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LOT 69 STRIVE BLACKMORE, ESTATE GIRRAWHEEN

IN COLLABORATION WITH



CONCEPT BUILDING DESIGN

DRAWN	DESIGNED	CHECKED	JOB N°
CC	CC	RS	TIE 727

CIVIL WORKS

CLIENT : CONCEPT BUILDING DESIGN  
 CLIENT PROJ. No : CP-265-15  
 PROJECT : LOT 69 STRIVE BLACKMORE ESTATE GIRRAWHEEN  
 JOB No. : TIE727  
 DRAWING TITLE : STORMWATER PLAN  
 DRAWING No : TIE735 CIVIL - C1.00 / C2.00

RAYMOND CHEONG  
 MIEAust CP Eng 583402  
 raymond@engenuitywa.com.au

DRAWN DESIGNED CHECKED RC  
 SCALE 1 : 200 A1

CONCEPT BUILDING DESIGN  
 IN COLLABORATION WITH

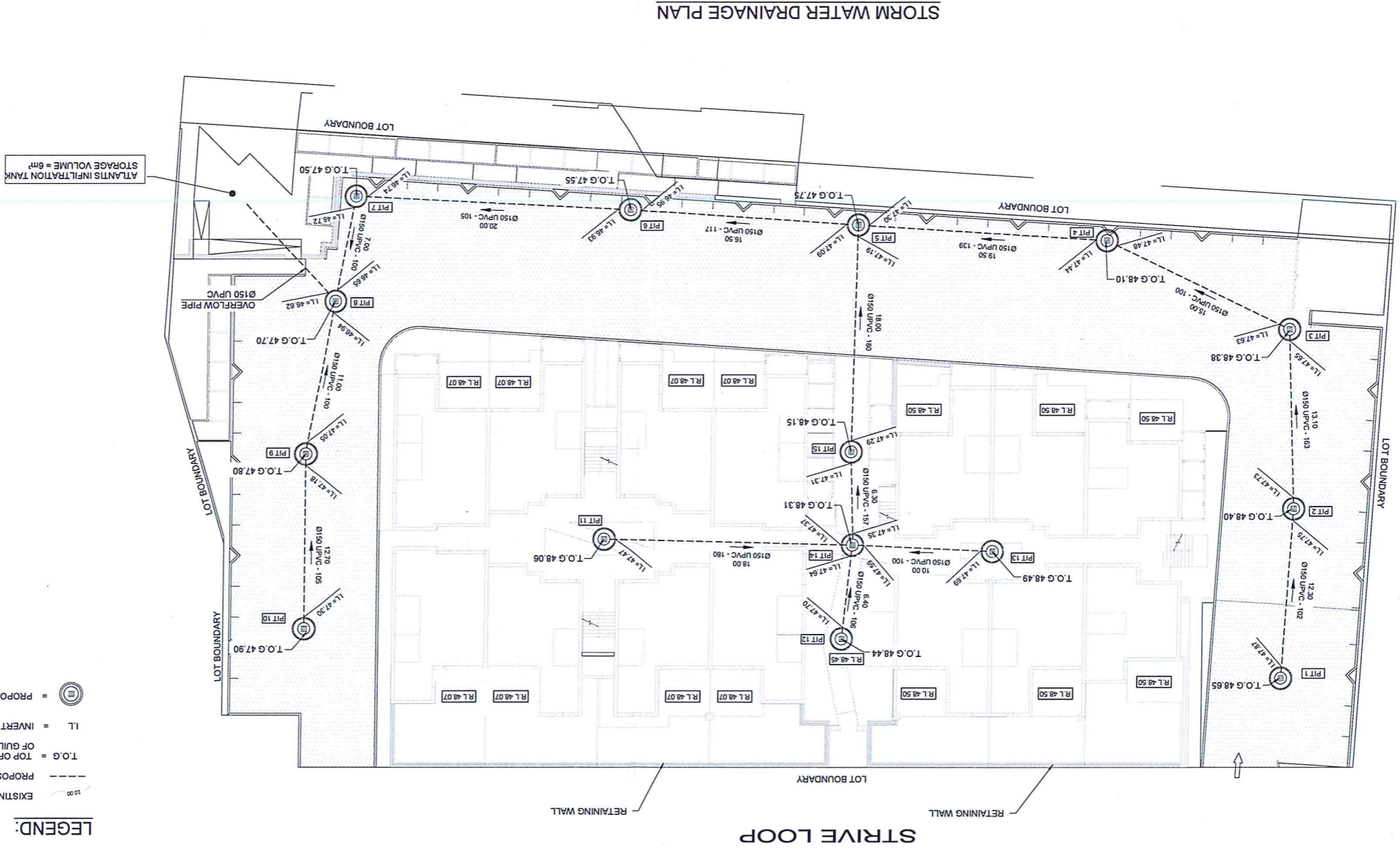
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 A: LEVEL 4/1101 HAY STREET, WEST PERTH WA  
 P: PO BOX 771 BUNBURY 6231



REV.	DATE	DESCRIPTION
A	05/07/16	ISSUED FOR CLIENT REVIEW
B	20/09/16	ISSUED FOR CLIENT REVIEW

SEE DWG TIE727 CIVIL - C2 FOR ROAD & PAVEMENT PLAN

NOTE:  
 ALL LEVELS CALCULATED BASED ON THE ARCHITECTURAL DRAWING.



LEGEND:

- ⊕ = PROPOSED OPEN BASE SOAKWELL (Ø1800 x 1200 DEPTH)
- ⊙ = PROPOSED STORMWATER PIPE
- T.O.G = TOP OF GRATE LEVELS
- I.L. = INVERT LEVEL OF DRAINAGE LINE
- = EXISTING GROUND LEVEL

NOTES:

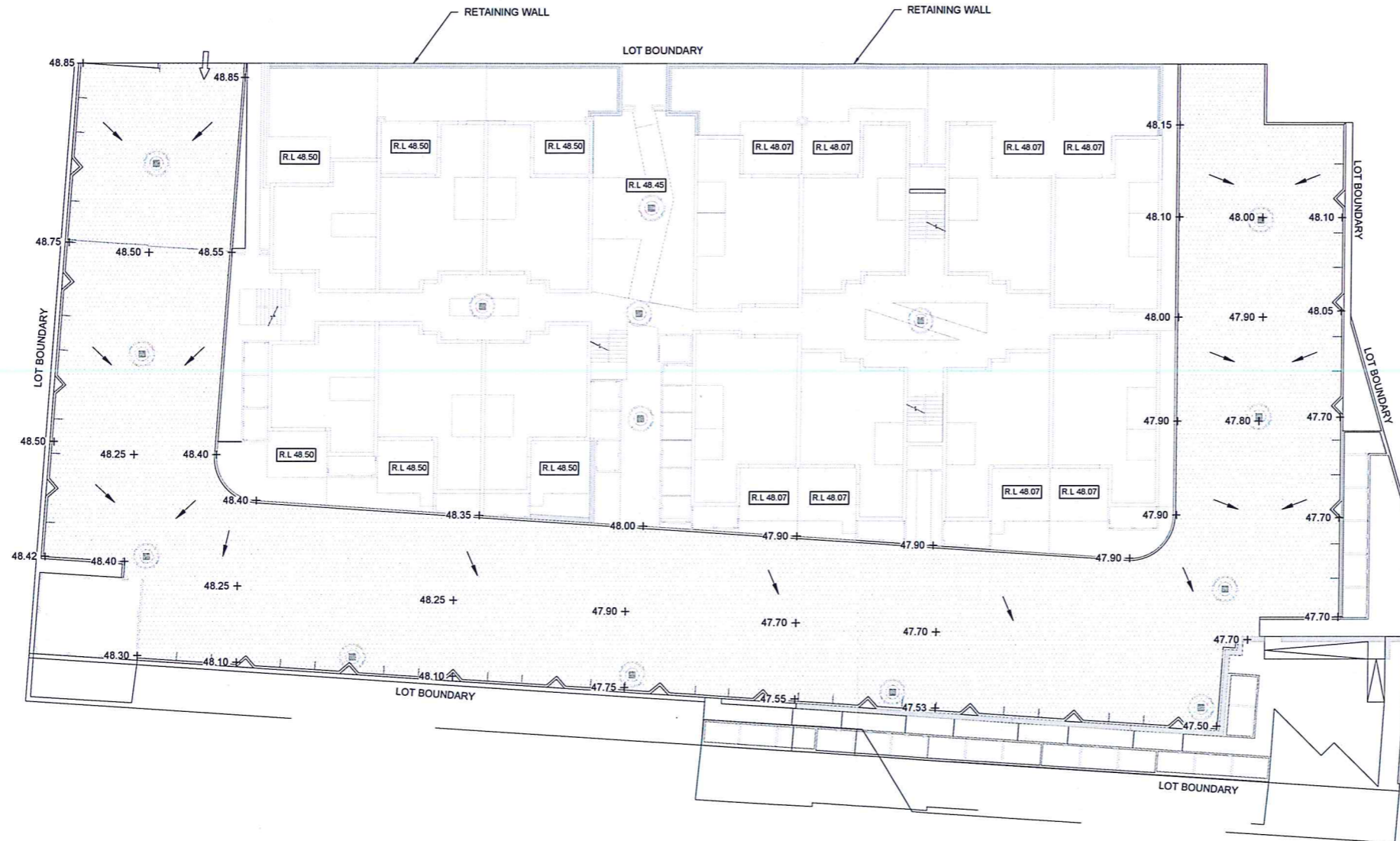
1. ALL PRECAST CONCRETE COMPONENTS SHALL BE OF APPROVED MANUFACTURE.
2. BACKFILL TO PIT SHALL BE COMPACTED TO 95% M.M.D.
3. ALL STORM WATER PIT CONNECTIONS TO CITY OF WANNEROO STANDARDS
4. ALL MAN HOLE TO CITY OF WANNEROO STANDARDS
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING WITH THE CITY OF WANNEROO TO ENSURE THE LATEST COUNCIL STANDARDS ARE USED, PRIOR TO ORDERING THE VARIOUS DRAINAGE STRUTURES REQUIRED FOR THE STORMWATER DRAINAGE SYSTEM.
6. WHERE CONNECTING INTO EXISTING DRAINAGE, THE CONTRACTOR IS TO PICK UP UPSTREAM AND DOWN STREAM INVERT LEVELS OF EXISTING DRAINAGE LINE IMMEDIATELY DOWN STREAM OF PROPOSED CONNECTION. THE CONTRACTOR TO SUPPLY THE SURVEY INFORMATION TO THE SUPERINTENDENT PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE CONSTRUCTION. THE CONTRACTOR TO THEN WAIT NOTIFICATION FROM THE SUPERINTENDENT THAT DRAINAGE CONSTRUCTION MAY COMMENCE.
7. ALL MANHOLES & GUILTY GRATES TO BE FLUSH WITH SURROUNDING PAVEMENT LEVELS UNLESS SHOWN OTHERWISE.
8. FOR CONNECTIONS FROM DOWNPIPES TO PIT & DRAINAGE PIPE NETWORK, PLEASE REFER TO ARCHITECTURAL DWGS.
9. MINIMUM PIPE COVER TO BE 450mm.



NORTH



STRIVE LOOP



NOTES:

- DESIGN LEVELS ARE TO TOP OF PAVEMENTS
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING WITH THE CITY OF SWAN TO ENSURE THE LATEST COUNCIL STANDARDS ARE USED, PRIOR TO ORDERING THE VARIOUS DRAINAGE STRUCTURES REQUIRED FOR THE STORMWATER DRAINAGE SYSTEM.
- SUBGRADE PREPARATION SHALL BE CARRIED OUT IN ALL AREAS WHERE A HARDSTAND OR ROAD PAVEMENT LAYER IS TO BE CONSTRUCTED. AFTER EXCAVATION OR FILLING, INCLUDING REFILL OF TRENCHES, TRIMMING AND BOXING OUT, THE FINISHED SURFACE OF THE SUB-GRADE SHALL CONFORM TO THE LINES, GRADES, SHAPES AND DIMENSIONS SHOWN ON THE DRAWINGS. PREPARATION OF THE PAVEMENT SHALL NOT COMMENCE UNTIL ALL DRAINAGE WORKS, CROSSINGS AND ASSOCIATED EXCAVATIONS AND BACKFILLING OPERATIONS, IN A PARTICULAR SECTION OF THE WORKS, HAVE BEEN COMPLETED. CARE SHALL BE TAKEN TO ENSURE THAT ALL BACKFILL TO TRENCHES HAS BEEN PROPERLY COMPACTED.
- THE SUBGRADE SHALL BE COMPACTED TO NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY WHEN TESTED BY TEST METHOD 5.2.1 AS 1289-2003 TO A MINIMUM DEPTH BELOW THE SURFACE OF 450MM. THE SUB-GRADE SHALL BE WORKED TO PROVIDE A LAYER UNIFORM IN ALL ITS CHARACTERISTICS.
- REFER DWG TIE327 CIVIL-C1 SHEET 1 FOR STORM WATER DRAINAGE

LEGEND:

- 26.00 = EXISTING GROUND LEVEL
- 21.50 + = PROPOSED PAVEMENT LEVELS
- = SURFACE WATER FLOW
- [ ] = PAVED AREA
- [ ] = PARKING BITUMEN AREA

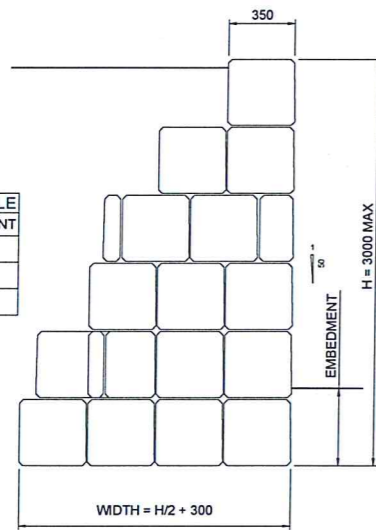
NOTE:  
ALL LEVELS CALCULATED BASED ON THE ARCHITECTURAL DRAWING.

SEE DWG TIE727 CIVIL - C1 FOR STORMWATER DRAINAGE PLAN

PAVEMENT PLAN AND DETAILS

1:200

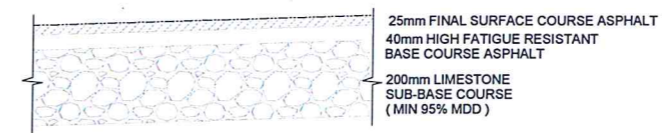
TYPICAL LIMESTONE WALL TABLE		
HEIGHT	WIDTH (mm)	EMBEDMENT
1000	800	200
2000	1300	300
3000	1800	400



TYPICAL LIMESTONE RETAINING WALL DETAIL

LIMESTONE RETAINING WALL NOTES:

- WALL TO BE BACK FILLED WITH FREE DRAINING GRANULAR MATERIAL, GROUND WATER TABLE TO BE KEPT BELOW BOTTOM OF WALL.
- REMOVE TOP SOIL FROM THE FOUNDATION AREA.
- GROUND TO UNDERSIDE OF WALL SHALL BE COMPACTED BY HAND OR WITH AN APPROVED VIBRATORY PLATE COMPACTOR OR ROLLER TO ACHIEVE THE COMPACTION OF 7 BLOWS PER 300MM MEASURED IN THE TOP 750MM WITH A 9.1KG, 16MM DIAMETER STANDARD PERTH PENETROMETER.
- MINIMUM DENSITY OF LIMESTONE TO BE 1700 KG/M3.
- USE STANDARD Ø3.15 GALVANISED MASONRY TIES BETWEEN EACH LEAF AT 500C/C HORIZONTALLY IN EACH BED JOINT.
- MORTAR TYPE "M3" TO BE USED FOR ALL JOINTS, EXCEPT WITHIN 1KM OF THE OCEAN WHERE MORTAR TYPE "M4" SHOULD BE USED
- CEMENT TYPE GP AND 100% WHITE PORTLAND SHOULD BE USED.
- RETAINING WALL NOT TO BE BACKFILLED AFTER 6 DAYS OF COMPLETION.
- FILL VOIDS WITH MORTAR AND ¾" NOT RUBBLE.
- NO BACKFILL TO BE PLACED AGAINST WALL UNTIL A MINIMUM OF 7 DAYS FOLLOWING COMPLETION OF WORK.
- LIMESTONE MAY BE CUT BLOCKS OR FREE STONES. STONES TO INTERLOCK TO FORM A STRONG BOND. USE MASONRY TIES AS NECESSARY. CONTACT THE ENGINEER IF UNSURE PRIOR TO PROCEEDING.
- LIMESTONE TO BE NON-FRIABLE.
- BACK SLOPE FACE OF WALL 1 : 50.



TYPICAL CARPARK STRUCTURE

REV.	DATE	DESCRIPTION
B	20/09/16	ISSUED FOR CLIENT REVIEW
A	05/07/16	ISSUED FOR CLIENT REVIEW



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CIVIL WORKS

SHEET C2.00

**Traffic Engineering Letter**  
KC00536.000 Strive Loop Girrawheen

13.12.2016

Andrew Maxwell  
1, 265 Walcott Street,  
North Perth, W.A. 6006

**Attn:** Ms Debora Waller

**Re: Strive Loop, Girrawheen Proposal for Traffic Impact Statement**

Andrew,

This letter has been prepared in order to compare the traffic impact of a proposed residential development at Lot 69 Strive Loop, Blackmore Estate Girrawheen for two options. The first option considers traffic impact of the proposed development with an access point from Strive Loop and the second option without this access point present.

We found that the traffic impact from the proposed development would not be adversely affected by the removal of the access from Strive Loop.

On subsequent pages are details of our findings. If you have any queries, please do not hesitate to contact us.

Regards,

**Marina Kleyweg**

Director | Principal of Traffic and Transport

**Ana Nikolic**

Graduate Traffic Engineer | M.Traff.Eng.



**Prepared by:** KCTT (Trading as Traffic and Transport Pty Ltd)  
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## 1. Traffic Engineering Letter

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### 1.1 Location

Lot Number	69
Road Name	Strive Loop
Suburb	Girrawheen
Description of Site	Currently the subject site is an empty lot. The proposed development is a multiple dwellings residential complex fronting Strive Loop to the north and neighbouring properties to the south, east and west. It should be noted that the subject site is located in an area that is under construction.

### 1.2 Land Uses

Are there any existing Land Uses NO

#### Proposed Land Uses

---

How many types of land uses are proposed?	Single land use
Nominate land use type and yield	42 Residential Units: 6 Units / 57.35 m <sup>2</sup> 12 Units / 66.37 m <sup>2</sup> 5 Units / 66.46 m <sup>2</sup> 1 Units / 66.42 m <sup>2</sup> 6 Units / 68.35 m <sup>2</sup> 1 Units / 75.25 m <sup>2</sup> 11 Units / 78.25 m <sup>2</sup>

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

### 1.3 Traffic Flow Distribution Comparison

	With access from Strive Loop	Without access from Strive Loop
How many routes are available for access / egress to the site?	3 routes are available	2 routes available
No of Daily Trips	231	
No of AM Trips	34	
No of PM Trips	34	
Route No 1	<b>Blackmore Avenue / Kelly Road / Allinson Drive / Seaton Place / Southern Access-Egress</b>	<b>Blackmore Avenue / Kelly Road / Allinson Drive / Seaton Place / Southern Access-Egress</b>
Provide details for Route No 1	<p>Access to the development from Blackmore Avenue and further on to Kelly Road / Allinson Drive / Seaton Place (access/egress point on the southern side of the lot).</p> <p>Egress from the development from Seaton Place (access/egress point on the southern side of the lot) and further on to Allinson Drive / Kelly Road / Blackmore Avenue.</p>	<p>Access to the development from Blackmore Avenue and further on to Kelly Road / Allinson Drive / Seaton Place (access/egress point on the southern side of the lot).</p> <p>Egress from the development from Seaton Place (access/egress point on the southern side of the lot) and further on to Allinson Drive / Kelly Road / Blackmore Avenue.</p>
Percentage of Vehicular Movements via Route No 1	30 % (69 VPD) 27% (9 VPH-PM) 41% (41 VPH-AM)	45% (104 VPD) 45% (15 VPH-PM) 45% (15 VPH-AM)
Route No 2	<b>Allinson Drive / Strive Loop / Northern Access</b>	<b>Allinson Drive / Seaton Place / Southern Access-Egress</b>
Provide details for Route No 2	<p>Access to the development from Allinson Drive/ Activity Way on to Strive Loop (access point on the northern side of the lot).</p>	<p>Access to the development from Allinson Drive on to Seaton Place (access/egress point on the southern side of the lot).</p> <p>Egress to the development from Seaton Place on to Allinson Drive (access/egress point on the southern side of the lot).</p>
Percentage of Vehicular Movements via Route No 2	33 % (76 VPD) 44% (15 VPH-PM) 9% (3 VPH-AM)	55% (127 VPD) 55% (19 VPH-PM) 55% (19 VPH-AM)
Route No 3	<b>Allinson Drive / Seaton Place / Southern Access-Egress</b>	N/A
Provide details for Route No 3	<p>Access to the development from Allinson Drive on to Seaton Place (access/egress point on the southern side of the lot).</p> <p>Egress to the development from Seaton Place on to Allinson Drive (access/egress point on the southern side of the lot).</p>	N/A
Percentage of Vehicular Movements via Route No 3	37 % (86 VPD) 29% (10 VPH-PM) 50% (17 VPH-AM)	N/A

*Note \* - It is expected that approximately 80% of vehicles in AM peak will be aiming to depart the proposed development while 20% of vehicles will be aiming to access the proposed development. In PM peak, it is expected that approximately 67% of vehicles will be aiming to access the development while 33% will be aiming to leave.*

## **1.4 Findings and recommendations**

The subject site is expected to generate 231 Vehicular Trips Per Day with 34 Vehicular Trips Per Peak Hour. Although it can be said that the proposed development makes a moderate impact according to WAPC guidelines, when taken in context of the existing surroundings it can be determined that the impact on the existing network is negligible.

It is expected that no more than 15 vehicles per hour (PM peak) would be accessing the proposed development with the open access from Strive Loop and as little as 3 vehicles per hour (AM peak), which is considered to be a very small traffic impact. In the case that this access is closed these vehicles would be using the southern access/egress point from Seaton Place. The additional volumes on this point caused by the closure of the access from Strive Loop are not expected to cause any adverse traffic impact on surrounding roads.

# TRANSPORT IMPACT STATEMENT

Lot 69 Strive Loop, Blackmore Estate

Girrawheen

July

Rev A

The logo for Kcitt features a stylized 'i' on the left, composed of three slanted parallel bars above a vertical bar. To the right of this is the lowercase text 'kcitt' in a bold, sans-serif font. The 'k' has a slanted top bar, the 'c' is a simple curve, and the 't's have slanted top bars. A solid dark grey horizontal bar is located at the bottom of the page.

**Kcitt**



**HISTORY AND STATUS OF THE DOCUMENT**

Revision	Date issued	Reviewed by	Approved by	Date approved	Revision type
Rev A	13.07.16	Josh Joseph	Marina Kleyweg	14.07.2016	Issued for Review

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Revision	Date of issue	Quantity	Issued to
Rev A	14.07.2016	1 PDF	Ms Debora Waller, Mr Paul Serdar (Greenhaven Property); Mr Alex Hollberg (Turquoise)

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<b>Author</b>	Ana Nikolic
<b>Project Director Project Manager</b>	Marina Kleyweg
<b>Name of Project</b>	Strive Loop Girrawheen
<b>Name of the Document</b>	KC00536.000 Strive Loop Girrawheen Rev A – Transport Impact Statement
<b>Document Version</b>	KC00536.000_R01_Rev A

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## Appendices

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**Appendix 1 - The layout of the proposed development**

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

**Appendix 3 - Vehicle Turning Circle Plans**

**Appendix 4 – Parking Management Plan**

## 1. Executive Summary

This Traffic Impact Statement (TIS) refers to the development of 42 residential units on the currently vacant Lot 69 Strive Loop, Girrawheen.

54 dedicated parking spaces are proposed for residents of the development, in line with the City of Wanneroo's policies on parking for residents. 5 dedicated parking spaces have been proposed in the development for visitors. This is lower than the 11 required per the City of Wanneroo's policies, however with abundant public parking already available in close proximity to the site, KCTT believe the provision of 5 parking bays is sufficient to cater to the development's needs.

It can be conservatively anticipated that 231 daily trips will result from the development, with 34 anticipated trips during both the morning and afternoon peak periods. The morning peak of the development is likely to occur between 8am and 9am, with the afternoon peak occurring between 5pm and 6pm, which aligns with the peak periods on the existing road network. 55% of the trip generation of the development are anticipated to access Allinson Rd north of Strive loop, 40% on Allinson Rd south of Strive Loop, 3% on to Activity Way and 2% on Strive Loop east of the development. These figures suggest the proposed development will have a moderate impact on the surrounding road network, however relative to the existing road network trip rate, KCTT believe the development will have a negligible impact.

The existing network currently experiences significantly lower crash rates than the network average, both for Killed or Serious Injury crashes (KSI) and all other crashes. Light Vehicles (B99) are able to fully navigate through the site, turning templates may be seen in Appendix 3 of this report. Accesses and Egresses have adequate sight distances, which will minimise any potential for safety incidents as a result of the development. It is recommended that a traffic management plan be implemented, similar to as shown in Appendix 4.

In summary, we do not believe this development will cause any adverse impact on the surrounding network.

## 2. Transport Impact Statement

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### 1.1. Location

Lot Number	69
Road Name	Strive Loop
Suburb	Girrawheen
Description of Site	Currently the subject site is an empty lot. The proposed development is a multiple dwellings residential complex fronting Strive Loop to the north and neighbouring properties to the south, east and west. It should be noted that the subject site is located in an area that is under construction.

### 1.2. Technical Literature Used

Local Government Authority	City of Wanneroo
Type of Development	Residential
Are the R-Codes referenced?	YES (State Planning Policy 3.1 Residential Design Codes 2015 R-Codes (incorporating amendments gazetted on 23/10/15)
<i>If YES, nominate which:</i>	R60
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?	Transport Assessment Guidelines for Developments Volume 5 – Technical Appendix
Are there applicable LGA schemes for this type of development?	YES
<i>If YES, Nominate:</i>	
Number of Scheme	No. 2
Name of Scheme	City of Wanneroo District Planning Scheme

**Transport Impact Statement**  
KC00536.000 Strive Loop, Girrawheen

Are there applicable DAP schemes for this type of development? <i>If YES, Nominate:</i>	YES
Number of Scheme	No. 1
Name of Scheme	Blackmore Estate, Girrawheen

### 1.3. Land Uses

Are there any existing Land Uses	NO
----------------------------------	----

#### Proposed Land Uses

---

How many types of land uses are proposed?	Single land use
Nominate land use type and yield	42 Residential Units: 6 Units / 57.35 m <sup>2</sup> 12 Units / 66.37 m <sup>2</sup> 6 Units / 66.46 m <sup>2</sup> 6 Units / 68.35 m <sup>2</sup> 12 Units / 78.25 m <sup>2</sup>

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

### 1.4. Local Road Network Information

How many roads front the subject site?	One
--	-----

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

Name	Strive Loop
Number of Lanes	two-way, one lane
Road Reservation Width	approximately 22 m
Road Pavement Width	approximately 6 m
Classification	N.A. – area still under construction
Speed Limit	N.A. – area still under construction
Bus Route	NO
On-street parking	YES

*Name of Other Roads within 400m radius of site, or roads likely to take increased traffic due to the development.*

#### Road 1

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**Transport Impact Statement**  
 KC00536.000 Strive Loop, Girrawheen

Name	Allinson Drive
Number of Lanes	two-way, one lane
Road Reservation Width	approximately 18 m
Road Pavement Width	approximately 7 m
Classification	Urban Local Road / Access Road
Speed Limit	50 kph
Bus Route	NO
On-street parking	NO

**1.5. 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 VPH	AM Peak Time	PM Peak VPH	PM Peak Time		Date of Traffic Count	<i>If older than 3 years multiply with a growth rate</i>
<b>Hudson Avenue</b>	East of Danbury Crescent	3,026	279	08:15	334	14:45	1.5 %	Oct 2007	3,201 (2016)
<b>Wanneroo Road</b>	South of Beach Road *	36,063	2,902	08:00	2,358	17:00	N.A. - HV not likely to be in higher volumes than generally expected.	Jun 2016	n.a.
	North of Beach Road *	37,387	3,094	08:00	2,209	17:00	N.A. - HV not likely to be in higher volumes than generally expected.	Jun 2016	n.a.
	South of Warwick Road	30,257	2,287	07:15	2,478	16:30	N.A. - HV not likely to be in higher volumes than generally expected.	Jan 2015	n.a.
<b>Beach Road</b>	East of Wanneroo Road	11,174	754	11:45	962	16:15	5.3%	Jan 2014	n.a.
	East of Wanneroo Road*	12,659	1,066	08:00	1,272	17:00	N.A. - HV not likely to be in higher volumes than generally expected.	Jun 2016	n.a.
	West of Wanneroo Road *	14,772	1,215	08:00	1,318	17:00	N.A. - HV not likely to be in higher volumes than generally expected.	Jun 2016	n.a.
<b>Templeton Crescent</b>	South of Marangaroo Drive*	6,119	324	08:00	594	16:00	N.A. - HV not likely to be in higher volumes than generally expected.	Jun 2016	n.a.
<b>Marangaroo Drive</b>	East of Templeton Crescent*	17,149	1,305	08:00	1,331	16:00	N.A. - HV not likely to be in higher volumes than generally expected.	Jun 2016	n.a.

**Transport Impact Statement**  
 KC00536.000 Strive Loop, Girrawheen

	West of Templeton Crescent*	14,258	1,189	08:00	997	16:00	N.A. - HV not likely to be in higher volumes than generally expected.	Jun 2016	n.a.
<b>Note</b> * These traffic volumes have been derived from SCATS data.									

### 1.6. Vehicular Crash Information

Is Crash Data Available on Main Roads WA website? YES

If YES, nominate important survey locations:

Location 1 Allinson Drive  
 Location 2 Intersection of Allinson Drive & Templeton Crescent

Road Name	SLK	Road Hierarchy	Functional Classification	Speed Limit	Crash Statistics			
					No of KSI Crashes	No of Medical Attention Crashes	No of PDO Major Crashes	No of PDO Minor Crashes
Allinson Drive	[0.00-0.70]	Access Road	Urban Local Road	50 kph	0	0	0	1
No of MVKT Travelled at Location					1,000 * 365 * 5 yrs * 0.7km = 1.2775 MVKT			
KSI Crash Rate					0 per 1.2775 MVKT = 0.0 crashes / MVKT			
Other Crash Rate					1 per 1.2775 MVKT = 0.78 crashes / MVKT			
Comparison with Crash Density and Crash Rate Statistics					0.078 crashes / MVKT crash rate is significantly lower than network average 3.52			
Allinson Drive & Templeton Crescent	n.a.	Access Road / Local Distributor	Urban Local Road / Significant Urban Local Road	50 kph / 50kph	0	0	0	3
No of MVKT Travelled at Location					1,000 * 365 * 5 yrs * 0.7km = 1.2775 MVKT			
KSI Crash Rate					0 per 1.2775 MVKT = 0.0 crashes / MVKT			
Other Crash Rate					1 per 1.2775 MVKT = 0.78 crashes / MVKT			
Comparison with Crash Density and Crash Rate Statistics					1.369 crashes / MVKT crash rate is significantly lower than network average 7.69			

The following table shows the Crash Density and Crash Rates on Metropolitan Local Roads as obtained from Main Roads WA on the 16<sup>th</sup> October 2014 by email request: -

CRASH DENSITY AND CRASH RATE ON METROPOLITAN LOCAL ROADS NETWORK ONLY				
	ALL CRASHES		KSI CRASHES (FAT+HOS)	
	DENSITY ALL CRASHES/KM over 5 years	CRASH RATE/MVKT	DENSITY KSI CRASHES/KM over 5 years	CRASH RATE/MVKT
LOCAL - MIDBLOCK	3.52	1.17	0.18	0.06
LOCAL - ALL	7.69	2.54	0.37	0.12

NOTE: BASED ON 5-YEARS DATA FOR THE PERIOD 2009 TO 2013.

## 1.7. Parking Requirements

Local Government

City of Wanneroo

Local Government Document Utilised

City of Wanneroo District Planning Scheme No. 2

Description of Parking Requirements in accordance with Scheme:

*" Multiple Dwelling - As per Residential Design Codes"*

*R-Codes: " Less than 110m2 and/or 1 or 2 bedrooms – Location B – 1.25 per multiple dwelling, visitors: 0.25 per dwelling"*

### Calculation of Parking

Land Use	Requirements	Yield	Total Parking
Residential Units			
Residents	<i>1.25 per multiple dwelling</i>	42 Units	53
Visitors	<i>0.25 per multiple dwelling</i>	42 Units	11

### Total Volume of Parking Provided by Proponent

Residents	54
Visitors	5

#### Justification

Visitors to the facility have parking options on site or within close walking proximity. Seeing that there are significant on-street facilities available in the vicinity of the subject site, it is expected that 50% of all visitors (6 visitors) will use on-street parking bays on surrounding roads. On-street parking is available within the road reservation of the adjacent roads. The closest on-street parking fronts the proposed development and currently provides 15 parking bays. With consideration of the substantial number of existing parking facilities in close proximity of the subject site, we believe that the proposed number of car parking spaces within the development will cater for its needs.

Have Vehicle Swept Paths been checked for Parking? YES

*If YES, provide description of performance:*

Vehicular access is allowed from Strive Loop on the western side of the lot, and egress on to Strive Loop on the eastern side of the lot. The plans for the proposed parking have been examined for navigability of a B99 passenger vehicle. The proposed parking is fully navigable by a B99 passenger vehicle.



### 1.8. Bicycle Parking

Local Government City of Wanneroo  
 Reference Document Utilised Residential Design Codes

Description of Parking Requirements in accordance with Scheme:

*“ One bicycle space to each three dwellings for residents; and one bicycle space to each ten dwellings for visitors, designed in accordance with AS2890.3 (as amended)”*

#### Parking Requirement in accordance with regulatory documents

Land Use	Requirements	Yield	Total Parking
Residential Units			
Residents	<i>1 bicycle space to each 3 dwellings</i>	42 Units	14
Visitors	<i>1 bicycle space to each 10 dwellings for visitors</i>	42 Units	5

#### Total Volume of Parking Provided by Proponent

Residents	N.A.
Visitors	N.A.

#### Justification

Should the council require bicycle parking in reference to Residential Design Codes, the proposed development would require a total of 19 bicycle spaces. Given this is a residential development it is expected that residents will store their bicycles in the store units or their respective dwellings.

### 1.9. ACROD Parking

Class of Building Class 2 - A building containing 2 or more sole-occupancy units each being a separate dwelling.  
 Does this building class require specific provision of ACROD Parking? NO

### 1.10. 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”*

#### Parking Requirement in accordance with regulatory documents

Land Use	Requirements	Yield	Total Parking
----------	--------------	-------	---------------

Residential Units	1 space per 50 flats or home units	42	1
-------------------	------------------------------------	----	---

**Total Volume of Parking Provided by Proponent**

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Service and Delivery Parking Justification	N.A.
--	------

The proposed development will be included into existing waste collection practise. Waste vehicles will not need to access the development. No other permanent service vehicle parking is required for the operation of the development.

**1.11. Calculation of Development Generated / Attracted Trips**

What are the likely hours of operation?	N.A. - For residential land uses, the hours of operation are not applicable.
What are the likely peak hours of operation?	The peak trip generations from a residential development are likely to be between 08:00 - 09:00 daily in the morning and 17:00 - 18:00 during the evening peak.
Do the development generated peaks coincide with existing road network peaks? <i>If YES, Which:</i>	YES AM peak
Guideline Document Used	WAPC Transport Assessment Guidelines for Developments
Base data for trip calculation (daily trips)	5.5*
Base data for trip calculation (AM peak trips)	0.8 vehicle trips per dwelling (25% IN/ 75% OUT)
Base data for trip calculation (PM peak trips)	0.8 vehicle trips per dwelling (67% IN / 33% OUT)
No of Daily Trips	231*
No of AM Peak Hour Trips	34
No of PM Peak Hour Trips	34
Does the site have existing trip generation / attraction?	NO
What is the total impact of the new proposed development?	MODERATE

*Note \* The WAPC Transport Assessment Guidelines do not offer daily vehicle trip generation rates for the land uses proposed within the development. The NSW RTA Guide to Traffic Generating Developments suggests developments of this type in Sydney tend to generate between 4 and 5 vehicular trips per dwelling for medium to high density developments. In Perth, the Department of Planning and Infrastructure conducted a series of studies in the late 1990's / early 2000's which showed that higher density dwellings tended to average closer to 5.5 vehicle trips per day. These studies assumed that anywhere between 50% and 60% of commuters were travelling to the work by car as a driver. KCTT propose to use an average VPD of 5.5 vehicular trips per day per residence.*

## 1.12. Traffic Flow Distribution

How many routes are available for access / egress to the site? 4 routes are available

<b>Route 1</b>	<b>Allinson Drive (north of Strive Loop)</b>
Provide details for Route No 1	<p>Access to the development from Allinson Drive on to Strive Loop (access point on the western side of the lot).</p> <p>Egress from the development on to Strive Loop (egress point on the eastern side of the lot) and further on to Allinson Drive.</p>
Percentage of Vehicular Movements via Route No 1	55 % (127 VPD / 19 VPH)
<b>Route 2</b>	<b>Allinson Drive (south of Strive Loop)</b>
Provide details for Route No 2	<p>Access to the development from Allinson Drive on to Strive Loop (access point on the western side of the lot).</p> <p>Egress from the development on to Strive Loop (egress point on the eastern side of the lot) and further on to Allinson Drive.</p>
Percentage of Vehicular Movements via Route No 2	40 % (92 VPD / 13 VPH)
<b>Route 3</b>	<b>Activity Way (north of Strive Loop)</b>
Provide details for Route No 3	<p>Access to the development from Activity Way on to Strive Loop (access point on the western side of the lot).</p> <p>Egress from the development on to Strive Loop (egress point on the eastern side of the lot) and further on to Activity Way.</p>
Percentage of Vehicular Movements via Route No 3	3 % (7 VPD/ 1 VPH)
<b>Route 4</b>	<b>Strive Loop (east of the proposed development)</b>
Provide details for Route No 4	<p>Access to the development from Strive Loop (access point on the western side of the lot).</p> <p>Egress from the development on to Strive Loop (egress point on the eastern side of the lot) and further on to Strive Loop and Esteem Lane.</p>
Percentage of Vehicular Movements via Route No 4	2% (5 VPD/ 1 VPH)

### 1.13. Road Safety

Are sight distances adequate at proposed intersections? YES

Justification

In order to navigate intersections in the vicinity of the subject site, vehicles must reduce operating speed to a maximum of 20km/h (if not stop fully), therefore the requirements for ASD and SISD are not applicable. A review of the plan for the proposed development indicates there are sufficient sight distances for safe traffic movements.

Road safety internal to the development:

KCTT suggests a Parking Management Plan as per sketch KC00536.000\_S40 provided in Appendix 4.

### 1.14. Public Transport Accessibility

How many bus routes are within 400 metres of the subject site?	1 route		
How many rail routes are within 800m of the subject site?	No rail routes		
Bus / Rail Route	Description	Peak Frequency	Off-Peak Frequency
386	Perth – Nollamara via Wanneroo Road	17 minutes	60 minutes
Walkscore Rating for Accessibility to Public Transport			
48 - Some Transit. A few nearby public transportation options.			
Is the development in a Greenfields area?	NO		

### 1.15. Pedestrian Infrastructure

Describe existing local pedestrian infrastructure within a 400m radius of the site:

Classification	Road Name
Other Shared Path (Shared by Pedestrians and Cyclists)	Beach Road, Wanneroo Road
Unclassified pedestrian paths (on both or either side of the road reservation)	Strive Loop, Blackmore Avenue, Allinson Drive, Templeton Crescent, Lidell Street, Derrington Crescent There are also various pedestrian paths that are separate from the road network.
Does the site have existing pedestrian facilities	NO
Does the site propose to improve pedestrian facilities?	NO
What is the Walk Score Rating?	51 - Somewhat Walkable. Some errands can be accomplished on foot.

**1.16.**

**1.16. Cyclist Infrastructure**

Are there any PBN Routes within an 800m radius of the subject site? YES

*If YES, describe:*

Classification	Road Name
“Good Road Riding Environment”	Blackmore Avenue, Balgronie Avenue and Templeton Crescent (between Blackmore Avenue and Balgronie Avenue)
“Other Shared Path (Shared by Pedestrians and Cyclists)”	Beach Road, Marangaroo Drive, Warwick Place and Wanneroo Road There are also various pedestrian paths that are separate from the road network.

Are there any PBN Routes within a 400m radius of the subject site? YES

*If YES, describe:*

Classification	Road Name
“Good Road Riding Environment”	Blackmore Avenue, Balgronie Avenue and Templeton Crescent (between Blackmore Avenue and Balgronie Avenue)

**1.17. Site Specific Issues and Proposed Remedial Measures**

Site Specific Issues	Remedial Measures
1. Provision of sufficient parking bays to cater for the requirements of the development.	The plans for the proposed development show residents 54 parking bays and 5 visitor parking bays. It is deemed this would be sufficient to cater for the requirements of the proposed development. In addition, another 15 on-street car parking bays are currently provided within the road reservation of Strive Loop. Therefore, we believe that the proposed number of car parking spaces will cater for the requirements of the proposed development.
2. Impact on the surrounding network.	The subject site is expected to generate 231 Vehicular Trips Per Day and 34 Vehicular Trips Per Peak Hour. Although it can be said that the proposed development makes a moderate impact according to WAPC guidelines, when taken in context of the existing surroundings it can be determined that the impact on the existing network is negligible.
3. Vehicle turning templates for standard passenger vehicle.	The proposed development is fully navigable by a B99 passenger vehicle. Vehicle turning templates for light vehicles are shown in Appendix 3.

# Appendix 1

## The Layout of the Proposed Development

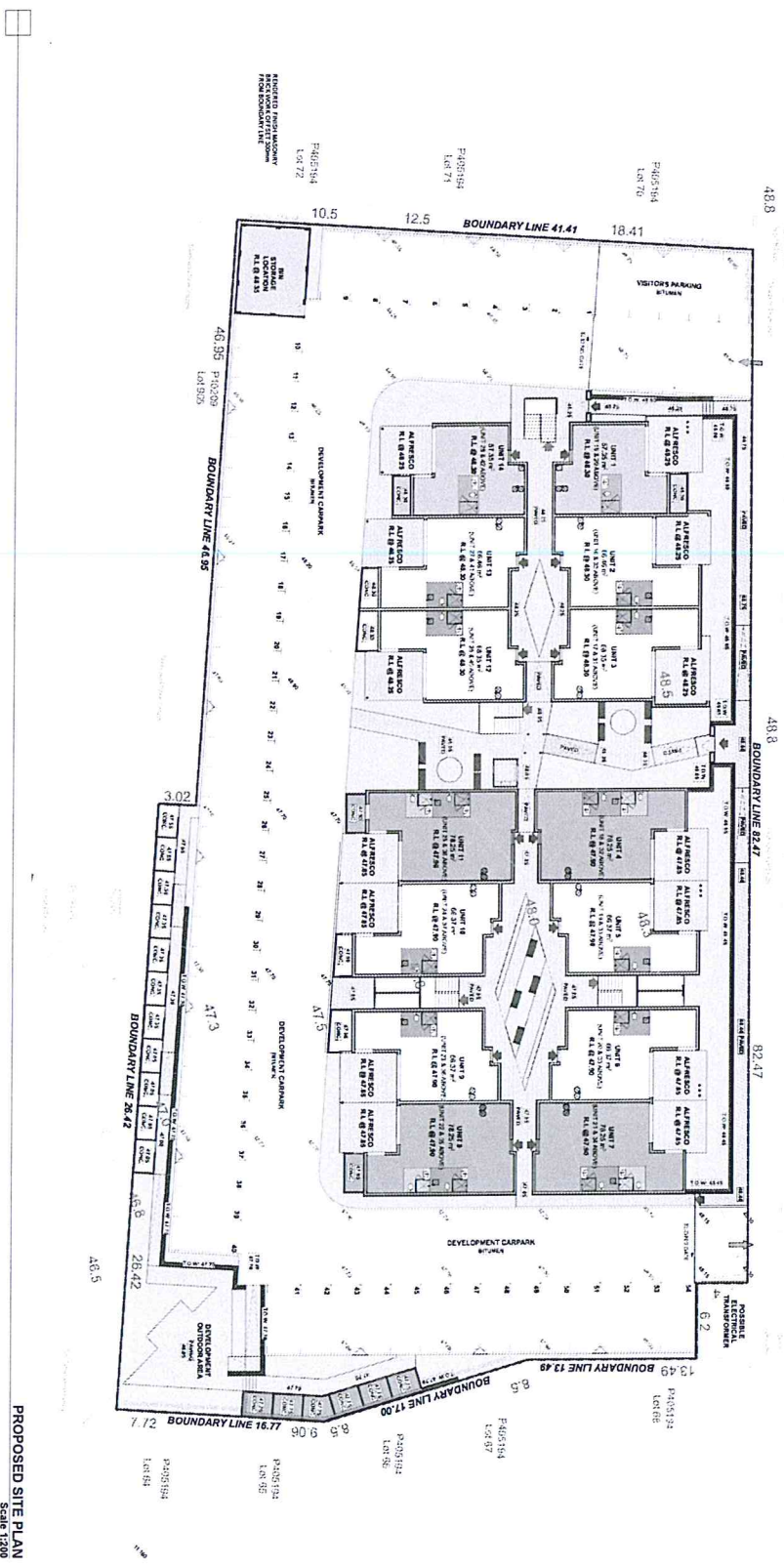
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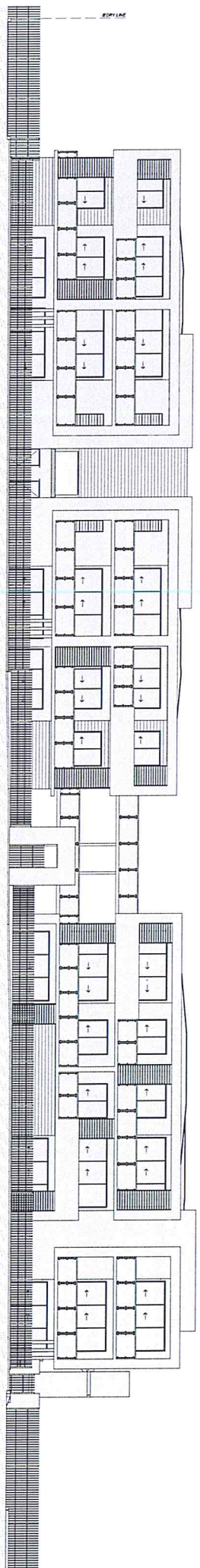
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# STRIVE LOOP

Vertical and Slanting  
0.05% (Minimum)



**PROPOSED SITE PLAN**  
Scale 1:300



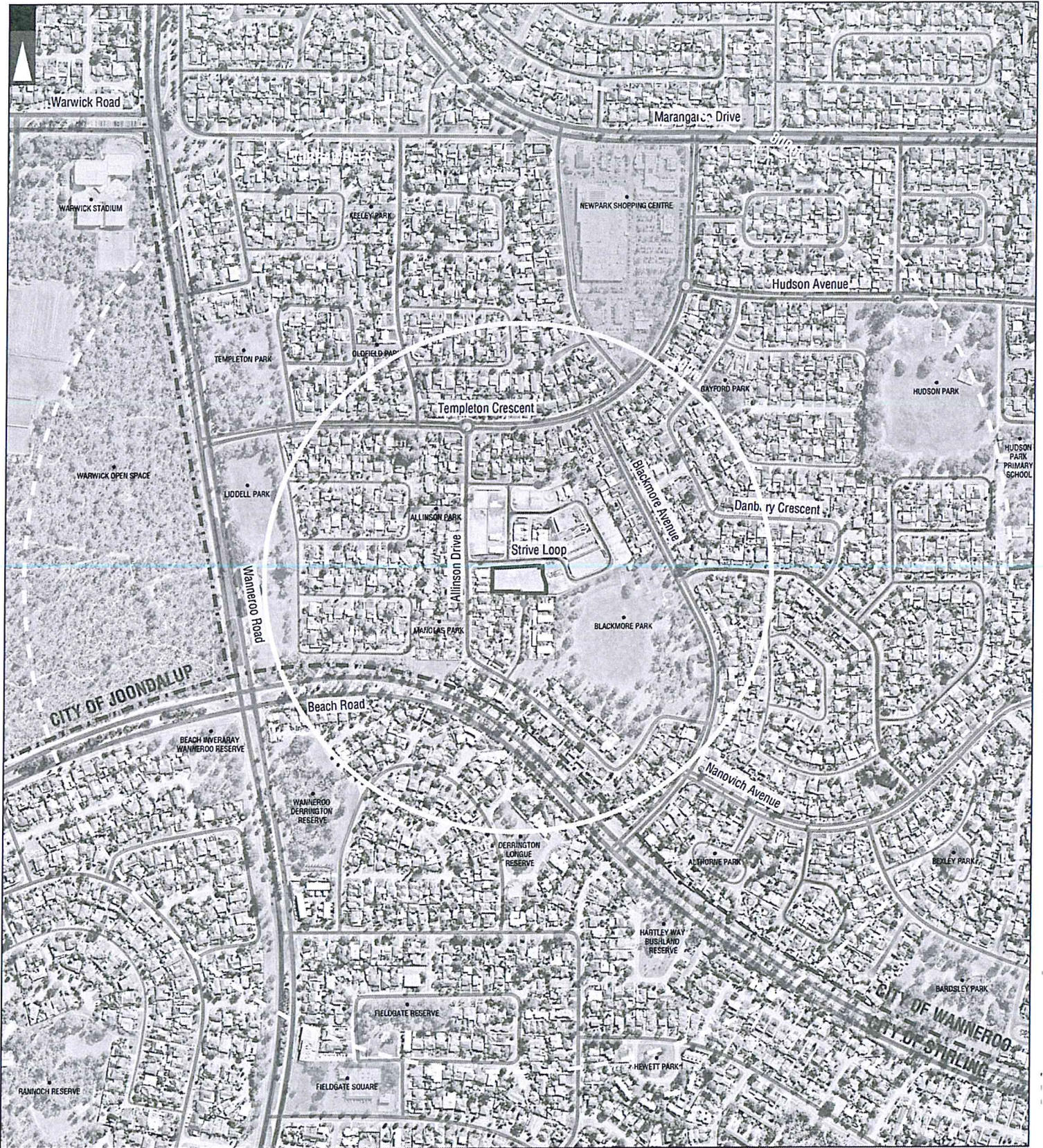
	<b>Project</b> Proposed Multiple Dwellings	<b>Client</b> Green Haven Property	<b>Address</b> Lot 69 Strive Loop, Baltimore Estate, Crawfishen	<b>20/20/2016</b> SOLID ION COMMENT <b>01/11/2016</b> SOLID ION COMMENTS	<b>CLIENT</b> Name: [ ] Address: [ ] Phone: [ ]	<b>Drawn</b> Name: [ ] Date: 22/06/2016	<b>Drawing Number</b> A02 of 04	<b>Job No.</b> CP 216.15 Date: 15/01/2016
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# Appendix 2

## Transport Planning and Traffic Plan

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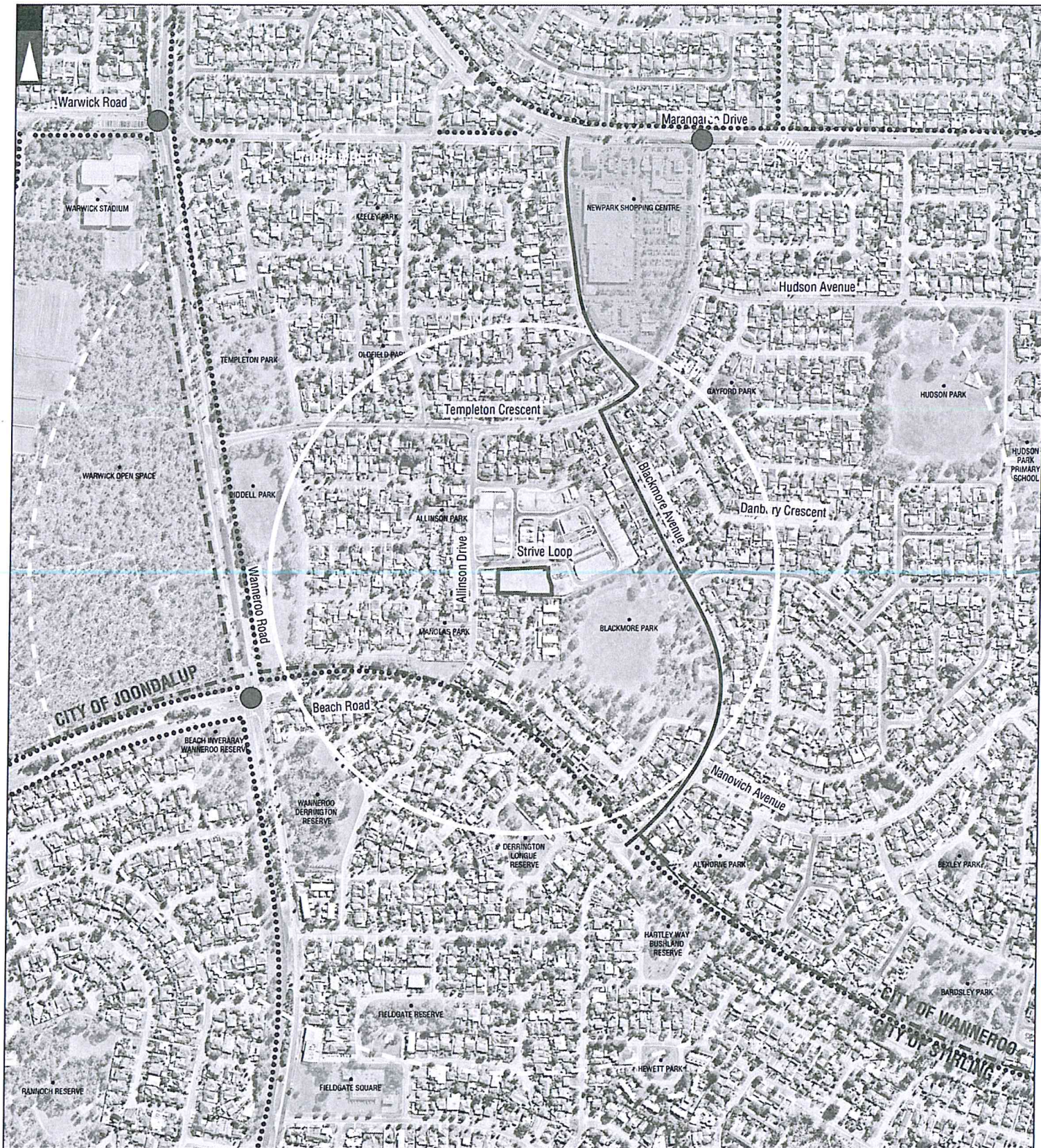


	<b>Hay Street</b>	STREET NAME
		LOCATION BOUNDARY
		DISTANCE FROM LOCATION
		LOCAL GOVERNMENT NAME
		LOCAL AUTHORITY BOUNDARY

**LEGEND**

			PROJECT: <b>LOT 69, STRIVE LOOP, GIRRAWHEEN</b>	DRAWN BY: Civil & Traffic Engineering Consultants Suite 7 No 10 Whipple Street Balgownie WA 6021
			TITLE: <b>LOCALITY PLAN - 800M RADIUS</b>	A.N.
			DRAWING NUMBER: <b>KC00536.000_S01</b>	
A	06-07-2016	ISSUED FOR REVIEW		
No	DATE	AMENDMENT		



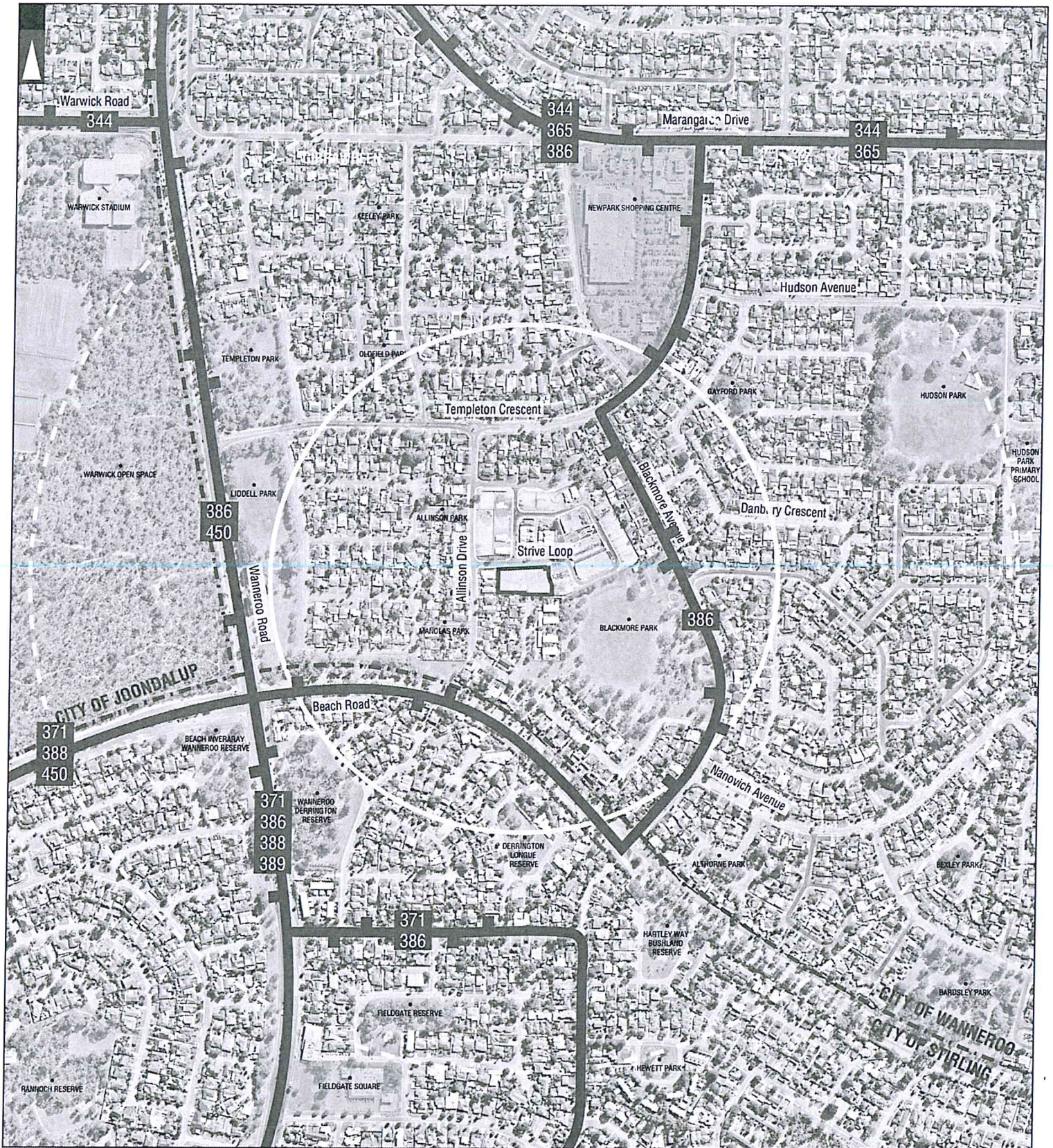


	<b>Hay Street</b>	<b>STREET NAME</b>		<b>GOOD ROAD RIDING ENVIRONMENT</b>
		<b>LOCATION BOUNDARY</b>		<b>OTHER SHARED PATH (SHARED BY PEDESTRIANS &amp; CYCLISTS)</b>
		<b>DISTANCE FROM LOCATION</b>		<b>TRAFFIC LIGHT</b>
	<b>NORTHBRIDGE</b>	<b>LOCAL GOVERNMENT NAME</b>		
		<b>LOCAL AUTHORITY BOUNDARY</b>		

**LEGEND**

Civil & Traffic Engineering Consultants  
 Suite 7 No 10 Whipple Street Bayswater WA 6107  
 Ph: 94 32 2700  
 Fax: 94 32 2744

			PROJECT: LOT 69, STRIVE LOOP, GIRRAWHEEN	DRAWN BY:
			TITLE: BICYCLE NETWORK PLAN - 800M RADIUS	A.N.
			DRAWING NUMBER: KC00536.000_S02	
A	06-07-2016	ISSUED FOR REVIEW		
No	DATE	AMENDMENT		

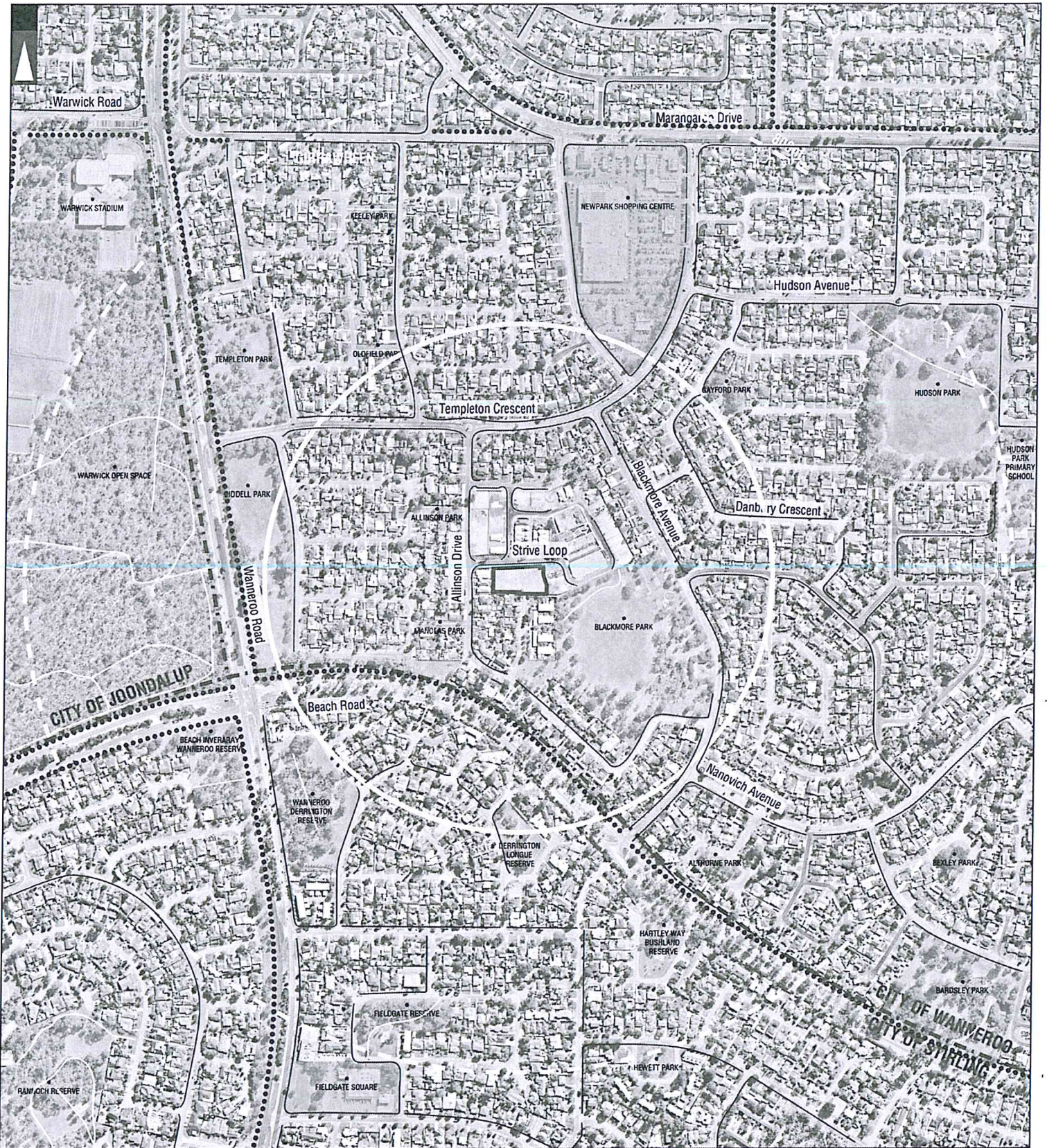


PARKS AND RECREATION	Hay Street	STREET NAME	<b>386</b>	BUS ROUTE NUMBER	<b>344</b>	MORLEY BUS STATION - WARWICK STATION VIA BALLAJURA AND ALEXANDER HEIGHTS	<b>388</b>	PERTH - NOLLAMARA VIA WANNEROO ROAD
PUBLIC PURPOSE		LOCATION BOUNDARY		BUS ROUTES / STOPS	<b>365</b>	MARANGAROO - MIRRABOOKA BUS STATION VIA WALDERTON AVENUE AND GIRRAWHEEN AVENUE	<b>389</b>	PERTH - NOLLAMARA VIA WANNEROO ROAD
SHOPPING AREA		DISTANCE FROM LOCATION		LOCAL GOVERNMENT NAME	<b>371</b>	MORLEY BUS STATION - MIRRABOOKA BUS STATION - WARWICK STATION	<b>450</b>	WARWICK STATION - LANGSDALE VIA KINGSHAY CITY SHOPPING CENTRE
ROAD		NORTHBRIDGE		LOCAL AUTHORITY BOUNDARY	<b>386</b>	PERTH - NOLLAMARA VIA WANNEROO ROAD		

**LEGEND**

			PROJECT: <b>LOT 69, STRIVE LOOP, GIRRAWHEEN</b>	DRAWN BY:	A.N.
			TITLE: <b>PUBLIC TRANSPORT PLAN - 800M RADIUS</b>		
			DRAWING NUMBER: <b>KC00536.000_S03</b>		
A	06-07-2016	ISSUED FOR REVIEW			
No	DATE	AMENDMENT			

David & Traffic Engineering Consultants  
Suite 7 No 10 Whipple Street, Perth WA 6001



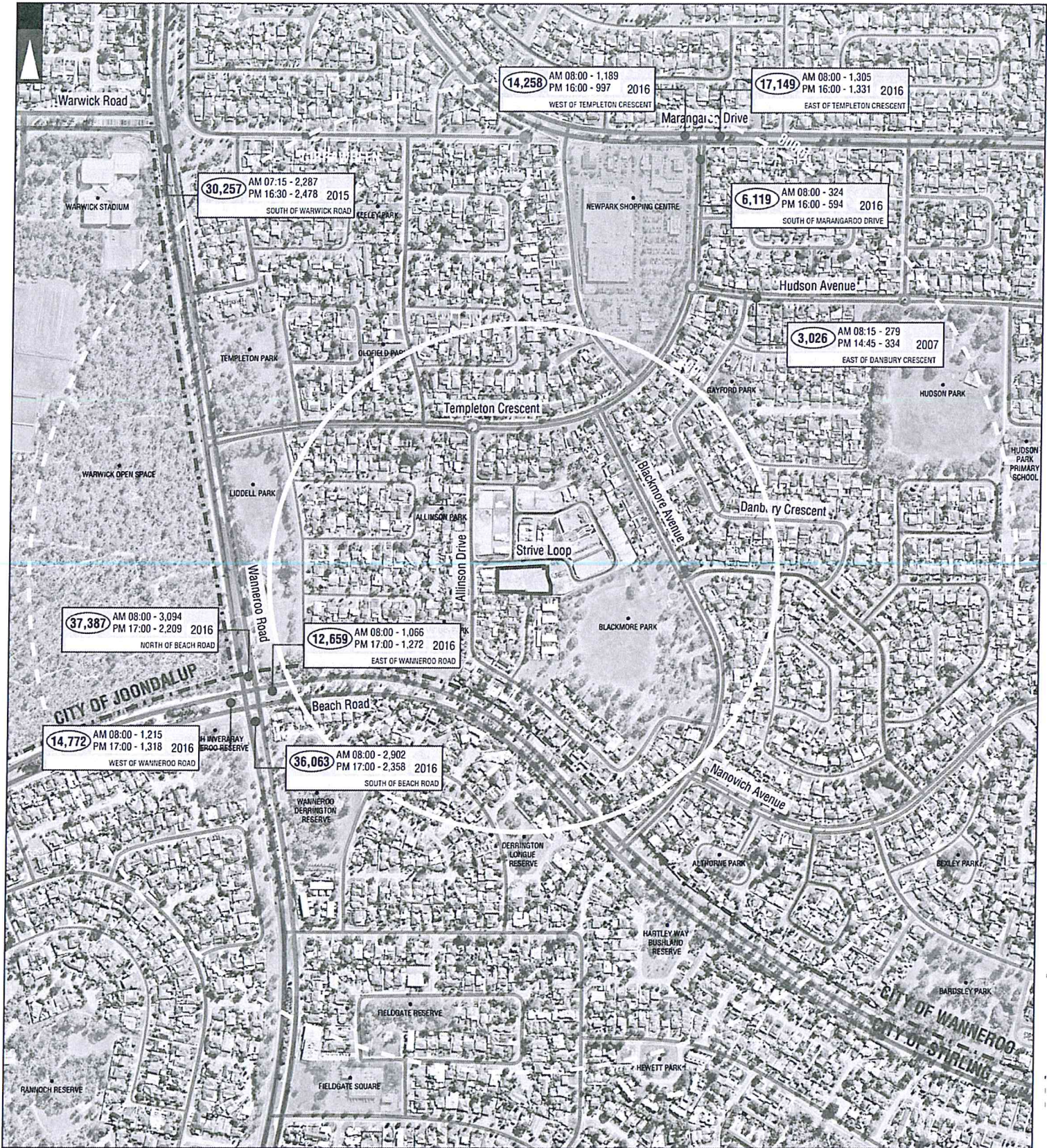
	<b>Hay Street</b>	STREET NAME		OTHER SHARED PATH (SHARED BY PEDESTRIANS & CYCLISTS)
		LOCATION BOUNDARY		WALKING TRAIL
		DISTANCE FROM LOCATION		PEDESTRIAN PATH
		LOCAL GOVERNMENT NAME		
		LOCAL AUTHORITY BOUNDARY		

**LEGEND**

Drawn & Traffic Engineering Consultants  
 Suite 7, No 10 Whipple Street, Rockingham WA 6011

A.N.

			PROJECT: <b>LOT 69, STRIVE LOOP, GIRRAWHEEN</b>	DRAWN BY:
			TITLE: <b>PEDESTRIAN PATHS PLAN - 800M RADIUS</b>	
A	06-07-2016	ISSUED FOR REVIEW	DRAWING NUMBER: <b>KC00536.000_S04</b>	
No	DATE	AMENDMENT		



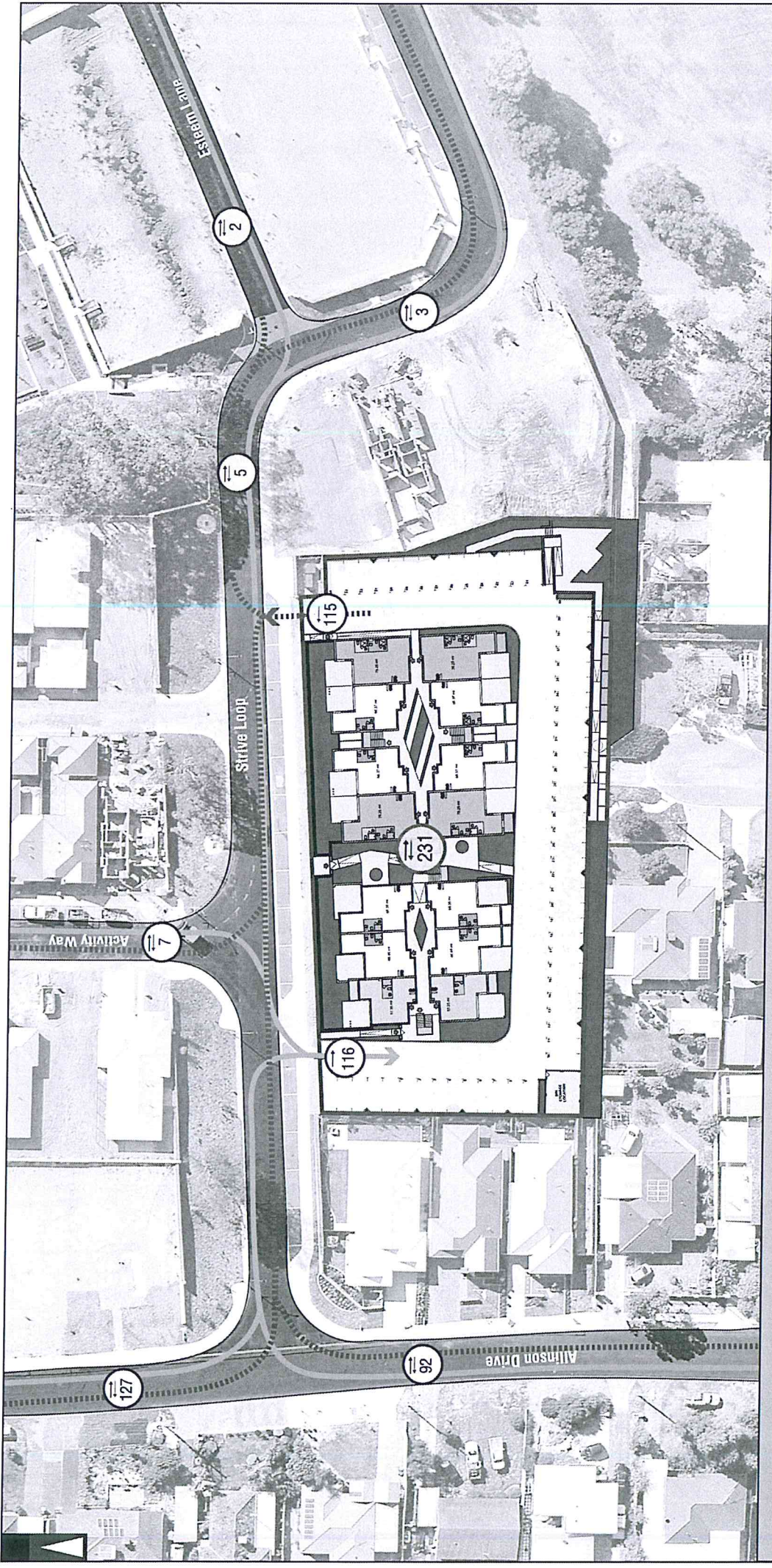
<ul style="list-style-type: none"> <li> PARKS AND RECREATION</li> <li> PUBLIC PURPOSE</li> <li> SHOPPING AREA</li> <li> ROAD</li> </ul>	<p><b>Hay Street</b> STREET NAME</p> <p> LOCATION BOUNDARY</p> <p> DISTANCE FROM LOCATION</p> <p> NORTHBRIDGE LOCAL GOVERNMENT NAME</p> <p> LOCAL AUTHORITY BOUNDARY</p>	<p><b>5,512</b> NUMBER OF VEHICLES PER DAY</p> <p>AM 1145 - 381 NUMBER OF VEHICLES PER AM PEAK HOUR</p> <p>PM 1630 - 480 NUMBER OF VEHICLES PER PM PEAK HOUR</p> <p><b>2014</b> YEAR</p> <p>EAST OF HARLOW ROAD LOCATION</p>
---	--	--

A	06-07-2016	ISSUED FOR REVIEW
No	DATE	AMENDMENT

PROJECT:	LOT 69, STRIVE LOOP, GIRRAWHEEN
TITLE:	EXISTING TRAFFIC COUNTS - 800M RADIUS
DRAWING NUMBER:	KC00536.000_S05

DRAWN BY:	Carl & Frank Engineering Consultants Suite 7 No 10 Warwick Street Balcatta WA 6187
A.N.	





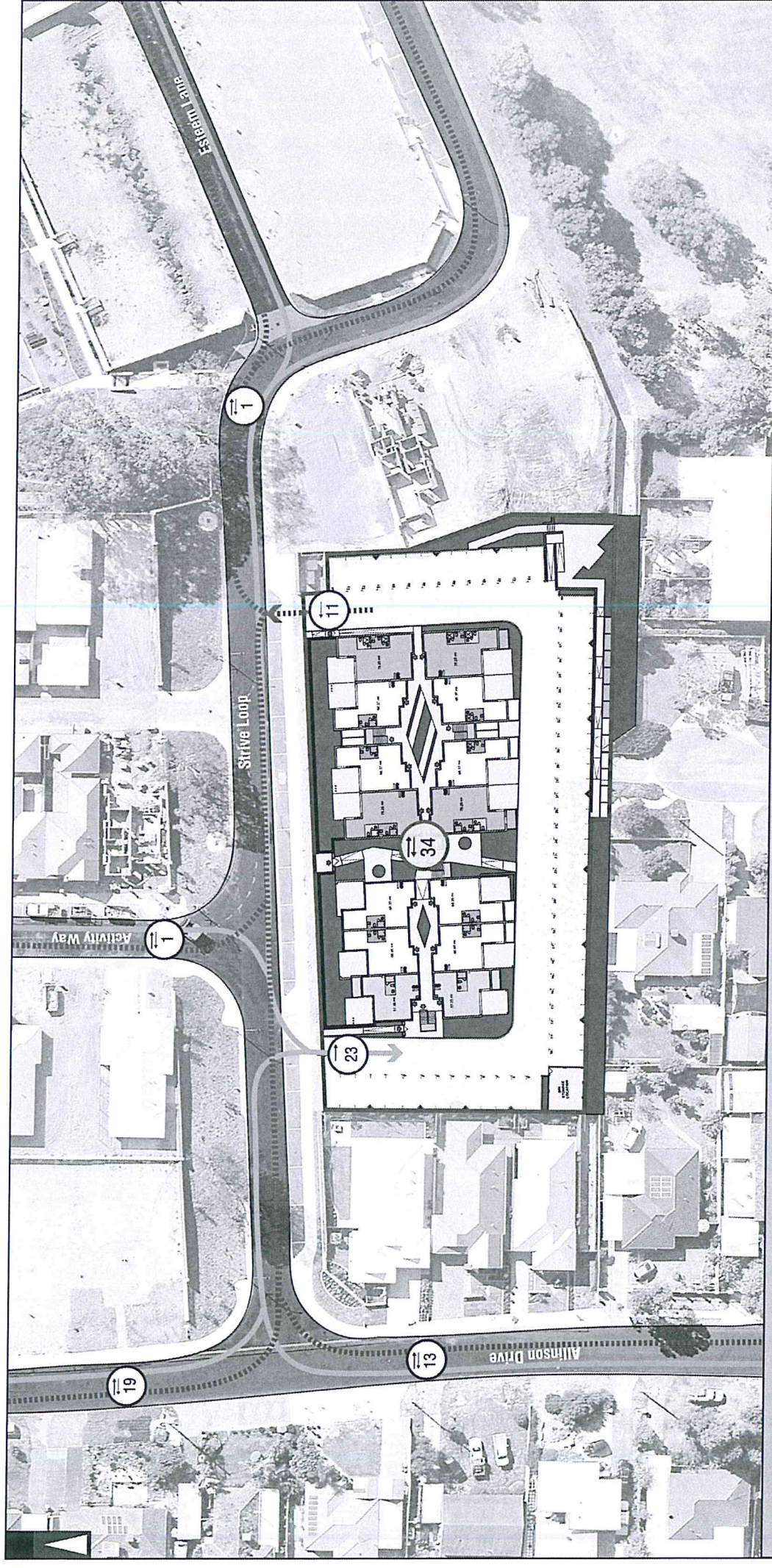
LOCATION BOUNDARY  
 ROAD (VARIED WITH ROAD WIDTH)  
 LEWIS ROAD ROAD NAME  
 Total Expected Traffic Generation from the proposed development: 1389  
 Total Expected Traffic Generation from Subject Site on this specific section of road - IN and OUT direction: 503  
 Traffic Flow IN Direction: 92  
 Traffic Flow OUT Direction:

NOTE: THE PLAN IS COURTESY OF CONCEPT BUILDING DESIGN

LEGEND

PROJECT:	LOT 69 STRIVE LOOP, GIRRAWHEEN	DRAWN BY:	A.N.
TITLE:	TRAFFIC FLOW DIAGRAM		
ISSUED FOR REVIEW	11-07-2016		
AMENDMENT	No		
DRAWING NUMBER:	KC00536.000_S06		

**kcctt**  
 Civil & Traffic Engineering Consultants  
 Suite 7 No 10 Whipple Street Belmont WA 6004  
 Ph: 08 9441 2700  
 Web: www.kcctt.com.au



LOCATION BOUNDARY  
 ROAD (VARIED WITH ROAD WIDTH)  
 LEWIS ROAD ROAD NAME  
 Total Expected Traffic Generation from the proposed development  
 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

1389  
 503

NOTE: THE PLAN IS COURTESY OF CONCEPT BUILDING DESIGN

**LEGEND**

PROJECT:		LOT 69 STRIVE LOOP, GIRRAWHEEN	
TITLE:		TRAFFIC FLOW DIAGRAM - PM PEAK	
DRAWING NUMBER:		KC00536.000_S07	
A	11-07-2016	ISSUED FOR REVIEW	
No	DATE	AMENDMENT	
DRAWN BY:		A.N.	

kctt  
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