



**PROPOSED CHILD CARE CENTRE  
LOT 9511,  
CORNER OF INDIGO PARKWAY AND BRIGGS ROAD,  
BYFORD**

**ENVIRONMENTAL ACOUSTIC ASSESSMENT**

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**ENVIRONMENTAL ACOUSTIC ASSESSMENT**  
**PROPOSED CHILD CARE CENTRE**  
**BYFORD**

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**ROWE GROUP**

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## 1. INTRODUCTION

Herring Storer Acoustics were commissioned to undertake an acoustic assessment of noise emissions associated with the proposed day care centre to be located at Lot 9511, Corner of Indigo Parkway and Briggs Road, Byford.

The report considers noise received at the neighbouring premises from the proposed development for compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*. This report considers noise emissions from:

- Children playing within the outside play areas of the centre; and
- Mechanical services.

We note that from information received from DWER, the bitumised area would be considered as a road, thus noise relating to motor vehicles is exempt from the *Environmental Protection (Noise) Regulations 1997*. We note that these noise sources are rarely critical in the determination of compliance. However, as requested by council and for completeness, they have been included in the assessment, for information purposes only.

For information, a plan of the proposed development is attached in Appendix A.

## 2. SUMMARY

Noise received at the neighbouring residences from the outdoor play areas would comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*, with the fencing, as shown on the plan attached in Appendix A; and provided outdoor play is limited to the day period (ie after 7am).

Noise from the mechanical services has also been assessed to comply with the relevant criteria. However, as the assessment has not been based on the mechanical services design, it is recommended that additionally, mechanical services design be reviewed for compliance with the Regulatory requirements.

It is noted that noise associated with cars movements and cars starting are exempt from complying with the Regulations. However, noise emissions from car doors is not strictly exempt from the Regulations. Noise received at the proposed and existing neighbouring residences from these noise sources would with the proposed fencing and parking restrictions, as shown on Figure 5.1 in Section 5, comply with the Regulatory requirements, at all times.

Thus, noise emissions from the proposed development, would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed hours of operation, with the inclusion of the following:

- 1 Although the proposed facility would open before 7 am (ie during the night period), the outdoor play area would not be used until after 7am. Thus, noise received at the neighbouring existing residences from the outdoor play area needs to comply with the assigned day period noise level.
- 2 Fencing to be as shown on the drawings attached in Appendix A.
- 3 Parking to be restricted, as shown on Figure 5.1 in Section 5 – Modelling.
- 4 For child care centres colourbond fencing is acceptable fencing material.

### 3. CRITERIA

The allowable noise level at the surrounding locales is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 & 8 stipulate maximum allowable external noise levels. For highly sensitive area of a noise sensitive premises this is determined by the calculation of an influencing factor, which is then added to the base levels shown below in Table 3.1. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. For other areas within a noise sensitive premises, the assigned noise levels are fixed throughout the day, as listed in Table 3.1.

**TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L <sub>A10</sub>	L <sub>A1</sub>	L <sub>Amax</sub>
Noise sensitive premises: highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80

Note: L<sub>A10</sub> is the noise level exceeded for 10% of the time.  
 L<sub>A1</sub> is the noise level exceeded for 1% of the time.  
 L<sub>Amax</sub> is the maximum noise level.  
 IF is the influencing factor.

Under the Regulations, a 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 m of that building or that part of the building.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

**“impulsiveness”** means a variation in the emission of a noise where the difference between L<sub>Apeak</sub> and L<sub>Amax(Slow)</sub> is more than 15 dB when determined for a single representative event;

**“modulation”** means a variation in the emission of noise that –

- (a) is more than 3 dB L<sub>Afast</sub> or is more than 3 dB L<sub>Afast</sub> in any one-third octave band;
- (b) is present for more at least 10% of the representative assessment period; and
- (c) is regular, cyclic and audible;

**“tonality”**

means 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  $L_{ASlow}$  levels.

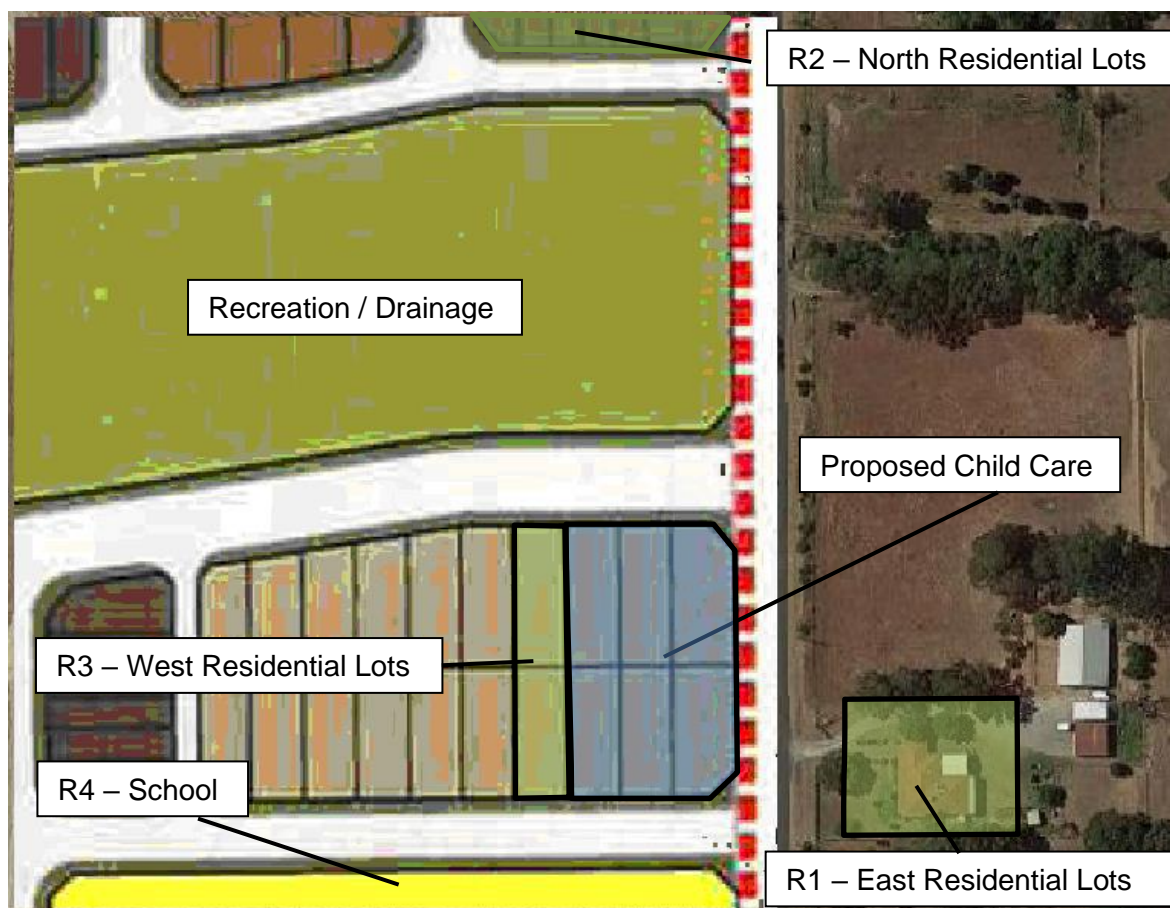
Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

**TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS**

Where <b>tonality</b> is present	Where <b>modulation</b> is present	Where <b>impulsiveness</b> is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: These adjustments are cumulative to a maximum of 15 dB.

An aerial showing the neighbouring premises are shown below on Figure 3.1.



**FIGURE 3.1 – NEIGHBOURING LOTS**

For the neighbouring residences, the influencing factor has been determined to be +0 dB. Thus, the assigned noise levels would be as listed in Table 3.3.

**TABLE 3.3 - ASSIGNED OUTDOOR NOISE LEVEL**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		LA10	LA1	LAm <sub>ax</sub>
Noise sensitive premises: highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)	45	55	65
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40	50	65
	1900 - 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

Note: LA10 is the noise level exceeded for 10% of the time.  
LA1 is the noise level exceeded for 1% of the time.  
LAm<sub>ax</sub> is the maximum noise level.

#### 4. PROPOSAL

From information supplied, we understand that the child care centre normal hours of operations would be between 0700 and 1800 hours, Monday to Friday (closed on public holidays). It is understood that the proposed childcare centre will cater for a maximum of 110 children: with the following breakdown:

Infant	0 – 2 years	20 places
Pre-Kindy	2 – 3 years	30 places
Kindy	3+ years	60 places

It is noted that although the proposed child care centre would open before 7 am (ie during the night period), the outdoor play area would not be used until after 7am.

#### 5. MODELLING

To assess the noise received at the neighbouring premises from the proposed development, noise modelling was undertaken using the noise modelling program SoundPlan.

Calculations were carried out using the DWER’s weather conditions, which relate to worst case noise propagation, as stated in the Department of Environment Regulation “*Draft Guidance on Environmental Noise for Prescribed Premises*”. These conditions include winds blowing from sources to the receiver(s).

Calculations were based on the sound power levels used in the calculations are listed in Table 5.1.

**TABLE 5.1 – SOUND POWER LEVELS**

Item	Sound Power Level, dB(A)
Children Playing	83 (per 10 children)
Car Moving in Car Park	79
Car Starting	85
Door Closing	87
Air conditioning condensing Unit	10 @ 71
Exhausts	72 (kitchen)

Notes:

- 1 Acoustic modelling of outdoor play noise was made, based on:
  - any age group of children within the outdoor play area (ie worst case scenario)
- 2 The noise level for the air conditioning has been based on the sound power levels used for previous assessment of child care centres. From other studies, we understand that the noise associated with the condensing units would be conservative.
- 3 For this child care centre, it is recommended that the air conditioning units be surrounded on all sides by a barrier minimum being to height of units, preferably 500mm above top of units.
- 4 The noise modelling has been based on fences surrounding the outdoor play area, and to the west (as shown in Appendix A).
- 5 To determine the restriction to the parking, a point noise source was located in each car bay.
- 6 Modelling shows that noise received at the neighbouring residences from car doors closing would comply with the assigned noise level for the day period. However, to achieve compliance during the night period (ie before 7am), for staff arriving, the parking needs to be restricted, as shown on Figure 5.1.
- 7 With only staff arriving before 07:00 am, there would be no car starts before 7am. We also note that as the school would not be occupied during the night period, compliance is only required for the day period.
- 8 Calculation were undertaken for the receivers at 1.5 metres above the ground level.
- 9 Noise modelling was undertaken to a number of different receiver locations for each of the neighbouring residences. However, to simplify the assessment, only the noise level in the worst case location (ie highest noise level), have been listed.

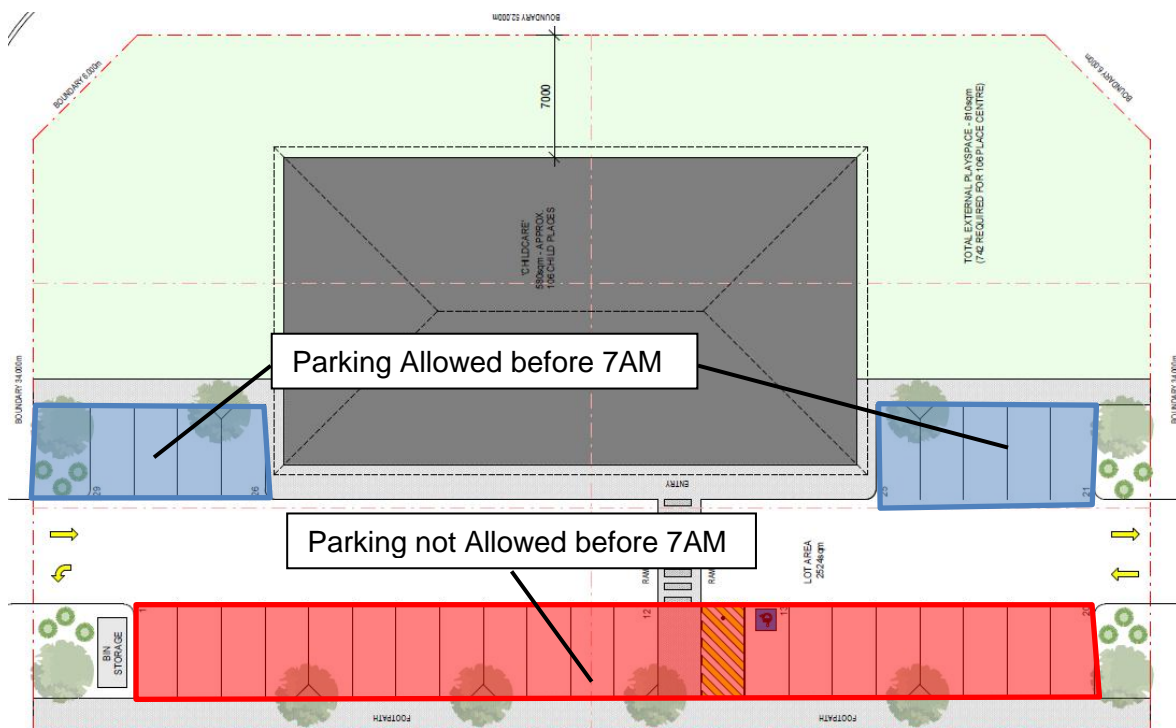


FIGURE 5.1 – PARKING RESTRICTIONS



## 6. ASSESSMENT

The resultant noise levels at the neighbouring residence from children playing outdoors and the mechanical services are tabulated in Table 6.1.

From previous measurements, noise emissions from children playing does not contain any annoying characteristics. Noise emissions from the mechanical services could be tonal and a +5 dB(A) penalty would be applicable, as shown in Table 6.1. Noise emissions from both outdoor play and the mechanical services needs to comply with the assigned  $L_{A10}$  noise levels.

**TABLE 6.1 - ACOUSTIC MODELLING RESULTS FOR  $L_{A10}$  CRITERIA  
OUTDOOR PLAY AREAS AND MECHANICAL PLANT**

Neighbouring Premises	Calculated Noise Level (dB(A))	
	Children Playing	Air Conditioning
R1 – East Residential Lots	45	26 (31)
R2 – North Residential Lots	39	6 (11)
R3 – West Residential Lots	39	26 (31)
R4 – School	45	25 (30)

( ) Includes +5 dB(A) penalty for tonality

With regards to noise associated with cars within the parking area, resultant noise levels are tabulated in Tables 6.2 and 6.3. It is noted that noise emissions from a moving car being an  $L_{A1}$  noise level, with noise emissions from cars starting and doors closing being an  $L_{Amax}$  noise level.

Based on the definitions of tonality, noise emissions from car movements and car starts, being an  $L_{A1}$  and  $L_{Amax}$  respectively, being present for less than 10% of the time, would not be considered tonal. Thus, no penalties would be applicable, and the assessment would be as listed in Table 6.2 (Car Moving) and Table 6.3 (Car Starting). However, noise emissions from car doors closing could be impulsive, hence the +10dB penalty has been included in the assessment.

**TABLE 6.2 - ACOUSTIC MODELLING RESULTS  $L_{A1}$  CRITERIA  
CAR MOVING**

Neighbouring Premises	Calculated Noise Level (dB(A))
R1 – East Residential Lots	34
R2 – North Residential Lots	33
R3 – West Residential Lots	43
R4 – School	41

**TABLE 6.3 - ACOUSTIC MODELLING RESULTS  $L_{Amax}$  CRITERIA  
CAR STARTING / DOOR CLOSING**

Neighbouring Premises	Calculated Noise Level (dB(A))			
	Car Starting		Door Closing	
	Day Period	Night Period	Day Period	Night Period
R1 – East Residential Lots	42	N/A	42 [52]	42 [52]
R2 – North Residential Lots	35	N/A	35 [45]	35 [45]
R3 – West Residential Lots	49	N/A	49 [59]	41 [51]
R4 – School	45	N/A	45 [55]	45 [55]

[ ] Includes +10 dB(A) penalty for impulsiveness.

Tables 6.4 to 6.9 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

**TABLE 6.4 – ASSESSMENT OF L<sub>A10</sub> NOISE LEVEL EMISSIONS  
OUTDOOR PLAY (DAY PERIOD)**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
R1 – East Residential Lots	45	45	Complies
R2 – North Residential Lots	39	45	Complies
R3 – West Residential Lots	39	45	Complies
R4 – School	45	45	Complies

**TABLE 6.5 – ASSESSMENT OF L<sub>A10</sub> NIGHT PERIOD NOISE LEVEL EMISSIONS  
AIR CONDITIONING**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
R1 – East Residential Lots	31	35	Complies
R2 – North Residential Lots	11	35	Complies
R3 – West Residential Lots	31	35	Complies
R4 – School	30	35	Complies

**TABLE 6.6 – ASSESSMENT OF L<sub>A1</sub> NIGHT PERIOD NOISE LEVEL EMISSIONS  
CAR MOVEMENTS**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
R1 – East Residential Lots	34	45	Complies
R2 – North Residential Lots	33	45	Complies
R3 – West Residential Lots	43	45	Complies
R4 – School	41	45	Complies

**TABLE 6.7 – ASSESSMENT OF L<sub>Amax</sub> DAY PERIOD NOISE LEVEL EMISSIONS  
CAR STARTING**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
R1 – East Residential Lots	42	65	Complies
R2 – North Residential Lots	35	65	Complies
R3 – West Residential Lots	49	65	Complies
R4 – School	45	65	Complies

**TABLE 6.8 – ASSESSMENT OF L<sub>Amax</sub> DAY PERIOD NOISE LEVEL EMISSIONS  
CAR DOOR**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
R1 – East Residential Lots	52	65	Complies
R2 – North Residential Lots	45	65	Complies
R3 – West Residential Lots	59	65	Complies
R4 – School	55	65	Complies

**TABLE 6.9 – ASSESSMENT OF L<sub>Amax</sub> NIGHT PERIOD NOISE LEVEL EMISSIONS  
CAR DOOR**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
R1 – East Residential Lots	52	55	Complies
R2 – North Residential Lots	45	55	Complies
R3 – West Residential Lots	51	55	Complies
R4 – School	N/A	N/A	Complies

## 7. CONCLUSION

Noise received at the neighbouring residences from the outdoor play area would comply with day period assigned noise level, with the fencing as shown on the drawings attached in Appendix A.

The air conditioning condensing units have also been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times.

It is noted that noise associated with cars movements and cars starting are exempt from complying with the Regulations. However, noise emissions from car doors are not strictly exempt from the Regulations. Noise received at the neighbouring residences from these noise sources would with the fencing, as shown on the drawings attached in Appendix A and the restrictions in parking, as shown on Figure 5.1 in Section 5 comply with the Regulatory requirements, at all times.

Thus, noise emissions from the proposed development, would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed hours of operation, with the inclusion of the following:

- 1 Although the proposed facility would open before 7 am (ie during the night period), the outdoor play area would not be used until after 7am. Thus, noise received at the neighbouring existing residences from the outdoor play area needs to comply with the assigned day period noise level.
- 2 Fencing to be as shown on the drawings attached in Appendix A.
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- 4 For child care centres colourbond fencing is acceptable fencing material.