

# TRANSPORT IMPACT STATEMENT

1447-1457 Mandurah Road,  
Baldivis

September 2018

Rev A Draft



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<b>Author of the Report</b>	Jelena Simic
<b>Project Team</b>	Justin Storer
<b>Project Director / Project Manager</b>	Marina Kleyweg
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**Appendix 1** - The layout of the proposed development

**Appendix 2** - Transport Planning and Traffic Plans

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## 1. Executive Summary

The proposed development is a mixed-use development comprising of: Lifestyle Village with a total of 67 units, an additional single residence for the owner, a clubhouse and shops. It is surrounded by rural residential lots and fronts Mandurah Road to the west

Traffic attracted to the proposed development will be predominantly generated by the residents of the Lifestyle Village, while other land uses within development could be observed as ancillary uses which mostly will be utilised by the residents of the Lifestyle Village. Therefore, although the cumulative traffic generation of the proposed development is 529 VPD (if no reciprocity is considered) it is expected that approximately an additional **332 vehicles per day** will be generated into the network external to the proposed development, with a forecasted impact of around **29 vehicular movements per hour in the PM peak hour** (when reciprocity is applied).

According to the City of Rockingham Town Planning Scheme No. 2, this development requires 43 parking bays if no reciprocity is applied. However, KCTT's opinion is that when considering the potential reciprocity of the development, the total parking requirement will not exceed 22 parking bays. The primary reasoning behind this is the nature of the development, where it can be expected that most of the Clubhouse patrons will be occupants of the Lifestyle Village. As such, it is likely that residents will park their cars in the bay provided at their residence. Given that the development plans propose the provision of 26 parking bays adjacent to the Clubhouse and Shops, based on the considerations outlined, the provided parking bays are more than sufficient to cater for the car parking requirements of the proposed development.

The navigability of parking layout and accessibility of parking bays has been assessed against a B99 passenger vehicle and 8.8m service vehicles, which found that the roads are fully navigable by both vehicles with minor adjustments as shown on Appendix 3. KCTT believes that dedicated service bays would not be needed because it is expected that deliveries to the Non-residential land uses would occur using smaller service vehicles than what was used in the assessment.

The proposed development plans did not specify any bicycle facilities. It is highly unlikely that guests will use bicycles to visit the proposed development. However, it is likely that recreational cycling would occur. Given these considerations, KCTT believes that it would be beneficial for this development to provide bicycle facilities for the non-residential land uses. More specifically, this would mean the provision of minimal bicycle parking bays as required by Planning Policy 3.3.14 and infrastructure within the proposed communication areas which promotes safe and efficient cycling.



## 2. Transport Impact Statement

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### 2.1 Location

Lot Number (Street Number)	Lot 13 (No. 1457) and Lot 2 (No. 1447)
Road Name	Mandurah Road
Suburb	Baldivis
Description of Site	The Subject development area is surrounded with rural residential lots and fronts Mandurah Road to the west. The proposed development is a mixed-use development comprising of: Lifestyle Village with a total of 67 units, an additional single residence for the owner, a clubhouse and shops.

### 2.2 Technical Literature Used

Local Government Authority	City of Rockingham
Type of Development	Mixed-use Primarily Residential with additional land uses (a clubhouse and shops).
Are the R-Codes referenced? <i>If YES, nominate which:</i>	YES State Planning Policy 3.1 Residential Design Codes 2018 R-Codes (incorporating amendments gazetted on 2/8/2013, 23/10/15 and 2/3/2018)
Is the NSW RTA Guide to Traffic Generating Developments Version 2.2 October 2002 (referenced to determine trip generation / attraction rates for various land uses) referenced?	YES
Which WAPC Transport Impact Assessment Guideline should be referenced?	Volume 4 - Individual Developments
Are there applicable LGA schemes for this type of development? <i>If YES, Nominate:</i>	YES
Number of Scheme	No. 2
Name of Scheme	City of Rockingham Town Planning Scheme
Are Austroads documents referenced?	YES
Are there applicable DAP schemes for this type of development?	NO

## 2.3 Land Uses

Are there any existing Land Uses

YES

If YES, Nominate:

Two rural residential dwellings

### Proposed Land Uses

How many types of land uses are proposed?

4

Nominate land use type and yield

**Lifestyle Village** inclusive of :

– 22 units with 1 bed + 1 study

– 45 units 2 bed + study

Total of 67 Units

#### Clubhouse

– app. 280m<sup>2</sup> GFA / 230m<sup>2</sup> NLA\*

– assumed 3 employees

– Assumed capacity - up to 120 persons

#### Shops

– app. 242m<sup>2</sup> GFA / 220m<sup>2</sup> NLA\*

**Single residence** (for the owner)

*Note\*: KCTT used yields as provided on plans received from the architect where applicable. Where yields information was unavailable, the yields were assumed for purpose of transport impact estimation.*

*It should be taken into the consideration that terms NLA (Net Lettable Area) and GLFA have the same meaning. The NSW RTA Guide states that as a guide, about 75% of the gross floor area is deemed gross leasable floor area". However, the percentage of NLA in relation to GFA depends on development location and uses.*

Are the proposed land uses complimentary with the surrounding land-uses?

YES

Subject Area is within a Rural Zone bounded to the south partially with the Special Rural and Special Residential Zone.

## 2.4 Local Road Network Information

How many roads front the subject site?

One (1)

Name of Roads Fronting Subject Site / Road Classification and Description:

### Road 1

#### Road Name

Mandurah Road

Number of Lanes

two way, one lane per direction, divided

Road Reservation Width

App. 40m

Road Pavement Width

App. 7.5m

Classification

Rural Local Road / Regional Distributor

Speed Limit

70kph

Bus Route

NO

If YES Nominate Bus Routes

-

On-street parking

NO

## 2.5 Traffic Volumes

Road Name	Location of Traffic Count	Vehicles Per Day (VPD)	Vehicles per Peak Hour (VPH)				Heavy Vehicle % <i>If HV count is Not Available, are HV likely to be in higher volumes than generally expected?</i>	Year	
			AM Peak Time	AM Peak - Peak VPH	PM Peak Time	PM Peak - Peak VPH		Date of Traffic Count	<i>If older than 3 years multiply with a growth rate</i>
Mandurah Road	South of Safety Bay Road (SLK 9.40)	7,386	07:45	521	16:00	705	7.1%	2017/18	–
	South of Sixty Eight Road (SLK 14.06)	5,672	08:00	485	16:00	523	8.4%	2017/18	–
Sixty Eight Road	East of Mandurah Road (SLK 0.44)	3,408	08:00	343	14:45	328	4.3%	2017/18	–

Note - The traffic volumes have been derived from Main Roads.

## 2.6 Vehicular Crash Information

Is Crash Data Available on Main Roads WA website? YES

If YES, nominate important survey locations:

Location 1

Mandurah Road [SLK 12.50 -13.11]

Location 2

Intersection of Mandurah Road & Outridge Road

Period of crash data collection

01/01/2013 - 31/12/2017

Road Name	SLK	Functional Classification		Road Hierarchy	Speed Limit	Crash Statistics			
						No of KSI Crashes	No of Medical Attention Crashes	No of PDO Major Crashes	No of PDO Minor Crashes
Mandurah Road	12.50 - 13.11	Rural Road	Local Road	Regional Distributer	70kph	KCTT have accessed the Main Roads WA website on 30.08.2018 and no crash data for analysed section of the Mandurah Road was reported for the above-mentioned data collection period.			
Mandurah Road & Outridge Road	12.50	Rural Road	Local Road / Urban Local Road	Regional Distributer / Access Road	70kph / 50kph	0	0	1	0
No of MVKT Travelled at Location					App.7,000 VPD*365*5 years*0.3km = 3.83 MVKT				
KSI Crash Rate					0 KSI crashes / 3.83 MVKT = 0 KSI crashes/MVKT				
All Crash Rate					1 crashes / 3.83 MVKT = 0.26 crashes/MVKT				
Comparison with Crash Density and Crash Rate Statistics					The crash rate of 0.26 crashes / MVKT is significantly lower than the network average of 1.73 crashes / MVKT over the 5 year period.				

## Transport Impact Statement

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The following table shows the Crash Density and Crash Rates on Metropolitan Local Roads as obtained from Main Roads WA on the 14<sup>th</sup> May 2018 by email request: -

### Crash Density and Crash Rate on Metropolitan Local Roads Network only

	All Crashes		Serious Injury Crashes (Fatal+Hospital)	
	Average Annual Crash Density (All Crashes/KM)	Average Annual Crash Rate (All Crashes/MVKT)	Average Annual Crash Density (Ser. Inj. Crashes/KM)	Average Annual Crash Rate (Ser. Inj. Crashes/MVKT)
Metro Local Road - Midblock	2.99	0.81	0.13	0.03
Metro Local Road - All	6.41	1.73	0.26	0.07

Note: Based on 5-years data for the period 2013 to 2017.

## 2.7 Parking Requirements

Local Government

City of Rockingham

Local Government Document Utilised

City of Rockingham Town Planning Scheme No. 2

### Description of Parking Requirements in accordance with Scheme:

According to the City of Rockingham Town Planning Scheme No. 2, subject area is a part of Rural Zone, therefore the following minimum car parking requirements applies :

- Club Premises / Reception Centre - 1 bay for every 4 persons the building is designed to accommodate
- Shop / Convenience Store - 6 bays per 100m<sup>2</sup> NLA
- Residential - In accordance with the R-Codes  
(Location B – not within the following distances: 250m of High Frequency Bus Route and/or 800m of a train station on a High Frequency Rail Route)
- 2 + bedroom dwelling– 2 spaces per dwelling
- Aged persons' dwelling – 1 space per dwelling
- Visitors Parking - On-site visitors car parking spaces for grouped and multiple dwelling developments provided at a rate of one space for each four dwellings, or part thereof in excess of four dwellings, served by a common access.

### Calculation of Parking

Land Use	Requirements	Yield	Total Parking
<b>Lifestyle Village</b> (Parking requirements will be accommodated at the premises of each respective dwelling)	1 space per dwelling	67	n/a
<b>Clubhouse</b> (allow 50 % reciprocity, given that most of the visitors will be from Lifestyle Village)	1 bay for every 4 persons the building is designed to accommodate	App. 120 persons	15 (30)*
<b>Shops</b> (allow 50 % reciprocity, given that most of the visitors will be from Lifestyle Village)	6 bays per 100m <sup>2</sup> NLA	220m <sup>2</sup> NLA	7 (13)*
<b>Single residence</b> (it is expected that residences will provide parking on the premises)	2 spaces per dwelling	1 residential dwelling	n/a
<b>Total Volume of Parking Required in accordance with Scheme</b>			<b>22 (43)*</b>
Note* - parking requirement if no reciprocity is applied			
<b>Total Volume of Parking Provided by Proponent</b>			<b>26</b>

### Justification

According to the City of Rockingham Town Planning Scheme No. 2, this development requires 43 parking bays if no reciprocity is applied. However, given the nature of the development, it is highly likely that some reciprocity will occur. It can be expected that most of the patrons (adopted 50%) of Clubhouse and will be occupants of the Lifestyle Village. Parking requirements for residential use are not included in the calculation given that residents will park their vehicles at their premises. Having in mind all that, KCTT believe that the total parking requirement will not exceed 22 parking bays as calculated in the table above.

The development plans propose the provision of 26 parking bays adjacent to the Clubhouse and Shops. Based on the calculation above, provided parking bays are more than sufficient to cater for the car parking requirements of the proposed development.

### Have Vehicle Swept Paths been checked for Parking?

YES

*If YES, provide description of performance:*

A vehicle swept paths analysis has been completed for the B99 (5.2m) passenger vehicle. A few departures from the standards have been identified through the analysis, as follows:

- Adequate space for manoeuvring of the delivery vehicles needs to be provided adjacent to the community hall and shops. KCTT shows swept path assuming that passenger vehicles will be used for deliveries, those paths need to be reassessed if larger vehicles will need to approach the delivery zones.
- Width of the proposed road in front of the shops allows for one way traffic only therefore additional line marking and traffic signs needs to be implemented to clearly identified and lead the traffic flow.
- Some minor kerb modification are required and additional space provided at blind isles areas as shown on plans in Appendix 3, however this can be addressed in detailed design phase.

The internal roads were also checked with a service vehicle (8.8m). The service vehicle can navigate through the development utilising the northern crossover only. Please refer to plan S22 in Appendix 3 for clarity.

## 2.8 Bicycle Parking

### Local Government

City of Rockingham

### Reference Document Utilised

Planning Policy 3.3.14 – Bicycle Parking & End-of-trip Facilities

### Description of Parking Requirements in accordance with Scheme:

#### - Club Premises

none required (Minimum Long-term Parking)

1 space for every 30 people the building is designed to accommodate (Minimum Short-term Parking)

#### - Local Shops (less than 1,000m<sup>2</sup> NLA) -

1 space per 250m<sup>2</sup> NLA (Minimum Long-term Parking)

1 space per 150m<sup>2</sup> NLA (minimum 2 spaces) (Minimum Short-term Parking)

### Parking Requirement in accordance with regulatory documents

Land Use	Yield	Total Bicycle Parking requirement	
		Minimum Long-term Parking Employee Resident Spaces	Minimum Short-term Parking Visitor/Shopper spaces
<b>Lifestyle Village</b>	n/a	n/a	n/a
<b>Clubhouse</b>	up to 120	0	4
<b>Shops</b>	230m <sup>2</sup> NLA	1	2
<b>Single residence</b>	n/a	n/a	n/a
		<b>1</b>	<b>6</b>

### Justification

The proposed development plans did not have specified cyclist facilities.

It is highly unlikely that guests will use bicycles to visit the proposed development. However, the use of bicycles and other transportation modes can be expected within the development or from the development for recreation purposes. It can be expected that the residents of the Lifestyle Village will be able to store their bicycles in their respective dwellings. For other land-uses, bicycle parking should be provided to promote the use of alternative transportation modes within the development. KCTT believe that provision of minimal bicycle parking bays as required in accordance with Planning Policy 3.3.14 and suitable infrastructure within proposed communication areas that promotes safe and efficient cycling would be beneficial for this development.

## 2.9 ACROD Parking

**Class of Building** **Class 6:** a shop or other building for the sale  
**Does this building class require specific provision of ACROD Parking?** YES  
**Reference Document Utilised** National Construction Code of Australia  
**Description of Parking Requirements:**  
 Class 6 - up to 1000 carparking spaces – 1 space for every 50 carparking spaces or part thereof

### Parking Requirement in accordance with regulatory documents

Land Use	Requirements	Yield	Total Parking
Lifestyle Village / Residential Use	Since the residents will park their car in their respective driveways, the calculation is not applicable	N/A	N/A
Clubhouse / Shops	1 space for every 50 car parking spaces or part thereof	26	1
<b>Total Volume of ACROD Parking Required</b>			<b>1</b>

### Justification

Exact location of ACROD is expected to be shown at later stages plans. Given that, based on the calculation of parking bays requirements there is an excess of parking for this development one parking bay may potentially be removed in favour of required shared space for the ACROD bay.

## 2.10 Delivery and Service Vehicles

**Guideline Document used as reference:** NSW RTA Guide to Traffic Generating Developments

### Requirements

*Residential flat buildings (50% of spaces adequate for trucks): < 200 flats or home units = 1 space per 50 flats or home units;*

*Commercial premises (50% of spaces adequate for trucks): <20,000m<sup>2</sup> GFA – 1 space per 4,000m<sup>2</sup> GFA.*

### Parking Requirement in accordance with regulatory documents

Land Use	Requirements	Yield	Total Parking
Lifestyle Village / Residential Use	1 space per 50 flats or home units	67 + 2	2
Clubhouse / Shops	1 space per 4,000m <sup>2</sup> GFA	app. 520m <sup>2</sup> GFA	1

**Total Volume of Service and Delivery Parking Provided by Proponent** N/A\*

Note\* - the proposed development plans did not have specified Service and Delivery Parking Area.

### Justification

KCTT believe that service vehicle could operate safely within the development internal road network. Each component of the development needs to provide a loading area for safe storage of delivery vehicles designed to accommodate the movements of the largest vehicle that will need to approach to that portion of the proposed development. However, it is expected that delivery for Clubhouse and shops will be conducted with smaller

vehicles, and therefore, a need for a dedicated bay would not be needed. No other permanent service vehicle parking is required for the operation of the residential uses.

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## 2.11 Calculation of Development Generated / Attracted Trips

What are the likely hours of operation?

For residential use the hours of operation are not applicable.

What are the likely peak hours of operation?

The clubhouse is expected to be open in period 09:00-17:00.

Majority of the activity is likely to be conducted in the period between 08:00AM and 20:00PM. It is expected that morning peak for the traffic generation will be from 08:00AM to 10:00 AM, for the morning check-out peak, while the afternoon peak is expected to be in the period between 14:00PM to 16:00PM, for the evening check-in peak.

Guideline Document Used

WAPC Transport Assessment Guidelines for Developments

Rates from above document:

**Retail** (with significant food retail component) - 10 vehicular trips per 100m<sup>2</sup> of NLA for the PM Peak and 2.5 trips per 100m<sup>2</sup> for the AM peak hour. A 50% IN / 50% OUT split has been adopted for the PM peak and an 80% IN / 20% OUT split for the AM peak hour; ITE Trip Generation Report (9th Edition)

Guideline Document Used

**Recreational Community Centre:**

Rates from above document:

Daily 33.82 VPD per KSF2 = 36.40 VPD per 100m<sup>2</sup> GFA

AM Peak – 2.05 VPH per KSF2 = 2.21 VPH per 100m<sup>2</sup> GFA

PM Peak – 2.74 VPH per KSF2 = 2.95 VPH per 100m<sup>2</sup> GFA

A 66% / 34% IN/OUT split has been assumed for the AM peak

and a 49% / 51% IN/OUT split has been assumed for the PM peak.

NSW RTA Guide to Traffic Generating Developments

Guideline Document Used

Rates from above document:

**Retail** - 121 vehicular trips per 100m<sup>2</sup> of GLFA;

**Housing for aged and disabled persons** - 1 - 2 vehicular trips per dwelling daily; PM Peak - 0.1 - 0.2 per dwelling;

Land Use Type	Rate above	Yield	Daily Traffic Generation	PM Peak
<b>Existing detached dwellings</b> (will remain)	9 vehicle trips per unit PM Peak - 0.8 vehicle trips per unit	2 houses	18 VPD	2 VPH
<b>Lifestyle Village</b>	Daily – 2 VPD per dwelling PM Peak – 0.2 VPH per dwelling	67	134	13
<b>Clubhouse</b> (allow 50 % reciprocity, given that most of the visitors will be from Lifestyle Village)	36.40 VPD / 100m <sup>2</sup> GFA PM - 2.95 VPH / 100m <sup>2</sup> GFA	app. 4,000m <sup>2</sup> GFA	51 (102)*	4 (8)*
<b>Shops</b> (allow 50 % reciprocity, given that most of the visitors will be from Lifestyle Village)	121 VPD per 100m <sup>2</sup> of NLA PM - 10 VPH / 100m <sup>2</sup>	385m <sup>2</sup> NLA	147 (293)*	12 (24)*
<b>Total of existing traffic (A)</b>			18 VPD	2 VPH
<b>Total Expected Traffic Generation from the proposed development (B)</b>			350 VPD (529VPD)*	31 VPH (45VPH)*
<b>Total Additional Traffic Generation from the proposed development (B-A)</b>			<b>332 VPD</b> <b>(511 VPD)*</b>	<b>29 VPH</b> <b>(43VPH)*</b>

Note \*- The number in brakes represents cumulative value – no reciprocity between the lands uses has been taken into account.

Does the site have existing trip generation / attraction?

YES

(given that both existing houses are planned to remain, existing trip generation is added to the calculation above)

No of Daily Trips

18 VPD

No of AM Peak Hour Trips

2 VPH

No of PM Peak Hour Trips

2 VPH



What is the total impact of the new proposed development?

According to WAPC guidelines, all developments generating 10-100 VPH can be deemed to have a **moderate** impact on the network

**Justification**

Traffic attracted to the proposed development will be predominantly generated by the residents of the Lifestyle Village, while other land uses within development could be observed as ancillary uses and special features which mostly will be utilised by the residents of the Lifestyle Village. Therefore, although the cumulative traffic generation of the proposed development is 529 VPD (if no reciprocity is taken into account) it is expected that approximately additional **332 vehicles per day** will be generated into the network external to the proposed development, with a forecasted impact of around **29 vehicular movements per hour in the PM peak hour** (when reciprocity is applied).

## 2.12 Traffic Flow Distribution

How many routes are available for access / egress to the site?

2

**Route 1**

Provide details for Route No 1

**To the North via Mandurah Road**

Percentage of Vehicular Movements via Route No 1

60%

**Route 2**

Provide details for Route No 2

**To the South via Mandurah Road**

Percentage of Vehicular Movements via Route No 2

40%

## 2.13 Road Safety

Are sight distances adequate at proposed intersections?

YES

**Justification**

The Mandurah Road sections north and south from the crossovers are long and straight and provide long, clear sight distances. Below is an extract from Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections Table 3.2:

Guide to Road Design Part 4A: Unsignalised and Signalised Intersections

**Table 3.2: Safe intersection sight distance (SISD) and corresponding minimum crest vertical curve size for sealed roads ( $S < L$ )**

Design speed (km/h)	Based on safe intersection sight distance for cars <sup>(1)</sup> $h_1 = 1.1; h_2 = 1.25, d = 0.36^{(2)}$ ; Observation time = 3 sec					
	$R_T = 1.5 \text{ sec}^{(3)}$		$R_T = 2.0 \text{ sec}$		$R_T = 2.5 \text{ sec}$	
	SISD (m)	K	SISD (m)	K	SISD (m)	K
40	67	4.9	73	6	—	—
50	90	8.6	97	10	—	—
60	114	14	123	16	—	—
70	141	22	151	25	—	—
80	170	31	181	35	—	—
90	201	43	214	49	226	55
100	234	59	248	66	262	74
110	—	—	285	87	300	97
120	—	—	324	112	341	124
130	—	—	365	143	383	157

For the design speed of 80kph of Naturaliste Terrace, the required SISD is 181m and it is met in both directions on Mandurah Road. See below figure:

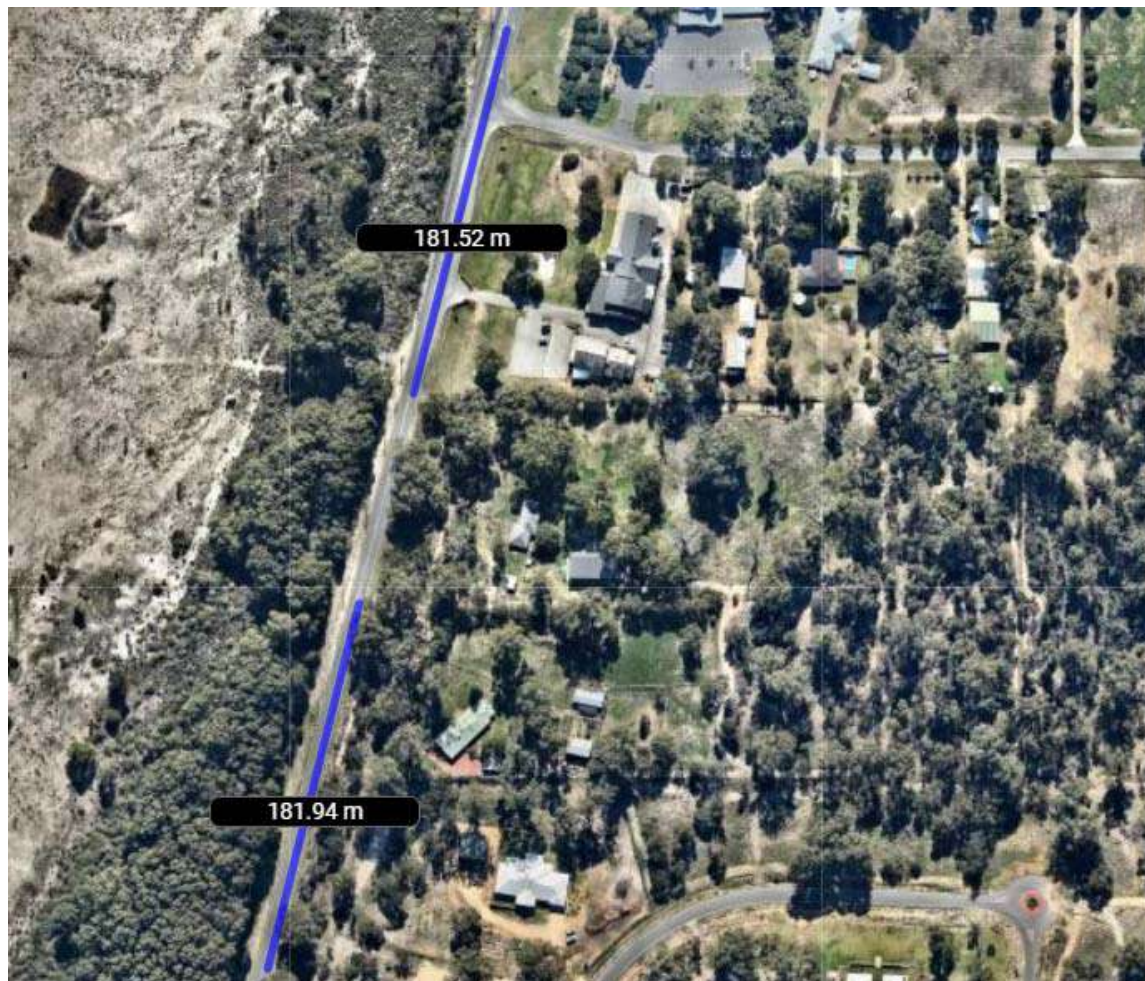


Figure: Safe Intersection Sight Distance from the approximate position of the proposed crossovers on Mandurah Road

#### Road safety internal to the development:

The proposed development has clearly defined internal circulation road network. As some of the proposed roads exceed and/or a close to 100m in length some traffic calming measures are required.

An intersections and crossovers need to be designed to accommodate the movement of largest vehicles that will need to utilise the subject portion of the proposed development.

## 2.14 Road Cross-Section Requirements

Does this development propose the construction of new roads?

YES

Nominate proposed road cross sections below.

Road Name	Hierarchy	Road Carriageway Width	Reserve Width
All internal roads within development	Access Street D	6m	n/a

## 2.15 Vehicle Crossover Requirements

Are vehicle crossovers required onto existing road networks?	YES
How many existing crossovers?	2
How many proposed crossovers?	2 (existing crossover to be redesigned)
How close are proposed crossovers to existing intersections?	The northern crossover is approximately 140m from the intersection of Mandurah Road and Outridge Road while southern is approximately 360m from the intersection of Mandurah Road and Stringybark Way.
Does this meet existing standards?	YES

## 2.16 Public Transport Accessibility

How many bus routes are within 400 metres of the subject site?	No Bus Routes
How many rail routes are within 800 metres of the subject site?	No Rail Routes
Are high frequency bus routes required to justify a reduction in parking?	NO
Is the development in a Greenfields area?	NO

## 2.17 Pedestrian Infrastructure

Describe existing local pedestrian infrastructure within a 400m radius of the site:	
The proposed development is in rural, mostly unbuilt area. Therefore, at present no pedestrian infrastructure is available near the subject site.	
Does the site have existing pedestrian facilities	NO
Does the site propose to improve pedestrian facilities?	YES
<i>If YES, describe the measures proposed.</i>	
Pedestrian paths would be provided on one side of carriageways within the proposed development.	
What is the Walk Score Rating?	
9   Car-Dependent. Almost all errands require a car.	

## 2.18 Cyclist Infrastructure

Are there any PBN Routes within an 800m radius of the subject site?	NO
Are there any PBN Routes within a 400m radius of the subject site?	NO
Does the site have existing cyclist facilities?	NO
Does the site propose to improve cyclist facilities?	YES
<i>If YES, describe the measures proposed.</i>	
Please refer to the Section 2.9 of this Report.	

## 2.19 Site Specific Issues and Proposed Remedial Measures

How many site specific issues need to be discussed?

1

### Site Specific Issue No 1

**Describe the traffic impact of the proposed development.**

Remedial Measure / Response

Traffic attracted to the proposed development will be predominantly generated by the residents of the Lifestyle Village, while other land uses within development could be observed as ancillary uses and special features which mostly will be utilised by the residents of the Lifestyle Village. Therefore, although the cumulative traffic generation of the proposed development is 529 VPD (if no reciprocity is taken into account) it is expected that approximately additional **332 vehicles per day** will be generated into the network external to the proposed development, with a forecasted impact of around **29 vehicular movements per hour in the PM peak hour** (when reciprocity is applied).

# **Appendix 1**

## **The Layout of the Proposed Development**



NOTE:  
REMOVE UNDERGROWTH TO  
VERGE PLANT GROUND COVERS  
& RETICULATE



RAISED VEGETABLE  
GARDEN



COMMUNAL AREA



SHADE PERGOLA & BBQ



OUTDOOR GYM

PASSIVE ACTIVITY



LOG SEATS



LOG SEATS



WATER FEATURE



SCULPTURE

SUNSET RETREAT



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ARCHITECTS  
PTY. LTD.  
5 Padbury Terrace Midland WA 6056  
T 08 9274 5559  
F 08 9274 4408  
M 04 0827 4556  
E braudearchitects@inet.net.au

ABN 87 064 182 547

**PROPOSED DEVELOPMENT**  
At Lots 13 & 2 Mandurah Rd BALDIVIS  
For Client Name

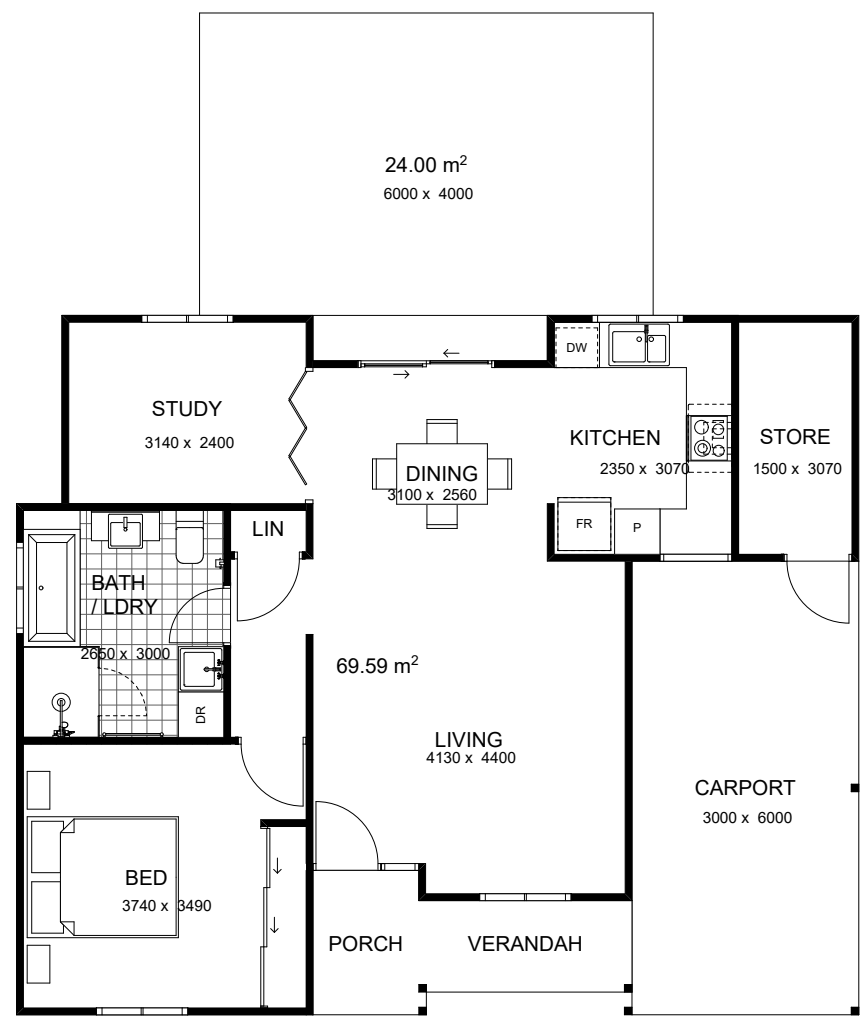
VERSION 4

SITE PLAN			
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DATE	16.03.2018	FILE	RET_017_zh.pln
AUTHOR	eb	DRAWING	SK 1
DRAWN	zh	REF	01.01
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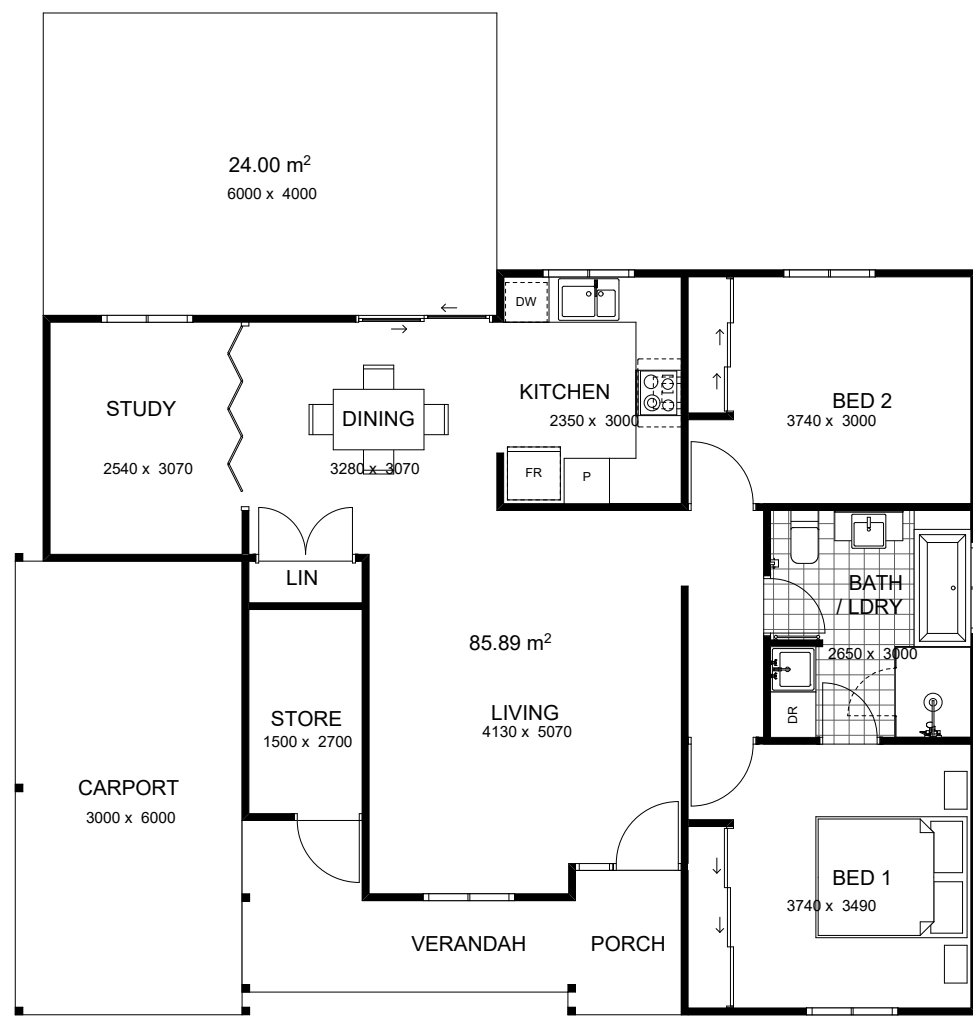
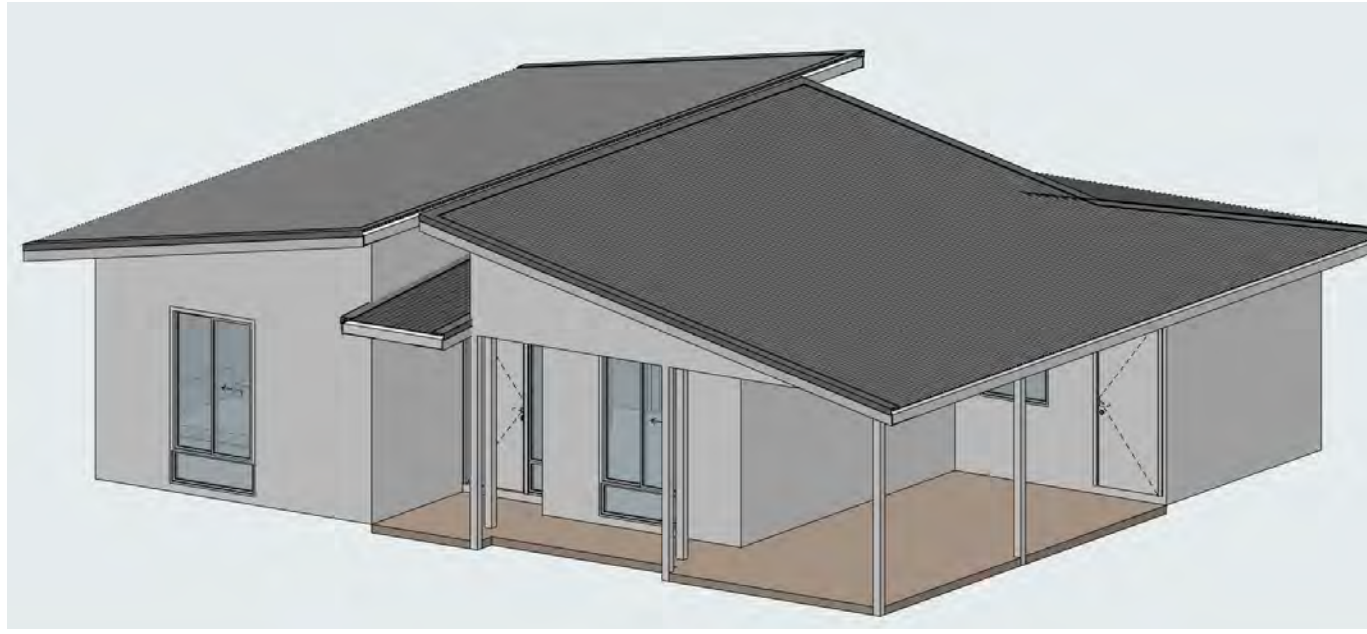
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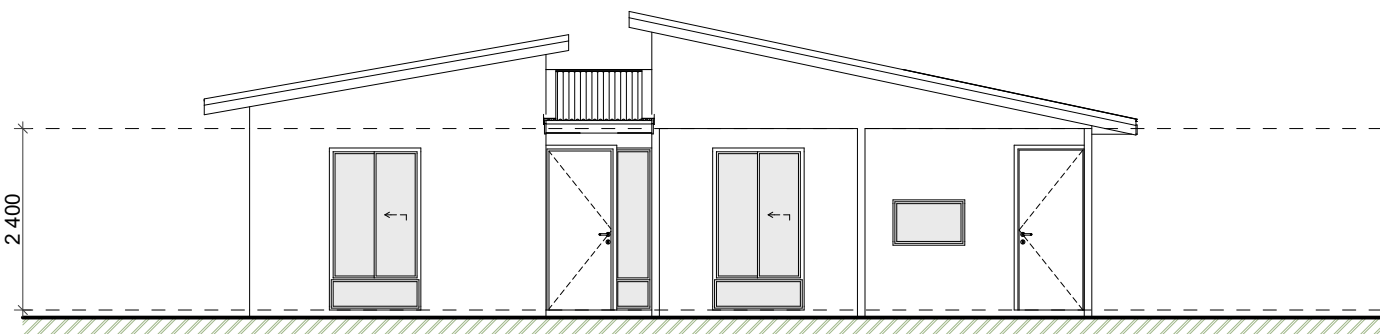




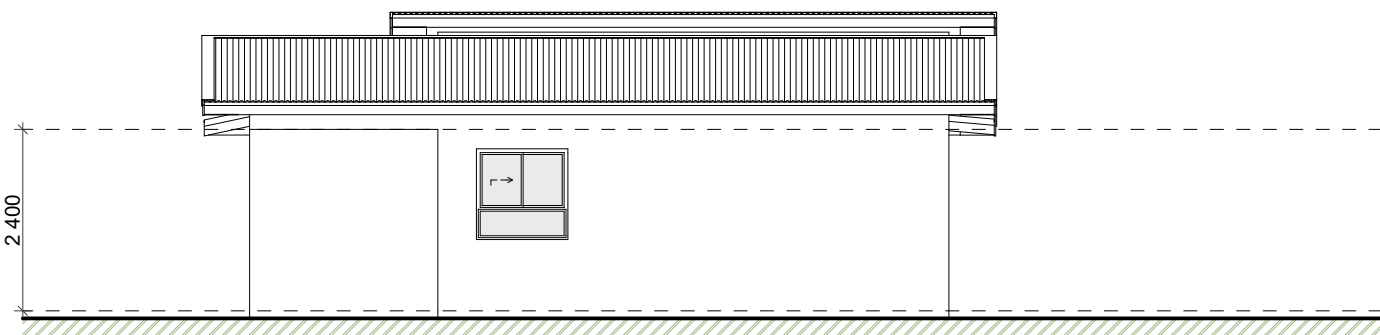
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SCALE 1:100



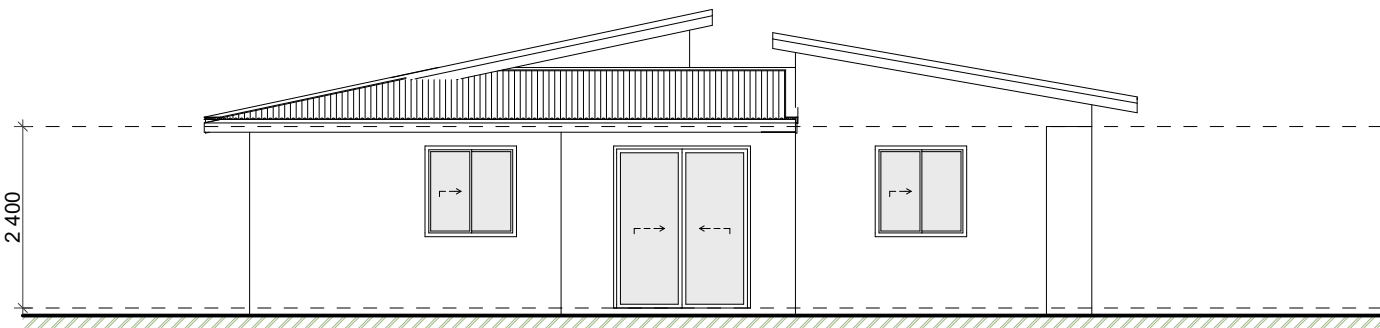
2 BED UNIT FLOOR PLAN  
SCALE 1:100



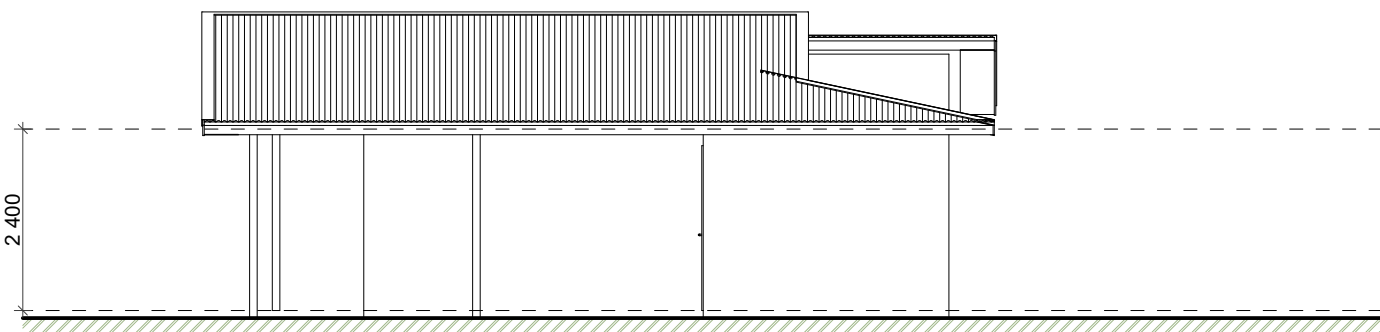
FRONT ELEVATION  
SCALE 1:100



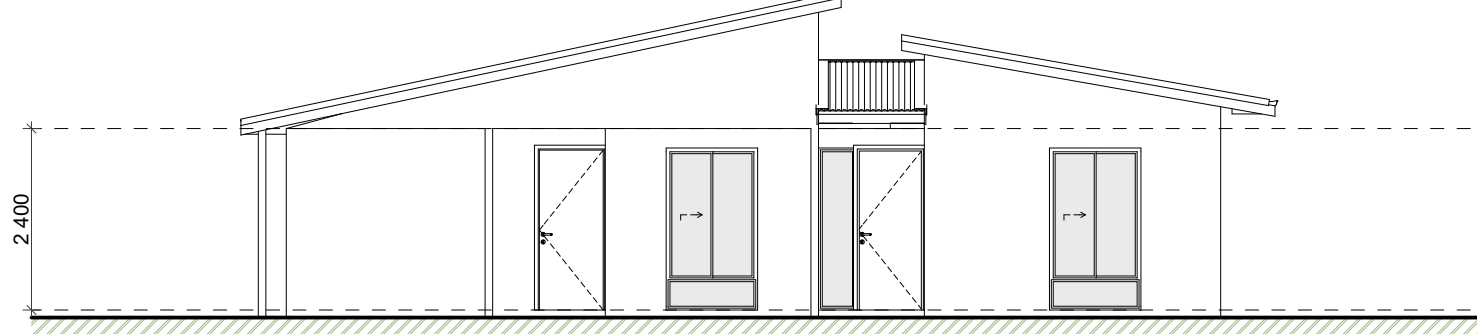
SIDE ELEVATION  
SCALE 1:100



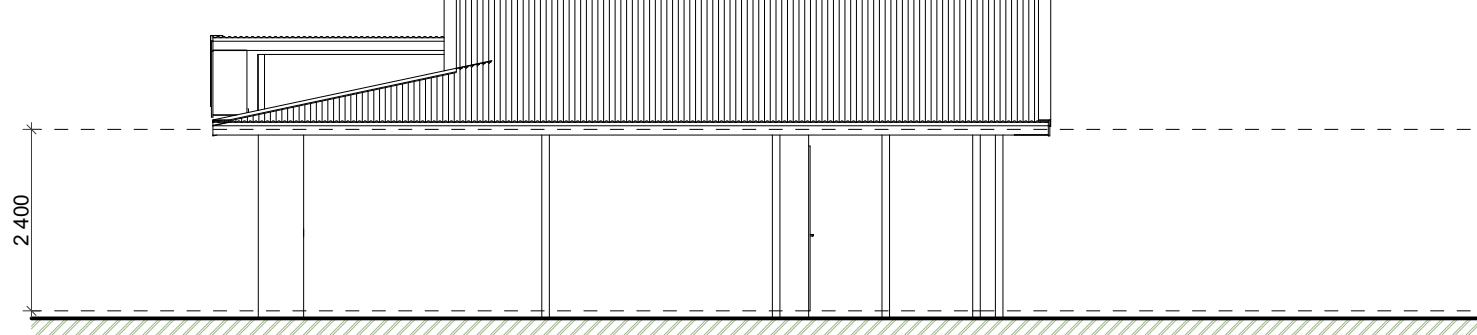
REAR ELEVATION  
SCALE 1:100



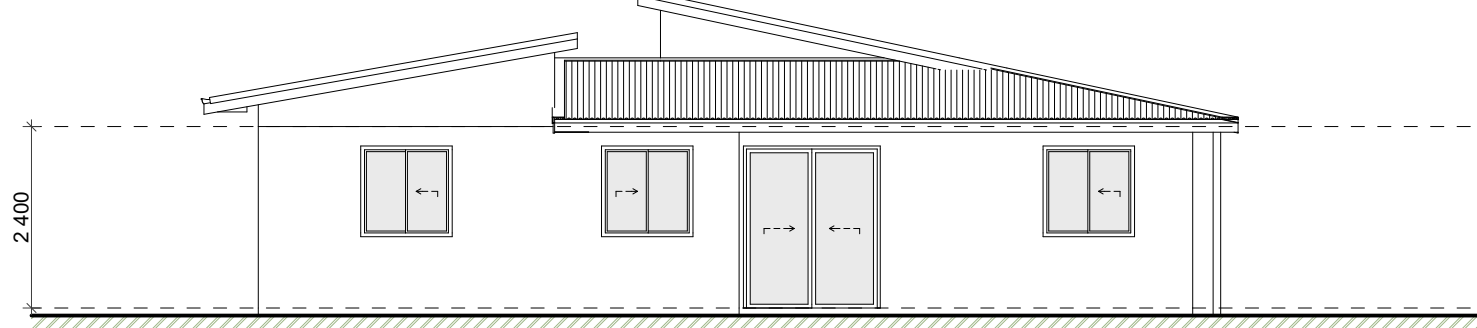
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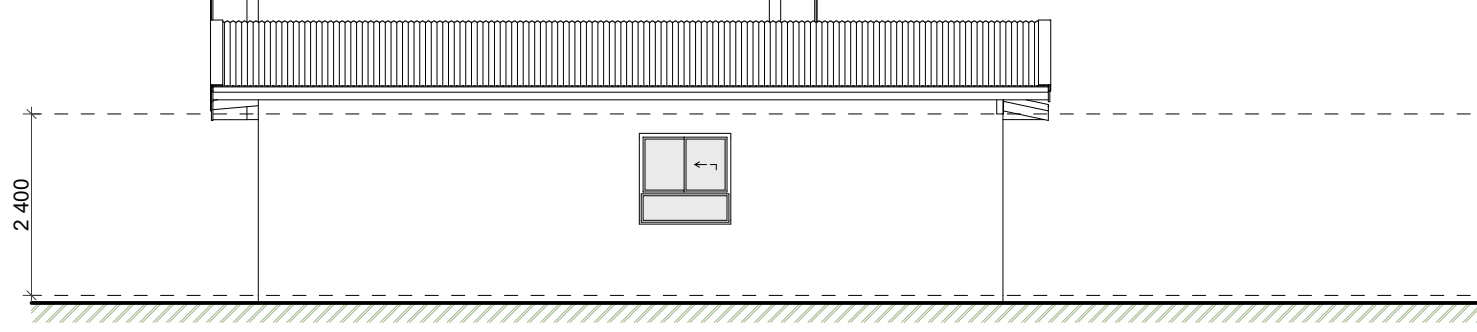
FRONT ELEVATION  
SCALE 1:100



SIDE ELEVATION  
SCALE 1:100



REAR ELEVATION  
SCALE 1:100



SIDE ELEVATION  
SCALE 1:100

## SUNSET RETREAT

## VERSION 4



**BRAUDE**  
ARCHITECTS  
PTY. LTD.  
c Padbury Terrace Midland WA 6056  
T 08 9274 5559  
F 08 9274 4408  
M 04 0827 4556  
E braudearchitects@inet.net.au

ABN 87 064 182 547

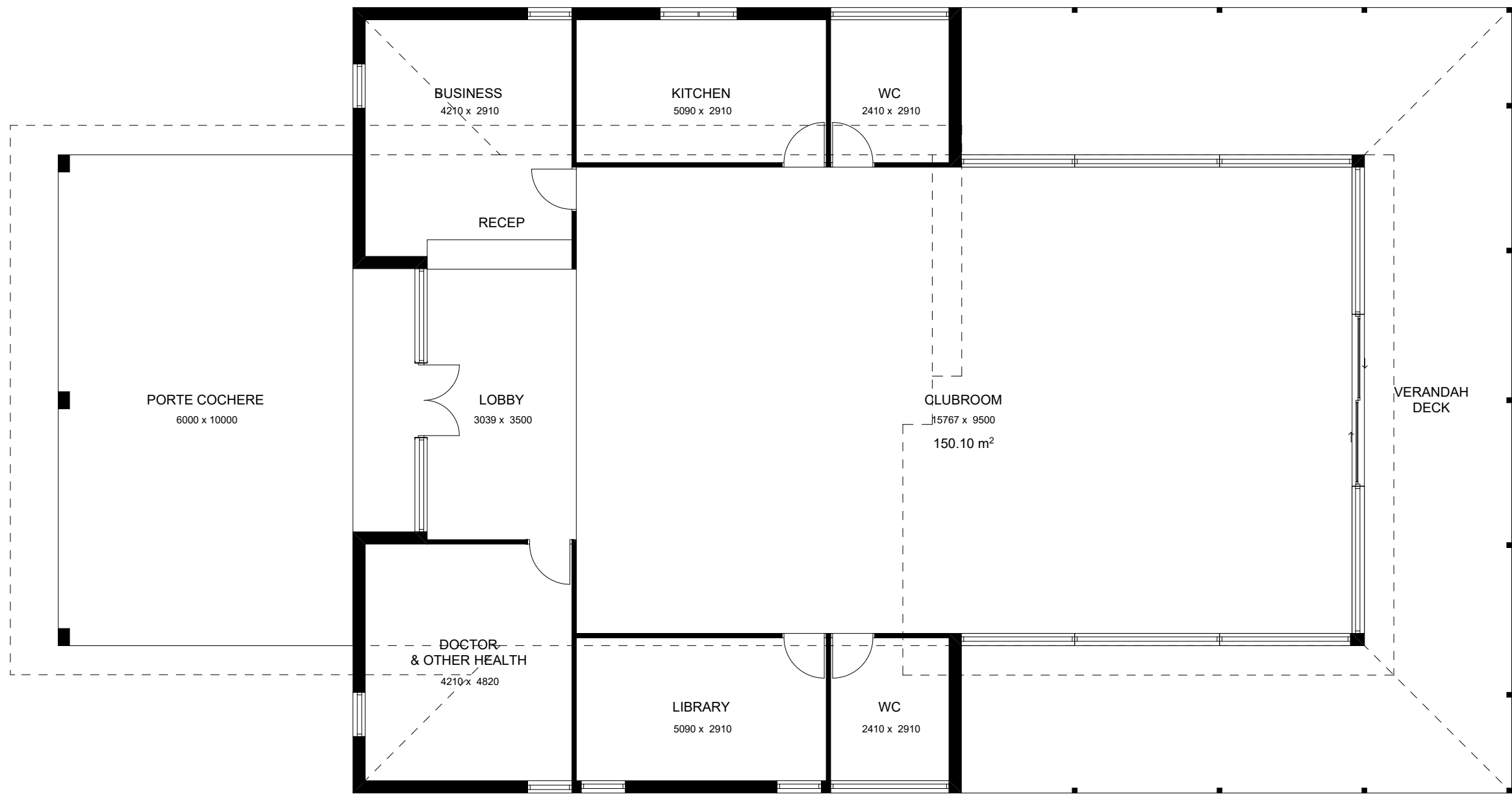
**PROPOSED DEVELOPMENT**  
At Lots 13 & 2 Mandurah Rd BALDIVIS  
For Client Name

UNITS FLOOR PLAN & ELEVATIONS			
TITLE	SCALE	WORK	PLOT
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DATE	16.03.2018	FILE	RET_017_zh.pln
AUTHOR	eb	DRAWINGS	PAPER A1
DRAWN	zh	REV	01.01
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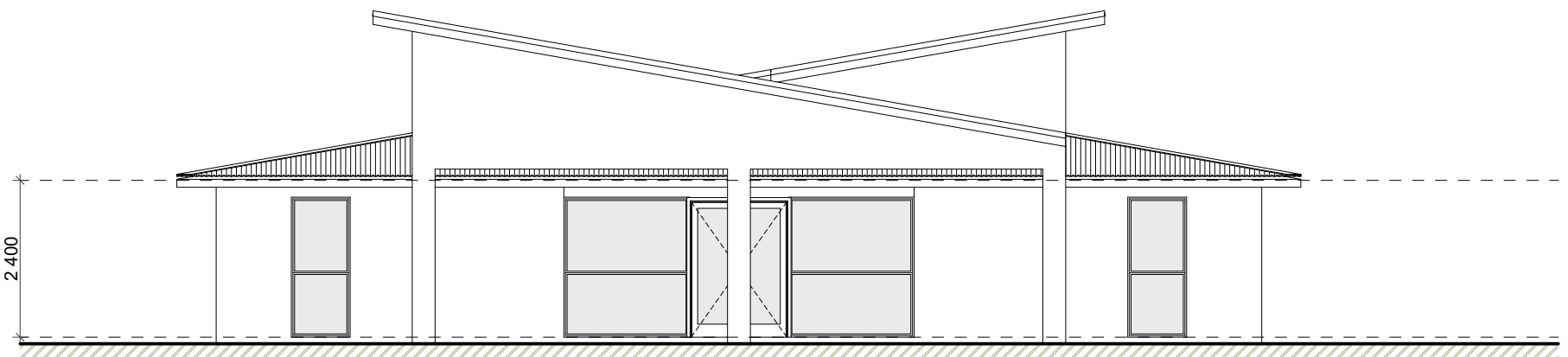
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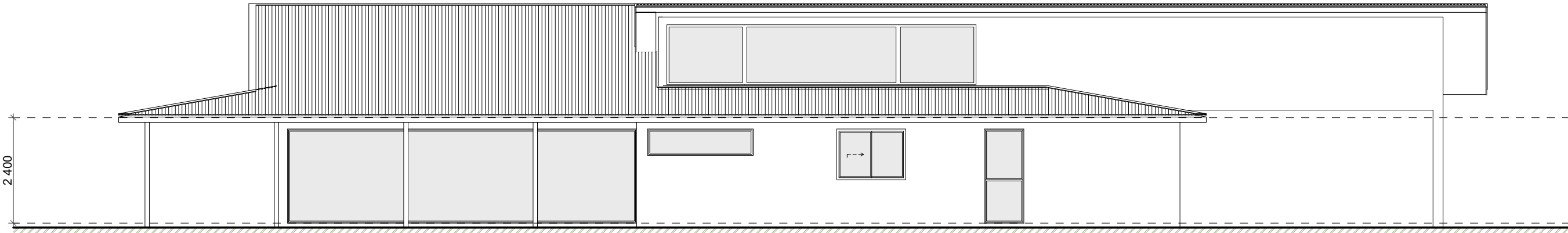




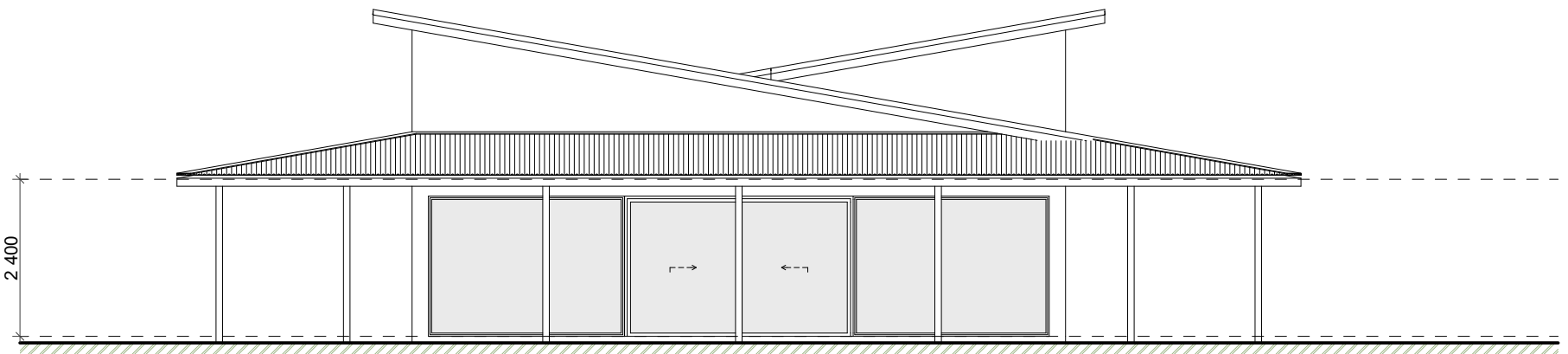
CLUB HOUSE FLOOR PLAN  
SCALE 1:100



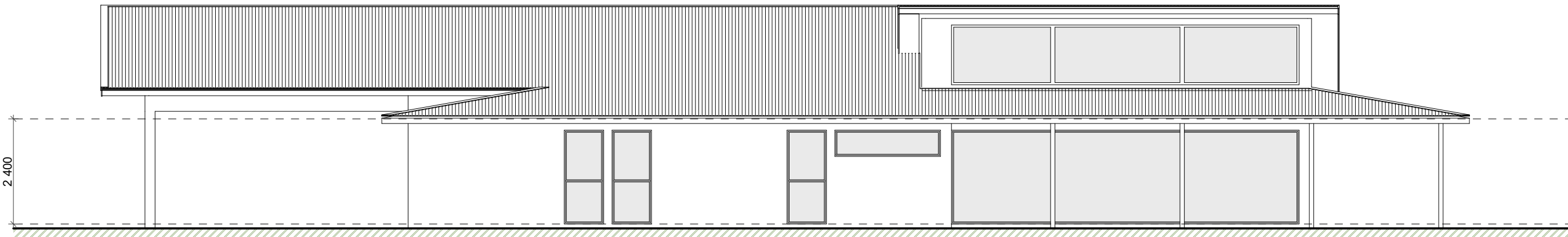
WEST ELEVATION  
SCALE 1:100



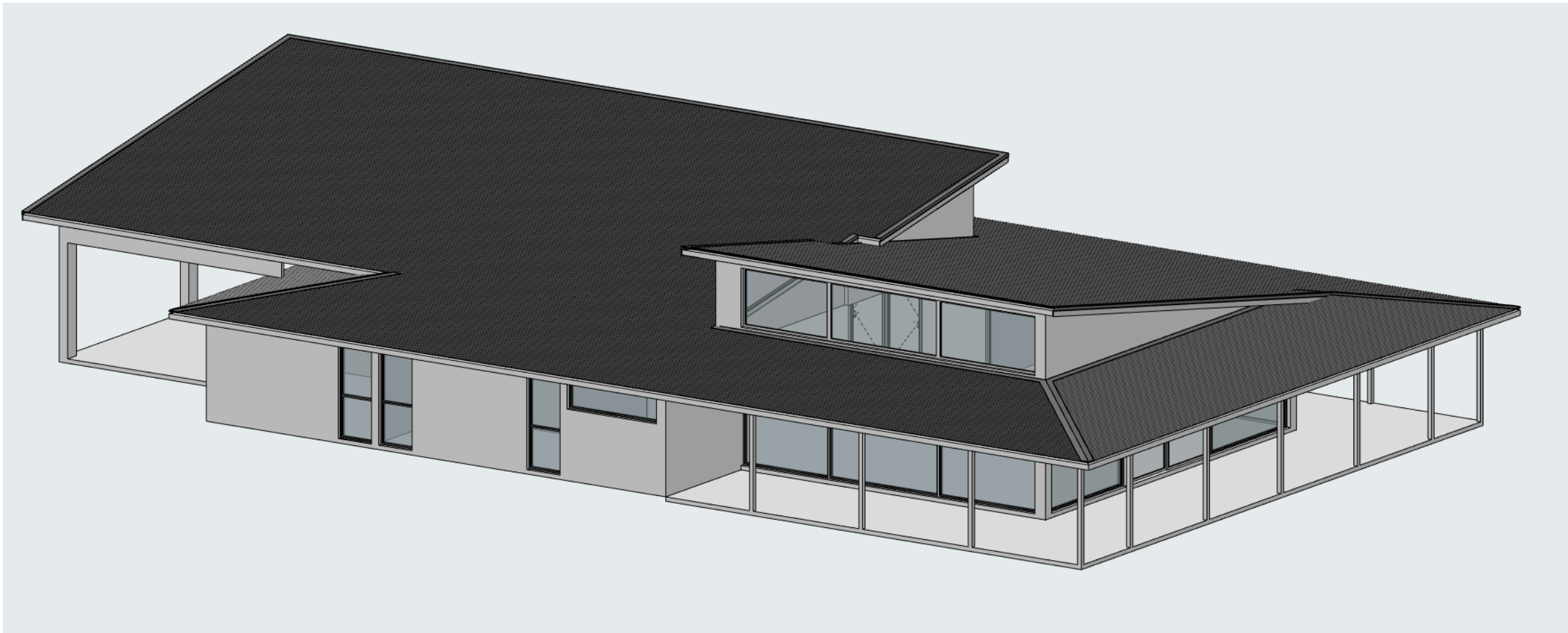
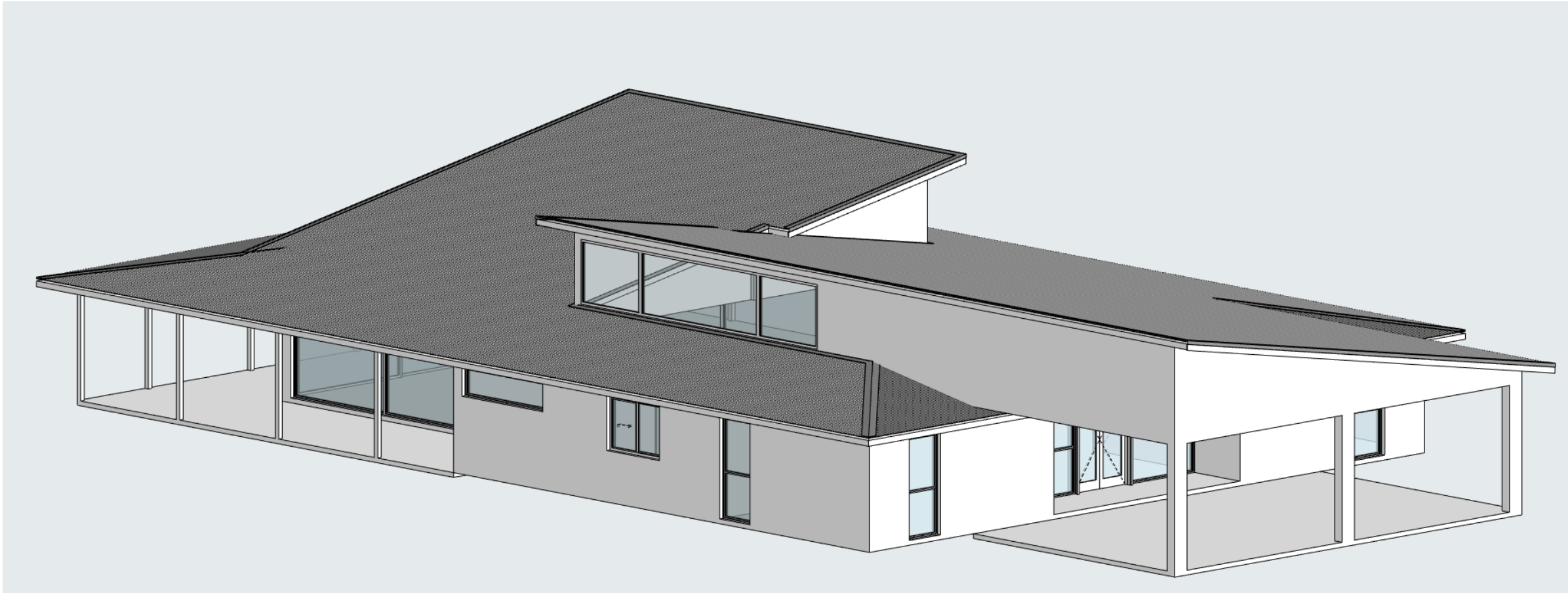
NORTH ELEVATION  
SCALE 1:100



EAST ELEVATION  
SCALE 1:100





SOUTH ELEVATION  
SCALE 1:100



SUNSET RETREAT

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ARCHITECTS  
PTY. LTD.

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T 08 9274 5559  
F 08 9274 4408  
M 04 0827 4556  
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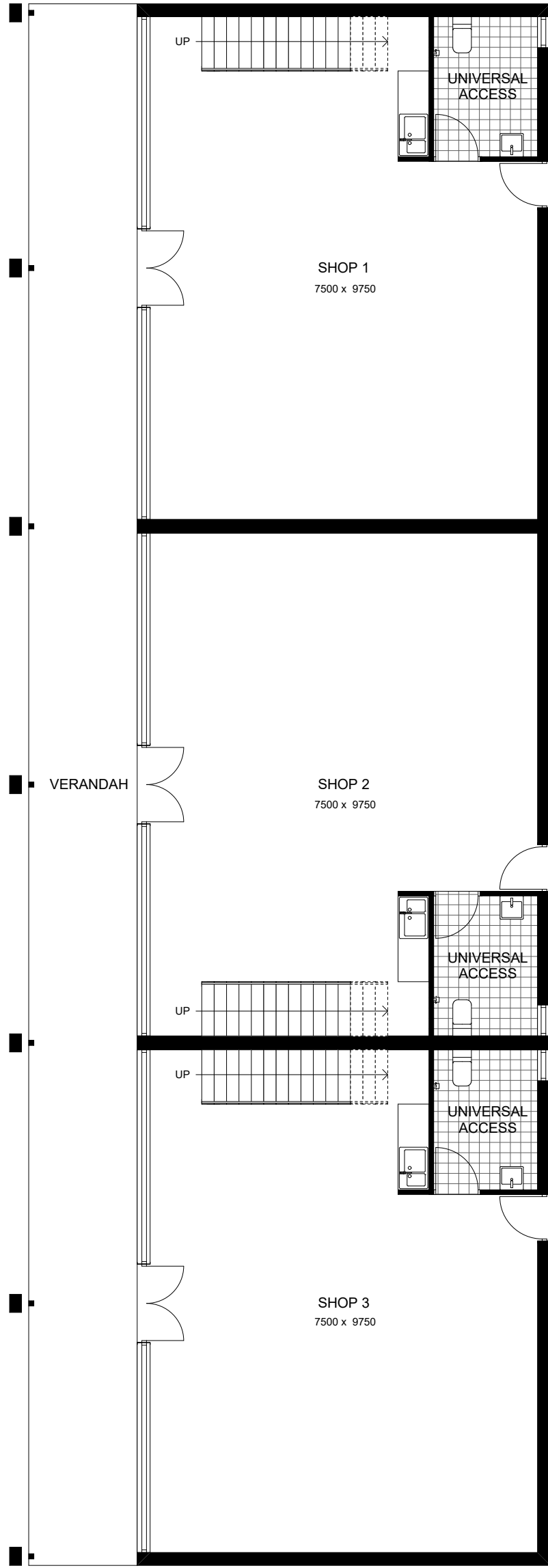
ABN 87 064 182 547

**PROPOSED DEVELOPMENT**  
At Lots 13 & 2 Mandurah Rd BALDIVIS  
For Client Name

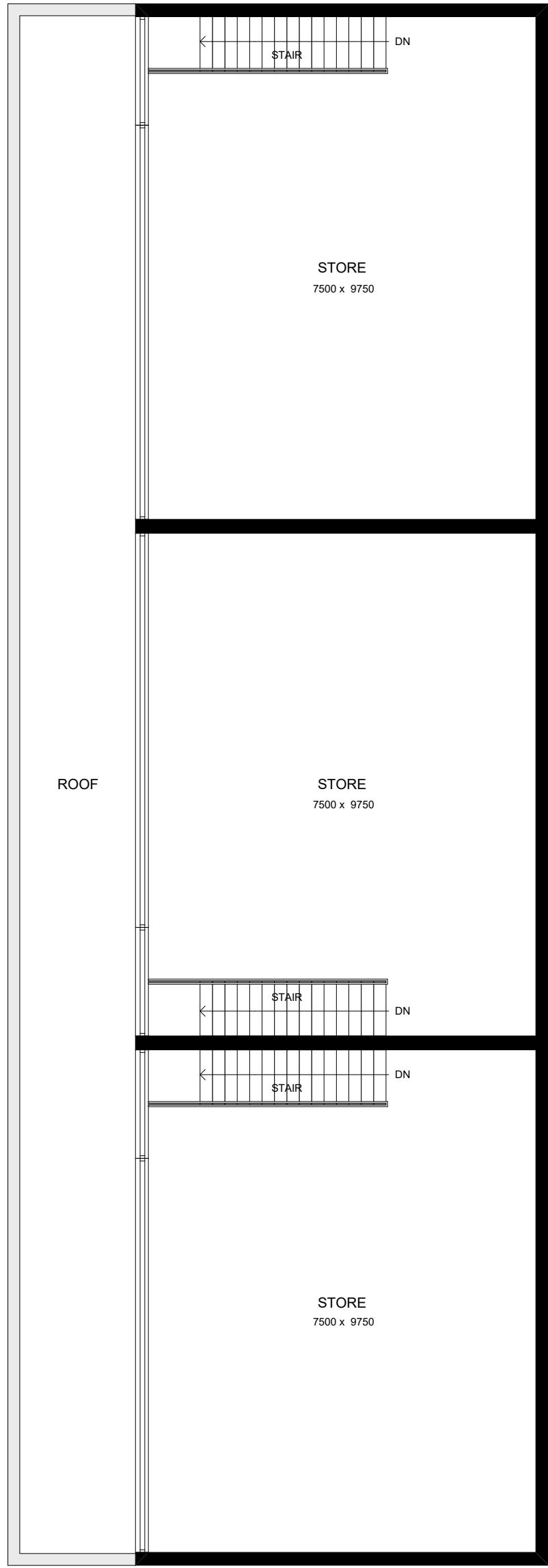
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SCALE 1:100	WORK 17-110	PLOT 30.07.2018
DATE 16.03.2018	FILE RET_017_zh.pln	PAPER A1
AUTHOR eb	DRAWINGS	REV 01.01
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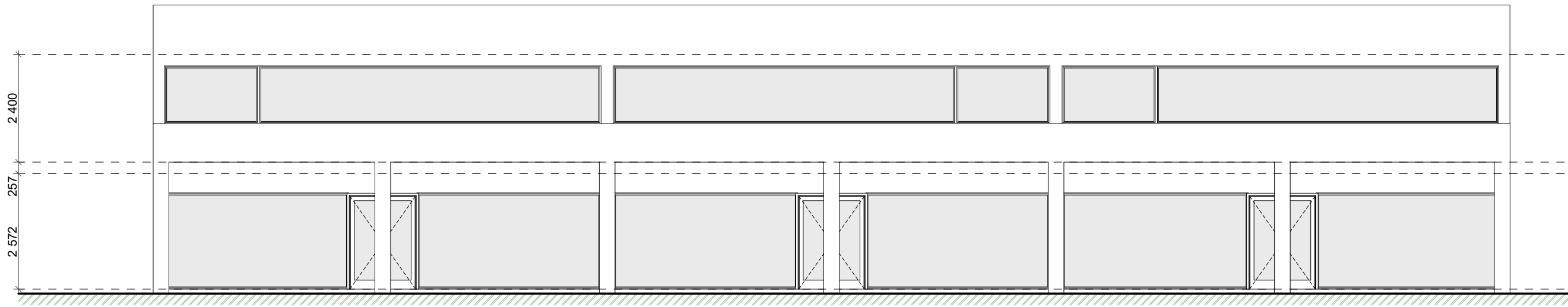




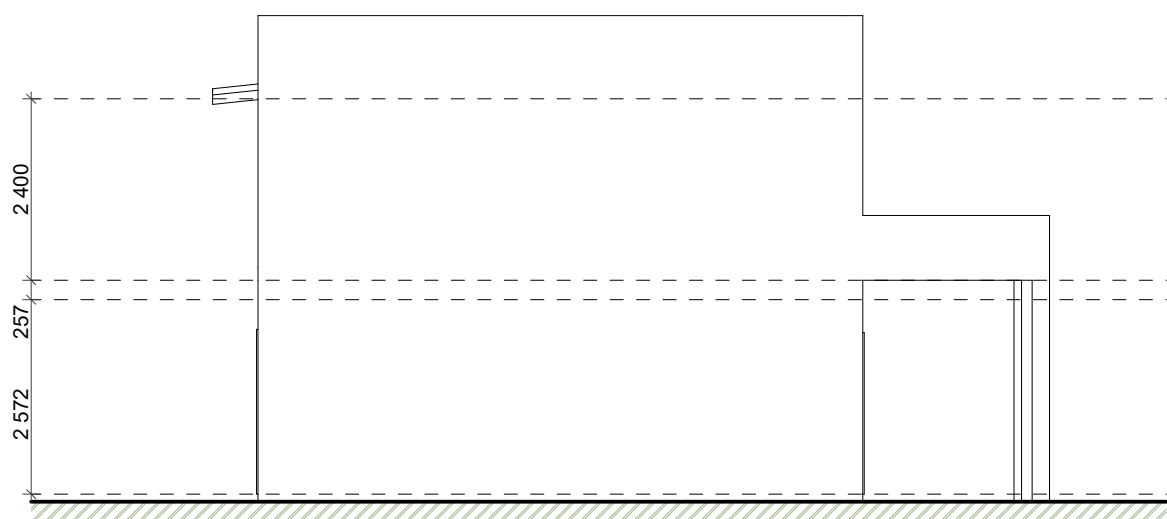
SHOPS GROUND FLOOR PLAN  
SCALE 1:100



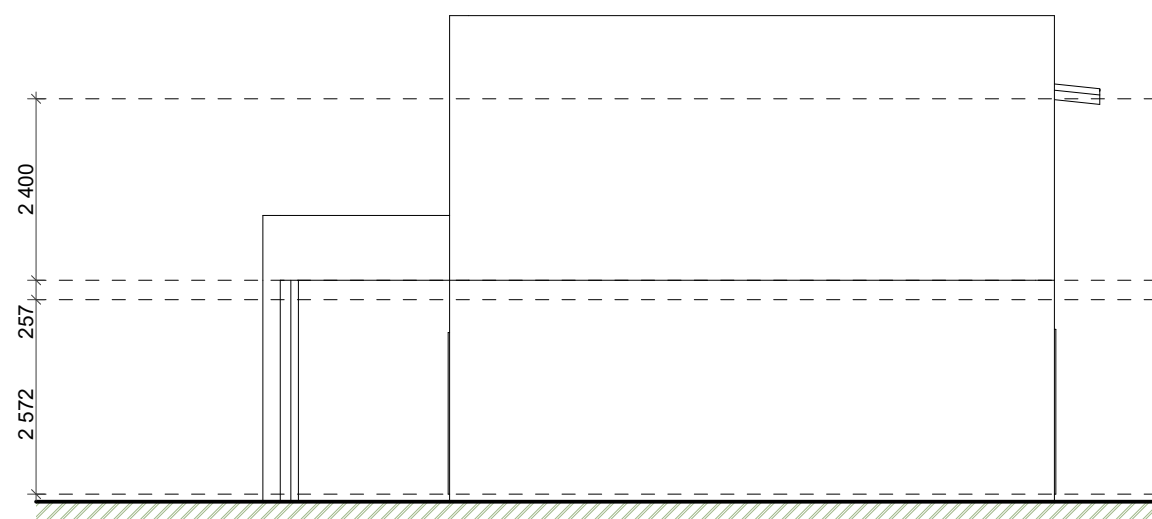
SHOPS FIRST FLOOR PLAN  
SCALE 1:100



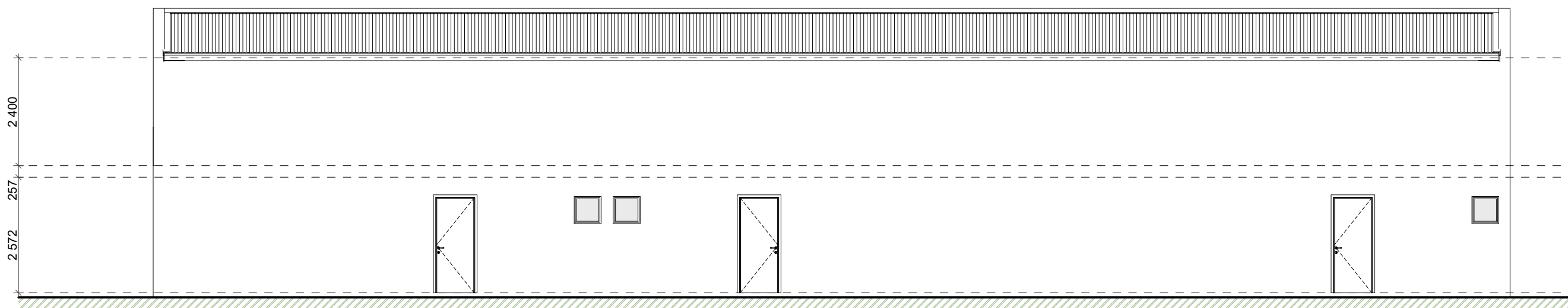
WEST ELEVATION  
SCALE 1:100



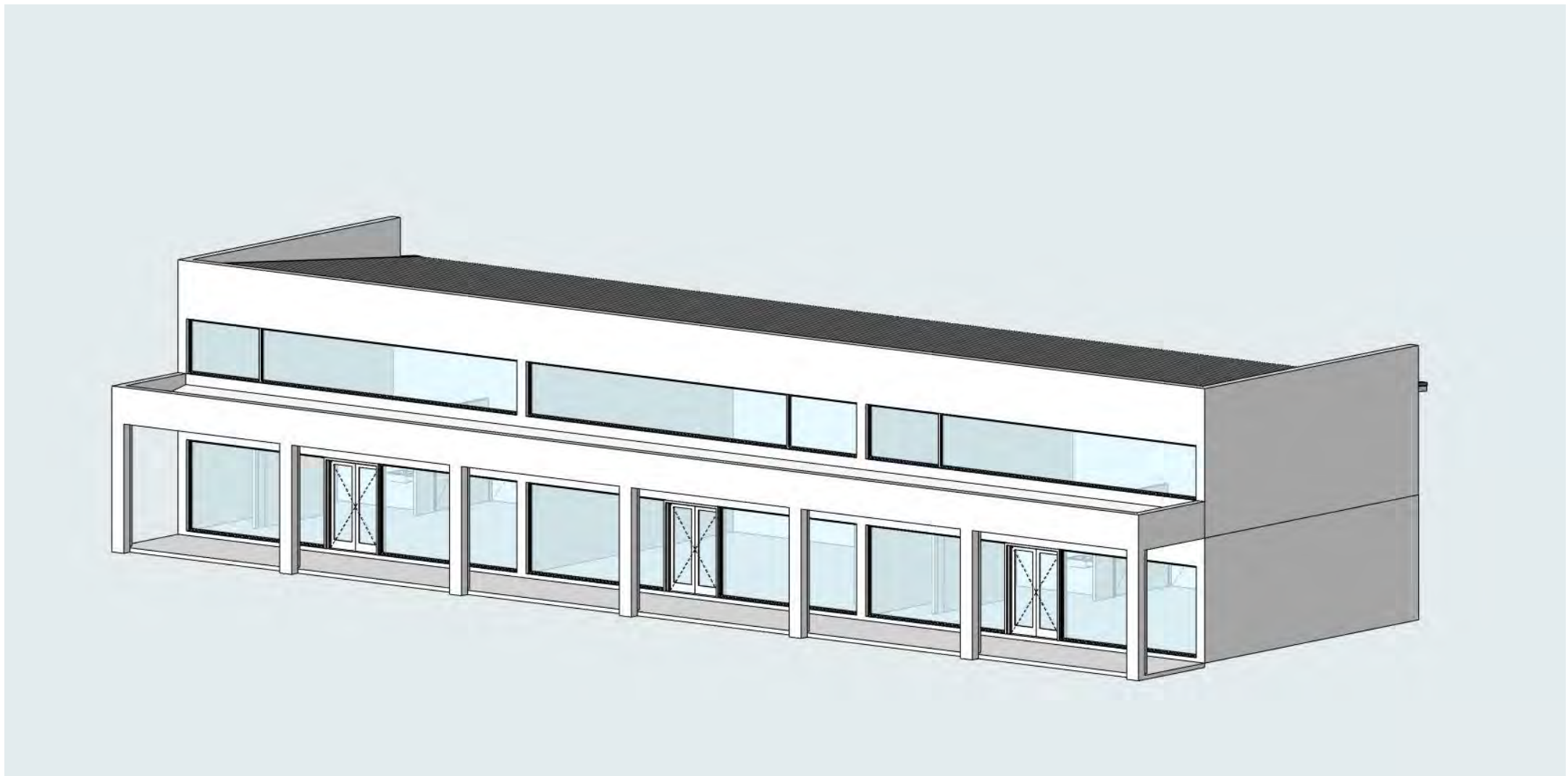
NORTH ELEVATION  
SCALE 1:100



SOUTH ELEVATION  
SCALE 1:100



EAST ELEVATION  
SCALE 1:100



SUNSET RETREAT



**BRAUDE**  
ARCHITECTS  
PTY. LTD.  
c Padbury Terrace Midland WA 6056  
T 08 9274 5559  
F 08 9274 4408  
M 04 0827 4556  
E braudearchitects@inet.net.au

ABN 87 064 182 547

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At Lots 13 & 2 Mandurah Rd BALDIVIS  
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VERSION 4

SHOPS FLOOR PLAN & ELEVATIONS			
TITLE	SCALE	WORK	PLOT
	1:100	17-110	30.07.2018
DATE	16.03.2018	FILE	RET_017_zh.pln
AUTHOR	eb	DRAWING	PAPER
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ARCHITECTS  
PTY. LTD.

7A Clarke Way Bassendean WA 6054  
T 08 9274 5559  
F 08 9274 4408  
M 04 0827 4556  
E braudearchitects@inet.net.au

ABN 87 064 182 547

NOTE:  
BIOMAX  
WASTEWATER RECYCLING  
SYSTEM  
TANK LOCATION



## SUNSET RETREAT



BRAUDE  
ARCHITECTS  
PTY. LTD.

5 Padbury Terrace Midland WA 6056  
T 08 9274 5559  
F 08 9274 4408  
M 04 0827 4556  
E braudearchitects@inet.net.au

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PROPOSED DEVELOPMENT  
At Lots 13 & 2 Mandurah Rd BALDIVIS  
For Client Name

## VERSION 4

SITE PLANT TANK LOCATIONS			
TITLE	SCALE	WORK	DATE
1:500	17-110	30.07.2018	
DATE	FILE	PAPER	REV
16.03.2018	RET_017_zh.pln	A1	
AUTHOR	DRAWING		
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zh			
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LOCATION	AREA
A	=168m <sup>2</sup>
B	=289m <sup>2</sup>
C	=1200m <sup>2</sup>
D	=539m <sup>2</sup>
E	=450m <sup>2</sup>
F	=452m <sup>2</sup>
G	=451m <sup>2</sup>
H	=595m <sup>2</sup>
I	=264m <sup>2</sup>
J	=432m <sup>2</sup>
K	=209m <sup>2</sup>
L	=396m <sup>2</sup>
M	=115m <sup>2</sup>
N	=123m <sup>2</sup>
<b>TOTAL:</b>	<b>5683m<sup>2</sup></b>

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ARCHITECTS  
PTY. LTD.

5 Padbury Terrace Midland WA 6056  
T 08 9274 5569  
F 08 9274 1408  
M 04 0827 4556  
E braudearchitects@iinet.net.au

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At Lots 13 & 2 Mandurah Rd BALDIVIS  
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**VERSION 4**

TITLE			
RECREATION AREA SITE PLAN			
SCALE	WORK	PLCT	
1:500	17-110	30.07.2018	
DATE	FILE	PAPER	
16.03.2018	RET_017_zh.pln	A1	
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VIEW FROM SOUTH-WEST



VIEW FROM SOUTH-EAST



VIEW FROM NORTH-WEST

## SUNSET RETREAT

## VERSION 4



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ARCHITECTS  
PTY. LTD.

5 Padbury Terrace Midland WA 6056  
T 08 9274 5569  
F 08 9274 1408  
M 04 0827 4556  
E braudearchitects@inet.net.au

ABN 87 064 182 547

**PROPOSED DEVELOPMENT**  
**At Lots 13 & 2 Mandurah Rd BALDIVIS**  
**For Client Name**

CHECK ALL DIMENSIONS ON SITE

TITLE			
PERSPECTIVES			
SCALE	WORK	PLOT	
	17-110	30.07.2018	
DATE	FILE	PAPER	
16.03.2018	RET_017_zh.pln	A2	
AUTHOR	DRAWING	REV	
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**SITE SECTION A:A**  
1:100 Sk1 & Sk2

**SUNSET RETREAT**

**VERSION 4**



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ARCHITECTS  
PTY. LTD.**  
c Padbury Terrace Midland WA 6056  
T 08 9274 5569  
F 08 9274 4408  
M 04 0827 4556  
E braudearchitects@inet.net.au

ABN 87 064 182 547

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TITLE			
SITE SECTION			
SCALE	1:500	WORK	17-110
DATE	16.03.2018	FILE	RET_017_zh.pln
AUTHOR	eb	DRAWING	SK 8
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VIEW FROM SOUTH-WEST



VIEW FROM SOUTH-EAST



VIEW FROM NORTH-WEST

## SUNSET RETREAT

## VERSION 4



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ARCHITECTS  
PTY. LTD.

5 Padbury Terrace Midland WA 6056  
T 08 9274 5569  
F 08 9274 1408  
M 04 0827 4556  
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ABN 87 064 182 547

**PROPOSED DEVELOPMENT**  
**At Lots 13 & 2 Mandurah Rd BALDIVIS**  
**For Client Name**

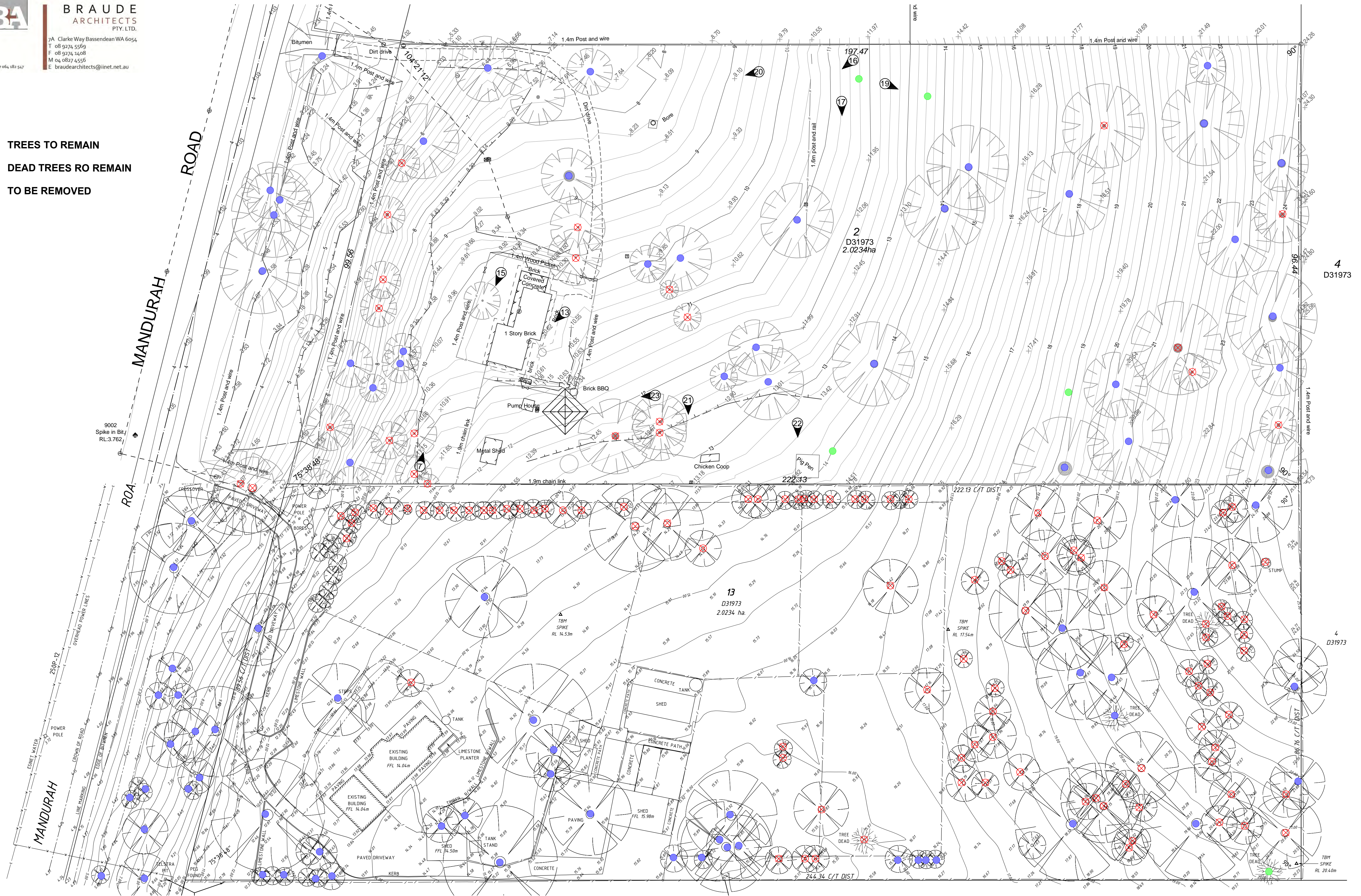
CHECK ALL DIMENSIONS ON SITE

TITLE			
PERSPECTIVES			
SCALE	WORK	17-110	PLOT 30.07.2018
DATE	FILE	RET_017_zh.pln	PAPER A2
AUTHOR	DRAWING	eb	REV
DRAWN	zh	SK 9	
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- TREES TO REMAIN
- DEAD TREES RO REMAIN
- ⊗ TO BE REMOVED



## SUNSET RETREAT

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F 08 9274 4408  
M 04 0827 4556  
E braudearchitects@inet.net.au

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**PROPOSED DEVELOPMENT**  
At Lots 13 & 2 Mandurah Rd BALDIVIS  
For Client Name

SURVEY PLAN			
TITLE	17-110	30.07.2018	
SCALE	1:500	WORK	
DATE	16.03.2018	FILE	RET_017_zh.pln
AUTHOR	eb	DRAWING	
DRAWN	zh	SK 10	
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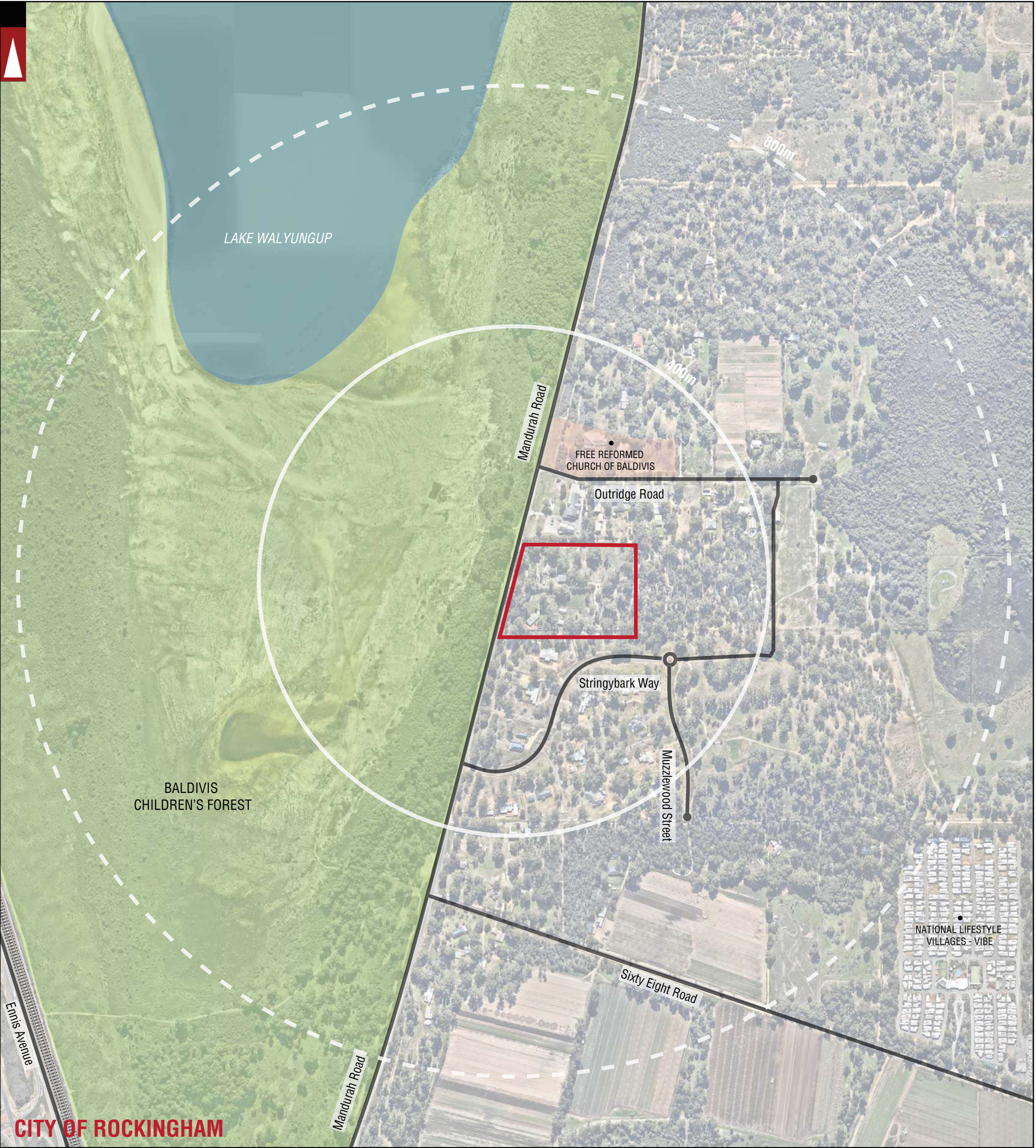
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# **Appendix 2**

## **Transport Planning and Traffic Plans**





PARKS AND RECREATION

WATERWAYS

PUBLIC PURPOSE

ROAD

Hay Street

STREET NAME

RAILWAY

LOCATION BOUNDARY

DISTANCE FROM LOCATION

CITY OF ROCKINGHAM

LOCAL GOVERNMENT NAME

LOCAL AUTHORITY BOUNDARY

BALDIVIS

SUBURB

Certified System

Quality ISO 9001

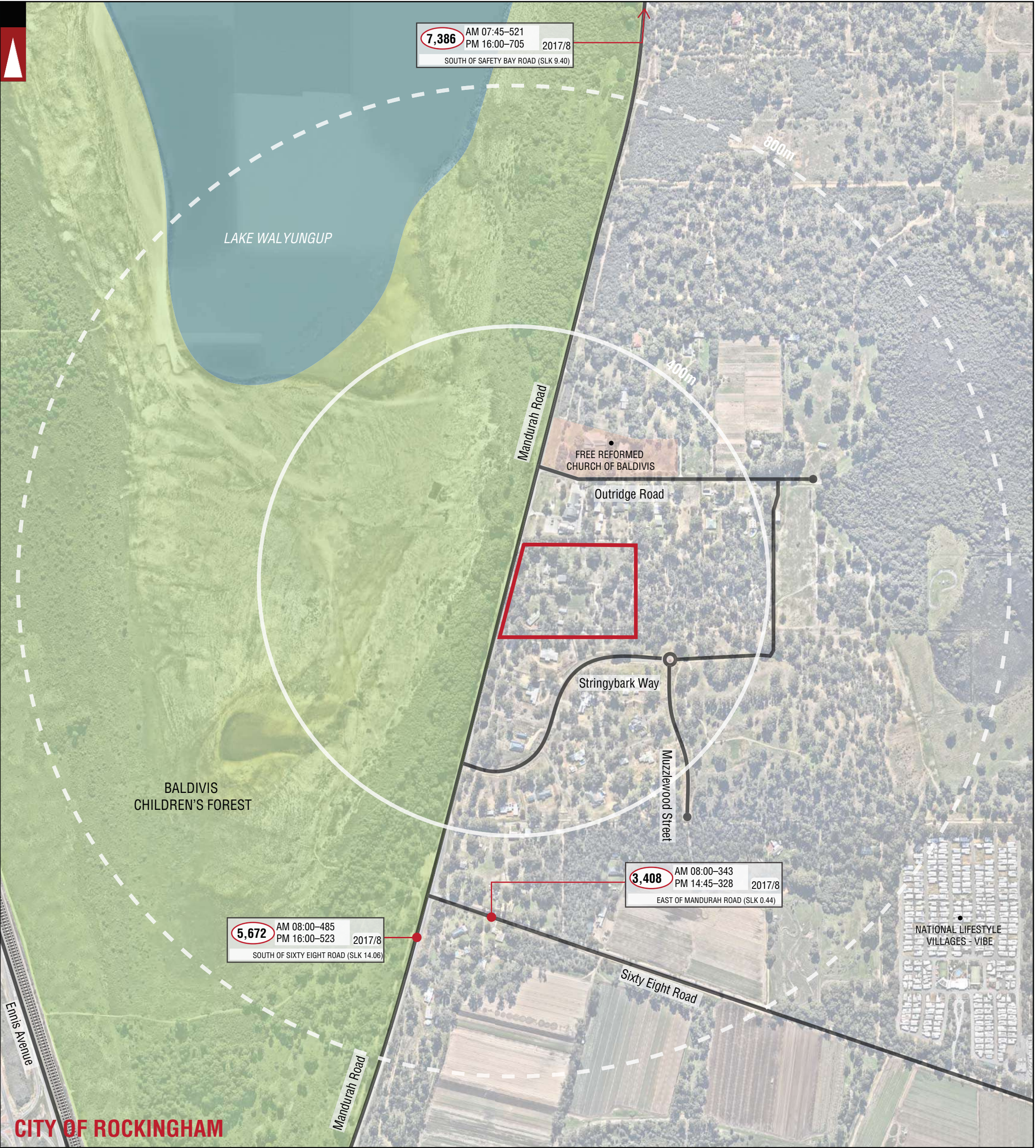
SAI GLOBAL

LEGEND

			PROJECT:	1447-1457 MANDURAH ROAD, BALDIVIS	DRAWN BY:	Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021	<div>PH: 08 9441 2700 WEB: www.kctt.com.au</div> <div>kctt</div>
			TITLE:	LOCALITY PLAN - 800M RADIUS			
A	03-09-2018	ISSUED FOR REVIEW	DRAWING NUMBER:	KC00894.000_ S01	J.S.		
No	DATE	AMENDMENT					







PARKS AND RECREATION

WATERWAYS

PUBLIC PURPOSE

ROAD

Hay Street

STREET NAME

RAILWAY

LOCATION BOUNDARY

DISTANCE FROM LOCATION

LOCAL GOVERNMENT NAME

LOCAL AUTHORITY BOUNDARY

SUBURB

CITY OF ROCKINGHAM

BALDIVIS

5,512

AM 1145 – 381  
PM 1630 – 480

2014

NUMBER OF VEHICLES PER DAY

NUMBER OF VEHICLES PER AM PEAK HOUR

NUMBER OF VEHICLES PER PM PEAK HOUR

YEAR

LOCATION

Certified System

Quality ISO 9001

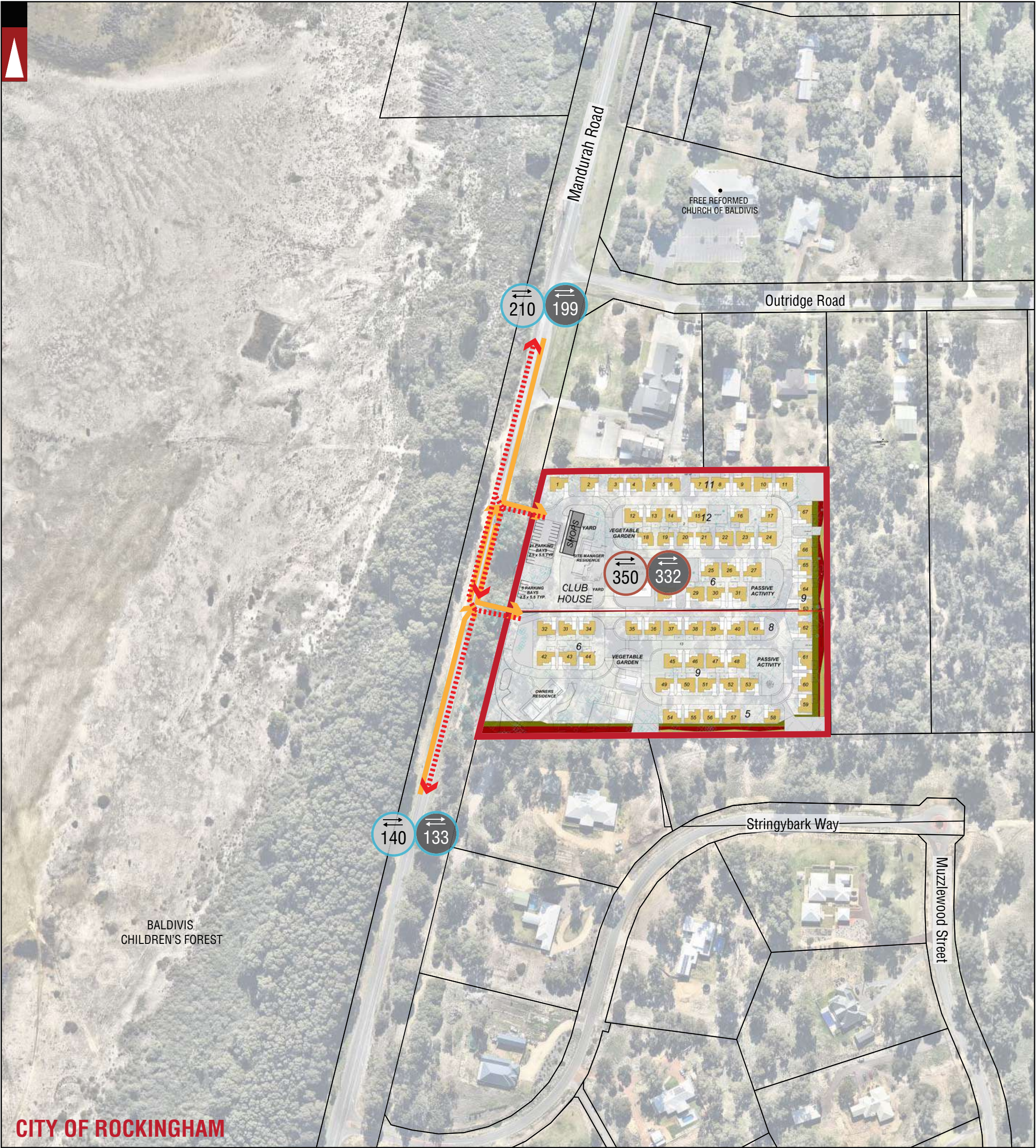
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LEGEND

			PROJECT:	1447-1457 MANDURAH ROAD, BALDIVIS	DRAWN BY:	Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021
			TITLE:	EXISTING TRAFFIC COUNTS - 800M RADIUS		
A	03-09-2018	ISSUED FOR REVIEW	DRAWING NUMBER:	KC00894.000_ S05	J.S.	PH: 08 9441 2700 WEB: www.kctt.com.au
No	DATE	AMENDMENT				







PARKS AND RECREATION

WATERWAYS

PUBLIC PURPOSE

LOCATION BOUNDARY

CITY OF ROCKINGHAM

LOCAL GOVERNMENT NAME

BALDIVIS

SUBURB

Hay Street

STREET NAME

1,389

Expected Traffic Generation from the proposed development

503

Total Expected Traffic Generation from Subject Site on the specific section of road - IN and OUT direction

Traffic Flow IN Direction

Traffic Flow OUT Direction

1,389

Total Additional Traffic Generation from the proposed development

503

Total Additional Traffic Generation from the proposed development on the specific section of road - IN and OUT direction

Certified System

Quality ISO 9001

SAI GLOBAL

LEGEND

			PROJECT: 1447-1457 MANDURAH ROAD, BALDIVIS	DRAWN BY: Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021
			TITLE: TRAFFIC FLOW DIAGRAM	J.S.
A	03-09-2018	ISSUED FOR REVIEW	DRAWING NUMBER: KC00894.000_S06	PH: 08 9441 2700 WEB: www.kctt.com.au
No	DATE	AMENDMENT		







PARKS AND RECREATION

WATERWAYS

PUBLIC PURPOSE

HAY STREET

STREET NAME

CITY OF ROCKINGHAM

LOCAL GOVERNMENT NAME

BALDIVIS

SUBURB

LOCATION BOUNDARY

TRAFFIC FLOW IN DIRECTION

TRAFFIC FLOW OUT DIRECTION

1,389

EXPECTED TRAFFIC GENERATION FROM THE PROPOSED DEVELOPMENT

503

EXPECTED TRAFFIC GENERATION FROM SUBJECT SITE ON THE SPECIFIC SECTION OF ROAD - IN AND OUT DIRECTION

1,389

TOTAL ADDITIONAL TRAFFIC GENERATION FROM THE PROPOSED DEVELOPMENT

503

TOTAL ADDITIONAL TRAFFIC GENERATION FROM THE PROPOSED DEVELOPMENT ON THE SPECIFIC SECTION OF ROAD - IN AND OUT DIRECTION

CERTIFIED SYSTEM

SAI GLOBAL

LEGEND

			PROJECT:	1447-1457 MANDURAH ROAD, BALDIVIS	DRAWN BY:	Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balcatta WA 6021
			TITLE:	TRAFFIC FLOW DIAGRAM - PM PEAK		
A	03-09-2018	ISSUED FOR REVIEW	DRAWING NUMBER:	KC00894.000_S07	J.S.	PH: 08 9441 2700 WEB: www.kctt.com.au
No	DATE	AMENDMENT				