Monarch Glen Precinct 101 and 102

Traffic Impact Assessment

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

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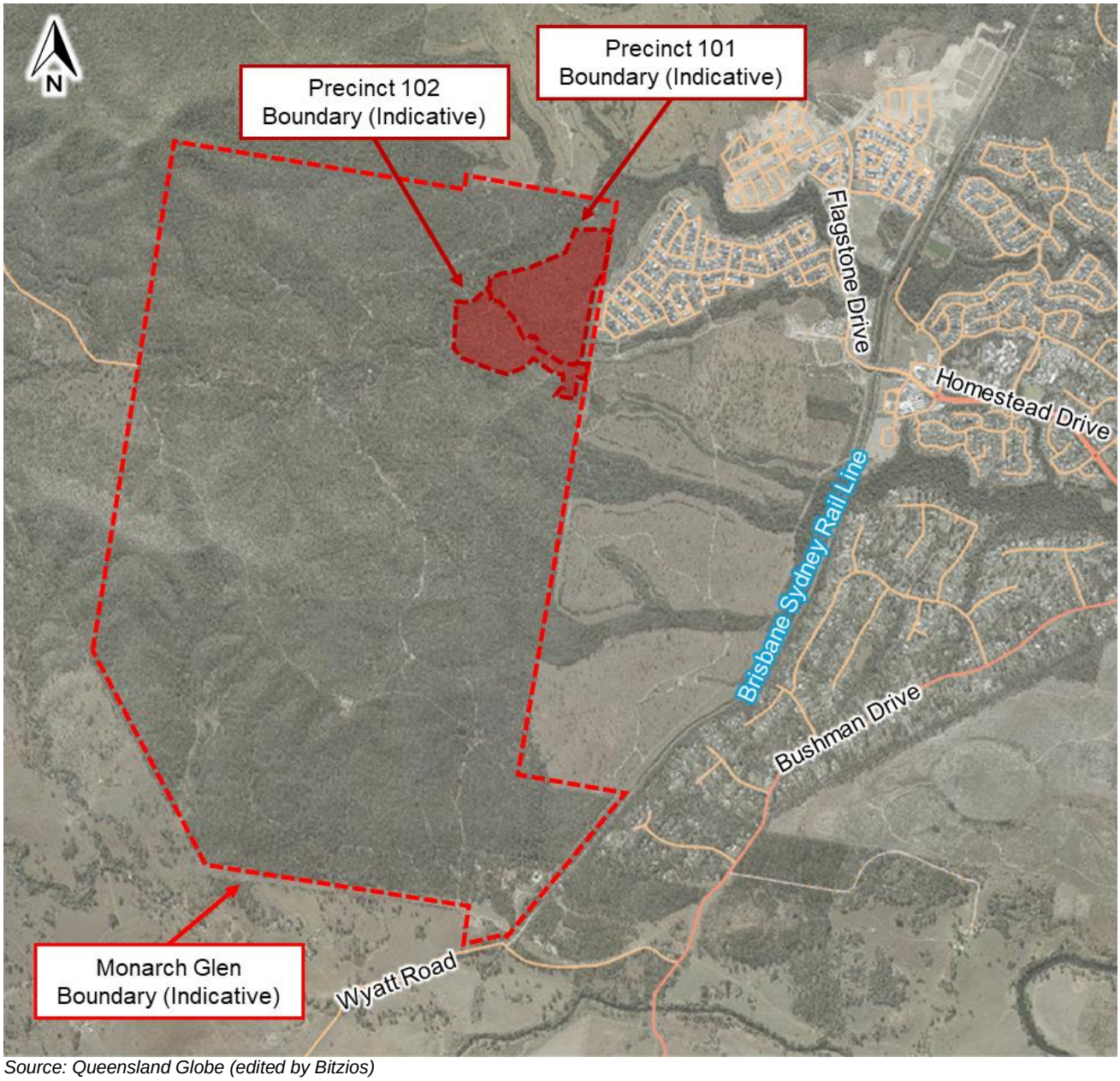
1. INTRODUCTION

1.1 Background

Bitzios Consulting (Bitzios) has been engaged to undertake a Traffic Impact Assessment (TIA) for the proposed Precinct 101 and 102 (subject site) within Monarch Glen (formerly Undullah). The location of the subject site with respect to the Monarch Glen boundary is illustrated in Figure 1.1.



Source: Queensland Globe (edited by Bitzios)

Figure 1.1: Site Location

This report documents the proposed transport network and its integration with the surrounding network and future planning in the region. It includes an assessment of key intersections and identifies the necessary active transport and public transport provisions to suitably service the development.

1.2 Development Summary

Precincts 101 and 102 are residential subdivisions comprising of residential Lots and various type of parklands / open space. The Lot plan of the subject site is provided at **Appendix A** and illustrated in Figure 1.2.

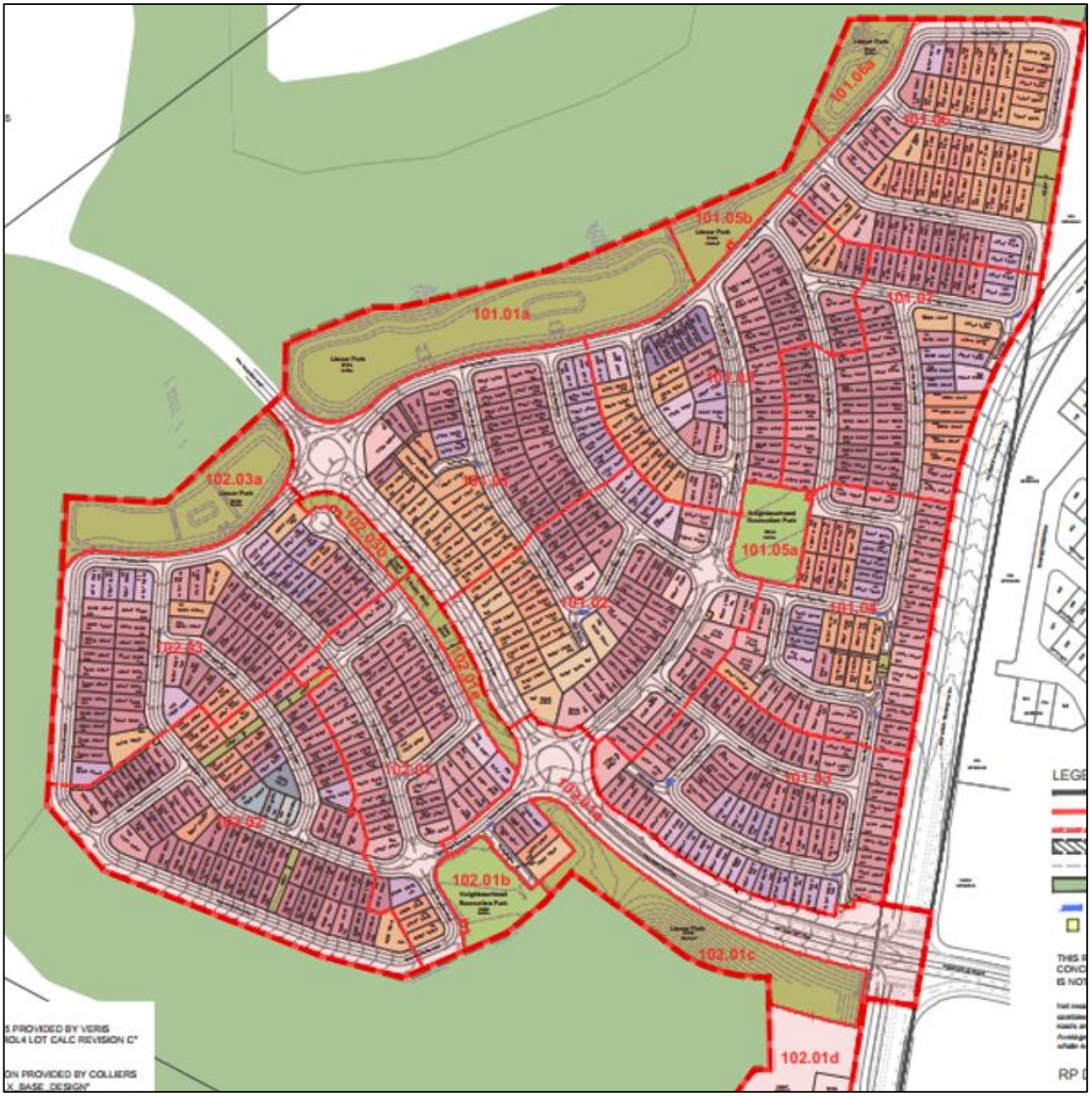


Figure 1.2: Proposed Development Layout

1.3 Scope of Assessment

The purpose of this assessment is to provide an overview and analysis of traffic and transport related elements of the subject site with the following scope of assessment:

- A review of the development's context with relation to transport planning within Monarch Glen, the Greater Flagstone PDA and overarching transport planning in the South Logan area
- A review of the proposed development against relevant planning to date
- Detailing previous strategic modelling undertaken used to identify and evaluate appropriate road layout and road cross-sections within the subject site
- Intersection modelling to assess key intersections within the subject site
- Review alternate transport provisions throughout the site, including consideration of public and active transport facilities and connections.

1.4 Reference Material

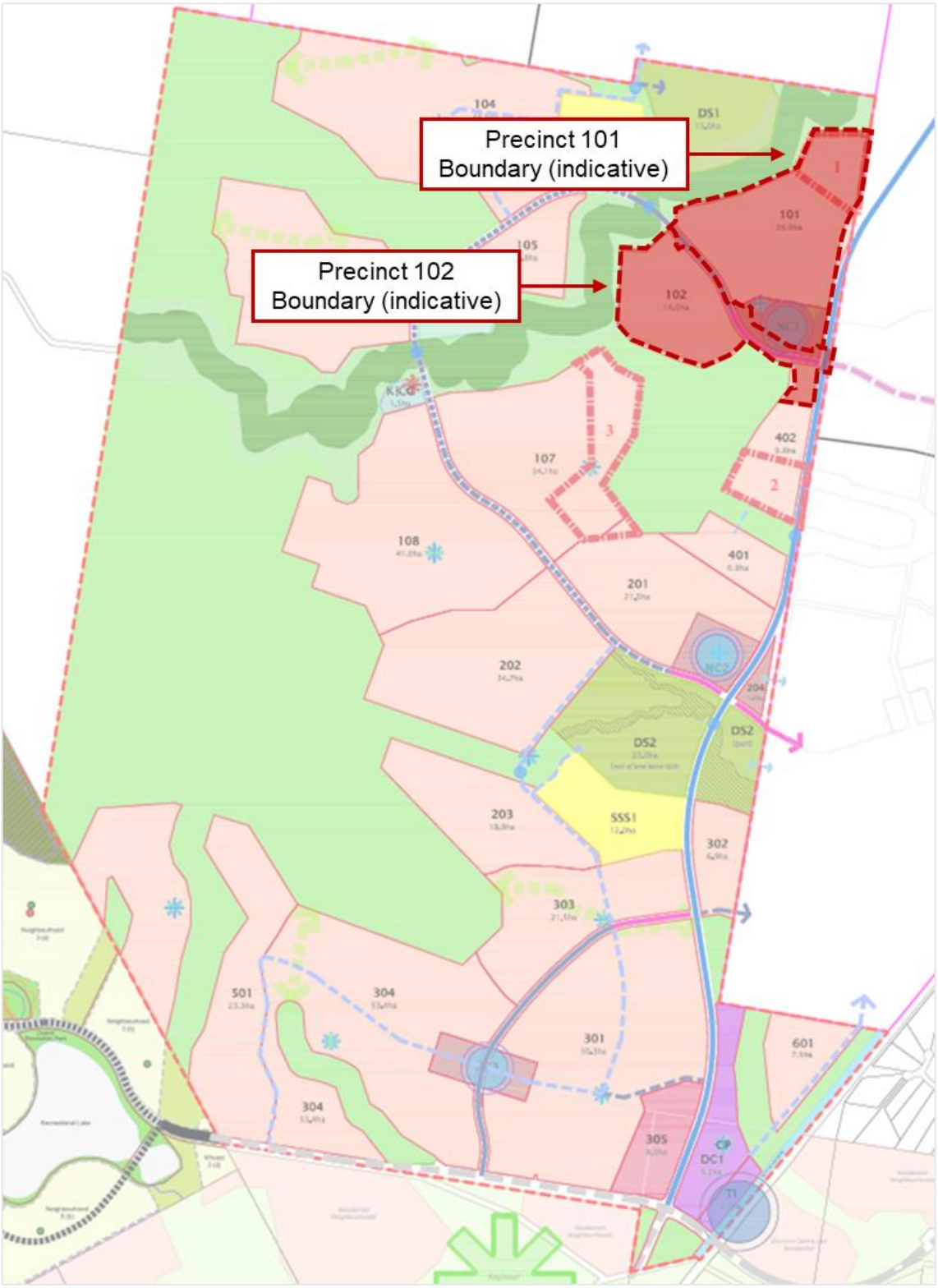
The following planning documents have been considered as a part of this assessment including (but not limited to):

- Endorsed Undullah Movement Network IMP
- Endorsed Undullah Context Area Plan
- The Greater Flagstone PDA Development Scheme
- The Greater Flagstone PDA Infrastructure Planning and Background Report (IPBR)
- The Development Charges and Offset Plan (DCOP) and mapping
- The South Logan Strategic Transport Model and relevant reporting
- Relevant Economic Development Queensland (EDQ) Guidelines and Practice Notes.

2. SITE LOCATION & PLANNING CONTEXT

2.1 Context Area Plan

The Undullah Context Area Plan was endorsed on 12th January 2018. The location of the subject site with respect to the Undullah Context Area Plan is illustrated in Figure 2.1.



Source: Undullah Context Area Plan – Drawing No:30729-GP07 (edited by Bitzios)

Figure 2.1: Undullah Context Area Plan

2.2 Greater Flagstone Priority Development Area (PDA)

2.2.1 Overview

The Greater Flagstone PDA was declared on the 8th October 2010 and is located west of Jimboomba within the southern part of Local City Council's LGA. Key PDA information is as follows:

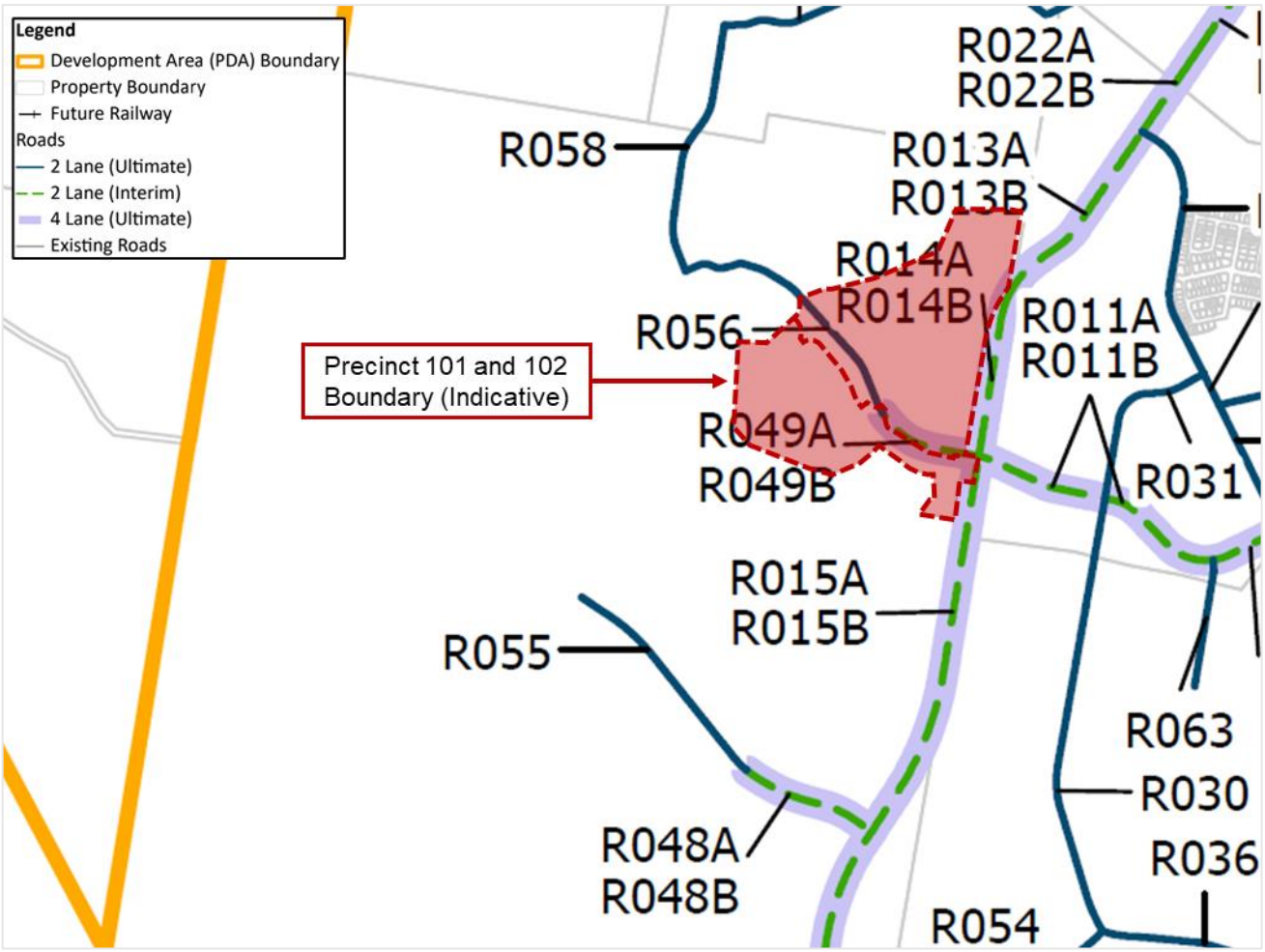
- The PDA is made up of three (3) separate land areas totalling 7,188ha
- It is projected to experience significant growth in employment and industry
- It is estimated to accommodate approximately 51,500 dwellings & 138,000 residents.

The larger PDA land area is bordered by the Brisbane-Sydney rail line (which is predominately a freight line at present) located east of the subject site, while the Mount Lindesay Highway is located further to the east. The proposed Town Centre Masterplan forms a key portion of the PDA employment area.

2.2.2 Greater Flagstone Development Charges and Offset Plan (DCOP)

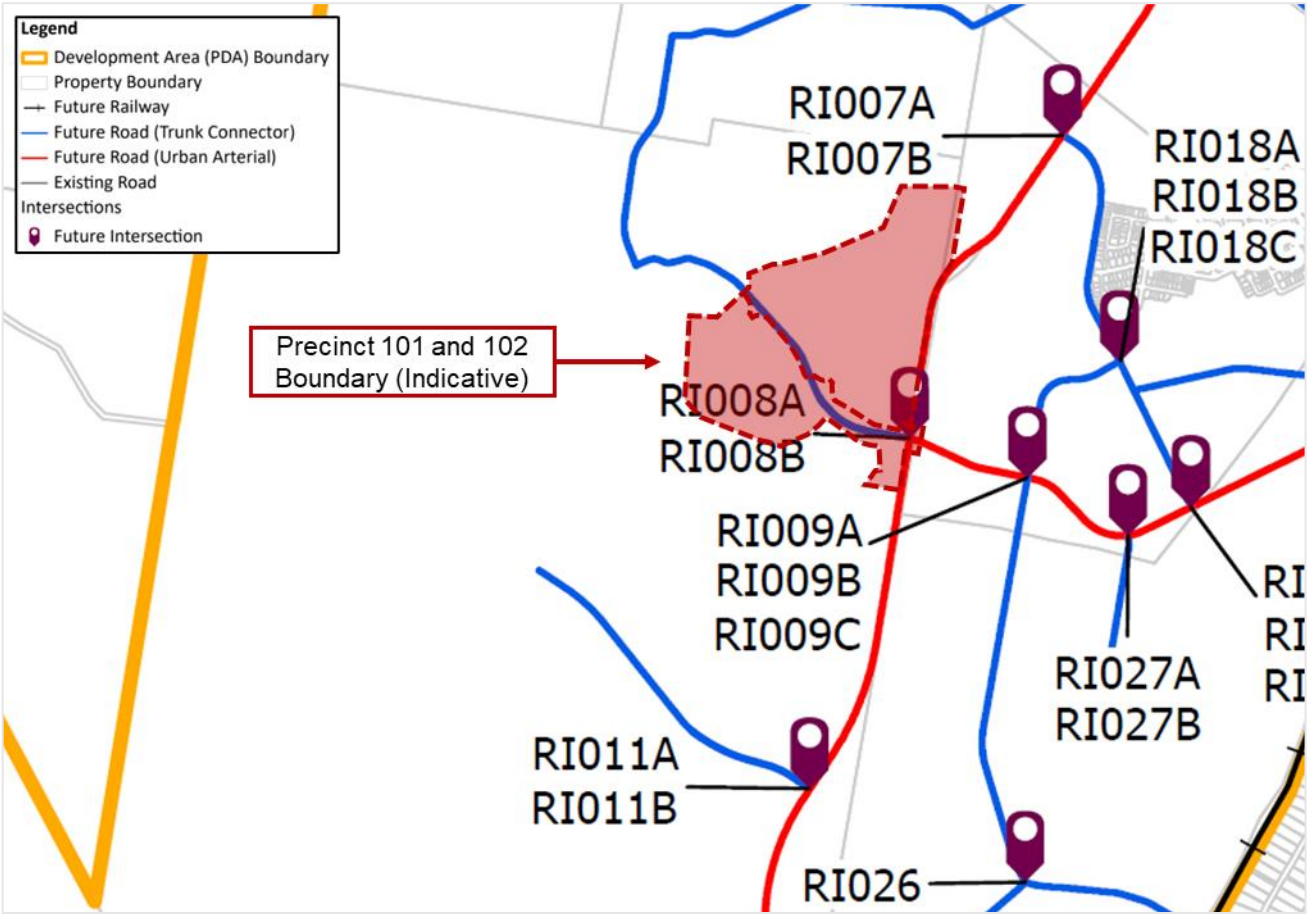
To ensure infrastructure delivery and funding is suitably allocated, EDQ developed the Greater Flagstone PDA Development Charges and Offset Plan (DCOP) effective July 2022. This document provides guidance to trunk infrastructure planning through the PDA.

Planned trunk transport infrastructure in the vicinity of the subject site is illustrated in Figure 2.2 and Figure 2.3.



Source: EDQ DCOP Maps (edited by Bitzios)

Figure 2.2: DCOP Transport (Roads) Trunk Infrastructure



Source: EDQ DCOP Maps (edited by Bitzios)

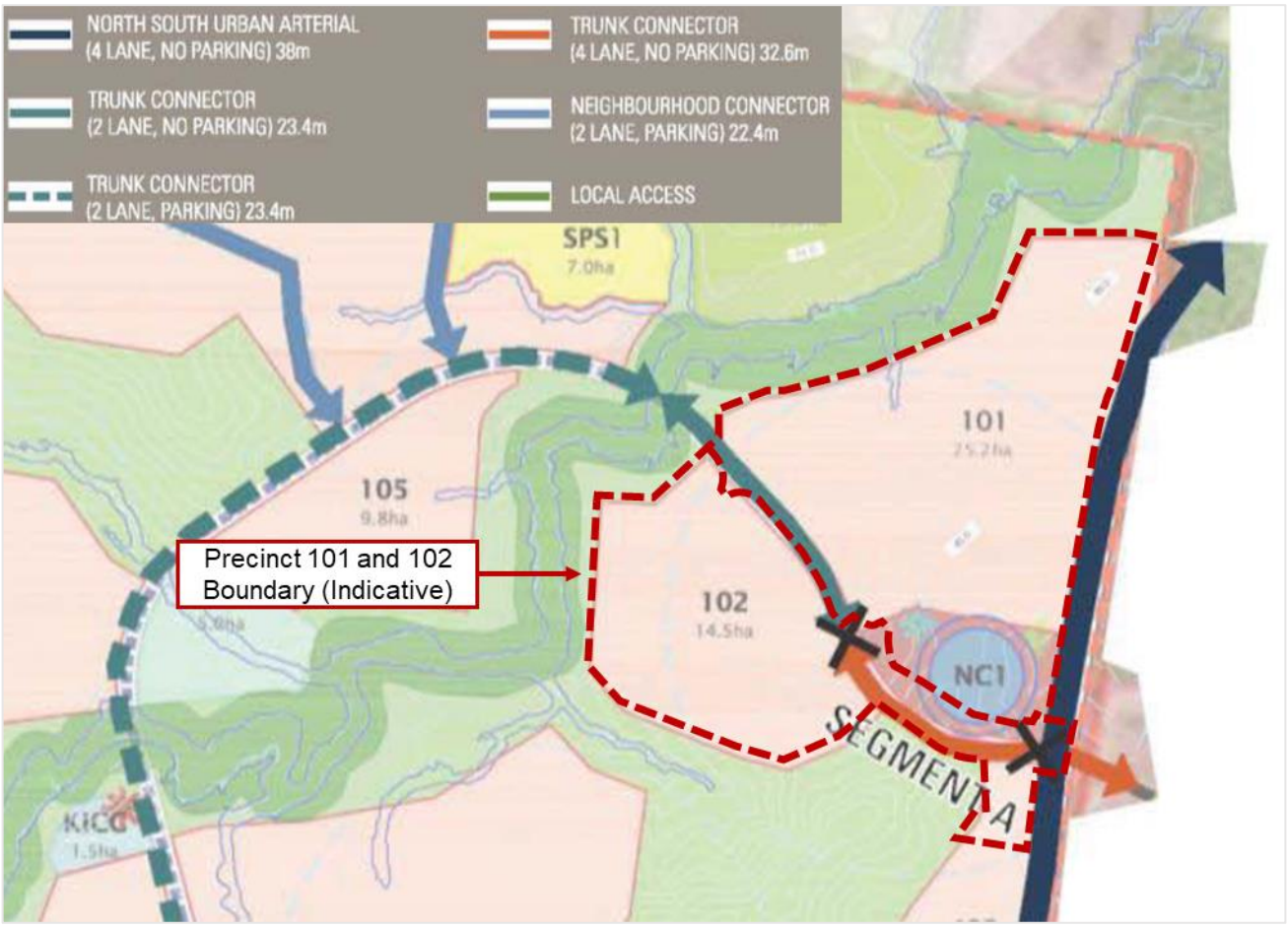
Figure 2.3: DCOP Transport (Intersections) Trunk Infrastructure

2.2.3 Movement Infrastructure Master Plan (IMP)

The endorsed Undullah Movement IMP was considered when developing the transport infrastructure requirements of the subject site. The endorsed Movement IMP considers:

- Road hierarchy and alignment
- Public transport network
- Active transport network.

It is noted that transport planning in the Flagstone PDA has significantly developed since the endorsement of the Undullah Movement IMP. A revised IMP is currently being developed for Monarch Glen to reflect latest standards and planning. Regardless, the endorsed IMP road network is illustrated in Figure 2.4



Source: Undullah Masterplan Access and Movement Strategy prepared 17 February 2017 (edited by Bitzios)

Figure 2.4: Endorsed Movement IMP Road Network

3. DEVELOPMENT DETAILS

3.1 Proposed Development

The proposed Precinct 101 and Precinct 102 development areas are residential precincts with proposed development yields as follows:

- **Precinct 101:** 393 Residential Lots
- **Precinct 201:** 182 Residential Lots

In addition to residential allotments, a number of green spaces are proposed including pedestrian linkages, stormwater detention areas, local parks and open space. The Precinct 101 and 102 plan prepared by Saunders Havill Group is provided at **Appendix A**.

3.2 Road Hierarchy

3.2.1 Overview

The proposed road hierarchy for the subject site is illustrated in Figure 3.1.

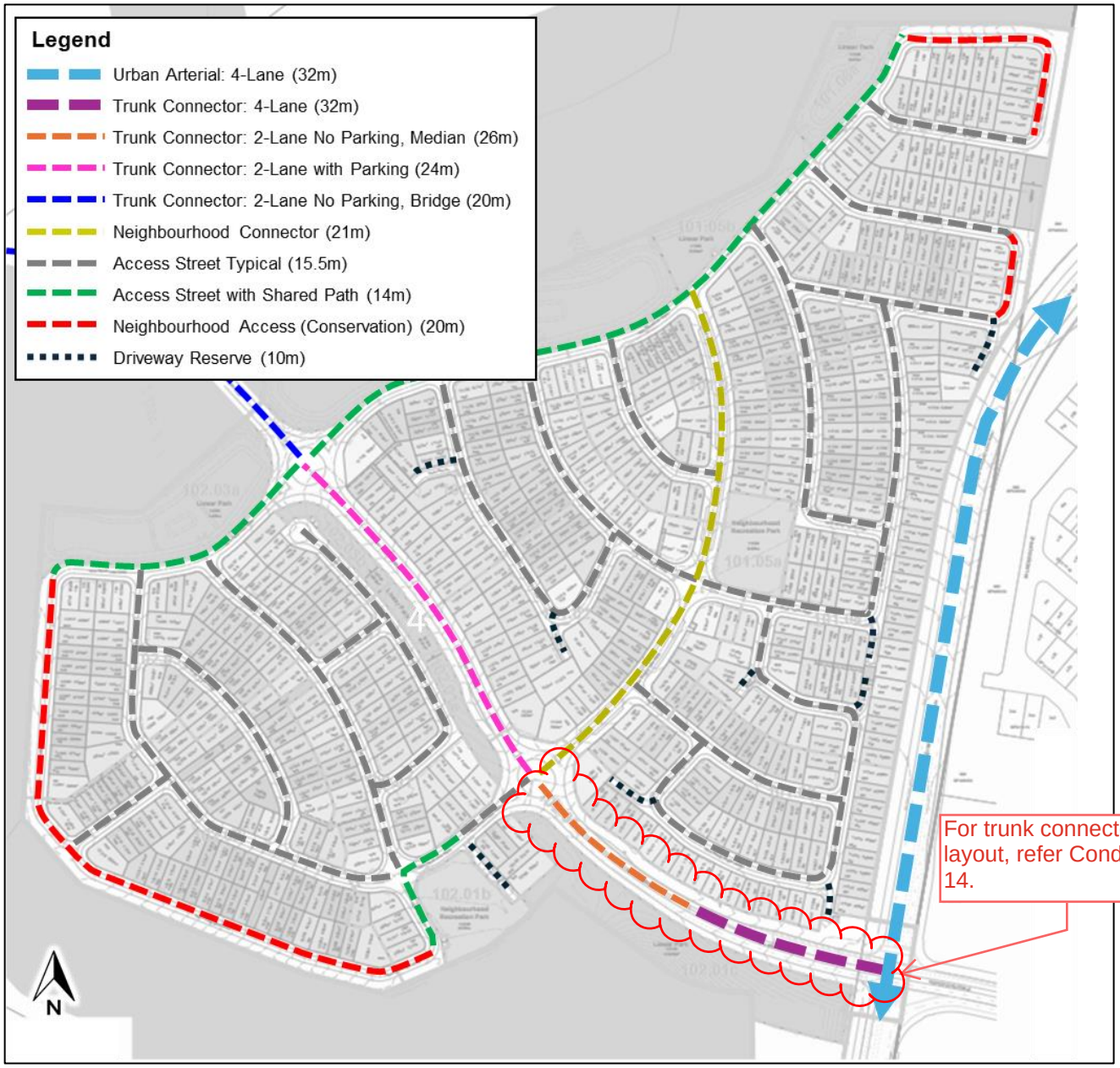


Figure 3.1: Road Hierarchies

The above road hierarchy plan as well as detailed typical cross-sections for the proposed road types, (prepared by Colliers) are provided at **Appendix B**. Proposed design parameters for each of the specific proposed road hierarchies detailed in Table 3.1.

Table 3.1: Typical Road Cross Sections

Road Hierarchy	Road Reserve	Seal Width[1]	Lanes	Median	Parking Lanes	Bus	Footpath	Cycle	Lot Access
Urban Arterial 4-Lane	32m	14m	4	Yes	No	Yes	1.5m (both sides)	2.4m (both sides)	No
Trunk Connector 4-Lane	32m	14m	4	Yes	No	Yes	1.5m (both sides)	2m one-way (both sides)	No
Trunk Connector 2-Lane No Parking (Median)	26m	10m	2	Yes	No	Yes	1.5m (both sides)	2m one-way (both sides)	Yes if <10,000vpd & <60km/h
Trunk Connector 2-Lane with Parking (One-side)	24m	10.9m	2	No	One-side	Yes	3m shared path (one side) 1.5m (other side)	3m two-way (one side) 3m shared path (other side)	
Trunk Connector 2-Lane No Parking (Bridge)	20m	10m	2	No	No	Yes	1.5m (both sides)	2m one-way (both sides)	No
Neighbourhood Connector	21m	12m	2	No	Yes	Yes	1.5m (one side)	2.5m shared path (one side)	Yes
Access Street (Typical)	15.5m	7.5m	2	No	No	No	1.5m (one side)	No	Yes
Access Street with Shared Path	14m	7.5m	2	No	No	No	4m Shared Path (one side)		Yes
Access Street (Conservation)	20m	7.5m	2	No	No	No	2m (one side)	No	Yes
Driveway Reserve	10m	5.5m	2	No	No	No	No	No	Yes

[1]*Seal width includes parking lane / indented parking widths*

Based on the roadside environment, typical verge widths / road reserve widths may be modified based on the following special conditions:

- The road reserve width of any road adjacent parks / open space of equal or greater width than 15m may be reduced by up to 2m, where required active transport provisions are provided within the adjacent green space
- Where an acoustic barrier is required, the road reserve width shall be widened by 2m to facilitate appropriate landscaping buffer to the acoustic barrier.

The proposed urban arterial road cross-section is consistent with the New Beith Road cross-section outlined in the recently endorsed Flagstone City MNIMP (*P2300.005R Flagstone City_Movement Network IMP*). The four-lane trunk connector cross-section proposed is in accordance with the Flagstone PDA IPBR road requirements for this short length of road (DCOP ID: R049B).

Cross-sections of other road types are proposed generally in accordance with the EDQ Street and Movement Network guideline, with some variations detailed in the following sections.

3.2.2 Trunk Connector: 2-Lane (No Parking, With Median) (26m)

The proposed *Trunk Connector: 2-Lane (No Parking, With Median) (26m)* is consistent with the *Trunk Connector (2 lane – no parking)* cross-section detailed in Figure 5A of the EDQ Street and Movement Network guideline, with the addition of a 4m wide median. This median proposed provides a consistent, high-quality entry experience for drivers along the length of road between New Beith Road and the eastern roundabout proposed. This cross-section is also consistent with the endorsed Movement Network IMP.

3.2.3 Trunk Connector: 2-Lane (With Parking) (24m)

As shown in Figure 3.1 and on the plans provided at **Appendix A**, direct driveway access for residential Lots is proposed along the north-eastern side of the *Trunk Connector: 2-Lane (With Parking) (24m)*. As discussed further in Section 4.1.3, undertaken modelling shows daily traffic volumes on the proposed *Trunk Connector: 2-Lane (With Parking) (24m)* of 8,269 vehicles. This volume is within the 10,000vpd limit for direct driveway access as per EDQ's Street and Movement Network Guidelines. To provide suitable parking provision to these lots, on-street parking is proposed on the north-eastern side of the road.

As it is preferable that any carparking for the linear parklands on the south-western side occur on the local street network, no parking lane is proposed on the south-western side of the road. The *Trunk Connector: 2-Lane (With Parking) (24m)* is proposed a combination of cross-sections outlined in Figure 5A and Figure 5B from EDQ's Street and Movement Network guideline and is shown in Figure 3.2.

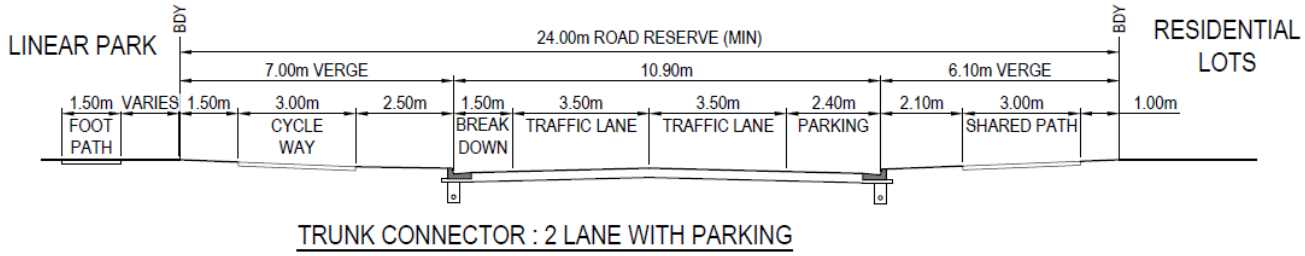


Figure 3.2: Trunk Connector: 2-Lane (With Parking) (24m)

On the side of the trunk connector fronting linear parklands the footpath is proposed to be provided within the adjacent open space area for the length of trunk road between the roundabouts. Based on feedback provided by EDQ, to remove potential conflicts between users of a separated cycleway on residential Lot driveways on the northern side of the cross-section, a 3m shared path is proposed on the side of the cross-section fronting the residential properties. This maintains a high-quality active transport facility on this side of the road, while removing the separated cycle way and driveway conflicts. A wider cycle way is also proposed on the southern side of the road fronting the linear park.

3.2.4 Trunk Connector: 2-Lane (No Parking, Bridge) (20m)

The *Trunk Connector: 2-Lane (No Parking, Bridge) (20m)* is proposed immediately to the north-west of Precinct 101 and 102. The narrower cross-section is required at this location considering the need to construct a substantial bridge at this location. Sufficient sealed road widths and active transport provisions are maintained in the narrower cross-sections as per EDQ's guidelines, and the proposed road type is therefore considered appropriate noting the constraints present. This cross-section is also consistent with the endorsed Movement Network IMP.

3.2.5 Neighbourhood Connector (21m)

A *Neighbourhood Connector (21m)* road type is proposed within Precinct 101. Daily traffic volumes expected on this road are not expected to exceed 3,000vpd and as such, a neighbourhood access street would be appropriate at this location from a traffic capacity perspective. However, the length of the proposed *Neighbourhood Connector (21m)* is considered to act as:

- The 'central spine' for Precinct 101 forming the access route for most residents in the precinct
- A direct pedestrian connection through Precinct 101 and to the proposed local park at the northern end of Precinct 101

Therefore, while a typical neighbourhood connector road type is not warranted by traffic volumes in accordance with the EDQ Street and Movement Network Guideline, a wider cross-section than a neighbourhood access is a desirable outcome for this link. The proposed *Neighbourhood Connector (21m)* cross-section is considered appropriate for this purpose providing:

- Footpaths on both side of the road for improved pedestrian connectivity compared to a neighbourhood access road
- Wider sealed pavement width for resident / visitor wayfinding clearly demonstrating the road as 'central spine' road in the precinct.
- Where possible indented parking lanes servicing residential Lots while also providing opportunities for natural embellishment / green space build outs to form a green link through the precinct.

This cross-section is also consistent with the endorsed Movement Network IMP.

3.2.6 Access Street (15.5m)

Access Streets (15.5m) are proposed at 15.5m wide, marginally narrower than the neighbourhood access road reserve width outlined in the EDQ Street and Movement Network Guideline. However, proposed sealed road width and pedestrian provisions are consistent with the requirements specified in the EDQ guideline. As such, from a traffic engineering perspective, the proposed neighbourhood access is considered fit for purpose and consistent with the intent of the EDQ guideline. It is further noted that this road reserve width is consistent with existing neighbourhood access roads within the Everleigh Greenbank community also located in the Flagstone PDA.

Access Streets (15.5m) are proposed with a 4m wide verge, does not align with the 4.25m wide verge within EDQ guidelines, however it is consistent with Logan City Council's standard cross sections.

A wider access street cross-section is proposed on the roads at the extents of the proposed precincts where bounding open space. This wider cross-section facilitates appropriate bushfire separation and is compliant with relevant requirements of EDQ guidelines.

This proposed *Access Streets (15.5m)* is consistent with road cross sections provided within the Everleigh development and the endorsed Movement Network IMP

3.2.7 Access Street (14m)

A narrower access street cross-section is proposed adjacent the detention basins and local park on the western extents of Precinct 101 and 102. This is consistent with conditions detailed in Section 3.2.1 where the verge width / road reserve width may be narrowed by up to 2m where adjacent green space. It is also noted that a 4m shared path is proposed along this corridor (DCOP ID ORP004 & ORP005), utilising the adjacent green space, in line with the DCOP Transport (off-road pathways) map.

Access Streets (14m) are proposed with a 4m wide verge, does not align with the 4.25m wide verge within EDQ guidelines, however it is consistent with Logan City Council's standard cross sections.

This proposed *Access Streets (14m)* is consistent with road cross sections provided within the Everleigh development and the endorsed Movement Network IMP.

3.3 Intersections

3.3.1 Overview

Key principles for the proposed intersection forms and their locations are as follows:

- Intersections with four-lane roads should be signalised or otherwise restricted to left-in / left-out
- The number of four-way intersections should be minimised, with four-way intersections signalised or provided as a roundabout, where servicing primarily residential uses
- Intersection spacing shall generally comply with those specified in EDQ's Guideline No. 6: Street and Movement Network, unless otherwise constrained and proposed spacing appropriately justified.

Specific to Precinct 101 and Precinct 102, the following is proposed:

- The Homestead Drive / New Beith Road intersection is proposed as signalised in accordance with the Greater Flagstone PDA Infrastructure Planning and Background Report (IPBR) with the form of this intersection adopted generally in accordance with the Flagstone City Movement Network IMP
- Four-way roundabouts are proposed on the trunk road through the site (DCOP id. R049 & R056) to provide access to residential Precinct 101 and 102
- Proposed roundabouts are spaced over 300m apart and also 300m from the Homestead Drive / New Beith Road intersection in line with the requirements of the EDQ Street and Movement Network Guideline for a trunk connector

Based on the above, the proposed intersection locations are considered to achieve a well-resolved road network and appropriate intersection performance without adverse impacts to safety and efficiency.

Forecast performance of key intersections is assessed in Section 4.2.

3.3.2 Roundabout Design

Design of the proposed key roundabouts on the trunk connector through the subject site were assessed against the relevant requirements of the Austroads Guide to Road Design Part 4B and the Austroads Design Vehicles and Turning Path Templates as detailed in Table 3.2.

Table 3.2: Roundabout Design

Design Criteria	Parameter	Required	Complies / Adopted
Central Island Radius	Desired Driver Speed[1] on fastest leg prior to roundabout	60km/h	**60km/h Adopted**
	Desirable minimum for one-lane roundabout	12m min.	**Complies 30m Adopted**
Design Vehicle	Trunk-Trunk (trunk connector through movements)	20m AV	**Complies**
	Trunk-Local (turning movements)	8.8m MRV	**Complies**
Checking Vehicle	Trunk-Trunk (trunk connector through movements)	20m AV	**Complies**
	Trunk-Local (turning movements)	12.5 HRV	**Complies**
Vehicle Clearances	To kerbs and centrelines	0.5m	**Complies**
	Between vehicles	1.0m	**Complies**
Circulating Width	AV design vehicle / 30m central island radius	5.7m min.	**Complies 7.2m Adopted**
Pedestrians	Pedestrian Refuge within Splitter Island	Min. 2.4m	**Complies**

[1]*On trunk roads, the primary factors influencing the "desired speed" are roadside environment and speed limit, since these will usually limit desired speed before the standard of the horizontal alignment.*

As demonstrated, the design complies with the relevant requirements of the Austroads Guides, accommodating the required checking and design vehicle manoeuvring, and is therefore suitable. Swept path diagrams of design and checking vehicles around the roundabouts area provided in **Appendix C**.

3.4 Access Considerations

A base set of principles was adhered to when determining access locations throughout the development and provided generally in accordance with the following requirements:

- Property accesses shall be provided on a property's lower order frontage road where practical
- Direct property access should be minimised on Trunk Connector roads where traffic volumes >10,000 veh/d or posted speeds >60km/h
- Property accesses shall be clear of prohibited access locations, in particular:
  - Be located clear of nearby intersections as per AS2890.1
  - Be located outside of the functional area of an intersection to avoid queuing impacts
  - Be provided perpendicular to the road unless designed as a one-way access for ease of manoeuvring
- Vehicle crossover design and separation of vehicle crossovers shall be as per the relevant requirements of IPWEAQ Standard Drawings RS-049, RS-050 and RS-051 and Logan City Council requirements.

As mentioned, detailed access design shall be undertaken with each future development application and apply the above general principles to ensure there is no adverse impact to the surrounding road network and that safety is not compromised.

4. TRAFFIC ASSESSMENT

4.1 Strategic Modelling

4.1.1 Overview

Veitch Lister Consulting Pty Ltd (VLC) has previously developed the South Logan Strategic Transport Model (SLSTM) to inform transport and land use planning in the south Logan region, including the Flagstone PDA. The details of this strategic modelling methodology are documented in the *South Logan Strategic Transport Model: Model Development and Network Apportionments* report.

More recently, VLC was engaged by EDQ to investigate the realignment of Wyatt Road (DCOP ID R017) using the SLSTM. Scenario 3 of the Wyatt Road realignment Review undertaken by VLC was identified as the preferred option going forward, with EDQ advising that this scenario should be adopted for future traffic forecasting. As such, a cordon of the Scenario 3 Wyatt Road Investigation model, based on the SLSTM, was sourced for the Monarch Glen context area for the ultimate (2066) design horizon.

4.1.2 Land Use Plan

The land use patterns within Monarch Glen, from the SLSTM Scenario 3 Wyatt Road Investigation model, are illustrated in Figure 4.1. The locations, scale and type of land uses shown are generally consistent with the endorsed Undullah Context Area plan.

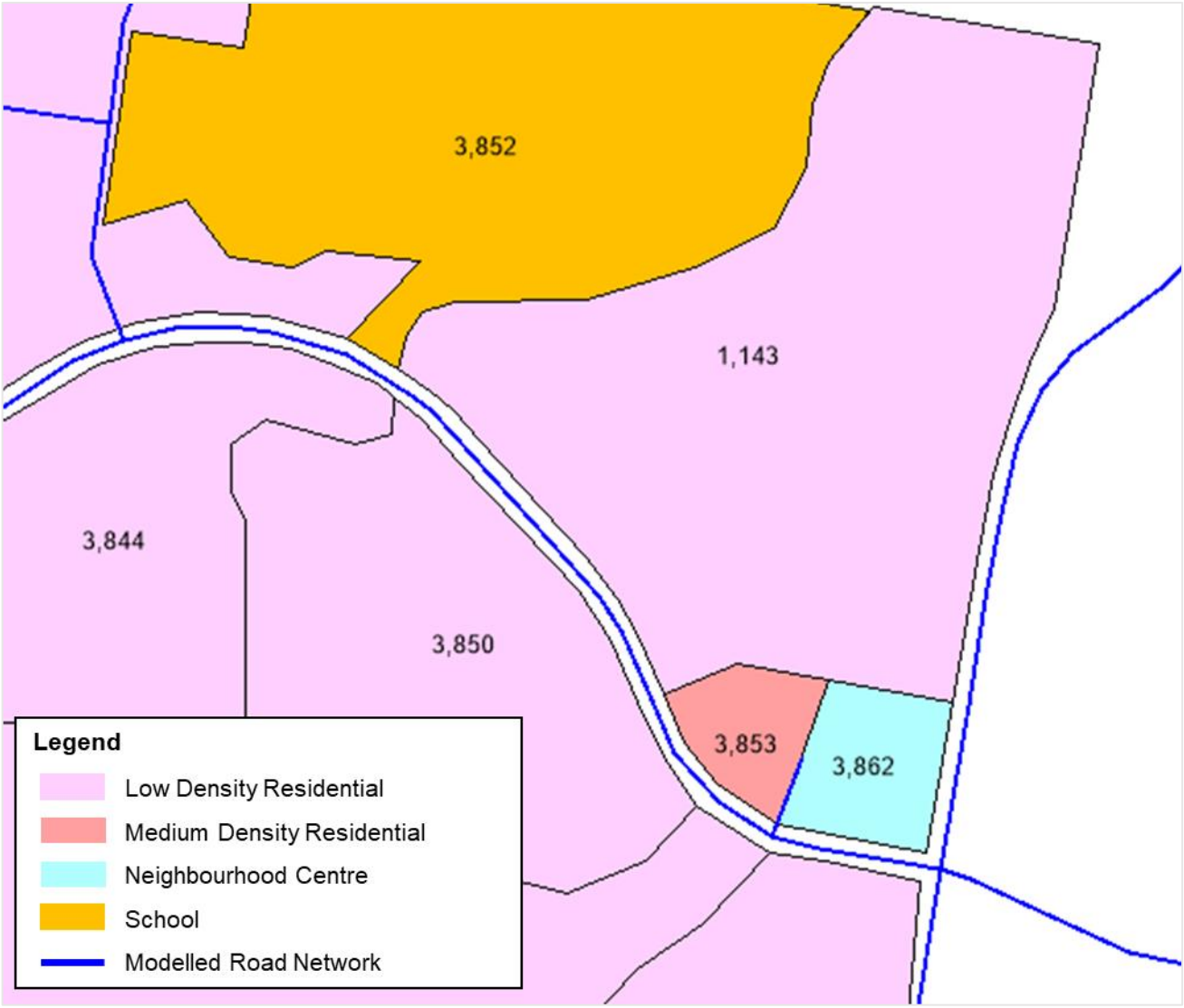


Figure 4.1: 2066 Monarch Glen Strategic Model Land Use Plan

As shown in proposed development plans provided at **Appendix A**, the neighbourhood centre / medium density residential areas are no longer proposed to be located with Precinct 101 & 102. These zones, represented as zone 3,862 and zone 3,853 in the above land use plan, will be relocated to an alternate location within Monarch Glen and subsequently assessed in separate future applications. Precinct 101 and Precinct 102 is therefore represented in the model by zone 1,143 and zone 3,850 respectively. Traffic generation of zones 1,143 and 3,850 will be appropriately scaled in the following assessment to reflect Precinct 101 & 102 residential yields proposed.

4.1.3 Daily Traffic Volume Plots

Forecast ultimate (2066) daily traffic volumes, sourced from the SLSTM Wyatt Road Realignment Review: Scenario 3, are illustrated in Figure 4.2.

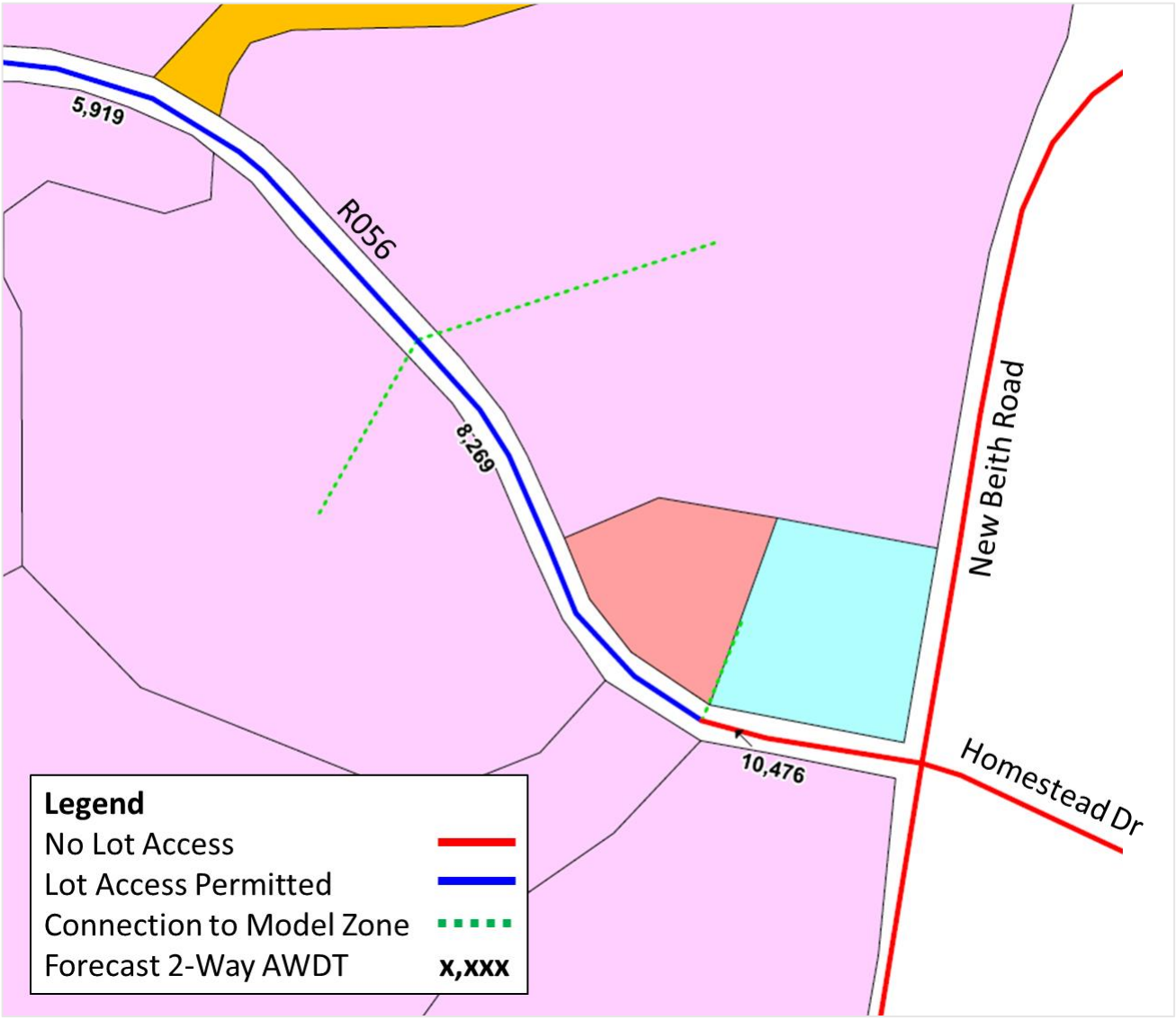


Figure 4.2: SLSTM Forecast Ultimate (2066) Daily Traffic Volumes

The key outcome demonstrated by the above is that in the ultimate (2066) design horizon, traffic volumes on the length of trunk connector immediately west of New Beith Road are expected to marginally exceed 10,000vpd. However, west of the zone 1,143 and zone 3,850 connections, daily traffic volumes are significantly lower, indicating that the majority of daily traffic volumes to / from Precinct 101 & 102 are via the east of the site. As such, to the west of the first entry point to Precinct 101 & 102, being the eastern roundabout proposed, traffic volumes are forecast to be lower than 10,000vpd, facilitating direct Lot access off the trunk connector road as detailed in Section 0.

4.2 Intersection Assessment

4.2.1 Overview

The key intersections within the proposed Precinct 101 and Precinct 102 development were assessed using SIDRA Intersection. Assessed intersection included the Homestead Drive / New Beith Road intersection as well as proposed intersections between development access roads as the through trunk road connection (DCOP id. R049 & R056). The intersections assessed are illustrated in Figure 4.3.

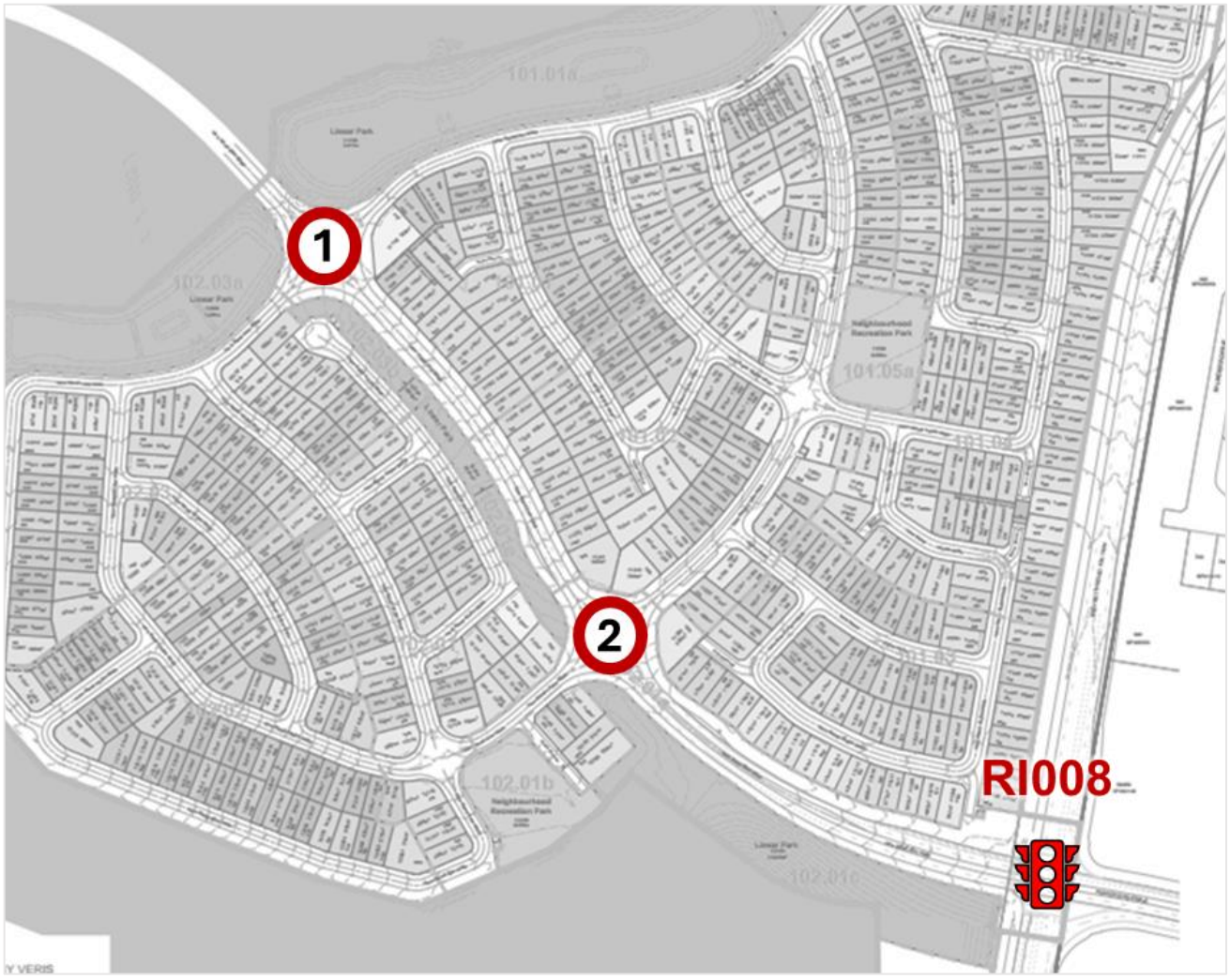


Figure 4.3: Key Intersections Assessed

4.2.2 Development Traffic Generation

Traffic generation of the SLSTM zones within the Precinct 101 and 102 area as well as expected traffic generation of the proposed development yield is shown in Table 4.1. Traffic generation of the proposed Precinct 101 and 102 is determined by scaling the zone 1,143 and zone 3,850 traffic generation to reflect the number of dwellings proposed in each precinct.

Table 4.1: Precinct 101 & 102 Peak Hour Development Traffic Generation

Zone / Precinct	Land Use	Yield	AM Peak Trips		PM Peak Trips	
			IN	OUT	IN	OUT
SLSTM Wyatt Road Investigation Scenario 3						
1,143	Low Density Residential	333 Dwellings	55	132	119	54
3,850	Low Density Residential	200 Dwellings	35	80	72	34
3,853	Medium Density Residential	48 Dwellings	9	16	14	8
3,862	Neighbourhood Centre	240 Jobs	146	57	75	147
		Total Trip Generation	**245**	**285**	**280**	**243**
Proposed Precinct 101 & 102 Development						
101	Low Density Residential	393 Dwellings	65	156	140	64
102	Low Density Residential	182 Dwellings	32	73	66	31
		Total Trip Generation	**97**	**229**	**206**	**95**
		Net Change	**- 148**	**- 56**	**- 74**	**- 148**

As shown, the traffic generation associated with the proposed Precinct 101 and Precinct 102 residential development is expected to be substantially lower than the traffic generation of the corresponding area included in the endorsed context plan / modelled in the SLSTM. As such, traffic generation associated with the proposed Precinct 101 and 102 development yield is expected to be catered for by current road network infrastructure planning / provisions.

Regardless of the above, intersection modelling of forecast ultimate (2066) peak hour traffic volumes is detailed further in the following sections.

4.2.3 Intersection Traffic Volumes

Ultimate (2066) peak hour turn volumes at the New Beith Road / Homestead Drive intersection are sourced from the Flagstone PDA IPBR. These volumes are provided at **Appendix D** (Sheet 1). Distribution of traffic to / from the Precinct 101 and Precinct 102 zones, as sourced from the SLSTM Scenario 3 Wyatt Road Investigation, are provided at **Appendix D** (Sheet 2 – Sheet 5). From this, Precinct 101 and Precinct 102 development traffic volumes and subsequently forecast ultimate (2066) peak hour traffic volumes are provided at Appendix D (Sheet 6 & Sheet 7).

4.2.4 SIDRA Results

The intersection layout adopted for the New Beith Road / Homestead Drive intersection (Intersection 3) is generally in accordance with the Flagstone City Movement Network IMP. This intersection layout, as well as the layouts of proposed roundabouts, as assessed in SIDRA, are shown in Figure 4.4 to Figure 4.6.

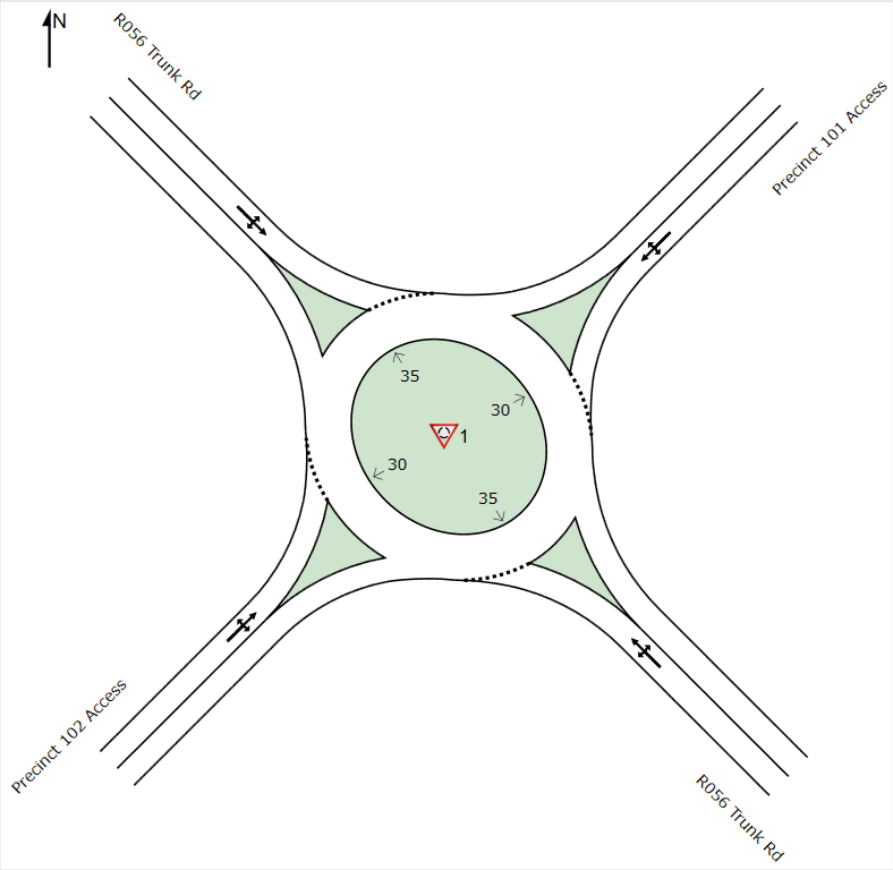


Figure 4.4: Intersection 1 SIDRA Intersection Layout

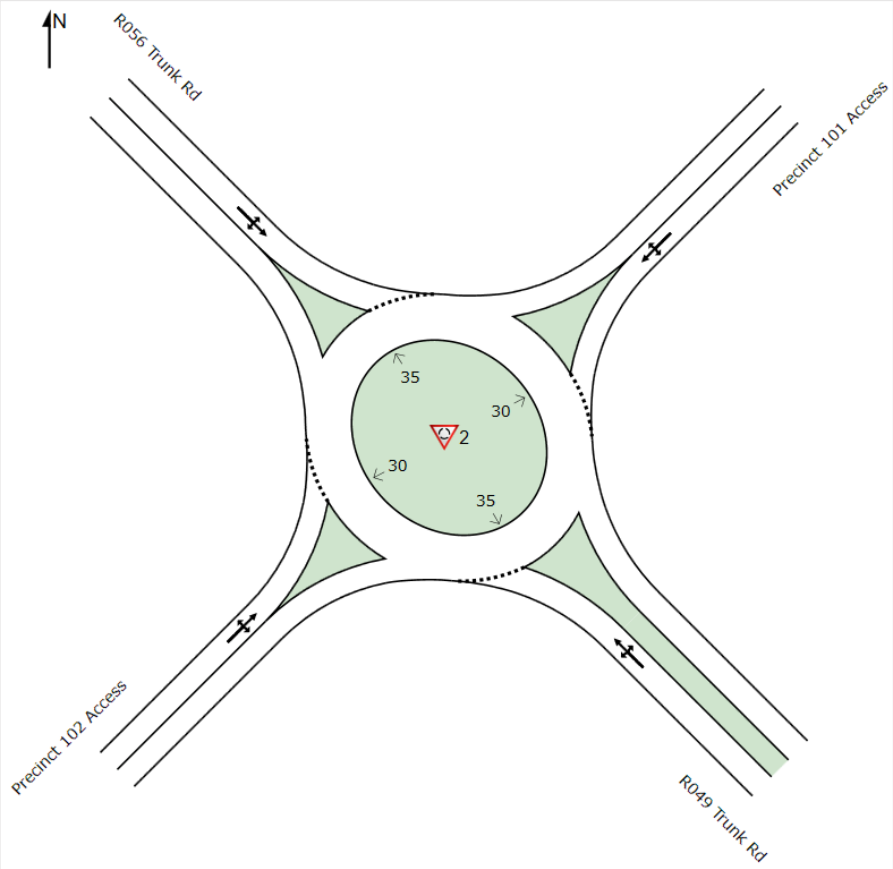


Figure 4.5: Intersection 2 SIDRA Intersection Layout

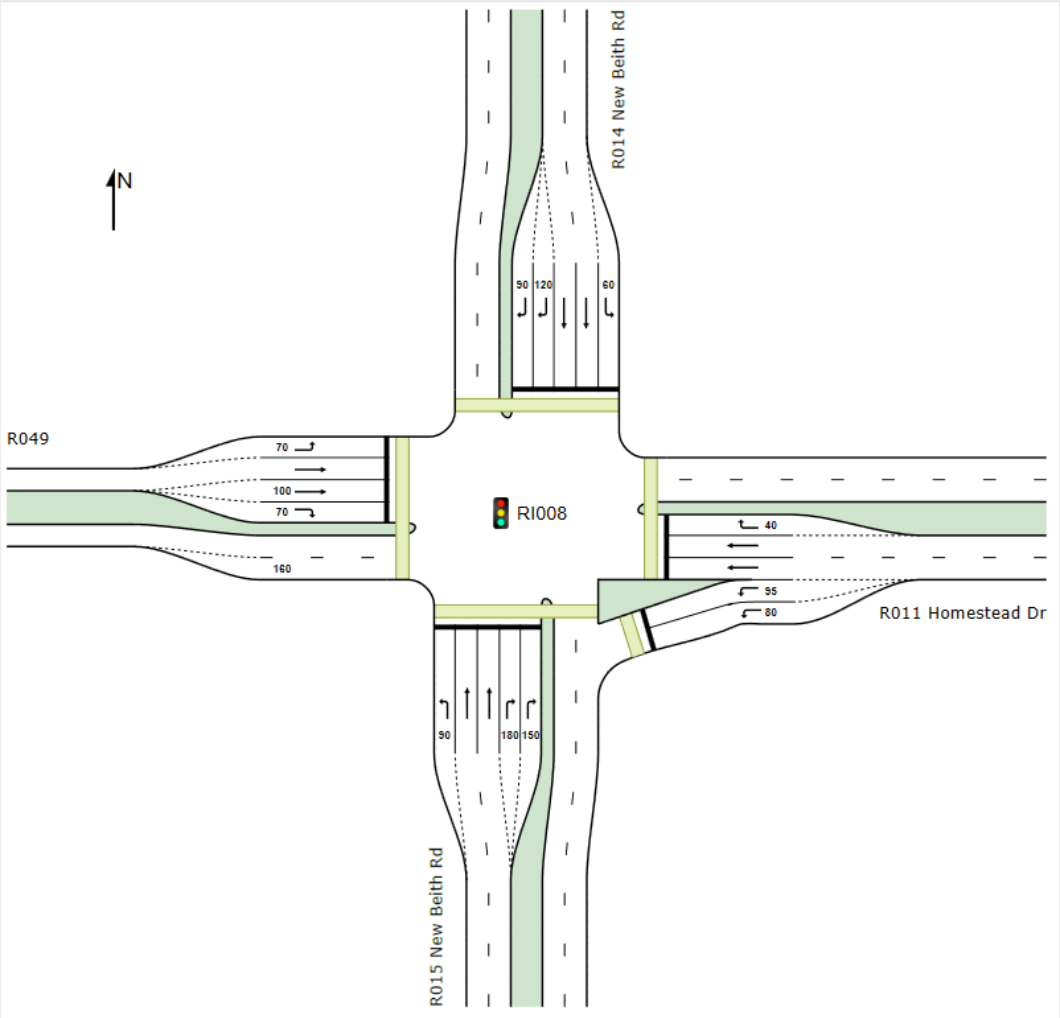


Figure 4.6: Intersection 3 SIDRA Intersection Layout

A summary of the SIDRA Intersection results for the key intersections assessed is outlined in Table 4.2. Detailed SIDRA outputs are provided at **Appendix E**.

Table 4.2: SIDRA Intersection Results Summary

Intersection ID	DOS (v/c)		Avg. Delay (Seconds)		Level of Service (LOS)	
	AM	PM	AM	PM	AM	PM
1	0.37	0.36	4	4	A	A
2	0.40	0.40	4	4	A	A
RI008	0.85	0.95	47	73	D	F

As shown, proposed Precinct 101 and Precinct 102 roundabouts are expected to operate within acceptable performance limits with ultimate (2066) forecast traffic volumes. The performance of the New Beith Road / Homestead Drive intersection (RI008) is expected to exceed typical thresholds (DOS >0.9) in the PM peak only. It is however noted that this level of congestion is typical for major arterial intersections or signalised intersections within major centre. This forecast is also based on assumed traffic growth over a 40+ year period with planning and movement patterns likely to change substantially in this time. Importantly, New Beith Road / Homestead Drive intersection (RI008) SIDRA results are consistent with modelled results from the Flagstone City Movement IMP and are generally consistent with modelled results from the DCOP IPBR.

5. PUBLIC & ACTIVE TRANSPORT PROVISIONS

5.1 Public Transport

Regional and local bus routes are proposed throughout the subject site generally in accordance with the current Movement IMP and the Context Area plan. Specific bus routes through the development are subject to consultation with TMR / TransLink, however bus stops have been proposed within the development to maximise public transport accessibility and coverage. Bus stop locations that service the subject site are shown in Figure 5.1 demonstrating a high level of public transport coverage.

Also shown is the 400m walking catchment from future major bus routes along New Beith Road. In accordance with endorsed Flagstone City Movement IMP, bus stops are ultimately expected to be delivered by others along New Beith Road. As will be detailed in Section 5.2, an active transport connection is proposed between the northern portion of Precinct 101 and New Beith Road. As such, residents living in northern Precinct 101 Lots, out of the catchment of proposed bus stops within the subject site, may be able to access future bus services on New Beith Road.

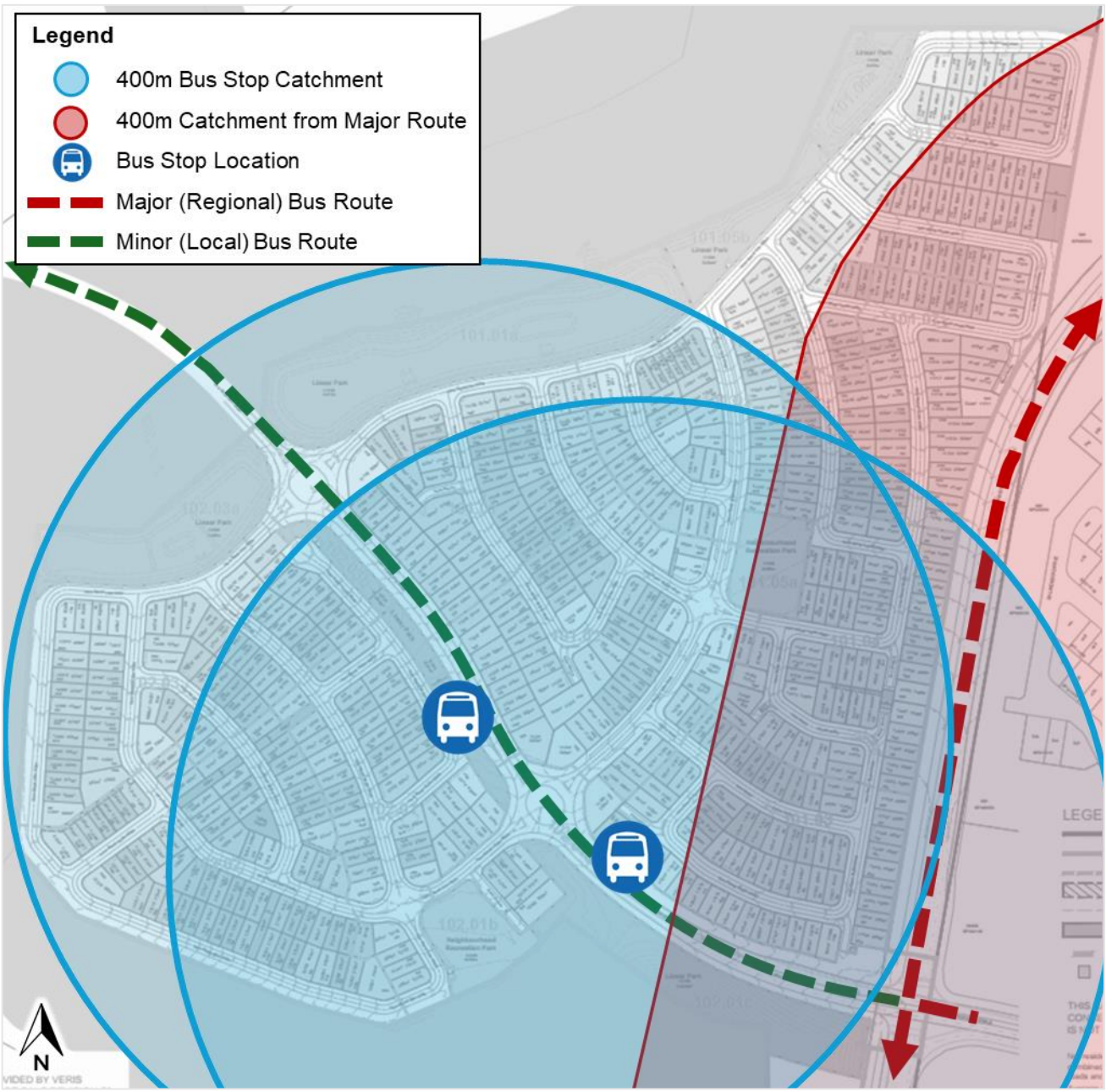


Figure 5.1: Proposed Bus Stop Locations & Catchment

The stops provided as part of the development are proposed adjacent crossing points at the eastern roundabout and generally co-located with 'pedestrian linkages' to the nearby residential catchments. This affords residents / passengers with more direct connection points from the stop infrastructure / bus service.

As shown, the majority of the proposed development area is located within reasonable walking distance of a future public transport route / stop, with only a small portion (~25 lots) outside of the 400m walking radius. Consistent with public transport requirements of the Flagstone Development Scheme, 95.7% of residential dwellings are located either within the catchment of the proposed bus stop or within 400m of future services on New Beith Road.

5.2 Active Transport Provisions

Pedestrian infrastructure will be provided throughout the subject site both within the road reserve and outside the road reserve, through park linkages and open space. An active transport strategy was developed for the site area to deliver a hierarchy of active transport provisions. The strategy is based on:

- Key active transport attractors
- Relevant user types
- Key active transport desire line routes.

Key active transport attractors within the subject site consist of the various types of parklands and bus stop locations. Additional key active transport attractors outside of the precinct also include the Flagstone City Town Centre to the east and the future school planned to the west. The key attractors and key pedestrian desire line routes through the site area are depicted in Figure 5.2.

Desire Line Routes	Key Attractors
Major	Park
Medium	Bus Stop
Low	Future School

Figure 5.2: Key Attractors and Active Transport Desire Line Routes

Based on the above attractors and desire line routes, an active transport route hierarchy was developed to specify a set of criteria and relevant infrastructure based on route classification.

The overarching hierarchy classification considers three levels, being:

- Major
- Medium
- Low.

The hierarchy does not suggest any lower level of importance or quality of infrastructure, rather defines the type of trip attractors/generators and user types that are most likely to use the prevailing facility, and therefore assist in the determination of an appropriate facility/infrastructure type.

For example:

a Major classification applies to routes / infrastructure that service multiple trip attractors such as connections between schools, parklands and major retail centres. This hierarchy may warrant a wider treatment due to a higher volume of active transport users.

a Low classification applies to routes / infrastructure that primarily service the immediate catchment, are not expected to service a large number of user types and warrant pathway treatments within the road reserve e.g. 1.5m footpath(s).

The route hierarchy criteria are summarised in Table 5.1.

Table 5.1: Criteria to Determine Route Hierarchy

Classification	Criteria	Infrastructure
Major	Provides connections: ▪ Within or between key centres ▪ To schools, shopping centres, transit hubs/stops ▪ Along major, higher volume transport routes	Includes: ▪ Separated cycleways ▪ Shared paths outside road reserve ▪ Shared paths ≥3m inside road reserve both sides of road
Medium	Provides connections: ▪ Within and between residential areas ▪ To major active transport routes ▪ To open space / parks ▪ To public transport stops	Includes: ▪ Shared path inside road reserve one side ▪ Shared paths ≤3m inside road reserve both sides of road
Low	Provides connections: ▪ Within immediate catchment (400m) ▪ On lower order, lower volume transport routes	Includes: ▪ Pathways inside road reserve one side (e.g. 1.5m footpath)

The key active transport linkages throughout the site area were therefore developed adopting the strategy of key attractors, key desire line routes and the criteria outlined in the route hierarchy classification. The key active transport linkages and route hierarchy is shown in Figure 5.3.

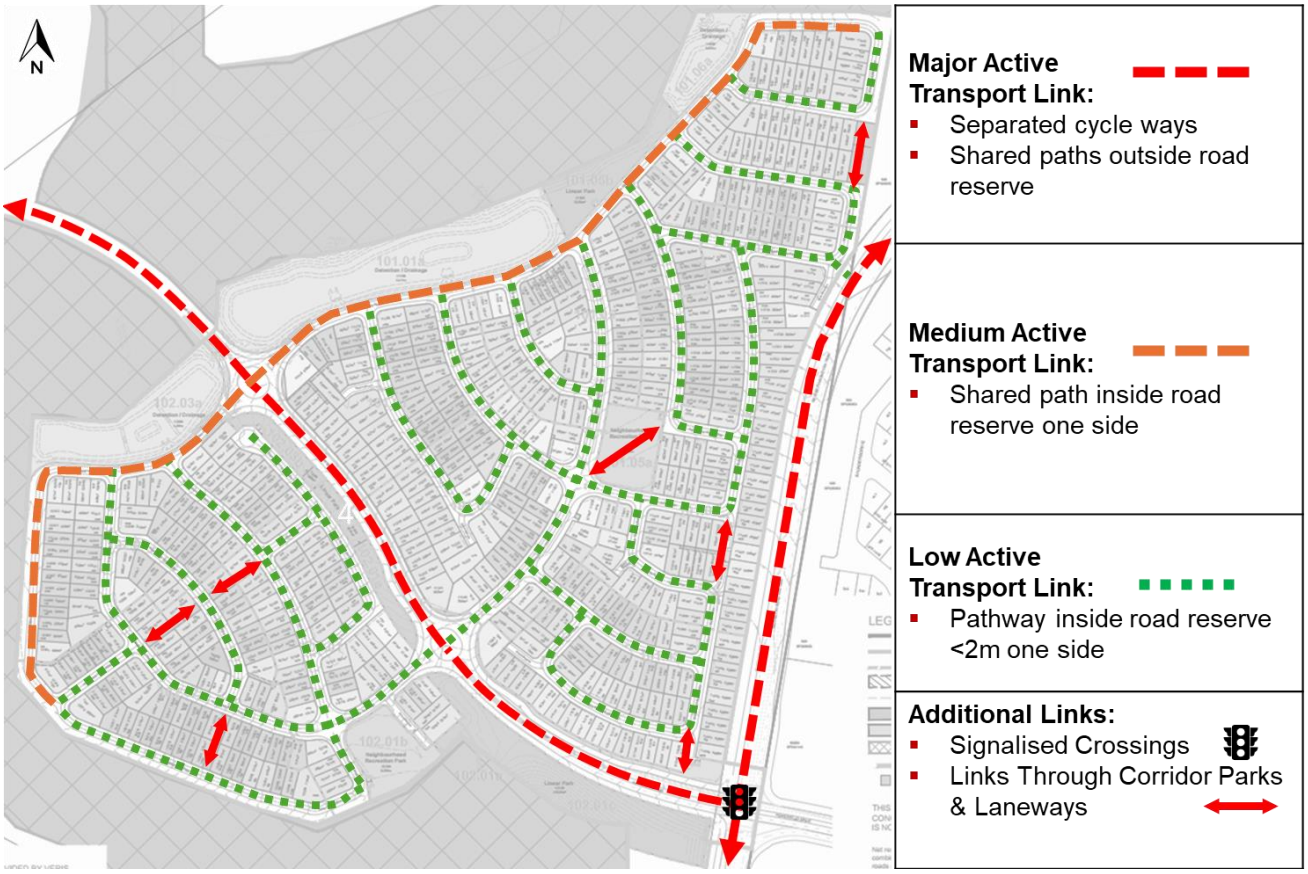


Figure 5.3: Active Transport Linkages

As shown, the proposed key active transport linkages are considered to provide a high-level of service and accessibility for the subject site and provide connectivity to surrounding services and properties. The proposed connections also generally align with the active transport components of the current Movement IMP.

6. SUMMARY & CONCLUSIONS

The traffic and transport findings for Precincts 101 and 102 of Monarch Glen are summarised as follows:

- The proposed development is located within the north-east portion of the endorsed Undullah Context Area
- Precincts 101 and 102 comprises of 575 residential dwellings with a range of parks & open space
- Precincts 101 and 102 will include the trunk roads R049 and the eastern portion of R056 in accordance with the Greater Flagstone DCOP. In addition, consideration has been given to the future trunk intersection RI008
- Proposed road hierarchies are generally in accordance with the Monarch Glen Movement and Network IMP, the Flagstone PDA IPBR or the EDQ Street and Movement Network Guideline as required
- The proposed roundabouts are compliant with the relevant requirements of the Austroads Guide to Road Design Part 4B and the Austroads Design Vehicles and Turning Path Templates
- Strategic traffic modelling was undertaken by VLC to provide forecast ultimate (2066) daily traffic volumes, informing road hierarchy requirements and Lot access considerations
- Overall findings of intersection modelling of key intersections demonstrate that proposed roundabouts can cater for forecast ultimate (2066) peak hour traffic volumes and New Beith Road / Homestead Drive intersection performance is expected to be consistent with results shown in the Monarch Glen Movement and Network IMP, Flagstone City Movement IMP and modelled results from the DCOP IPBR
- Consistent with public transport requirements of the Flagstone Development Scheme, 95.7% of residential dwellings are located either within the catchment of the proposed bus stops or within 400m of future services on New Beith Road
- Precincts 101 and 102 are considered to provide a highly accessible active transport network, with a range of route options both within and outside the road reserve. The proposed connections also generally align with the active transport components of the Movement IMP.

Based on the above assessment, it is concluded that the proposed road network, intersection arrangements and active transport and public transport provisions will accommodate transport demands associated with the proposed Monarch Glen precinct 101 and 102 development.

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Appendix A: Development Plans

ROL 4: PRECINCT 101 & 102

NOT TO BE USED FOR ENGINEERING DESIGN OR CONSTRUCTION

NOTES

This plan was prepared as a conceptual layout only. The information on this plan is not suitable for any other purpose.

Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions.

No reliance should be placed on the information on this plan for detailed subdivision design or for any financial dealings involving the land.

Pavements and centrelines shown are indicative only and are subject to Engineering Design.

Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Net residential density means the total number of dwellings divided by the combined area of residential lots, Neighbourhood Recreation Parks, internal local roads and half the width of local roads bordering the site.
Average net residential density means net residential density calculated for a whole neighbourhood.

PROJECTION - GDA2020 MGA56
SUBJECT BOUNDARIES SP351245 PROVIDED BY VERIS
DRAWING REFERENCE "402971 ROL4 LOT CALC REVISION C"
DATED 13/03/2025

BULK EARTHWORKS INFORMATION PROVIDED BY COLLIERS
DRAWING REFERENCE "24-0750_X_BASE_DESIGN"
DATED 20/03/2025

THIS RAL & POD PACKAGE WAS PREPARED AS A CONCEPTUAL LAYOUT ONLY. THE INFORMATION HEREON IS NOT SUITABLE FOR ANY OTHER PURPOSE.

LEGEND

- Site Boundary
- ROL 4 Boundary

RP DESCRIPTION: Lots 1-3 on SP351245

SCALE @A1 1:10000 @A3 1:20000 - LENGTHS ARE IN METRES

100 0 100 200 300 400 500 600 700 800 900 1000 1100 1200

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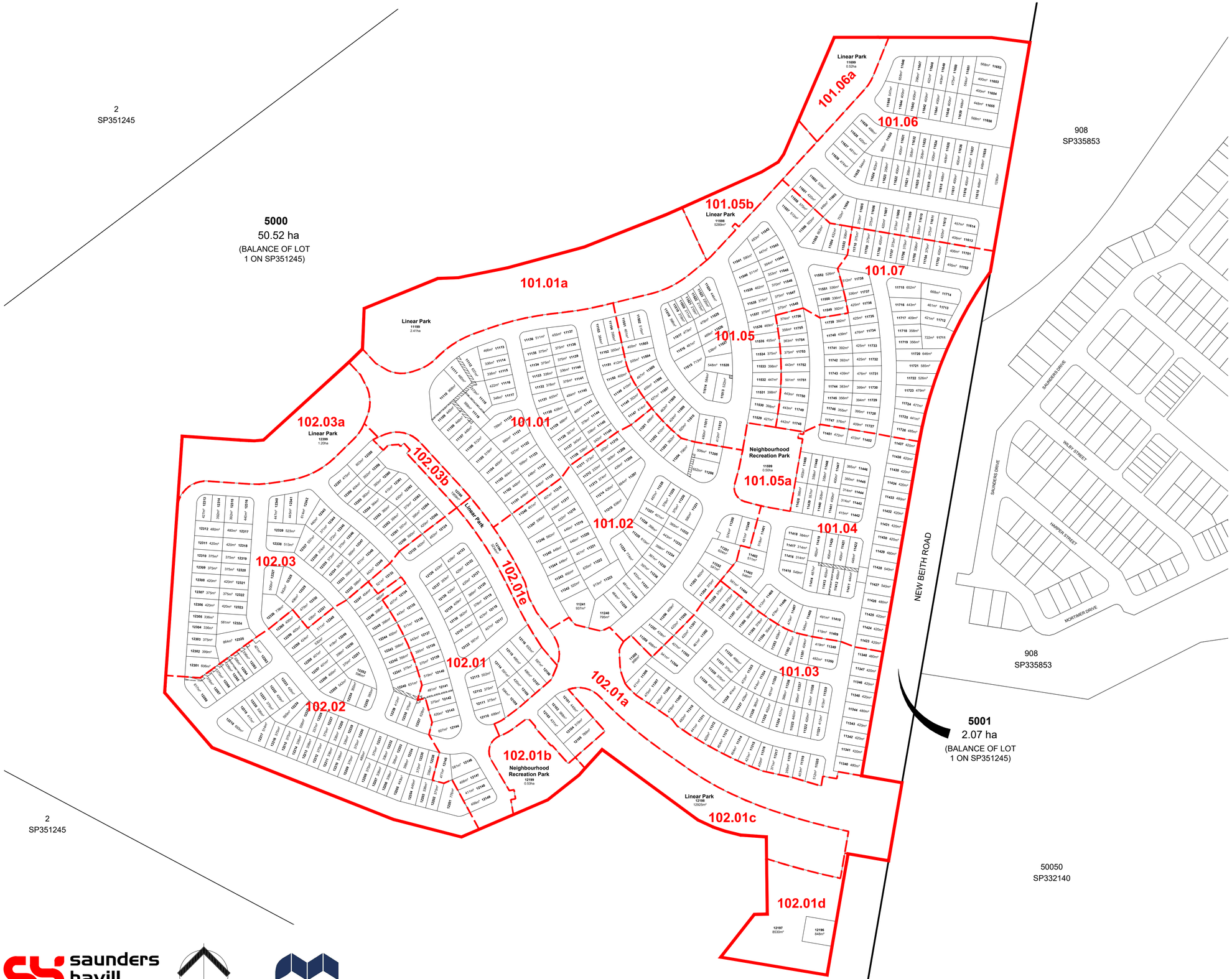
ROL 4: PRECINCT 101 & 102 - PRELIMINARY SUB-PRECINCT PLAN



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Average net residential density means net residential density calculated for a whole neighbourhood.

PROJECTION - GDA2020 MGA56
SUBJECT BOUNDARIES SP351245 PROVIDED BY VERIS
DRAWING REFERENCE "402971 ROL4 LOT CALC REVISION C"
DATED 13/03/2025

BULK EARTHWORKS INFORMATION PROVIDED BY COLLIERS
DRAWING REFERENCE "24-0750_X_BASE_DESIGN"
DATED 20/03/2025

THIS RAL & POD PACKAGE WAS PREPARED AS A CONCEPTUAL LAYOUT ONLY. THE INFORMATION HEREON IS NOT SUITABLE FOR ANY OTHER PURPOSE.

LEGEND

- Site Boundary
- ROL 4 Boundary
- Sub-precinct Boundary
- Proposed Easement

RP DESCRIPTION: Lots 1-3 on SP351245

SCALE @A1 1:2000 @A3 1:4000 - LENGTHS ARE IN METRES

20 0 20 40 60 80 100 120 140 160 180 200 220

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ROL 4: RECONFIGURATION OF A LOT PLAN

PROJECTION - GDA2020 MGA56
SUBJECT BOUNDARIES SP351245 PROVIDED BY VERIS
DRAWING REFERENCE "402971 ROL4 LOT CALC REVISION C"
DATED 13/03/2025

BULK EARTHWORKS INFORMATION PROVIDED BY COLLIERS
DRAWING REFERENCE "24-0750_X_BASE_DESIGN"
DATED 20/03/2025

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NOT TO BE USED FOR ENGINEERING DESIGN OR CONSTRUCTION

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Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions.

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* This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

LEGEND

- Site Boundary
- ROL 4 Boundary
- Sub-precinct Boundary
- Proposed Easement
- Design Contour (1.0m Interval) - Colliers 19/03/2025
- Conservation Area
- Indicative Bin Pad location
- Indicative PMT / RMU Site

THIS RAL & POD PACKAGE WAS PREPARED AS A CONCEPTUAL LAYOUT ONLY. THE INFORMATION HEREON IS NOT SUITABLE FOR ANY OTHER PURPOSE.

Net residential density means the total number of dwellings divided by the combined area of residential lots, Neighbourhood Recreation Parks, internal local roads and half the width of local roads bordering the site.
Average net residential density means net residential density calculated for a whole neighbourhood.

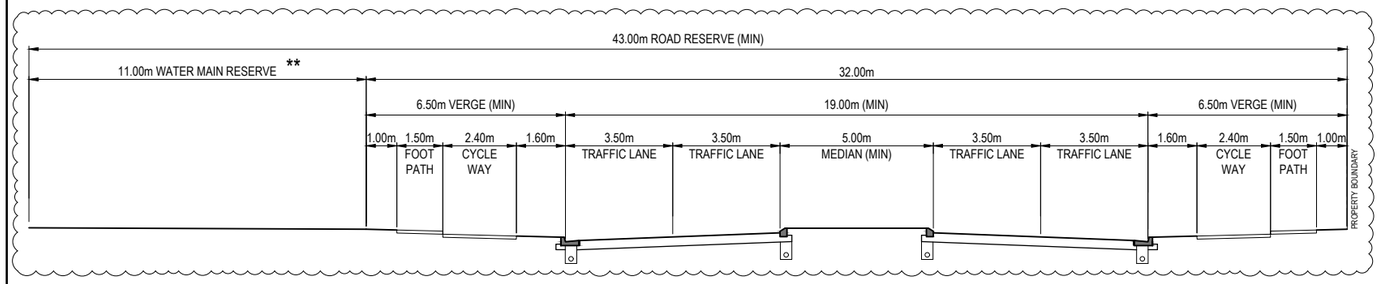
RP DESCRIPTION: Lots 1-3 on SP351245

SCALE @A1 1:2000 @A3 1:4000 - LENGTHS ARE IN METRES
20 0 20 40 60 80 100 120 140 160 180 200 220

DEVELOPMENT STATISTICS

RESIDENTIAL ALLOTMENTS	Typical Width	No. Lots	%	Net Area
25m Deep Lots				
Villa	V25	11.2m	1	0.2%	0.059 ha
Courtyard	C25	14m	2	0.3%	0.089 ha
Premium Courtyard	PC25	16m	1	0.2%	0.039 ha
Sub Total			**4**	**0.7%**	**0.187 ha**
RESIDENTIAL ALLOTMENTS	**Typical Width**		**No. Lots**	**%**	**Net Area**
28m Deep Lots				
Terrace - Front Loaded	T28	7.5m	7	1.2%	0.191 ha
Villa	V28	11.2m	4	0.7%	0.126 ha
Premium Villa	PV28	12.5m	17	3.0%	0.636 ha
Courtyard	C28	14m	32	5.6%	1.396 ha
Premium Courtyard	PC28	16m	14	2.4%	0.719 ha
Traditional	TD28	18m	4	0.7%	0.266 ha
Premium Traditional	PT28	20m	1	0.2%	0.065 ha
Sub Total			**79**	**13.7%**	**3.399 ha**
RESIDENTIAL ALLOTMENTS	**Typical Width**		**No. Lots**	**%**	**Net Area**
30m Deep Lots				
Villa	V30	11.2m	48	8.3%	1.651 ha
Premium Villa	PV30	12.5m	136	23.7%	5.431 ha
Courtyard	C30	14m	115	20.0%	5.140 ha
Premium Courtyard	PC30	16m	50	8.7%	2.548 ha
Traditional	TD30	18m	11	1.9%	0.684 ha
Premium Traditional	PT30	20m	5	0.9%	0.343 ha
Sub Total			**365**	**63.5%**	**15.797 ha**
RESIDENTIAL ALLOTMENTS	**Typical Width**		**No. Lots**	**%**	**Net Area**
32m Deep Lots				
Villa	V32	11.2m	9	1.6%	0.333 ha
Premium Villa	PV32	12.5m	57	9.9%	2.484 ha
Courtyard	C32	14m	41	7.1%	2.008 ha
Premium Courtyard	PC32	16m	14	2.4%	0.863 ha
Traditional	TD32	18m	4	0.7%	0.295 ha
Premium Traditional	PT32	20m	2	0.3%	0.169 ha
Sub Total			**127**	**22.1%**	**6.152 ha**
Total Allotments			**575**	**100%**	**25.535 ha**
Land Budget			**Area (Ha)**	**%**	
Area of Subject Site / Stage			**48.211 ha**	**—**	
Net Residential Allotments			**25.535 ha**	53.0%	
Linear Park / Pedestrian Linkage			6.762 ha	14.0%	
Neighbourhood Recreation Park			1.026 ha	2.1%	
Local Road Areas			2.967 ha	6.2%	
Major Road Areas			2.967 ha	6.2%	
Balance Lot 12196			0.085 ha	0.2%	
Balance Lot 12197			0.853 ha	1.8%	
Total Area			**48.211 ha**	**100%**	
Average Lot Size (m²)			**444.1 m²**		
Net Density (dw/ha)			**15.3 dw/ha**		

Appendix B: Typical Road Cross-Sections



URBAN ARTERIAL : 4 LANE (NEW BEITH ROAD)

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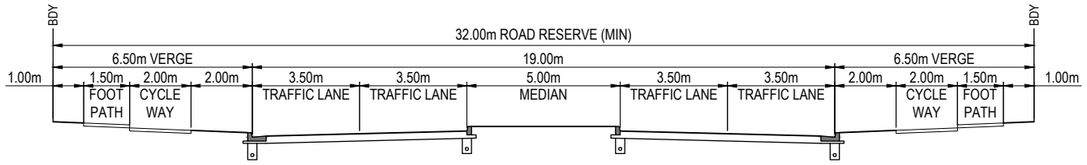
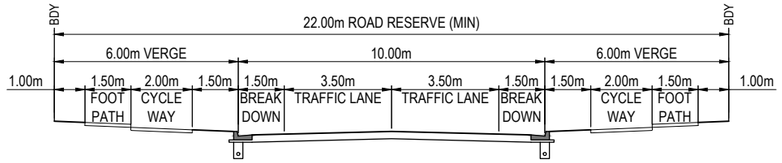
SCALE 1:200 (A3)



TRUNK CONNECTOR : 4 LANE (NO PARKING)

SCALE 1:100 (A1)
SCALE 1:200 (A3)



TRUNK CONNECTOR : 2 LANE NO PARKING (NO MEDIAN)

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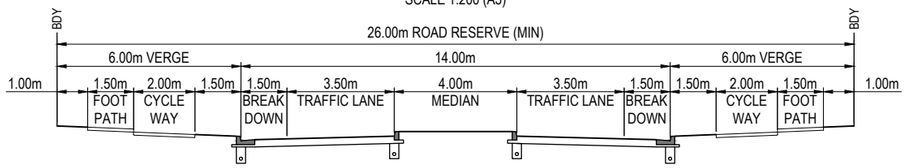
SCALE 1:200 (A3)



TRUNK CONNECTOR : 2 LANE NO PARKING (MEDIAN)

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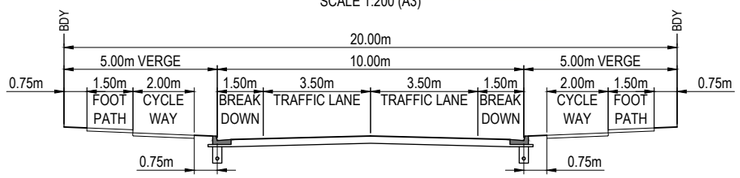
SCALE 1:200 (A3)



TRUNK CONNECTOR : 2 LANE NO PARKING (BRIDGE - NO MEDIAN)

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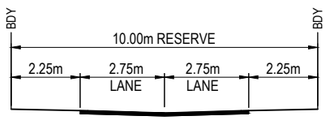
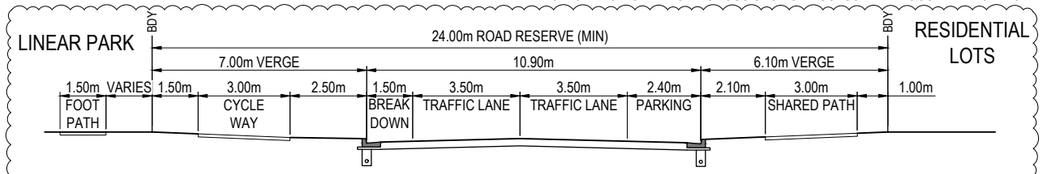


DRIVEWAY RESERVE (TYPICAL)

1:100 (A1)
1:200 (A3)

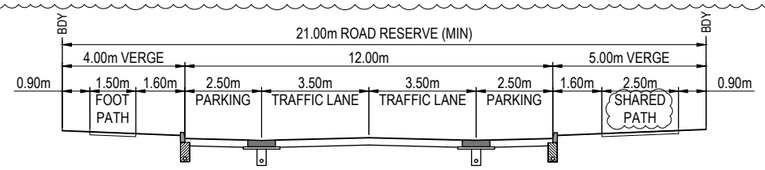
GENERAL NOTES:

ADD 2m LANDSCAPE BUFFER IF INTERFACING WITH ACOUSTIC FENCE.
IF => 15m LINEAR PARK ADJACENT: REDUCE VERGE TO 4m AND MOVE PATHS TO PARK
REFER TO MONARCH GLEN ROAD CROSS SECTION ASSESSMENT DOCUMENT FOR MORE



TRUNK CONNECTOR : 2 LANE WITH PARKING

SCALE 1:100 (A1)
SCALE 1:200 (A3)



NEIGHBOURHOOD CONNECTOR 1

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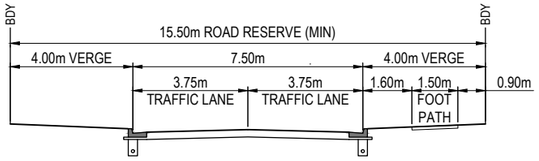
SCALE 1:200 (A3)



ACCESS STREET (TYPICAL)

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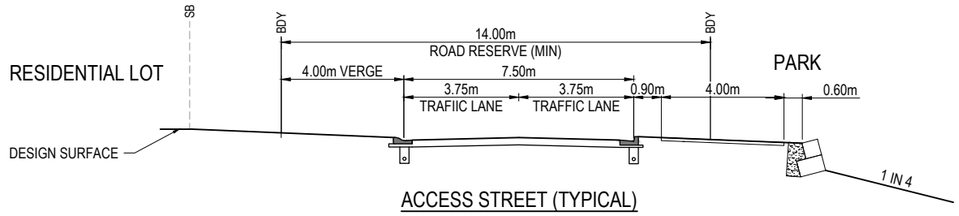
SCALE 1:200 (A3)



ACCESS STREET (TYPICAL)

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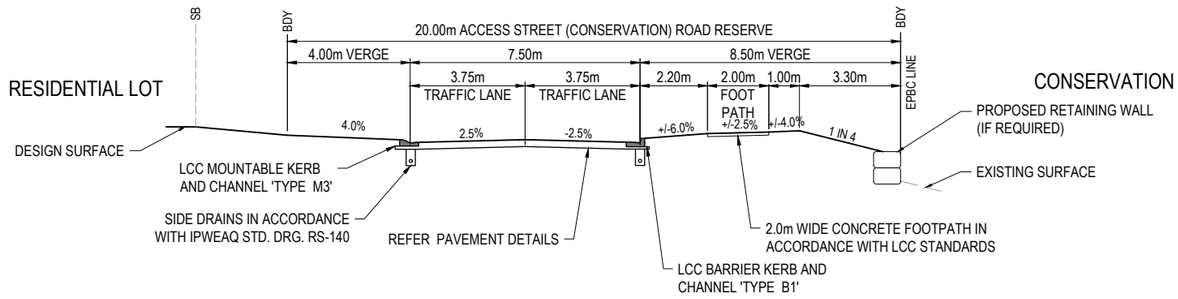
SCALE 1:200 (A3)



ACCESS STREET (CONSERVATION) - TYPICAL CROSS SECTION

SCALE 1:100 (A1)
SCALE 1:200 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
A	17.12.24	NK	TP	ORIGINAL ISSUE
B	20.03.25	NK	TP	LOTS AND EASEMENTS AMENDED
C	04.04.25	NK	TP	DRAWINGS AMENDED
D	11.09.25	KN	DH	UPDATED TYPICAL SECTION

DRAWN
DESIGN

STATUS: **FOR DEVELOPMENT APPLICATION NOT FOR CONSTRUCTION**

APPROVED: DANIEL COLLINS RPEQ 18631 DATE: 11.09.25

FOR AND ON BEHALF OF COLLIERS INTERNATIONAL ENGINEERING & DESIGN PTY LTD

Colliers

SCALE
1:100 1 0 1 2 3 4 5 A1
1:200 A3

CLIENT: mirvac

ASSOCIATED CONSULTANT: ENGENY, saunders havill group

PROJECT NAME: **MONARCH GLEN No. 1 PTY LTD**

R.O.L. 4
HOMESTEAD DRIVE
MONARCH GLEN

DRAWING TITLE: **ROAD HIERARCHY TYPICAL DETAIL**

PROJECT No.	DRAWING No.	REVISION
24-0750	DA-0251	D

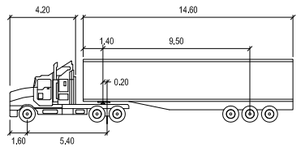
PLOT - 11 Sep 2025 05:44 PM - LOCATION - H:\2022\0408 Ucullalin (Uptown), Flagstone\Design\Acad\ROL 4\24-0750-DA-P101-0250-ROAD LAYOUT.dwg

Appendix C: Swept Path Diagrams

N

Notes:

Vehicle Clearance (500mm)

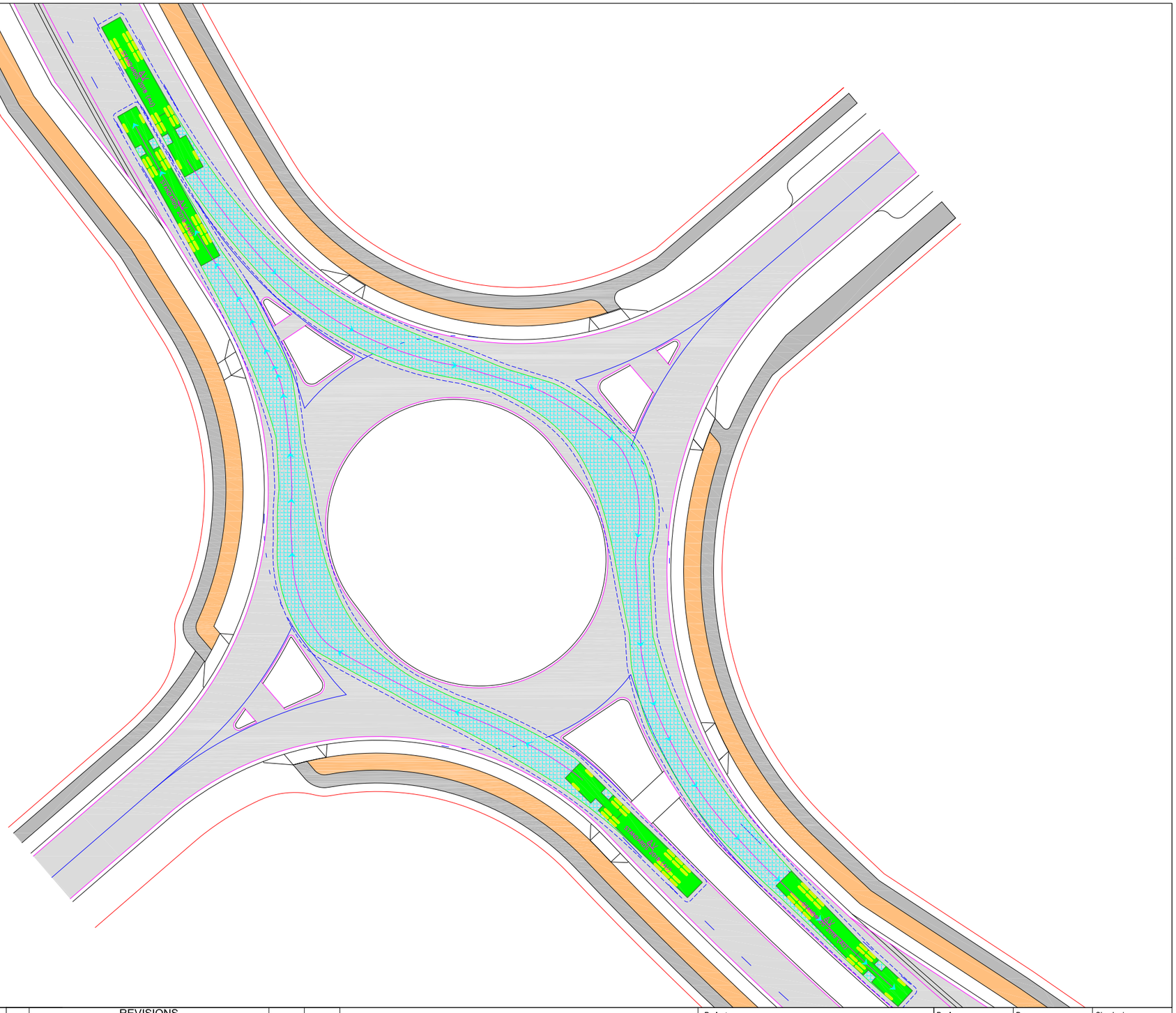


AV (20.0m)

meters

Tractor Width	: 2,50	Lock to Lock Time	: 6,0
Trailer Width	: 2,50	Steering Angle	: 28,3
Tractor Track	: 2,50	Articulating Angle	: 72,0
Trailer Track	: 2,50		

DESIGN VEHICLE



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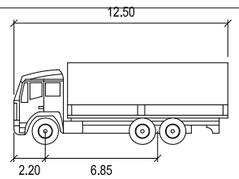
Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP	Design: H.M	Drawn: H.M
Title: Intersection 1: AV 1	CONCEPT ONLY	Checked: A.P
	Date: 29.11.2024	
	Project Number: P6607	Sheet Number: 1
		Issue: 001

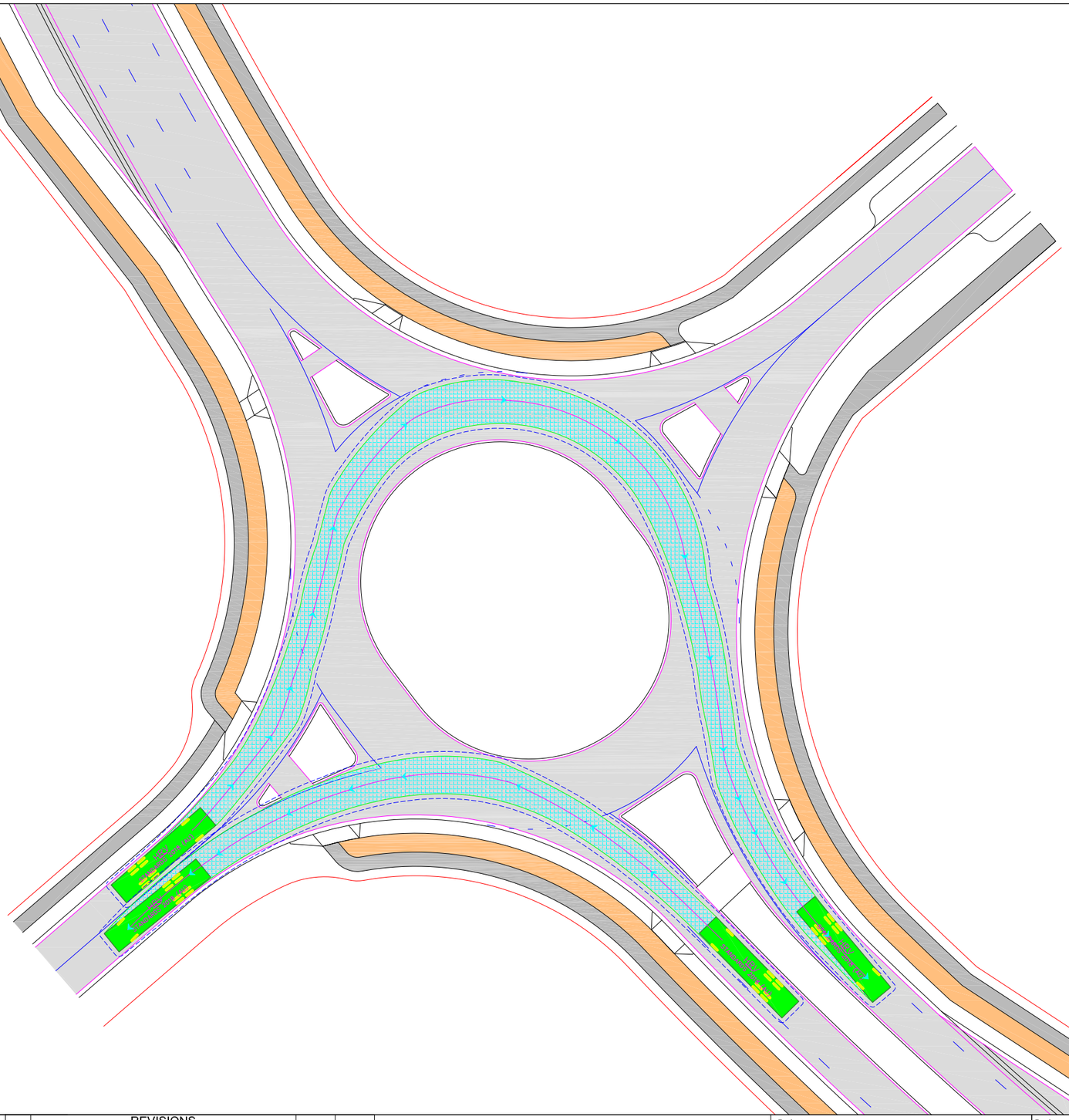
Notes:

Vehicle Clearance (500mm)



HRV	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

DESIGN VEHICLE



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Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP

Title: Intersection 1: HRV 1

Design	Drawn	Checked
H.M	H.M	A.P

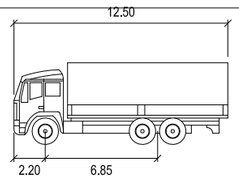
CONCEPT ONLY

Date: 29.11.2024

Project Number	Sheet Number	Issue
P6607	2	001

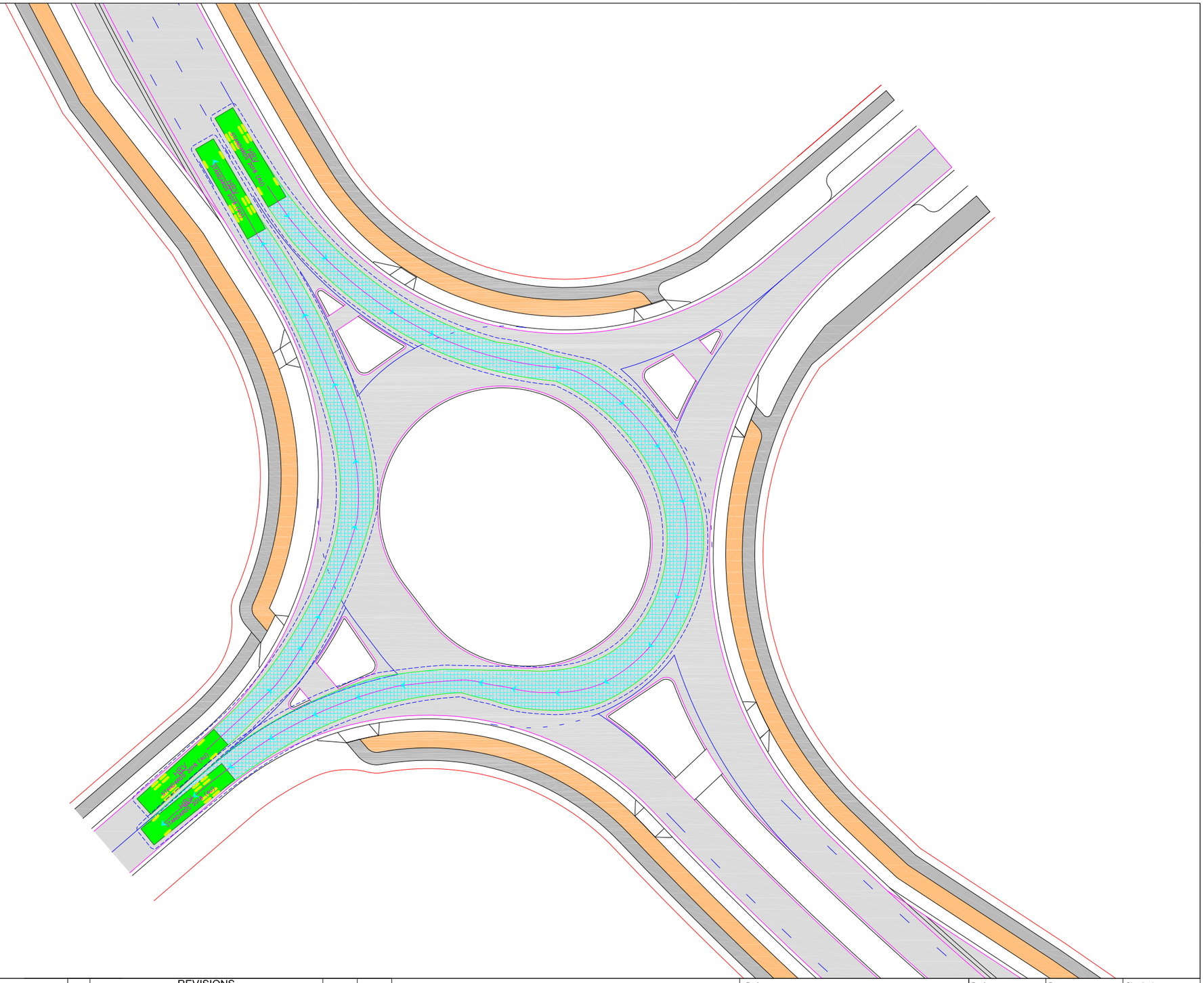
Notes:

Vehicle Clearance (500mm)



HRV	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

DESIGN VEHICLE



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Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP

Title: Intersection 1: HRV 2

Design	Drawn	Checked
H.M	H.M	A.P

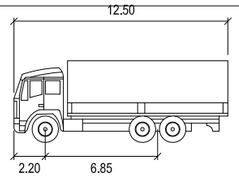
CONCEPT ONLY

Date: 29.11.2024

Project Number	Sheet Number	Issue
P6607	3	001

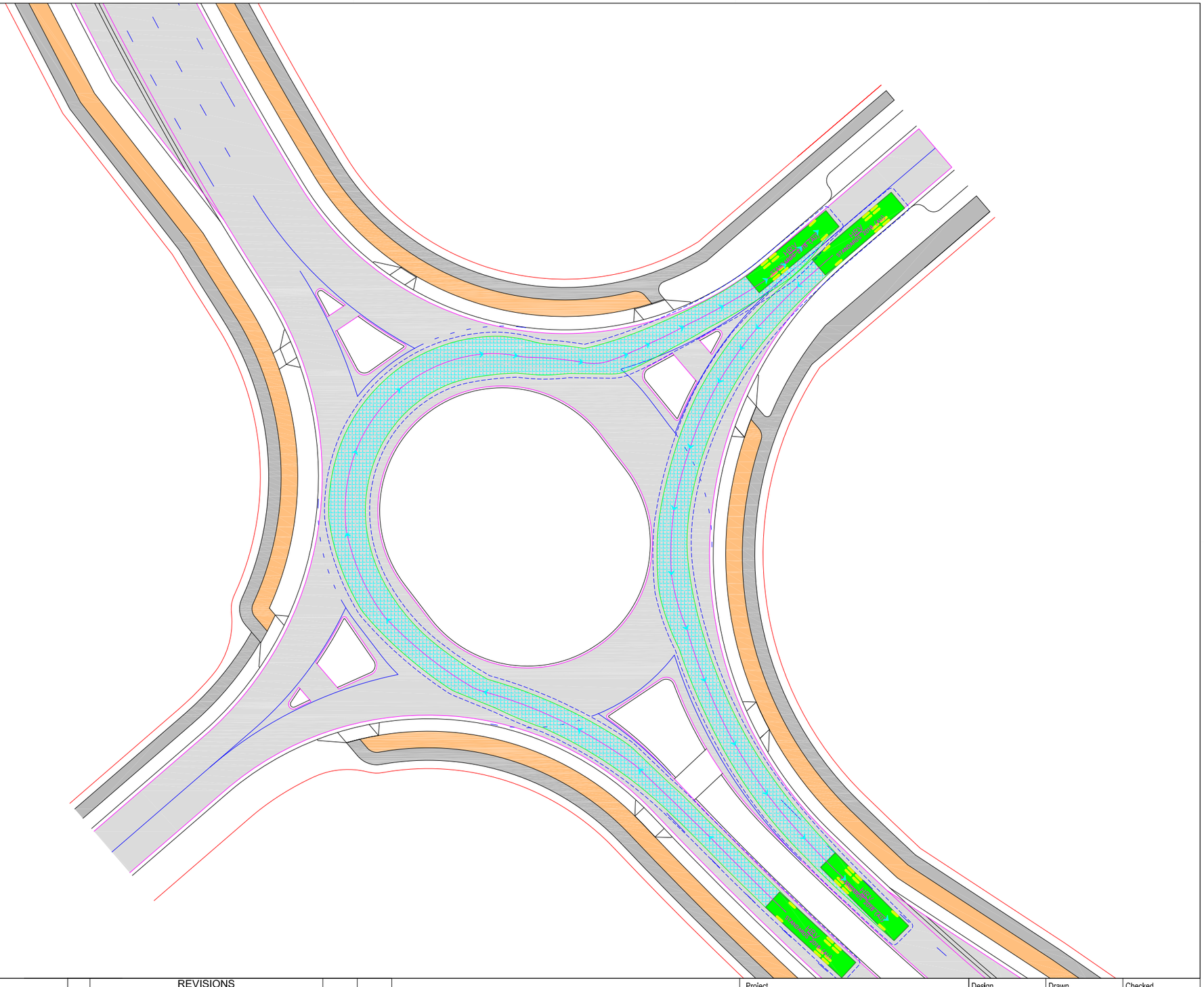
Notes:

Vehicle Clearance (500mm)



HRV	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

DESIGN VEHICLE



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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP	Design: H.M	Drawn: H.M	Checked: A.P
Title: Intersection 1: HRV 3	CONCEPT ONLY	Date: 29.11.2024
	Project Number: P6607	Sheet Number: 4	Issue: 001

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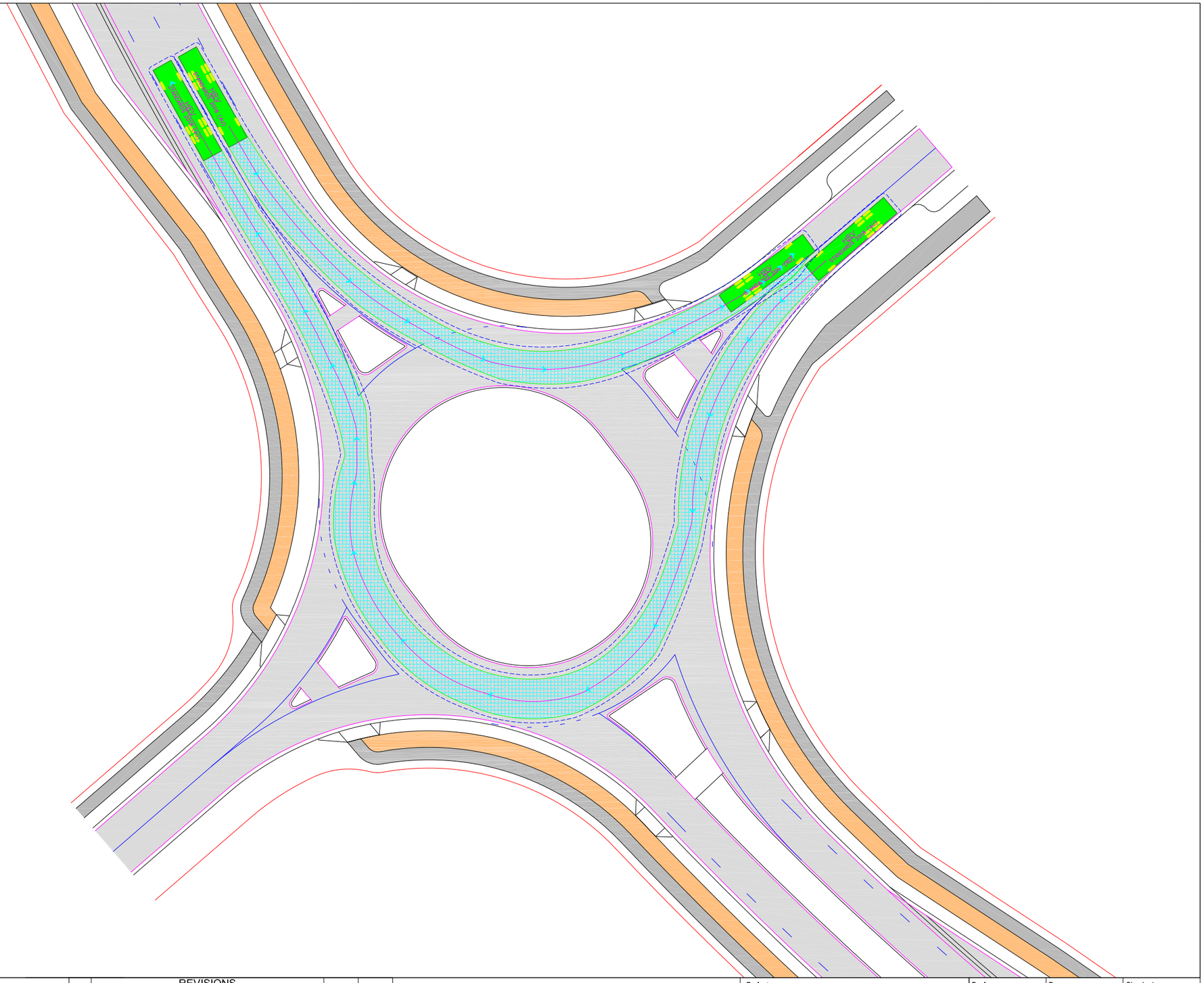
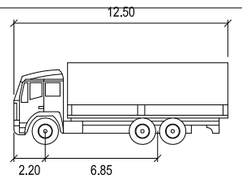
Notes:



Vehicle Clearance (500mm)



HRV	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

DESIGN VEHICLE

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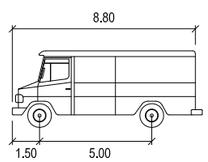
Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project	Design	Drawn	Checked
Monarch Glen IMP	H.M	H.M	A.P
Title: Intersection 1: HRV 4	CONCEPT ONLY	Date: 29.11.2024	
	Project Number: P6607	Sheet Number: 5	Issue: 001

Notes:

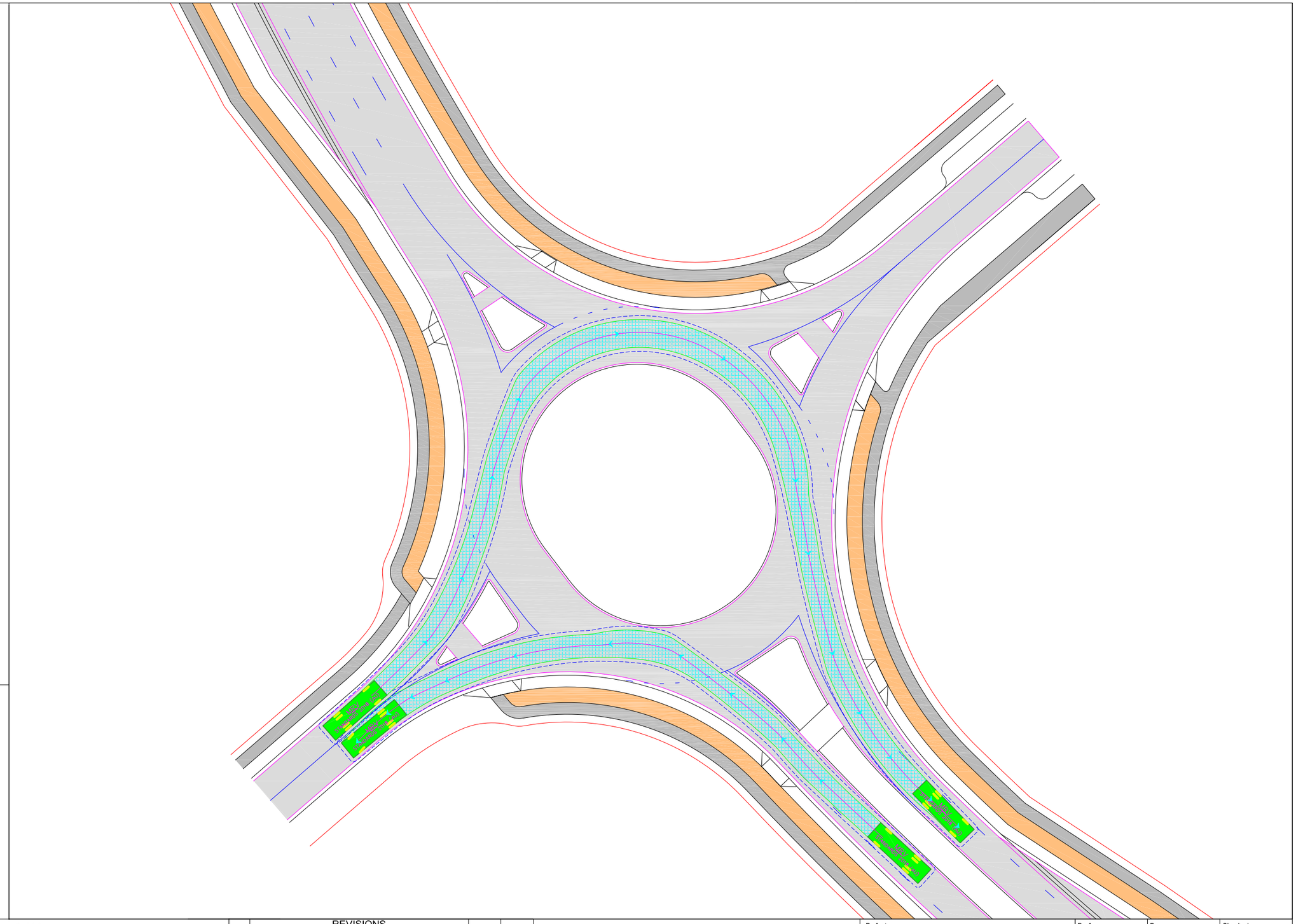
Vehicle Clearance (500mm)



MRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

DESIGN VEHICLE



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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 — 0 5 10 15 20 25 — 1:500

Project	Design	Drawn	Checked
Monarch Glen IMP	H.M	H.M	A.P
Title: Intersection 1: MRV 1	CONCEPT ONLY	Date: 29.11.2024	
	Project Number: P6607	Sheet Number: 6	Issue: 001

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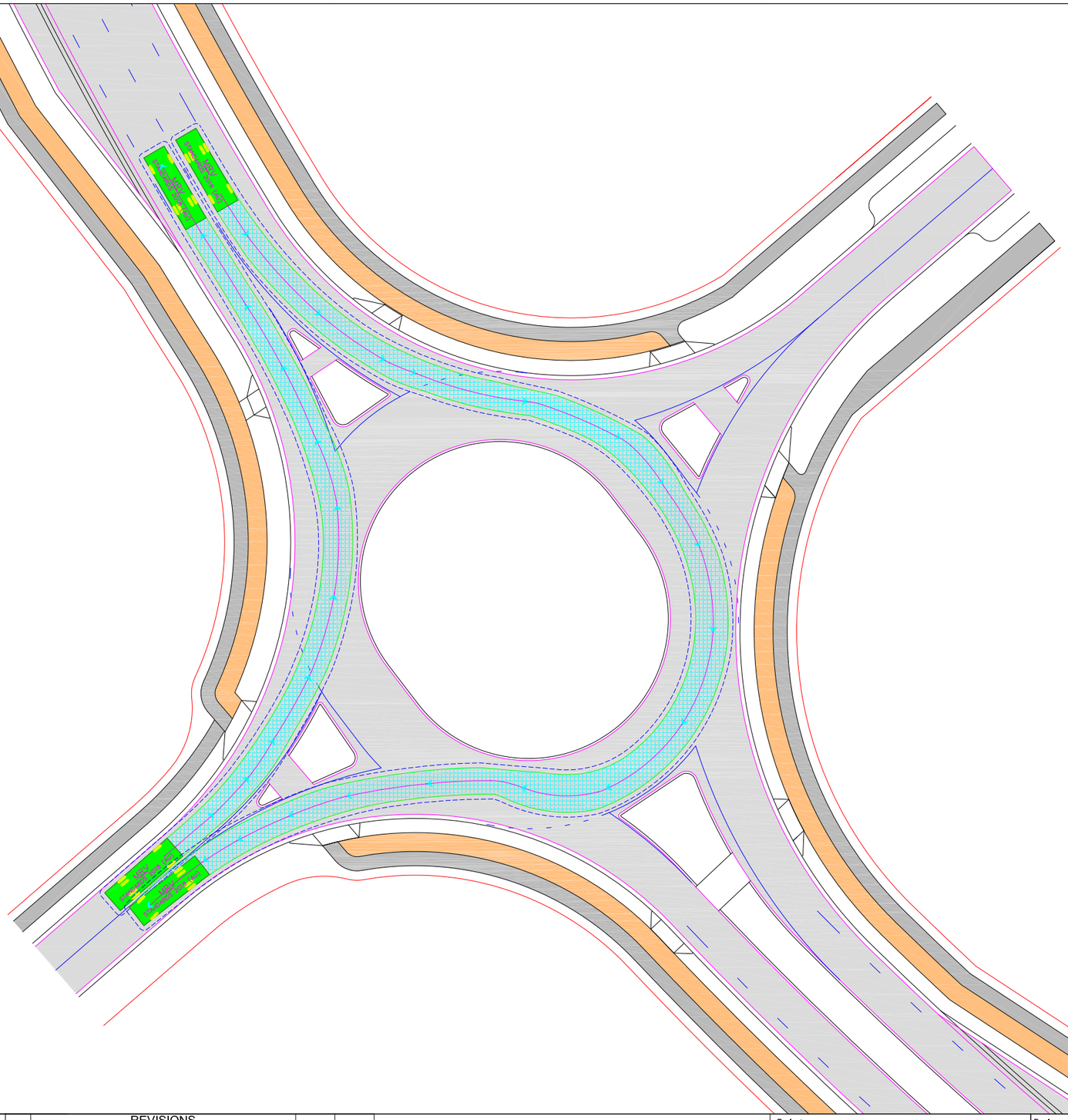
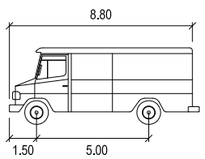
Notes:



Vehicle Clearance (500mm)



MRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP	Design: H.M	Drawn: H.M	Checked: A.P
Title: Intersection 1: MRV 2	CONCEPT ONLY	Date: 29.11.2024	
	Project Number: P6607	Sheet Number: 7	Issue: 001

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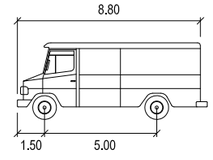
Notes:

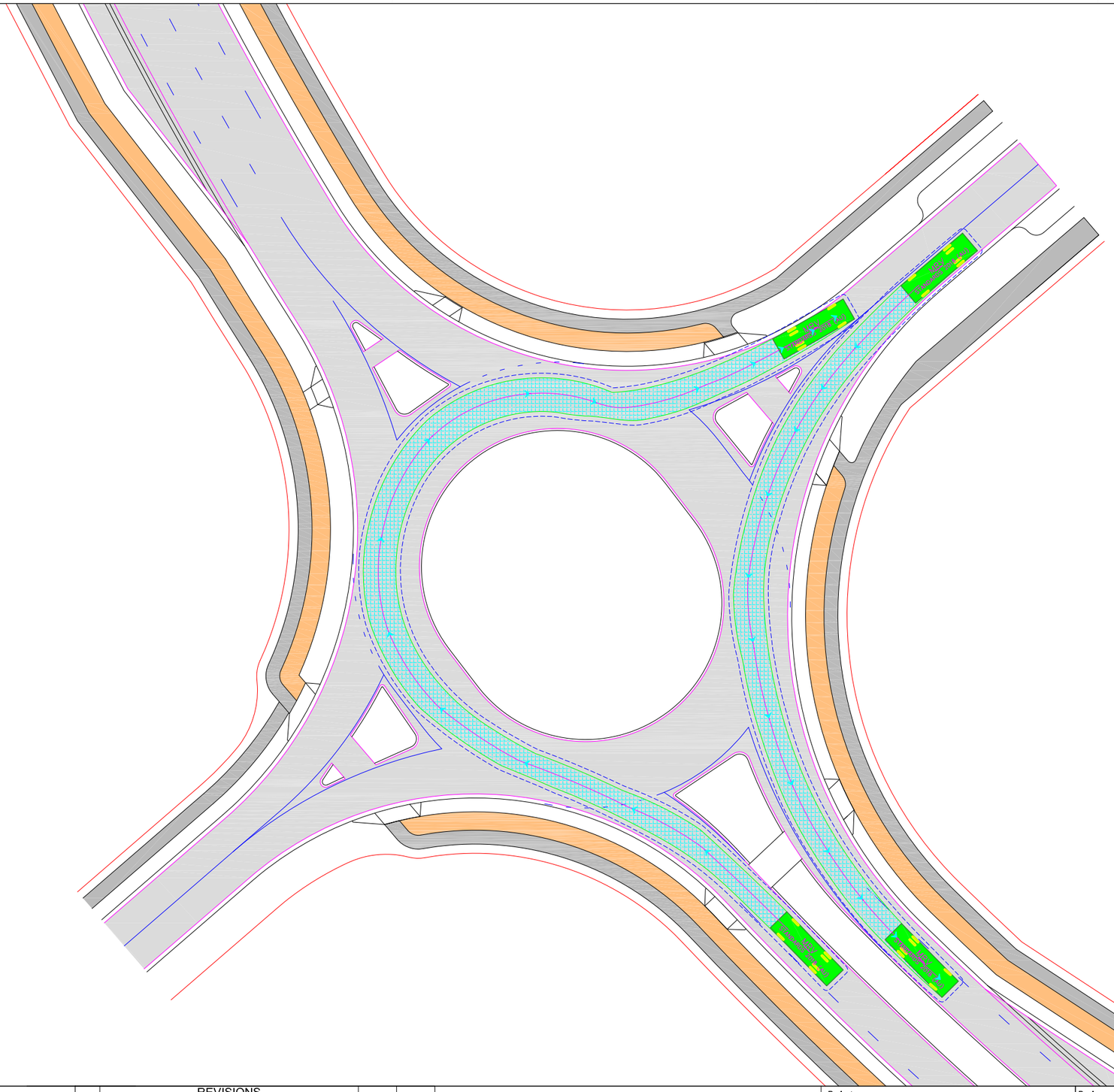
Vehicle Clearance (500mm)



MRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

DESIGN VEHICLE



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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

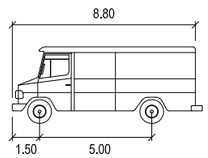
Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP	Design: H.M	Drawn: H.M	Checked: A.P
Title: Intersection 1: MRV 3	CONCEPT ONLY	Date: 29.11.2024
	Project Number: P6607	Sheet Number: 8	Issue: 001

N

Notes:

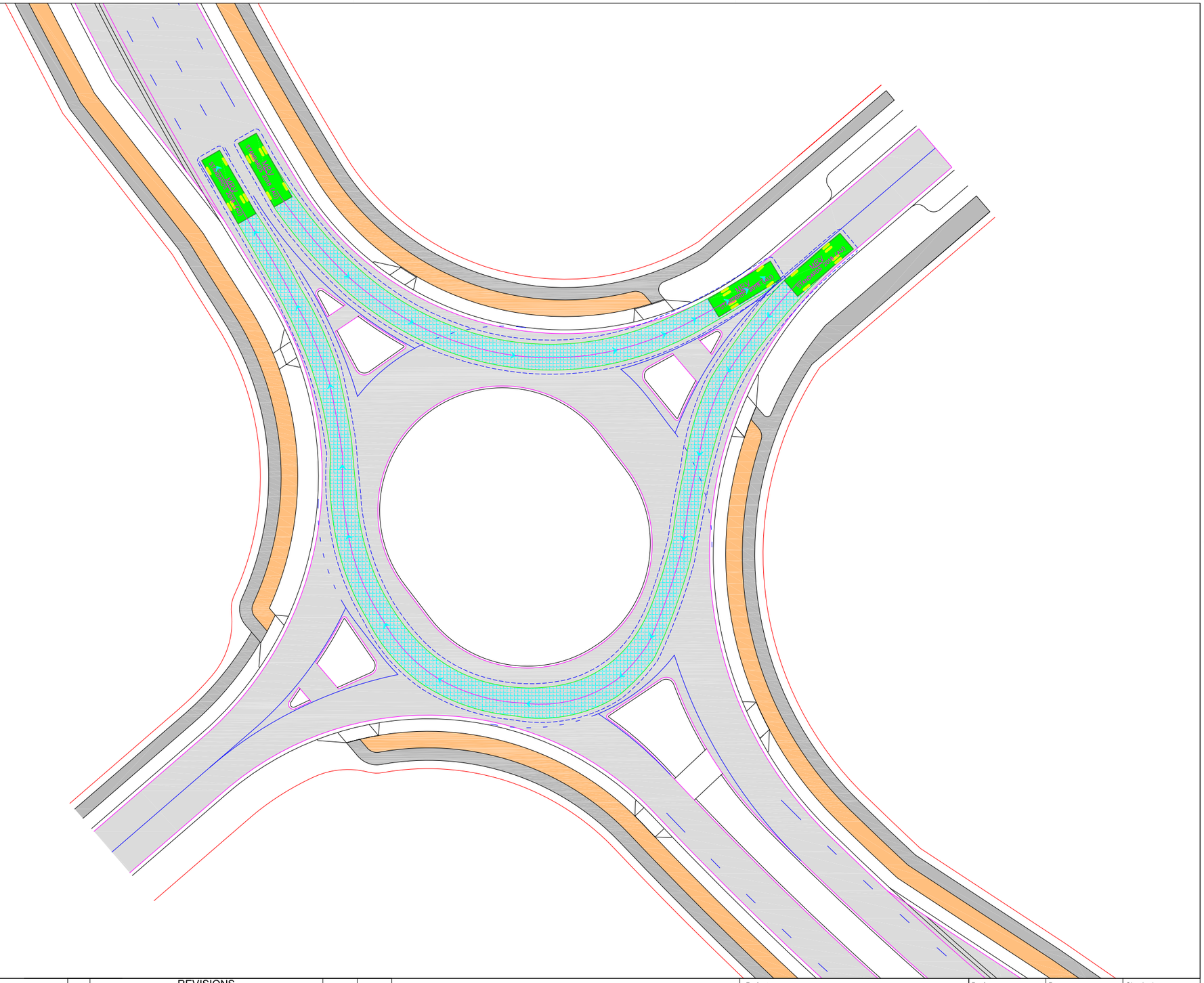
Vehicle Clearance (500mm)



MRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

DESIGN VEHICLE



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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP

Title: Intersection 1: MRV 4

Design	Drawn	Checked
H.M	H.M	A.P

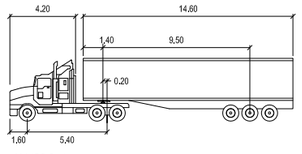
CONCEPT ONLY

Date: 29.11.2024

Project Number	Sheet Number	Issue
P6607	9	001

Notes:

Vehicle Clearance (500mm)



AV (20.0m)

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50		

DESIGN VEHICLE

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REVISIONS			
Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP

Title: Intersection 2: AV 1

Design	Drawn	Checked
H.M	H.M	A.P

CONCEPT ONLY

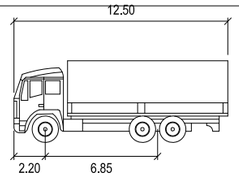
Date: 29.11.2024

Project Number	Sheet Number	Issue
P6607	10	001

N

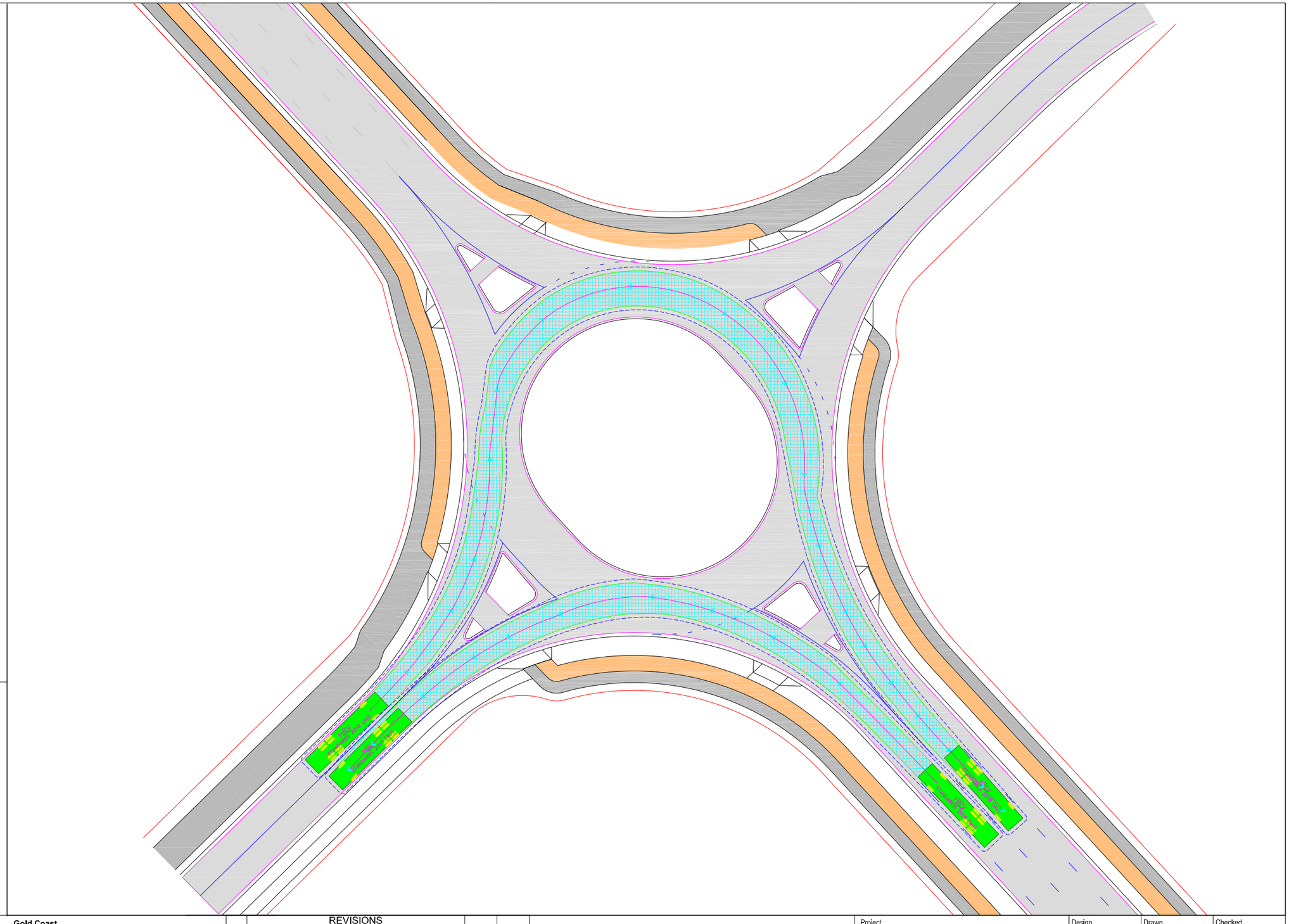
Notes:

Vehicle Clearance (500mm)



HRV	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

DESIGN VEHICLE



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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP	Design: H.M	Drawn: H.M	Checked: A.P
	CONCEPT ONLY		Date: 29.11.2024
Title: Intersection 2: HRV 1	Project Number: P6607	Sheet Number: 11	Issue: 001

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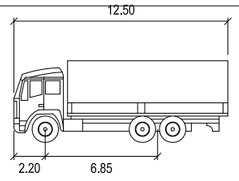
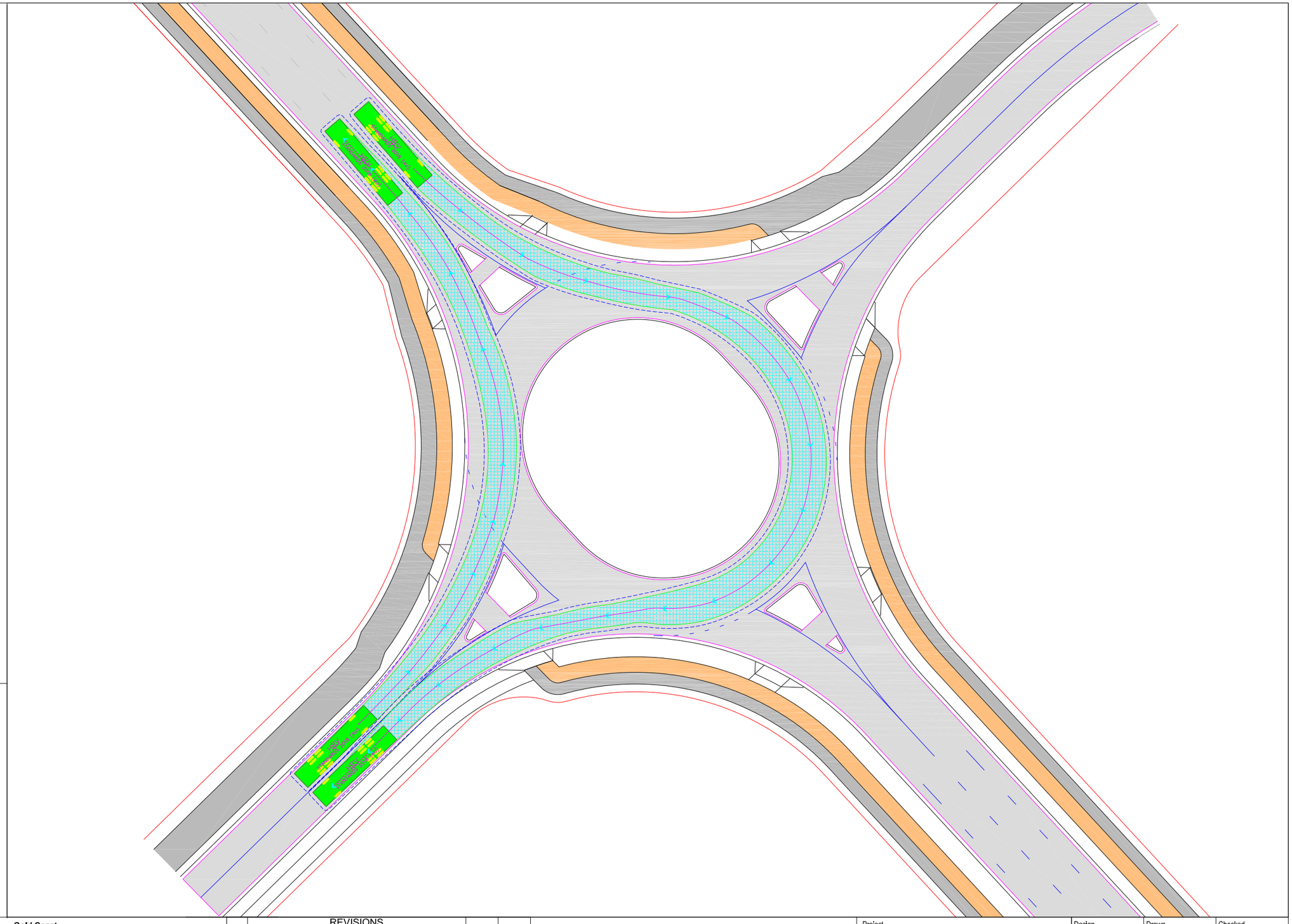
Notes:

Vehicle Clearance (500mm)



HRV	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

DESIGN VEHICLE



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REVISIONS			
Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP

Title: Intersection 2: HRV 2

Design	Drawn	Checked
H.M	H.M	A.P

CONCEPT ONLY

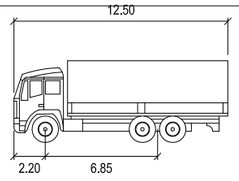
Date: 29.11.2024

Project Number	Sheet Number	Issue
P6607	12	001

N

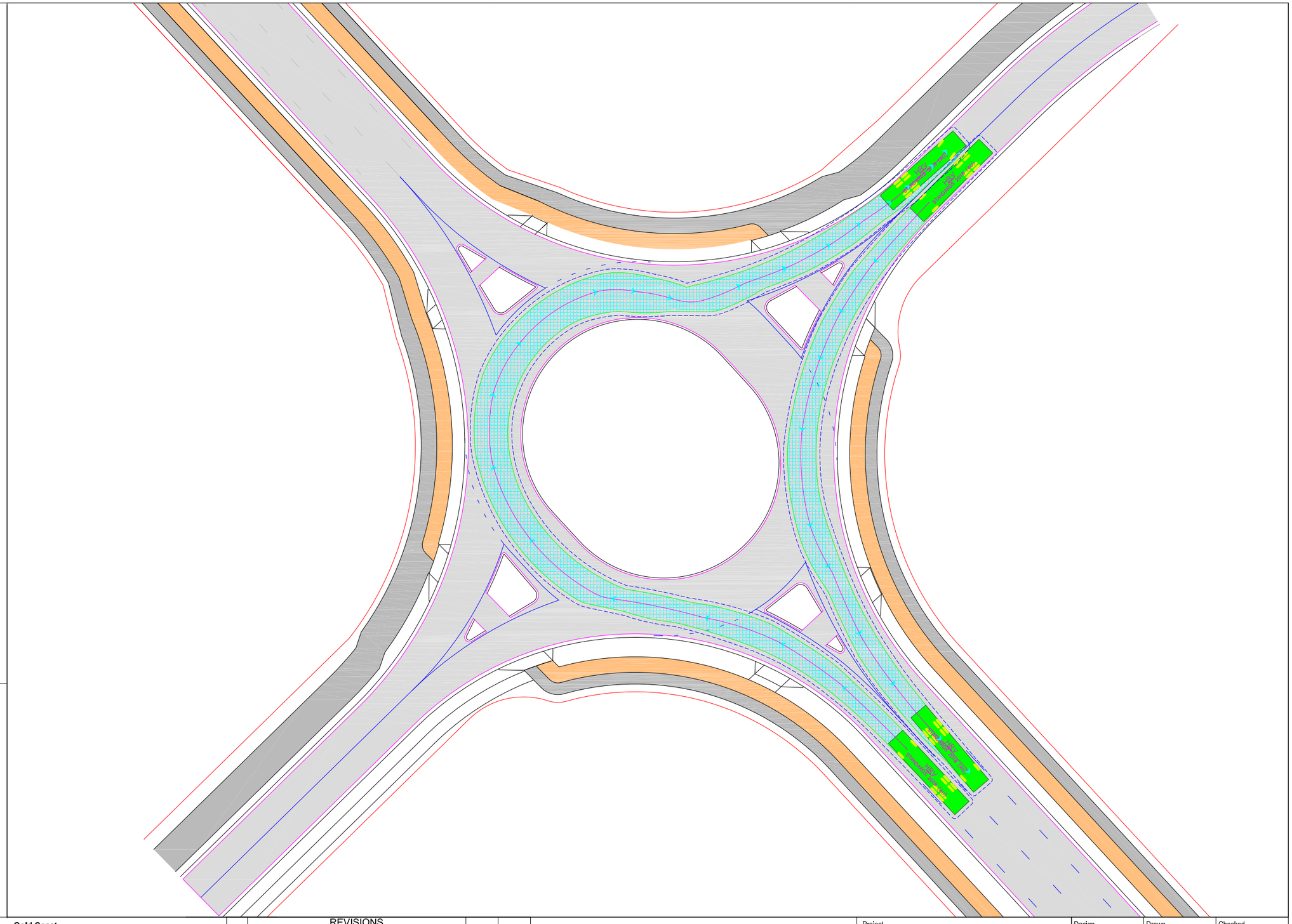
Notes:

Vehicle Clearance (500mm)



HRV	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

DESIGN VEHICLE



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP

Title: Intersection 2: HRV 3

Design	Drawn	Checked
H.M	H.M	A.P

CONCEPT ONLY

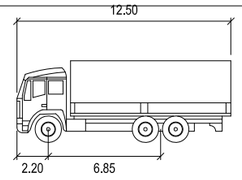
Date: 29.11.2024

Project Number	Sheet Number	Issue
P6607	13	001

N

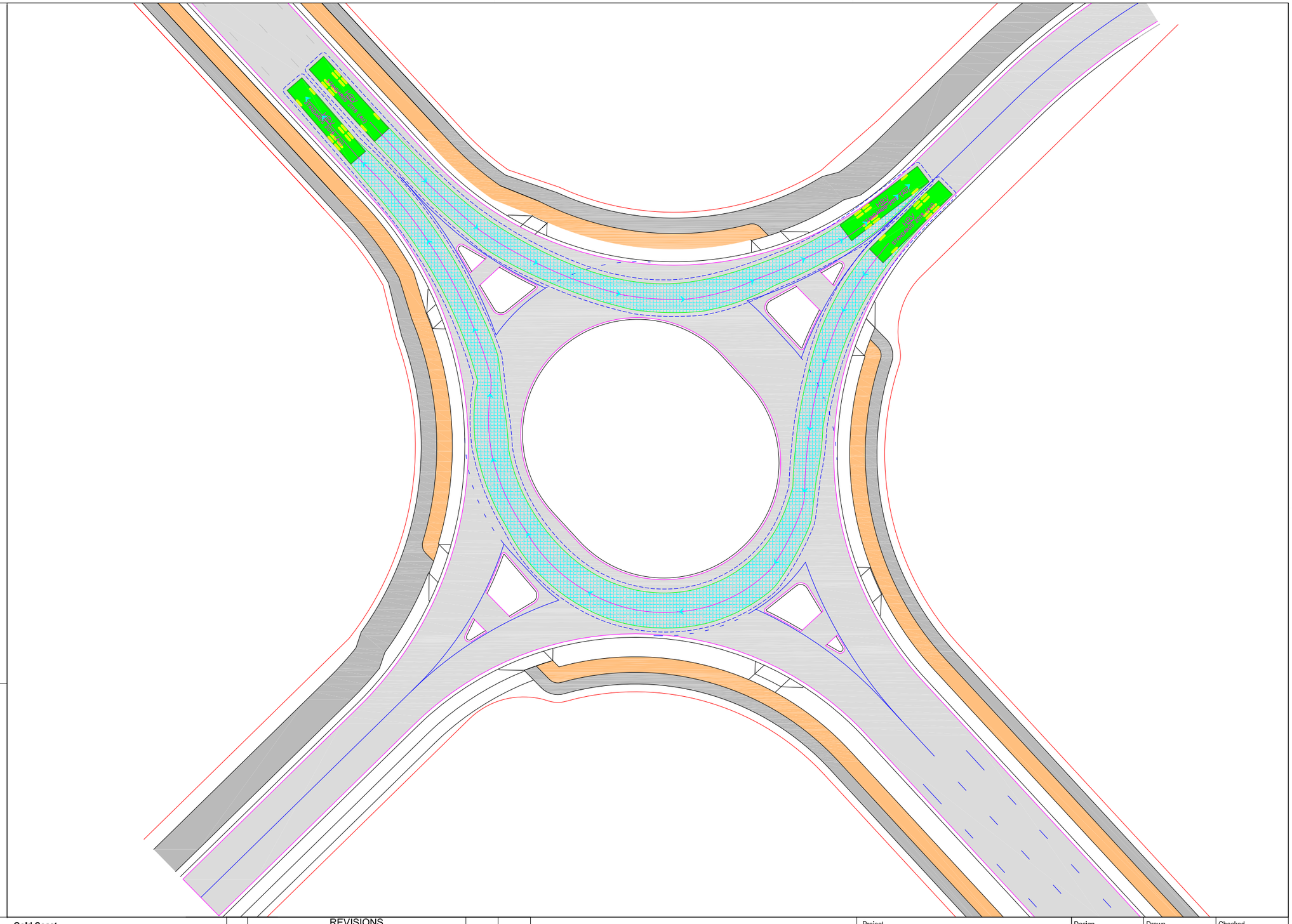
Notes:

Vehicle Clearance (500mm)



HRV	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

DESIGN VEHICLE



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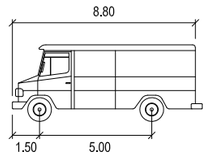
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP	Design: H.M	Drawn: H.M	Checked: A.P
Title: Intersection 2: HRV 4	CONCEPT ONLY		Date: 29.11.2024
	Project Number: P6607	Sheet Number: 14	Issue: 001

Notes:

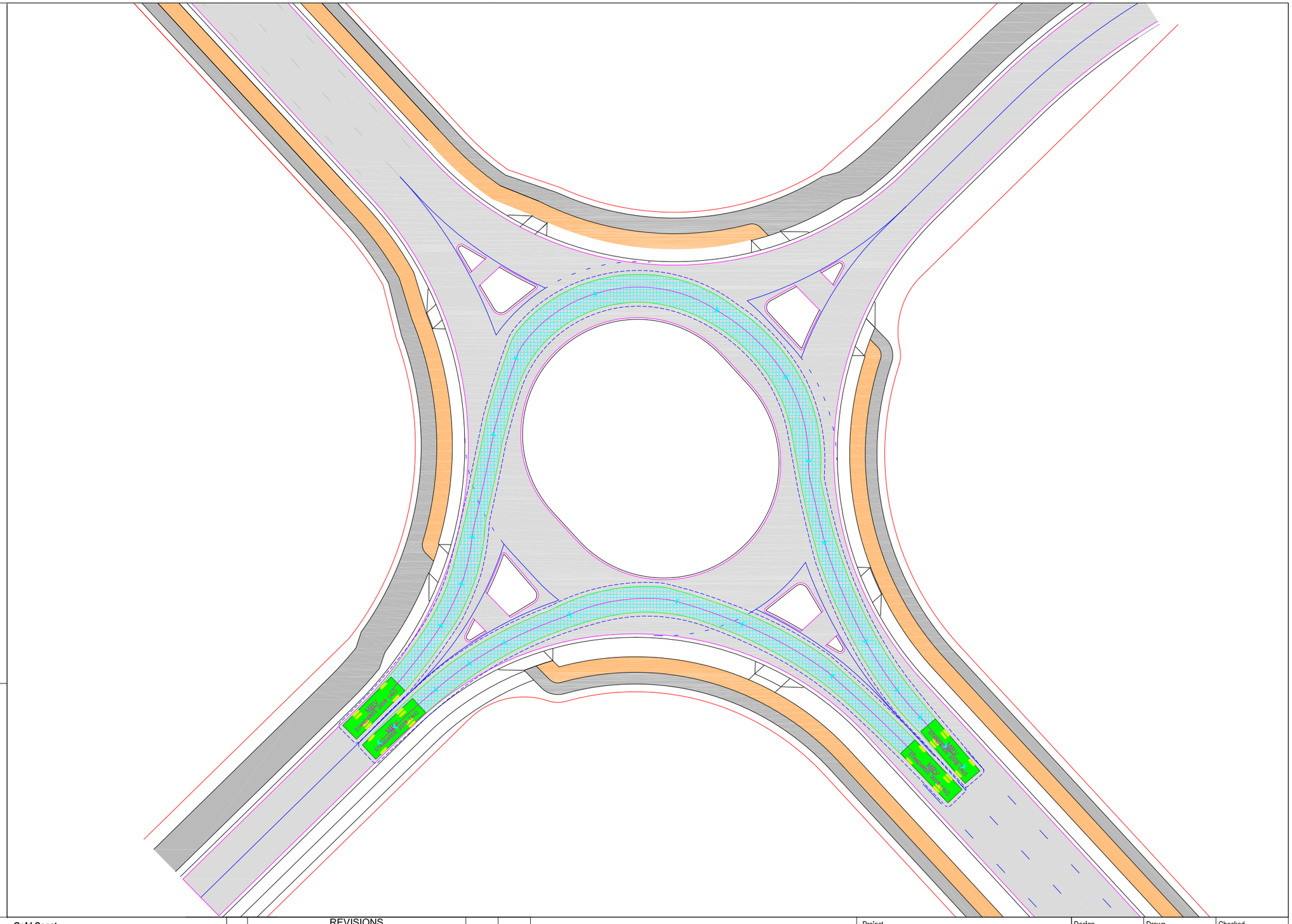
Vehicle Clearance (500mm)



MRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

DESIGN VEHICLE



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REVISIONS			
Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP

Title: Intersection 2: MRV 1

Design	Drawn	Checked
H.M	H.M	A.P

CONCEPT ONLY

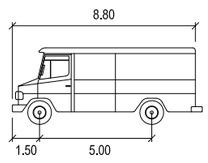
Date: 29.11.2024

Project Number	Sheet Number	Issue
P6607	15	001

N

Notes:

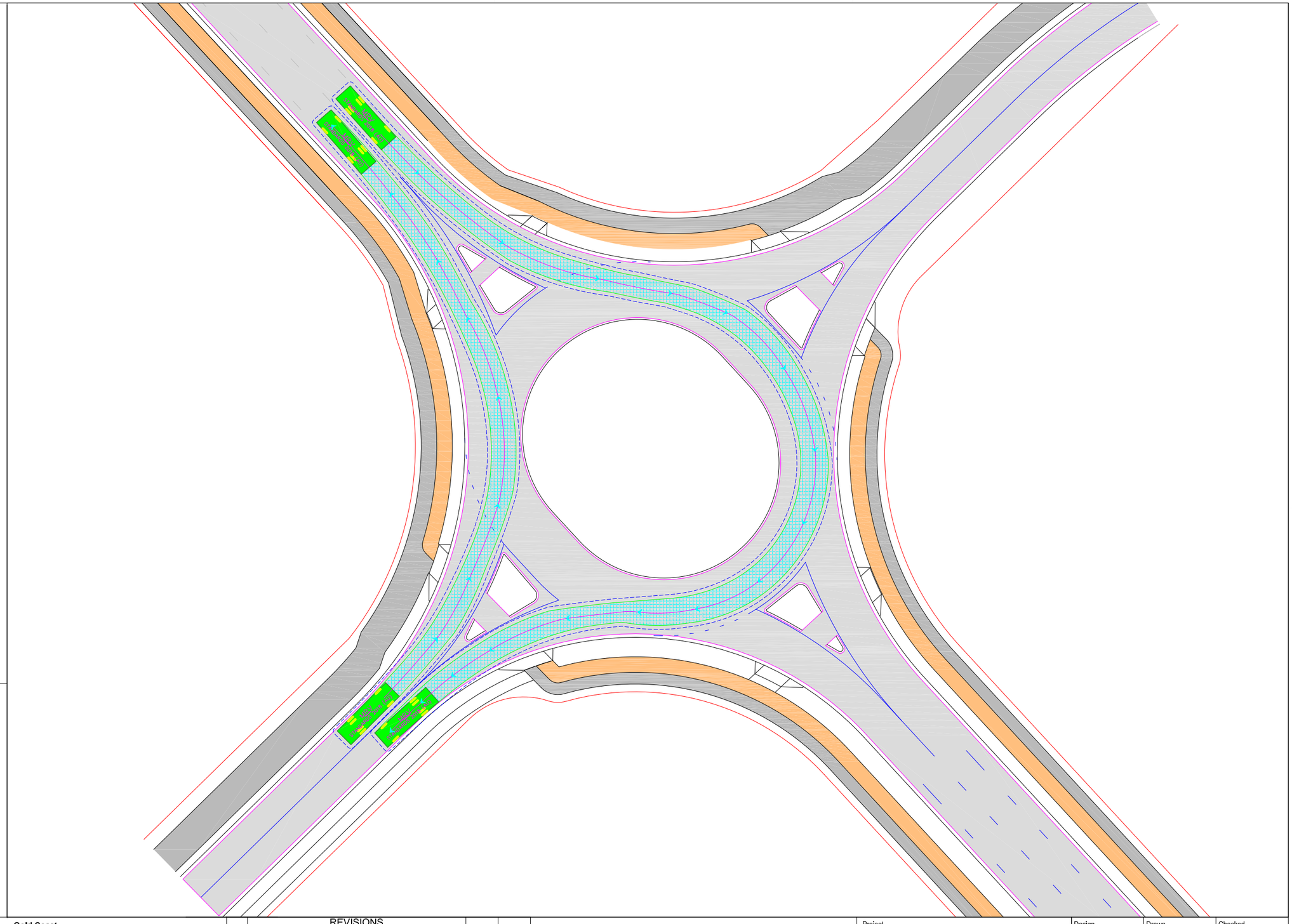
Vehicle Clearance (500mm)



MRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

DESIGN VEHICLE



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP

Title: Intersection 2: MRV 2

Design	Drawn	Checked
H.M	H.M	A.P

CONCEPT ONLY

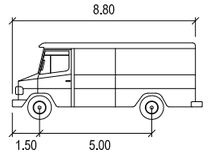
Date: 29.11.2024

Project Number	Sheet Number	Issue
P6607	16	001

N

Notes:

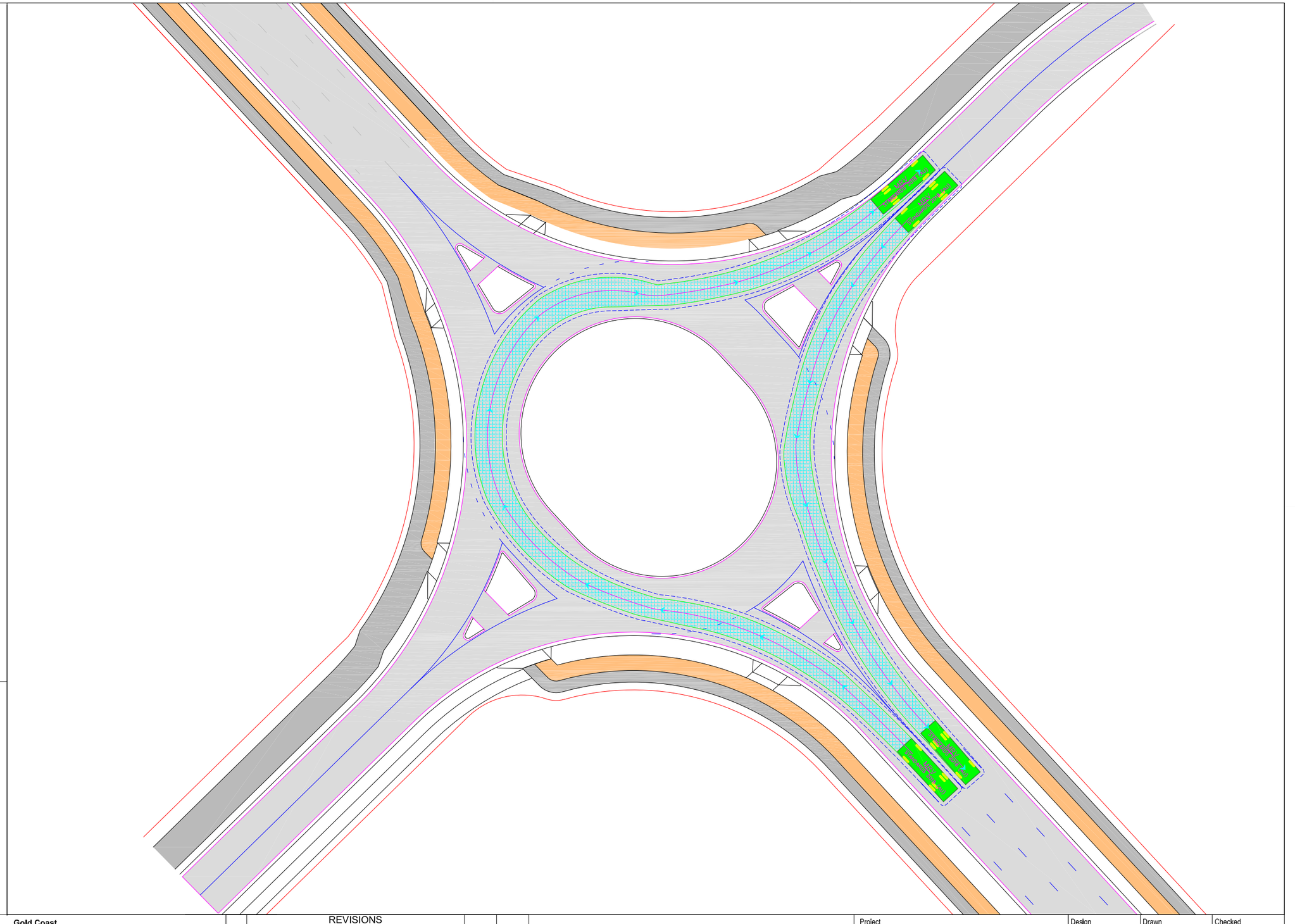
Vehicle Clearance (500mm)



MRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

DESIGN VEHICLE



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP

Title: Intersection 2: MRV 3

Design	Drawn	Checked
H.M	H.M	A.P

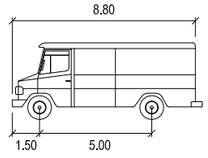
CONCEPT ONLY

Date: 29.11.2024

Project Number	Sheet Number	Issue
P6607	17	001

Notes:

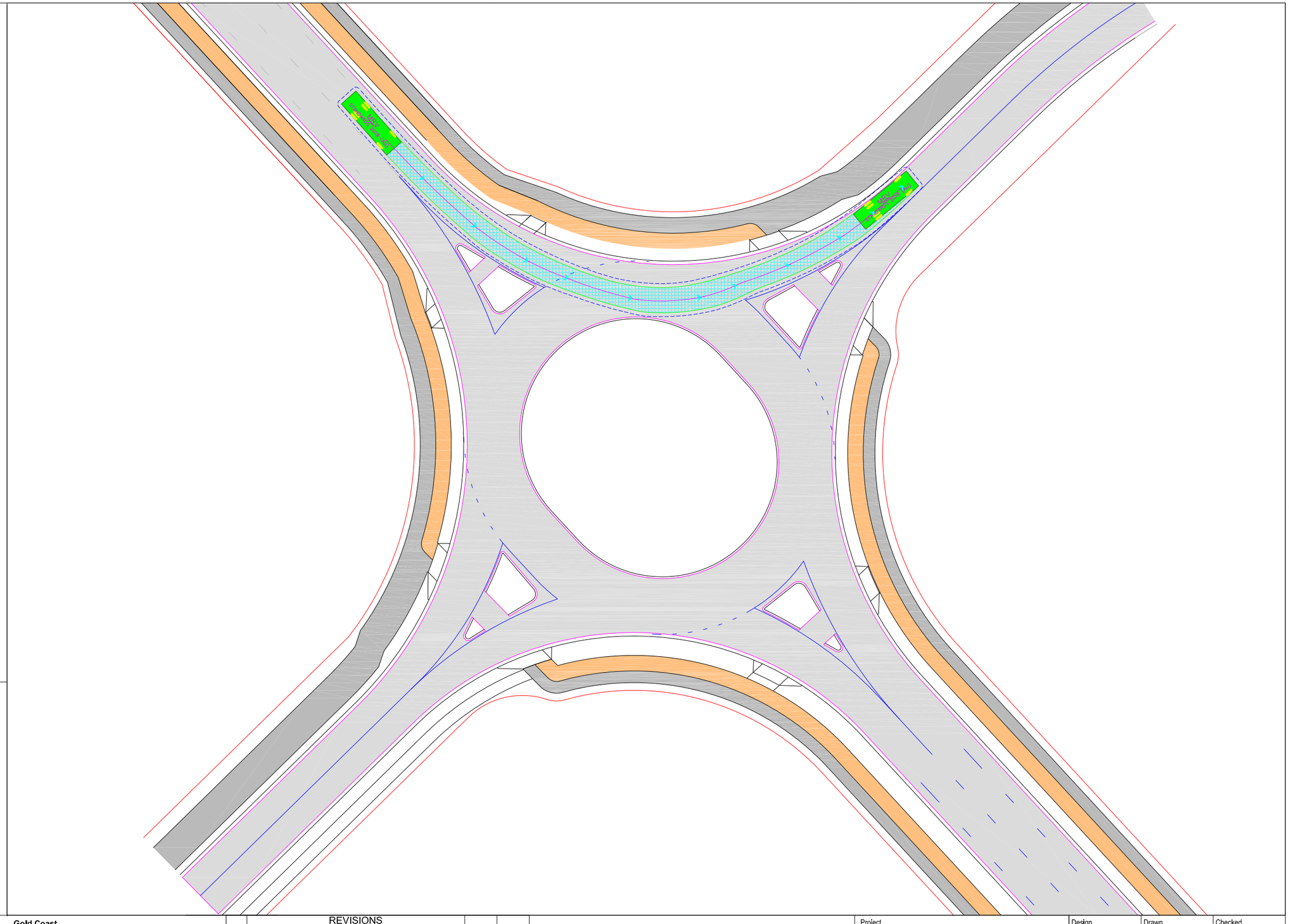
Vehicle Clearance (500mm)



MRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

DESIGN VEHICLE



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Studio 203, 3 Gladstone Street, Newtown NSW 2042
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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Assessment	H.M	27.09.2024

Scale @ A3 0 5 10 15 20 25 1:500

Project: Monarch Glen IMP

Title: Intersection 2: MRV 4

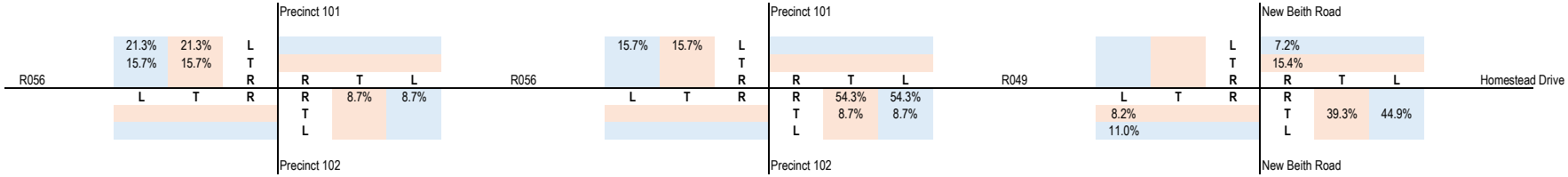
Design	Drawn	Checked
H.M	H.M	A.P

CONCEPT ONLY

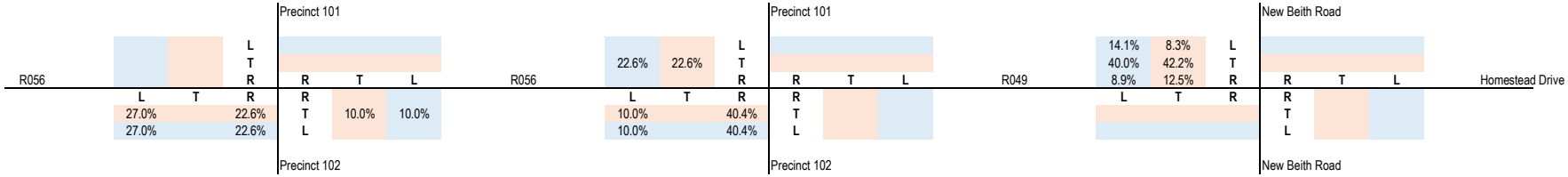
Date: 29.11.2024

Project Number	Sheet Number	Issue
P6607	18	001

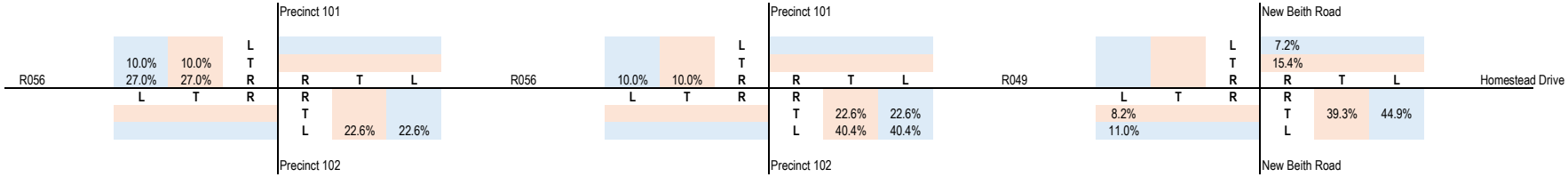
Appendix D: Network Diagrams



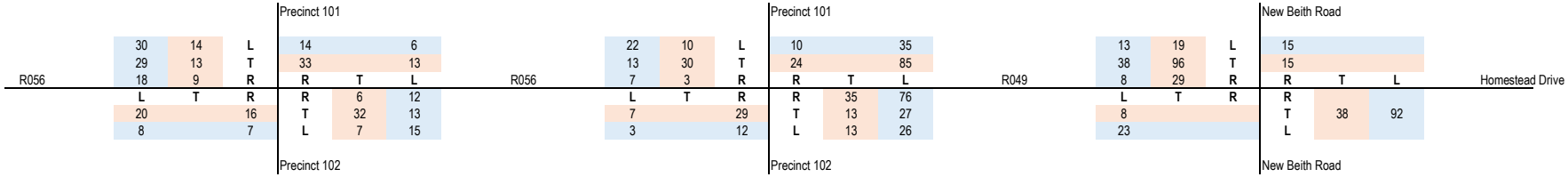
BITZIOS consulting	**Sheet Name:** Precinct 101 Distribution IN	**Sheet Number:** 3 of 7
	Project Name: Monarch Glen Precinct 101 and Precinct 102	**Date:** 17/09/2024



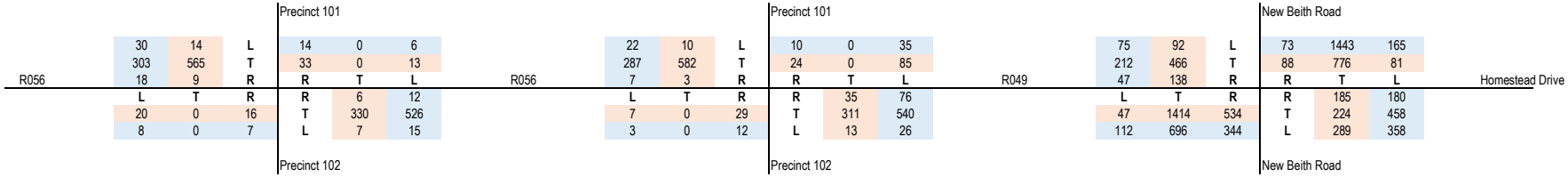
BITZIOS consulting	**Sheet Name:** Precinct 102 Distribution OUT	**Sheet Number:** 4 of 7
	Project Name: Monarch Glen Precinct 101 and Precinct 102	**Date:** 17/09/2024



BITZIOS consulting	**Sheet Name:** Precinct 102 Distribution IN	**Sheet Number:** 5 of 7
	Project Name: Monarch Glen Precinct 101 and Precinct 102	**Date:** 17/09/2024



BITZIOS consulting	**Sheet Name:** Precinct 101 and 102 Development Traffic Volumes	**Sheet Number:** 6 of 7
	Project Name: Monarch Glen Precinct 101 and Precinct 102	**Date:** 17/09/2024



BITZIOS consulting	**Sheet Name:** Peak Traffic Volumes with Proposed Precinct 101 and 102 Development Traffic	**Sheet Number:** 7 of 7
	Project Name: Monarch Glen Precinct 101 and Precinct 102	**Date:** 17/09/2024

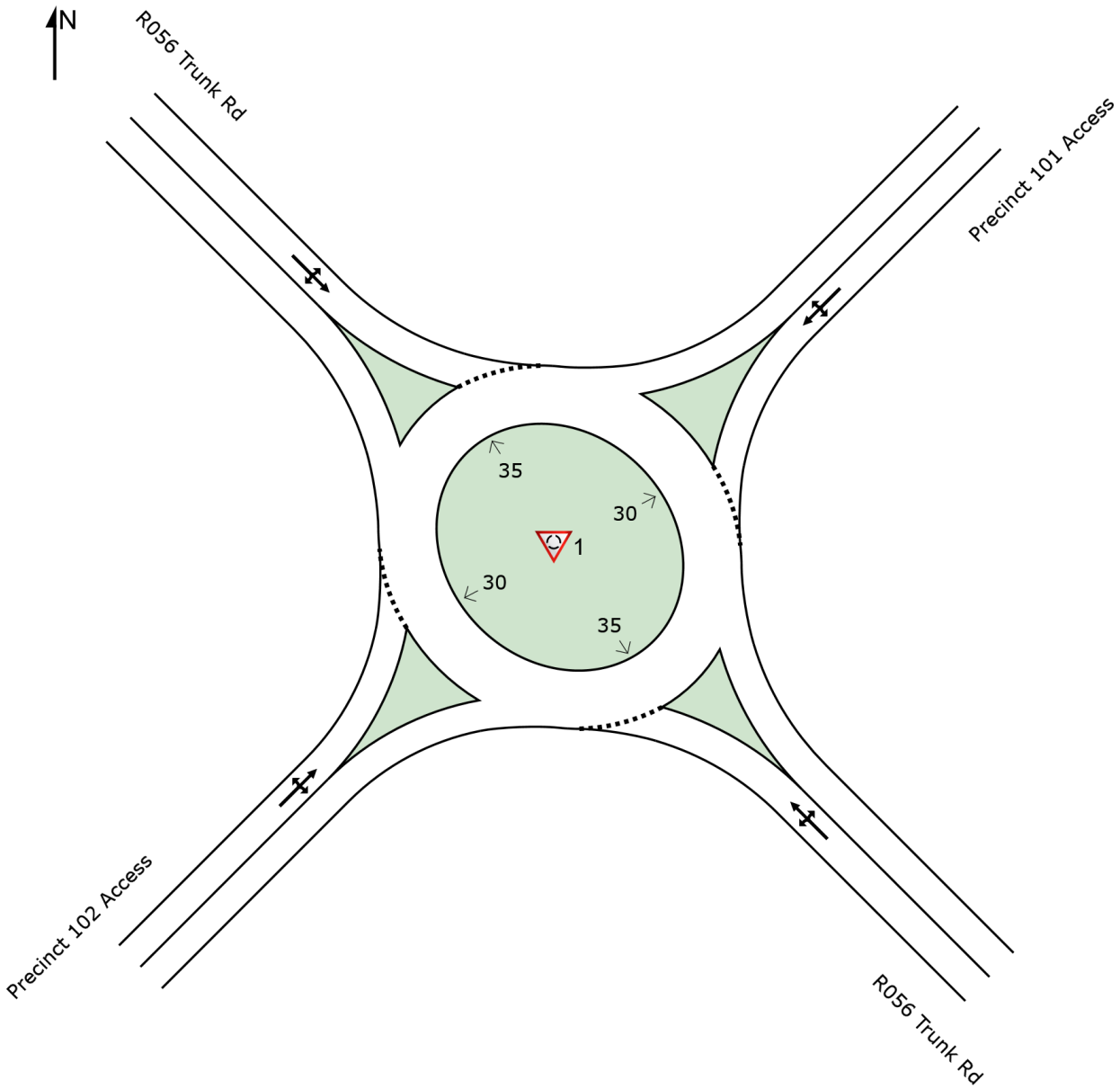
Appendix E: SIDRA Outputs

SITE LAYOUT

Site: 1 [1_2066 AM (Site Folder: AM)]

Trunk Road (R056) / Western Roundabout
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 1 [1_2066 AM (Site Folder: AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Trunk Road (R056) / Western Roundabout
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
SouthEast: R056 Trunk Rd															
4	L2	All MCs	7	1.0	7	1.0	0.231	3.4	LOS A	1.3	9.1	0.16	0.34	0.16	50.6
5	T1	All MCs	347	1.1	347	1.1	0.231	3.4	LOS A	1.3	9.1	0.16	0.34	0.16	53.0
6	R2	All MCs	6	1.0	6	1.0	0.231	9.4	LOS A	1.3	9.1	0.16	0.34	0.16	50.1
Approach			361	1.1	361	1.1	0.231	3.5	LOS A	1.3	9.1	0.16	0.34	0.16	52.9
NorthEast: Precinct 101 Access															
7	L2	All MCs	14	1.0	14	1.0	0.053	6.5	LOS A	0.3	2.1	0.61	0.68	0.61	43.2
8	T1	All MCs	1	1.0	1	1.0	0.053	6.2	LOS A	0.3	2.1	0.61	0.68	0.61	39.3
9	R2	All MCs	35	1.0	35	1.0	0.053	12.2	LOS A	0.3	2.1	0.61	0.68	0.61	42.3
Approach			49	1.0	49	1.0	0.053	10.5	LOS A	0.3	2.1	0.61	0.68	0.61	42.5
NorthWest: R056 Trunk Rd															
10	L2	All MCs	15	1.0	15	1.0	0.371	3.3	LOS A	2.5	17.5	0.13	0.33	0.13	50.9
11	T1	All MCs	595	1.1	595	1.1	0.371	3.3	LOS A	2.5	17.5	0.13	0.33	0.13	53.3
12	R2	All MCs	9	1.0	9	1.0	0.371	9.3	LOS A	2.5	17.5	0.13	0.33	0.13	44.5
Approach			619	1.1	619	1.1	0.371	3.4	LOS A	2.5	17.5	0.13	0.33	0.13	53.1
SouthWest: Precinct 102 Access															
1	L2	All MCs	21	1.0	21	1.0	0.036	5.1	LOS A	0.2	1.3	0.48	0.58	0.48	45.7
2	T1	All MCs	1	1.0	1	1.0	0.036	4.9	LOS A	0.2	1.3	0.48	0.58	0.48	42.1
3	R2	All MCs	17	1.0	17	1.0	0.036	10.9	LOS A	0.2	1.3	0.48	0.58	0.48	44.7
Approach			39	1.0	39	1.0	0.036	7.6	LOS A	0.2	1.3	0.48	0.58	0.48	45.2
All Vehicles			1068	1.1	1068	1.1	0.371	3.9	LOS A	2.5	17.5	0.18	0.36	0.18	52.3

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: 1 [1_2066 PM (Site Folder: PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Trunk Road (R056) / Western Roundabout
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
SouthEast: R056 Trunk Rd															
4	L2	All MCs	16	1.0	16	1.0	0.357	3.4	LOS A	2.1	14.7	0.14	0.34	0.14	50.7
5	T1	All MCs	554	1.1	554	1.1	0.357	3.3	LOS A	2.1	14.7	0.14	0.34	0.14	53.2
6	R2	All MCs	13	1.0	13	1.0	0.357	9.4	LOS A	2.1	14.7	0.14	0.34	0.14	50.2
Approach			582	1.1	582	1.1	0.357	3.5	LOS A	2.1	14.7	0.14	0.34	0.14	53.1
NorthEast: Precinct 101 Access															
7	L2	All MCs	6	1.0	6	1.0	0.020	4.8	LOS A	0.1	0.7	0.44	0.59	0.44	44.6
8	T1	All MCs	1	1.0	1	1.0	0.020	4.6	LOS A	0.1	0.7	0.44	0.59	0.44	41.0
9	R2	All MCs	15	1.0	15	1.0	0.020	10.6	LOS A	0.1	0.7	0.44	0.59	0.44	43.7
Approach			22	1.0	22	1.0	0.020	8.6	LOS A	0.1	0.7	0.44	0.59	0.44	43.9
NorthWest: R056 Trunk Rd															
10	L2	All MCs	32	1.0	32	1.0	0.224	3.3	LOS A	1.2	8.6	0.10	0.35	0.10	50.9
11	T1	All MCs	319	1.1	319	1.1	0.224	3.3	LOS A	1.2	8.6	0.10	0.35	0.10	53.3
12	R2	All MCs	19	1.0	19	1.0	0.224	9.3	LOS A	1.2	8.6	0.10	0.35	0.10	44.5
Approach			369	1.1	369	1.1	0.224	3.6	LOS A	1.2	8.6	0.10	0.35	0.10	52.7
SouthWest: Precinct 102 Access															
1	L2	All MCs	8	1.0	8	1.0	0.018	6.2	LOS A	0.1	0.7	0.59	0.59	0.59	44.8
2	T1	All MCs	1	1.0	1	1.0	0.018	5.9	LOS A	0.1	0.7	0.59	0.59	0.59	41.0
3	R2	All MCs	7	1.0	7	1.0	0.018	11.9	LOS A	0.1	0.7	0.59	0.59	0.59	43.8
Approach			17	1.0	17	1.0	0.018	8.7	LOS A	0.1	0.7	0.59	0.59	0.59	44.2
All Vehicles			991	1.1	991	1.1	0.357	3.7	LOS A	2.1	14.7	0.14	0.35	0.14	52.6

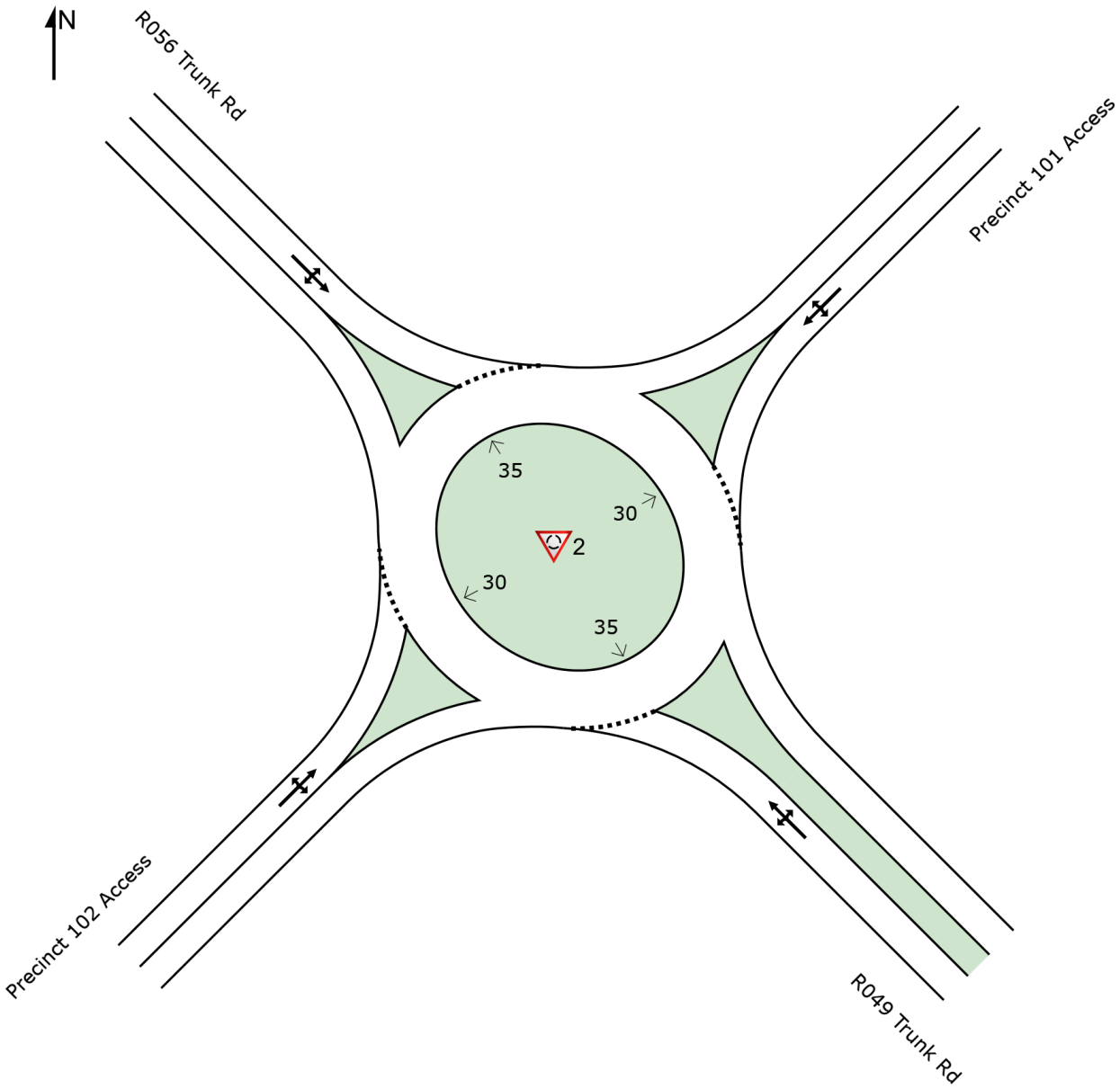
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout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

SITE LAYOUT

Site: 2 [2_2066 AM (Site Folder: AM)]

R056 Trunk Rd / R049 Trunk Rd / Precinct 101 & 102 Accesses
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 2 [2_2066 AM (Site Folder: AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

R056 Trunk Rd / R049 Trunk Rd / Precinct 101 & 102 Accesses
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
SouthEast: R049 Trunk Rd															
4	L2	All MCs	14	1.0	14	1.0	0.234	3.3	LOS A	1.3	8.9	0.12	0.37	0.12	50.4
5	T1	All MCs	327	1.1	327	1.1	0.234	3.3	LOS A	1.3	8.9	0.12	0.37	0.12	52.9
6	R2	All MCs	37	1.0	37	1.0	0.234	9.3	LOS A	1.3	8.9	0.12	0.37	0.12	49.9
Approach			378	1.1	378	1.1	0.234	3.9	LOS A	1.3	8.9	0.12	0.37	0.12	52.6
NorthEast: Precinct 101 Access															
7	L2	All MCs	89	1.0	89	1.0	0.130	6.9	LOS A	0.8	5.4	0.66	0.66	0.66	45.2
8	T1	All MCs	1	1.0	1	1.0	0.130	6.7	LOS A	0.8	5.4	0.66	0.66	0.66	41.3
9	R2	All MCs	25	1.0	25	1.0	0.130	12.6	LOS A	0.8	5.4	0.66	0.66	0.66	44.1
Approach			116	1.0	116	1.0	0.130	8.1	LOS A	0.8	5.4	0.66	0.66	0.66	44.9
NorthWest: R056 Trunk Rd															
10	L2	All MCs	11	1.0	11	1.0	0.404	3.5	LOS A	2.8	19.6	0.24	0.34	0.24	49.9
11	T1	All MCs	613	1.1	613	1.1	0.404	3.5	LOS A	2.8	19.6	0.24	0.34	0.24	52.5
12	R2	All MCs	3	1.0	3	1.0	0.404	9.6	LOS A	2.8	19.6	0.24	0.34	0.24	43.8
Approach			626	1.1	626	1.1	0.404	3.5	LOS A	2.8	19.6	0.24	0.34	0.24	52.4
SouthWest: Precinct 102 Access															
1	L2	All MCs	7	1.0	7	1.0	0.035	5.2	LOS A	0.2	1.4	0.49	0.60	0.49	43.8
2	T1	All MCs	1	1.0	1	1.0	0.035	5.0	LOS A	0.2	1.4	0.49	0.60	0.49	40.0
3	R2	All MCs	31	1.0	31	1.0	0.035	11.0	LOS A	0.2	1.4	0.49	0.60	0.49	42.9
Approach			39	1.0	39	1.0	0.035	9.7	LOS A	0.2	1.4	0.49	0.60	0.49	43.0
All Vehicles			1159	1.1	1159	1.1	0.404	4.3	LOS A	2.8	19.6	0.25	0.39	0.25	51.5

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: 2 [2_2066 PM (Site Folder: PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

R056 Trunk Rd / R049 Trunk Rd / Precinct 101 & 102 Accesses
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
SouthEast: R049 Trunk Rd															
4	L2	All MCs	27	1.0	27	1.0	0.399	3.3	LOS A	2.4	16.9	0.09	0.37	0.09	50.4
5	T1	All MCs	568	1.1	568	1.1	0.399	3.3	LOS A	2.4	16.9	0.09	0.37	0.09	52.9
6	R2	All MCs	80	1.0	80	1.0	0.399	9.3	LOS A	2.4	16.9	0.09	0.37	0.09	49.9
Approach			676	1.1	676	1.1	0.399	4.0	LOS A	2.4	16.9	0.09	0.37	0.09	52.5
NorthEast: Precinct 101 Access															
7	L2	All MCs	37	1.0	37	1.0	0.043	4.8	LOS A	0.2	1.5	0.44	0.54	0.44	47.1
8	T1	All MCs	1	1.0	1	1.0	0.043	4.5	LOS A	0.2	1.5	0.44	0.54	0.44	43.8
9	R2	All MCs	11	1.0	11	1.0	0.043	10.5	LOS A	0.2	1.5	0.44	0.54	0.44	46.0
Approach			48	1.0	48	1.0	0.043	6.0	LOS A	0.2	1.5	0.44	0.54	0.44	46.8
NorthWest: R056 Trunk Rd															
10	L2	All MCs	23	1.0	23	1.0	0.226	3.6	LOS A	1.3	8.9	0.23	0.36	0.23	49.9
11	T1	All MCs	302	1.1	302	1.1	0.226	3.6	LOS A	1.3	8.9	0.23	0.36	0.23	52.5
12	R2	All MCs	7	1.0	7	1.0	0.226	9.6	LOS A	1.3	8.9	0.23	0.36	0.23	43.8
Approach			333	1.1	333	1.1	0.226	3.7	LOS A	1.3	8.9	0.23	0.36	0.23	52.2
SouthWest: Precinct 102 Access															
1	L2	All MCs	3	1.0	3	1.0	0.018	7.3	LOS A	0.1	0.9	0.66	0.59	0.66	42.2
2	T1	All MCs	1	1.0	1	1.0	0.018	7.1	LOS A	0.1	0.9	0.66	0.59	0.66	38.1
3	R2	All MCs	13	1.0	13	1.0	0.018	13.1	LOS A	0.1	0.9	0.66	0.59	0.66	41.4
Approach			17	1.0	17	1.0	0.018	11.6	LOS A	0.1	0.9	0.66	0.59	0.66	41.4
All Vehicles			1074	1.1	1074	1.1	0.399	4.1	LOS A	2.4	16.9	0.16	0.38	0.16	52.0

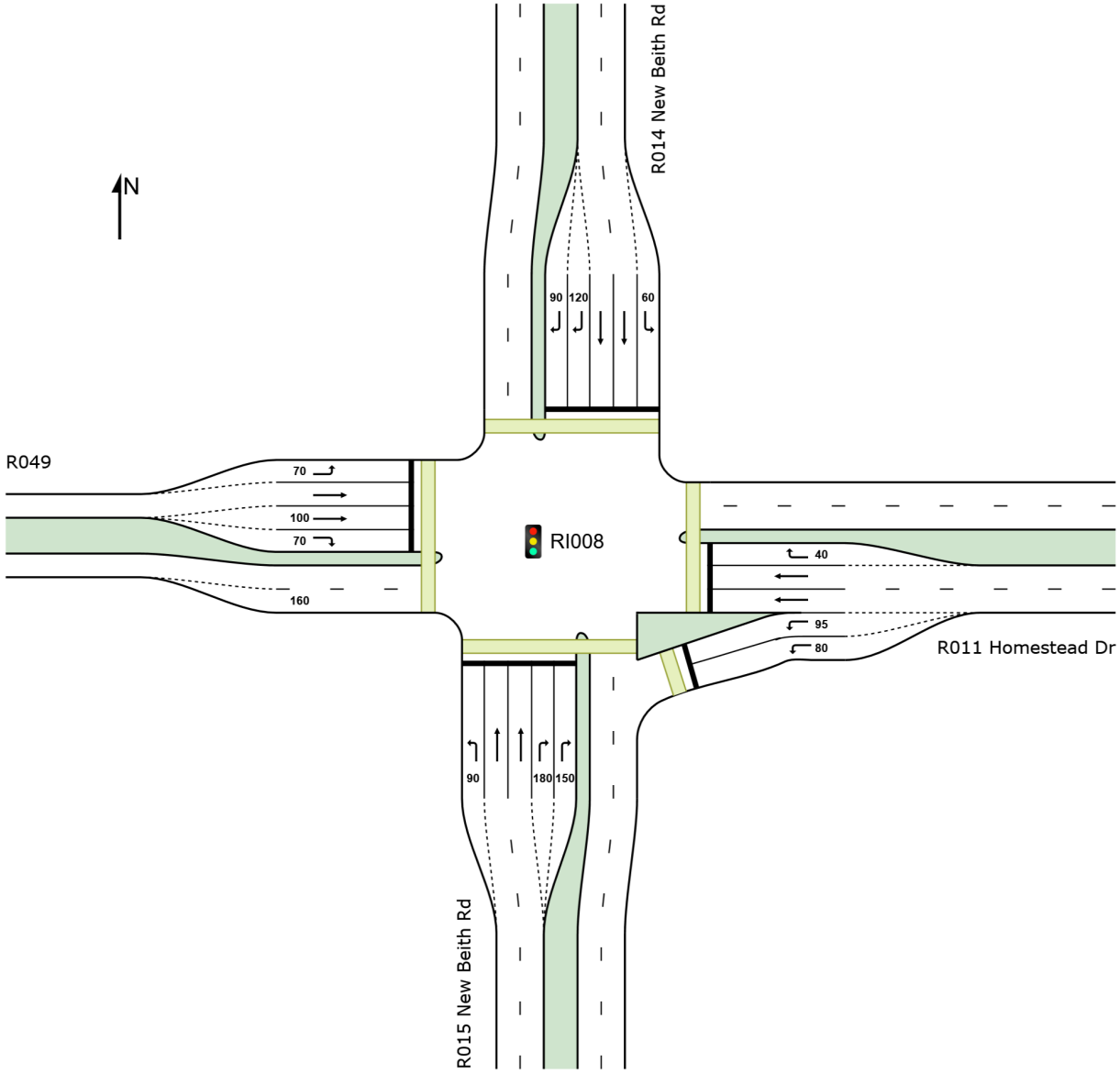
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout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

SITE LAYOUT

Site: RI008 [RI008_2066 AM (Site Folder: AM)]

RI008 - New Beith Road / Homestead Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: RI008 [RI008_2066 AM (Site Folder: AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

RI008 - New Beith Road / Homestead Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

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: R015 New Beith Rd															
1	L2	All MCs	49	2.2	49	2.2	0.044	22.7	LOS B	0.7	5.0	0.41	0.65	0.41	47.1
2	T1	All MCs	1488	2.0	1488	2.0	* 0.847	40.4	LOS C	41.2	293.5	0.96	0.91	1.01	38.4
3	R2	All MCs	562	1.2	562	1.2	0.704	53.6	LOS D	15.6	110.1	0.98	0.85	1.00	31.5
Approach			2100	1.8	2100	1.8	0.847	43.5	LOS D	41.2	293.5	0.95	0.89	0.99	34.9
East: R011 Homestead Dr															
4	L2	All MCs	304	2.5	304	2.5	0.206	30.7	LOS C	5.8	41.1	0.69	0.74	0.69	39.0
5	T1	All MCs	236	1.4	236	1.4	0.467	55.8	LOS D	6.7	47.8	0.97	0.77	0.97	29.1
6	R2	All MCs	195	1.7	195	1.7	* 0.848	74.2	LOS F	12.4	88.4	1.00	0.97	1.25	27.9
Approach			735	1.9	735	1.9	0.848	50.3	LOS D	12.4	88.4	0.86	0.81	0.93	31.6
North: R014 New Beith Rd															
7	L2	All MCs	85	1.3	85	1.3	0.105	26.5	LOS B	1.6	11.4	0.61	0.71	0.61	45.7
8	T1	All MCs	817	3.5	817	3.5	0.708	44.5	LOS D	21.8	157.2	0.95	0.82	0.95	36.6
9	R2	All MCs	93	3.6	93	3.6	* 0.533	70.3	LOS E	3.0	21.5	1.00	0.75	1.01	24.3
Approach			995	3.3	995	3.3	0.708	45.3	LOS D	21.8	157.2	0.92	0.81	0.92	34.2
West: R049															
10	L2	All MCs	97	2.3	97	2.3	0.205	43.0	LOS D	4.4	31.7	0.82	0.76	0.82	31.0
11	T1	All MCs	491	0.9	491	0.9	* 0.791	56.7	LOS E	14.8	104.2	1.00	0.92	1.12	28.0
12	R2	All MCs	145	0.8	145	0.8	0.497	56.3	LOS D	7.9	55.9	0.96	0.80	0.96	27.6
Approach			733	1.1	733	1.1	0.791	54.8	LOS D	14.8	104.2	0.97	0.88	1.05	28.3
All Vehicles			4562	2.0	4562	2.0	0.848	46.8	LOS D	41.2	293.5	0.93	0.86	0.98	33.2

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: R015 New Beith Rd												
P1	Full	15	15	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
East: R011 Homestead Dr												

P2	Full	30	30	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96
P2B	Slip/ Bypass	30	30	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96
North: R014 New Beith Rd												
P3	Full	30	30	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96
West: R049												
P4	Full	30	30	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96
All Pedestrians		135	135	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96

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

MOVEMENT SUMMARY

Site: RI008 [RI008_2066 PM (Site Folder: PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

RI008 - New Beith Road / Homestead Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

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: R015 New Beith Rd															
1	L2	All MCs	118	0.9	118	0.9	0.162	27.2	LOS B	3.4	24.1	0.68	0.73	0.68	39.7
2	T1	All MCs	733	2.1	733	2.1	0.755	58.4	LOS E	25.3	180.5	0.99	0.87	1.00	31.4
3	R2	All MCs	362	1.5	362	1.5	* 0.924	94.7	LOS F	15.3	108.5	1.00	1.03	1.35	23.4
Approach			1213	1.8	1213	1.8	0.924	66.2	LOS E	25.3	180.5	0.96	0.90	1.08	28.5
East: R011 Homestead Dr															
4	L2	All MCs	377	0.9	377	0.9	0.337	49.2	LOS D	10.6	75.0	0.83	0.79	0.83	32.6
5	T1	All MCs	482	0.7	482	0.7	* 0.950	95.3	LOS F	21.6	152.1	1.00	1.06	1.30	22.0
6	R2	All MCs	189	1.2	189	1.2	0.860	103.4	LOS F	15.0	106.0	1.00	0.96	1.23	25.3
Approach			1048	0.9	1048	0.9	0.950	80.2	LOS F	21.6	152.1	0.94	0.94	1.12	24.5
North: R014 New Beith Rd															
7	L2	All MCs	174	1.3	174	1.3	0.156	38.5	LOS C	3.0	21.4	0.46	0.69	0.46	48.0
8	T1	All MCs	1519	1.5	1519	1.5	* 0.940	82.9	LOS F	66.0	467.6	1.00	1.07	1.16	30.2
9	R2	All MCs	77	1.4	77	1.4	0.074	55.1	LOS D	2.1	14.7	0.75	0.71	0.75	30.3
Approach			1769	1.5	1769	1.5	0.940	77.3	LOS F	66.0	467.6	0.94	1.02	1.08	26.4
West: R049															
10	L2	All MCs	79	2.8	79	2.8	0.092	28.4	LOS B	3.1	22.2	0.58	0.71	0.58	36.7
11	T1	All MCs	223	1.0	223	1.0	* 0.407	64.1	LOS E	7.5	53.2	0.96	0.76	0.96	26.2
12	R2	All MCs	49	0.0	49	0.0	0.190	67.4	LOS E	3.2	22.6	0.92	0.74	0.92	25.0
Approach			352	1.3	352	1.3	0.407	56.5	LOS E	7.5	53.2	0.87	0.75	0.87	27.8
All Vehicles			4382	1.4	4382	1.4	0.950	73.3	LOS F	66.0	467.6	0.94	0.95	1.07	26.6

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: R015 New Beith Rd												
P1	Full	15	15	69.2	LOS F	0.1	0.1	0.96	0.96	223.0	200.0	0.90
East: R011 Homestead Dr												

P2	Full	30	30	69.2	LOS F	0.1	0.1	0.96	0.96	223.1	200.0	0.90
P2B	Slip/ Bypass	30	30	69.2	LOS F	0.1	0.1	0.96	0.96	223.1	200.0	0.90
North: R014 New Beith Rd												
P3	Full	30	30	69.2	LOS F	0.1	0.1	0.96	0.96	223.1	200.0	0.90
West: R049												
P4	Full	30	30	69.2	LOS F	0.1	0.1	0.96	0.96	223.1	200.0	0.90
All Pedestrians		135	135	69.2	LOS F	0.1	0.1	0.96	0.96	223.0	200.0	0.90

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

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