

PROPOSED CHILD CARE CENTRE 39 KING DAVID BOULEVARD / 67 KINGSWAY MADELEY

ENVIRONMENTAL ACOUSTIC ASSESSMENT

JULY 2022

OUR REFERENCE: 29836-1-22226



DOCUMENT CONTROL PAGE

ENVIRONMENTAL ACOUSTIC ASSESSMENT

PROPOSED CHILD CARE CENTRE MADELEY

Job No: 22226

Document Reference: 29836-1-22226

FOR

DYNAMIC PLANNING AND DEVELOPMENTS PTY LTD

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Author:	Tim Reynolds		Checked By:		Paul Daly	
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This report has been prepared in accordance with the scope of services and on the basis of information and documents provided to Herring Storer Acoustics by the client. To the extent that this report relies on data and measurements taken at or under the times and conditions specified within the report and any findings, conclusions or recommendations only apply to those circumstances and no greater reliance should be assumed. The client acknowledges and agrees that the reports or presentations are provided by Herring Storer Acoustics to assist the client to conduct its own independent assessment.

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Herring Storer Acoustics

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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 39 King David Boulevard / 67 Kingsway, Madeley.

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 area would comply with day period assigned noise level, with fencing as shown on Figure 5.1 in Section 5 – Modelling.

The air conditioning condensing units have also been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times, provided the condensing units are located on the western facade, adjacent to the bike racks; and they are either installed with Level 2 night period 'Low Noise' modes or screened from the neighbours to the west.

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 comply at all times, with the fencing, as shown on Figure 5.1 in Section 5 and parking to bay 1 is restricted to the day period only.

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:

- 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.
- Fencing to be as shown on Figure 5.1 in Section 5 Modelling. Other fencing to be as indicated in the attached drawings. We note that for this development, colourbond is an acceptable fencing material.

- As the air conditioning has not been design at this stage, it is recommended that the design be reviewed / assessed to ensure compliance with the Environmental Protection (Noise) Regulations 1997 are achieved.
- The air conditioning condensing units to be located on the western facade, adjacent to the bike rakes; and they are either installed with Level 2 night period 'low noise' modes or screened from the neighbours to the west installed with "Low Noise" night period modes.

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	Time of Day		Assigned Level (dB)		
Receiving Noise			L _{A1}	L _{Amax}	
	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF	
Noise sensitive premises: highly sensitive area	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	

Note:

L_{A10} is the noise level exceeded for 10% of the time.

 L_{A1} is the noise level exceeded for 1% of the time.

L_{Amax} is the maximum noise level.

IF is the influencing factor.

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_{Apeak} and $L_{Amax(Slow)}$ 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_{AFast} or is more than 3 dB L_{AFast} 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 tonality is present	Where modulation is present	Where impulsiveness is present	
+5 dB(A)	+5 dB(A)	+10 dB(A)	

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

For this development, the closest existing neighbouring residences are located to the west and south, with future residence located to the north, west and south. It is noted that the premises to the east are commercial premises. An aerial showing the neighbouring premises are shown below on Figure 3.1.



FIGURE 3.1 - NEIGHBOURING LOTS

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At the neighbouring residences within 100 metres of Kingsway Reserve (ie Residences to West, south west and east), with Kingsway being a secondary road and the Cricket club (with clubroom) being within the inner circle, the Influencing Factor for these neighbouring residences has been determined to be +4 dB. For the other residences (ie residences to the north and north west), the Influencing Factor would be +2 dB as they are still within 100 metres of Kingsway. Thus, the assigned noise levels would be as listed in Tables 3.3 and 3.4.

TABLE 3.3 - ASSIGNED OUTDOOR NOISE LEVEL RESIDENCES EAST, SOUTH WEST AND WEST

Premises	Time of Day		Assigned Level (dB)		
Receiving Noise			L _{A1}	L _{Amax}	
	0700 - 1900 hours Monday to Saturday (Day)		59	69	
Noise sensitive premises: highly	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	44	54	69	
sensitive area	1900 - 2200 hours all days (Evening)	44	54	59	
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	39	49	59	

Note: L_{A10} is the noise level exceeded for 10% of the time.

L_{A1} is the noise level exceeded for 1% of the time.

L_{Amax} is the maximum noise level.

TABLE 3.4 - ASSIGNED OUTDOOR NOISE LEVEL RESIDENCES TO NORTH

Premises	Time of Day		Assigned Level (dB)		
Receiving Noise	Time of Day	L _{A10}	L _{A1}	L _{Amax}	
Noise sensitive premises: highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)		57	67	
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	42	52	67	
	1900 - 2200 hours all days (Evening)	42	52	57	
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	379	47	57	

Note:

L_{A10} is the noise level exceeded for 10% of the time.

 L_{A1} is the noise level exceeded for 1% of the time.

 $L_{\mbox{\scriptsize Amax}}$ is the maximum noise level.

4. PROPOSAL

From information supplied, we understand that the child care centre normal hours of operations would be between 0630 and 1830 hours, Monday to Friday (closed on public holidays). It is understood that the proposed childcare centre will cater for a maximum of 92 children: with the following breakdown:

Nursery	0 - 2 years	12 places
Toddlers	2 - 3 years	20 places
Kindy	3 - 4 years	30 places
Kindy	4 - 5 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.

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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).

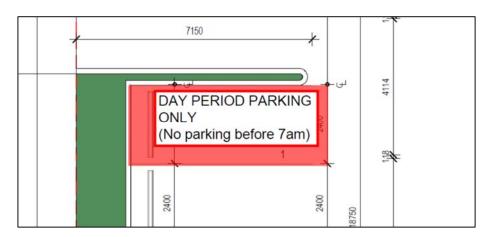
Calculations were based on the sound power levels used in the calculations are listed in Table 5.1.

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	4 @ 70 (Childcare)		

TARIE 5.1 - SOUND POWER LEVELS

Notes:

- Even though the noise emissions from children under the age of 2 years is relatively low compared to the other children, to be conservative, acoustic modelling of outdoor play noise was made, based on 90 children playing within the outdoor play areas at the one time, utilising 9 groups of 10 children, sound power levels distributed as plane sources.
- 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.
- For this development, it is recommended that the air conditioning condensing units would be located along the western façade of the building, near the bike rakes.
- 4 The noise modelling has been based on fencing, as shown on Figure 5.1.
- For noise emissions from car doors to comply during the night period, as shown below, parking within car bay 1 is restricted to the day period only (ie no parking before 7am).



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 - BOUNDARY FENCING

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 $L_{\rm A10}$ noise levels.

TABLE 6.1 - ACOUSTIC MODELLING RESULTS FOR LA10 CRITERIA OUTDOOR PLAY AREAS AND MECHANICAL PLANT

	Calc	Calculated Noise Level (dB(A))			
Neighbouring Premises	Children Blevin	Air Cond	ditioning		
	Children Playing	Day Period	Night Period		
North	42	34 (39)	28 (33)		
East	49	20 (25)	14 (19)		
South West	44	28 (33)	22 (27)		
West	48	38 (43)	32 (37)		
North West	42	33 (38)	27 (32)		

⁽⁾ 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))
North	44
East	45
South West	31
West	43
North West	39

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

	Calculated Noise Level (dB(A))				
Neighbouring Premises	Car Starting		Door Closing		
	Day Period	Night Period	Day Period	Night Period	
North	48	44	50 [60]	46 [56]	
East	45	45	47 [57]	47 [57]	
South West	35	35	36 [46]	36 [46]	
West	47	47	48 [58]	48 [58]	
North West	43	43	44 [54]	44 [54]	

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

Tables 6.4 to 6.11 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

TABLE 6.4 – ASSESSMENT OF L_{A10} NOISE LEVEL EMISSIONS OUTDOOR PLAY (DAY PERIOD)

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	42	47	Complies
East	49	49	Complies
South West	44	49	Complies
West	48	49	Complies
North West	42	47	Complies

TABLE 6.5 – ASSESSMENT OF $L_{\rm A10}$ DAY PERIOD NOISE LEVEL EMISSIONS AIR CONDITIONING

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Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level		
North	39	47	Complies		
East	25	49	Complies		
South West	33	49	Complies		
West	43	49	Complies		
North West	38	47	Complies		

TABLE 6.6 – ASSESSMENT OF $L_{\rm A10}$ NIGHT PERIOD NOISE LEVEL EMISSIONS AIR CONDITIONING

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level	
North	33	37	Complies	
East	19	39	Complies	
South West	27	39	Complies	
West	37	39	Complies	
North West	32	37	Complies	

TABLE 6.7 – ASSESSMENT OF La1 NIGHT PERIOD NOISE LEVEL EMISSIONS CAR MOVEMENTS

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Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level	
North	44	47	Complies	
East	45	49	Complies	
South West	31	49	Complies	
West	43	49	Complies	
North West	39	47	Complies	

TABLE 6.8 – ASSESSMENT OF $L_{\mbox{\scriptsize Amax}}$ DAY PERIOD NOISE LEVEL EMISSIONS CAR STARTING

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	48	67	Complies
East	45	69	Complies
South West	35	69	Complies
West	47	69	Complies
North West	43	67	Complies

TABLE 6.9 – ASSESSMENT OF L $_{\rm Amax}$ NIGHT PERIOD NOISE LEVEL EMISSIONS CAR STARTING

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level	
North	46	57	Complies	
East	45	59	Complies	
South West	35	59	Complies	
West	47	59	Complies	
North West	43	57	Complies	

TABLE 6.10 – ASSESSMENT OF L_{Amax} DAY PERIOD NOISE LEVEL EMISSIONS CAR DOOR

CAR DOOR				
Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level	
North	60	67	Complies	
East	57	69	Complies	
South West	46	69	Complies	
West	58	69	Complies	
North West	54	67	Complies	

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TABLE 6.11 – ASSESSMENT OF L_{Amax} NIGHT PERIOD NOISE LEVEL EMISSIONS CAR DOOR

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level		
North	56	57	Complies		
East	57	59	Complies		
South West	46	59	Complies		
West	58	59	Complies		
North West	54	57	Complies		

7. CONCLUSION

Noise received at the neighbouring residences from the outdoor play area would comply with day period assigned noise level, with fencing as shown on Figure 5.1 in Section 5 – Modelling.

The air conditioning condensing units have also been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times, provided the condensing units are located on the western facade, adjacent to the bike racks; and they are either installed with Level 2 night period 'Low Noise' modes or screened from the neighbours to the west.

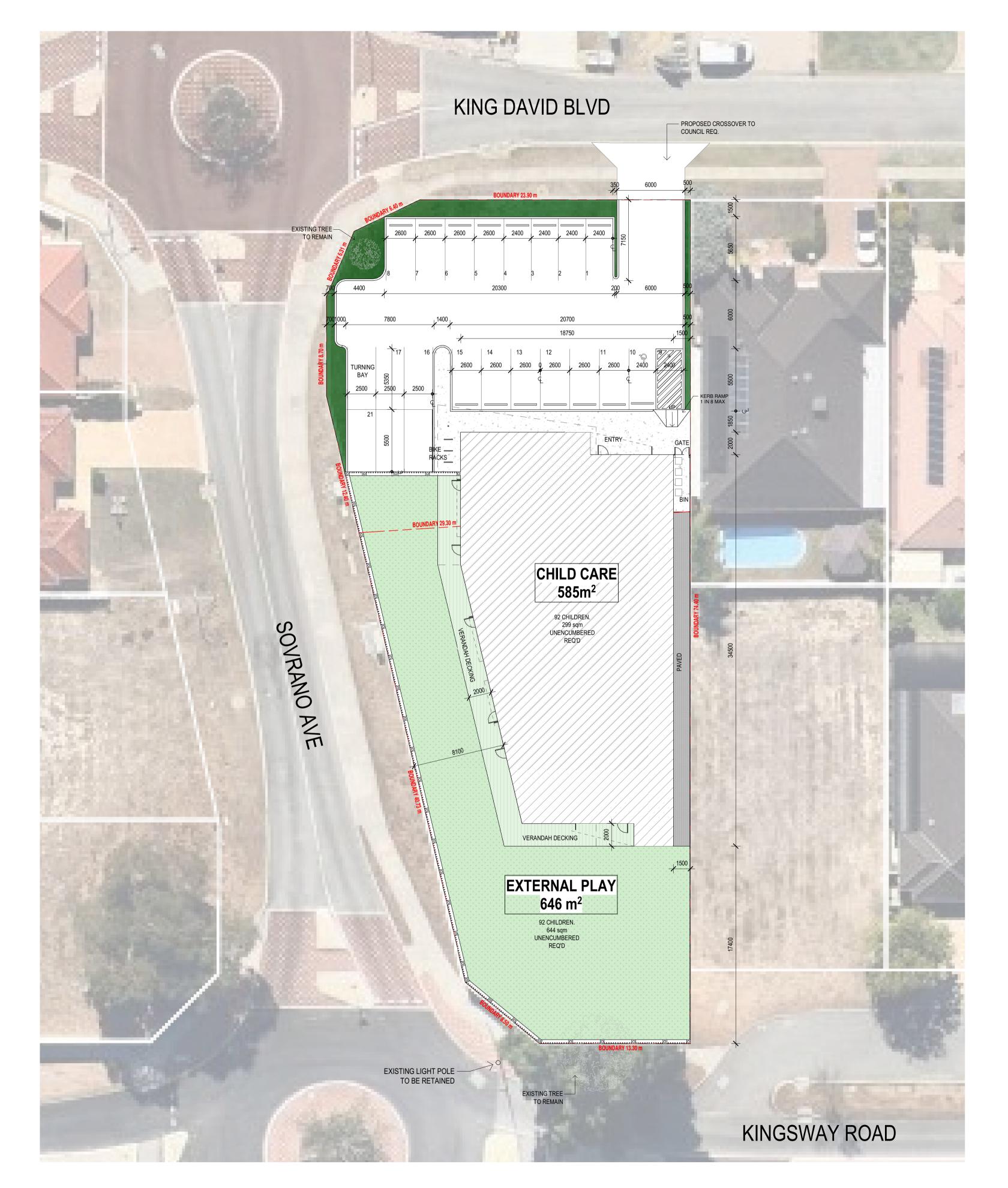
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Thus, noise emissions from the proposed development, would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed hours of operation, with the inclusion of the following:

- 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.
- Fencing to be as shown on Figure 5.1 in Section 5 Modelling. Other fencing to be as indicated in the attached drawings. We note that for this development, colourbond is an acceptable fencing material.
- As the air conditioning has not been design at this stage, it is recommended that the design be reviewed / assessed to ensure compliance with the Environmental Protection (Noise) Regulations 1997 are achieved.
- The air conditioning condensing units to be located on the western facade, adjacent to the bike rakes; and they are either installed with Level 2 night period 'low noise' modes or screened from the neighbours to the west installed with "Low Noise" night period modes.

APPENDIX A

PLANS



NOTE:
THIS FEASIBILITY STUDY IS SUBJECT TO THE FOLLOWING:
• FEATURE SITE SURVEY (TO BE CONFIRMED)
• PLANNING ADVICE (TO BE CONFIRMED)
• TRAFFIC ADVICE (TO BE CONFIRMED)
• SITE SERVICES, EASEMENTS, ETC TO BE CONFIRMED
• SETBACKS TO BOUNDARY TO BE CONFIRMED BY PLANNER

OCCUPATION SCHEDULE - 92 CHILDREN			
AGE GROUP	NO. OF CHILDREN	NO. OF STAFF	RATIO
NURSERY - BIRTH TO 2 YRS	12 CHILDREN	3 STAFF	1:4
TODDLERS - 2-3 YRS	20 CHILDREN	4 STAFF	1:5
KINDY - 3-4 YRS	30 CHILDREN	3 STAFF	1:10
KINDY - 4-5 YRS	30 CHILDREN	3 STAFF	1:10
TOTAL	92 CHILDREN	13 STAFF	

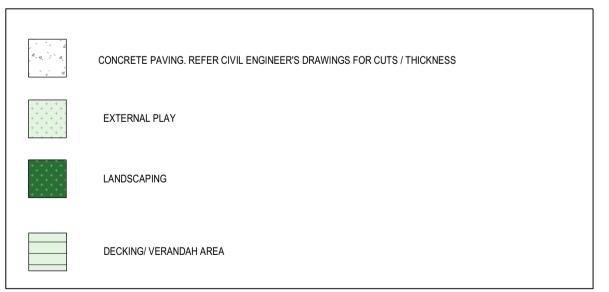
CAR BAYS - 9 BAYS UP TO 54 PLACES + 1 PER 8 OVER = 14 CAR BAYS REQ'D CAR BAYS - 1 PER 1 STAFF = 13 CAR BAYS REQ'D TOTAL CAR BAYS = 27 BAYS (21 BAYS PROVIDED, 6 BAY SHORTFALL)

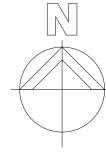
CHILDREN NUMBERS AND AREAS TO BE VERIFIED IN DESIGN LAYOUT COUNCIL DISCUSSIONS REQUIRED TO REVIEW PLANNING REQUIREMENTS

LOCAL AUTHORITY: CITY OF WANNEROO

PRELIMINARY ONLYPLAN SUBJECT TO PLANNING, TRAFFIC, ACOUSTIC, SURVEY AND SPECIALIST ASSESSMENT. LEVELS AND FUNCTIONALITY WITH SITE TOPOGRAPHY SUBJECT TO SURVEY CROSSOVERS TO BE ASSESSED

SITE PLAN LEGEND





В	PERLIM DESIGN	LD	DM	26.07.2022
Α	INTERIM ISSUE	LD	DM	21.07.2022
	INTERIM ISSUE	JS	DM	20.07.2022
revision/ issue	description	drawn by	check by	date
project		drawn	description	

PROPOSED MADELEY CHILDCARE CENTRE 39 KING DAVID BVD / 67 KINGSWAY RD

Third Floor, 38 Richardson Street, West Perth, WA 6005 PO Box 743, West Perth, WA 6872 Ph: (08) 9322 5144 Fax: (08) 9322 5740 Email: admin@hcparch.com

DM date 26.07.2022

checked

JS PROPOSED OVERALL SITE





