

**PROPOSED CHILD CARE CENTRE  
LOT 1062 TUBEROSE ROAD  
PIARA WATERS**

**ENVIRONMENTAL ACOUSTIC ASSESSMENT**

JULY 2020

OUR REFERENCE: 26001-2-20167

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**ENVIRONMENTAL ACOUSTIC ASSESSMENT**  
**PROPOSED CHILD CARE CENTRE**  
**TUBEROSE ROAD, PIARA WATERS**

Job No: 20167

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FOR

**LDV PROJECTS**

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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 Lot 1062 (#55) Tuberoso Road, Piara Waters.

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 premises from children playing in the outdoor areas would, with the proposed boundary fencing as shown on Figure 03 in Section 5 - Modelling, comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*, for the day period. However, it is noted that 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 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.

Additionally, noise from the mechanical services has also been assessed to comply with the relevant criteria. For information, the recommended locations for the condensing units are shown on Figure 02 in Section 5 – Modelling.

It is noted that noise associated with cars are exempt from complying with the Regulations. Noise received at the neighbouring residences would comply with the Regulatory requirements, with boundary fencing shown on Figure 03 in Section 5 – Modelling.

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 boundary fencing as shown in Figure 03 in Section 5 and the air conditioning condensing units located as shown on Figure 02 in Section 5.

### 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 <sub>A10</sub>	L <sub>A1</sub>	L <sub>Amax</sub>
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 : any area other than highly sensitive area	All hours	60	75	80

Note: L<sub>A10</sub> is the noise level exceeded for 10% of the time.  
 L<sub>A1</sub> is the noise level exceeded for 1% of the time.  
 L<sub>Amax</sub> is the maximum noise level.  
 IF is the influencing factor.

Under the Regulations, a highly sensitive area means that area (if any) of noise sensitive premises comprising –

- (a) A building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
- (b) Any other part of the premises within 15 m of that building or that part of the building.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

**“impulsiveness”** means a variation in the emission of a noise where the difference between L<sub>Apeak</sub> and L<sub>Amax(Slow)</sub> 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<sub>AFast</sub> or is more than 3 dB L<sub>AFast</sub> 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.

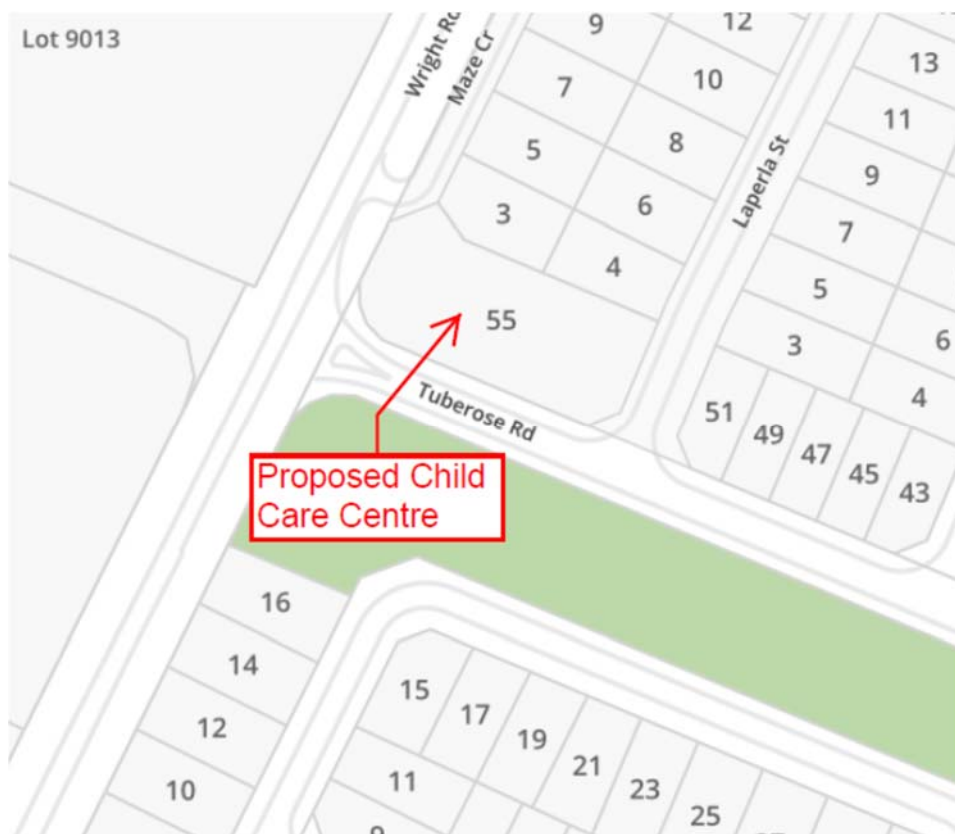
**TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS**

Where <b>tonality</b> is present	Where <b>modulation</b> is present	Where <b>impulsiveness</b> 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 of concern to the proposed development, are located around the development.

A development plan of the area is shown below as Figure 01, noting that the lots to the west of Wright Road would also be residential.



**FIGURE 01 – NEIGHBOURING LOTS**

At the neighbouring residences, with the medical centre to the south, the influencing factor has been determined to be 0 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 <sub>A10</sub>	L <sub>A1</sub>	L <sub>Amax</sub>
Noise sensitive premises : highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)	45	55	65
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40	50	65
	1900 - 2200 hours all days (Evening)	40	50	55
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35	45	55
Commercial Premises	All hours	60	75	80

Note: L<sub>A10</sub> is the noise level exceeded for 10% of the time.  
 L<sub>A1</sub> is the noise level exceeded for 1% of the time.  
 L<sub>Amax</sub> 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 1900 hours, Monday to Friday (closed on public holidays). It is understood that the proposed childcare centre will cater for a maximum of 97 children, with the following breakdown of children :

Babies	13 places
Toddlers	40 places
Pre Kindy	20 places
Kindy	24 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.

For reference, plans are attached in Appendix A.

#### 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	2 @ 68 2 @ 70

Notes :

- 1 Given the number and breakdown of children, acoustic modelling of outdoor play noise was made, based on 70 children playing within the outdoor play areas at the one time, utilising 7 groups of 10 children sound power levels distributed as plane sources.
- 2 With regards to the air conditioning, we understand that the air conditioning has not been designed at this stage of the development. However, it is recommended that the condensing units would be located as shown on Figure 02.
- 3 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.
- 4 Boundary fencing being as shown below on Figure 03. The fencing needs to be continuous in construction (ie no gaps), with a minimum density of 15 kg/m<sup>2</sup>.
- 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 for each location ( ie West, north, east and southern residences) have been listed.
- 6 Modelling shows that noise received at the neighbouring residence for car movements, car starts and car doors closing would comply with the assigned noise level for the day period. However, to achieve compliance at the residence to the north and east (i.e. adjacent residences to the car park) during the night period (ie before 7am), the fencing adjacent to the car park needs to be as shown on Figure 03.

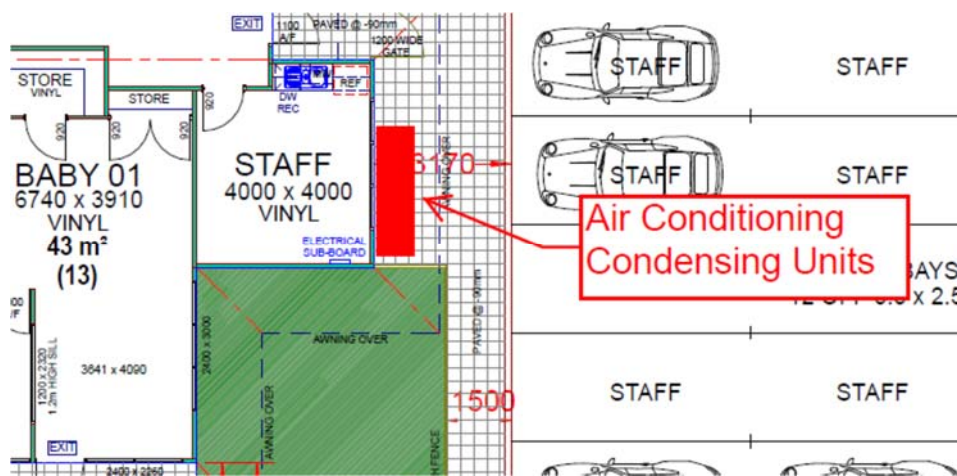
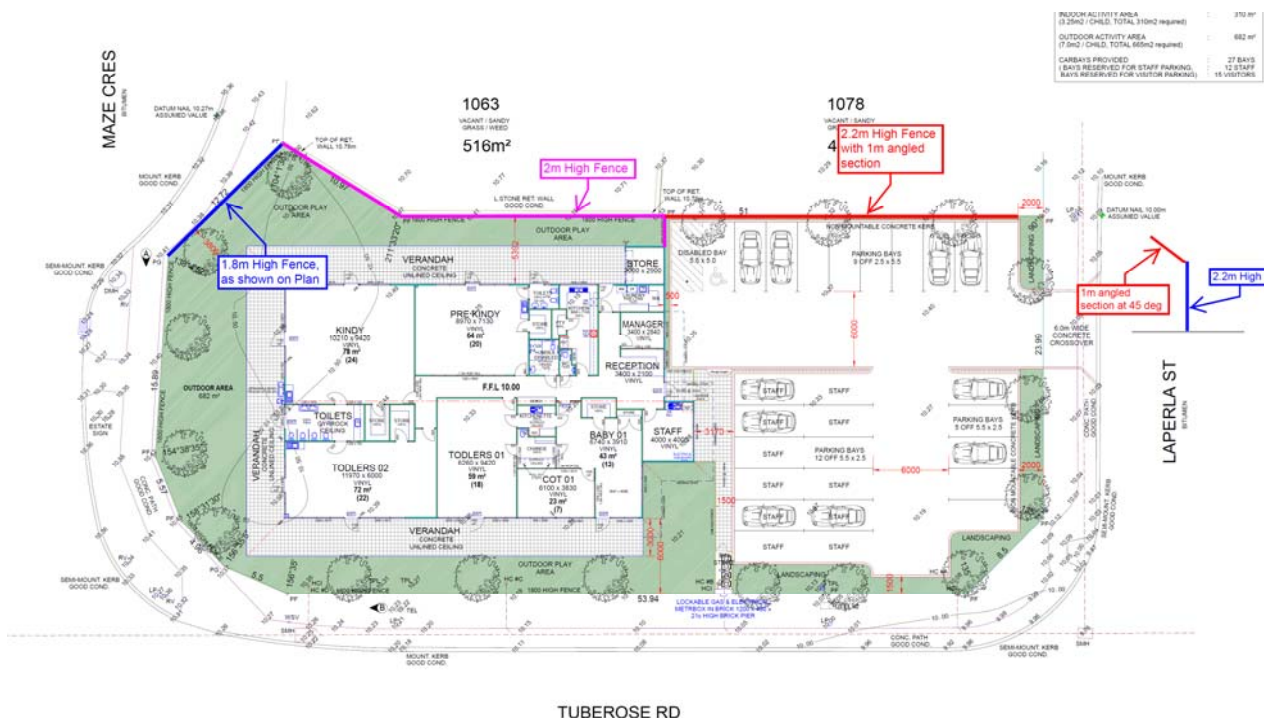


FIGURE 02 – AIR CONDITIONING





TUBEROSE RD  
**FIGURE 03 – 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
West	42	16 (21)
North	44	30 (35)
East	42	30 (35)
South	43	29 (34)

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

With regards to noise associated with cars within the parking area, resultant noise levels are tabulated in Tables 6.2 and 6.3. It is noted that noise emissions from a moving car being an  $L_{A1}$  noise level, with noise emissions from cars starting and doors closing being an  $L_{Amax}$  noise level.

Based on the definitions of tonality, noise emissions from car movements and car starts, being an  $L_{A1}$  and  $L_{Amax}$  respectively, being present for less than 10% of the time, would not be considered tonal. Thus, no penalties would be applicable, and the assessment would be as listed in Table 6.2 (Car Moving) and Table 6.3 (Car Starting). However, noise emissions from car doors closing could be impulsive, hence the +10dB penalty has been included in the assessment.

**TABLE 6.2 - ACOUSTIC MODELLING RESULTS  $L_{A1}$  CRITERIA  
CAR MOVING**

Neighbouring Premises	Calculated Noise Level (dB(A))
West	30
North	38
East	39
South	34

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

Neighbouring Premises	Calculated Noise Level (dB(A))	
	Car Starting	Door Closing
	Night	Night
West	37	38 [48]
North	43	45 [55]
East	43	44 [54]
South	39	41 [51]

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

Tables 6.4 to 6.8 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
West	42	45	Complies
North	44	45	Complies
East	42	45	Complies
South	43	45	Complies

**TABLE 6.5 – ASSESSMENT OF  $L_{A10}$  NIGHT PERIOD NOISE LEVEL EMISSIONS  
AIR CONDITIONING**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
West	21	35	Complies
North	35	35	Complies
East	35	35	Complies
South	34	35	Complies

**TABLE 6.6 – ASSESSMENT OF  $L_{A1}$  NIGHT PERIOD NOISE LEVEL EMISSIONS  
CAR MOVEMENTS**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
West	30	45	Complies
North	38	45	Complies
East	39	45	Complies
South	34	45	Complies

**TABLE 6.7 – 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
West	37	55	Complies
North	43	55	Complies
East	43	55	Complies
South	39	55	Complies

**TABLE 6.8 – 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
West	48	55	Complies
North	55	55	Complies
East	54	55	Complies
South West	51	55	Complies

## 7. CONCLUSION

Noise received at the neighbouring residential premises from children playing in the outdoor play area would, with the boundary fencing as shown on Figure 03, comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the day period. It is understood that although the child care centre would open before 7am, the outdoor play area would not to be utilised until after 7am. Hence, compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997* would be achieved.

With the air condition condensing units located, as shown in Figure 02, noise from the mechanical services has also been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times.

It is noted that noise associated with cars movements and cars starting are exempt from complying with the Regulations. However, noise emissions from car doors is not strictly exempt from the Regulations. Noise received at the neighbouring residences from these noise sources would comply with the Regulatory requirements, with boundary fencing shown on Figure 03 in Section 5 – Modelling.

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 mitigation as outlined above.

# **APPENDIX A**

## PLAN

SERVICE RECORD			
STATUS	LOCATED	AVAILABLE	NO SERVICE CONFIRM
WATER			✓
SEWERAGE			✓
GAS			✓
TEL / COMM			✓
POWER			✓
O/H			✓

SERVICES MARKED CONFIRM REQUIRE BUILDER / CLIENT TO CONFIRM AVAILABILITY AND / OR POSITION ON SITE.

DRAINAGE	
COMBO PIT	
GRATE	
SIDE ENTRY PIT	
STORM WATER MANHOLE	

ELECTRICITY	
CABLE DOME	
CABLE MANHOLE	
CABLE PIT	
CONSUMER POLE	
LIGHT POLE	
POWER POLE	
STAY POLE	
STAY WIRE ANCHOR	
O/H POWER LINE	

SEWERAGE	
SEWER MANHOLE	
INSPECTION OPENING	
SEWER LINE	

TELECOMMUNICATIONS	
TEL / COMMS MANHOLE	
TEL / COMMS MARKER	
TEL / COMMS PIT	

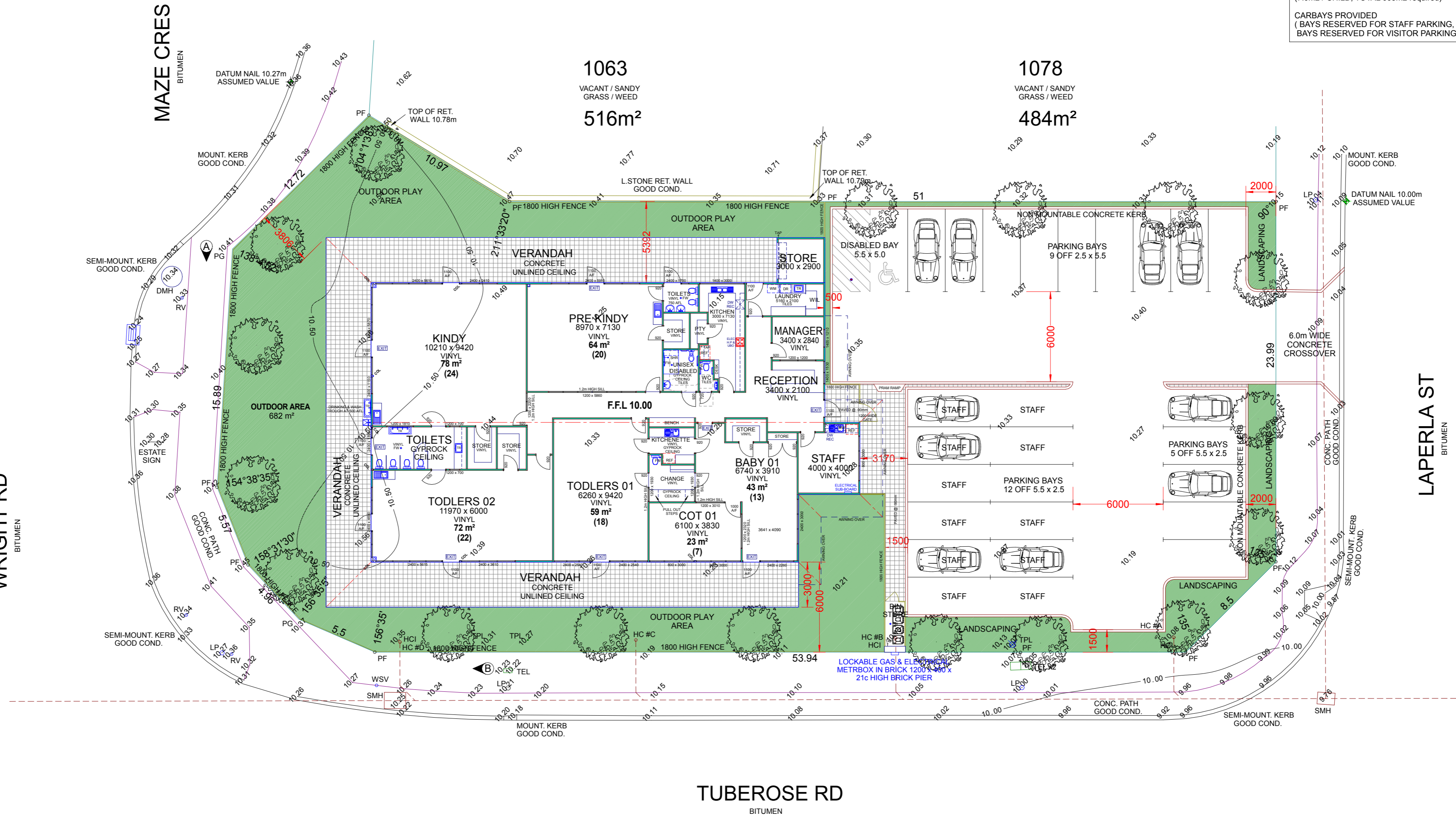
WATER	
FLUSH POINT	
HYDRANT	
STOP VALVE	
TAP	
WATER MARKER	
WATER METER	

SURVEY	
DATUM	
PEG FOUND	

OTHER	
AWNING / EAVES	
BANK - BOTTOM	
BANK - TOP	
ROOF RIDGE	
WINDOW / DOOR	

SERVICE LEGEND			
MAZE CRES	BITUMEN	WRIGHT RD	BITUMEN
TUBEROSE RD	BITUMEN	LAPERLA ST	BITUMEN

PROPOSED CHILDCARE CENTRE (97 PLACES)	
LOT AREA	: 2086 m <sup>2</sup>
BUILDING AREA	: 624.63 m <sup>2</sup>
LANDSCAPING AREA	: 117 m <sup>2</sup>
INDOOR ACTIVITY AREA (3.25m <sup>2</sup> / CHILD, TOTAL 310m <sup>2</sup> required)	: 310 m <sup>2</sup>
OUTDOOR ACTIVITY AREA (7.0m <sup>2</sup> / CHILD, TOTAL 665m <sup>2</sup> required)	: 682 m <sup>2</sup>
CARBAYS PROVIDED (BAYS RESERVED FOR STAFF PARKING, 12 STAFF BAYS RESERVED FOR VISITOR PARKING)	: 27 BAYS
	: 12 STAFF
	: 15 VISITORS



**SITE PLAN**  
 JOB No 19-2024  
 SCALE 1:200 ON A2 SHEET

**PROPOSED PIARA WATERS CHILDCARE CENTRE**  
**LOT 1062 TUBEROSE ROAD**  
**PIARA WATERS**

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