TRAFFIC AND PARKING IMPACT ASSESSMENT OF THE PROPOSED WARRIEWOOD RESIDENTIAL SUBDIVISION AT 120 MONA VALE ROAD, WARRIEWOOD

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Development Type: **Warriewood Residential Subdivision**

Site Address: **120 Mona Vale Road, Warriewood**

Prepared for: **Opera Properties Pty Ltd**

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1 INTRODUCTION

M^{C}Laren Traffic Engineering was commissioned by *Opera Properties Pty Ltd* to provide a traffic and parking impact assessment of the proposed Warriewood Residential Subdivision at 120 Mona Vale Road, Warriewood as depicted in **Annexure A**.

1.1 Description and Scale of Development

The proposed development has the following characteristics relevant to traffic and parking:

- Subdivision of land into a 63-lot residential subdivision;
- Demolition of existing structures;
- Construction of three (3) public roads;
- Upgrades to Boundary Street, which fronts the eastern boundary of the site;
- A new local road connection between Jubilee Avenue and Boundary Street.
- Emergency vehicle access to Mona Vale Road at the western end of the site (not Boundary Street).

1.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

The proposed development does not qualify as a traffic generating development with relevant size and/or capacity under *Clause 2.122* of the *SEPP (Transport and Infrastructure) 2021,* as the proposal includes the subdivision of less than 200 or more allotments with no direct access to (or access within 90m of) a classified road. Accordingly, a formal referral to Transport for NSW (TfNSW) is not necessary, and the application can be assessed by the Northern Beaches Council only. It is noted that under Schedule 2, Column 2 that the subject DA proposes less than 200 dwellings and therefore does not trigger TfNSW concurrence.

The proposed development has frontage to a classified road and, therefore, qualifies as such concerning *Clause 2.119 of SEPP (Transport and Infrastructure) 2021*. The development, therefore, must satisfy that:

> *(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.*
>
> *(ii) the emission of smoke or dust from the development*
>
> *(iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land.*

The proposed development has frontage to Mona Vale Road, a TfNSW Classified Main Road (MR) (No. 162); accordingly, Northern Beaches Council must be satisfied that the development meets the above criteria. Further assessment in relation to *Clause 2.119* of the SEPP is detailed in **Section 5.5**.

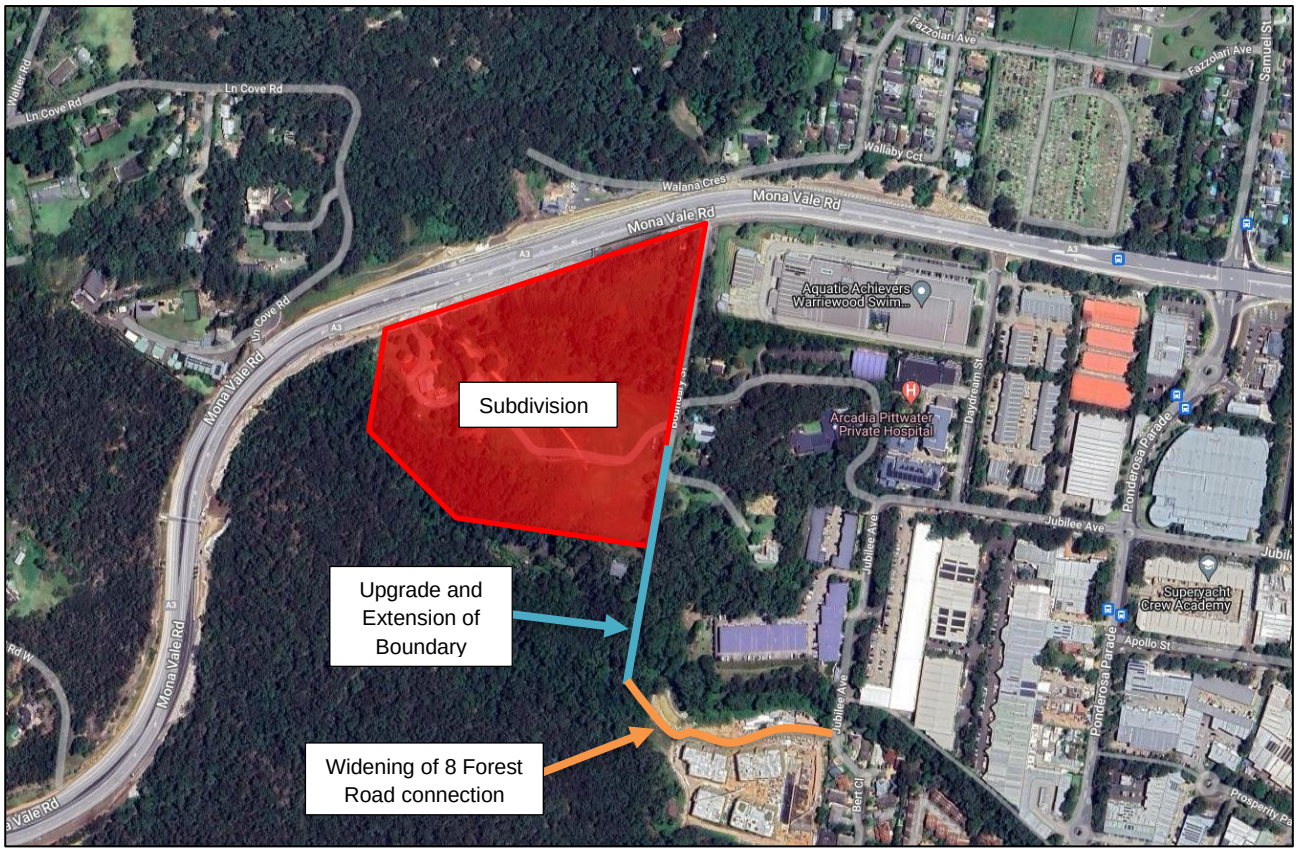
1.3 Site Description

The subject site includes three (3) lots legally identified as Lot 3/DP124602, Lot 4/DP124602 and Lot 5/DP124602. The subject site is currently zoned *R2 – Low Density Residential* and *C4 – Environmental Living* under the *Pittwater Local Environmental Plan 2014.*

The proposed residential lots will be erected within Lot 5 DP124602. The subject site has frontages to Mona Vale Road to the north and Boundary Street to the east. The site is immediately adjacent to environmental land to the south and north and industrial developments to the west, which contain Arcadia Pittwater Private Hospital and Pittwater Uniting Church. Further away from the site, there are residential developments to the east, west and north-west.

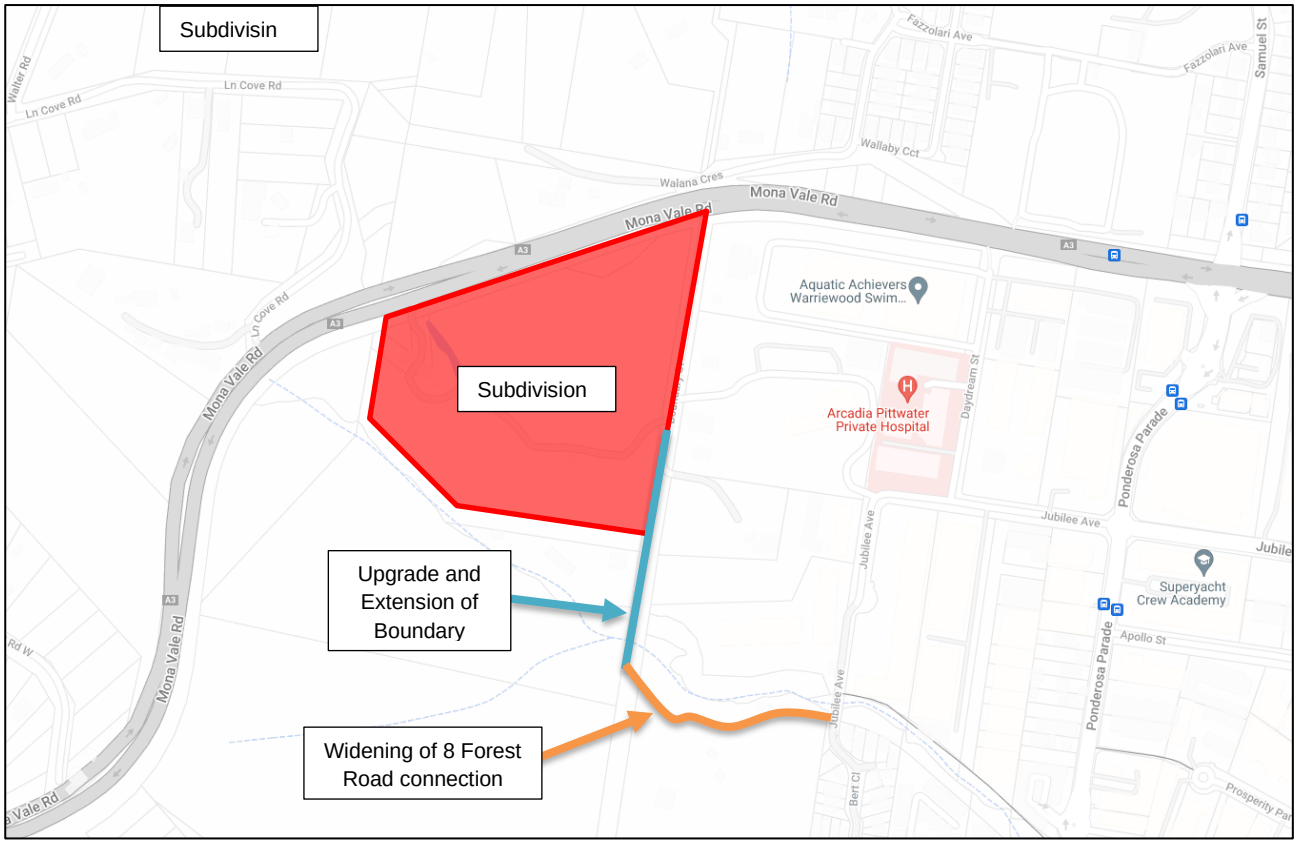
1.4 Site Context

The location of the site is shown on an aerial photo and a street map in **Figure 1** and **Figure 2** respectively.



Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

2 EXISTING TRAFFIC AND PARKING CONDITIONS

2.1 Road Hierarchy

The road network servicing the site has characteristics as described in the following sub-sections.

2.1.1 Mona Vale Road

- TfNSW Classified Main Road (No. 162);
- Generally, 20m wide carriageway with two (2) traffic flow lanes in each direction separated by a concrete barrier or physical median;
- From 250m west of Ponderosa Parade, 80km/h in both directions;
- From 250m west of Ponderosa Parade, 60km/h in both directions;
- Kerbside parking is not permitted along either side of the road.

2.1.2 Boundary Street

- Unclassified LOCAL Road;
- Approximately 4m wide carriageway facilitating single lane traffic flow between unsealed road shoulders;
- No speed limit signposted – default 50km/h speed limit applies;
- Parking on the verge is not strictly permitted on either side of the road:
    - However, parking on the verge may occur where the road verge permits.

2.1.3 Ponderosa Parade

- Unclassified COLLECTOR Road;
- Generally, 13m wide carriageway facilitating one (1) traffic flow lane in each direction and kerbside parking on both sides of the road;
- Unrestricted kerbside parking permitted along the eastern side of the road;
- Restricted “1/4P” and “4P” parking restrictions along the western side of the road.

2.1.4 Jubilee Avenue (Road)

- Unclassified LOCAL Road;
- Approximately 12m wide carriageway facilitating two-way traffic flow and kerbside parking;
- No speed limit signposted – default 50km/h speed limit applies;
- Generally, unrestricted kerbside parking is permitted on both sides of the road.

2.1.5 Jubilee Avenue (Access Road)

- Unclassified Access Road;
- Approximately 6m wide carriageway facilitating two-way traffic flow;
- No formal speed limit signposted – default 50km/h speed limit applies;
    - However, 20km/h signposted speed limit (unknown whether this is endorsed by Council);
- No kerbside parking is permitted on either sides of the road.

2.1.6 Bert Close

- Unclassified LOCAL Private Road;
- Approximately 6m wide carriageway facilitating two-way traffic flow;
- Signposted 10km/h Shared Zone applies;
- Generally, unrestricted kerbside parking is permitted on both sides of the road, and parking occasionally occurs.

2.2 Existing Traffic Management

- Signalised intersection of Ponderosa Parade / Mona Vale Road / Samuel Street;
- Roundabout controlled intersection of Ponderosa Parade / Jubilee Avenue;
- Driveway-controlled access from Jubilee Avenue (Access Road) to Jubilee Road.
- Priority controlled intersection of Jubilee Avenue (Access Road) / Bert Close.

2.3 Existing Traffic Environment

Turning movement count traffic surveys were conducted at the intersections of Jubilee Avenue / Ponderosa Parade and Jubilee Avenue / Jubilee Avenue (Access Road) from 7:00AM to 9:30AM and 2:30PM to 6:00PM on Thursday 8 February 2024 representing a typical operating weekday. The full survey results are shown in **Annexure B** for reference.

2.3.1 Existing Road Performance

The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.1, **Table 1** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure C**.

TABLE 1: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.1)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE						
Jubilee Avenue /Ponderosa Parade	AM	0.76	10.1 (Worst: 17)	**A** (Worst: B)	Roundabout	UT from Ponderosa Parade (S)
	PM	0.77	10.5 (Worst: 21.3)	**A** (Worst: B)		UT from Jubilee Avenue (W)
Access Driveway / Jubilee Avenue[5]	AM	0.04	4.7 (Worst: 10.4)	**NA** (Worst: A)	Give Way	LT from Jubilee Avenue
	PM	0.05	3 (Worst: 10.5)	**NA** (Worst: A)		LT from Jubilee Avenue

Notes:

(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

(5) It is noted that much of the through traffic entering and exiting this intersection are construction vehicles for the development at 8 Forest Road. For a conservative estimate, these volumes have been kept within both intersections.

As shown, the relevant intersections are currently performing at a high level of efficiency, with an overall or worst movement Level of Service “A” conditions in both the AM & PM peak hour periods. The Level of Service “A” performance is characterised by low approach delays and spare capacity.

2.4 Public Transport

The subject site has access to the existing bus stop (ID: 210262) located approximately 900m walking distance to the east of site on Ponderosa Parade, the bus stop services existing bus routes 182 (Mona Vale to Narrabeen) provided by Keolis Downer Northern Beaches. In addition to this, north-east of the site on Mona Vale Road, existing bus stop (ID: 2103102) services existing bus routes 196 (Mona Vale to Gordon) and 197 (Mona Vale to Macquarie University via Gordon), both services are provided by CDC NSW.

The location of the site subject to the surrounding public transport network is shown in **Figure 3**.

Site Location

FIGURE 3: PUBLIC TRANSPORT NETWORK MAP

2.5 Future Road and Infrastructure Upgrades

2.5.1 Mona Vale Road Upgrades

The Mona Vale Road upgrade project between Manor Road and Foley Street by Transport for NSW has recently been completed and is now open to general traffic. This project provides two (2) traffic lanes in each direction along Mona Vale Road across the site's frontage, in addition to widened shoulders, median separation, and facilities for cyclists and pedestrians. Traffic signals have replaced the previous roundabout control at the intersection of Mona Vale Road with Ponderosa Parade. These traffic signals have provided significant benefits by providing increased capacity to accommodate growth as well as providing a much safer environment for pedestrians, cyclists and the vulnerable to cross all legs of this intersection.

2.5.2 8 Forest Road, Warriewood – Residential Subdivision

The residential development at 8 Forest Road (under application N0440/15 from the Northern Beaches Development Application tracker), is currently under construction. The subject development includes the construction of 66 apartments within 4 residential flat buildings, 14 dwellings in a multi-dwelling housing and the retention of the existing dwelling house. Access to the site will be made via Jubilee Avenue (Access Road) at Bert Close.

As this development will be completed and operated in the near future, the traffic impacts of this development have also been considered within this report traffic assessment, as outlined in **Section 5.2.**

3 SUBDIVISIONAL ROAD DESIGN

3.1 Design Standards

Reference is made to *Pittwater 21 Development Control Plan* (P21DCP) – *Section C – Part C6: Design Criteria for Warriewood Valley Release Area:*

> ***C6.4 The Road System and Pedestrian and Cyclist Network***
>
> ***Controls***
>
> ***The Road System***
>
> *…The road plans must comply with the relevant specifications and cross sections in Council's Warriewood Valley Roads Masterplan.*
>
> *In order to address these objectives and controls, the following road hierarchy is applicable:*
>
> - *Sub-Arterial streets are Ponderosa Parade, Macpherson St, Warriewood Road (East of Macpherson St), Garden Street and Boondah Road*
> - *Collector Streets are Foley Street, Jubilee Avenue, Vineyard Street, Orchard Street,Fern Creek Road, Daydream Street and any new road with traffic volumes 2,000 - 5,000 per day*
> - *Local Streets are located within the sectors servicing up to 2,000 vpd*
> - *Access Streets are located within sectors servicing up to 3,000 vpd*
> - *Access lanes are located within sectors servicing up to 100 vpd*
> - *Entry streets – for the primary entrance street to a Sector, Buffer Area or development site*

Further reference is made to the *Warriewood Valley Roads Masterplan 2018* which outlines the road design requirements, as summarised in **Table 2**.

TABLE 2: WARRIEWOOD VALLEY ROADS MASTERPLAN 2018

Street Type	Sub-Arterial	Collector Street	Local Street(1)	Access Street(2)	Laneway (3)	Sector Entry Street
Maximum Traffic Volume Per Day	10,000	5,000	2000	< 300	< 300	N/A
Design Speed	50km/h	50km/h	40km/h	30km/h	10km/h	50km/h
Speed Limit	50km/h	50km/h	50km/h	50km/h	10km/h Shared Zone	50km/h
Traffic Lane Width	4.2m	3.7m	Total 7.5m carriageway to cater for traffic, parking, cyclists	Total 7.5m carriageway to cater for traffic, parking, cyclists	5.5m	4.2m
Shared Path Width	2.1m – 2.5m shared path on both sides of the carriageway	2.1m shared path on both sides of the carriageway	N/A	N/A	N/A	N/A
Total Road Reserve Width	20m minimum	20m minimum	16.0m minimum	12.5m minimum	7m	Variable – refer to cross section
Verge Width	N/A	N/A	4.25m on both sides of carriageway	2.5m on both sides	0.75m on both sides	N/A

Notes:

(1) Maximum number of dwellings = 200.
(2) Maximum number of dwellings = 30.
(3) Maximum number of dwellings = 30 for two-way traffic lanes.

Road 01 and Road 02 within the proposed subdivision are best classified as Access Streets with New Boundary Road (NB Road) being best classified as a Local Street. These roads have been designed to satisfy the minimum road reserve widths and traffic lane widths in accordance with P21DCP requirements.

3.2 Sight Line Assessment

Reference is made to *AUSTROADS Guide to Road Design Part 4A: Unsignalised and Signalised Intersections – 3.2.2 Safe Intersection Sight Distance (SISD),* which outlines the following equation:

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

Where

SISD = safe intersection sight distance (m)

D_T = decision time (sec) = observation time (3 sec) + reaction time (sec) – refer to AGRD Part 3 (Austroads 2016b) for a guide to values

V = operating (85th percentile) speed (km/h)

d = coefficient of deceleration – refer to Table 3.3 and AGRD Part 3 for a guide to values

a = longitudinal grade in % (in direction of travel: positive for uphill grade, negative for downhill grade)

The parameters used to calculate the SISD applicable to the subject intersection are as follows:

- D_T = 5.0 seconds (as per AGRD Guidelines);
- V = 50km/h (design speed);
- d = 0.36 (as per AGRD Guideline);
- a = varies (see below).

As the longitudinal gradient varies on each approach to the relevant intersections, the SISD requirement at each intersection is calculated individually and summarised in **Table 3**.

TABLE 3: SISD CALCULATION

Intersection	Road	Approach	Approach Gradient (a)	Required SISD	Compliance (Yes / No)
Road 01 / NB Road	NB Road	Northbound	13.9%	89.2m	Yes
		Southbound	7.6%	92m	Yes
Road 02 / Road 01	Road 01	Eastbound	-21.6%	137m	No
		Westbound	0.6%	96.3m	Yes

The SISD requirements are achieved for all approaches except for the eastbound approach along Road 01, which is discussed in more detail below.

3.2.1 East Approach along Road 01

Due to the existing terrain conditions in this location, achieving strict compliance with the SISD requirements for a 50km/h design speed will be difficult.

In order to manage this, it is recommended that traffic calming mechanisms such as an oval threshold or slow chicane (i.e. lateral traffic calming device, not speed humps) be included in the detailed design plans along Road 01 prior to its intersection with Road 02. The selected traffic calming mechanism can be offset 48m from the intersection with Road 02, and with a design speed of 30km/h, vehicles will be able to achieve the minimum SISD to the intersection with Road 02. A minor adjustment to property boundaries of two lots at this corner would be required. **Figure 4** and **Figure 5,** demonstrates the horizontal and vertical SISD requirements for 30km/h traffic calming device, respectively.

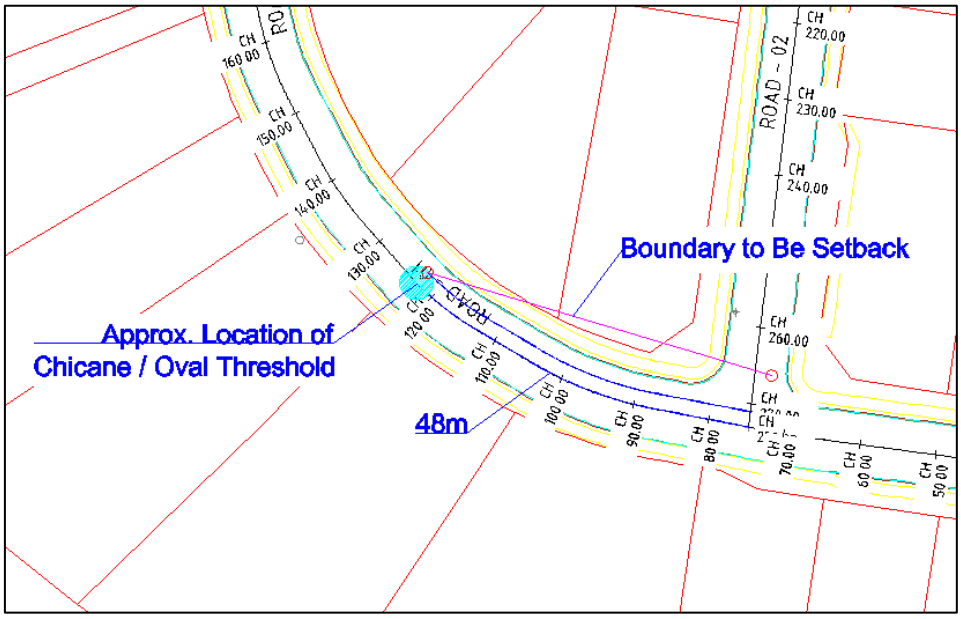


FIGURE 4: HORIZONTAL SISD PROFILE – WITH 30KM/H TRAFFIC CALMING DEVICE

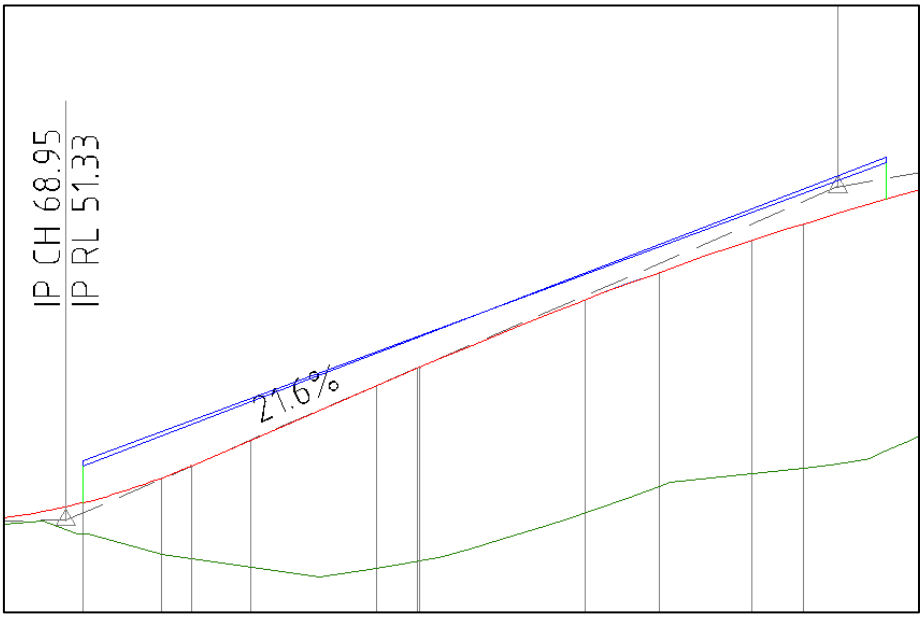


FIGURE 5: VERTICAL SISD PROFILE – WITH 30KM/H TRAFFIC CALMING DEVICE

3.3 Subdivision Recommendations

3.3.1 Double “BB” Lines

It is recommended that double “BB” lines be implemented at the curve adjoining Road 02 to “NB Road” to guide vehicles in opposite directions and prohibit kerbside parking on either side of the road where the “BB” lines are located. It is noted that it is illegal to park within 3m of double-white lines.

3.3.2 “No Parking” Signage

It is recommended that “No Parking” signage is implemented on the either side of the road along all approaches for the first 10m from an intersection.

3.4 Public Footpath Connection to Mona Vale Road via Boundary Street

A public footpath is to be detailed within Boundary Street, connecting the existing path (and stairs) along Mona Vale Road at the Boundary Street junction with the proposed 63-lot residential subdivision. This connection should also include a separate ramp to provide an access link to the subdivision for cyclists and parents with strollers to the Mona Vale Road footpath.

3.5 Access via 8 Forest Road, Warriewood

Vehicular access to the proposed residential subdivision will occur through an extension of Boundary Street to the south to connect to the rear of 8 Forest Road, Warriewood. This road will connect to the internal roads within the approved 8 Forest Road development.

As part of this connection, the internal roadway within the 8 Forest Road, Warriewood site, will be widened to achieve an 8m wide sealed carriageway. Preparations have been made (stormwater, civil, etc.) to allow the seamless widening of this internal road without significant impacts on the 8 Forest Road property.

Attached in **Annexure D** is a concept of the proposed widening of this access road, including swept path testing of this access. In **Annexure E**, a letter from *Warren Smith Consulting Engineers* dated 20 August 2024 is provided, indicating that the widened roadway surface will not impact the current designs of the stormwater basins.

4 PARKING ASSESSMENT

4.1 Council Parking Requirement

Reference is made to the P21DCP, which designates the following parking rates applicable to the proposed development:

> ***B6.3 Off-Street Vehicle Parking Requirements***
>
> *Controls*
>
> | ***Number of bedrooms per dwelling but not a secondary dwelling*** | ***Parking requirements per dwelling*** |
> |---|---|
> | *1 bedroom* | *1 space* |
> | *2 bedrooms or more* | *2 spaces* |
>
> *For a Secondary Dwelling a minimum of 1 space is required in addition to existing requirement for the principal dwelling (based on number of bedrooms in principal dwelling).*

The floor plans of each individual lot have not been produced, as this DA is simply for a subdivision. It is typical that each individual lot will submit an application to the Council, which will determine the specific car parking requirements. In any case, it is expected that the car parking requirements of P21DCP can be satisfied by each lot within the development.

4.2 Parking for People with Disabilities

It is expected that the accessible car parking requirements can be determined during the development application stage of each individual lot, as required.

4.3 Planning for Bushfire Protection 2019

The proposed subdivision is located within an area of Bushfire Prone Land such that the requirements within the *NSW Rural Fire Service's Planning for Bush Fire Protection 2019* are applicable to the site. An extract from *Planning for Bush Fire Protection 2019* (PBP) relevant to access road requirements for rural/residential subdivisions within Asset Protection Zones (APZ) is reproduced, as shown in **Figure 6**.

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	The intent may be achieved where:	
PERIMETER ROADS	› access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	› are two-way sealed roads; › minimum 8m carriageway width kerb to kerb; › parking is provided outside of the carriageway width; › hydrants are located clear of parking areas; › are through roads, and these are linked to the internal road system at an interval of no greater than 500m; › curves of roads have a minimum inner radius of 6m; › the maximum grade road is 15 degrees and average grade of not more than 10 degrees; › the road crossfall does not exceed 3 degrees; and › a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

FIGURE 6: PBD TABLE 5.3B EXTRACT

It is recommended that any circulation roads located within an APZ comply with the above requirements and are signposted with “No Parking” restrictions on either side of the carriageway.

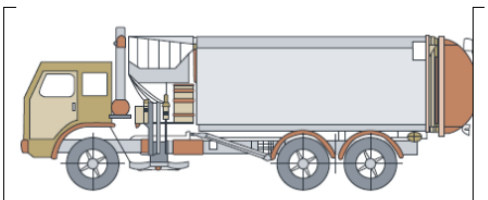
To assess the ability of a general fire appliance to utilise the proposed turning bay and circulating roads, swept path testing of a general fire applicant (MRV) has been undertaken, with results reproduced in **Annexure F**. The swept path results indicate that a general fire appliance can turn around using the turning bulb within three (3) manoeuvres which is the most convenient number of manoeuvres for the proposed turning head type. It is noted that a 12.5m long HRV has also been tested and can also turn around within the turning bulb within three (3) manoeuvres, which covers the requirements for a specialist fire appliance. Therefore, the turning head facilities at the end of Road 01 and all roads within the subdivision are considered acceptable for fire brigade access.

4.4 Servicing & Loading

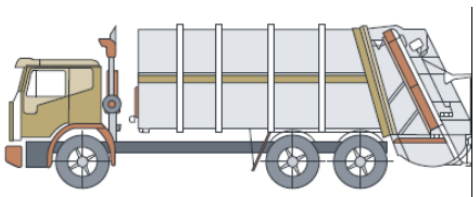
The P21DCP does not outline specific loading and servicing requirements applicable to the subject subdivision. Instead, the P21DCP states “*all development that is, or includes, demolition and/or construction, must comply with the appropriate sections of the Waste Management Guidelines…”*.

As such, further reference is made to *Northern Beaches Council – Waste Management Guidelines* which provides specifications for Council’s waste collection vehicle, as shown in **Figure 7**.

Collection Vehicle Specifications



Heavy rigid side arm compaction vehicle



Heavy rigid rear loader compaction vehicle

Photo sourced: from: Better Practice Guide for Waste Management in Multi-unit Dwellings, Department of Environment and Climate Change NSW 2008.

Vehicle	Length	Width	Service height	Travel height	Weight	Turning Circle
Council’s waste vehicle	9.7m	2.5m	4.5m	3.9m	22.5t	19m

FIGURE 7: NORTHERN BEACHES COUNCIL WASTE COLLECTION VEHICLE

Waste collection is expected to be undertaken utilising the proposed roads of the subdivision. Any specific servicing and loading requirements for individual lots can be determined during the development application process. Swept path tests have been undertaken of a 12.5m length Heavy Rigid Vehicle (HRV), demonstrating successful circulation of the internal roadways with results presented in **Annexure F.**

4.5 Treatment at the end of Jubilee Street

The proposed development seeks access via 8 Forest Road and the existing Jubilee Avenue Access Road, which extends from the end of Jubilee Avenue, where a current turning bulb is present. Multiple large industrial/commercial estates have direct access to this turning bulb, in addition to the existing Jubilee Avenue Access Road, which serves Bert Close, 8 Forest Road, and the proposed 120 Mona Vale Road. As such there is an increase in the number of opposing vehicle conflicts at the existing turning bulb caused by drivers turning in and out of multiple different driveways, as shown below in **Figure 8.**

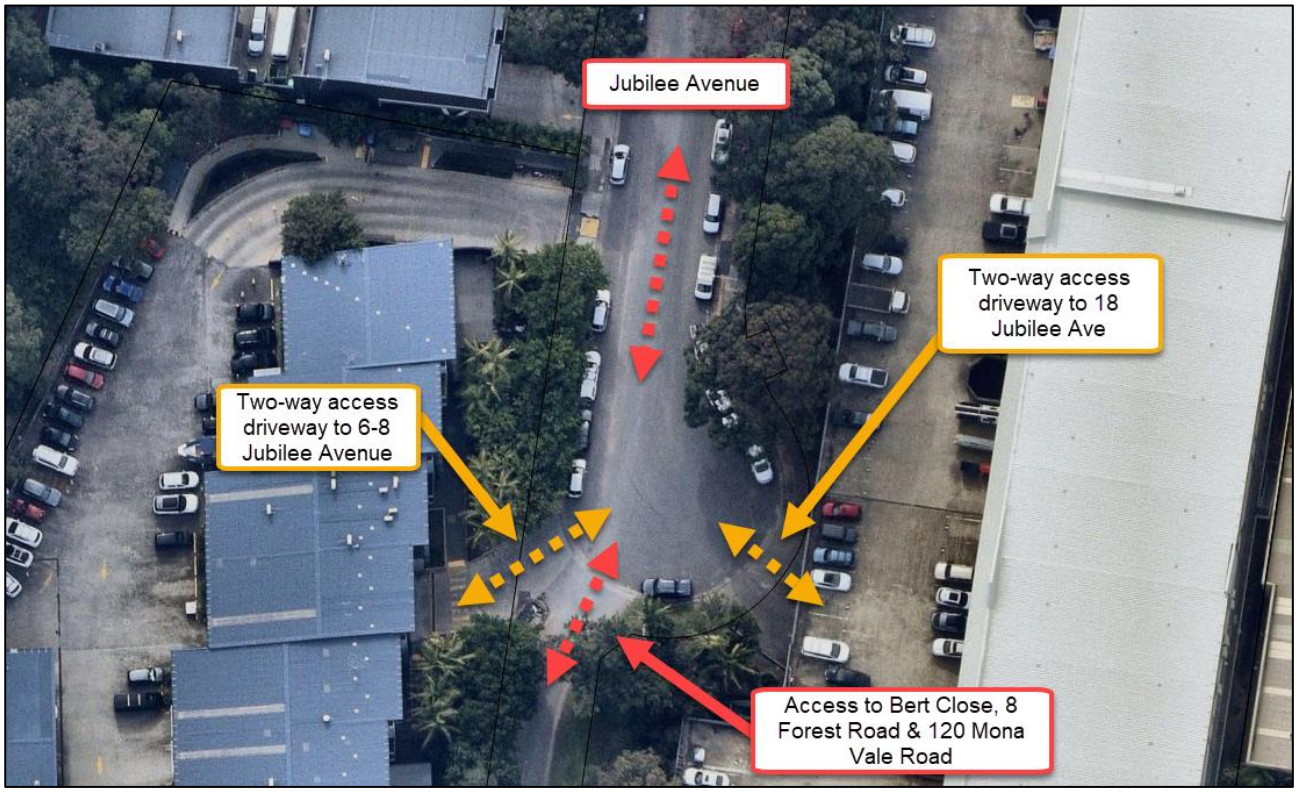


FIGURE 8: CONFLICTS AT END OF JUBILEE AVENUE

In order to manage these conflicts it is recommended that this turning bulb is upgraded to include a small roundabout to control the priority of vehicles entering and exiting driveways and to also slow through traffic to/from the Jubilee Avenue Access Roadway, as the requirement to give-way to other vehicles on the road will be formalised.

A concept of this potential roundabout termination treatment is provided in **Annexure G**. SIDRA testing of this arrangement has been conducted in **Section 5.4** of this report.

5 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections.

5.1 Traffic Generation

Traffic generation rates for the subject land uses are provided in the *Guide to Traffic Generating Developments Technical Direction (TDT 2013/04a)* as adopted by Transport for NSW (TfNSW) and are as follows:

> ***Low density residential dwellings***
>
> *Daily vehicle trips = 10.7 per dwelling in Sydney, 7.4 per dwelling in regional areas*
>
> *Weekday average evening peak hour vehicle trips = 0.99 per dwelling in Sydney (maximum 1.39), 0.78 per dwelling in regional areas (maximum 0.90)*
>
> *Weekday average morning peak hour vehicle trips = 0.95 per dwelling in Sydney (maximum 1.32), 0.71 per dwelling in regional areas (maximum 0.85)*

TABLE 4: ESTIMATED TRAFFIC GENERATION

Use	Scale	Peak	Generation Rate	Trips[(1)]
Low Density Residential	63 Dwellings	AM	0.95 trips per dwelling	60 trips (12 in, 48 out)
		PM	0.99 trips per dwelling	62 trips (50 in, 12 out)

Notes:
(1) 20% inbound and 80% outbound assumed for the AM peak periods and vice versa for the PM peak period.

As shown, the expected traffic generation associated with the proposed development categorised in 'Sydney' is in the order of **60** vehicle trips in the AM peak period (12 in, 48 out) and **62** vehicle trips in the PM peak period (50 in, 12 out).

5.2 8 Forest Road Traffic Generation

As previously mentioned in **Section 2.5.2**, the 81-dwelling residential development at 8 Forest Road is currently under construction. As such, it is appropriate to consider the cumulative traffic impacts of both developments. Reference is made to *8 Forest Rd, Warriewood Proposed Residential Development, (N0440/15) – S4.56 Traffic and Parking Review* written *by MLA Transport Planning* which estimates the traffic generation for the 8 Forest Road development as approximately 46 to 52 two-way trips during a peak hour. The resulting traffic generation from both developments is summarised in **Table 5**.

TABLE 5: 8 FOREST ROAD TRAFFIC GENERATION

Use	Scale	Peak	Generation Rate	Trips[(1)]
Proposed Development				
Low Density Residential	63 Dwellings	AM	0.95 trips per dwelling	60 trips (12 in, 48 out)
		PM	0.99 trips per dwelling	62 trips (50 in, 12 out)
8 Forest Road, Warriewood				
Residential Development	81 Dwellings	AM	*MLA Transport Planning Report*	52 (10 in, 42 out)
		PM	*MLA Transport Planning Report*	52 (42 in, 10 out)
Total	**-**	**AM**	**-**	**112 trips (22 in, 90 out)**
		PM		**114 trips (92 in, 22 out)**

Notes:

(1) 20% inbound and 80% outbound are assumed for the AM peak periods and vice versa for the PM peak period.

As shown, the resulting traffic generation associated with both developments is in the order of **112** trips (22 in, 90 out) during the AM peak hour period and **114** trips (92 in, 22 out) during the PM peak hour period.

5.3 Traffic Assignment

The road network, traffic surveys and locations of residential areas surrounding the site have been assessed and the following traffic assignment has been assumed for all traffic to and from the site:

- 60% to/from the north and west via Ponderosa Parade (N);
- 10% to/from the east via Jubilee Avenue (E);
- 30% to/from the south via Ponderosa Parade (S)

For the purposes of this assessment, the development at 8 Forest Road is assumed to follow the same traffic assignment.

5.4 Traffic Impact

The traffic generation outlined in **Section 5.1, 5.2 5.3** above has been added to the existing traffic volumes recorded. SIDRA INTERSECTION 9.1 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 6**.

TABLE 6: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.1)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE						
Jubilee Avenue /Ponderosa Parade	AM	0.76	10.1 (Worst: 17)	**A** (Worst: B)	Roundabout	UT from Ponderosa Parade (S)
	PM	0.77	10.5 (Worst: 12.9)	**A** (Worst: B)		UT from Jubilee Avenue (W)
Access Driveway /Jubilee Avenue	AM	0.04	4.7 (Worst: 10.4)	**NA** (Worst: A)	Give Way	LT from Jubilee Avenue (S)
	PM	0.05	3 (Worst: 10.5)	**NA** (Worst: A)		LT from Jubilee Avenue (S)
FUTURE (PRE-DEVELOPMENT) PERFORMANCE – EXISTING + 8 Forest Road						
Jubilee Avenue /Ponderosa Parade	AM	0.77	10.5 (Worst: 17.6)	**A** (Worst: B)	Roundabout	UT from Jubilee Avenue (E)
	PM	0.78	11.1 (Worst: 22.2)	**A** (Worst: B)		UT from Jubilee Avenue (W)
Access Driveway /Jubilee Avenue[5]	AM	0.05	3.3 (Worst: 10.4)	**NA** (Worst: A)	Give Way	LT from Jubilee Avenue (S)
	PM	0.07	2.2 (Worst: 10.6)	**NA** (Worst: A)		LT from Jubilee Avenue (S)
Access Driveway /Jubilee Avenue[6]	AM	0.06	5.5 (Worst: 12.9)	**A** (Worst: A)	Roundabout	RT from Jubilee Avenue (S)
	PM	0.08	4.3 (Worst: 13)	**A** (Worst: A)		RT from Jubilee Avenue (S)
FUTURE (POST-DEVELOPMENT) PERFORMANCE – EXISTING + 8 Forest Road + 120 MVR						
Jubilee Avenue /Ponderosa Parade	AM	0.78	11.2 (Worst: 18.7)	**A** (Worst: B)	Roundabout	UT from Jubilee Avenue (E)
	PM	0.81	12 (Worst: 23.5)	**A** (Worst: B)		UT from Jubilee Avenue (W)
Access Driveway /Jubilee Avenue[5]	AM	0.06	2.5 (Worst: 10.4)	**NA** (Worst: A)	Give Way	LT from Jubilee Avenue (S)
	PM	0.10	1.7 (Worst: 10.8)	**NA** (Worst: A)		LT from Jubilee Avenue (S)
Access Driveway /Jubilee Avenue[6]	AM	0.09	5.4 (Worst: 12.9)	**A** (Worst: A)	Roundabout	RT from Jubilee Avenue (S)
	PM	0.11	4.5 (Worst: 13)	**A** (Worst: A)		RT from Jubilee Avenue (S)
FUTURE (POST-DEVELOPMENT) PERFORMANCE 2034 SCENARIO						
Jubilee Avenue / Ponderosa Parade	AM	0.88	13.8 (Worst: 23.2)	**A** (Worst: B)	Give Way	UT from Ponderosa Parade (S)
	PM	0.90	15.5 (Worst: 35.5)	**B** (Worst: C)		UT from Jubilee Avenue (W)

NOTES: See **Table 1** for notes 1 to 6 inclusive.

(6) Access Driveway / Jubilee Avenue cul-de-sac under roundabout control (see **Annexure G** for concept)

As shown, the intersections of Jubilee Avenue / Ponderosa Parade and Jubilee Avenue / Access Driveways will all retain the same overall level of service under future conditions with minimal delays and additional capacity, indicating that the proposed development will have no adverse impact on the existing road network.

It is noted that the performance of the Jubilee Avenue / Ponderosa Parade intersection has also been tested under a 2034 scenario (with 10-year background traffic growth). After 10 years, the intersection operates at a Level of Service "A" or "B', indicating minimal delays and additional capacity even after 10 years. The end of Jubilee Avenue still operates efficiently if a roundabout is installed to control vehicle priorities, still operating at a level of service "A", indicating minimal delays and additional capacity.

5.5 SEPP (Transport and Infrastructure) 2021 Clause 2.119

The proposed development has frontage to Mona Vale Road, a TfNSW classified road (No. 162) and as such an assessment against the criteria in *Clause 2.119 of SEPP (Transport and Infrastructure)* is presented below. The relevant items raised in Clause 2.119 are presented below (italicised) with MTE response thereafter.

> *(a) where practicable and safe, vehicular access to the land is provided by a road other than the classified road, and*

MTE Response: The subject proposal does not seek access via Mona Vale Road and will achieve access to Boundary Street with an extension to Jubilee Avenue via 8 Forest Road.

> *(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.

MTE Response: There are not proposed new vehicle access points to Mona Vale Road proposed.

ii. the emission of smoke or dust from the development

MTE Response: For others to address.

iii. the nature, volume or frequency of vehicles using the classified road to gain access to the land.

MTE Response: Section 5 outlines the expected peak hour traffic generation and impact on the surrounding intersections. The traffic generation of the site will not have an adverse impact on the surrounding intersections.

5.6 Emergency Vehicle Access & Temporary Construction Vehicle Access

Direct emergency vehicle access via Mona Vale Road (MVR) to this subdivision under previous schemes was approved by TfNSW and would no doubt be endorsed by Fire & Rescue NSW and the NSW Rural Fire Service. The emergency vehicle access is proposed (subject to further detail) at the end of the site, where the design of the Mona Vale Road upgrade has included a vehicular access possible via the Mona Vale Road junction with Boundary Street.

The western direct emergency vehicular access via Mona Vale Road, which is expected to be gated and opened by emergency vehicles (fire, ambulance, police) personnel during emergencies only, can also be used for temporary construction vehicle access.

6 CONCLUSION

In view of the foregoing, the subject Warriewood Residential Subdivision proposal at 120 Mona Vale Road, Warriewood (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts. The following outcomes of this traffic and parking impact assessment are relevant to note:

a) The proposal includes the subdivision of 63-lots for residential use. Each lot has sufficient room to accommodate the DCP-required parking within each lot.

b) The proposed internal roads comply with the road design requirements of the Warriewood Valley Roads Masterplan 2018 for Access Streets and Local Streets.

c) A sightline assessment of all proposed intersections indicates that the required SISD is achieved for all approaches except for the north approach along Road 01.

d) Due to the natural landform, a resolution cannot be achieved by adjusting lot boundaries, and hence, it is recommended that a traffic calming device be installed on this approach to reduce approach speeds to 30km/h. The installation of such a device will achieve compliant SISD (for 30km/h) with minimal lot boundary adjustments.

e) The report recommends sections of Double “BB” Lines and “No Parking “ signage in some locations to benefit sightlines and improve road safety.

f) The internal road design has been tested for a 12.5m HRV (Waste Vehicle) and an 8.8m MRV (General Fire Appliance), with all proposed roads providing suitable access for these design and test vehicles.

g) Access to the site will be achieved via an extension of Boundary Street to reach 8 Forest Road, Warriewood. The internal road within the 8 Forest Road, Warriewood property will be widened as outlined in the concept plans in **Annexure D**. From 8 Forest, vehicles will connect to Jubilee Avenue, providing vehicular access to the remainder of the road network.

h) It is recommended that the end of Jubilee Avenue is treated with a roundabout to enforce priority and improve safety. A concept for this roundabout is provided in **Annexure G**.

i) No parking areas have been provided, and hence the plans have not been assessed by MTE against the relevant sections of *AS2890.1:2004*, *AS2890.2:2018* and *AS2890.6:2022* as a part of this traffic and parking impact assessment. Compliance of the development is to be undertaken during the development application stage of each individual lot.

j) The traffic generation of the proposed development has been estimated to be some **60** trips in the AM peak period (12 in, 48 out) and **62** trips in the PM peak period (50 in, 12 out). The cumulative impacts of this proposal and 8 Forest Road have also been considered. The cumulative impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.1, indicating that there will be no adverse impact to the performance of the intersections as a result of the generated traffic.

k) Emergency Vehicle Access and Temporary Construction Vehicle access is to be detailed with direct access to Mona Vale Road at the western end of the site.

l) A public footpath is to be detailed within Boundary Street, connecting the existing path (and stairs) along Mona Vale Road at the Boundary Street junction with the proposed 63-lot residential subdivision.

ANNEXURE A: PROPOSED SUBDIVISION PLANS
(9 SHEETS)

The contractor shall check and verify all work on site (including work by others) before commencing the landscape installation. Any discrepancies are to be reported to the Project Manager or Landscape Architect prior to commencing work. Do not scale this drawing. Any required dimensions not shown shall be referred to the Landscape Architect for confirmation.

Issue	Revision Description	Drawn	Check	Date
B	Issue for Coordination	JW	RS	27.08.2024
A	Issue for Coordination	JW	RS	19.08.2024

NOT FOR CONSTRUCTION

A1

Legend

- Property boundary
- Existing creek line
- 25m riparian corridor
- 50m buffer zone
- 29 BAL Line
- Minimum house plot (175 m²)
- Open space

Client
Kuatro

Project
120-122 Mona Vale Road,
Warriewood

SITE IMAGE
Level 1, 3-5 Baptist Street
Redfern NSW 2016
Australia

Tel: (61 2) 8332 5600
Fax: (61 2) 9698 2877
www.siteimage.com.au

Site Image (NSW) Pty Ltd
ABN 44 801 262 380

Landscape Architects

DEVELOPMENT APPLICATION

Drawing Name
Spatial Concept Plan

Scale 1:750 @ A1
0 3 6 12 18 30m
SHEET

Job Number	Drawing Number	Issue
SS24-5315	SP-001	B

N

MONA VALE ROAD

ROAD

STREET

PROPOSED ROAD

BOUNDARY

NARRABEEN CREEK

1
D.P. 383009

2
2572m²

3
2513m²

4
2500m²

5
3177m²
(2521m² EX. ROA)

6
1540m²

7
1290m²
1236m²
EX.HANDLE

8
1387m²
1210m²
EX.HANDLE

9
700m²

10
700.6m²

11
1209m²
1105m²
EX.HANDLE

12
1075m²
1002m²
EX.HANDLE

13
1194m²

14
1187m²

15
1211m²

16
1187m²

17
1163m²

18
1230m²

Pt.1
PROPOSED RESERVE

Pt.1
COMMUNITY PROPERTY

COMMUNITY PROPERTY LOT

2.5 WIDE

(A) PROPOSED EASEMENT TO DRAIN WATER 1.5 WIDE
(B) PROPOSED RIGHT OF ACCESS 6 WIDE AND VARIABLE
(B) PROPOSED EASEMENT TO DRAIN WATER 6 WIDE & VARIABLE
(B) PROPOSED EASEMENT FOR SERVICES 6 WIDE & VARIABLE

LAND PROPOSED TO BE ACQUIRED BY NORTHERN BEACHES COUNCIL

20
1020m²

19
943.9m²

21
520.2m²

22
520.3m²

23
520.3m²

24
520.4m²

25
520.5m²

26
520.5m²
33

27
526.1m²
33.02

28
517.7m²
28.98

29
558.6m²

30
585.4m²

31
521.8m²

32
524.1m²
34.94

33
524.3m²
34.94

34
524.4m²
34.96

35
524.5m²
34.96

36
524.5m²
34.97

37
500.2m²

38
500.5m²

39
500.3m²

40
928.8m²
(548.5m²)

41
500.4m²

42
641.2m²

43
721.9m²

44
658.6m²

45
596.8m²

46
505.3m²

47
534.3m²

48
515.1m²

49
954m²

50
845.1m²

51
1655m²
1464m²
(EX. HANDLE)

52
562.8m²

53
671.2m²

54
1311m²
1174m²
(EX. HANDLE)

55
1196m²

56
1013m²

57
1243m²
(1108m² EX. ROA)

58
1389m²
(1210m² EX. ROA)

59
1270m²
(1115m² EX. ROA)

60
553.7m²
503.5m²
(EX. ROA)

61
500.6m²

62
500.0m²

63
531.0m²
33.00

64
530.9m²
33.01

100
D.P. 1174851

10
D.P. 5055

2
D.P. 816070

PUBLIC ROAD CONNECTION THROUGH 8 FOREST ROAD

No.	AMENDMENT DESCRIPTION	BY	DATE
F	LOTS 2-5 ADJUSTED	R.S.	19/08/24
E	UPDATED FOR DA SUBMISSION	A.S.	15.08.24
D	LOT ADDED AND RESERVES REDUCED	S.W.	14.11.23
C	LOT 63 REMOVED AND LOTS 1-16 ADJUSTED	S.W.	13.11.23
B	ROAD 1 REMOVED	S.W.	31.05.16
A	FIRST ISSUE	J.G.	30.09.15

mepstead & ASSOCIATES
REGISTERED SURVEYORS AND DEVELOPMENT CONSULTANTS

Sydney
10/4 Central Avenue, Thornleigh N.S.W. 2120
Phone 02 9875 4500 **Fax** 02 9875 4833

Postal
PO BOX 208, Pennant Hills N.S.W. 1715

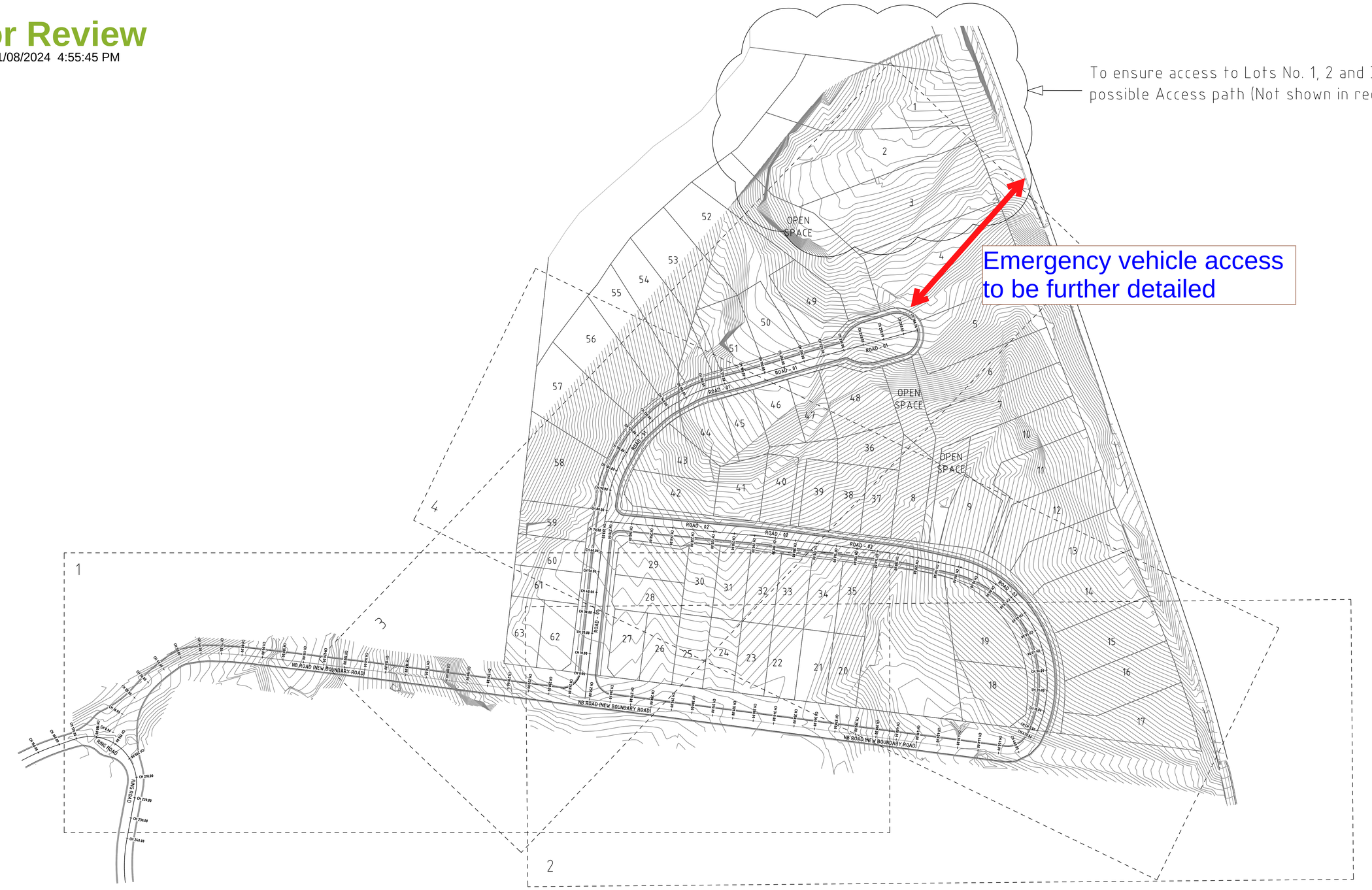
Internet
mepstead@mepstead.com.au
www.mepstead.com.au

Designed: S.W. | Scale: 1:800 | Principal: R. & S. MUSTACA | Drg. No. 4034 SUB1_F
Drawn: J.G. | Datum:MM | Project: PLAN OF PROPOSED SUBDIVISION OF LOTS 3, 4 & 5 D.P. 124602 | Sheet No. 1 of 1 sheets
Checked: S.W. | Date: 30.09.15 | KNOWN AS 120-122 MONA VALE ROAD, WARRIEWOOD | Our Ref: 4034
L.G.A: PITTWATER | A1

For Review
1/08/2024 4:55:45 PM

To ensure access to Lots No. 1, 2 and 3, we need to discuss possible Access path (Not shown in recent subdivision plans).

Emergency vehicle access to be further detailed



SITE LAYOUT

NOTES

1. This drawing should be reviewed in conjunction with DWG Nos. 301, 302, 303, and 304.

DRAFT DRAWING SET FOR DISCUSSION ONLY

00	ISSUED FOR DISCUSSION	HR	31.07.24

Architect
Work In Progress

Client

Engineer
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Project
120-122 MONA VALE ROAD, WARRIEWOOD NSW

Drawn	Designed	Approved
HN	HN	HR

Project No. S10479
Scale N.T.S
Title SITE LAYOUT
Drawing No. C300
Revision 0

Issued By	Checked By	Date
HR	HR	31-07-2024

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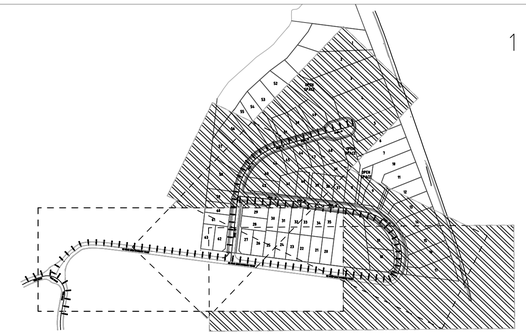
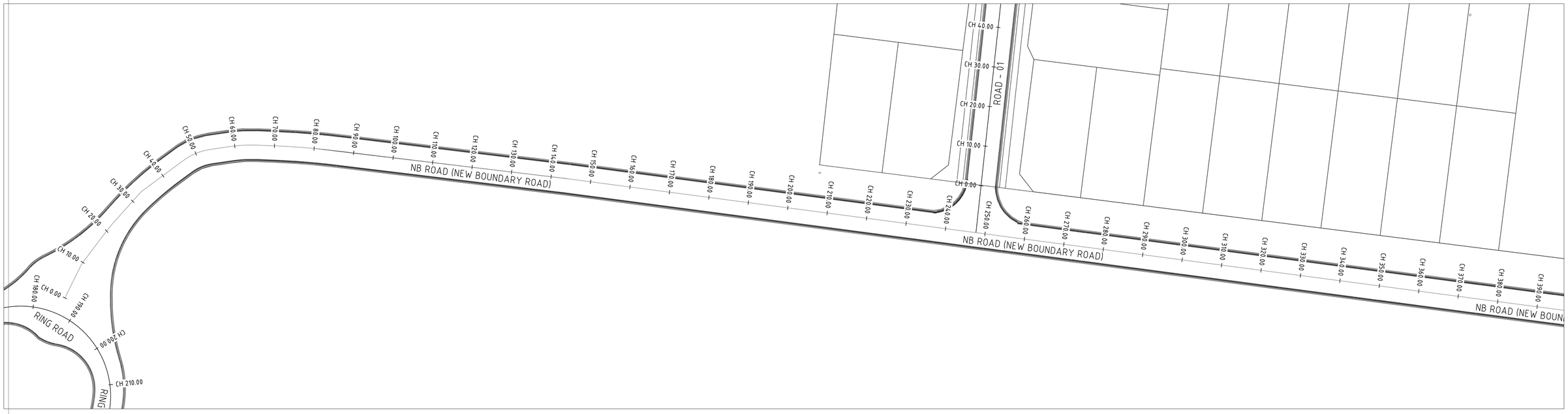


SITE KEY PLAN



PLAN VIEW - NEW BOUNDARY ROAD (Ch 0+000 TO Ch 0+373)

NOTES

1. This drawing should be reviewed in conjunction with DWG Nos. 305.

DRAFT DRAWING SET FOR DISCUSSION ONLY

00	ISSUED FOR DISCUSSION	HR	31.07.24

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Project
120-122 MONA VALE ROAD, WARRIEWOOD NSW

Title
PLAN - NB ROAD (Ch 0+000 TO Ch 0+373)

Drawn	Designed	Approved
HN	HN	HR

Project No.	Scale
S10479	N.T.S

Drawing No.	Revision
C301	0

Issued By	Checked By	Date
HR	HR	31-07-2024

Original sheet size A1 (841x594)

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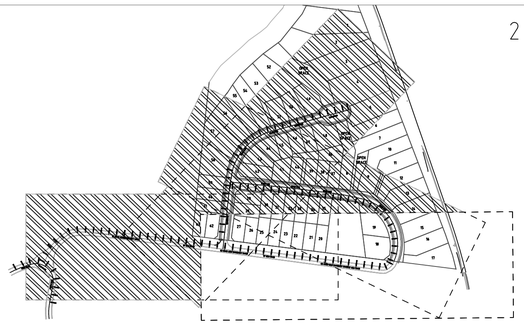

SITE KEY PLAN

PLAN VIEW - NEW BOUNDARY ROAD (Ch 0+373 TO Ch 0+474.239)

NOTES

1. This drawing should be reviewed in conjunction with DWG Nos. 305.

DRAFT DRAWING SET FOR DISCUSSION ONLY

00	ISSUED FOR DISCUSSION	HR	26.07.24

Architect

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Project	Drawn	Designed	Approved
120-122 MONA VALE ROAD, WARRIEWOOD NSW	HN	HN	HR
	Project No.	Scale	
	S10479	N.T.S	
Title	Drawing No.		Revision
PLAN - NB ROAD (Ch 0+373 TO 0+474.239)	C302		0
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	HR	HR	31-07-2024

Original sheet size A1 (841x594)

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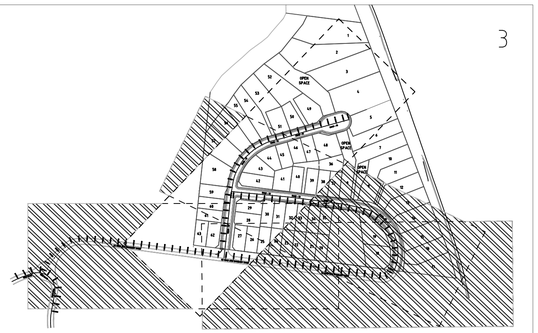
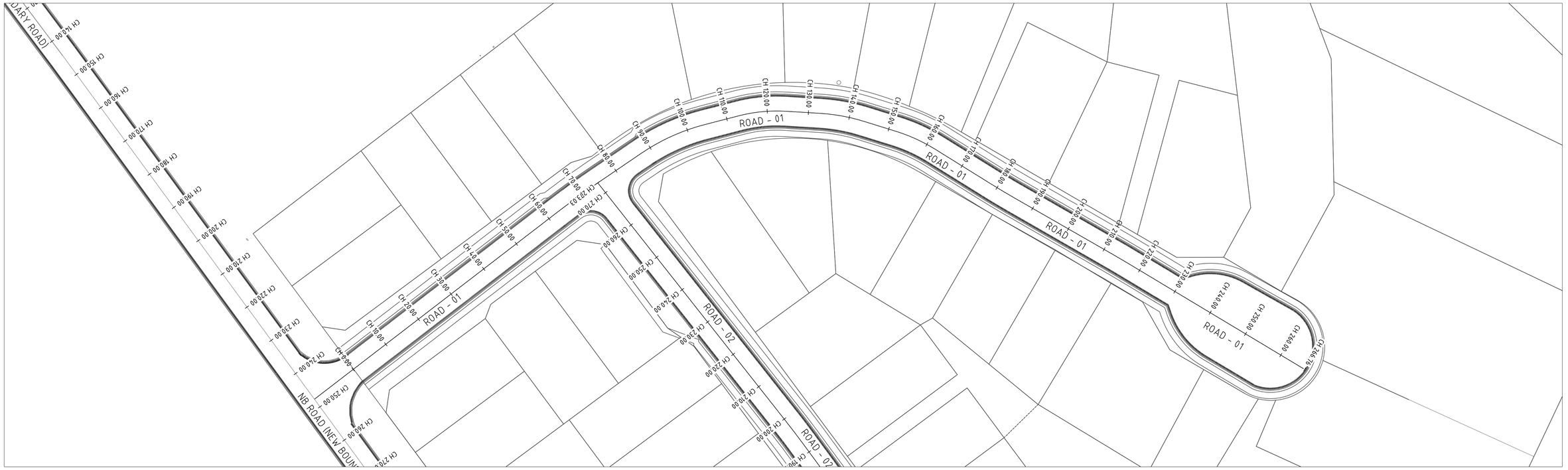


SITE KEY PLAN



PLAN VIEW - ROAD - 01

NOTES

1. This drawing should be reviewed in conjunction with DWG Nos. 306.

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00	ISSUED FOR DISCUSSION	HR	31.07.24

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Project	**Drawn**	**Designed**	**Approved**
120-122 MONA VALE ROAD, WARRIEWOOD NSW	HN	HN	HR
	Project No.	**Scale**	
	S10479	N.T.S	
Title	**Drawing No.**		**Revision**
PLAN VIEW - ROAD - 01	C303		0
	Issued By	**Checked By**	**Date**
	HR	HR	31-07-2024

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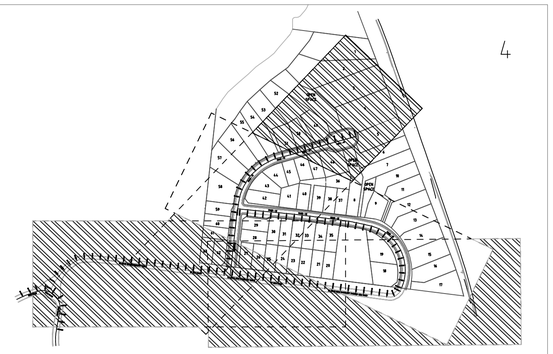

SITE KEY PLAN

PLAN VIEW - ROAD - 02

NOTES

1. This drawing should be reviewed in conjunction with DWG Nos. 306.

DRAFT DRAWING SET FOR DISCUSSION ONLY

00	ISSUED FOR DISCUSSION	HR	31.07.24

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Project
120-122 MONA VALE ROAD, WARRIEWOOD NSW

Title
PLAN VIEW - ROAD - 02

Drawn	Designed	Approved
HN	HN	HR

Project No.	Scale
S10479	N.T.S

Drawing No.	Revision
C304	0

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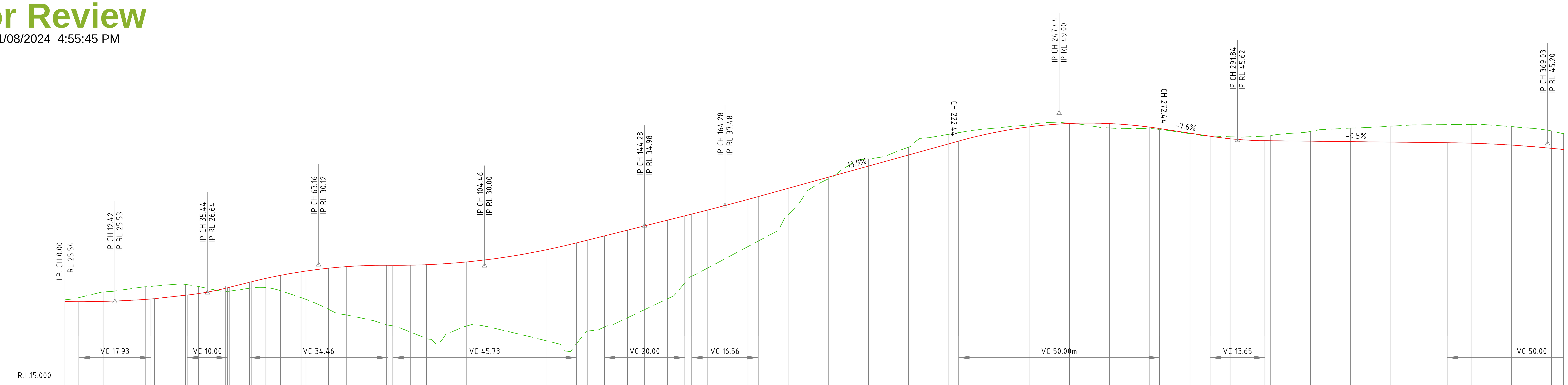
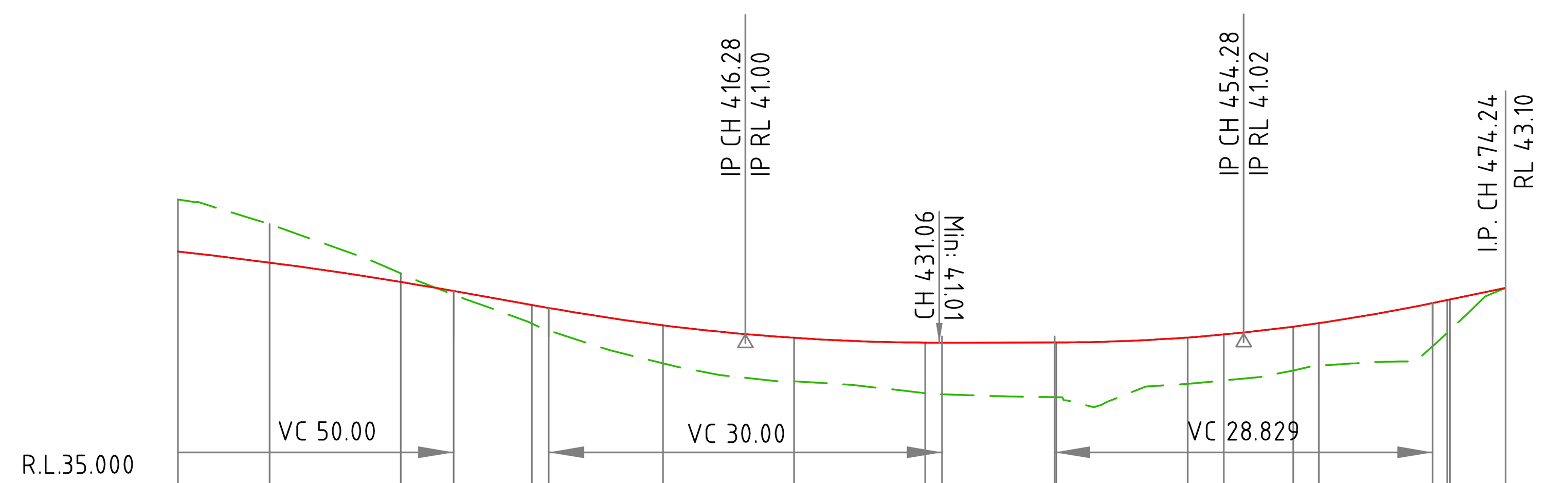


CHAINAGE	DESIGN LEVELS	EXISTING LEVELS	DEPTH
0.000	25.541	25.765	-0.224
3.459	25.539	26.036	-0.497
9.510	25.575	26.747	-1.172
10.000	25.581	26.763	-1.182
19.452	25.802	27.372	-1.570
20.000	25.821	27.392	-1.571
21.391	25.871	27.443	-1.572
21.414	25.872	27.444	-1.572
22.312	25.914	27.478	-1.564
30.000	26.338	27.682	-1.344
30.440	26.363	27.649	-1.286
33.258	26.546	27.421	-0.874
40.000	27.212	26.775	0.437
40.352	27.256	26.802	0.454
40.440	27.267	26.808	0.459
41.009	27.338	26.851	0.488
45.924	27.956	27.212	0.744
46.494	28.027	27.254	0.773
50.000	28.437	27.297	1.139
53.662	28.816	26.905	1.911
58.785	29.263	26.040	3.222
60.000	29.354	25.821	3.533
65.595	29.705	24.594	5.111
70.000	29.899	23.883	6.016
70.017	29.900	23.882	6.018
80.000	30.071	22.647	7.424
80.390	30.070	22.618	7.452
81.592	30.066	22.528	7.539
86.055	30.081	21.744	8.337
90.000	30.141	20.957	9.183
100.000	30.487	22.505	7.981
110.000	31.112	21.858	9.254
120.000	32.018	20.645	11.373
127.320	32.858	20.306	12.552
130.000	33.193	21.872	11.321
134.281	33.728	22.386	11.342
140.000	34.443	23.532	10.911
144.278	34.978	24.547	10.431
144.284	34.978	24.548	10.430
150.000	35.693	25.904	9.789
154.281	36.228	27.865	8.363
156.004	36.443	28.710	7.733
160.000	36.949	29.736	7.213
170.000	38.273	32.403	5.870
172.558	38.625	33.085	5.540
180.000	39.656	36.323	3.333
190.000	41.041	40.838	0.203
200.000	42.427	43.326	-0.899
210.000	43.812	44.778	-0.965
220.000	45.198	46.381	-1.183
222.441	45.536	46.585	-1.049
230.000	46.461	47.077	-0.616
240.000	47.307	47.586	-0.279
250.000	47.724	47.752	-0.027
260.000	47.712	47.164	0.548
270.000	47.270	47.081	0.189
272.441	47.097	46.980	0.117
280.000	46.522	46.456	0.065
285.018	46.140	46.174	-0.034
290.000	45.825	46.068	-0.243
298.670	45.583	46.163	-0.581
300.000	45.576	46.233	-0.657
310.000	45.521	46.731	-1.209
320.000	45.467	47.150	-1.684
330.000	45.412	47.385	-1.973
340.000	45.358	47.569	-2.211
344.033	45.336	47.584	-2.248
350.000	45.274	47.606	-2.332
360.000	45.036	47.339	-2.302
370.000	44.632	46.793	-2.161
373.000	44.478	46.468	-1.990

LONG SECTION – NB ROAD (Ch 0+000 tO Ch 0+ 373)
HORIZONTAL 1:500
HORIZONTAL 1:250



CHAINAGE	DESIGN LEVELS	EXISTING LEVELS	DEPTH
373.000	44.478	46.468	-1.990
380.000	44.061	45.530	-1.469
390.000	43.323	43.646	-0.323
394.033	42.978	42.840	0.138
400.000	42.447	41.740	0.707
401.281	42.333	41.476	0.857
410.000	41.672	40.220	1.452
420.000	41.192	39.540	1.652
430.000	41.011	39.083	1.929
431.281	41.010	39.037	1.973
439.872	41.016	38.929	2.087
440.000	41.016	38.928	2.088
450.000	41.206	39.438	1.768
452.756	41.321	39.570	1.751
458.051	41.619	39.951	1.668
460.000	41.754	40.127	1.627
468.690	42.522	40.876	1.646
469.801	42.637	41.383	1.254
470.000	42.658	41.475	1.182
474.239	43.098	43.095	0.003

LONG SECTION – NB ROAD (Ch 0+373 tO Ch 0+ 474.239)
HORIZONTAL 1:500
HORIZONTAL 1:250

NOTES

1. This drawing should be reviewed in conjunction with DWG Nos. 301 and 302.
2. Displayed levels along the proposed centerline.

DRAFT DRAWINGS FOR DISCUSSION ONLY

Rev	Description	By	Date
00	ISSUED FOR DISCUSSION	HR	26.07.24

Architect

Work In Progress

Client

Engineer

eiaustralia
Practical Solutions for Built Environments
EI Australia
Suite 6.01
55 Miller Street
Pyrmont, NSW 2009
T 02 9516 0722

Project	Drawn	Designed	Approved
120-122 MONA VALE ROAD, WARRIEWOOD NSW	HN	HN	HR

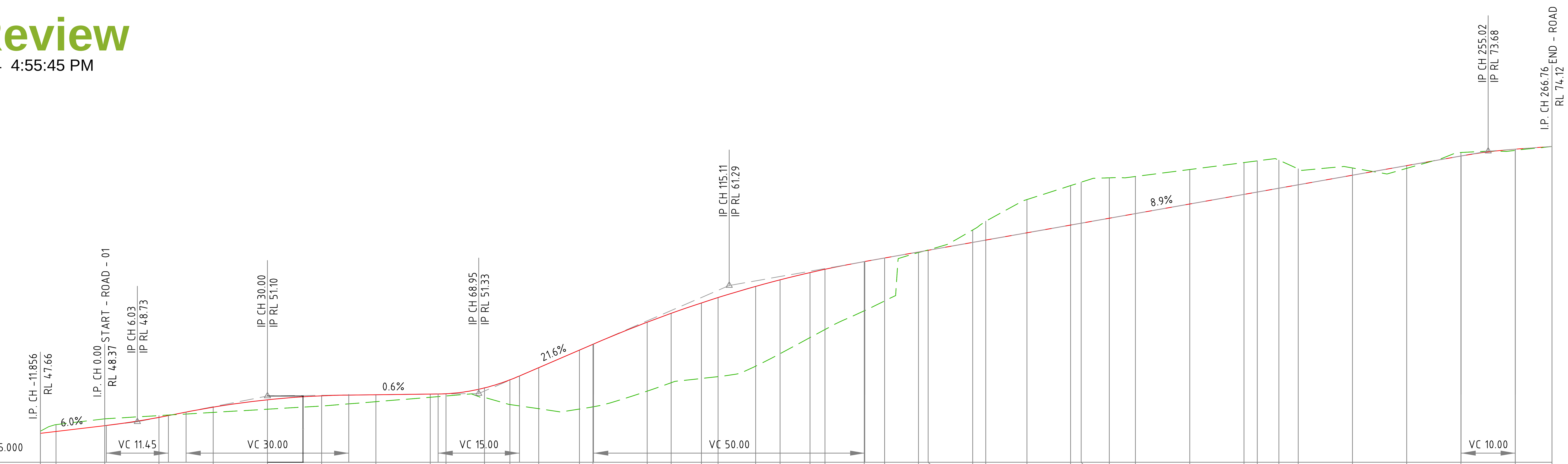
Project No.	Scale
S10479	N.T.S

Title	Drawing No.	Revision
LONG SECTION NEW BOUNDARY ROAD	C305	0

Issued By	Checked By	Date
HR	HR	31-07-2024

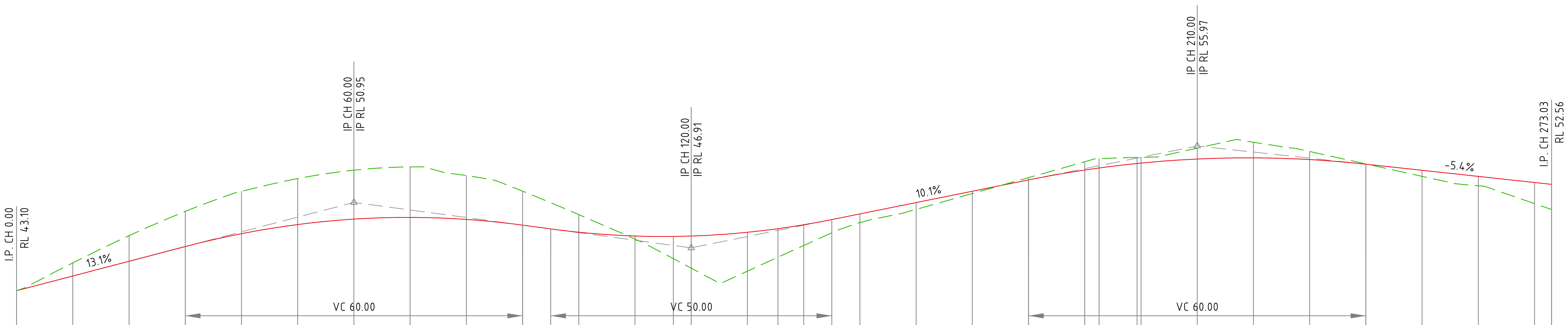
Original sheet size A1 (841x594)

For Review
1/08/2024 4:55:45 PM



CHAINAGE	DESIGN LEVELS	EXISTING LEVELS	DEPTH
-11.856	47.658	47.852	-0.194
-10.000	47.784	48.408	-0.624
0.000	48.369	49.001	-0.632
10.000	49.296	49.296	0.000
20.000	49.591	49.591	0.000
30.000	49.886	49.886	0.000
40.000	50.181	50.181	0.000
50.000	50.581	50.581	0.000
60.000	50.986	50.986	0.000
62.914	51.104	51.104	0.000
70.000	50.928	50.928	0.000
74.691	50.319	50.319	0.000
80.000	49.931	49.931	0.000
87.505	49.896	49.896	0.000
90.000	50.105	50.105	0.000
100.000	51.551	51.551	0.000
104.421	52.330	52.330	0.000
110.000	52.718	52.718	0.000
113.066	52.885	52.885	0.000
120.000	53.859	53.859	0.000
124.497	55.005	55.005	0.000
130.000	56.485	56.485	0.000
132.777	57.232	57.232	0.000
140.000	58.958	58.958	0.000
143.762	59.872	59.872	0.000
150.000	64.329	64.329	0.000
151.777	64.571	64.571	0.000
160.000	66.415	66.415	0.000
162.406	67.215	67.215	0.000
170.000	69.215	69.215	0.000
178.045	70.505	70.505	0.000
180.000	70.819	70.819	0.000
185.176	71.222	71.222	0.000
190.000	71.347	71.347	0.000
200.000	71.989	71.989	0.000
210.000	72.630	72.630	0.000
212.454	72.788	72.788	0.000
216.435	72.852	72.852	0.000
220.000	72.052	72.052	0.000
230.000	72.131	72.131	0.000
240.000	72.094	72.094	0.000
250.000	73.561	73.561	0.000
260.000	73.757	73.757	0.000
266.765	74.116	74.116	0.000

LONG SECTION - ROAD-01 (Ch 0-011.856 tp Ch 0+ 266.765)
HORIZONTAL 1:500
HORIZONTAL 1:250



CHAINAGE	DESIGN LEVELS	EXISTING LEVELS	DEPTH
0.000	43.100	43.100	0.000
10.000	45.573	45.573	0.000
20.000	47.989	47.989	0.000
30.000	50.149	50.149	0.000
40.000	51.935	51.935	0.000
50.000	53.070	53.070	0.000
60.000	53.816	53.816	0.000
70.000	54.109	54.109	0.000
80.000	53.335	53.335	0.000
90.000	51.948	51.948	0.000
100.000	49.867	49.867	0.000
100.003	49.867	49.867	0.000
110.000	47.679	47.679	0.000
116.823	45.945	45.945	0.000
120.000	45.103	45.103	0.000
130.000	44.839	44.839	0.000
135.434	46.082	46.082	0.000
140.000	47.113	47.113	0.000
150.000	49.149	49.149	0.000
160.000	50.329	50.329	0.000
170.000	51.742	51.742	0.000
180.000	53.155	53.155	0.000
190.000	54.567	54.567	0.000
192.540	54.839	54.839	0.000
199.295	54.950	54.950	0.000
200.000	54.958	54.958	0.000
210.000	55.773	55.773	0.000
220.000	56.302	56.302	0.000
230.000	55.474	55.474	0.000
240.000	54.372	54.372	0.000
250.000	53.271	53.271	0.000
260.000	52.433	52.433	0.000
270.000	50.844	50.844	0.000
273.027	50.319	50.319	0.000

LONG SECTION - ROAD - 02 (Ch 0+000 tp Ch 0+ 273.027)
HORIZONTAL 1:500
HORIZONTAL 1:250

NOTES

1. This drawing should be reviewed in conjunction with DWG Nos. 301 and 302.
2. Displayed levels along the proposed centerline.

DRAFT DRAWING SET FOR DISCUSSION ONLY

Rev	Description	By	Date
00	ISSUED FOR DISCUSSION	HR	26.07.24

Architect: **Work In Progress**

Client:

Engineer: eiaustralia — Practical Solutions for Built Environments
EI Australia
Suite 6.01
55 Miller Street
Pyrmont, NSW 2009
T 02 9516 0722

Project: 120-122 MONA VALE ROAD, WARRIEWOOD NSW

Title: LONG SECTION ROAD - 01 & ROAD - 02

Drawn	Designed	Approved
HN	HN	HR

Project No.	Scale
S10479	N.T.S

Drawing No.	Revision
C306	0

Issued By	Checked By	Date
HR	HR	31-07-2024

Original sheet size A1 (841x594)

ANNEXURE B: TRAFFIC SURVEY DATA
(2 SHEETS)

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY trafficsurvey.com.au

Intersection of Jubilee Ave and Ponderosa Parade, Warriewood

GPS -33.678483, 151.288556

Date:	Thu 08/02/24
Weather:	Fine
Suburban:	Warriewood
Customer:	McLaren

North:	Ponderosa Parade
East:	Jubilee Ave
South:	Ponderosa Parade
West:	Jubilee Ave

Survey Period	AM:	7:00 AM-9:30 AM
	PM:	2:30 PM-6:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	3:30 PM-4:30 PM

All Vehicles

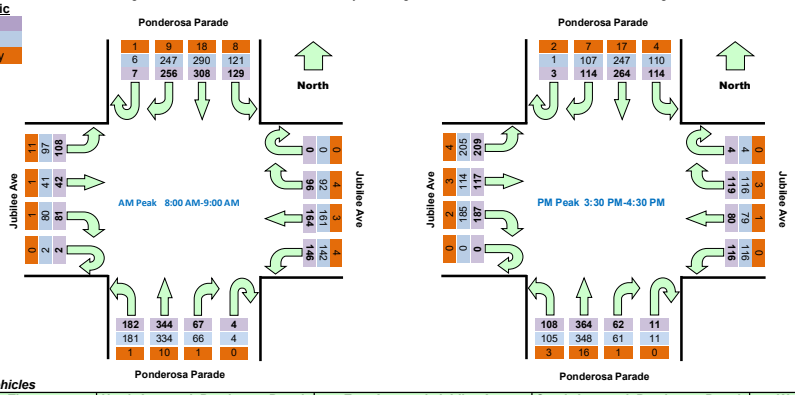
Time		North Approach Ponderosa Parade				East Approach Jubilee Ave				South Approach Ponderosa Parade				West Approach Jubilee Ave				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	5	34	45	18	0	25	17	23	2	6	66	21	0	5	4	14	1306	
7:15	7:30	2	41	51	19	0	20	25	28	0	3	69	21	0	14	6	15	1437	
7:30	7:45	3	42	52	18	0	30	12	16	1	15	42	31	0	8	4	14	1624	
7:45	8:00	3	53	65	13	1	30	42	35	0	7	77	59	1	11	6	16	1873	
8:00	8:15	2	53	54	25	0	22	34	33	0	17	81	41	1	16	9	28	1936	Peak
8:15	8:30	2	72	88	33	0	31	43	34	2	18	87	34	0	22	10	25	1889	
8:30	8:45	0	53	91	35	0	30	40	48	1	21	94	57	0	21	16	30	1707	
8:45	9:00	3	78	75	36	0	13	47	31	1	11	82	50	1	22	7	25		
9:00	9:15	3	60	43	21	1	20	34	20	1	8	53	30	3	29	13	30		
9:15	9:30	2	40	53	14	0	11	16	17	1	11	57	34	1	20	14	28		
14:30	14:45	0	31	59	33	0	21	13	20	0	4	64	16	0	27	19	54	1633	
14:45	15:00	0	23	71	25	0	16	16	33	2	12	68	24	0	23	18	48	1743	
15:00	15:15	0	30	99	19	0	40	23	43	2	10	72	16	0	41	22	40	1832	
15:15	15:30	1	30	84	21	0	20	19	29	1	29	106	27	0	24	18	27	1858	
15:30	15:45	0	27	76	26	2	34	12	25	0	20	115	21	0	43	28	42	1872	Peak
15:45	16:00	0	35	53	27	1	30	27	29	2	12	85	44	0	34	22	67	1780	
16:00	16:15	2	30	56	27	1	29	21	39	6	17	83	16	0	59	37	60	1773	
16:15	16:30	1	22	79	34	0	26	20	23	3	13	81	27	0	51	30	40	1784	
16:30	16:45	1	17	58	17	1	31	14	25	0	11	65	15	0	39	28	57	1762	
16:45	17:00	1	26	72	29	1	31	26	37	2	8	60	36	0	35	29	68	1734	
17:00	17:15	0	25	63	32	0	26	14	32	1	16	88	15	0	57	31	94	1616	
17:15	17:30	0	21	51	35	0	36	17	26	1	21	75	18	1	40	28	58		
17:30	17:45	0	18	41	30	1	30	7	21	1	12	61	13	0	38	29	49		
17:45	18:00	1	29	66	24	0	32	14	28	1	10	49	19	0	24	10	36		

Peak Time		North Approach Ponderosa Parade				East Approach Jubilee Ave				South Approach Ponderosa Parade				West Approach Jubilee Ave				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	7	256	308	129	0	96	164	146	4	67	344	182	2	81	42	108	1936
15:30	16:30	3	114	264	114	4	119	80	116	11	62	364	108	0	187	117	209	1872

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Ponderosa Parade				East Approach Jubilee Ave				South Approach Ponderosa Parade				West Approach Jubilee Ave			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	5	29	41	17	0	24	17	23	1	6	63	21	0	5	3	13
7:15	7:30	2	40	48	15	0	17	25	28	0	3	66	21	0	13	6	14
7:30	7:45	3	41	50	17	0	26	12	15	1	15	40	30	0	8	3	12
7:45	8:00	1	52	62	12	1	29	42	34	0	7	74	58	0	10	6	14
8:00	8:15	2	51	49	25	0	22	33	33	0	16	79	41	1	16	9	26
8:15	8:30	1	69	81	31	0	31	41	33	2	18	84	34	0	22	10	20
8:30	8:45	0	52	89	31	0	28	40	46	1	21	93	56	0	21	16	28
8:45	9:00	3	75	71	34	0	11	47	30	1	11	78	50	1	21	6	23
9:00	9:15	2	58	42	21	1	20	33	20	1	8	49	29	3	29	13	25
9:15	9:30	1	36	48	12	0	11	16	17	1	11	53	34	1	20	13	27
14:30	14:45	0	27	57	29	0	20	13	19	0	4	61	15	0	24	19	50
14:45	15:00	0	22	69	24	0	15	16	33	2	12	62	24	0	22	18	42
15:00	15:15	0	28	94	19	0	39	22	42	2	10	70	15	0	39	21	39
15:15	15:30	1	28	73	21	0	20	16	28	1	28	102	26	0	23	18	26
15:30	15:45	0	27	69	24	2	32	12	25	0	19	110	18	0	43	27	41
15:45	16:00	0	33	49	27	1	29	27	29	2	12	80	44	0	34	21	65
16:00	16:15	1	27	52	26	1	29	21	39	6	17	79	16	0	58	37	59
16:15	16:30	0	20	77	33	0	26	19	23	3	13	79	27	0	50	29	40
16:30	16:45	1	16	56	16	1	29	14	25	0	11	62	15	0	38	28	56
16:45	17:00	1	26	68	29	1	30	26	37	2	7	59	35	0	35	29	66
17:00	17:15	0	25	60	32	0	26	14	32	1	16	87	14	0	56	31	92
17:15	17:30	0	20	50	34	0	36	17	26	0	21	73	18	1	40	28	57
17:30	17:45	0	17	41	29	1	30	7	21	1	12	59	13	0	37	29	49
17:45	18:00	0	28	66	24	0	31	14	28	1	10	49	19	0	23	10	36

Peak Time		North Approach Ponderosa Parade				East Approach Jubilee Ave				South Approach Ponderosa Parade				West Approach Jubilee Ave				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	6	247	290	121	0	92	161	142	4	66	334	181	2	80	41	97	1864
15:30	16:30	1	107	247	110	4	116	79	116	11	61	348	105	0	185	114	205	1809

Heavy Vehicles

Time		North Approach Ponderosa Parade				East Approach Jubilee Ave				South Approach Ponderosa Parade				West Approach Jubilee Ave			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	5	4	1	0	1	0	0	1	0	3	0	0	0	1	1
7:15	7:30	0	1	3	4	0	3	0	0	0	0	3	0	0	1	0	1
7:30	7:45	0	1	2	1	0	4	0	1	0	0	2	1	0	0	1	2
7:45	8:00	2	1	3	1	0	1	0	1	0	0	3	1	1	1	0	2
8:00	8:15	0	2	5	0	0	0	1	0	0	1	2	0	0	0	0	2
8:15	8:30	1	3	7	2	0	0	2	1	0	0	3	0	0	0	0	5
8:30	8:45	0	1	2	4	0	2	0	2	0	0	1	1	0	0	0	2
8:45	9:00	0	3	4	2	0	2	0	1	0	0	4	0	0	1	1	2
9:00	9:15	1	2	1	0	0	0	1	0	0	0	4	1	0	0	0	5
9:15	9:30	1	4	5	2	0	0	0	0	0	0	4	0	0	0	1	1
14:30	14:45	0	4	2	4	0	1	0	1	0	0	3	1	0	3	0	4
14:45	15:00	0	1	2	1	0	1	0	0	0	0	6	0	0	1	0	6
15:00	15:15	0	2	5	0	0	1	1	1	0	0	2	1	0	2	1	1
15:15	15:30	0	2	11	0	0	0	3	1	0	1	4	1	0	1	0	1
15:30	15:45	0	0	7	2	0	2	0	0	0	1	5	3	0	0	1	1
15:45	16:00	0	2	4	0	0	1	0	0	0	0	5	0	0	0	1	2
16:00	16:15	1	3	4	1	0	0	0	0	0	0	4	0	0	1	0	1
16:15	16:30	1	2	2	1	0	0	1	0	0	0	2	0	0	1	1	0
16:30	16:45	0	1	2	1	0	2	0	0	0	0	3	0	0	1	0	1
16:45	17:00	0	0	4	0	0	1	0	0	0	1	1	1	0	0	0	2
17:00	17:15	0	0	3	0	0	0	0	0	0	0	1	1	0	1	0	2
17:15	17:30	0	1	1	1	0	0	0	0	1	0	2	0	0	0	0	1
17:30	17:45	0	1	0	1	0	0	0	0	0	0	2	0	0	1	0	0
17:45	18:00	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0

Peak Time		North Approach Ponderosa Parade				East Approach Jubilee Ave				South Approach Ponderosa Parade				West Approach Jubilee Ave				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	1	9	18	8	0	4	3	4	0	1	10	1	0	1	1	11	72
15:30	16:30	2	7	17	4	0	3	1	0	0	1	16	3	0	2	3	4	63

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY trafficsurvey.com.au

Intersection of Access Driveway and Jubilee Ave, Warriewood

GPS *-33.679170, 151.285617*

Date:	Thu 08/02/24
Weather:	Fine
Suburban:	Warriewood
Customer:	McLaren

North:	Jubilee Ave
East:	Access Driveway
South:	Jubilee Ave
West:	Access Driveway

Survey Period	AM:	7:00 AM-9:30 AM
	PM:	2:30 PM-6:00 PM
Traffic Peak	AM:	7:45 AM-8:45 AM
	PM:	2:30 PM-3:30 PM

All Vehicles

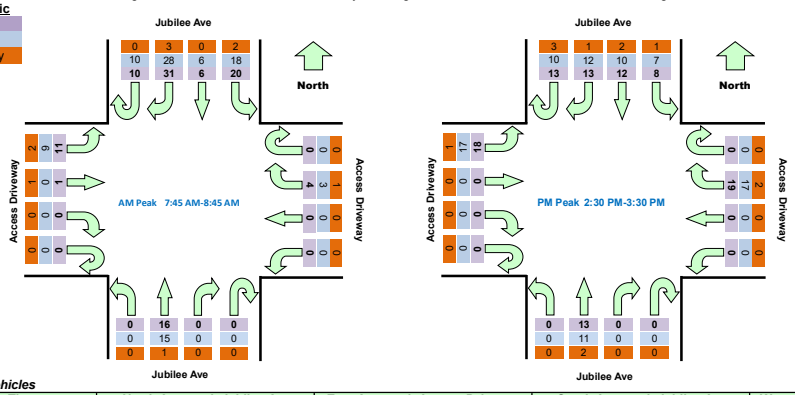
Time		North Approach Jubilee Ave				East Approach Access Driveway				South Approach Jubilee Ave				West Approach Access Driveway				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	2	3	5	1	0	1	0	0	0	0	2	0	0	0	0	0	81	
7:15	7:30	2	1	4	2	0	1	0	0	0	0	7	0	0	0	0	1	93	
7:30	7:45	1	4	3	6	0	0	0	0	0	0	6	0	0	0	0	1	97	
7:45	8:00	3	12	4	3	0	1	0	0	0	0	2	0	0	0	0	3	99	Peak
8:00	8:15	3	5	1	5	0	0	0	0	0	0	7	0	0	0	0	5	98	
8:15	8:30	2	5	1	8	0	1	0	0	0	0	3	0	0	0	1	1	88	
8:30	8:45	2	9	0	4	0	2	0	0	0	0	4	0	0	0	0	2	86	
8:45	9:00	5	6	7	2	0	2	0	0	0	0	2	0	0	0	0	3		
9:00	9:15	3	0	2	4	0	2	0	0	0	0	2	0	0	0	0	3		
9:15	9:30	2	5	2	4	0	2	0	0	0	0	2	0	0	0	0	3		
14:30	14:45	5	4	3	2	0	5	0	0	0	0	4	0	0	0	0	3	96	Peak
14:45	15:00	5	1	0	2	0	1	0	0	0	0	4	0	0	0	0	6	92	
15:00	15:15	2	5	7	3	0	8	0	0	0	0	2	0	0	0	0	4	96	Peak
15:15	15:30	1	3	2	1	0	5	0	0	0	0	3	0	0	0	0	5	89	
15:30	15:45	2	3	3	1	0	3	0	0	0	0	5	0	0	0	0	5	87	
15:45	16:00	1	4	4	2	0	2	0	0	0	0	2	0	0	0	0	8	90	
16:00	16:15	2	2	4	3	0	2	0	0	0	0	5	0	0	0	0	6	92	
16:15	16:30	1	1	4	4	0	3	0	0	0	0	2	0	0	0	0	3	88	
16:30	16:45	5	2	2	1	0	6	0	0	0	0	1	0	0	0	0	8	88	
16:45	17:00	1	3	2	0	0	10	0	0	0	0	6	0	0	0	0	3	73	
17:00	17:15	1	2	3	1	0	4	0	0	0	0	3	0	0	0	0	6	59	
17:15	17:30	4	2	2	4	0	3	0	0	0	0	2	0	0	0	0	1		
17:30	17:45	0	0	4	0	0	2	0	0	0	0	1	0	0	1	0	2		
17:45	18:00	1	1	4	2	0	0	0	0	0	0	1	0	0	0	0	2		

Peak Time		North Approach Jubilee Ave				East Approach Access Driveway				South Approach Jubilee Ave				West Approach Access Driveway				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	10	31	6	20	0	4	0	0	0	0	16	0	0	0	1	11	99
14:30	15:30	13	13	12	8	0	19	0	0	0	0	13	0	0	0	0	18	96

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Jubilee Ave				East Approach Access Driveway				South Approach Jubilee Ave				West Approach Access Driveway			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	2	3	5	1	0	1	0	0	0	0	2	0	0	0	0	0
7:15	7:30	2	1	4	2	0	1	0	0	0	0	7	0	0	0	0	1
7:30	7:45	1	4	2	6	0	0	0	0	0	0	4	0	0	0	0	1
7:45	8:00	3	11	4	3	0	1	0	0	0	0	1	0	0	0	0	2
8:00	8:15	3	4	1	5	0	0	0	0	0	0	7	0	0	0	0	4
8:15	8:30	2	4	1	7	0	1	0	0	0	0	3	0	0	0	0	1
8:30	8:45	2	9	0	3	0	1	0	0	0	0	4	0	0	0	0	2
8:45	9:00	5	6	6	2	0	1	0	0	0	0	2	0	0	0	0	3
9:00	9:15	3	0	2	4	0	2	0	0	0	0	2	0	0	0	0	3
9:15	9:30	2	5	2	4	0	2	0	0	0	0	2	0	0	0	0	3
14:30	14:45	3	4	3	2	0	4	0	0	0	0	4	0	0	0	0	3
14:45	15:00	4	1	0	2	0	1	0	0	0	0	3	0	0	0	0	6
15:00	15:15	2	4	6	3	0	8	0	0	0	0	1	0	0	0	0	3
15:15	15:30	1	3	1	0	0	4	0	0	0	0	3	0	0	0	0	5
15:30	15:45	2	3	3	1	0	3	0	0	0	0	4	0	0	0	0	5
15:45	16:00	1	3	4	2	0	2	0	0	0	0	2	0	0	0	0	7
16:00	16:15	2	2	4	3	0	2	0	0	0	0	5	0	0	0	0	6
16:15	16:30	1	1	4	4	0	3	0	0	0	0	2	0	0	0	0	3
16:30	16:45	5	2	2	1	0	6	0	0	0	0	1	0	0	0	0	8
16:45	17:00	1	3	2	0	0	10	0	0	0	0	6	0	0	0	0	3
17:00	17:15	1	2	3	1	0	4	0	0	0	0	2	0	0	0	0	5
17:15	17:30	4	2	2	4	0	3	0	0	0	0	2	0	0	0	0	1
17:30	17:45	0	0	4	0	0	2	0	0	0	0	1	0	0	1	0	2
17:45	18:00	1	1	4	1	0	0	0	0	0	0	1	0	0	0	0	2

Peak Time		North Approach Jubilee Ave				East Approach Access Driveway				South Approach Jubilee Ave				West Approach Access Driveway				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	10	28	6	18	0	3	0	0	0	0	15	0	0	0	0	9	89
14:30	15:30	10	12	10	7	0	17	0	0	0	0	11	0	0	0	0	17	84

Heavy Vehicles

Time		North Approach Jubilee Ave				East Approach Access Driveway				South Approach Jubilee Ave				West Approach Access Driveway			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	7:45	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0
7:45	8:00	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1
8:00	8:15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15	8:30	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
8:30	8:45	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
8:45	9:00	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
9:00	9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15	9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	14:45	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
14:45	15:00	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
15:00	15:15	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	1
15:15	15:30	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
15:45	16:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:00	16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
17:15	17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Jubilee Ave				East Approach Access Driveway				South Approach Jubilee Ave				West Approach Access Driveway				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	3	0	2	0	1	0	0	0	0	1	0	0	0	1	2	10
14:30	15:30	3	1	2	1	0	2	0	0	0	0	2	0	0	0	0	1	12

ANNEXURE C: SIDRA RESULTS
(36 SHEETS)

MOVEMENT SUMMARY

Site: 101 [Ex AM Ponderosa Pde / Jubilee Ave (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Ponderosa Parade / Jubilee Avenue
Existing conditions
AM Peak Period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ponderosa Parade (S)															
1	L2	All MCs	192	0.5	192	0.5	0.762	12.9	LOS A	9.0	64.0	0.90	0.97	1.30	41.5
2	T1	All MCs	362	2.9	362	2.9	0.762	12.7	LOS A	9.0	64.0	0.90	0.97	1.30	41.8
3	R2	All MCs	71	1.5	71	1.5	0.762	15.7	LOS B	9.0	64.0	0.90	0.97	1.30	41.3
3u	U	All MCs	4	0.0	4	0.0	0.762	17.0	LOS B	9.0	64.0	0.90	0.97	1.30	41.4
Approach			628	2.0	628	2.0	0.762	13.1	LOS A	9.0	64.0	0.90	0.97	1.30	41.6
East: Jubilee Avenue (E)															
4	L2	All MCs	154	2.7	154	2.7	0.617	12.8	LOS A	5.7	40.5	0.88	0.92	1.16	41.4
5	T1	All MCs	173	1.8	173	1.8	0.617	12.5	LOS A	5.7	40.5	0.88	0.92	1.16	41.7
6	R2	All MCs	101	4.2	101	4.2	0.617	15.7	LOS B	5.7	40.5	0.88	0.92	1.16	41.2
6u	U	All MCs	1	0.0	1	0.0	0.617	16.9	LOS B	5.7	40.5	0.88	0.92	1.16	41.3
Approach			428	2.7	428	2.7	0.617	13.4	LOS A	5.7	40.5	0.88	0.92	1.16	41.4
North: Ponderosa Parade (N)															
7	L2	All MCs	136	6.2	136	6.2	0.622	5.3	LOS A	3.9	28.9	0.47	0.58	0.47	44.6
8	T1	All MCs	324	5.8	324	5.8	0.622	4.7	LOS A	3.9	28.9	0.47	0.58	0.47	45.0
9	R2	All MCs	269	3.5	269	3.5	0.622	7.8	LOS A	3.9	28.9	0.47	0.58	0.47	44.5
9u	U	All MCs	7	14.3	7	14.3	0.622	9.4	LOS A	3.9	28.9	0.47	0.58	0.47	44.4
Approach			737	5.1	737	5.1	0.622	6.0	LOS A	3.9	28.9	0.47	0.58	0.47	44.8
West: Jubilee Avenue (W)															
10	L2	All MCs	114	10.2	114	10.2	0.352	8.4	LOS A	2.3	17.0	0.77	0.72	0.77	43.4
11	T1	All MCs	44	2.4	44	2.4	0.352	7.8	LOS A	2.3	17.0	0.77	0.72	0.77	43.7
12	R2	All MCs	85	1.2	85	1.2	0.352	10.8	LOS A	2.3	17.0	0.77	0.72	0.77	43.3
12u	U	All MCs	2	0.0	2	0.0	0.352	12.2	LOS A	2.3	17.0	0.77	0.72	0.77	43.3
Approach			245	5.6	245	5.6	0.352	9.2	LOS A	2.3	17.0	0.77	0.72	0.77	43.4
All Vehicles			2039	3.7	2039	3.7	0.762	10.1	LOS A	9.0	64.0	0.72	0.79	0.91	42.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Ex PM Ponderosa Pde / Jubilee Ave (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Ponderosa Parade / Jubilee Avenue
Existing conditions
PM Peak Period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ponderosa Parade (S)															
1	L2	All MCs	114	2.8	114	2.8	0.584	6.9	LOS A	4.5	32.6	0.66	0.66	0.71	44.4
2	T1	All MCs	383	4.4	383	4.4	0.584	6.6	LOS A	4.5	32.6	0.66	0.66	0.71	44.7
3	R2	All MCs	65	1.6	65	1.6	0.584	9.6	LOS A	4.5	32.6	0.66	0.66	0.71	44.3
3u	U	All MCs	12	0.0	12	0.0	0.584	11.0	LOS A	4.5	32.6	0.66	0.66	0.71	44.3
Approach			574	3.7	574	3.7	0.584	7.1	LOS A	4.5	32.6	0.66	0.66	0.71	44.6
East: Jubilee Avenue (E)															
4	L2	All MCs	122	0.0	122	0.0	0.443	8.7	LOS A	3.0	21.1	0.76	0.76	0.81	43.2
5	T1	All MCs	84	1.3	84	1.3	0.443	8.4	LOS A	3.0	21.1	0.76	0.76	0.81	43.5
6	R2	All MCs	125	2.5	125	2.5	0.443	11.6	LOS A	3.0	21.1	0.76	0.76	0.81	43.0
6u	U	All MCs	4	0.0	4	0.0	0.443	12.9	LOS A	3.0	21.1	0.76	0.76	0.81	43.0
Approach			336	1.3	336	1.3	0.443	9.7	LOS A	3.0	21.1	0.76	0.76	0.81	43.2
North: Ponderosa Parade (N)															
7	L2	All MCs	120	3.5	120	3.5	0.544	6.4	LOS A	3.5	26.0	0.61	0.68	0.66	44.4
8	T1	All MCs	278	6.4	278	6.4	0.544	6.0	LOS A	3.5	26.0	0.61	0.68	0.66	44.8
9	R2	All MCs	120	6.1	120	6.1	0.544	9.0	LOS A	3.5	26.0	0.61	0.68	0.66	44.3
9u	U	All MCs	3	66.7	3	66.7	0.544	12.0	LOS A	3.5	26.0	0.61	0.68	0.66	43.4
Approach			521	6.1	521	6.1	0.544	6.8	LOS A	3.5	26.0	0.61	0.68	0.66	44.6
West: Jubilee Avenue (W)															
10	L2	All MCs	220	1.9	220	1.9	0.765	17.1	LOS B	10.0	71.3	0.98	1.06	1.52	39.3
11	T1	All MCs	123	2.6	123	2.6	0.765	17.0	LOS B	10.0	71.3	0.98	1.06	1.52	39.5
12	R2	All MCs	197	1.1	197	1.1	0.765	19.9	LOS B	10.0	71.3	0.98	1.06	1.52	39.1
12u	U	All MCs	1	0.0	1	0.0	0.765	21.3	LOS B	10.0	71.3	0.98	1.06	1.52	39.2
Approach			541	1.8	541	1.8	0.765	18.1	LOS B	10.0	71.3	0.98	1.06	1.52	39.3
All Vehicles			1972	3.4	1972	3.4	0.765	10.5	LOS A	10.0	71.3	0.75	0.79	0.94	42.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Ex AM Jubilee Ave / Access Driveway (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Jubilee Avenue / Access Driveway
Existing conditions
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Jubilee Avenue (S)															
1b	L3	All MCs	1	0.0	1	0.0	0.011	10.4	LOS A	0.0	0.1	0.02	0.17	0.02	16.7
2	T1	All MCs	17	6.3	17	6.3	0.011	0.0	LOS A	0.0	0.1	0.02	0.17	0.02	49.2
3	R2	All MCs	1	0.0	1	0.0	0.011	8.0	LOS A	0.0	0.1	0.02	0.17	0.02	16.7
3u	U	All MCs	1	0.0	1	0.0	0.011	6.7	LOS A	0.0	0.1	0.02	0.17	0.02	51.2
Approach			20	5.3	20	5.3	0.011	1.3	NA	0.0	0.1	0.02	0.17	0.02	41.0
East: Access Driveway (E)															
4	L2	All MCs	1	0.0	1	0.0	0.007	0.0	LOS A	0.0	0.2	0.09	0.10	0.09	18.3
4a	L1	All MCs	1	0.0	1	0.0	0.007	0.2	LOS A	0.0	0.2	0.09	0.10	0.09	10.7
6	R2	All MCs	4	25.0	4	25.0	0.007	0.5	LOS A	0.0	0.2	0.09	0.10	0.09	18.2
6u	U	All MCs	1	0.0	1	0.0	0.007	6.8	LOS A	0.0	0.2	0.09	0.10	0.09	18.8
Approach			7	14.3	7	14.3	0.007	1.3	LOS A	0.0	0.2	0.09	0.10	0.09	16.6
North: Jubilee Avenue (N)															
7	L2	All MCs	21	10.0	21	10.0	0.043	8.3	LOS A	0.2	1.5	0.08	0.70	0.08	16.4
8	T1	All MCs	6	0.0	6	0.0	0.043	0.1	LOS A	0.2	1.5	0.08	0.70	0.08	46.3
9a	R1	All MCs	33	9.7	33	9.7	0.043	7.4	LOS A	0.2	1.5	0.08	0.70	0.08	16.4
9u	U	All MCs	11	0.0	11	0.0	0.043	6.8	LOS A	0.2	1.5	0.08	0.70	0.08	48.0
Approach			71	7.5	71	7.5	0.043	6.9	NA	0.2	1.5	0.08	0.70	0.08	19.4
SouthWest: Access Driveway (SW)															
30a	L1	All MCs	12	18.2	12	18.2	0.012	0.1	LOS A	0.0	0.4	0.10	0.06	0.10	17.2
32a	R1	All MCs	2	50.0	2	50.0	0.012	0.6	LOS A	0.0	0.4	0.10	0.06	0.10	10.3
32b	R3	All MCs	1	0.0	1	0.0	0.012	0.3	LOS A	0.0	0.4	0.10	0.06	0.10	17.2
32u	U	All MCs	1	0.0	1	0.0	0.012	6.8	LOS A	0.0	0.4	0.10	0.06	0.10	17.7
Approach			16	20.0	16	20.0	0.012	0.6	LOS A	0.0	0.4	0.10	0.06	0.10	15.8
All Vehicles			114	9.3	114	9.3	0.043	4.7	NA	0.2	1.5	0.07	0.48	0.07	20.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Ex PM Jubilee Ave / Access Driveway (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Jubilee Avenue / Access Driveway
Existing conditions
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Jubilee Avenue (S)															
1b	L3	All MCs	1	0.0	1	0.0	0.009	10.5	LOS A	0.0	0.1	0.04	0.20	0.04	16.7
2	T1	All MCs	14	15.4	14	15.4	0.009	0.0	LOS A	0.0	0.1	0.04	0.20	0.04	49.0
3	R2	All MCs	1	0.0	1	0.0	0.009	8.0	LOS A	0.0	0.1	0.04	0.20	0.04	16.7
3u	U	All MCs	1	0.0	1	0.0	0.009	6.8	LOS A	0.0	0.1	0.04	0.20	0.04	50.9
Approach			17	12.5	17	12.5	0.009	1.6	NA	0.0	0.1	0.04	0.20	0.04	39.5
East: Access Driveway (E)															
4	L2	All MCs	1	0.0	1	0.0	0.023	0.1	LOS A	0.1	0.6	0.14	0.07	0.14	16.8
4a	L1	All MCs	1	0.0	1	0.0	0.023	0.2	LOS A	0.1	0.6	0.14	0.07	0.14	10.2
6	R2	All MCs	20	10.5	20	10.5	0.023	0.5	LOS A	0.1	0.6	0.14	0.07	0.14	16.8
6u	U	All MCs	1	0.0	1	0.0	0.023	6.7	LOS A	0.1	0.6	0.14	0.07	0.14	17.3
Approach			23	9.1	23	9.1	0.023	0.7	LOS A	0.1	0.6	0.14	0.07	0.14	16.3
North: Jubilee Avenue (N)															
7	L2	All MCs	8	12.5	8	12.5	0.047	8.4	LOS A	0.2	1.7	0.07	0.53	0.07	16.6
8	T1	All MCs	22	9.5	22	9.5	0.047	0.0	LOS A	0.2	1.7	0.07	0.53	0.07	48.1
9a	R1	All MCs	14	7.7	14	7.7	0.047	7.4	LOS A	0.2	1.7	0.07	0.53	0.07	16.6
9u	U	All MCs	23	13.6	23	13.6	0.047	6.9	LOS A	0.2	1.7	0.07	0.53	0.07	49.3
Approach			67	10.9	67	10.9	0.047	5.0	NA	0.2	1.7	0.07	0.53	0.07	29.8
SouthWest: Access Driveway (SW)															
30a	L1	All MCs	19	5.6	19	5.6	0.015	0.1	LOS A	0.1	0.4	0.11	0.05	0.11	16.8
32a	R1	All MCs	1	0.0	1	0.0	0.015	0.4	LOS A	0.1	0.4	0.11	0.05	0.11	10.2
32b	R3	All MCs	1	0.0	1	0.0	0.015	0.2	LOS A	0.1	0.4	0.11	0.05	0.11	16.9
32u	U	All MCs	1	0.0	1	0.0	0.015	6.8	LOS A	0.1	0.4	0.11	0.05	0.11	17.3
Approach			22	4.8	22	4.8	0.015	0.4	LOS A	0.1	0.4	0.11	0.05	0.11	16.4
All Vehicles			129	9.8	129	9.8	0.047	3.0	NA	0.2	1.7	0.09	0.32	0.09	23.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future AM Ponderosa Pde / Jubilee Ave (Site Folder: Future Pre-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Ponderosa Parade / Jubilee Avenue
Future conditions (Pre-Development)
AM Peak Period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ponderosa Parade (S)															
1	L2	All MCs	195	0.5	195	0.5	0.771	13.4	LOS A	9.3	66.2	0.91	0.99	1.33	41.4
2	T1	All MCs	362	2.9	362	2.9	0.771	13.1	LOS A	9.3	66.2	0.91	0.99	1.33	41.6
3	R2	All MCs	71	1.5	71	1.5	0.771	16.1	LOS B	9.3	66.2	0.91	0.99	1.33	41.2
3u	U	All MCs	4	0.0	4	0.0	0.771	17.5	LOS B	9.3	66.2	0.91	0.99	1.33	41.2
Approach			632	2.0	632	2.0	0.771	13.6	LOS A	9.3	66.2	0.91	0.99	1.33	41.5
East: Jubilee Avenue (E)															
4	L2	All MCs	154	2.7	154	2.7	0.634	13.6	LOS A	6.0	43.0	0.90	0.95	1.22	41.0
5	T1	All MCs	174	1.8	174	1.8	0.634	13.2	LOS A	6.0	43.0	0.90	0.95	1.22	41.3
6	R2	All MCs	101	4.2	101	4.2	0.634	16.4	LOS B	6.0	43.0	0.90	0.95	1.22	40.9
6u	U	All MCs	1	0.0	1	0.0	0.634	17.6	LOS B	6.0	43.0	0.90	0.95	1.22	40.9
Approach			429	2.7	429	2.7	0.634	14.1	LOS A	6.0	43.0	0.90	0.95	1.22	41.1
North: Ponderosa Parade (N)															
7	L2	All MCs	136	6.2	136	6.2	0.638	5.5	LOS A	4.3	31.7	0.50	0.60	0.51	44.6
8	T1	All MCs	324	5.8	324	5.8	0.638	5.0	LOS A	4.3	31.7	0.50	0.60	0.51	45.0
9	R2	All MCs	276	3.4	276	3.4	0.638	8.0	LOS A	4.3	31.7	0.50	0.60	0.51	44.6
9u	U	All MCs	7	14.3	7	14.3	0.638	9.7	LOS A	4.3	31.7	0.50	0.60	0.51	44.3
Approach			743	5.1	743	5.1	0.638	6.3	LOS A	4.3	31.7	0.50	0.60	0.51	44.7
West: Jubilee Avenue (W)															
10	L2	All MCs	140	8.3	140	8.3	0.413	8.8	LOS A	2.9	20.9	0.79	0.74	0.80	44.4
11	T1	All MCs	48	2.2	48	2.2	0.413	8.2	LOS A	2.9	20.9	0.79	0.74	0.80	44.4
12	R2	All MCs	99	1.1	99	1.1	0.413	11.2	LOS A	2.9	20.9	0.79	0.74	0.80	44.1
12u	U	All MCs	2	0.0	2	0.0	0.413	12.4	LOS A	2.9	20.9	0.79	0.74	0.80	43.7
Approach			289	4.7	289	4.7	0.413	9.6	LOS A	2.9	20.9	0.79	0.74	0.80	44.3
All Vehicles			2094	3.6	2094	3.6	0.771	10.5	LOS A	9.3	66.2	0.75	0.81	0.95	42.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future PM Ponderosa Pde / Jubilee Ave (Site Folder: Future Pre-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Ponderosa Parade / Jubilee Avenue
Future conditions (Pre-Development)
PM Peak Period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ponderosa Parade (S)															
1	L2	All MCs	127	2.5	127	2.5	0.613	7.7	LOS A	5.1	36.6	0.70	0.71	0.79	44.6
2	T1	All MCs	383	4.4	383	4.4	0.613	7.3	LOS A	5.1	36.6	0.70	0.71	0.79	44.5
3	R2	All MCs	65	1.6	65	1.6	0.613	10.3	LOS A	5.1	36.6	0.70	0.71	0.79	44.1
3u	U	All MCs	12	0.0	12	0.0	0.613	11.6	LOS A	5.1	36.6	0.70	0.71	0.79	44.1
Approach			587	3.6	587	3.6	0.613	7.8	LOS A	5.1	36.6	0.70	0.71	0.79	44.5
East: Jubilee Avenue (E)															
4	L2	All MCs	122	0.0	122	0.0	0.462	9.3	LOS A	3.3	23.1	0.78	0.79	0.86	42.9
5	T1	All MCs	88	1.2	88	1.2	0.462	9.1	LOS A	3.3	23.1	0.78	0.79	0.86	43.4
6	R2	All MCs	125	2.5	125	2.5	0.462	12.1	LOS A	3.3	23.1	0.78	0.79	0.86	42.7
6u	U	All MCs	4	0.0	4	0.0	0.462	13.4	LOS A	3.3	23.1	0.78	0.79	0.86	42.8
Approach			340	1.2	340	1.2	0.462	10.3	LOS A	3.3	23.1	0.78	0.79	0.86	43.0
North: Ponderosa Parade (N)															
7	L2	All MCs	120	3.5	120	3.5	0.572	6.6	LOS A	3.9	28.9	0.64	0.70	0.69	44.5
8	T1	All MCs	278	6.4	278	6.4	0.572	6.2	LOS A	3.9	28.9	0.64	0.70	0.69	44.8
9	R2	All MCs	146	5.0	146	5.0	0.572	9.4	LOS A	3.9	28.9	0.64	0.70	0.69	44.9
9u	U	All MCs	3	66.7	3	66.7	0.572	12.3	LOS A	3.9	28.9	0.64	0.70	0.69	43.4
Approach			547	5.8	547	5.8	0.572	7.2	LOS A	3.9	28.9	0.64	0.70	0.69	44.8
West: Jubilee Avenue (W)															
10	L2	All MCs	226	1.9	226	1.9	0.784	18.1	LOS B	10.8	76.7	1.00	1.09	1.58	39.0
11	T1	All MCs	124	2.5	124	2.5	0.784	17.9	LOS B	10.8	76.7	1.00	1.09	1.58	39.2
12	R2	All MCs	200	1.1	200	1.1	0.784	20.9	LOS B	10.8	76.7	1.00	1.09	1.58	38.9
12u	U	All MCs	1	0.0	1	0.0	0.784	22.2	LOS B	10.8	76.7	1.00	1.09	1.58	38.8
Approach			552	1.7	552	1.7	0.784	19.1	LOS B	10.8	76.7	1.00	1.09	1.58	39.0
All Vehicles			2026	3.3	2026	3.3	0.784	11.1	LOS A	10.8	76.7	0.78	0.82	0.99	42.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future AM Jubilee Ave / Access Driveway (Site Folder: Future Pre-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Jubilee Avenue / Access Driveway
Future conditions (Pre-Development)
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Jubilee Avenue (S)															
1b	L3	All MCs	1	0.0	1	0.0	0.032	10.4	LOS A	0.0	0.1	0.01	0.06	0.01	17.1
2	T1	All MCs	61	1.7	61	1.7	0.032	0.0	LOS A	0.0	0.1	0.01	0.06	0.01	56.7
3	R2	All MCs	1	0.0	1	0.0	0.032	8.0	LOS A	0.0	0.1	0.01	0.06	0.01	17.1
3u	U	All MCs	1	0.0	1	0.0	0.032	6.7	LOS A	0.0	0.1	0.01	0.06	0.01	55.2
Approach			64	1.6	64	1.6	0.032	0.4	NA	0.0	0.1	0.01	0.06	0.01	52.7
East: Access Driveway (E)															
4	L2	All MCs	1	0.0	1	0.0	0.007	0.0	LOS A	0.0	0.2	0.13	0.11	0.13	18.2
4a	L1	All MCs	1	0.0	1	0.0	0.007	0.3	LOS A	0.0	0.2	0.13	0.11	0.13	10.7
6	R2	All MCs	4	25.0	4	25.0	0.007	0.8	LOS A	0.0	0.2	0.13	0.11	0.13	18.2
6u	U	All MCs	1	0.0	1	0.0	0.007	6.8	LOS A	0.0	0.2	0.13	0.11	0.13	18.8
Approach			7	14.3	7	14.3	0.007	1.5	LOS A	0.0	0.2	0.13	0.11	0.13	16.6
North: Jubilee Avenue (N)															
7	L2	All MCs	21	10.0	21	10.0	0.050	8.5	LOS A	0.2	1.7	0.16	0.64	0.16	16.5
8	T1	All MCs	17	0.0	17	0.0	0.050	0.2	LOS A	0.2	1.7	0.16	0.64	0.16	49.7
9a	R1	All MCs	33	9.7	33	9.7	0.050	7.6	LOS A	0.2	1.7	0.16	0.64	0.16	16.5
9u	U	All MCs	11	0.0	11	0.0	0.050	7.0	LOS A	0.2	1.7	0.16	0.64	0.16	48.9
Approach			81	6.5	81	6.5	0.050	6.2	NA	0.2	1.7	0.16	0.64	0.16	21.3
SouthWest: Access Driveway (SW)															
30a	L1	All MCs	12	18.2	12	18.2	0.013	0.2	LOS A	0.0	0.4	0.17	0.09	0.17	17.2
32a	R1	All MCs	2	50.0	2	50.0	0.013	1.0	LOS A	0.0	0.4	0.17	0.09	0.17	10.3
32b	R3	All MCs	1	0.0	1	0.0	0.013	0.5	LOS A	0.0	0.4	0.17	0.09	0.17	17.2
32u	U	All MCs	1	0.0	1	0.0	0.013	6.8	LOS A	0.0	0.4	0.17	0.09	0.17	17.7
Approach			16	20.0	16	20.0	0.013	0.8	LOS A	0.0	0.4	0.17	0.09	0.17	15.8
All Vehicles			168	6.3	168	6.3	0.050	3.3	NA	0.2	1.7	0.10	0.34	0.10	26.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future PM Jubilee Ave / Access Driveway (Site Folder: Future Pre-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Jubilee Avenue / Access Driveway
Future conditions (Pre-Development)
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Jubilee Avenue (S)															
1b	L3	All MCs	1	0.0	1	0.0	0.015	10.6	LOS A	0.0	0.1	0.04	0.14	0.04	16.9
2	T1	All MCs	24	8.7	24	8.7	0.015	0.1	LOS A	0.0	0.1	0.04	0.14	0.04	53.3
3	R2	All MCs	1	0.0	1	0.0	0.015	8.1	LOS A	0.0	0.1	0.04	0.14	0.04	16.9
3u	U	All MCs	1	0.0	1	0.0	0.015	7.0	LOS A	0.0	0.1	0.04	0.14	0.04	53.2
Approach			27	7.7	27	7.7	0.015	1.1	NA	0.0	0.1	0.04	0.14	0.04	45.7
East: Access Driveway (E)															
4	L2	All MCs	1	0.0	1	0.0	0.024	0.2	LOS A	0.1	0.6	0.17	0.09	0.17	16.8
4a	L1	All MCs	1	0.0	1	0.0	0.024	0.3	LOS A	0.1	0.6	0.17	0.09	0.17	10.2
6	R2	All MCs	20	10.5	20	10.5	0.024	0.8	LOS A	0.1	0.6	0.17	0.09	0.17	16.8
6u	U	All MCs	1	0.0	1	0.0	0.024	6.7	LOS A	0.1	0.6	0.17	0.09	0.17	17.2
Approach			23	9.1	23	9.1	0.024	1.0	LOS A	0.1	0.6	0.17	0.09	0.17	16.3
North: Jubilee Avenue (N)															
7	L2	All MCs	8	12.5	8	12.5	0.071	8.4	LOS A	0.3	2.1	0.08	0.35	0.08	16.9
8	T1	All MCs	66	3.2	66	3.2	0.071	0.1	LOS A	0.3	2.1	0.08	0.35	0.08	53.7
9a	R1	All MCs	14	7.7	14	7.7	0.071	7.5	LOS A	0.3	2.1	0.08	0.35	0.08	16.9
9u	U	All MCs	23	13.6	23	13.6	0.071	7.0	LOS A	0.3	2.1	0.08	0.35	0.08	52.0
Approach			112	6.6	112	6.6	0.071	3.1	NA	0.3	2.1	0.08	0.35	0.08	37.3
SouthWest: Access Driveway (SW)															
30a	L1	All MCs	19	5.6	19	5.6	0.015	0.1	LOS A	0.1	0.4	0.12	0.06	0.12	16.8
32a	R1	All MCs	1	0.0	1	0.0	0.015	0.6	LOS A	0.1	0.4	0.12	0.06	0.12	10.2
32b	R3	All MCs	1	0.0	1	0.0	0.015	0.5	LOS A	0.1	0.4	0.12	0.06	0.12	16.9
32u	U	All MCs	1	0.0	1	0.0	0.015	6.8	LOS A	0.1	0.4	0.12	0.06	0.12	17.3
Approach			22	4.8	22	4.8	0.015	0.5	LOS A	0.1	0.4	0.12	0.06	0.12	16.4
All Vehicles			184	6.9	184	6.9	0.071	2.2	NA	0.3	2.1	0.09	0.25	0.09	29.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future AM Jubilee Avenue / Access Driveway (Site Folder: Future Pre-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Jubilee Avenue / Access Driveway
Future conditions (Pre-Development)
AM Peak Period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Jubilee Avenue (S)															
1b	L3	All MCs	1	0.0	1	0.0	0.050	6.8	LOS A	0.2	1.6	0.17	0.43	0.17	16.6
2	T1	All MCs	60	0.0	60	0.0	0.050	3.9	LOS A	0.2	1.6	0.17	0.43	0.17	46.3
3	R2	All MCs	1	0.0	1	0.0	0.050	12.9	LOS A	0.2	1.6	0.17	0.43	0.17	16.6
3u	U	All MCs	1	0.0	1	0.0	0.050	8.7	LOS A	0.2	1.6	0.17	0.43	0.17	45.8
Approach			63	0.0	63	0.0	0.050	4.1	LOS A	0.2	1.6	0.17	0.43	0.17	43.7
East: Access Driveway (E)															
4	L2	All MCs	1	0.0	1	0.0	0.006	0.3	LOS A	0.0	0.2	0.19	0.06	0.19	16.1
4a	L1	All MCs	1	0.0	1	0.0	0.006	0.3	LOS A	0.0	0.2	0.19	0.06	0.19	10.0
6	R2	All MCs	4	25.0	4	25.0	0.006	0.4	LOS A	0.0	0.2	0.19	0.06	0.19	16.1
6u	U	All MCs	1	0.0	1	0.0	0.006	0.3	LOS A	0.0	0.2	0.19	0.06	0.19	10.0
Approach			7	14.3	7	14.3	0.006	0.3	LOS A	0.0	0.2	0.19	0.06	0.19	13.7
North: Jubilee Avenue (N)															
7	L2	All MCs	21	10.0	21	10.0	0.056	6.7	LOS A	0.3	2.0	0.05	0.75	0.05	16.3
8	T1	All MCs	17	0.0	17	0.0	0.056	3.6	LOS A	0.3	2.0	0.05	0.75	0.05	44.5
9a	R1	All MCs	33	9.7	33	9.7	0.056	11.0	LOS A	0.3	2.0	0.05	0.75	0.05	16.3
9u	U	All MCs	11	0.0	11	0.0	0.056	8.4	LOS A	0.3	2.0	0.05	0.75	0.05	44.0
Approach			81	6.5	81	6.5	0.056	8.0	LOS A	0.3	2.0	0.05	0.75	0.05	20.8
SouthWest: Access Driveway (SW)															
30a	L1	All MCs	12	18.2	12	18.2	0.014	0.4	LOS A	0.1	0.5	0.22	0.08	0.22	16.1
32a	R1	All MCs	2	50.0	2	50.0	0.014	0.6	LOS A	0.1	0.5	0.22	0.08	0.22	10.0
32b	R3	All MCs	1	0.0	1	0.0	0.014	0.4	LOS A	0.1	0.5	0.22	0.08	0.22	16.2
32u	U	All MCs	1	0.0	1	0.0	0.014	0.4	LOS A	0.1	0.5	0.22	0.08	0.22	10.0
Approach			16	20.0	16	20.0	0.014	0.4	LOS A	0.1	0.5	0.22	0.08	0.22	14.4
All Vehicles			167	5.7	167	5.7	0.056	5.5	LOS A	0.3	2.0	0.12	0.53	0.12	23.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future PM Jubilee Avenue / Access Driveway (Site Folder: Future Pre-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Jubilee Avenue / Access Driveway
Future conditions (Pre-Development)
PM Peak Period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Jubilee Avenue (S)															
1b	L3	All MCs	1	0.0	1	0.0	0.023	6.8	LOS A	0.1	0.8	0.19	0.46	0.19	16.5
2	T1	All MCs	24	8.7	24	8.7	0.023	4.0	LOS A	0.1	0.8	0.19	0.46	0.19	46.0
3	R2	All MCs	1	0.0	1	0.0	0.023	13.0	LOS A	0.1	0.8	0.19	0.46	0.19	16.5
3u	U	All MCs	1	0.0	1	0.0	0.023	8.7	LOS A	0.1	0.8	0.19	0.46	0.19	45.5
Approach			27	7.7	27	7.7	0.023	4.6	LOS A	0.1	0.8	0.19	0.46	0.19	40.4
East: Access Driveway (E)															
4	L2	All MCs	1	0.0	1	0.0	0.020	0.5	LOS A	0.1	0.7	0.25	0.11	0.25	16.1
4a	L1	All MCs	1	0.0	1	0.0	0.020	0.5	LOS A	0.1	0.7	0.25	0.11	0.25	10.0
6	R2	All MCs	20	10.5	20	10.5	0.020	0.6	LOS A	0.1	0.7	0.25	0.11	0.25	16.1
6u	U	All MCs	1	0.0	1	0.0	0.020	0.5	LOS A	0.1	0.7	0.25	0.11	0.25	10.0
Approach			23	9.1	23	9.1	0.020	0.6	LOS A	0.1	0.7	0.25	0.11	0.25	15.2
North: Jubilee Avenue (N)															
7	L2	All MCs	8	12.5	8	12.5	0.075	6.7	LOS A	0.4	2.7	0.05	0.59	0.05	16.5
8	T1	All MCs	66	3.2	66	3.2	0.075	3.6	LOS A	0.4	2.7	0.05	0.59	0.05	45.7
9a	R1	All MCs	14	7.7	14	7.7	0.075	11.0	LOS A	0.4	2.7	0.05	0.59	0.05	16.5
9u	U	All MCs	23	13.6	23	13.6	0.075	8.6	LOS A	0.4	2.7	0.05	0.59	0.05	45.0
Approach			112	6.6	112	6.6	0.075	5.8	LOS A	0.4	2.7	0.05	0.59	0.05	33.8
SouthWest: Access Driveway (SW)															
30a	L1	All MCs	19	5.6	19	5.6	0.018	0.4	LOS A	0.1	0.6	0.20	0.07	0.20	16.2
32a	R1	All MCs	1	0.0	1	0.0	0.018	0.3	LOS A	0.1	0.6	0.20	0.07	0.20	10.0
32b	R3	All MCs	1	0.0	1	0.0	0.018	0.3	LOS A	0.1	0.6	0.20	0.07	0.20	16.2
32u	U	All MCs	1	0.0	1	0.0	0.018	0.3	LOS A	0.1	0.6	0.20	0.07	0.20	10.0
Approach			22	4.8	22	4.8	0.018	0.4	LOS A	0.1	0.6	0.20	0.07	0.20	15.3
All Vehicles			184	6.9	184	6.9	0.075	4.3	LOS A	0.4	2.7	0.11	0.45	0.11	26.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future AM Ponderosa Pde / Jubilee Ave (Site Folder: Future Post-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Ponderosa Parade / Jubilee Avenue
Future conditions (Post-Development)
AM Peak Period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ponderosa Parade (S)															
1	L2	All MCs	199	0.5	199	0.5	0.784	14.0	LOS A	9.8	69.7	0.93	1.02	1.39	41.1
2	T1	All MCs	362	2.9	362	2.9	0.784	13.8	LOS A	9.8	69.7	0.93	1.02	1.39	41.3
3	R2	All MCs	71	1.5	71	1.5	0.784	16.8	LOS B	9.8	69.7	0.93	1.02	1.39	40.9
3u	U	All MCs	4	0.0	4	0.0	0.784	18.1	LOS B	9.8	69.7	0.93	1.02	1.39	40.9
Approach			636	2.0	636	2.0	0.784	14.2	LOS A	9.8	69.7	0.93	1.02	1.39	41.2
East: Jubilee Avenue (E)															
4	L2	All MCs	154	2.7	154	2.7	0.658	14.6	LOS B	6.5	46.4	0.92	0.98	1.29	40.6
5	T1	All MCs	175	1.8	175	1.8	0.658	14.3	LOS A	6.5	46.4	0.92	0.98	1.29	40.9
6	R2	All MCs	101	4.2	101	4.2	0.658	17.5	LOS B	6.5	46.4	0.92	0.98	1.29	40.4
6u	U	All MCs	1	0.0	1	0.0	0.658	18.7	LOS B	6.5	46.4	0.92	0.98	1.29	40.5
Approach			431	2.7	431	2.7	0.658	15.2	LOS B	6.5	46.4	0.92	0.98	1.29	40.7
North: Ponderosa Parade (N)															
7	L2	All MCs	136	6.2	136	6.2	0.657	5.8	LOS A	4.8	35.3	0.54	0.62	0.57	44.5
8	T1	All MCs	324	5.8	324	5.8	0.657	5.3	LOS A	4.8	35.3	0.54	0.62	0.57	44.9
9	R2	All MCs	283	3.3	283	3.3	0.657	8.4	LOS A	4.8	35.3	0.54	0.62	0.57	44.6
9u	U	All MCs	7	14.3	7	14.3	0.657	10.0	LOS A	4.8	35.3	0.54	0.62	0.57	44.3
Approach			751	5.0	751	5.0	0.657	6.6	LOS A	4.8	35.3	0.54	0.62	0.57	44.7
West: Jubilee Avenue (W)															
10	L2	All MCs	171	6.8	171	6.8	0.486	9.9	LOS A	3.8	27.5	0.83	0.78	0.91	44.7
11	T1	All MCs	54	2.0	54	2.0	0.486	9.3	LOS A	3.8	27.5	0.83	0.78	0.91	44.6
12	R2	All MCs	114	0.9	114	0.9	0.486	12.4	LOS A	3.8	27.5	0.83	0.78	0.91	44.3
12u	U	All MCs	2	0.0	2	0.0	0.486	13.4	LOS A	3.8	27.5	0.83	0.78	0.91	43.5
Approach			340	4.0	340	4.0	0.486	10.6	LOS A	3.8	27.5	0.83	0.78	0.91	44.6
All Vehicles			2157	3.5	2157	3.5	0.784	11.2	LOS A	9.8	69.7	0.78	0.83	1.01	42.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future PM Ponderosa Pde / Jubilee Ave (Site Folder: Future Post-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Ponderosa Parade / Jubilee Avenue
Future conditions (Post Development)
PM Peak Period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ponderosa Parade (S)															
1	L2	All MCs	143	2.2	143	2.2	0.649	8.7	LOS A	5.8	42.1	0.75	0.76	0.88	44.5
2	T1	All MCs	383	4.4	383	4.4	0.649	8.2	LOS A	5.8	42.1	0.75	0.76	0.88	44.2
3	R2	All MCs	65	1.6	65	1.6	0.649	11.1	LOS A	5.8	42.1	0.75	0.76	0.88	43.7
3u	U	All MCs	12	0.0	12	0.0	0.649	12.5	LOS A	5.8	42.1	0.75	0.76	0.88	43.7
Approach			603	3.5	603	3.5	0.649	8.7	LOS A	5.8	42.1	0.75	0.76	0.88	44.2
East: Jubilee Avenue (E)															
4	L2	All MCs	122	0.0	122	0.0	0.488	10.1	LOS A	3.6	25.8	0.81	0.82	0.93	42.6
5	T1	All MCs	94	1.1	94	1.1	0.488	9.9	LOS A	3.6	25.8	0.81	0.82	0.93	43.2
6	R2	All MCs	125	2.5	125	2.5	0.488	12.9	LOS A	3.6	25.8	0.81	0.82	0.93	42.4
6u	U	All MCs	4	0.0	4	0.0	0.488	14.2	LOS A	3.6	25.8	0.81	0.82	0.93	42.4
Approach			345	1.2	345	1.2	0.488	11.1	LOS A	3.6	25.8	0.81	0.82	0.93	42.7
North: Ponderosa Parade (N)															
7	L2	All MCs	120	3.5	120	3.5	0.605	6.9	LOS A	4.5	32.7	0.67	0.72	0.74	44.5
8	T1	All MCs	278	6.4	278	6.4	0.605	6.5	LOS A	4.5	32.7	0.67	0.72	0.74	44.8
9	R2	All MCs	178	4.1	178	4.1	0.605	9.9	LOS A	4.5	32.7	0.67	0.72	0.74	45.4
9u	U	All MCs	3	66.7	3	66.7	0.605	12.6	LOS A	4.5	32.7	0.67	0.72	0.74	43.4
Approach			579	5.5	579	5.5	0.605	7.6	LOS A	4.5	32.7	0.67	0.72	0.74	44.9
West: Jubilee Avenue (W)															
10	L2	All MCs	234	1.8	234	1.8	0.807	19.4	LOS B	11.8	84.0	1.00	1.14	1.66	38.6
11	T1	All MCs	125	2.5	125	2.5	0.807	19.2	LOS B	11.8	84.0	1.00	1.14	1.66	38.7
12	R2	All MCs	204	1.0	204	1.0	0.807	22.2	LOS B	11.8	84.0	1.00	1.14	1.66	38.4
12u	U	All MCs	1	0.0	1	0.0	0.807	23.5	LOS B	11.8	84.0	1.00	1.14	1.66	38.3
Approach			564	1.7	564	1.7	0.807	20.4	LOS B	11.8	84.0	1.00	1.14	1.66	38.6
All Vehicles			2092	3.2	2092	3.2	0.807	12.0	LOS A	11.8	84.0	0.80	0.86	1.06	42.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future AM Jubilee Ave / Access Driveway (Site Folder: Future Post-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Jubilee Avenue / Access Driveway
Future conditions (Post-Development)
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Jubilee Avenue (S)															
1b	L3	All MCs	1	0.0	1	0.0	0.057	10.4	LOS A	0.0	0.1	0.01	0.03	0.01	17.2
2	T1	All MCs	112	0.9	112	0.9	0.057	0.0	LOS A	0.0	0.1	0.01	0.03	0.01	58.2
3	R2	All MCs	1	0.0	1	0.0	0.057	8.0	LOS A	0.0	0.1	0.01	0.03	0.01	17.2
3u	U	All MCs	1	0.0	1	0.0	0.057	6.7	LOS A	0.0	0.1	0.01	0.03	0.01	56.0
Approach			115	0.9	115	0.9	0.057	0.2	NA	0.0	0.1	0.01	0.03	0.01	55.7
East: Access Driveway (E)															
4	L2	All MCs	1	0.0	1	0.0	0.008	0.1	LOS A	0.0	0.2	0.15	0.12	0.15	18.2
4a	L1	All MCs	1	0.0	1	0.0	0.008	0.5	LOS A	0.0	0.2	0.15	0.12	0.15	10.7
6	R2	All MCs	4	25.0	4	25.0	0.008	1.3	LOS A	0.0	0.2	0.15	0.12	0.15	18.1
6u	U	All MCs	1	0.0	1	0.0	0.008	6.8	LOS A	0.0	0.2	0.15	0.12	0.15	18.8
Approach			7	14.3	7	14.3	0.008	1.8	LOS A	0.0	0.2	0.15	0.12	0.15	16.6
North: Jubilee Avenue (N)															
7	L2	All MCs	21	10.0	21	10.0	0.058	8.7	LOS A	0.3	2.0	0.22	0.58	0.22	16.6
8	T1	All MCs	29	0.0	29	0.0	0.058	0.4	LOS A	0.3	2.0	0.22	0.58	0.22	51.2
9a	R1	All MCs	33	9.7	33	9.7	0.058	7.8	LOS A	0.3	2.0	0.22	0.58	0.22	16.6
9u	U	All MCs	11	0.0	11	0.0	0.058	7.3	LOS A	0.3	2.0	0.22	0.58	0.22	49.7
Approach			94	5.6	94	5.6	0.058	5.6	NA	0.3	2.0	0.22	0.58	0.22	23.3
SouthWest: Access Driveway (SW)															
30a	L1	All MCs	12	18.2	12	18.2	0.014	0.4	LOS A	0.1	0.4	0.22	0.12	0.22	17.2
32a	R1	All MCs	2	50.0	2	50.0	0.014	1.6	LOS A	0.1	0.4	0.22	0.12	0.22	10.3
32b	R3	All MCs	1	0.0	1	0.0	0.014	0.8	LOS A	0.1	0.4	0.22	0.12	0.22	17.2
32u	U	All MCs	1	0.0	1	0.0	0.014	6.8	LOS A	0.1	0.4	0.22	0.12	0.22	17.7
Approach			16	20.0	16	20.0	0.014	1.0	LOS A	0.1	0.4	0.22	0.12	0.22	15.8
All Vehicles			232	4.5	232	4.5	0.058	2.5	NA	0.3	2.0	0.11	0.26	0.11	30.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future PM Jubilee Ave / Access Driveway (Site Folder: Future Post-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Jubilee Avenue / Access Driveway
Future conditions (Post Development)
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Jubilee Avenue (S)															
1b	L3	All MCs	1	0.0	1	0.0	0.021	10.8	LOS A	0.0	0.1	0.04	0.11	0.04	17.1
2	T1	All MCs	37	5.7	37	5.7	0.021	0.1	LOS A	0.0	0.1	0.04	0.11	0.04	55.4
3	R2	All MCs	1	0.0	1	0.0	0.021	8.3	LOS A	0.0	0.1	0.04	0.11	0.04	17.1
3u	U	All MCs	1	0.0	1	0.0	0.021	7.3	LOS A	0.0	0.1	0.04	0.11	0.04	54.4
Approach			40	5.3	40	5.3	0.021	0.8	NA	0.0	0.1	0.04	0.11	0.04	49.5
East: Access Driveway (E)															
4	L2	All MCs	1	0.0	1	0.0	0.026	0.3	LOS A	0.1	0.7	0.20	0.11	0.20	16.8
4a	L1	All MCs	1	0.0	1	0.0	0.026	0.5	LOS A	0.1	0.7	0.20	0.11	0.20	10.2
6	R2	All MCs	20	10.5	20	10.5	0.026	1.2	LOS A	0.1	0.7	0.20	0.11	0.20	16.7
6u	U	All MCs	1	0.0	1	0.0	0.026	6.7	LOS A	0.1	0.7	0.20	0.11	0.20	17.2
Approach			23	9.1	23	9.1	0.026	1.4	LOS A	0.1	0.7	0.20	0.11	0.20	16.3
North: Jubilee Avenue (N)															
7	L2	All MCs	8	12.5	8	12.5	0.098	8.5	LOS A	0.3	2.4	0.08	0.25	0.08	17.0
8	T1	All MCs	119	1.8	119	1.8	0.098	0.1	LOS A	0.3	2.4	0.08	0.25	0.08	55.7
9a	R1	All MCs	14	7.7	14	7.7	0.098	7.5	LOS A	0.3	2.4	0.08	0.25	0.08	17.0
9u	U	All MCs	23	13.6	23	13.6	0.098	7.1	LOS A	0.3	2.4	0.08	0.25	0.08	53.2
Approach			164	4.5	164	4.5	0.098	2.1	NA	0.3	2.4	0.08	0.25	0.08	42.5
SouthWest: Access Driveway (SW)															
30a	L1	All MCs	19	5.6	19	5.6	0.016	0.2	LOS A	0.1	0.4	0.14	0.07	0.14	16.8
32a	R1	All MCs	1	0.0	1	0.0	0.016	0.9	LOS A	0.1	0.4	0.14	0.07	0.14	10.2
32b	R3	All MCs	1	0.0	1	0.0	0.016	0.8	LOS A	0.1	0.4	0.14	0.07	0.14	16.9
32u	U	All MCs	1	0.0	1	0.0	0.016	6.8	LOS A	0.1	0.4	0.14	0.07	0.14	17.3
Approach			22	4.8	22	4.8	0.016	0.6	LOS A	0.1	0.4	0.14	0.07	0.14	16.4
All Vehicles			249	5.1	249	5.1	0.098	1.7	NA	0.3	2.4	0.09	0.20	0.09	33.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future AM Jubilee Avenue / Access Driveway (Site Folder: Future Post-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Jubilee Avenue / Access Driveway
Future conditions (Post Development)
AM Peak Period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Jubilee Avenue (S)															
1b	L3	All MCs	1	0.0	1	0.0	0.087	6.8	LOS A	0.4	2.9	0.17	0.44	0.17	16.8
2	T1	All MCs	111	0.0	111	0.0	0.087	4.4	LOS A	0.4	2.9	0.17	0.44	0.17	49.7
3	R2	All MCs	1	0.0	1	0.0	0.087	12.9	LOS A	0.4	2.9	0.17	0.44	0.17	16.8
3u	U	All MCs	1	0.0	1	0.0	0.087	8.7	LOS A	0.4	2.9	0.17	0.44	0.17	47.4
Approach			114	0.0	114	0.0	0.087	4.5	LOS A	0.4	2.9	0.17	0.44	0.17	47.9
East: Access Driveway (E)															
4	L2	All MCs	1	0.0	1	0.0	0.006	0.3	LOS A	0.0	0.2	0.21	0.07	0.21	16.1
4a	L1	All MCs	1	0.0	1	0.0	0.006	0.3	LOS A	0.0	0.2	0.21	0.07	0.21	10.0
6	R2	All MCs	4	25.0	4	25.0	0.006	0.5	LOS A	0.0	0.2	0.21	0.07	0.21	16.1
6u	U	All MCs	1	0.0	1	0.0	0.006	0.3	LOS A	0.0	0.2	0.21	0.07	0.21	10.0
Approach			7	14.3	7	14.3	0.006	0.4	LOS A	0.0	0.2	0.21	0.07	0.21	13.7
North: Jubilee Avenue (N)															
7	L2	All MCs	21	10.0	21	10.0	0.064	6.7	LOS A	0.3	2.3	0.06	0.74	0.06	16.4
8	T1	All MCs	29	0.0	29	0.0	0.064	4.1	LOS A	0.3	2.3	0.06	0.74	0.06	46.7
9a	R1	All MCs	33	9.7	33	9.7	0.064	11.0	LOS A	0.3	2.3	0.06	0.74	0.06	16.4
9u	U	All MCs	11	0.0	11	0.0	0.064	8.4	LOS A	0.3	2.3	0.06	0.74	0.06	44.8
Approach			94	5.6	94	5.6	0.064	7.6	LOS A	0.3	2.3	0.06	0.74	0.06	22.7
SouthWest: Access Driveway (SW)															
30a	L1	All MCs	12	18.2	12	18.2	0.015	0.7	LOS A	0.1	0.6	0.29	0.13	0.29	16.1
32a	R1	All MCs	2	50.0	2	50.0	0.015	1.0	LOS A	0.1	0.6	0.29	0.13	0.29	10.0
32b	R3	All MCs	1	0.0	1	0.0	0.015	0.6	LOS A	0.1	0.6	0.29	0.13	0.29	16.2
32u	U	All MCs	1	0.0	1	0.0	0.015	0.6	LOS A	0.1	0.6	0.29	0.13	0.29	10.0
Approach			16	20.0	16	20.0	0.015	0.7	LOS A	0.1	0.6	0.29	0.13	0.29	14.4
All Vehicles			231	4.1	231	4.1	0.087	5.4	LOS A	0.4	2.9	0.13	0.53	0.13	28.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future PM Jubilee Avenue / Access Driveway (Site Folder: Future Post-Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Jubilee Avenue / Access Driveway
Future conditions (Post Development)
PM Peak Period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Jubilee Avenue (S)															
1b	L3	All MCs	1	0.0	1	0.0	0.033	6.8	LOS A	0.2	1.1	0.19	0.46	0.19	16.7
2	T1	All MCs	37	5.7	37	5.7	0.033	4.4	LOS A	0.2	1.1	0.19	0.46	0.19	48.5
3	R2	All MCs	1	0.0	1	0.0	0.033	13.0	LOS A	0.2	1.1	0.19	0.46	0.19	16.7
3u	U	All MCs	1	0.0	1	0.0	0.033	8.7	LOS A	0.2	1.1	0.19	0.46	0.19	46.7
Approach			40	5.3	40	5.3	0.033	4.8	LOS A	0.2	1.1	0.19	0.46	0.19	44.0
East: Access Driveway (E)															
4	L2	All MCs	1	0.0	1	0.0	0.021	0.8	LOS A	0.1	0.7	0.31	0.15	0.31	16.1
4a	L1	All MCs	1	0.0	1	0.0	0.021	0.8	LOS A	0.1	0.7	0.31	0.15	0.31	10.0
6	R2	All MCs	20	10.5	20	10.5	0.021	0.9	LOS A	0.1	0.7	0.31	0.15	0.31	16.0
6u	U	All MCs	1	0.0	1	0.0	0.021	0.8	LOS A	0.1	0.7	0.31	0.15	0.31	10.0
Approach			23	9.1	23	9.1	0.021	0.8	LOS A	0.1	0.7	0.31	0.15	0.31	15.2
North: Jubilee Avenue (N)															
7	L2	All MCs	8	12.5	8	12.5	0.107	6.7	LOS A	0.5	3.9	0.05	0.56	0.05	16.7
8	T1	All MCs	119	1.8	119	1.8	0.107	4.1	LOS A	0.5	3.9	0.05	0.56	0.05	48.8
9a	R1	All MCs	14	7.7	14	7.7	0.107	11.0	LOS A	0.5	3.9	0.05	0.56	0.05	16.7
9u	U	All MCs	23	13.6	23	13.6	0.107	8.6	LOS A	0.5	3.9	0.05	0.56	0.05	46.4
Approach			164	4.5	164	4.5	0.107	5.5	LOS A	0.5	3.9	0.05	0.56	0.05	38.6
SouthWest: Access Driveway (SW)															
30a	L1	All MCs	19	5.6	19	5.6	0.019	0.4	LOS A	0.1	0.6	0.22	0.08	0.22	16.2
32a	R1	All MCs	1	0.0	1	0.0	0.019	0.4	LOS A	0.1	0.6	0.22	0.08	0.22	10.0
32b	R3	All MCs	1	0.0	1	0.0	0.019	0.4	LOS A	0.1	0.6	0.22	0.08	0.22	16.2
32u	U	All MCs	1	0.0	1	0.0	0.019	0.4	LOS A	0.1	0.6	0.22	0.08	0.22	10.0
Approach			22	4.8	22	4.8	0.019	0.4	LOS A	0.1	0.6	0.22	0.08	0.22	15.3
All Vehicles			249	5.1	249	5.1	0.107	4.5	LOS A	0.5	3.9	0.11	0.46	0.11	30.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future AM Ponderosa Pde / Jubilee Ave (Site Folder: Future Post-Development 2034 Growth Scenario)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Ponderosa Parade / Jubilee Avenue
Future conditions 2034 Growth Scenario
AM Peak Period
Site Category: (None)
Roundabout
Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ponderosa Parade (S)															
1	L2	All MCs	199	0.5	199	0.5	0.876	19.2	LOS B	14.8	105.5	1.00	1.23	1.80	38.9
2	T1	All MCs	435	2.9	435	2.9	0.876	18.9	LOS B	14.8	105.5	1.00	1.23	1.80	39.0
3	R2	All MCs	71	1.5	71	1.5	0.876	21.9	LOS B	14.8	105.5	1.00	1.23	1.80	38.7
3u	U	All MCs	4	0.0	4	0.0	0.876	23.2	LOS B	14.8	105.5	1.00	1.23	1.80	38.7
Approach			708	2.1	708	2.1	0.876	19.3	LOS B	14.8	105.5	1.00	1.23	1.80	39.0
East: Jubilee Avenue (E)															
4	L2	All MCs	154	2.7	154	2.7	0.719	18.3	LOS B	7.9	56.9	0.97	1.07	1.50	39.0
5	T1	All MCs	175	1.8	175	1.8	0.719	18.0	LOS B	7.9	56.9	0.97	1.07	1.50	39.3
6	R2	All MCs	101	4.2	101	4.2	0.719	21.2	LOS B	7.9	56.9	0.97	1.07	1.50	38.8
6u	U	All MCs	1	0.0	1	0.0	0.719	22.3	LOS B	7.9	56.9	0.97	1.07	1.50	38.9
Approach			431	2.7	431	2.7	0.719	18.9	LOS B	7.9	56.9	0.97	1.07	1.50	39.1
North: Ponderosa Parade (N)															
7	L2	All MCs	136	6.2	136	6.2	0.712	6.3	LOS A	6.1	44.9	0.60	0.64	0.65	44.3
8	T1	All MCs	389	5.8	389	5.8	0.712	5.7	LOS A	6.1	44.9	0.60	0.64	0.65	44.8
9	R2	All MCs	283	3.3	283	3.3	0.712	8.8	LOS A	6.1	44.9	0.60	0.64	0.65	44.4
9u	U	All MCs	7	14.3	7	14.3	0.712	10.4	LOS A	6.1	44.9	0.60	0.64	0.65	44.1
Approach			815	5.1	815	5.1	0.712	6.9	LOS A	6.1	44.9	0.60	0.64	0.65	44.6
West: Jubilee Avenue (W)															
10	L2	All MCs	171	6.8	171	6.8	0.538	11.7	LOS A	4.6	33.4	0.89	0.85	1.06	43.7
11	T1	All MCs	54	2.0	54	2.0	0.538	11.1	LOS A	4.6	33.4	0.89	0.85	1.06	43.6
12	R2	All MCs	114	0.9	114	0.9	0.538	14.2	LOS A	4.6	33.4	0.89	0.85	1.06	43.4
12u	U	All MCs	2	0.0	2	0.0	0.538	15.3	LOS B	4.6	33.4	0.89	0.85	1.06	42.6
Approach			340	4.0	340	4.0	0.538	12.5	LOS A	4.6	33.4	0.89	0.85	1.06	43.6
All Vehicles			2294	3.6	2294	3.6	0.876	13.8	LOS A	14.8	105.5	0.84	0.93	1.23	41.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Future PM Ponderosa Pde / Jubilee Ave (Site Folder: Future Post-Development 2034 Growth Scenario)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

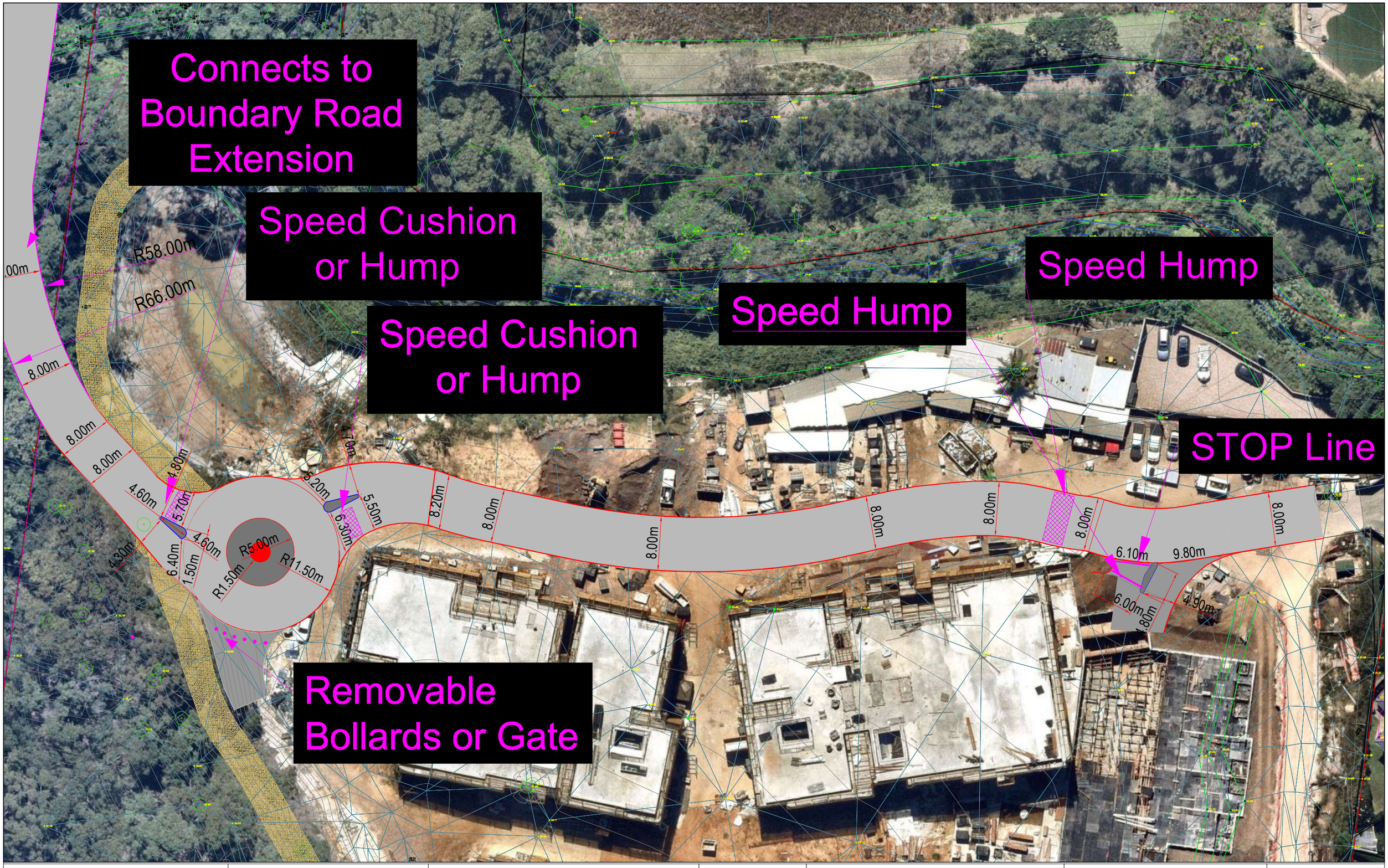
Ponderosa Parade / Jubilee Avenue
Future conditions 2034 Growth Scenario
PM Peak Period
Site Category: (None)
Roundabout
Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ponderosa Parade (S)															
1	L2	All MCs	143	2.2	143	2.2	0.729	10.0	LOS A	7.9	57.2	0.82	0.82	1.04	43.8
2	T1	All MCs	460	4.4	460	4.4	0.729	9.5	LOS A	7.9	57.2	0.82	0.82	1.04	43.5
3	R2	All MCs	65	1.6	65	1.6	0.729	12.4	LOS A	7.9	57.2	0.82	0.82	1.04	43.0
3u	U	All MCs	12	0.0	12	0.0	0.729	13.8	LOS A	7.9	57.2	0.82	0.82	1.04	43.1
Approach			680	3.6	680	3.6	0.729	9.9	LOS A	7.9	57.2	0.82	0.82	1.04	43.5
East: Jubilee Avenue (E)															
4	L2	All MCs	122	0.0	122	0.0	0.526	11.5	LOS A	4.2	29.9	0.86	0.87	1.04	41.9
5	T1	All MCs	94	1.1	94	1.1	0.526	11.3	LOS A	4.2	29.9	0.86	0.87	1.04	42.5
6	R2	All MCs	125	2.5	125	2.5	0.526	14.4	LOS A	4.2	29.9	0.86	0.87	1.04	41.7
6u	U	All MCs	4	0.0	4	0.0	0.526	15.7	LOS B	4.2	29.9	0.86	0.87	1.04	41.7
Approach			345	1.2	345	1.2	0.526	12.5	LOS A	4.2	29.9	0.86	0.87	1.04	42.0
North: Ponderosa Parade (N)															
7	L2	All MCs	120	3.5	120	3.5	0.662	7.4	LOS A	5.5	40.1	0.71	0.75	0.82	44.3
8	T1	All MCs	333	6.4	333	6.4	0.662	7.0	LOS A	5.5	40.1	0.71	0.75	0.82	44.6
9	R2	All MCs	178	4.1	178	4.1	0.662	10.4	LOS A	5.5	40.1	0.71	0.75	0.82	45.2
9u	U	All MCs	3	66.7	3	66.7	0.662	13.2	LOS A	5.5	40.1	0.71	0.75	0.82	43.2
Approach			635	5.5	635	5.5	0.662	8.0	LOS A	5.5	40.1	0.71	0.75	0.82	44.7
West: Jubilee Avenue (W)															
10	L2	All MCs	234	1.8	234	1.8	0.898	31.5	LOS C	17.4	123.4	1.00	1.48	2.24	34.3
11	T1	All MCs	125	2.5	125	2.5	0.898	31.3	LOS C	17.4	123.4	1.00	1.48	2.24	34.4
12	R2	All MCs	204	1.0	204	1.0	0.898	34.2	LOS C	17.4	123.4	1.00	1.48	2.24	34.1
12u	U	All MCs	1	0.0	1	0.0	0.898	35.5	LOS C	17.4	123.4	1.00	1.48	2.24	34.1
Approach			564	1.7	564	1.7	0.898	32.4	LOS C	17.4	123.4	1.00	1.48	2.24	34.2
All Vehicles			2224	3.3	2224	3.3	0.898	15.5	LOS B	17.4	123.4	0.84	0.98	1.28	40.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

ANNEXURE D: PROPOSED WIDENING OF 8 FOREST ROAD ACCESS WAY AND SWEPT PATH TESTING (5 SHEETS)



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Client / Project:
Opera Properties Pty Ltd

Project Address:
120 Mona Vale Road, Warriewood

Notes:
CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Scale @ A3 1:1409.3638

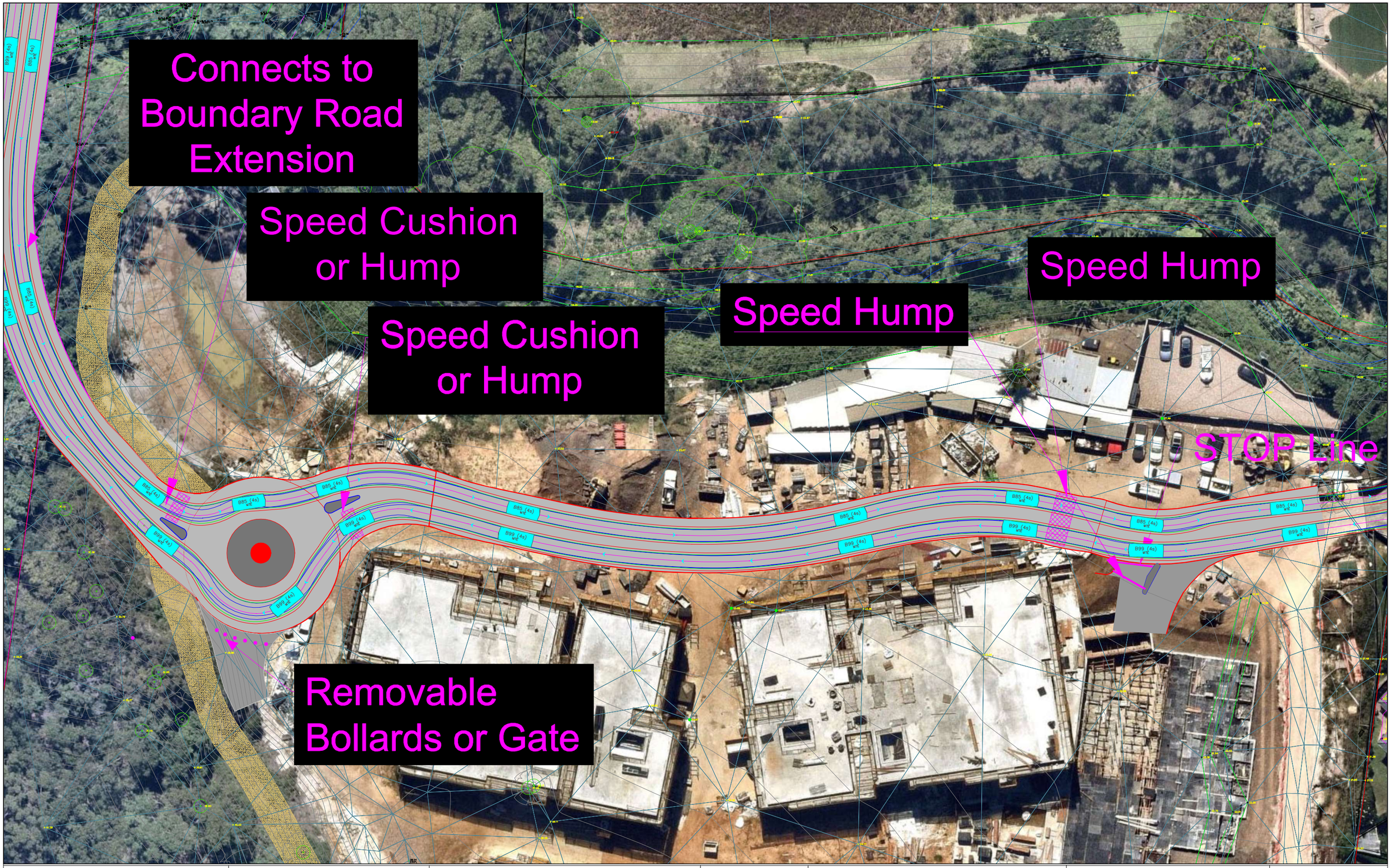
Project No:
230923

Drawing Title:
8 Forest Road - Roadway Widening Concept

Revision History

Version	Date	Notes
A	29/08/2024	Initial Revision
B	02/09/2024	Dimensions Included

Filename: acad-4034-det (mga2020) combined - mte concept.dwg



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Notes:
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Tested Using:
*AutoTURN 11
*ZWCAD 2019

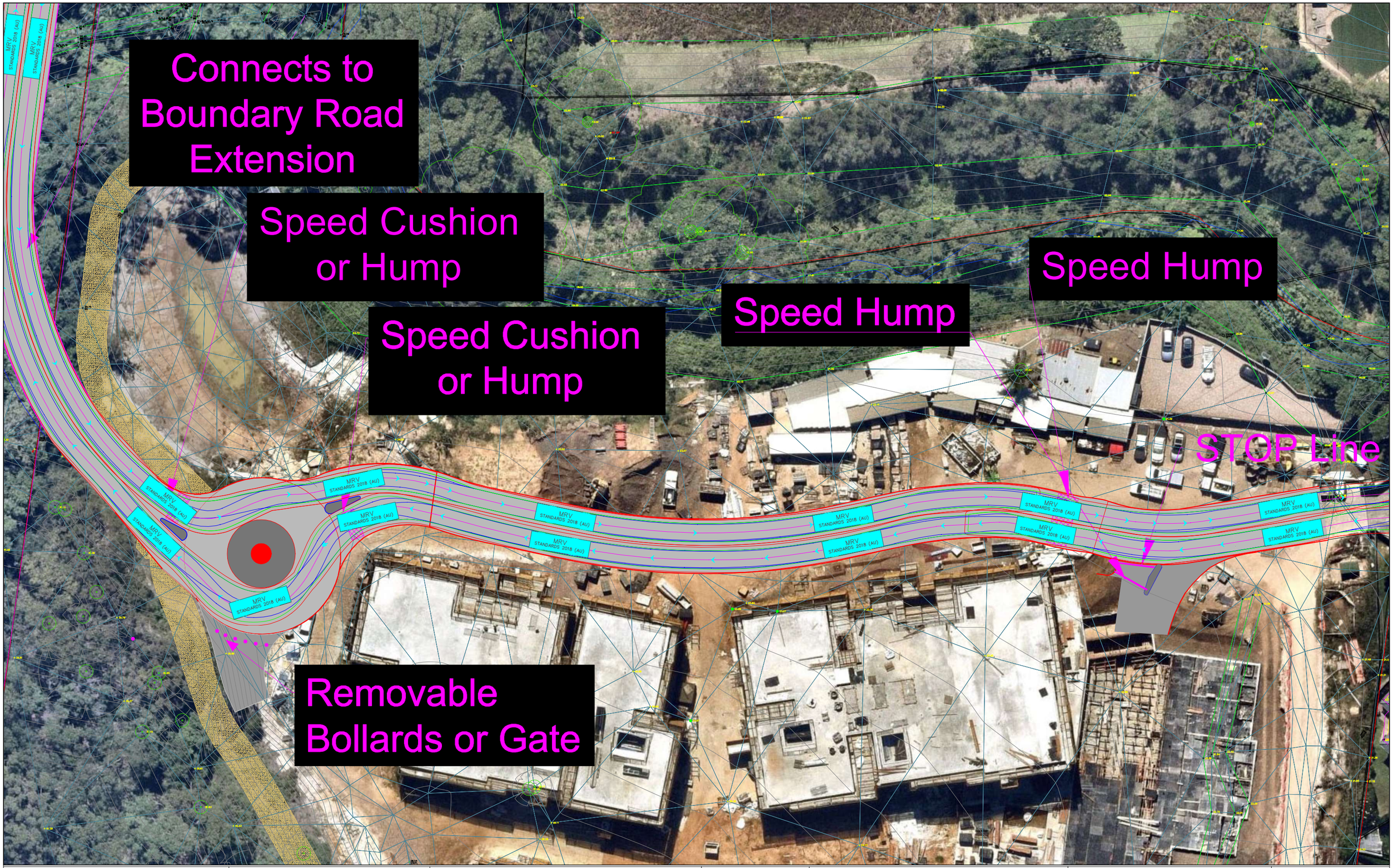
Scale @ A3 1:1409.3638

Project No:
230923

Drawing Title:
8 Forest Road - Roadway Widening Concept
B99 v B85 Passing Swept Paths

Revision History		
Version	Date	Notes
A	29/08/2024	Initial Revision

Filename: acad-4034-det (mga2020) combined - mte concept.dwg



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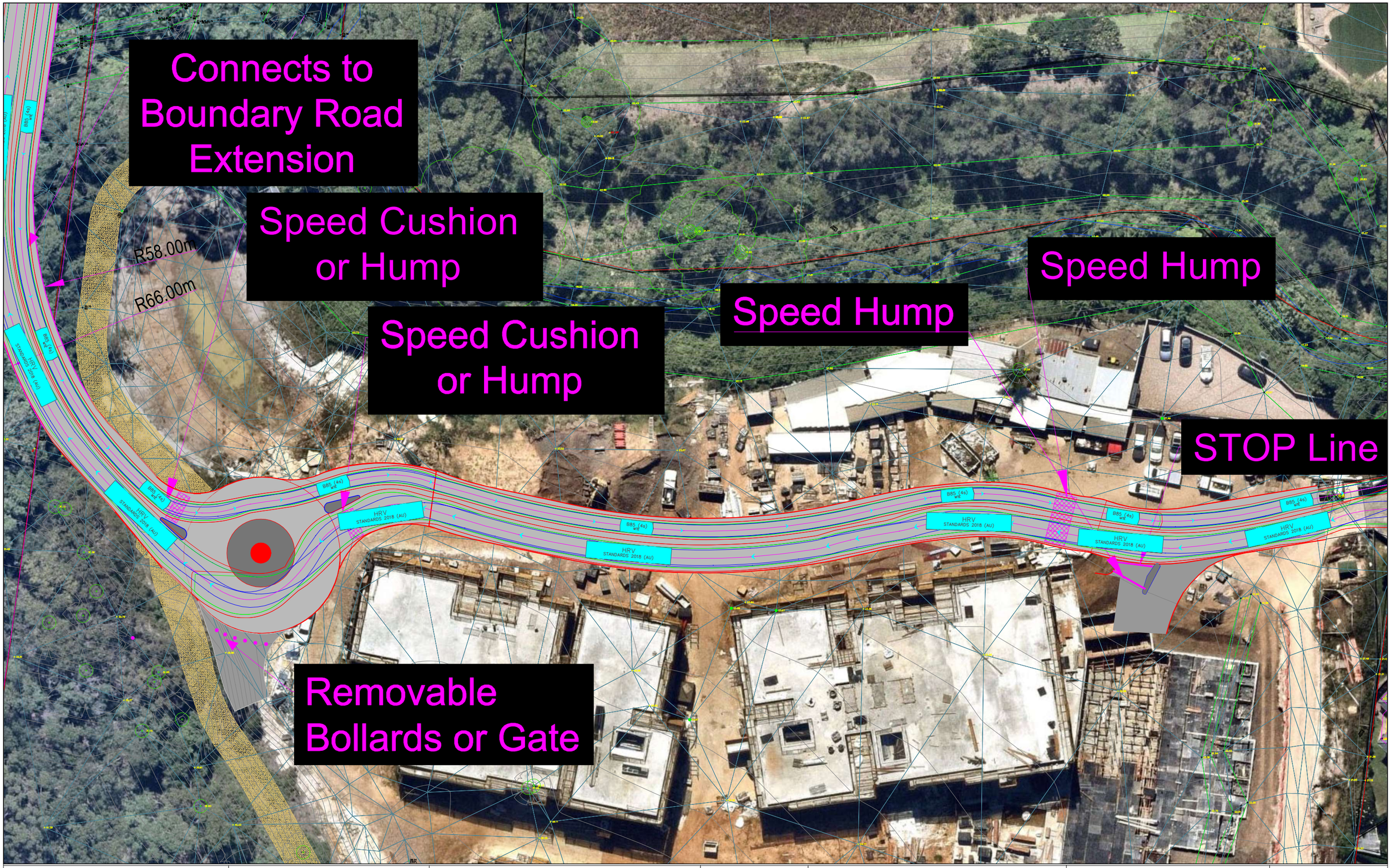
Tested Using:
*AutoTURN 11
*ZWCAD 2019
Scale @ A3 1:1409.3638

Project No:
230923

Drawing Title:
8 Forest Road - Roadway Widening Concept
MRV v MRV Passing Swept Paths

Revision History		
Version	Date	Notes
A	29/08/2024	Initial Revision

Filename: acad-4034-det (mga2020) combined - mte concept.dwg



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Notes:
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Tested Using:
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*ZWCAD 2019

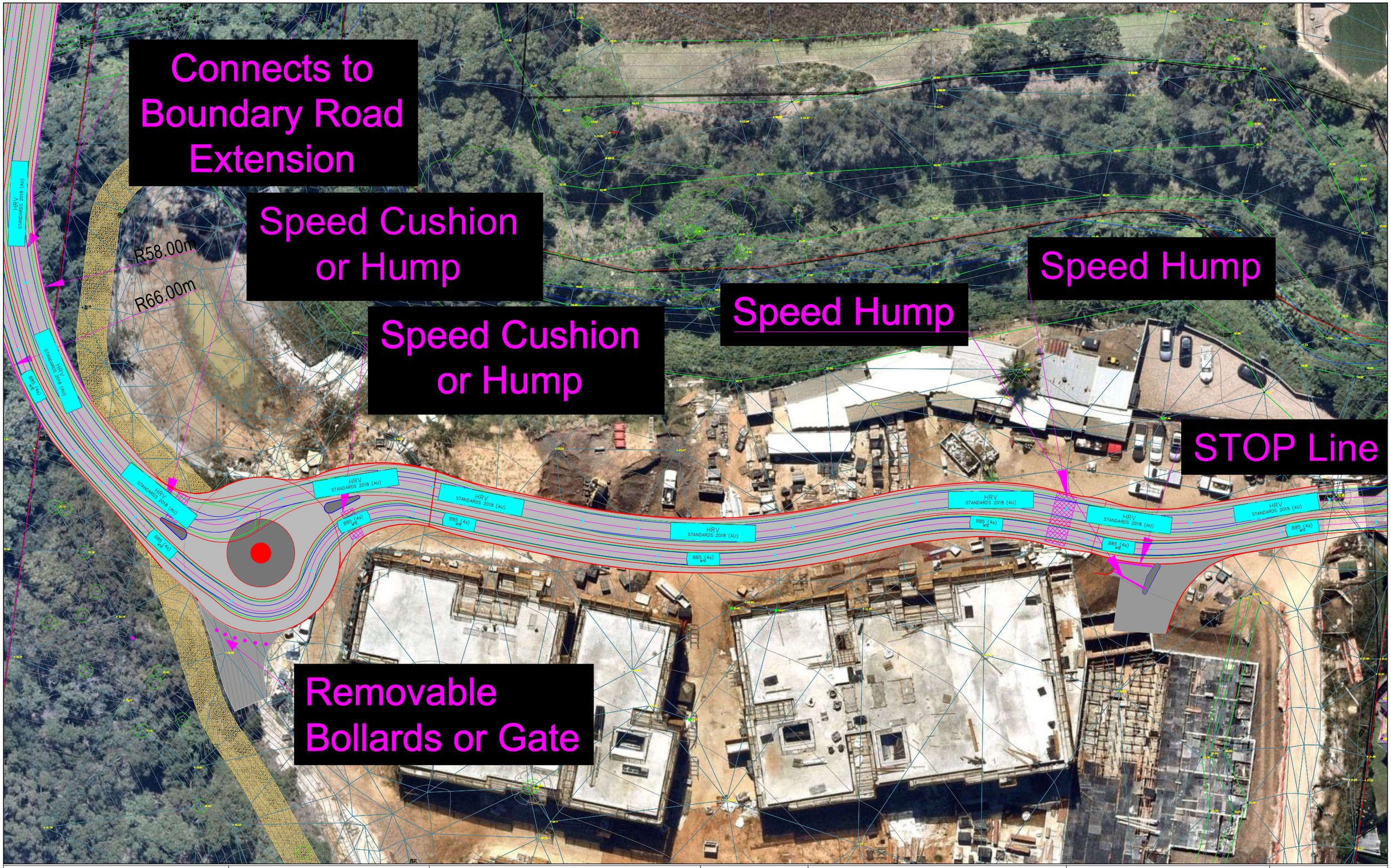
Scale @ A3 1:1409.3638

Project No:
230923

Drawing Title:
8 Forest Road - Roadway Widening Concept
HRV (IN) v B85 (OUT) Passing Swept Paths

Revision History		
Version	Date	Notes
A	02/09/2024	Initial Revision

Filename: acad-4034-det (mga2020) combined - mte concept.dwg



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Scale @ A3 1:1409.3638

Project No:
230923

Drawing Title:
8 Forest Road - Roadway Widening Concept
B85 (IN) v HRV (OUT) Passing Swept Paths

Revision History

Version	Date	Notes
A	02/09/2024	Initial Revision

Filename: acad-4034-det (mga2020) combined - mte concept.dwg

ANNEXURE E: CIVIL ENGINEERING ADVICE OF STORMWATER CAPACITY IN 8 FOREST ROAD (1 SHEET)

WSce Pty Ltd
Warren Smith Consulting Engineers

ACN 668 655 141
ABN 75 668 655 141

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Sydney, NSW 2000

Level 9, Suite 9.03
2 Queen Street
Melbourne 3000 VIC

Level 7
123 Eagle Street
Brisbane City QLD 4000

Level 3, Unit 27
490 Northbourne Avenue
Dickson ACT 2602

info@wsce.com.au
wsce.com.au

20th August 2024

Tony Cusick
Kuatro Build
Suite 1 / 3B Macquarie Street
Sydney NSW 2000

Dear Tony,

Re: Forest Lodge Warriewood - Bioretention Basin Volume Check

Upon Kuatro's request, WSce have conducted a basin volume check for the future road extension to a total of 8m wide, which has an area of approximately 450m^2 as highlighted in the below **Figure 1**.

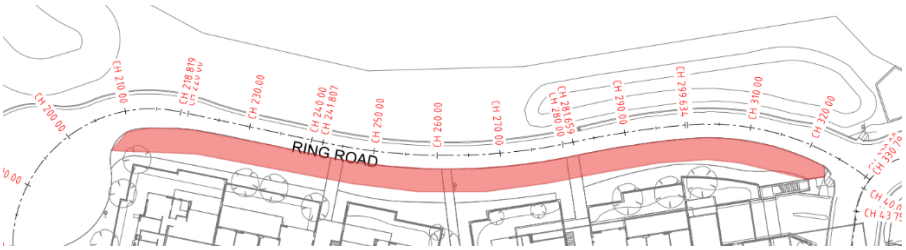

Figure 1 – Road extension area

We revised our DRAINS model *7368002 – Forest Lodge Warriewood [09].drn* based on this scenario and assuming no change to the local drainage system as currently documented on the WSce Draft Construction Certificate drawings C6.01 (Rev05), C6.02 (Rev07), C6.04 (Rev07), C6.11 (Rev05), C6.12 (Rev05), C6.13 (Rev03), C6.14 (Rev03), C6.21 (Rev06) & C6.22 (Rev06).

Upon running the minor and major storm scenarios in the DRAINS model, considering the extension area as 100% impervious, we confirm there is no impact to the current design of the basins as per the aforementioned design drawings.

Regards,

Isabella Stewart
Senior Engineer - Civil & Water Engineering

M: +61 403 616 408 | E: istewart@wsce.com.au

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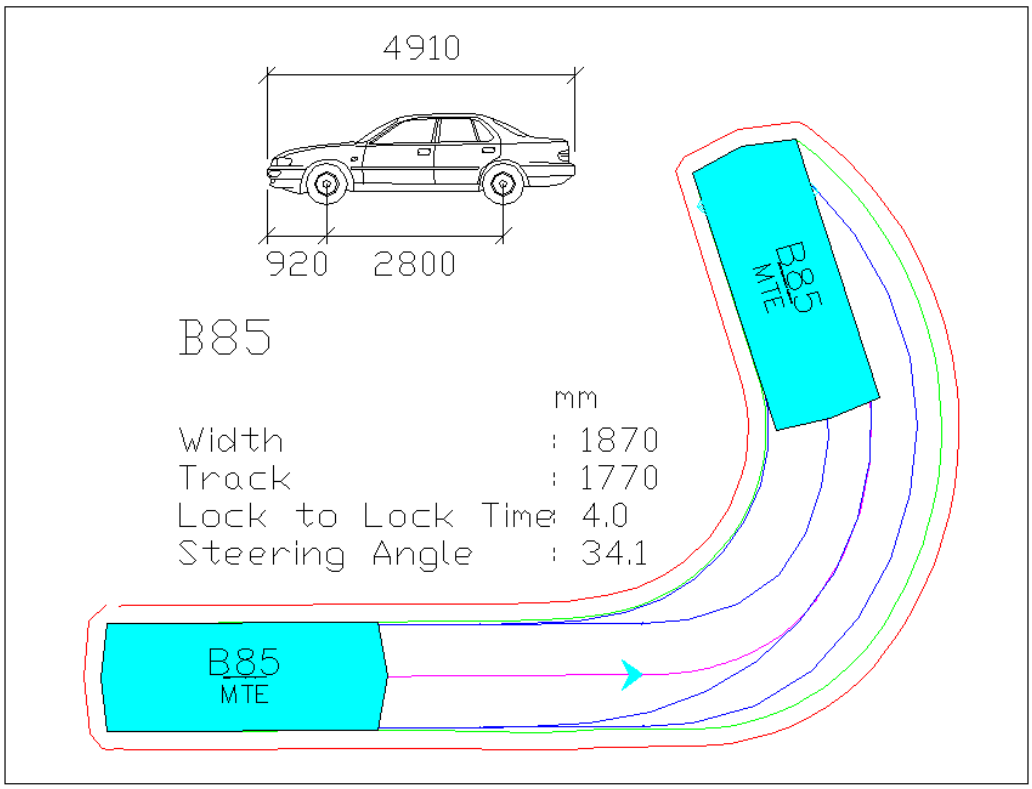
ANNEXURE F: SWEPT PATH TESTING
(7 SHEETS)

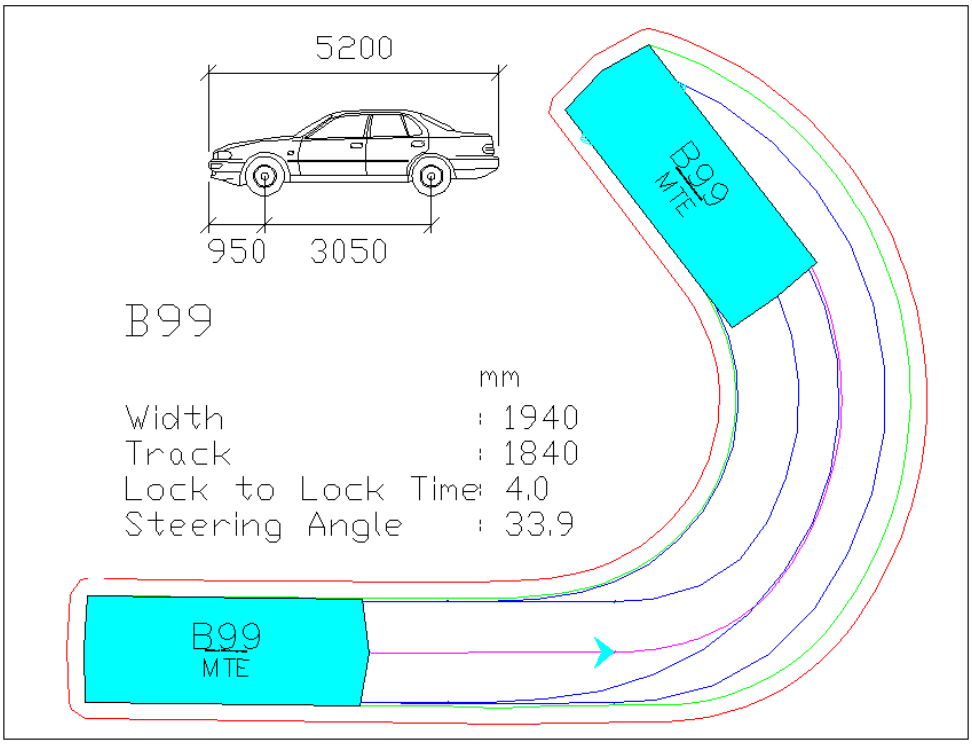


AUSTRALIAN STANDARD 85TH PERCENTILE SIZE VEHICLE (B85)

Blue – Tyre Path

Green – Vehicle Body

Red – 300mm Clearance

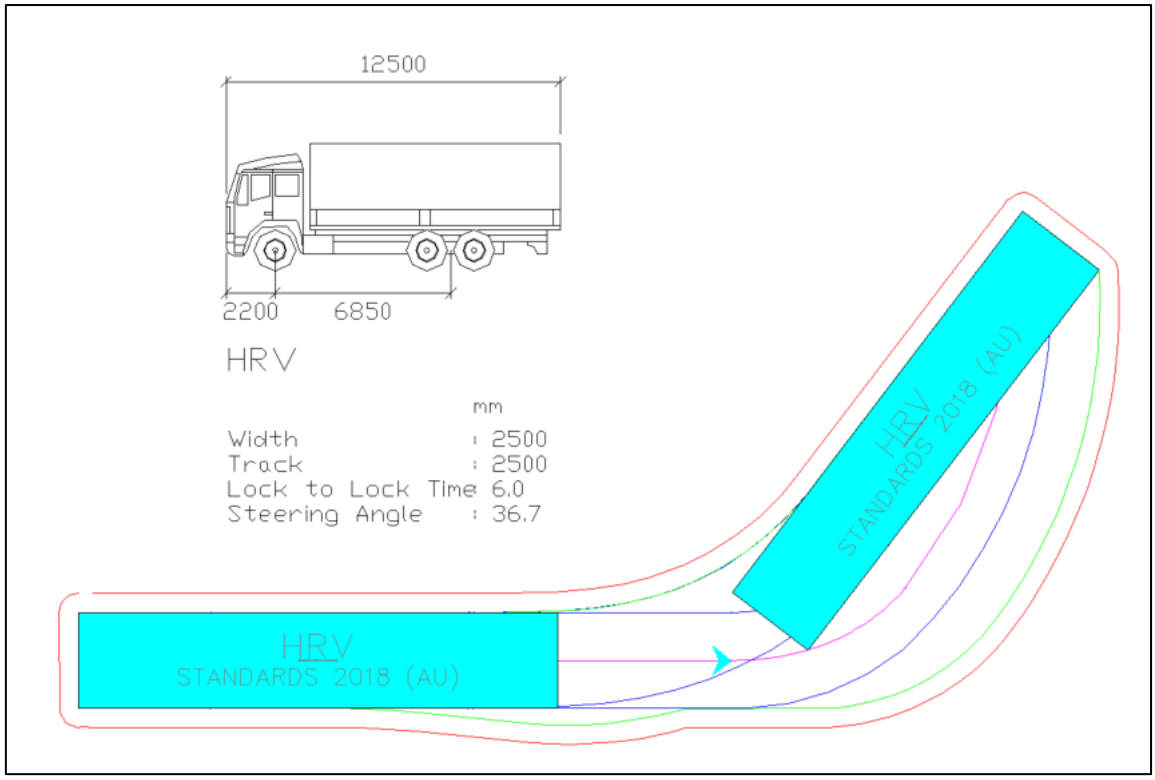


AUSTRALIAN STANDARD 99.8TH PERCENTILE SIZE VEHICLE (B99)

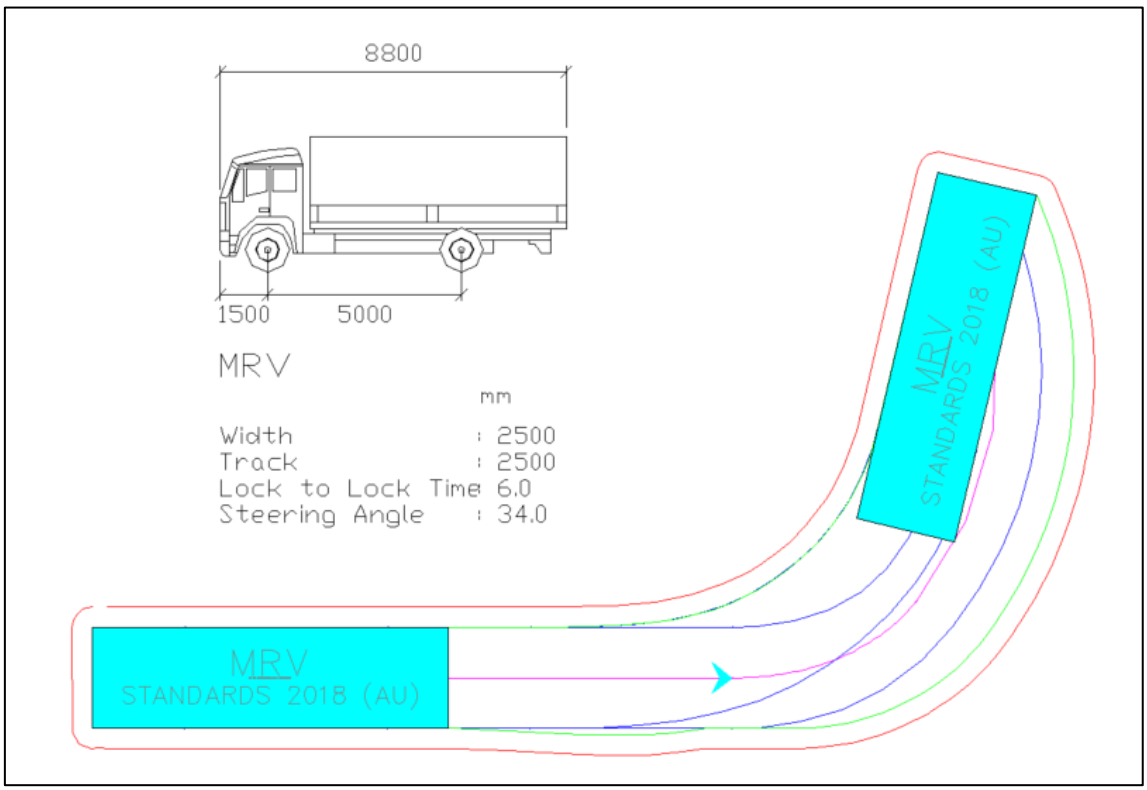
Blue – Tyre Path

Green – Vehicle Body

Red – 300mm Clearance

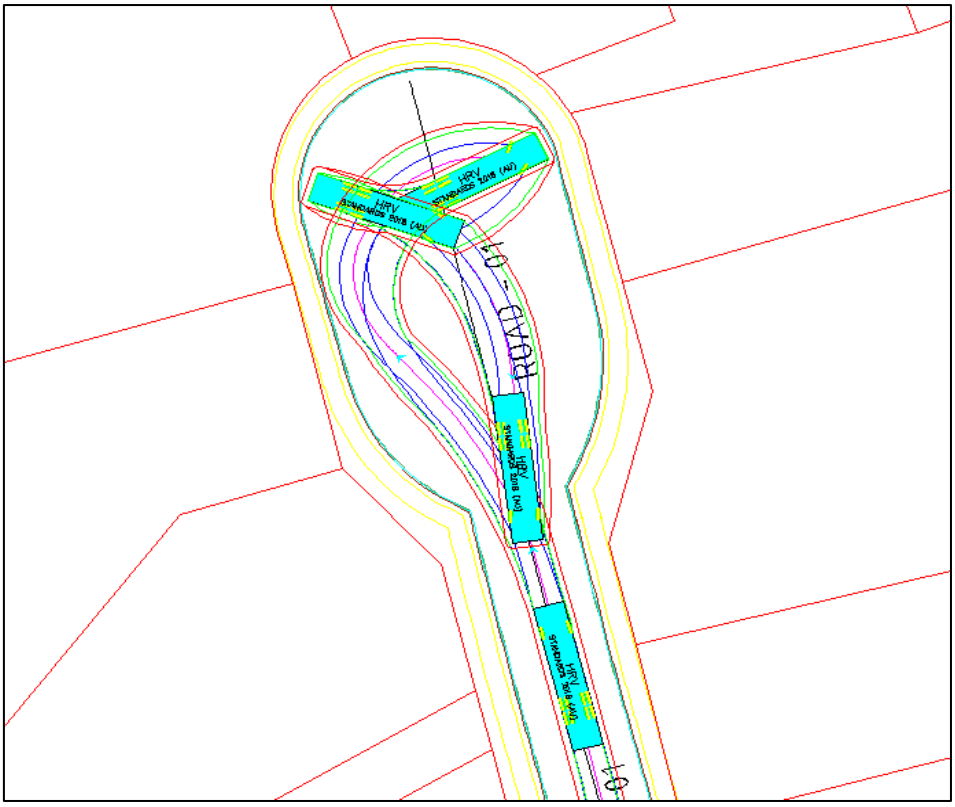


AUSTRALIAN STANDARD 12.5M LENGTH HEAVY RIGID VEHICLE

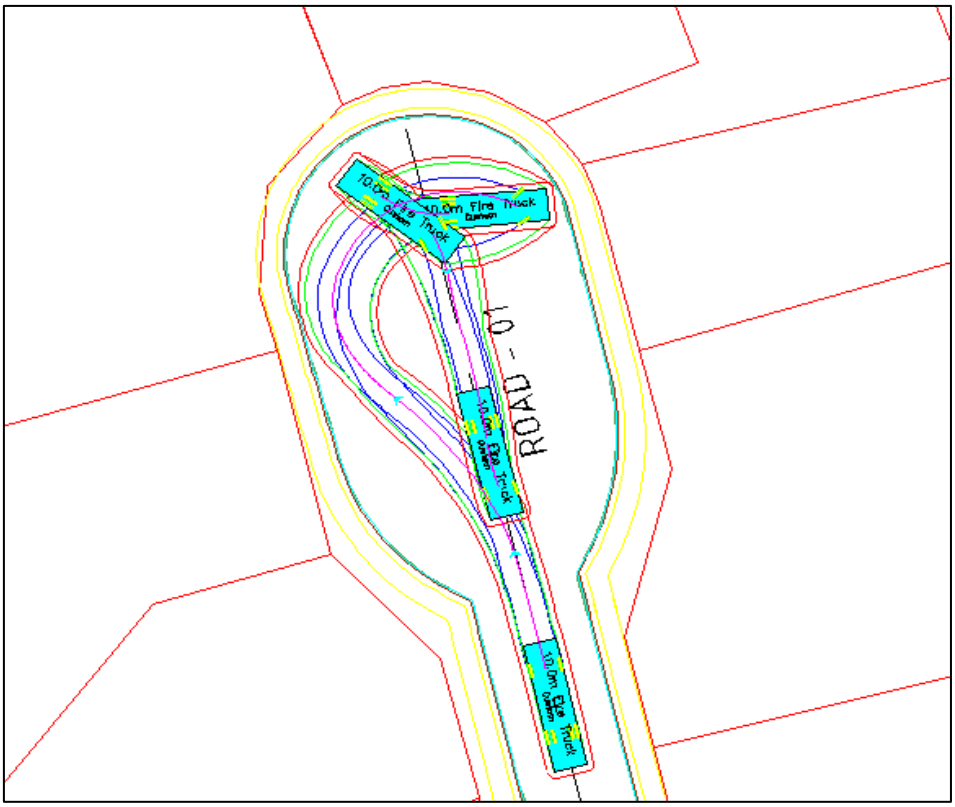


AUSTRALIAN STANDARD MEDIUM RIGID VEHICLE (MRV)

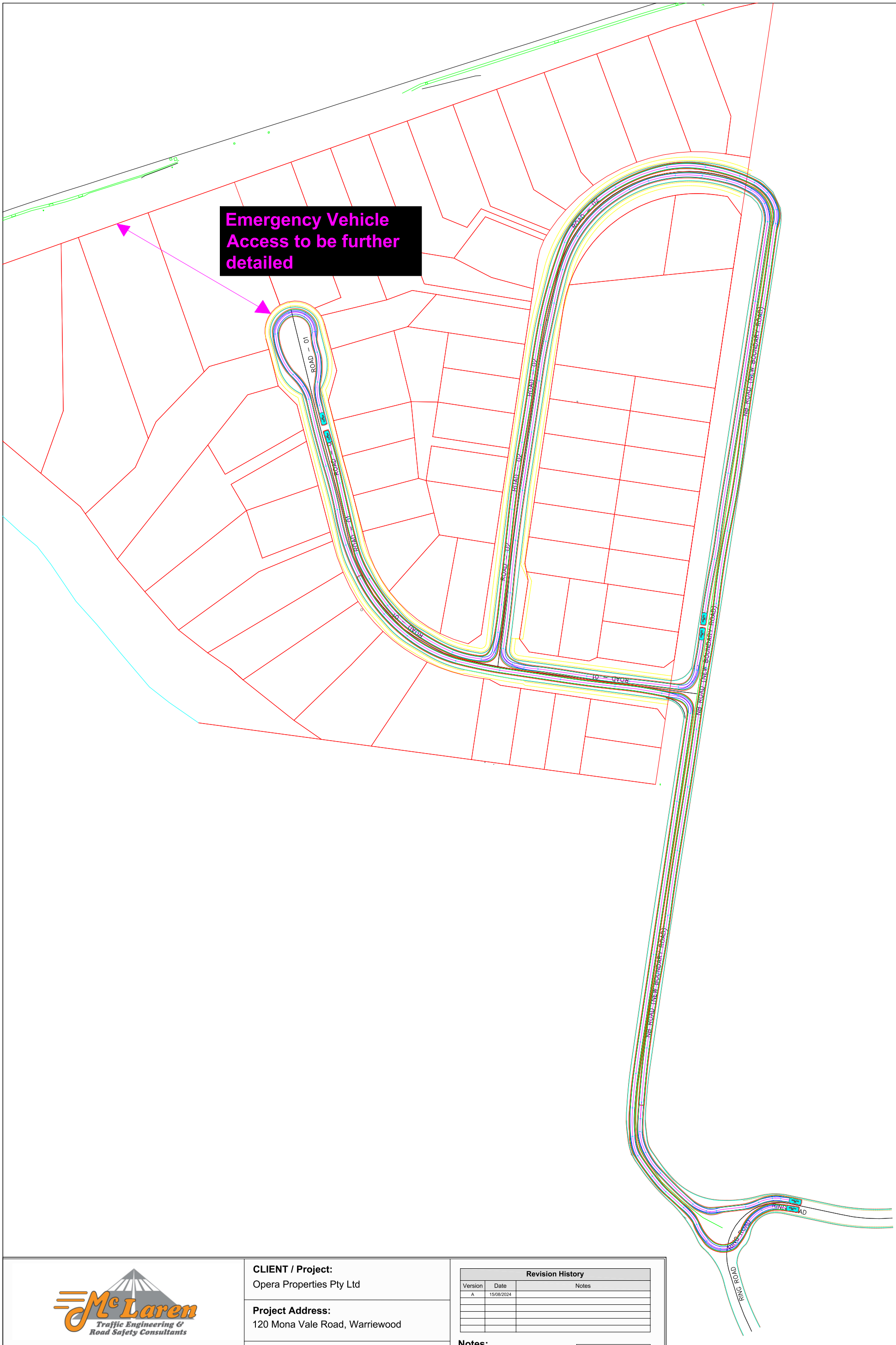
Blue – Tyre Path
Green – Vehicle Body
Red – 500mm Clearance



TURNING HEAD (3PT TURN) – HRV CIRCULATION SUCCESSFUL



TURNING HEAD (3PT TURN) – FIRE TRUCK CIRCULATION SUCCESSFUL



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CLIENT / Project:
Opera Properties Pty Ltd

Project Address:
120 Mona Vale Road, Warriewood

Project Number: 230923

Drawing Title:
01 - B99-B99 Passing

Revision History		
Version	Date	Notes
A	15/08/2024	

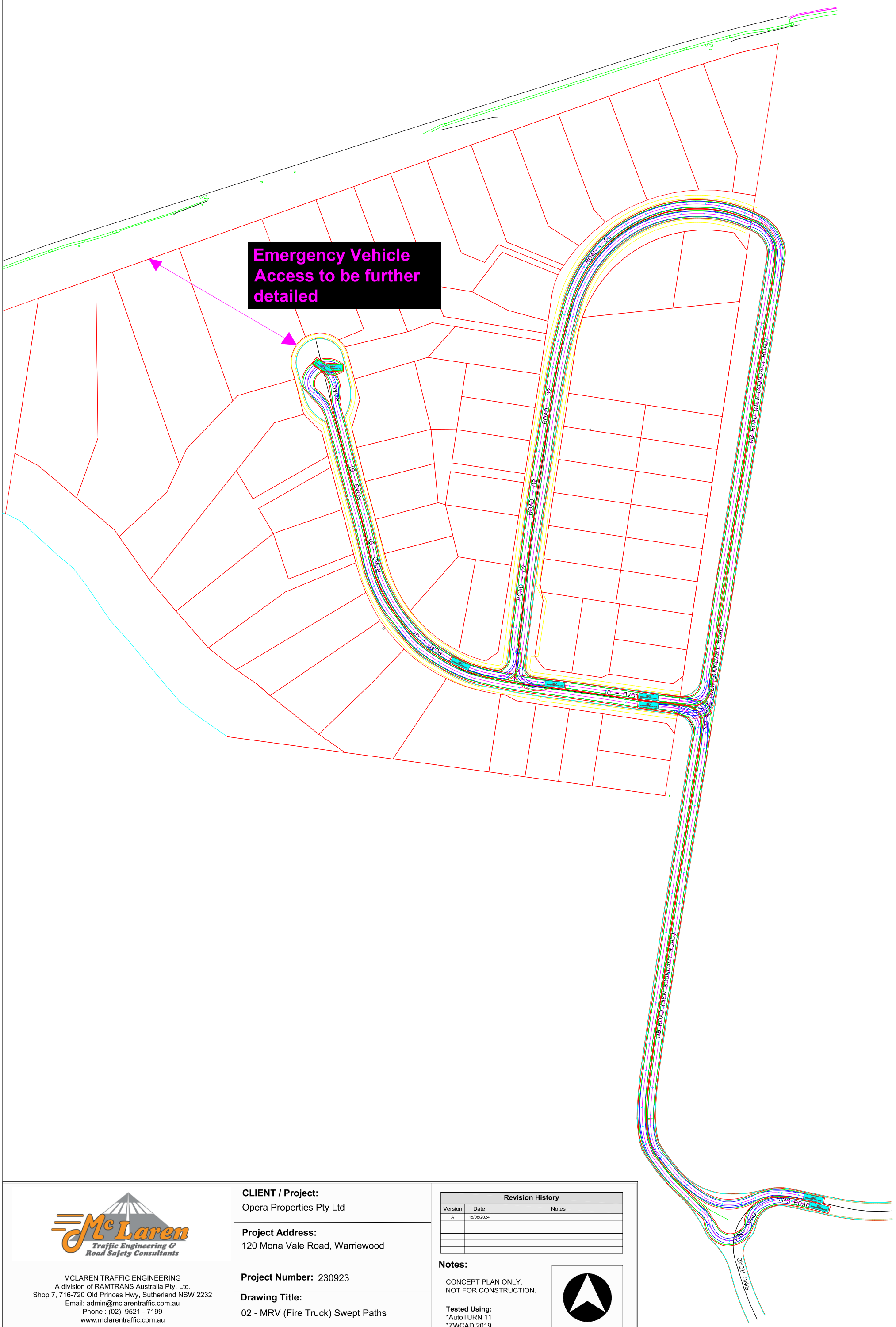
Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: spts for report.dwg

Scale @ A3 - 1:1500



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CLIENT / Project:
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Project Address:
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Project Number: 230923

Drawing Title:
02 - MRV (Fire Truck) Swept Paths

Revision History		
Version	Date	Notes
A	15/08/2024	

Notes:

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Tested Using:
*AutoTURN 11
*ZWCAD 2019

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CLIENT / Project:
Opera Properties Pty Ltd

Project Address:
120 Mona Vale Road, Warriewood

Project Number: 230923

Drawing Title:
03 - HRV (Waste Vehicle) Swept Paths - Inbound

Revision History		
Version	Date	Notes
A	15/08/2024	

Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: spts for report.dwg

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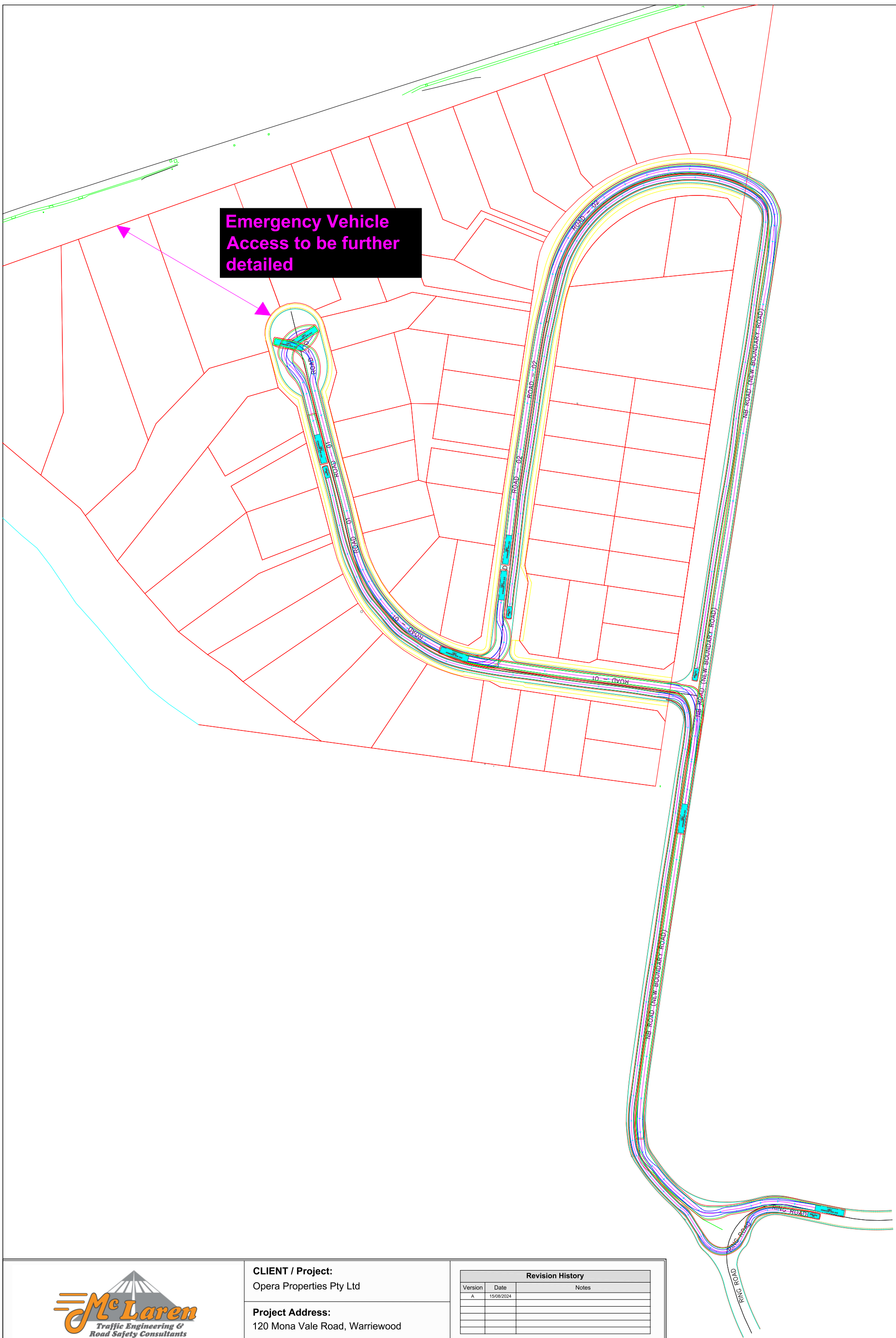

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CLIENT / Project:
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Project Address:
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Project Number: 230923

Drawing Title:
04 - HRV (Waste Vehicle) Swept Paths - Outbound

Revision History		
Version	Date	Notes
A	15/08/2024	

Notes:

CONCEPT PLAN ONLY.
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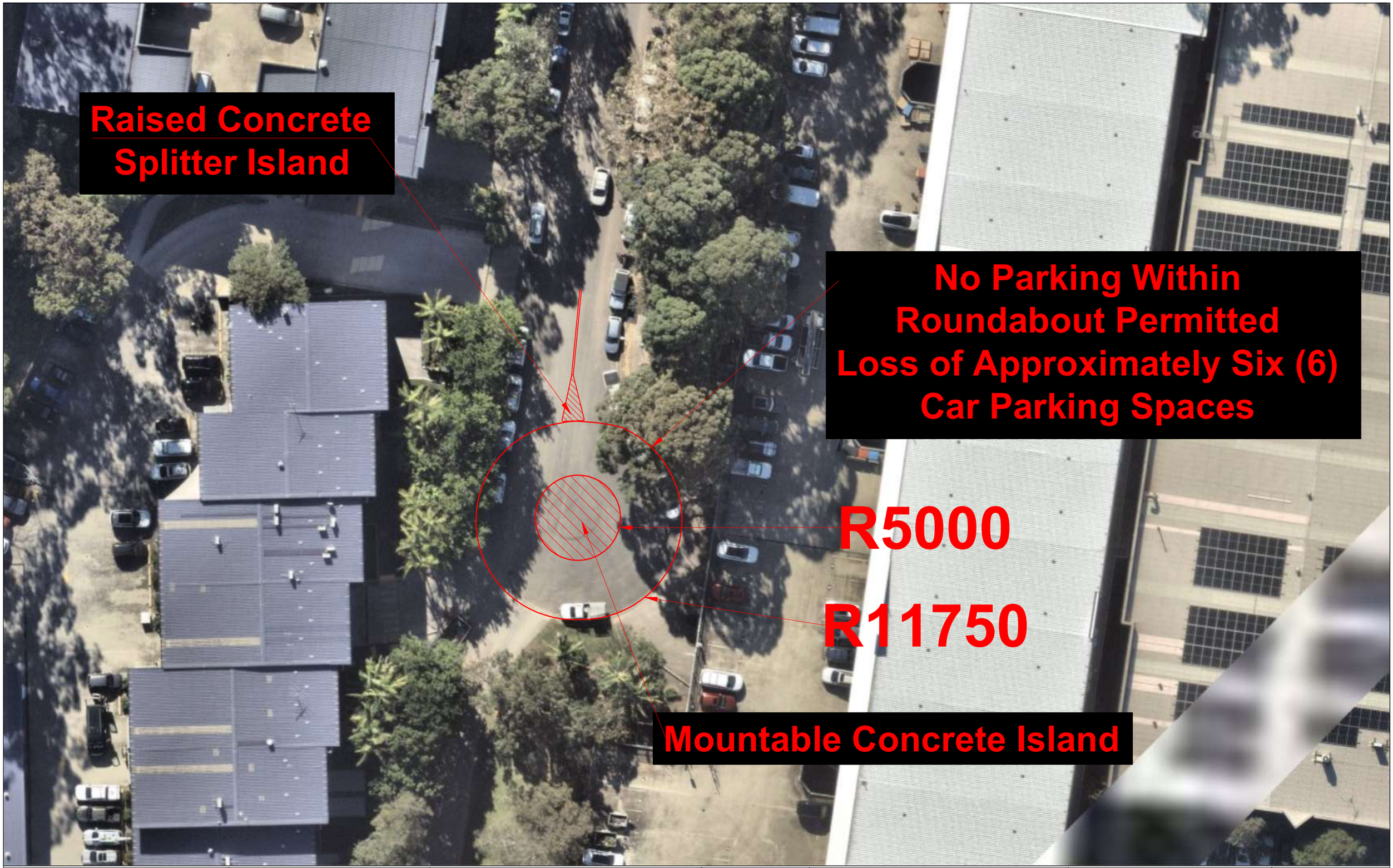
Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: spts for report.dwg

Scale @ A3 - 1:1500

ANNEXURE G: JUBILEE AVENUE ROUNDABOUT TERMINATION TREATMENT CONCEPT (1 SHEET)



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*ZWCAD 2019

Scale @ A3 1:400

Project No:
230923

Drawing Title:
Jubilee Av Roundabout Concept

Revision History		
Version	Date	Notes
A	12/08/2024	

Filename: roundabout concept.dwg