

Appendix 4

Environmental Noise Assessment

Childcare Noise Impact Assessment

Lot 89 (#573) Lake Road, Seville Grove

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**Prepared for
Blok Property**

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1 INTRODUCTION

It is proposed to develop the land located at 573 Lake Road, Seville Grove (refer *Figure 1-1*) into a childcare centre and out-of-hours school care (OHSC) capable of accommodating up to 100 children overall. The proposed childcare centre development will consist of the following:

- One childcare building capable of accommodating up to 100 children, grouped as follows:
 - Activity 1 and 2, 0-24 months, 12 children in each activity group,
 - Activity 3, 2 to 3 years old, 15 children,
 - Activity 4 and 5, 3 years or over, 20 children in each group, and
 - an out-of-hours school care (OHSC), accommodating up to 21 children aged 5 years or over,
- Three outdoor areas:
 - One main outdoor play area located to the north-west of the childcare building, and
 - One baby outdoor play area to the east along San Jacinta Road, and
 - One area located to the east of the OHSC building.
- The existing house will be demolished.
- Amenities and associated mechanical plant such as:
 - kitchen with range-hood and exhaust fan assumed to be located on the roof above,
 - Various exhaust fans (toilets, laundry, nappy room) assumed to be located on the roof above, and
 - AC plant located at various locations on the walls and roof of the childcare and OHSC buildings.
- Car parking on the south side of the building (27 bays) and three (3) bays close to the building.

This report presents the assessment of the noise emissions from child play, car doors closing in the car park and mechanical plant associated with the childcare centre against the *Environmental Protection (Noise) Regulations 1997* (the Regulations) based on the development drawings shown in *Appendix A*.

The proposed hours of operation are 6.30am to 6.30pm Monday to Friday. Therefore, it is expected for staff and parents to arrive and park before 7.00am, which is during the night-time period of the Regulations. However, it is noted that outdoor child play would not occur prior to 7.00am.

The proposed development plans are provided in *Appendix A*.

Appendix B shows the proposed local structure plan, precinct A1, Lake Road, Champion Lakes.

Appendix C contains a description of some of the terminology used throughout this report.



Figure 1-1 Project Locality

2 CRITERIA

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997* (the Regulations).

Regulation 7 defines the prescribed standard for noise emissions as follows:

“7. (1) Noise emitted from any premises or public place when received at other premises –

- (a) Must not cause or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind; and
- (b) Must be free of –
 - i. tonality;
 - ii. impulsiveness; and
 - iii. modulation,
 when assessed under regulation 9”

A “...noise emission is taken to significantly contribute to a level of noise if the noise emission ... exceeds a value which is 5 dB below the assigned level...”

Tonality, impulsiveness and modulation are defined in Regulation 9. Noise is to be taken to be free of these characteristics if:

- (a) The characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of noise emission; and
- (b) The noise emission complies with the standard prescribed under regulation 7 after the adjustments of *Table 2-1* are made to the noise emission as measured at the point of reception.

Table 2-1 Adjustments Where Characteristics Cannot Be Removed

Where Noise Emission is Not Music			Where Noise Emission is Music	
Tonality	Modulation	Impulsiveness	No Impulsiveness	Impulsiveness
+ 5 dB	+ 5 dB	+ 10 dB	+ 10 dB	+ 15 dB

Note: The above are cumulative to a maximum of 15dB.

The baseline assigned levels (prescribed standards) are specified in Regulation 8 and are shown in *Table 2-2*.

Table 2-2 Baseline Assigned Noise Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L _{A10}	L _{A1}	L _{Amax}
Noise sensitive premises: highly sensitive area ¹	0700 to 1900 hours Monday to Saturday (Day)	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays (Sunday)	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days (Evening)	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	35 + influencing factor	45 + influencing factor	55 + influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80

1. **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 metres of that building or that part of the building.

The proposed site is located within a residential area. The closest noise sensitive receivers include the single storey houses located to the east across San Jacinta Road and the land to the west, across Lake Road, which is part of the precinct A1 local structure plan. While there is a small commercial property (deli) to the south, this will not affect the influencing factor. Both Lake Road and Ranford Road carry less than 6,000 vehicles per day, so a transportation factor does not apply.

Therefore, the baseline levels as detailed in Table 2-2 are applicable for this assessment.

It is further noted that the Scout Hall at #17 San Jacinta Road was considered a commercial receiver, therefore attracting the higher assigned noise levels.

It must be noted the assigned noise levels above apply outside the receiving premises and at a point at least 3 metres away from any substantial reflecting surfaces. Where this was not possible to be achieved due to the close proximity of existing buildings and/or fences, the noise emissions were assessed at a point within 1 metre from building facades and a -2 dB adjustment was made to the predicted noise levels to account for reflected noise.

It is noted the assigned noise levels are statistical levels and therefore the period over which they are determined is important. The Regulations define the Representative Assessment Period (RAP) as *a period of time of not less than 15 minutes, and not exceeding 4 hours*, which is determined by an *inspector or authorised person* to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission. An *inspector or authorised person* is a person appointed under Sections 87 & 88 of the *Environmental Protection Act 1986* and include Local

Government Environmental Health Officers and Officers from the Department of Environment Regulation. Acoustic consultants or other environmental consultants are not appointed as an *inspector or authorised person*. Therefore, whilst this assessment is based on a 4 hour RAP, which is assumed to be appropriate given the nature of the operations, this is to be used for guidance only.

3 METHODOLOGY

Computer modelling has been used to predict the noise emissions from the development to all nearby receivers. The software used was *SoundPLAN 8.2* with the ISO 9613 algorithms (ISO 17534-3 improved method) selected as they include the influence of wind and given the relatively short source-receiver distances. Input data required in the model are:

- Meteorological Information;
- Topographical data;
- Ground Absorption; and
- Source sound power levels.

3.1 Meteorological Information

Meteorological information utilised is provided in *Table 3-1* and is considered to represent worst-case conditions for noise propagation. At wind speeds greater than those shown, sound propagation may be further enhanced, however background noise from the wind itself and from local vegetation is likely to be elevated and dominate the ambient noise levels.

Table 3-1 Modelling Meteorological Conditions

Parameter	Day (0700-1900)	Night (1900-0700)
Temperature (°C)	20	15
Humidity (%)	50	50
Wind Speed (m/s)	Up to 5 m/s	Up to 5 m/s
Wind Direction*	All	All

* Note that the modelling package used allows for all wind directions to be modelled simultaneously.

It is generally considered that compliance with the assigned noise levels needs to be demonstrated for 98% of the time, during the day and night periods, for the month of the year in which the worst-case weather conditions prevail. In most cases, the above conditions occur for more than 2% of the time and therefore must be satisfied.

3.2 Topographical Data

Topographical data was based on land spot heights sourced from *Google Earth*.

It is noted the topography is flat and with no significant differences in elevations between the childcare development and surrounding premises.

3.3 Buildings and Receivers

Surrounding existing buildings were included in the noise model, as these can provide noise shielding as well as reflection paths.

Single storey houses were modelled as buildings at 3.5 metres high and with receivers located 1.5 metres above local ground level.

The childcare centre building was modelled at 4.0 metres high.

3.4 Source Sound Levels

The sound power levels used in the modelling are provided in *Table 3-2*.

Table 3-2 Source Sound Power Levels, dB

Description	Octave Band Centre Frequency (Hz)								Overall dB(A)
	63	125	250	500	1k	2k	4k	8k	
Child Play, babies (24 kids), L_{10}	47	56	66	73	79	78	71	63	83
Child Play 2-3 years old (15 kids), L_{10}	49	58	68	75	81	80	73	65	85
Child Play 3 years old or over (21 kids), L_{10}	54	63	73	80	86	85	78	70	90
Child Play 3 years old or over (40 kids), L_{10}	57	66	76	83	89	88	81	73	93
AC plant, 9.5 kW, each, L_{10}	80	72	69	67	66	62	56	54	70
AC plant, 5 kW, each, L_{10}	73	71	70	67	66	59	54	48	70
Toilet / Laundry / Change Exhaust Fan, L_{10}	60	65	62	63	60	61	56	53	67
Kitchen exhaust fan, L_{10}	50	64	62	70	69	66	62	50	73
Closing Car Door, L_{max}	71	74	77	81	80	78	72	61	84

The following is noted in relation to the source levels above:

- Child Play source levels represent the group of children playing outside at the same time. It is noted that based on observations and measurements, the noise levels tend to increase with the children's age and therefore children 3 years and above were considered noisier than children aged 2-3 years. Outdoor child play was modelled as area sources at various heights to account for the slight difference in height between age groups as follows:
 - 3 years and above - 1.0 metre above ground plane;
 - 2-3 years old - 0.9 metre above ground plane; and
 - Babies - 0.8 metres above ground plane.
- As this is DA stage, the final selection of the AC units is not yet available, however it is understood AC plant will consist of 9.5 kW units for the Activity Rooms and 5 kW units for other rooms. Most units are located on the walls at various locations around the childcare

and OHSC building, with the exception of one shown on the roof. All units were modelled as point sources, with the 9.5 kW located 1.4 metres above ground and the 5 kW units located 1 metre above roof level, or 2.3 metres above ground level when stacked above a 9.5 kW unit.

- Other mechanical plant was assumed of including six exhaust fans (toilet, laundry, change room) and one kitchen exhaust fan/rangehood fan. All were modelled as point sources 0.5 metre above roof level, and above the area serviced.
- Car doors closing were modelled as a point source 1.0 metre above ground level and in the middle of the car bay. Since noise from a car door closing is a short term event, only the L_{Amax} level is applicable but can occur prior to 7.00am.

3.5 Ground Absorption

Ground absorption varies from a value of 0 to 1, with 0 being for an acoustically reflective ground (e.g. asphalt, concrete) and 1 for acoustically absorbent ground (e.g. grass/sand). In this instance, a value of 1 has been used for the outdoor play areas and any grassed areas, and 0 for the surroundings including roads, pavement, driveways, etc.

3.6 Walls and Fences

The existing boundary fences are 1.8 metres high wire mesh and therefore not considered to provide any acoustic benefits.

A 2.1 metre high masonry wall is located along the boundary of Lot 18 (#580) Lake Road.

Figure 3-1 shows a view of the 3D model based on the information above in relation to topography and building. Also shown are the outdoor play areas as purple shapes, and the point sources (e.g. car doors, AC plant) as pink dots.

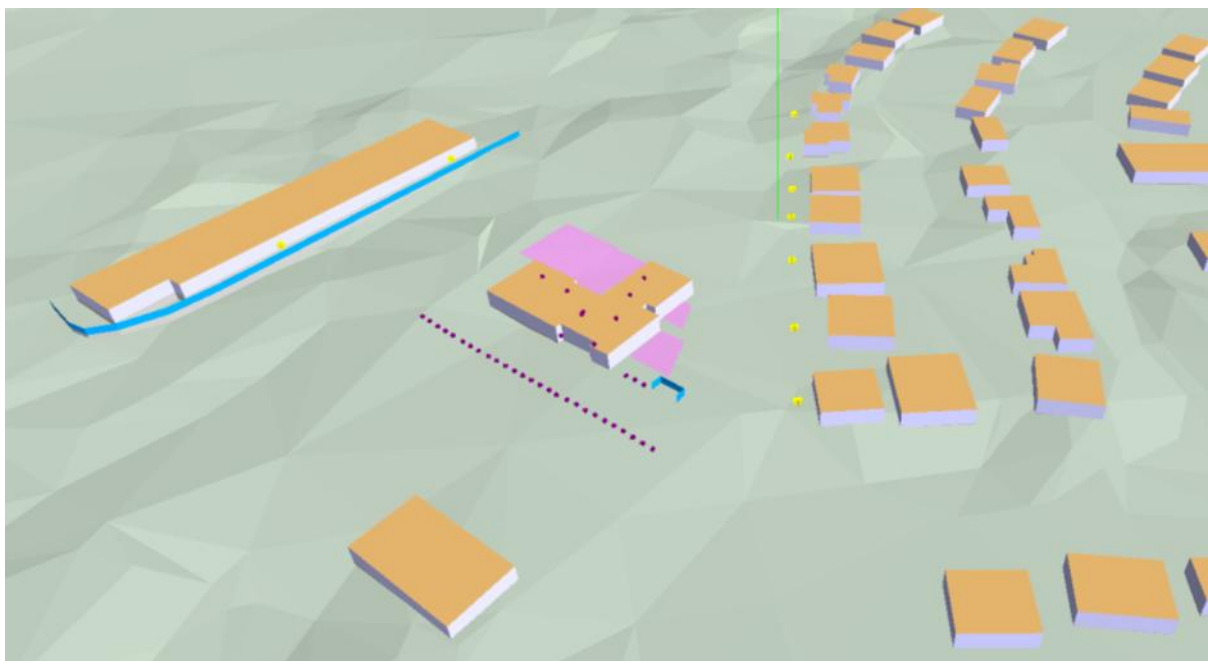


Figure 3-1 South Elevation of 3D Noise Model

4 RESULTS

4.1 Outdoor Child Play

The childcare development will host up to 100 children and as a worst case scenario, all 100 children were assumed to be playing outside for extended periods of time, as follows:

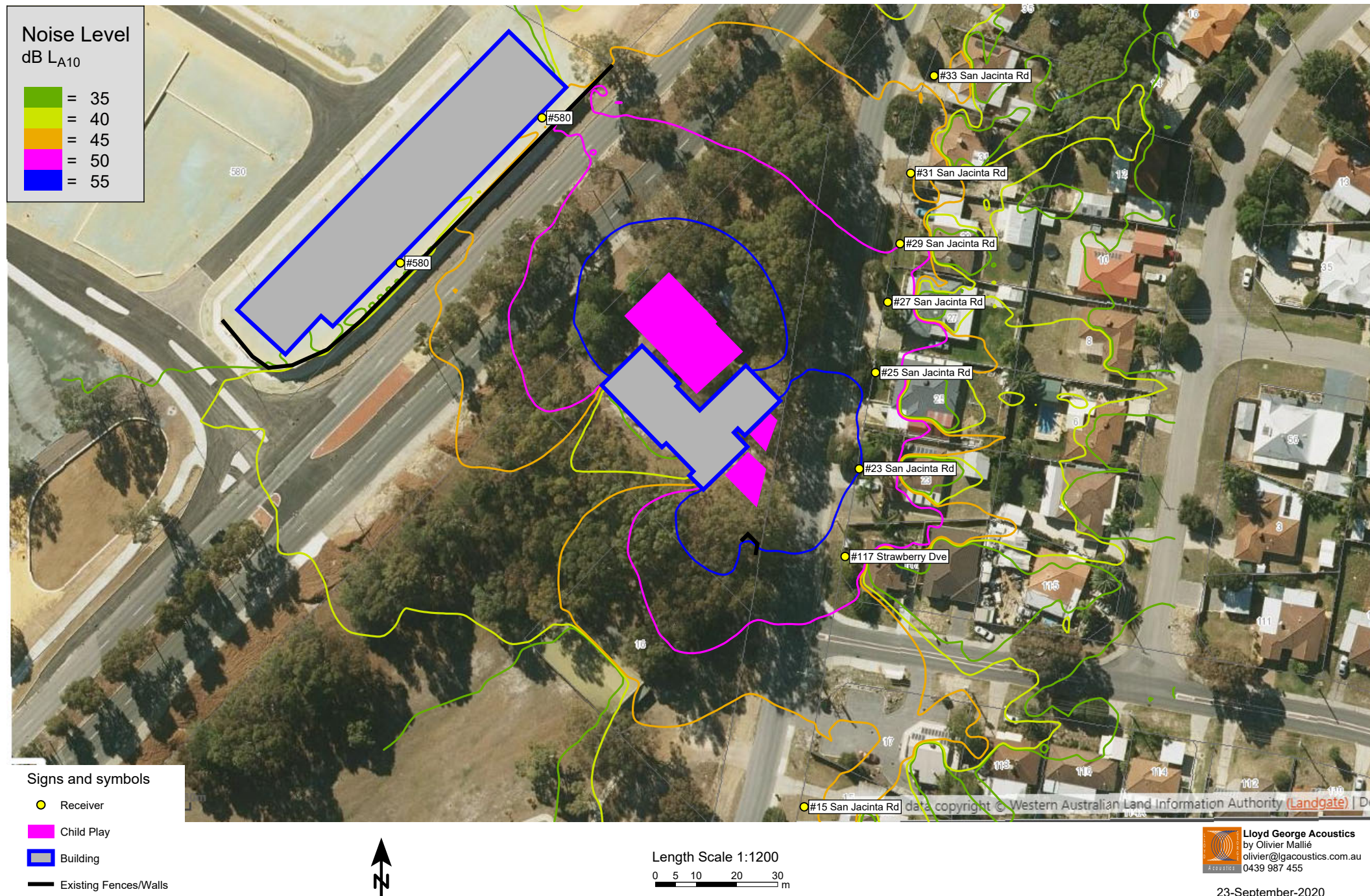
- 24 babies (Activity 1 and 2) in the east outdoor area,
- 15 children aged 2-3 years old (Activity 3) in the main outdoor area,
- 40 children aged 3 years or over (Activity 4 and 5) in the main outdoor area, and
- 21 children aged 5 years or over (out-of-hours school care) east of the OHSC building.

The predicted noise levels are summarised in *Table 4-1* and are from child play only i.e. mechanical plant noise is not included (refer *Section 4-3* for details).

Figure 4-1 also shows the predicted noise levels as a noise contours map at ground level.

Table 4-1 Predicted Noise Levels of Child Play, dB LA10

Receiver	Floor	Façade	Predicted Noise Level
#15 San Jacinta Rd	GF	-	44
#23 San Jacinta Rd	GF	-	55
#25 San Jacinta Rd	GF	-	54
#27 San Jacinta Rd	GF	-	52
#29 San Jacinta Rd	GF	-	50
#31 San Jacinta Rd	GF	-	45
#33 San Jacinta Rd	GF	-	44
#117 Strawberry Dve	GF	-	54
#580 Lake Rd	GF	SE	44



4.2 Car Doors Closing

The model includes noise from car doors closing in various parking bays.

Table 4-2 presents the highest predicted noise levels from a car door closing in any bay. Figure 4-3 also shows the predicted noise levels as a noise contours map at ground level.

Table 4-2 Predicted Car Doors Closing Noise Levels, dB L_{Amax}

Receiver	Floor	Façade	Predicted Levels
#15 San Jacinta Rd	GF	-	39
#23 San Jacinta Rd	GF	-	46
#25 San Jacinta Rd	GF	-	43
#27 San Jacinta Rd	GF	-	37
#29 San Jacinta Rd	GF	-	35
#31 San Jacinta Rd	GF	-	31
#33 San Jacinta Rd	GF	-	28
#117 Strawberry Dve	GF	-	48
#580 Lake Rd	GF	SE	37



4.3 Mechanical Plant

Mechanical plant consists of AC plant and extraction fans for the kitchen, laundry and toilets. However, at this stage, mechanical plant has not been designed in detail so that the assessment uses typical plant located on the walls and roof of the building. If architectural louvres are provided around the AC plant, these are not considered to provide significant noise attenuation benefits.

Table 4-3 presents the overall noise levels assuming all plant is operating simultaneously and at full capacity e.g. cold winter day, with the noise contribution from the AC plant alone also provided for reference. Figure 4-3 also shows the predicted overall noise levels at ground floor height.

Table 4-3 Predicted Noise Levels of Mechanical Plant, dB L_{A10}

Receiver	Floor	Orientation	Overall Noise Level	AC Only
#15 San Jacinta Rd	GF	-	30	28
#23 San Jacinta Rd	GF	-	38	38
#25 San Jacinta Rd	GF	-	41	41
#27 San Jacinta Rd	GF	-	40	40
#29 San Jacinta Rd	GF	-	37	37
#31 San Jacinta Rd	GF	-	34	33
#33 San Jacinta Rd	GF	-	32	32
#117 Strawberry Dve	GF	-	32	27
#580 Lake Rd	GF	SE	32	31

Proposed Childcare Centre - Mechanical Plant Noise Levels (all plant running)

Lot 89 (#573) Lake Road, Seville Grove

Figure 4-3



4.4 Indoor Child Play

An assessment of noise levels from indoor child play was carried out and the resulting noise levels at all locations were predicted to be well below that of outdoor child play considered in *Section 4.1*. This assessment was carried out based on the following considerations:

- Internal noise levels within activity rooms would not exceed those from outdoor play for each age group;
- Any music played within the internal activity areas would be 'light' music with no significant bass content and played at a relatively low level.

5 ASSESSMENT

5.1 Outdoor Child Play

Outdoor child play is considered to only occur during the daytime, that is after 7.00am when the assigned noise level is 45 dB L_{A10} . Noise from child play is not considered to contain annoying characteristics within the definition of the Regulations, therefore no adjustments are made to the predicted noise levels.

As a worst-case scenario, all children are initially assumed to play outside simultaneously for extended periods of time (i.e. over 24 minutes), therefore the L_{A10} assigned noise level is applicable. *Table 5-1* presents the assessment of child play noise against the daytime assigned noise level.

Table 5-1 Assessment of Outdoor Child Play Noise Levels

Receiver	Assigned Daytime Noise Level, dB L_{A10}	Predicted Noise Level dB L_{A10}	Exceedence
#15 San Jacinta Rd	45	44	<i>Complies</i>
#23 San Jacinta Rd	45	55	10
#25 San Jacinta Rd	45	54	9
#27 San Jacinta Rd	45	52	7
#29 San Jacinta Rd	45	50	5
#31 San Jacinta Rd	45	45	<i>Complies</i>
#33 San Jacinta Rd	45	44	<i>Complies</i>
#117 Strawberry Dve	45	54	9
#580 Lake Rd	45	44	<i>Complies</i>

It can be from *Table 5-1* that exceedences up to 10 dB are predicted to the receivers to the east. Given the level of exceedences, a combination of solid fencing and child play management will be required, as follows:

- Provide a 2.1 metre high solid acoustic fence to the east and north of the main outdoor play area, as shown on *Figure 5-1*, and
- Provide a 1.6 metre high solid acoustic fence around the smaller outdoor play area on the east side, as shown on *Figure 5-1*, and
- Restrict the number of children aged 3 years or over to no more than 40 in the main outdoor area, and
- Out-of-hours school care children are to go to the main outdoor area for active play i.e. no child play on the east side of the OSHC building. However, it is expected that a small group of children could participate in passive activities such as reading in this area.

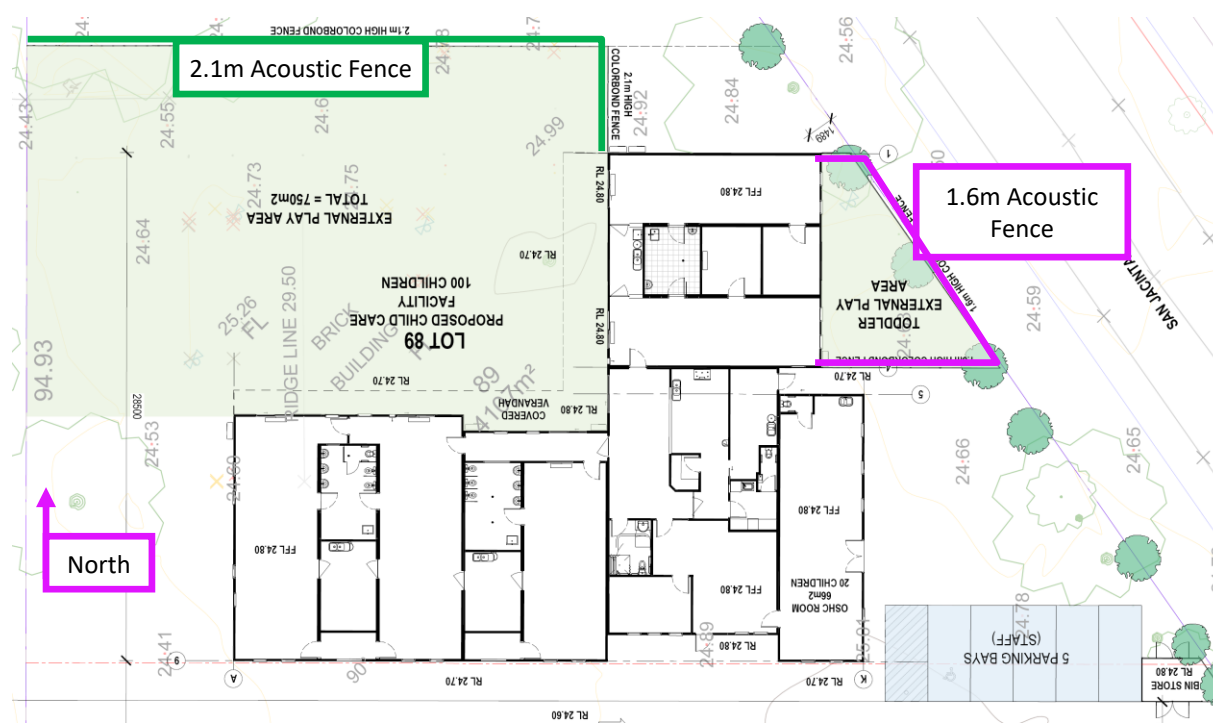


Figure 5-1 Acoustic Fencing Requirements

It must be noted the acoustic fence is to be built to achieve a surface mass of at least 8 kg/m^2 but can incorporate translucent sections (e.g. *Perspex*) to preserve sight-lines or natural light ingress. Where *Colorbond* fencing is a preferred method of construction, two fences are to be installed in front of each other (e.g. 50mm gap between fences) to control noise leakage via the fences, noting that insulation in the cavity between the fences is not required.

5.2 Car doors

Car doors closing noise are short duration events and were therefore assessed against the L_{Amax} assigned noise level. Given the proposed hours of operation, staff members and parents can arrive before 7.00am, when the night-time assigned noise level of 55 dB L_{Amax} is applicable.

Given the relative short source to receiver distances, car doors closing noise may be impulsive within the definition of the Regulations. Therefore, an adjustment of +10 dB (refer *Table 2-1*) was made to the predicted noise levels.

Table 5-2 presents the assessment of the adjusted car doors closing noise levels (i.e. predicted+10) against the night-time assigned noise level at the receivers.

Table 5-2 Assessment of Cars Doors Closing Noise Levels

Receiver	Assigned Night-time Noise Level, dB L_{Amax}	Adjusted Noise Level dB L_{Amax}	Exceedence
#15 San Jacinta Rd	55	49	Complies
#23 San Jacinta Rd	55	56	1
#25 San Jacinta Rd	55	53	Complies
#27 San Jacinta Rd	55	47	Complies
#29 San Jacinta Rd	55	45	Complies
#31 San Jacinta Rd	55	41	Complies
#33 San Jacinta Rd	55	38	Complies
#117 Strawberry Dve	55	58	3
#580 Lake Rd	55	47	Complies

From the above assessment, it can be seen that a marginal exceedence of 1 dB is predicted at #23 San Jacinta Road, where the noise contribution from the northern bays is causing the exceedence. An exceedence of 3 dB is also predicted at #117 Strawberry Drive, with the closest car bays to San Jacinta Road causing the exceedence.

Therefore, to achieve compliance at all times parking could be managed such that, before 7.00am, these car bays closest to the receivers are not used. However, modelling also shows that a fence 1.4 metres high could be provided along the northern bays to allow parking there at anytime. This is illustrated on *Figure 5-2* with car bays not to be used before 7.00am shaded in red.

5.3 Mechanical Plant

Table 5-2 presents the assessment of the noise emissions from all mechanical plant against the L_{A10} night-time assigned noise level, noting that before 7.00am noise was considered to be tonal, therefore the predicted noise levels were adjusted by +5 dB.

Receiver	Assigned Night Noise Level, dB L _{A10}	Adjusted Noise Level, dB L _{A10}	Exceedence
#15 San Jacinta Rd	35	35	<i>Complies</i>
#23 San Jacinta Rd	35	43	8
#25 San Jacinta Rd	35	46	11
#27 San Jacinta Rd	35	45	10
#29 San Jacinta Rd	35	42	7
#31 San Jacinta Rd	35	39	4

Receiver	Assigned Night Noise Level, dB L _{A10}	Adjusted Noise Level, dB L _{A10}	Exceedence
#33 San Jacinta Rd	35	37	2
#117 Strawberry Dve	35	37	2
#580 Lake Rd	35	37	2

At this stage, mechanical plant has not been designed in detail, therefore it is possible for alternative AC units or plant layout to be investigated during detailed design. To achieve compliance at all times, a minimum 11 dB overall noise reduction is required, which could be achieved with the following combination of noise controls:

- All plant to be the quietest available, and
- Select AC units which can operate on a 'low noise mode' prior to 7.00am, or potentially not operate before 7.00am. Data obtained from manufacturers such as Fujitsu for their AJY (JS IIs) range of units indicate that an overall 6-7 dB reduction can be achieved by setting the unit on 'Level 2' quiet mode. When on such mode, it is also assumed that tonality would no longer be present in the noise emissions, and
- Locate AC plant on the roof and provide for acoustic louvres or solid barriers around the AC plant e.g. 6 mm solid fibre sheeting behind architectural louvres. The height and extent of the louvers/barriers will need to be determined based on final plant selection and location, and/or
- Locate AC plant at ground level on the south wall and behind a solid plant yard noise wall. The height and extent of the plant yard noise wall will need to be determined based on final plant selection and location, and
- Kitchen exhaust fan could be located within the ceiling space and ducted to the roof, with the roof cowl then to be located furthest away from sensitive receivers, and
- Allow for silencers or acoustic flexible ducts on the outside air side of all exhaust fans, and
- All plant to be mounted on suitable anti-vibration mounts.

The above is to be reviewed during detailed design/building permit stage when mechanical plant selection and layout is known.

6 CONCLUSIONS

The noise impacts from the proposed childcare centre to be located at Lot 89 (#573) Lake Road in Seville Grove, have been assessed against the relevant criteria of the *Environmental Protection (Noise) Regulations 1997*.

Based on the modelling and assessments in relation to the noise emissions from child play and car doors closing, it is concluded that compliance can be achieved, provided acoustic fencing and child play management as described in *Section 5.1* are implemented.

In addition, the following best practices in relation to child play should be implemented:

- The behaviour and 'style of play' of children should be monitored to prevent particularly loud activity e.g. loud banging/crashing of objects, 'group' shouts/yelling,
- Favour soft finishes in the outdoor play area to minimise impact noise (e.g. soft grass, sand pit(s), rubber mats) over timber or plastic,
- Favour soft balls and rubber wheeled toys,
- Crying children should be taken inside to be comforted,
- No amplified music to be played outside,
- External doors and windows to be closed during indoor activity / play, and
- Any music played within the internal activity areas to be 'light' music with no significant bass content and played at a relatively low level.

With regard to car doors closing, exceedences of the night-time assigned noise level were also predicted at some receivers if specific car bays are used before 7.00am. However, compliance can be achieved at all times provided parking management as described in *Section 5.2* is implemented.

Finally, mechanical plant noise can also result in exceedences of the assigned noise levels, however mechanical plant has not been designed in detail and therefore the following is to be considered, and reviewed, during detailed design:

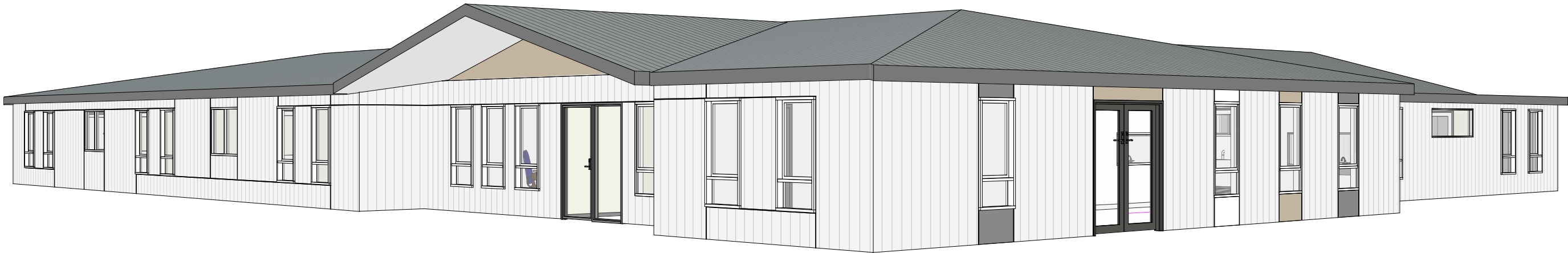
- All plant to be the quietest available, and
- Select AC units which can operate on a 'low noise mode' prior to 7.00am, or potentially not operate before 7.00am. Data obtained from manufacturers such as Fujitsu for their AJY (JS IIs) range of units indicate that an overall 6-7 dB reduction can be achieved by setting the unit on 'Level 2' quiet mode. When on such mode, it is also assumed that tonality would no longer be present in the noise emissions, and
- Locate AC plant on the roof and provide for acoustic louvres or solid barriers around the AC plant e.g. 6 mm solid fibre sheeting behind architectural louvres. The height and extent of the louvers/barriers will need to be determined based on final plant selection and location, and/or
- Locate AC plant at ground level on the south wall and behind a solid plant yard noise wall. The height and extent of the plant yard noise wall will need to be determined based on final plant selection and location, and

- Kitchen exhaust fan could be located within the ceiling space and ducted to the roof, with the roof cowl then to be located furthest away from sensitive receivers, and
- Allow for silencers or acoustic flexible ducts on the outside air side of all exhaust fans, and
- All plant to be mounted on suitable anti-vibration mounts.

Appendix A

Development Plans

SHEET LIST_TENDER	
	SHEET NAME
A00-CS01	COVER PAGE
A00-CS02	CODE LEGEND
A01-CS04	PERSPECTIVE VIEW
A01-SP01	SITE PLAN
A01-SP02	SITE LOCATION PLAN
A02-FP01	GENERAL FLOOR PLAN
A03-EL01	ELEVATIONS
A03-EL02	ELEVATIONS



CHILD CARE CENTRE

PROJECT NO.: J001371	PROJECT CLIENT BLOKK PROPERTY
PROJECT STATUS DESIGN DEVELOPMENT	PROJECT ADDRESS: LAKE ROAD, SEVILLE GROVE, WA



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SHEET			
COVER PAGE			
DRAWN	CHECKED	SCALE	SIZE
MMG	PR		A3
DRAWING NO.			REVISION
A00-CS01			B
DC SIGN OFF:			

BUILDING CLASSIFICATION:	NCC CLASS 9b
BAL LEVEL:	N/A
CLIMATE ZONE:	5
CYCLONIC REGION CLASSIFICATION:	"A" REGION
REGION A WINDOWS DESIGN CRITERIA:	AS2047
SERVICEABILITY PRESSURE:	GENERAL: 840Pa, UP TO 2400MM FROM CORNER - 900Pa
ULTIMATE STRENGTH PRESSURE:	GENERAL: 1230Pa, UP TO 2400MM FROM CORNER - 1307Pa
WATER PENETRATION RESISTANCE PRESSURE:	NON EXPOSED: 150Pa EXPOSED: 200Pa
WIND LOAD IN ACCORDANCE WITH:	AS.1170.2-2011
FLOOR STRUCTURAL STEEL PROTECTION MINIMUM CATEGORY:	ATMOSPHERIC CORROSIVITY CATEGORY "C3"
DESIGN CRITERIA IN ACCORDANCE WITH:	AS1170.1-2002: IMPOSED FLOOR ACTIONS (TABLE 3.1).
ALLOWABLE FLOOR LOADS:	B-3.0kPa UNIFORMLY DISTRIBUTED. 4.5kN CONCENTRATED LOAD.
DESIGN CRITERIA IN ACCORDANCE WITH:	AS1170.4-2007:
PROBABILITY:	P=1/500 (TABLE 3.1)
KP:	1.0 (TABLE 3.1)
SITE HAZARD FACTOR Z ALLOWED:	0.15 (FIGURE 3.2(C)).
EARTHQUAKE DESIGN CATEGORY:	II AS PER TABLE 2.1.

FLOOR COVERING:	FCO-01	CONCRETE FLOORING TYPE: TBC
	FTI-01	TILES TYPE: TBC COLOUR: TBC
	FVI-01	VINYL TYPE: 2.0MM COLOUR: TBC
EXTERNAL CLADDING:	WMC-01	COLORBOND CUSTOM ORB® COLOUR: AS PER ELEVATIONS
	WMC-02	STANDING SEAM CLADDING HILAND TRAY OR SIMILAR COLOUR: AS PER ELEVATIONS
	WFC-01	FC BOARD WEATHERBOARD WIDTH: 170MM COLOUR: PAINTED WHITE
	WFC-02	FC SHEET MATRIX PANEL OR SIMILAR WIDTH: 900 MM COLOUR: PAINTED AS PER ELEVATIONS
	WTM-01	TIMBER LOOKING CLADDING WEATHERTEX OR SIMILAR WIDTH: 170 MM COLOUR: NATURAL
INTERNAL LINING:	WPB-01	PLASTERBOARD THICKNESS: 10mm COLOUR: WHITE
	WPB-02	FYRCHEK PLASTERBOARD THICKNESS: 13mm COLOUR: WHITE
	WSK-01	WALL SKIRTING TYPE: TIMBER BULLNOSE SKIRTING BOARDS COLOUR: TBC
	WSK-02	WALL SKIRTING TYPE: TILE SKIRTING TO ALL WET AREAS COLOUR: TBC
CEILING LINING:	CPB-01	PLASTERBOARD THICKNESS: 10mm COLOUR: WHITE
	CCC-01	PLASTERBOARD CORNICE TYPE: COVED
ROOF INSULATION:	R2.5 R1.3	EARTHWOOL BATTS BETWEEN CEILING JOISTS ANTI-CONDENSATION BLANKET UNDER ROOF SHEETING
WALL INSULATION:	R2.5	EARTHWOOL BATS TO ALL WALLS AND 6.5mm E-THERM UNDER EXTERNAL CLADDING.
ROOF CLADDING:	RMS-01	ROOF SHEETING CORRUGATED METAL ROOF SHEETS COLOUR: ZINCALUME THICKNESS: 0.42BMT
ROOF FLASHINGS & CORNER TRIMS:	RFL-01	COLORBOND BARGE CAPPING COLOUR: MONUMENT
	RFA-01	COLORBOND FASCIA COLOUR: MONUMENT
	REG-01	COLORBOND GUTTER COLOUR: MONUMENT
EAVES SOFFIT:	RSL-01	EAVES SOFFIT 4.5MM FIBRE CEMENT BOARD COLOUR: WHITE
ALLOW FOR STANDARD SERVICES. SERVICES LAYOUT TBC		

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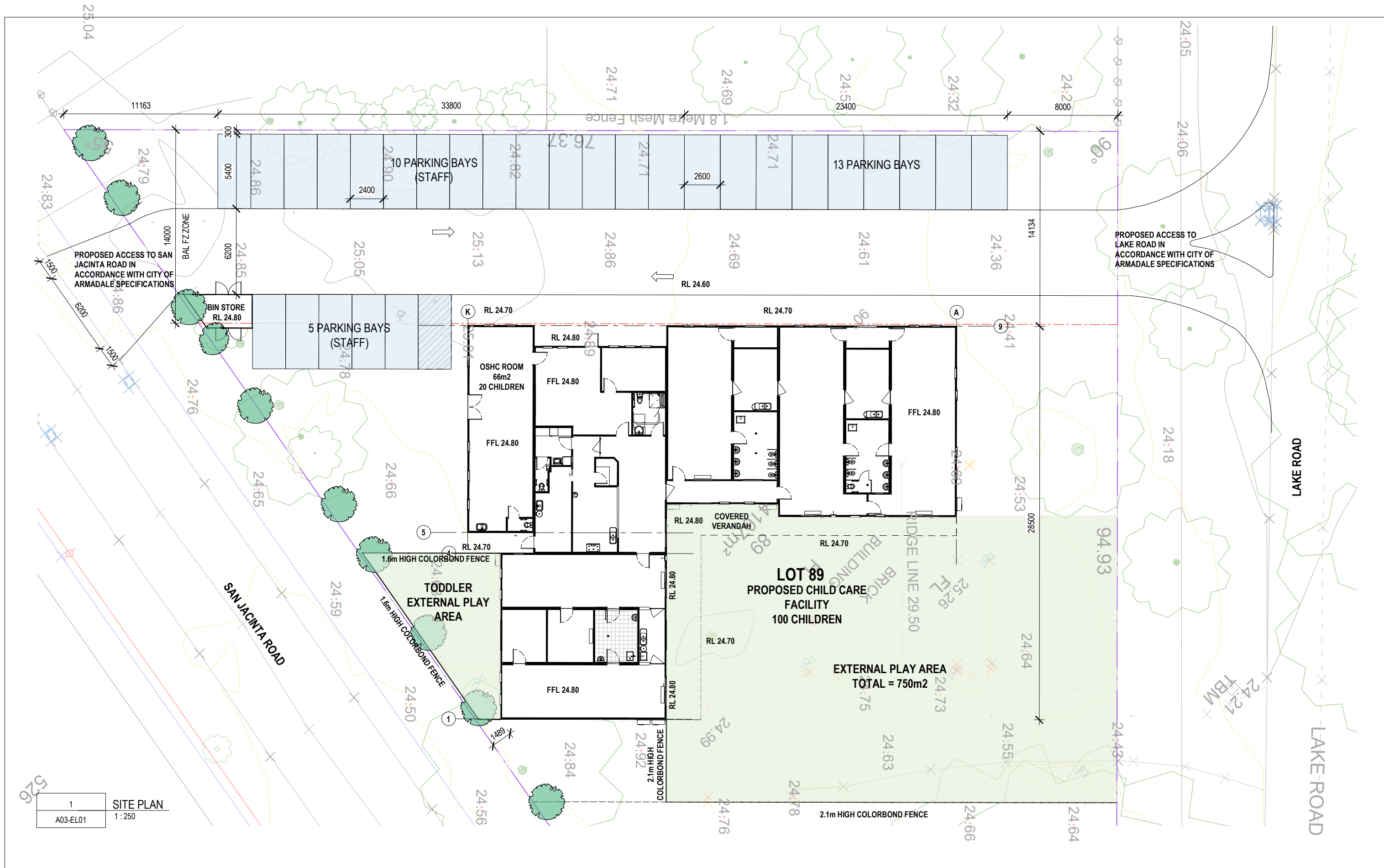
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BLOKK PROPERTY

LAKE ROAD, SEVILLE GROVE, WA

A

DC SIGN OFF:



D	ADJUSTMENTS FOR ACOUSTIC AND PLANNER COMMENTS	22/09/20	MMG	PR
C	DA REVISED FOR BAL	17/09/20	MMG	PR
B	PLANNING REVISIONS	08/09/20	MMG	PR
A	DA SUBMISSION	03/09/20	MMG	PR
NO. DESCRIPTION		DATE	BY	CHK'D

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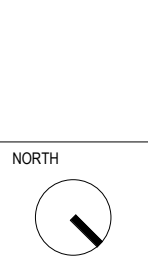
PROJECT NO.:
J001371

PROJECT STATUS
DESIGN DEVELOPMENT

PROJECT CLIENT
BLOKK PROPERTY

PROJECT:
CHILD CARE CENTRE

PROJECT ADDRESS
LAKE ROAD, SEVILLE GROVE, WA



SHEET
SITE PLAN

DRAWN
MMG

CHECKED

SCALE
As indicated

SIZE
A3

DRAWING NO.
A01-SP01

REVISION
D

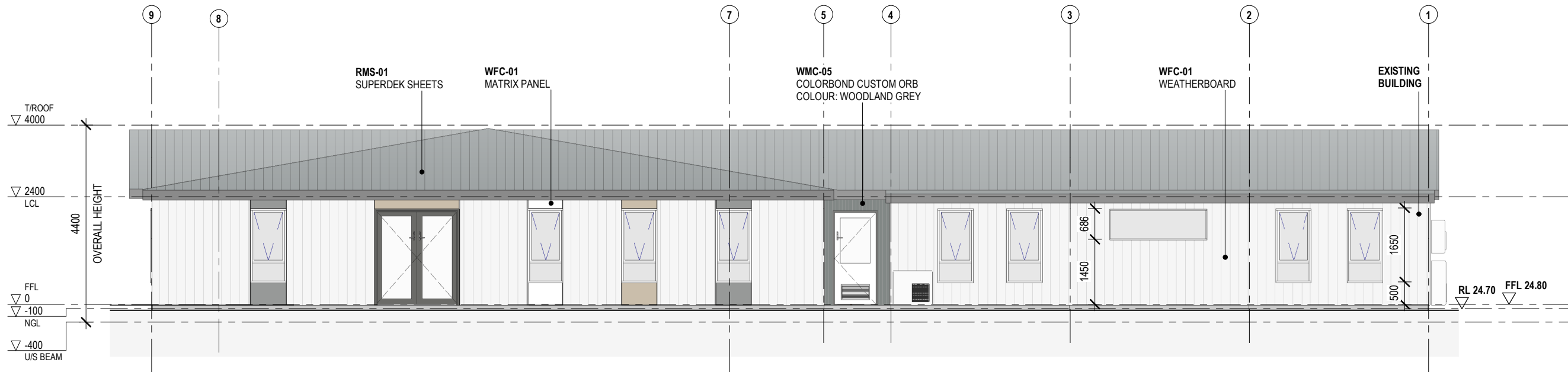
DC SIGN OFF:

ROOM...	AR...
ACTIVITY 1	45 m²
ACTIVITY 2	45 m²
ACTIVITY 3	50 m²
ACTIVITY 4	65 m²
ACTIVITY 5	65 m²
BED TROLLEY 1	5 m²
BED TROLLEY 2	5 m²
CHANGE	12 m²
COTS 1	13 m²
COTS 2	12 m²
HALLWAY	13 m²
KITCHEN	22 m²
LAUNDRY	6 m²
NUTRITION	30 m²
PANTRY	3 m²
PREP 1	7 m²
PREP 2	7 m²
PREP 3	7 m²
RECEPTION	35 m²
STAFF ROOM	14 m²
STAFF WC	2 m²
STORE 1	7 m²
STORE 2	7 m²
UAT	7 m²
WC 1	16 m²
WC 2	15 m²
TOTAL	515 m²

B	DA REVISED FOR BAL	17/09/20	MMG	PR
A	DA SUBMISSION	03/09/20	MMG	PR
NO.	DESCRIPTION	DATE	BY	CHK'D



1	FRONT ELEVATION
A02-FP01	1 : 125



2	SIDE ELEVATION 1
A02-FP01	1 : 100

B	DA REVISED FOR BAL	17/09/20	MMG	PR
A	DA SUBMISSION	03/09/20	MMG	PR
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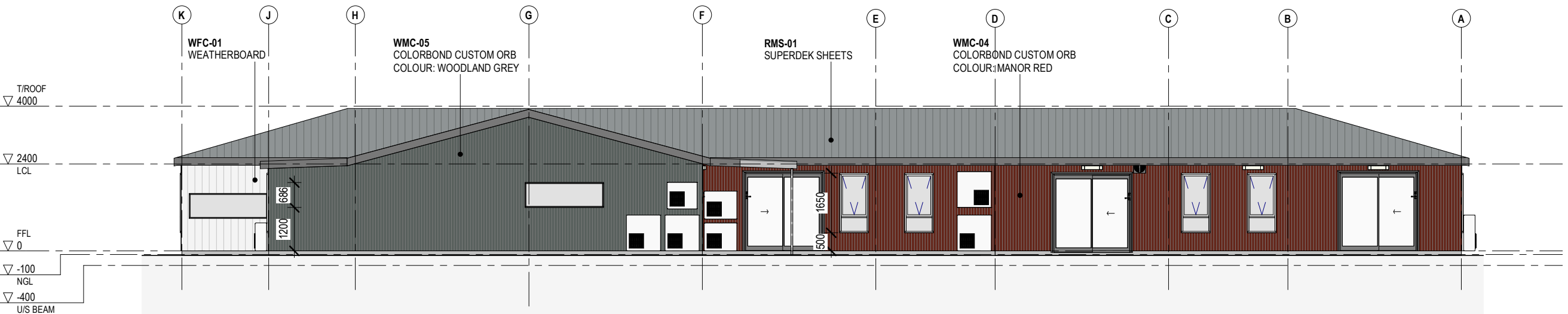
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SHEET
ELEVATIONS

DRAWN MMG	CHECKED PR	SCALE As indicated	SIZE A3
DRAWING NO. A03-EL01		REVISION B	
DC SIGN OFF:			



3	SIDE ELEVATION 2 1:100
A02-FP01	



4	REAR ELEVATION 1:125
A02-FP01	

B	DA REVISED FOR BAL	17/09/20	MMG	PR
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PROJECT:
CHILD CARE CENTRE

PROJECT ADDRESS
LAKE ROAD, SEVILLE GROVE, WA

SHEET
ELEVATIONS

DRAWN
SAS

CHECKED
MMG

SCALE
As indicated

SIZE
A3

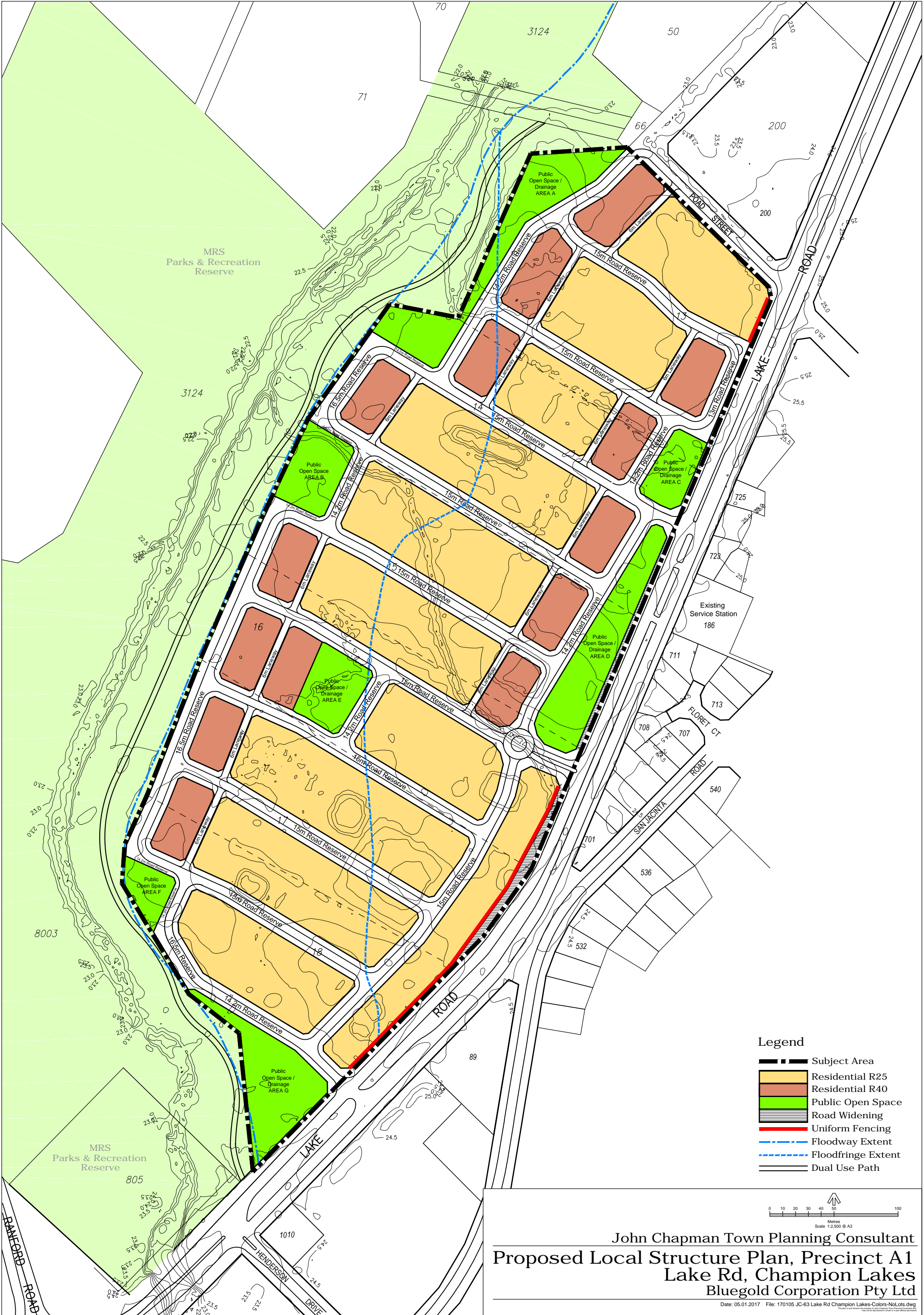
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A03-EL02

REVISION
B

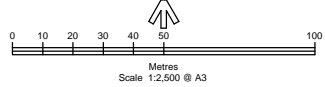
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Appendix B

Local Structure Plan, Precinct A1



- Legend**
- Subject Area
 - Residential R25
 - Residential R40
 - Public Open Space
 - Road Widening
 - Uniform Fencing
 - Floodway Extent
 - Floodfringe Extent
 - Dual Use Path



John Chapman Town Planning Consultant
Proposed Local Structure Plan, Precinct A1
Lake Rd, Champion Lakes
Bluegold Corporation Pty Ltd

Appendix C

Terminology

The following is an explanation of the terminology used throughout this report.

Decibel (dB)

The decibel is the unit that describes the sound pressure and sound power levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

A-Weighting

An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as L_A dB.

Sound Power Level (L_w)

Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly measured using a sound level meter but is calculated based on measured sound pressure levels at known distances. Noise modelling incorporates source sound power levels as part of the input data.

Sound Pressure Level (L_p)

The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

L_{ASlow}

This is the noise level in decibels, obtained using the A frequency weighting and the S (Slow) time weighting as specified in IEC 61672-1:2002. Unless assessing modulation, all measurements use the slow time weighting characteristic.

L_{AFast}

This is the noise level in decibels, obtained using the A frequency weighting and the F (Fast) time weighting as specified in IEC 61672-1:2002. This is used when assessing the presence of modulation only.

L_{APeak}

This is the greatest absolute instantaneous sound pressure in decibels using the A frequency weighting as specified in IEC 61672-1:2002.

L_{Amax}

An L_{Amax} level is the maximum A-weighted noise level during a particular measurement.

L_{A1}

An L_{A1} level is the A-weighted noise level which is exceeded for one percent of the measurement period and is considered to represent the average of the maximum noise levels measured.

L_{A10}

An L_{A10} level is the A-weighted noise level which is exceeded for 10 percent of the measurement period and is considered to represent the “intrusive” noise level.

L_{Aeq}

The equivalent steady state A-weighted sound level (“equal energy”) in decibels which, in a specified time period, contains the same acoustic energy as the time-varying level during the same period. It is considered to represent the “average” noise level.

L_{A90}

An L_{A90} level is the A-weighted noise level which is exceeded for 90 percent of the measurement period and is considered to represent the “background” noise level.

One-Third-Octave Band

Means a band of frequencies spanning one-third of an octave and having a centre frequency between 25 Hz and 20 000 Hz inclusive.

L_{Amax} assigned level

Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded at any time.

L_{A1} assigned level

Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded for more than 1% of the representative assessment period.

L_{A10} assigned level

Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded for more than 10% of the representative assessment period.

Tonal Noise

A tonal noise source can be described as a source that has a distinctive noise emission in one or more frequencies. An example would be whining or droning. The quantitative definition of tonality is:

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 $L_{A\ Slow}$ levels.

This is relatively common in most noise sources.

Modulating Noise

A modulating source is regular, cyclic and audible and is present for at least 10% of the measurement period. The quantitative definition of modulation is:

a variation in the emission of noise that —

- (a) is more than 3 dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;
- (b) is present for at least 10% of the representative.

Impulsive Noise

An impulsive noise source has a short-term banging, clunking or explosive sound. The quantitative definition of impulsiveness is:

a variation in the emission of a noise where the difference between $L_{A \text{ peak}}$ and $L_{A \text{ Max slow}}$ is more than 15 dB when determined for a single representative event;

Major Road

Is a road with an estimated average daily traffic count of more than 15,000 vehicles.

Secondary / Minor Road

Is a road with an estimated average daily traffic count of between 6,000 and 15,000 vehicles.

Influencing Factor (IF)

$$= \frac{1}{10} (\% \text{ Type A}_{100} + \% \text{ Type A}_{450}) + \frac{1}{20} (\% \text{ Type B}_{100} + \% \text{ Type B}_{450})$$

where :

% Type A₁₀₀ = the percentage of industrial land within
a 100m radius of the premises receiving the noise

% Type A₄₅₀ = the percentage of industrial land within
a 450m radius of the premises receiving the noise

% Type B₁₀₀ = the percentage of commercial land within
a 100m radius of the premises receiving the noise

% Type B₄₅₀ = the percentage of commercial land within
a 450m radius of the premises receiving the noise

+ Traffic Factor (maximum of 6 dB)

= 2 for each secondary road within 100m

= 2 for each major road within 450m

= 6 for each major road within 100m

Representative Assessment Period

Means a period of time not less than 15 minutes, and not exceeding four hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission.

Background Noise

Background noise or residual noise is the noise level from sources other than the source of concern. When measuring environmental noise, residual sound is often a problem. One reason is that regulations often require that the noise from different types of sources be dealt with separately. This separation, e.g. of traffic noise from industrial noise, is often difficult to accomplish in practice. Another reason is that the measurements are normally carried out outdoors. Wind-induced noise, directly on the microphone and indirectly on trees, buildings, etc., may also affect the result. The character of these noise sources can make it difficult or even impossible to carry out any corrections.

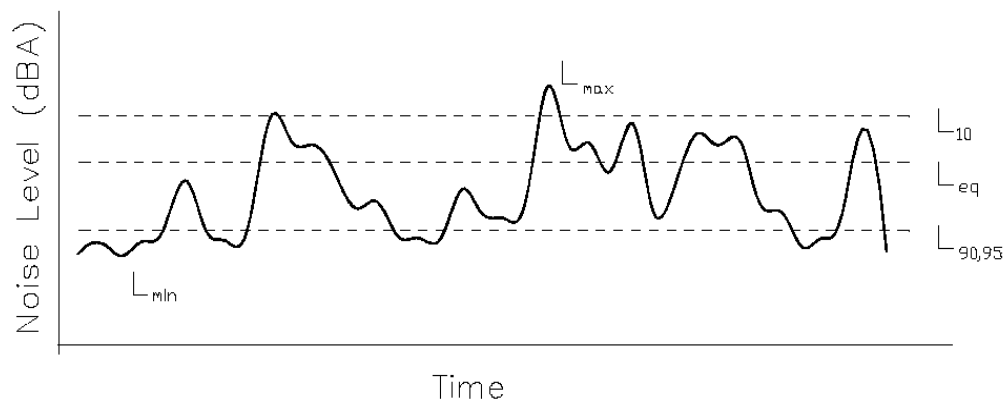
Ambient Noise

Means the level of noise from all sources, including background noise from near and far and the source of interest.

Specific Noise

Relates to the component of the ambient noise that is of interest. This can be referred to as the noise of concern or the noise of interest.

Chart of Noise Level Descriptors



Typical Noise Levels

