



# Transport Impact Assessment

Project:	Proposed Child Care Centre Lot 212 Gungurru Avenue, Hocking
Client:	Del Borrello
Author:	Paul Nguyen
Date:	21 <sup>st</sup> May 2019
Document #	1903015-TIA-001

CONSULTING CIVIL AND TRAFFIC ENGINEERS  
1 ST. FLOOR, 908 ALBANY HIGHWAY, EAST VICTORIA PARK WA 6101.  
PHONE|+61 8 9355 1300  
FACSIMILE| +61 8 9355 1922  
EMAIL| admin@shawmac.com.au



## Document Status

Version	Prepared By	Reviewed By	Approved By	Date
1	P. Nguyen	L. Dawson	L. Dawson	01/04/2019
2	P. Nguyen	L. Dawson	L. Dawson	21/05/2019



# Contents

- 1. Introduction ..... 1
  - 1.1. Background..... 1
  - 1.2. Location ..... 1
- 2. Proposed Development..... 3
- 3. Traffic Management on Frontage Streets..... 4
  - 3.1. Road Layout and Hierarchy ..... 4
  - 3.2. Intersections..... 5
  - 3.3. Existing Traffic Volumes..... 5
- 4. Vehicle Access and Parking..... 6
  - 4.1. Proposed Access and Parking ..... 6
  - 4.2. Parking Supply..... 6
  - 4.3. Access and Parking Layout..... 7
    - 4.3.1. Parking ..... 7
  - 4.4. Access Sight Distance ..... 7
  - 4.5. Provision for Service Vehicles..... 9
- 5. Traffic Volumes and Vehicle Types..... 10
  - 5.1. Trip Generation ..... 10
  - 5.2. Access Capacity ..... 11
  - 5.3. Vehicle Types ..... 13
- 6. Public Transport Access ..... 14
- 7. Pedestrian and Cyclist Access ..... 15
- 8. Site Specific and Safety Issues ..... 16
  - 8.1. Crash History ..... 16
- 9. Conclusions ..... 17
- Appendix A – Development Plans..... 18



## Figures

Figure 1: General Site Location.....	1
Figure 2: Site Location and Layout.....	2
Figure 3: Surrounding Land Use .....	3
Figure 4: Road Network Layout and Hierarchy.....	4
Figure 5: Average Weekday Traffic (AWT) Counts .....	5
Figure 6: Vehicle Access and Parking Layout.....	6
Figure 7: AS2890.1 – 90 Degree Angled Parking.....	7
Figure 8: AS2890.1 – Access Sight Distance Requirements.....	8
Figure 9: Access Sight Distance.....	9
Figure 10: Distribution of Site Trips .....	11
Figure 11: Modelled Access Layout and Vehicle Movement during the Morning Peak Hour .....	12
Figure 12: SIDRA Assessment Results – Gungurru Avenue Access – Morning Peak Hour .....	13
Figure 13: Bus Stop Locations .....	14
Figure 14: Pedestrian and Cyclist Accessibility .....	15
Figure 15: Crash Summary .....	16

## Tables

Table 1: Road Configuration.....	4
----------------------------------	---

# 1. Introduction

## 1.1. Background

Shawmac has been engaged to prepare a Transport Impact Assessment for a proposed child care centre to be located on the south-east corner of Wanneroo Road and Gungurru Avenue in Hocking. The site is within the City of Wanneroo. This Transport Impact Assessment has been prepared in accordance with the following documents:

- Western Australian Planning Commission document *Transport Assessment Guidelines for Development: Volume 4 – Individual Developments* (WAPC TIA Guidelines); and
- City of Wanneroo *Local Planning Policy 2.3 – Child Care Centres* (LPP2.3)

## 1.2. Location

The site address is Lot 212 (No. 4) Gungurru Avenue, Hocking. The general location of the site shown in **Figure 1**. An aerial photo of the site is shown in **Figure 2**.



Figure 1: General Site Location



Figure 2: Site Location and Layout

## 2. Proposed Development

The proposal development is a child care centre accommodating up to 135 children and 22 staff. The proposed operating hours are from 6.30am to 6.30pm Monday to Friday.

The site plan is attached as **Appendix A**.

There are existing single storey residential dwelling on the lot. The surrounding land use is primarily residential. A summary of the surrounding development is shown in **Figure 3**.

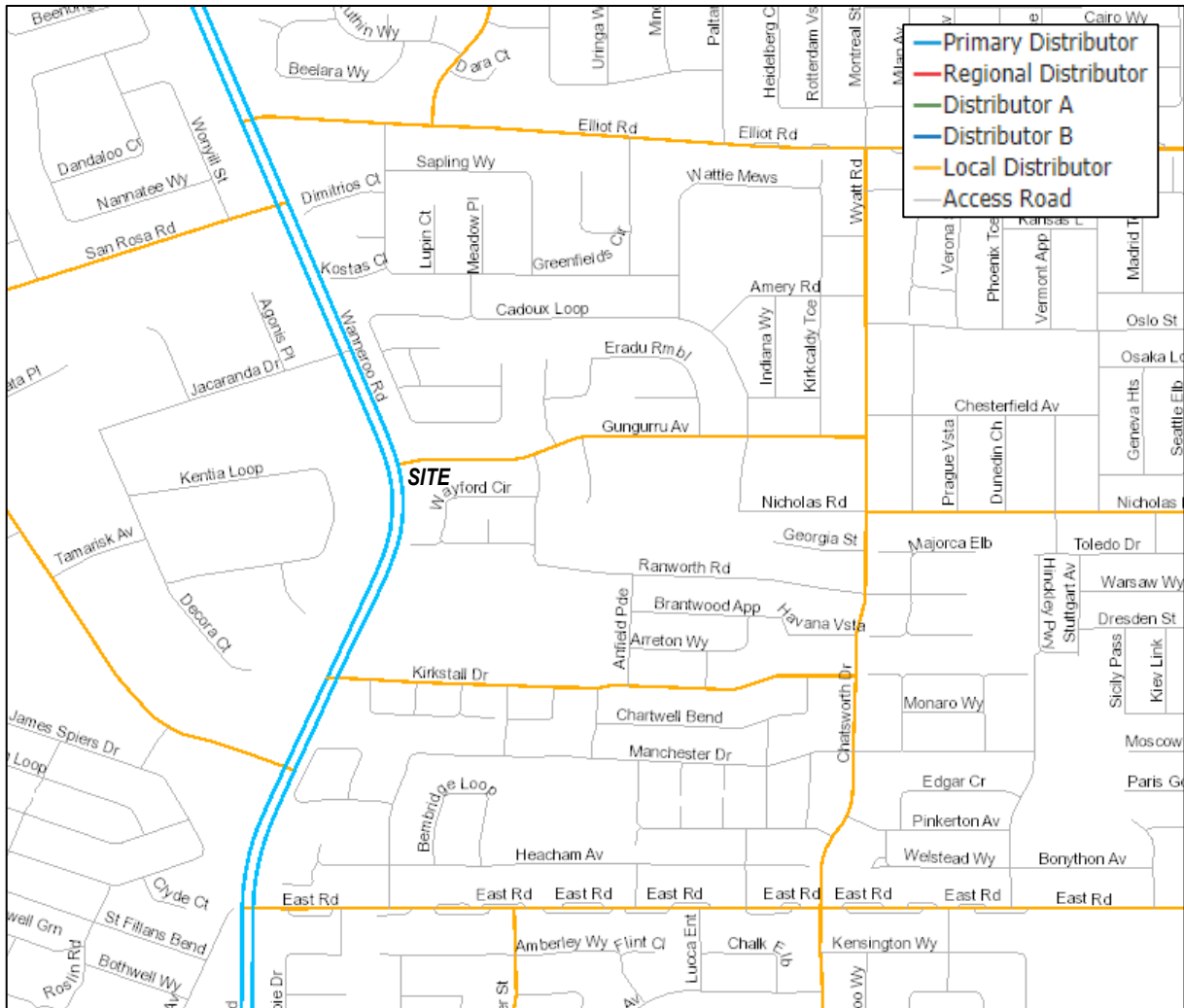


Figure 3: Surrounding Land Use

### 3. Traffic Management on Frontage Streets

#### 3.1. Road Layout and Hierarchy

The layout and hierarchy of the surrounding road network as obtained from the MRWA *Road Information Mapping System* is shown in **Figure 4**.



**Figure 4: Road Network Layout and Hierarchy**

The road cross sections and pavement widths of the surrounding road network are summarised in **Table 1**.

**Table 1: Road Configuration**

Road	Cross Section	Pavement Width (approx.)	Speed Limit
Wanneroo Road	Dual carriageway – 4 lanes	2 x 7.5 metres	70km/h
Gunguru Avenue	Single carriageway – 2 lanes	7.4 metres	50km/h
Wayford Circle	Single carriageway – 2 lanes	6.0 metres	50km/h



### 3.2. Intersections

Gunguru Avenue intersects with Wanneroo Road as a T-intersection with only left-in/left-out movements permitted.

### 3.3. Existing Traffic Volumes

The latest traffic data as sourced from MRWA's Traffic Maps is shown in **Figure 5**.

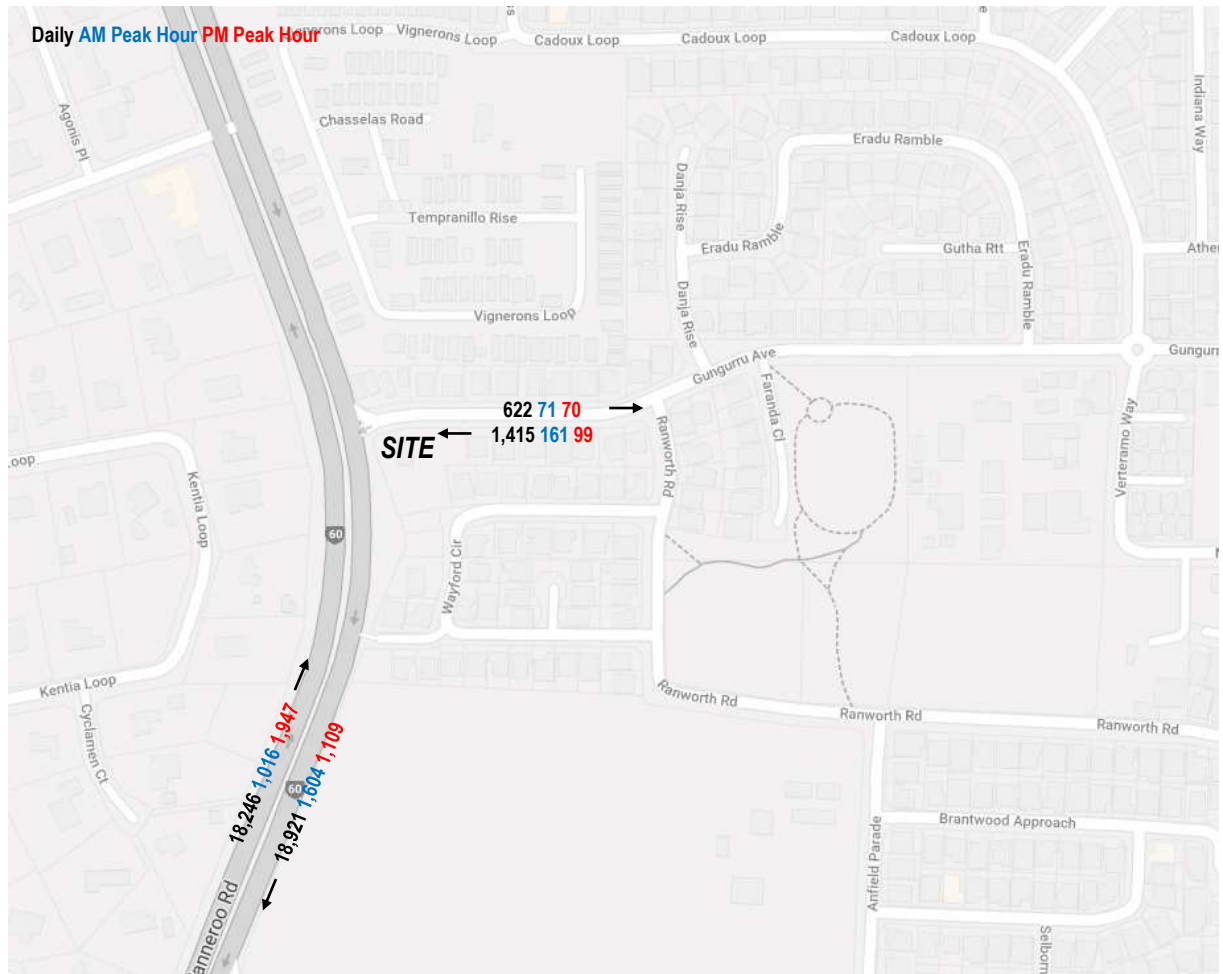


Figure 5: Average Weekday Traffic (AWT) Counts

## 4. Vehicle Access and Parking

### 4.1. Proposed Access and Parking

Vehicle access will be via a new crossover from Gungurru Avenue in the same location as the existing crossover and a new crossover from Wayford Circle. A main car park will connect to Gungurru Avenue and will have 36 bays including 1 ACROD bay. The secondary car park from Wayford Circle will have 4 bays.

The proposed access and parking layout is shown in **Figure 6**.



Figure 6: Vehicle Access and Parking Layout

### 4.2. Parking Supply

According to LPP2.3, the on-site parking requirement is:

- 9 bays; plus
- 1 bay per 7 children in excess of 72; plus
- 1 bay per staff member.

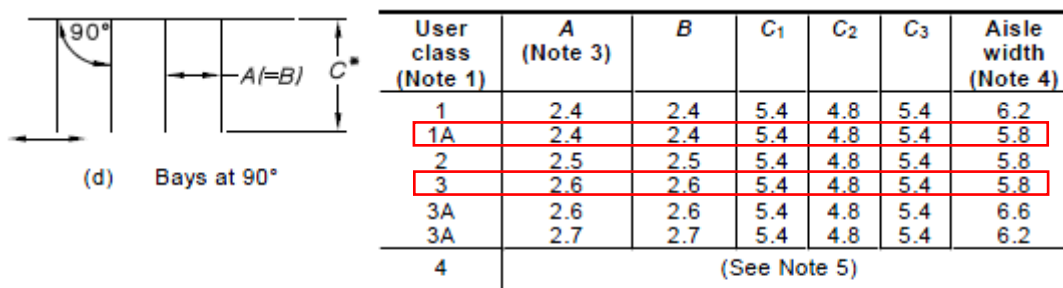
Based on 135 children and 22 staff, the minimum car parking requirement is 40 bays (18 for pick-up/drop-off and 22 for staff). The proposed 40 bays meets this requirement and is therefore considered to be adequate to meet the likely parking demand.

### 4.3. Access and Parking Layout

#### 4.3.1. Parking

The layout and dimensions of the car park have also been assessed for compliance with Australian Standard AS2890.1-2004 – *Parking facilities – Off-street car parking* (AS2890.1). The facility has been assessed as a Class 1A facility for staff parking and a Class 3 parking facility for the short term parking for pick-up and drop off.

The required dimensions for 90 degree angled parking are shown in **Figure 7**.



\*Dimension C is selected as follows (see Note 6):

C<sub>1</sub>—where parking is to a wall or high kerb not allowing any overhang.

C<sub>2</sub>—where parking is to a low kerb which allows 600 mm overhang in accordance with Clause 2.4.1(a)(i).

C<sub>3</sub>—where parking is controlled by wheelstops installed at right angles to the direction of parking, or where the ends of parking spaces form a sawtooth pattern, e.g. as shown in the upper half of Figure 2.4(b).

**Figure 7: AS2890.1 – 90 Degree Angled Parking**

The parking bays and aisles are compliant with the AS2890.1 requirements except for the pick-up/drop-off bays which are designed to be 2.5 metres (100mm short of the minimum requirement). In this instance, the 100mm shortfall in bay width is considered to be adequately compensated by the wider parking aisle (6.0 metres - 200mm wider than minimum requirement) and therefore no change to the bay dimensions are recommended.

Due to the differing bay widths, it is recommended that the staff bays are clearly marked and/or signposted to ensure the appropriate use of these bays.

AS2890.1 also requires that provision for turning around is required at the end of blind aisles longer than six 90 degree spaces. One of the bays at the end of the aisle closest to Wanneroo Road has been reserved as a turnaround bay to satisfy this requirement.

### 4.4. Access Sight Distance

Figure 3.2 of AS2890.1, shown as **Figure 8**, prescribes the minimum required stopping sight distance (SSD) for access driveways based on the approach speed of vehicles on the frontage road.

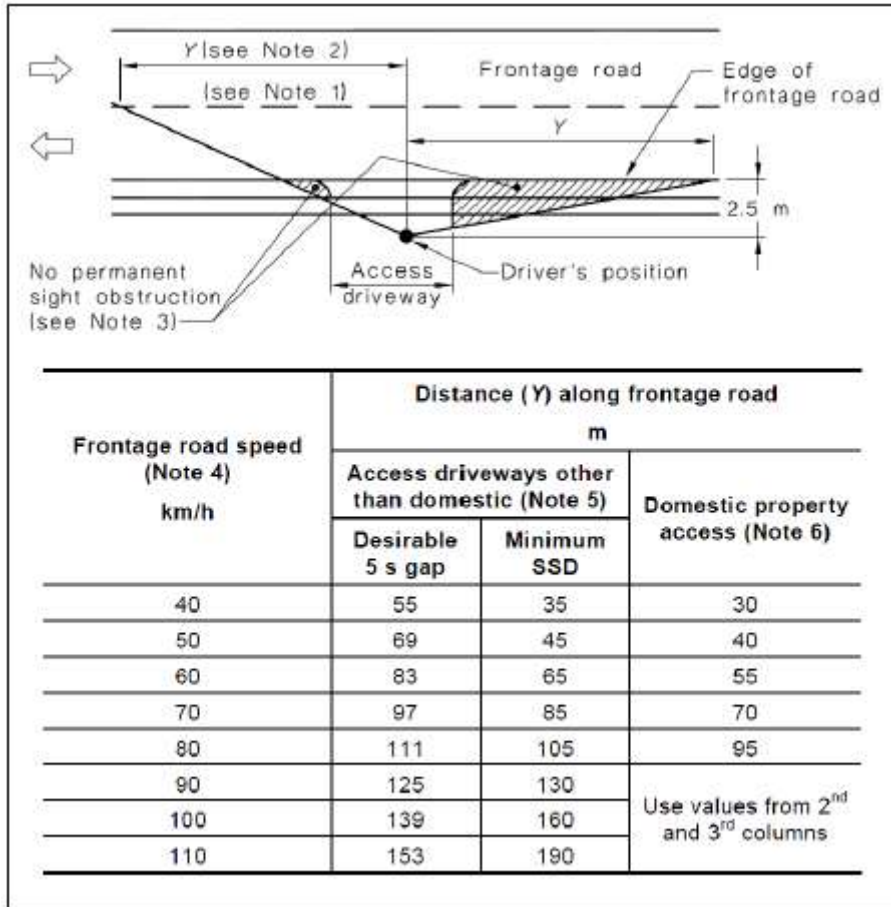


Figure 8: AS2890.1 – Access Sight Distance Requirements

Based on the 50km/h frontage speed along Gungurru Avenue Wayford Circle, the minimum required SSD from the proposed crossovers is 45 metres. A desktop review using aerial imagery and Google Street view concludes that the minimum sight distance is achieved in both directions as shown in **Figure 9**.



Figure 9: Access Sight Distance

#### 4.5. Provision for Service Vehicles

Waste will be collected from the Gungurru Avenue kerbside by a private contractor.



---

## 5. Traffic Volumes and Vehicle Types

---

### 5.1. Trip Generation

The volume of traffic generated by the child care centre has been estimated using trip generation rates from the NSW Roads and Maritime Services (formerly RTA) *Guide to Traffic Generating Developments*. The proposed child care centre can be classified as a “Long day-care centre” with peak periods of traffic generation generally coinciding with the peak period of traffic on the road network from 7 to 9 am and from 4 to 6 pm. The trip generation rate is 0.8 vehicle trips per child in the morning and 0.7 vehicle trips per child in the afternoon.

Based on the 135 child capacity, the development is estimated to generate approximately 108 vehicle trips during the morning peak period and 95 vehicle trips during the afternoon peak period. The above guideline does not provide a daily trip generation rate and therefore the daily trip generation rate for *Day Care Centre* from the Institute of Transportation Engineers (ITE) *Trip Generation* has been used which is 4.38 trips per student. Based on the 135 child capacity, the site is predicted to generate 591 daily vehicle trips.

The likely traffic catchment of the child care centre would include most of Hocking and some of the neighbouring suburbs. Due to the left-in/left-out restriction at the Wanneroo Road / Gungurru Avenue intersection, the attraction of traffic to and from the site is expected to be distributed relatively evenly in both directions along Gungurru Avenue. The estimated distribution of site generated trips is shown in **Figure 10**.



**Figure 10: Distribution of Site Trips**

The WAPC TIA Guidelines refers to Austroads Guide to Traffic Management for assessment of the impact of changes in traffic flows on the surrounding road network. Austroads *Guide to Traffic Management Part 3: Traffic Studies and Analysis* (AGTM03) notes that the following typical mid-block lane capacities for urban roads with interrupted flow:

- 900 pc/h on an undivided road
- 1,000 pc/h on a divided road

Based on the peak hour flows as shown in **Figure 10**, the additional trips generated by the child care centre will not increase the peak hour flows above the capacity of the existing roads. Although the majority of vehicle trips will be made via Gungurru Avenue, the existing peak hour volumes are relatively low and there is adequate capacity to accommodate the development traffic.

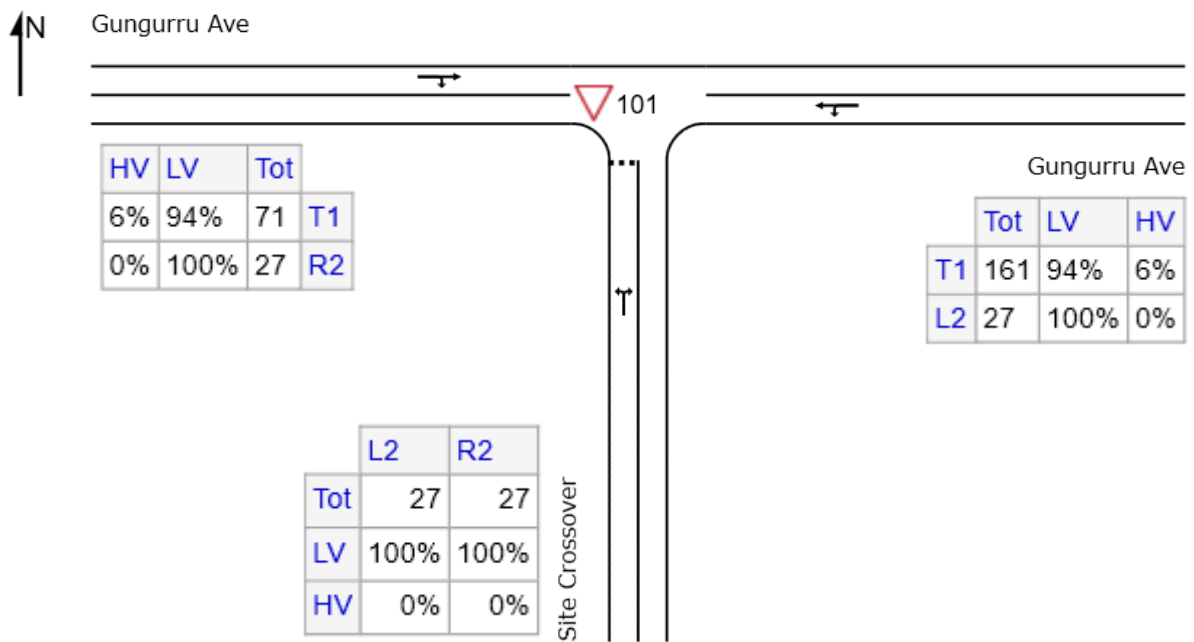
## 5.2. Access Capacity

A high level capacity analysis of the primary site crossover on Gungurru Avenue has been undertaken using SIDRA Intersection 8.0 to confirm that the access will perform at an acceptable level during the peak periods.

Only the morning peak period has been assessed as the morning peak is slightly higher along Gungurru Avenue than the afternoon peak. The morning drop-off peak at child care centres is also likely to occur within a shorter period than the pick-up period in the afternoon as suggested by the trip generation.

The modelled layout and peak hour volumes are shown in **Figure 11**. For simplicity it was assumed that:

- All site trips were made through the Gungurru Avenue;
- All trips including two vehicle movements (1 inbound and 1 outbound); and
- Trips were split 50/50 from both directions along Gungurru Avenue.



**Figure 11: Modelled Access Layout and Vehicle Movement during the Morning Peak Hour**

The results of the analysis, as shown in **Figure 12**, indicate the crossover will perform well within capacity during the morning peak period with a degree of saturation 0.1 (capacity is typically at 0.9) and a Level of Service A.





**Site: 101 [Gungurru Ave Crossover - Morning Peak]**

Site Category: -  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Site Crossover												
1	L2	27	0.0	0.046	5.1	LOS A	0.2	1.1	0.27	0.55	0.27	46.0
3	R2	27	0.0	0.046	5.6	LOS A	0.2	1.1	0.27	0.55	0.27	45.6
Approach		54	0.0	0.046	5.3	LOS A	0.2	1.1	0.27	0.55	0.27	45.8
East: Gungurru Ave												
4	L2	27	0.0	0.100	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	49.0
5	T1	161	6.3	0.100	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	49.5
Approach		188	5.4	0.100	0.7	NA	0.0	0.0	0.00	0.08	0.00	49.4
West: Gungurru Ave												
11	T1	71	6.3	0.056	0.2	LOS A	0.2	1.2	0.17	0.16	0.17	48.7
12	R2	27	0.0	0.056	5.2	LOS A	0.2	1.2	0.17	0.16	0.17	47.7
Approach		98	4.6	0.056	1.6	NA	0.2	1.2	0.17	0.16	0.17	48.4
All Vehicles		340	4.3	0.100	1.7	NA	0.2	1.2	0.09	0.18	0.09	48.5

Figure 12: SIDRA Assessment Results – Gungurru Avenue Access – Morning Peak Hour

A sensitivity analysis was also undertaken to account for the assumptions and for potential growth in traffic along Gungurru Avenue. Even with all peak hour movements doubled, the access is still predicted to perform within capacity (degree of saturation 0.2 and Level of Service A).

A capacity analysis at any other external intersections has not been undertaken as the expected trip generation is sufficiently low.

### 5.3. Vehicle Types

The site is only expected to generate car trips.

## 6. Public Transport Access

The following public transport services are currently available within reasonable walking distance from the site:

- Transperth Bus Route 389 operating between Perth and Wanneroo via Wanneroo Road.
- Transperth Bus Route 468 operating between Whitfords Station and Joondalup Station via Wanneroo Road.
- Transperth Bus Route 467 operating between Whitfords Station and Joondalup Station via Pearsall, Hocking and Ashby.

The nearest bus stops are located as shown in **Figure 13**.

The existing service is considered adequate to meet the likely public transport demand of the proposed development.

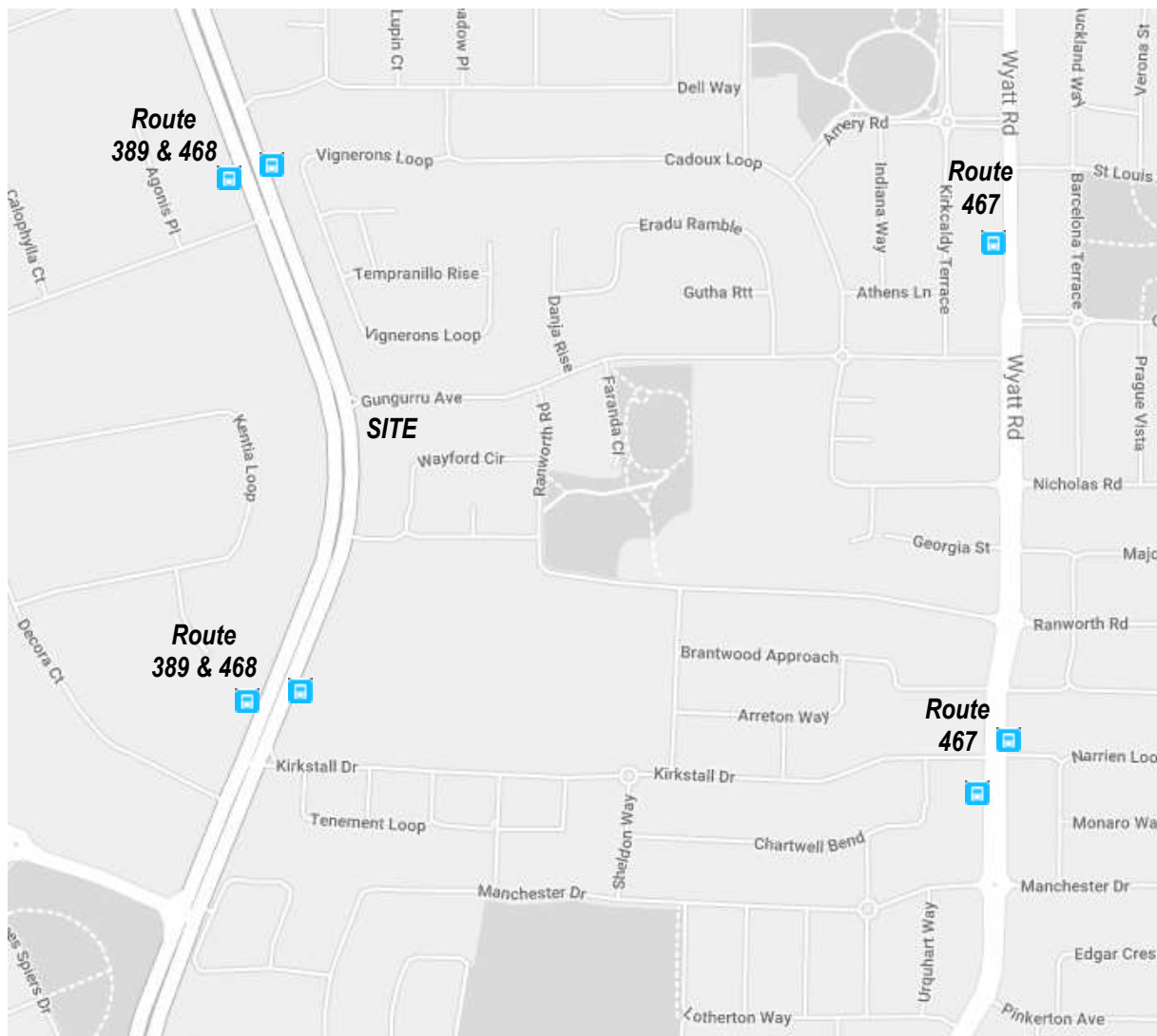


Figure 13: Bus Stop Locations

## 7. Pedestrian and Cyclist Access

Pedestrian entry to the site will be from Gungurru Avenue as shown in **Figure 14**. The entrance is only a short distance from the existing path along this road. A walkway connecting the roadside path to the building entrance is proposed internally to accommodate any pedestrians.

There is also a secondary pedestrian entrance from the smaller car park from Wayford Circle for staff use.



**Figure 14: Pedestrian and Cyclist Accessibility**

The City of Wanneroo Local Planning Scheme notes that Local Government may require the provision of bicycle parking and end of trip facilities in accordance with Austroads' *Guide to Engineering Practice Part 14: Bicycles* (currently covered by Austroads' *Guide to Traffic Management Part 11: Parking*). Austroads recommends 1 bicycle space for child day care centres.

A bicycle rack with two bicycle spaces is shown close to the entrance which complies with Austroads' recommendation.

## 8. Site Specific and Safety Issues

### 8.1. Crash History

The number of crashes occurring at mid-block locations and intersections in the vicinity of the site within the five-year period ending December 2017 was sourced from the MRWA Reporting Centre as illustrated in **Figure 15**.



**Figure 15: Crash Summary**

The number of recorded crashes is considered to be relatively low for the volume of traffic on the adjacent roads and do not suggest any particular safety issue with the existing road layout. The volume of traffic expected to be generated by the development is low and not considered to increase the risk of crashes above acceptable levels.



## 9. Conclusions

---

A transport assessment of the proposed child care centre to be located on the corner of Wanneroo Road and Gungurru Avenue, Hocking, in the City of Wanneroo has concluded the following:

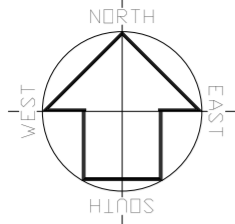
- There is adequate capacity in the existing road network to accommodate the expected development traffic.
- The proposed car parking supply satisfies the minimum requirements as outlined by the City of Wanneroo Local Planning Policy 2.3.
- The layout of the car park is primarily compliant with Australian Standards except for the proposed pick-up/drop-off car bay width of 2.5 metres which is 100mm below the minimum requirement of 2.6 metres. In this instance the minor shortfall in bay width is considered to be adequately compensated by the aisle width which is 200mm wider than the minimum requirements.
- There is adequate sight distance from the proposed site crossovers in both directions.
- The existing available public transport service is considered adequate to meet the likely public transport demand of the development.
- A bicycle rack with 2 spaces is proposed which meets the Austroads recommended bicycle parking provision.
- A review of the crash history adjacent to the site did not indicate any safety issues with the road network and the additional traffic generated by the proposed development is not likely to increase the risk of crashes.



---

## Appendix A – Development Plans

---



**LOT 212**

3576sqm

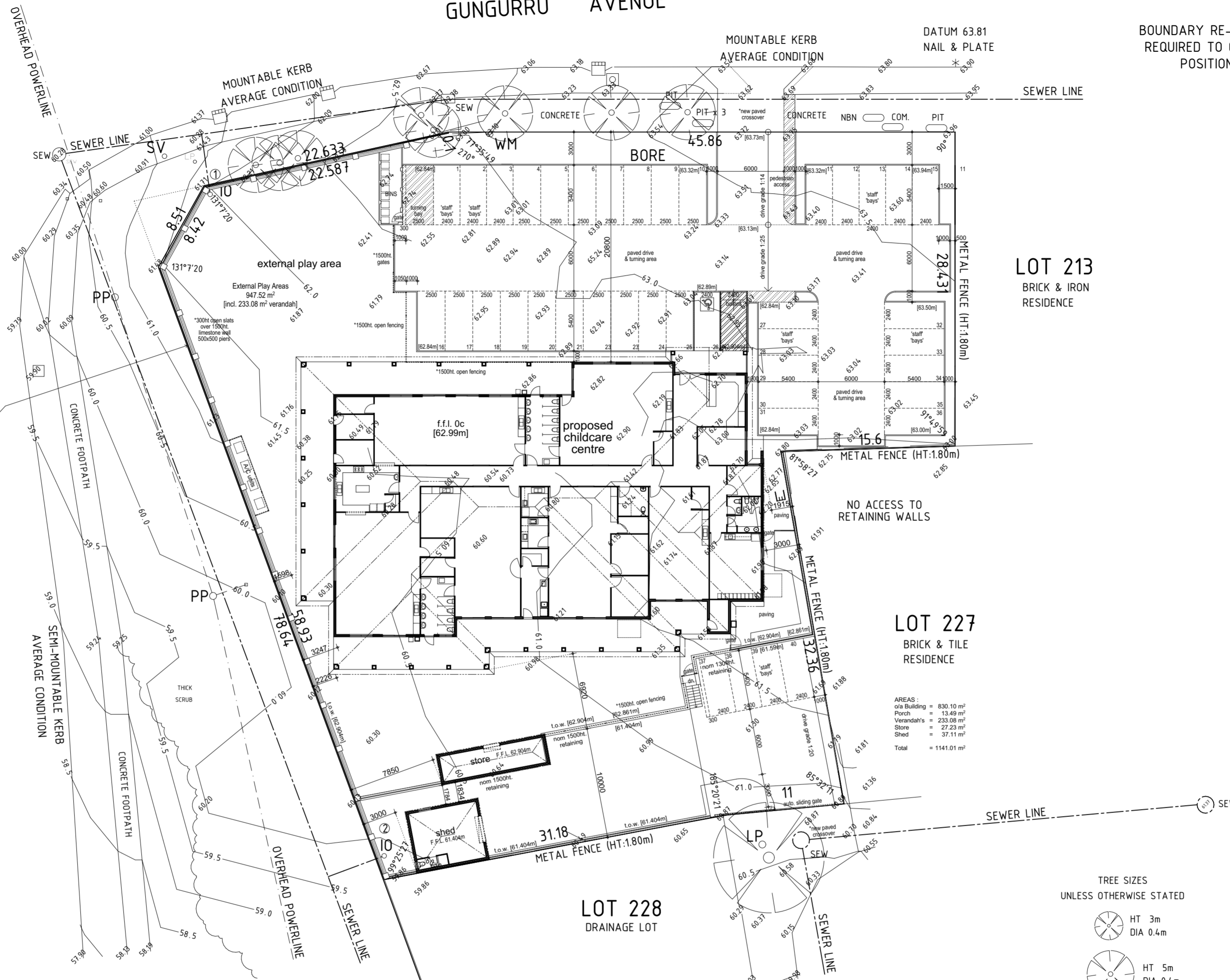
SANDY  
GRASS COVER

NOTE: A.H.D. VALUE DERIVED FROM  
MANHOLE AA1496.  
THIS VALUE DERIVED FROM WATER CORP.  
AS CONSTRUCTED RECORDS & MAY NOT BE  
EXACT. AN A.H.D. SURVEY IS REQUIRED  
TO OBTAIN AN ACCURATE VALUE.

**LOT 56**  
P.A.W.  
0.1m WIDE

**WANNEROO ROAD**

**GUNGURRU AVENUE**



**WARNING!**  
BOUNDARY RE-ESTABLISHMENT SURVEY  
REQUIRED TO CONFIRM LOT BOUNDARY  
POSITION AND DIMENSIONS.

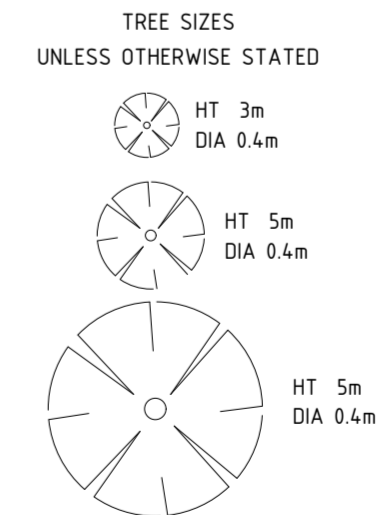
SERVICE INFORMATION	
SCALE BAR - 1:300 @ A2	
AREA	ESTABLISHED
SEWERAGE	YES DEPTH SEE BELOW
WATER	YES PRELAD L
ELECTRICAL	YES OH
TELECOM	YES
GAS	YES
DRAFTED TS SURVEYOR TS	

SERVICE LEGEND	
<b>WATER</b>	
SV	STOP VALVE
HY	HYDRANT
FP	FLUSH POINT
WM	WATER METER
<b>SEWERAGE</b>	
SEW	SEWER MANHOLE
IS	INSPECTION OPENING
IQ	INSPECTION SHAFT
<b>GAS</b>	
GM	GAS METER
SV	SERVICE VALVE
<b>ELECTRICAL</b>	
PD	POWER DOME
PP	POWER POLE
LP	LAMP POST
CP	CONSUMER POLE
SWA	STAY WIRE ANCHOR
<b>STORMWATER</b>	
SM	STORMWATER MANHOLE
GR	GRATE
SEP	SIDE ENTRY PIT
<b>TELECOM</b>	
PIT	TELECOM PIT
<b>SURVEY</b>	
PF	PEG FOUND
PG	PEG GONE
*	DATUM

**LOT 227**  
BRICK & TILE  
RESIDENCE

AREAS:  
o/a Building = 830.10 m<sup>2</sup>  
Porch = 13.49 m<sup>2</sup>  
Verandah's = 233.08 m<sup>2</sup>  
Store = 27.23 m<sup>2</sup>  
Shed = 37.11 m<sup>2</sup>  
Total = 1141.01 m<sup>2</sup>

**LOT 228**  
DRAINAGE LOT



① SEW CONN POSITION APPROXIMATE ONLY  
SEW INV. 59.08  
UP. 2.00  
DEPTH. 0.63m

② SEW CONN POSITION APPROXIMATE ONLY  
SEW INV. 57.15  
UP. 1.50  
DEPTH. 1.21m

**IMPORTANT EXPLANATORY NOTES**

- The information on this drawing is current at the date of survey and is prepared for the client names in the title block.
- All services are to be confirmed with relevant authorities. This includes without limitation; Sewerage / Water Supply / Drainage / Power Supply / Gas Supply & Communications.
- Further Limitations / Interests / Encumbrances / Notifications may be listed on the Certificate of Title.
- Original lot dimensions taken from Landgate Survey Plans.
- Boundary Re-establishment Survey required to confirm lot boundary position and dimension before any design works. Location of boundary in relation to fences or boundary markers is not guaranteed and is placed as per 'best fit'.
- TSA Surveys does not accept liability for loss or damage to any person or corporation who may rely on this plan for any purpose.
- Permission is required from TSA Surveys for the reproduction or copying of this plan.

CLIENT	DEL BORRELLO		
ADDRESS	LOT 212 (#4) GUNGURRU AVENUE, HOCKING		
AUTHORITY	WANNEROO	PLAN P23992	C/T Vol.Fol. 2198/589
DATE OF SURVEY	16/2/2019	JOB REFERENCE	TSA172 - FS
	TYSON SEGARAM   LICENSED SURVEYOR M   0433 304 648 E   tyson@tsasurveys.com.au W   www.tsasurveys.com.au A.B.N. 57 295 169 896		

date:	revision
27/3/19	minor carparking changes

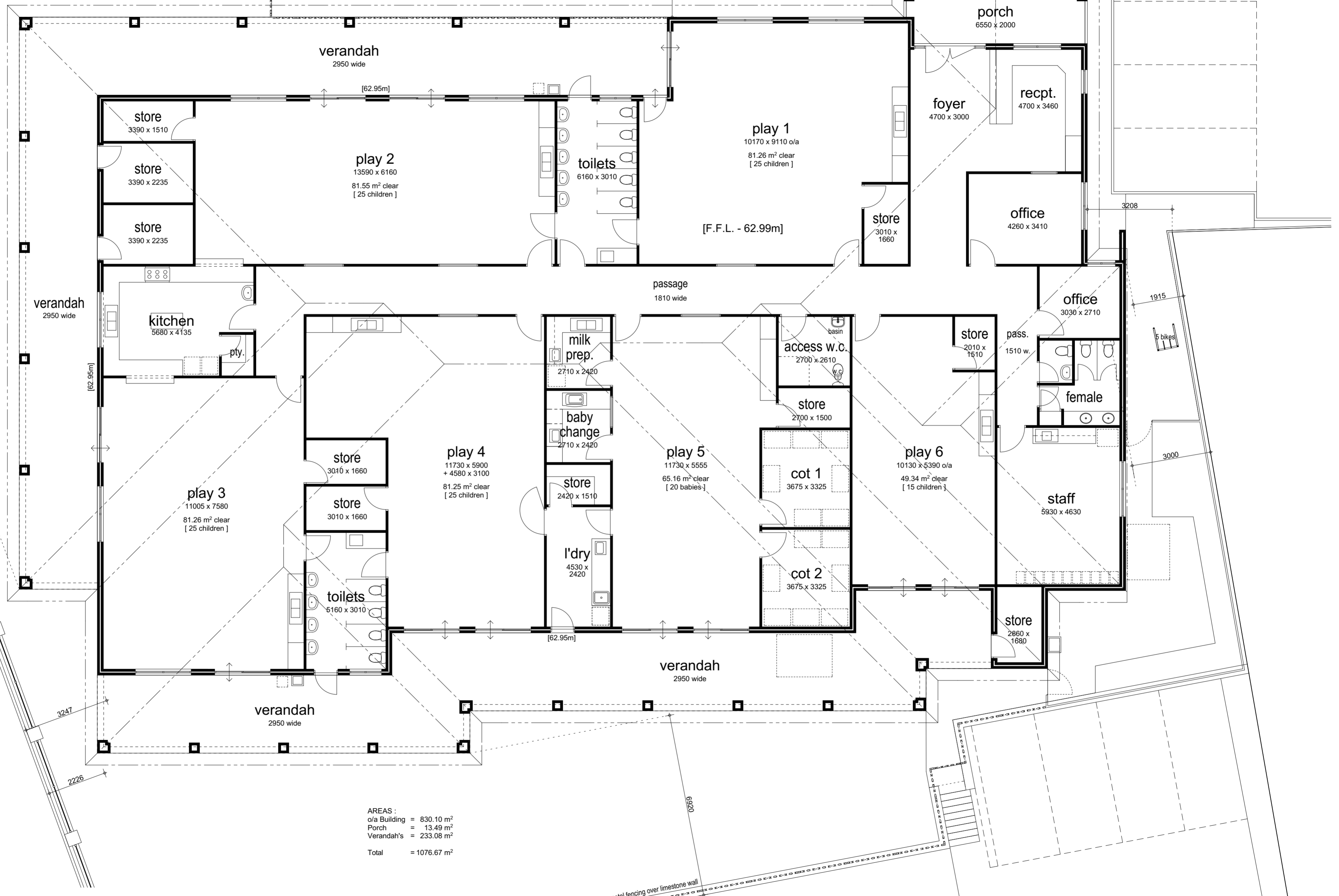
**PROPOSED CHILDCARE CENTRE  
TO BE ERCTED ON LOT 212 (hse: 4)  
GUNGURRU AVENUE - HOCKING: FOR  
CF TOWN PLANNING & DEVELOPMENT**

**alan king**  
architectural drafting  
DIPLOMA OF ARCHITECTURAL DRAFTING No 3503  
1/11 Riverview Street South Perth WA 6151  
Phone/Fax :- 9367 2814

drawn:	a.c.k.	drwg no:	2 of 9
date:	MARCH 19	scale:	1:300
		SITE	

**SITE PLAN**  
scale 1:300

External Play Areas  
947.52 m<sup>2</sup>  
[incl. 233.08 m<sup>2</sup> verandah]



AREAS :  
o/a Building = 830.10 m<sup>2</sup>  
Porch = 13.49 m<sup>2</sup>  
Verandah's = 233.08 m<sup>2</sup>  
Total = 1076.67 m<sup>2</sup>

FLOOR PLAN scale 1:100

date: 27/3/19	revision minor carparking changes	PROPOSED CHILDCARE CENTRE TO BE ERRECTED ON LOT 212 (hse: 4) GUNGURRU AVENUE - HOCKING: FOR CF TOWN PLANNING & DEVELOPMENT	 alan king architectural drafting DIPLOMA OF ARCHITECTURAL DRAFTING No 3503 1/11 Riverview Street South Perth WA 6151 Phone/Fax :- 9367 2814	drawn: a.c.k.	drwg no: 4 of 9
				date: MARCH 19	scale: 1:100





**CARPARKING:**

STAFF: [22 bays] (5400x2400)  
 20 Babies 1/4 = 5  
 50 Todlers 1/5 = 10  
 65 Kindies 1/10 = 7 (6.5)

**CLIENTS: [18 bays] (5400x2500)**

135 Children  
 Up to 72 = 9  
 135-72 = 63/7 = 9

TOTAL = 40 bays  
 + 1 Turning bay.

**STORES:**

External 0.3m<sup>2</sup> per child  
 135 x 0.3m<sup>2</sup> = 40.5m<sup>2</sup>  
 Provided = 41.57m<sup>2</sup>

Internal 0.2m<sup>2</sup> per child  
 135 x 0.2m<sup>2</sup> = 27m<sup>2</sup>  
 Provided = 27.21m<sup>2</sup>

**PLAY AREAS:**

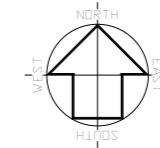
135 x 7.0m<sup>2</sup> = 945.0m<sup>2</sup>

Verandah = 233.08m<sup>2</sup>  
 Yard = 714.44m<sup>2</sup>

TOTAL = 947.52m<sup>2</sup>

\*Plan showing clear areas

**SITE PLAN**  
 scale 1:300



date:	revision
27/3/19	minor carparking changes

**PROPOSED CHILDCARE CENTRE  
 TO BE ERECTED ON LOT 212 (hse: 4)  
 GUNGURRU AVENUE - HOCKING: FOR  
 CF TOWN PLANNING & DEVELOPMENT**

**alan king**  
 architectural drafting  
 DIPLOMA OF ARCHITECTURAL DRAFTING No 3503  
 1/11 Riverview Street South Perth WA 6151  
 Phone/Fax :- 9367 2814

drawn: a.c.k.	drwg no: <b>5 of 9</b>
date: MARCH 19	
scale: 1:300	AREAS