ACOUSTIC, VIBRATION & NOISE Pty Ltd
Suite 2B, 34 Macmahon St, Hurstville NSW 2220 ABN: 22 615 582 002
Phone: 9793 1393 Email: info@acousticsolutions.com.au

Acoustic Report
-For Community Facility -

For proposed development at

No. 682 Castlereagh Road, Agnes Bank

Prepared By: Domeniki Tsagaris (M.I.E. Aust), B.E.(UNSW)
Australian Acoustical Society (Sub).
Approved By: Moussa Zaioor (M.I.E. Aust), CPENG,
Australian Acoustical Society (Member).

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DOCUMENT CONTROL

Date	*Revision History*	*Prepared By:*	*Reviewed and Authorised by:*
04/02/2019	Initial Report	Domeniki Tsagaris	Moussa Zaioor
12/06/2020	Final Report	Domeniki Tsagaris	Moussa Zaioor

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1.0 Scope of Work

Acoustic, Vibration & Noise Solutions Pt Ltd was commissioned to investigate the environmental noise impact of the proposed alterations and additions to the existing Community Facility located at No. 682 Castlereagh Road, Agnes Bank (Figure 1 – Site Location) on the local environment; in accordance with Penrith City Council's requirements and relevant Australian Standards/Policies.

The following assessment will be prepared in conjunction with the Architectural Plans by Architectural Plans by Design by RJV and Statement of Environmental Effects by Corona Project.

This commission involves the following:

- Inspect the site and environs.
- Measure the background noise levels at critical locations and times.
- Establish acceptable noise level criterion.
- Quantify noise emissions from the proposed alterations & additions to the existing Community Facility
- Calculate the level of noise emission, taking into account building envelope
- Transmission loss, screen walls and distance attenuation.
- Provide in principle noise control recommendations (if necessary).
- Prepare an Environmental and Construction Noise Impact Report.

Figure 1 - Site Location

2.0 General Description and Environment

The proposed development is for the Community Facility for the Vaishnav Sangh of Sydney which is used to conduct regular educational and cultural activities for the Indian community as well as celebrate key festivals with the community and provide an educational service to children and youth.

The Community Facility will be open seven days a week. Community site users will attend the site:

- Monday –Friday with a maximum of 50 people between 5:00pm and 7:00pm.
- Saturday and Sunday with 50-100 people between 12:00pm-7:00pm
- Event Days is a regular monthly event with 200 people attending, approximately 12 times per year.

Administrative staff will be present on site at any time during the day. The number of staff is as follow;

- Monday - Friday with a maximum of 5 staff members,
- Saturday and Sunday with a maximum of 7 staff members.

The Community Facility will include the following (Figure 2 – Site Plan)

- Administrative room,
- Male and female bathrooms,
- Kitchen with storage room,
- Art room,
- Library,
- Children's play area, and
- Volleyball court.

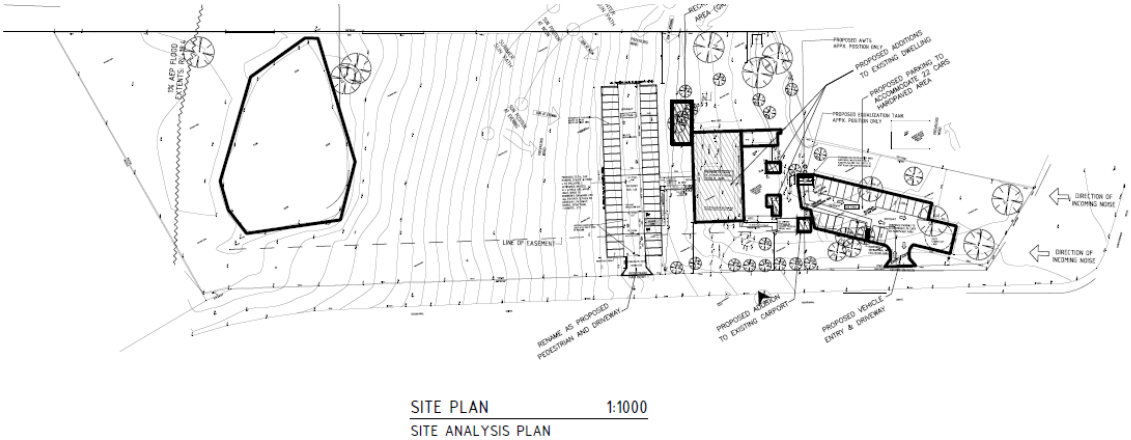


Figure 2 - Site Plan

The Community Facility's proposed extension to the existing dwelling and proposed car park is located at the rear of an existing residential property. The Community Facility proposal a new carpark to the front of the site and to undergo alterations and additions to accommodate a maximum of 200 attendees and an additional 36 car spaces, as per architectural plans by RJV.

The proposed Community Facility is located within a rural/residential area. Residential properties with associated farmland located south east and east of the site at No. 676-680 Castlereagh Road and No. No.674 Castlereagh Road, respectively (Figure 3- Nearest Residential Receivers).

The nearest residential receiver that may be affected by the use of the proposed Community Facility are located directly south east the site at No. 676-680 Castlereagh Road, Agnes Bank as shown in Figure 3. Other potential residential receiver is located east of the site at No.674 Castlereagh Road, Agnes Bank. For the purpose of this report, the nearest residential receiver will be the residential property located south east of the site at No. 676-680 Castlereagh Road, Agnes Bank due to its close proximity to the proposed carpark.

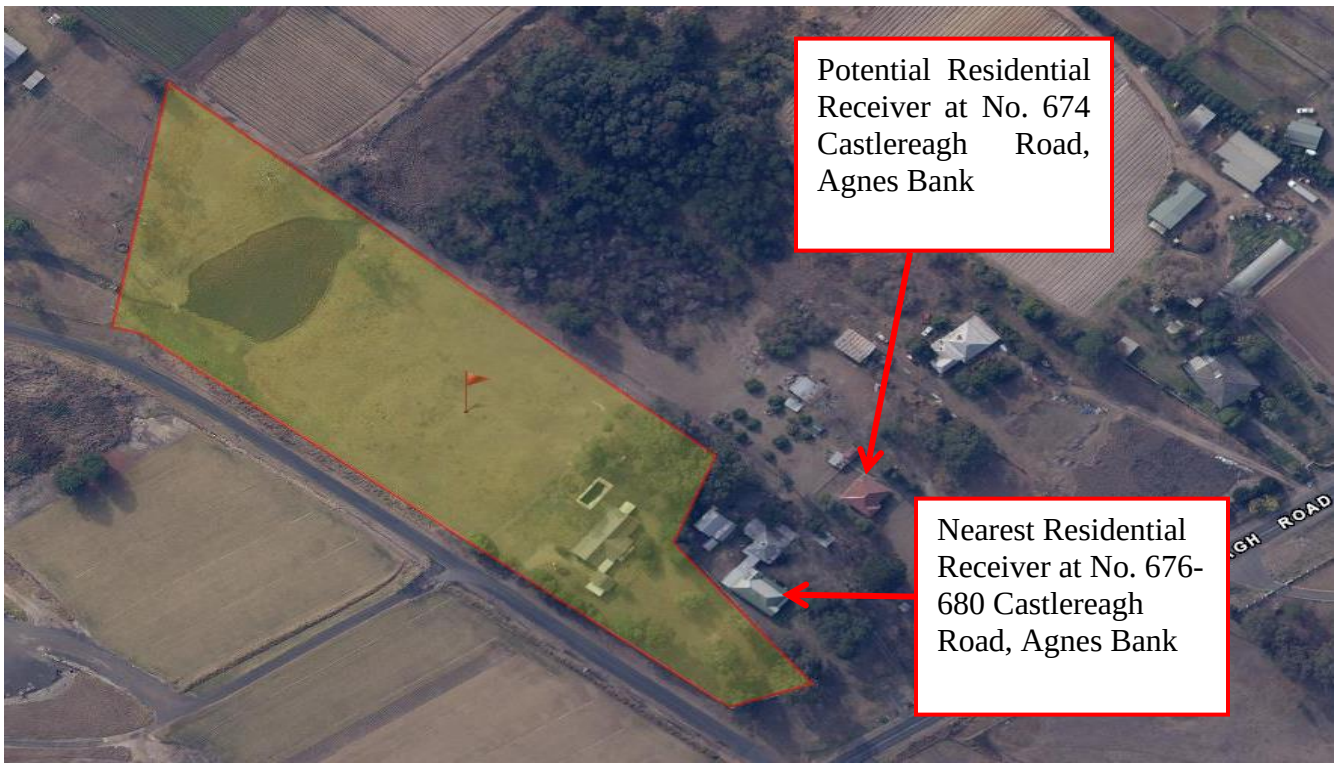


Figure 3 – Nearest Residential Receivers

3.0 Operational Activities

Major noise producing activities at the Community Facility have been considered below:

- Vehicles arriving and departing the site,
- Attendees arriving and departing the site,
- Indoor activities,
- Outdoor activities, and
- Mechanical plant and Equipment.

The main activities held at the Community Facility are cultural activities, celebrations and educational classes. The proposed extension and conversion of the Community Facility will accommodate for a maximum of 200 attendees.

The number of car spaces from the existing car park and the proposed car park are as follow:

- Sixty-three (63) car spaces
- Two (2) mobility parking
- One (1) minibus parking

Hence the main source of noise from the proposed Community Facility will be from vehicles entering and existing the on-site car parks and from attendees outside as they arrive/exist the proposed facility.

4.0 ACOUSTIC DESCRIPTORS

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

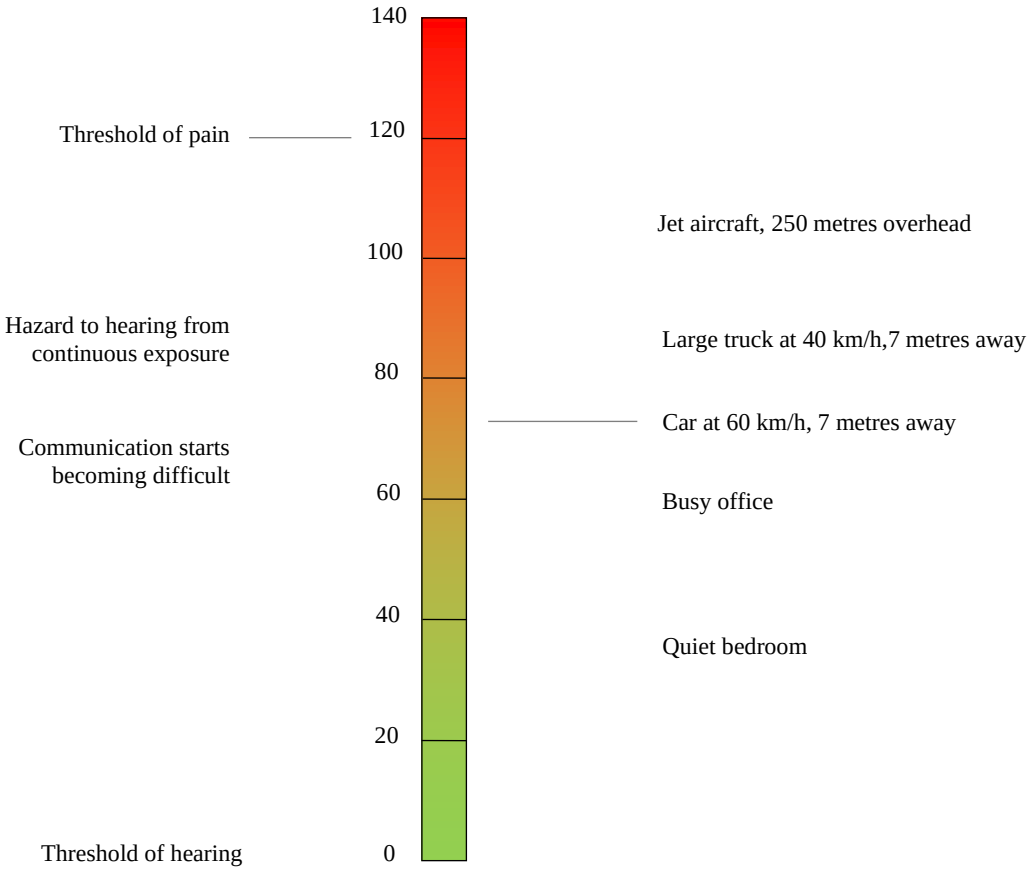
L_{A50} – The L_{A50} level is the noise level which is exceeded for 50% of the sample period. During the sample period, the noise level is below the L_{A50} level for 50% of the time.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

The level of common sounds on the dB(A) scale as the figure below:



5.0 Noise SURVEY and Instrumentation

On the 23rd of January an engineer from this office went to the above address and carried out noise measurements for noise levels at the proposed building line facing Castlereagh Road Points A (Figure 4 - Noise Reading Location). The unattended environment noise monitoring was conducted for seven (7) days from Wednesday 23rd January to Wednesday 30th January, 2019. All sound pressure levels are rounded to the nearest whole decibel. All measurements were taken in accordance with the Australian Standards AS 1055 "*Acoustics- Description and Measurements of Environmental Noise*".

The noise survey was conducted to determine a conservative reading of the existing day and evening noise levels [15hrs- 7:00 -22:00] $L_{(A90,\ 15\ minutes\ [1hr])}$ and $L_{(Aeq,\ 15\ minutes\ [1\ hr])}$ and to determine a conservative reading of existing night and early morning noise levels [9hrs-22:00-7:00] $L_{(A90,\ 15\ minutes\ [1hr])}$ and $L_{(Aeq,\ 15\ minutes\ [1\ hr])}$.

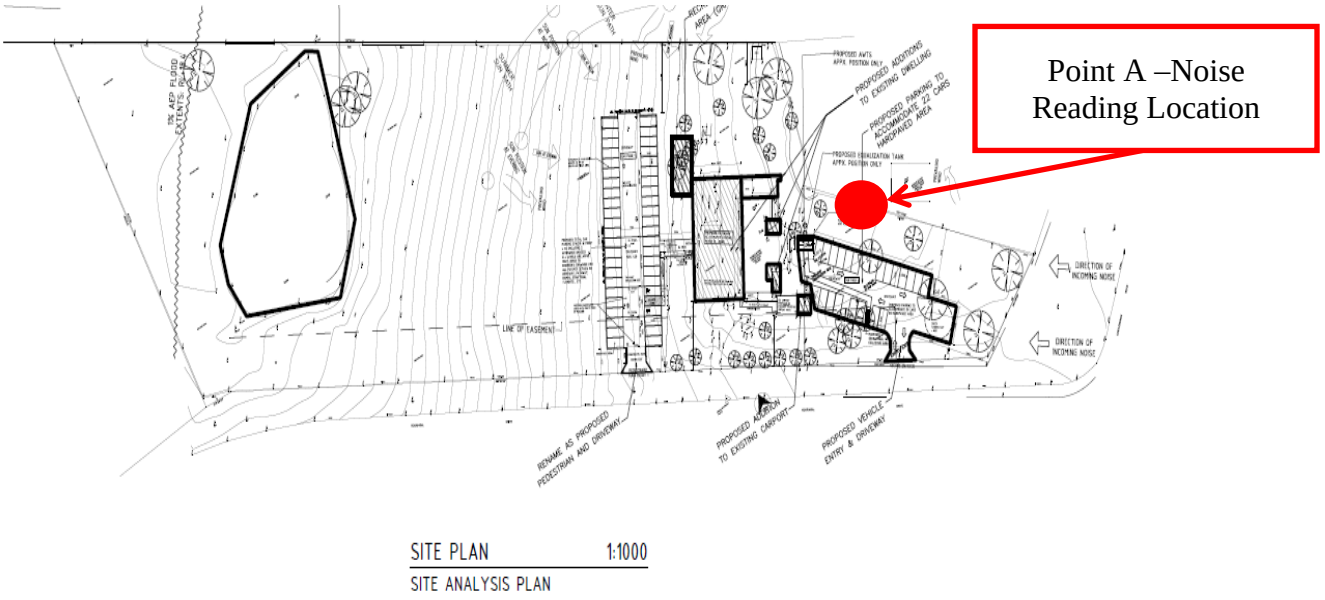


Figure 4 - Noise Reading Location

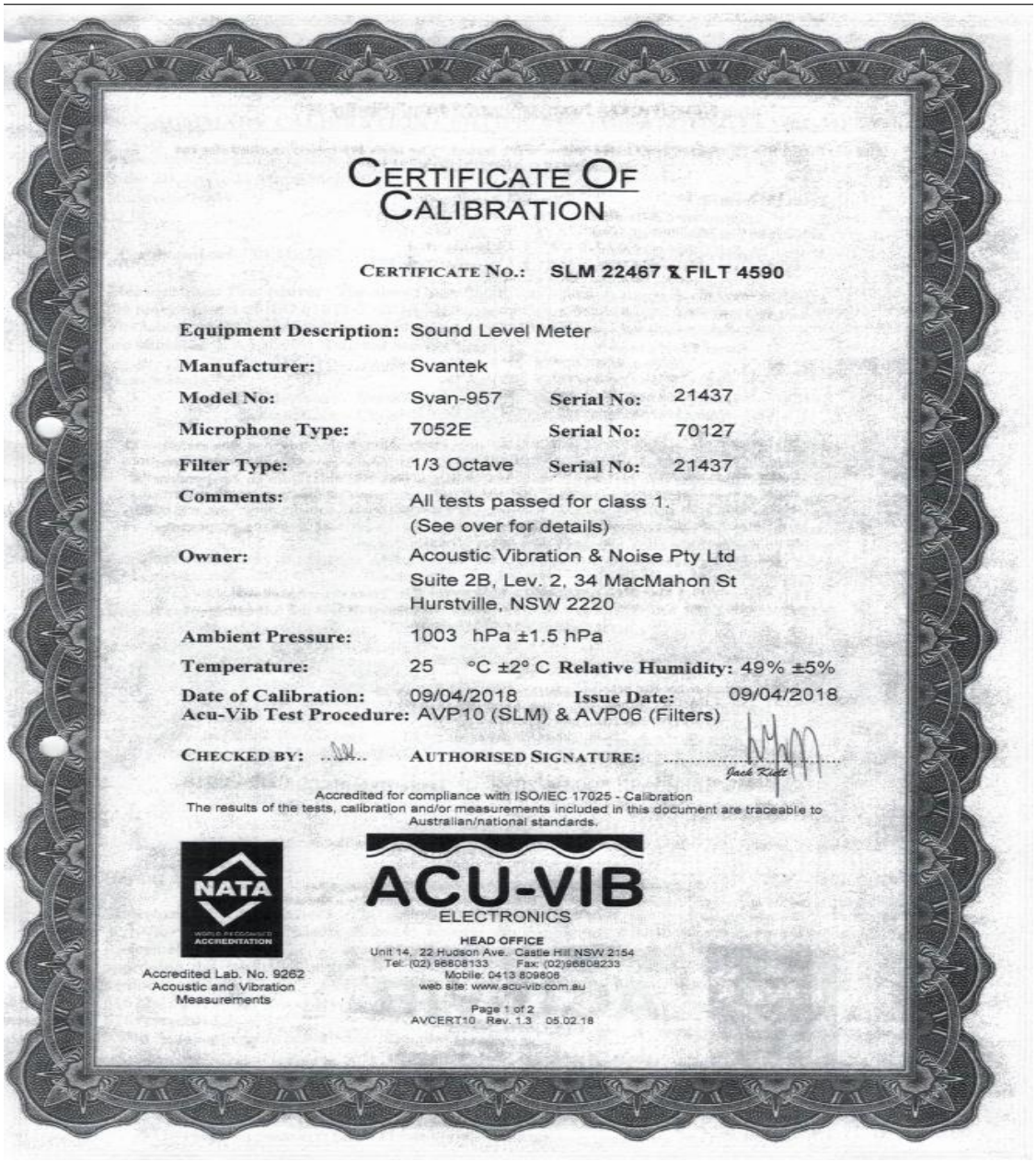
The measurement procedure and the equipment used for the noise survey are described below. All sound pressure levels are rounded to the nearest whole decibel. All sound level measurements and analysis carried throughout this report are carried with Svantek 957 Noise and vibration level meter (Figure 5- Calibration Certificate) which has the following features:

- Type 1 sound level measurements meeting IEC 61672:2002
- General vibration measurements (acceleration, velocity and displacement) and HVM meeting ISO 8041:2005 standard
- Three parallel independent profiles
- 1/1 and 1/3 octave real time analysis
- Acoustic dose meter function
- FFT real time analysis (1920 lines in up to 22.4 kHz band)
- Reverberation Time measurements (RT 60)
- Advanced Data Logger including spectra logging
- USB Memory Stick providing almost unlimited logging capacity
- Time domain signal recording
- Advanced trigger and alarm functions
- USB 1.1 Host & Client interfaces (real time PC "front end" application supported)
- RS 232 and IrDA interfaces
- Modbus protocol

Machine was calibrated prior to reading. Any noise readings affected by strong wind or rain have been disregarded. The Full Average Statistical Noise Parameters $\mathbf{L_{(Aeq,\ 15\ minutes)}}$, $\mathbf{L_{(A90,\ 15\ minutes)}}$, $\mathbf{L_{(A10,\ 15\ minutes)}}$, $\mathbf{L_{(A1,\ 15\ minutes)}}$ are presented in Figure 6 – Noise Survey. A Summary of those readings is presented in the table below:

Table 5.1 –Summary of Noise Survey Results 23rd January – 30th January, 2019

Point A-Time	$\mathbf{L_{Aep}}$ dB(A)	**RBL** dB(A)
Day Time (7:00am-6:00pm)	46	37
Evening Time (6:00pm-10:00pm)	41	34
Night time (10:00pm-7:00am)	39	33



CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: SLM 22467 & FILT 4590

Equipment Description:	Sound Level Meter		
Manufacturer:	Svantek		
Model No:	Svan-957	**Serial No:**	21437
Microphone Type:	7052E	**Serial No:**	70127
Filter Type:	1/3 Octave	**Serial No:**	21437
Comments:	All tests passed for class 1. (See over for details)		
Owner:	Acoustic Vibration & Noise Pty Ltd Suite 2B, Lev. 2, 34 MacMahon St Hurstville, NSW 2220		
Ambient Pressure:	1003 hPa ±1.5 hPa		
Temperature:	25 °C ±2° C	**Relative Humidity:**	49% ±5%
Date of Calibration:	09/04/2018	**Issue Date:**	09/04/2018

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: ... **AUTHORISED SIGNATURE:** ... Jack Kidd

Accredited for compliance with ISO/IEC 17025 - Calibration
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.

NATA
WORLD RECOGNISED ACCREDITATION

Accredited Lab. No. 9262
Acoustic and Vibration Measurements

ACU-VIB
ELECTRONICS

HEAD OFFICE
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
Tel: (02) 96808133 Fax: (02)96808233
Mobile: 0413 809808
web site: www.acu-vib.com.au

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Figure 5 - Calibration Certificate

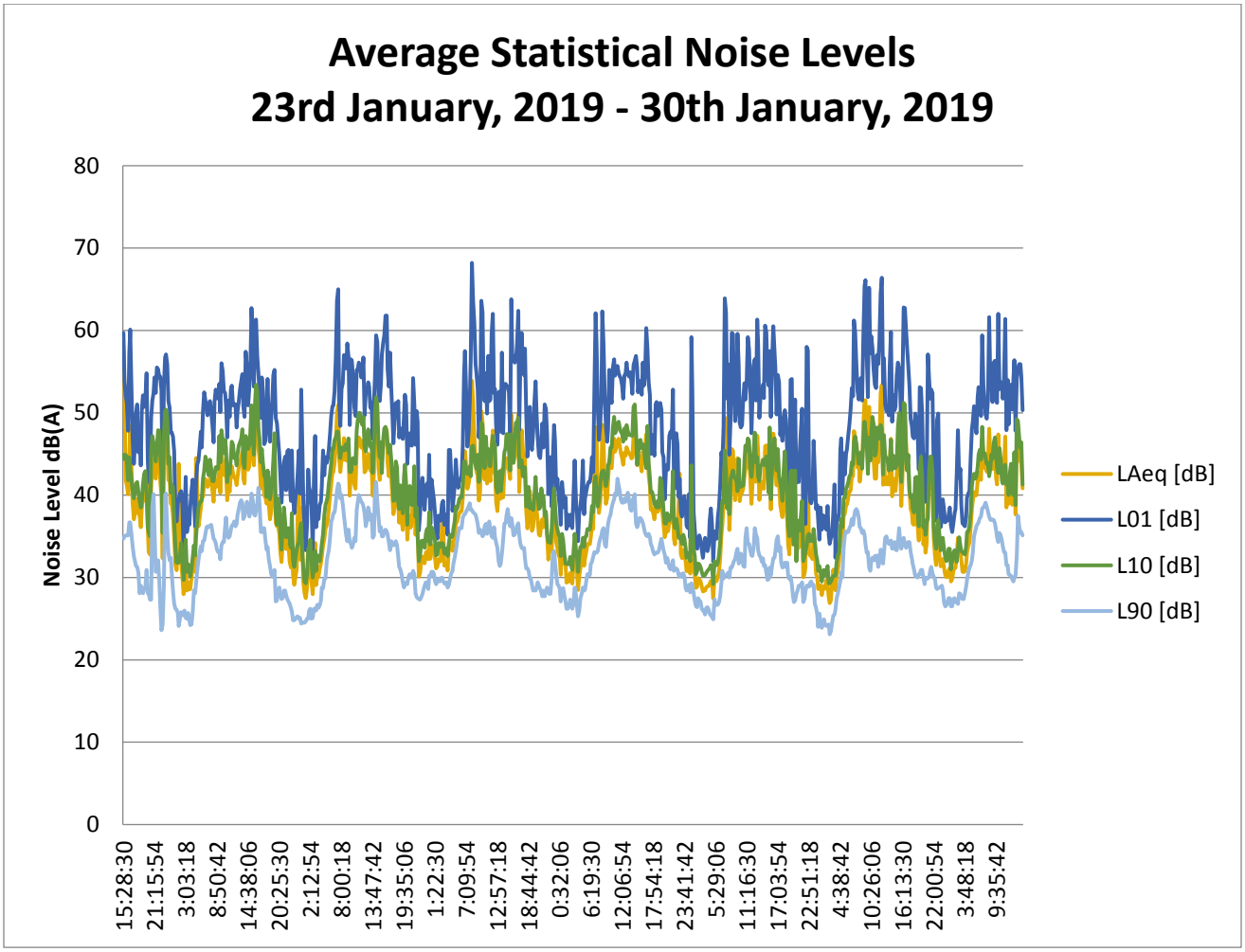

Figure 6 - Noise Survey

6.0 ACCEPTABLE NOISE LEVEL FROM PROPOSED DEVELOPMENT

6.1 Noise GUIDE for Local Government

The Department of Environment and Conservation (NSW) published the amended *Noise Guide for Local Government* in October 2010. The policy is specifically aimed at assessing noise from light industry, shops, entertainment, public buildings, air conditioners, pool pumps and other noise sources in residential areas.

The appropriate regulatory authority (Local Council) may, by notice in writing given to such a person, prohibit the person from causing, permitting or allowing:

1. any specified activity to be carried on at the premises, or
2. any specified article to be used or operated at the premises.

or both, in such a manner as to cause the emission from the premises, at all times or on specified days, or between specified times on all days or on specified days, of noise that, when measured at any specified point (whether within or outside the premises,) is in excess of a specified level.

It is an offence to contravene a noise control notice. Prior to being issued with a noise control notice, no offence has been committed.

The Protection of the Environment Operations Act 1997 defines "Offensive Noise" as noise:

1. (a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:
2. (i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or
3. (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
2. (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 regulation.

6.2 NSW Noise Policy for Industry (2017)

The above policy seeks to promote environmental well-being through preventing and minimizing noise by providing a frame work and process for deriving noise limits conditions for consent and licenses.

The Noise Policy for Industry 2017 recommends two separate noise criteria to be considered, the Intrusive Noise Criteria and the Amenity Noise Criteria. A project noise trigger level being the lowest of the amenity and the intrusiveness noise level is then determined.

If the predicted noise level L_{Aeq} from the proposed project exceeds the noise trigger level, then noise mitigation is required. The extent of any 'reasonable and feasible' noise mitigation required whether at the source or along the noise path is to ensure that the predicted noise level L_{Aeq} from the project at the boundary of most affected residential receiver is not greater than the noise trigger level.

6.2.1 Amenity Noise Criteria

The amenity noise levels presented for different residential categories are presented in Table 2.2 of the Noise Policy for Industry 2017. These levels are introduced as guidance for appropriate noise levels in residential areas surrounding industrial areas.

For the proposed development at No. 682 Castlereagh Road, Agnes Bank the recommended amenity noise levels are presented in table 6.2.1 below:

Table 6.2.1- Recommended Amenity Noise levels

TYPE OF RECIEVER	AREA	TIME PERIOD	RECOMMENDED Leq NOISE LEVEL, dB(A)
Residence	Suburban	Day	55
		Evening	45
		Night	40

Where a noise source contains certain characteristics such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, a correction is to be applied which is to be added to the measured or predicted noise levels at the receiver, before comparison with the criteria. Shown below are the correction factors that are to be applied:

Table 6.2.1.2 – Modifying Factor Corrections as per Fact Sheet C (Noise Policy for Industry 2017)

FACTOR	CORRECTION
Tonal Noise	+ 5 dB
Low Frequency Noise	+ 5 dB
Impulsive Noise	Apply difference in measured fast and impulse response levels, as the correction, up to a maximum of 5 dB.
Intermittent Noise	+ 5 dB

According to Section 2.4 of the above policy, the project amenity noise level is determined as follows:

Project amenity noise level for industrial developments = recommended amenity noise level (Table 2.2) minus 5 dB(A)

To convert from a period level to a 15 minute level, a plus 3 is added as per section 2.2 of the policy.

Therefore, the project amenity noise level for the proposed development at No. 682 Castlereagh Road, Agnes Bank is as follows:

Daytime: 55- 5+ 3=53 dB(A)
Evening: 45 -5+ 3=43 dB(A)
Night-time: 40- 5+ 3=38 dB(A)

6.2.2 Intrusiveness Noise Criteria

Section 2.2.1 of the Noise Guide for Local Government states that a noise source is generally considered to be intrusive if the noise from the source when measured over a 15-minute period exceeds the background noise by more than 5 dB(A). Similarly, The Noise Policy for Industry in Section 2.3 summarizes the intrusive criteria as below:

$L_{Aeq,15\,minute} \leq$ rating background level plus 5

While the background noise level known as $LA_{90,15\ minutes}$ is the Noise exceeded 90% percent of a time period over which annoyance reactions may occur (taken to be 15 minutes). The RBL is defined as the overall single-figure $L_{A90,15\ minutes}$ background level representing each assessment period (day/evening/night) over the whole monitoring period.

For the short-term method, the rating background noise level is simply the lowest measured LAF90,15min level.

For the long-term method, the rating background noise level is defined as the median value of:

- all the day assessment background levels over the monitoring period for the day
- all the evening assessment background levels over the monitoring period for the evening, or
- all the night assessment background levels over the monitoring period for the night.

Therefore, the acceptable L_{eq} noise intrusiveness criterion for the proposed development during the day & night is as follows:

Daytime: **37 + 5 = 42** **dB(A)**
Evening: **34 + 5 = 39** **dB(A)**
Night-time: **33 + 5 = 38** **dB(A)**

6.2.3 Project Noise Trigger Level

A summary of intrusiveness and amenity noise levels as determined in sections 6.2.1 & 6.2.2 are shown in table 6.2.3 below:

Table 6.2.3 - Summary of Intrusiveness and project amenity noise levels

Period	Intrusiveness Noise Level dB(A)	Project Amenity Noise level dB(A)
Day Time (7:00am-6:00pm)	42	53
Evening Time (6:00pm-10: am)	39	43
Night & Early Morning (10:00pm – 7:00am)	38	48

The project noise trigger level is the lower (that is, the most stringent) value of the amenity and intrusiveness noise levels for the day, evening and night time. Therefore, the project noise trigger levels for the proposed development are as shown below

Daytime: $L_{Aeq,15\ min}$ **42 dB(A)**
Evening: $L_{Aeq,15\ min}$ **39 dB(A)**
Night-time: $L_{Aeq,15\ min}$ **38 dB(A)**

The proposed Community Facility and its activities including all mechanical plant will not exceed the project noise trigger level at the most sensitive location, provided all noise control recommendations in Section 8.0 are adhered to.

6.3 Road Traffic Noise Criteria

The proposed Community Facility will also need to comply with the criteria of the NSW Road Noise Policy, for the potential impact of additional traffic that may be generated by the development, on nearby residential developments.

Table 3 in Section 2.3.1 of the NSW Road Noise Policy, sets out traffic noise assessment criteria as follows:

Table 6.3 – NSW Road Noise Policy Traffic Noise Criteria

Road Category	Type of Project/land Use	Assessment Criteria –dB(A)	
		Day (7am-10pm)	Night (10pm-7am)

Local Roads	Existing Residences affected by **additional traffic** on existing local roads general by land use developments	LAeq (1 hour) 55 (external)	LAeq (1 hour) 50 (external)

6.4 Interim Construction Noise Guideline

People react to noise from construction will depend on the time of day that works are undertaken. Residents are usually most annoyed by work at night-time as it has the potential to disturb sleep. Noise from work on evenings, Saturday afternoons, Sundays and public holidays can also be annoying to most residents as it may interrupt leisure activities.

Section 4, Table 2 of the above criteria sets out management levels for noise at residences and how they are to be applied. Restrictions to the hours of construction may apply to activities that generate noise at residences above the 'highly noise affected' noise management level.

Table 6.4 – Noise at Residences Using Quantitative Assessment

Time of Day	Management level LAeq (15 min)	How to apply
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB Day: 7am-6pm (37+10 = **47dB(A)**)	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured LAeq (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for

		works near residences 2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dB Evening:6pm-10pm (34+5=**39dB(A))** Night:10pm-7am (33+5 = **38 dB(A)**)	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community.

The proposed construction of the car park and extension of the Community Facility does not require heavy equipment and large construction work such as pile drilling/hammering. Construction is to be done within the recommended standard hours listed in the Interim Construction Noise Guidelines. Noise emitted from construction work must comply with the specific management levels of the Interim Construction Noise Guidelines Section 4 Table 2.

7.0 PREDICTED NOISE FOR COMMUNITY FACILITY

As stated in Section 3 of this report noise levels from the proposed facility are classifies into the following main noise source:

- Vehicles arriving and departing the site,
- Attendees arriving and departing the site,
- Indoor activities,
- Outdoor activities, and
- Mechanical plant and Equipment.

7.1 Vehicles Arriving and Departing the Site

The proposed car park located at the eastern boundary of the site will accommodate for thirty-six (36) car spaces. While, the proposed alteration to the existing car park located at the southern boundary of the site will accommodate for thirty (30) car spaces and one (1) minibus parking. Access to both car parks will be from Kooringal Drive.

As previously mentioned in Section 2 of this report, the operations of the Community Facility is as follow

- Non-event Day: Administrative duties staff will be attending the site during the week, and their work hours: Mon-Fri - 5 people (max.) Sat/Sun -7 people

(max.); timings – any time during the day. Community site uses attend the site: Mon-Fri - 15 persons between 5pm-7 pm. Sat-Sun – maximum 50 people between noon-7 pm.

- Event Day: is represented by a regular monthly event - 200 persons attending fortnightly, approximately 12 times per year, with peak arrivals and departures outside the am and pm on-road peak hours.

As per the Transport Impact Study by Henson Consulting, the generated traffic volumes from the operations of the Community Facility are predicted in Table 7.1.1. It assumes that staff will arrive in morning peak hours and depart in the evening peak hour, while event attendees are estimated to arrive one hour before the event and depart one hour after the event. Additional, the following traffic generation rates are estimated based on the car occupancy of one (1) staff member per car and three (3) attendees per car for events.

Table 7.1.1 – Subject Site Traffic Generation (Peak Hour)

		Staff				Other attendees				Total
		persons	car occup	prop peak	cars/h	persons	car opp	prop peak	cars/h	veh/h
Non-event day										
arrival peak	in	5	1	1	5	15	3	1	5	10
	out	0	1	1	0	0	3	1	0	0
departure peak	in	0	1	1	0	0	3	1	0	0
	out	5	1	1	5	15	3	1	5	10
Event day										
arrival peak	in	7	1	1	7	200	3	1	67	74
	out	0	1	1	0	0	3	1	0	0
departure peak	in	0	1	1	0	0	3	1	0	0
	out	7	1	1	7	200	3	1	67	74
Event day with 2.5 safety factor to allow for short term 5-minute peaks within the peak hour										
arrival peak	in	7	1	1	7	200			167	174
	out	0	1	1	0	0			0	0
departure peak	in	0	1	1	0	0			0	0
	out	7	1	1	7	200			167	174

Car park noises typically may comprise of people talking, car radios and car doors, with the loudest activity being the noise produced by closing car doors.

Table 7.1.2 – Car Park Noise Source Levels

Car Park Noise Source	Average Sound Power Level, dB(A)
Car Door Closing	91
Car Starting	91
Car Accelerating	91
Car Moving	85
Minibus	87

The predicted noise levels due to vehicles arriving and departing the site will be governed by existing background noise levels from Castlereagh Road and the surrounding residential/rural activities. Distance attenuation loss has also been taken into consideration when making our prediction, as well as recommendations made in this report.

As the proposed car park is located at the eastern boundary of the site, the nearest residential receiver at No. 676-680 Castlereagh Road, will be the most potential affected receiver. The Predicted noise levels from vehicles arriving and departing the proposed car park to the most affected residential receiver at No. No. 676-680 Castlereagh Road is presented in Table 7.1.3.

Table 7.1.3 – Predicted Noise Levels from Vehicles Arriving & Departing the Car Park at No. 676-680 Castlereagh Road, Agnes Bank

Activity	Expected Max Leq dB(A) at No. 676-680 Castlereagh Road	Complies with the NSW Noise Policy for Industry		
		Day (7am-6pm)	Evening (6pm-10pm)	Night (10pm-7am)
Non-event day – arrival and departure peak	29	Yes (<42 db(A))	Yes (<39 db(A))	N/A
Event day – arrival and departure peak	39.7 ~ 40	Yes (<42 db(A))	* No (>39 db(A))	N/A

Note that the community Facility will not be operating past 7:00pm (See Section 2 of this report), therefore complies with the NSW Noise Policy for Industry during the night Period

***** The noise levels at the front boundary of No. 676-680 Castlereagh Road, Agnes Bank complies with Table 3 in Section 2.3.1 of the NSW Road Noise Policy. The sound pressure level increase at the boundary of No. 676-680 Castlereagh Road, as a result of cars arriving and departing the car park is 1.7 dB which is negligible and is not detected by a human ear as indicated in the table below.

Table 7.1.3 – Perceived Changes to the Human Ear

Change in Sound Level	Perceived Changes to the Human Ear
± 1dB	Not perceptible
± 2dB	Hardly perceptible
± 3dB	Threshold of perception

± 5dB	Clearly noticeable
± 10dB	Twice (or half) as Loud

7.2 Attendees Arriving, Departing and Congregating

As previously mention, the Community Facility will be operating from Monday to Friday between 5:00pm-7:00pm to accommodate for 15 people, Saturday and Sunday between 12:00pm-7:00pm with an expectancy of 50 attendees and Event days that occur monthly with a maximum of 200 attendees.

Major noise source associated when attendees of the Community Facility congregate in the proposed car park upon arrival and departure as well as undertake outdoor activities such as outdoor celebrations, children playing in the designated play area and on the volley ball court.

Table 7.2.1 Noise Produced in Conversation

Descriptor	Mean Sound Level dB(A)	Standard Deviation dB(A)
Casual Speech	52	± 5
Normal Speech	58	± 5
Raised Speech	65	± 7
Loud Speech	74	± 9
Shouting	82	± 9

Due to the close proximity of the proposed car park located adjacent to the east boundary of the site, the nearest receiver at No. 676-680 Castlereagh Road will be the most potentially affected by attendees outside the car park.

The calculations were made in the Table 7.2.2 assumes that vocal noise will be casual-normal speech and that approximately 30% of attendees are speaking at the same time. Due to the stop-start nature of conversation and due to the many different directions that speakers would be facing, the likely LAeq speech noise levels would be as follows, provided the recommendations in Section 8.0 of this report are adhered to.

Table 7.2.2 – Predicted Noise Levels from attendees upon arriving and departing the carpark at No. 676-680 Castlereagh Road, Agnes Bank

Activity	Expected Max Leq dB(A) at No. 676-680 Castlereagh Road	Complies with the NSW Noise Policy for Industry		
		Day (7am-6pm)	Evening (6pm-10pm)	Night (10pm-7am)
Non-event day – arrival peak and departure peak with maximum 15 attendees	31	Yes (< 42 dB(A))	Yes (< 39 dB(A))	N/A
Non-event day – arrival peak and departure peak with maximum 100 attendees	38	Yes (< 42 dB(A))	Yes (< 39 dB(A))	N/A
Event day – arrival peak and departure peak with maximum 200 attendees	41	Yes (< 42 dB(A))	**No (>38 dB(A))**	N/A

Note that the community Facility will not be operating past 7:00pm (See Section 2 of this report), therefore complies with the NSW Noise Policy for Industry during the night Period

It is recommended that there is no talking in the proposed car park area. However this may pose as a difficultly, it is suggested that staff usher attendees in an orderly fashion upon arrival and departure to control and limit the amount of talking in the carpark.

7.3 Proposed Mechanical Plant & Equipment

A range of mechanical plant, equipment and ventilation will be included in the proposed Community Facility at No. 682 Castlereagh Road, Agnes Bank, such as air-conditioning units, Kitchen Exhausts and Toilet Exhausts. Noise emitted by the use of the proposed mechanical plant is assessed by the NSW Noise Policy for Industry 2017 and Council conditions/requirements.

Typical noise levels for air-condition and exhaust fans are presented in Table 7.3.1.

Table 7.3.1 –Typical Mechanical Plant Leq Sound Power Levels

FREQUENCY [Hz]	63	125	250	500	1000	2000	4000	8000	dBA
Typical Kitchen Exhaust fan	59	59	57	68	65	64	56	49	**70**
Typical Bathroom Exhaust fan	54	54	62	63	60	59	51	44	**65**
Typical A/C Condensing Unit	71	69	67	61	58	54	47	44	**64**

As the proposed development is still in the initial application stage, we recommend that further acoustic assessment is carried out when the development has been approved and Mechanical Services plans have been prepared for our review. However, provided recommendations in Section 8.5 of this report are adhered to, all proposed mechanical plant and equipment is likely to comply with the criteria of the Noise Policy and Council Conditions.

8.0 NOISE CONTROL RECOMMENDATIONS

8.1 Management of Proposed Community Facility

Attendees must be informed of the nearest residential noise receivers and the importance of minimizing indoor and outdoor noise produced.

It is recommended that administrative staff usher attendees upon arrival and departure especial during Event Days when maximum attendance is expected to ensure that attendees enter and leave the site in an orderly fashion and ensure that farewells and greets occur inside the facility.

8.2 Signs

Signs reminding attendees to minimise noise at all times shall be installed at entry and exit points of the proposed Community Facility and car park area. It is advised that the signs be provided in several languages to accommodate the different language needs of members of the community.

8.3 Operation of Windows & Doors

All operable windows and doors located in the proposed Community Facility are to be closed during hours of operation (see Section 2 for operating hours).

8.4 Construction Work

Construction work must be done between the following hours;

- Monday to Friday: 7:00am to 6:00pm
- Saturday: 8:00am to 1:00pm
- No work is to be completed on Sunday and on public holidays.

All noise emitted from construction work must comply with Section 4 Table 2 of the Interim Construction Noise Guidelines.

8.5 Mechanical Plant & Equipment

As previously mentioned, we recommend acoustic assessment of all proposed Mechanical Plant & Equipment once the development has been approved and Mechanical Services Plans have been prepared.

In general, we recommend that all new external air-conditioning units are to be acoustically enclosed or set away by more than 3.0m from any boundary.

8.6 Sound Barrier

We recommend that a 2.1 metre high Sound Barrier is installed on the eastern boundaries of the site, adjacent to the nearest residential receivers at No. 676-680 Castlereagh Road, Agnes Bank (Figure 7 – Sound Barrier Location). The gap-free barrier is to be of lapped & capped timber, colourbond or masonry construction, to a height of 2.1 metres.

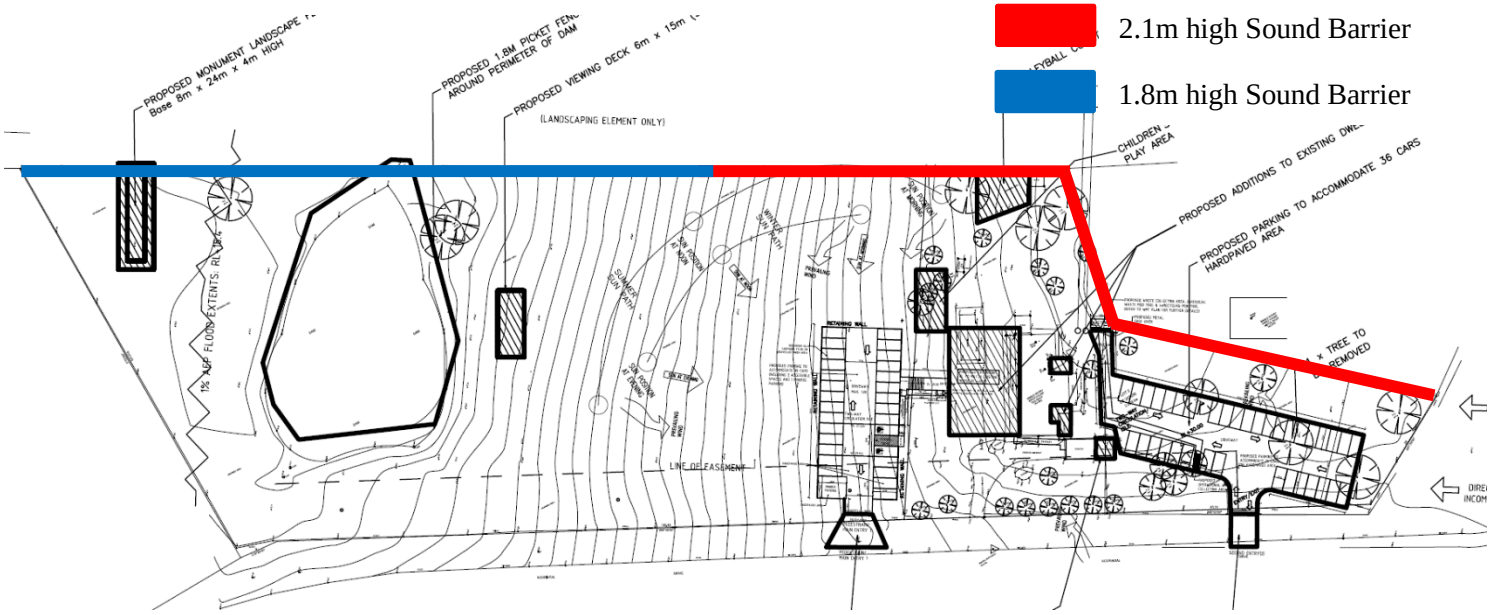

Figure 7– Sound Barrier Location

8.7 Noise Management Plan

A Noise Management Plan should be implemented and should include the following:

- Install a contact number at the front of the Community Facility so that complaints regarding the centre operation can be made.
- Implement a complaint handling procedure. If a noise complaint is received the complaint should be recorded on a Complaint Form. The Complaint Form should contain the following:
    - Name and address of the Complainant
    - Time and date the Complaint was received
    - The nature of the complaint and the time/date the noise was heard
    - The name of the employee that received the complaint
    - Actions taken to investigate the complaint and the summary of the results of the investigation
    - Indication of what was occurring at the time the noise was happening (if applicable)
    - Required remedial action (if applicable)

- Validation of the remedial action
- Summary of feedback to the complaint

Also a permanent register of complaints should be held on the premises, which shall be reviewed monthly by attendees to ensure all complaints are being responded to. All complaints received shall be reported to management with initial action/investigation commencing within 7 days. The complaint should also be notified of the results and actions arising from the investigation.

9.0 DISCUSSION & CONCLUSION

Acoustic, Vibration & Noise Pty Ltd have taken background noise level measurements at the most noise sensitive locations near the proposed Community Facility at No. 682 Castlereagh Road, Agnes Bank. The levels of noise emission from the proposed Community Facility have been calculated and quantified using reliable test data.

Provided the noise controls as recommended in Section 8.0 of this report are fully implemented, we are confident that the noise emission levels will be controlled and not exceed the criteria outlined in Section 6.0 of this report and will satisfy the conditions/requirements of Council.

Should you require further explanations, please do not hesitate to contact us.

Yours Sincerely,

M. Zaioor
M.S. Eng'g Sci. (UNSW).
M.I.E.(Aust), CPEng
Australian Acoustical Society (Member)