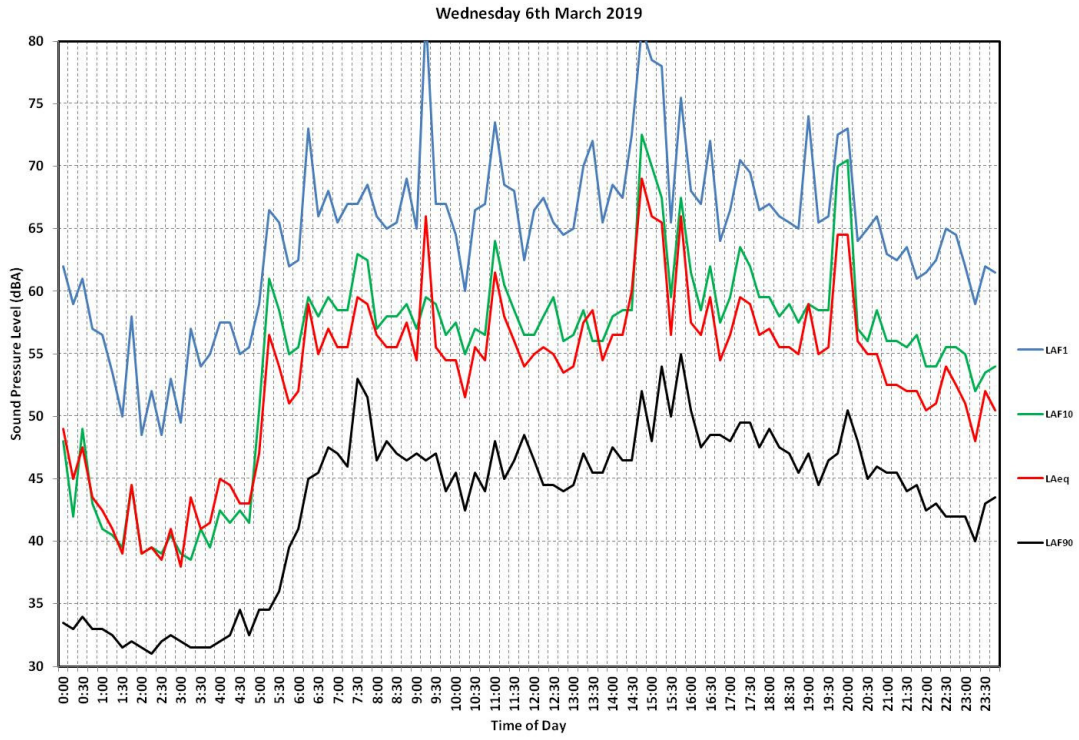
Important Note. *All products and materials suggested by 'Noise and Sound Services' are selected for their acoustical properties only. All other properties such as airflow, aesthetics, chemical, corrosion, combustion, construction details, decomposition, expansion, fire rating, smoke, ventilation, etc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

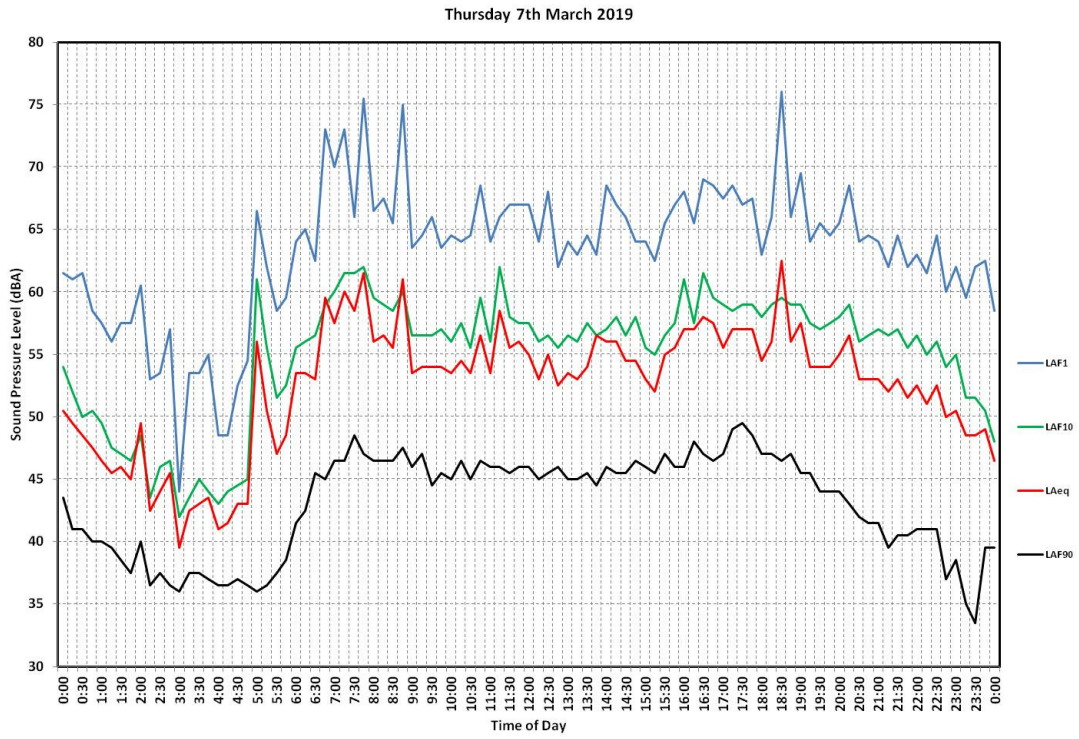
APPENDIX A – MEASURED AMBIENT NOISE LEVELS

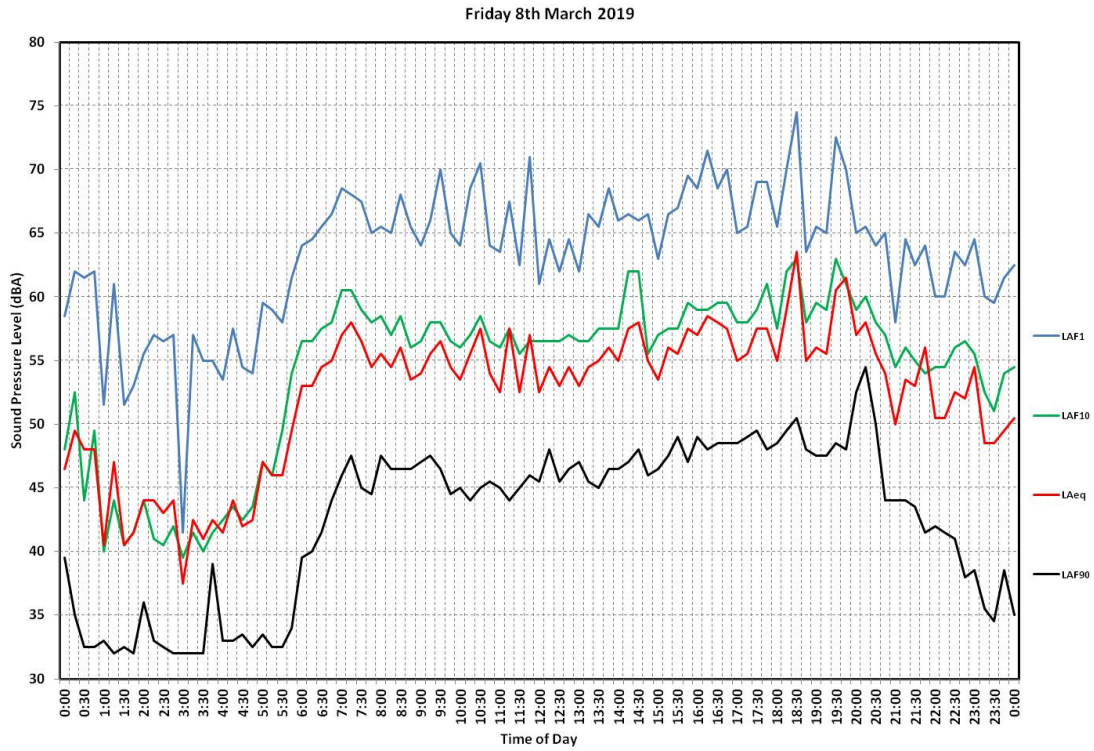
Environmental noise levels can vary considerably with time; therefore it is not adequate to use a single number to fully describe the acoustic environment. The preferred, and now generally accepted, method of recording and presenting noise measurements is based upon a statistical approach. For example, the L_{AF10} noise level is the level exceeded for 10% of the time, and is approximately the average maximum noise level. The L_{AF90} 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.

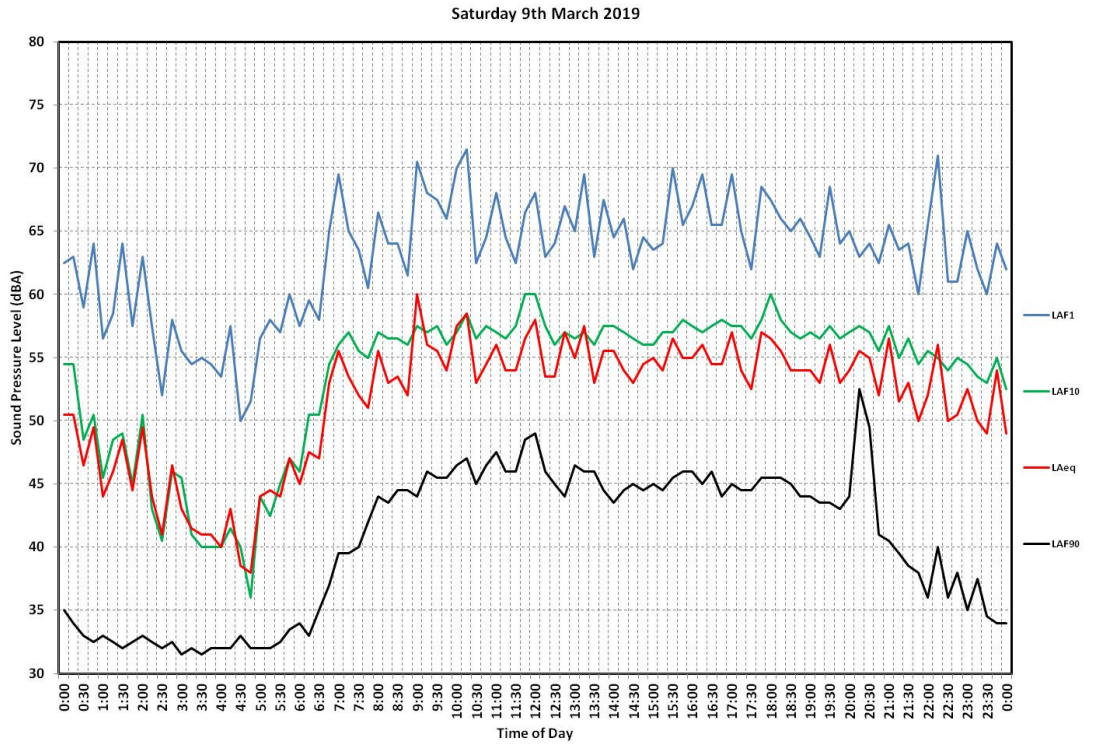
The measurements results from ambient noise monitoring are shown below.

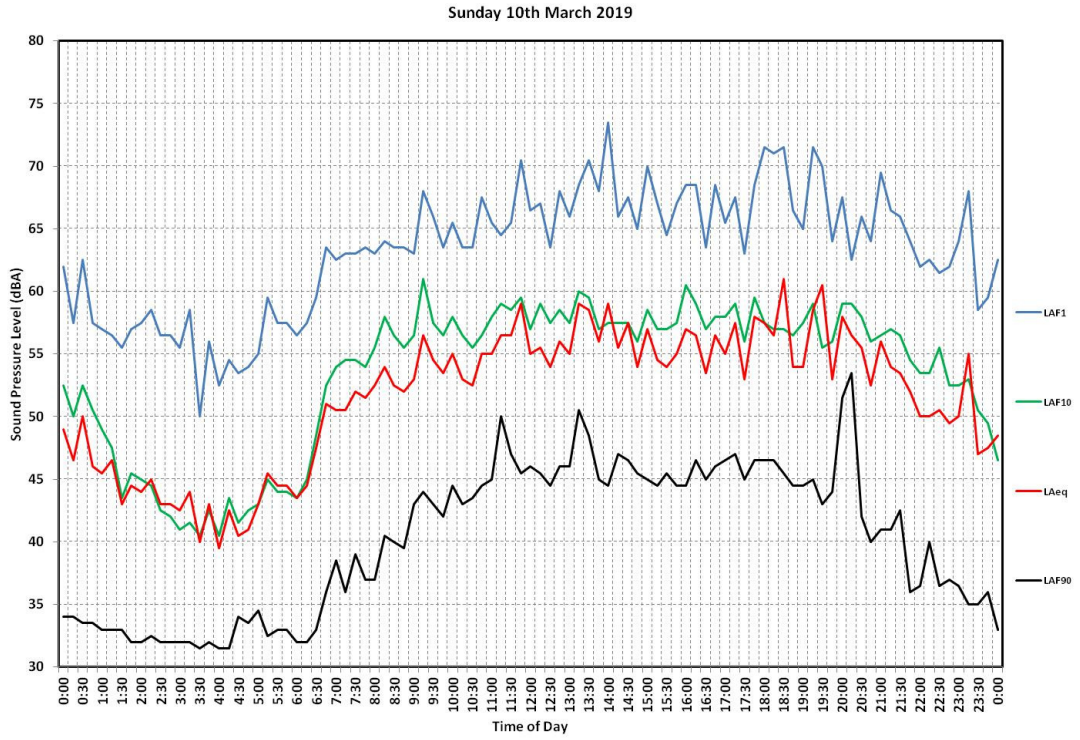


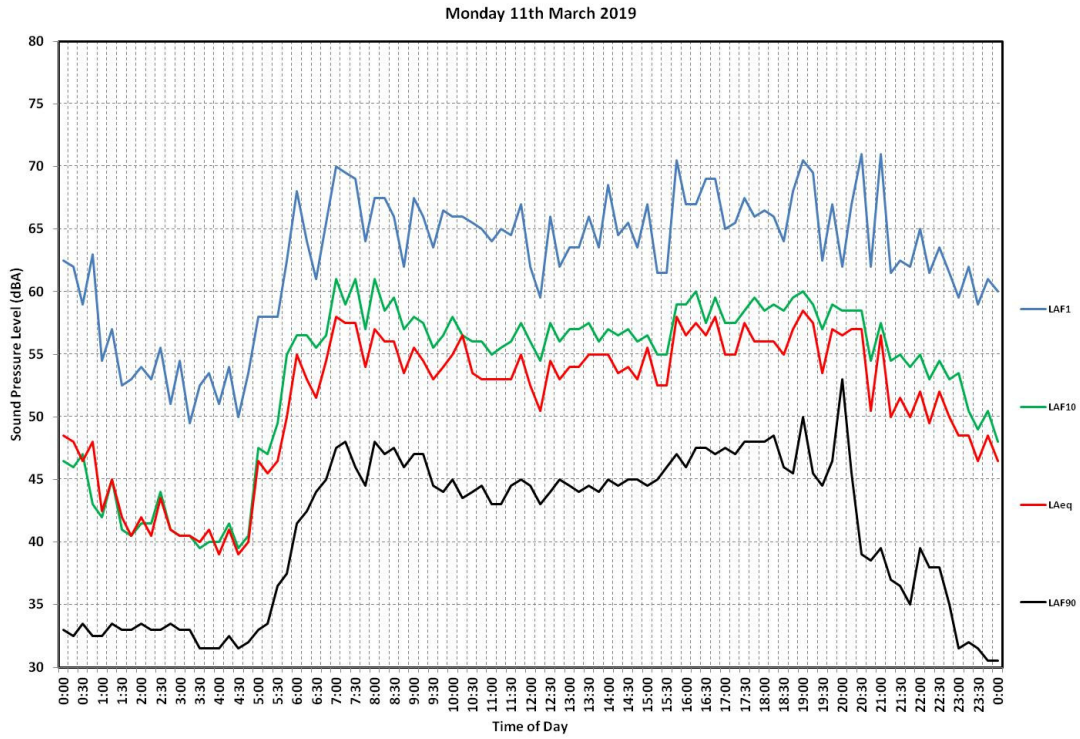

Wednesday 6th March 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90

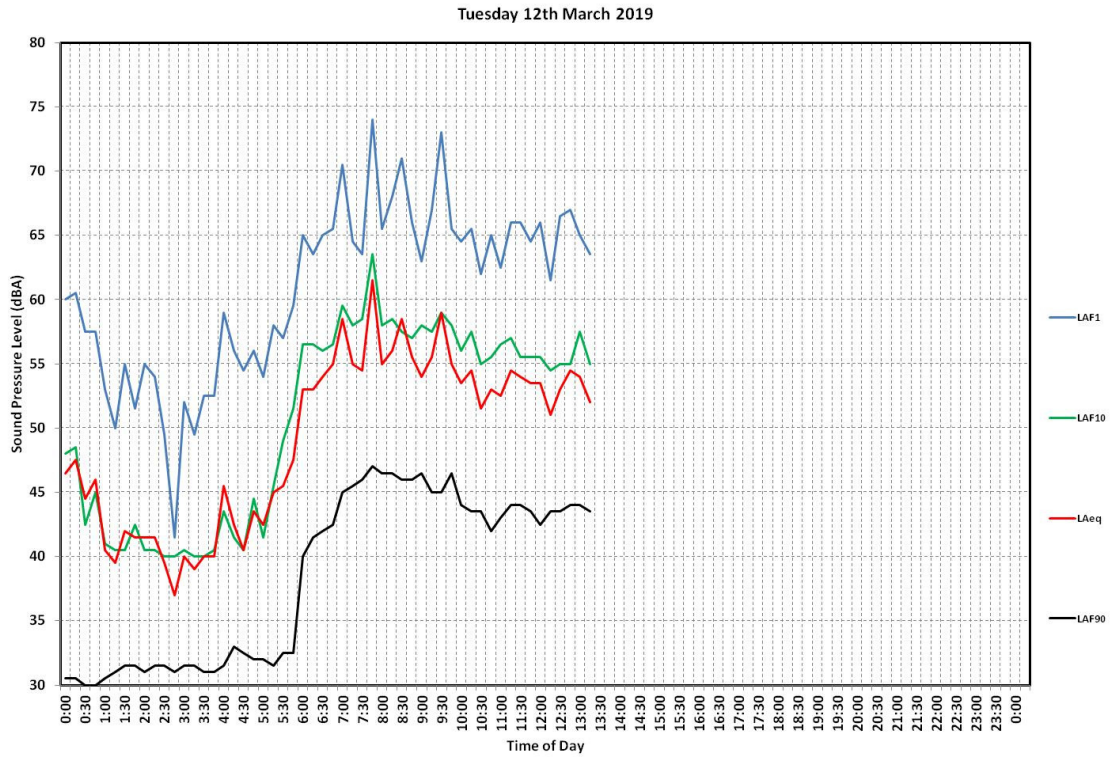

Thursday 7th March 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90


Friday 8th March 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90


Saturday 9th March 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90


Sunday 10th March 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90


Monday 11th March 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90


Tuesday 12th March 2019
Sound Pressure Level (dBA)
Time of Day
LAF1
LAF10
LAeq
LAF90