

**PROPOSED CHILD CARE CENTRE
EDWARD MILLEN RESERVE
15 HILL VIEW TERRACE
EAST VICTORIA PARK**

ENVIRONMENTAL ACOUSTIC ASSESSMENT

SEPTEMBER 2023

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ENVIRONMENTAL ACOUSTIC ASSESSMENT
PROPOSED CHILD CARE CENTRE
EAST VICTORIA PARK

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FOR

BLACKOAK CAPITAL

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1. INTRODUCTION

Herring Storer Acoustics were commissioned by Blackoak Capital to undertake an acoustic assessment of noise emissions associated with the proposed child care centre to be located at Edward Millen Reserve, 15 Hill View Terrace, East Victoria Park.

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.

Note, this report only considers details of the child care centre and not the remainder of the development.

2. SUMMARY

Noise received at the neighbouring residences from the outdoor play areas would comply with the requirements of the *Environmental Protections (Noise) Regulations 1997*, 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 with barriers at least 1m above source height. 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 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 Rooftop mechanical plant barriered with height at least 1m above source height.
- 3 No specialist acoustic fencing required.
- 4 Parking not required to be restricted.

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 _{A10}	L _{A1}	L _{Amax}
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_{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.

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_{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.

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

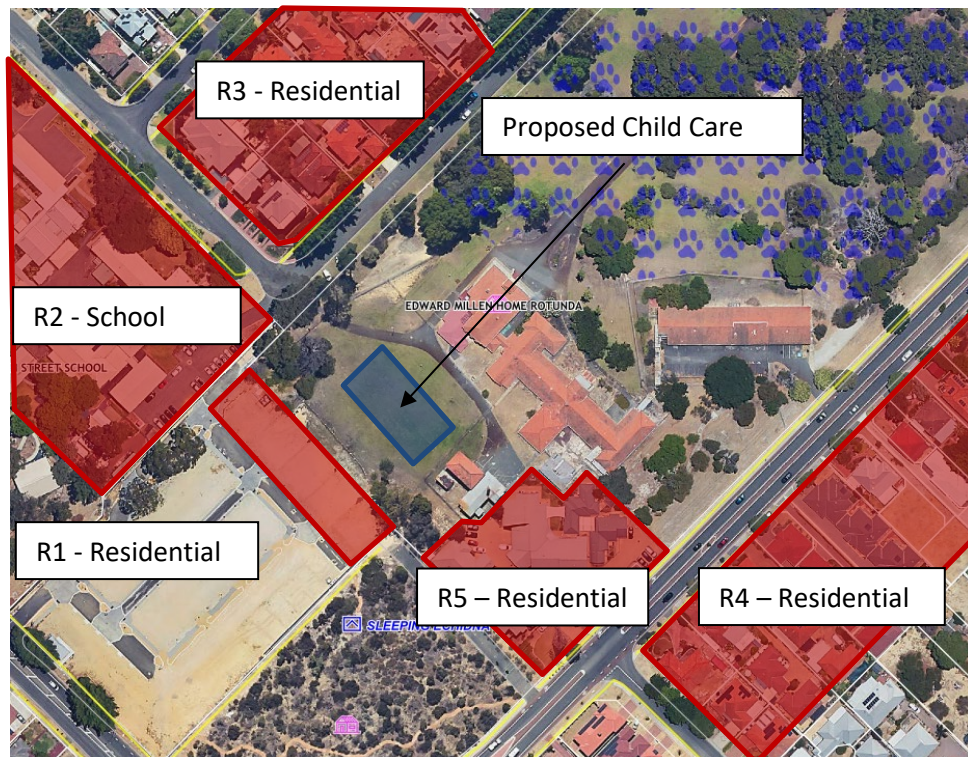


FIGURE 3.1 – NEIGHBOURING LOTS

For the neighbouring residences, the influencing factor has been determined to be +8 dB based on the following:

R1, R4 and R5		
Major Road within 450m –	Berwick Street	+2 dB
Minor Road within 100m	Hill View Terrace	+2 dB
Total		+4 dB

R2 and R3		
Major Road within 450m –	Berwick Street	+2 dB
Total		+2 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 _{ax}
R1, R4 and R5	0700 - 1900 hours Monday to Saturday (Day)	49	59	69
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	44	54	69
	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
R2 and R3	0700 - 1900 hours Monday to Saturday (Day)	47	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)	37	47	57

Note: LA10 is the noise level exceeded for 10% of the time.
 LA1 is the noise level exceeded for 1% of the time.
 LAm_{ax} is the maximum noise level.

Note R1 is currently undeveloped but treated as Residential due to Town of Victoria Park LDP 3 indicating its approval for residential development.

4. PROPOSAL

From information supplied, we understand that the child care centre normal hours of operations would likely be between 0630 and 1800 hours, Monday to Friday (closed on public holidays). It is understood that the proposed childcare centre will cater for approximately 104 children:

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

Item	Sound Power Level, dB(A)
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, the air conditioning units have been considered barriered.
- 4 The noise modelling has been based on no solid boundary fence. Any fences have no acoustic requirements 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 not have to be restricted.
- 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.

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 South West Residential	47	31 (36)
R2 School	40	23 (28)
R3 West Residential	39	25 (30)
R4 East Residential	37	21 (26)
R5 South East Residential	28	17 (22)

() 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 South West Residential	44
R2 School	38
R3 West Residential	41
R4 East Residential	44
R5 South East Residential	22

**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	
R1 South West Residential	49	49 [59]
R2 School	43	44 [54]
R3 West Residential	42	43 [53]
R4 East Residential	27	28 [38]
R5 South East Residential	26	27 [37]

[] 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_{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
R1 South West Residential	47	49	Complies
R2 School	40	47	Complies
R3 West Residential	39	47	Complies
R4 East Residential	37	49	Complies
R5 South East Residential	28	49	Complies

**TABLE 6.5 – ASSESSMENT OF L_{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
R1 South West Residential	36	39	Complies
R2 School	28	37	Complies
R3 West Residential	30	37	Complies
R4 East Residential	26	39	Complies
R5 South East Residential	22	39	Complies

**TABLE 6.6 – ASSESSMENT OF L_{A1} 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 South West Residential	44	49	Complies
R2 School	38	47	Complies
R3 West Residential	41	47	Complies
R4 East Residential	44	49	Complies
R5 South East Residential	22	49	Complies

**TABLE 6.7 – ASSESSMENT OF L_{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
R1 South West Residential	49	69	Complies
R2 School	43	67	Complies
R3 West Residential	42	67	Complies
R4 East Residential	27	69	Complies
R5 South East Residential	26	69	Complies

**TABLE 6.8 – ASSESSMENT OF L_{Amax} 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 South West Residential	59	69	Complies
R2 School	54	67	Complies
R3 West Residential	53	67	Complies
R4 East Residential	38	69	Complies
R5 South East Residential	37	69	Complies

**TABLE 6.9 – 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
R1 South West Residential	59	59	Complies
R2 School	54	57	Complies
R3 West Residential	53	59	Complies
R4 East Residential	38	59	Complies
R5 South East Residential	37	59	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 comply with the Regulatory requirements, at all times.

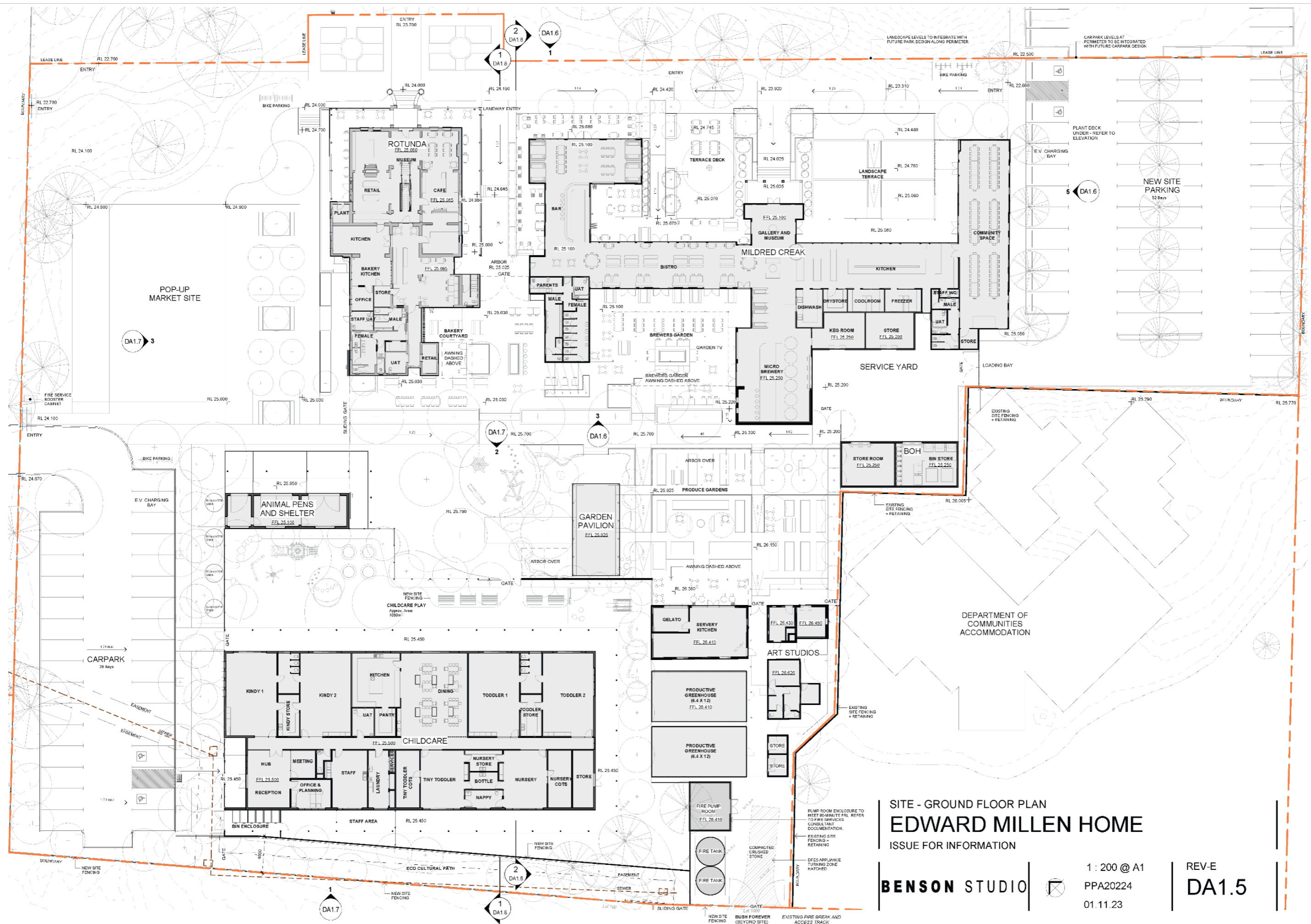
Thus, noise emissions from the proposed development, would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed hours of operation, with the inclusion of the following:

- 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 Rooftop mechanical plant barriered with height at least 1m above source height.
- 3 No specific acoustic fencing required.
- 4 Parking has no requirement to be restricted.

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



SITE - GROUND FLOOR PLAN
EDWARD MILLEN HOME
 ISSUE FOR INFORMATION

BENSON STUDIO

1 : 200 @ A1
 PPA20224
 01.11.23

REV-E
DA1.5

PUMP ROOM ENCLOSURE TO MEET 2017 FSL REFER TO FIRE SERVICES CONSULTANT DOCUMENTATION.
 EXISTING SITE FENCING + RETAINING
 DEF'S APPLIANCE TURNING ZONE HATCHED
 COMPACTED CRUSHED STONE
 BUSH FOREVER (BEYOND SITE)
 EXISTING FIRE BREAK AND ACCESS TRACK