



WAVEFORM
ACOUSTICS

PROJECT# 260362

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ACOUSTIC REPORT INFORMATION SHEET

PROJECT

23-25 Townsend Road, Whittington VIC

PREPARED FOR

C Stephanie Osagiede

E admin@aglowservices.com.au

PREPARED BY

Leigh Bernoth of Waveform Acoustics

REVIEWED BY

Rohan Barnes of Waveform Group

Albert St, Blackburn

Tel: 0402 477 774

E: info@waveformacoustics.com.au

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EXECUTIVE SUMMARY

Waveform Acoustics has been engaged by Aglow Services to prepare an Acoustic Report for a proposed Child Care Centre at 23-25 Townsend Road, Whittington VIC 3219.

The site is located within the City of Greater Geelong municipal area and is subject to the provisions of the Greater Geelong Planning Scheme. The land is zoned General Residential Zone (GRZ) and is proposed to be developed as a childcare centre with a maximum capacity of 94 children.

The purpose of this assessment is to evaluate the potential noise impacts associated with the proposed operation of the childcare centre and to demonstrate that noise emissions can be managed to minimise unreasonable impacts on nearby noise-sensitive receivers. This report also establishes applicable noise limits for any plant and equipment associated with the development.

The plans provided indicate operating hours of 6:30 am to 6:30 pm Monday to Friday, with the centre closed on Saturdays and Sundays. Accordingly, compliance with the applicable EPA noise requirements must be maintained during the Day, Evening and Night periods.

A site inspection was carried out on 23 June 2026, with noise monitoring conducted onsite from 23 to 29 June 2026. Our environmental noise monitoring has measured existing background levels present at the site in order to determine the regulated noise limits for plant & equipment, and the target noise levels from children's outdoor play.

As a procedural basis, we have used the systems and measures as set out in the Association of Australian Acoustical Consultants Guidelines for Child Care Acoustic Assessment (September 2020). We have used the procedures from this guideline to set target noise levels for children's play, as well as identify sound power levels of children to model noise impacts. This guideline describes sound power levels of children, which we have used in SoundPLAN modelling software in order to determine potential noise impacts from children's outdoor play.

This assessment identified three primary noise risks associated with the proposed development:

- **Children's outdoor play noise**, due to the proximity of nearby residential receivers.
- **Vehicle noise**, particularly car door slams associated with staff and visitor parking.
- **Mechanical plant and equipment**, including potential installations involving air-conditioning systems, ventilation and exhaust systems.

To address these risks and achieve compliance with the applicable EPA noise requirements, this report outlines in detail a range of required measures, summarised as follows:

- Provision of a minimum **2.4 m high acoustic fence** adjacent to outdoor play areas.
- Implementation of a **staggered outdoor play schedule**, with no more than 47 children (50% capacity) using outdoor play areas at any one time, supported by management measures that encourage passive outdoor activities.
- Provision of a minimum **1.8 m high boundary fence** adjacent to car parking areas.
- Assessment of all proposed mechanical plant and equipment by a suitably qualified acoustic consultant prior to installation to demonstrate compliance with the noise limits established in this report.

Further details regarding the identified noise risks, mitigation measures and compliance requirements are provided in Sections 6 to 8 of this report.

It is our opinion based on the available environmental noise data, plans received and technical performance information from suppliers for products selected for the development, strict implementation of the requirements outlined in this acoustic assessment report will enable the centre to achieve the nominated noise targets and regulatory noise limits.

Best Regards,



Rohan Barnes MAAS

Principal Consultant

1. LEGISLATION AND GUIDELINES

In the preparation of the report the following legislation and guidelines were used:

1. EPA publication 1826.5: 'Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues' (Noise Protocol).

This publication provides a protocol for the purpose of determining noise limits for new and existing commercial, industrial and trade premises and entertainment venues as defined by the Regulations. It sets the methodology for assessing the effective noise level to determine unreasonable noise under Regulations 118, 125 and 130. The measurement procedures of this Noise Protocol are also used to determine aggravated noise under Regulations 121, 127 and 131.

2. Environment Protection Regulations 2021

The objectives of these Regulations are to further the purposes of, and give effect to, the Environment Protection Act 2017 by imposing obligations in relation to environmental protection in Victoria.

3. State Environmental Protection General Environmental Duty (GED)2021

New environment protection laws will mean that anyone engaging in an activity posing a risk of harm to human health and the environment, from pollution or waste, must manage that risk to prevent harm as far as reasonably practicable. This general environmental duty applies to all Victorians. It means you will need to proactively assess and manage the risks of harm from your activities. Eliminating or reducing risk is important because industry activities could impact - Noise – affecting people's sleep; communication, cognition and learning; domestic or recreational activities; tranquillity and enjoyment inside and outside

GED Considerations – Noise from Children's Play

In Victoria, there is **no specific statutory noise limit** that directly applies to noise generated by children's play. However, this source typically represents the primary contributor to noise emissions from child care and early learning centres.

As per the EPA Publication 1856, Reasonably Practicable, under the GED it is reasonable to reference reliable, reputable sources, such as guidelines, standards and industry practices to determine and manage environmental risk, forming the 'state of knowledge' as part of the GED assessment. If the guideline, standard, or industry practice used is *challenged*, the assessment considers whether the controls applied were **reasonably practicable based on current industry knowledge and standards**.

4. AAAC Guidelines for Child Care Acoustic Assessment

This guideline sets out a recommended assessment method for the submission of a Noise Impact Assessment to accompany a Development Application for Child Care Centres, and typical recommendations for the control of noise from such centres

The Association of Australasian Acoustical Consultants (AAAC)'s Guidelines for Child Care Acoustic Assessment detail criteria for assessing noise from Child Care centres, which is widely accepted as suitable criteria for *identifying risk in relation to noise generated by children's play*.

2. CONTEXT AND PURPOSE

The project site involves a proposal to develop a childcare centre to be located at **23–25 Townsend Road, Whittington VIC 3219** within the City of Greater Geelong municipal area.

This acoustic assessment considers the potential noise impacts associated with the operation of the facility on surrounding noise-sensitive land uses. The assessment also provides recommendations for acoustic treatments, where required, to minimise noise impacts on neighbouring properties.

The proposed development comprises a single-storey childcare centre with a maximum capacity of **94 children** and approximately **23 staff members**. The facility contains six childcare rooms providing care for both children under 3 years of age and children over 3 years of age, comprising:

- **Children Room 01:** 12 children under 3 years
- **Children Room 02:** 12 children under 3 years
- **Children Room 03:** 16 children under 3 years
- **Children Room 04:** 16 children under 3 years
- **Children Room 05:** 16 children over 3 years
- **Children Room 06:** 22 children over 3 years

The proposed operating hours are:

- **Monday to Friday:** 6:30 am – 6:30 pm
- **Saturday:** Closed
- **Sunday:** Closed

The site has an area of approximately **1,872 m²** and is designed with a childcare facility centrally located on the allotment. The development incorporates reception and waiting areas, administration facilities, staff amenities, kitchen facilities, storage areas, children's rooms, associated toilet facilities, and covered verandahs. Noted that plans indicate a second story is designated specifically for staff rooms and planning (no childcare on this level).

The site includes an outdoor play area of approximately 708 m² and a car park containing 11 parking spaces.

Current plans indicate boundary fencing generally comprising 1.8 m high Colorbond fencing, with metal picket fencing provided along portions of the frontage.

Noise associated with the proposed development is expected to primarily comprise children's outdoor play activities, staff and visitor vehicle movements, arrivals and departures associated with the childcare centre, waste collection and delivery vehicles. As these activities have the potential to affect nearby residential receivers, an assessment of operational noise impacts has been undertaken as part of this report.

Accordingly, the objectives of this report are to:

- Assess potential noise impacts at the nearest noise-sensitive receivers in accordance with AAAC guidance.
- Determine applicable noise limits in accordance with the EPA Victoria Noise Protocol (Publication 1826.5).
- Assess operational noise generated by outdoor play areas, vehicle movements and general childcare centre activities.
- Provide acoustic mitigation measures, where required, to minimise impacts on adjoining residential properties.

3. ACOUSTIC ASSESSMENT

The following provides details of the acoustic assessment for the site.

3.1 Environmental Noise Data

Environmental noise data was collected using Class 1 instruments, listed in Table 1 below.

Table 1. Instrument register.

Equipment Register	Equipment no.	Calibration
ARL Ngara Noise Logger	878270	due 25.1.28
SV 33A Calibrator	73304	due 18.12.26

Unattended noise measurements were undertaken outdoors between 23.06.26 to 29.06.26 in the rear yard of the project site. Approximately at the mid-point between NSRs 109 and 113 Stanley Street. Refer Appendix 1 for location marked on satellite image of the site.

Environmental conditions¹ were also considered in the assessment, as summarised in Table 2, with periods affected by rainfall and wind speeds exceeding 19 km/h excluded from the dataset.

Table 2. Environmental conditions during noise monitoring period.

Date	Temperature (C°) max/min	Rain (mm)	Windspeeds (km/h), average/max
Tuesday 23.06.2026	15.9 / 6.1	0.2 mm	14.8 km/h
Wednesday 24.06.2026	17.4 / 5.9	no rain recorded	10.8 km/h
Thursday 25.06.2026	14.5 / 3.9	0.4 mm	6.8 km/h
Friday 26.06.2026	13.3 / 5.4	no rain recorded	4.3 km/h
Saturday 27.06.2026	11.6 / 6.8	no rain recorded	7.6 km/h
Sunday 28.06.2026	12.8 / 2.5	no rain recorded	7.6 km/h
Monday 29.06.2026	15.2 / 5.2	0.2 mm	20.2 km/h

3.2 Noise Protocol, Plant & Machinery (EPA Publication 1826.5)

Noise limits have been determined using the EPA Protocol Urban Area Method, taking into account the following factors:

- As the site is situated in a General Residential Area (GRZ), with nearest sensitive receivers also located the GRZ area.
- There are no rural areas nearby that would be expected to be impacted by noise emissions from the project site.

Table 3 below describes the noise limits at noise sensitive areas as set out in the EPA Victoria Noise Protocol (Publication 1826.5) for noise from commercial, industrial and trade premises, which includes mechanical services-type noise such as HVAC systems, refrigeration units, and other fixed plant.

¹ Source: <https://www.willyweather.com.au>

Table 3. EPA 1826.5 Determined Limits from commercial, industrial and trade premises.

PERIOD ²	1826.5 ZONING LEVEL dB(A)	EXISTING LEVEL ³ dB LA90	DETERMINED LIMIT dB LAeq
DAY	50	43	50 (Neutral)
EVENING	44	47	50 (High)
NIGHT	39	46	49 (High)
DETERMINED LIMITS: Day: 50 dB LAeq Evening: 50 dB LAeq Night: 49 dB LAeq Note, compliance with determined limits requires: - Any items of plant and machinery such as, but not limited to, mobile plant and equipment, compressors, air conditioning systems, exhaust and extraction systems must be within the determined limits. - Any new plant or machinery must have positioning, make and model verified by an acoustic consultant to ensure compliance is maintained.			

4. OUTDOOR PLAY AREA NOISE

As outdoor play is an aspect of the Child Care Centre, measures need to be taken to ensure that Noise Sensitive Receivers (NSRs) are not impacted by the noise generated by children's play. For this reason we have determined target noise levels for outdoor play areas in accordance with AAAC guidelines⁴.

4.1 Target Noise Levels for Outdoor Play Areas

In accordance with AAAC guidelines the noise generated from outdoor play areas:

- Cannot exceed the **background levels +10dB over a 15-minute period** at the assessment location when children's play is less than 4 hours per day, with 2 hours in the morning and 2 hours in the afternoon.
- Cannot exceed the **background levels +5dB over a 15-minute period** at the assessment location when children's play is greater than the previously described 4 hours per day.
- Should not exceed a **target noise level of 45dB LAeq,15min** if background levels are determined as less than 40dB LA90.

As we would typically expect noise from children's play to be associated with the Day Period, we have used the Day Period limits to determine the noise exposure on the nearby NSRs. As existing levels measured above 40dB LA90 we have adopted the AAAC guideline level of **46dB LAeq,15min** as the target, as shown in the following table.

Table 4. Target noise level limits for outdoor play areas.

Period (refer Appendix 9)	Existing Level ⁵ dB LA90	Determined Target Noise Level dB LAeq	Notes
Day	41	46	Assumes unrestricted outdoor play.

The assessment location is defined as the most effected point on or within any residential receiver property boundaries. For the purposes of modelling, we have assumed this to be within the 'noise sensitive area' which is defined as (within the Environment Protection Regulations 2021) the part of the land within the boundary of a parcel of land that is within 10 metres of the outside of the external walls of a dwelling.

² Please refer to Appendix 9, Operating time periods.

³ Existing levels are determined based on the average of 15-min background level over the testing period, within the proposed hours of operation.

⁴ Association of Australasian Acoustical Consultants, Guideline for Child Care Centre Acoustic Assessment, Version 3.0

⁵ Determined from analysis of 15-min dB LA90 measured within the proposed operating hours.

4.2 Sound Power Levels

The noise levels of boys and girls is assumed to be similar. A typical range for effective sound power levels for groups of ten children playing is provided in the AAAC Guidelines, as detailed in the table below:

Table 5. Sound power levels as per AAAC Guidelines.

Number and Age of Children	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dB	63	125	250	500	1K	2K	4K	8K
10 Children, 0 – 2 years old	78	54	60	66	72	74	71	67	64
10 Children, 2 – 3 years old	85	61	67	73	79	81	78	74	70
10 Children, 3 – 5 years old	87	64	70	75	81	83	80	76	72

To calculate the effective sound power level the specific number of children will be required and the following formula used:

If the children play at separate times, then the calculation at a single point is as follows:

- Effective Sound power Level for 'n' children = Effective sound power level for 10 children + 10 log (n/10)

Using the above formula, we can determine the sound power and octave band power levels for the number of children present in the outdoor play area. From this point, we have used acoustic modelling software SoundPlan to predict noise levels at nearby sensitive receivers.

4.3 Acoustic Modelling - Children's Play Areas

Acoustic modelling was undertaken to assess the impact of children's outdoor play activities on nearby residential receivers and to determine the effectiveness of various mitigation scenarios. Four scenarios were assessed, ranging from active play with no acoustic fencing through to passive play with reduced outdoor occupancy and acoustic fencing. The scenario's tested are listed as follows:

- Scenario 1:** Outdoor active play, full capacity, no acoustic fencing
- Scenario 2:** Outdoor active play, full capacity, with 2.4 meter high acoustic fencing
- Scenario 3:** Outdoor passive play, full capacity, with 2.4 meter high acoustic fencing
- Scenario 4:** Outdoor active play, staggered play (at 50% capacity), with 2.4 meter high acoustic fencing

The modelling predicts that both acoustic fencing and management strategies will be necessary to achieve the adopted guideline target. Key findings are summarised as follows:

- Active outdoor play at full capacity without acoustic fencing (Scenario 1) is predicted to exceed the adopted guideline target at a number of surrounding residential receivers.
- Acoustic fencing (Scenario 2) is predicted to reduce noise at nearby residents, but is not expected to fully address the noise impacts from active outdoor play at full capacity (indicating further noise mitigation strategies are required).
- Staggered play at 50% capacity (Scenario 4) is predicted to be the most effective management strategy, and additional noise reductions would be expected where passive play activities (Scenario 3) are also encouraged.

Detailed modelling results are provided in Appendix 6, with a summary of the key modelling outcomes presented in Table 6 below.

Table 6. Acoustic modelling results for scenarios considered.

Receiver	Target Limit dB L _{Aeq}	Scenario 1. Outdoor active play, full capacity, no acoustic fencing.		Scenario 2. Outdoor active play, full capacity, with acoustic fencing.		Scenario 3. Outdoor passive play, full capacity, with acoustic fencing.		Scenario 4. Outdoor active play, 50% capacity, with acoustic fencing.	
		Modelled Result	Exceedance	Modelled Result	Exceedance	Modelled Result	Exceedance	Modelled Result	Exceedance
2 Wombat Court	46	59.8	13.8	49.5	3.5	43.5	-	40.5	-
3 Wombat Court		66.3	20.3	55.3	9.3	49.3	3.3	46.3	0.3
5 Wombat Court		61.5	15.5	50.2	4.2	44.2	-	41.2	-
6 Wombat Court		57.9	11.9	46.6	0.6	40.6	-	37.6	-
21 Townsend Road		54.6	8.6	42.7	-	36.7	-	33.7	-
26 Townsend Road		45.4	-	35.7	-	29.5	-	26.6	-
27 Townsend Road		39.0	-	38.0	-	31.9	-	29.0	-
28 Townsend Road		45.7	-	35.8	-	29.7	-	26.7	-
Unit 1 / 7 Koala Court		63.5	17.5	52.5	6.5	46.5	0.5	43.5	-
Unit 3 / 7 Koala Court		59.2	13.2	48.8	2.8	42.8	-	39.8	-

5. CAR PARKING NOISE

The following modelling demonstrates the expected noise levels associated with the loudest anticipated vehicle-related noise sources from staff and visitor parking activities.

In our opinion, impact noises such as car door slams are the most likely vehicle-related noise event to generate sound levels and acoustic characteristics that could affect nearby Noise Sensitive Receivers (NSRs) during the Night Period. These events may also present a risk of sleep disturbance.

The modelling assumes a point source of impact noise located at the most sensitive areas of the car park, as determined by the proximity of the NSRs, and considers scenarios both with and without car park fencing along the boundaries. A worst-case scenario involving two (2) simultaneous car door slams at locations closest to the NSR boundaries along Townsend Road has been assessed.

Results for the car door slam assessment are presented in Table 7 below. Key modelling assumptions are as follows:

- Ground factor of 0.2 (0 = Hard, 1 = Soft)
- A point source to demonstrate a car door slams for designated car park areas (as indicated on plans)
- Car door slam 98 dB(A), Sound power reference using SoundPLAN software database.
- Car park fencing height 1.8 meters
- Levels above 65dB(A) indicate potential for sleep disturbance

Table 7. Staff car parking noise involving door slams.

Receiver	Target Threshold dB(A)	Scenario 1. Car door slam, without fencing		Scenario 2. Car door slam, with 1.8 m fencing.	
		Modelled Result	Exceedance	Modelled Result	Exceedance
21 Townsend Road	65	70.0	5.0	59.8	-
26 Townsend Road		64.0	-	65.0	-
27 Townsend Road		72.0	7.0	60.5	-
28 Townsend Road		63.9	-	64.9	-

Note that, we anticipate that most other noises associated with the operation of a motor vehicle will typically be lower than the noise produced by a car door slam, and therefore we have only modelled level predicting this worst-case noise.

Due to the high variability in regard to vehicles that have the potential to access the site, the noise levels produced from specific vehicles could be louder at times than typical vehicle noise emissions, however we anticipate noise from car door slams to be comparable.

It is our view that, as this modelling is **based on a worst-case noise**, risks can be mitigated with management strategies, such as signage and management procedures involving education of patrons, which can be effective in reducing noise in the early hours of the morning. For detailed modelling results refer to Appendix 6.

6. EPA NOISE PROTOCOL COMPLIANCE REQUIREMENTS

To ensure EPA Noise Protocol compliance is met Facility management is to ensure the following

6.1 Plant & Equipment Noise

Mechanical Services Noise

A review of the submitted architectural site layout, elevations and roof plan did not identify any nominated HVAC plant, air-conditioning condensers, ventilation equipment, exhaust fans, or other mechanical services equipment.

Any mechanical services proposed for the development must comply with the following requirements.

- Where practicable, all outdoor mechanical plant, including air-conditioning condensers and similar equipment, should be located at ground level.
- **Outdoor air conditioning (HVAC)** equipment **must** be installed on appropriate vibration isolation mounts to minimise the transmission of structure-borne noise and vibration.
- The final location, type and acoustic performance of all mechanical equipment should be reviewed by a suitably qualified acoustic consultant prior to installation to demonstrate compliance with the **determined** noise limits **specified** in this report.

Any new plant or mechanical equipment, including but not limited to air-conditioning systems, kitchen exhaust systems and extraction systems, must comply with the **determined** noise limits.

The position, make, model and acoustic performance of any new plant or machinery should be reviewed by a qualified acoustic consultant prior to installation to confirm ongoing compliance with the relevant noise requirements.

6.2 Signage to be Displayed

Signage is to be installed at site entrances and within the car parking areas reminding staff, parents and visitors to be considerate of neighbouring properties and to minimise noise where possible.

Signage should include advice to avoid vehicle door slamming, particularly during the early morning and evening periods.

Signage should be clearly visible, easily identifiable and prominently displayed.

6.3 Scheduled Activities

- Waste collection shall be conducted in accordance with EPA Publication 1254 'Noise Control Guidelines' and shall not occur after 20:00, and before 07:00 weekdays or 09:00 all other days.
- Deliveries shall be conducted in accordance with EPA Publication 1254 'Noise Control Guidelines' and shall not occur after 22:00, and before 07:00 weekdays or 09:00 all other days.

7. GENERAL ENVIRONMENTAL DUTY (GED) RISK ASSESSMENT

Environmental laws introduced in 2021 requires that anyone engaging in an activity posing a risk of harm to human health and the environment, from pollution or waste, must manage that risk to prevent harm as far as reasonably practicable. Refer Appendix 6 – General Environmental Duty for further details regarding the GED.

The following table provides an assessment of risks from noise hazards associated with the proposed operations in accordance with requirements under the GED.

The GED requires any person or business to proactively identify and manage environmental risks, including risks from noise emissions. Even where no specific licence condition exists, and no pollution has yet occurred, a person may still be non-compliant if they fail to minimise risks so far as reasonably practicable (SFARP).

Businesses typically show GED compliance through:

- Environmental risk assessments
- Risk Management & Monitoring Programs (RMMP)
- Procedures, training, and monitoring records

For child care and early learning centres, this includes but is not limited to, in the context of noise, the following:

- Plant/equipment on site
- Emissions from children in outdoor play areas
- Noise associated with vehicle movements and activity within car park areas
- Any other noise generated on site relating to typical site operations

Identified noise risks associated with the proposed development:

- Noise from plant and equipment, including any new mechanical services such as kitchen exhaust and extraction systems.
- Noise generated by children using the outdoor play areas.
- Vehicle-related noise, particularly during the early morning period between 6:00 am and 7:00 am.

The assessed risk levels and recommended control measures for noise associated with children's outdoor play activities are discussed in the following sections of this report.

Table 9 presents an assessment of the noise-related risks associated with the proposed operation of the facility, in accordance with the requirements of the General Environmental Duty (GED).

The assessment considers the likelihood and consequence of identified noise hazards and the effectiveness of proposed control measures. The risk ratings have been determined using the methodology outlined in Appendix 7 – Risk Management Matrix and should be read in conjunction with that appendix.

Table 9. GED Risk Assessment.

Identified Hazard	Potential Causes	Initial Risk Rating (Without Controls)	Recommended Controls	Residual Risk Rating (With Controls Implemented)
Noise generated by children's play in outdoor areas.	Noise levels generated by children exceeding AAAC guideline limits	Medium Risk (B4) • Moderate (B) • Likely (4)	• Ensure management strategies are in place to minimise noise from children's play as far as is reasonably practical. • Acoustic fencing to be installed to mitigate noise at identified NSRs at risk. Refer section 8 below for specific details	Low Risk (A2) • Minor (A) • Unlikely (2)

Identified Hazard	Potential Causes	Initial Risk Rating (Without Controls)	Recommended Controls	Residual Risk Rating (With Controls Implemented)
New potential plant and equipment noise	When plant and equipment is installed, proximity to NSR may cause exceedances with determined limits	Medium Risk (B3) - Moderate (B) - Possible (3)	Engage an acoustic consultant verify any equipment and positioning before installation Schedule operational noise testing for compliance. Note: this also falls under EPA 1826 compliance, see section 6 of this report Refer section 8 below for details	Low Risk (A2) - Minor (A) - Unlikely (2)
Noise generated from vehicle parking	Early morning noise generated in the Night Period may disturb sleep of nearby residents.	Medium Risk (B4) - Moderate (B) - Likely (4)	- Implement the management measures outlined in Section 6.2, including signage encouraging patrons to minimise noise and avoid slamming vehicle doors. - Education and awareness with staff and visitors to minimise disturbance during the night period. Refer section 8 below for details	Low Risk (A3) - Minor (A) - Possible (3)

8. GED OBLIGATIONS and REQUIREMENTS

To meet the requirements of the General Environmental Duty (GED), site management must identify and manage reasonably foreseeable noise risks associated with the operation of the childcare centre. This assessment identified the following primary noise risks:

- Children's outdoor play noise, due to the proximity of nearby residential receivers.
- Vehicle noise, particularly car door slams associated with staff and visitor parking.

To manage these risks, site management must develop, implement and maintain a Noise Management Plan. As a minimum, the Noise Management Plan shall address the following aspects:

8.1 Management of Children Outdoor Play Areas to Minimise Noise

Management is to ensure systems and practices are in place to ensure noise levels from children can be managed. This involves staff training and awareness and is to consider the following in order to reduce noise impacts (as per AAAC guidelines):

- **The number of children playing outside** at any one time be **limited to forty-five** (50% of capacity) to meet the noise criteria;
- **Hours of play should only take play during the Day Period**, in order to reduce the risk of sleep disturbance and nuisance noise at the NSR.
- A separate daily program for both the warmer and cooler months should be established to regulate the total time spent outdoors and indoors;
- **A contact phone number for the Centre's director should be made available to neighbours** to facilitate communication and to resolve any neighbourhood issues that may arise due to operation of the Centre;
- The type of outdoor activities may be programmed to encourage and allow only quiet or "passive" activities such as painting, garden exploration, reading, block play or drawing in certain areas of the centre's outdoor play area;
- Crying children should be taken inside the centre and comforted;
- The behaviour of children should be monitored and modified as required by adequately trained child care workers;
- Parents and guardians should be informed of the importance of noise minimisation when entering the site, dropping off or picking up children;
- Carers/staff should be educated to control the level of their voice while outside.

8.2 Boundary Fencing Requirements

The following outlines requirements for minimising the noise risks associated with facility operations involving outdoor play and vehicle noise in the car park.

(i) Outdoor Play Area Acoustic Fence Requirements

Based on the modelling results, the proposed 1.8 m high metal boundary fence is not expected to provide sufficient noise attenuation to adequately manage noise impacts from outdoor play activities at nearby residential receivers. Accordingly, a purpose-designed acoustic fence is required.

The acoustic fence must be installed in the locations indicated in Figure 1 and shall comply with the following minimum specifications:

Acoustic Fence Specification

- The acoustic fence shall have a minimum height of **2.4 metres** above ground level.

NOTE: Where the fence is proposed on top of a retaining wall, or where the playground area is elevated relative to the adjoining property, the final fence height shall be reviewed and confirmed by a qualified acoustic prior to installation.

- A system with a minimum surface mass of 15kg/m^2 is required, at a minimum 2.4m in height, ensuring that there is no line-of-sight to NSR window systems.
- Refer Appendix 9 for details regarding acoustic fencing systems.

It should be noted that the provision of acoustic fencing does not guarantee compliance with the AAAC target noise levels in all circumstances. However, acoustic fencing is considered a minimum mitigation measure to reduce noise impacts and protect the amenity of nearby residents.



Figure 1. Minimum 2.4 meter high Acoustic Fence (indicated in blue)

(ii) Car Park Boundary Fence Requirements

Based on the modelling results, the proposed 1.8 m high boundary fence is expected to provide sufficient noise attenuation to minimise noise impacts associated with vehicle movements and car door slams.

The fence shall be constructed and maintained as a continuous barrier with no gaps, openings or penetrations that could compromise its acoustic performance. The location of the 1.8m high fencing is indicated in Figure 2 below.



Figure 2. Minimum 1.8 meter high metal Colorbond fence (indicated in red)

8.3 New Plant and Equipment

Any new plant, equipment or mechanical services proposed as part of the development, including but not limited to air-conditioning units, kitchen exhaust systems, refrigeration equipment and extraction fans, shall be designed and selected to ensure compliance with the applicable noise limits at nearby noise-sensitive receivers.

Prior to installation, the make, model, noise emission data and proposed location of any new plant or equipment shall be reviewed by a suitably qualified acoustic consultant to verify that the equipment will not result in adverse noise impacts. Where necessary, acoustic mitigation measures shall be incorporated into the design, such as acoustic screens, attenuators, enclosures or alternative equipment selections.

To demonstrate compliance, the following requirements shall be met:

- The make, model and location of all new plant and equipment shall be reviewed by an acoustic consultant prior to installation.
- Manufacturer noise data shall be provided for all proposed equipment.
- Any acoustic treatments identified as necessary by the acoustic consultant shall be implemented as part of the final design.
- If noise complaints are received following installation, acoustic testing shall be undertaken and additional mitigation measures implemented where required.

8.4 Vehicle Noise Education and Awareness

The facility shall promote noise awareness amongst staff, parents, guardians and visitors through induction processes, routine communications and the provision of appropriate signage. Signage shall be prominently displayed within the car park and at site entrances, reminding patrons to be considerate of neighbouring residents, minimise unnecessary noise, avoid loud conversations, and close vehicle doors quietly.

The following measures shall be implemented:

- Display clear and visible signage promoting considerate behaviour in parking and drop-off/pick-up areas.
- Educate staff on the importance of minimising vehicle-related noise, particularly during the night-time and early morning periods.
- Encourage parents, guardians and visitors to avoid slamming vehicle doors and to keep noise levels to a minimum when arriving at or leaving the site.
- Periodically review the effectiveness of these measures and respond to any noise complaints received from nearby residents.

9. DISCLAIMER

This report contains the determined EPA limits for plant & equipment on site, as well as predictions about noise generated within the site of the proposed child care centre, as per the AAAC guidelines.

The EPA limits apply only to plant & equipment on site, such as, but not limited to, air conditioners, heaters, and other required equipment for the operation of the site.

The AAAC guidelines give information regarding sound power levels for airborne noise emissions from children during outdoor play, as well as controls and recommendations of management of the Child Care Centre to control noise generated by children's play. *We base the requirements and recommendations from this report on the airborne noise levels from children's play, based on these guidelines.*

Aspects related to noise generated by children that require management intervention are discussed within this report. Management solutions will always be required on site as an active consideration during day-to-day operations of the Child Care Centre.

There may be other impacts to the greater area, such as noise generated from additional traffic accessing the proposed centre; *noise generated outside the proposed Child Care Centre is beyond the scope of this report.*

With these things considered, based on the scope of our assessment, available environmental noise data and plans received, implementation of the measures outlined in this report, would be expected to minimise the noise impact on the neighbouring residences from the Child Care Centre and any plant and machinery.

Where clarification is required or the recommended acoustic treatments may be found to impact on other services or statutory requirements, independent advice, as appropriate, is to be sought in respect to any such impact that these acoustic works may have on the building design and construction.

Noise predictions presented in this report are based on SoundPLAN acoustic modelling using defined assumptions and the best available input data. The results are indicative estimates for the modelled scenarios and may differ from actual conditions due to environmental variability, modelling limitations, and uncertainties in input data.

Rohan Barnes

Waveform Acoustics

APPENDIX 1 – Site Satellite Image



Source: Google Earth

APPENDIX 2 – Site Photos



Noise monitoring instrument at site

APPENDIX 3 – Site Plan

Plans (rev 3), dated: 14.07.2026



APPENDIX 4 – Zoning Map



Planning Zones

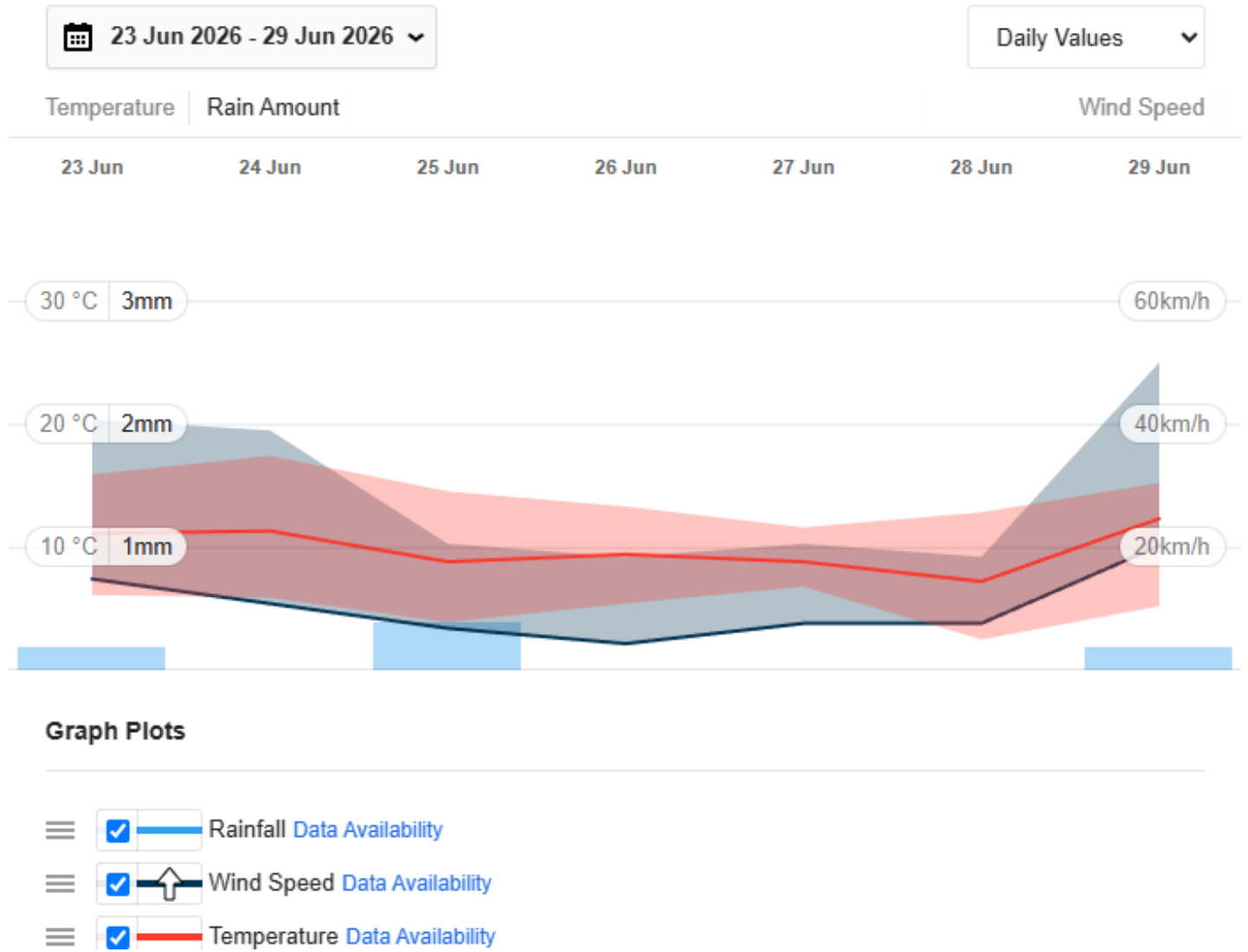
GENERAL RESIDENTIAL ZONE (GRZ)

GENERAL RESIDENTIAL ZONE - SCHEDULE 1 (GRZ1)



From www.planning.vic.gov.au at 21 July 2026 03:42 PM

APPENDIX 5 –Weather Data



Source: www.willyweather.com.au

APPENDIX 6 – Acoustic Models

OUTDOOR PLAY ACOUSTIC MODELS

Scenario 1. Outdoor Active Play, Full Capacity, No Acoustic Fencing

The following assumptions have been made for the purposes this modelling:

- Ground effect of 0.20, representing predominantly hard terrain.
- Environmental Conditions: Temperature 10C and 70% Humidity.
- Area Source Noise: 96 dB(A)
- No boundary acoustic fencing in place
- Active Play and full capacity (94 children outdoors)
- Single story dwelling height 4.5 meters
- Receiver height 1.6 meters
- Noise emission height 0.5 meters

Receiver	Limit dB LAeq	Modelled Level dB(A)	Exceedance
2 Wombat Court	46	59.8	13.8
3 Wombat Court		66.3	20.3
5 Wombat Court		61.5	15.5
6 Wombat Court		57.9	11.9
21 Townsend Road		54.6	8.6
26 Townsend Road		45.4	-
27 Townsend Road		39.0	-
28 Townsend Road		45.7	-
Unit 1 / 7 Koala Court		63.5	17.5
Unit 3 / 7 Koala Court		59.2	13.2



Scenario 2. Outdoor Active Play, Full Capacity, With Acoustic Fencing

The following assumptions have been made for the purposes this modelling:

- Ground effect of 0.20, representing predominantly hard terrain.
- Environmental Conditions: Temperature 10C and 70% Humidity.
- Area Source Noise: 95 dB(A)
- Boundary acoustic fencing in place, height 2.4 meters
- Active Play and full capacity (94 children outdoors)
- Single story dwelling height 4.5 meters
- Receiver height 1.6 meters
- Area source noise emission height 0.5 meters

Receiver	Limit dB L _{Aeq}	Modelled Level dB(A)	Exceedance
2 Wombat Court	46	49.5	3.5
3 Wombat Court		55.3	9.3
5 Wombat Court		50.2	4.2
6 Wombat Court		46.6	0.6
21 Townsend Road		42.7	-
26 Townsend Road		35.7	-
27 Townsend Road		38.0	-
28 Townsend Road		35.8	-
Unit 1 / 7 Koala Court		52.5	6.5
Unit 3 / 7 Koala Court		48.8	2.8



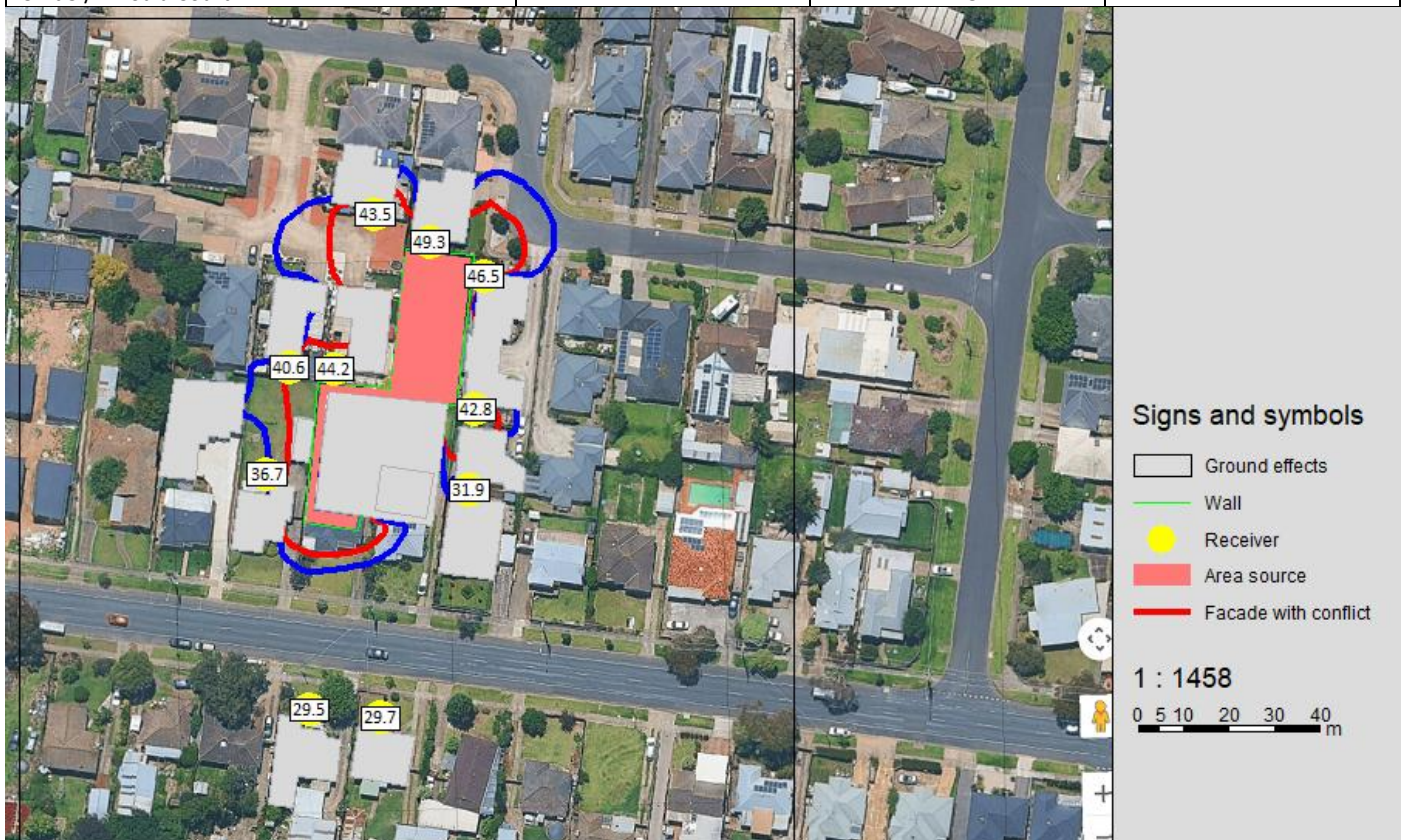
Scenario 3. Outdoor Passive Play, Full Capacity, With Acoustic Fencing

As per the AAAC Guideline an adjustment of -6 dB has been applied in each age group for children involved in passive play.

The following assumptions have been made for the purposes this modelling:

- Ground effect of 0.20, representing predominantly hard terrain.
- Environmental Conditions: Temperature 10C and 70% Humidity.
- Area Source Noise: 89 dB(A)
- Boundary acoustic fencing in place, height 2.4 meters
- Passive Play and full capacity (94 children outdoors)
- Single story dwelling height 4.5 meters
- Receiver height 1.6 meters
- Area source noise emission height 0.5 meters

Receiver	Limit dB L _{Aeq}	Modelled Level dB(A)	Exceedance
2 Wombat Court	46	43.5	-
3 Wombat Court		49.3	3.3
5 Wombat Court		44.2	-
6 Wombat Court		40.6	-
21 Townsend Road		36.7	-
26 Townsend Road		29.5	-
27 Townsend Road		31.9	-
28 Townsend Road		29.7	-
Unit 1 / 7 Koala Court		46.5	0.5
Unit 3 / 7 Koala Court		42.8	-



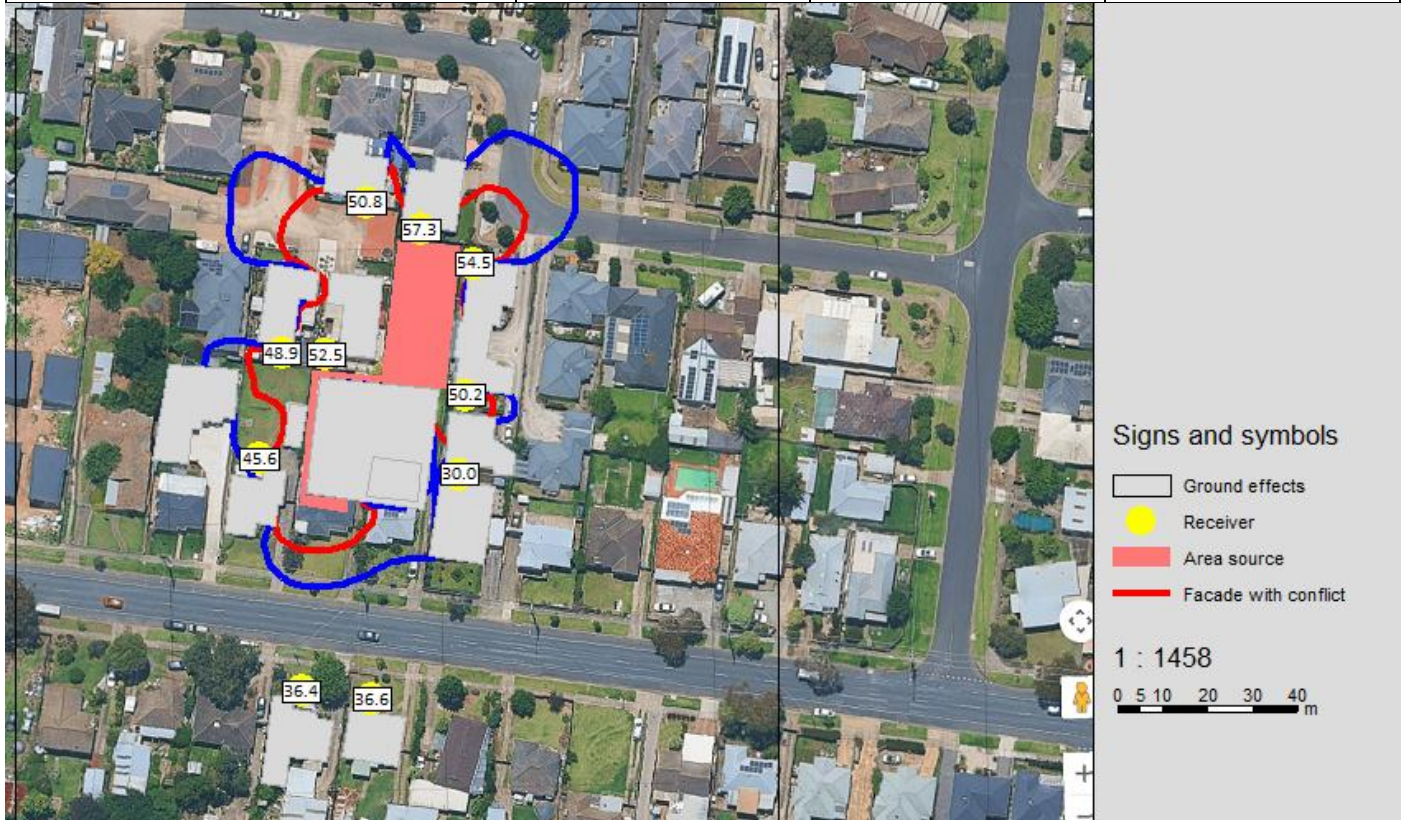
Scenario 4. Outdoor Active Play, Staggered (50% Capacity), With Acoustic Fencing

This model involves the practice of staggered play where no more than 50% of children are involved in outdoor play at any one time.

The following assumptions have been made for the purposes this modelling:

- Ground effect of 0.20, representing predominantly hard terrain.
- Environmental Conditions: Temperature 10C and 70% Humidity.
- Area Source Noise: 86 dB(A)
- Boundary acoustic fencing in place, height 2.4 meters
- Active Play and 50% capacity (47 children outdoors)
- Single story dwelling height 4.5 meters
- Receiver height 1.6 meters
- Area source noise emission height 0.5 meters

Receiver	Limit dB LAeq	Modelled Level dB(A)	Exceedance
2 Wombat Court	46	40.5	-
3 Wombat Court		46.3	0.3
5 Wombat Court		41.2	-
6 Wombat Court		37.6	-
21 Townsend Road		33.7	-
26 Townsend Road		26.6	-
27 Townsend Road		29.0	-
28 Townsend Road		26.7	-
Unit 1 / 7 Koala Court		43.5	-
Unit 3 / 7 Koala Court		39.8	-

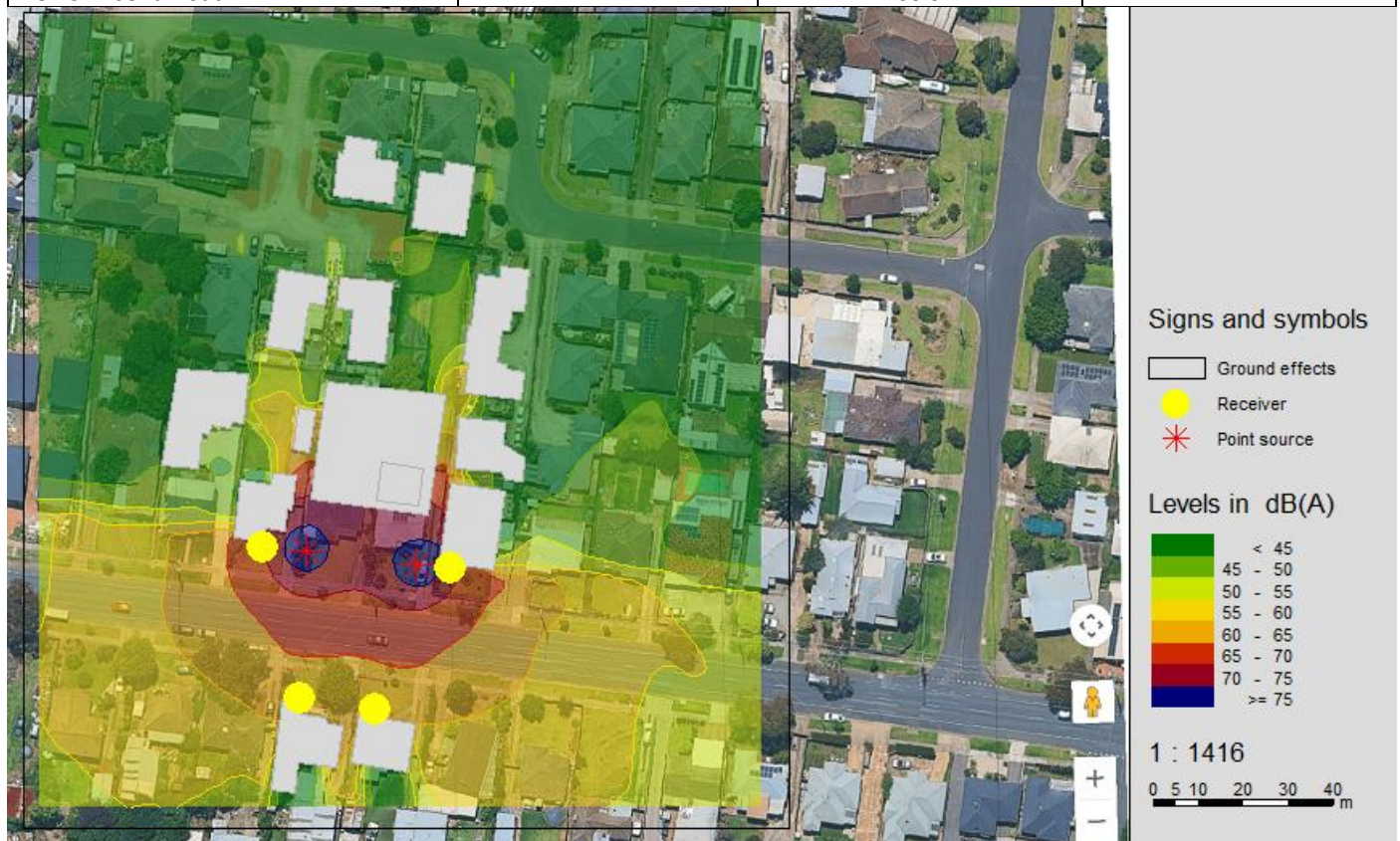


CAR PARK DOOR SLAM ACOUSTIC MODELLING**Scenario 1. Car Door Slams, No Car Park Fencing**

The following assumptions have been made for the purposes this modelling:

- Ground effect of 0.20, representing predominantly hard terrain.
- Environmental Conditions: Temperature 10C and 70% Humidity.
- Car door slam 98 dB(A), Sound power reference using SoundPLAN software database.
- Noise emission height 0.5 meters
- No fencing in place to mitigate noise from car park.
- Single story dwelling height 4.5 meters
- Receiver at NSR façade, height 1.6 meters
- Levels above 65dB(A) indicate potential for sleep disturbance

Receiver	Target Threshold dB(A)	Scenario 1. Car door slam, without fencing	
		Modelled Result	Exceedance
21 Townsend Road	65	70.0	5.0
26 Townsend Road		64.0	-
27 Townsend Road		72.0	7.0
28 Townsend Road		63.9	-



Scenario 2. Car Door Slams, With 1.8 meter Car Park Fencing

The following assumptions have been made for the purposes this modelling:

- Ground effect of 0.20, representing predominantly hard terrain.
- Environmental Conditions: Temperature 10C and 70% Humidity.
- Car door slam 98 dB(A), Sound power reference using SoundPLAN software database.
- Noise emission height 0.5 meters
- No fencing in place to mitigate noise from car park.
- Single story dwelling height 4.5 meters
- Receiver at NSR façade, height 1.6 meters
- Car park fencing height 1.8 meters
- Levels above 65dB(A) indicate potential for sleep disturbance

Receiver	Target Threshold dB(A)	Scenario 2. Car door slam, with 1.8 m fencing.	
		Modelled Result	Exceedance
21 Townsend Road	65	59.8	-
26 Townsend Road		65.0	-
27 Townsend Road		60.5	-
28 Townsend Road		64.9	-



APPENDIX 7 – General Environmental Duty

EPA General Environmental Duty 2021 sets out the following guidelines to follows:

- Understand your duties under the EP Act
- Identify Hazards
- Assess Risks
- Manage the Risks
- Implement Controls

UNDERSTAND YOUR DUTIES UNDER THE EP ACT

Anyone engaging in an activity that poses risk of harm to human health and the environment, from pollution or waste, or noise must eliminate or reduce that risk. You also need to eliminate or reduce risk as far as reasonably practicable. You can do this by putting appropriate controls in place that are proportionate to the risk.

Your approach to managing risk will depend on the complexity and scale of your activities or project, as well as the nature of the risks you need to manage.

EPA Victoria specifies a four (4) step risk management process, involving: identifying the hazards, assessing risk, implementing controls and ongoing checking. The process is outlined by the Victorian EPA⁶ and is summarised as follows:



⁶ Environmental Protection Authority Victoria, Assessing and controlling risk: A guide for business. Publication 1695.1, August 2018

STEP ONE: IDENTIFY HAZARDS



Hazards associated with commercial and industrial activities include anything that can cause harm to people or the environment. Common hazards include:

- Noise
- Odour
- Dust
- Chemical hazards
- Fire hazards

STEP TWO: ASSESS THE RISKS



The hazards identified during step 1 must be assessed to determine how they could lead to harm, how severe that harm could be and how likely it is to happen.

Risk assessment is a process for building knowledge and understanding of hazards and their associated risks so decisions can be made on how best to control them.

The following steps should be taken:

- Assess the likelihood of a hazard causing an impact
- Assess the consequences, or severity, of each impact
- Calculate a risk rating for each hazard

STEP THREE: IMPLEMENT CONTROLS



The options for controlling risk are prioritised from the highest level of effectiveness to the lowest.

When selecting controls the following hierarchy should be followed:



STEP FOUR: CHECK CONTROLS



Controls that are put in place to prevent or mitigate risks must be monitored to ensure they work as planned.

Checking controls involves the same methods as in the initial hazard identification step (step 1), and 'closes the loop' in which risk control measures can be maintained.

Common methods used to check the effectiveness of controls are:

- Regular site inspections and audits
- Consulting with employees, contractors, occupants and landlords
- Inspecting, testing and maintenance of risk control systems
- Using available information, such as manufacturer/supplier instructions
- Analysing records and data, such as incident and near miss reports

If these checks are made on a regular basis, then failures in controls can be identified as well as opportunities for improvement.

APPENDIX 8 – Risk Assessment Matrix

	CONSEQUENCE					
	A – Minor	B – Moderate	C – Major	D – Severe	E – Extreme	
	First aid treatment. Fully recoverable.	Medical / professional treatment required. Fully recoverable	Extensive / professional medical treatment. Fully recoverable over an extended period.	Severe injury, permanent incapacitation. Impact requires change to work function.	Catastrophic, single or multiple deaths.	HUMAN HEALTH, HEALTH & SAFETY
LIKELIHOOD	Negligible or no environmental damage. No residual pollution impacts.	Impacts within the immediate vicinity of the impact; and short-term residual impact <1 year	Impacts are within the local area; and /or medium-term residual impact (2-5yrs)	Impact extends across the region (within a state); and/or longer-term residual impact (5-20yrs)	Impacts extends beyond the region (e.g. between states or nationally); and/or long term residual impacts >20yrs	ENVIRONMENT
(5) Almost Certain Expected to occur. High probability of occurring, e.g. >90%.	Medium	High	High	Extreme	Extreme	
(4) Likely Likely (e.g. >75% chance) of occurring under normal circumstances.	Medium	Medium	High	High	Extreme	
(3) Possible Could reasonably be expected under normal circumstances.	Low	Medium	Medium	High	High	
(2) Unlikely Unusual, not likely to occur under normal circumstances	Low	Low	Medium	Medium	High	
(1) Very unlikely. Rare circumstance, highly unusual.	Low	Low	Low	Medium	High	

APPENDIX 9 – Acoustic Fencing

When designing an acoustic fence system, a surface mass of at least 15kg/m^2 is often specified as the minimum target for effective construction.

The principles of sound transmission & barrier performance describe that lower surface mass systems, such as a standard timber or Colorbond fence, do not sufficiently reduce noise directly passing *through* the fence mass. .

Industry guidance indicates that a surface mass of 15kg/m^2 is typically the threshold where transmission through the barrier becomes negligible when compared to the diffraction of noise over the top of the fence system. Increasing the mass beyond this point will result in diminishing returns, and fence height becomes the important aspect of the system's overall effectiveness.

The following systems described meet the required surface mass of 15kg/m^2 :

OPTION 1 – TIMBER FENCING

Construction of acoustic fencing:

- 25mm thick timber palings
- Each paling to overlap a minimum of 35mm
- 1 x layer of either 3mm Fibre Cement sheeting or 6mm plywood
- There are to be no breaks in the acoustic fence system, as any penetrations will reduce the efficacy of the system.
- Any penetrations between palings must be sealed with Selleys Flame Flex
 - Installed via manufacturer's requirements for an acoustic seal
- The fence system must be inspected after 6 months to ensure that any gaps are sealed, as wood is likely to warp as it dries in position.

OPTION 2 – COLORBOND FENCING

Construction of acoustic fencing:

- Colorbond metal sheet for inner lining (facing the play area)
 - 0.42 BMT, minimum thickness
- 3mm Fibre Cement sheet or 6mm plywood
- 140mm cavity
- 14kg/m^3 glasswool insulation batts, 90mm thickness
- Colorbond metal sheet for outer lining (facing the NSR)
 - 0.42 BMT, minimum thickness
- There are to be no breaks in the acoustic fence system, as any penetrations will reduce the efficacy of the system.

OPTION 3 – PROPRIETARY SYSTEM

A proprietary system by Modular Walls could be used, specifically the AcoustiMax75 system⁷, at the required height.

⁷ <https://modularwalls.com.au/product/acoustimax/>

APPENDIX 9 - Operating Time Periods

From the Environmental Protection Regulations 2021:

116 Definitions—operating time periods

In this division (3), **in relation to noise emitted from *commercial, industrial and trade premises*—**

day period means:

- Monday to Saturday (except public holidays), from 7am to 6pm

evening period means:

- Monday to Saturday, from 6pm to 10pm; and
- Sunday and public holidays, from 7am to 10pm

night period means:

- 10pm to 7am the following day.

123 Definitions—operating time periods

In this Subdivision, **in relation to music noise emitted from indoor entertainment venues—**

day and evening period means:

- Monday to Saturday (other than a public holiday), from 7 a.m. to 11 p.m.;
- Sunday or a public holiday (other than if either is preceding a public holiday), from 9 a.m. to 10 p.m.;
- Sunday or a public holiday (if either is preceding a public holiday), from 9 a.m. to 11 p.m.;

night period means:

- Monday to Friday (other than a public holiday or a day preceding a public holiday), from 11 p.m. to 7 a.m. the following day;
- Saturday or any day preceding a public holiday, from 11 p.m. to 9 a.m. the following day;
- Sunday or a public holiday (if neither is preceding a public holiday), from 10 p.m. to 7 a.m. the following day.

Glossary Of Acoustic Terms

Decibel (dB)	A logarithmic unit used to express the ratio between two sound pressures or powers. It is a relative measurement with reference to a specific threshold (usually 0 dB for sound pressure).
dB(A)	A-weighted decibels, which apply a frequency weighting to sound measurements to better represent the human ear's sensitivity to different frequencies.
dB(C)	C-weighted decibels, the C-weighting curve is relatively flat and does not emphasize any specific frequency range. It covers the entire audible frequency range with equal weighting. C-weighting is less commonly used in general sound level measurements, but it may be used in specific applications, such as measuring peak sound levels or when the sound being measured contains substantial low-frequency content.
Octave Band	A frequency band in which the upper frequency is twice the lower frequency (e.g., 63 Hz - 125 Hz).
Third-Octave Band	A frequency band with higher resolution, splitting each octave into 3 centre frequency measurement points.
LAeq	Equivalent Continuous Sound Level, an average sound level over a specific time period, often used to represent overall noise exposure.
LAmx	Maximum A-weighted sound level, the highest instantaneous sound level during a particular time period.
LAmín	Minimum A-weighted sound level, the lowest instantaneous sound level during a particular time period.
LA90	The A-weighted sound pressure level which is exceeded for 90% of the time interval considered.
LOCT10	The 'C' weighted or linear sound pressure level for a specified octave band that is exceeded for 10% of the time.
Sound Pressure (SPL)	The amplitude of sound waves in a specific medium, typically measured in decibels (dB).
Sound Power (SWL)	The total amount of acoustic energy radiated by a sound source, measured in watts (W) or decibels (dB).
Frequency	The number of complete cycles of a sound wave occurring per second, measured in Hertz (Hz).
Sound Level Meter (SLM)	An instrument used to measure sound pressure levels in decibels.
Reverberation Time (Rt)	The time it takes for a sound to decay by 60 dB after the sound source has stopped, indicating the acoustic characteristics of a room.
Tonality	Refers to the presence of a distinct pitch or frequency in the noise. It suggests that the noise contains specific frequencies that are more pronounced or dominant than others. For example, a steady hum or whine might exhibit tonality because it has a clear and consistent pitch.
Impulsiveness	Describes sudden, brief bursts of noise or sound energy within a continuous noise environment. These bursts are often characterized by their rapid onset and short duration. Examples of impulsive noise include the bang of a door slamming or the roar of an engine starting.
Intermittency	Refers to the irregular or sporadic nature of noise, where there are periods of sound interspersed with periods of relative quiet or lower sound levels. It's the quality of being occasional or not continuous. This could include noise sources that turn on and off intermittently, such as machinery operating in cycles or intermittent traffic noise.