REVERB ACOUSTICS

Noise and Vibration Consultants

Noise Impact Assessment
Wedding Venue, Function Centre,
Lot 10, DP.1035397,
893 Paterson Road
Woodville NSW

October 2024

Prepared for Albion Farm Gardens
Report No. 24-2941-R1

Building Acoustics-Council/EPA Submissions-Modelling-Compliance-Certification

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SECTION 1
Introduction - Technical Reference/Documents

1.1 INTRODUCTION

Reverb Acoustics has been commissioned to provide a Noise Impact Assessment (NIA) for a proposed Wedding Venue and Function Centre at Lot 10 DP.1035397, 893 Paterson Road, Woodville. The assessment considers likely sources of noise that may impact upon nearby residential receivers from operation of the site. The purpose of this report is to recommend appropriate acoustic measures that must be implemented to ensure compliance with the requirements of the NSW Environment Protection Authority (EPA) and Port Stephens Council (PSC).

The assessment was requested by Albion Park Gardens in support of and to accompany a Development Application to PSC and to ensure any noise control measures required are incorporated during the design stages.

1.2 TECHNICAL REFERENCE / DOCUMENTS

AS 1276.1-1999 *"Acoustics – Rating of sound insulation in buildings and of building elements. Part 1: Airborne sound insulation"*.

NSW Environment Protection Authority (2017). *Noise Policy for Industry*

NSW Roads and Traffic Authority (2001). *Environmental Noise Management Manual*

NSW Environment Protection Authority (1994). *Environmental Noise Control Manual*

Department of Environment and Climate Change NSW (2007). *Noise Guide for Local Government.*

Liquor Administration Board *"Noise Control Guidelines"*

Preliminary plans supplied by our client. Note that variations from the design supplied to us, may affect the acoustic recommendations.

A Glossary of commonly used acoustical terms is presented in Appendix A to aid the reader in understanding the Report.

SECTION 2
Existing Acoustic Environment Assessment Criteria

2.1 EXISTING ACOUSTIC ENVIRONMENT

A background noise level survey was conducted using a Class 1, Svan 977 environmental noise logging monitor, installed at the east boundary of the property, approximately 30 metres from the near lane of traffic on Paterson Road (see Figure 1). The selected location is representative of the acoustic environment in the receiver area and is considered an acceptable location for determination of the background noise in accordance with Appendix B of the EPA's Noise Policy for Industry (NPfI).

Noise levels were continuously monitored from 1 October to 8 October 2024, to determine the existing background and ambient noise levels for the area. The instrument was programmed to accumulate environmental noise data continuously and store results in internal memory.

The data were then analysed to determine 15 minute Leq and statistical noise levels using dedicated software supplied with the instrument. The instrument was calibrated with a Brüel and Kjaer 4230 sound level calibrator producing 94dB at 1kHz before and after the monitoring period, as part of the instrument's programming and downloading procedure, and showed an error less than 0.5dB.

Table 1 shows a summary of our noise survey, including the Assessment Background Levels (ABL's), for the day, evening, and night periods. From these ABL's the Rating Background Level (RBL) has been calculated, according to the procedures described in the EPA's NPfI and by following the procedures and guidelines detailed in Australian Standard AS1055-1997, "Acoustics - Description and Measurement of Environmental Noise, Part 1 General Procedures". A complete set of logger results is not shown, but available on request.

Table 1: Summary of Noise Logger Results, dB(A)

Time Period	Background L90			Ambient Leq		
	Day 7am-6pm	Evening 6pm-10pm	Night 10pm-7am	Day 7am-6pm	Evening 6pm-10pm	Night 10pm-7am
1-2 oct	33.5	36.6	31.3	50.7	44.8	49.7
2-3 Oct	37.3	34.3	29.6	53.0	47.2	48.9
3-4 Oct	35.6	35.7	30.0	51.0	45.8	49.4
4-5 Oct	34.6	34.9	30.0	52.9	44.5	48.0
5-6 Oct	38.8	37.1	29.8	53.5	45.2	48.8
6-7 oct	42.0	34.8	29.2	54.9	43.5	49.9
7-8 Oct	38.0	37.7	30.5	50.6	44.3	50.0
RBL	**37.3**	**35.7**	**30.0**	**--**	**--**	**--**
LAeq	**--**	**--**	**--**	**52.6**	**45.2**	**49.3**
Background Noise Level 6pm-12am 32.3dB(A),L90						

Site, weather and measuring conditions were all satisfactory during the noise survey. We therefore see no serious reason to modify the results because of influencing factors related to the site, weather or our measuring techniques.

Additional attended background noise level surveys have also been completed using a Class 1, Svan 977 Sound Level Meter. As part of our noise surveys a typical frequency spectrum of the background noise environment was recorded, which has been adjusted to give a total level equivalent to the average background noise levels from 6pm-12am. Table 2 shows the measured background (L90) frequency spectrum in the receiver areas.

Table 2: Measured Background Noise Level Spectrum, L(A)90

Location	1/1 Octave dB(A)	Before 12am
M1	31.5 Hz	15
	63 Hz	19
	125 Hz	22
	250 Hz	24
	500 Hz	25
	1 kHz	27
	2 kHz	25
	4 kHz	20
	8 kHz	14
	Total A	32

Figure 1: Location Plan

2.2 CRITERIA

2.2.1 Mechanical Plant (Impact on Neighbours)

Noise from industrial noise sources scheduled under the Protection of Environment Operations Act is assessed using the EPA's NPfI. However, local Councils and Government Departments may also apply the criteria for land use planning, compliance and complaints management. The NPfI specifies two separate criteria designed to ensure existing and future developments meet environmental noise objectives. The first limits intrusive noise to 5dB(A) above the background noise level and the other aims to protect against progressively increasing noise in developing areas, based on the existing (Leq) noise level from industrial noise sources. Project Noise trigger levels are established for new developments by applying both criteria to the situation and adopting the more stringent of the two.

The existing L(A)eq for the receiver areas is dominated by traffic on nearby roads, agricultural activity and some commercial/light industrial noise sources during the day, evening and night. Reference to Table 2.2 of the NPfI shows that all receiver areas are classified as rural. The Project Amenity Level is derived by subtracting 5dB(A) from the recommended amenity level shown in Table 2.2. A further +3dB(A) adjustment is required to standardise the time periods to LAeq, 15 minute.

The adjustments are carried out as follows:

Recommended Amenity Noise Level (Table 2.2) – 5dB(A) +3dB(A)

Table 3 below specifies the applicable project intrusiveness and amenity noise trigger levels for the proposed redevelopment.

Table 3: - Intrusiveness and Amenity Noise levels

Period	Intrusiveness Criteria	Amenity Criteria
Day	42 (37+5)	48 (50-5+3)
Evening	41 (36+5)	43 (45-5+3)
Night	35 (30+5)	38 (40-5+3)
Receiver Type: Rural (See EPA's NPfI - Table 2.1)		

Project Noise Trigger Levels, determined as the more stringent of the intrusiveness criteria and the amenity / high traffic criteria, are as follows:

Day **42dB LAeq,15 Minute** 7am to 6pm Mon to Sat or 8am to 6pm Sun and Pub Hol.
Evening **41dB LAeq,15 Minute** 6pm to 10pm
Night **35dB LAeq,15 Minute** 10pm to 7am Mon to Sat or 10pm to 8am Sun and Pub Hol.

NOTE: Section 2.6 of the NPfI states that assessment should be to the most affected point on or within the residential property boundary, or if that is more than 30m from the residence, at the most affected point within 30m of the residence.

2.2.2 Noise Guide for Local Government – Sleep Arousal

Section 2.2.4 of EPA's Noise Guide for Local Government, 2013 suggests that a screening test should be carried out to ensure short-term noise events do not interrupt the sleep of occupants of a residence. The Guide recommends that intruding noise should not exceed the prevailing background (L90) noise level by more than 15dB(A), expressed as either an L(A)1(1 minute) or L(A)max noise level.

Based on an average minimum background noise level of 31dB(A),L90 for night (10pm-12am) the sleep arousal criterion is set at **46dB(A),Lmax** at the bedroom window of any affected residential receiver.

2.2.3 Amplified Entertainment/Site Activities - Liquor &Gaming NSW

Since this assessment relates to control of noise from licensed premises, together with determination of a Development Application, two relevant criteria apply for assessment of noise impacts from amplified entertainment. Reproduced below are the LA10 Noise Conditions adopted for assessment purposes:

"The LA10 noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5Hz - 8kHz inclusive) by more than 5dB between 07:00 am and 12:00 midnight at the boundary of any affected residence.

The LA10 noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5Hz - 8kHz inclusive) between 12:00 midnight and 07:00 am at the boundary of any affected residence.

Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00 midnight and 07:00 am." (NOTE: The Function Centre will not trade beyond midnight and amplified entertainment will cease by 10pm, therefore clauses relating to criteria after 12am do not apply).

For the purposes of this condition, the LA10 can be taken as the average maximum deflection of the noise emission from the licensed premises.

Alternate criteria that may apply are those taken from the EPA's NPfI, which considers noise from industrial noise sources scheduled under the Protection of Environment Operations Act. Since the premises is licensed and the LA10 criteria are more stringent in this case, we have adopted criteria shown above and in Table 4.

Table 4: Noise Planning Levels, L(A)10 – Amplified Entertainment

Location	1/1 Octave dB(A)	6pm-10pm	10pm-12am
Nearest Residences	31.5 Hz	24	20
	63 Hz	28	24
	125 Hz	31	27
	250 Hz	33	29
	500 Hz	34	30
	1 kHz	36	32
	2 kHz	34	30
	4 kHz	29	25
	8 kHz	23	19
	Total A	41	37

SECTION 3
Noise Impact Assessment
Site Operation

3.1 PROJECT DESCRIPTION

Albion Farm Gardens seeks Development Consent for a Wedding Venue and Function Centre at Lot 10 DP.1035397, 893 Paterson Road, Woodville. This proposal is for a function room for a maximum of one hundred and eighty (180) guests, to include a kitchen and amenities.

Proposed trading/operating hours at the site are as follows:

- Function Room 9am-11.30pm
- Amplified Music (Indoors) 9am-10.00pm
- Background (incidental) music 9am-11.30pm

Note that no amplified entertainment is permitted outdoors with the exception of wedding ceremonies, which forms part of a separate approval.

The proposal is in the preliminary stages, although we understand that the function centre will be designed with input from Reverb Acoustics to ensure sensible design that considers the amenity of nearby neighbours. Strategies will include positioning the function room break-out areas and recreational areas on the south side of the building facing away from nearest residences and/or in shielded locations.

The purpose of this assessment is to identify the noise impact from operation of the site at nearest residential receivers (see Figure 1), and to ensure any noise control measures are incorporated during the design stages.

3.2 METHODOLOGY

3.2.1 Amplified Entertainment/PA Usage

A theoretical assessment of amplified entertainment in the Function Room has been carried out to predict the noise level at the nearest potentially affected residential boundaries. Consultation with our client reveals that soloists, duos, DJs are proposed up until 10pm. Using noise data for the above scenario and the known criteria at nearby residences enabled calculation of the required transmission loss of each building element and barrier design.

The Sound Power Levels, Lw dB(A), of typical entertainment types expected at the premises are shown in the following Tables. The noise source has been placed in the centre of the room, as the exact location of the "stage" is unknown, and theoretically propagated to nearest residences taking into account reverberant field loss to internal surfaces and barrier loss from intervening structures.

The Sound Power Levels, Lw dB(A), of anticipated entertainment types are shown in the following Tables. The noise sources have been placed in the nominated areas and theoretically propagated to nearest residences taking into account reverberant field loss to internal surfaces and transmission loss through each building element.

Table 5: Lw, Acoustic Performer No Amplified Base, dB(A),L10

	Octave Band Centre Frequency, Hz								
dB(A)	**31.5**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
95	53	61	74	84	88	90	89	85	79

Table 6: Lw, Typical DJ/Duo, dB(A),L10

	Octave Band Centre Frequency, Hz								
dB(A)	**31.5**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
103	61	69	86	95	96	97	95	91	88

3.2.2 Site Activities

Future noise sources on the site cannot be measured at this time, consequently typical noise levels have been sourced from manufacturers' data and/or our library of technical data. These noise level measurements were taken with a Svan 912AE Sound and Vibration Analyser. The instrument is Class 1 accuracy, in accordance with the requirements of IEC 61672, and has the capability to measure steady, fluctuating, intermittent and/or impulsive sound, and to compute and display percentile noise levels for the measuring period. A calibration signal was used to align the instrument train prior to measuring and checked at the conclusion. Difference in the two measurements was less than 0.5dB. Each measurement was taken over a representative time period to include all aspects of machine operation, including additional start-up noise where applicable. Items of equipment, which produced a brief burst of noise, such as a truck, were measured for a similarly brief time period to ensure the results were not influenced by long periods of inactivity between operations. Sound measurements were generally made around all sides of each machine/activity, to enable the acoustic sound power (dB re 1pW) to be calculated. The sound power level of each item is then theoretically propagated to each receiver with allowances made for geometric spreading, directivity, molecular absorption, intervening topography or barriers and ground effects giving the received noise level at the receiver from that particular plant item.

Addition of the received Sound Pressure Level (SPL) for each of the individual operating sources gives the total SPL at each receiver, which is then compared to the relevant criteria. Where noise impacts above the criteria are identified, suitable noise control measures are implemented and reassessed to demonstrate satisfactory received noise levels.

The sound power level of each activity was determined according to the procedures described in AS IEC 61672-2004 as appropriate, and theoretically propagated to nearby receivers.

Due to the non-continuous nature of activities, duration adjustments are determined using the following formula. Where noise impacts above the criteria are identified, suitable noise control measures are implemented and reassessed to demonstrate satisfactory received noise levels in the residential area.

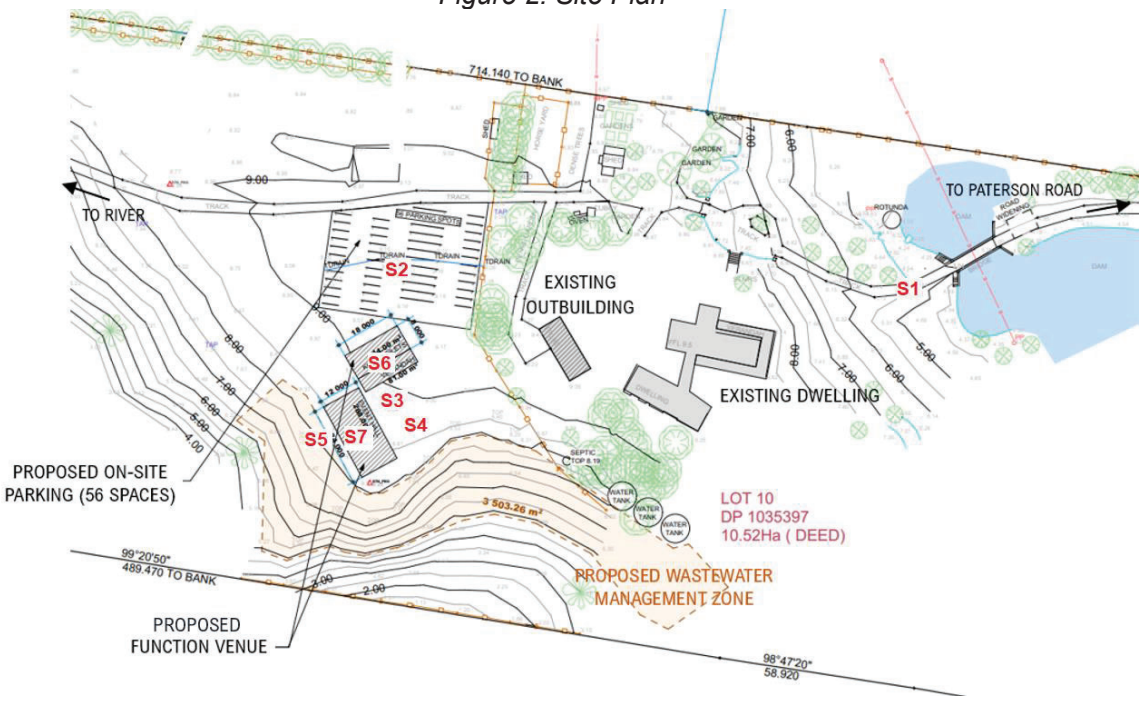
Equation 2:

$$L_{eq},T = Lw - \quad 10\ log\ (2\,\pi\,r^2)\ + 10\ log\ \frac{(D\ x\ N)}{T}$$

Where Lw is sound power level of source (dB(A))
R distance to receiver (m)
D is duration of noise for each event (sec)
N is number of events
T is total assessment period (sec)

Figure 2 below shows the layout of the site and the anticipated location of noise generating activities/equipment that may impact upon the nearest receivers.

Figure 2: Site Plan



LEGEND:

S1. Vehicles main entry
S2. Vehicles carpark
S3. Background (Incidental music)
S4. Guests at Function break-out
S5. Air conditioning plant
S6. Kitchen Exhaust
S7. Amplified entertainment (indoors)

3.2.3 Atmospheric Conditions

In the Woodville region, atmospheric conditions can exacerbate received noise levels for a percentage of the time. Temperature inversions may be expected in the area during the night and early morning at a frequency of greater than 30% of the time during winter and to a lesser degree in the warmer months. Inversion effects are strongest in the early hours of the morning but tend to weaken rapidly and may be considered to have completely dissipated by 9am or earlier. Wind in a particular direction can also cause increased received noise levels at downwind receivers. However, given the relatively short distance from the site to nearest receivers, noise enhancement due to inversions and wind will be negligible and has not been considered further.

3.3 ANALYSIS AND DISCUSSION

3.3.1 Received Noise Levels – Amplified Entertainment

The following Table shows calculations of noise propagated through the open (south) doors of the Function Room, while a DJ is performing and the resulting impact at the nearest residence east of the site (R3).

Table 7: Calculated SPL (Entertainment) – East Residence (R3)
Propagated through Open Function Room Doors

		Octave Band Centre Frequency, Hz								
Item	**dB(A)**	**31.5**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Source Lw	**103**	61	69	86	95	96	97	95	91	88
Barrier loss/dir[1]		5	5	5	4	4	2	0	0	0
SPL at rec	**34**	**-**	**-**	**16**	**26**	**27**	**29**	**29**	**24**	**17**
Criteria	**41**	**24**	**28**	**31**	**33**	**34**	**36**	**34**	**29**	**23**
Impact	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

1. Intervening structures, operable doors to Function Room open.

Theoretical results in the above Table show that noise emissions from entertainment will be compliant with the overall LA10 criteria prior to 10pm, based on proposed construction details outlined in Section 4.

Table 8 shows a summary of calculations to predict the resulting noise impact at all nearby residential receivers from entertainment within the function rooms.

Table 8: Calculated SPL (Entertainment)
Propagated to Nearest Residential Receivers dB(A),L10

		Octave Band Centre Frequency, Hz								
Noise Path	**dB(A)**	**31.5**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
R1. Residence NW	28	-	-	17	24	23	21	15	7	-
R2. Residence NE	22	-	-	11	18	17	15	9	1	-
R3. Residence E	34	-	-	16	26	27	29	29	24	17
R4. Residence SE	33	-	-	15	25	26	28	28	23	16
Crit (before 10pm)	**41**	**24**	**28**	**31**	**33**	**34**	**36**	**34**	**29**	**23**

Theoretical results in the above Table shows that noise emissions from entertainment are predicted to be compliant with the overall LA10 criteria, subject to the construction details and strategies described in Section 4 being implemented. In the unlikely event of a valid complaint, the first course of action should be to close the operable doors to the function room. Note that all other access doors must be closed when amplified entertainment takes place.

While we consider that the controls recommended to reduce entertainment noise to acceptable levels will be satisfactory, the wide variation in output from entertainment providers may cause higher than predicted noise in the residential area. Should valid complaint occur, we recommend the installation of an electronic Noise Limiter in the affected area. These devices have been proven capable of controlling low frequency emissions and are a cost effective solution for minor noise exceedances.

3.3.2 Received Noise Levels – Site Noise

Reference to preliminary calculations reveal that exceedances of the criteria may occur at night, therefore the following noise control modifications will be necessary to achieve compliance:

1. Limiting Sound Pressure Levels (SPL's) for mechanical plant.
2. Restriction on allowable times for amplified entertainment (9am-10pm).
3. No outdoor amplified entertainment permitted.
4. Restrictions operating times for Function Room (9am-11.30pm).

The following Table shows calculations to predict received noise levels from the site based on a worst-case situation, as shown on Figure 2 during the day and evening, propagated to the nearest residences east of the site (R3). All calculations have been carried out with the above noise control in place.

Table 9: Received Noise - Site Activities dB(A),Leq DAY
Propagated East to Nearest Residence R3

Item/Activity	Lw dB(A)	Dist to Rec (m)	Duration (sec)	No. of Events	Barrier Loss/TL	Received dB(A)
Vehicles main access road S1	85	140	10	120	2	33
Vehicles carpark S2	78	350	20	120	3	20
Background music (outdoors) S3	92	350	900	1	4	29
Guests function break-out S4	85	350	900	90	4	22
Air conditioning plant S5	71	350	900	1	21	-
Kitchen exhaust S6	78	350	900	1	2	17
Amplified music Function S7	103	350	900	1	10	34
				Combined		**38**
				Criteria (D/E)		**42/41**
				Impact		**0/0**

As can be seen by the results in Table 9, the cumulative noise impact from activities associated with the site are predicted to be compliant with the criteria at all nearby receivers, providing the recommended noise control detailed in Section 4 is incorporated into the design of the site. Table 10 shows a summary of predicted noise impacts during all time periods at nearest all nearby residential receivers with noise control in place.

Table 10: Summary Received Noise – All Nearby Residential Receivers

Receiver Loc'n	Received Noise (Day/Evening/Night)						
	Period	dB(A),Leq	Crit	Impact	dB(A),Lm	Crit	Impact
Residence NW R1	Day	35	42	0	-	N/A	-
	Evening	35	41	0	-	N/A	-
	10pm-12am	34	37	0	38	46	0
Residence NE R2	Day	30	42	0	-	N/A	-
	Evening	30	41	0	-	N/A	-
	10pm-12am	29	37	0	34	46	0
Residence E R3	Day	38	42	0	-	N/A	-
	Evening	38	41	0	-	N/A	-
	10pm-12am	35	37	0	36	46	0
Residence SE R4	Day	35	42	0	-	N/A	-
	Evening	35	41	0	-	N/A	-
	10pm-12am	32	37	0	37	46	0

As can be seen by results in the above Table, noise associated with site activities and equipment will generally be compliant with the criteria during all time periods at all nearby receivers, providing acoustic strategies detailed in Section 4 are implemented.

SECTION 4
Summary of Recommended Noise Control

4.1 NOISE CONTROL RECOMMENDATIONS

4.1.1 The following trading and operating hours are acceptable:

- Function Room	9am-11.30pm
- Amplified Music (Indoors)	9am-10.00pm
- Background (incidental) music	9am-11.30pm

4.1.2 As part of Construction Certificate documentation a detailed assessment of the noise impacts from all mechanical plant associated with the development will be required once locations and selections have been finalised.

4.1.3. No noise control is required for mechanical plant providing noise emissions for individual items are below the specified limits:

Item	*Max SPL at a Dist of 1 metre*	*Lw*
Air Conditioning Condenser	82dB(A)	88dB(A)
Refrigeration	82dB(A)	88dB(A)
Exhaust Discharge	80dB(A)	86dB(A)

4.1.4 Acoustic barriers are to be constructed at the fan discharge of exhaust plant that exceeds the limits specified in 4.1.3 above. Barriers must fully enclose at least three sides towards any residence. In our experience, a more efficient and structurally secure barrier is one that encloses all four sides. The barrier must extend at least 600mm above and below the fan centre and/or the discharge outlet and must be no further than 1200mm from the edges of the exhaust. Barrier construction should consist of ***either*** Acoustisorb panels (available through Modular Walls) ***or*** an outer layer of one sheet of 12mm fibre cement sheeting (Villaboard, Hardiflex), or 19mm marine plywood. The inside (plant side) is to be lined with an absorbent foam to reduce reverberant sound (fibrous infills are not recommended as they will deteriorate if wet), Note that variations to barrier construction or alternate materials are not permitted without approval from the acoustical consultant. Barrier construction is based solely on acoustic issues. Visual, wind load issues must be considered and designed by appropriately qualified engineers.

4.1.5 Acoustic barriers are to be constructed adjacent to air conditioning/refrigeration plant that exceeds the limits specified in 4.1.3 above. Acoustic barriers 500mm above the highest plant item must be erected between the plant and residences. Barrier construction is to consist of ***either*** Acoustisorb panels (available through Modular Walls) ***or*** an outer layer of 12mm fibre cement sheeting, 25mm construction plywood, Hebel Powerpanel, or similar material, with an absorbent inner surface of perforated metal (minimum 10-15% open area) backed with a water resistant acrylic batt or blanket. The acoustic barrier must continue at least 300mm below the top of the plant deck.

4.1.6 Where plant intended to be installed on the site produces noise in excess of specified levels, noise control will be required to ensure satisfactory noise emissions. The contractor responsible for supplying and installing the plant should be asked to supply evidence that installed plant meets this noise emission limit, or that noise control included with the plant is effective in reducing the sound level to the specified limit.

4.1.7 It should be noted that no penalties have been applied for tonality in our calculations, therefore the tenderer's attention is drawn to the fact that mechanical plant may be near sensitive receivers, and it is vitally important that units are free from specifically annoying characteristics (eg. tones, squeaks, pulsations etc). Careful selection of plant, equipment, piping and ducting systems is recommended to ensure quiet and vibration free operation in compliance with the specified noise criteria. Replacement and/or modification will be necessary to all systems causing undue noise or vibration exceeding the specified criteria.

4.1.8 All amplified entertainment must be restricted to the indoor Function Centre, i.e. no amplified entertainment outdoors, Byfold doors on the south side of the Function Room may remain open. In the event of a valid compliant in regard to amplified entertainment, the first course of action should be to shut the external doors.

4.1.9 All amplified entertainment in the Function Room must cease by 10pm. Background (incidental) music may continue past this time until venue closure.

4.1.10 In the event of valid complaints arising from amplified music, we recommend installing an electronic Sound Limiter or similar limiting device in affected areas. These devices have been proven capable of controlling low frequency emissions and are a cost effective solution for minor noise exceedances. Options are detailed below:

If DJ/Band uses own sound system:
Electronic Sound Limiter
Suppliers: https://www.technologysoundandvision.com.au
https://www.waveformacoustics.com.au/noise-and-sound-limiters
https://www.acousticaldesign.com.au/noise-volume-limiters-indicators

If using in-house sound system for all providers:
DSP Controller with inbuilt rms limiting.
Suppliers: https://www.a1audio.com.au

4.1.11 Background "incidental" music is permitted in outdoor areas at all times. A limiting SPL of **75dB(A),Lmax** is to be set at a distance of 3000mm from each speaker. Once this output limit is achieved, corresponding references should be assigned to the sound system controls and should only be accessed by responsible staff familiar with the system settings.

4.1.12 Typical construction and strategies for the Function Centre include the following:

- Orientating building so doors leading to break-out areas are located on the south side of the building.
- With the exception of main doors on south side of the building, all external windows and doors must be closed when amplified entertainment takes place in the Function Centre.
- Guest break-out areas are to be located on the south side of the function Room building.
- All external glazing to achieve minimum Rw33 rating. Laboratory data suggests 6.5mm Vlam Hush glass with acoustic seals at perimeter, or similar.
- Roof construction to be designed in conjunction with the acoustic consultant, achieving minimum Rw41 rating.
- Wall construction to be designed in conjunction with the acoustic consultant, achieving minimum Rw38 rating.
-

4.1.13 Vehicles and items of equipment should not be left idling unnecessarily, particularly when in exposed locations prior to 7am or after 10pm. Items found to produce excessive noise compared to industry best practice should be removed from the site or stood down until repairs or modifications can be made.

4.1.14 Consideration should be given to providing surface treatment to inside surfaces of areas where large groups of people may gather, in particular the Function Room. Our recommendations are not mandatory but will enable the space to function for the intended purpose, providing a more comfortable acoustic environment for occupants. The following options are available:

Option 1: Secondary ceiling consisting of perforated metal (minimum 15% open area), backed with R1.5 insulation.
Option 2: Suspend/attach Armstrong Soundscape Shapes 50-100mm from plasterboard ceiling surface.
Link: https://www.armstrongceilings.com/commercial/en-au/search.html?q=sounscape+shapes
Option 3: Suspend functional absorbers (acoustic rafts or baffles) from the ceiling. We recommend Ecophon Solo Panels (NRC 0.75), which can be suspended horizontally as rafts.
Web Link https://www.himmel.com.au/product-listing/2016/07/13/ecophon-solo-panels
Option 4: Fix Ecoustic panels to the ceiling 2500mm x 150/350mm x 24mm.
Web Link: https://instyle.com.au/products/acoustic-panels/ecoustic-acoustic-panel-8mm-13-5mm-25mm-50mm/
Option 5: Echosorb 25 Acoustic Baffles hung vertically and evenly spaced throughout the room.
Web Link: https://www.acoustica.com.au/product/echosorb/

4.1.15 For both employees and sub-contractors some form of education campaign is suggested to ensure satisfactory noise levels at nearby residences. The education can be part of in-service training, flowed down contractually to all sub-contractors.

SECTION 5
Conclusion

5.1 CONCLUSION

A noise impact assessment for the proposed Wedding Venue and Function Centre at Lot 10 DP.1035397, 893 Paterson Road, Woodville, has been completed, resulting in noise control recommendations summarised in Section 4 of this Report. The site is suitable for the intended purpose, providing recommendations outlined in this report are incorporated into the design. With these or equivalent measures in place, noise from the site will be either within the criterion or generally below the existing background noise level in the area for the majority of the time.

The existing average Leq noise levels already impacting the residential areas is equal to or above that predicted by the proposal and since the character and amplitude of activities associated with the site will be similar to those already impacting the area, it will be less intrusive than an unfamiliar introduced source.

Providing the recommendations presented in this report are implemented, operation of the site will not have any long term adverse noise impact upon the acoustic amenity of nearby residents. We therefore see no acoustic reason why the proposal should be denied.

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Principal Consultant

APPENDIX A
Definition of Acoustic Terms

Definition of Acoustic Terms

Term	Definition
dB(A)	A unit of measurement in decibels (A), of sound pressure level which has its frequency characteristics modified by a filter ("A-weighted") so as to more closely approximate the frequency response of the human ear.
ABL	*Assessment Background Level* – A single figure representing each individual assessment period (day, evening, night). Determined as the L90 of the L90's for each separate period.
RBL	*Rating Background Level* – The overall single figure background level for each assessment period (day, evening, night) over the entire monitoring period.
Leq	Equivalent Continuous Noise Level - which, lasting for as long as a given noise event has the same amount of acoustic energy as the given event.
L90	The noise level which is equalled or exceeded for 90% of the measurement period. An indicator of the mean minimum noise level, and is used in Australia as the descriptor for background or ambient noise (usually in dBA).
L10	The noise level which is equalled or exceeded for 10% of the measurement period. L_{10} is an indicator of the mean maximum noise level, and was previously used in Australia as the descriptor for intrusive noise (usually in dBA).