

**PROPOSED CHILD CARE CENTRE  
LOT 2 (#1785) KEANE STREET EAST  
MT HELENA**

**ENVIRONMENTAL ACOUSTIC ASSESSMENT**

JULY 2023

OUR REFERENCE: 31332-1-23232

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**PROPOSED CHILD CARE CENTRE**  
**MT HELENA**

Job No: 23232

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FOR

**MT HELENA**

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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 2 (#1785) Keane Street East, Mt Helena.

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 design of the mechanical services has not been undertaken at this stage of the project, it is recommended that the 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 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 an 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
Commercial Premises	All Hours	60	75	80
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.

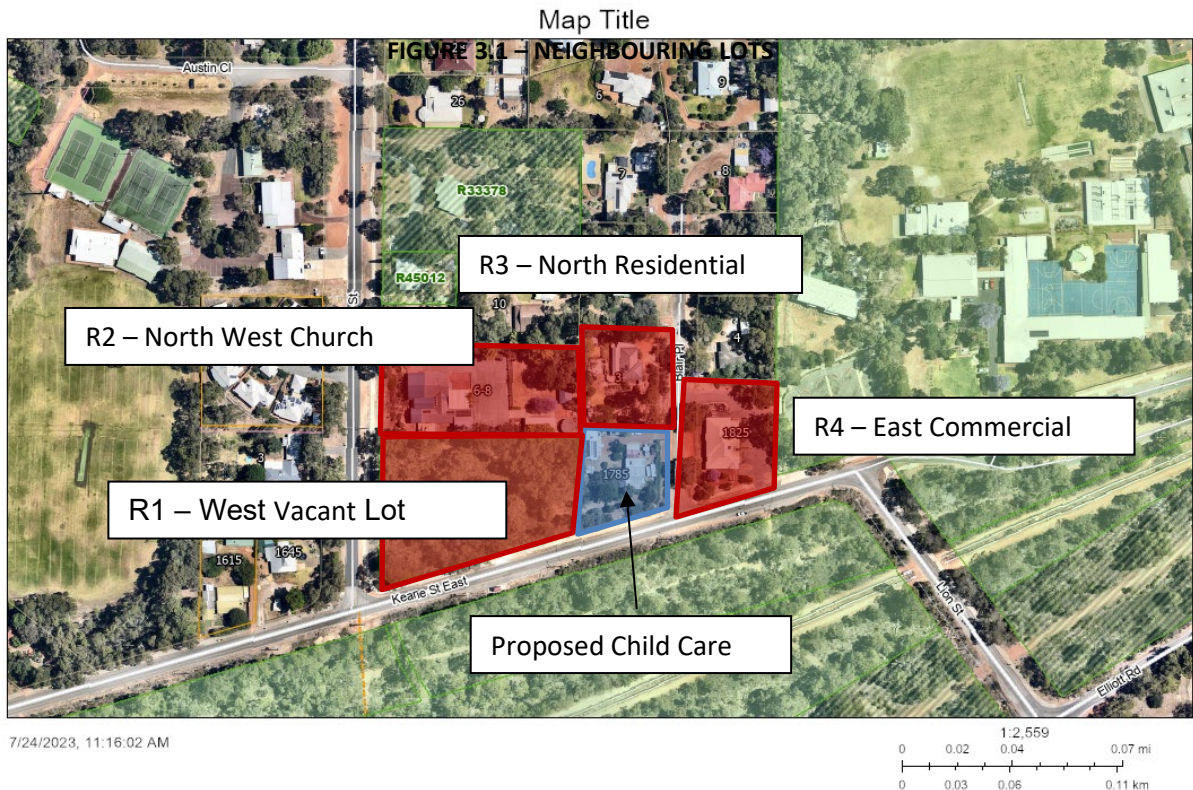
Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

**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.



7/24/2023, 11:16:02 AM

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>
R2 and R3	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
R1 and R4	All Hours	60	75	80

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.

Note R1 is currently undeveloped and zoned “Urban” / “Public Purposes” and hence treated as a Commercial Premises for the purposes of receiving noise.

#### 4. PROPOSAL

From information supplied, we understand that the child care centre normal hours of operations would be between 0630 and 1800 hours, Monday to Friday (closed on public holidays). It is understood that the proposed childcare centre will cater for a maximum of 79 children: with the following breakdown:

Infant	0 – 18 months	12 places
Toddler	18-24 months	12 places
Pre-Kindy	24-36 months	25 places
Kindy	3 years+	30 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, as well as plans and contours provide by the client.

**TABLE 5.1 – SOUND POWER LEVELS**

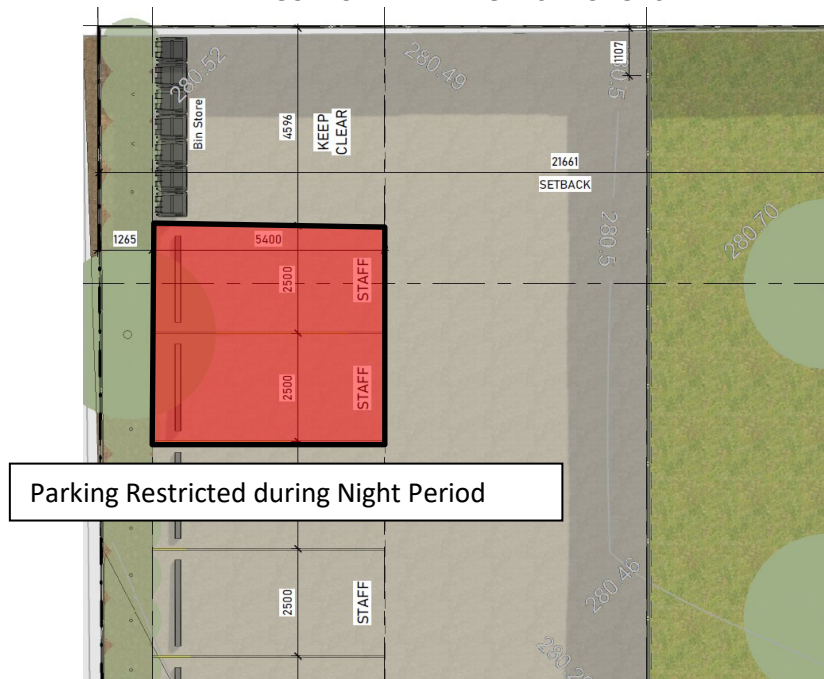
<b>Item</b>	<b>Sound Power Level, dB(A)</b>
Children Playing	<24 months 78 (per 10 children) >24 months 83 (per 10 children)
Car Moving in Car Park	79
Car Starting	85
Door Closing	87
Air conditioning condensing Unit	71 each

**Notes:**

- 1 Acoustic modelling of outdoor play noise was made, based on 80 children over the age of 2 years 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 north most air conditioning units be surrounded on all sides by a barrier minimum 1000mm tall.
- 4 The noise modelling has been based on 1800mm high solid boundary fence as shown in Appendix A. Other fences have no requirement and may be partial height, garrison or similar.
- 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 day period.
- 7 To comply with the night time period, parking would have to be restricted for the two north most staff bays (indicated below) during that time.
- 8 With only staff arriving before 07:00 am, there would be no car starts before 7am.
- 9 Calculation were undertaken for the receivers at 1.5 metres above the ground level.
- 10 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 tables below show the assessment of noise emissions of concern from the operation. Standard building construction will be sufficient to ensure that noise from inside the building will meet the regulations.

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 – West Vacant Lot	44	14 (19)
R2 – North West Church	43	18 (23)
R3 – North Residential	44	20 (25)
R4 – East Commercial	47	41 (46)

( ) 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<sub>A1</sub> CRITERIA  
CAR MOVING**

Neighbouring Premises	Calculated Noise Level (dB(A))
R1 – West Vacant Lot	45
R2 – North West Church	42
R3 – North Residential	45
R4 – East Commercial	26

**TABLE 6.3 - ACOUSTIC MODELLING RESULTS L<sub>Amax</sub> 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 – West Vacant Lot	52	N/A	52 [62]	52 [62]
R2 – North West Church	48	N/A	48 [58]	45 [55]
R3 – North Residential	47	N/A	47 [57]	44 [54]
R4 – East Commercial	26	N/A	26 [36]	25 [35]

[ ] 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 – West Vacant Lot	44	60	Complies
R2 – North West Church	43	45	Complies
R3 – North Residential	44	45	Complies
R4 – East Commercial	47	60	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 – West Vacant Lot	19	60	Complies
R2 – North West Church	23	35	Complies
R3 – North Residential	25	35	Complies
R4 – East Commercial	46	60	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 – West Vacant Lot	45	75	Complies
R2 – North West Church	42	45	Complies
R3 – North Residential	45	45	Complies
R4 – East Commercial	26	75	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 – West Vacant Lot	52	80	Complies
R2 – North West Church	48	65	Complies
R3 – North Residential	47	65	Complies
R4 – East Commercial	26	80	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 – West Vacant Lot	62	80	Complies
R2 – North West Church	58	65	Complies
R3 – North Residential	57	65	Complies
R4 – East Commercial	36	80	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 – West Vacant Lot	62	80	Complies
R2 – North West Church	55	55	Complies
R3 – North Residential	54	55	Complies
R4 – East Commercial	35	80	Complies

## 7. CONCLUSION

Noise received at the neighbouring residences from the outdoor play area would comply with day period assigned noise level, with 1.8m fencing shown 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, if barriered as previously noted.

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.
- 3 Parking to be restricted, as shown on Figure 5.1 in Section 5 – Modelling.
- 4 For child care centres colourbond fencing is an acceptable fencing material.

Finally, it is recommended to adopt best practices in managing a child care centre to reduce noise, including but not limited to no amplified music to be played outside, and favouring soft finishes in the outdoor play area.

# **APPENDIX A**

## PLANS



TOTAL SITE AREA:	1897m <sup>2</sup>
CAR PARK:	798m <sup>2</sup>
LANDSCAPING:	85m <sup>2</sup>
CAR PARKING AREA:	664m <sup>2</sup>
PAVEMENT:	49m <sup>2</sup>
BUILDING:	490m <sup>2</sup>
FOYER:	14m <sup>2</sup>
CORRIDOR 1:	19m <sup>2</sup>
CORRIDOR 2:	20m <sup>2</sup>
OFFICE:	6m <sup>2</sup>
MEETING ROOM:	8m <sup>2</sup>
STAFF ROOM:	11m <sup>2</sup>
LAUNDRY:	10m <sup>2</sup>
KITCHEN:	22m <sup>2</sup>
UAT:	6m <sup>2</sup>

<b>BUILDING (CONT.):</b>	
0-18 MONTHS:	42m <sup>2</sup>
18-36 MONTHS:	42m <sup>2</sup>
36-18 MONTHS:	84m <sup>2</sup>
+36 MONTHS:	102m <sup>2</sup>
COT ROOM 1:	13m <sup>2</sup>
COT ROOM 2:	11m <sup>2</sup>
BABY CHANGE:	15m <sup>2</sup>
BOTTLE PREP:	7m <sup>2</sup>
JUNION WC:	15m <sup>2</sup>
STORE 1:	1m <sup>2</sup>
STORE 2:	2m <sup>2</sup>
STORE 3:	4m <sup>2</sup>
OUTDOOR:	609m <sup>2</sup>
DRYING COURT:	9m <sup>2</sup>
LANDSCAPING East:	18m <sup>2</sup>

<b>OUTDOOR (CONT.):</b>	
LANDSCAPING NORTH:	17m <sup>2</sup>
OUTDOOR PLAY 1:	258m <sup>2</sup>
OUTDOOR PLAY 2:	91m <sup>2</sup>
OUTDOOR PLAY 3:	216m <sup>2</sup>

1 Ground Floor  
A102 1:100

**BLOOM**  
ARCHITECTURE

Mount Helena Child Care  
Ground Floor Plan  
Project no: 1601 N/A  
Date: 14/07/2023 A102  
Drawn by: VD  
Reviewed by: S. Scale: 1:100