

Environmental Noise Assessment - Childcare Centre

Lot 320 (#109) Brooklands Drive, Henley Brook

Reference: 260311402-01A

Prepared for:
Blok Property Australia

Reference: 260311402-01A

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Date	Rev	Description	Author	Verified
11-May-26	0	Issued to Client	Matt Nolan	Matt Moyle
13-May-26	A	Updated elevations and fence heights	Matt Nolan	-

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EXECUTIVE SUMMARY

Lloyd George Acoustics was engaged by Blokk Property Australia to undertake a noise assessment for a proposed childcare centre (CCC) to be located at Lot 320 (#109) Brooklands Drive, Henley Brook. This report considered noise emissions from the proposed childcare centre to surrounding properties by way of noise modelling of child play, mechanical plant and car door closings.

The predicted noise from child play was shown to be compliant provided the following:

- Staggered play is implemented as per the noise management plan provided that indicates up to 31 children will be playing outside simultaneously; and
- Solid fencing shown in *Figure 3-2* is constructed. This must be free of gaps and of minimum surface mass 8 kg/m². Such material includes brick, limestone and double sheeted *Colorbond*. For areas where visual permeability is required, sound-rated plexiglass can be used provided all air gaps are sealed.

The predicted noise from car door closings was shown to be compliant provided the following:

- Seventeen daytime bays as shown in *Figure 4-3* are only used after 7.00am; and
- Solid fencing shown in *Figure 3-2* is constructed. This must be free of gaps and of minimum surface mass 8 kg/m². Such material includes brick, limestone and double sheeted *Colorbond*.

Mechanical plant noise was calculated to be compliant at all locations except two residences to the west. Once the plant has been designed and selected, this should be further reviewed to ensure compliance prior to Building Permit.

It is noted that single storey receivers have been used within the model for the future residential receivers. If these were double storey, additional noise mitigation may be required.

1. INTRODUCTION

Lloyd George Acoustics was engaged by Blokk Property Australia to undertake an environmental noise assessment for a proposed childcare centre (CCC) to be located at Lot 320 (#109) Brooklands Drive, Henley Brook (refer *Figure 1-1*) with the site plan shown in *Figure 1-2* and full Development Application (DA) plans provided in *Appendix A*. The purpose of this report is to consider noise emissions from the proposed childcare centre to surrounding properties.



Figure 1-1: Subject Site Location (Source: DPLH PlanWA)

The proposed childcare centre will be open Monday to Friday, 6.30am to 6.30pm and consist of the following:

- Six internal teaching spaces capable of accommodating up to 94 children, grouped as follows:
 - Activity 5 & 6: each with 12 places for children aged 0-2 years;
 - Activity 3 & 4: each with 15 places for children aged 2-3 years;
 - Activity 1 & 2: each with 20 places for children aged 3-5 years.
- Outdoor play areas (not used prior to 7.00am) with up to 31 children playing outside simultaneously as per the noise management plan provided in *Appendix A*;
- Amenities and associated mechanical plant such as:
 - Kitchen exhaust fan assumed to be located on roof above;
 - Various exhaust fans (toilets, laundry, nappy room) assumed to be located on the roof above;
 - Air-conditioning (AC) plant, assumed to be located on the ground in the designated yard as shown on the DA Plans;
- Car parking on the west side of the lot including seventeen car parks only to be used after 7.00am.



Figure 1-2: Proposed Site Plan

With regard to noise emissions, consideration is given to noise from child play, mechanical services and closing car doors at neighbouring properties, against the prescribed standards of the *Environmental Protection (Noise) Regulations 1997*.

Appendix B contains a description of some of the terminology used throughout this report.

2. CRITERIA

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997* (the Regulations).

2.1. Regulations 7, 8 & 9

This group of regulations defines the prescribed standard for noise emissions applicable to child play, mechanical services and car door closing as follows:

“7. Prescribed standard for noise emissions

- (1) *Noise emitted from any premises or public place when received at other premises –*
 - (a) *must not cause, or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind; and*
 - (b) *must be free of –*
 - (i) *tonality; and*
 - (ii) *impulsiveness; and*
 - (iii) *modulation,**when assessed under regulation 9.*
- (2) *For the purposes of subregulation (1)(a), a noise emission is taken to significantly contribute to a level of noise if the noise emission ... exceeds a value which is 5 dB below the assigned level at the point of reception.”*

Tonality, impulsiveness and modulation are defined in regulation 9 (refer *Appendix B*). Under regulation 9(3), *“Noise is taken to be free of the characteristics of tonality, impulsiveness and modulation if -*

- (a) *the characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of noise emission; and*
- (b) *the noise emission complies with the standard prescribed under regulation 7(1)(a) after the adjustments in the table [Table 2-1] ... are made to the noise emission as measured at the point of reception.”*

Table 2-1 Adjustments Where Characteristics Cannot Be Removed

Where Noise Emission is Not Music*			Where Noise Emission is Music	
Tonality	Modulation	Impulsiveness	No Impulsiveness	Impulsiveness
+ 5 dB	+ 5 dB	+ 10 dB	+ 10 dB	+ 15 dB

* These adjustments are cumulative to a maximum of 15 dB.

The assigned levels (prescribed standards) for all premises are specified in regulation 8(3) and are shown in *Table 2-2*. The L_{A10} assigned level is applicable to noises present for more than 10% of a representative assessment period, generally applicable to “steady-state” noise sources. The L_{A1} is for short-term noise sources present for less than 10% and more than 1% of the time. The L_{Amax} assigned level is applicable for incidental noise sources, present for less than 1% of the time.

Table 2-2 Baseline Assigned Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area ¹	0700 to 1900 hours Monday to Saturday (Day)	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays (Sunday)	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days (Evening)	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	35 + influencing factor	45 + influencing factor	55 + influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial Premises	All hours	60	75	80
Industrial and Utility Premises	All hours	65	80	90

1. *highly sensitive area* means that area (if any) of noise sensitive premises comprising —

- (a) a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
- (b) any other part of the premises within 15 metres of that building or that part of the building.

The influencing factor (IF), in relation to noise received at noise sensitive premises, has been determined to be 0 dB. *Table 2-3* shows the assigned levels including the influencing factor at the receiving locations.

Table 2-3 Assigned Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L _{A10}	L _{A1}	L _{Amax}
0 dB IF Noise sensitive premises: highly sensitive area ¹	0700 to 1900 hours Monday to Saturday (Day)	45	55	65
	0900 to 1900 hours Sunday and public holidays (Sunday)	40	50	65
	1900 to 2200 hours all days (Evening)	40	50	55
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	35	45	55
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80

1. *highly sensitive area* means that area (if any) of noise sensitive premises comprising —
- a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
 - any other part of the premises within 15 metres of that building or that part of the building.

It must be noted the assigned levels above apply outside the receiving premises and at a point at least 3 metres away from any substantial reflecting surfaces.

The assigned levels are statistical levels and therefore the period over which they are determined is important. The Regulations define the Representative Assessment Period (RAP) as “a period of time of not less than 15 minutes, and not exceeding 4 hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission”. An inspector or authorised person is a person appointed under Sections 87 & 88 of the *Environmental Protection Act 1986* and include Local Government Environmental Health Officers and Officers from the Department of Water Environmental Regulation. Acoustic consultants or other environmental consultants are not appointed as an inspector or authorised person. Therefore, whilst this assessment is based on a 4-hour RAP, which is assumed to be appropriate given the nature of the operations, this is to be used for guidance only.

2.2. Regulation 3

“3. Regulations do not apply to certain noise emissions

- (1) *Nothing in these regulations applies to the following noise emissions —*
- Noise emissions from the propulsion and braking systems of motor vehicles operating on a road;”*

The childcare centre car park is considered a road and therefore vehicle noise (propulsion and braking) is not assessed. Noise from vehicle car doors however are assessed, since these are not part of the propulsion or braking system.

2.3. Regulation 14A

“14A. Waste Collection and Other Works

- (2) Regulation 7 does not apply to noise emitted in the course of carrying out class 1 works if –*
- (a) The works are carried out in the quietest reasonable and practicable manner; and*
 - (b) The equipment used to carry out the works is the quietest reasonably available;*

class 1 works means specified works carried out between -

- (a) 0700 hours and 1900 hours on any day that is not a Sunday or a public holiday; or*
- (b) 0900 hours and 1900 hours on a Sunday or public holiday.*

specified works means -

- (a) The collection of waste; or*
- (b) The cleaning of a road or the drains for a road; or*
- (c) The cleaning of public places, including footpaths, cycle paths, car parks and beaches;”*

In the case where specified works are to be carried out outside of class 1, a noise management plan is to be prepared and approved by the CEO.

3. METHODOLOGY

Computer modelling has been used to predict the noise emissions from the development to all nearby receivers. The software used was *SoundPLAN 9.1* with the ISO 9613-2:2024-01 algorithms selected, as they include the influence of wind and are considered appropriate given the relatively short source to receiver distances. Input data required in the model are listed below and discussed in *Section 3.1* to *Section 0*:

- Meteorological Information;
- Topographical data;
- Ground Absorption; and
- Source sound power levels.

3.1. Meteorological Conditions

Meteorological information utilised is provided in *Table 3-1* and is considered to represent worst-case conditions for noise propagation. At wind speeds greater than those shown, sound propagation may be further enhanced, however background noise from the wind itself and from local vegetation is likely to be elevated and dominate the ambient noise levels.

Table 3-1: Modelling Meteorological Conditions

Parameter	Day (7.00am to 7.00pm)	Night (7.00pm to 7.00am)
Temperature (°C)	20	15
Humidity (%)	50	50
Wind Speed (m/s)	Up to 5	Up to 5
Wind Direction*	All	All

* The modelling package allows for all wind directions to be modelled simultaneously.

Alternatives to the above default conditions can be used where one year of weather data is available and the analysis considers the worst 2% of the day and night for the month of the year in which the worst-case weather conditions prevail (source: *Draft Guideline on Environmental Noise for Prescribed Premises*, May 2016). In most cases, the default conditions occur for more than 2% of the time and therefore must be satisfied.

3.2. Topographical Data

Topographical data was adapted from publicly available information (e.g. *Google*) in the form of spot heights and combined with the site plan. The ground level of the future residence to the east (107 Brooklands Drive) is understood to be located 350mm lower than the CCC outdoor play area. All other residences are assumed to be relatively flat when compared to the CCC outdoor play areas and car park.

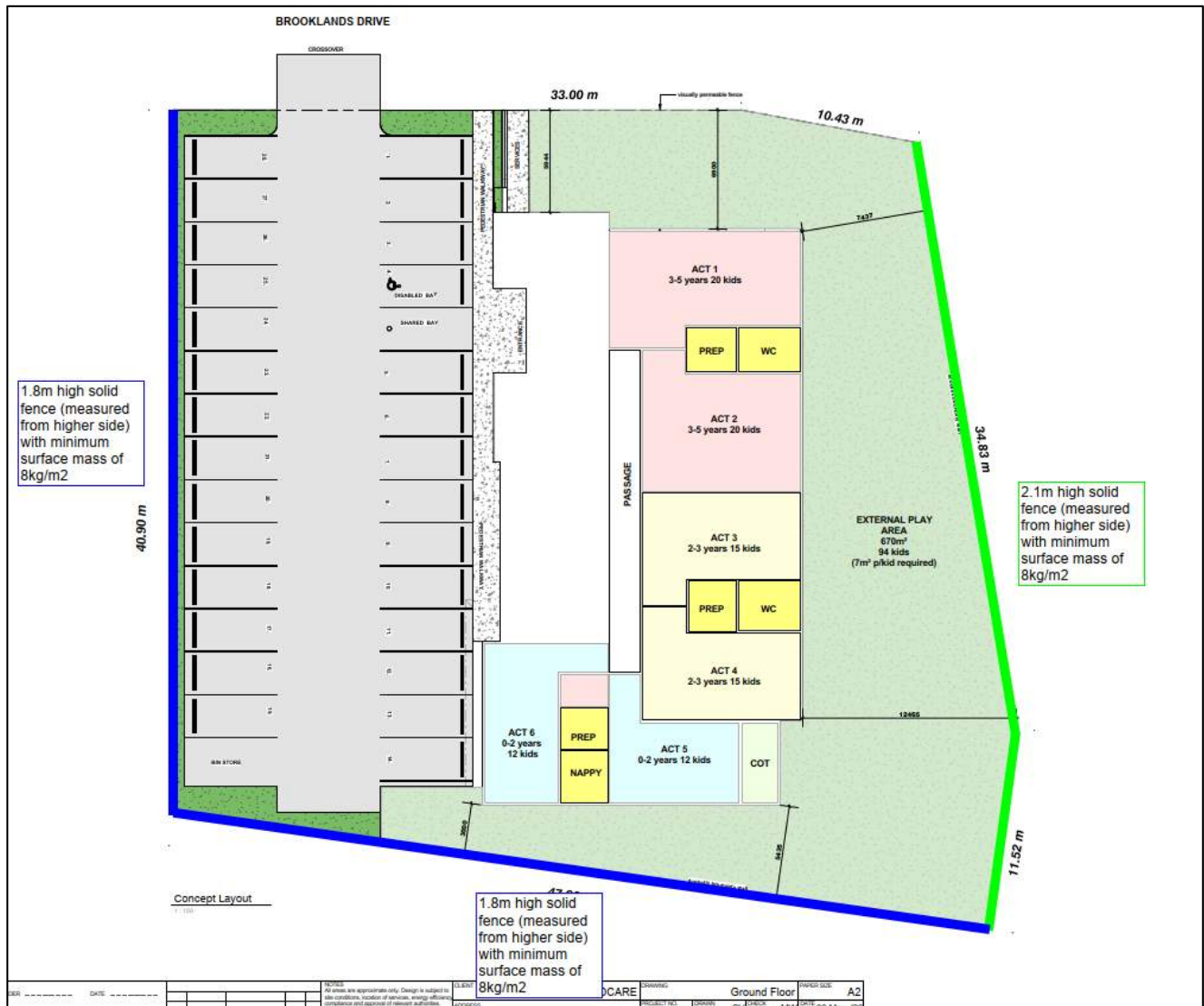
Surrounding existing buildings were also incorporated in the noise model, as these can provide noise shielding as well as reflection paths. Single storey buildings are modelled with a height of 3.5-metres, with only single storey receivers assumed at a height of 1.4-metres above ground level.

The childcare centre building outline is incorporated in the noise model as per the *Appendix A* plans at an assumed height of 5 metres. Solid boundary fencing is to be included as shown in *Figure 3-2*. This fencing is to be free of any gaps and of minimum surface mass 8 kg/m^2 . Such material includes brick, limestone, concrete and double sheeted *Colorbond*. For areas where visual permeability is required, sound-rated plexiglass can be used provided air gaps are sealed. A 2-metre-high solid screen has been included around the Dry Court & AC Store.

Figure 3-1 shows a 2D overview of the noise model with the location of all relevant receivers identified. Pink dots represent point sources in the noise model (mechanical plant) with the pink polygons representing child play and car doors.



Figure 3-1: Overview of Noise Model



3.3. Ground Absorption

The ground absorption has been assumed to be 0.0 (0%) for the roads, 0.5 (50%) outside of the roads and 1.0 (100%) for the play areas, noting that 0.0 represents hard reflective surfaces such as water and 1.0 represents absorptive surfaces such as grass.

3.4. Source Sound Levels

The source sound power levels used in the modelling are provided in *Table 3-2*.

Table 3-2: Source Sound Power Levels, dB

Description	Octave Band Centre Frequency (Hz)								Overall dB(A)
	63	125	250	500	1k	2k	4k	8k	
Babies Play Aged 0-2 Years (10 kids), L_{10}	54	60	66	72	74	71	67	64	78
Toddler Play Aged 2-3 Years (10 kids), L_{10}	61	67	73	79	81	78	74	70	85
Kindy Play Aged 3+ Years (10 kids), L_{10}	64	70	75	81	83	80	76	72	87
AC Plant, double fan unit (each), L_{10}	72	74	68	69	63	61	53	47	70
General Exhaust Fans (each), L_{10}	60	65	62	63	60	61	56	53	67
Kitchen Exhaust Fan, L_{10}	50	64	61	70	69	66	62	50	73
Closing Car Door (each), L_{max}	71	74	77	81	80	78	72	61	84

The following is noted in relation to *Table 3-2*:

- Child play source levels are based on *Guideline for Childcare Centre Acoustic Assessments Version 3.0* produced by the Association of Australasian Acoustical Consultants (AAAC) published September 2020. Where the number of children for individual play areas is specified in the plans, these have been adjusted from the reference source levels using appropriate acoustical calculations. Outdoor child play was modelled as area sources at 1.0-metre above ground level. Staggered outdoor play has been included with a maximum number of 31 children outdoors at any one time. The sound power levels used in the model were scaled as follows:
 - 8 children aged 0-2 years = 77 dB(A);
 - 10 children aged 2-3 years = 85 dB(A);
 - 13 children aged 3+ years = 88 dB(A).
- Based on the AAAC Guideline 3.0, source sound power levels for AC condensing units were assumed. Medium sized (double fan) outdoor units were deemed appropriate with four (4) modelled as point sources in the Dry Court & AC Store.
- Other mechanical plant includes four (4) exhaust fans (toilets and laundry) and one kitchen exhaust fan. All were modelled as point sources approximately 0.5 metres above roof level and above the area serviced.
- Car doors closing were modelled as an area source 1.0-metre above ground level, with the results showing the total sound power located in the 'worst-case' location for each receiver. Since noise from a car door closing is a short term event, only the L_{Amax} level is applicable. The seventeen daytime car parks (as shown in *Figure 4-4*) were not included within the night period car door noise assessment.

4. RESULTS AND ASSESSMENT

4.1. Outdoor Child Play Noise

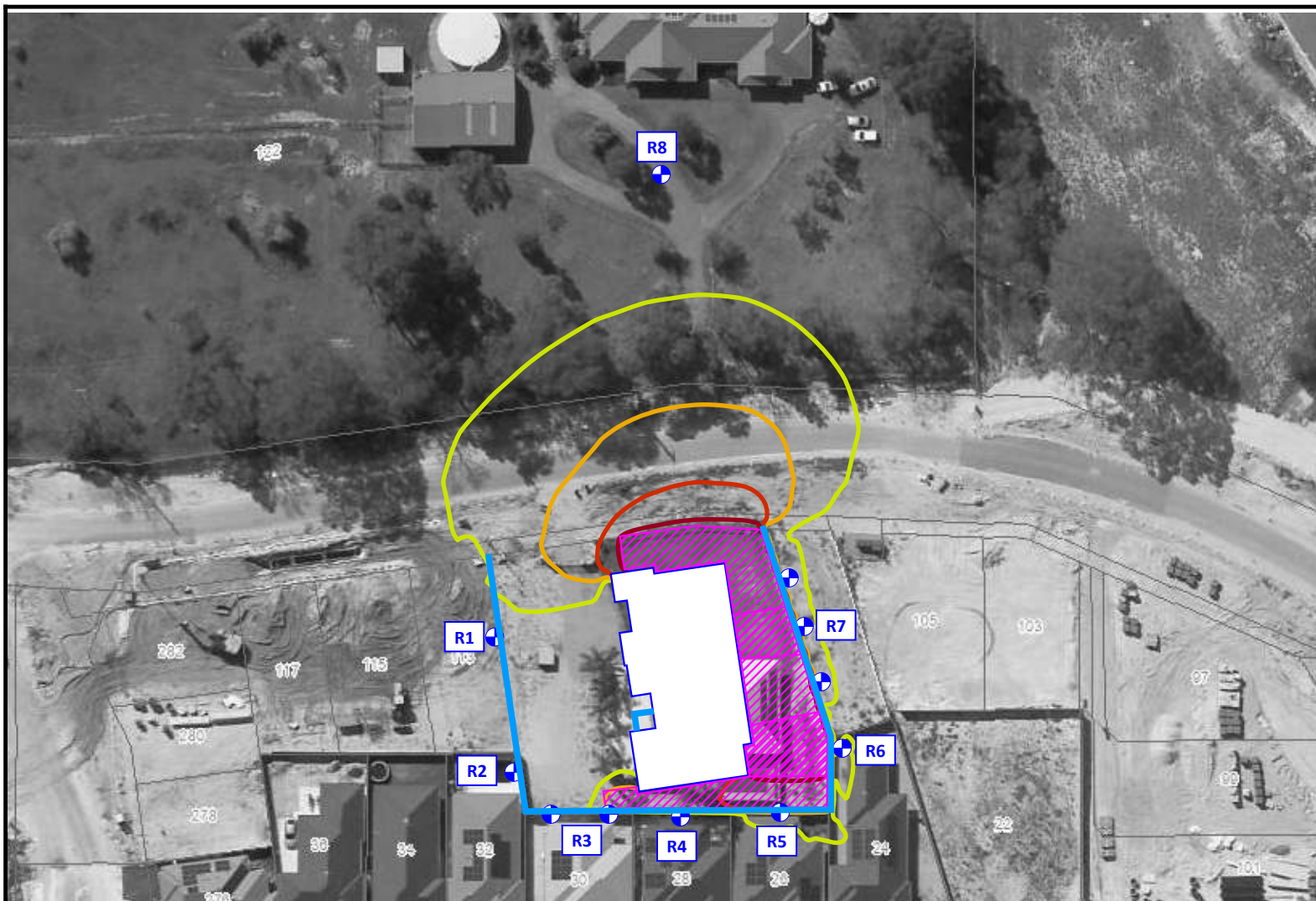
The childcare development will host up to 94 children. It is noted play time will be staggered and therefore not all children would be playing outside at once for extended periods of time. Noise levels were predicted for up to 31 children playing simultaneously as a worst-case scenario, with the results provided and assessed in *Table 4-1*. The critical assigned level is during the day, as whilst the childcare centre will open at 6.30am, child play will not commence until after 7.00am. Noise from child play is not considered to contain annoying characteristics within the definition of the Regulations and therefore no adjustments are made to the predicted noise levels. A noise contour plot is also provided in *Figure 4-1*. It is noted that the highest noise level from predictions at multiple receivers were used.

Table 4-1: Child Play Noise Predicted Levels and Assessment, dB L_{A10}

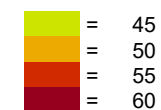
Receiver	Babies (0-2 yo)	Toddler (2-3 yo)	Kindy (3+ yo)	Total	Assigned Level	Assessment
R1 – 113 Brooklands Dr (future residence)	22	21	32	32	45	Complies
R2 – 32 Tolmer St	27	22	25	30	45	Complies
R3 – 30 Tolmer St	35	29	24	36	45	Complies
R4 – 28 Tolmer St	38	35	24	39	45	Complies
R5 – 26 Tolmer St	38	41	36	43	45	Complies
R6 – 24 Tolmer St	35	43	39	45	45	Complies
R7 – 107 Brooklands Dr (future residence)	28	41	44	45	45	Complies
R8 – 122 Brooklands Dr	24	34	41	42	45	Complies

Based on 31 children playing outside simultaneously, the assessment demonstrates compliance is achieved during the day.

Figure 4-1



Noise levels
L_{A10}, dB



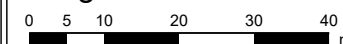
Legend

- Childcare Centre
- +

 Receivers
- Child Play
- Solid Fence



Length Scale 1:1000



Proposed Childcare Centre
Lot 320 (#109) Brooklands Drive, Henley Brook

L_{A10} Noise Contour Plot - Outdoor Childplay
Ground Floor Level
Winds in All Direction

SoundPLAN v9.1
ISO 9613 Algorithms

Job No. 260311402

13 May 2026



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4.2. Mechanical Plant Noise

Mechanical plant noise consists of the outdoor AC condensing units and exhaust fans. Predicted and assessed noise levels are provided in *Table 4-2*. The critical assigned level is during the night, as the plant may operate prior to 7.00am. An adjustment of + 5 dB is included for tonality, since this may be present for such noise sources. A noise contour plot is also provided in *Figure 4-2*. It is noted that the highest noise level from predictions at multiple receivers were used.

Table 4-2: Mechanical Plant Noise Predicted Levels and Assessment, dB L_{A10}

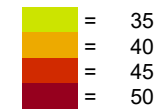
Receiver	AC	Exhaust Fans	Total	Total Adjusted	Assigned Level	Assessment
R1 – 113 Brooklands Dr (future residence)	28	31	33	38	35	+3 dB
R2 – 32 Tolmer St	21	31	31	36	35	+1 dB
R3 – 30 Tolmer St	20	30	30	35	35	Complies
R4 – 28 Tolmer St	20	29	29	34	35	Complies
R5 – 26 Tolmer St	14	25	26	31	35	Complies
R6 – 24 Tolmer St	13	27	27	32	35	Complies
R7 – 107 Brooklands Dr (future residence)	14	25	26	31	35	Complies
R8 – 122 Brooklands Dr	10	27	27	32	35	Complies

The calculations show compliance at all receiver locations except two residences located to the west. It must be noted that the assessment is based on assumptions in relation to the number, location, size and type of mechanical plant. Therefore, once the mechanical plant has been designed and selected, noise is to be reviewed by a suitably qualified acoustical consultant.

Figure 4-2



Noise levels
L_{A10}, dB

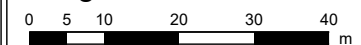


Legend

- Childcare Centre
- Receivers
- * Mech Plant
- Solid Fence



Length Scale 1:1000



Proposed Childcare Centre
Lot 320 (#109) Brooklands Drive, Henley Brook

L_{A10} Noise Contour Plot - Mechanical Plant
Ground Floor Level
Winds in All Direction

SoundPLAN v9.1
ISO 9613 Algorithms

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4.3. Car Door Closing Noise

Predicted and assessed noise levels for car doors closing are provided in *Table 4-3* being the maximum noise level from all car bays except the seventeen daytime only bays. The critical assigned level is during the night, as car door closings will occur prior to 7.00am. An adjustment of + 10 dB is included for impulsiveness, since this may be present for such noise sources. The seventeen daytime only car bays are shown in *Figure 4-3* and a noise contour plot is provided in *Figure 4-4*. It is noted that the highest noise level from predictions at multiple receivers were used.

Table 4-3: Car Door Closing Noise Predicted Levels and Assessment, dB L_{Amax}

Receiver	Car Door	Total Adjusted	Assigned Level	Assessment
R1 – 113 Brooklands Dr (future residence)	45	55	55	Complies
R2 – 32 Tolmer St	45	55	55	Complies
R3 – 30 Tolmer St	45	55	55	Complies
R4 – 28 Tolmer St	32	42	55	Complies
R5 – 26 Tolmer St	24	34	55	Complies
R6 – 24 Tolmer St	20	30	55	Complies
R7 – 107 Brooklands Dr (future residence)	23	33	55	Complies
R8 – 122 Brooklands Dr	38	48	55	Complies

Noise from car doors closing from all car bays except the seventeen daytime only bays is predicted to comply at all nearest receivers during the critical night period. Where parking occurs in all the bays after 7.00am, compliance is predicted given the assigned level is increased by +10 dB.

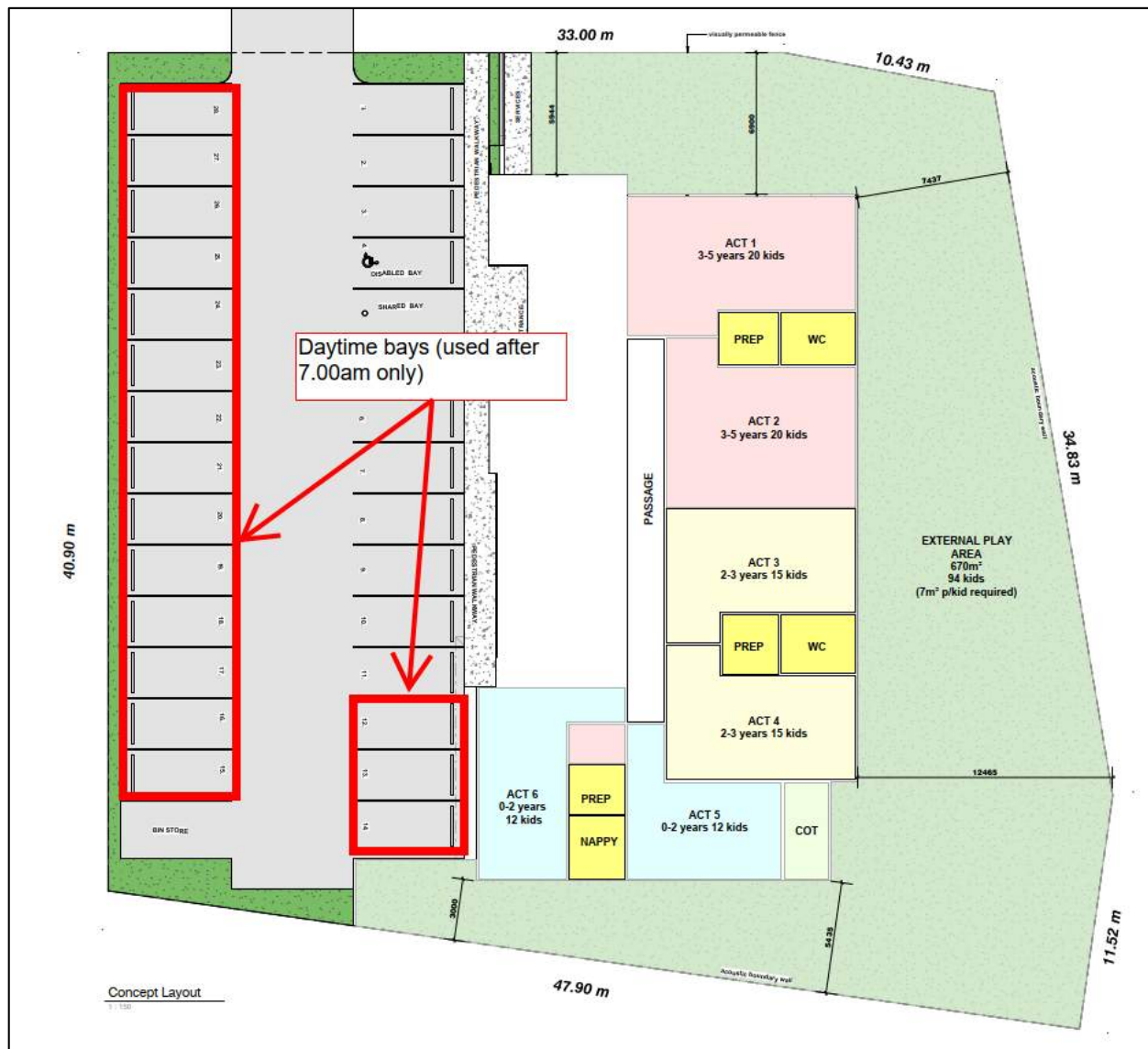


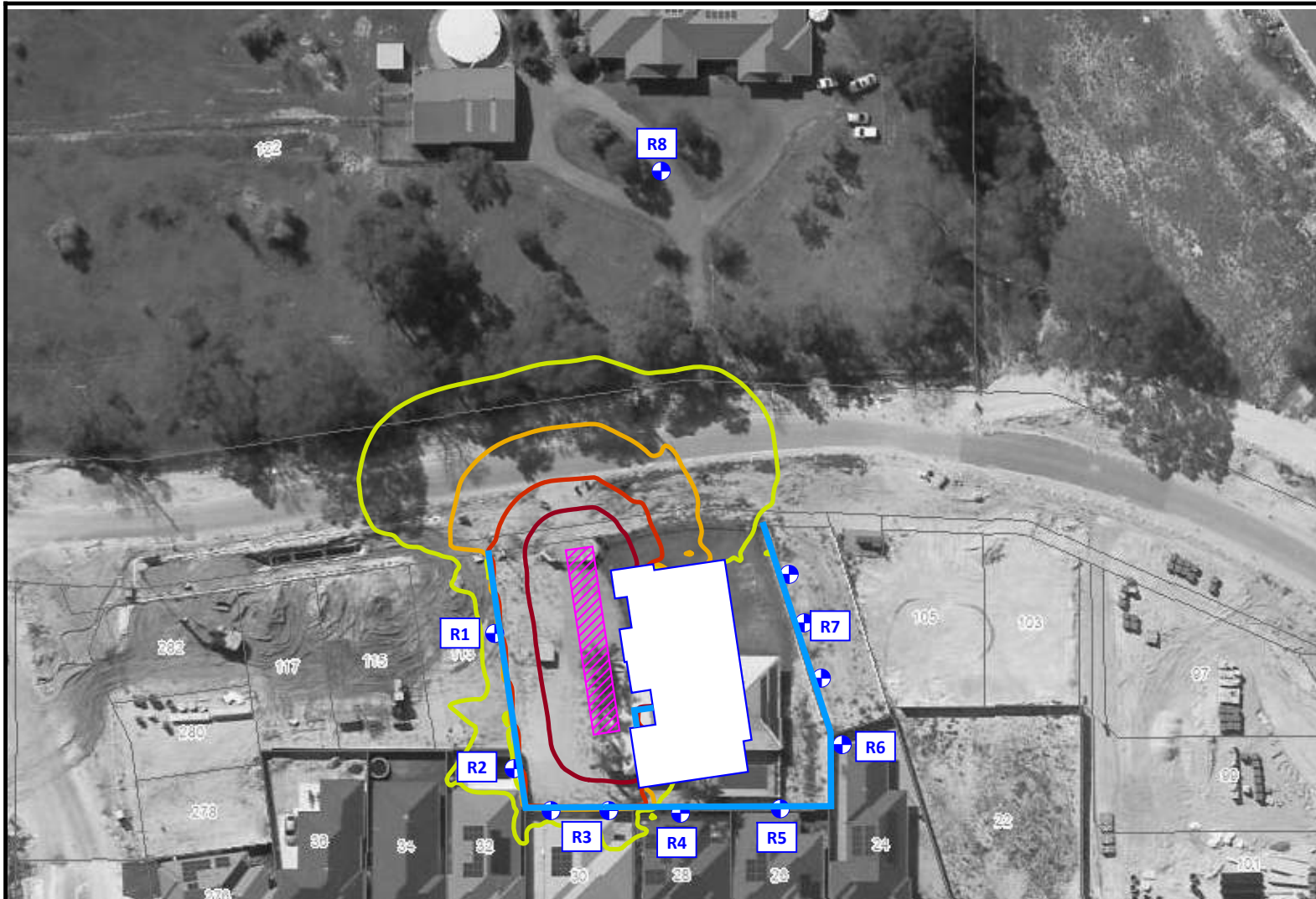
Figure 4-3: Daytime Only Car Bays

4.4. Indoor Child Play

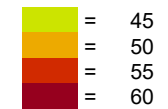
An assessment of noise levels from indoor child play was carried out and the resulting noise levels at all locations were predicted to be well below that of outdoor child play considered in *Section 4.1*. This assessment was carried out based on the following considerations:

- Internal noise levels within activity rooms would not exceed those from outdoor play for each age group, regardless of windows being open or closed. Nevertheless, it is recommended all windows to activity rooms be minimum 6mm thick glass; and
- Any music played within the internal activity areas would be 'light' music with no significant bass content and played at a relatively low level.

Figure 4-4



Noise levels
L_{Amax}, dB

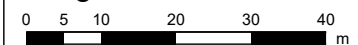


Legend

- Childcare Centre
- Receivers
- Car Doors
- Solid Fence



Length Scale 1:1000



Proposed Childcare Centre
Lot 320 (#109) Brooklands Drive, Henley Brook

L_{Amax} Noise Contour Plot - Car Door Closing during Night
Ground Floor Level
Winds in All Direction

SoundPLAN v9.1
ISO 9613 Algorithms

Job No. 260311402

13 May 2026



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5. RECOMMENDATIONS

5.1. Child Play

The predicted noise from child play is compliant provided the following:

- Staggered play is implemented as per the noise management plan provided that indicates up to 31 children will be playing outside simultaneously; and
- Solid fencing shown in *Figure 3-2* is constructed. This must be free of gaps and of minimum surface mass 8 kg/m². Such material includes brick, limestone and double sheeted *Colorbond*. For areas where visual permeability is required, sound-rated plexiglass can be used provided all air gaps are sealed.

Whilst not necessarily required for compliance, to further minimise noise impacts as part of best practice, the following are provided:

- The behaviour and 'style of play' of children should be monitored to prevent particularly loud activity e.g. loud banging/crashing of objects, 'group' shouts/yelling;
- Favour soft finishes in the outdoor play area to minimise impact noise (e.g. soft grass, sand pit(s), rubber mats) over timber or plastic;
- Favour soft balls and rubber wheeled toys;
- Crying children should be taken inside to be comforted;
- No amplified music to be played outside;
- Any music played within the internal activity areas to be 'light' music with no significant bass content and played at a relatively low level;
- Car park drainage grates or similar to be plastic or metal with rubber gasket and secured to avoid excess banging.

5.2. Mechanical Plant

For mechanical plant, the following are recommended:

- Once the mechanical plant has been designed and selected, the noise levels shall be reviewed prior to Building Permit;
- All exhaust fans shall be located inside the ceiling void and shall be axial fan type, allowing the incorporation of an attenuator if required;
- All fans shall be variable speed drive so that maximum speed is only occurring when necessary with demand;
- Air-conditioning shall have a 'night' / 'quiet' mode option, in case required for prior to 7.00am operation, subject to final detailed analysis;
- All plant shall be selected taking into consideration noise levels. That is, when comparing manufacturers of equivalent equipment, select the quieter model;
- All plant is to be appropriately vibration isolated to 95% isolation efficiency.

5.3. Car Doors

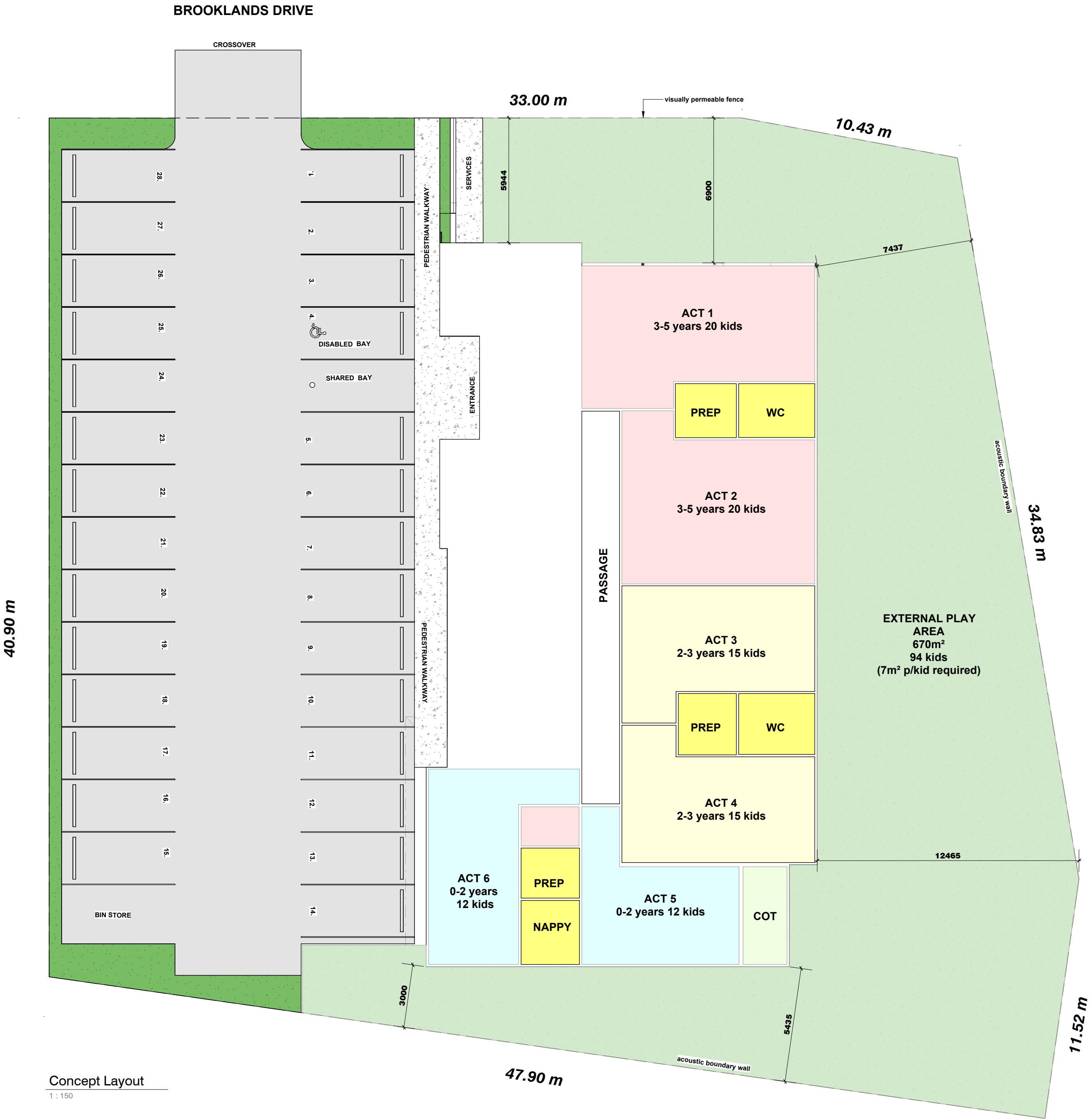
The predicted noise from car door closings is compliant provided the following:

- Seventeen daytime bays as shown in *Figure 4-3* are only used after 7.00am; and
- Solid fencing shown in *Figure 3-2* is constructed. This must be free of gaps and of minimum surface mass 8 kg/m². Such material includes brick, limestone and double sheeted *Colorbond*.

Appendix A – Development Plans and Noise Management Plan

ROOM CALCULATIONS			
Room	Area	Size	Children
Activity 1	0-2 years	39 m²	12
Activity 2	0-2 years	39 m²	12
Activity 3	2-3 years	49 m²	15
Activity 4	2-3 years	49 m²	15
Activity 5	3-5 years	65 m²	20
Activity 6	3-5 years	66 m²	20
		307 m²	94

AREAS	
PROPOSED BUILDING	585.9 m²
PROPOSED PARKING LOT	785.6 m²
EXTERNAL PLAY AREA	667.1 m²
TOTAL	2038.5 m²



Concept Layout

1 : 150

- ↔ door viewing panel
- SC structural column to eng. spec
- hatch indicates internal raking ceiling extent
- hatch indicates ext raking ceiling extent
- hatch indicates varied ceiling height
- roof beams to eng. details

BUILDER'S NOTES

1 • Mechanically vent to outside
sd • Smoke Detector alarm to be installed in accordance to BCA requirements
dp • Down Pipe location, nominal only, down pipe and gutter to comply to BCA requirements
td • Tie Down, refer to engineer's drawings for specifications
l/o • Lift Off hinge door frame to sanitary compartments BCA requirements

4 Browning Road
Armadale WA 6112
Phone: (08) 9399 6715
Fax: (08) 9399 8564
admin@iqconstruction.com.au

BUILDER	DATE	3	14 Apr. '26	Full SD Set	SV	MW
CLIENT 1	DATE	2	31 Mar. '26	Concept 02	SV	MW
CLIENT 2	DATE	1	27 Mar. '26	Concept 01	SV	MW
REV	DATE	DESCRIPTION	BY	CHK		

NOTES

All areas are approximate only. Design is subject to site conditions, location of services, energy efficiency compliance and approval of relevant authorities.

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CLIENT	HENLEY CHILDCARE	DRAWING	Ground Floor	PAPER SIZE	A2
ADDRESS	109 Brooklands Drive, Henley Brook	PROJECT NO.	0000	DRAWN	SV
		CHECK	MW	DATE	08 May. '26
		PROJECT STAGE	SCALE	1:100	DRAWING NO. rev 3
		SKETCH	0m	5m	S001

Staggered Outdoor Play and Acoustic Management Plan

Prepared to support JDAP acoustic management requirements

Service licensed capacity: 94 children

Outdoor use limit: no more than one third of the total licensed capacity outdoors at any one time

Maximum children outdoors at any one time: 31 children

1. Purpose

This Staggered Outdoor Play and Acoustic Management Plan outlines how the service will manage outdoor play to reduce cumulative noise impact and support the acoustic requirements associated with the JDAP approval process. The plan is based on limiting the number of children using the outside environment at any one time to no more than one third of the total licensed capacity.

The service will use a planned, staggered outdoor access model supported by flexible indoor programming, room-based transition routines, active supervision, and daily monitoring by the Responsible Person in charge.

2. Licensed Capacity and Outdoor Occupancy Limit

Age group	Licensed places	One-third outdoor allocation	Maximum outdoor group size
Infants	24	8	8
Children 2-3 years	30	10	10
Children 3-5 years	40	13.33	13
Total	94	31.33	31

For operational and acoustic management purposes, the one-third calculation has been rounded down to ensure the outdoor environment does not exceed 31 children at any one time. This creates a conservative control measure and avoids exceeding the intended acoustic threshold.

3. Core Acoustic Control Measure

- No more than 31 children will be in the outside environment at any one time.
- Outdoor groups will be scheduled and monitored by age cohort.
- The service will avoid whole-service outdoor play, combined outdoor play across all rooms, or unscheduled mass transitions to the outdoor environment.
- Exception: Quarterly regulatory required evacuation drills
- Outdoor play will be staggered across the day, with the remaining children engaged in indoor learning environments, meals, rest routines, small-group experiences, or calm transition activities.
- The Responsible Person will monitor outdoor numbers throughout the day and adjust access if attendance patterns, weather, behaviour, or staffing require a more conservative approach.

4. Staggered Outdoor Play Model

The proposed model divides the outdoor program into three rotating outdoor groups. Each group reflects approximately one third of the licensed capacity across each age band.

Outdoor rotation group	Infants	2-3 years	3-5 years	Total children outdoors
Group A	8	10	13	31
Group B	8	10	13	31
Group C	8	10	14*	32*

*Group C includes 14 children in the 3-5 year age band for enrolment grouping purposes only. In practice, the service will not allow all Group C children outdoors at the same time. One child from the 3-5 year age band will remain indoors or transition later so the outdoor total remains capped at 31 children.

This means the operational outdoor limit remains fixed at 31 children, even where internal grouping arrangements create uneven group sizes.

5. Sample Daily Outdoor Rotation Schedule

The following schedule is an example only and may be adapted according to attendance, weather, child needs, staffing, routines, and curriculum planning. The maximum outdoor number must not be exceeded.

Time	Outdoor group	Maximum number outdoors	Indoor program for remaining children
6:30 am - 8:30 am	Mixed low-number group	Not exceeding 15	Arrival settling, indoor small-group play
8:30 am - 9:30 am	Group A	31	Arrival settling, indoor small-group play, breakfast/morning tea routines
9:45 am - 10:45 am	Group B	31	Indoor project work, free flow
11:00 am - 12:00 pm	Group C, capped at 31	31	Indoor curriculum experiences, lunch preparation, calm play, free flow
12:00 pm - 2:30 pm	Reduced outdoor use only, where appropriate	Maximum 10	Lunch, rest, sleep, quiet play and indoor experiences
2:30 pm - 3:30 pm	Group A or mixed low-number group	Maximum 20	Afternoon tea, indoor experiences, progressive rest wake-up routines
3:30 pm - 4:30 pm	Group B or Group C low-number group	31	Indoor experiences, free play
4:30 pm - 5:30 pm	Mixed low-number group	Not exceeding 15	Late-day indoor play and departure routines with family grouping
5:30 pm - 6:00 pm	N/A	None	Family Grouping Indoor Service Closing Routine

6. Transition Management

- Outdoor transitions will occur in small groups/ individual children's choices to change environments rather than as whole-room or whole-service movements.
- Educators will complete a headcount, as they are required to do anyway, before children move outdoors, while children are outdoors, and when children return indoors.

- Children waiting for their outdoor rotation will be provided with purposeful indoor experiences to avoid congestion at doors, verandahs, or transition points.
- Where children request outdoor access outside their scheduled rotation, educators will check the current outdoor count before approving the transition.
- If the outdoor area has reached the cap of 31 children, additional children will wait indoors until another child or group returns inside.

7. Supervision, Monitoring and Record Keeping

- The Nominated Supervisor/ Responsible Person will oversee implementation of the staggered outdoor play plan each day.
- Each room or age group will maintain awareness of its allocated outdoor time and current outdoor numbers.
- Daily outdoor planning will be adjusted when attendance is lower than licensed capacity; however, the 31-child maximum will remain the upper limit.
- Educators will use room rolls, transition records, or headcount lists to confirm the number of children outdoors.
- Any deviation from the schedule will be managed only where the outdoor occupancy limit remains compliant.
- The service will review the effectiveness of the staggered play arrangements as part of operational meetings and in response to any acoustic, neighbour, or compliance feedback.

8. Outdoor Play Space Design Considerations

The playground design, currently in the conceptual planning phase, has been developed with significant consideration given to acoustic impact mitigation. The proposed design approach incorporates the strategic placement of quieter, lower-intensity play experiences and activities requiring less gross motor engagement closer to boundary areas, while more active play zones are positioned further within the site.

In addition, careful consideration is being given to the selection of surface materials and play resources to minimise noise generation. Proposed acoustic mitigation measures also include the incorporation of sound-absorbing roof and shade structures over key play areas and play structures to further reduce noise transmission beyond the site boundaries.

9. Additional Noise Management Strategies

- Educators will actively support calm outdoor engagement and redirect sustained high-volume play where required.
- Outdoor experiences will favour smaller group play, nature play, construction, sand, water, gross motor circuits and quieter exploratory experiences rather than whole-group running games.
- Outdoor equipment and experiences will be arranged to spread children across the outdoor space and avoid concentrated noise in one location.

- Educators will use calm voice modelling and proximity guidance rather than calling across the outdoor environment.
- The service will avoid whistles, amplified music, megaphones, loud bells or other unnecessary noise-generating devices in the outdoor environment.
- Where weather or child behaviour increases noise risk, the Responsible Person may shorten outdoor rotations or reduce outdoor group sizes further.

9. Staff Responsibilities

Role	Responsibility
Approved Provider / Management	Ensure the staggered outdoor play plan is embedded into service operations and reviewed as required.
Nominated Supervisor / Responsible Person	Monitor daily compliance with the outdoor occupancy cap and adjust the schedule as needed.
Room Leaders	Coordinate room transitions, communicate with other rooms, and ensure children are prepared for scheduled outdoor access.
Educators	Maintain active supervision, complete headcounts, support calm play, and ensure no additional children enter the outdoor environment once the cap is reached.

10. Commitment

The service is committed to managing outdoor play in a way that supports children's health, wellbeing and learning while also responding responsibly to acoustic requirements. The staggered outdoor play model provides a practical and measurable control by ensuring that no more than one third of the licensed capacity, being a maximum of 31 children, access the outside environment at any given time.

This plan will be implemented through daily programming, educator communication, headcounts, transition controls and Responsible Person oversight.

Appendix B – Terminology

The following is an explanation of the terminology used throughout this report:

- **Decibel (dB)**

The decibel is the unit that describes the sound pressure levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

- **A-Weighting**

An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as L_A , dB.

- **Sound Power Level (L_w)**

Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly measured using a sound level meter but is calculated based on measured sound pressure level at known distances. Noise modelling incorporates source sound power levels as part of the input data.

- **Sound Pressure Level (L_p)**

The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc. and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

- **L_{ASlow}**

This is the noise level in decibels, obtained using the A-frequency weighting and the S (slow) time weighting. Unless assessing modulation, all measurements use the slow time weighting characteristic.

- **L_{AFast}**

This is the noise level in decibels, obtained using the A-frequency weighting and the F (fast) time weighting. This is used when assessing the presence of modulation.

- **L_{APeak}**

This is the greatest absolute instantaneous sound pressure level in decibels using the A-frequency weighting.

- **L_{Amax}**

An L_{Amax} level is the maximum A-weighted noise level during a particular measurement.

- **L_{A1}**

The L_{A1} level is the A-weighted noise level exceeded for 1 percent of the measurement period and is considered to represent the average of the maximum noise levels measured.

- **L_{A10}**

The L_{A10} level is the A-weighted noise level exceeded for 10 percent of the measurement period and is considered to represent the “intrusive” noise level.

- **L_{A90}**

The L_{A90} level is the A-weighted noise level exceeded for 90 percent of the measurement period and is considered to represent the “background” noise level.

- **L_{Aeq}**

The equivalent steady state A-weighted sound level (“equal energy”) in decibels which, in a specified time period, contains the same acoustic energy as the time-varying level during the same period. It is considered to represent the “average” noise level.

- **One-Third-Octave Band**

Means a band of frequencies spanning one-third of an octave and having a centre frequency between 25 Hz and 20000 Hz inclusive.

- **Representative Assessment Period**

Means a period of time not less than 15 minutes, and not exceeding four hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission.

- **L_{Amax} assigned level**

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded at any time.

- **L_{A1} assigned level**

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded for more than 1 percent of the representative assessment period.

- **L_{A10} assigned level**

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded for more than 10 percent of the representative assessment period.

- **Tonal Noise**

A tonal noise source can be described as a source that has a distinctive noise emission in one or more frequencies. An example would be whining or droning. The quantitative definition of tonality is:

- the presence in the noise emission of tonal characteristics where the difference between -
 - (a) the A-weighted sound pressure level in any one-third octave band; and
 - (b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

This is relatively common in most noise sources.

- **Modulating Noise**

A modulating source is regular, cyclic and audible and is present for at least 10% of the measurement period. The quantitative definition of modulation is:

- a variation in the emission of noise that —
 - (a) is more than 3 dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band; and
 - (b) is present for at least 10% of the representative assessment period; and
 - (c) is regular, cyclic and audible.

- **Impulsive Noise**

An impulsive noise source has a short-term banging, clunking or explosive sound. The quantitative definition of impulsiveness means:

- a variation in the emission of a noise where the difference between L_{Apeak} and L_{Amax} is more than 15 dB when determined for a single representative event.

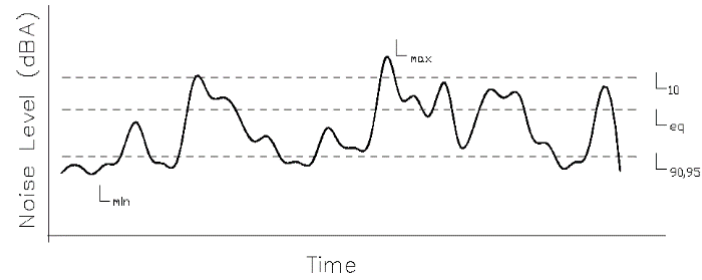
- **Major Road**

Is a road with an estimated average daily traffic count of more than 15,000 vehicles.

- **Secondary / Minor Road**

Is a road with an estimated average daily traffic count of between 6,000 and 15,000 vehicles.

- Chart of Noise Level Descriptors



- Austroads Vehicle Class

VEHICLE CLASSIFICATION SYSTEM AUSTROADS	
CLASS	VEHICLE TYPES
1	Light Vehicles Car, Van, Wagon, 4WD, Off-Road, Motorcycle
2	Light - Medium Truck, Coach, Bus
3	Heavy Vehicles Two axle truck or bus 7.5 tonnes
4	Three axle truck or bus 7.5 tonnes, 2 axle groups
5	Four axle truck or bus 7.5 tonnes, 3 axle groups
6	Three axle articulated 7.5 tonnes, 3 axle groups
7	Four axle articulated 7.5 tonnes, 3 or 4 axle groups
8	Five axle articulated 7.5 tonnes, 3 or 4 axle groups
9	Six axle articulated 7.5 tonnes, 3 or 4 axle groups
10	Long Vehicles and Road Trains Double or Heavy Truck and Trailer 7.5 tonnes, 4 axle groups
11	Double Road Train 7.5 tonnes, 5 or 6 axle groups
12	Triple Road Train 7.5 tonnes, 7 or 8 axle groups

- Typical Noise Levels

