The Acoustic Group
CONSULTING ACOUSTICAL AND VIBRATION ENGINEERS

50.4539.R2:MSC

26 April 2020

Alexander & Co.
Level 3, Studio 306
53-59 Great Buckingham Street
REDFERN NSW 2016

Attention: Ms S. Harris

Dear Sirs,

PROPOSED GROUND FLOOR ALTERATIONS
FRESHWATER HOTEL
29 MOORE STREET, HARBOARD

The purpose of this report is to present the results, findings and recommendations of an acoustic assessment in relation to the proposed alterations and additions to the ground floor area of the subject hotel.

I am familiar with the subject premises when trading as the Harboard Beach Hotel under previous owners. I have conducted compliance testing at the hotel and assessed modifications to the hotel on a number of occasions since August 1997. In 1998 I undertook measurements and recommended upgrading of the glazing on the western façade of the hotel.

I am therefore familiar with the surrounding area in relation to hotel operations. My last compliance test of the hotel in operation was in March 2006 in relation to music emission from live entertainment in the form of a solo guitarist with amplified backing. The testing found full compliance with the noise conditions specified on the liquor licence for an internal noise level of 92 dB(A) obtained at 5 m from the solo guitarist. I recommended that whilst there was compliance it would be prudent to install a noise limiter to maintain that internal noise level.

Earlier this year I was instructed that the hotel was being sold and that following settlement there would need to be an acoustic investigation of noise emission from the hotel with respect to proposed alterations and additions to the first-floor level of the hotel.

I attended the hotel on the afternoon of Saturday, 22 February 2020 (prior to settlement) to ascertain existing operations and to determine what ambient noise levels and attended measurements at night would need to be undertaken for the preparation of acoustic report to accompany the proposed alterations and additions.

At the time of my site visit there was no entertainment occurring inside the hotel but there was a DJ in the beer garden on the northern side of the hotel to which I did not find any issues of concern with respect to music emission from the hotel.

Since the purchase of the hotel by the new owners the requirements of the government to close hotel premises, as part of the proactive measures to address coronavirus, renders the conduct of measurements of existing operations unable to be undertaken at the present point in time .

I am instructed that with the closure of the hotel it is proposed that there will be alterations and additions to the ground floor the hotel that would not, with respect to normal operations the hotel, give rise to any change in noise emission from the ground floor area if the level of music was at the level that I had assessed in 1998. I note that from an acoustic perspective the proposed alterations and additions to the ground floor would, with respect to entertainment occurring on the ground floor towards the western side of the hotel would be marginally lower at residential receivers by reason of proposed sound locks and an internal screen inside the north-western door leading to the external beer garden.

I am instructed that the proposed alterations and additions involve the demolition of existing toilets, construction of new toilets and installation of a new kitchen. While such alterations would not alter the emission of music from the premises there is potential for a change in noise emission from the hotel as result of mechanical plant associated with the new kitchen.

Previous night-time site visits to undertake acoustic compliance testing has identified that the acoustic environment of the area around the hotel is dominated by surf noise and distant traffic, and influenced by noise from existing mechanical plant at the subject hotel.

The normal acoustic assessment criteria utilised by the Council for mechanical plant is the intrusiveness noise target issued by the EPA which is expressed as the ambient background +5 dB(A) when measured as an LAeq level over 15 minutes at any affected residential boundary or on the residence.

In this regard a site visit was carried out on the evening of Wednesday, 22 April 2020 prior to and shortly after 10 pm (being instructed the time of closing of the proposed kitchen) to determine ambient noise levels in the absence of any noise from the operation of the hotel.

The Site

The subject premise is located on the south eastern corner of the intersection of Moore Road and Charles Street at Harboard.

The Hotel building is located in the north western corner of the site with the southern portion of the site (that continues out to Underwood Street) used for vehicular parking. The eastern end of the site has a bottle shop and adjoins a residential flat building.

The nearest residential premises to the entertainment area is a block of flats on the south western corner of the intersection.

The western side of Charles Street (opposite the hotel site) are two residential dwellings (#2 & #4 Charles Street), whilst when past Moore Road there are residential dwellings on both sides of Charles Street.

There are residential premises on the northern side of Moore Road (opposite the Hotel), generally with high fences to Moore Road.

South of the Hotel (on the opposite side of Underwood Street are residential premises.

The topography of the area has Undercliff Road elevated above the Hotel with Charles Street sloping down as one proceeds in a northerly direction.

Appendix A1 provides an aerial view of the subject site and surrounding area, with an illustration of the attended monitoring locations used for the ambient measurements.

Measurement Techniques

Ambient measurements were taken in accordance with the Australian Standard AS1055 *"Acoustics - Description and Measurement of Environmental Noise"* and the ambient background measurement procedures set out in Fact Sheet B of the EPA's *Noise Policy for Industry*.

The attended sound level measurements were recorded using a Brüel & Kjær 2250 Sound Level Meter (serial no. 3004338). The calibration of the meter to the manufacturer's requirements was current at the time of the measurements.

The reference calibration level of the meter was checked prior to and after measurements using a Brüel & Kjær Sound Level Calibrator Type 4231 and exhibited no system drift.

Measurement Results

At the time of the measurements the weather at the site was clear sky, cool (18° C) and no wind detected at the site, and therefore suitable for ambient measurements

Attendance to Location 1 on Moore Road found an ambient background level of 41 dB(A) being a contribution of surf noise and mechanical plant from the subject hotel. Assuming the mechanical plant to have a contribution of 39 dB(A) and the ambient background noise from the surf and general distant traffic roar would be 37 dB(A). Accordingly mechanical plant at Location 1 complied with the intrusive noise target.

At Location 2 in Charles Street the acoustic environment was found to be a general roar of distant traffic and surf noise punctuated by intermittent noise from individual vehicle movements on Charles Street, Moore Road and Undercliff Road. No mechanical plant noise from the hotel could be detected at Location 2. Accordingly mechanical plant noise from the hotel at Location 2 fully complied with the intrusive noise target by significant margin.

At Location 3 in Undercliff Road the ambient background level of 39 dB(A) was considered to be influenced by mechanical plant at the subject hotel.

Location 3 is shielded from surf noise by reason of residential buildings along the northern side of Undercliff Road. During the sample period both surf noise and distant road traffic could occasionally be detected. There were no breaks in the operation of the mechanical plant and therefore an ambient background level without the influence of mechanical plant could not be determined.

The results of the attended measurements are provided in Appendix B as a time splice graphs showing the variation in the A-weighted level over time, and also a table of A-weighted statistical results in octave bands.

A comparison of the recent ambient measurements with previous measurements at the site, when the hotel was in operation and there were significant road traffic movements in the area, reveals background noise levels recorded in April 2020 are noticeably lower and are not representative of the background levels that would occur under normal operations.

The situation of reduced traffic throughout the Sydney area as a result of the corona virus lockdown dramatically reduces ambient background levels to that that normally occurs for an area. Therefore, caution is required in utilising the level set out in Appendix B for design purposes.

Acoustic Criteria

In relation to noise emission from licensed premises, Liquor & Gaming NSW ("L&G NSW") have identified on their website, under Liquor & Gaming NSW decisions reports on disturbance complaints, the use of the "LA10 Noise Condition".

In L&G NSW assessments there is a requirement to break up the analysis into frequency components called octave bands with centre frequencies from 31.5 Hz to 8 kHz. Musically speaking, low frequency is typical of the bass guitar and bass drum whilst high frequency is like a cymbal or a triangle. The octave bands measured encompass most of the audible spectrum and the LA10 Noise Condition analysis requires the music to be assessed in individual octave bands.

The LA10 Noise Condition are in two parts according to different times of day, being the pre-midnight criteria (7.00 am to midnight) and the post-midnight criteria (after midnight to 7.00 am). The pre-midnight criterion allows noise emissions from a licensed premise to exceed the background noise level by 5 dB in any octave band with centre frequencies between 31.5 Hz and 8 kHz at any residential boundary.
As the background level is defined as the level that is exceeded for 90% of the time and therefore is measured on a statistical basis, the impact of the acoustic environment of the area on a statistical L10 level requires one to determine the noise level attributed to the licensed premises.

To identify the difference between the existing ambient L10 and the noise to be assessed from a licensed premise, the before midnight residential boundary noise criterion is described as:

> *The LA10* noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz*

> *– 8k Hz inclusive) by more than 5 dB between 07:00 am and 12:00 midnight at the boundary of any affected residence.*
>
> *For the purpose of this condition the LA10* can be taken as the average maximum deflection of the noise emission from the licensed premises.*

The post–midnight noise criteria are more stringent and require that the noise emission from any licenced premises is not to exceed the background noise level within the same octave bands used in the pre–midnight criteria at any residential boundary. The post-midnight criteria also stipulate that noise emissions from licenced premises are to be inaudible in any habitable room of any residential premises.

There is often a misconception/misinformation in terms of the permitted LA10 numerical criteria and inaudibility. Compliance **with the before midnight criterion permits noise from the licensed premises to be audible at residential boundaries and permits measurable increases above the background level.** This means noise from licensed premises is permitted to be audible inside the dwellings before midnight.

For the after-midnight period noise from licensed premises can be audible at the residential boundary and comply with the boundary noise limits. The inaudibility criterion **ONLY** applies inside the residential premises after midnight. From acoustic standards/policy documents in Australia the normal practice is to apply the inaudibility criterion to habitable rooms, not bathrooms, dressing rooms or garages.

As access is not normally available to premises for the period after midnight, determination of the inaudibility criterion is generally based upon a derived contribution of between 7 to 10 dB below the background level, measured externally to a residential premise. This contribution indicates a negligible increase above the background level (in individual octave bands) and should result in compliance with the inaudibility criterion inside the dwelling.

The EPA's *Noise Guide for Local Government* (2013 version) identifies in Chapter 1 (pages 1.9 and 1.22) that the Office of Liquor, Gaming and Racing (now Liquor & Gaming NSW) is the authority responsible for noise from licensed premises.

Section 1.5 of the EPA's *Noise Policy for Industry* identifies that the policy does not apply to "amplified music/patrons noise from premises including those licensed by Liquor & Gaming NSW".

Therefore, under the current EPA documentation the OLGR/L&G NSW "LA10 Noise Condition" would be the condition to be used for noise emission from activities occurring in the licensed areas of a licensed premises, whilst the noise emission of mechanical plant servicing licensed premises would fall under the EPA's *Noise Policy for Industry* intrusiveness criterion of background +5 dB(A).

I am instructed the Freshwater Hotel will cease operation at midnight. Therefore, the noise emission of music from the hotel is assessed with respect to the L&G NSW criterion of background +5 dB in octave bands/criteria of background +0 dB in octave bands and inaudibility within the habitable rooms of residential premises that apply after midnight.

Acoustic Assessment

Noise Emission from Current Hotel Operations

In accordance with similar applications, normally the Council require consideration of the cumulative noise from the hotel, i.e. and existing and proposed operations. However under the corona virus lockdown, as discussed above, that cannot occur for the subject hotel at the present point in time.

With respect to mechanical plant noise emissions our testing during a period where ambient noise levels would be lower than normal revealed compliance with the EPA's background +5 dB(A) criterion up to 10pm, being the period I am instructed to which the kitchen would operate.

For operations after midnight then I consider the current level of noise emitted from mechanical plant at the hotel (cool rooms etc) would continue. Based on the recent measurements and previous ambient noise level measurements I do not consider there is a requirement for additional controls with respect to existing mechanical plant.

Obviously during our site visit the kitchen was not in use and therefore for design purposes to maintain compliance with the intrusiveness noise target one needs to specify a design level to apply to mechanical plant associated with the ground floor renovations.

At the present point in time there is no specification of mechanical plant that is proposed to service the kitchen upgrade other than the general requirement to satisfy the Building Code of Australia for mechanical ventilation, air conditioning and kitchen exhaust fans. This is not an uncommon situation when preparing a Development Application.

I am instructed that the Council has requested acoustic input into the specification of mechanical plant servicing the ground floor refurbishment.

In this regard a conservative approach has been adopted with respect to all new mechanical plant servicing the ground floor (kitchen and bathrooms) to specify a noise design contribution from the new mechanical plant when assessed at residential boundaries not to exceed the assumed ambient background levels obtained on the recent survey, being:

- At residential boundaries near Location 1 (Moore Road) the contribution of the new plant is not to exceed 37 dB(A) inclusive of any adjustments as required by the EPA's Noise Policy for Industry for any tonal or intermittent noise characteristics.

- At residential boundaries Location 2 (Charles Street Road) the contribution of the new plant is not to exceed 38 dB(A) inclusive of any adjustments as required by the EPA's Noise Policy for Industry for any tonal or intermittent noise characteristics.

- At residential boundaries near Location 3 (Undercliffe Moore Road) and along the common boundary between hotel and the residential buildings to the east the contribution of the new plant is not to exceed 37 dB(A) inclusive of any adjustments as required by the EPA's Noise Policy for Industry for any tonal or intermittent noise characteristics.

I am advised it is proposed the new plant will be located on existing plant room decks at the subject hotel. On this basis I anticipate that those decks will require acoustic screening on the eastern side of the plant to achieve the noise target identified for Location 3 and the common boundary between the hotel and the residential buildings to the east.

It is not unusual for Council to require prior to the issue of a construction certificate that the mechanical plant be fully designed, acoustically assessed and certification of compliance with the above noise levels.

Noise Emission from Ground Floor Internal Licensed Areas

With respect to the provision of music inside the ground floor area of the hotel, on referring to my compliance testing conducted in 2006 the premises complied with the LA10 condition for an internal level of 92 dB(A) recorded at a position 5 m from the speakers associated with the solo guitarist.

In 2020 it is not uncommon (prior to the corona virus lockdown) to have an internal level from solo artists in the order of 95-100 dB(A) for a position 5 m from the speakers associated with the solo artists. On the basis of there being no live bands inside the hotel premises then allowing for an internal level of 100 dB(A) from entertainment, as described above one could upgrade the existing 6mm glass on the western façade and northern façade of the entertainment area in the north-western corner of the ground floor of the hotel to fixed double glazing of 10.5mm (Viridian VLam Hush) with a 40 mm air gap and 8.5mm Vlam Hush.

In relation to the gaming room I do not see that there is a need for any acoustic upgrading of the façade but if that area of the ground floor is to be refurbished then I recommend that an acoustic ceiling having an NRC (Noise Reduction Coefficient) of not less than 0.85 be specified.

Conclusion

With respect to the application for refurbishment of the ground floor area of the hotel that is to be subject of a development application lodged with Northern Beaches Council, the Council has requested an acoustic assessment to accompany the application.

In the current climate where the hotel is not operating I am unable to assess noise emission from the existing operations but have been able to rely upon the results of previous testing that I personally conducted at the hotel to ascertain compliance with the noise conditions contained on the liquor licence.

On the basis of an increase in the internal noise levels from that that I obtained in 2006 I have recommended the western and northern glazing for the entertainment area on the north-western corner of the ground floor of the hotel be acoustically upgraded to a high-performance double glazing system.

Taking into account the proposed airlocks and the also the layout of the ground floor I do not see the need for any additional noise control measures but have recommended that if the gaming areas are to be upgraded then there is benefit (for the patrons) in the provision of acoustic absorption in the ceiling of those spaces.

With respect to the alterations that would result in a new kitchen I anticipate that there would be new mechanical plant serving that area with an expectation that the plant would be acoustically quieter than existing plant.

However at the present point in time there is no actual design and/or specification of the plant to be used. Therefore in the absence of such material I have specified a noise design for the proposed plant. In this regard I have utilised ambient noise measurements obtained during the community lockdown which results in lower ambient noise levels by a significant reduction in traffic and in the absence of any hotel operations.

Adopting the conservative approach to ensure that the mechanical plant for the refurbished ground floor does not give rise to any acoustic impact I have nominated noise targets relative to the ambient background level recently recorded, which in my view a lower than that that would occur when the hotel is in operation.

There is an expectation that the Council would require prior to the issue of a construction certificate certification that the proposed mechanical plant (which would then be known at that point in time) has been designed and incorporates the appropriate noise controls to meet the nominated noise targets.

Yours faithfully,

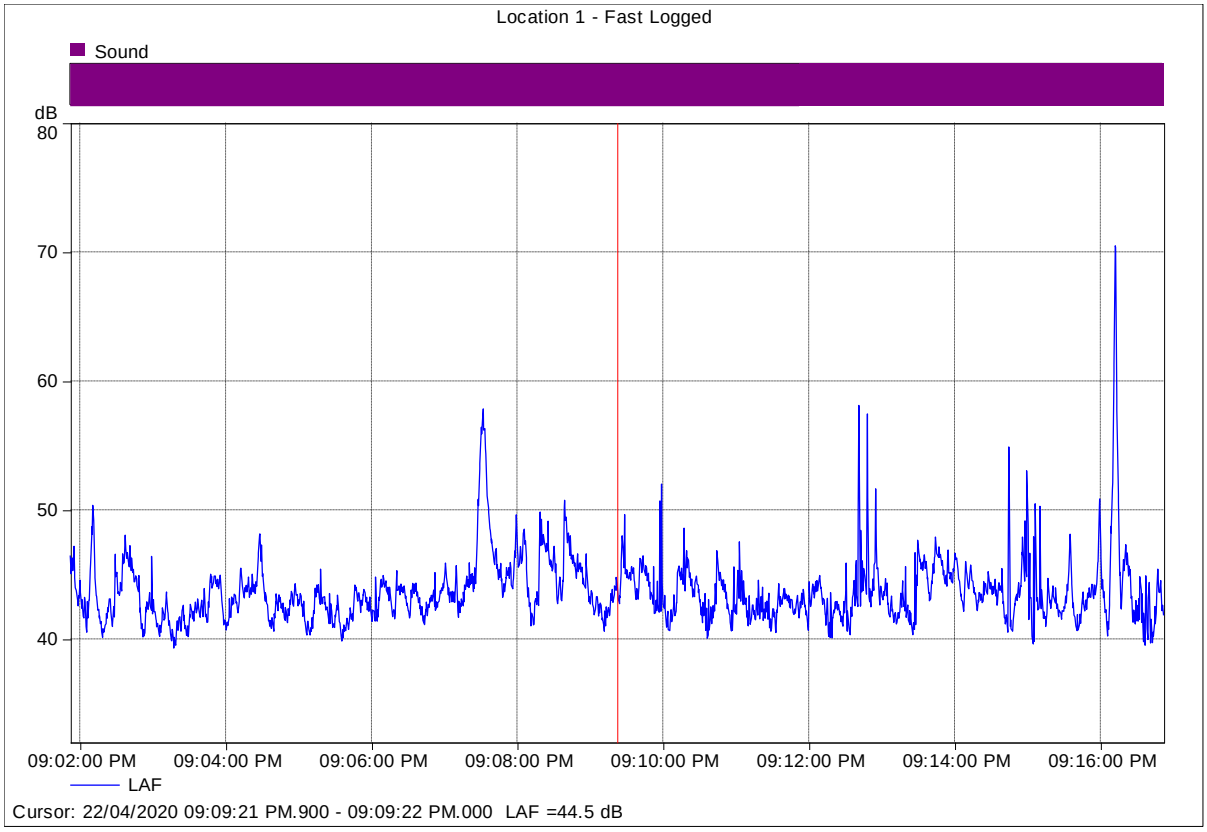
THE ACOUSTIC GROUP PTY LTD

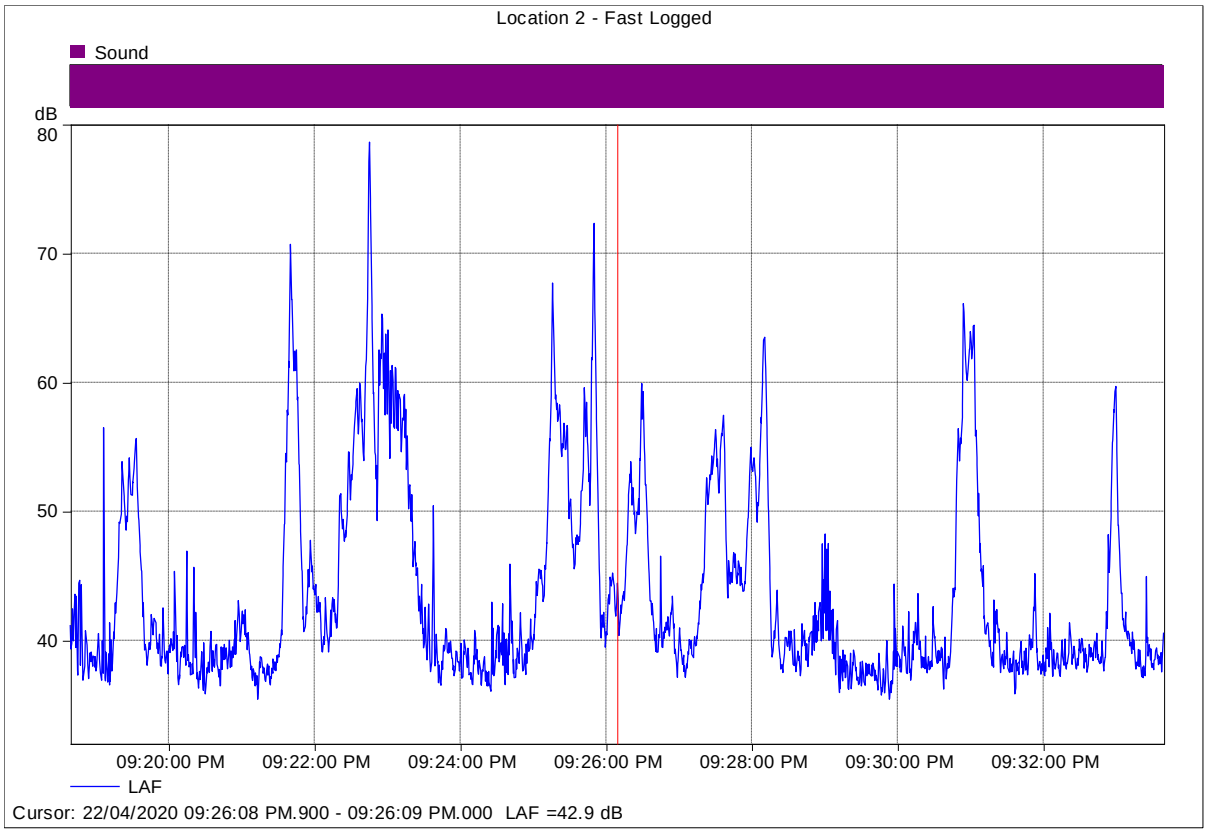
STEVEN E. COOPER

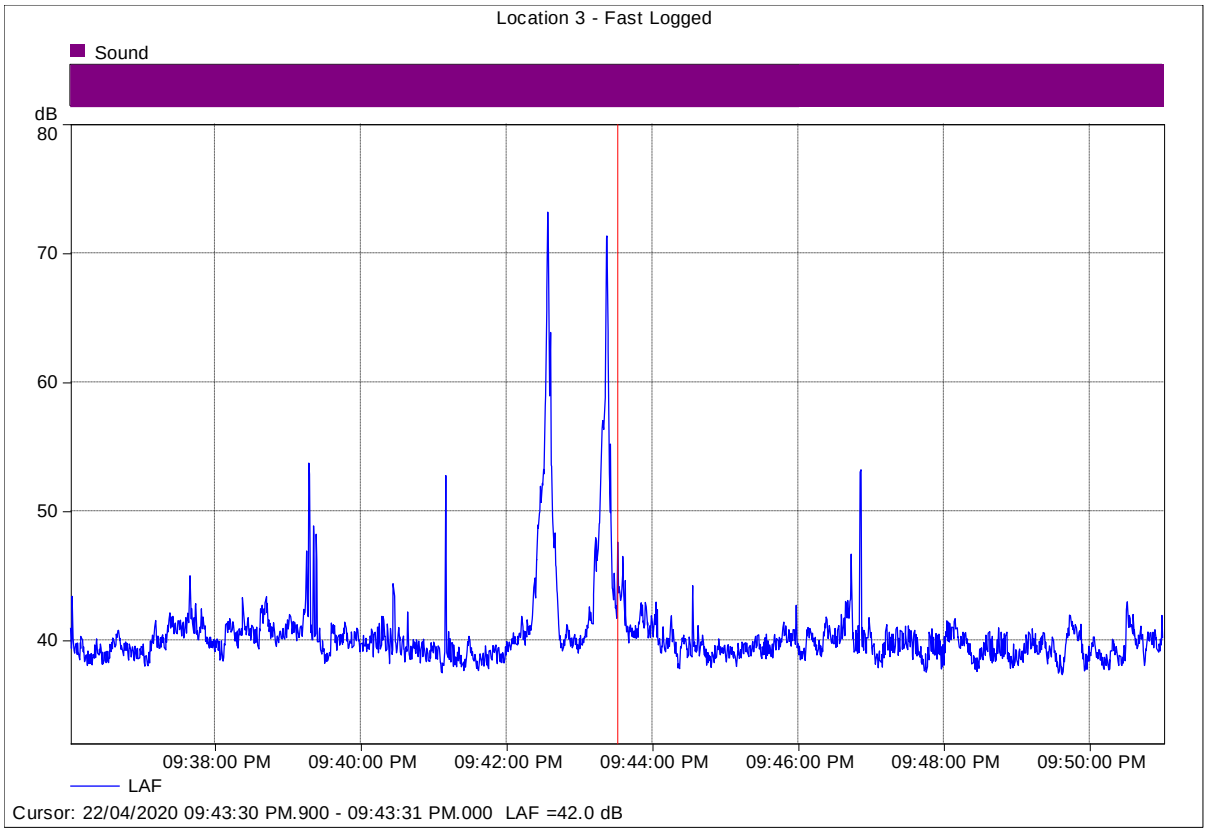
APPENDIX A: Site and Measurement Locations

Attended Noise Monitoring Locations

APPENDIX B: Attended Ambient Measurements







Location	Parameter	dB(A)	A-weighted Octave Band Centre Frequency (Hz)								
			31	63	125	250	500	1k	2k	4k	8k
1	Ambient L_{10}	46	16	27	32	36	39	42	40	33	22
	Ambient L_{eq}	46	15	28	32	34	39	42	40	33	23
	Ambient L_{90}	41	11	21	26	30	35	37	34	27	15
2	Ambient L_{10}	56	22	33	39	44	48	52	48	39	28
	Ambient L_{eq}	55	20	43	41	47	48	50	46	40	31
	Ambient L_{90}	38	5	16	22	26	32	33	29	23	13
3	Ambient L_{10}	42	15	26	26	31	37	37	33	32	23
	Ambient L_{eq}	48	15	27	26	32	39	42	42	42	33
	Ambient L_{90}	39	9	19	22	27	34	33	29	24	15