

**PROPOSED CHILD CARE CENTRE
140 St ANDREWS DRIVE
YANCHEP**

ENVIRONMENTAL ACOUSTIC ASSESSMENT

SEPTEMBER 2023

OUR REFERENCE: 31640-1-22282

DOCUMENT CONTROL PAGE

ENVIRONMENTAL ACOUSTIC ASSESSMENT
PROPOSED CHILD CARE CENTRE
YANCHEP

Job No: 22282

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FOR

GERMANO DESIGN GROUP

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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 140 St Andrews Drive, Yanchep.

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 for the day period.

The air conditioning condensing units, being located on the northern façade outside the reception / staff room, would also comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at the neighbouring residences. However, to achieve compliance during the night period, the air conditioning condensing units need to be installed with "low noise" night modes which reduce noise levels by a minimum of 6 dB(A).

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.

Note : The fence to the north / north west side of the child care centre, as shown on Figure 5.1 can be a permeable open type fence, and the noise modelling has been based on an open type fence providing no barrier to the neighbouring residences.

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 The fencing to the north, as shown on Figure 5.1 in Section 5 - Modelling can be permeable / open type fencing. We note that for this development, colourbond is an acceptable fencing material.
- 3 The air conditioning condensing units located on the northern façade, outside the reception / staff room. However, to achieve compliance during the night period, the air conditioning condensing units are to be installed with "low noise" night modes which reduce noise emission by a minimum of 6 dB(A).
- 4 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 and mitigation measures are as required for the final design.

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

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 north, west and south of the proposed development. An aerial showing the neighbouring premises are shown below on Figure 3.1.

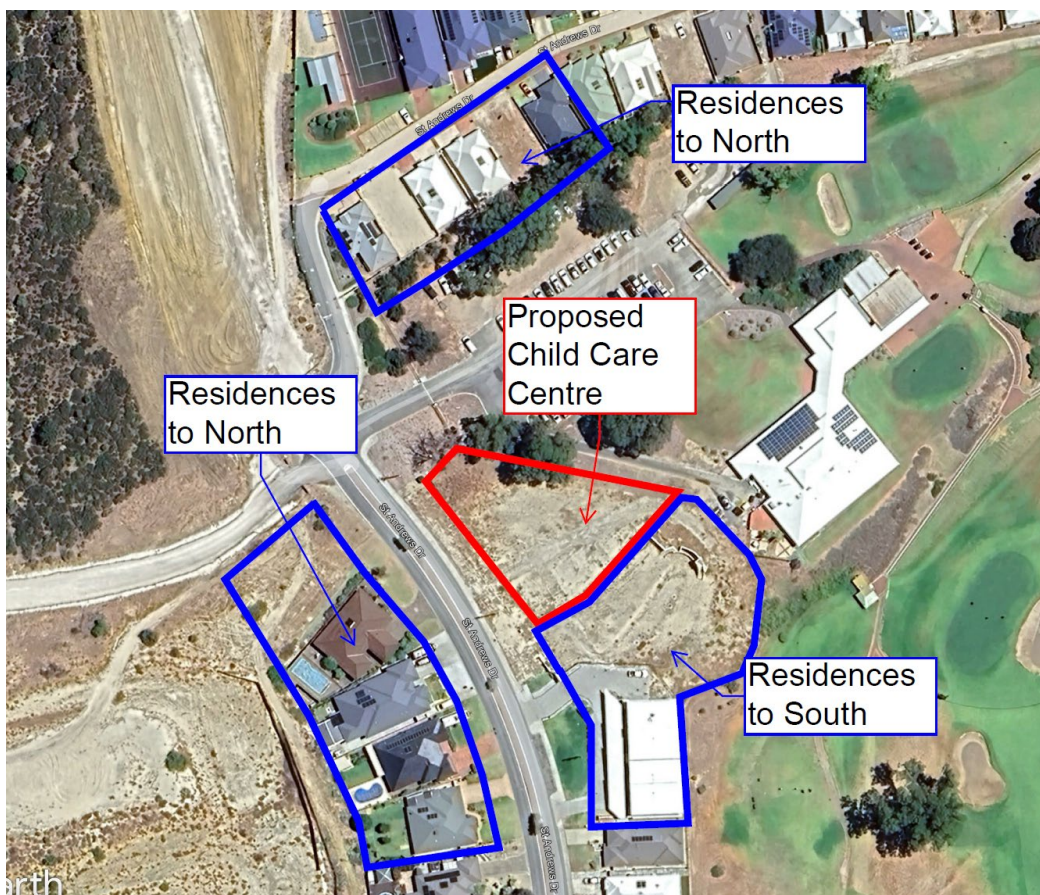


FIGURE 3.1 – NEIGHBOURING LOTS

At the neighbouring residences, with the golf course and associated Club House, the Influencing Factor has been determined to be +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)		
		L _{A10}	L _{A1}	L _{Amax}
Noise sensitive premises: highly sensitive area	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: 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.

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:

Activity 1	0 – 2 years	12 places
Activity 2	2 – 3 years	20 places
Activity 3	2 – 3 years	20 places
Activity 4	3+ years	20 places
Activity 5	3+ years	20 places

It is noted that although the proposed child care centre would open before 7 am (ie during the night period), the outdoor play area would not be used until after 7am.

5. MODELLING

To assess the noise received at the neighbouring premises from the proposed development, noise modelling was undertaken using the noise modelling program SoundPlan.

Calculations were carried out using the DWER's weather conditions, which relate to worst case noise propagation, as stated in the Department of Environment Regulation "*Draft Guidance on Environmental Noise for Prescribed Premises*". These conditions include winds blowing from sources to the receiver(s).

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

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	5 @ 73

Notes:

- 1 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.
- 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 development, it is recommended that the air conditioning condensing units would be located on the western façade, outside the Reception / staff room and be screened with louvres from neighbouring premises. Although not required for compliance, it is recommended that the air conditioning condensing units are to be installed with "low Noise" night modes that reduce noise emission by at least 6 dB(A).
- 4 It is noted that the fence to the north / north west side of the child care centre, as shown on Figure 5.1 can be a permeable open type fence, and the noise modelling has been based on an open type fence providing no barrier to the neighbouring residences.
- 5 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.

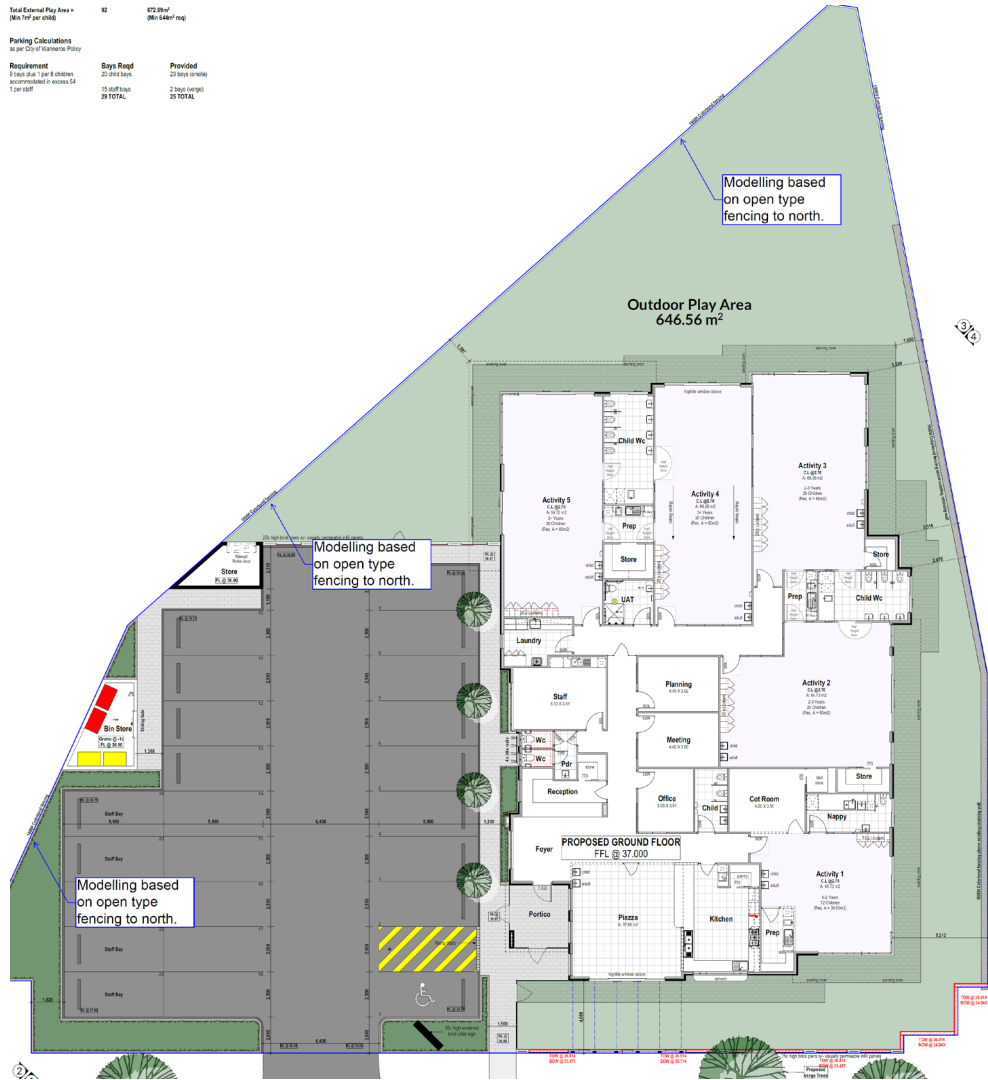


FIGURE 5.1 – BOUNDARY FENCING

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_{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	
		Day Period	Night Period
North	41	32 (37)	26 (31)
West	45	35 (40)	29 (34)
South	40	14 (19)	8 (13)

() 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 +10 dB 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	34
West	42
South	25

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

Neighbouring Premises	Calculated Noise Level (dB(A))	
	Car Starting	Door Closing
North	39	40 [50]
West	46	47 [57]
South	24	25 [35]

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

Tables 6.4 to 6.9 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

**TABLE 6.4 – ASSESSMENT OF L_{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	41	47	Complies
West	45	47	Complies
South	40	47	Complies

**TABLE 6.5 – ASSESSMENT OF L_{A10} DAY NOISE LEVEL EMISSIONS
MECHANICAL SERVICES**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	37	47	Complies
West	40	47	Complies
South	19	47	Complies

**TABLE 6.6 – ASSESSMENT OF L_{A10} NIGHT NOISE LEVEL EMISSIONS
MECHANICAL SERVICES**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	31	37	Complies
West	34	37	Complies
South	13	37	Complies

**TABLE 6.7 – 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
North	34	47	Complies
West	42	47	Complies
South	25	47	Complies

**TABLE 6.8 – ASSESSMENT OF L_{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	39	57	Complies
East	46	57	Complies
South	24	57	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
North	50	57	Complies
East	57	57	Complies
South	35	57	Complies

7. CONCLUSION

Noise received at the neighbouring residences from the outdoor play area would comply with day period assigned noise level for the day period.

The air conditioning condensing units, being located on the northern façade outside the reception / staff room, would also comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at the neighbouring residences. However, to achieve compliance during the night period, the air conditioning condensing units need to be installed with “low noise” night modes which reduce noise levels by a minimum of 6 dB(A).

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- 3 The air conditioning condensing units located on the northern façade, outside the reception / staff room. However, to achieve compliance during the night period, the air conditioning condensing units are to be installed with "low noise" night modes which reduce noise emission by a minimum of 6 dB(A).
- 4 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 and mitigation measures are as required for the final design.

APPENDIX A

PLANS

MAC HOMES

Address:Lot 1022 (#150) St Andrews Drive,
YANCHEP

Childcare Centre

Job Number: 21109

Drawing No	Description
PD01	Cover Sheet
PD02	3D
PD03	Existing Site Survey
PD04	Site Plan
PD05	Context Plan
PD06	Floor Plan
PD07	Elevations



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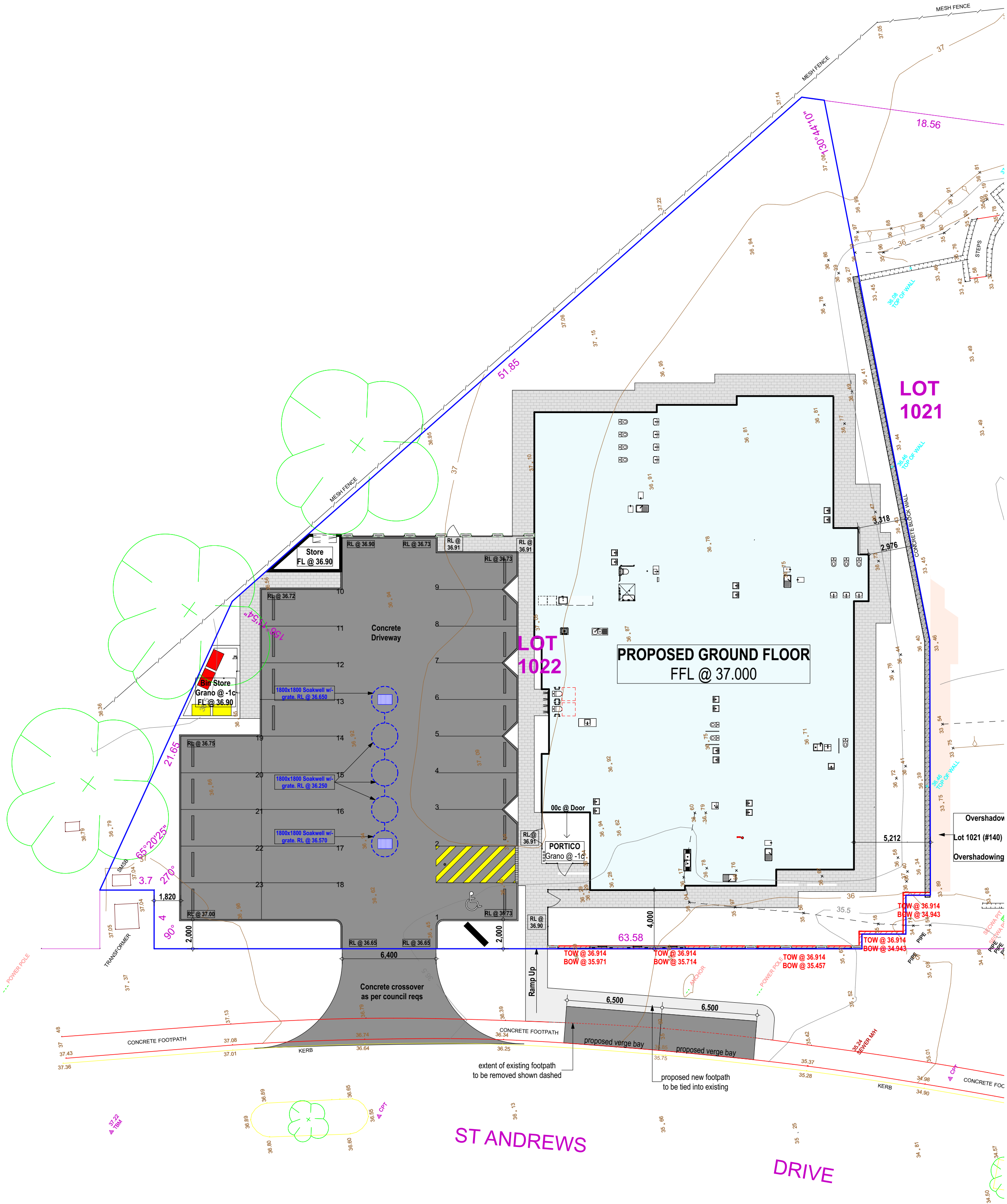
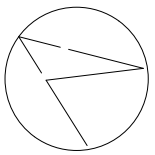
ROSS McLOUGHLIN
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LOT 1020 (No.150) ST ANDREWS DRIVE - YANCHEP

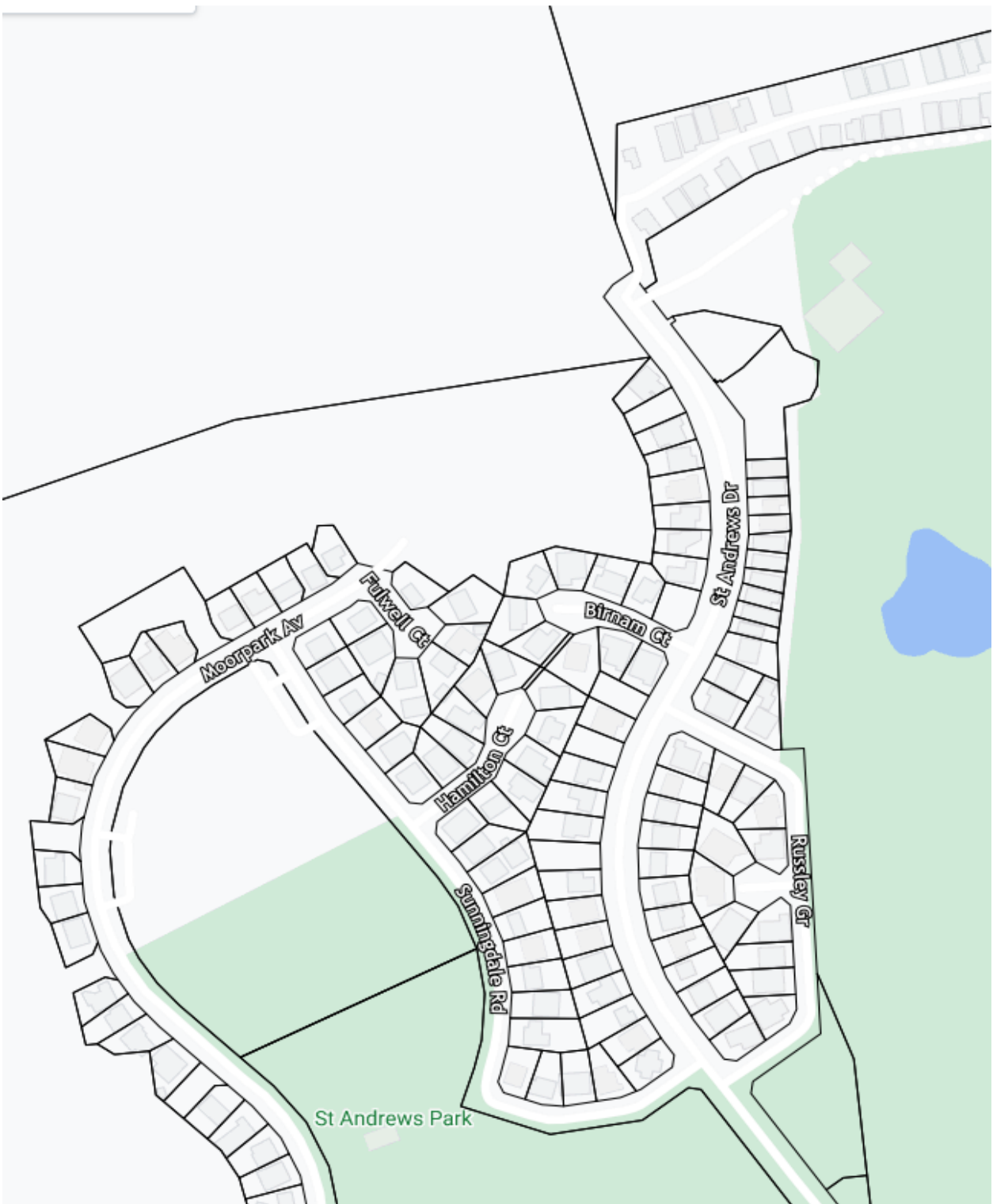
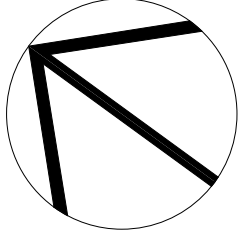
SITE PLAN - STRATA LOT 9

SCALE:	1:200 @ A1 SIZE	LOCAL AUTHORITY:	CITY OF WANNEROO	SURVEYOR:	RAM
DATE:	24.7.2019	PLAN:	LOT 9 ON STRATA PLAN 70720	DRAWN:	RAM
DATUM:	AHD	AREA:	4138m ²	SDR FILE:	YP5

CHECK CERTIFICATE OF TITLE FOR EASEMENTS, RESTRICTIVE COVENANTS, ETC.
THIS SURVEY DOES NOT GUARANTEE THE CORRECT POSITION OF BOUNDARY PEGS OR FENCES.
ALL FEATURES AND BUILDING POSITIONS ARE APPROXIMATE ONLY, AS THEY HAVE BEEN
POSITIONED FROM MEASUREMENTS TAKEN FROM EXISTING PEGS, FENCES AND WALLS.
INFORMATION SHOWN ON THIS PLAN IS CURRENT AT THE DATE SHOWN.
ROSS McLOUGHLIN SURVEYS ACCEPTS NO RESPONSIBILITY FOR ANY CHANGES THAT
HAVE OCCURRED AFTER THIS DATE TO SITE LEVELS, FEATURES OR BUILDINGS.
CADASTRAL BOUNDARY DIMENSIONS SHOWN HAVE BEEN OBTAINED FROM SURVEY PLANS
AND ARE SUBJECT TO FIELD SURVEY.
A BOUNDARY RE-ESTABLISHMENT SURVEY IS RECOMMENDED PRIOR TO UNDERTAKING
ANY SITE WORKS OR CONSTRUCTION.



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Client
MAC HOMES
Project Name
Childcare Centre
Project Address
Lot 1022 (#150) St Andrews Drive, YANCHEP

Drawing Title:
Site Plan
Scale: as noted
Sheet Size: A1
Project No:
21109
Drawing No:
PD04 of 07

Issue:
Development Approval

Rev: Description: Drawn: CD
008 Hydraulic
Revision Number: 008
Date: 23.08.2023

Revision	Description	Date
006	Hydraulic	23.08.23
007	Planning Drawings	31.07.23
008	Sketch	29.07.22
009	Sketch	24.02.22
004	Sketch	22.02.22
003	Sketch	11.02.22
002	Sketch	20.01.22

Unit: 3/1 Mulgool Road, Malaga WA 6090

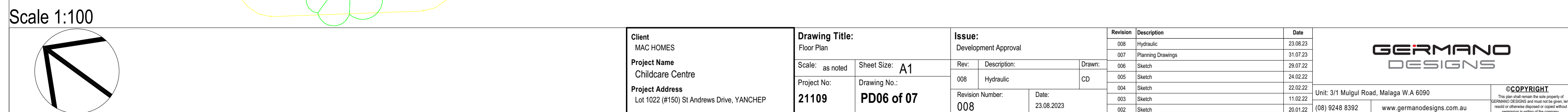
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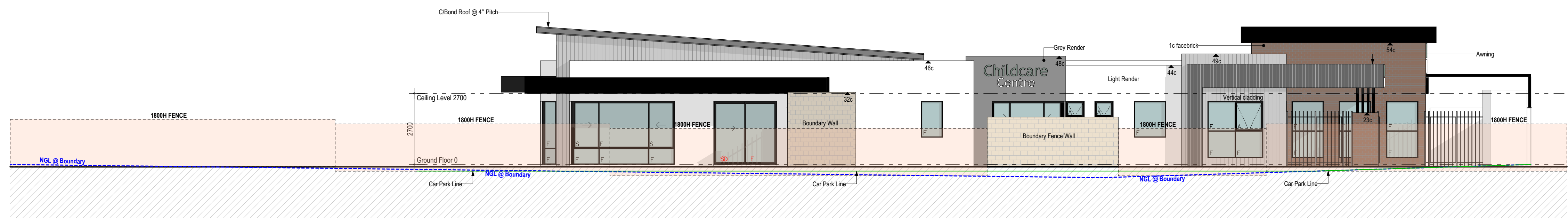
Requirement	Bays Req'd	Provided
9 bays plus 1 per 8 children accommodated in excess 54 1 per staff	20 child bays 15 staff bays 29 TOTAL	23 bays (onsite) 2 bays (verge) 25 TOTAL

Ground Floor	
Childcare Centre	675.56
Bin Store	15.09
Portico	11.55
Store	9.77
	711.97 m²

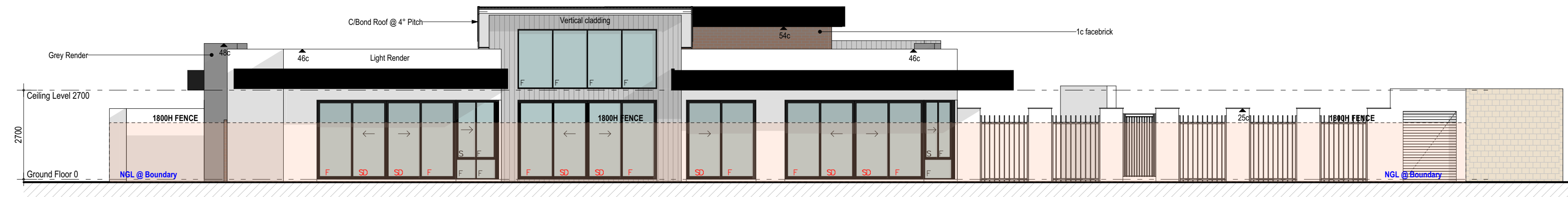


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<div>Client MAC HOMES</div> <div>Project Name Childcare Centre</div> <div>Project Address Lot 1022 (#150) St Andrews Drive, YANCHIEP</div>	<div>Drawing Title: Elevations</div>		<div>Issue: Development Approval</div>		<table><thead><tr><th>Revision</th><th>Description</th><th>Date</th></tr></thead><tbody><tr><td>008</td><td>Hydraulic</td><td>23.08.2023</td></tr><tr><td>007</td><td>Planning Drawings</td><td>31.07.23</td></tr><tr><td>006</td><td>Sketch</td><td>29.07.22</td></tr><tr><td>005</td><td>Sketch</td><td>24.02.22</td></tr><tr><td>004</td><td>Sketch</td><td>22.02.22</td></tr><tr><td>003</td><td>Sketch</td><td>11.02.22</td></tr><tr><td>002</td><td>Sketch</td><td>20.01.22</td></tr></tbody></table>			Revision	Description	Date	008	Hydraulic	23.08.2023	007	Planning Drawings	31.07.23	006	Sketch	29.07.22	005	Sketch	24.02.22	004	Sketch	22.02.22	003	Sketch	11.02.22	002	Sketch	20.01.22
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