



**PROPOSED DEVELOPMENT
LOT 2 YANCHEP BEACH ROAD
YANCHEP**

ENVIRONMENTAL ACOUSTIC ASSESSMENT

MARCH 2019

OUR REFERENCE: 22971-3-18073



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ENVIRONMENTAL ACOUSTIC ASSESSMENT
LOT 2 YANCHEP BEACH ROAD, YANCHEP

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FOR

OFF2SITE PROJECTS

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1. INTRODUCTION

Herring Storer Acoustics were commissioned by Off2Site Projects to undertake an acoustic assessment of noise emissions associated with the proposed development, including child care centre, located at Lot 2 Yanchep Beach Road, 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 child care centre; and
- Mechanical services.

For reference, plans of the proposed development are attached in Appendix A.

2. SUMMARY

We understand that it is proposed that the proposed child care centre would only operate between 7:00am and 7:00pm, Monday to Friday and would cater for up to 68 children, including 12 babies.

Noise received at the neighbouring premises from children playing in the outdoor areas would comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*, for the proposed hours of operation.

Noise from the mechanical services has been assessed to also comply with the relevant assigned noise levels. However, the mechanical services positioned on the roof, should be located towards the north side of the development.

Thus, noise emissions from the proposed development, including the child care centre, would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times.

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 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 commercial 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	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 neighbouring residences are located to the south across the Right of Carriageway Easement. For these residences, the influencing factor (IF) has been calculated at +4 dB.

Based on the above influencing factor, the assigned outdoor noise levels for the neighbouring residential locations are listed in Table 3.3.

TABLE 3.3 - ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L _{A 10}	L _{A 1}	L _{A max}
Noise sensitive premises	0700 - 1900 hours Monday to Saturday	49	59	69
	0900 - 1900 hours Sunday and Public Holidays	44	54	69
	1900 - 2200 hours all days	44	54	59
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	39	49	59

Note: L_{A10} is the noise level exceeded for 10% of the time.
 L_{A1} is the noise level exceeded for 1% of the time.
 L_{Amax} is the maximum noise level.

4. PROPOSAL

We understand that the proposal development is to contain 2 tenancies, including a child care centre. For reference, plans of the proposed development are attached in Appendix A.

From information supplied, we understand that the child care centre normal hours of operations would be between 0700 and 1900 hours, Monday to Friday (closed on public holidays). It is understood that the proposed childcare centre will cater for a maximum of 68 children, with the following breakdown of age groups :

0 – 1 years	12 children
1 – 2 years	16 children
2 – 3 years	20 children
3+ years	20 children

As the child care centre would be open from 7am, noise received at the neighbouring premises from the children within the outdoor area of the child care centre, needs to comply with the assigned noise levels for the day period. However, as the other tenancies could be open during the night period, an assessment of the noise received at the neighbouring residences from the mechanical services for both the day and night periods has also been undertaken.

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 standard weather conditions as stated in the Department of Environment Regulation “*Draft Guidance on Environmental Noise for Prescribed Premises*”.

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)
Air conditioning condensing Units	6 @ 71

It is noted that the outdoor play area is located in the south west corner of the proposed development. The outdoor play area is enclosed in a 1.8 metre high colourbond boundary fence. For this usage, the colourbond fence is adequate as the boundary fence / barrier and its construction does not need to be upgraded.

With regards to the mechanical services, with the slope of the roof and the parapet to the northern façade of the development, it has been assumed, and recommended, that the mechanical services be located towards the northern part of the roof, behind the parapet.

6. ASSESSMENT

Given the size of the outdoor play area, acoustic modelling of outdoor play noise was made, based on 40 children playing outside within the outdoor play areas at the one time, utilising 4 groups of 10 children with sound power levels distributed as plane sources. The resultant noise levels at the neighbouring residence from children playing outdoors are tabulated in Table 6.1.

The resultant noise levels from the air conditioning at the neighbouring residence are also listed in Table 6.1. With regards to the mechanical service, noise modelling was undertaken for the following scenarios :

- Scenario 1 - Day period, with all mechanical services operating.
- Scenario 2 - Night period, with the mechanical service for the child care centre not operating, but the mechanical services to the other tenancy would be operating.

Note : The noise modelling for the mechanical services does not include any diversity of operation. Thus, the assessment of the mechanical services would be considered conservative.

From previous measurements, noise emissions from children playing is a broadband noise and does not contain any annoying characteristics. Noise emissions from the mechanical services would be tonal and a +5 dB(A) penalty would be applied, as shown in Table 6.1.

Finally, we note that calculations were undertaken to all the neighbouring premises located to the south, however to simplify the assessment, only the noise level at the worst case location has been listed.

**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
Residences to South	43	32 (37)	27 (32)

() Includes +5 dB(A) penalty for tonality

Tables 6.2 and 6.3 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

**TABLE 6.2 – 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
Residences to South	43	49	Complies

**TABLE 6.3 – ASSESSMENT OF L_{A10} DAY PERIOD NOISE LEVEL EMISSIONS
ALL AIR CONDITIONING**

Scenario	Assessable Noise Level, dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
1 – Day Period	37	49	Complies
2 – Night Period	32	39	Complies

7. CONCLUSION

It is proposed that the proposed child care centre would only operate between 7am and 7pm, Monday to Friday (excluding Public Holidays) and would cater for up to 68 children, including 12 babies.

Noise received at the neighbouring residential premises from children playing in the outdoor play area and “simulated” outdoor play area (with doors open) would comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed operating hours.

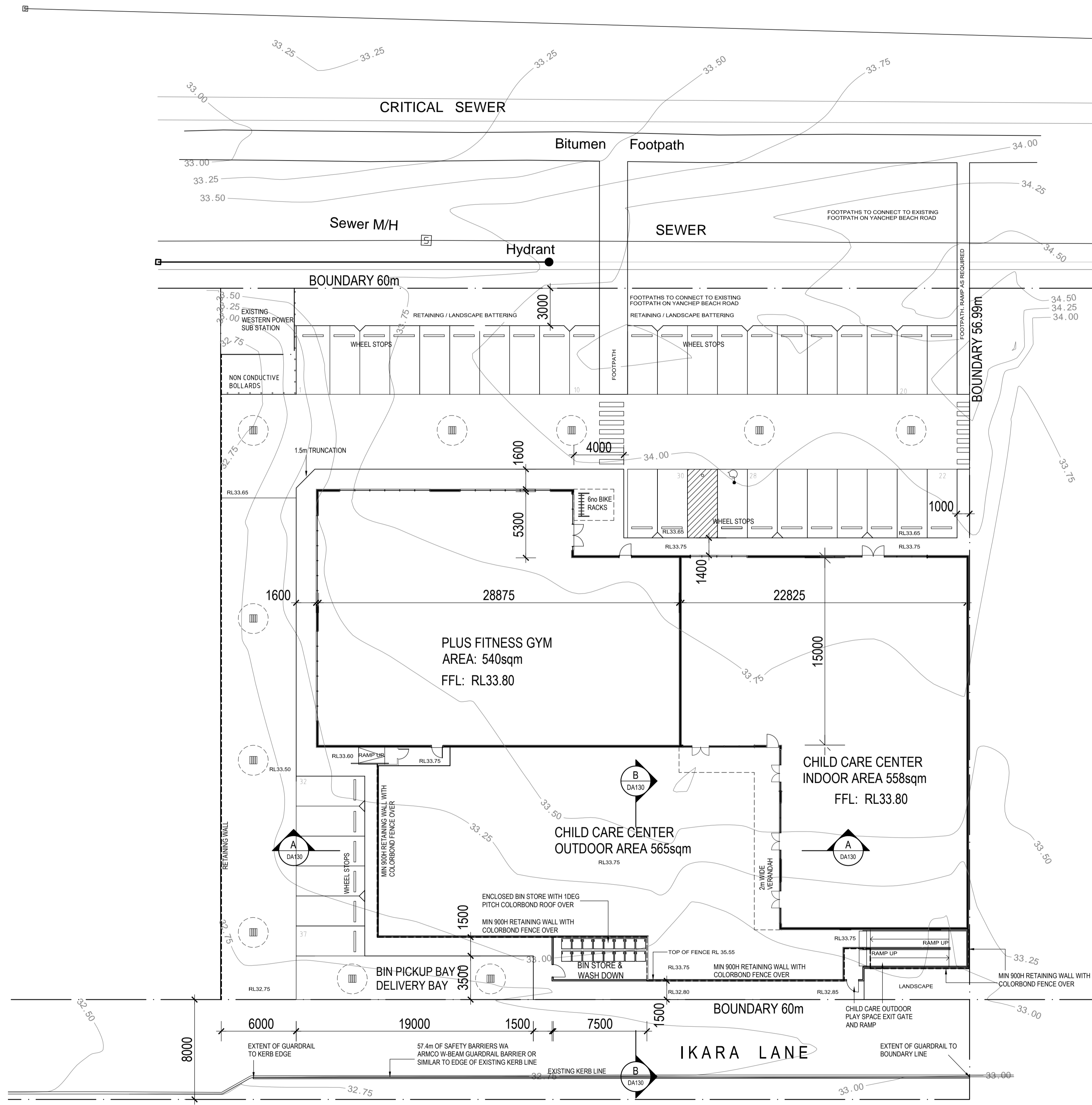
Noise from the mechanical services has also been assessed to comply with the relevant criteria. However, the mechanical services, positioned on the roof, should be located towards the north side of the development, behind the parapet.

Thus, noise emissions from the proposed development, would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times.

APPENDIX A

PLANS

No	DATE	ISSUE / REVISION
A	12.03.18	ISSUE FOR DEVELOPMENT APPROVAL
B	17.05.18	REVISED DEVELOPMENT APPLICATION
C	01.06.18	REVISED DEVELOPMENT APPLICATION
D	26.07.18	ISSUE FOR CONSULTANT COORDINATION REVISED CAR PARKING AND SITE LAYOUT
E	30.07.18	ISSUE FOR REVISED DA APPLICATION
F	01.08.18	ADJUST PARKING TO SATISFY COUNCIL REQMENTS INCLUDE CRASH BARRIER TO IKARA LANE
G	12.09.18	ADJUST RETAINING WALL AND FENCE TO CHILD CARE OUTDOOR AREA. NOTE ROOF TO BIN STORE
J	04.03.19	INCLUSION OF GYM. ADJUST REAR EXIT TO CHILD CARE PLAY SPACE. ADJUST CAR PARKING, INCREASE LANDSCAPING AREA



PARKING REQUIREMENTS

GYM
RECREATION CENTRE. 1 BAY PER 4 PEOPLE ACCOMMODATED
ANTICIPATE 20 TO 40 PEOPLE AT ANY ONE TIME
CALCULATE ON 40 PERSONS
40 PERSONS = 10 CAR BAYS REQUIRED

PARKING REQUIRED FOR 68 CHILD, CHILD CARE CENTRE:

CHILDREN 0-1	12 CHILDREN	1 TEACHER PER 4 CHILDREN	3 TEACHERS REQ
CHILDREN 1-2	16 CHILDREN	1 TEACHER PER 4 CHILDREN	4 TEACHERS REQ
CHILDREN 2-3	20 CHILDREN	1 TEACHER PER 5 CHILDREN	4 TEACHERS REQ
CHILDREN 3+	20 CHILDREN	1 TEACHER PER 10 CHILDREN	2 TEACHERS REQ

PARKING REQUIRED 1 BAY PER TEACHER, THEREFORE 13 BAYS REQUIRED
PARKING REQUIRED FOR 65-72 CHILDREN - 9 BAYS

CHILD CARE CENTRE (68 CHILD)
13 BAYS TEACHERS & 9 BAYS CHILDREN 22 CARBAYS

TOTAL BAYS REQUIRED = 32 BAYS

BAYS AVAILABLE = 37 (5 BAY EXCESS)

STORMWATER SOAKWELL CALCULATION
STORMWATER DRAINAGE TO COMPLY WITH AS / NZS 3500.3

EQUIVALENT IMPERVIOUS AREA	ROOF	1136sqm
	CARPARK	1188sqm
	TOTAL	2324 sqm

SOAKWELL SIZE 2.4m DIAMETER x 2.4m DEEP
THEREFORE 229.31m³ - AREA SERVED FOR 100 YEAR 24 HOUR STORM

SOAKWELL SIZE / EIA 229.31m³ / 2324sqm
NUMBER OF SOAKWELLS REQUIRED 10no (EACH 2.4m x 2.4m)

NOT FOR CONSTRUCTION

ISSUE FOR DEVELOPMENT APPROVAL

OFF2SITE PROJECTS

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CLIENT: **CARDIFF CAPITAL PTY LTD**

PROJECT: **COMMERCIAL DEVELOPMENT**
LOT 2 YANCHEP BEACH ROAD, YANCHEP

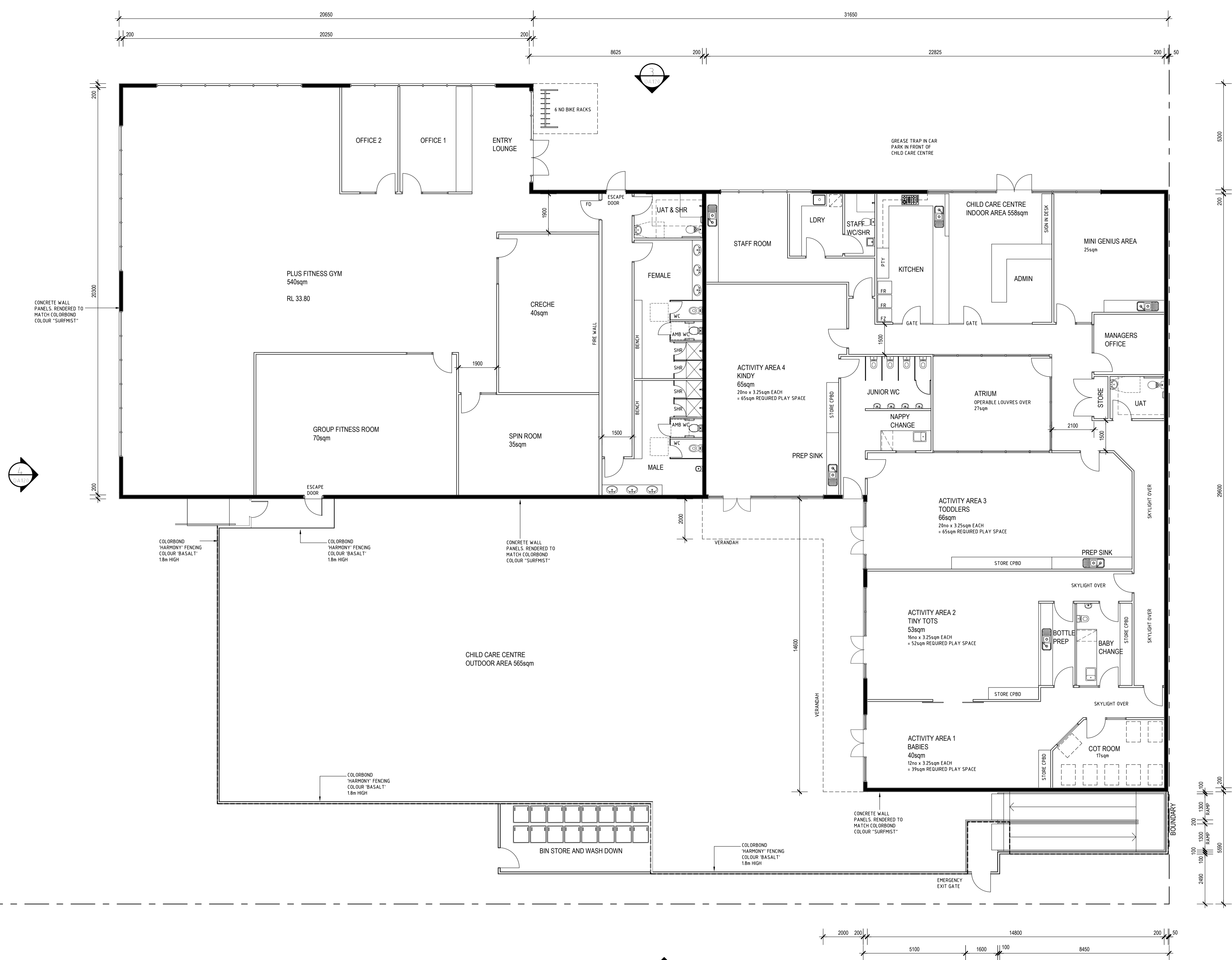
DRAWING: **SITE PLAN**

PROJECT DATE	FEB 2019	DWG No	DA101	REV	J
PROJECT No	17028				
SCALE	1 : 200 @ A1				

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SITE PLAN
SCALE 1:200

No	DATE	ISSUE / REVISION
A	12.03.18	ISSUE FOR DEVELOPMENT APPROVAL
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D	30.07.18	REVISED CAR PARKING AND SITE LAYOUT ISSUE FOR REVISED DA APPLICATION
E	04.03.19	INCLUSION OF GYM, ADJUST REAR EXIT TO CHILD CARE PLAY SPACE, ADJUST CAR PARKING, INCREASE LANDSCAPING AREA



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CONSTRUCTION**

**ISSUE FOR
DEVELOPMENT APPROVAL**

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PROJECTS**

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PROJECT: **COMMERCIAL DEVELOPMENT**
LOT 2 YANCHEP BEACH ROAD, YANCHEP

DRAWING: **FLOOR PLANS**

PROJECT DATE: FEB 2019	DWG No: 17028	REV: DA110	REV: E
PROJECT No: 17028			
SCALE: 1: 100 @ A1			

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FLOOR PLAN
SCALE 1:100

