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**PARKING & TRAFFIC IMPACT ASSESSMENT  
PROPOSED RESTAURANT PRECINCT  
78 – 88 TENCH AVENUE  
JAMISONTOWN**

**Ref: 14-086**

**MARCH 2015**

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## 1. INTRODUCTION

The Practice of Thompson Stanbury Associates has been commissioned by C. & S. Sentas to prepare a Parking & Traffic Impact Assessment accompanying a Development Application (DA) lodged with Penrith City Council. The subject DA proposes the expansion of an existing restaurant development located at 78 – 88 Tench Avenue, Jamisontown (hereafter referred to as the 'subject site') to accommodate an additional nine restaurant tenancies.

The purpose of this report is to assess and document the likely parking and traffic implications of the proposed development and to recommend appropriate remedial measures where required. Specifically, this report:

- Assesses the adequacy, or otherwise, of the proposed off-street parking provision having regard to the rates specified by Penrith City Council;
- Assesses the suitability of the proposed vehicular, pedestrian and cyclist access arrangements based on standards specified by the Australian Standards;
- Assesses the proposed parking layout with respect to internal circulation and vehicle manoeuvrability;
- Reviews the existing traffic conditions within the vicinity of the site, including traffic volumes, traffic efficiency and general traffic safety; and
- Determines the expected traffic generation from the proposed development based on Roads and Maritime generation rates, and assesses the impact of the net increase in traffic on the surrounding road network.

Throughout this report, reference is made to the following documents:

- The Roads and Maritime Services' *Guide to Traffic Generating Developments*;
- Australian Standard *Parking Facilities Part 1: Off-Street Parking* (AS 2890.1-2004), *Part 2: Off-Street Commercial Vehicle Facilities* (AS2890.2-2002), *Part 3: Bicycle Parking Facilities* (AS2890.3-1993) and *Part 6: Off-Street Parking for People with Disabilities* (AS2890.6-2009); and
- Penrith City Council's *Development Control Plan 2010* (DCP 2010).

This report has been prepared pursuant to State Environmental Planning Policy (Infrastructure) 2007.

The report should be read in conjunction with architectural plans prepared by Morson Group Pty. Ltd., reduced copies of which are contained within **Appendix 1**.

## **2. SITE DETAILS**

### **2.1 Site Location**

The subject site is situated on the south-eastern side of Tench Avenue, approximately 130m to the north-east of M4 Motorway, Jamisontown. This location is illustrated in the neighbourhood context as **Figure 1** overleaf, being an extract of UBDs *Australian City Streets*, Version 4.

### **2.2 Site Description**

The subject site provides a real property description of Lot 3 DP 30354 and a street address of 78 – 88 Tench Avenue, Jamisontown. The site predominantly forms a rectangular shaped parcel of land providing an approximate frontage to Tench Avenue of 130m. The site extends to the south-east away from Tench Avenue some 260m, thereby providing a total area in the order of 3.4 hectares.

### **2.3 Existing Uses**

A Coffee Club restaurant building is currently located within the northern portion of the site, providing a leasable floor area of 480m<sup>2</sup>. This restaurant provides an existing seating area of 316m<sup>2</sup>, accommodating 76 internal and 44 external seats.

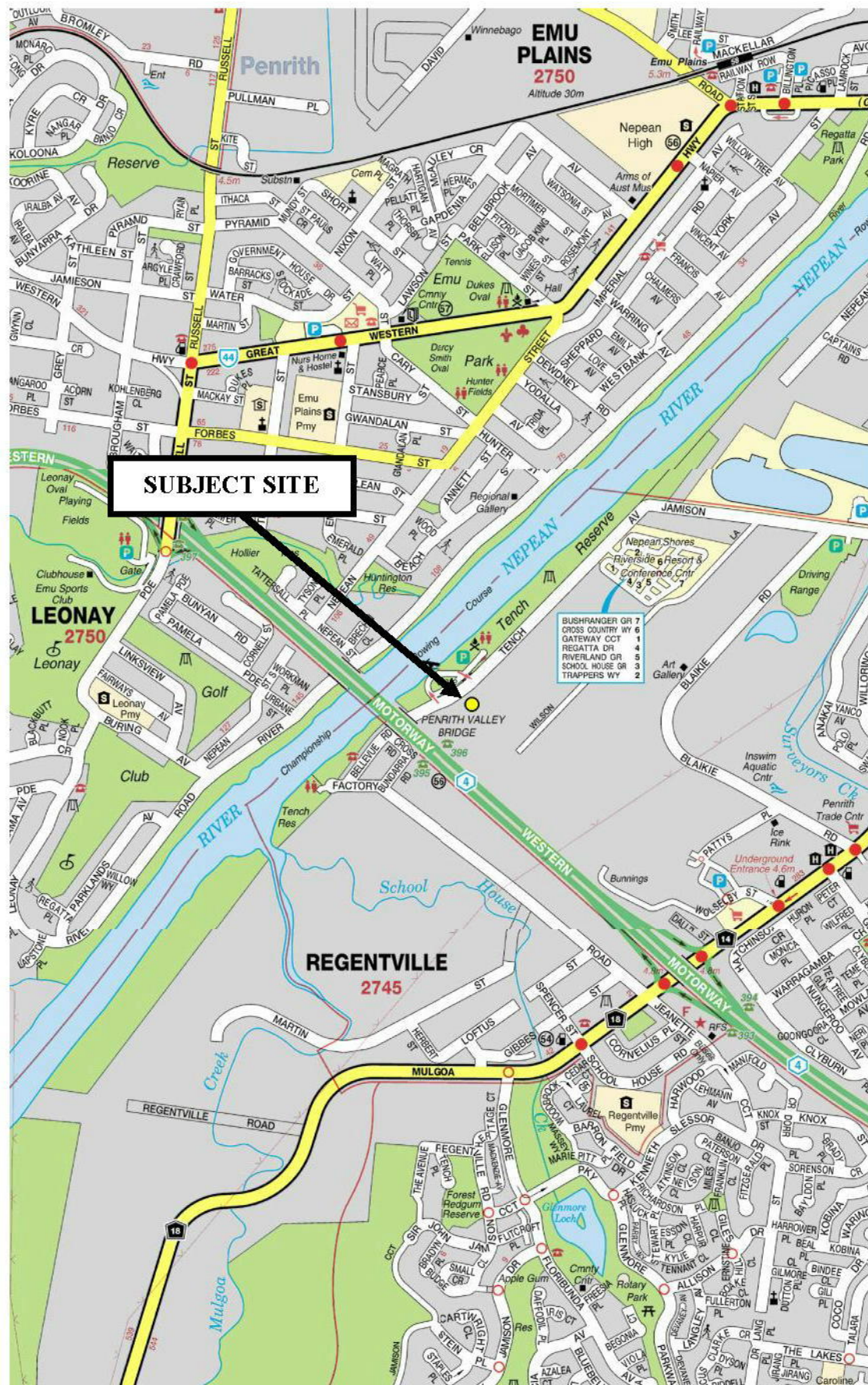
The existing Coffee Club restaurant is serviced by an internal car parking area containing 61 passenger vehicle parking spaces, connecting with Tench Avenue via two separate ingress and egress driveways. The existing egress driveway provides connectivity to a service road which runs parallel to Tench Avenue, which also currently serves as an informal parking area.

### **2.4 Surrounding Uses**

The site is adjoined to the south-west, south-east and north-east by rural residential parcels of land.

Tench Reserve, accommodating a series of recreation facilities, is located to the north-west, on the opposite side of Tench Avenue, abutting Nepean River.



**FIGURE 1 – SITE LOCATION**

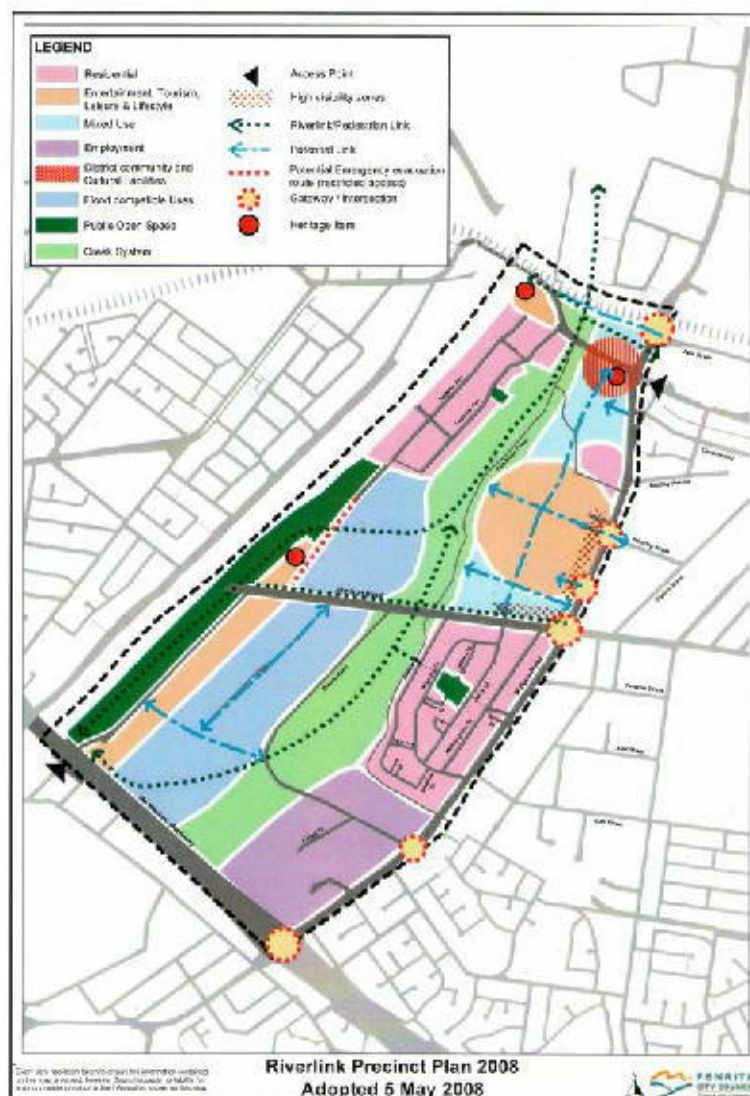


### 3. STRATEGIC CONTEXT

The Nepean River was critical to the development of Penrith as a major centre in Western Sydney. However, as modes of transport changed over time through the twentieth century, the River became less important for the ongoing operation of Penrith. The River now accommodates a range of recreational activities and Tench Reserve forms an important connection point between land and river, accommodating a boat ramp, picnic, BBQ and parkland areas, being serviced by Tench Avenue.

Penrith City Council adopted the Riverlink Precinct Plan 2008 on 5 May 2008 which captured land located between Nepean River to the west, M4 Motorway to the south, Mulgoa Road to the east and the Western Railway Line to the north. This Plan formulated a Precinct based on a mix of activity nodes, whereby a diverse range of land uses and services are provided throughout. The Plan, illustrated by **Figure 2** below, incorporated a substantial entertainment and leisure-based focus, including entertainment facilities to attract visitors from an extensive catchment as well as servicing the local community.

**FIGURE 2 – RIVERLINK PRECINCT PLAN 2008**



The Plan involved the provision of entertainment, tourism, leisure and lifestyle uses within land abutting Tench Avenue to the east, thereby activating Tench Reserve. It also included a potential road link between Tench Avenue and Blaikie Road to improve connectivity between Tench Reserve and Mulgoa Road.

Penrith City Council subsequently engaged Clouston Associates to prepare the 'Our River' Nepean River Master Plan in November 2013. The purpose of the Master Plan was to reinforce the connection between the River and the community. The Master Plan identified that the success of the existing Coffee Club within the site suggests opportunities for more cafes / restaurants along the foreshore. It however stated the following constraints within the subject vicinity:

- Vehicle access and parking is often poorly arranged in Tench Reserve identifying that there is a need for a more strategic approach to parking along the foreshore;
- The bridge to bridge path loop for pedestrians and cyclists is not complete and the bridge crossings are either unsafe or have poor amenity;
- Many of the paths along the foreshore are discontinuous and of differing dimensions, design and safety; and
- Local access to the foreshore is principally by car with few safe pedestrian / bicycle path links from adjoining neighbourhoods.

In the vicinity of the subject site, the Master Plan aimed to expand Tench Reserve into a recreation and tourist precinct, improving circulation and parking and reducing user conflicts. Proposals within the Master Plan included the possible new road connection between Tench Avenue and Blaikie Road, the proposed expansion of tourism / recreation facilities with car parking, upgrading of the existing boat ramp and launch / wash down and the provision of additional off-street car parking.

**Figure 3** overleaf provides an extract of the Master Plan for comprising the precinct immediately surrounding the subject site.

Since the preparation of the Master Plan, the recent gazettal of the Penrith Local Environmental Plan 2010 Amendment No. 4 has rezoned the subject site from Rural 1(A1) to Tourist SP3 thereby identifying the precinct as a tourist and recreation precinct. The subject proposal involves the expansion of the existing Coffee Club development to comprise additional restaurant tenancies consistent with Penrith LEP 2010 Amendment No. 4 and the abovementioned previous strategic documents.

**FIGURE 3 – EXTRACT OF ‘OUR RIVER’ MASTER PLAN**

### CONCEPT MASTERPLAN - SOUTHERN CURTILAGE AND TENCH RESERVE

#### LEGEND

- |  |   |
|--|---|
|  | <b>Our Accessible River</b>   |
|  | Improve the ability to get to the river   |
|  | Provide a range of continuous pathway loops   |
|  | Create a strong sense of arrival  |
|  | Connect to the city   |
|  | <b>Our Active River</b>   |
|  | Provide a range of facilities and attractions   |
|  | <b>Our Cultural River</b>   |
|  | Enhance views and vistas to and from the river  |
|  | <b>Our Healthy River</b>  |
|  | Reinforce native vegetation link from river through creeks and streets                        |
|  | Provide filtered views through to the river and open views at street ends                     |
|  | <b>Our Managed River</b>  |
|  | Manage and maintain the bank's water edge infrastructure                                      |
|  | Manage and maintain water course for water levels and quality                                 |
|  | Pedestrian and bicycle pathways   |
|  | Water edge access point   |
|  | River tour platform/jetty   |
|  | Upgrade existing boat ramp and launch / wash down area, new car parking for cars and trailers |
|  | Upgrade and formalize parking under and next to motor way                                     |
|  | Pedestrian bridge slung under motorway  |
|  | Upgraded parking under and next to motorway   |
|  | Non powered vessel access (Kayaks) with launch 'pool' and buoys on river edge                 |
|  | Upgrade car parking and toilet  |



#### 4. PROPOSED DEVELOPMENT

##### 4.1 Built Form

The subject application seeks Council approval for expansion of the existing Coffee Club restaurant development to provide an additional nine restaurant tenancies within two additional buildings.

**Table 1** below provides a summary existing and proposed tenancy floor areas and seating arrangements.

TABLE 1 PROPOSED RESTAURANT TENANCY FLOOR AREA AND SEATING ARRANGEMENTS						
Tenancy	Number of Seats			Gross Floor Area (m <sup>2</sup> )	Leasable Floor Area (m <sup>2</sup> )	Seating Area (m <sup>2</sup> )
	Internal	External	Total			
Coffee Club	76	44	120	314.3	480	316
1	68	36	104	336.9	420	182
2	24	48	72	101.1	181	120
3	32	32	64	121.9	175	105
4	24	92	116	111.8	228	174
5	48	16	64	260.3	282	113
6	48	24	72	218.3	253	113
7	68	32	100	285.2	330	150
8	92	48	140	377.3	431	221
9	32	36	68	118.5	170	103
<b>TOTAL</b>	<b>512</b>	<b>408</b>	<b>920</b>	<b>2,246</b>	<b>2,950</b>	<b>1,598</b>

Tenancy 1 is proposed to be contained within a single building located to the north-east of the existing Coffee Club building whilst the remaining eight new tenancies are proposed to be contained within a single separate building located to the south-west of the existing Coffee Club building.

The existing site access arrangements, comprising separate ingress and egress driveways are proposed to be retained. These driveways are to provide direct connectivity to a small frontage parking area containing 15 parking spaces. In addition, a large rear parking area containing a further 146 parking spaces in conjunction with loading facilities is proposed. Connectivity between the frontage and rear parking areas are proposed by a new internal roadway running along the north-eastern site boundary. Further, a new internal access road is also proposed to run along the south-western site boundary linking the rear parking area with the existing service road connection to Tench Avenue in the vicinity of the western site corner.

Pedestrian access to the development is proposed via the provision of a shared pathway running through the north-western portion of the site, linking with the existing path along the south-eastern side of Tench Avenue. Further, pedestrian connectivity between Tench Reserve and the subject site is proposed via the provision of two new pedestrian refuges within Tench Avenue adjacent to the northern and western corners of the site.

## **5. ACCESS & INTERNAL CONSIDERATIONS**

### **5.1 Vehicular Access**

#### **5.1.1 Passenger Vehicles**

The subject development is proposed to be accessed by three driveways connecting with Tench Avenue, as follows:

- A 7m wide ingress only driveway located within the northern corner of the site, being slightly off-set from the Tench Reserve egress driveway;
- A 6m wide egress only driveway approximately central to the site frontage; and
- A 6.5m wide combined ingress / egress driveway located within the western corner of the site, being directly opposite the Tench Reserve ingress driveway.

In order to assess the suitability of the proposed site access arrangements, reference is made to AS2890.1-2004. This Standard provides driveway design specifications based on the primary land use proposed, the number of parking spaces accommodated and the functional order of the access road. Based on the primary land use being restaurant based, a site wide parking provision of 161 (but capable of increasing to 340 spaces – see Section 5.2.1 of this report) spaces and the local access (non-arterial) function of Tench Avenue, AS2890.1-2004 specifies, at minimum, a Category 4 type access driveway, comprising a 6m ingress driveway separated from a 6m wide egress driveway. The three driveways proposed readily exceed this minimum Standard requirement and accordingly, the proposed site access arrangements are considered to be satisfactory in terms of design.

The relatively consistent vertical and horizontal alignment of Tench Avenue within the immediate vicinity of the subject site results in sight distance between the proposed access driveways and the frontage road being satisfactory and in accordance with the relevant specifications provided within AS2890.1-2004 for the sign posted speed limit of 50km/h within Tench Avenue.

It is acknowledged that the driveways adjoining the northern and western corners of the site are located in close proximity to the driveways servicing Tench Reserve located on the north-western side of Tench Avenue. The Tench Reserve driveways however accommodate limited traffic demand (see Section 5.2 of this report) and accordingly, interaction between the site access and the Tench Reserve driveways is minimal. In any case, the proposed driveway arrangement essentially involves the maintenance of the existing situation, which has been observed to facilitate safe and efficient access arrangements to land abutting Tench Avenue.

#### **5.1.2 Heavy Vehicles**

It is acknowledged that the subject development is likely to require servicing by delivery and refuse collection vehicles, up to and including Medium Rigid Vehicles (MRVs). These vehicles are proposed to access the development via the ingress only

driveway located within the northern corner, travel in a forward direction to access the formalised loading areas via the rear parking area, prior to exiting the site in a forward direction via the egress only driveway, located central to the Tench Avenue frontage.

In order to demonstrate the suitability of the proposed access driveways to accommodate the previously described service vehicle movements, this Practice has prepared swept path plans, reduced copies of which are contained within **Appendix 2** for reference. The swept path plans have been generated using Autoturn software and derived from MRV vehicle specifications provided within AS2890.2-2002 and illustrate that MRVs are capable of entering and exiting the site via the proposed site access driveways in a safe and efficient manner.

### 5.1.3 Pedestrian

Pedestrian access to / from the subject site is proposed to be facilitated by the provision of a crescent shaped shared path providing connectivity to the forecourt servicing the restaurant tenancies and the existing path along the south-eastern side of Tench Avenue to the north of the driveways adjoining the northern and western corners of the site.

In order to formalise pedestrian movements between the subject site and Tench Reserve, pedestrian refuges are also proposed to be provided within Tench Avenue to the north of the driveways adjoining the northern and western corners of the site, thereby providing safe and efficient connectivity to the abovementioned internal crescent shaped shared path.

## 5.2 Off-Street Parking

### 5.2.1 Passenger Vehicle Parking

The proposed development provides a total of 161 formalised off-street parking spaces, comprising 15 spaces within Tench Avenue frontage parking area and 136 parking spaces within the rear parking area.

Penrith City Council provides the following relevant locally sensitive parking requirements within Part C10 of DCP 2010 relating to Transport, Access and Parking:

#### ***Restaurants***

*1 per 5.5m<sup>2</sup> of seating area or 1 per 4 seats, whichever is greater plus*

*1 space per employee*

Based on the total development providing 1,598m<sup>2</sup> of seating area, 920 seats and assuming that each tenancy generates a requirement for 5 staff (50 employees in total), the following calculations are made:

$$1,598\text{m}^2 / 5.5\text{m}^2 + 50 = 340 \text{ spaces, or}$$

$$920 / 4 + 50 = 280 \text{ spaces}$$

DCP 2010 therefore requires the provision of 340 spaces.

The proposed formalised parking provision of 161 spaces therefore represents a shortfall of some 179 spaces, with respect to the requirements of DCP 2010.

Whilst it is acknowledged that the abovementioned shortfall is significant, it is not considered desirable to provide the additional 179 spaces in a formalised hardstand arrangement. It is accordingly proposed that the required additional spaces be provided in an informal arrangement (gravel with surface buttons to delineate parking bays and aisles) through the extension of the rear parking area to the south-east. There is significant capacity within the development site to accommodate such an informal parking area. In this regard, the architectural plans contained within **Appendix 1** illustrate an indicative informal parking layout. Incorporating the proposed informal parking area to the rear of the subject site, the proposed capacity of the site to accommodate parked vehicles suitably complies with Council's DCP 2010 requirements and accordingly, is considered to be satisfactory.

### **5.2.2 Bicycle Parking**

The proposed development provides 14 bicycle racks capable of accommodating 28 bicycles, adjacent to the southern Coffee Club building wall.

Penrith Council refer to NSW Government's *Planning Guidelines for Walking and Cycling* with respect to the provision of bicycle parking. This publication provides the following recommendations relevant to the subject proposal:

***Restaurants Customers***

*3% of seating capacity*

***Restaurant Staff***

*3% of staff*

Based on a seating capacity of 920 and 50 staff, a total of 29 bicycle parking spaces are recommended in accordance with the NSW Government's *Planning Guidelines for Walking and Cycling*. The proposed bicycle parking provision of 28 spaces is considered to be reasonably consistent with the NSW Government's recommendations.

### **5.3 On-Street Parking**

The Tench Avenue pavement provides for on-street parallel parking along both shoulders during daylight periods, with 'No Stopping' restrictions applying between 9.00pm and 5.00am.

### **5.4 Internal Circulation**

#### **5.4.1 Passenger Vehicles**

The internal passenger vehicle parking areas are proposed to be split into three areas as follows:



- The frontage parking area is proposed to comprise a single row of 90 degree angle parking serviced by a single one-way parking aisle connecting the northern and central access driveways;
- The rear parking area is proposed to comprise four 90 degree parking rows serviced by two north-south parking aisles; and
- A small number of parking spaces are also proposed as a combination of 90 degree angled and parallel arrangements, being serviced by the roadway running along the south-eastern site boundary, connecting to the southern-most Tench Avenue access driveway.

The abovementioned various parking and circulation areas have been designed in accordance with AS2890.1-2004 providing the following minimum dimensions:

- Standard 90 degree parking space width – 2.6m;
- Disabled 90 degree parking space width – 2.4m;
- Parallel parking space width – 2.1m;
- 90 degree parking space length – 5.4m;
- Parallel parking space length – 6.3m;
- End parallel parking space length – 6.6m;
- Parking aisle width – 5.8m; and
- One and two way roadway – 5.5m.

The proposed site layout as it relates to passenger vehicle manoeuvrability is therefore considered satisfactory.

#### **5.4.2 Service Vehicles**

Draft DCP 2014 provides design vehicle requirements for commercial and industrial developments based on the site area. This document specifies that any site providing an areas in excess of 4,000m<sup>2</sup> should make provision to be serviced by articulated vehicles. It is however the experience of this Practice that commercial development servicing requirement differ greatly depending on the specific type of use and indeed, the tenancy size. Given that the largest restaurant tenancy is less than 500m<sup>2</sup> suggests that the site will be serviced by small and medium rigid vehicles (including garbage collection vehicles). In this regard, Council advised during pre-lodgement discussions that the site should be designed to accommodate MRVs.

The restaurant tenancies are proposed to be serviced by a total of three loading areas as follows:

- The existing Coffee Club building is currently serviced by a loading area provided in a parallel arrangement to the rear parking area, providing dimensions of 11m x 3.5m;
- The standalone tenancy 1 building (to the north of the Coffee Club building) is proposed to provide a 90 degree loading dock, also accessed via the rear parking area, providing dimensions of 12m x 3.5m; and
- The new southern building (containing tenancies 2 – 9) is proposed to be serviced by a double loading dock, provided at 90 degrees to the rear parking area, comprising dimensions of 9m x 7m.

In order to demonstrate the ability of the abovementioned on-site loading areas to accommodate the largest vehicle expected to service the site, this Practice has prepared swept path plans, reduced copies of which are contained within **Appendix 2** for reference. The swept path plans have been generated using Autoturn software and derived from MRV vehicle specifications provided within AS2890.2-2002. These plans illustrate that MRVs are capable of accessing / vacating the proposed loading areas and manoeuvring throughout the site in a safe and efficient manner.

It is acknowledged that the swept path plans illustrate that MRVs are expected to encroach over the full width of internal access roads when manoeuvring through the site, thereby temporarily impeding internal passenger vehicle circulation. Such impedance is however not expected to result in unreasonable internal circulation conflicts as it will only occur over short periods of time, being most likely outside peak site operational periods, as is industry expectation. In consideration of this and the above discussion, the proposed loading arrangements are therefore considered to be satisfactory.

### 5.4.3 Bicycles

Bicycle parking is proposed to be accommodated through the provision of a series of double sided storage racks, adjoining the southern wall of the existing Coffee Club building. These racks have been designed to accord with the relevant AS2890.3-1993 specifications, providing the following minimum dimensions:

- Space length – 1.7m;
- Rack spacing – 1.2m;
- Rack set-back from adjoining walls – 0.9m; and
- Aisle width adjoining racks – 1.5m.

The proposed bicycle parking arrangements are therefore considered satisfactory.

## **6. EXISTING TRAFFIC CONDITIONS**

### **6.1 Surrounding Road Network**

Tench Avenue performs an access function to abutting development and Tench Reserve under the care and control of Penrith City Council. In this regard, it provides a south-west / north-east connection between Factory Road (with Bellevue Road) in the south-west and Jamison Road in the north-east.

Tench Avenue provides an 11m wide pavement providing one through lane of traffic in each direction, being separated by double barrier centre lines. Through traffic movements are separated from parallel parking within both shoulders by marked edge lines. Traffic flow is governed by a sign posted speed limit of 50km/h.

To the south, Tench Avenue forms an underpass below M4 Motorway, prior to becoming Bellevue Road, which in turn forms a T-junction with Factory Road, operating under major / minor priority control with Factory Road forming the priority route. Factory Road performs a higher order access function, linking the Nepean River foreshore with Mulgoa Road in the south-east, to which left in / left out movements are facilitated.

To the north, Tench Avenue curves to the east to form Jamison Road, a collector road linking with Mulgoa Road under traffic signal control, prior to extending to Parker Road and Bringelly Road at Kingswood.

Mulgoa Road performs a State Road under the care and control of the Roads & Maritime Services. It provides an arterial function providing a north-south connection between Llandilo in the north (with Castlereagh Road and Cranebrook Road) and Wallacia in the south. In the vicinity of Jamisontown, Mulgoa Road provides a four lane divided carriageway, with additional exclusive turning lanes provided on approach to major intersections, primarily governed by traffic signal control. Mulgoa Road provides full interchange facilities with M4 Motorway in the immediate precinct, linking to the greater Sydney metropolitan area to the east and Blue Mountains and beyond to the west.

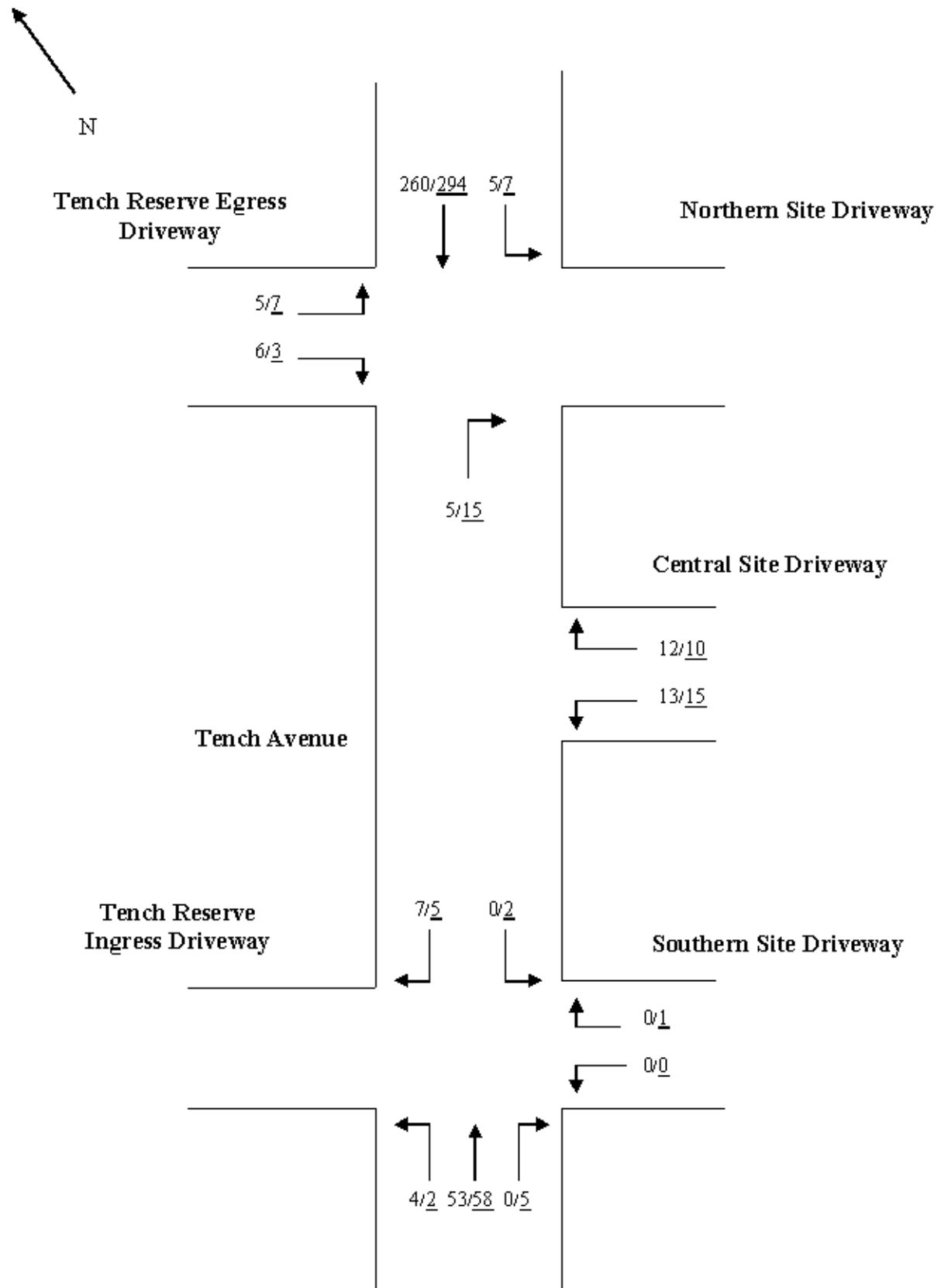
### **6.2 Existing Traffic Volumes**

In order to obtain an indication of the existing operation of Tench Avenue in the immediate vicinity of the subject site, reference is made to weekday evening and Saturday midday peak hour traffic surveys undertaken by staff of this Practice. Traffic surveys were undertaken of Tench Avenue through vehicle movements and turning movements to and from the subject site and Tench Reserve access driveways between 4.00pm – 6.00pm and 11.00am – 1.00pm and on the 5<sup>th</sup> and 6<sup>th</sup> of September 2014.

**Figure 2** overleaf provides a graphical representation of the surveyed peak hour traffic volumes, whilst full details are contained within **Appendix 3**.

**FIGURE 2**  
**EXISTING (SEPTEMBER 2014) PEAK HOUR TRAFFIC VOLUMES**  
**TENCH AVENUE, THE SUBJECT SITE & TENCH RESERVE**

Legend: Weekend (12pm – 1pm) / Weekday (4pm – 5pm)





**Figure 2** indicates the following:

- Tench Avenue accommodates a two directional peak hour traffic demand of between 300 – 350 vehicles per hour;
- The subject site generates in the order of 35 – 55 peak hour vehicle movements; and
- Tench Reserve generates approximately 20 peak hour vehicle movements.

### **6.3 Existing Road Network Operation**

In order to undertake an assessment of the operational performance of Tench Avenue, reference is made to the Roads & Maritime Services' *Guide to Traffic Generating Developments*. This publication indicates that a two lane two way carriageway accommodating peak hour directional traffic volumes less than 380 vehicles per hour provides a level of service 'A' / 'B'. Such a level service indicates free flow where drivers are virtually unaffected by others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is high, and the general level of comfort and convenience provided is excellent.

With respect to the above, it has been observed that motorists are able to enter and exit the subject site (and the opposing Tench Reserve) with a good level of safety and efficiency.

In a regional context, the subject precinct is provided with connectivity to the surrounding regional road network through the provision of traffic signals at the intersection of Mulgoa Road and Jamison Road. Whilst peak demands within Mulgoa Road are considerable commensurate with the State Road function of the route, the traffic signal control at Jamison Road provides exclusive turning phases thereby facilitating safe and efficient connectivity to / from the Tench Reserve precinct. A secondary link to Mulgoa Road is also provided via Blaikie Road which connects Jamison Road to Mulgoa Road, also under traffic signal control.

### **6.4 Public Transport**

Westbus provides a single bus service along Tench Avenue being Route 795, operating between Warragamba and Penrith. This service operates a total of eight services on weekdays between approximately 7.00am and 4.00pm and six services on weekends and public holidays between approximately 9.00am and 7.00pm.

The closest bus stop is located immediately to the north of the site.

The abovementioned bus service connects with other bus services operating along Mulgoa Road and with the major public transport interchange at Penrith Railway Station.

## **6.5 Pedestrian / Cycle**

Tench Avenue provides a path along the eastern side of Tench Avenue immediate adjacent to the subject site. This path provides connectivity to Tench Reserve which contains a further path running along the eastern Nepean River foreshore, linking with the Penrith CBD to the north and also to a regional east-west cycle trail adjoining M4 Motorway to the south.

The Penrith Accessible Trails Hierarchy Strategy incorporates a future shared path along Jamison Road between York Road and Tench Reserve, whilst the 'Our River' Master Plan also incorporates a series of improved pedestrian and cyclist accessibility and mobility infrastructure in the immediate vicinity of the subject site.

## **7. PROJECTED TRAFFIC CONDITIONS**

### **7.1 Traffic Generation**

In order to estimate the existing traffic generation of the development, reference is made to the Roads & Maritime Services' *Guide to Traffic Generating Developments*. This publication provides average traffic generation rates for a range of land uses based on extensive surveys undertaken throughout the Sydney metropolitan area. The following rates are provided pertinent to the subject development:

#### ***Restaurants***

*5 peak hour trips per 100m<sup>2</sup> GFA*

Application of the above Roads & Maritime Services rates to the total proposed development GFA of 2,246m<sup>2</sup> results in an estimated peak hour traffic generation rate of 113 vehicle movements to and from the subject site.

### **7.2 Trip Assignment**

In order to gauge the impact of the traffic projected to be generated by the proposed development on the local road network, it is necessary to distribute the traffic generated by the proposed development along the major approach routes before it dissipates throughout the general road network.

It is common to assume that trips to the subject site will be distributed in accordance with existing traffic patterns. In this regard, a majority of vehicles currently accessing the precinct currently originate from the north along Jamison Road and Tench Avenue. Accordingly, the following trip assignment is estimated:

- 80% of vehicles will access the site from the north along Jamison Road and Tench Avenue; and
- The remaining 20% are projected to travel via Factory Road and Tench Avenue from the south.

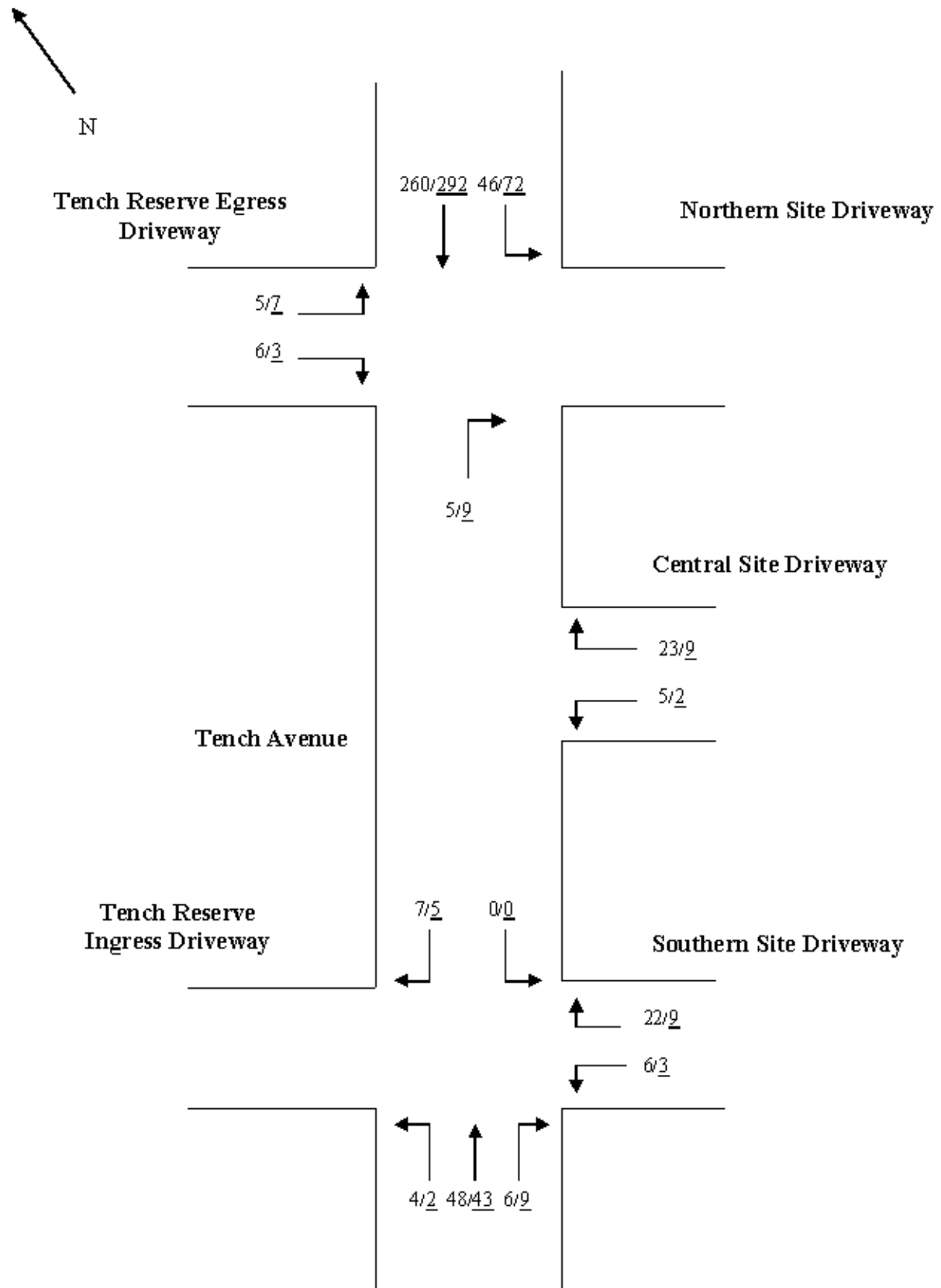
Further to the above, for the purposes of this assessment, it is estimated that vehicle trips are evenly distributed between inbound and outbound movements during the weekend lunch time peak whilst site generated traffic provides a 80% / 20% inbound / outbound split during the weekday evening peak, associated with dinner trade.

### **7.3 Projected Traffic Volumes**

Based on the discussion provided previously on likely traffic generation and trip assignment, the projected peak hour traffic volumes have been formulated by adding the trip assignment to the to the existing volumes surveyed provided within **Figure 2**. **Figure 3** overleaf provides an estimation of the future traffic volumes associated with and adjoining the subject site.

**FIGURE 3**  
**PROJECTED PEAK HOUR TRAFFIC VOLUMES**  
**TENCH AVENUE, THE SUBJECT SITE & TENCH RESERVE**

Legend: Weekend (12pm – 1pm) / Weekday (4pm – 5pm)





## 7.4 Projected Road Network Performance

In order to objectively assess the likely future operation of Tench Avenue, the site access driveways and the Tench Reserve access driveways, a SIDRA computer intersection analysis has been undertaken. SIDRA is a computerised traffic arrangement program which, when volume and geometrical configurations of an intersection are imputed, provides an objective assessment of the operation efficiency under varying types of control (i.e. signs, signal and roundabouts). Key indicators of SIDRA include level of service where results are placed on a continuum from A to F, with A providing the greatest intersection efficiency and therefore being the most desirable by the Roads and Maritime Services.

SIDRA uses detailed analytical traffic models coupled with an iterative approximation method to provide estimates of the abovementioned key indicators of capacity and performance statistics. Other key indicators provided by SIDRA are average vehicle delay, the number of stops per hour and the degree of saturation. Degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Degree of saturation is a useful and professionally accepted measure of intersection performance.

SIDRA provides analysis of the operating conditions that can be compared to the performance criteria set out in **Table 2** (being the RTA NSW method of calculation of Level of Service).

TABLE 2 LEVELS OF SERVICE CRITERIA FOR INTERSECTION		
Level of Service	Average Delay per Vehicle (secs/veh)	Expected Delay
<b>SIGNALISED INTERSECTIONS AND ROUNDABOUTS</b>		
A	Less than 14	Little or no delay
B	15 to 28	Minimal delay and spare capacity
C	29 to 42	Satisfactory delays with spare capacity
D	43 to 56	Satisfactory but near capacity
E	57 to 70	At capacity, incidents will cause excessive delays
F	> 70	Extreme delay, unsatisfactory
<b>GIVE WAY &amp; STOP SIGNS</b>		
A	Less than 14	Good
B	15 to 28	Acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Near capacity
E	57 to 70	At capacity and requires other control mode
F	> 70	Unsatisfactory and requires other control mode

The projected conditions have been modelled utilising the peak hour traffic volumes presented within **Figure 3**. **Table 3** provides a summary of the SIDRA output data whilst more detailed summaries are included as **Appendix 4**.

<b>TABLE 3</b> <b>SIDRA OUTPUT – PROJECTED PEAK HOUR PERFORMANCE</b> <b>TENCH AVENUE JUNCTIONS WITH SITE AND RESERVE ACCESS</b> <b>DRIVEWAYS</b>		
	<b>Weekend Midday Peak</b>	<b>Weekday Evening Peak</b>
<b>TENCH AVENUE, NORTH SITE INGRESS DRIVEWAY &amp; RESERVE EGRESS ACCESS</b>		
Average Vehicle Delay	9.4	9.0
Degree of Saturation	0.16	0.20
Level of Service	A	A
<b>TENCH AVENUE &amp; CENTRAL SITE EGRESS DRIVEWAY</b>		
Average Vehicle Delay	9.8	9.7
Degree of Saturation	0.14	0.16
Level of Service	A	A
<b>TENCH AVENUE, SOUTH SITE DRIVEWAY AND RESERVE INGRESS ACCESS</b>		
Average Vehicle Delay	10.2	13.8
Degree of Saturation	0.14	0.31
Level of Service	A	A

**Table 3** indicates that the Tench Avenue junctions with all site and Tench Reserve access driveways are projected to operate with a level of service 'A', representing good conditions with spare capacity. Accordingly, motorists are projected to be able to enter and exit the subject development site in a safe and efficient manner, without unreasonable impedance on existing through Tench Avenue traffic movements.

### 7.5 Assessment of Compliance with Strategic Intent

The Riverlink Precinct Plan 2008 involved the provision of entertainment, tourism, leisure and lifestyle uses within land abutting Tench Avenue to the east, thereby activating Tench Reserve.

The subsequent 'Our River' Nepean River Master Plan identified that the success of the existing Coffee Club within the site suggests opportunities for more cafes / restaurants along the foreshore. It however stated that existing constraints within the subject vicinity limited the connectivity between potential entertainment and tourism uses on the eastern side of Tench Avenue to the recreational uses within Tench Reserve. The subject proposal aims to improve this connectivity through the following:

- The provision of additional parking within the precinct;
- The combining of site and Reserve access driveways into formalised intersections;
- The provision of pedestrian refuge treatments to connect the site with the Reserve; and
- The provision of a formalised internal shared path to connect with the existing path within Tench Avenue and the abovementioned pedestrian refuge treatments, linking with Tench Reserve.

## 8. CONCLUSION

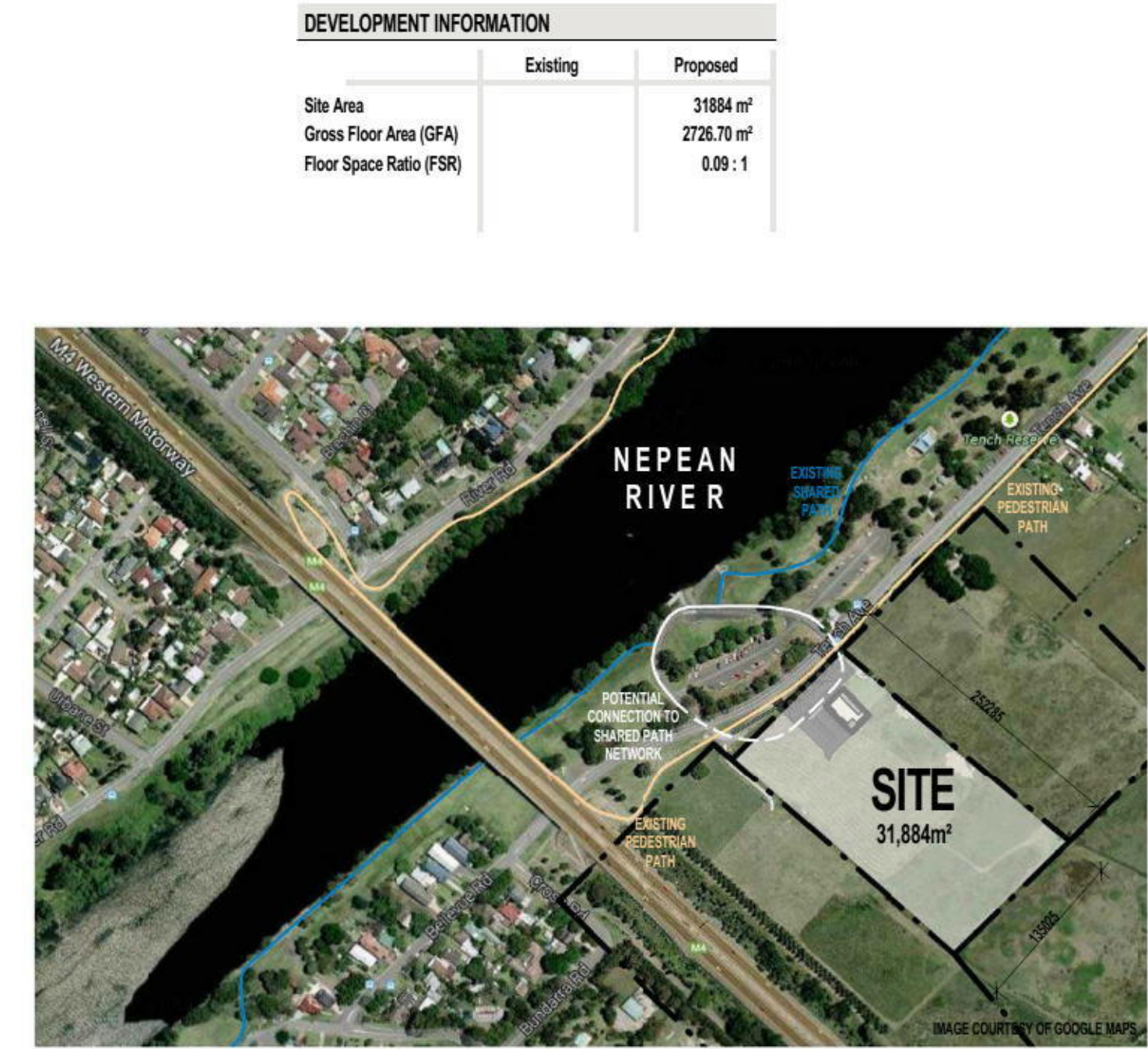
This Practice has undertaken an assessment of the potential parking and traffic implications associated with a proposal to expand the existing restaurant development to accommodate 9 additional tenancies within 68 – 78 Tench Avenue, Jamisontown. Based on this assessment, the following conclusions are now made:

- Whilst the proposed formalised off-street parking provision represents a shortfall with respect to Council's relevant DCP requirements for restaurant uses, there is adequate overflow capacity to accommodate Council's parking requirements in an informal manner within the south-eastern portion of the site;
- The proposed access arrangements, internal circulation and manoeuvring arrangements are capable of providing for safe and efficient vehicular movements during peak times;
- The surrounding road network operates with a good level of service during peak periods;
- The subject development has been projected to generate in the order of 113 additional peak hour vehicle trips to and from the subject site; and
- It is considered that the adjoining road network is capable of accommodating the additional traffic projected to be generated by the subject development.

Based on the contents of this report and the conclusions contained herein, we consider that there are no traffic related issues that should prevent approval of the subject application and we therefore recommend that action to Council.

# **APPENDIX 1**





Context Plan (True North)  
1 : 5000



VIS - View A



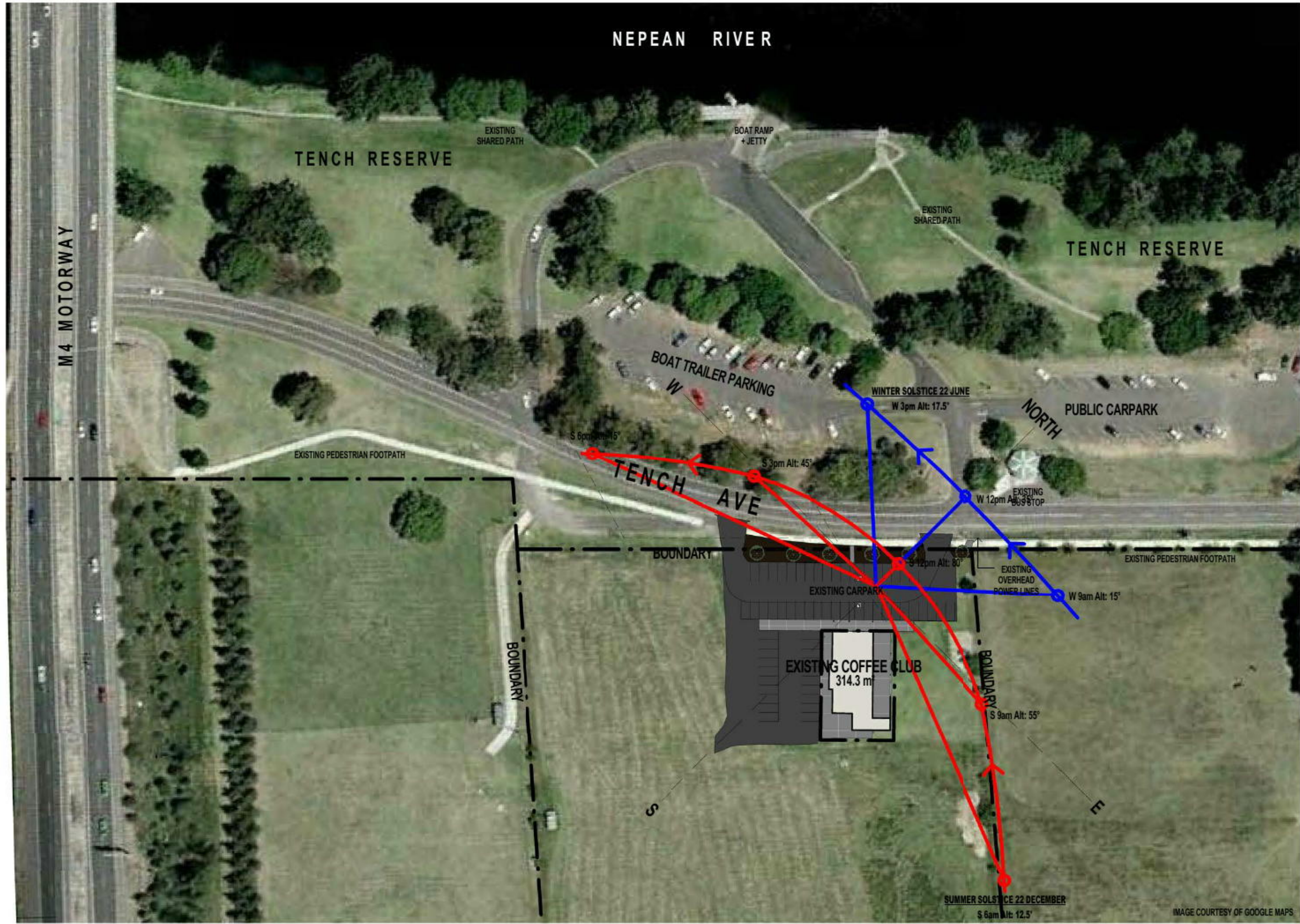
VIS - View B



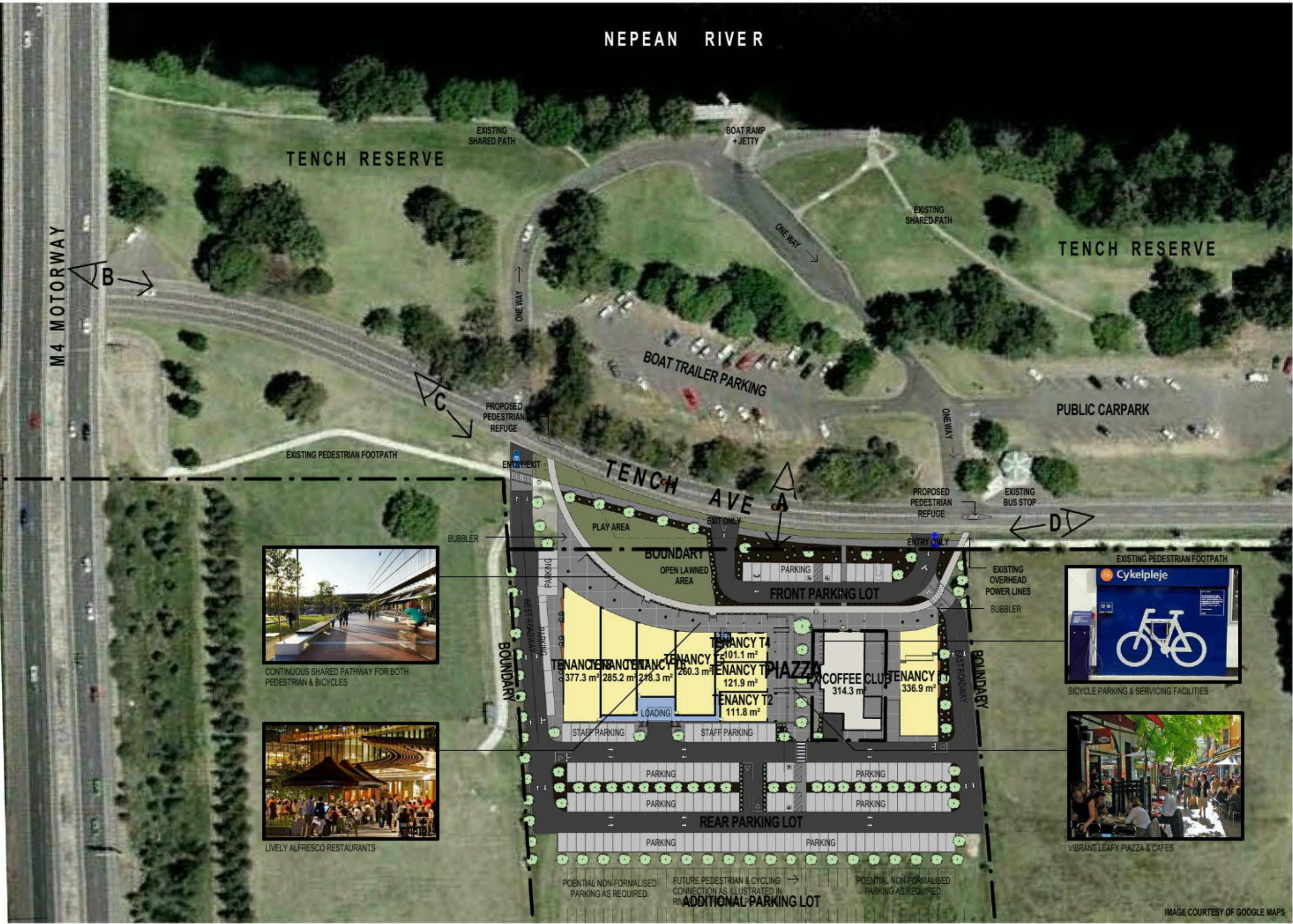
VIS - View C



VIS - View D



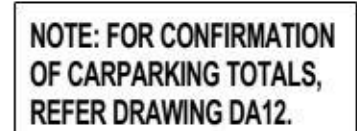
Existing Site Plan & Analysis  
1 : 1000



Proposed Site Plan & Visual Impact Study (VIS)  
1 : 1000

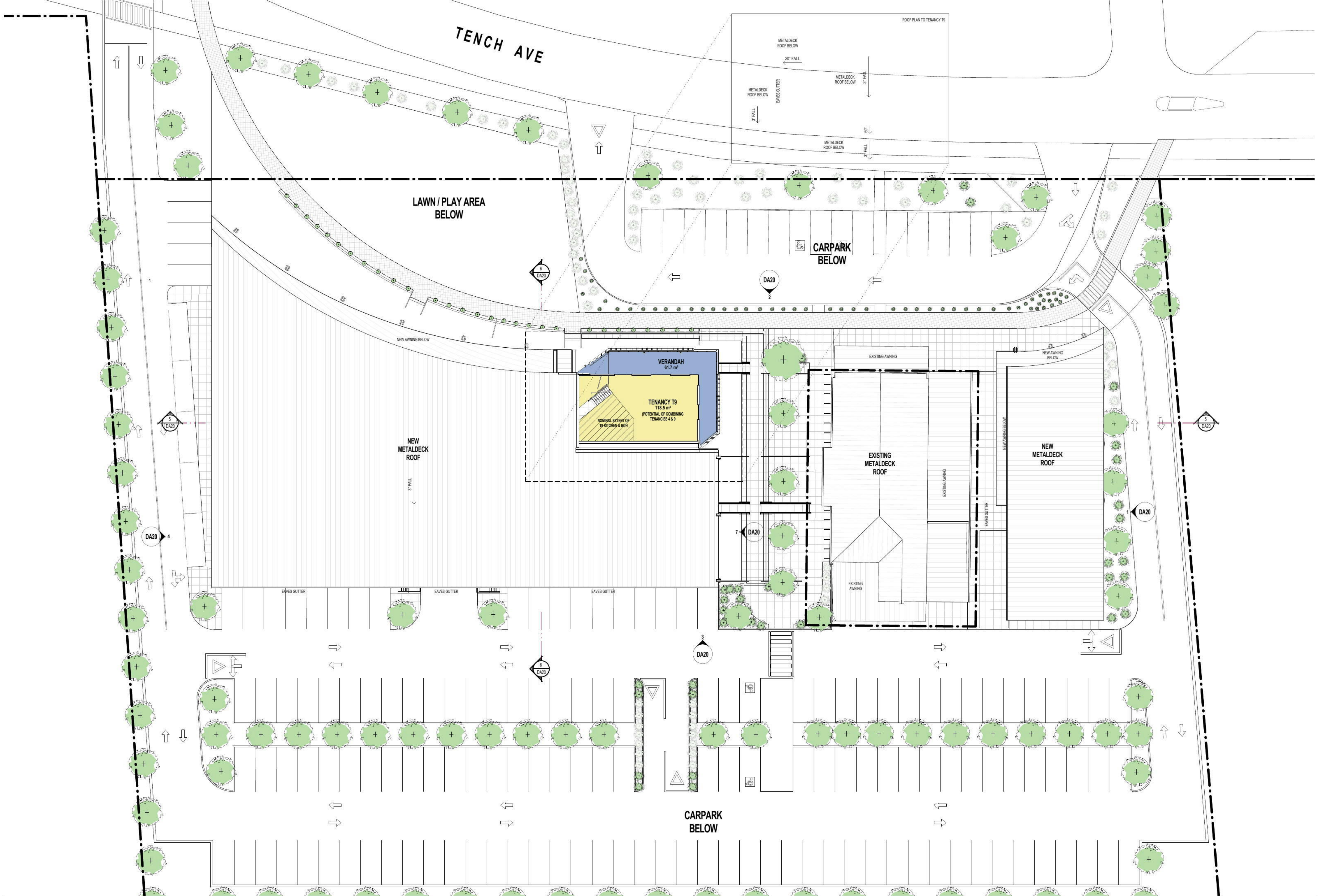
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3P	13-03-2015	FOR CO-ORDINATION	PROPOSED RECREATION AND TOURISM PRECINCT	STIMSON & BAKER	MORSON GROUP	DESIGNER	As Indicated	MAR 2015	SHEET SIZE: A1		DA01
7P	27-02-2015	FOR REVIEW	LOT 3, DP 30354, TENCH AVE, PENRITH, NSW								8P
6P	20-08-2014	FOR CO-ORDINATION									
5P	18-08-2014	FOR CO-ORDINATION									
4P	12-08-2014	FOR TRAFFIC REVIEW									





SHEET NAME	PROPOSED GROUND FLOOR PLAN	DRAWING NUMBER	DA10
		ISSUE NO.	10P





ISSUE	DATE	AMENDMENT	PROJECT	MORSON GROUP	PROPOSED RECREATION AND TOURISM PRECINCT	SHEET SIZE: A1	PROPOSED ROOF & UPPER LEVEL FLOOR PLAN	DRAWING NUMBER
SP	13-03-2015	FOR CO-ORDINATION	LOT 3, DP 30354, TENCH AVE, PENRITH, NSW	1:200	MAR 2015	DA11		
4P	27-02-2015	FOR REVIEW						
3P	20-08-2014	FOR CO-ORDINATION						
2P	18-08-2014	FOR CO-ORDINATION						
1P	14-08-2014	FOR REVIEW						







## **APPENDIX 2**



## NOTES:-

1. THIS PLAN IS BASED ON ARCHITECTURAL PLANS PREPARED BY MORSON GROUP.
2. THE TURNING PATHS USED ON THIS PLAN ARE GENERATED USING AUTOTURN SOFTWARE AND DERIVED FROM SPECIFICATIONS PROVIDED WITHIN THE AUSTRALIAN STANDARD FOR PARKING FACILITIES PART 2: OFF-STREET COMMERCIAL VEHICLE FACILITIES (AS2890.2-2002) FOR MEDIUM RIGID VEHICLES.



## THOMPSON STANBURY ASSOCIATES

PROPOSED RESTAURANT DEVELOPMENT

78 - 88 TENCH AVENUE

JAMISTONTOWN

MRV VEHICLE SWEEP PATH PLANS

SCALE: 1: 500

FILE: 14-086

DATE: 18/03/2015

SUPERSEDES  
SHEET/ISSUE

ISSUE

A

SHEET

1





## NOTES:-

1. THIS PLAN IS BASED ON ARCHITECTURAL PLANS PREPARED BY MORSON GROUP.
2. THE TURNING PATHS USED ON THIS PLAN ARE GENERATED USING AUTOTURN SOFTWARE AND DERIVED FROM SPECIFICATIONS PROVIDED WITHIN THE AUSTRALIAN STANDARD FOR PARKING FACILITIES PART 2: OFF-STREET COMMERCIAL VEHICLE FACILITIES (AS2890.2-2002) FOR MEDIUM RIGID VEHICLES.



## THOMPSON STANBURY ASSOCIATES

PROPOSED RESTAURANT DEVELOPMENT

78 - 88 TENCH AVENUE

JAMISTONTOWN

MRV VEHICLE SWEEP PATH PLANS

SCALE: 1: 500

FILE: 14-086

DATE: 18/03/2015

SUPERSEDES  
SHEET/ISSUE

ISSUE

A

SHEET

2





## NOTES:-

1. THIS PLAN IS BASED ON ARCHITECTURAL PLANS PREPARED BY MORSON GROUP.
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THOMPSON STANBURY ASSOCIATES

PROPOSED RESTAURANT DEVELOPMENT

78 - 88 TENCH AVENUE

JAMISTONTOWN

MRV VEHICLE SWEEP PATH PLANS

SCALE: 1: 500

FILE: 14-086

DATE: 18/03/2015

SUPERSEDES  
SHEET/ISSUE

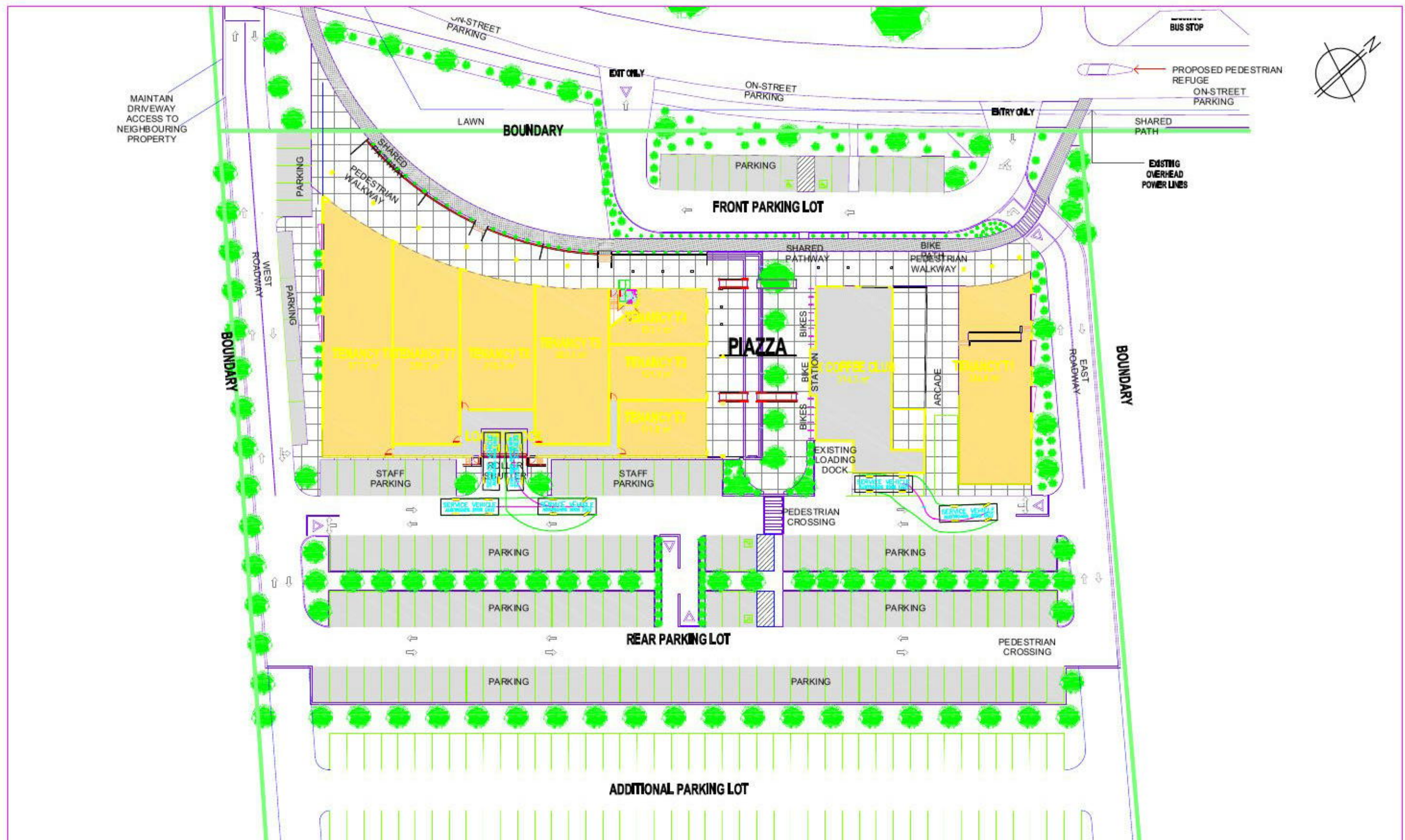
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3





## NOTES:-

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2. THE TURNING PATHS USED ON THIS PLAN ARE GENERATED USING AUTOTURN SOFTWARE AND DERIVED FROM SPECIFICATIONS PROVIDED WITHIN THE AUSTRALIAN STANDARD FOR PARKING FACILITIES PART 2: OFF-STREET COMMERCIAL VEHICLE FACILITIES (AS2890.2-2002) FOR MEDIUM RIGID VEHICLES.



## THOMPSON STANBURY ASSOCIATES

PROPOSED RESTAURANT DEVELOPMENT

78 - 88 TENCH AVENUE

JAMISTONTOWN

MRV VEHICLE SWEEP PATH PLANS

SCALE: 1: 500

FILE: 14-086

DATE: 18/03/2015

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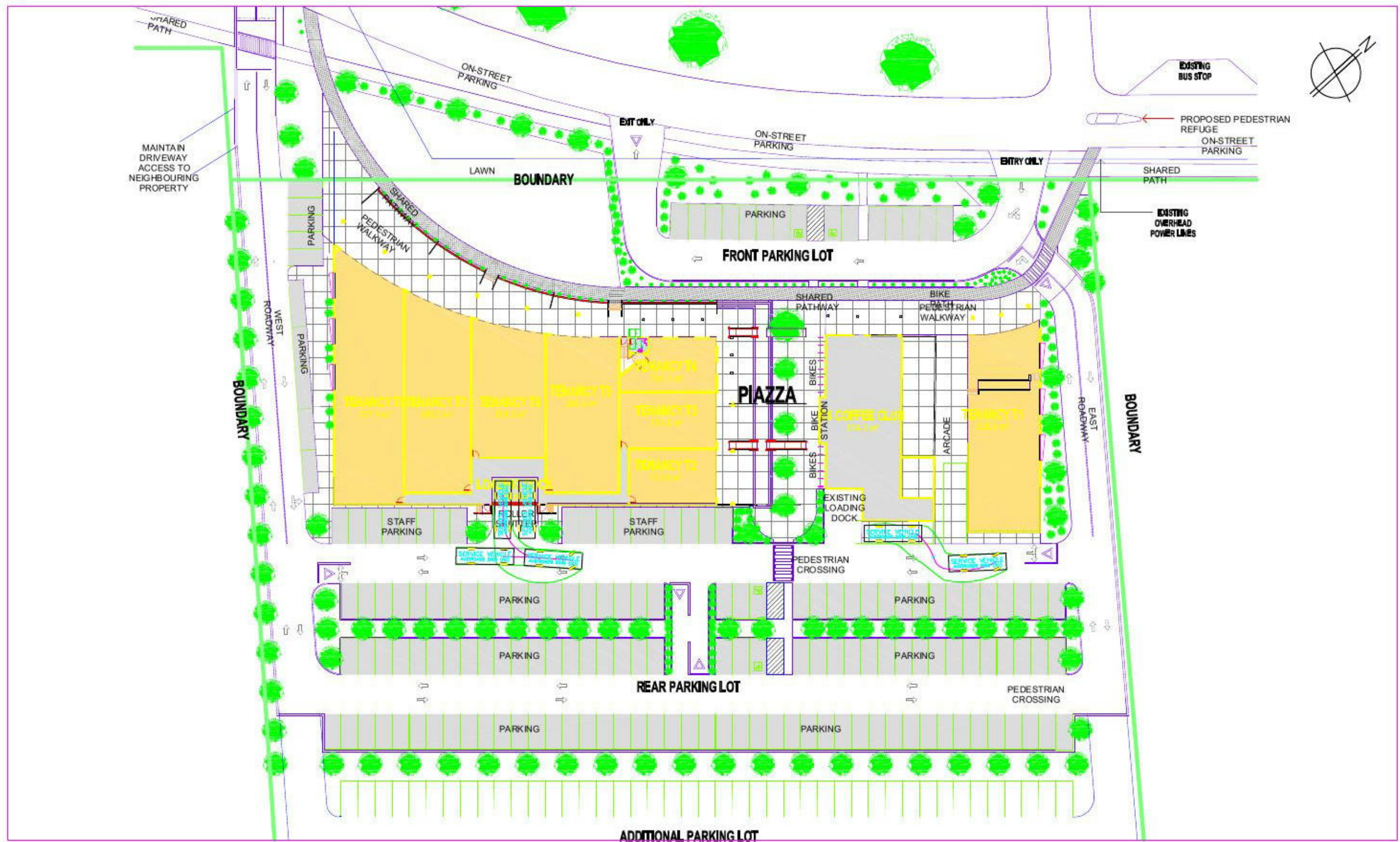
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4





## NOTES:-

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2. THE TURNING PATHS USED ON THIS PLAN ARE GENERATED USING AUTOTURN SOFTWARE AND DERIVED FROM SPECIFICATIONS PROVIDED WITHIN THE AUSTRALIAN STANDARD FOR PARKING FACILITIES PART 2: OFF-STREET COMMERCIAL VEHICLE FACILITIES (AS2890.2-2002) FOR MEDIUM RIGID VEHICLES.



## THOMPSON STANBURY ASSOCIATES

PROPOSED RESTAURANT DEVELOPMENT

78 - 88 TENCH AVENUE

JAMISTONTOWN

MRV VEHICLE SWEEP PATH PLANS

SCALE: 1: 500

FILE: 14-086

DATE: 18/03/2015

SUPERSEDES  
SHEET/ISSUE

ISSUE

A

SHEET

5



## **APPENDIX 3**

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All Correspondence:  
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**THOMPSON  
STANBURY  
ASSOCIATES**

ABN: 79 943 737 368

TRAFFIC COUNTS AT: Tench Avenue, Penrith  
DATE: 5/09/14 & 6/09/14  
TIME: 11:00am-1:00pm, 4pm-6pm  
WEATHER: Fine

Time	Access 1		Access 2				Access 3		Access 4		Access 5	
	↑	↓	↓	↓	↑	↑	↓	↑	↓	↓	↑	↓
11.00 – 11.15am	1	4	0	0	0	0	0	0	4	1	1	1
11.15 – 11.30am	1	0	0	0	0	0	4	1	2	0	2	5
11.30 – 11.45am	1	1	0	0	0	0	2	3	2	1	0	1
11.45 – 12.00am	3	3	0	1	0	1	2	1	2	3	0	1
<b>Total</b>	<b>6</b>	<b>8</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>3</b>	<b>8</b>
12.00 – 12.15pm	0	3	0	0	0	0	2	4	1	1	0	2
12.15 – 12.30pm	2	3	0	0	0	0	1	3	1	4	3	1
12.30 – 12.45pm	1	0	0	0	0	0	2	5	1	0	3	0
12.45 – 1.00pm	1	1	0	0	0	0	8	0	3	0	0	2
<b>TOTAL</b>	<b>4</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>12</b>	<b>5</b>	<b>5</b>	<b>6</b>	<b>5</b>
4.00 – 4.15pm	0	0	0	3	0	0	7	0	5	5	0	4
4.15 – 4.30pm	1	2	1	2	0	1	2	2	0	4	0	0
4.30 – 4.45pm	1	1	1	0	0	0	1	6	1	3	2	1
4.45 – 5.00pm	0	2	0	0	0	0	5	2	1	3	1	2
<b>TOTAL</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>15</b>	<b>10</b>	<b>7</b>	<b>15</b>	<b>3</b>	<b>7</b>
5.00 – 5.15pm	0	1	0	0	0	1	4	1	1	0	1	0
5.15 – 5.30pm	1	2	0	0	0	0	1	3	1	1	1	2
5.30 – 5.45pm	0	0	0	0	0	0	2	5	4	5	0	3
5.45 – 6.00pm	0	0	0	0	0	2	7	3	2	7	1	3
<b>TOTAL</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>14</b>	<b>12</b>	<b>8</b>	<b>13</b>	<b>3</b>	<b>8</b>

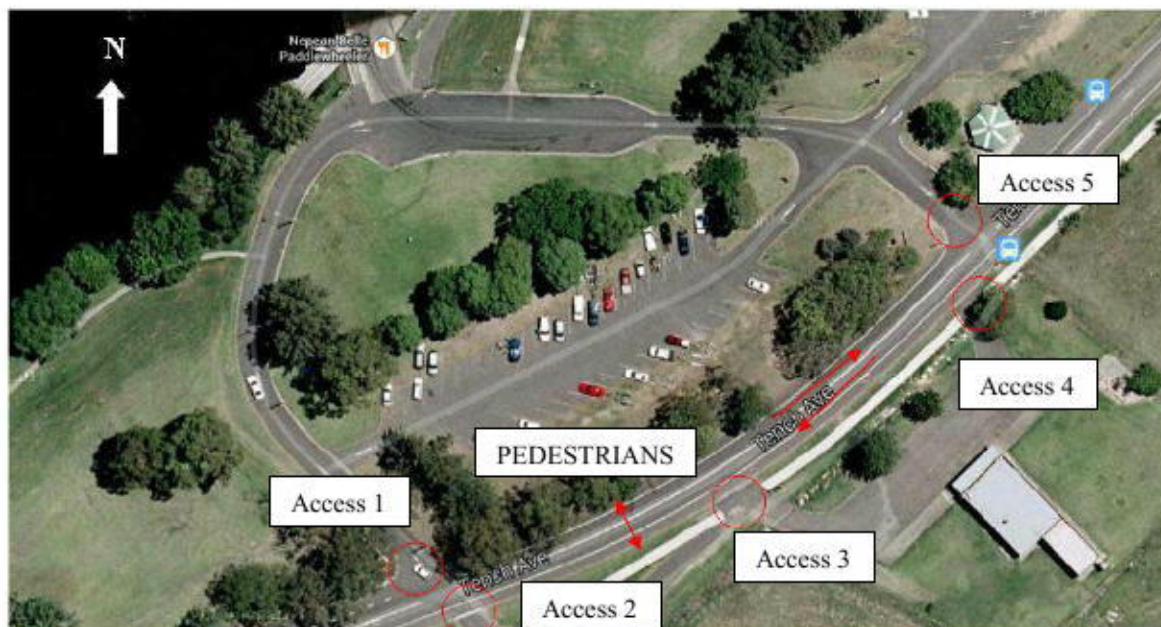


Figure 1- Access Driveways & Vehicular movement

Time	Through Movements		Pedestrians
	East	West	
11.00 11.15am	19	38	1
11.15 11.30am	9	55	3
11.30 11.45am	11	61	0
11.45 12.00am	7	59	1
<b>Total</b>	<b>46</b>	<b>213</b>	<b>5</b>
12.00 12.15pm	15	49	7
12.15 12.30pm	16	69	0
12.30 12.45pm	13	80	0
12.45 1.00pm	9	62	1
<b>TOTAL</b>	<b>53</b>	<b>260</b>	<b>8</b>
4.00 4.15pm	12	57	0
4.15 4.30pm	22	91	0
4.30 4.45pm	14	75	0
4.45 5.00pm	10	71	3
<b>TOTAL</b>	<b>58</b>	<b>294</b>	<b>3</b>
5.00 5.15pm	4	53	4
5.15 5.30pm	10	57	2
5.30 5.45pm	8	45	2
5.45 6.00pm	6	62	0
<b>TOTAL</b>	<b>28</b>	<b>217</b>	<b>8</b>

## **APPENDIX 4**

# MOVEMENT SUMMARY

 Site: Tench Avenue & Northern Access Driveway

Projected Weekend Peak  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tench Avenue South											
2	T1	48	5.0	0.029	1.1	LOS A	0.2	1.3	0.39	0.06	57.9
3	R2	5	5.0	0.029	6.8	LOS A	0.2	1.3	0.39	0.06	55.3
Approach		53	5.0	0.029	1.6	NA	0.2	1.3	0.39	0.06	57.6
North: Tench Avenue North											
7	L2	46	5.0	0.163	5.6	LOS A	0.0	0.0	0.00	0.09	57.3
8	T1	260	5.0	0.163	0.0	LOS A	0.0	0.0	0.00	0.09	59.2
Approach		306	5.0	0.163	0.9	NA	0.0	0.0	0.00	0.09	58.9
West: Tench Reserve Egress											
10	L2	5	5.0	0.013	9.4	LOS A	0.0	0.3	0.16	0.92	51.1
12	R2	6	5.0	0.013	8.9	LOS A	0.0	0.3	0.16	0.92	50.4
Approach		11	5.0	0.013	9.1	LOS A	0.0	0.3	0.16	0.92	50.7
All Vehicles		370	5.0	0.163	1.2	NA	0.2	1.3	0.06	0.11	58.4

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SIDRA INTERSECTION 6.0.24.4877

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**SIDRA  
INTERSECTION 6**



# MOVEMENT SUMMARY

 Site: Tench Avenue & Northern Access Driveway

Projected Weekday Peak  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tench Avenue South											
2	T1	44	5.0	0.031	1.4	LOS A	0.2	1.4	0.43	0.11	57.3
3	R2	9	5.0	0.031	7.1	LOS A	0.2	1.4	0.43	0.11	54.8
Approach		53	5.0	0.031	2.3	NA	0.2	1.4	0.43	0.11	56.9
North: Tench Avenue North											
7	L2	72	5.0	0.195	5.6	LOS A	0.0	0.0	0.00	0.12	57.1
8	T1	292	5.0	0.195	0.0	LOS A	0.0	0.0	0.00	0.12	58.9
Approach		364	5.0	0.195	1.1	NA	0.0	0.0	0.00	0.12	58.5
West: Tench Reserve Egress											
10	L2	7	5.0	0.010	9.0	LOS A	0.0	0.3	0.12	0.94	51.2
12	R2	3	5.0	0.010	8.5	LOS A	0.0	0.3	0.12	0.94	50.6
Approach		10	5.0	0.010	8.9	LOS A	0.0	0.3	0.12	0.94	51.0
All Vehicles		427	5.0	0.195	1.5	NA	0.2	1.4	0.06	0.14	58.1

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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**SIDRA  
INTERSECTION 6**

# MOVEMENT SUMMARY

 Site: Tench Avenue & Central Site Access

Projected Weekend Peak  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tench Avenue South											
2	T1	48	5.0	0.025	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		48	5.0	0.025	0.0	NA	0.0	0.0	0.00	0.00	60.0
East: Central Site Access											
4	L2	5	5.0	0.033	9.8	LOS A	0.1	0.8	0.37	0.89	51.1
6	R2	23	5.0	0.033	9.5	LOS A	0.1	0.8	0.37	0.89	50.9
Approach		28	5.0	0.033	9.6	LOS A	0.1	0.8	0.37	0.89	50.9
North: Tench Avenue North											
8	T1	266	5.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		266	5.0	0.141	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		342	5.0	0.141	0.8	NA	0.1	0.8	0.03	0.07	59.1

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

**STOP** Site: Tench Avenue & Central Site Access

Projected Weekday Peak  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tench Avenue South											
2	T1	43	5.0	0.023	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		43	5.0	0.023	0.0	NA	0.0	0.0	0.00	0.00	60.0
East: Central Site Access											
4	L2	2	5.0	0.013	9.9	LOS A	0.0	0.3	0.38	0.87	51.0
6	R2	9	5.0	0.013	9.6	LOS A	0.0	0.3	0.38	0.87	50.8
Approach		11	5.0	0.013	9.7	LOS A	0.0	0.3	0.38	0.87	50.9
North: Tench Avenue North											
8	T1	295	5.0	0.156	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		295	5.0	0.156	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		349	5.0	0.156	0.3	NA	0.0	0.3	0.01	0.03	59.6

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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**INTERSECTION 6**

# MOVEMENT SUMMARY

**STOP** Site: Tench Avenue & Southern Site Access

Projected Weekend Peak  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tench Avenue South											
1	L2	4	5.0	0.032	6.5	LOS A	0.2	1.4	0.36	0.09	55.9
2	T1	48	5.0	0.032	0.9	LOS A	0.2	1.4	0.36	0.09	57.6
3	R2	6	5.0	0.032	6.4	LOS A	0.2	1.4	0.36	0.09	55.3
Approach		58	5.0	0.032	1.8	NA	0.2	1.4	0.36	0.09	57.2
East: Southern Site Access											
4	L2	6	5.0	0.038	10.2	LOS A	0.1	0.9	0.39	0.89	50.9
6	R2	22	5.0	0.038	9.7	LOS A	0.1	0.9	0.39	0.89	50.4
Approach		28	5.0	0.038	9.8	LOS A	0.1	0.9	0.39	0.89	50.5
North: Tench Avenue North											
7	L2	1	5.0	0.142	5.8	LOS A	0.8	5.9	0.16	0.02	57.3
8	T1	259	5.0	0.142	0.2	LOS A	0.8	5.9	0.16	0.02	59.2
9	R2	7	5.0	0.142	5.9	LOS A	0.8	5.9	0.16	0.02	56.5
Approach		267	5.0	0.142	0.4	NA	0.8	5.9	0.16	0.02	59.1
All Vehicles		353	5.0	0.142	1.3	NA	0.8	5.9	0.21	0.10	58.0

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

**STOP** Site: Tench Avenue & Southern Site Access

Projected Weekday Peak  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tench Avenue South											
1	L2	2	5.0	0.034	8.3	LOS A	0.2	1.7	0.55	0.13	54.8
2	T1	43	5.0	0.034	2.7	LOS A	0.2	1.7	0.55	0.13	56.5
3	R2	9	5.0	0.034	8.2	LOS A	0.2	1.7	0.55	0.13	54.2
Approach		54	5.0	0.034	3.8	NA	0.2	1.7	0.55	0.13	56.0
East: Southern Site Access											
4	L2	3	5.0	0.027	13.8	LOS A	0.1	0.6	0.59	0.94	48.8
6	R2	9	5.0	0.027	13.2	LOS A	0.1	0.6	0.59	0.94	48.3
Approach		12	5.0	0.027	13.3	LOS A	0.1	0.6	0.59	0.94	48.4
North: Tench Avenue North											
7	L2	1	5.0	0.308	5.8	LOS A	2.1	15.1	0.17	0.01	57.4
8	T1	575	5.0	0.308	0.2	LOS A	2.1	15.1	0.17	0.01	59.2
9	R2	5	5.0	0.308	5.9	LOS A	2.1	15.1	0.17	0.01	56.5
Approach		581	5.0	0.308	0.3	NA	2.1	15.1	0.17	0.01	59.2
All Vehicles		647	5.0	0.308	0.8	NA	2.1	15.1	0.21	0.03	58.7

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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