# TRAFFIC IMPACT ASSESSMENT

## Proposed Boarding House Development

## 195-197 Sydney Road, Fairlight

Prepared for: Micronest Pty Ltd

Reference: 0071r01v03

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# 1. Introduction

## 1.1. Overview

PDC Consultants has been commissioned by Micronest Pty Ltd to undertake a traffic impact assessment of a Development Application (DA) relating to a proposed boarding house development at 195-197 Sydney Road, Fairlight. Specifically, the DA proposes the demolition of all existing buildings, consolidation of two (2) separate lots and the construction of a 6-storey boarding house development consisting of:

- 75 boarding rooms including a single manager's room;
- Two (2) parking levels with a total of 38 car parking spaces;
- A single 6.4 metre Small Rigid Vehicle (SRV) service vehicle bay;
- A 6.5 metre wide combined entry / exit driveway onto Sydney Road.

Having regard for the above, it is evident that whilst the development will access a classified arterial road (Sydney Road), it incorporates less than 50 car parking spaces. Accordingly, the development is not of a scale that requires referral of the DA to the Roads and Maritime Services (RMS) under the provisions of the State Environmental Planning Policy (Infrastructure) 2007.

The site is located in the newly formed Northern Beaches Council local government area (LGA) however a consolidated Development Control Plan for the Northern Beaches Council LGA is yet to be announced or adopted. The proposed development has therefore been assessed in accordance with the Manly Development Control Plan 2013 Amendment 11 and Local Environmental Plan 2013.

In addition to Council's planning controls, the proposed development has also been assessed in accordance with the State Environmental Planning Policy (Affordable Rental Housing) 2009.

## 1.2. Structure of this Report

This report documents the findings of our investigations in relation to the anticipated traffic and parking impacts of the proposed development and should be read in the context of the Statement of Environmental Effects (SEE), prepared separately by Urbis. The remainder of this report is structured as follows:

- Section 2: Describes the site and existing traffic and parking conditions in the locality;
- Section 3: Describes the proposed development;
- Section 4: Assesses the parking requirements of the development;

- Section 5: Assesses the traffic impacts of the development;
- Section 6: Discusses the proposed access and internal design arrangements;
- Section 7: Provides an overview of the traffic management measures to be implemented during construction;
- Section 8: Presents the overall study conclusions.

## 1.3. References

In preparing this report, reference has been made to the following guidelines / standards:

- Manly Local Environmental Plan 2013 (Manly LEP 2013);
- Manly Development Control Plan 2013 Amendment 11 (Manly DCP 2013);
- State Environmental Planning Policy (Infrastructure) 2007 (SEPP Infrastructure 2007);
- State Environmental Planning Policy (Affordable Rental Housing) 2009 (SEPP ARH 2009);
- Disability (Access to Premises – Buildings) Standards 2010 (Disability Standard 2010)
- Australian Standard AS 2890.1-2004, Part 1: Off-Street Car Parking (AS 2890.1);
- Australian Standard AS 2890.2-2002, 2890.2: Part 2: Off-Street Commercial Vehicle Parking (AS 2890.2)
- Australian Standard AS 2890.3-2015, Part 3: Bicycle Parking Facilities (AS 2890.3);
- Australian Standard AS 2890.6-2009, Part 6: Off-Street Parking for People with Disabilities (AS 2890.6);
- RMS Guide to Traffic Generating Development 2002 (RMS Guide);
- RMS Technical Direction TDT 2013/04a - Guide to Traffic Generating Developments, Updated Traffic Surveys (RMS Guide Update).

# 2. Existing Conditions

## 2.1. Location and Site

The subject site is located at 195-197 Sydney Road, Fairlight, being approximately one kilometre north-west of the Manly Ferry Wharf and 11 kilometres north-east of the Sydney CBD. More specifically, it is located on the southern side of Sydney Road between its intersections with Cohen Street to the east and Brisbane Street to the west.

The site is comprised of two (2) separate lots formally identified as Lot 2, DP 589654 and Lot 87, DP 1729. It is irregular in configuration and has a combined area of approximately 1,750m$^2$. The site has a single street frontage being Sydney Road to the north, having a length of approximately 26 metres. The eastern and western boundaries border neighbouring residential developments, having lengths of 67 metres and 78 metres respectively. The southern boundary also borders a residential development having a length of 25 metres.

The site currently accommodates two separate residential dwellings, with one dwelling located on each lot. Vehicular access to each lot is currently provided via a 3.0 metre wide combined entry / exit driveway onto Sydney Road. Each of these accesses serve a detached single vehicle garage located at the north-western corner of each lot.

**Figures 1 and 2** overleaf provide an appreciation of the site's location in both a broad and local context respectively.

## 2.2. Road Network

The road hierarchy in the vicinity of the site is shown by **Figure 1** overleaf, with the following roads considered noteworthy:

- Sydney Road: forms part of an RMS Main Road, MR 159. Sydney Road generally runs in an east-west direction intersecting Belgrave Street in the east and Frenchs Forest Road / Ethel Street in the west. It is subject to 60km/h speed zoning restrictions and accommodates (2) lanes of traffic in each direction. Near the site, unrestricted parallel parking is permitted along both kerbsides of Sydney Road.

- Pittwater Road: forms part of an RMS Main Road, MR 159. Pittwater Road runs in a north-south direction between Mona Vale in the north and Fairlight in the south. Near the site, it is subject to 60km/h speed zoning restrictions and accommodates two (2) lanes of traffic in each direction. Pittwater Road carries approximately 41,000 vehicles per day (vpd).

- Condamine Street: forms part of an RMS Main Road, MR 164 and an RMS Secondary Road, SR 2112. Condamine Street runs in a north-south direction intersecting Pittwater Road in the north and Ernest Street in the south. It is subject to 60km/h speed zoning restrictions and accommodates two (2) lanes of traffic in both directions, carrying approximately 21,000 vpd.

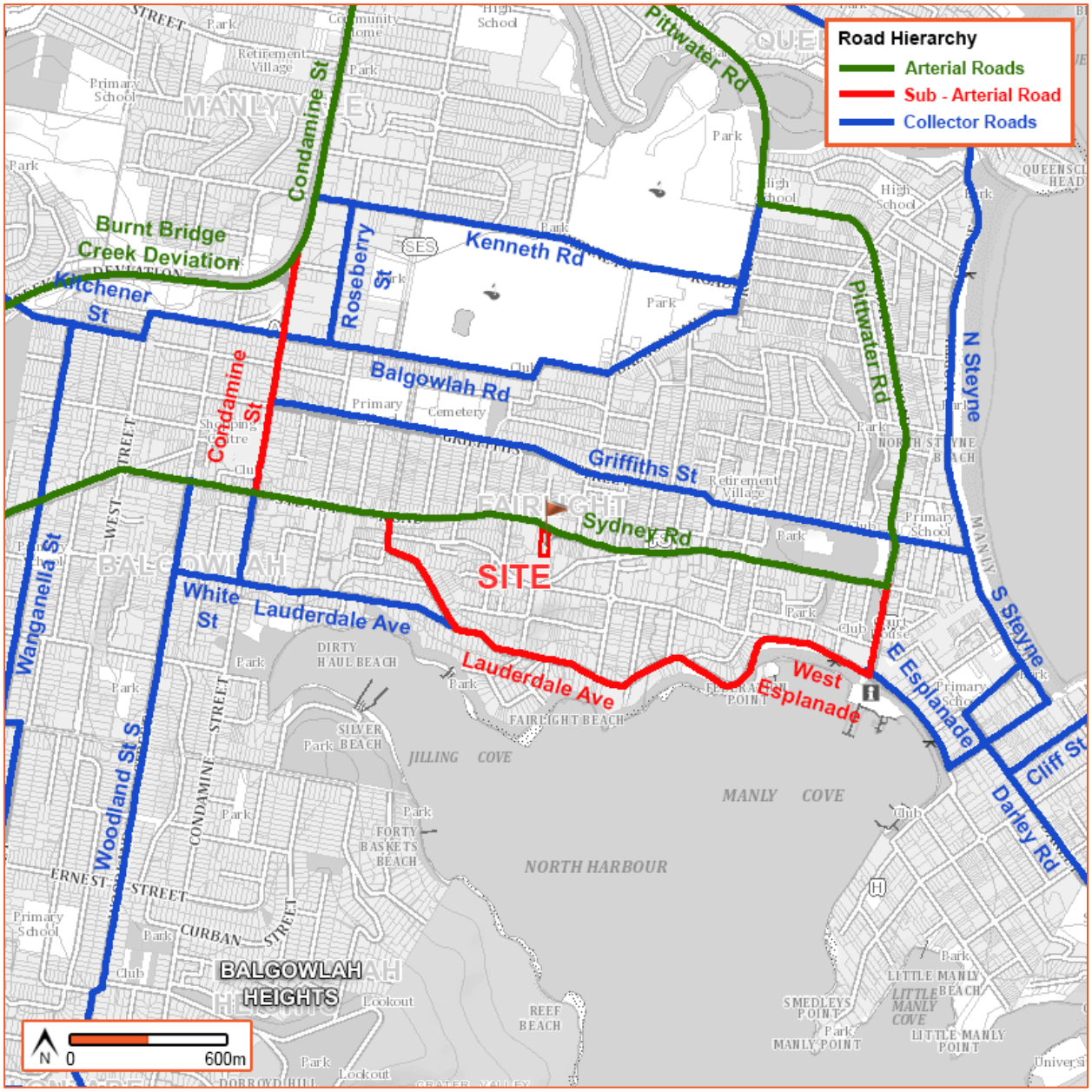



Figure 1: Location & Road Hierarchy Plan


Figure 2: Site Plan

## 2.3. Active Transport

### 2.3.1. Bus Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan bus services includes all areas within a 400 metre radius of a bus stop. As can be seen from **Figure 3**, the site is situated within 400 metres of numerous bus stops located along Sydney Road, Hilltop Crescent and Lauderdale Avenue and hence, falls within the walking catchment area. Accordingly, residents and visitors of the proposed development will have convenient access to public bus services for journeys to / from the site.

**Table 1** below shows the notable town centres that are accessible via these bus services and the average service headways during peak and off-peak periods.

**Table 1: Bus Services**

| ROUTE NO. | ROUTE (TO / FROM) | ROUTE DECRIPTION | AVERAGE HEADWAY |
|---|---|---|---|
| 132 | Warringah Mall to Manly | Via North Balgowlah | Weekdays: 20-30 minutes peak / 1 hour off peak<br>Weekends: 1 hour on Saturdays & Sundays |
| 135 | North Head to Warringah Mall | Via Manly | Weekdays: 30 minutes peak / 1 hour off peak<br>Weekends: 1 hour on Saturdays & Sundays |
| 142 | Allambie to Manly | Via Balgowlah | Weekdays: 30 minutes peak / 1 hour off peak<br>Weekends: 1 hour on Saturdays & Sundays |
| 143 | Manly to Chatswood | Via Balgowlah & St Leonards | Weekdays: 15-30 minutes peak only<br>Weekends: No services |
| 144 | Manly to Chatswood | Via Royal North Shore Hospital | Weekdays: 10-15 minutes peak / 15 minutes off peak<br>Weekends: 15 minutes on Saturdays & Sundays |
| 151 | Mona Vale to City Queen Victoria Building (QVB) | Via Narrabeen, Dee Why, Balgowlah, Neutral Bay & North Sydney | Weekdays: Late night – early morning service<br>Weekends: Late night – early morning service |
| E50 | Milsons Point to Manly (Express) | Via North Sydney, Neutral Bay & Balgowlah | Weekdays: 10-15 minutes peak only<br>Weekends: No services |
| E70 | Manly to City Wynyard (Express) | Via Balgowlah, Cremorne & Neutral Bay | Weekdays: 10-15 minutes peak only<br>Weekends: No services |
| E71 | Manly to City Wynyard (Express) | Via Clontarf | Weekdays: 20 minutes peak only<br>Weekends: No services |

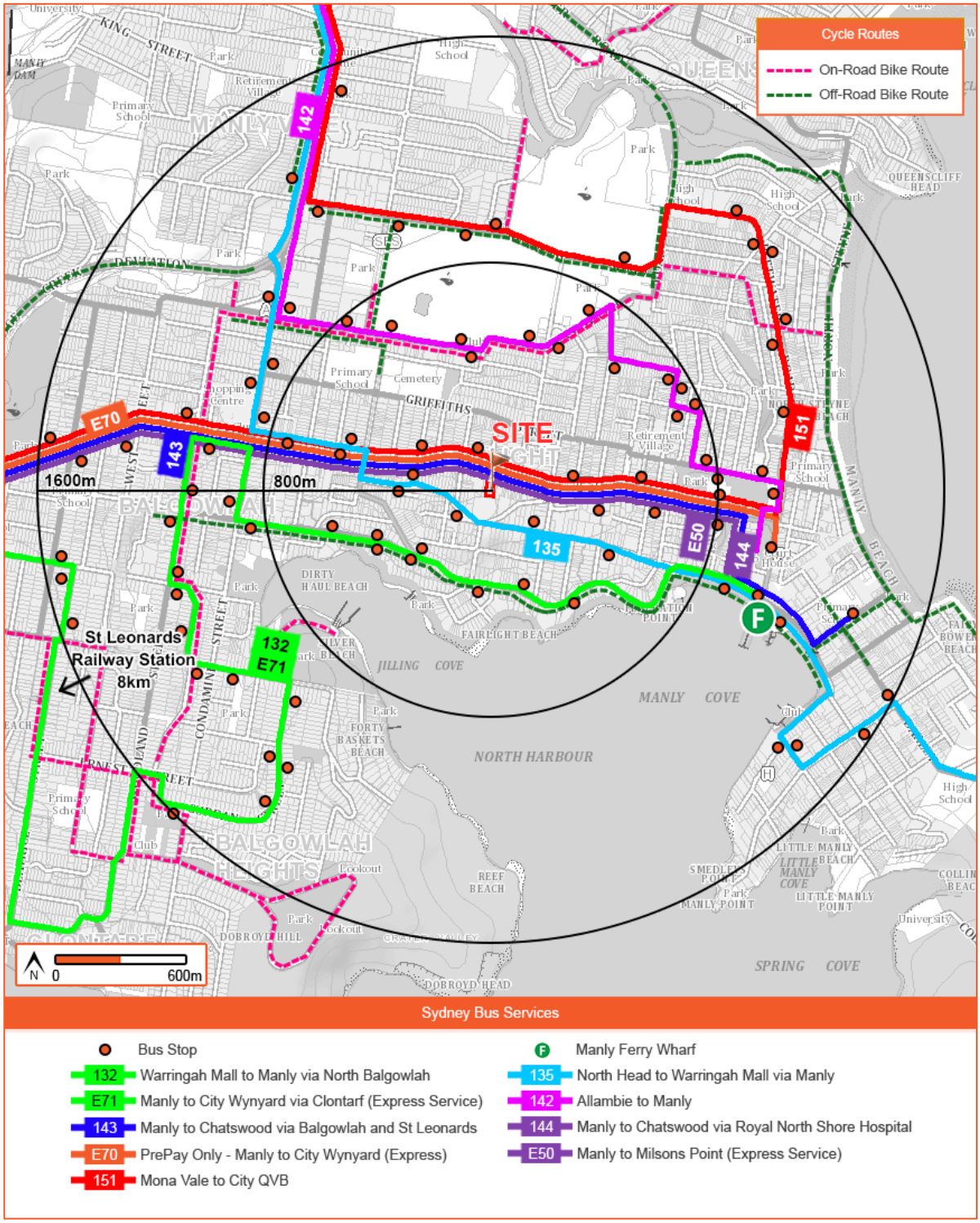



Figure 3: Active Transport Services

### 2.3.2. Ferry Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan ferry wharves includes all areas within an 800 metre radius of a wharf. It can be seen from **Figure 3** that Manly Wharf is located approximately 1.0 kilometre from the site and hence, falls outside the typical walking catchment area. Notwithstanding, it is considered that residents and visitors of the development would still have convenient access to these ferry services noting they can be accessed within a 12 minute bus, 4-9 minute cycle or 15 minute walking commute.

Manly Wharf is serviced by two ferry companies including Sydney Ferries and the Many Fast Ferry. **Table 2** below shows the services available from Manly Wharf and the average service headways during peak and off-peak periods.

**Table 2: Ferry Services**

| OPERATOR | ROUTE (TO / FROM) | ROUTE DECRIPTION | AVERAGE HEADWAY |
|---|---|---|---|
| Sydney Ferries | F1 Circular Quay to Manly | - | Weekdays: 30 minutes all day<br>Weekends: 30 minutes all day<br>Public Holidays: 30 minutes all day |
| Manly Fast Ferry | Manly to Circular Quay | - | Weekdays: 10 minutes peak / 20 minutes off peak<br>Weekends: 20-30 minutes all day (6am-9pm)<br>Public Holidays: 20-30 minutes all day (6am-9pm) |
| | Manly to Darling Harbour | Via Milsons Point & Pyrmont Bay | Weekdays: 20-40 minutes peak only<br>Weekends: No services<br>Public Holidays: No services |
| | Manly to North Sydney | Via Milsons Point | Weekdays: 20-40 minutes peak only<br>Weekends: No services<br>Public Holidays: No services |
| | Manly to Pyrmont Bay | Via Milsons Point | Weekdays: 20-40 minutes peak only<br>Weekends: No services<br>Public Holidays: No services |
| | Manly to Watsons Bay | Via Quarantine Station | Weekdays: 1-1.5 hours (10am-4pm)<br>Weekends: 1 hour (12pm-6pm)<br>Public Holidays: 1 hour (12pm-6pm) |

### 2.3.3. Rail Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan railway stations includes all areas within an 800 metre radius of a station. No railway stations are provided within 800 metres of the site however North Sydney Railway Station, located some 8 kilometres south-west of the site, could be accessed as part of a multi-model (bus and rail) journey. Both Circular Quay Station and Wynyard Station could also be accesses as part of a multi-model (ferry and rail) journey from Manly Wharf. **Figure 4** overleaf illustrates the Sydney rail network.

### 2.3.4. Cycle Network

**Figure 3** shows that the site has limited access to the local bicycle network although an on-road cycle path is provided along Balgowlah Road to the north of the site and an off-road cycle path provided along Lauderdale Avenue to the south of the site. These provide connections to the wider cycle path network including paths to / from the Sydney CBD via The Spit Bridge and Sydney Harbour Bridge.

## 2.4. Existing Traffic Generation

As discussed in Section 2.1 of this report, the site currently accommodates two (2) residential dwellings. The RMS Guide Update stipulates a trip rate of 0.95 trips / dwelling / hour during the 7:00-9:00am (AM) peak period and 0.99 trips / dwelling / hour during the 4:00-6:00pm (PM) peak period for low-density residential dwellings. Application of these rates to the two (2) existing residential dwellings results in the following traffic generation:

- 2 vehicle trips / hour (0 in, 2 out), during the AM peak period
- 2 vehicle trips / hour (2 in, 0 out), during the PM peak period

The above assumes an inbound split of 20 / 80 during the AM peak period noting that most residents would leave for work during the weekday AM peak period, and arrive home during the weekday PM peak period. Notwithstanding, it is considered that the most relevant use of the above is to determine the net change in traffic generation as a result of the proposed development, as is discussed in Section 5.1 of this report.


Figure 4: Sydney Trains Rail Network – Suburban

## 2.5. Existing Intersection Performance

To determine the existing intersection performance of the key Sydney Road / Hill Street intersection, a traffic survey was undertaken on a typical Tuesday being 14/08/2018, between the hours of 7:00-9:00am and 4:00-6:00pm which correspond to the weekday AM and PM commuter peak periods respectively. The raw survey data is included in **Appendix A**, for reference.

The results of the surveys were used to develop existing (base-case) SIDRA models of the Sydney Road / Hill Street intersection for the AM and PM peak periods, with the base models calibrated and validated against intersection queue lengths and phase / cycle times, as was observed during separate site inspections during both the AM and PM peak periods.

SIDRA modelling outputs a range of performance measures, in particular:

- Degree of Saturation (DOS) – The DOS is used to measure the performance of intersections where a value of 1.0 represents an intersection at theoretical capacity. As the performance of an intersection approaches DOS of 1.0, queue lengths and delays increase rapidly. It is usual to attempt to keep DOS to less than 0.9, with satisfactory intersection operation generally achieved with a DOS below 0.8.
- Average Vehicle Delay (AVD) – The AVD (or average delay per vehicle in seconds) for intersections also provides a measure of the operational performance of an intersection and is used to determine an intersection's Level of Service (see below). For signalised intersections, the AVD reported relates to the average of all vehicle movements through the intersection. For Give Way, Stop & Roundabout controlled intersections, the AVD reported is that for the movement with the highest AVD.
- Level of Service (LOS) – This is a comparative measure that provides an indication of the operating performance, based on AVD.

**Table 3** below provides a recommended baseline for assessment of intersection performance as per the RMS Guide.

**Table 3: Intersection Performance Criteria**

| LEVEL OF SERVICE | AVERAGE DELAY PER VEHICLE (seconds/vehicle) | TRAFFIC SIGNALS AND ROUNDABOUTS | GIVE WAY AND STOP SIGNS |
|---|---|---|---|
| A | Less than 14 | Good operation | Good operation |
| B | 15 to 28 | Good with acceptable delays and spare capacity | Acceptable delays and spare capacity |
| C | 29 to 42 | Satisfactory | Satisfactory, but accident study required |
| D | 43 to 56 | Operating near capacity | Near capacity and accident study required |
| E | 57 to 70 | At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode | At capacity, requires other control mode |
| F | More than 70 | Unsatisfactory and requires additional capacity | Unsatisfactory and requires other control mode or major treatment |

A summary of the modelling results for the existing (base-case) models is provided in **Table 4** below. Reference should also be made to the detailed SIDRA outputs provided in **Appendix B** which provide additional information regarding intersection performance.

Table 4: Summary of SIDRA Modelling Results - Existing

| INTERSECTION | SCENARIO | PERIOD | DEGREEE OF SATURATION | AVERAGE DELAY (seconds) | LEVEL OF SERVICE |
|---|---|---|---|---|---|
| Sydney Road / Hill Street | Existing | AM | 0.543 | 14.0 | A |
| | | PM | 0.540 | 12.6 | A |

It is evident from **Table 4** above, that the key Sydney Road / Hill Street intersection operates very well under existing conditions with a DOS of 0.543, AVD of 14.0 seconds and a LOS A during the AM peak period. Similarly, the results also show that intersection operates very well during the PM peak period with a DOS of 0.540, AVD of 12.6 seconds and a LOS A.

Nevertheless, it is important to note that that the most relevant use of these results is to compare the relative change in performance as a result of the proposed development as is discussed in Section 5 of this report.

# 3. Proposed Development

A detailed description of the proposed development for which approval is now sought, is outlined in the Statement of Environmental Effects prepared separately by Urbis. In summary, the subject application relates to the demolition of all existing buildings, consolidation of two (2) separate lots and the construction of a 6-storey boarding house development consisting of:

- 75 boarding rooms including a single manager's room;
- Two (2) levels of parking accommodating a total of:
  - 38 x car parking spaces;
  - 15 x motorcycle parking spaces;
  - 15 x bicycle parking spaces;
  - 1 x 6.4 metre SRV service vehicle bay;
- A 6.5 metre wide combined entry / exit driveway onto Sydney Road.

The parking and traffic implications arising from the proposed development are discussed in Sections 4 and 5 respectively. A copy of the relevant architectural drawings, prepared by Modularium, are also included in **Appendix C**.

# 4. Parking Requirements

## 4.1. Car Parking

Clause 29(2)(e) of the SEPP ARH 2009 outlines the following car parking rates for boarding house developments:

> *(2) A consent authority must not refuse consent to development to which this Division applies on any of the following grounds:*
>
> ***(e) parking***
>
> *if:*
>
> *(i) in the case of development carried out by or on behalf of a social housing provider in an accessible area—at least 0.2 parking spaces are provided for each boarding room, and*
>
> *(ii) in the case of development carried out by or on behalf of a social housing provider not in an accessible area—at least 0.4 parking spaces are provided for each boarding room, and*
>
> *(iia) in the case of development not carried out by or on behalf of a social housing provider—at least 0.5 parking spaces are provided for each boarding room, and*
>
> *(iii) in the case of any development—not more than 1 parking space is provided for each person employed in connection with the development and who is resident on site.*

The application is not being carried out by or on behalf of a social housing provider and accordingly, the parking rates under Clause 29(2)(e)(iia) and Clause 29(2)(e)(iii) of the SEPP ARH 2009 are required to be adopted for the development.

Additionally, Schedule 3 of the Manly DCP 2013 – Part A1: Parking Rates and Requirements for Vehicles stipulates car parking rates for boarding house developments. **Table 5** below shows the car parking requirement for the development based on the applicable car parking rates under both the SEPP ARH 2009 and Manly DCP 2013.

**Table 5: Car Parking Requirement & Provision**

| TYPE | NO. | SEPP PARKING RATE | DCP PARKING RATE | SEPP REQUIREMENT | DCP REQUIREMENT | PARKING PROVISION |
|---|---|---|---|---|---|---|
| Boarding Rooms | 75 | 0.5 spaces / room | 0.4 spaces / room | 38 | 30 | 38 |
| Manager / Employee | 1 | Max. 1.0 space / manager | 1.0 space / manager or employee | 0 | 1 | |
| | | | ***TOTAL*** | ***38*** | ***31*** | ***38*** |

It is evident from the above that the development requires a minimum of 38 car parking spaces under the SEPP ARH 2009 and 31 car parking spaces under the Manly DCP 2013. Additionally, it is evident from **Table 5** and specifically, Clause 29(2)(e)(iii) of the SEPP ARH 2009, that the development is permitted to provide a *maximum* of one additional car parking space for an on-site manager however this is an optional provision that does not influence the minimum requirement for 38 car parking spaces.

In response, the development provides a total of 38 car parking spaces and therefore satisfies the requirements of both the SEPP ARH 2009 and Manly DCP 2013. The proposed car parking provision is therefore considered acceptable and will ensure that all car parking demands are accommodated on-site, with no reliance on on-street parking.

## 4.2. Accessible Car Parking

The SEPP ARH 2009 does not specify a rate for the provision of accessible car parking and accordingly, reference was made to the Disability Standard 2010 to determine the minimum number of accessible car parking spaces that are required by the development. The development provides a total of 3 accessible boarding rooms and therefore requires a minimum of 2 accessible parking space to be provided, as per Table D3.5 of the Disability Standard 2010. In response, the development provides a total of 3 accessible car parking spaces which satisfies the requirements of the Disability Standard 2010 and is considered an acceptable level of provision.

## 4.3. Motorcycle Parking

Clause 30(1)(h) of the SEPP ARH 2009 stipulates minimum motorcycle parking rates that are required to be adopted for boarding house developments. **Table 6** below shows the minimum motorcycle parking requirement for the development and the proposed parking provision in response.

**Table 6: Motorcycle Parking Requirement & Provision**

| TYPE | NO. | SEPP ARH PARKING RATE | MINIMUM REQUIREMENT | PARKING PROVISION |
|---|---|---|---|---|
| Boarding Rooms | 75 | 0.2 spaces / room | 15 | 15 |
| | | ***TOTAL*** | ***15*** | ***15*** |

It is evident from **Table 6** that the proposed development is required to provide a minimum of 15 motorcycle spaces under the SEPP ARH 2009. In response, the development provides a total of 15 motorcycle spaces across the two parking levels and therefore satisfies the minimum requirement of the SEPP ARH 2009. The proposed motorcycle parking provision is therefore considered acceptable.

## 4.4. Bicycle Parking

Both the Manly DCP 2013 and Clause 30(1)(h) of the SEPP ARH 2009 stipulate minimum bicycle parking rates that are required to be adopted for boarding house developments. **Table 7** below shows the minimum bicycle parking requirements for the development under application of both policies, and the proposed parking provision in response.

**Table 7: Bicycle Parking Requirement & Provision**

| TYPE | NO. | DCP PARKING RATE | SEPP ARH PARKING RATE | DCP REQUIREMENT | SEPP ARH REQUIREMENT | PARKING PROVISION |
|---|---|---|---|---|---|---|
| Boarding Rooms | 75 | 0.2 spaces / room | 0.2 spaces / room | 15 | 15 | 15 |
| | | | ***TOTAL*** | ***15*** | ***15*** | ***15*** |

It is evident from **Table 7** that the proposed development is required to provide a minimum of 15 bicycle spaces under application of both the Manly DCP 2013 and SEPP ARH 2009. In response, the development provides a total of 15 bicycle spaces across the two parking levels and therefore satisfies the minimum requirements of both the Manly DCP 2013 and SEPP ARH 2009. The proposed bicycle parking provision is therefore considered acceptable.

## 4.5. Service Vehicle Parking & Waste Collection

Neither of the SEPP ARH 2009 or Manly DCP 2013 policies stipulate a rate for the provision of service vehicle parking. Notwithstanding, the development provides a single service vehicle bay suitable for all vehicles up to and including a 6.4 metre SRV, located on Level 00 (Ground Floor). This provision is considered acceptable and will ensure any minor and infrequent demands such as removalist vehicles are accommodated on-site.

Waste collection of the development will be undertaken by private waste contractor with the use of a 6.4 metre SRV. This will ensure that waste collection can be undertaken on-site within the Level 00 (Ground Floor) parking area, thereby eliminating the potential for any performance and safety impacts to Sydney Road. Waste trucks will enter the site in a forward direction and stand within the parking aisle whilst bins are collected from the Level 00 (Ground Floor) holding room, provided at the north-eastern corner of the site. Once all bins have been emptied, the waste truck shall utilise the loading bay to turn around, before exiting the site in a forward direction.

Swept path analysis has been undertaken of the proposed service vehicle parking arrangements, with the use of a 6.4 metre SRV, as defined within AS 2890.2. The results are provided as **Appendix D** and confirm that satisfactory entry and exit manoeuvres will be achieved to the loading bay and that a 6.4 metre SRV will be able to enter and exit the site in a forward direction.

The proposed service vehicle parking arrangements are therefore considered acceptable and will operate safely and efficiently.

# 5. Traffic Impacts

## 5.1. Trip Generation

Neither of the RMS Guide or RMS Guide Update policies include traffic generation rates for boarding house developments. Reference was therefore made to the medium density residential trip rates outlined in the RMS Guide, noting that the traffic generation of these developments would be somewhat comparable to a boarding house development. In this regard, it is noted that the RMS Guide recommends the application of a peak period traffic generation rate of 0.4 trips / dwelling for a studio dwelling, which attract a car parking rate of 1.0 car space / dwelling.

Conversely, the SEPP ARH 2009 requires car parking to be provided at a rate of 0.5 car spaces / boarding room, or 50% of that required under the RMS Guide for a studio dwelling. Accordingly, a peak period traffic generation rate of 0.2 trips / boarding room can be derived for boarding house developments. Application of this rate to the 75 boarding rooms proposed, therefore results in the following peak period traffic generation:

- 15 vehicle trips / hour (3 in, 12 out), during the AM peak period;
- 15 vehicle trips / hour (12 in, 3 out), during the PM peak period.

The above traffic generation is not a net increase however, as this does not take into consideration the generation of the existing development, as is discussed in Section 2.4 of this report. In this regard, the net increase in generation as a result of the proposed development is expected to be as follows:

- 13 vehicle trips / hour (3 in, 10 out), during the AM peak period;
- 13 vehicle trips / hour (3 in, 10 out), during the PM peak period.

## 5.2. Traffic Distribution & Impacts

Having regard for the location of the site, it is expected that the above traffic generation will be distributed to either the east or west of the site along Sydney Road. The expected distribution is as follows:

- To / from the East: 25% of all traffic;
- To / from the West: 75% of all traffic.

With the above in mind, it is expected that the development will result in a net increase of 10 vehicle trips to the west of the site and 3 vehicle trips to the east of the site, during both the AM and PM peak periods.

The resultant impact of the 10 additional vehicle trips through the key Sydney Road / Hill Street intersection was assessed using SIDRA. **Table 8** below provides a summary of the modelling results and includes a comparison against the existing intersection performances which have been extracted from **Table 4** of this report. The detailed SIDRA results are also provided in **Appendix B** for reference.

**Table 8: Summary of SIDRA Modelling Results – Existing plus Development**

| INTERSECTION | SCENARIO | PERIOD | DEGREEE OF SATURATION | AVERAGE DELAY (seconds) | LEVEL OF SERVICE |
|---|---|---|---|---|---|
| Sydney Road / Hill Street | Existing | AM | 0.543 | 14.0 | A |
| | | PM | 0.540 | 12.6 | A |
| | Existing + Development | AM | 0.545 | 14.0 | A |
| | | PM | 0.546 | 12.6 | A |

As can be seen from above, the increase in traffic volumes as a result of the development will have negligible impacts on the performance of the Sydney Road / Hill Street intersection. Indeed, the intersection will experience a very minor increase in the DOS, with no change to the existing AVD or LOS A during both the AM and PM peak periods.

In summary, the increase in traffic volumes will be accommodated by the existing intersection with minimal impacts during both peak periods, with no external improvements required to facilitate the development. The traffic impacts of the development are therefore considered acceptable.

# 6. Design Aspects

## 6.1. Access

The development incorporates 38 car parking spaces User Class 1A, with access onto an RMS arterial road, Sydney Road. Accordingly, the development requires a Category 2 Driveway under Table 3.1 of AS 2890.1, being a combined entry / exit driveway of width 6.0 to 8.0 metres. In response, the development provides a combined entry / exit driveway of width 6.5 metres onto Sydney Road, thereby satisfying the requirements of AS 2890.1.

The proposed arrangements have also been assessed using swept path analysis in accordance with AS 2890.1 (for cars) and AS 2890.2 (for a 6.4 metre SRV). The results of this analysis are included in Appendix D and confirm compliance with the requirements of both AS 2890.1 and AS 2890.2.

Given that the development proposes access onto an RMS classified road, it is also considered critical to make reference to Clause 101 of the SEPP Infrastructure 2007, which has been reproduced below for reference:

> ***101 Development with frontage to classified road***
>
> *(1) The objectives of this clause are:*
>
> *(a) to ensure that new development does not compromise the effective and ongoing operation and function of classified roads, and*
>
> *(b) to prevent or reduce the potential impact of traffic noise and vehicle emission on development adjacent to classified roads.*
>
> *(2) The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that:*
>
> *(a) where practicable, vehicular access to the land is provided by a road other than the classified road, and*
>
> *(b) the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of:*
>
> *(i) the design of the vehicular access to the land, or*
>
> *(ii) the emission of smoke or dust from the development, or*
>
> *(iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land, and*
>
> *(c) the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road.*

The following comments are provided in response to the traffic requirements of Clause 101 of the SEPP Infrastructure 2007:

- The site has a single street frontage being the RMS classified road of Sydney Road. Hence, it is not possible (or practicable) to provide access to the subject site via any other road than Sydney Road.
- As discussed above, the design of the vehicle access complies with the requirements of AS 2890.1 and AS 2890.2 and will ensure that all vehicles including 6.4 metre SRV trucks, enter and exit the site in a forward direction. This is considered an improvement on the existing arrangements which either require cars to reverse from Sydney Road into the site, or reverse from the site onto Sydney Road.
- As discussed in Section 5 of this report, the nature and scale of the boarding house development will result in a moderate increase in traffic generation. This generation will be in the form of light-vehicles (cars) only, apart from a limited number of 6.4 metre SRV movements which will occur on an infrequent basis.
- The SIDRA modelling results discussed in Section 5.2 of this report confirm that the net increase in traffic generation as a result of the proposal will have negligible impacts on the performance of the key Sydney Road / Hill Street intersection. Indeed, the modelling results demonstrate that the development will not result in any change to the existing intersection delays or Level of Service A.

The proposed design of the access is therefore considered acceptable and complies with the relevant requirements of AS 2890.1 and AS 2890.2. The development is also considered to satisfy the requirements of Clause 101 of the SEPP Infrastructure 2007 in that the safety, efficiency and on-going operation of Sydney Road will not be adversely affected by the development.

## 6.2. Sight Distance

Sight distance at the vehicle access is required to be assessed in accordance with Figure 3.2 of AS 2890.1. With a frontage road speed of 60 km/h, the development requires a minimum sight distance of 65 metres to the east and west along Sydney Road, as per Figure 3.2 of AS 2890.1. An inspection of the site was undertaken to confirm available sight distances at the proposed location of the vehicle access. This has confirmed that a sight distance of 67 metres will be achieved to both the east and west, along Sydney Road. The sight distance achieved at the proposed location of the vehicle access therefore complies with the requirements of Figure 3.2 of AS 2890.1, and the vehicle access will operate safely.

## 6.3. Internal Design

The proposed internal parking arrangements comply with the relevant requirements of AS 2890.1, AS 2890.2, AS 2890.3 and AS 2890.6 with the following design aspects considered noteworthy:

### 6.3.1. Driveway & Ramp

- The driveway has a maximum grade of 5% (1 in 20) grade for the first 6 metres inside the property boundary and therefore satisfies Clause 3.3 of AS 2890.1.

- The vehicular ramp has a maximum grade of 25% (1 in 4) with 2.0 metre transitions of 12.5% (1 in 8) provided at both ends, thereby satisfying Clause 2.5.3 of AS 2890.1.

- The vehicular ramp has a minimum width of 3.0 metres between kerbs and will therefore accommodate one lane, two-way traffic flow, as demonstrated by the swept path analysis results included in **Appendix D**. The one-lane, two-way ramp complies with AS 2890.1 and is considered appropriate in the circumstances given that the ramp will accommodate a low number of vehicle movements that will be tidal in nature (i.e. most residents will leave the site during the AM peak period and arrive at the site during PM peak period).

- Due to the one-lane, two-way vehicle ramp and constrained intervisibility from one end of the ramp to the other, the use of traffic signals is required to manage vehicle movements along the ramp. In this regard, the architectural plans included in **Appendix C** show that traffic signals will be provided at both ends of the vehicle ramp to manage traffic flow and ensure that vehicle movements occur safely and efficiently.

### 6.3.2. Parking Modules

- All car parking spaces are provided in accordance with the User Class 1A requirements of AS 2890.1, having a minimum space width of 2.4 metres and length of 5.4 metres, with an aisle width of 5.8 metres.

- The accessible car parking spaces are provided with a minimum space width of 2.4 metres and length of 5.4 metres, with an aisle width of 5.8 metres. Additionally, these spaces are located immediately adjacent to a 2.4 metre wide and 5.4 metre long shared area, thereby satisfying the requirements of AS 2890.6.

- The SRV bay has a minimum space length of 6.4 metres and width of 3.5 metres, and therefore complies with AS 2890.2.

- All walls / columns are located outside of the space design envelope, as required under Figure 5.2 of AS 2890.1.

### 6.3.3. Head Heights

- A minimum clear head height of 2.2 metres is required above all traffic circulation and car parking areas in accordance with Clause 5.3.1 of AS 2890.1.

- A minimum clear head height of 2.5 metres is required above the accessible car parking space and shared areas, in accordance with Clause 2.4 of AS 2890.6.

- A minimum clear head height of 3.5 metres is required above all areas to be traversed by the SRV including directly above the service vehicle bay, in accordance with AS 2890.2.

### 6.3.4. Other Design Aspects

- A 2.5 metre by 2.0 metre visual splay is provided on the egress side of the driveway, at the property boundary, in accordance with Figure 3.3 of AS 2890.1. This area is to be kept clear of all vertical obstructions with a height greater than 0.6 metres.

- All car parking spaces will be allocated to particular on-site residents and accordingly, there would never be an instance when a resident would enter the car park and not be able to park within their designated parking space. This also eliminates the requirement for a turning bay to be provided within the parking levels.

- All bicycle parking spaces are provided as Security Level B facilities, in accordance with AS 2890.3.

- All motorcycle spaces are provided in accordance with Clause 2.4.7 of AS 2890.1.

In summary, the internal parking arrangements have been designed in accordance with AS 2890.1, AS 2890.2, AS 2890.3 and AS 2890.6. Any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

# 7. Construction Traffic Management Plan

## 7.1. Overview

A Construction Traffic Management Plan (CTMP) is a document that details the proposed traffic management arrangements to be implemented for the construction of a development, and seeks to minimise the impact of the construction activities on the surrounding community, in terms of both vehicle traffic and pedestrian amenity. In summary, a CTMP typically addresses the following:

- Construction program;
- Hours of work;
- Traffic management including the proposed vehicular access arrangements, truck routes, Works Zone / loading arrangements, traffic control plans and pedestrian access / protection measures;
- Construction impacts including traffic generation and contractor parking demands;
- Any public transport services impacted / affected;
- Pedestrian and emergency vehicle access.

At the time this report was prepared, a builder had not been appointed on the project and accordingly, there was insufficient information available to allow for the preparation of a CTMP. Notwithstanding, given that Council's Pre-DA Advice Letter dated 10/07/2018 requested the construction traffic impacts to be considered, an assessment has been undertaken of the expected truck routes to / from the site and Works Zone requirements for construction of the development, as is discussed below. It is emphasised that the information provided below is indicative only and would need to be reassessed once a builder has been appointed on the project.

## 7.2. Truck Routes

The proposed truck routes to / from the site are illustrated by **Figure 5** overleaf, and can be summarised as follows:

- All trucks will arrive at the site via either:
    - Spit Road, Manly Road, Burnt Bridge Creek Deviation, Condamine Street, Kenneth Road, Balgowlah Road, Pittwater Road and Sydney Road; or
    - Pittwater Road and Sydney Road.
- All trucks will depart from the site via either:
    - Sydney Road, Manly Road and Spit Road; or
    - Sydney Road and Condamine Street.

It is evident that the site benefits from convenient access to the arterial road network and hence trucks would not be required to circulate through local streets in order to access the site. Accordingly, the proposed truck routes would have negligible impacts on the general public and neighbouring residents / businesses.


Figure 5: Truck Routes

## 7.3. Works Zone

Whilst the requirement for a Works Zone was unable to be confirmed with a builder, it is noted that the proposed development wold occupy the majority of the site and hence, it is expected that loading and unloading of trucks would need to occur from a Works Zone along the Sydney Road frontage. This would likely be provided in the form of a 26 metre long Works Zone which would occupy the entire site frontage, as shown by **Figure 6** below.


**Figure 6: Proposed Works Zone**

Having regard for the above, Council is invited to impose a suitable condition of consent requiring a detailed CTMP to be submitted to and approved by Council prior to the issue of any Construction Certificate. The condition should also include any site-specific requirements that Council would like addressed.

# 8. Conclusions

In summary:

- PDC Consultants has been commissioned by Micronest Pty Ltd to undertake a traffic impact assessment of a Development Application (DA) relating to a proposed boarding house development at 195-197 Sydney Road, Fairlight. The DA proposes the demolition of all existing buildings, consolidation of two (2) separate lots and the construction of a 6-storey boarding house development consisting of:
    - 75 boarding rooms including a single manager's room;
    - Two (2) parking levels with a total of 38 car parking spaces;
    - A single 6.4 metre SRV service vehicle bay;
    - A 6.5 metre wide combined entry / exit driveway onto Sydney Road.
- The traffic generation assessment confirms that the development will generate a total of 15 vehicle trips / hour during both the weekday 7-9am (AM) and 4-6pm (PM) peak periods. The net increase will be only 13 vehicle trips / hour during both peak periods, once the generation of the existing development is taken into consideration. The SIDRA modelling results confirm that the proposed increase in traffic generation will have a negligible impact on the performance of the key Sydney Road / Hill Street intersection with only a minor increase to the degree of saturation, with no change to the existing average delay and Level of Service A during both the AM and PM peak periods. The traffic impacts of the development are therefore considered acceptable.
- The SEPP ARH 2009 and Manly DCP 2013 requires the development to provide a minimum of 38 car spaces and 31 car spaces respectively. In response, the development provides a total of 38 car parking spaces comprising and therefore satisfies the minimum requirements of both the SEPP ARH 2009 and Manly DCP 2013. The proposed car parking provision is therefore considered acceptable and will ensure that all car parking demands are accommodated on-site, with no reliance on on-street parking.
- The development provides 15 motorcycle spaces in accordance with the SEPP ARH 2009, and 15 bicycle spaces in accordance with the SEPP ARH 2009 and Manly DCP 2013. The proposed motorcycle and bicycle parking provisions are therefore considered acceptable.
- The proposed access and internal parking arrangements comply with the relevant requirements of AS 2890.1, AS 2890.2, AS 2890.3 and AS 2890.6. Any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.
- Council is invited to impose a suitable condition of consent requiring a CTMP to be submitted to and approved by Council prior to the issue of any Construction Certificate. The CTMP will seek to minimise the impact of the construction activities on the surrounding community, in terms of both vehicle traffic and pedestrian amenity.

It is therefore concluded that the proposed development is supportable on traffic planning grounds.

# Appendix A

# R.O.A.R. DATA

***Reliable, Original & Authentic Results***

Ph.88196847, Mob. 0418 239019

Client : pdc Consultants
Job No/Name : 6883 FAIRLIGHT Hill St
Day/Date : Tuesday 14th August 2018

**Lights**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| Time Per | L | T | R | L | T | R | L | T | R | L | T | R | TOT |
| 0700 - 0715 | 9 | 10 | 35 | 10 | 79 | 8 | 16 | 8 | 1 | 7 | 79 | 0 | **262** |
| 0715 - 0730 | 4 | 12 | 38 | 8 | 85 | 7 | 22 | 14 | 0 | 4 | 97 | 3 | **294** |
| 0730 - 0745 | 4 | 18 | 28 | 6 | 109 | 8 | 18 | 22 | 1 | 3 | 85 | 9 | **311** |
| 0745 - 0800 | 7 | 14 | 38 | 12 | 115 | 9 | 18 | 30 | 0 | 2 | 93 | 6 | **344** |
| 0800 - 0815 | 5 | 17 | 25 | 13 | 101 | 10 | 17 | 18 | 0 | 1 | 96 | 3 | **306** |
| 0815 - 0830 | 6 | 15 | 35 | 19 | 116 | 4 | 8 | 22 | 2 | 1 | 88 | 3 | **319** |
| 0830 - 0845 | 4 | 28 | 37 | 8 | 118 | 7 | 17 | 41 | 2 | 1 | 78 | 2 | **343** |
| 0845 - 0900 | 2 | 13 | 25 | 7 | 141 | 6 | 20 | 24 | 1 | 1 | 101 | 4 | **345** |
| **Period End** | **41** | **127** | **261** | **83** | **864** | **59** | **136** | **179** | **7** | **20** | **717** | **30** | **2524** |

**Heavies**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| Time Per | L | T | R | L | T | R | L | T | R | L | T | R | TOT |
| 0700 - 0715 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | **12** |
| 0715 - 0730 | 1 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | **19** |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | **10** |
| 0745 - 0800 | 0 | 0 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | **17** |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 4 | 0 | **11** |
| 0815 - 0830 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 6 | 0 | **8** |
| 0830 - 0845 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | **9** |
| 0845 - 0900 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | **7** |
| **Period End** | **1** | **0** | **1** | **0** | **40** | **3** | **0** | **0** | **0** | **0** | **48** | **0** | **93** |

**Lights**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| Peak Time | L | T | R | L | T | R | L | T | R | L | T | R | TOT |
| 0700 - 0800 | 24 | 54 | 139 | 36 | 388 | 32 | 74 | 74 | 2 | 16 | 354 | 18 | **1211** |
| 0715 - 0815 | 20 | 61 | 129 | 39 | 410 | 34 | 75 | 84 | 1 | 10 | 371 | 21 | **1255** |
| 0730 - 0830 | 22 | 64 | 126 | 50 | 441 | 31 | 61 | 92 | 3 | 7 | 362 | 21 | **1280** |
| **0745 - 0845** | 22 | 74 | 135 | 52 | 450 | 30 | 60 | 111 | 4 | 5 | 355 | 14 | **1312** |
| 0800 - 0900 | 17 | 73 | 122 | 47 | 476 | 27 | 62 | 105 | 5 | 4 | 363 | 12 | **1313** |
| **PEAK HOUR** | **22** | **74** | **135** | **52** | **450** | **30** | **60** | **111** | **4** | **5** | **355** | **14** | **1312** |

**Heavies**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| Peak Time | L | T | R | L | T | R | L | T | R | L | T | R | TOT |
| 0700 - 0800 | 1 | 0 | 1 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | **58** |
| 0715 - 0815 | 1 | 0 | 1 | 0 | 28 | 1 | 0 | 0 | 0 | 0 | 26 | 0 | **57** |
| 0730 - 0830 | 0 | 0 | 1 | 0 | 20 | 2 | 0 | 0 | 0 | 0 | 23 | 0 | **46** |
| **0745 - 0845** | 0 | 0 | 1 | 0 | 19 | 2 | 0 | 0 | 0 | 0 | 23 | 0 | **45** |
| 0800 - 0900 | 0 | 0 | 0 | 0 | 14 | 3 | 0 | 0 | 0 | 0 | 18 | 0 | **35** |
| **PEAK HOUR** | **0** | **0** | **1** | **0** | **19** | **2** | **0** | **0** | **0** | **0** | **23** | **0** | **45** |

**Combined**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| Time Per | L | T | R | L | T | R | L | T | R | L | T | R | TOT |
| 0700 - 0715 | 9 | 10 | 35 | 10 | 83 | 8 | 16 | 8 | 1 | 7 | 87 | 0 | **274** |
| 0715 - 0730 | 5 | 12 | 38 | 8 | 94 | 7 | 22 | 14 | 0 | 4 | 106 | 3 | **313** |
| 0730 - 0745 | 4 | 18 | 28 | 6 | 114 | 8 | 18 | 22 | 1 | 3 | 90 | 9 | **321** |
| 0745 - 0800 | 7 | 14 | 39 | 12 | 123 | 9 | 18 | 30 | 0 | 2 | 101 | 6 | **361** |
| 0800 - 0815 | 5 | 17 | 25 | 13 | 107 | 11 | 17 | 18 | 0 | 1 | 100 | 3 | **317** |
| 0815 - 0830 | 6 | 15 | 35 | 19 | 117 | 5 | 8 | 22 | 2 | 1 | 94 | 3 | **327** |
| 0830 - 0845 | 4 | 28 | 37 | 8 | 122 | 7 | 17 | 41 | 2 | 1 | 83 | 2 | **352** |
| 0845 - 0900 | 2 | 13 | 25 | 7 | 144 | 7 | 20 | 24 | 1 | 1 | 104 | 4 | **352** |
| **Period End** | **42** | **127** | **262** | **83** | **904** | **62** | **136** | **179** | **7** | **20** | **765** | **30** | **2617** |

**Peds**

| | NORTH | WEST | SOUTH | EAST | |
|---|---|---|---|---|---|
| | *Hill St* | *Sydney Rd* | *Hill St* | *Sydney Rd* | |
| Time Per | UNCLASSIFIED | UNCLASSIFIED | UNCLASSIFIED | UNCLASSIFIED | TOT |
| 0700 - 0715 | | | | | **0** |
| 0715 - 0730 | | | | | **0** |
| 0730 - 0745 | *Not* | *Not* | *Not* | *Not* | **0** |
| 0745 - 0800 | *Required* | *Required* | *Required* | *Required* | **0** |
| 0800 - 0815 | | | | | **0** |
| 0815 - 0830 | | | | | **0** |
| 0830 - 0845 | | | | | **0** |
| 0845 - 0900 | | | | | **0** |
| **Period End** | **0** | **0** | **0** | **0** | **0** |

**Combined**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| Peak Time | L | T | R | L | T | R | L | T | R | L | T | R | TOT |
| 0700 - 0800 | 25 | 54 | 140 | 36 | 414 | 32 | 74 | 74 | 2 | 16 | 384 | 18 | **1269** |
| 0715 - 0815 | 21 | 61 | 130 | 39 | 438 | 35 | 75 | 84 | 1 | 10 | 397 | 21 | **1312** |
| 0730 - 0830 | 22 | 64 | 127 | 50 | 461 | 33 | 61 | 92 | 3 | 7 | 385 | 21 | **1326** |
| **0745 - 0845** | 22 | 74 | 136 | 52 | 469 | 32 | 60 | 111 | 4 | 5 | 378 | 14 | **1357** |
| 0800 - 0900 | 17 | 73 | 122 | 47 | 490 | 30 | 62 | 105 | 5 | 4 | 381 | 12 | **1348** |
| **PEAK HOUR** | **22** | **74** | **136** | **52** | **469** | **32** | **60** | **111** | **4** | **5** | **378** | **14** | **1357** |

**Peds**

| | NORTH | WEST | SOUTH | EAST | |
|---|---|---|---|---|---|
| | *Hill St* | *Sydney Rd* | *Hill St* | *Sydney Rd* | |
| Peak Per | UNCLASSIFIED | UNCLASSIFIED | UNCLASSIFIED | UNCLASSIFIED | TOT |
| 0700 - 0800 | 0 | 0 | 0 | 0 | **0** |
| 0715 - 0815 | 0 | 0 | 0 | 0 | **0** |
| 0730 - 0830 | 0 | 0 | 0 | 0 | **0** |
| 0745 - 0845 | 0 | 0 | 0 | 0 | **0** |
| 0800 - 0900 | 0 | 0 | 0 | 0 | **0** |
| **PEAK HR** | **0** | **0** | **0** | **0** | **0** |

# R.O.A.R DATA

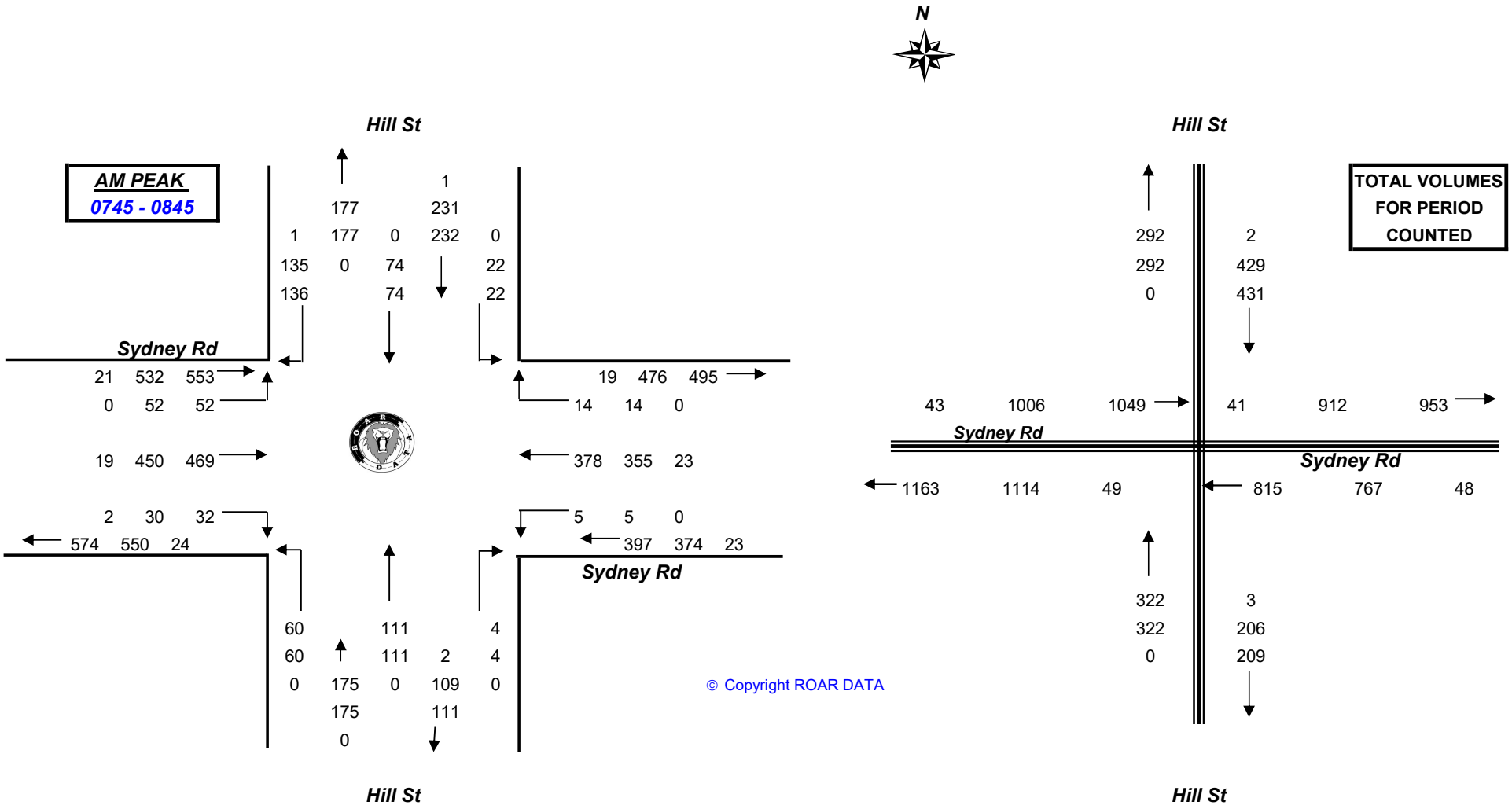
***Reliable, Original & Authentic Results***

Ph.88196847, Mob. 0418 239019

Client : pdc Consultants

Job No/Name : 6883 FAIRLIGHT Hill St

Day/Date : Tuesday 14th August 2018



# R.O.A.R. DATA

***Reliable, Original & Authentic Results***

Ph.88196847, Mob. 0418 239019

Client : pdc Consultants
Job No/Name : 6883 FAIRLIGHT Hill St
Day/Date : Tuesday 14th August 2018

**Lights**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| **Time Per** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **TOT** |
| 1600 - 1615 | 4 | 17 | 12 | 13 | 94 | 12 | 16 | 14 | 2 | 1 | 98 | 5 | **288** |
| 1615 - 1630 | 1 | 12 | 11 | 14 | 116 | 8 | 10 | 8 | 1 | 0 | 85 | 3 | **269** |
| 1630 - 1645 | 4 | 17 | 18 | 18 | 108 | 11 | 10 | 9 | 0 | 1 | 91 | 2 | **289** |
| 1645 - 1700 | 8 | 25 | 22 | 19 | 122 | 26 | 13 | 14 | 0 | 0 | 81 | 4 | **334** |
| 1700 - 1715 | 2 | 25 | 14 | 9 | 119 | 11 | 11 | 17 | 0 | 0 | 82 | 4 | **294** |
| 1715 - 1730 | 5 | 18 | 18 | 12 | 117 | 12 | 7 | 19 | 0 | 4 | 118 | 4 | **334** |
| 1730 - 1745 | 4 | 26 | 18 | 15 | 109 | 16 | 12 | 9 | 0 | 0 | 103 | 3 | **315** |
| 1745 - 1800 | 10 | 22 | 31 | 12 | 153 | 15 | 13 | 20 | 1 | 0 | 107 | 5 | **389** |
| **Period End** | **38** | **162** | **144** | **112** | **938** | **111** | **92** | **110** | **4** | **6** | **765** | **30** | **2512** |

**Heavies**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| **Time Per** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **TOT** |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 6 | 2 | 0 | 2 | 0 | 0 | 5 | 0 | **15** |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | **13** |
| 1630 - 1645 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 1 | 0 | 0 | 12 | 0 | **20** |
| 1645 - 1700 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | **8** |
| 1700 - 1715 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | **7** |
| 1715 - 1730 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 0 | 5 | 0 | **11** |
| 1730 - 1745 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 1 | 0 | 0 | 3 | 0 | **10** |
| 1745 - 1800 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | **8** |
| **Period End** | **0** | **0** | **0** | **0** | **38** | **3** | **0** | **6** | **0** | **0** | **45** | **0** | **92** |

**Lights**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| **Peak Time** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **TOT** |
| 1600 - 1700 | 17 | 71 | 63 | 64 | 440 | 57 | 49 | 45 | 3 | 2 | 355 | 14 | **1180** |
| 1615 - 1715 | 15 | 79 | 65 | 60 | 465 | 56 | 44 | 48 | 1 | 1 | 339 | 13 | **1186** |
| 1630 - 1730 | 19 | 85 | 72 | 58 | 466 | 60 | 41 | 59 | 0 | 5 | 372 | 14 | **1251** |
| 1645 - 1745 | 19 | 94 | 72 | 55 | 467 | 65 | 43 | 59 | 0 | 4 | 384 | 15 | **1277** |
| 1700 - 1800 | 21 | 91 | 81 | 48 | 498 | 54 | 43 | 65 | 1 | 4 | 410 | 16 | **1332** |
| **PEAK HOUR** | **21** | **91** | **81** | **48** | **498** | **54** | **43** | **65** | **1** | **4** | **410** | **16** | **1332** |

**Heavies**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| **Peak Time** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **TOT** |
| 1600 - 1700 | 0 | 0 | 0 | 0 | 20 | 2 | 0 | 3 | 0 | 0 | 31 | 0 | **56** |
| 1615 - 1715 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 2 | 0 | 0 | 28 | 0 | **48** |
| 1630 - 1730 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 3 | 0 | 0 | 25 | 0 | **46** |
| 1645 - 1745 | 0 | 0 | 0 | 0 | 16 | 1 | 0 | 3 | 0 | 0 | 16 | 0 | **36** |
| 1700 - 1800 | 0 | 0 | 0 | 0 | 18 | 1 | 0 | 3 | 0 | 0 | 14 | 0 | **36** |
| **PEAK HOUR** | **0** | **0** | **0** | **0** | **18** | **1** | **0** | **3** | **0** | **0** | **14** | **0** | **36** |

**Combined**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| **Time Per** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **TOT** |
| 1600 - 1615 | 4 | 17 | 12 | 13 | 100 | 14 | 16 | 16 | 2 | 1 | 103 | 5 | **303** |
| 1615 - 1630 | 1 | 12 | 11 | 14 | 121 | 8 | 10 | 8 | 1 | 0 | 93 | 3 | **282** |
| 1630 - 1645 | 4 | 17 | 18 | 18 | 115 | 11 | 10 | 10 | 0 | 1 | 103 | 2 | **309** |
| 1645 - 1700 | 8 | 25 | 22 | 19 | 124 | 26 | 13 | 14 | 0 | 0 | 87 | 4 | **342** |
| 1700 - 1715 | 2 | 25 | 14 | 9 | 123 | 11 | 11 | 18 | 0 | 0 | 84 | 4 | **301** |
| 1715 - 1730 | 5 | 18 | 18 | 12 | 122 | 12 | 7 | 20 | 0 | 4 | 123 | 4 | **345** |
| 1730 - 1745 | 4 | 26 | 18 | 15 | 114 | 17 | 12 | 10 | 0 | 0 | 106 | 3 | **325** |
| 1745 - 1800 | 10 | 22 | 31 | 12 | 157 | 15 | 13 | 20 | 1 | 0 | 111 | 5 | **397** |
| **Period End** | **38** | **162** | **144** | **112** | **976** | **114** | **92** | **116** | **4** | **6** | **810** | **30** | **2604** |

**Peds**

| | NORTH | WEST | SOUTH | EAST | |
|---|---|---|---|---|---|
| | *Hill St* | *Sydney Rd* | *Hill St* | *Sydney Rd* | |
| **Time Per** | **UNCLASSIFIED** | **UNCLASSIFIED** | **UNCLASSIFIED** | **UNCLASSIFIED** | **TOT** |
| 1600 - 1615 | | | | | **0** |
| 1615 - 1630 | | | | | **0** |
| 1630 - 1645 | *Not* | *Not* | *Not* | *Not* | **0** |
| 1645 - 1700 | *Required* | *Required* | *Required* | *Required* | **0** |
| 1700 - 1715 | | | | | **0** |
| 1715 - 1730 | | | | | **0** |
| 1730 - 1745 | | | | | **0** |
| 1745 - 1800 | | | | | **0** |
| **Period End** | **0** | **0** | **0** | **0** | **0** |

**Combined**

| | NORTH | | | WEST | | | SOUTH | | | EAST | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Hill St* | | | *Sydney Rd* | | | *Hill St* | | | *Sydney Rd* | | | |
| **Peak Time** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **L** | **T** | **R** | **TOT** |
| 1600 - 1700 | 17 | 71 | 63 | 64 | 460 | 59 | 49 | 48 | 3 | 2 | 386 | 14 | **1236** |
| 1615 - 1715 | 15 | 79 | 65 | 60 | 483 | 56 | 44 | 50 | 1 | 1 | 367 | 13 | **1234** |
| 1630 - 1730 | 19 | 85 | 72 | 58 | 484 | 60 | 41 | 62 | 0 | 5 | 397 | 14 | **1297** |
| 1645 - 1745 | 19 | 94 | 72 | 55 | 483 | 66 | 43 | 62 | 0 | 4 | 400 | 15 | **1313** |
| 1700 - 1800 | 21 | 91 | 81 | 48 | 516 | 55 | 43 | 68 | 1 | 4 | 424 | 16 | **1368** |
| **PEAK HOUR** | **21** | **91** | **81** | **48** | **516** | **55** | **43** | **68** | **1** | **4** | **424** | **16** | **1368** |

**Peds**

| | NORTH | WEST | SOUTH | EAST | |
|---|---|---|---|---|---|
| | *Hill St* | *Sydney Rd* | *Hill St* | *Sydney Rd* | |
| **Peak Per** | **UNCLASSIFIED** | **UNCLASSIFIED** | **UNCLASSIFIED** | **UNCLASSIFIED** | **TOT** |
| 1600 - 1700 | 0 | 0 | 0 | 0 | **0** |
| 1615 - 1715 | 0 | 0 | 0 | 0 | **0** |
| 1630 - 1730 | 0 | 0 | 0 | 0 | **0** |
| 1645 - 1745 | 0 | 0 | 0 | 0 | **0** |
| 1700 - 1800 | 0 | 0 | 0 | 0 | **0** |
| **PEAK HR** | **0** | **0** | **0** | **0** | **0** |

# R.O.A.R DATA

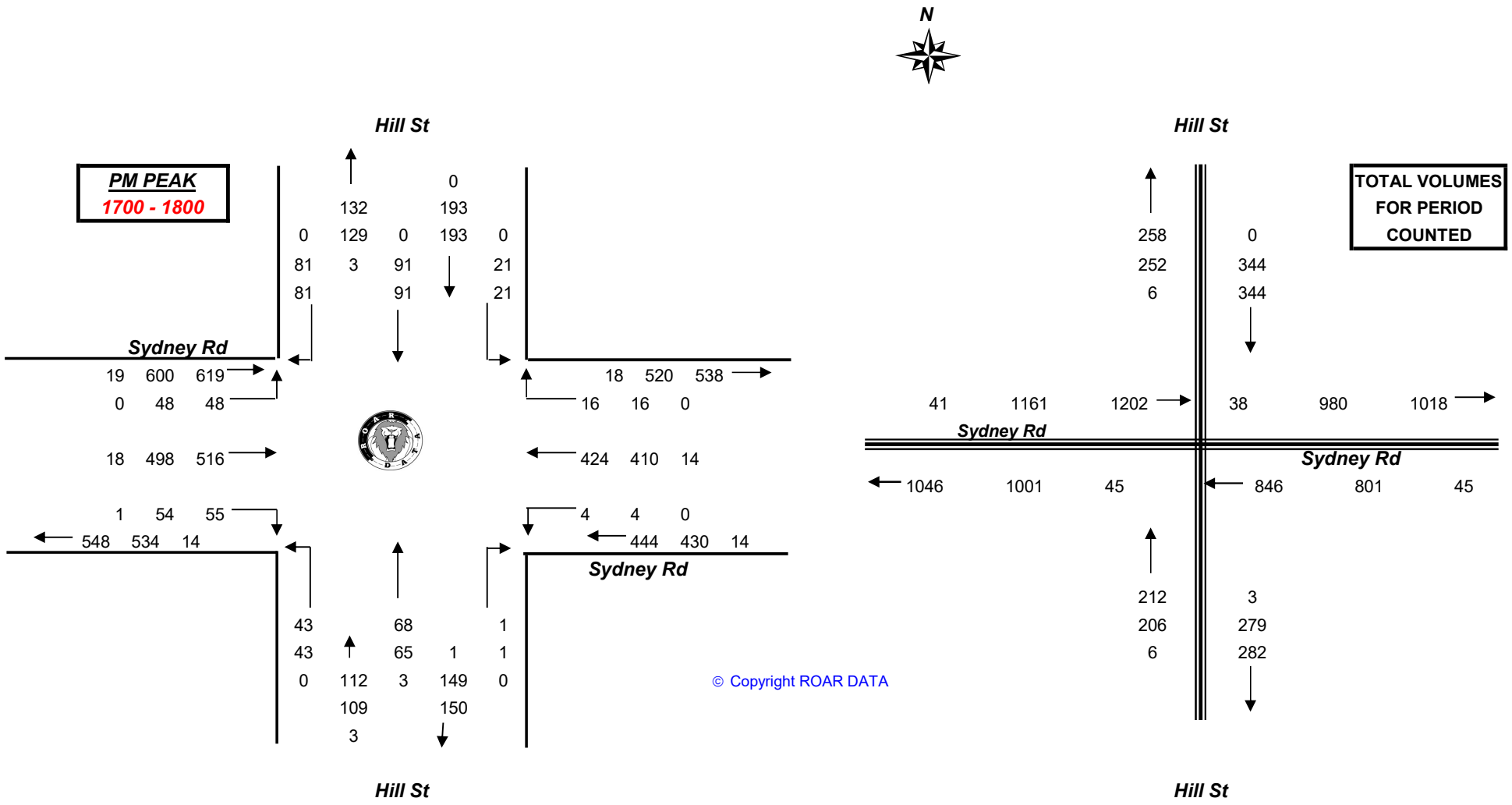
***Reliable, Original & Authentic Results***

Ph.88196847, Mob. 0418 239019

Client : pdc Consultants

Job No/Name : 6883 FAIRLIGHT Hill St

Day/Date : Tuesday 14th August 2018



# R.O.A.R. DATA

***Reliable, Original & Authentic Results***

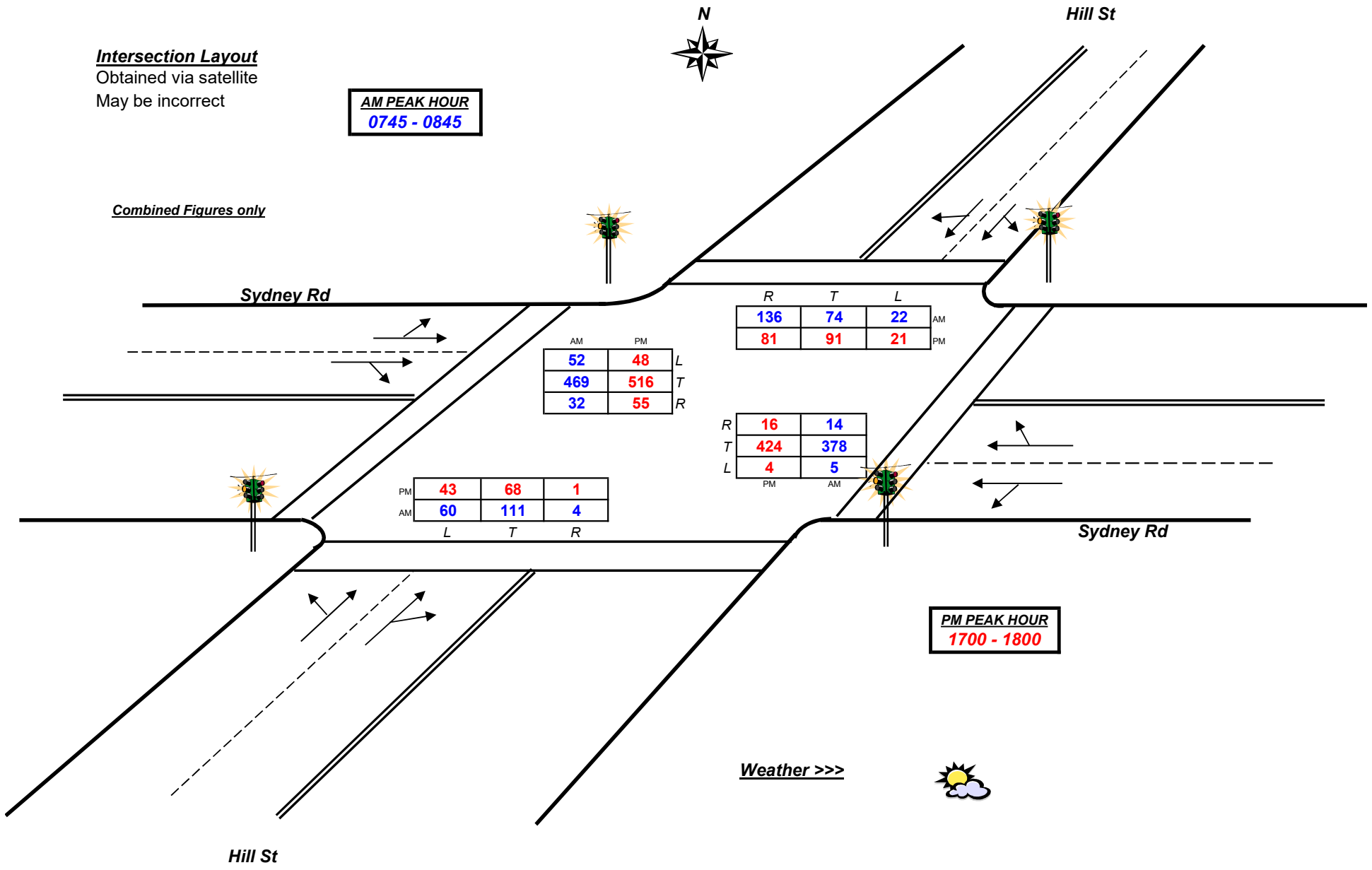
Ph.88196847, Mob. 0418 239019

Client : pdc Consultants
Job No/Name : 6883 FAIRLIGHT Hill St
Day/Date : Tuesday 14th August 2018

***Intersection Layout***
Obtained via satellite
May be incorrect

**AM PEAK HOUR**
**0745 - 0845**

***Combined Figures only***

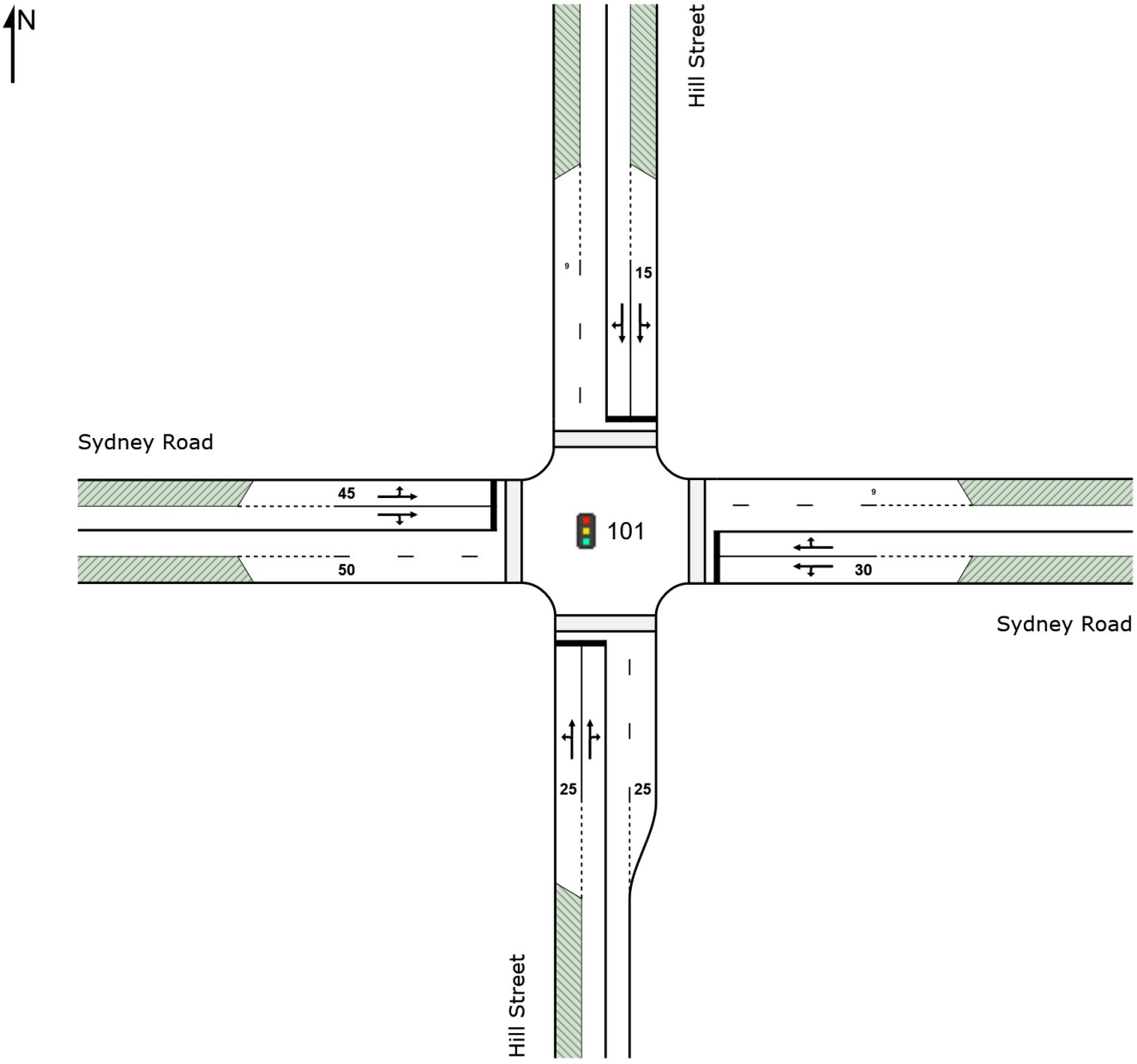


# Appendix B

# SITE LAYOUT

## Site: 101 [Sydney Rd x Hill St AM - EX ]

Intersection: Sydney Road x Hill Street
Period: PM
Scenario: Existing
Site Category: (None)
Signals - Fixed Time Isolated





Organisation: PDC CONSULTANTS | Created: Thursday, 30 August 2018 1:54:23 PM
Project: C:\Users\J_Bon\Google Drive\PDC Consultants\Jobs\0071\Modelling\0071m01 PDC Modelling - Sydney Rd x Hill St.sip8

# MOVEMENT SUMMARY

## Site: 101 [Sydney Rd x Hill St AM - EX ]

Intersection: Sydney Road x Hill Street
Period: PM
Scenario: Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | 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 | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Hill Street | | | | | | | | | | | | |
| 1 | L2 | 63 | 0.0 | 0.136 | 23.8 | LOS B | 1.5 | 10.3 | 0.81 | 0.72 | 0.81 | 31.4 |
| 2 | T1 | 117 | 0.0 | 0.228 | 18.2 | LOS B | 2.8 | 19.5 | 0.80 | 0.65 | 0.80 | 34.2 |
| 3 | R2 | 4 | 0.0 | 0.228 | 22.7 | LOS B | 2.8 | 19.5 | 0.80 | 0.65 | 0.80 | 37.7 |
| Approach | | 184 | 0.0 | 0.228 | 20.2 | LOS B | 2.8 | 19.5 | 0.81 | 0.67 | 0.81 | 33.4 |
| East: Sydney Road | | | | | | | | | | | | |
| 4 | L2 | 5 | 0.0 | 0.113 | 13.5 | LOS A | 1.6 | 12.1 | 0.54 | 0.45 | 0.54 | 47.0 |
| 5 | T1 | 398 | 6.1 | 0.348 | 9.4 | LOS A | 5.5 | 40.5 | 0.62 | 0.53 | 0.62 | 50.9 |
| 6 | R2 | 15 | 0.0 | 0.348 | 15.4 | LOS B | 5.5 | 40.5 | 0.64 | 0.56 | 0.64 | 46.8 |
| Approach | | 418 | 5.8 | 0.348 | 9.6 | LOS A | 5.5 | 40.5 | 0.62 | 0.53 | 0.62 | 50.7 |
| North: Hill Street | | | | | | | | | | | | |
| 7 | L2 | 23 | 0.0 | 0.124 | 22.1 | LOS B | 1.4 | 10.0 | 0.78 | 0.64 | 0.78 | 41.2 |
| 8 | T1 | 78 | 0.0 | 0.535 | 19.6 | LOS B | 4.8 | 33.6 | 0.84 | 0.71 | 0.84 | 32.1 |
| 9 | R2 | 143 | 0.7 | 0.535 | 26.5 | LOS B | 4.8 | 33.6 | 0.91 | 0.79 | 0.91 | 36.6 |
| Approach | | 244 | 0.4 | 0.535 | 23.9 | LOS B | 4.8 | 33.6 | 0.87 | 0.75 | 0.87 | 35.9 |
| West: Sydney Road | | | | | | | | | | | | |
| 10 | L2 | 55 | 0.0 | 0.109 | 14.1 | LOS A | 1.6 | 11.2 | 0.56 | 0.59 | 0.56 | 44.6 |
| 11 | T1 | 494 | 4.1 | 0.543 | 10.4 | LOS A | 9.6 | 69.5 | 0.70 | 0.64 | 0.70 | 49.9 |
| 12 | R2 | 34 | 6.3 | 0.543 | 16.2 | LOS B | 9.6 | 69.5 | 0.72 | 0.64 | 0.72 | 41.6 |
| Approach | | 582 | 3.8 | 0.543 | 11.1 | LOS A | 9.6 | 69.5 | 0.69 | 0.63 | 0.69 | 49.0 |
| All Vehicles | | 1428 | 3.3 | 0.543 | 14.0 | LOS A | 9.6 | 69.5 | 0.72 | 0.63 | 0.72 | 45.1 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle 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.

**Movement Performance - Pedestrians**

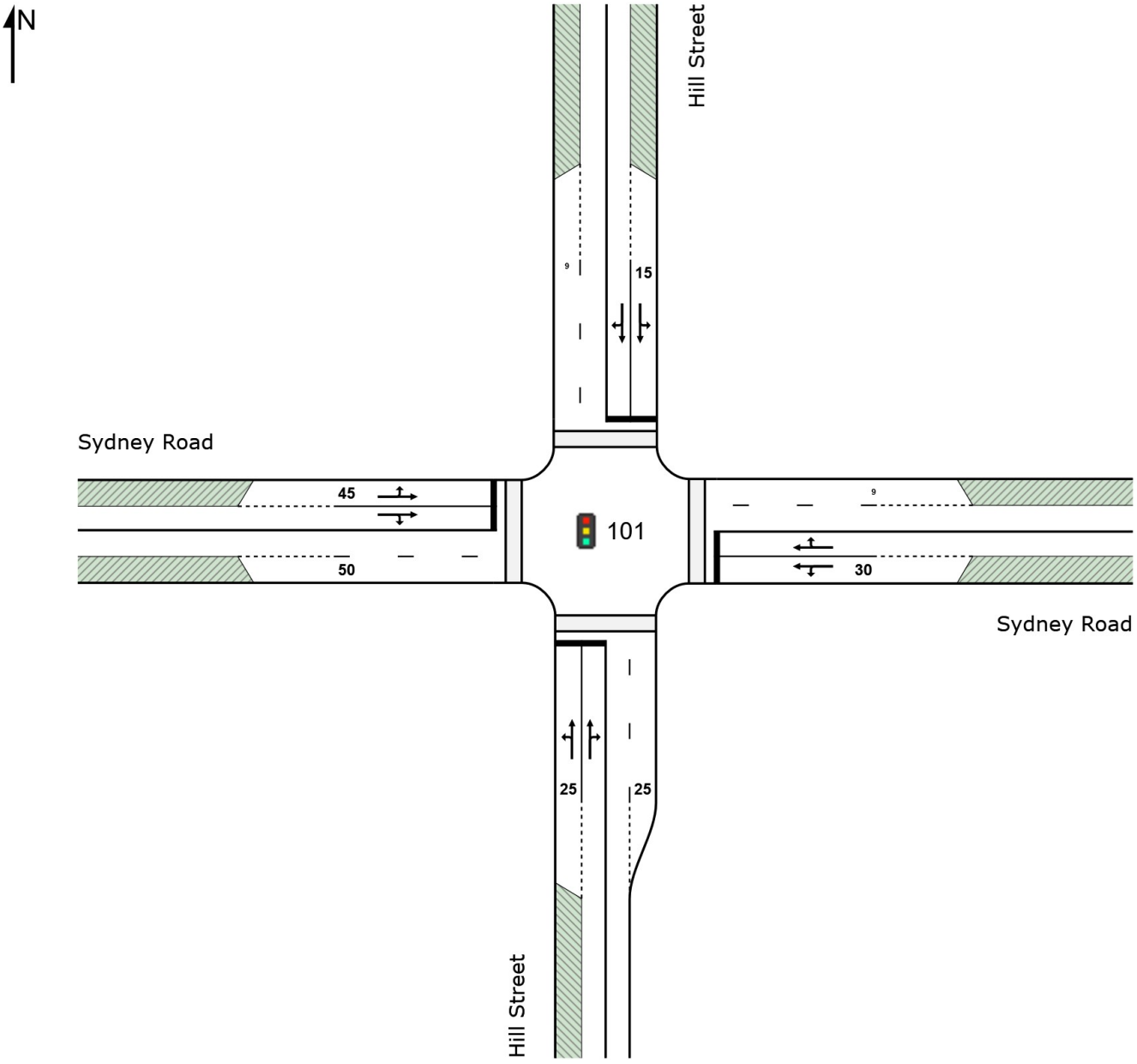
| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 24.4 | LOS C | 0.1 | 0.1 | 0.90 | 0.90 |
| P2 | East Full Crossing | 53 | 24.4 | LOS C | 0.1 | 0.1 | 0.90 | 0.90 |
| P3 | North Full Crossing | 53 | 24.4 | LOS C | 0.1 | 0.1 | 0.90 | 0.90 |
| P4 | West Full Crossing | 53 | 24.4 | LOS C | 0.1 | 0.1 | 0.90 | 0.90 |
| All Pedestrians | | 211 | 24.4 | LOS C | | | 0.90 | 0.90 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# SITE LAYOUT

## Site: 101 [Sydney Rd x Hill St AM - EX + DEV]

Intersection: Sydney Road x Hill Street
Period: PM
Scenario: Existing + Development
Site Category: (None)
Signals - Fixed Time Isolated





Organisation: PDC CONSULTANTS | Created: Monday, 3 September 2018 9:53:56 AM
Project: C:\Users\jbonc\Google Drive\PDC Consultants\Jobs\0071\Modelling\0071m01 PDC Modelling - Sydney Rd x Hill St.sip8

# MOVEMENT SUMMARY

## Site: 101 [Sydney Rd x Hill St AM - EX + DEV]

Intersection: Sydney Road x Hill Street
Period: PM
Scenario: Existing + Development
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | 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 | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Hill Street | | | | | | | | | | | | |
| 1 | L2 | 63 | 0.0 | 0.136 | 23.8 | LOS B | 1.5 | 10.3 | 0.81 | 0.72 | 0.81 | 31.4 |
| 2 | T1 | 117 | 0.0 | 0.228 | 18.2 | LOS B | 2.8 | 19.5 | 0.80 | 0.65 | 0.80 | 34.2 |
| 3 | R2 | 4 | 0.0 | 0.228 | 22.7 | LOS B | 2.8 | 19.5 | 0.80 | 0.65 | 0.80 | 37.7 |
| Approach | | 184 | 0.0 | 0.228 | 20.2 | LOS B | 2.8 | 19.5 | 0.81 | 0.67 | 0.81 | 33.4 |
| East: Sydney Road | | | | | | | | | | | | |
| 4 | L2 | 5 | 0.0 | 0.115 | 13.6 | LOS A | 1.7 | 12.4 | 0.54 | 0.45 | 0.54 | 46.9 |
| 5 | T1 | 407 | 5.9 | 0.355 | 9.4 | LOS A | 5.7 | 41.6 | 0.62 | 0.53 | 0.62 | 50.9 |
| 6 | R2 | 15 | 0.0 | 0.355 | 15.5 | LOS B | 5.7 | 41.6 | 0.65 | 0.56 | 0.65 | 46.8 |
| Approach | | 427 | 5.7 | 0.355 | 9.7 | LOS A | 5.7 | 41.6 | 0.62 | 0.53 | 0.62 | 50.7 |
| North: Hill Street | | | | | | | | | | | | |
| 7 | L2 | 23 | 0.0 | 0.124 | 22.1 | LOS B | 1.4 | 10.0 | 0.78 | 0.64 | 0.78 | 41.2 |
| 8 | T1 | 78 | 0.0 | 0.535 | 19.6 | LOS B | 4.8 | 33.6 | 0.84 | 0.71 | 0.84 | 32.1 |
| 9 | R2 | 143 | 0.7 | 0.535 | 26.5 | LOS B | 4.8 | 33.6 | 0.91 | 0.79 | 0.91 | 36.6 |
| Approach | | 244 | 0.4 | 0.535 | 23.9 | LOS B | 4.8 | 33.6 | 0.87 | 0.75 | 0.87 | 35.9 |
| West: Sydney Road | | | | | | | | | | | | |
| 10 | L2 | 55 | 0.0 | 0.109 | 14.1 | LOS A | 1.6 | 11.2 | 0.56 | 0.58 | 0.56 | 44.6 |
| 11 | T1 | 496 | 4.0 | 0.545 | 10.4 | LOS A | 9.6 | 69.9 | 0.70 | 0.64 | 0.70 | 49.8 |
| 12 | R2 | 34 | 6.3 | 0.545 | 16.3 | LOS B | 9.6 | 69.9 | 0.72 | 0.65 | 0.72 | 41.6 |
| Approach | | 584 | 3.8 | 0.545 | 11.1 | LOS A | 9.6 | 69.9 | 0.69 | 0.64 | 0.69 | 49.0 |
| All Vehicles | | 1440 | 3.3 | 0.545 | 14.0 | LOS A | 9.6 | 69.9 | 0.72 | 0.63 | 0.72 | 45.1 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle 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.

**Movement Performance - Pedestrians**

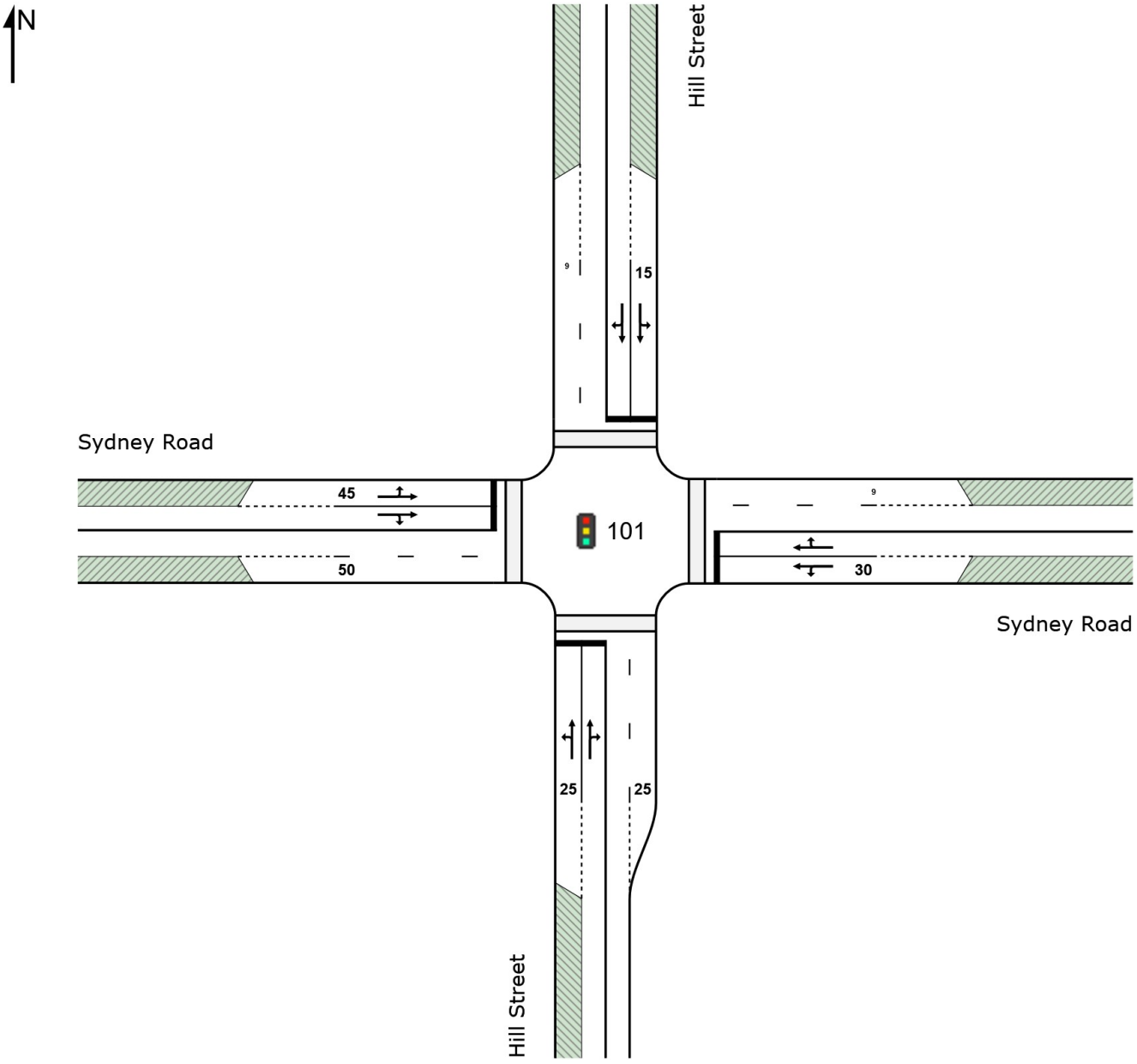
| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 24.4 | LOS C | 0.1 | 0.1 | 0.90 | 0.90 |
| P2 | East Full Crossing | 53 | 24.4 | LOS C | 0.1 | 0.1 | 0.90 | 0.90 |
| P3 | North Full Crossing | 53 | 24.4 | LOS C | 0.1 | 0.1 | 0.90 | 0.90 |
| P4 | West Full Crossing | 53 | 24.4 | LOS C | 0.1 | 0.1 | 0.90 | 0.90 |
| All Pedestrians | | 211 | 24.4 | LOS C | | | 0.90 | 0.90 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# SITE LAYOUT

## Site: 101 [Sydney Rd x Hill St PM - EX]

Intersection: Sydney Road x Hill Street
Period: PM
Scenario: Existing
Site Category: (None)
Signals - Fixed Time Isolated





Organisation: PDC CONSULTANTS | Created: Thursday, 30 August 2018 1:54:27 PM
Project: C:\Users\J_Bon\Google Drive\PDC Consultants\Jobs\0071\Modelling\0071m01 PDC Modelling - Sydney Rd x Hill St.sip8

# MOVEMENT SUMMARY

## Site: 101 [Sydney Rd x Hill St PM - EX]

Intersection: Sydney Road x Hill Street
Period: PM
Scenario: Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 65 seconds (Site User-Given Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | 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 | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Hill Street | | | | | | | | | | | | |
| 1 | L2 | 45 | 0.0 | 0.132 | 29.2 | LOS C | 1.2 | 8.7 | 0.87 | 0.72 | 0.87 | 28.7 |
| 2 | T1 | 72 | 4.4 | 0.183 | 23.1 | LOS B | 1.9 | 14.1 | 0.85 | 0.66 | 0.85 | 31.6 |
| 3 | R2 | 1 | 0.0 | 0.183 | 27.6 | LOS B | 1.9 | 14.1 | 0.85 | 0.66 | 0.85 | 34.8 |
| Approach | | 118 | 2.7 | 0.183 | 25.5 | LOS B | 1.9 | 14.1 | 0.86 | 0.68 | 0.86 | 30.5 |
| East: Sydney Road | | | | | | | | | | | | |
| 4 | L2 | 4 | 0.0 | 0.108 | 11.5 | LOS A | 1.7 | 11.9 | 0.45 | 0.38 | 0.45 | 49.3 |
| 5 | T1 | 446 | 3.3 | 0.331 | 7.1 | LOS A | 5.6 | 40.5 | 0.52 | 0.46 | 0.52 | 52.9 |
| 6 | R2 | 17 | 0.0 | 0.331 | 13.0 | LOS A | 5.6 | 40.5 | 0.55 | 0.49 | 0.55 | 48.4 |
| Approach | | 467 | 3.2 | 0.331 | 7.3 | LOS A | 5.6 | 40.5 | 0.52 | 0.46 | 0.52 | 52.7 |
| North: Hill Street | | | | | | | | | | | | |
| 7 | L2 | 22 | 0.0 | 0.123 | 27.3 | LOS B | 1.2 | 8.7 | 0.84 | 0.67 | 0.84 | 38.6 |
| 8 | T1 | 96 | 0.0 | 0.533 | 25.4 | LOS B | 4.7 | 32.6 | 0.91 | 0.75 | 0.91 | 29.4 |
| 9 | R2 | 85 | 0.0 | 0.533 | 30.9 | LOS C | 4.7 | 32.6 | 0.94 | 0.78 | 0.94 | 35.2 |
| Approach | | 203 | 0.0 | 0.533 | 27.9 | LOS B | 4.7 | 32.6 | 0.92 | 0.75 | 0.92 | 33.3 |
| West: Sydney Road | | | | | | | | | | | | |
| 10 | L2 | 51 | 0.0 | 0.108 | 11.5 | LOS A | 1.6 | 11.5 | 0.45 | 0.50 | 0.45 | 46.8 |
| 11 | T1 | 543 | 3.5 | 0.540 | 8.5 | LOS A | 10.3 | 74.3 | 0.63 | 0.59 | 0.63 | 51.2 |
| 12 | R2 | 58 | 1.8 | 0.540 | 14.4 | LOS A | 10.3 | 74.3 | 0.65 | 0.60 | 0.65 | 43.3 |
| Approach | | 652 | 3.1 | 0.540 | 9.3 | LOS A | 10.3 | 74.3 | 0.62 | 0.58 | 0.62 | 50.4 |
| All Vehicles | | 1440 | 2.6 | 0.540 | 12.6 | LOS A | 10.3 | 74.3 | 0.65 | 0.58 | 0.65 | 46.6 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle 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.

**Movement Performance - Pedestrians**

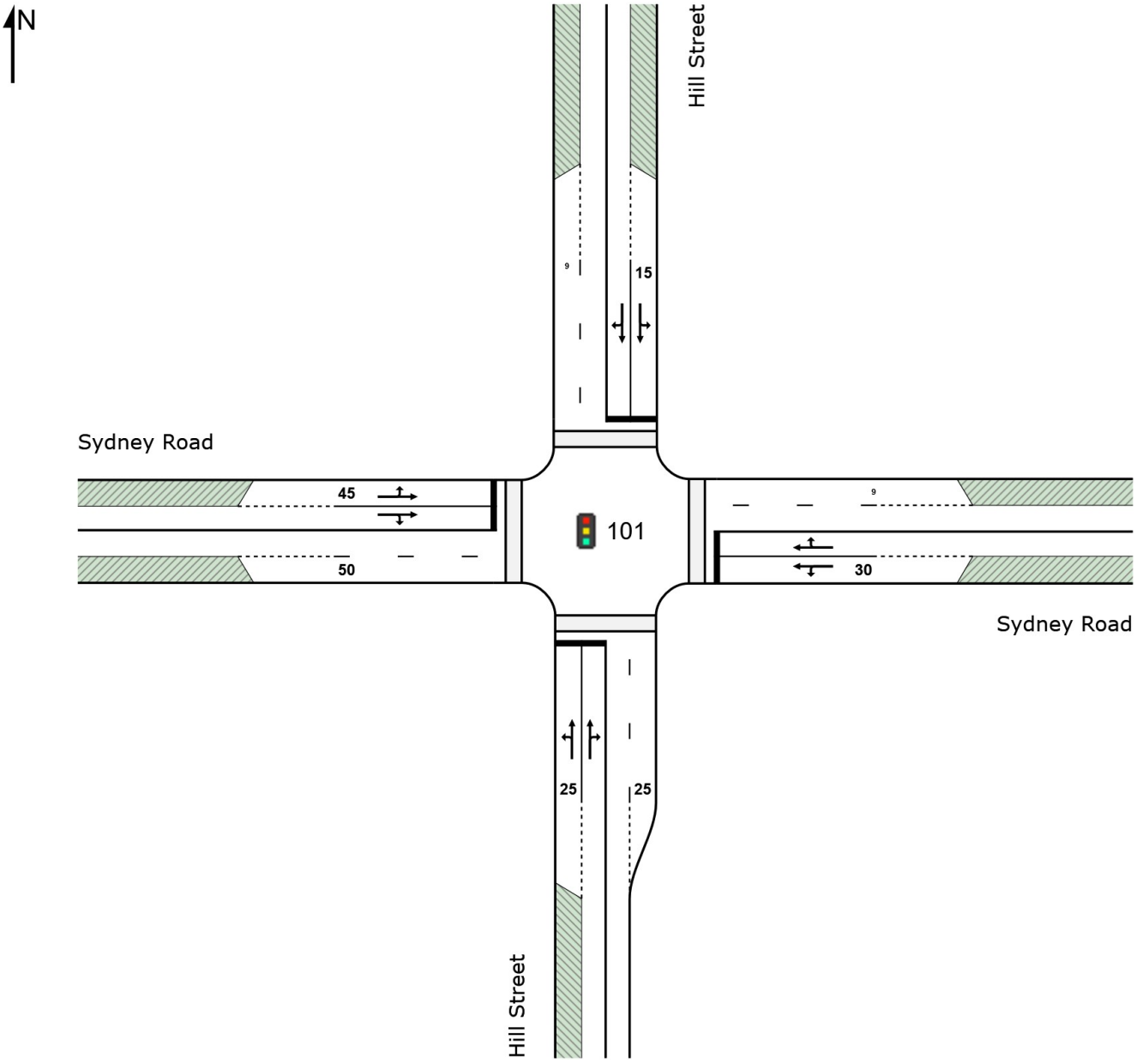
| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 26.8 | LOS C | 0.1 | 0.1 | 0.91 | 0.91 |
| P2 | East Full Crossing | 53 | 26.8 | LOS C | 0.1 | 0.1 | 0.91 | 0.91 |
| P3 | North Full Crossing | 53 | 26.8 | LOS C | 0.1 | 0.1 | 0.91 | 0.91 |
| P4 | West Full Crossing | 53 | 26.8 | LOS C | 0.1 | 0.1 | 0.91 | 0.91 |
| All Pedestrians | | 211 | 26.8 | LOS C | | | 0.91 | 0.91 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# SITE LAYOUT

## Site: 101 [Sydney Rd x Hill St PM - EX + DEV]

Intersection: Sydney Road x Hill Street
Period: PM
Scenario: Existing + Development
Site Category: (None)
Signals - Fixed Time Isolated





Organisation: PDC CONSULTANTS | Created: Monday, 3 September 2018 9:55:13 AM
Project: C:\Users\jbonc\Google Drive\PDC Consultants\Jobs\0071\Modelling\0071m01 PDC Modelling - Sydney Rd x Hill St.sip8

# MOVEMENT SUMMARY

## Site: 101 [Sydney Rd x Hill St PM - EX + DEV]

Intersection: Sydney Road x Hill Street
Period: PM
Scenario: Existing + Development
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 65 seconds (Site User-Given Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | 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 | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Hill Street | | | | | | | | | | | | |
| 1 | L2 | 45 | 0.0 | 0.132 | 29.2 | LOS C | 1.2 | 8.7 | 0.87 | 0.72 | 0.87 | 28.7 |
| 2 | T1 | 72 | 4.4 | 0.182 | 23.1 | LOS B | 1.9 | 14.1 | 0.85 | 0.66 | 0.85 | 31.6 |
| 3 | R2 | 1 | 0.0 | 0.182 | 27.6 | LOS B | 1.9 | 14.1 | 0.85 | 0.66 | 0.85 | 34.8 |
| Approach | | 118 | 2.7 | 0.182 | 25.5 | LOS B | 1.9 | 14.1 | 0.86 | 0.68 | 0.86 | 30.5 |
| East: Sydney Road | | | | | | | | | | | | |
| 4 | L2 | 4 | 0.0 | 0.108 | 11.5 | LOS A | 1.7 | 12.0 | 0.45 | 0.38 | 0.45 | 49.3 |
| 5 | T1 | 448 | 3.3 | 0.333 | 7.1 | LOS A | 5.7 | 40.7 | 0.52 | 0.46 | 0.52 | 52.9 |
| 6 | R2 | 17 | 0.0 | 0.333 | 13.0 | LOS A | 5.7 | 40.7 | 0.55 | 0.49 | 0.55 | 48.4 |
| Approach | | 469 | 3.1 | 0.333 | 7.3 | LOS A | 5.7 | 40.7 | 0.52 | 0.46 | 0.52 | 52.6 |
| North: Hill Street | | | | | | | | | | | | |
| 7 | L2 | 23 | 0.0 | 0.124 | 28.2 | LOS B | 1.3 | 8.8 | 0.85 | 0.68 | 0.85 | 38.2 |
| 8 | T1 | 96 | 0.0 | 0.535 | 25.7 | LOS B | 4.7 | 32.8 | 0.92 | 0.75 | 0.92 | 29.3 |
| 9 | R2 | 85 | 0.0 | 0.535 | 30.9 | LOS C | 4.7 | 32.8 | 0.94 | 0.78 | 0.94 | 35.2 |
| Approach | | 204 | 0.0 | 0.535 | 28.1 | LOS B | 4.7 | 32.8 | 0.92 | 0.76 | 0.92 | 33.2 |
| West: Sydney Road | | | | | | | | | | | | |
| 10 | L2 | 51 | 0.0 | 0.109 | 11.5 | LOS A | 1.6 | 11.6 | 0.45 | 0.50 | 0.45 | 46.8 |
| 11 | T1 | 552 | 3.4 | 0.546 | 8.6 | LOS A | 10.5 | 75.6 | 0.63 | 0.59 | 0.63 | 51.2 |
| 12 | R2 | 58 | 1.8 | 0.546 | 14.5 | LOS A | 10.5 | 75.6 | 0.66 | 0.61 | 0.66 | 43.3 |
| Approach | | 660 | 3.0 | 0.546 | 9.3 | LOS A | 10.5 | 75.6 | 0.62 | 0.59 | 0.62 | 50.4 |
| All Vehicles | | 1452 | 2.6 | 0.546 | 12.6 | LOS A | 10.5 | 75.6 | 0.65 | 0.58 | 0.65 | 46.6 |

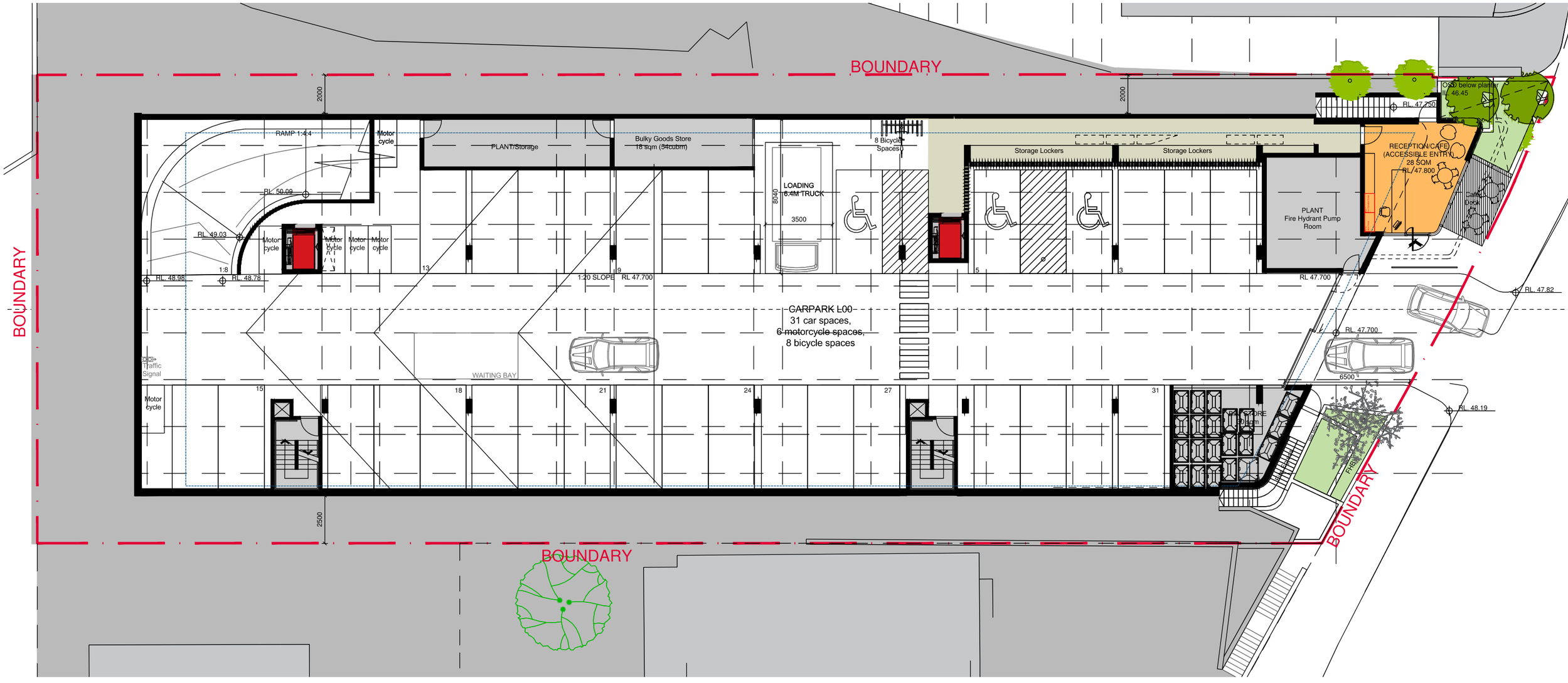
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard 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.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 26.8 | LOS C | 0.1 | 0.1 | 0.91 | 0.91 |
| P2 | East Full Crossing | 53 | 26.8 | LOS C | 0.1 | 0.1 | 0.91 | 0.91 |
| P3 | North Full Crossing | 53 | 26.8 | LOS C | 0.1 | 0.1 | 0.91 | 0.91 |
| P4 | West Full Crossing | 53 | 26.8 | LOS C | 0.1 | 0.1 | 0.91 | 0.91 |
| All Pedestrians | | 211 | 26.8 | LOS C | | | 0.91 | 0.91 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# Appendix C




01 Level 00 Plan

Floor Plan 1:200 @a3

NOT FOR CONSTRUCTION

| Revision | Date | Description | Initial | Checked |
|---|---|---|---|---|
| A | 25-09-2018 | Developement Application Issue | DS | MD |
| P2 | 10-07-2018 | Preliminary Council Issue | MD | MD |

195-197 Sydney Road
Fairlight

LEVEL 00 PLAN



| | |
|---|---|
| Scale | 1:250@A3 / 1:125@A1 |
| Drawn | MD |
| Checked | |
| Project No. | M21701 |
| Status | |
| Plot Date | 7/10/2018 2:38 PM |
| Plot File | ... |
| Drawing No. | A01.00[A] |
| [Revision] | |

**MODULARIUM PTY LTD**
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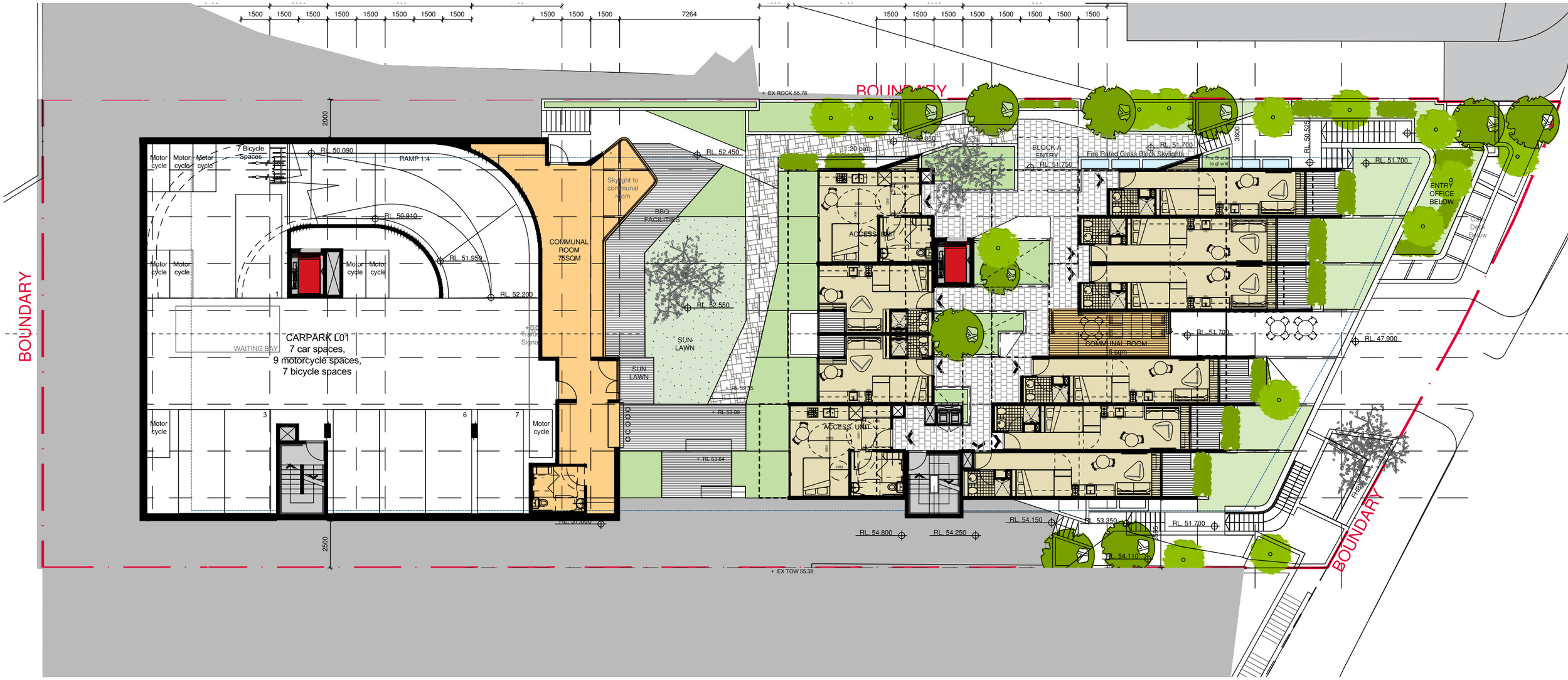
Nominated Architect: **Marko Damic** Reg.8730

MODULARIUM




01 Level 01 Plan

Floor Plan 1:200 @a3

# NOT FOR CONSTRUCTION

| Revision | Date | Description | Initial | Checked |
|---|---|---|---|---|
| A | 25-09-2018 | Developement Application Issue | DS | MD |
| P2 | 10-07-2018 | Preliminary Council Issue | MD | MD |

195-197 Sydney Road
Fairlight

LEVEL 01 PLAN



| | |
|---|---|
| Scale | 1:250@A3 / 1:125@A1 |
| Drawn | MD |
| Checked | |
| Project No. | M21701 |
| Status | |
| Plot Date | 7/10/2018 2:38 PM |
| Plot File | ... |
| Drawing No. | [Revision] |

A01.01[A]

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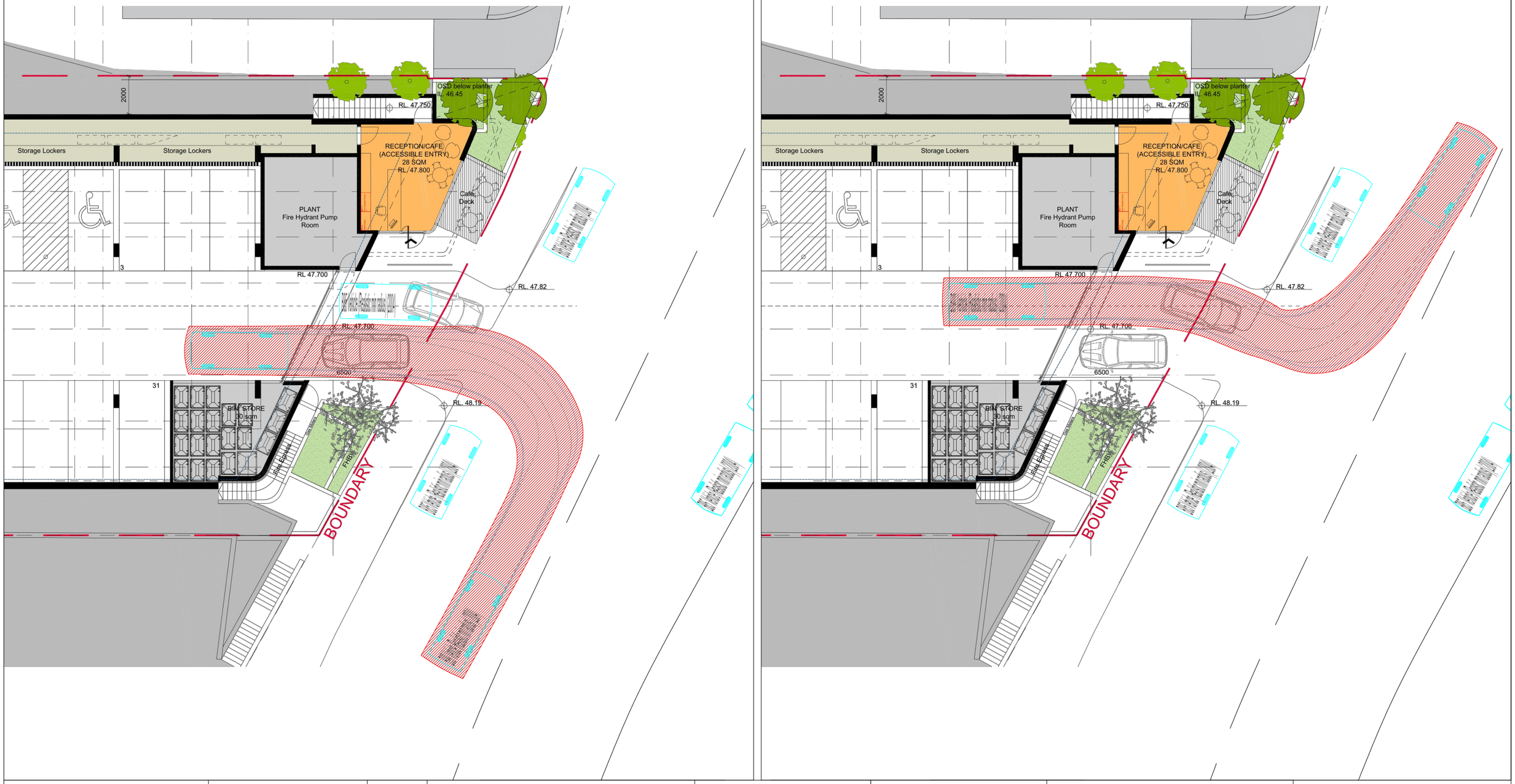
# Appendix D







| No. | Date | Description |
|---|---|---|
| | | |

**Swept Path Key**

- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

North


Drawing Prepared By

PDC Consultants
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ABN: 70 615 064 670


| | | | |
|---|---|---|---|
| Architect: Modularium | Project: 195-197 Sydney Road, Fairlight | Drawing Title: Level 00 Plan<br>B99 Design Vehicle Swept Path Analysis<br>Site Entry / Exit Movements | Drawing No.: 001 / Revision No.: - |
| Client: Micronest Pty Ltd | Project No: 0071 | Sheet Status: NOT FOR CONSTRUCTION | Drawn By: JB / Date: 12/10/2018 |
| | | | Scale: 1:200 @ A3 (0m 2 4 6 8) |


| No. | Date | Description |
|---|---|---|
| | | |

**Swept Path Key**
- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

North


**Drawing Prepared By**

PDC Consultants
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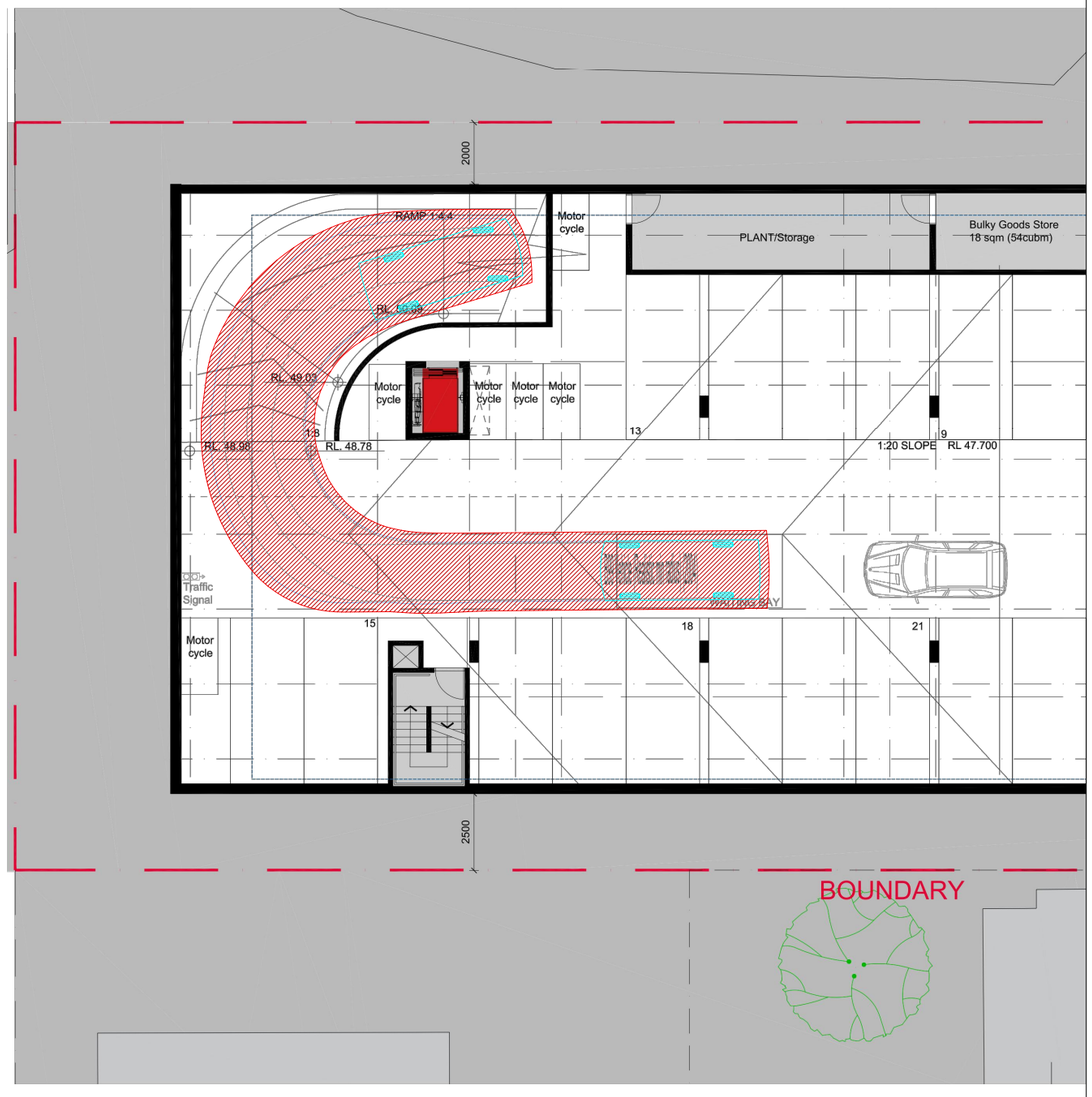
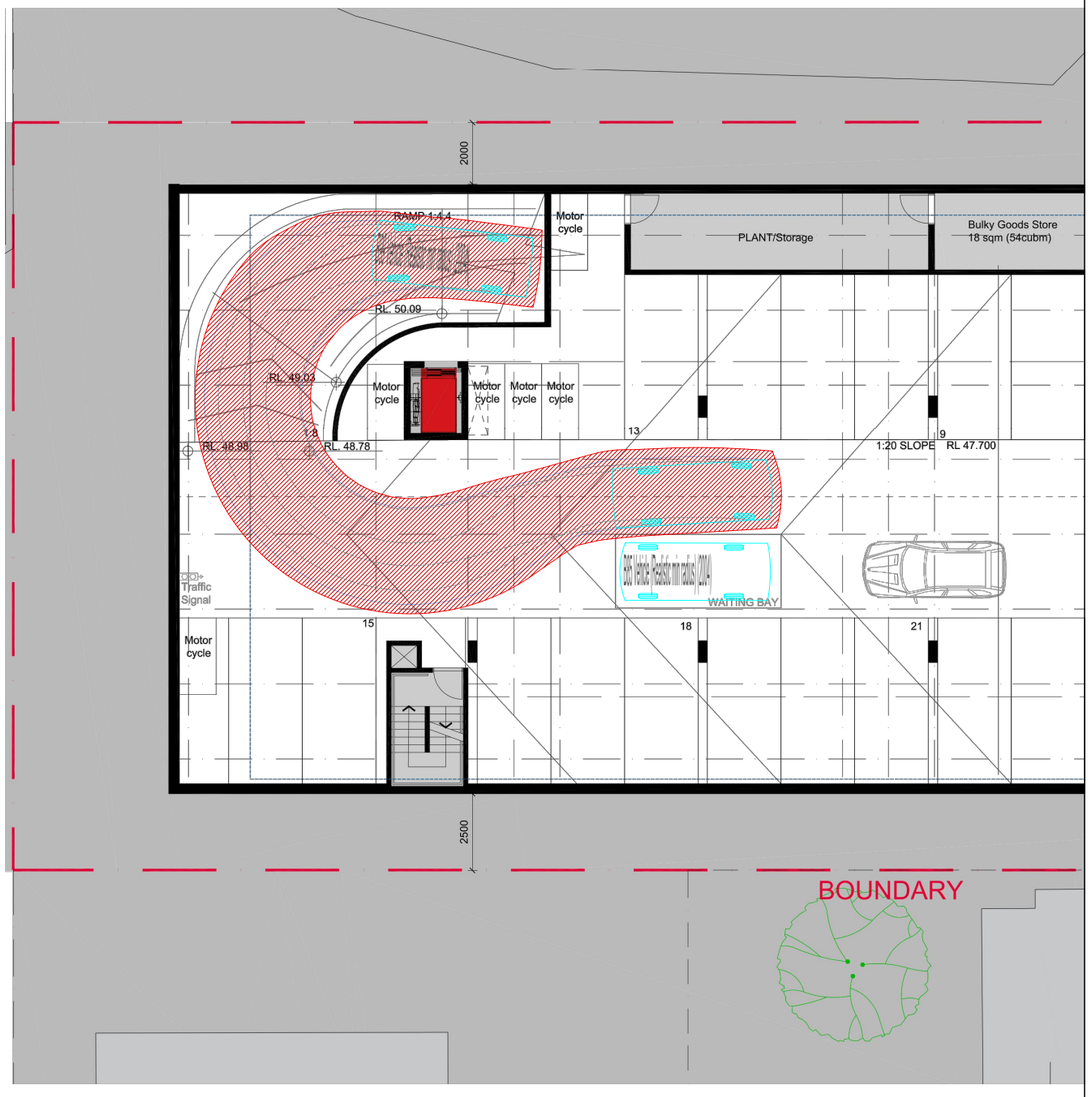
t: +61 2 7900 6514
w: www.pdcconsultants.com.au
ABN: 70 615 064 670


| | | | |
|---|---|---|---|
| Architect: Modularium | Project: 195-197 Sydney Road, Fairlight | Drawing Title: Level 00 Plan<br>B99 Design Vehicle Swept Path Analysis<br>Site Entry / Exit Movements | Drawing No.: 002 |
| | | | Revision No.: - |
| | | | Drawn By: JB |
| | | | Date: 12/10/2018 |
| Client: Micronest Pty Ltd | Project No: 0071 | Sheet Status: NOT FOR CONSTRUCTION | Scale: 1:250 @ A3 |

0m 2 4 6 8




| No. | Date | Description |
|---|---|---|
| | | |

**Swept Path Key**

- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

North: N


Drawing Prepared By

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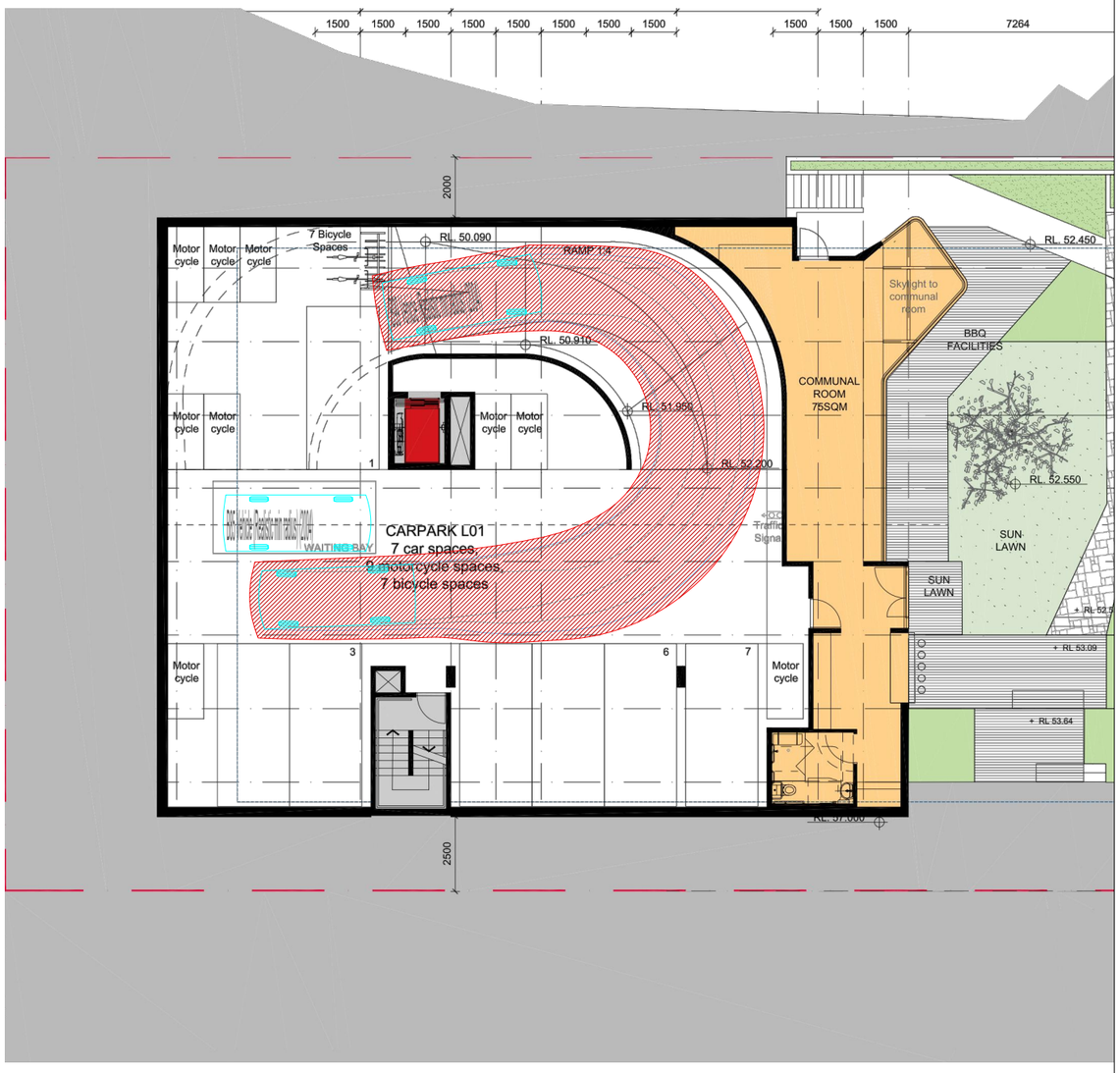
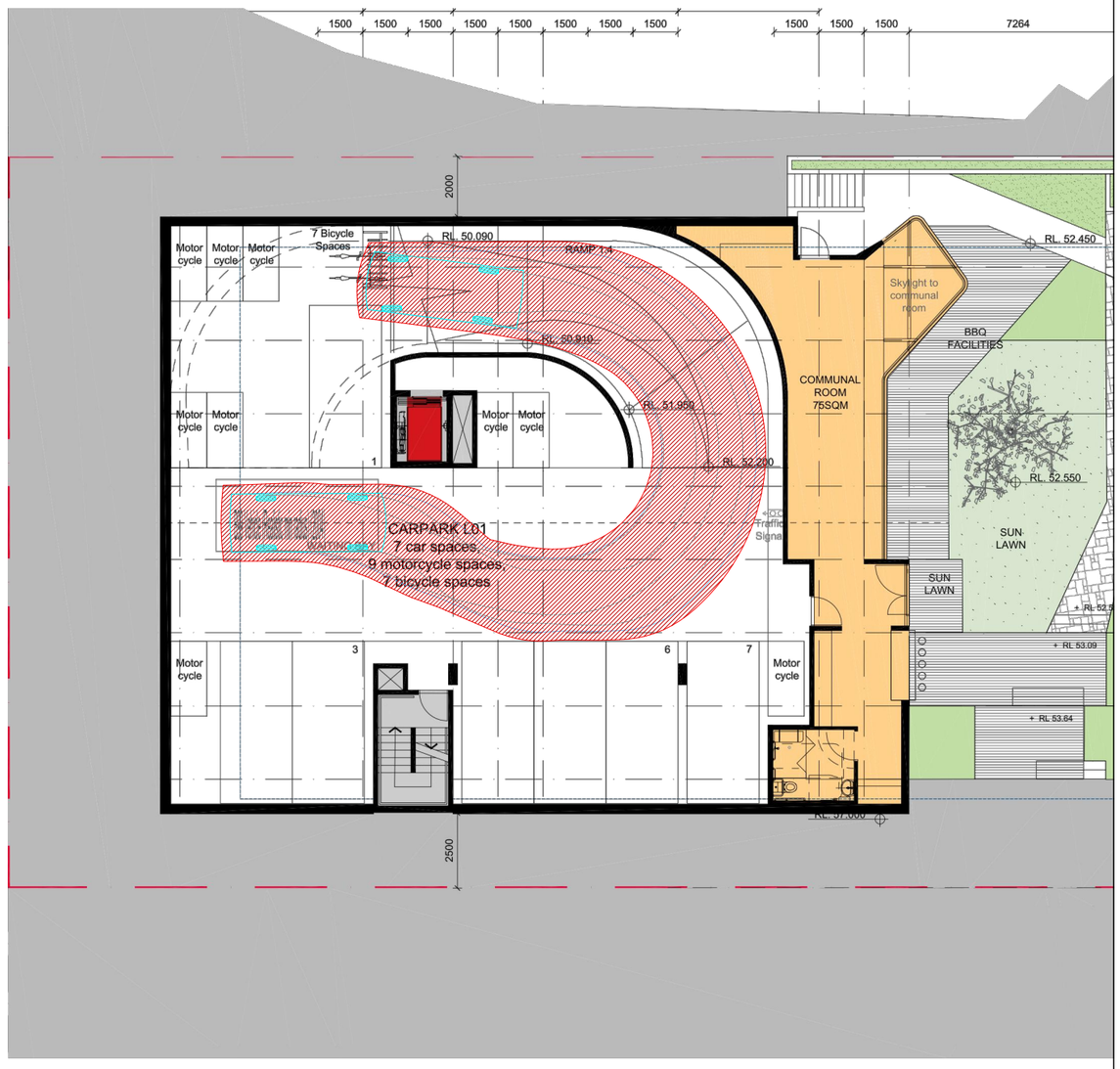
| | | | | |
|---|---|---|---|---|
| Architect: Modularium | Project: 195-197 Sydney Road, Fairlight | Drawing Title: Level 00 Plan<br>B99 Design Vehicle Swept Path Analysis<br>Basement Circulation (1 of 2) | Drawing No.: 003 | Revision No.: - |
| | | | Drawn By: JB | Date: 12/10/2018 |
| Client: Micronest Pty Ltd | Project No: 0071 | Sheet Status: NOT FOR CONSTRUCTION | Scale: 1:200 @ A3 | |

0m 2 4 6 8




| No. | Date | Description |
|---|---|---|
| | | |

**Swept Path Key**

- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

North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| | | | |
|---|---|---|---|
| Architect: Modularium | Project: 195-197 Sydney Road, Fairlight | Drawing Title: Level 01 Plan<br>B99 Design Vehicle Swept Path Analysis<br>Basement Circulation (2 of 2) | Drawing No.: 004 / Revision No.: - |
| Client: Micronest Pty Ltd | Project No: 0071 | Sheet Status: NOT FOR CONSTRUCTION | Drawn By: JB / Date: 12/10/2018 |
| | | | Scale: 1:200 @ A3 (0m 2 4 6 8) |