



PROPOSED CHILD CARE CENTRE

**94 KOORYONG ROAD
RIVERVALE**

ENVIRONMENTAL ACOUSTIC ASSESSMENT

OCTOBER 2019

OUR REFERENCE: 24879-2-19266

City of Belmont
RECEIVED 08/10/2019
Application No: 403/2019



DOCUMENT CONTROL PAGE

ENVIRONMENTAL ACOUSTIC ASSESSMENT
CHILD CARE CENTRE - RIVERVALE

Job No: 19266

Document Reference : 24879-2-19266

FOR

HARLEY DYKSTRA**City of Belmont**
RECEIVED 08/10/2019
Application No: 403/2019

DOCUMENT INFORMATION				
Author:	Tim Reynolds	Checked By:	Paul Daly	
Date of Issue:	04 October 2019			
REVISION HISTORY				
Revision	Description	Date	Author	Checked
1	Updated Plans	4/10/2019		
DOCUMENT DISTRIBUTION				
Copy No.	Version No.	Destination	Hard Copy	Electronic Copy
1	1	Harley Dykstra Attn : Madison Mackenzie Email : madisonm@harleydykstra.com.au		✓
1	2	Harley Dykstra Attn : Madison Mackenzie Email : madisonm@harleydykstra.com.au		✓

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.

CONTENTS

1.	INTRODUCTION	1
2.	SUMMARY	1
3.	CRITERIA	2
4.	PROPOSAL	4
5.	MODELLING	4
6.	RESULTS	6
7.	ASSESSMENT	6
7.1	L _{A10} Noise Emissions	6
7.2	L _{A1} Noise Emissions	7
7.3	L _{AMax} Noise Emissions	7

APPENDICIES

A	Plans
---	-------

1. INTRODUCTION

Herring Storer Acoustics were commissioned to undertake an acoustic assessment of noise emissions associated with the proposed child care centre to be located at 94 Kooyong Road, Rivervale.

This report assesses noise emissions from the premises with regards to compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*. For this development of a Child Care Centre, the noise sources considered as part of this assessment include :

- Mechanical Services; and
- Children within the outdoor play area.

We note that from information received from DWER, the bitumised area would be considered as a road, thus noise relating to the “propulsion and braking of 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, for completeness, they have been included in the assessment, for information purposes only.

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

2. SUMMARY

Currently, the only residential neighbour is to the north east of the proposed development, across Kooyong Road. The premise to the south east and south west are commercial premises, while the premises to the north west is vacant land. However, it is noted that the land to the north west is zoned residential, thus, an assessment of noise received at this premises has also been undertaken.

It is understood 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. Thus, noise received at the neighbouring residences from the outdoor play area needs to comply with the assigned day period noise level. However, other noise sources would need to comply with the assigned night period noise levels.

Noise received at the neighbouring premises from children playing in the outdoor areas would, even with the open fencing, comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*, for the proposed hours of operation, provided outdoor play is limited to the day period.

Although not needing to comply with the regulatory criteria, noise from cars, including closing of doors and engine starts, would also comply with the relevant noise criteria.

Finally, although at this stage of the development the mechanical services have not been finalised, would also comply with the relevant noise criteria.

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.

3. CRITERIA

The allowable noise level for noise sensitive premises in the vicinity of the proposed Facility site is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base assigned noise levels for residential premises are 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
Noise sensitive premises: other than highly sensitive area	At all times	60	75	80
Commercial	At all times	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.

The “Highly sensitive area” of a noise sensitive premises 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;

City of Belmont
RECEIVED 08/10/2019
Application No: 403/2019

“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 residential premises of concern are located, as shown on Figure 3.1 below.



FIGURE 3.1 – AREA AROUND PROPOSED FACILITY

The neighbouring Premises are shown in Figure 3.1. Francisco Street is a secondary road, thus, the Influencing Factor for the neighbouring residences has been determined to be +3 dB.

We note that for the vacant land to the north east, currently the land would be “noise sensitive premises: other than highly sensitive area”. However, it has been assessed for future development, as “noise sensitive premises: highly sensitive area”.

The assigned noise level for the neighbouring premises of concern are listed in Tables 3.3 and 3.4.

**TABLE 3.3 - ASSIGNED OUTDOOR NOISE LEVEL
NEIGHBOURING RESIDENCE TO NORTH WEST**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L _A 10	L _A 1	L _A max
Noise sensitive premises : Highly sensitive area	0700 - 1900 hours Monday to Saturday	48	58	68
	0900 - 1900 hours Sunday and Public Holidays	43	53	68
	1900 - 2200 hours all days	43	53	58
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	38	48	58

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
NEIGHBOURING COMMERCIAL PREMISES**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L _A 10	L _A 1	L _A max
Commercial	At all times	60	75	80

4. PROPOSAL

From information supplied, we understand that the child care centre could open before 7:00am (ie 6:30am), with the normal hours of operations would be between 6:30am and 7:00pm, Monday to Friday (closed on public holidays). It is understood that the proposed childcare centre will cater for a maximum of 76 children, including 16 children between 0 and 24 months .

It is noted that although the proposed child care centre would open before 7:00am (ie during the night period), the outdoor play area would not be used until after 7:00am. Thus, noise received at the neighbouring residences from the outdoor play area needs to comply with the assigned day period noise level. However, other noise sources would need to comply with the assigned night period noise levels.

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

5. MODELLING

Modelling of the noise propagation from the proposed development was carried out using an environmental noise modelling computer program, "SoundPlan". Calculations were carried out using the EPA worst case weather conditions as stated in the Environmental Protection Authority's "Draft Guidance for Assessment of Environmental Factors No.8 - Environmental Noise".

Noise emissions from the development, include:

- Mechanical Services.
- Car movements on Site.
- Car engine start and door closing.
- Children in Outdoor play area.

The calculations were based on the sound power levels listed in Table 5.1.

TABLE 5.1 – SOUND POWER LEVELS

Item of Equipment	Sound Power Level, (dB(A))
Children Playing (3 years and over)	83 (per 10 children)
Air Conditioning Condensing Units	4 @ 71
Cars moving	79
Car Start	85
Car Door	87

The above noise sources need to comply with the following assigned noise levels :

L _{A10}	-	Outdoor play and mechanical services.
L _{A1}	-	Car movements.
L _{AMax}	-	Car starts and doors closing.

With regards to noise emissions, the following are noted:

- 1 Noise from babies is considerably less than for toddlers. Thus, noise from babies would not contribute to the noise associated with outdoor play and thus was not included in the modelling.
- 2 At this stage of the project, the mechanical service has not been designed. Therefore, the noise sources have been based on designs used for the same or similar developments.
- 3 It has been assumed that the mechanical services would be located within plantrooms, as shown on the drawings.
- 4 Although not all children would be within the outdoor play area at the same time, acoustic modelling of outdoor play noise was made, based on 60 children playing outside within the outdoor play areas at the one time, utilising 6 groups of 10 children with sound power levels distributed as plane sources.
- 5 It has been assumed that the balustrade to the first floor deck and mezzanine would be open type fencing on the sides (ie south west and south east) facing the commercial premises. However, on the north western side facing the vacant land, the fencing would be solid to a height of 1.2 metres.

It is noted that the residences to the north east are 2 storey. Thus, for these residences, noise modelling was undertaken for both the ground and first floors. With regards to the residential premises to the north west, modelling was undertaken for possible future development. As these residence could be 2 storey residence, the noise modelling and assessment was undertaken to both the ground and first floors.

Noise modelling was undertaken to the neighbouring premises, as shown on Figure 3.1. To simplify the analysis, only the results for the worst case locations have been listed.

6. RESULTS

The results of the noise modelling are listed in Table 6.1.

**TABLE 6.1 – CALCULATED NOISE LEVELS
DAY PERIOD**

Location	Noise Source / Calculated Noise Levels (dB(A))				
	Outdoor Play	Mechanical services	Car Movement	Car Start	Car Door
Residence R1	33	20 (25)	22	26	27 [37]
Residence R2	32	15 (20)	21	24	26 [36]
Vacant Land	47	33 (38)	43	47	48 [58]
Commercial to south east	60	20 (25)	51	53	55 [65]
Commercial to South West	55	18 (23)	45	49	51 [61]

() Includes +5 dB(A) penalty of a tonal component

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

7. ASSESSMENT

The assessment for the noise sources that are required to achieve compliance are outlined below.

7.1 L_{A10} NOISE EMISSIONS

Tables 7.1 to 7.3 summarise the applicable Assigned Noise Levels, and assessable noise level emissions associated for the sources needing to comply with the L_{A10} criteria.

TABLE 7.1 – ASSESSMENT OF L_{A10} NOISE LEVEL FOR OUTDOOR PLAY

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L _{A10} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
Residence R1	33	Day Period	48	Complies
Residence R2	32	Day Period	48	Complies
Vacant Land	47	Day Period	48	Complies
Commercial to south east	60	All Hours	60	Complies
Commercial to South West	55	All Hours	60	Complies

**TABLE 7.2 – ASSESSMENT OF L_{A10} NOISE LEVEL FOR MECHANICAL SERVICES
NIGHT PERIOD**

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L _{A10} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
Residence R1	25	Night Period	38	Complies
Residence R2	20	Night Period	38	Complies
Vacant Land	38	Night Period	38	Complies
Commercial to south east	25	All Hours	60	Complies
Commercial to South West	23	All Hours	60	Complies

7.2 L_{A1} NOISE EMISSIONS

Tables 7.3 summarises the applicable Assigned Noise Levels, and assessable noise level emissions for car movements.

**TABLE 7.3 – ASSESSMENT OF L_{A1} NOISE LEVEL EMISSIONS FOR CAR MOVEMENTS
ALL PERIODS**

Source	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L _{A1} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
Residence R1	22	Night Period	48	Complies
Residence R2	21	Night Period	48	Complies
Vacant Land	43	Night Period	48	Complies
Commercial to south east	51	All Hours	75	Complies
Commercial to South West	45	All Hours	75	Complies

Note : Noise emission from car movements within the car park, would be the same regardless of the time period.

7.3 L_{AMAX} NOISE EMISSIONS

Tables 7.4 and 7.5 summarises the applicable Assigned Noise Levels, and assessable noise level emissions for car starts and car doors closing.

**TABLE 7.4 – ASSESSMENT OF L_{AMAX} NOISE LEVEL EMISSIONS FOR CAR START
ALL PERIODS**

Source	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L _{A1} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
Residence R1	26	Day Period	58	Complies
Residence R2	24	Day Period	58	Complies
Vacant Land	47	Day Period	58	Complies
Commercial to south east	53	All Hours	80	Complies
Commercial to South West	49	All Hours	80	Complies

**TABLE 7.5 – ASSESSMENT OF L_{AMAX} NOISE LEVEL EMISSIONS FOR CAR DOOR
ALL PERIODS**

Source	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L _{A1} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
Residence R1	37	Day Period	58	Complies
Residence R2	36	Day Period	58	Complies
Vacant Land	58	Day Period	58	Complies
Commercial to south east	65	All Hours	80	Complies
Commercial to South West	61	All Hours	80	Complies

From the above assessments, noise received at the neighbouring residences, even using a conservative analysis, complies with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed operating times, provided the balustrade to the first floor deck and mezzanine facing the vacant land (ie north western side side) to be solid to a height of 1.2 metres.

Finally, although not needing to comply with the regulatory criteria, noise from cars, including closing of doors and engine start-up, would also currently comply with the relevant noise criteria. However, in the future, if development was to take place around the child care centre, compliance would still be achieved during the day period. However, to comply during the night period (ie before 7am) cars would need to park under the first floor deck. Thus, this deck provides a barrier for the noise received at possible upper storeys from engine starts and doors closing.