

WINSTON LANGLEY

TRAFFIC REPORT FOR
PLANNING PROPOSAL
FOR PROPOSED RETAIL
DEVELOPMENT, TURRAMURRA

AUGUST 2018 (AMENDED JUNE 2019)

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I. INTRODUCTION

- I.1 Colston Budd Rogers and Kafes Pty Ltd has been commissioned by Winston Langley to prepare a report examining the traffic implications of a proposed retail development in Turrumurra. The site is on the corner of Eastern Road and Tennyson Avenue and is shown in Figure 1.
- I.2 The site is currently occupied by a service station and a nursery. A planning proposal is being lodged for a retail development of 1,540m² GFA, with vehicular access from Eastern Road.
- I.3 This report assesses the traffic implications of the proposed development through the following chapters:
- Chapter 2 - describing the existing conditions; and
 - Chapter 3 - assessing the traffic implications of the proposed development.

2. EXISTING CONDITIONS

Site Location and Road Network

- 2.1 The site is at 105 Eastern Road and 45-47 Tennyson Avenue, on the corner of Eastern Road and Tennyson Avenue, at Turramurra. The site also has frontage to Alice Street. It is occupied by a service station and a nursery. Vehicular access is provided from Eastern Road via two driveways for the service station. Three driveways are provided from Tennyson Avenue: two to the service station and one for the nursery. The site location is shown in Figure 1.
- 2.2 There is a group of shops on the south-eastern corner of Eastern Road and Tennyson Road, opposite the site. Other surrounding development is generally residential.
- 2.3 Eastern Road forms part of a connection between the Pacific Highway in the south and residential areas in Turramurra and Wahroonga. In the vicinity of the site it provides one traffic lane and one parking lane in each direction, clear of intersections. There are bus stops on both sides of the road, adjacent to the site. Angle parking is provided on the eastern side of the road, south of the site and adjacent the shops. There is a pedestrian crossing on Eastern Road at Tennyson Avenue and a median adjacent the shops.
- 2.4 Tennyson Avenue runs east from Eastern Road at an unsignalised intersection controlled by give way signs. It provides access to residential areas and has a 50 kilometre per hour speed limit. Tennyson Avenue provides for one traffic lane in each direction with parking permitted on both sides. There is short term parking and a mail zone next to the shops.
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- 2.5 Alice Street is north of the site. It intersects Eastern Road at an unsignalised t-intersection controlled by give way signs. It provides for two-way traffic, with parking permitted. Alice Street provides access to residential properties.

Traffic Flows

- 2.6 Traffic generated by the proposed development will have its greatest effects during weekday afternoon and Saturday lunchtime peak periods when it combines with other traffic on the surrounding road network. In order to gauge traffic conditions, counts were undertaken during weekday afternoon and Saturday lunchtime periods at the following intersections:

- ❑ Eastern Road/Tennyson Avenue; and
- ❑ Eastern Road/Alice Street.

- 2.7 The results of the surveys are shown in Figures 2 and 3 and summarised in Table 2.1. Eastern Road carried some 900 to 1,300 vehicles per hour two-way during the weekday afternoon and Saturday lunchtime peak periods. Flows on Tennyson Avenue were lower at some 245 to 265 vehicles per hour two-way. Alice Street carried some 50 to 60 vehicles per hour two-way.

Table 2.1: Two-way (sum of both directions) peak hour traffic flows			
Road	Location	Weekday afternoon	Saturday lunchtime
Eastern Road	North of Alice Street	1,285	885
	North of Tennyson Avenue	1,265	910
	South of Tennyson Avenue	1,225	935
Tennyson Avenue	East of Eastern Road	265	245
Alice Street	East of Eastern Road	60	50

- 2.8 The traffic surveys recorded traffic generations of 30 and 70 vehicles per hour two-way (sum of entries plus exits) from the site during the weekday afternoon and Saturday peak hours respectively.

Intersection Operations

- 2.9 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections shown in Figures 2 and 3 have been analysed using the SIDRA program.

- 2.10 SIDRA simulates the operations of intersections to provide a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):

- ρ For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode.
>70	=	"F"	Unsatisfactory and requires additional capacity

ρ For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode

2.11 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.12 The analysis found that the unsignalised intersection of Eastern Road with Tennyson Avenue is operating with average delays for the highest delayed movement of less than 15 seconds per vehicle during weekday afternoon and Saturday lunchtime peak periods. This represents level of service A/B, a good level of service.

2.13 The intersection of Eastern Road with Alice Street is operating with average delays for all movements of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of service.

Residential Amenity

- 2.14 In addition to the physical capacity of the road network, traffic flow can also impact on the amenity of properties fronting the roads carrying the flows. The definition of the impacts on residential amenity by varying levels of traffic flow is extremely complex. Perceptions of impact vary greatly from person to person. Traffic flows that one person may find perfectly acceptable may be considered excessive by another. The level of impact is affected by the nature of the street and the area in which it is located, its width, building setbacks, grades, etc. as well as by the speed of traffic and the mix of cars and heavy vehicles.
- 2.15 Roads and Maritime Services has undertaken considerable research into appropriate environmental capacity performance standards for residential streets. It's "Guide to Traffic Generating Developments" defines the following environmental capacity performance standards for local residential streets and collector roads:
- Local Roads
 - Environmental goal – 200 vehicles per hour in the peak hour;
 - Maximum flow – 300 vehicles per hour in the peak hour;
 - Collector Roads
 - Environmental goal – 300 vehicles per hour in the peak hour;
 - Maximum flow – 500 vehicles per hour in the peak hour.
- 2.16 Table 2.1 shows that Tennyson Avenue is carrying traffic volumes less than the maximum for a local road. Alice Street is carrying flows less than the environmental goal for a local road.
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Public Transport

- 2.17 Local bus services are provided by Transdev. Services operate along Eastern Road, past the site. There are bus stops on both sides of the road, adjacent to the site.
- 2.18 Route 575 connects Macquarie University with Hornsby via West Pymble, Pymble, Turramurra, Wahroonga East and Waitara. Services are every 30 minutes in each direction, with more frequent services during weekday peak periods.
- 2.19 Route 576T operates between Wahroonga and North Wahroonga. Four services are provided on weekdays.
- 2.20 The site is therefore accessible by public transport.

3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 The planning proposal would provide for a retail development of 1,540m² GFA, with vehicular access from Eastern Road. This chapter assesses the implications of the proposed development through the following sections:

- ❑ public transport;
- ❑ parking provision;
- ❑ access, servicing and internal layout;
- ❑ traffic generation and effects;
- ❑ matters raised by council; and
- ❑ summary.

Public Transport

3.2 As previously discussed, the site is adjacent to bus services which operate along Eastern Road. These services offer alternatives to travel by modes other than car, particularly for employees.

3.3 The proposed development would provide employment opportunities and retail facilities close to public transport services. The proposal would therefore strengthen demand for these services. The proposed development is therefore consistent with government policy and the planning principles of:

- (a) improving accessibility to employment and services by walking, cycling, and public transport;
 - (b) improving the choice of transport and reducing dependence solely on cars for travel purposes;
-

- (c) supporting the efficient and viable operation of public transport services; and
- (d) moderating growth in the demand for travel and the distances travelled, especially by car.

Parking Provision

- 3.4 Part 22 of the Ku-ring-gai Development Control Plan includes a parking requirement of one space per 17m² GFA for shops. This rate is based on the RMS guideline rate for shopping centres up to 10,000m².
- 3.5 With 1,540m², the development would require 91 parking spaces. By comparison, the RMS “Guide to Traffic Generating Developments”, which is based on extensive surveys, includes a formula for calculating parking demands when the breakdown of various uses within a retail development are known. The coefficients for supermarkets/large fruit markets and specialty shops are 4.2 and 4.5 spaces per 100m² respectively. Based on a 1,000m² main tenant and smaller tenancies of 540m², the parking demands of the development would be some 66 spaces.
- 3.6 On-site parking will be provided, having regards to the above requirements as indicated on the concept plans (copy appended).

Access, Servicing and Internal Layout

- 3.7 Vehicular access is proposed to be provided from Eastern Road for customers and service vehicles. Driveways will be provided in accordance with the Australian Standard for Parking Facilities (Part 1: Off-street car parking and Part 2: Off-street commercial vehicle facilities), AS 2890.1:2004 and AS 2890.2 – 2002, to accommodate cars and service vehicles.
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- 3.8 The on site parking will be provided in at-grade and basement levels. Ramp grades and transitions, as well as parking space dimensions, aisle widths and internal circulation will be provided in accordance with AS 2890.1:2004 at the development application stage.
- 3.9 A loading dock will be provided for deliveries to the development. Service vehicles will enter the site from Eastern Road, manoeuvre within the loading dock and exit in a forward direction. A turntable is proposed to be provided in the dock manoeuvring area.

Traffic Generation and Effects

- 3.10 Traffic generated by the proposed development will have its greatest effects during weekday afternoon and Saturday lunchtime peak periods when it combines with other traffic on the surrounding road network.
- 3.11 RMS surveys of retail developments found the following two-way (sum of both directions) traffic generation rates for supermarkets and specialty shops:
- supermarket: 15.5 and 14.7 vehicles per hour per 100m² during Thursday afternoon and Saturday peak hours respectively;
 - specialty shops: 4.6 and 10.7 vehicles per hour per 100m² during Thursday afternoon and Saturday peak hours respectively.
- 3.12 The development would therefore generate some 180 and 200 vehicles per hour two-way during weekday afternoon and Saturday peak hours respectively.
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- 3.13 As discussed in Chapter 2, the site generated 30 and 70 vehicles per hour two-way during the surveyed weekday afternoon and Saturday peak hours. Therefore, the increase in traffic generation would be some 150 and 130 vehicles per hour two-way during weekday afternoons and Saturday peak periods respectively.
- 3.14 The RMS guidelines suggest that 25 per cent of visits are likely to be passing trade, i.e. customers who would have driven past the site regardless of their visit to the site. We have used this percentage.
- 3.15 The additional traffic has been assigned to the road network. Two-way peak hour traffic flows plus the additional traffic from the proposed development are shown in Figures 2 and 3, and summarised in Table 3.1. Traffic increases on Eastern Road would be some 60 to 130 vehicles per hour two-way during peak hours. Increases on Tennyson Avenue and Alice Street would be lower at some 10 to 30 vehicles per hour two-way.

Table 3.1: Two-way peak hour traffic flows plus development traffic					
Road	Location	Weekday afternoon		Saturday lunchtime	
		Existing	Plus development	Existing	Plus development
Eastern Road	North of Alice Street	1,285	+70	885	+80
	North of Tennyson Avenue	1,265	+100	910	+110
	South of Tennyson Avenue	1,225	+70	935	+80
Tennyson Avenue	East of Eastern Road	265	+30	245	+30
Alice Street	East of Eastern Road	60	+10	50	+10

- 3.16 The intersections previously analysed in Chapter 2 have been re-analysed with SIDRA for the additional development traffic flows shown in Figures 2 and 3.

- 3.17 The analysis found that the intersection of Eastern Road with Tennyson Avenue would continue to operate with average delays for the highest delayed movement of less than 15 seconds per vehicle during weekday afternoon and Saturday lunchtime peak periods. This represents level of service A/B, a good level of service.
- 3.18 The intersection of Eastern Road with Alice Street would continue to operate with average delays for all movements of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of service.
- 3.19 The traffic increases would not cause traffic flows in Tennyson Road or Alice Street to cross the environmental amenity thresholds set out in Chapter 2.
- 3.20 Therefore, the road network will be able to accommodate the additional traffic from the proposed development.

Matters Raised by Council

- 3.21 Council's pre-planning proposal advice includes a number of traffic and transport matters. These matters are discussed below.
- *Assessment of traffic generation based on floor space of the proposal, assess impacts on nearby intersections, and whether the proposal will place undue strain on the surrounding road network;*
 - *Ideally use similarly located Harris Farm outlets as a benchmark for the traffic generation of the proposal*

3.22 This matter is discussed in paragraphs 3.10 to 3.20. With regards to the traffic generation of a Harris Farm store, our assessment is based on some 130 to 150 vehicles per hour two-way for Harris Farm, during weekday afternoon and Saturday peak periods. We have undertaken surveys of the Harris Farm at Boronia Park, which found traffic generations of some 100 to 110 vehicles per hour two-way during weekday afternoon and Saturday peak hours. Our assessment is therefore conservative, being 30 to 40 vehicles more.

- *Integration of land use and transport:*
 - *Analysis of journey to work characteristics, with the proposal as a destination. Assessment of access to employees (Greater Sydney Commission goal of 30min city), noting that the proposal will generate employment demand.*

3.23 Regarding this matter, journey to work data includes the following modes of travel for people working in the zone (excluding people who worked from home):

- 75 per cent travel as car drivers;
- eight per cent travel as car passenger;
- four per cent travel by train;
- three per cent walked;
- two per cent travel by bus;
- two per cent travel by bicycle;
- two per cent travel by motorbike; and
- four per cent travel by other modes.

3.24 The proposal will increase employment and services in the local area. Experience at other Harris Farm stores indicates that the vast majority of employees live close to the store. The Journey to Work data indicates that of the people who work in

the travel zone, the largest proportion (approximately half) also live in the travel zone. Many employees in the development will therefore be able to walk to work.

3.25 However, based on up to some 20 employees being in the store at one time, up to some 15 employees may drive to work. This is a low number which is included in the traffic assessment, and to which the assessment is not sensitive.

- *Assessment of catchment and level of access to public transport, and whether the surrounding public transport network has the capacity to absorb demands created by the proposal.*

3.26 Regarding other employees, the capacity of the public transport network would not be sensitive to the small additional number of employees (up to some five) which may use it.

3.27 Regarding customers, most customers would walk or use a car. Customers using a bus would be more likely to visit the development as part of another trip, such as to or from work.

3.28 It is therefore likely that the number of people using public transport, associated with the development, would not noticeably change.

- *Assessment of access to local services (retail/supermarket, medical, recreational, educational, leisure and community facilities)*

3.29 The proposal would increase local retail and services close to existing facilities, reducing the need for travel further afield.

- *Assessment of access to active transport connections (walking and cycling links).
Assess adequacy of existing pedestrian infrastructure/facilities (e.g. pedestrian facilities and connections across Tennyson Avenue and Eastern Road)*
- *Assessment of roads safety implications (access points, nearby bus stops, etc)*

3.30 Roads adjacent to the development include footpaths on both sides. There is also a pedestrian crossing in Eastern Road, south of the site. Conditions for pedestrians will be improved by the removal of a number of existing driveways to the site from Tennyson Avenue and Eastern Road.

3.31 The access point to the development will be provided in accordance with the Australian Standard for Parking Facilities (Part 1; Off-street Car Parking), AS 2890.1:2004, to cater for a car park of the size and type proposed. There is a bus stop conveniently adjacent to the site, which will be unaffected by the proposed development.

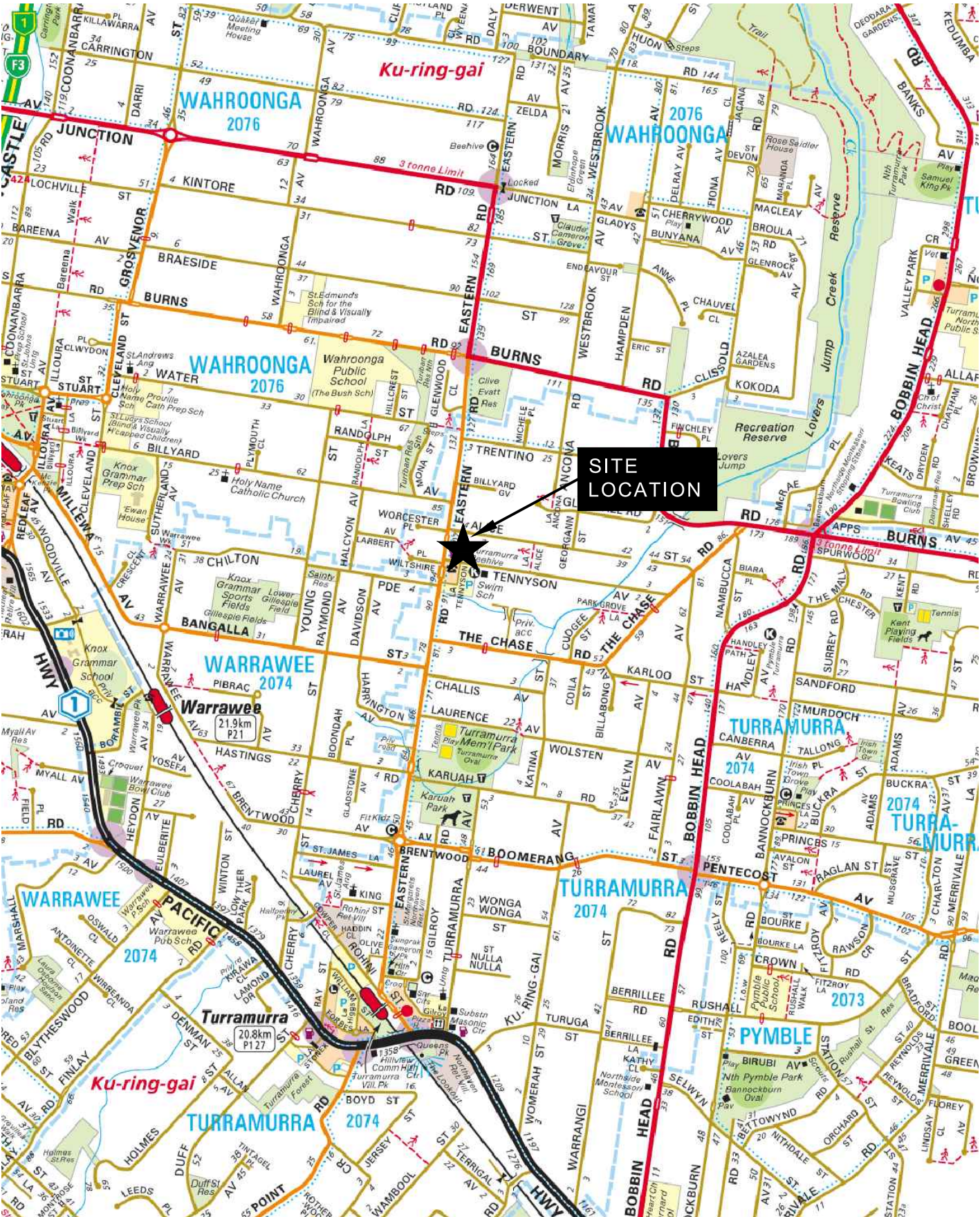
Summary

3.32 In summary, the main points relating to the traffic implications of the proposed development are as follows:

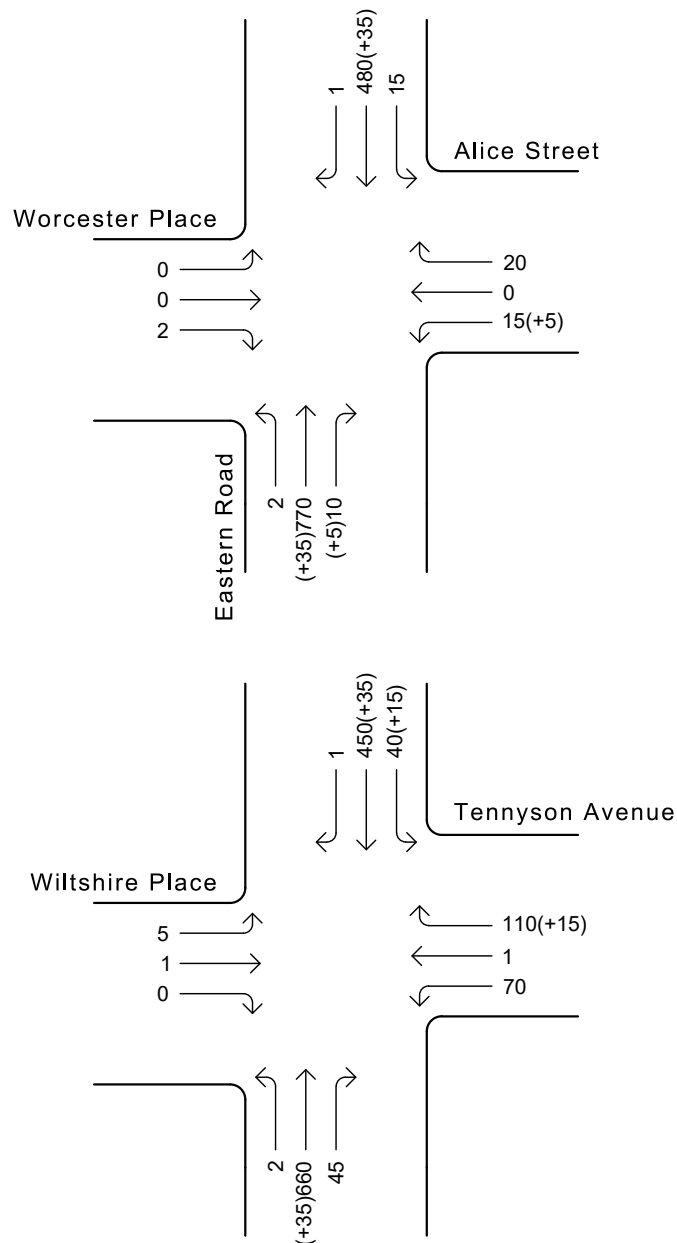
- i) the proposed development would be accessible by public transport services;
- ii) appropriate parking will be provided;
- iii) access, servicing and internal layout should be provided in accordance with AS 2890.1:2004 and AS 2890.2 – 2002; and

- iv) the road network will be able to accommodate the additional traffic from the proposed development.

APPENDIX
CONCEPT PLANS



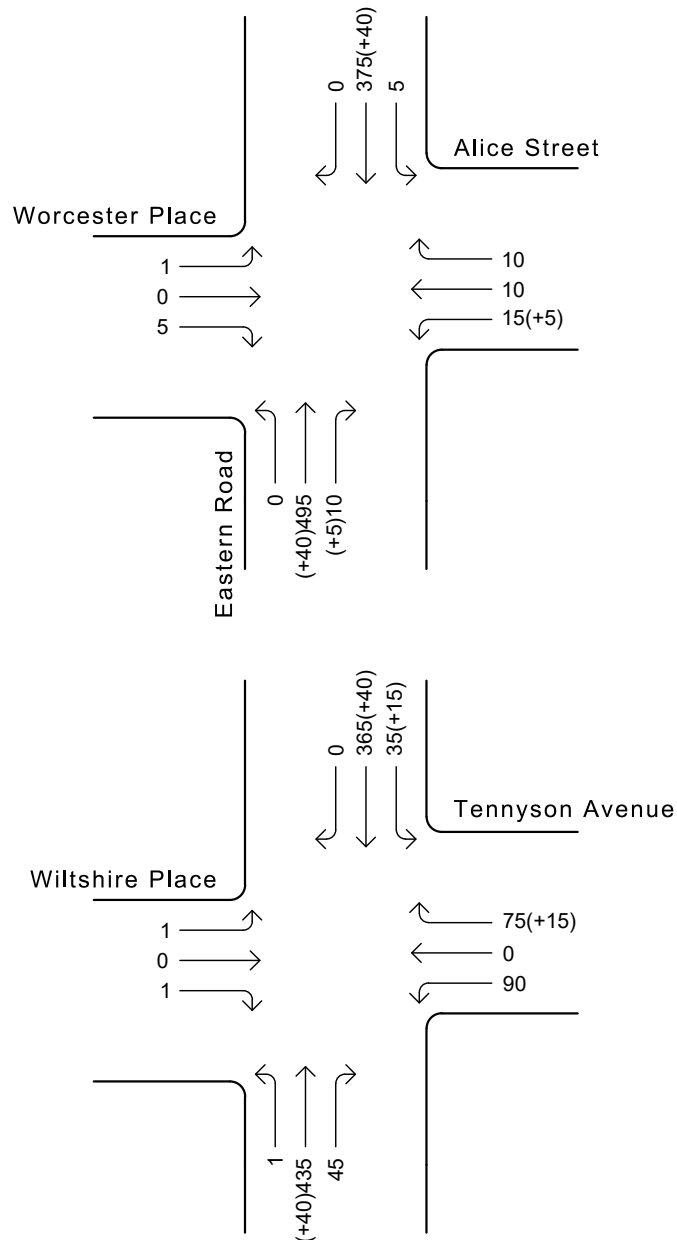
Location Plan



LEGEND

- 100 - Existing Peak Hour Traffic Flows
- (+10) - Additional Development Traffic

Thursday afternoon peak hour traffic flows plus development traffic



LEGEND

- 100 - Existing Peak Hour Traffic Flows
- (+10) - Additional Development Traffic

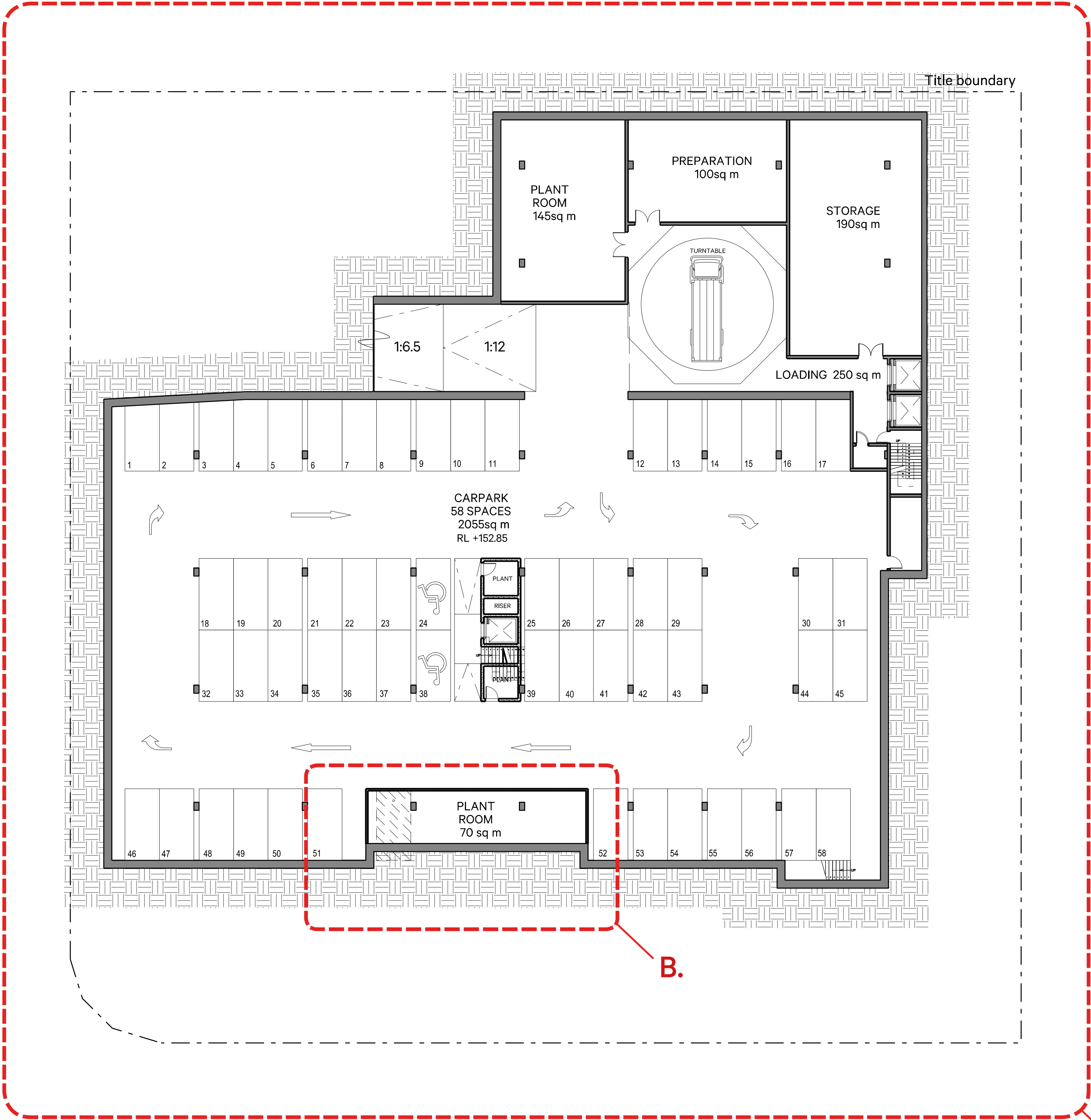
Saturday midday peak hour traffic flows plus development traffic

schedule of changes

Letter	Date	Description
A.	18.04.2019	INDICATIVE TREE CANOPY EXTENT RE-MOVED FROM PLAN
B.	18.04.2019	BASEMENT EXTENT MODIFIED TO SUIT TPZ - RESULTANT REDUCTION IN CARPARKS.
C.	18.04.2019	BARN RETAIL BUILDING FOOTPRINT REDUCED TO SUIT TPZ
D.	08.02.2018	EXTENT OF HARD PAVING REDUCED TO SUIT TPZ

EASTERN ROAD

ALICE STREET



TENNYSON AVENUE

A.

B.

Revision	Date	Reason for issue	Drawn by
1	08.02.2018	For Information	TANDEM
2	20.08.2018	For Town Planning Submission	TANDEM
3	23.08.2018	For Town Planning Submission	TANDEM
4	18.04.2019	Amended TP Sub-mission -TPZ modifications	TANDEM

PRELIMINARY
NOT FOR CONSTRUCTION
Figured dimensions take precedence to scale readings. Verify all dimensions on site. Report any discrepancies to TANDEM for decision before proceeding with the work. Do not scale drawings.



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Project Title
**45 Tennyson Avenue &
105 Eastern Road, Turramurra**

Client
**WINSTON LANGLEY +
HARRIS FARM**

Drawing Title
**BASEMENT LEVEL
PLAN**

Project Number	Drawing Number
17_003	A101
Drawing Status	Revision Number
TP	4

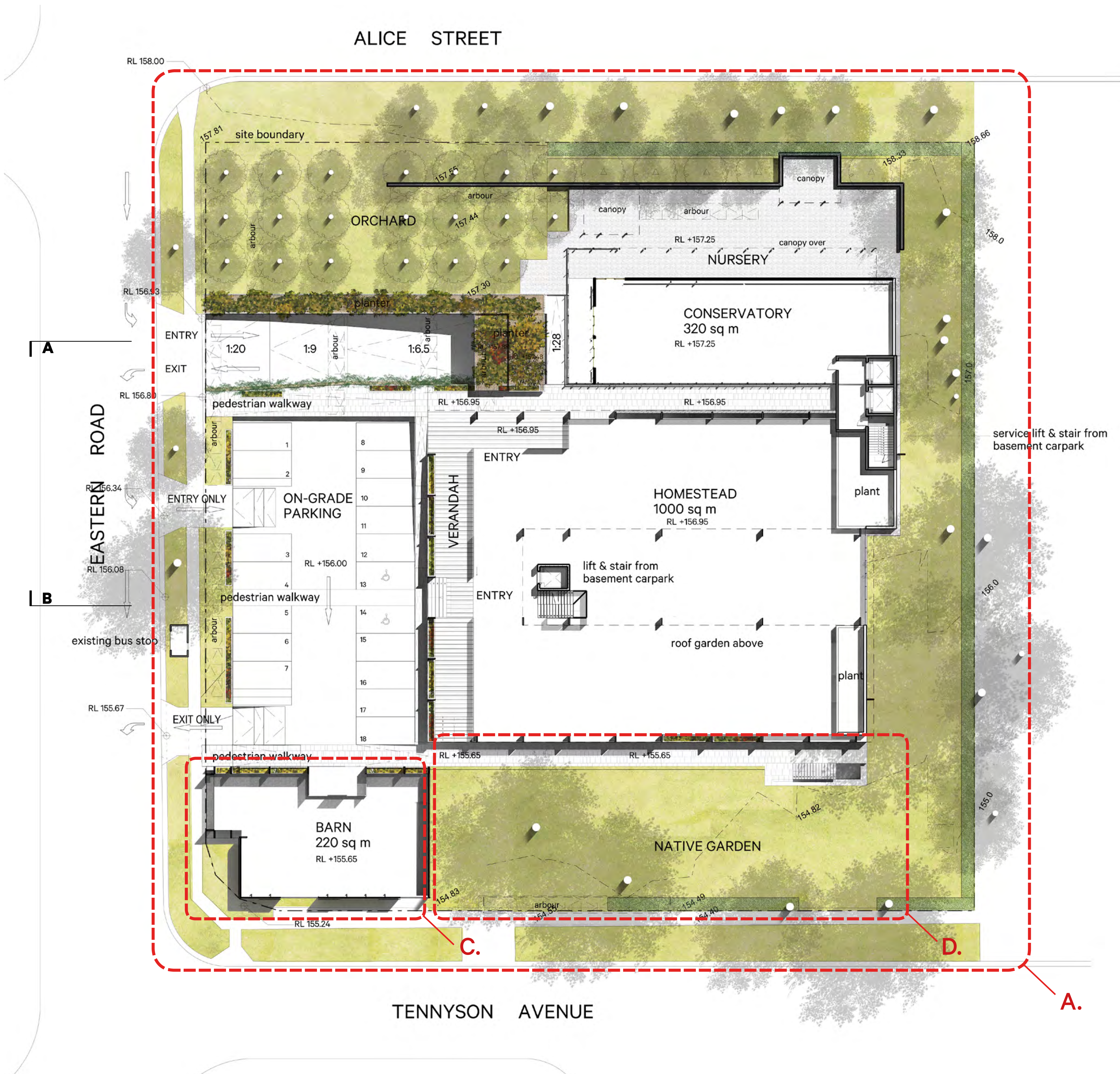
INDICATIVE CONCEPT ONLY

THE FARM
— TURRAMURRA —



schedule of changes

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Project Title
45 Tennyson Avenue & 105 Eastern Road, Turramurra

Client
WINSTON LANGLEY + HARRIS FARM

Drawing Title
GROUND LEVEL PLAN

Project Number	Drawing Number
17_003	A200
Drawing Status	Revision Number
TP	4

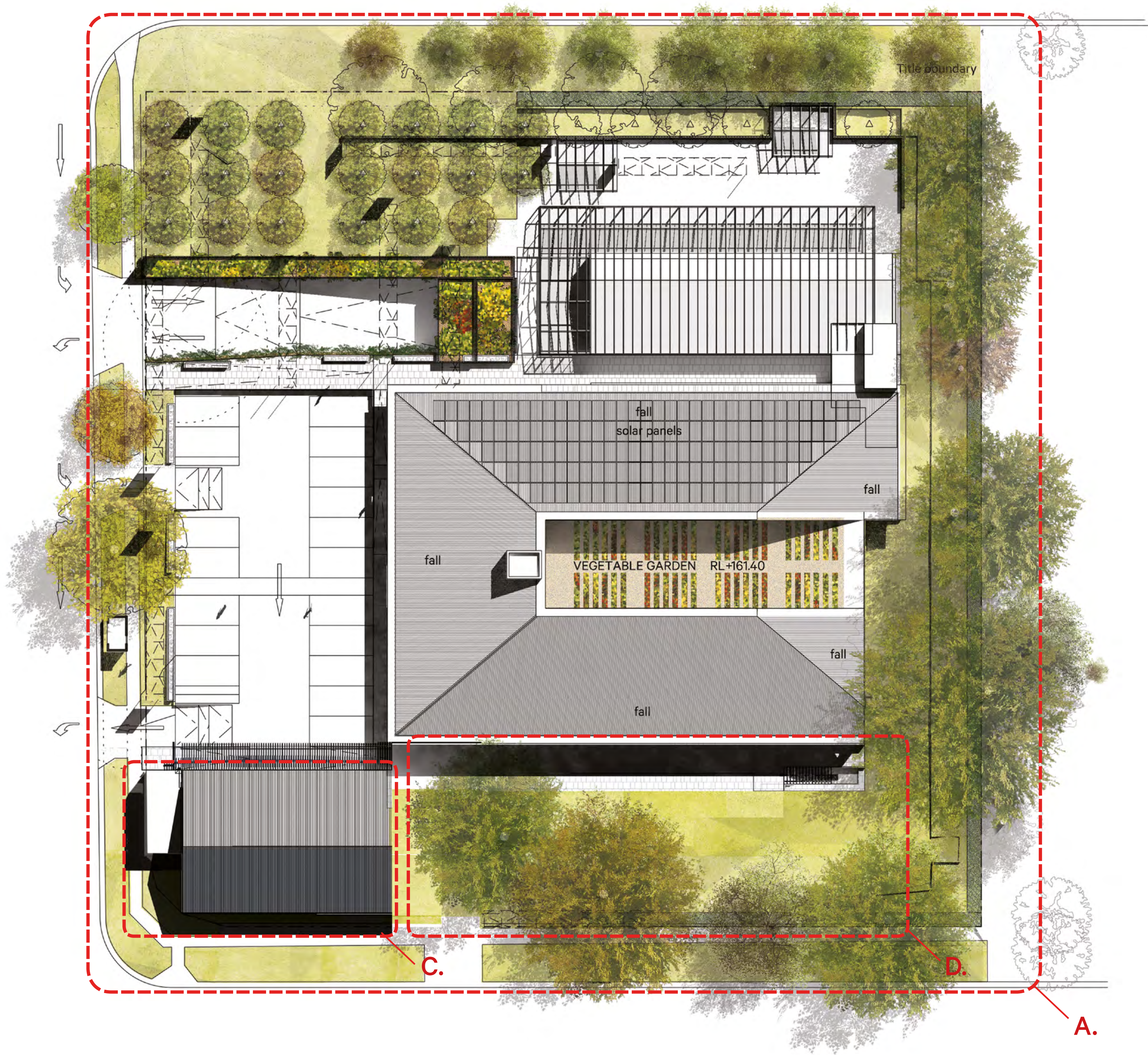
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Project Title
**45 Tennyson Avenue &
105 Eastern Road, Turrumurra**

Client
**WINSTON LANGLEY +
HARRIS FARM**

Drawing Title
**ROOF LEVEL
PLAN**

Project Number 17_003	Drawing Number A201
Drawing Status TP	Revision Number 4

INDICATIVE CONCEPT ONLY

THE FARM
— TURRAMURRA —