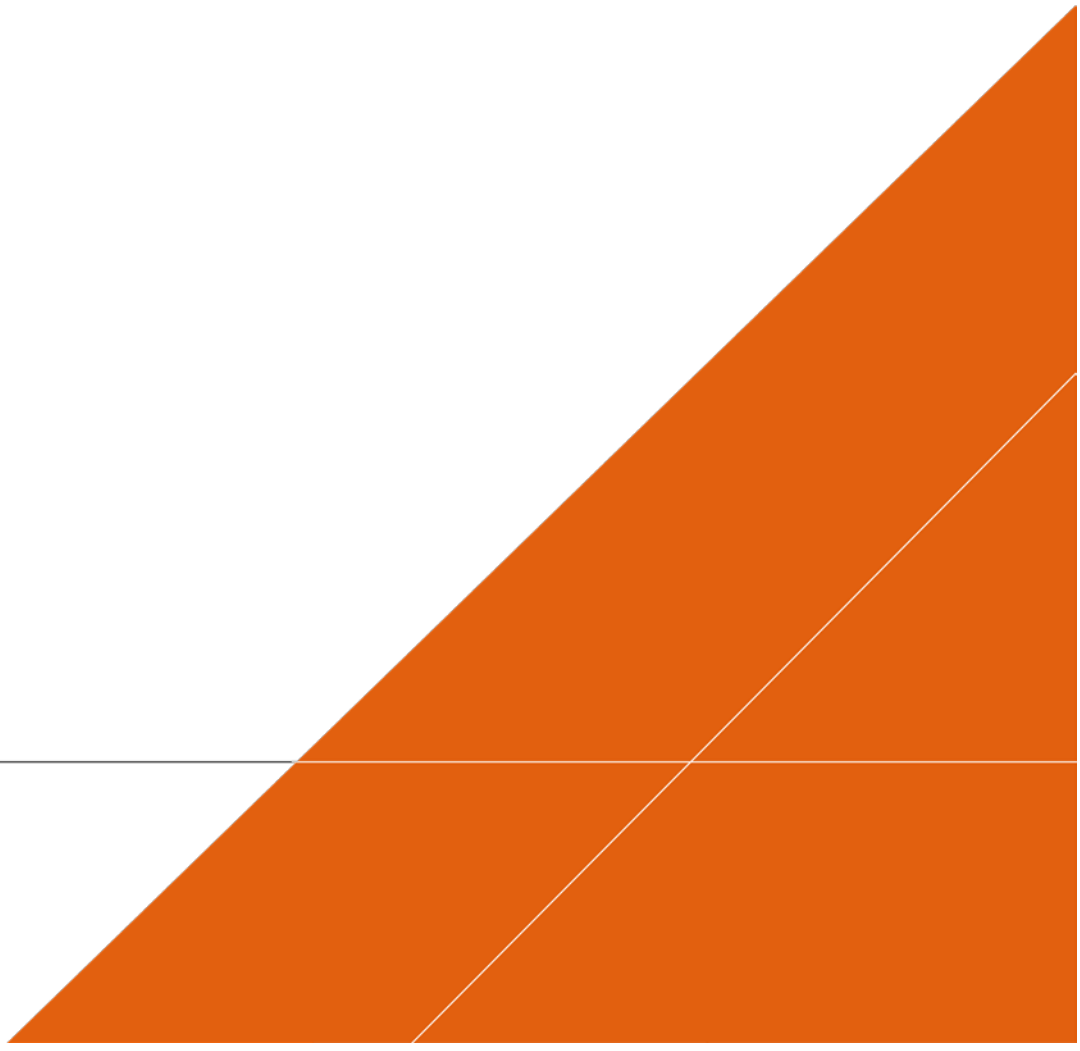
ARCADIS Design & Consultancy for natural and built assets

SHELL COVE – PRECINCT A

Traffic Impact Assessment

17 AUGUST 2018



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FRASERS PROPERTY AUSTRALIA SHELL COVE – PRECINCT A

Traffic Impact Assessment

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Report No Report Number

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Revision Text C

REVISIONS

Revision	Date	Description	Prepared by	Approved by
A	15/11/2017	Draft Traffic Impact Assessment (internal review)	LG	GE
B	17/11/2017	Draft Traffic Impact Assessment	LG	GE
C	17/08/2018	Draft Traffic Impact Assessment	OK	JH

EXECUTIVE SUMMARY

Frasers Property Australia (Frasers Property) is currently preparing a Subdivision Development Application (DA) for Precinct A of the Shell Cove Boat Harbour Precinct, which is located in the eastern part of the Shellharbour area in New South Wales. This traffic impact assessment (TIA) report has been prepared to identify the potential traffic impact of the proposed development on the local road network as well as address the following consent conditions required by Shellharbour City Council.

A traffic impact assessment was initially undertaken for Precinct A by Arcadis. The precinct has now been extended to contain the Outer Harbour development, consisting of boat maintenance and dry boating facility. Thus, the traffic impact assessment has been revised with similar traffic analysis done on the latest development with updated trip generation information.

Consent Condition Part D16 – Traffic states:

"An updated traffic impact assessment prepared by a suitably qualified person for each stage/precinct of the project which includes a cumulative impact assessment having regard to the status of the future construction of the intersection of Harbour Boulevard and Shellharbour Road"

An updated traffic impact assessment has been prepared by Arcadis for Precinct A under the cumulative development scenario which is the operation of all existing and future precincts. Details of the updated traffic impact assessment is provided in Section 3 of this report. It was determined as part of this updated traffic impact assessment that the previously adopted traffic volumes used for SIDRA modelling assessments were 44% lower due to revised yield for the Shell Cove Boat Harbour precinct. Based on the revised traffic volumes it was determined that all intersections would operate satisfactorily with the exception of the Shellharbour Road / Harbour Boulevard / Wattle Road intersection. A proposed mitigation measure for this intersection is provided.

Based on the outcomes of this TIA, Consent Condition Part D16 – Traffic has been generally satisfied.

Consent Condition Schedule 4 – Statement of Commitment 4.6 Point 1 states:

"The proponent undertakes to implement a Traffic Management Strategy in relation to the capacity of the road network to cater for additional traffic generation including service vehicles, access to and within the site and connectivity to existing developments – with particular emphasis on the following key intersection;

- *Shellharbour Road / Harbour Boulevard / Wattle Road – revised layout*
- *Addison Street / Harbour Boulevard – new traffic signals*
- *Brigantine Drive / Harbour Boulevard – single lane roundabout*
- *Cove Boulevard / Harbour Boulevard – single lane roundabout*
- *Road A / Harbour Boulevard – single lane roundabout."*

A review of previous traffic generation and SIDRA modelling determined that the revised yield would results in a 36% increase in traffic generation from the residential

component and 8% increase in traffic generation from the commercial component of the Shell Cove Boat Harbour Precinct. As a result, previously adopted traffic volumes were adjusted and inputted into SIDRA models for intersection performance assessment.

Based on the outcomes of this TIA, Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 1 has been generally satisfied.

The Consent Condition Schedule 4 – Statement of Commitment 4.6 Point 2 states:

"The proponent undertakes to consider the impact of development on existing public transport provisions, identify pedestrian movements and implement appropriate provisions for shared pathway/cycleways/public transportation routes to the existing and proposed road network including pedestrian shared zones in the Town Centre"

The study determined that the proposed shared bicycle/pedestrian path provides adequate connectivity not only within the Proposal but also to the external network. Additionally, the proposed bus route is anticipated to provide adequate services to the residents within the Proposal and will provide connectivity to the nearby Shell Cove town centre and the surrounding areas. It is also recommended that the proposed future bus route provides connectivity with the Shellharbour Junction train station through the re-routing or extension of Route 52.

Based on the outcomes of this TIA, Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 2 has been generally satisfied.

Consent Condition Schedule 4 – Statement of Commitment 4.6 Point 3 states:

"The proponent undertakes to incorporate parking in accordance with the requirements as part of subsequent Project Applications"

A review of on-site parking requirements and the provision of on-street parking was undertaken. The on-site parking requirements shall be in accordance with Section 13.1 of the Shellharbour City Council – Shellharbour Development Control Plan (SDCP), 2016. For provision of standard residential lots, duplex lots and superlots which consist of medium density residential, the SDCP requires:

- Two spaces per dwelling or dual occupancy with at least one of the spaces enclosed within a garage
- Either one space per one bedroom dwelling or 1.5 spaces per two or more bedroom dwellings and either 0.25 visitor spaces per one bedroom dwelling or 0.5 visitor spaces per two or more bedroom dwellings.

Based on the anticipated yield of the Proposal, approximately 219 resident car parks and 34 visitor car parks will be required in total. In addition to the residential component of the Proposal, the commercial land-use is anticipated to contain approximately 176 car parks for the commercial component, however, this is indicative and will be determined at a later date when a DA is submitted.

The Proposal provides approximately 233 on-street parking spaces and 20 parking bays, which is considered adequate for on-street parking for medium density or apartment sites.

Based on the outcomes of this TIA, Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 3 has been generally satisfied.

Assessment of Proposed Subdivisional Plan Against the Part 3A Consent

Based on the outcomes of this TIA, Part 3A Consent has been generally satisfied with no items being inconsistent with the Part 3A Consent.

CONTENTS

APPENDICES

1 INTRODUCTION

1.1 Background

Frasers Property Australia (Frasers Property) is currently preparing a Subdivision Development Application (DA) for Precinct A (the Proposal) of the Shell Cove Boat Harbour Precinct, which is located in the eastern part of the Shellharbour area in New South Wales. This application builds on the cumulative development and works planned for the entire Shell Cove Boat Harbour Precinct.

A traffic impact assessment was undertaken for Precinct A by Arcadis, with the report submitted to Frasers Property on 17th of November 2017. The precinct has now been extended to contain the Outer Harbour development, consisting of boat maintenance and dry boating facility. Thus, the traffic impact assessment has been revised with similar traffic analysis done on the latest development with updated trip generation information.

1.2 Purpose

The purpose of this traffic impact assessment (TIA) is to identify the potential traffic influence of the latest Proposal on the local road network and support the Subdivision DA for Precinct A of the Shell Cove Boat Harbour Precinct.

The TIA has been undertaken in accordance with the Roads and Maritime Services (RMS) Guide to Traffic Generating Developments, the relevant Shellharbour City Council (SCC) Development Control Plans and Guidelines, as well as the Part 3A Consent Conditions.

1.3 Report Structure

This report has been structured into the following chapters:

Chapter 2 provides site context for the Shell Cove Boat Harbour Precinct and Precinct A

Chapter 3 discusses the methodology adopted for this TIA and provides the key findings of the TIA

Chapter 4 discusses the compliance of the Proposal against Part 3A Consent and any departures from Part 3A Consent

Chapter 5 Summarises the findings and makes recommendations where necessary

2 SITE CONTEXT

2.1.1 Shell Cove Boat Harbour Precinct

The Shell Cove Boat Harbour Precinct project is a large scale, master planned, beachside, urban development located on the New South Wales South Coast in the Shellharbour City region, which is located 17km south of Wollongong and approximately 100km south of Sydney.

The master plan of the project is shown in Figure 2-1, and it comprises the development of a number of precincts including approximately 3,000 dwellings, a championship 18-hole golf course, and a 300 berth Boat Harbour, as well as a town centre, business park and associated open space, and environmental and social provisions.

The Waterfront consists of the Boat Harbour and Marina Precinct, which provides for short term accommodation as well as residential, retail, open spaces, commercial marina and dry berth/workshop facilities. Construction of the residential area within the Waterfront (Precincts B1 and C1) commenced in 2015. Stage 2 and 3 of the Boat Harbour construction are in progress.

To date, the completed developments include the first stage of the Town Centre retail, approximately 2,100 residential lots, the golf course and clubhouse, open space and several community facilities.

The surrounding land-uses of the Shell Cove site is largely the established residential area to the north and the west, as well as with the Killalea State Park to the south and Shellharbour South Beach to the east.

2.1.2 Precinct A

The Proposal (Precincts A1 and A2) is located to the south of Precinct C and west of Shell Cove beach, as presented in Figure 2-1 below. The Proposal will be accessed via Harbour Boulevard. In addition, nine intersections have been identified as the key intersections along Harbour Boulevard which are anticipated be impacted by the Proposal, including:

a. Shellharbour Road / Harbour Boulevard / Wattle Road signalised intersection
b. Addison Street / Harbour Boulevard signalised intersection
c. Brigantine Drive / Harbour Boulevard roundabout intersection
d. Cove Boulevard / Harbour Boulevard roundabout intersection
e. Road A / Harbour Boulevard roundabout intersection
f. Road B / Harbour Boulevard priority controlled intersection
g. Road C / Harbour Boulevard priority controlled intersection
h. Boat Ramp Access Road / Business Park Access Road / Harbour Boulevard roundabout
i. Road D / Harbour Boulevard priority controlled intersection

The Proposal will consist of 58 standard residential lots and six residential super-lots which have the following development yields:

- 55 land lots
- 3 duplex’s
- 59 medium density lots

- 13 studios

In addition to the residential component of the Proposal, a supporting commercial land-use is also proposed. Later, the Outer Harbour development containing a boat maintenance and dry boating facility was further added to the precinct. A preliminary lot layout for the Proposal is provided in Figure 2-2, whereas layout for the Outer Harbour Development is presented in Appendix F.

Figure 2-1 Shell Cove Master Plan - Precinct Locations

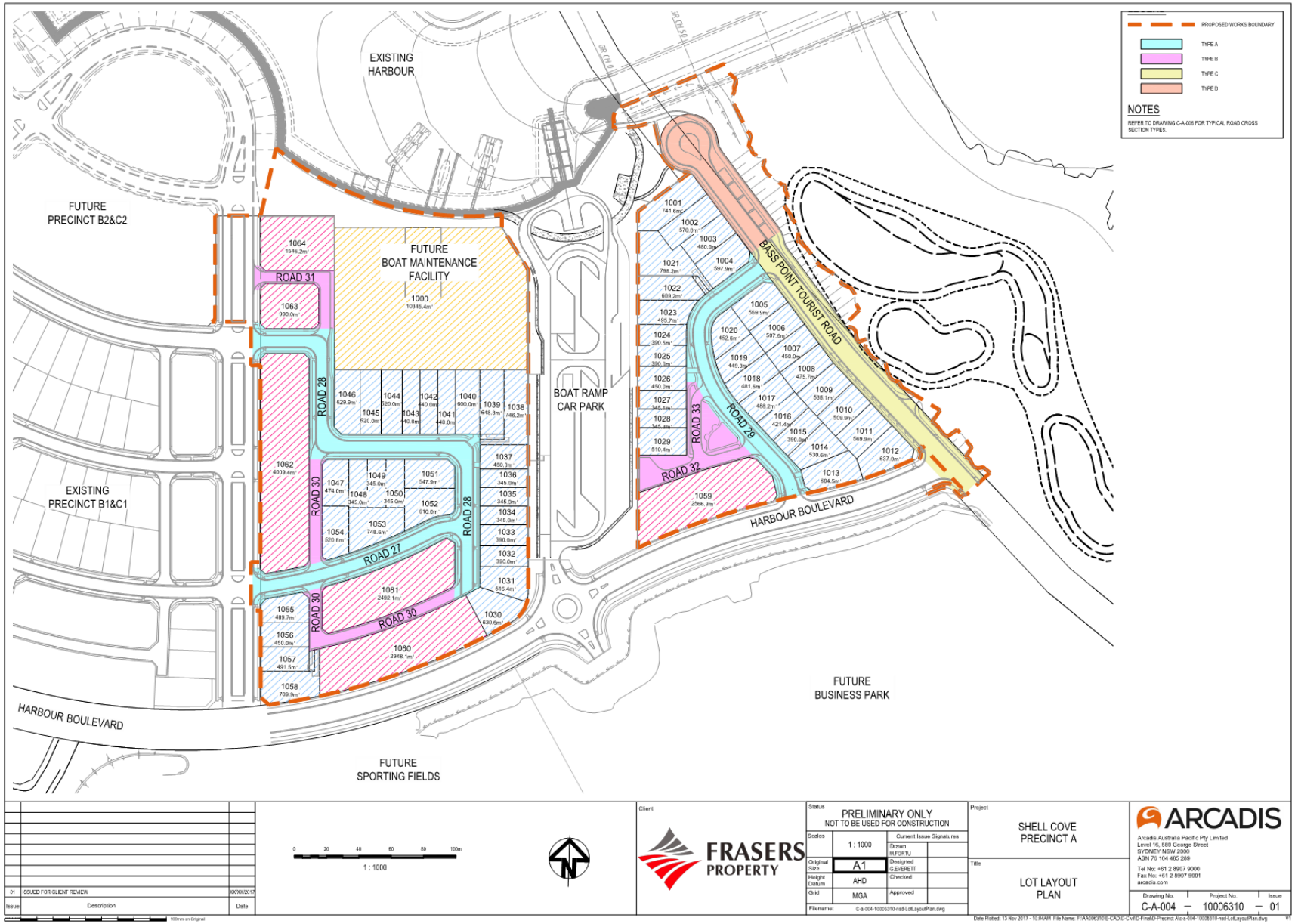


Figure 2-2 Precinct A Road Hierarchy and Lot Layout

3 TRAFFIC ASSESSMENT

3.1 Methodology

This TIA was undertaken through assessing the Proposal against the RMS, SCC and Part 3A Consent requirements including:

- identification of location and extent of the Proposal and Shell Cove Boat Harbour Precinct development (Section 2 of this report)
- identification and calculation of traffic generation related to the Proposal and Shell Cove Boat Harbour Precinct development (Section 3.2 of this report)
- an assessment to identify the likely traffic impacts as a result of the Proposal and the Shell Cove Boat Harbour Precinct development on the key intersections along Harbour Boulevard for peak periods (Section 3.3 of this report).
- review of the proposed Road Hierarchy for the Proposal (Section 3.4 of this report)
- analysis of on-site and on-road parking requirements for the Proposal (Section 3.5 of this report)
- analysis of active and public transport for the Proposal (Section 3.6 of this report)
- review of service vehicle swept paths and sight distances for the Proposal (Section 3.8 of this report)
- review of the planning requirements for the Proposal (Section 4 of this report)

3.1.1 Traffic Impact Assessment

To determine the likely impacts of the Proposal on the key intersections along Harbour Boulevard, the following assessment was undertaken.

- Review and determine the yield for the Proposal (provided by Frasers Property) and the yield for the rest of the Shell Cove Boat Harbour Precinct based on the previous traffic study '*Shell Cove Boatharbour Precinct Traffic Study*' conducted by MAUNSELL-AECOM in 2009 (MAUNSELL-AECOM traffic study)
- Determine appropriate traffic generation for this TIA by comparing the traffic generation under the current Roads and Maritime Services (RMS) Technical Direction (TDT 2013/04a) trip generation rates and the traffic generation adopted in the MAUNSELL-AECOM traffic study
- Calculate the percentage changes of the traffic generation under the RMS trip generation in comparison to the MAUNSELL-AECOM trip generation
- Extract the intersection volumes from the SIDRA models developed for the MAUNSELL-AECOM traffic study, and apply the percentage changes to the intersection volumes
- For intersections south of Road A / Harbour Boulevard (listed f-i below) the following steps were undertaken to determine turn volumes:
  - Determine daily trips per precinct
  - Determine percentage of each precinct per road south of Road A
  - Determine daily volumes and percentage per road
  - Apply percentages accordingly to movement diagram and distribute exit and approach traffic volumes from Road A / Harbour Boulevard intersection

- Assess intersection performance in SIDRA under the cumulative development scenario (all precincts are developed), based on the updated intersection volumes for the following locations:
    a. Shellharbour Road / Harbour Boulevard / Wattle Road signalised intersection
    b. Addison Street / Harbour Boulevard signalised intersection
    c. Brigantine Drive / Harbour Boulevard roundabout intersection
    d. Cove Boulevard / Harbour Boulevard roundabout intersection
    e. Road A / Harbour Boulevard roundabout intersection
    f. Road B / Harbour Boulevard priority controlled T-intersection
    g. Road C / Harbour Boulevard priority controlled T-intersection
    h. Boat Ramp / Business Park / Harbour Boulevard roundabout intersection
    i. Road D / Harbour Boulevard priority controlled T-intersection

The MAUNSELL-AECOM traffic study used traffic modelling in TRACKS (a strategic transport modelling software) for traffic generation and distribution of the entire Shell Cove Boat Harbour Precinct. This modelling approach is considered appropriate and adequate for the traffic analysis in this area. This TIA adopted the same traffic modelling and analysis approach with the updated yield and traffic generation.

3.1.2 Intersection Performance Criteria

3.1.2.1 Degree of Saturation (DOS)

The Degree of Saturation (DoS) is defined as the ratio of demand (arrival) flow to capacity, which is also known as volume/capacity, or v/c ratio. A DoS above 1.0 represents oversaturated conditions where the demand flows exceeds available capacity, and degrees of saturation below 1.0 represent under saturated conditions whereby demand flows are considered below capacity.

The DoS criteria of practical intersection performance adopted for this assessment is summarised in Table 3-1.

Table 3-1 Maximum practical degree of saturation

Intersection type	Maximum practical degree of saturation
Signals	0.90
Roundabouts	0.85
Sign-controlled	0.80

Source: 2013 RMS Modelling Guidelines

3.1.2.2 Level of Service (LOS)

Intersection Level of Service (LOS) was assessed using the standard NSW level of service criteria (see Table 3-2 below). For the purpose of this assessment a maximum threshold of LOS D was adopted.

Table 3-2 LOS Criteria for Intersection Capacity Analysis

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals and Roundabouts	Give-Way and Stop Signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing

Source: 2013 RMS Modelling Guidelines

3.2 Traffic Generation and Distribution

To determine the appropriate traffic generation for this TIA, a daily traffic generation comparison has been made between the traffic generation under the current 2013 RMS trip generation rates and the traffic generation adopted in the MAUNSELL-AECOM traffic study.

The comparison is split into the residential and the commercial / retail components of the development, as shown in Table 3-3 and Table 3-4 respectively. The comparison shows the revised yield and trip generation would generate additional 2,345 trips per day for the residential component, and have an additional 629 trips per day for the commercial / retail component.

Table 3-3 Residential Trip Generation Comparison

Land-use	Original Yield and Trips*				Revised Yield and Trips**			
	Quantity	Daily Trip Rate	Source	Daily Trips	Quantity	Daily Trip Rate	Source	Daily Trips
Apartment	674 apartments	4.00 trips/ apartment	Shell Cove Boat Harbour Precinct Traffic Study, MAUNSELL-AECOM, 2009	2,696	723 apartments	4.58 trips/ apartment	RMS Guide to Traffic Generating Developments 2013/04a - High Density Residential Flat Dwellings (Regional Average)	3,311
Land Lots	190 dwellings	9.00 trips/ dwelling		1,710	319 dwellings	7.40 trips/ dwelling	RMS Guide to Traffic Generating Developments 2013/04a - Low Density Residential Dwellings (Regional Areas)	2,368
Additional Duplex	0 duplex's	5.00 trips/ duplex		0	44 duplex's	5.00 trips/duplex	RTA Guide to Traffic Generating Developments (Section 3.3.2) - Medium Density Residential Flat Building (Smaller units and flats)	220
Medium Density	374 dwellings	6.00 trips/ dwelling		2,244	435 dwellings	6.50 trips/ dwelling	RTA Guide to Traffic Generating Developments (Section 3.3.2) - Medium Density Residential Flat Building (Larger units and town houses)	2,828
Studios	0 studios	5.00 trips/ studio		0	55 studios	5.00 trips/ studio	RTA Guide to Traffic Generating Developments (Section 3.3.2) - Medium Density Residential Flat Building (Smaller units and flats)	275
Total				**6,650**				**9,002**

Note:

*Based on quantity and trip generation rates identified in the Shell Cove Boat Harbour Precinct Traffic Study, MAUNSELLI-AECOM, 2009 report

** Based on revised yields and updated RMS trip generation rates

Table 3-4 Commercial/Retail Trip Generation Comparison

Land-use	Original Yield and Trips*				Revised Yield and Trips**			
	Quantity	Daily Trip Rate	Source	Daily Trips	Quantity	Daily Trip Rate	Source	Daily Trips
Serviced Apartments	N/A				150 apartments	3.00 trips/ apartment	RTA Guide to Traffic Generating Developments (Section 3.4.1) - Motels	450
Conference and Commercial	N/A				1,500 m^2	10.00 trips/ 100 m^2	RTA Guide to Traffic Generating Developments (Section 3.5) – Office and commercial	150
Tavern	N/A				1,400 m^2	60.00 trips/ 100 m^2	RTA Guide to Traffic Generating Developments (Section 3.7.2) – Restaurants	840
Retail	N/A				7,000 m^2	60.67 trips/ 100 m^2	RMS Guide to Traffic Generating Developments 2013/04a – Appendix F3 – SC8 Mittagong	4,247
Commercial Land-use	NA				5,100 m^2 (GLFA)	10.00 trips/ 100 m^2	RTA Guide to Traffic Generating Developments (Section 3.5) – Office and commercial	510
Boat Ramp	NA				2 ramps	40 launches per ramp per day	RMS NSW Boat Ramp Facility Guidelines (Section 5.1.1)	80

Land-use	Original Yield and Trips*				Revised Yield and Trips**			
	Quantity	Daily Trip Rate	Source	Daily Trips	Quantity	Daily Trip Rate	Source	Daily Trips
Marina Berths	300 marina berths	0.94 trips/ marina berth	Based on data sourced from *Shell Cove Boat Harbour Precinct: Precinct E, Wetland 6, Wetland 7 and the Northern Lands Traffic Impact Assessment, Christopher Hallam & Associates P/L, 2017* whereby 300 berths would generate 254 veh/day which is equivalent to 0.94 trips/berth	282	270 marina berths	0.94 trips/ marina berth	Based on data sourced from *Shell Cove Boat Harbour Precinct: Precinct E, Wetland 6, Wetland 7 and the Northern Lands Traffic Impact Assessment, Christopher Hallam & Associates P/L, 2017* whereby 300 berths would generate 254 veh/day which is equivalent to 0.94 trips/berth	254
Business Park	30,000 m^2	5.50 trips/ 100 m^2	Shell Cove Boat Harbour Precinct Traffic Study, Maunsell-AECOM, 2009 report	1,650	20,000 m^2	7.83 trips/ 100 m^2	TDT 2013/04a – Business parks and industrial estates (Regional Average)	1,566
Wet & Dry Berths in Outer Harbour	NA				12 wet berths 170 dry berths	0.94 trips/ berth	Based on data sourced from *Shell Cove Boat Harbour Precinct: Precinct E, Wetland 6, Wetland 7 and the Northern Lands Traffic Impact Assessment, Christopher Hallam & Associates P/L, 2017* whereby 300 berths would generate 254 veh/day which is equivalent to 0.94 trips/berth	171
Maintenance & Dry Boat Facility	NA				10 employees	2 trips / employee	Assumption as details of employee type is unknown (full-time, part-time, contractors, etc.)	20
Hotel	250 rooms	3.00 trips/ room	Shell Cove Boat Harbour Precinct Traffic Study, Maunsell-AECOM, 2009 report	750	N/A			

Land-use	Original Yield and Trips*				Revised Yield and Trips**			
	Quantity	Daily Trip Rate	Source	Daily Trips	Quantity	Daily Trip Rate	Source	Daily Trips
Supermarket	4,000 m^2	77.50 trips/ 100 m^2	Shell Cove Boat Harbour Precinct Traffic Study, Maunsell-AECOM, 2009 report	3,100	N/A			
Retail/Commercial	4,000 m^2	30.00 trips/ 100 m^2	Shell Cove Boat Harbour Precinct Traffic Study, Maunsell-AECOM, 2009 report	1,200	N/A			
Library	650 m^2	5.00 trips/ 100 m^2	Shell Cove Boat Harbour Precinct Traffic Study, Maunsell-AECOM, 2009 report	33	N/A			
Units	161 units	4.00 trips/ unit	Shell Cove Boat Harbour Precinct Traffic Study, Maunsell-AECOM, 2009 report	644	N/A			
Total				**7,659**				**8,288**

Note:

* Based on quantity and trip generation rates identified in the Shell Cove Boat Harbour Precinct Traffic Study, MAUNSELL-AECOM, 2009 report

** Based on revised yields and updated RMS trip generation rates

Based on the above comparison, it is evident that there is an anticipated 36% increase in daily traffic generation from the residential component of the Shell Cove Boat Harbour Precinct whilst there is an 8% increase in the commercial/retail component. As such, traffic volumes would need to increase for the cumulative assessment. To apply this increase, three zones were identified which would need to be increased accordingly based on their expected yield. These three zones were:

1. Precincts A, B and C
2. Precinct D
3. Precincts E, F, G and H

Based on the revised yield for each of the precincts it was determined that traffic generated from Precincts A, B and C would need to increase by 15%, Precinct D by 5% and Precincts E, F, G and H by 16%. The overall 36% increase was distributed accordingly between each of the zones, apart from the Precincts A, B and C which contained an additional 8% to account for the boat ramp, boat maintenance facility and the Outer Harbour developments. A breakdown of the yield per zone and the percentages are presented in Table 3-5.

Table 3-5 Zone Increase Distribution for Residential

Type	Precincts A, B and C		Precinct D		Precincts E, F, G and H		Total	
Apartment	180	25%	221	31%	322	45%	723	100%
Land Lots	160	50%	0	0%	160	50%	320	100%
Additional Duplex	21	48%	0	0%	23	52%	44	100%
Medium Density	258	59%	0	0%	177	41%	435	100%
Studios	35	64%	0	0%	20	36%	55	100%
Total	654	41%	221	14%	702	45%	1,577	100%
Percentage increase – Residential		15%		5%		16%		36%
Boat Ramp and Commercial Land-use		8%		0%		0%		8%
Percentage increase - total		23%		5%		16%		44%

A breakdown of the percentage increase adopted and applied to each movement within the study intersections is provided in Appendix B. These adopted percentage increases were applied to traffic volumes extracted from SIDRA models conducted for MAUNSELL-AECOM traffic study. Turn movement diagrams adopted for this assessment and used as inputs into the SIDRA models are also provided in Appendix C.

3.3 Intersection Traffic Assessment

To determine the potential impact of the Shell Cove development, SIDRA analysis was undertaken for the nine intersections along Harbour Boulevard for the opening year 2018, with results and findings of the traffic assessment presented in this section.

3.3.1 Shellharbour Road / Harbour Boulevard / Wattle Road signalised intersection

The layout of the Shellharbour Road / Harbour Boulevard / Wattle Road signalised intersection is shown in Figure 3-1. The layout is based on the RMS TCS plan (TCS 2455) attached in Appendix A.

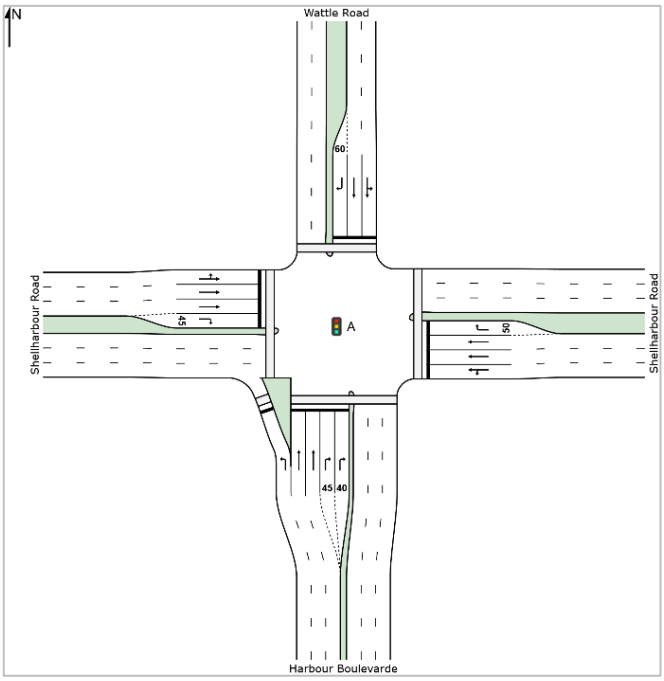


Figure 3-1 Shellharbour Road / Harbour Boulevard / Wattle Road Intersection

Based on the SIDRA modelling results, it is anticipated that the Shellharbour Road / Harbour Boulevard / Wattle Road intersection will not operate satisfactorily in either the AM or PM peak period, in accordance with the adopted performance criteria (Section 3.1.2). Intersection summary results are provided in Table 3-6.

Table 3-6 SIDRA Summary Results - Shellharbour Road / Harbour Boulevard / Wattle Road signalised intersection

Peak Period	Volume	DoS	Delay (s)	LOS
AM	4,852	1.689	460	LOS F
PM	4,359	1.581	328	LOS F

To make this intersection comply with the performance criteria, mitigation measures have been developed (see Figure 3-2) with the following additional lane configuration. Additionally, the signal phasing has also been altered from that presented in Appendix A to better suit the traffic flows of the intersection.

- North Approach:

  - Addition of a short left-turn slip-lane
  - Addition of a short through lane
  - Addition of a short exit lane
- East Approach:
  - Conversion of a through lane to a dedicated right-turn lane
  - Extension of turn bay length to 60m for the short right turn lane
- South Approach:
  - Conversion of full-length left-turn slip-lane to a combined left-turn slip-lane and through lane
- West Approach:
  - No changes

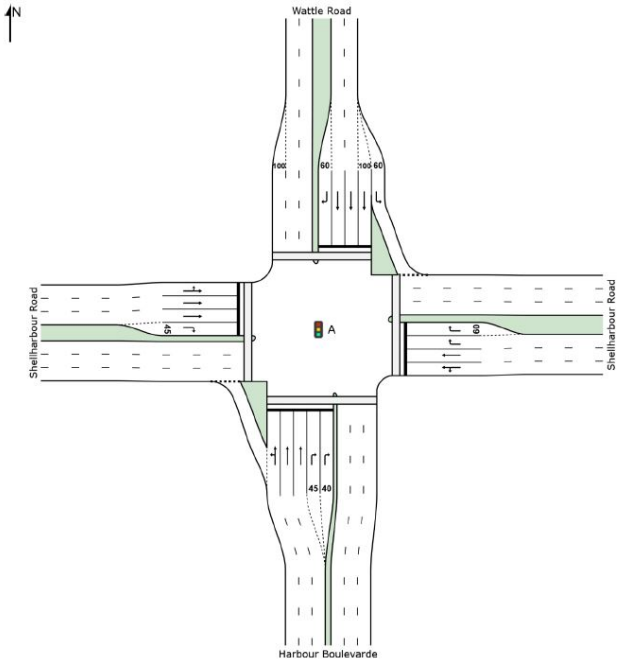


Figure 3-2 Shellharbour Road / Harbour Boulevard / Wattle Road Intersection – with mitigation

Based on the proposed mitigation measure and SIDRA modelling results, it is anticipated that the Shellharbour Road / Harbour Boulevard / Wattle Road intersection is predicted to operate satisfactorily in both the AM and PM peak periods, although the DoS is exceeding the threshold of 0.9 for a signalised intersection for PM peak. It is considered acceptable given this TIA adopted a conservative approach for future traffic volume estimation, and less traffic would be expected at this intersection for the opening year. Intersection summary results are provided in Table 3-7 and detailed SIDRA movement summaries are provided in Appendix D.

Table 3-7 SIDRA Summary Results - Shellharbour Road / Harbour Boulevard / Wattle Road signalised intersection

Peak Period	Volume	DoS	Delay (s)	LOS
AM	4,852	0.898	53	LOS D
PM	4,359	0.928	55	LOS D

3.3.2 Addison Street / Harbour Boulevard signalised intersection

The layout of the Addison Street / Harbour Boulevard signalised intersection signalised intersection is shown below. The layout is based on the RMS TCS plan (TCS 2455) attached in Appendix A.

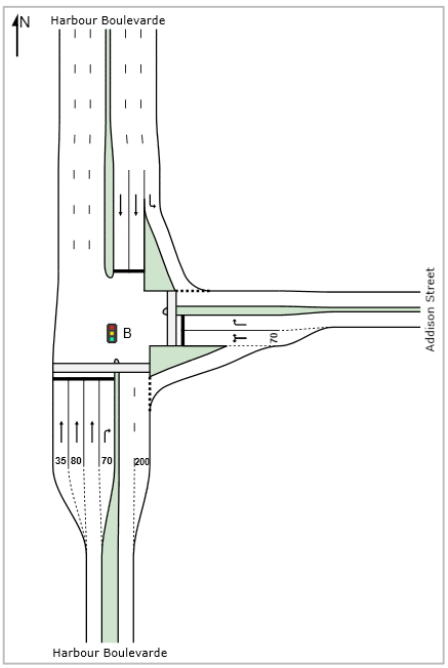


Figure 3-3 Addison Street / Harbour Boulevard Intersection

Based on the SIDRA modelling results it is anticipated that the Addison Street / Harbour Boulevard intersection will operate satisfactorily in both the AM and PM peak periods and with spare capacity to cater for more traffic. Intersection summary results are provided in Table 3-8 and detailed SIDRA movement summaries are provided in Appendix D.

Table 3-8 SIDRA Summary Results - Addison Street / Harbour Boulevard signalised intersection

Peak Period	Volume	DoS	Delay (s)	LOS
AM	2,314	0.726	18	LOS B
PM	2,284	0.563	12	LOS B

3.3.3 Brigantine Drive / Harbour Boulevard roundabout intersection

The layout of the Brigantine Drive / Harbour Boulevard roundabout intersection is shown below. The layout is based on the existing intersection configuration.

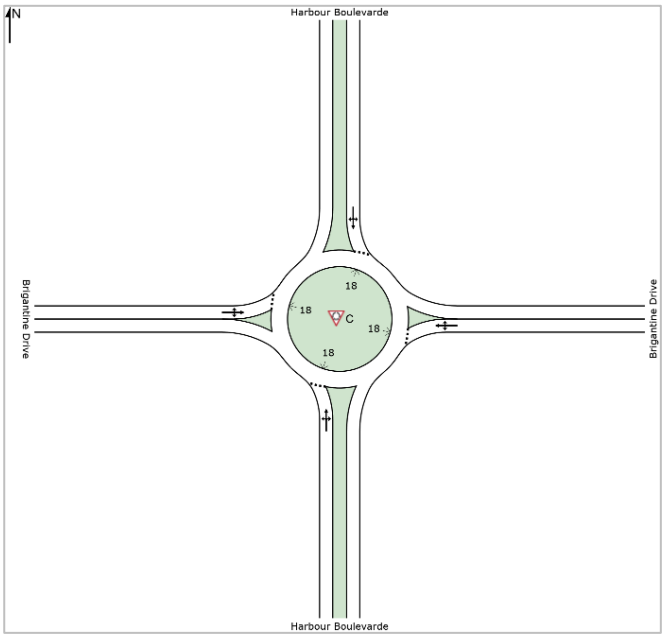


Figure 3-4 Brigantine Drive / Harbour Boulevard Roundabout

Based on the SIDRA modelling results it is anticipated that the Brigantine Drive / Harbour Boulevard intersection will operate satisfactorily in both the AM and PM peak periods and with spare capacity to cater for more traffic. Intersection summary results are provided in Table 3-9 and detailed SIDRA movement summaries are provided in Appendix D.

Table 3-9 SIDRA Summary Results - Brigantine Drive / Harbour Boulevard roundabout intersection

Peak Period	Volume	DoS	Delay (s)	LOS
AM	1,621	0.459	7	LOS A
PM	1,711	0.758	9	LOS A

3.3.4 Cove Boulevard / Harbour Boulevard roundabout intersection

The layout of the Cove Boulevard / Harbour Boulevard roundabout intersection is shown below. The layout is based on the existing intersection configuration.

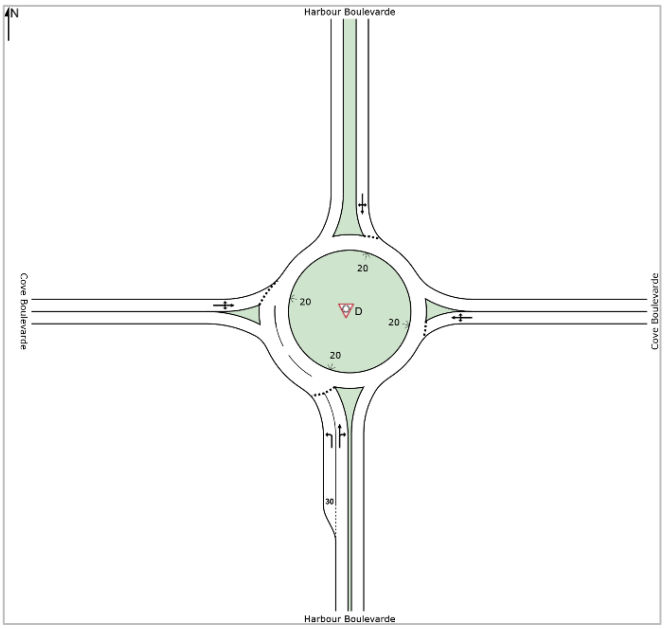


Figure 3-5 Cove Boulevard / Harbour Boulevard Roundabout

Based on the SIDRA modelling results it is anticipated that the Cove Boulevard / Harbour Boulevard intersection will operate satisfactorily in both the AM and PM peak periods and with spare capacity to cater for more traffic. Intersection summary results are provided in Table 3-10 and detailed SIDRA movement summaries are provided in Appendix D.

Table 3-10 SIDRA Summary Results - Cove Boulevard / Harbour Boulevard roundabout intersection

Peak Period	Volume	DoS	Delay (s)	LOS
AM	1,772	0.659	8	LOS A
PM	1,775	0.535	7	LOS A

3.3.5 Road A / Harbour Boulevard roundabout intersection

The layout of the Road A / Harbour Boulevard roundabout intersection is shown below. The layout is based on the existing intersection configuration.

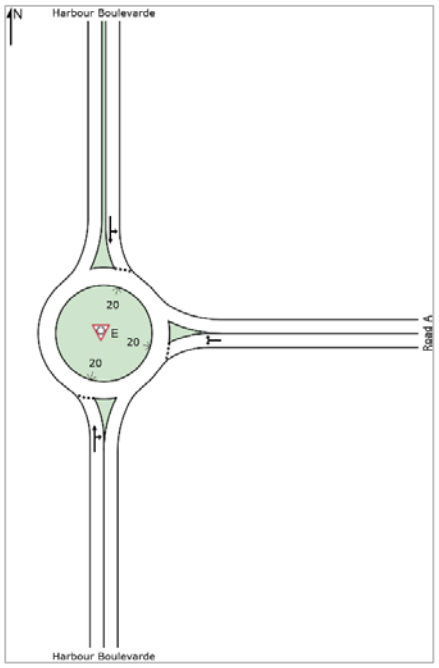


Figure 3-6 Road A / Harbour Boulevard Roundabout

Based on the SIDRA modelling results it is anticipated that the Road A / Harbour Boulevard intersection will operate satisfactorily in both the AM and PM peak periods and with spare capacity to cater for more traffic. Intersection summary results are provided in Table 3-11 and detailed SIDRA movement summaries are provided in Appendix D.

Table 3-11 SIDRA Summary Results - Road A / Harbour Boulevard roundabout intersection

Peak Period	Volume	DoS	Delay (s)	LOS
AM	1,371	0.387	6	LOS A
PM	1,384	0.443	7	LOS A

3.3.6 Road B / Harbour Boulevard priority controlled T-intersection

The layout of the Road B / Harbour Boulevard priority controlled T-intersection is shown below. The layout is based on the proposed intersection configuration.

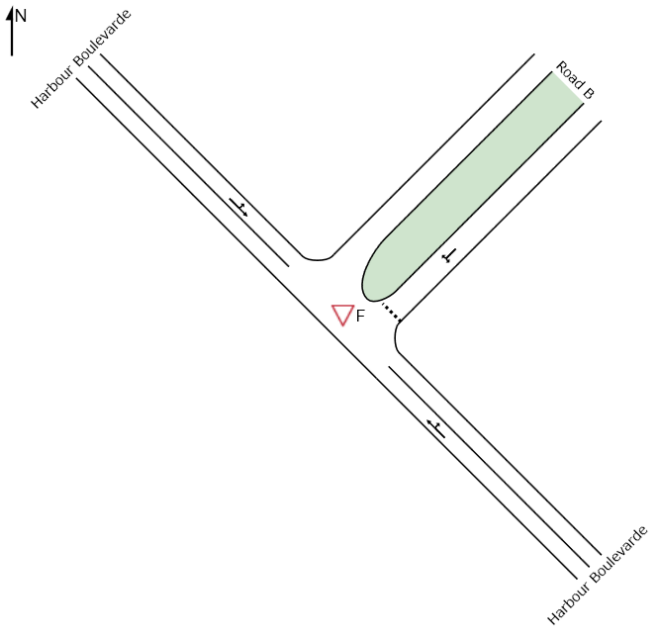


Figure 3-7 Road B / Harbour Boulevard Priority Controlled T-intersection

Based on the SIDRA modelling results it is anticipated that the Road B / Harbour Boulevard intersection will operate satisfactorily in both the AM and PM peak periods and with spare capacity to cater for more traffic. Intersection summary results are provided in Table 3-12 and detailed SIDRA movement summaries are provided in Appendix D.

Table 3-12 SIDRA Summary Results - Road B / Harbour Boulevard priority controlled T-intersection

Peak Period	Volume	DoS	Delay (s)	LOS
AM	503	0.126	2	LOS A
PM	508	0.120	2	LOS A

3.3.7 Road C / Harbour Boulevard priority controlled T-intersection

The layout of the Road C / Harbour Boulevard priority controlled T-intersection is shown below. The layout is based on the proposed intersection configuration.

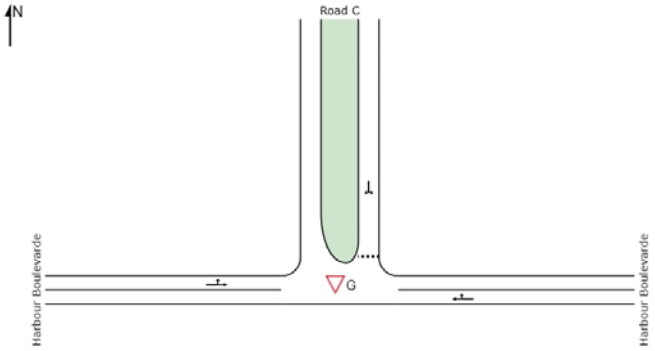


Figure 3-8 Road C / Harbour Boulevard Priority Controlled T-intersection

Based on the SIDRA modelling results it is anticipated that the Road C / Harbour Boulevard intersection will operate satisfactorily in both the AM and PM peak periods and with spare capacity to cater for more traffic. Intersection summary results are provided in Table 3-13 and detailed SIDRA movement summaries are provided in Appendix D.

Table 3-13 SIDRA Summary Results - Road C / Harbour Boulevard priority controlled T-intersection

Peak Period	Volume	DoS	Delay (s)	LOS
AM	373	0.095	3	LOS A
PM	376	0.108	3	LOS A

3.3.8 Boat Ramp / Business Park / Harbour Boulevard roundabout intersection

The layout of the 3.3.8 Boat Ramp / Business Park / Harbour Boulevard roundabout intersection is shown below. The layout is based on the proposed intersection configuration.

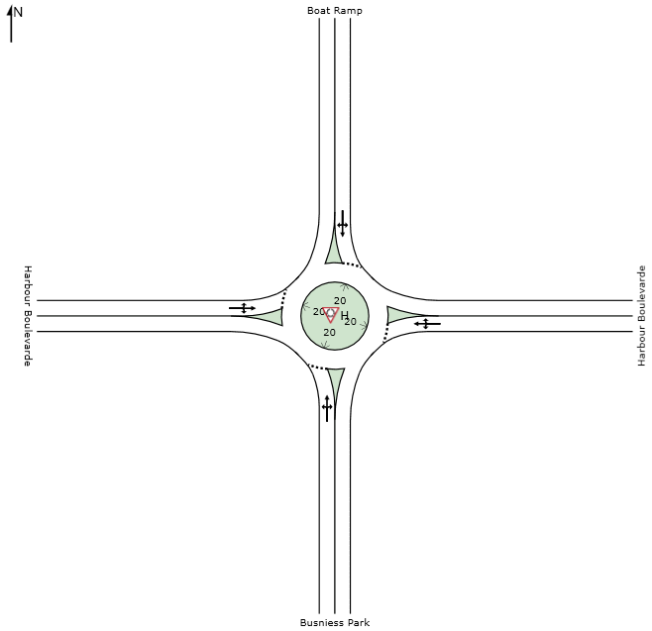


Figure 3-9 Boat Ramp / Business Park / Harbour Boulevard Roundabout

Based on the SIDRA modelling results it is anticipated that the Boat Ramp / Business Park / Harbour Boulevard roundabout intersection will operate satisfactorily in both the AM and PM peak periods and with spare capacity to cater for more traffic. Intersection summary results are provided in Table 3-14 and detailed SIDRA movement summaries are provided in Appendix D.

Table 3-14 SIDRA Summary Results - Boat Ramp / Business Park / Harbour Boulevard roundabout intersection

Peak Period	Volume	DoS	Delay (s)	LOS
AM	213	0.061	6	LOS A
PM	215	0.072	6	LOS A

3.3.9 Road D / Harbour Boulevard priority controlled T-intersection

The layout of the Road D / Harbour Boulevard priority controlled T-intersection is shown below. The layout is based on the existing intersection configuration.

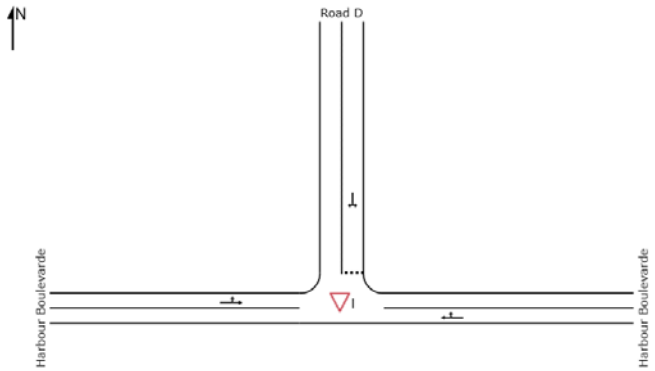


Figure 3-10 Road D / Harbour Boulevard Priority Controlled T-intersection

Based on the SIDRA modelling results it is anticipated that the Road D / Harbour Boulevard priority controlled T-intersection will operate satisfactorily in both the AM and PM peak periods and with spare capacity to cater for more traffic. Intersection summary results are provided in Table 3-15 and detailed SIDRA movement summaries are provided in Appendix D.

Table 3-15 SIDRA Summary Results - Road D / Harbour Boulevard priority controlled T-intersection

Peak Period	Volume	DoS	Delay (s)	LOS
AM	46	0.012	4	LOS A
PM	47	0.016	4	LOS A

3.4 Road Hierarchy

Within Precinct A, six street types are proposed to provide connectivity to all proposed land-uses. All medium density land lots are proposed to be adjacent to street types that contain either segregated on-street car-parking or combined parking/travel lanes. The proposed road hierarchy for Precinct A is presented in Figure 2-2.

A description of each of the six proposed street types along with a typical cross-section is provided in Section 3.4.1.1 below.

3.4.1.1 Precinct Street Types

3.4.1.1.1 Street Type A

Street Type A is considered a local street type consisting of:

- 1.2m footpaths and street trees contained within an approximate 2.2m wide verge on each side
- Two 3.75m wide traffic lanes contained within an approximate 7.5m wide carriageway which includes on-road parking availability

This street type will be applied to Road 27, Road 28 and Road 29 and will primarily service standard lots throughout Precinct A as a local street connecting to major connecting streets. On-street parking will be provided within the travel lane and it is not considered as a major issue based on the purpose for this type of road. A passing car is able to pull into an available space to the side of the road (e.g. adjacent to a driveway) and allow a service truck to continue past when needed.

A typical cross section of Street Type A is provided below in Figure 3-12.

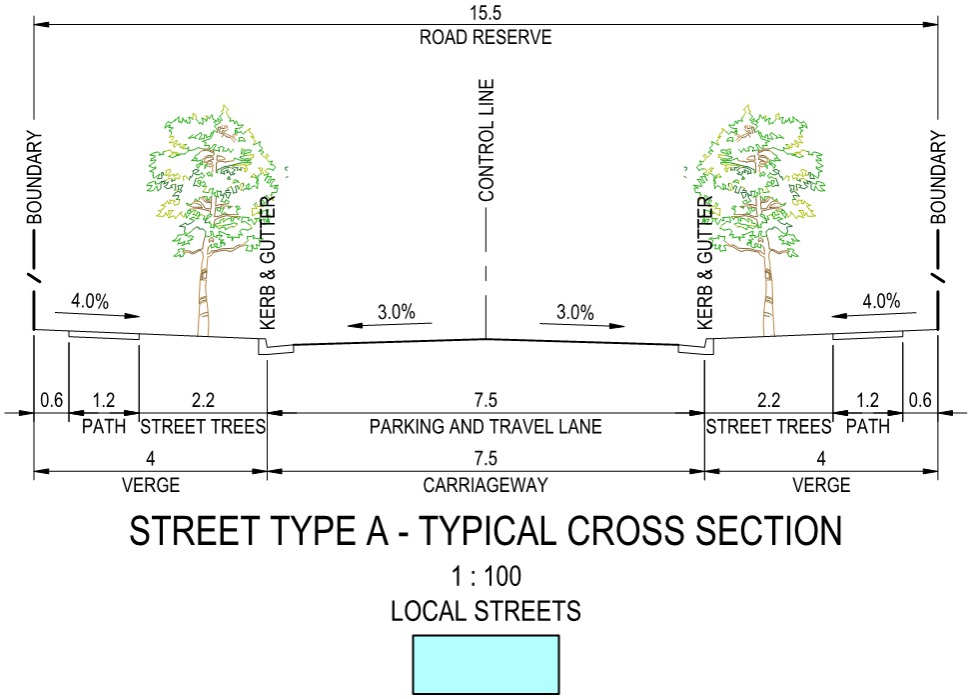


Figure 3-11 Street Type A typical cross section

3.4.1.1.2 Street Type B

Street Type B is considered a laneway type road consisting of:

- 1m of pavement/concrete within an approximate 1m wide verge on one side and trees only contained within an approximate 1m verge on the opposite side
- Two 3m wide traffic lanes contained within an approximate 6m wide carriageway
- No on-street car parks are provided

This street type will be applied to Road 30, Road 31, Road 32 and Road 33 and will service a small section of standard lots and primarily medium density residential. On-street parking for this laneway will not be provided and as such will result in minimal vehicle conflicts occurring, in particular service vehicles. The proposed lane widths for this laneway are considered adequate to allow for a service vehicle and standard vehicle to pass each other without any conflict occurring.

A typical cross section of Street Type B is provided below in Figure 3-15.

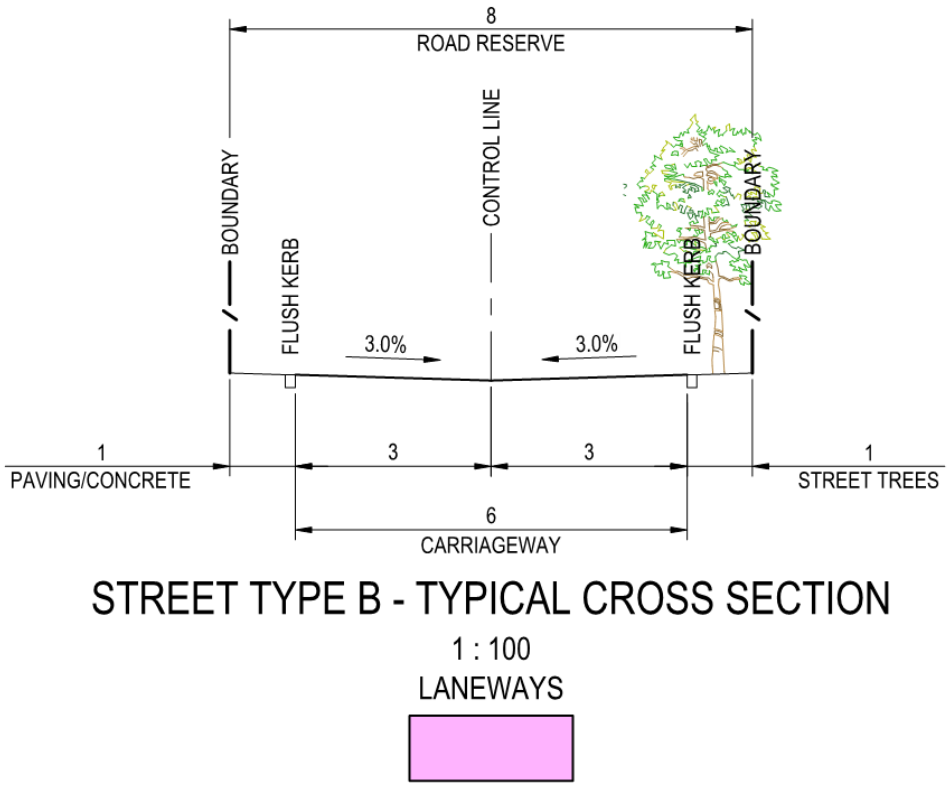


Figure 3-12 Street Type B typical cross section

3.4.1.1.3 Street Type C

Street Type C is considered a major connecting street type consisting of:

- 1.2m footpath and street trees contained within an approximate 4m wide verge on one side and a 2.5m footpath and street trees contained within an approximate 4.5m verge on the other side
- 2.1m wide segregated parking on each side and two 3.35m wide traffic lanes contained within an approximate 10.9m wide carriageway

Street Type C is proposed to be applied for a part of Bass Point Tourist Road which will provide the primary connectivity to the local beach and some residential lots. Additionally, the segregated parking bays will provide reduced vehicular conflict from parking manoeuvres and the width of the carriageway, in particular the lane widths.

A typical cross section of Street Type C is provided below in Figure 3-11.

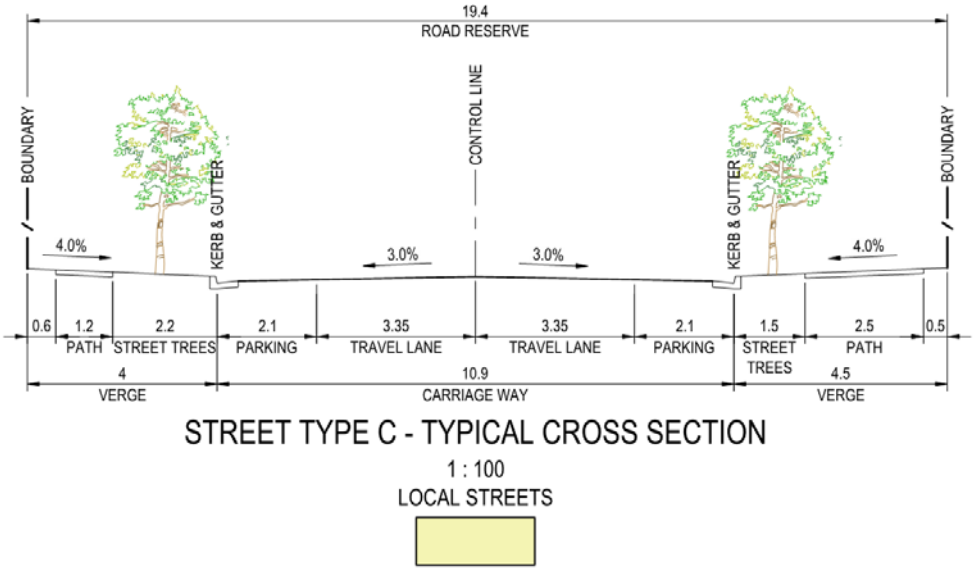


Figure 3-13 Street Type C typical cross section

3.4.1.1.4 Street Type D

Street Type D is considered a major connecting street type consisting of:

- 1.2m footpath and street trees contained within an approximate 4m wide verge on one side and a 2.5m footpath and street trees contained within an approximate 4.5m verge on the other side
- 2.1m wide segregated parking on one side and 5.6m wide segregated parking on the other side and two 3.35m wide traffic lanes contained within an approximate 14.4m wide carriageway

Street Type D is proposed to be applied for a part of Bass Point Tourist Road which will provide the primary connectivity to the local beach and some residential lots. Additionally, the segregated parking bays will provide reduced vehicular conflict from parking manoeuvres and the width of the carriageway, in particular the lane widths.

A typical cross section of Street Type D is provided below in Figure 3-10.

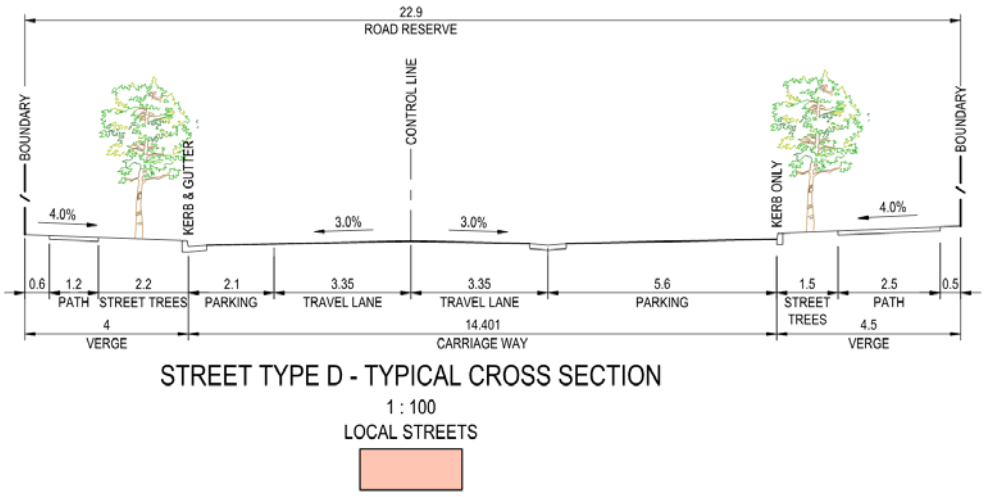


Figure 3-14 Street Type D typical cross section

3.5 Parking Assessment

3.5.1 On-site Parking

On-site parking requirements for the Proposal will be provided for the residential component, as part of separate DA's, in accordance with Section 13.1 of the *Shellharbour City Councils – Shellharbour Development Control Plan (SDCP), 2016*. Based on the provision of standard residential lots, duplex lots and superlots consisting of medium density residential, the SDCP requires:

- Two spaces per dwelling or dual occupancy with at least one of the spaces enclosed within a garage
- Either one space per one bedroom dwelling or 1.5 spaces per two or more bedroom dwellings and either 0.25 visitor spaces per one bedroom dwelling or 0.5 visitor spaces per two or more bedroom dwellings.

Based on the above parking requirements and the anticipated yield of the Proposal an approximate total of 219 resident car parks and 34 visitor car parks on-site parking spaces will be required.

In addition to the residential component of the Proposal, future commercial land-use is proposed adjacent to the boat ramp and is anticipated to contain approximately 176 commercial car parks and one courier car park for the commercial component. The number of commercial car parking spaces include the parking estimate for the Outer Harbour Development, which is estimated to require 48 car parking spaces at maximum. These parking numbers are indicative only and a separate DA will be submitted at a later date, in accordance with Section 13.1 of the *Shellharbour City Councils – Shellharbour Development Control Plan (SDCP), 2016*.

A breakdown is provided in Table 3-16. It is anticipated that all proposed lots will sufficiently meet the SDCP requirements with parking provided on-site.

Table 3-16 On-site Car Park Provision for the Proposal

Land-use Type	Quantity	Parking Rate	Total Parks
Land Lots	55	2 spaces per dwelling	110 resident car parks

Land-use Type	Quantity	Parking Rate	Total Parks
Duplex's	3	2 spaces per dwelling	6 resident car parks
Medium Density	59	1.5 spaces per two or more bedroom dwellings and 0.5 visitor spaces per two or more bedroom dwellings	89 resident car parks + 30 visitor car parks
Studios	13	1 spaces per two or more bedroom dwellings and 0.25 visitor spaces per two or more bedroom dwellings	14 resident car parks + 4 visitors
Commercial Land-use	5100m^3	1 space per 40m^2 GFA + 1 courier / service car parking space	128 commercial car parks plus 1 courier park 48 car parks for Outer Harbour Development
Proposal Total			219 resident car parks, 34 visitor car parks, 128 commercial car parks and 1 courier park

3.5.2 On-street Parking

To determine the adequacy of on-street parking in the vicinity of medium density or apartment sites, a review of on-street parking was undertaken. Based on the proposed provision of approximately 233 on-street parking spaces and 20 parking bays, it is anticipated that should the on-site parking provision for medium density or apartment sites be exceeded either due to higher car ownership for residents or large numbers of visitors, there would be adequate on-street parking.

Table 3-17 On-street Parking Comparison Results

Road	On-Street Parking	Parking Bays	Total
Harbour Boulevard	95	0	95
Bass Point Tourist Road	42	20	62
Road 27	16	0	16
Road 28	49	0	49
Road 29	31	0	31
Road 30	0	0	0

Road	On-Street Parking	Parking Bays	Total
Road 31	0	0	0
Road 32	0	0	0
Road 33	0	0	0
Total	233	20	253

3.6 Active Transport

The proposed pedestrian and cyclist network, as shown in Figure 3-15 below, will provide adequate connectivity both within the Shell Cove Boat Harbour Precinct and the surrounding areas.

The adopted and approved concept plan (presented in Figure 3-16) shows a pedestrian/cyclist path to the south of Precinct A and a pedestrian path to the north and east of Precinct A. For Precinct A, the shared pathway plan (Figure 3-15) proposes that the shared path will be provided along the Shell Cove harbour and extends to Bass Point Tourist Road in the east. It then continues south along the eastern side of Bass Point Tourist Road and then continues to the west along the southern side of Harbour Boulevard. The proposed shared paths have been designed in accordance with *Shellharbour Local Government Area Shared Use Path Strategy 2010*.

Shell Cove – Precinct A

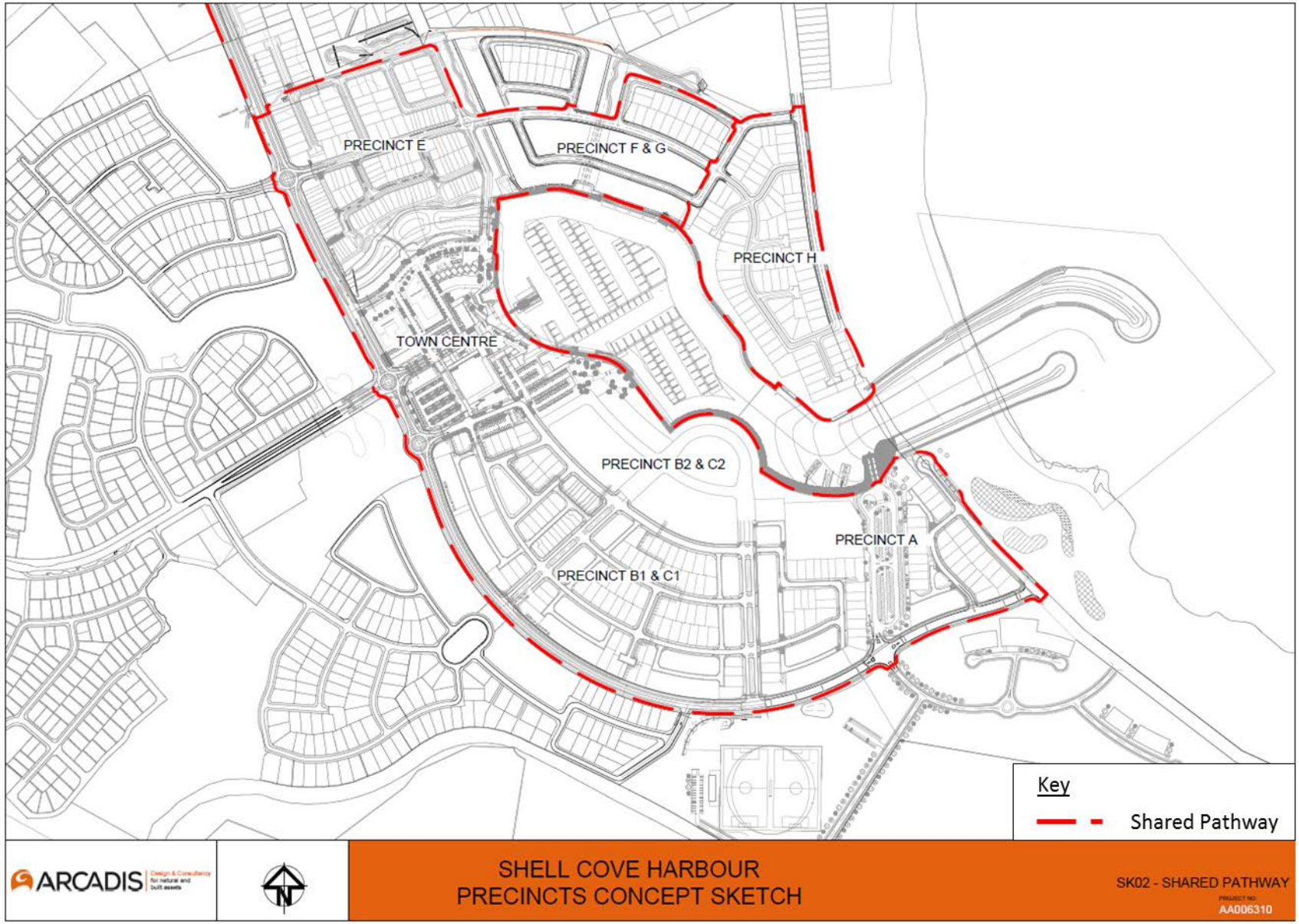


Figure 3-15 Shared pedestrian/bicycle path network

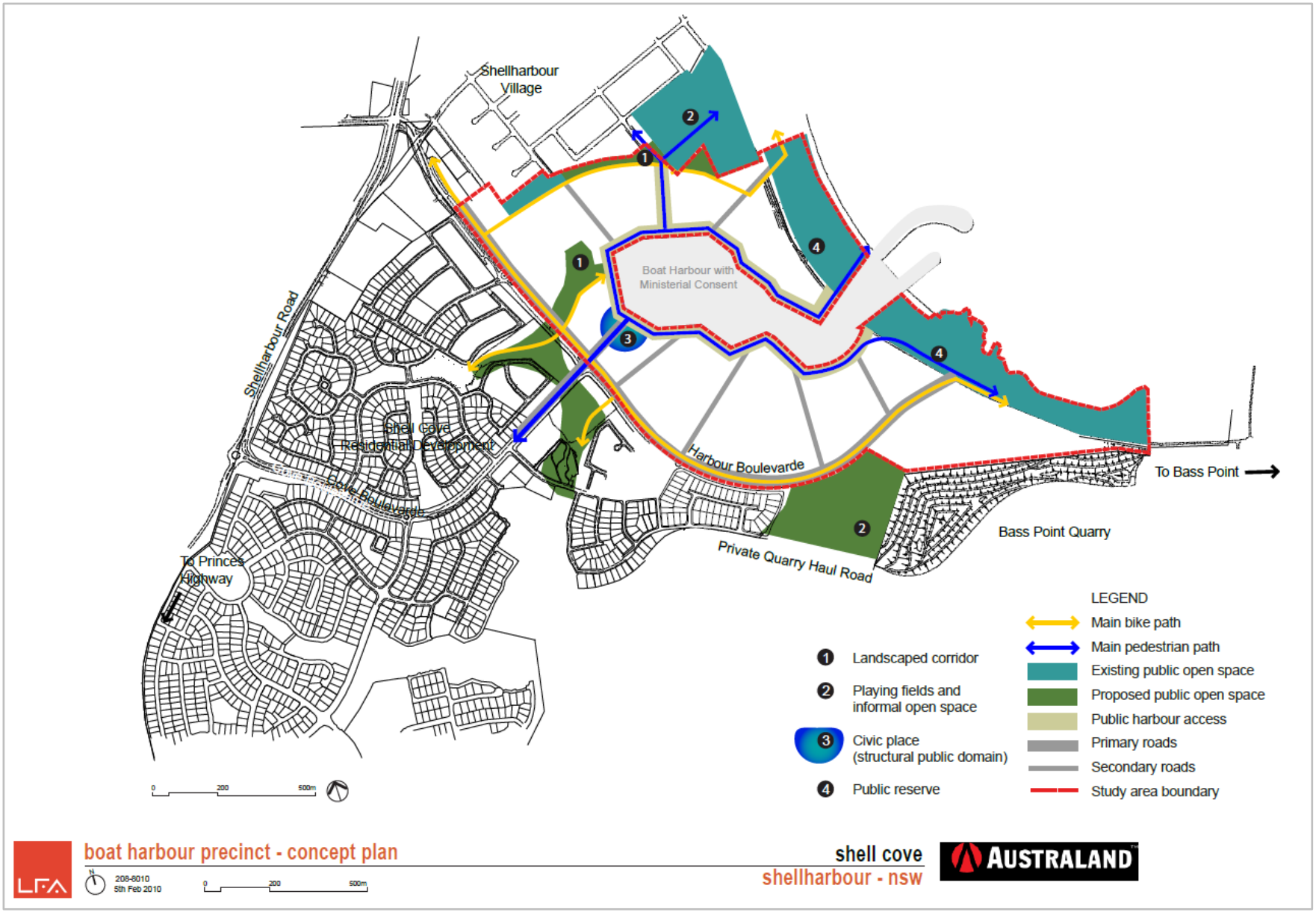


Figure 3-16 Approved Concept Plan - Open space, pedestrian and bicycle network

3.7 Public Transport

Currently there are two forms of public transport available within close proximity of the proposed Shell Cove Boat Harbour Precinct, with these being the bus routes serviced by Premier Buses and the South Coast Line trains operating through the Shellharbour Junction station. A more detailed description of each is provided below.

3.7.1.1 Buses

Premier Buses operate two bus routes within close proximity of the proposed Shell Cove Boat Harbour Precinct. These two routes are Route 52 and Route 53 which are shown in Figure 3-17 and Figure 3-18. Of these two routes, Route 52 provides direct connectivity to the Shellharbour Junction train station.

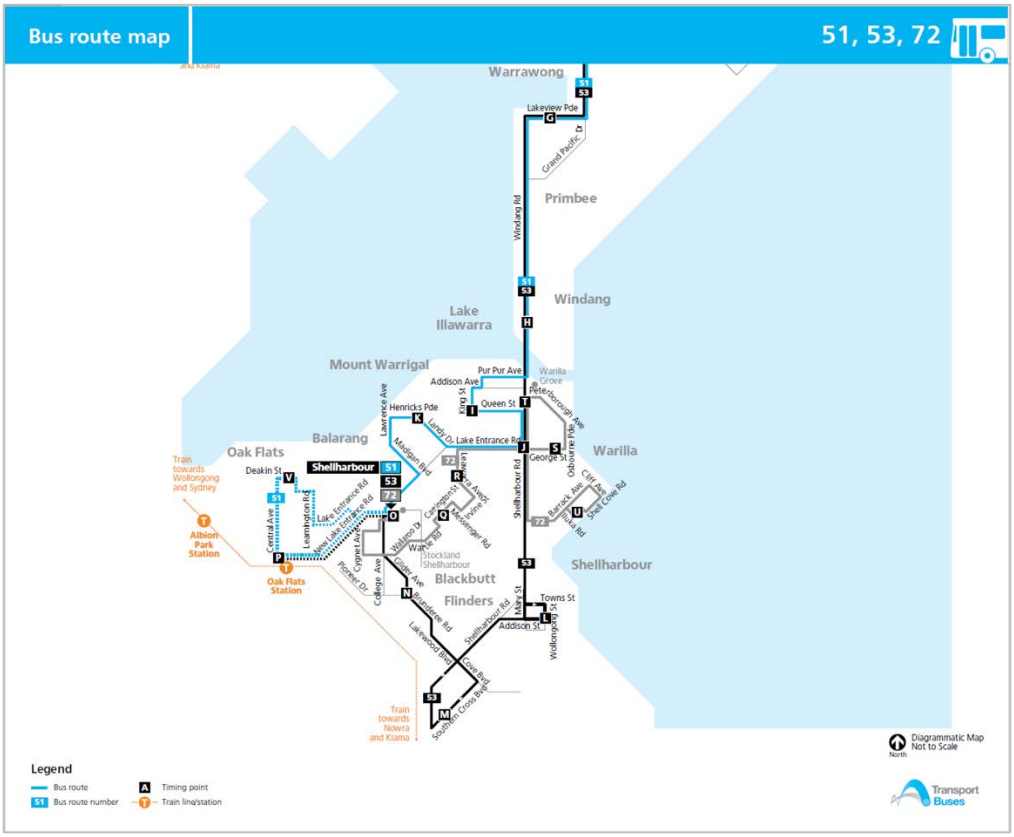


Figure 3-17 Route 51, 53 and 72 Bus Route Map (Source: Premier Illawarra Website http://www.premierillawarra.com.au/busmaps.html, retrieved 01/09/2017)

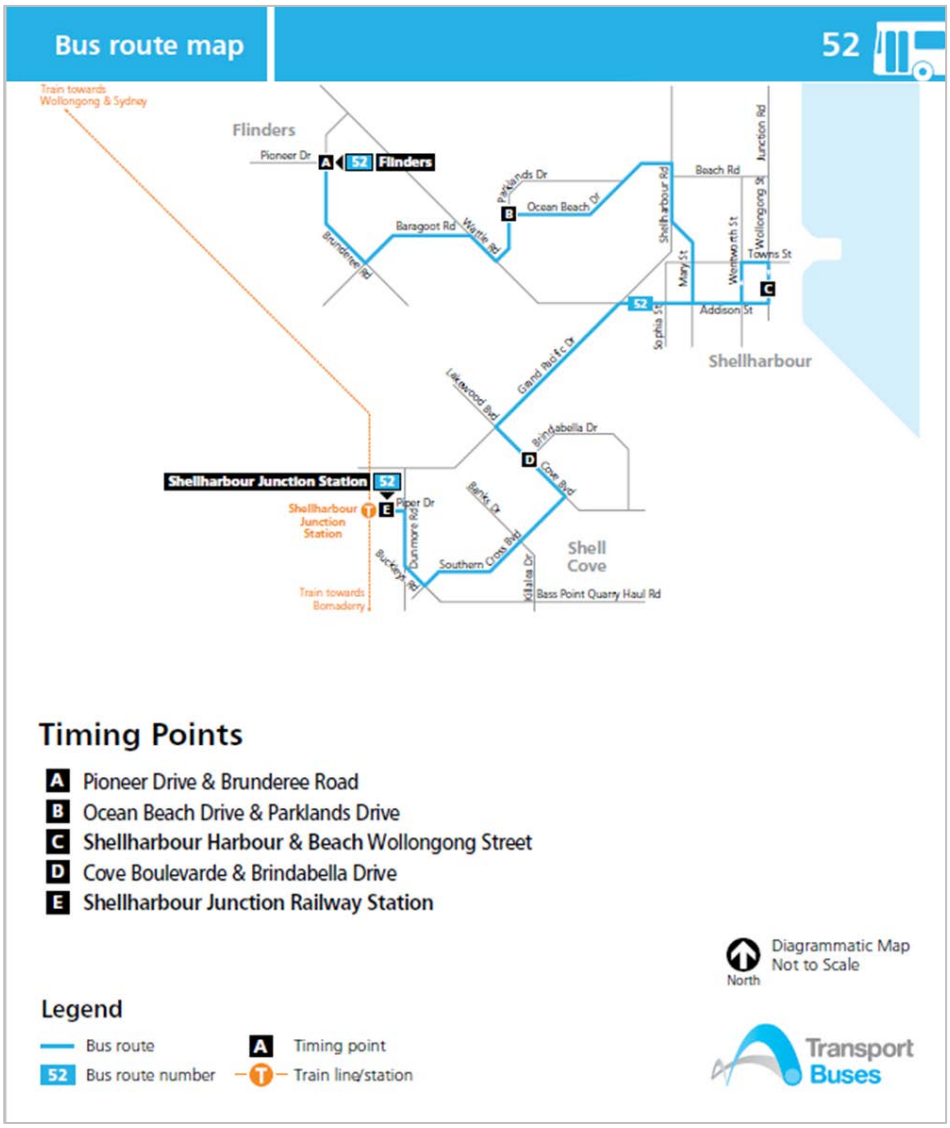


Figure 3-18 Route 52 Bus Route Map (Source: Premier Illawarra Website http://www.premierillawarra.com.au/busmaps.html, retrieved 01/09/2017)

Based on the *Preferred Project Report* (LFA, November 2010), an indicative future bus route is depicted in Figure 3-19 below which would operate as either an extension to one of the existing bus routes or as a new bus route. Based on a 400m “as the crow flies” walking catchment, it is anticipated that all residents within the Proposal would have access to the proposed future bus route along Harbour Boulevard. Although residents have access to the proposed future bus route, it is also suggested that the bus route shall provide connectivity with the Shellharbour Junction train station through the re-routing or extension of the existing Route 52.

Figure 3-19 Indicative Future Bus Routes

3.7.1.2 Trains

The Shellharbour Junction train station is approximately 3km west of the Shell Cove Boat Harbour Precinct and provides connectivity to/from the Sydney CBD via the South Coast Line. The Shellharbour Junction train station was recently upgraded in November 2014 and now includes a “kiss and ride” zone, taxi and bus bays, bike racks and 105 parking spaces. Currently there are 28 services to the Sydney CBD and 29 services from the Sydney CBD on a weekday with services departing every 25-40min in the morning.

3.8 Swept Path and Sight Distance Assessment

A swept path analysis was initially undertaken for a 12.5m Rigid Truck for all intersections within Precinct A. The swept path analysis showed that all intersections provided adequate manoeuvrability for a service vehicle on the provision that no-parking clearance was provided adjacent to the intersection, in accordance with the Figure 5 of the ‘NSW Transport Roads & Traffic Authority Technical Direction – Stopping and Parking Restrictions at Intersections and Crossings’ (dated October

2011). Although the swept path analysis identifies that service vehicles would need to manoeuvre across the centre of the roads at a number of locations, it is not considered a major issue based on the low traffic volumes of the service vehicles anticipated in this area. Vehicle swept path diagrams are provided in Appendix E.

In addition to the service vehicle swept path assessment, a sight distance assessment was also conducted for all proposed intersections. Based on the assessment it was determined that all intersection will provide adequate sight distances and conform with Austroads Guide to road design part 4A: Unsignalised and Signalised Intersections. Sight distance assessment diagrams are provided in Appendix E.

3.8.1.1 Outer Harbour Development

With the introduction of Outer Harbour Development in Precinct A, semi-trailer and articulated trucks are expected to enter the precinct for boat and fuel delivery purposes and to fulfil the operational requirements of the boat maintenance facility. Following truck trips are expected to serve the Outer Harbour Development on weekly basis:

- Fuel deliveries: 19.0m articulated vehicles for premium unleaded petrol (PULP) and diesel are expected twice per week subject to demand
- Boat deliveries: 19.0m semi-trailer trucks are expected twice per week subject to demand
- General deliveries: General deliveries trucks are expected three times per week subject to operational requirements
- Waste collection trucks: Waste collection trucks for garbage, recycling, oil waste, paint waste, etc. are expected four times per week subject to operational requirements

In addition to above truck trips, forklift and marine travel lift are expected in the Outer Harbour Development on occasional basis, however with no expectations of any traffic impact on the road network. Considering these additional truck trips with longer lengths, a swept path analysis was again conducted for a 19.0m Semi-Trailer Truck for all intersections to and from the new development. The swept path analysis showed that all intersections provided adequate manoeuvrability for the service vehicles on the provision that no-parking clearance was provided adjacent to the intersection, in accordance with the Figure 5 of the ‘NSW Transport Roads & Traffic Authority Technical Direction – Stopping and Parking Restrictions at Intersections and Crossings’ (dated October 2011).

4 REVIEW OF PROPOSAL IN CONTEXT OF PART 3A CONSENT CONDITIONS

4.1 Consent Condition Part D16 – Traffic

This Consent Condition states:

"An updated traffic impact assessment prepared by a suitably qualified person for each stage/precinct of the project which includes a cumulative impact assessment having regard to the status of the future construction of the intersection of Harbour Boulevard and Shellharbour Road"

An updated traffic impact assessment has been prepared by Arcadis for Precinct A under the cumulative development scenario which is the operation of all existing and future precincts. Details of the updated traffic impact assessment is provided in Section 3 of this report. It was determined as part of this updated traffic impact assessment that the previously adopted traffic volumes used for SIDRA modelling assessments were 44% lower due to revised yield for the Shell Cove Boat Harbour precinct. Based on the revised traffic volumes it was determined that all intersections would operate satisfactorily with the exception of the Shellharbour Road / Harbour Boulevard / Wattle Road intersection. A proposed mitigation measure for this intersection is provided in Section 3.3.1.

Based on the outcomes of this TIA, Consent Condition Part D16 – Traffic has been generally satisfied.

4.2 Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 1

This Consent Condition states:

"The proponent undertakes to implement a Traffic Management Strategy in relation to the capacity of the road network to cater for additional traffic generation including service vehicles, access to and within the site and connectivity to existing developments – with particular emphasis on the following key intersections:

- *Shellharbour Road / Harbour Boulevard / Wattle Road – revised layout*
- *Addison Street / Harbour Boulevard – new traffic signals*
- *Brigantine Drive / Harbour Boulevard – single lane roundabout*
- *Cove Boulevard / Harbour Boulevard – single lane roundabout*
- *Road A / Harbour Boulevard – single lane roundabout."*

As discussed in Section 3.2, a review of previous traffic generation and SIDRA modelling determined that the revised yield would results in a 36% increase in traffic generation from the residential component and 8% increase in traffic generation from the commercial component of the Shell Cove Boat Harbour Precinct. As a result, previously adopted traffic volumes were adjusted and inputted into SIDRA models for intersection performance assessment. Section 3.3 and 3.8 provide the detailed results of the intersection assessment and the service vehicle swept path assessment, respectively.

Based on the outcomes of this TIA, Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 1 has been generally satisfied.

4.3 Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 2

This Consent Condition states:

"The proponent undertakes to consider the impact of development on existing public transport provisions, identify pedestrian movements and implement appropriate provisions for shared pathway/cycleways/public transportation routes to the existing and proposed road network including pedestrian shared zones in the Town Centre"

The proposed active and public transport provisions for the Proposal have been investigated and reported in Section 3.6 and Section 3.7. It determined that the proposed shared bicycle/pedestrian path (in Figure 3-16) provides adequate connectivity not only within the Proposal but also to the external network. Additionally, the proposed bus route is anticipated to provide adequate services to the residents within the Proposal and will provide connectivity to the nearby Shell Cove town centre and the surrounding areas. It is also recommended that the proposed future bus route provides connectivity with the Shellharbour Junction train station through the re-routing or extension of Route 52.

Based on the outcomes of this TIA, Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 2 has been generally satisfied.

4.4 Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 3

This Consent Condition states:

"The proponent undertakes to incorporate parking in accordance with the requirements as part of subsequent Project Applications"

A review of on-site parking requirements and the provision of on-street parking was undertaken and reported in Section 3.5.

The on-site parking requirements shall be in accordance with Section 13.1 of the Shellharbour City Council – Shellharbour Development Control Plan (SDCP), 2016. For provision of standard residential lots, duplex lots and superlots which consist of medium density residential, the SDCP requires:

- Two spaces per dwelling or dual occupancy with at least one of the spaces enclosed within a garage
- Either one space per one bedroom dwelling or 1.5 spaces per two or more bedroom dwellings and either 0.25 visitor spaces per one bedroom dwelling or 0.5 visitor spaces per two or more bedroom dwellings.

Based on the anticipated yield of the Proposal, approximately 219 resident car parks and 34 visitor car parks will be required in total. In addition to the residential component of the Proposal, the commercial land-use is anticipated to contain approximately 176 car parks for the commercial component, however, this is indicative and will be determined at a later date when a DA is submitted.

The Proposal provides approximately 233 on-street parking spaces and 20 parking bays, which is considered adequate for on-street parking for medium density or apartment sites.

Based on the outcomes of this TIA, Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 3 has been generally satisfied.

4.5 Assessment of Proposed Subdivisional Plan Against the Part 3A Consent

Based on the outcomes of this TIA, Part 3A Consent has been generally satisfied with no items being inconsistent with the Part 3A Consent.

5 CONCLUSION AND RECOMMENDATIONS

Frasers Property Australia (Frasers Property) is currently preparing a Subdivision Development Application (DA) for Precinct A (the Proposal) of the Shell Cove Boat Harbour Precinct, which is located in the eastern part of the Shellharbour area in New South Wales. This application builds on the cumulative development and works planned for the entire Shell Cove Boat Harbour Precinct. The purpose of this traffic impact assessment (TIA) was to identify the potential traffic influence of the Proposal on the local road network and support the Subdivision DA for Precinct A of the Shell Cove Boat Harbour Precinct.
The Proposal will consist of 58 standard residential lots and six residential super-lots which have the following development yields:

- 55 land lots
- 3 duplex's
- 59 medium density lots
- 13 studios

In addition to the residential component of the Proposal, the precinct has now been extended to contain the Outer Harbour development, consisting of boat maintenance and dry boating facility.

Traffic Generation

A daily traffic generation comparison was made between the traffic generation under the current 2013 RMS trip generation rates and the traffic generation adopted in the MAUNSELL-AECOM traffic study. Based on the comparison there is an anticipated 36% increase in daily traffic generation from the residential component and a 8% increase in the commercial/retail component of the Shell Cove Boat Harbour Precinct. Based on the revised yield for each of the precincts it was determined that traffic generated from Precincts A, B and C would increase by 23%, Precinct D by 5% and Precincts E, F, G and H by 16%. The overall 44% increase was distributed accordingly between each of the zones.

Intersection Assessment

To determine the potential impacts of the Shell Cove development, SIDRA analysis was undertaken for the opening year 2018 and assessed the intersection performance under the cumulative development scenario (all precincts are developed), based on the updated intersection volumes for the following locations:

a. Shellharbour Road / Harbour Boulevard / Wattle Road signalised intersection
b. Addison Street / Harbour Boulevard signalised intersection
c. Brigantine Drive / Harbour Boulevard roundabout intersection
d. Cove Boulevard / Harbour Boulevard roundabout intersection
e. Road A / Harbour Boulevard roundabout intersection
f. Road B / Harbour Boulevard priority controlled intersection
g. Road C / Harbour Boulevard priority controlled intersection
h. Boat Ramp Access Road / Business Park Access Road / Harbour Boulevard roundabout
i. Road D / Harbour Boulevard priority controlled intersection

Based on the SIDRA modelling results, the Shellharbour Road / Harbour Boulevard / Wattle Road intersection would not operate satisfactorily in either the AM or PM peak

period, however, the proposed mitigation measure for this intersection resulted in the Shellharbour Road / Harbour Boulevard / Wattle Road intersection to operate satisfactorily in both the AM and PM peak periods. All remaining assessed intersections are anticipated to operate at acceptable level-of-service.

Parking Requirements

Based on the SCC parking requirements and the anticipated yield of the Proposal an approximate total of 219 resident car parks and 34 visitor car parks would be required for on-site parking spaces. The proposed provision of approximately 233 on-street parking spaces and 20 parking bays, it is anticipated that should the on-site parking provision for medium density or apartment sites be exceeded either due to higher car ownership for residents or large numbers of visitors, there would be adequate on-street parking. In addition to the residential component of the Proposal, the commercial land-use is anticipated to contain approximately 176 car parks.

Active Transport

For Precinct A, the shared pathway plan proposes that the shared path will be provided along the Shell Cove harbour and extends to Bass Point Tourist Road in the east. It then continues south along the eastern side of Bass Point Tourist Road and then continues to the west along the southern side of Harbour Boulevard. The proposed shared paths have been designed in accordance with *Shellharbour Local Government Area Shared Use Path Strategy 2010*.

Public Transport

Currently there are two forms of public transport available within close proximity of the proposed Shell Cove Boat Harbour Precinct, with these being the bus routes serviced by Premier Buses and the South Coast Line trains operating through the Shellharbour Junction station.
Based on a 400m “as the crow flies” walking catchment, it is anticipated that all residents within the Proposal would have access to the proposed future bus route along Harbour Boulevard. Although residents have access to the proposed future bus route, it is also suggested that the bus route shall provide connectivity with the Shellharbour Junction train station through the re-routing or extension of the existing Route 52. Currently there are 28 train services to the Sydney CBD and 29 train services from the Sydney CBD on a weekday with services departing every 25-40min in the morning.

Swept Path and Sight Distance Assessment

Two sets of swept path analyses have been undertaken for a 12.5m Rigid Truck and 19.0m Semi-Trailer Truck for all intersections within Precinct A. The swept path analysis shows that all intersections provide adequate manoeuvrability for a service vehicle on the provision that no-parking clearance is provided adjacent to the intersection, in accordance with the Figure 5 of the ‘NSW Transport Roads & Traffic Authority Technical Direction – Stopping and Parking Restrictions at Intersections and Crossings’ (dated October 2011). Additionally, a sight distance assessment was also conducted for all proposed intersections. Based on the assessment it was determined that all intersection will provide adequate sight distances and conform with Austroads Guide to road design part 4A: Unsignalised and Signalised Intersections.

Consent Conditions

Consent Condition Part D16 – Traffic states:

"An updated traffic impact assessment prepared by a suitably qualified person for each stage/precinct of the project which includes a cumulative impact assessment having regard to the status of the future construction of the intersection of Harbour Boulevard and Shellharbour Road"

An updated traffic impact assessment has been prepared by Arcadis for Precinct A under the cumulative development scenario which is the operation of all existing and future precincts. Details of the updated traffic impact assessment is provided in Section 3 of this report. It was determined as part of this updated traffic impact assessment that the previously adopted traffic volumes used for SIDRA modelling assessments were 44% lower due to revised yield for the Shell Cove Boat Harbour precinct. Based on the revised traffic volumes it was determined that all intersections would operate satisfactorily with the exception of the Shellharbour Road / Harbour Boulevard / Wattle Road intersection. A proposed mitigation measure for this intersection is provided in Section 3.3.1.

Based on the outcomes of this TIA, Consent Condition Part D16 – Traffic has been generally satisfied.

Consent Condition Schedule 4 – Statement of Commitment 4.6 Point 1 states:

"The proponent undertakes to implement a Traffic Management Strategy in relation to the capacity of the road network to cater for additional traffic generation including service vehicles, access to and within the site and connectivity to existing developments – with particular emphasis on the following key intersection;

a. Shellharbour Road / Harbour Boulevard / Wattle Road – revised layout
b. Addison Street / Harbour Boulevard – new traffic signals
c. Brigantine Drive / Harbour Boulevard – single lane roundabout
d. Cove Boulevard / Harbour Boulevard – single lane roundabout
e. Road A / Harbour Boulevard – single lane roundabout."

A review of previous traffic generation and SIDRA modelling determined that the revised yield would results in a 36% increase in traffic generation from the residential component and 8% increase in traffic generation from the commercial component of the Shell Cove Boat Harbour Precinct. As a result, previously adopted traffic volumes were adjusted and inputted into SIDRA models for intersection performance assessment.

Based on the outcomes of this TIA, Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 1 has been generally satisfied.

This Consent Condition Schedule 4 – Statement of Commitment 4.6 Point 2 states:

"The proponent undertakes to consider the impact of development on existing public transport provisions, identify pedestrian movements and implement appropriate provisions for shared pathway/cycleways/public transportation routes to the existing and proposed road network including pedestrian shared zones in the Town Centre"

It determined that the proposed shared bicycle/pedestrian path provides adequate connectivity not only within the Proposal but also to the external network. Additionally, the proposed bus route is anticipated to provide adequate services to the residents within the Proposal and will provide connectivity to the nearby Shell Cove town centre

and the surrounding areas. It is also recommended that the proposed future bus route provides connectivity with the Shellharbour Junction train station through the re-routing or extension of Route 52.

Based on the outcomes of this TIA, Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 2 has been generally satisfied.

Consent Condition Schedule 4 – Statement of Commitment 4.6 Point 3 states:

"The proponent undertakes to incorporate parking in accordance with the requirements as part of subsequent Project Applications"

A review of on-site parking requirements and the provision of on-street parking was undertaken. The on-site parking requirements shall be in accordance with Section 13.1 of the Shellharbour City Councils – Shellharbour Development Control Plan (SDCP), 2016. For provision of standard residential lots, duplex lots and superlots which consist of medium density residential, the SDCP requires:

- Two spaces per dwelling or dual occupancy with at least one of the spaces enclosed within a garage
- Either one space per one bedroom dwelling or 1.5 spaces per two or more bedroom dwellings and either 0.25 visitor spaces per one bedroom dwelling or 0.5 visitor spaces per two or more bedroom dwellings.

Based on the anticipated yield of the Proposal, approximately 219 resident car parks and 34 visitor car parks will be required in total. In addition to the residential component of the Proposal, the commercial land-use is anticipated to contain approximately 176 car parks for the commercial component, however, this is indicative and will be determined at a later date when a DA is submitted.

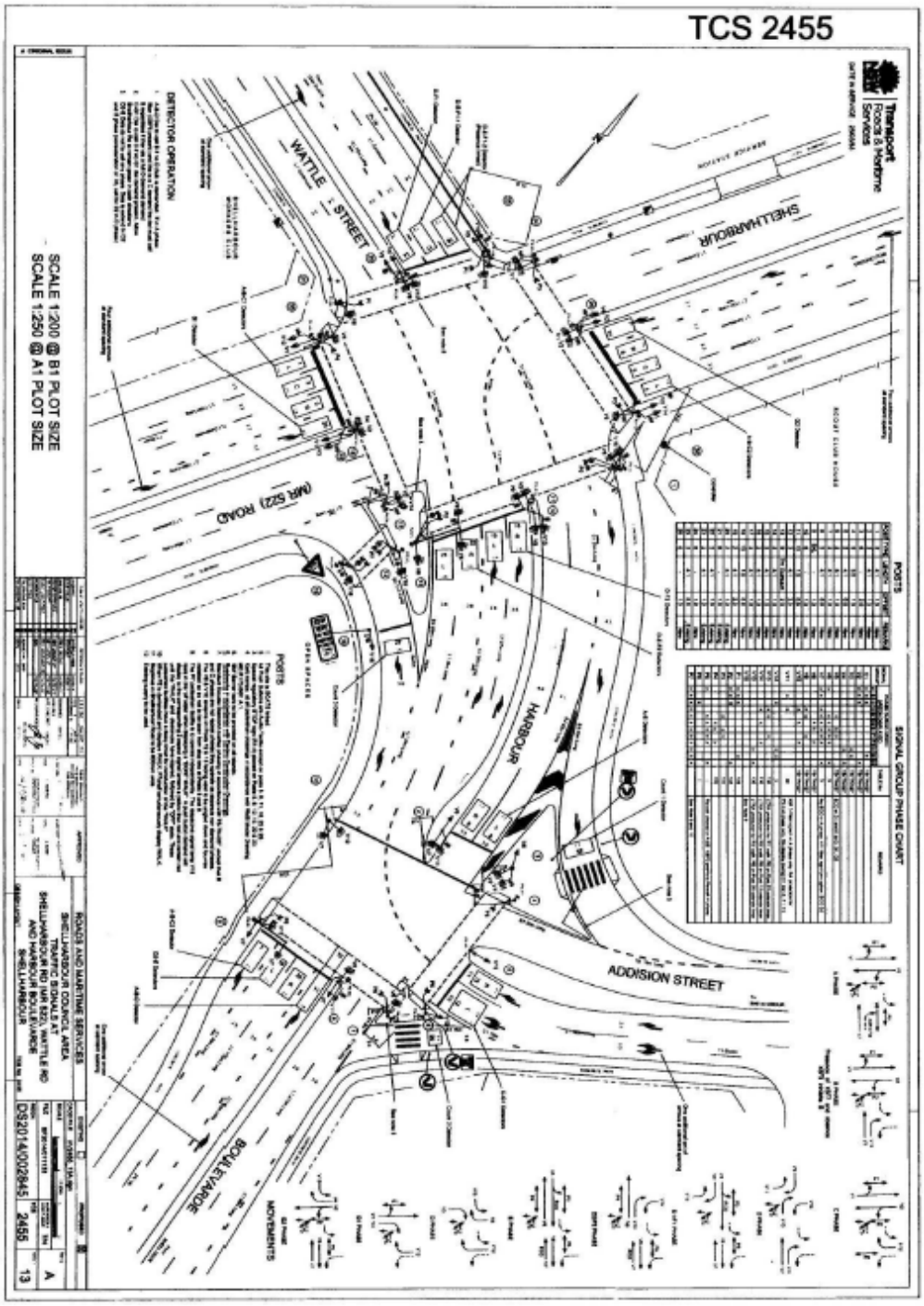
The Proposal provides approximately 233 on-street parking spaces and 20 parking bays, which is considered adequate for on-street parking for medium density or apartment sites.

Based on the outcomes of this TIA, Consent Conditions Schedule 4 – Statement of Commitment 4.6 Point 3 has been generally satisfied.

Assessment of Proposed Subdivisional Plan Against the Part 3A Consent

Based on the outcomes of this TIA, Part 3A Consent has been generally satisfied with no items being inconsistent with the Part 3A Consent.

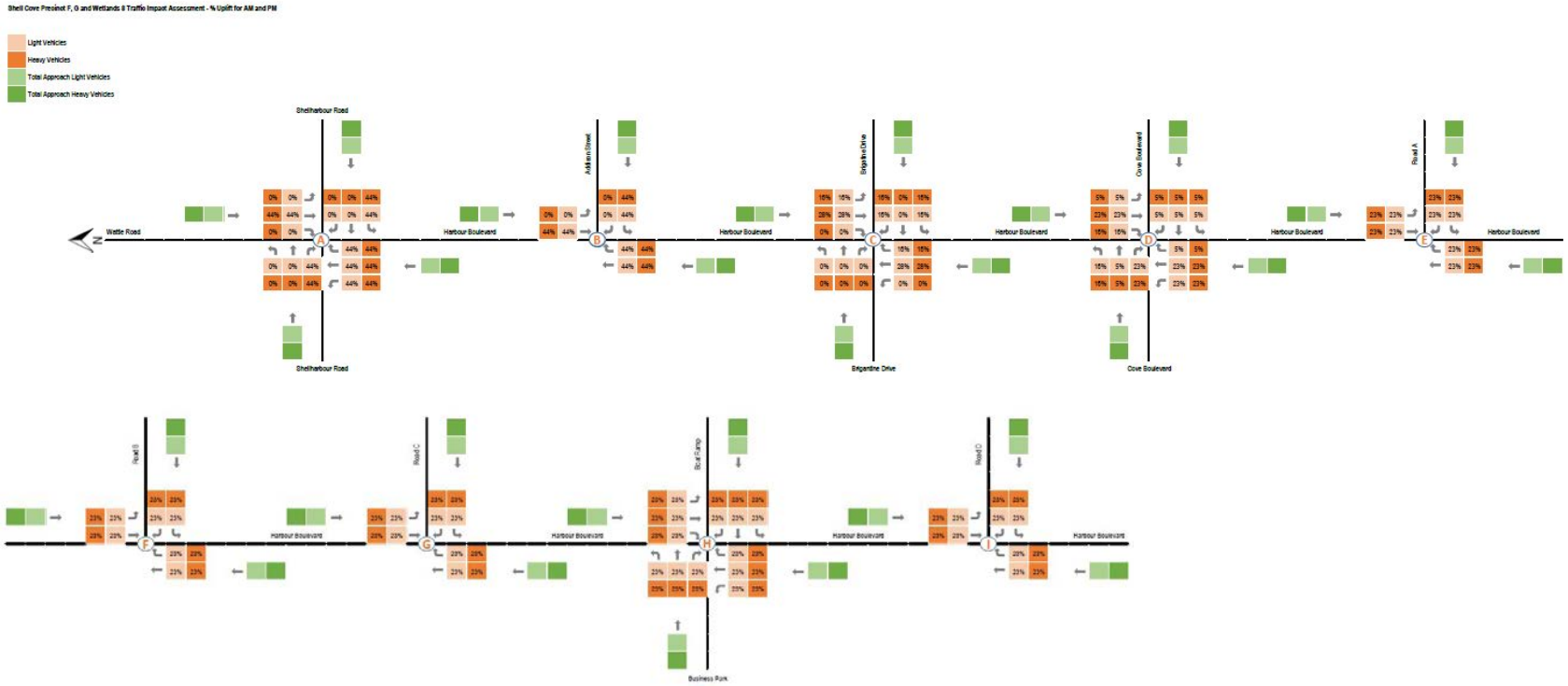
APPENDIX A – RMS TCS PLAN (TCS 2455)



Source from '*Shell Cove Boat Harbour Precinct: Precinct E, Wetland 6, Wetland 7 and the Northern Lands Traffic Impact Assessment, dated 7 March 2017*'

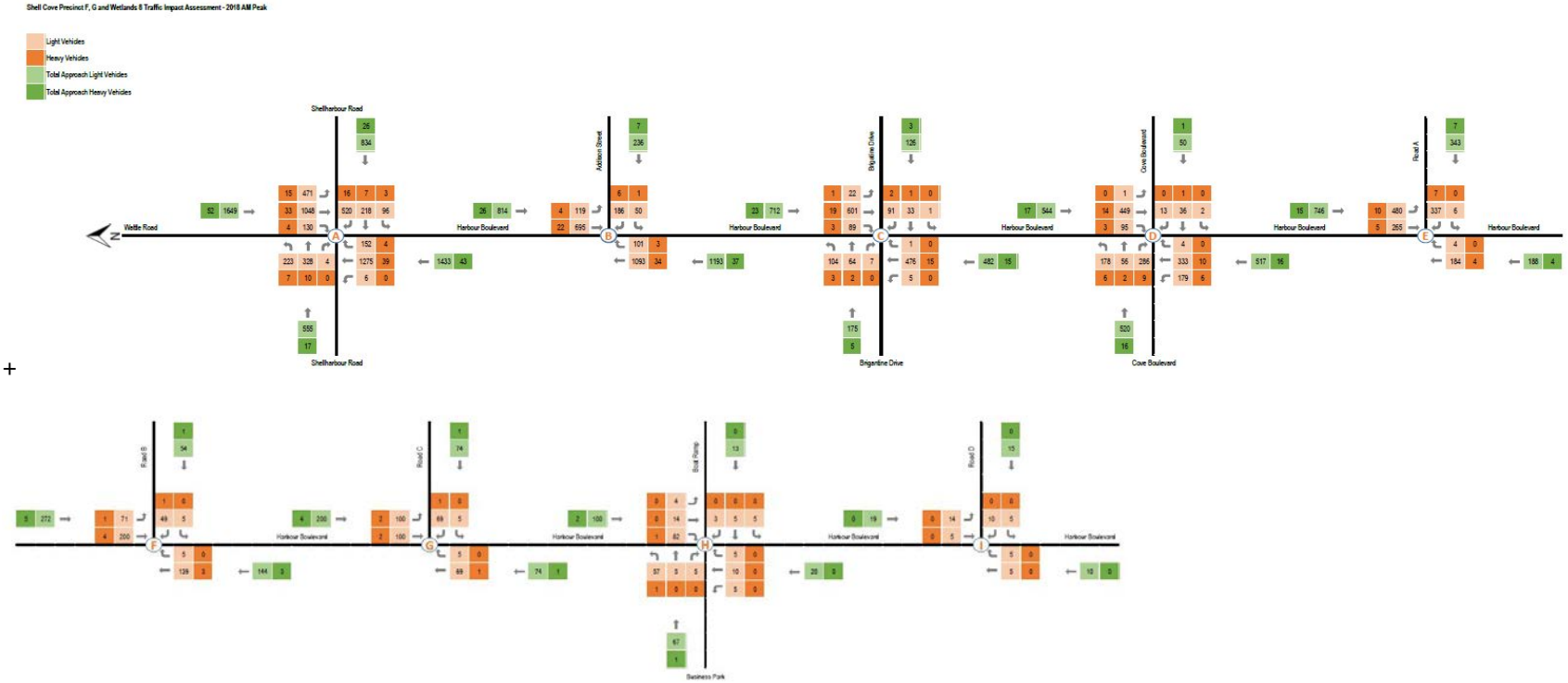
APPENDIX B – PERCENTAGE INCREASES IN TRAFFIC VOLUMES

Shell Cove – Precinct A



APPENDIX C – TURN MOVEMENT DIAGRAMS

Shell Cove – Precinct A



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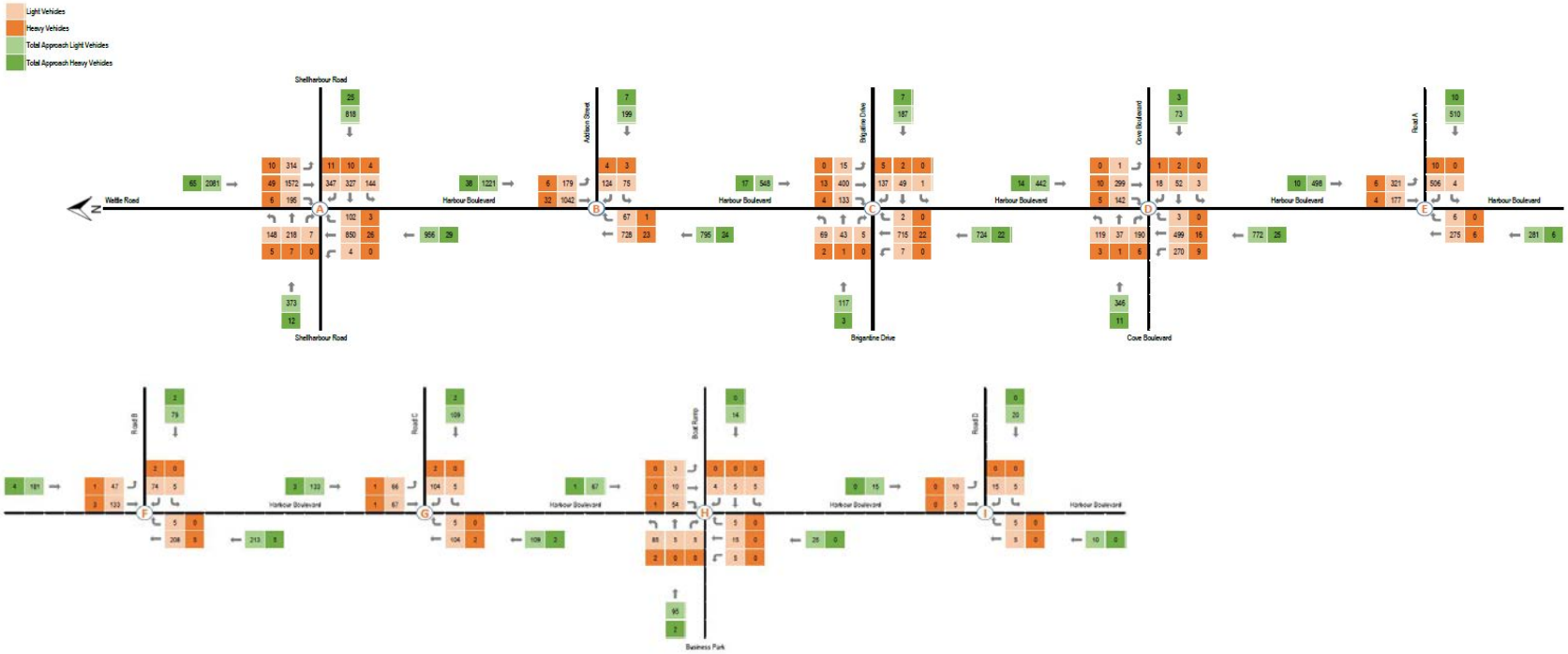
Shell Cove Precinct F, G and Wetlands 8 Traffic Impact Assessment - 2018 PM Peak



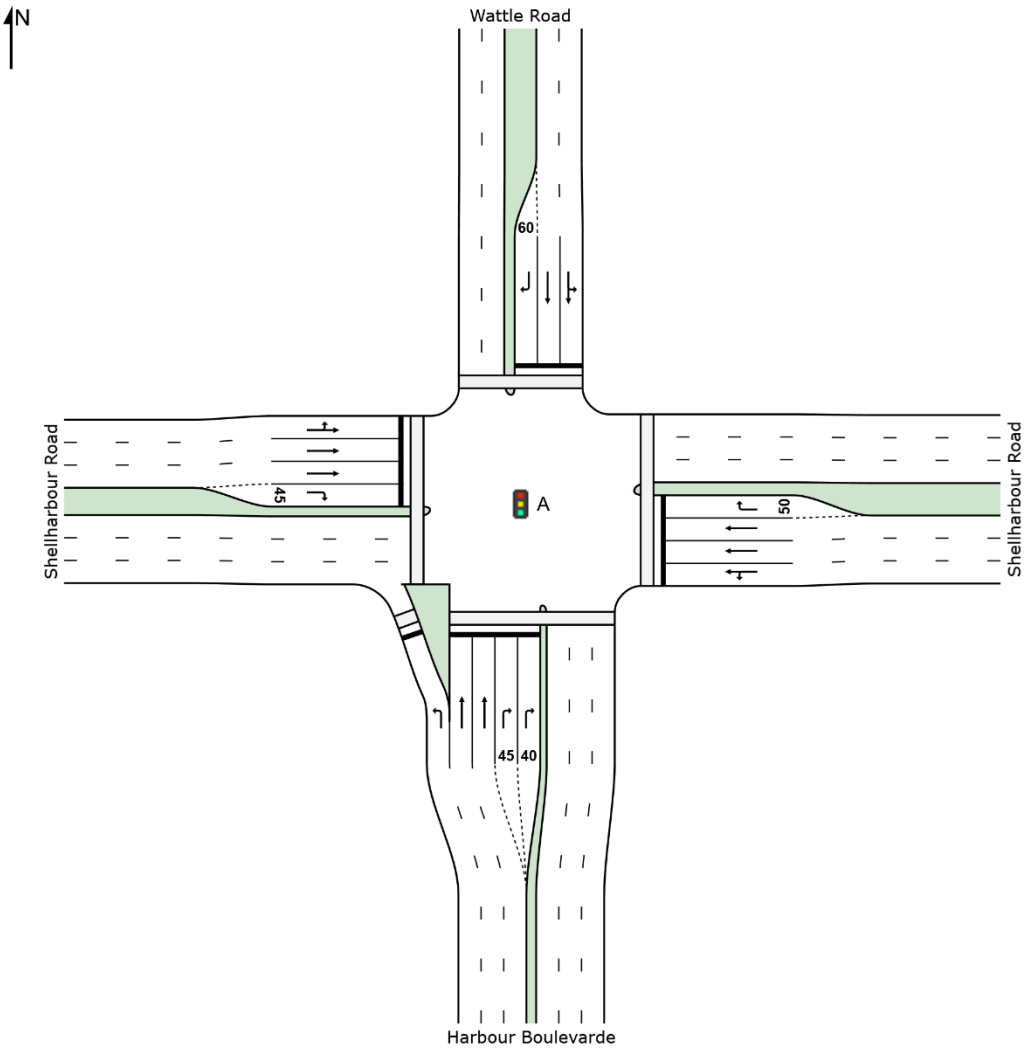
APPENDIX D – DETAILED SIDRA OUTPUTS

Without Mitigation

SITE LAYOUT

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 AM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 AM Peak]

Network: N101 [2018 AM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Cycle Time - Program)
Common Control Group: CCG1 [TCS2455]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	6	0.0	6	0.0	0.005	7.2	LOS A	0.1	0.4	0.25	0.57	48.7
2	T1	1383	3.0	1383	3.0	1.689	664.3	LOS F	11.4	81.6	1.00	2.82	2.9
3	R2	164	2.6	164	2.6	0.955	100.8	LOS F	7.1	50.7	1.00	0.97	15.2
Approach		1554	2.9	1554	2.9	1.689	602.1	LOS F	11.4	81.6	1.00	2.61	3.2
East: Shellharbour Road													
4	L2	104	3.0	104	3.0	0.206	45.0	LOS D	6.2	44.6	0.77	0.74	24.7
5	T1	237	3.1	237	3.1	0.206	43.6	LOS D	6.2	44.6	0.80	0.66	35.1
6	R2	564	3.0	564	3.0	1.539	552.9	LOS F	127.4	914.3	1.00	1.91	5.8
Approach		905	3.0	905	3.0	1.539	361.2	LOS F	127.4	914.3	0.92	1.45	8.0
North: Wattle Road													
7	L2	512	3.1	512	3.1	1.559	569.1	LOS F	197.2	1416.7	1.00	2.22	5.7
8	T1	1138	3.1	1138	3.1	1.559	563.9	LOS F	197.2	1416.7	1.00	2.57	3.1
9	R2	141	3.0	141	3.0	0.960	82.3	LOS F	9.3	67.0	1.00	1.04	25.4
Approach		1791	3.1	1791	3.1	1.559	527.5	LOS F	197.2	1416.7	1.00	2.35	4.3
West: Shellharbour Road													
10	L2	242	3.0	242	3.0	0.353	26.8	LOS C	7.3	52.7	0.76	0.79	40.8
11	T1	356	3.0	356	3.0	0.329	45.7	LOS D	10.2	73.4	0.84	0.70	34.5
12	R2	4	0.0	4	0.0	0.010	53.7	LOS D	0.2	1.6	0.80	0.64	22.3
Approach		602	3.0	602	3.0	0.353	38.1	LOS D	10.2	73.4	0.81	0.73	36.7
All Vehicles		4852	3.0	4852	3.0	1.689	459.6	LOS F	197.2	1416.7	0.96	2.07	5.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 72.6 %
Number of Iterations: 20 (maximum specified: 20)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	54.7	LOS E	0.2	0.2	0.86	0.86
P1S	South Slip/Bypass Lane Crossing	53	14.1	LOS B	0.1	0.1	0.61	0.61
P2	East Full Crossing	53	53.9	LOS E	0.2	0.2	0.85	0.85
P3	North Full Crossing	53	50.5	LOS E	0.2	0.2	0.82	0.82
P4	West Full Crossing	53	63.6	LOS F	0.2	0.2	0.92	0.92
All Pedestrians		263	47.4	LOS E			0.81	0.81

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.

PHASING SUMMARY

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 AM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

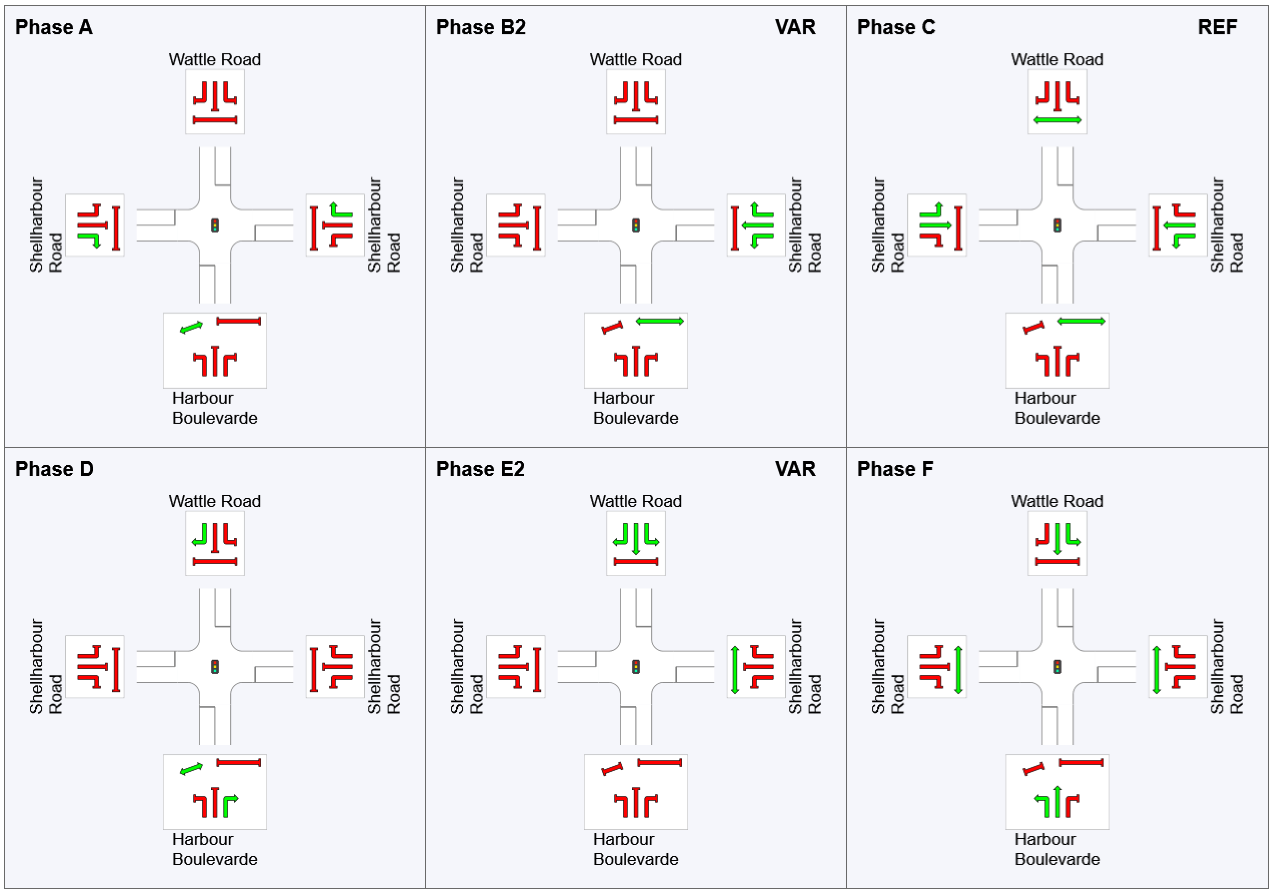
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase C
Input Phase Sequence: A, B1*, B2*, C, D, E1*, E2*, F
Output Phase Sequence: A, B2*, C, D, E2*, F
(* Variable Phase)

Phase Timing Results

Phase	A	B2	C	D	E2	F
Phase Change Time (sec)	101	124	0	25	37	42
Green Time (sec)	17	20	19	6	***	53
Phase Time (sec)	23	26	25	12	5	59
Phase Split	15%	17%	17%	8%	3%	39%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

*** No green time has been calculated for this phase because the next phase starts during its intergreen time. This occurs with overlap phasing where there is no single movement connecting this phase to the next, or where the only such movement is a dummy movement with zero minimum green time specified.
If a green time is required for this phase, specify a dummy movement with a non-zero minimum green time.

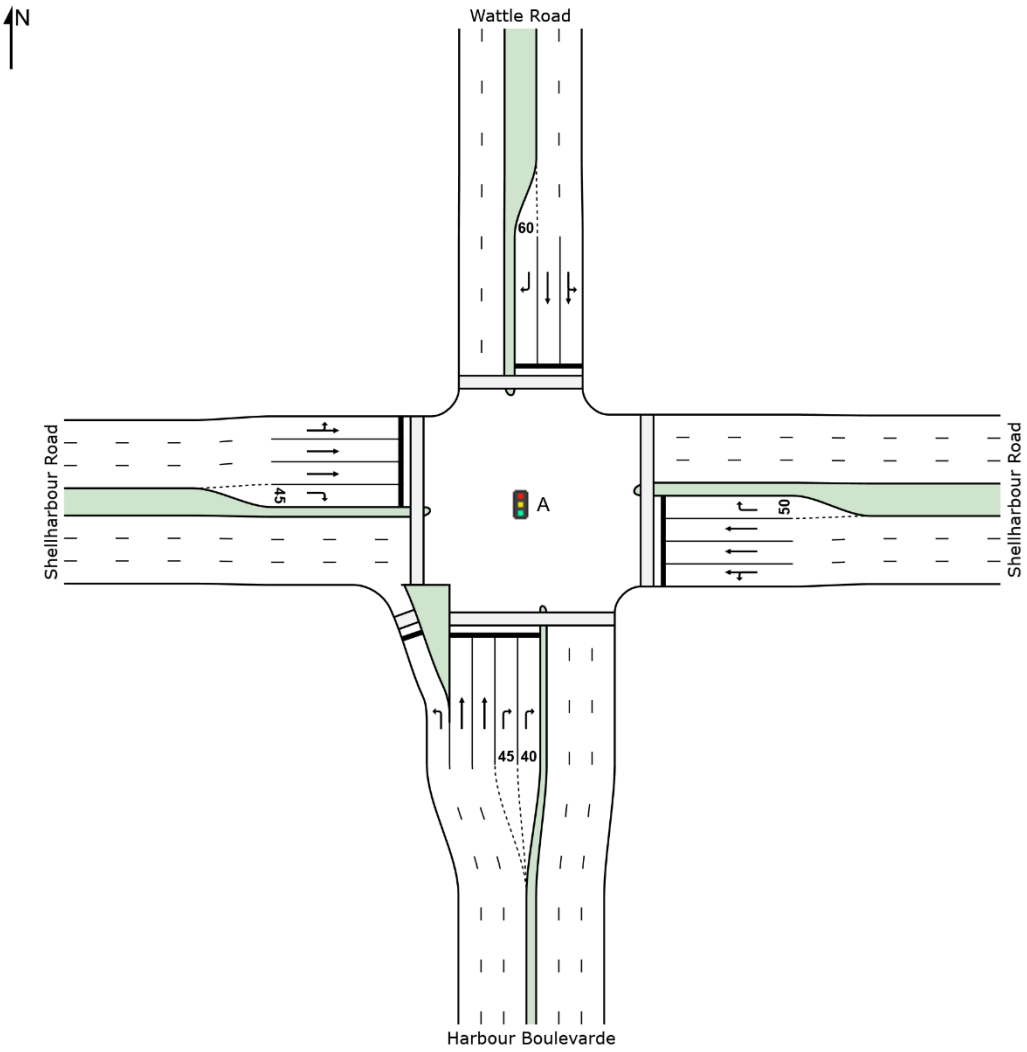


REF: Reference Phase
VAR: Variable Phase

SITE LAYOUT

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 PM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 PM Peak]

Network: N101 [2018 PM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Cycle Time - Program)
Common Control Group: CCG1 [TCS2455]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	4	0.0	4	0.0	0.003	8.1	LOS A	0.1	0.4	0.36	0.58	47.6
2	T1	876	3.0	876	3.0	0.909	72.4	LOS E	11.4	81.6	1.00	1.05	19.4
3	R2	105	2.9	105	2.9	0.714	87.6	LOS F	4.1	29.7	1.00	0.80	16.8
Approach		985	2.9	985	2.9	0.909	73.7	LOS E	11.4	81.6	1.00	1.02	19.2
East: Shellharbour Road													
4	L2	148	2.7	148	2.7	0.294	47.0	LOS D	9.2	65.6	0.80	0.77	24.1
5	T1	337	3.0	337	3.0	0.294	44.9	LOS D	9.2	65.6	0.83	0.69	34.7
6	R2	358	3.1	358	3.1	1.309	355.9	LOS F	64.6	463.9	1.00	1.61	8.5
Approach		843	3.0	843	3.0	1.309	177.4	LOS F	64.6	463.9	0.90	1.09	14.0
North: Wattle Road													
7	L2	324	3.1	324	3.1	1.581	587.6	LOS F	240.4	1726.6	1.00	2.50	5.5
8	T1	1621	3.0	1621	3.0	1.581	582.6	LOS F	240.4	1726.6	1.00	2.65	3.0
9	R2	201	3.0	201	3.0	1.262	286.3	LOS F	28.1	201.8	1.00	1.40	9.3
Approach		2146	3.0	2146	3.0	1.581	555.6	LOS F	240.4	1726.6	1.00	2.51	3.8
West: Shellharbour Road													
10	L2	153	3.3	153	3.3	0.220	23.4	LOS C	4.5	32.4	0.71	0.74	42.4
11	T1	225	3.1	225	3.1	0.208	43.9	LOS D	6.2	44.7	0.81	0.65	35.1
12	R2	7	0.0	7	0.0	0.022	60.3	LOS E	0.4	2.9	0.85	0.66	20.7
Approach		385	3.1	385	3.1	0.220	36.1	LOS D	6.2	44.7	0.77	0.69	37.4
All Vehicles		4359	3.0	4359	3.0	1.581	327.7	LOS F	240.4	1726.6	0.96	1.74	6.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.6 %
Number of Iterations: 19 (maximum specified: 20)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	54.7	LOS E	0.2	0.2	0.86	0.86
P1S	South Slip/Bypass Lane Crossing	53	14.4	LOS B	0.1	0.1	0.61	0.61
P2	East Full Crossing	53	47.3	LOS E	0.2	0.2	0.80	0.80
P3	North Full Crossing	53	50.5	LOS E	0.2	0.2	0.82	0.82
P4	West Full Crossing	53	58.2	LOS E	0.2	0.2	0.88	0.88
All Pedestrians		263	45.0	LOS E			0.79	0.79

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.

PHASE SEQUENCE

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 PM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Isolated
Sequence: Variable Phasing
Reference Phase: Phase C
Movement Class: All Movement Classes

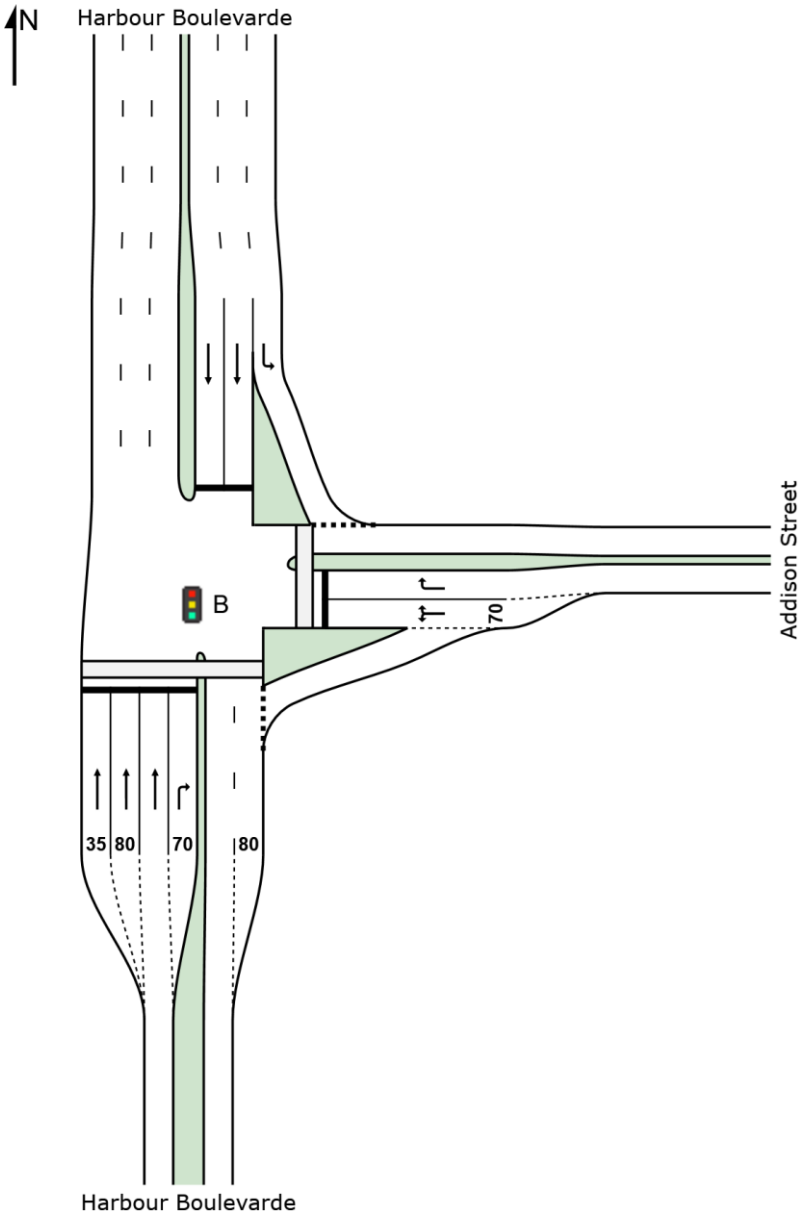
REF: Reference Phase
VAR: Variable Phase

Normal Movement Permitted/Opposed

SITE LAYOUT

Site: B [Addison Street / Harbour Boulevarde_2018 AM Peak]

Addison Street / Harbour Boulevarde
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: B [Addison Street / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Addison Street / Harbour Boulevarde
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Cycle Time - Program)
Common Control Group: CCG1 [TCS2455]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
2	T1	1127	3.0	1127	3.0	0.726	20.0	LOS C	13.2	94.6	0.80	0.73	34.2
3	R2	104	2.9	104	2.9	0.602	51.4	LOS D	5.9	42.6	1.00	0.80	31.0
Approach		1231	3.0	1231	3.0	0.726	22.7	LOS C	13.2	94.6	0.81	0.73	33.7
East: Addison Street													
4	L2	51	2.0	51	2.0	0.336	26.6	LOS C	5.1	36.3	0.74	0.76	32.4
6	R2	192	3.1	192	3.1	0.336	27.9	LOS C	5.1	36.3	0.76	0.76	31.6
Approach		243	2.9	243	2.9	0.336	27.7	LOS C	5.1	36.3	0.76	0.76	31.8
North: Harbour Boulevarde													
7	L2	123	3.3	83	3.2	0.061	4.4	LOS A	0.2	1.4	0.05	0.54	51.8
8	T1	717	3.1	482	3.1	0.424	4.9	LOS A	2.9	20.7	0.26	0.22	26.4
Approach		840	3.1	565 N1	3.1	0.424	4.8	LOS A	2.9	20.7	0.23	0.26	37.6
All Vehicles		2314	3.0	2039 N1	3.4	0.726	18.3	LOS B	13.2	94.6	0.64	0.61	33.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 72.6 %
Number of Iterations: 20 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	19.8	LOS B	0.1	0.1	0.73	0.73
All Pedestrians		105	44.6	LOS E			0.85	0.85

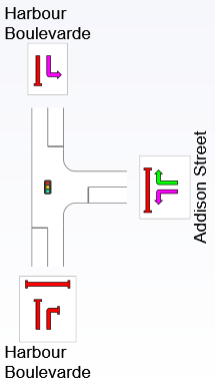
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASE SEQUENCE

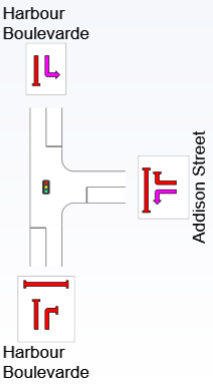
Site: B [Addison Street / Harbour Boulevarde_2018 AM Peak]

Addison Street / Harbour Boulevarde
Signals - Fixed Time Isolated
Sequence: Variable Phasing
Reference Phase: Phase C
Movement Class: All Movement Classes

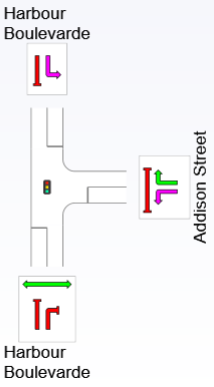
Phase A



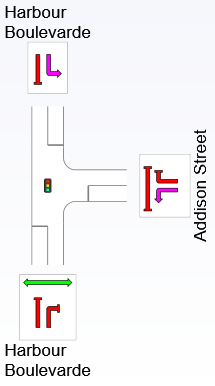
Phase B1 VAR



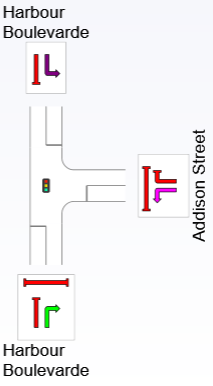
Phase B2 VAR



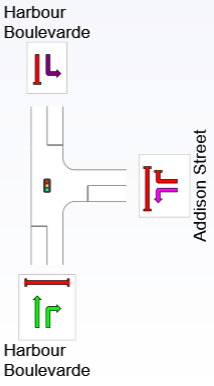
Phase C REF



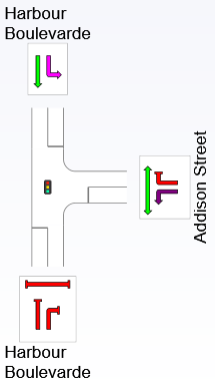
Phase D



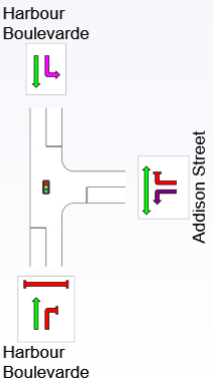
Phase E1 VAR



Phase E2 VAR

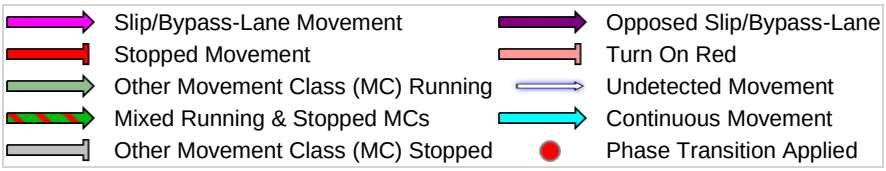


Phase F



REF: Reference Phase
VAR: Variable Phase

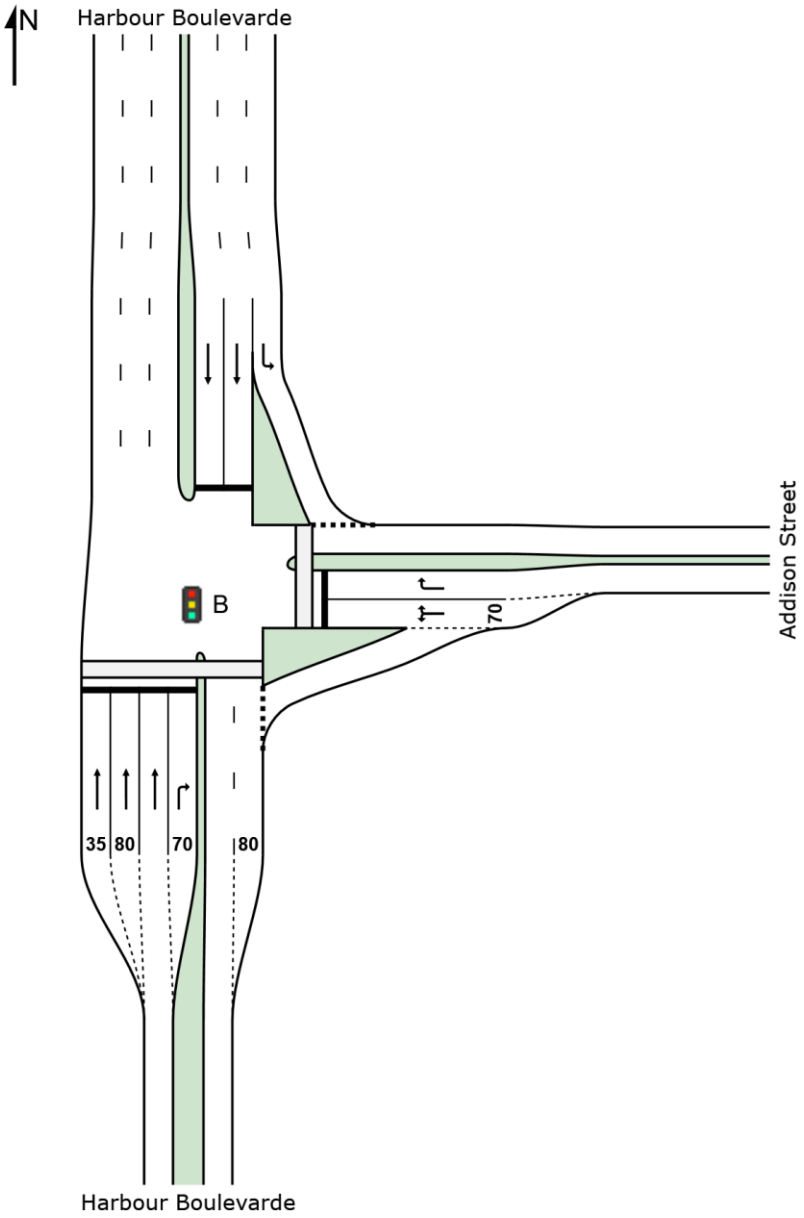
Normal Movement Permitted/Opposed



SITE LAYOUT

Site: B [Addison Street / Harbour Boulevarde_2018 PM Peak]

Addison Street / Harbour Boulevarde
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: B [Addison Street / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Addison Street / Harbour Boulevarde
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Cycle Time - Program)
Common Control Group: CCG1 [TCS2455]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
2	T1	751	3.1	751	3.1	0.365	11.3	LOS B	8.9	64.3	0.62	0.53	42.1
3	R2	68	1.5	68	1.5	0.420	50.9	LOS D	3.8	27.0	0.97	0.77	31.2
Approach		819	2.9	819	2.9	0.420	14.6	LOS B	8.9	64.3	0.65	0.55	39.8
East: Addison Street													
4	L2	78	3.8	78	3.8	0.288	26.4	LOS C	4.8	34.5	0.72	0.75	32.6
6	R2	128	3.1	128	3.1	0.288	30.3	LOS C	4.8	34.5	0.77	0.76	30.4
Approach		206	3.4	206	3.4	0.288	28.8	LOS C	4.8	34.5	0.75	0.76	31.2
North: Harbour Boulevarde													
7	L2	185	3.2	123	3.2	0.087	4.6	LOS A	0.5	3.4	0.08	0.55	51.6
8	T1	1074	3.0	714	3.0	0.563	4.7	LOS A	4.7	33.7	0.29	0.25	27.0
Approach		1259	3.0	837 N1	3.0	0.563	4.7	LOS A	4.7	33.7	0.26	0.29	38.0
All Vehicles		2284	3.0	1862 N1	3.7	0.563	11.7	LOS B	8.9	64.3	0.48	0.46	37.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.6 %
Number of Iterations: 19 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	17.4	LOS B	0.1	0.1	0.68	0.68
All Pedestrians		105	43.4	LOS E			0.82	0.82

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.

PHASING SUMMARY

Site: B [Addison Street / Harbour Boulevarde_2018 PM Peak]

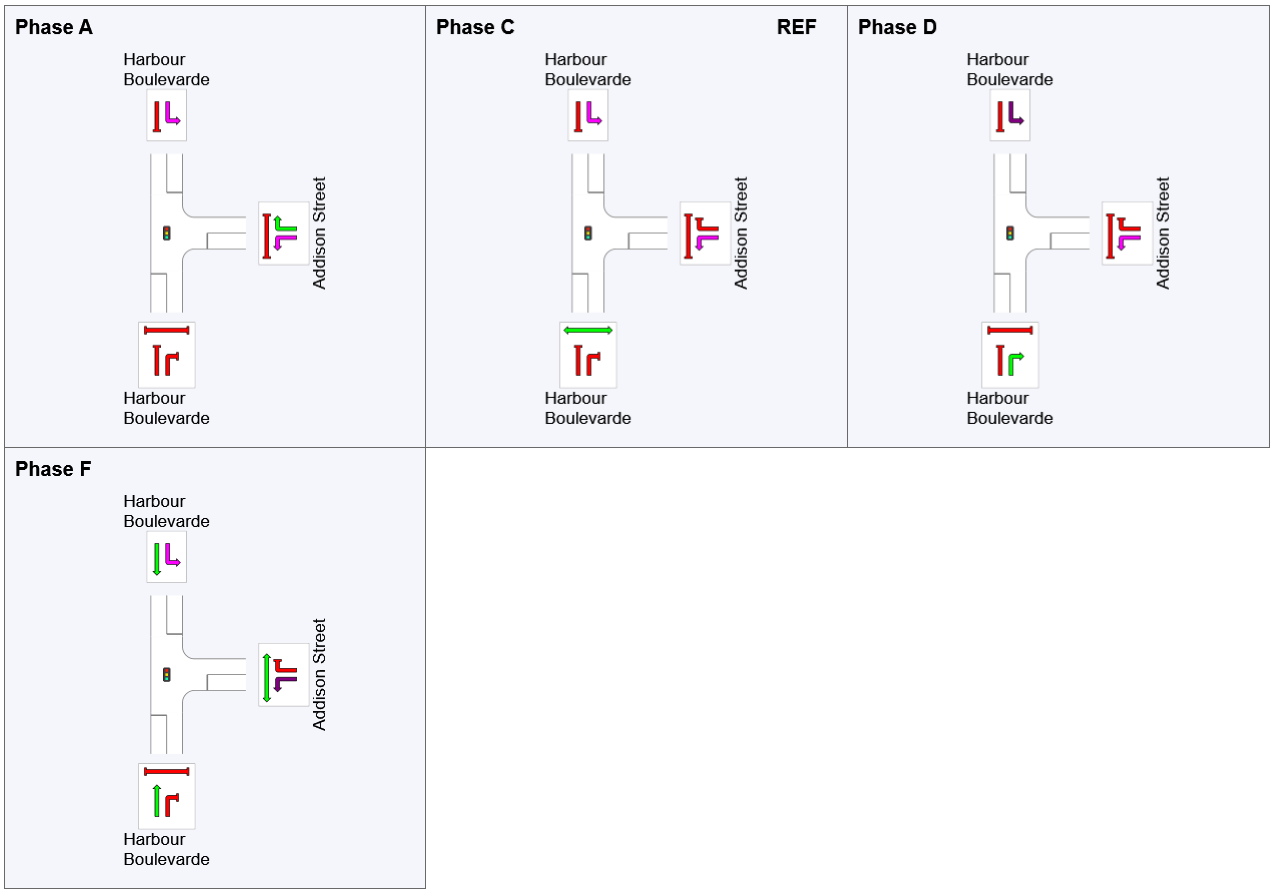
Addison Street / Harbour Boulevarde
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase C
Input Phase Sequence: A, B1*, B2*, C, D, E1*, E2*, F
Output Phase Sequence: A, C, D, F
(* Variable Phase)

Phase Timing Results

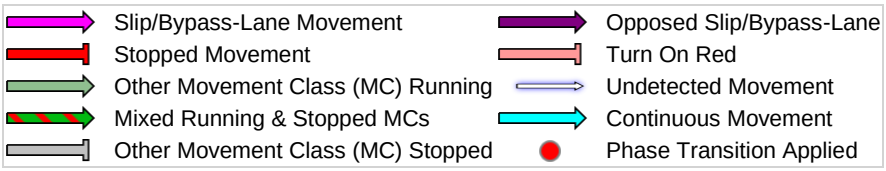
Phase	A	C	D	F
Phase Change Time (sec)	78	0	21	33
Green Time (sec)	6	16	6	39
Phase Time (sec)	11	22	12	45
Phase Split	12%	24%	13%	50%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.



REF: Reference Phase
VAR: Variable Phase

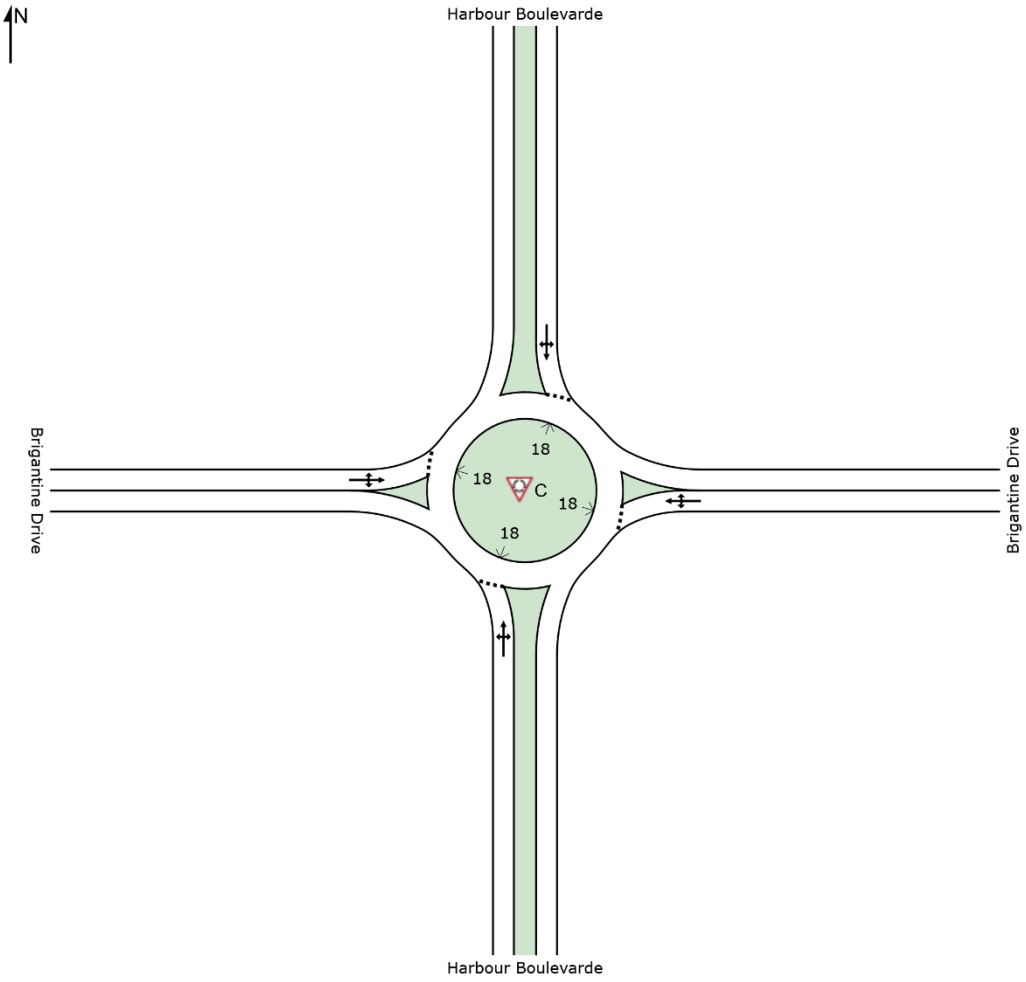
Normal Movement Permitted/Opposed



SITE LAYOUT

Site: C [Brigantine Drive / Harbour Boulevarde_2018 AM Peak]

Brigantine Drive / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: C [Brigantine Drive / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Brigantine Drive / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	5	0.0	5	0.0	0.459	5.6	LOS A	3.7	26.6	0.57	0.57	35.4
2	T1	517	3.1	517	3.1	0.459	5.9	LOS A	3.7	26.6	0.57	0.57	44.3
3	R2	1	0.0	1	0.0	0.459	10.2	LOS B	3.7	26.6	0.57	0.57	52.6
Approach		523	3.0	523	3.0	0.459	5.9	LOS A	3.7	26.6	0.57	0.57	44.2
East: Brigantine Drive													
4	L2	1	0.0	1	0.0	0.166	7.4	LOS A	1.0	7.2	0.67	0.75	44.8
5	T1	36	2.9	36	2.9	0.166	7.8	LOS A	1.0	7.2	0.67	0.75	40.0
6	R2	98	2.2	98	2.2	0.166	12.2	LOS B	1.0	7.2	0.67	0.75	44.8
Approach		135	2.3	135	2.3	0.166	11.0	LOS B	1.0	7.2	0.67	0.75	43.3
North: Harbour Boulevarde													
7	L2	24	4.3	17	4.4	0.399	4.6	LOS A	3.5	25.1	0.37	0.47	52.8
8	T1	653	3.1	455	3.1	0.399	4.8	LOS A	3.5	25.1	0.37	0.47	48.3
9	R2	97	3.3	67	3.3	0.399	9.2	LOS A	3.5	25.1	0.37	0.47	35.6
Approach		774	3.1	539 N1	3.2	0.399	5.3	LOS A	3.5	25.1	0.37	0.47	46.3
West: Brigantine Drive													
10	L2	113	2.8	113	2.8	0.260	8.1	LOS A	1.7	12.4	0.77	0.78	25.1
11	T1	69	3.0	69	3.0	0.260	8.3	LOS A	1.7	12.4	0.77	0.78	49.1
12	R2	7	0.0	7	0.0	0.260	12.7	LOS B	1.7	12.4	0.77	0.78	25.1
Approach		189	2.8	189	2.8	0.260	8.3	LOS A	1.7	12.4	0.77	0.78	40.4
All Vehicles		1621	3.0	1386 N1	3.5	0.459	6.5	LOS A	3.7	26.6	0.53	0.58	44.6

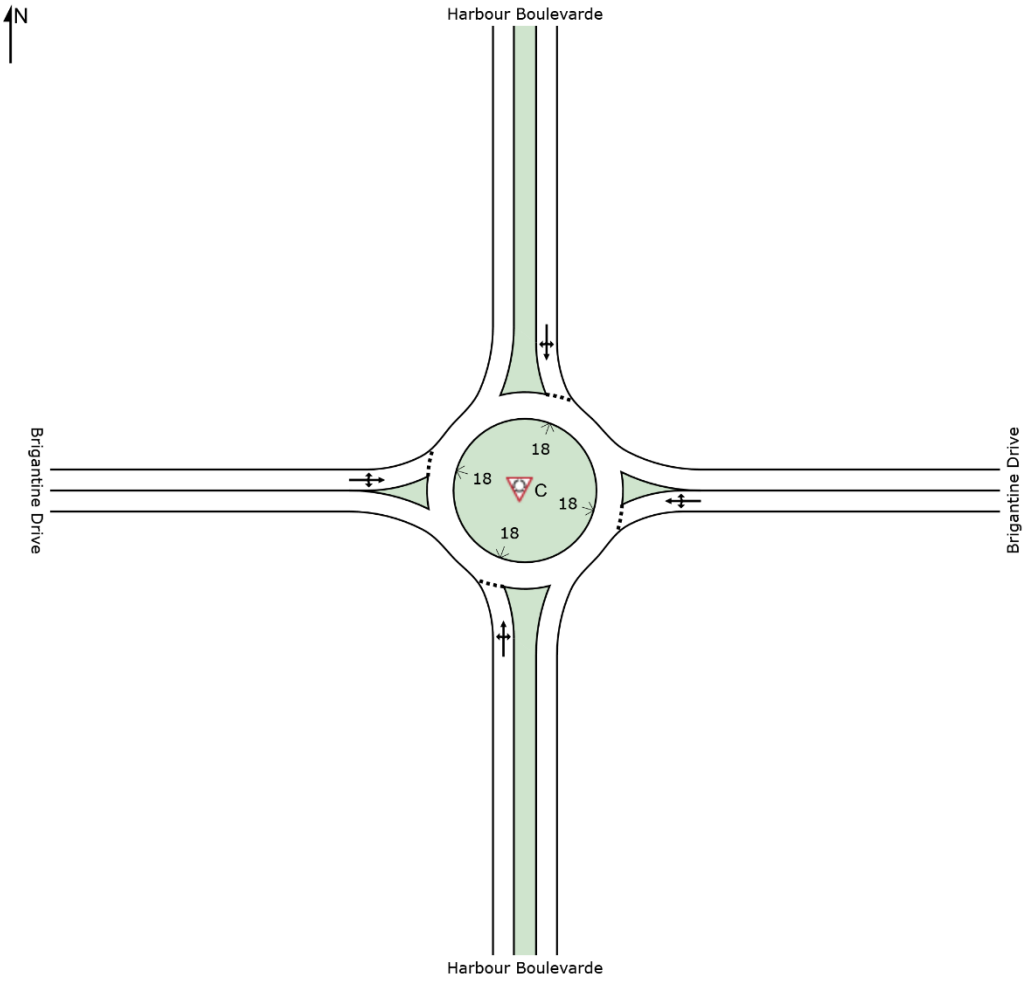
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 72.6 %
Number of Iterations: 20 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: C [Brigantine Drive / Harbour Boulevarde_2018 PM Peak]

Brigantine Drive / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: C [Brigantine Drive / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Brigantine Drive / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	7	0.0	7	0.0	0.758	10.4	LOS B	11.1	79.9	0.91	0.87	32.9
2	T1	776	3.0	776	3.0	0.758	10.8	LOS B	11.1	79.9	0.91	0.87	39.6
3	R2	2	0.0	2	0.0	0.758	15.1	LOS B	11.1	79.9	0.91	0.87	49.8
Approach		785	2.9	785	2.9	0.758	10.8	LOS B	11.1	79.9	0.91	0.87	39.6
East: Brigantine Drive													
4	L2	1	0.0	1	0.0	0.223	6.6	LOS A	1.4	10.0	0.61	0.72	45.5
5	T1	54	3.9	54	3.9	0.223	7.0	LOS A	1.4	10.0	0.61	0.72	40.4
6	R2	149	3.5	149	3.5	0.223	11.4	LOS B	1.4	10.0	0.61	0.72	45.5
Approach		204	3.6	204	3.6	0.223	10.2	LOS B	1.4	10.0	0.61	0.72	43.9
North: Harbour Boulevarde													
7	L2	16	0.0	11	0.0	0.293	4.3	LOS A	2.4	17.1	0.28	0.47	53.0
8	T1	435	3.1	299	3.2	0.293	4.6	LOS A	2.4	17.1	0.28	0.47	48.5
9	R2	144	2.9	99	2.9	0.293	8.9	LOS A	2.4	17.1	0.28	0.47	29.6
Approach		595	3.0	409 N1	3.0	0.293	5.6	LOS A	2.4	17.1	0.28	0.47	41.6
West: Brigantine Drive													
10	L2	75	2.8	75	2.8	0.282	11.9	LOS B	2.1	14.8	0.95	0.93	19.8
11	T1	46	2.3	46	2.3	0.282	12.1	LOS B	2.1	14.8	0.95	0.93	45.2
12	R2	5	0.0	5	0.0	0.282	16.4	LOS B	2.1	14.8	0.95	0.93	19.8
Approach		126	2.5	126	2.5	0.282	12.2	LOS B	2.1	14.8	0.95	0.93	35.1
All Vehicles		1711	3.0	1524 N1	3.4	0.758	9.4	LOS A	11.1	79.9	0.70	0.75	40.7

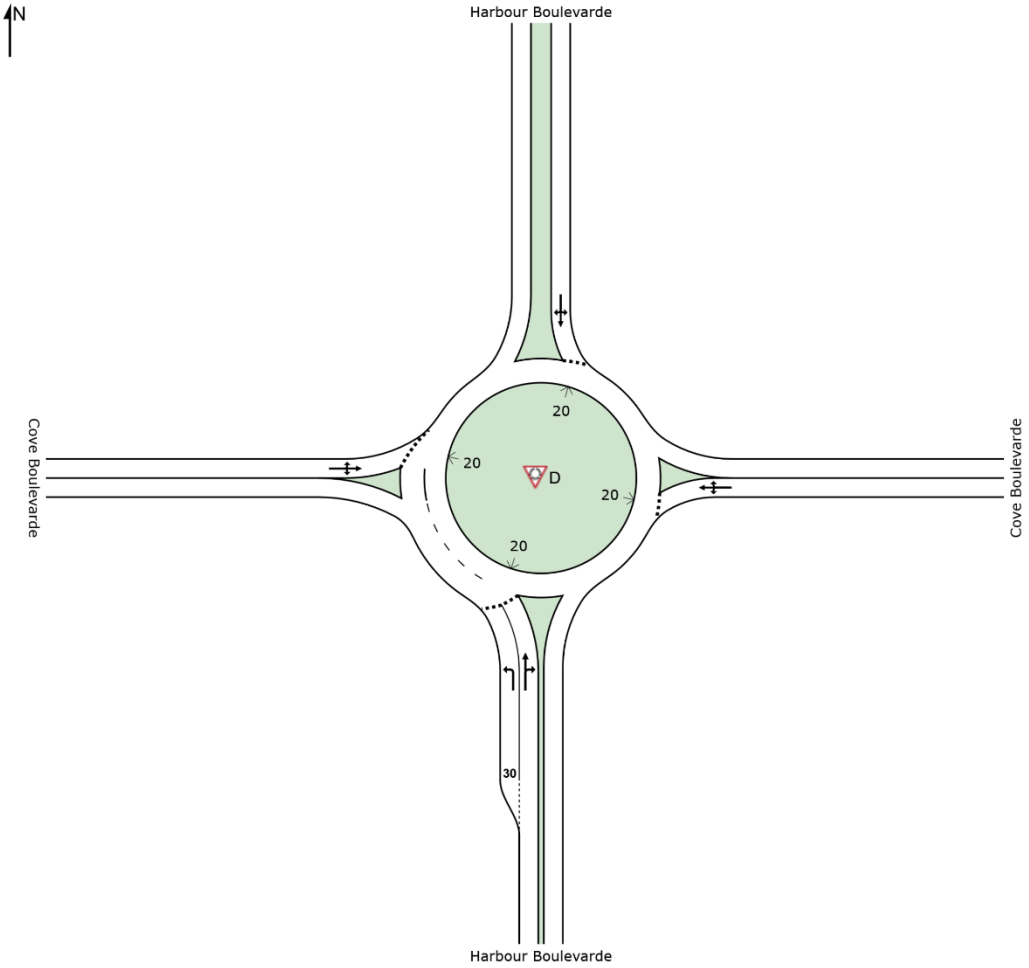
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.6 %
Number of Iterations: 19 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: D [Cove Boulevarde / Harbour Boulevarde_2018 AM Peak]

Cove Boulevarde / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: D [Cove Boulevarde / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Cove Boulevarde / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	195	3.2	195	3.2	0.167	4.3	LOS A	1.0	7.4	0.36	0.50	47.8
2	T1	361	2.9	361	2.9	0.250	4.1	LOS A	1.7	12.4	0.36	0.44	32.7
3	R2	4	0.0	4	0.0	0.250	8.7	LOS A	1.7	12.4	0.36	0.44	36.9
Approach		560	3.0	560	3.0	0.250	4.2	LOS A	1.7	12.4	0.36	0.46	41.3
East: Cove Boulevarde													
4	L2	2	0.0	2	0.0	0.081	8.7	LOS A	0.5	3.6	0.76	0.73	26.7
5	T1	39	2.7	39	2.7	0.081	9.0	LOS A	0.5	3.6	0.76	0.73	43.9
6	R2	14	0.0	14	0.0	0.081	13.6	LOS B	0.5	3.6	0.76	0.73	26.7
Approach		55	1.9	55	1.9	0.081	10.2	LOS B	0.5	3.6	0.76	0.73	40.9
North: Harbour Boulevarde													
7	L2	1	0.0	1	0.0	0.459	6.8	LOS A	3.6	26.0	0.76	0.73	44.0
8	T1	487	3.0	341	3.0	0.459	7.2	LOS A	3.6	26.0	0.76	0.73	42.1
9	R2	103	3.1	72	3.1	0.459	11.8	LOS B	3.6	26.0	0.76	0.73	48.8
Approach		592	3.0	414 N1	3.0	0.459	8.0	LOS A	3.6	26.0	0.76	0.73	43.8
West: Cove Boulevarde													
10	L2	194	3.3	194	3.3	0.659	9.6	LOS A	6.5	47.0	0.79	0.91	37.2
11	T1	61	3.4	61	3.4	0.659	9.9	LOS A	6.5	47.0	0.79	0.91	39.5
12	R2	311	3.1	311	3.1	0.659	14.5	LOS B	6.5	47.0	0.79	0.91	37.2
Approach		565	3.2	565	3.2	0.659	12.3	LOS B	6.5	47.0	0.79	0.91	37.5
All Vehicles		1772	3.0	1594 N1	3.4	0.659	8.3	LOS A	6.5	47.0	0.63	0.70	40.5

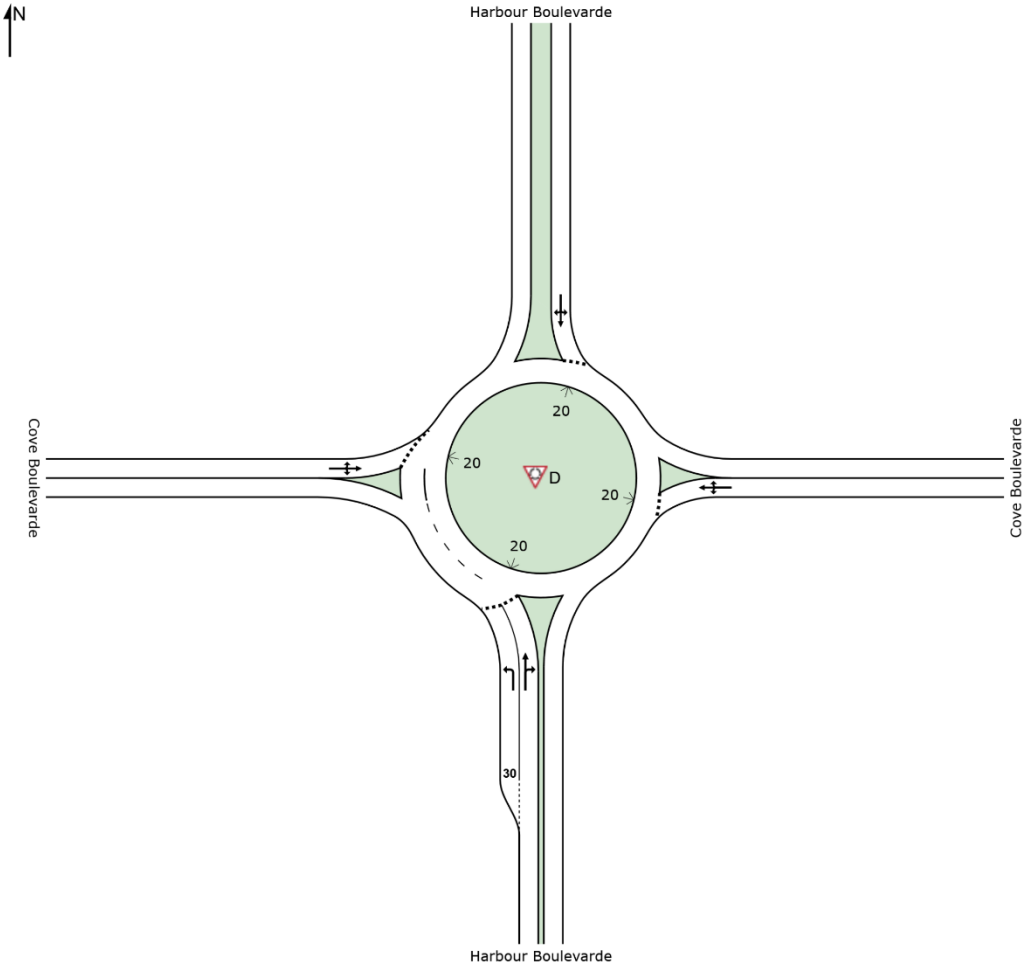
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 72.6 %
Number of Iterations: 20 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: D [Cove Boulevarde / Harbour Boulevarde_2018 PM Peak]

Cove Boulevarde / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: D [Cove Boulevarde / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Cove Boulevarde / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	294	3.2	294	3.2	0.268	4.8	LOS A	1.7	12.6	0.47	0.56	47.2
2	T1	542	3.1	542	3.1	0.393	4.6	LOS A	3.0	21.7	0.48	0.50	31.0
3	R2	3	0.0	3	0.0	0.393	9.1	LOS A	3.0	21.7	0.48	0.50	35.8
Approach		839	3.1	839	3.1	0.393	4.7	LOS A	3.0	21.7	0.48	0.52	40.1
East: Cove Boulevarde													
4	L2	3	0.0	3	0.0	0.100	7.2	LOS A	0.6	4.3	0.66	0.68	28.6
5	T1	57	3.7	57	3.7	0.100	7.6	LOS A	0.6	4.3	0.66	0.68	45.4
6	R2	20	5.3	20	5.3	0.100	12.3	LOS B	0.6	4.3	0.66	0.68	28.6
Approach		80	3.9	80	3.9	0.100	8.7	LOS A	0.6	4.3	0.66	0.68	42.6
North: Harbour Boulevarde													
7	L2	1	0.0	1	0.0	0.333	5.6	LOS A	2.5	17.8	0.59	0.63	44.7
8	T1	325	3.2	233	3.3	0.333	5.9	LOS A	2.5	17.8	0.59	0.63	43.0
9	R2	155	3.4	111	3.5	0.333	10.5	LOS B	2.5	17.8	0.59	0.63	49.4
Approach		481	3.3	345 N1	3.3	0.333	7.4	LOS A	2.5	17.8	0.59	0.63	45.8
West: Cove Boulevarde													
10	L2	128	2.5	128	2.5	0.535	10.2	LOS B	4.2	30.3	0.81	0.95	36.5
11	T1	40	2.6	40	2.6	0.535	10.5	LOS B	4.2	30.3	0.81	0.95	38.9
12	R2	206	3.1	206	3.1	0.535	15.1	LOS B	4.2	30.3	0.81	0.95	36.5
Approach		375	2.8	375	2.8	0.535	13.0	LOS B	4.2	30.3	0.81	0.95	36.8
All Vehicles		1775	3.1	1639 N1	3.4	0.535	7.3	LOS A	4.2	30.3	0.59	0.65	40.9

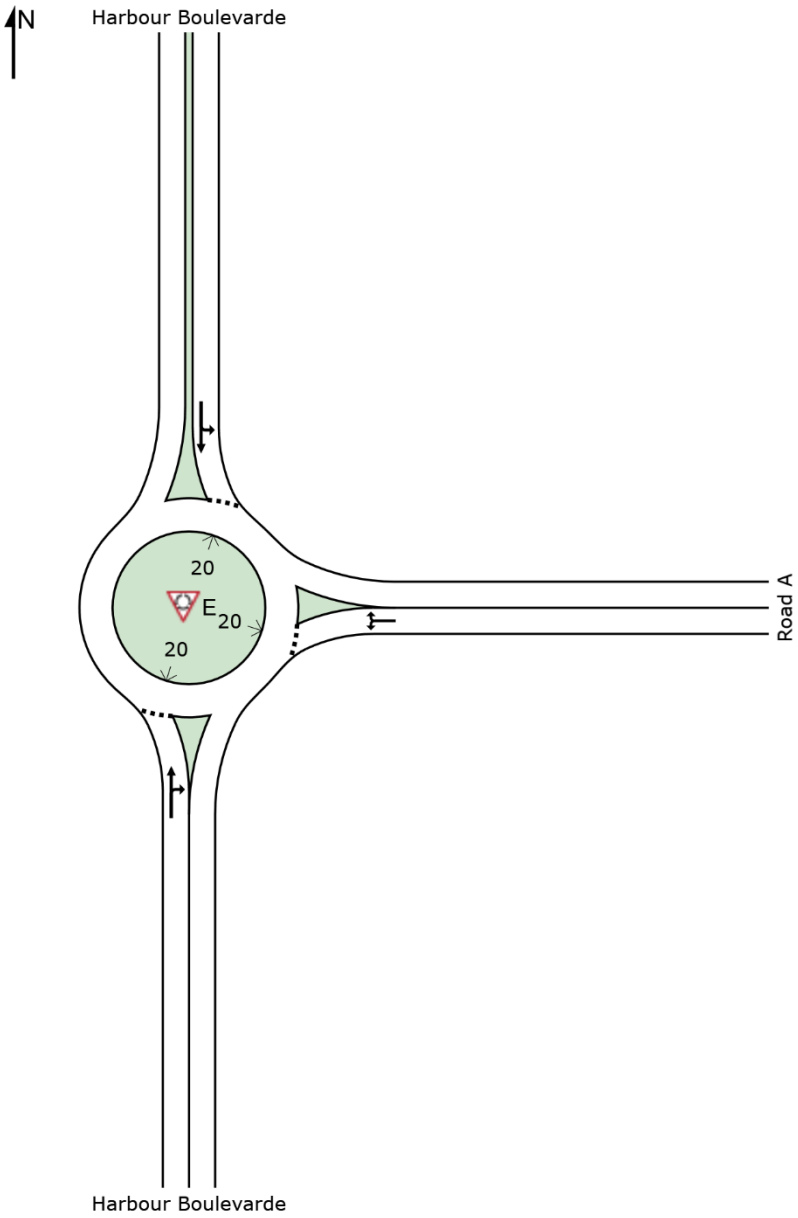
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.6 %
Number of Iterations: 19 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: E [Road A / Harbour Boulevarde_2018 AM Peak]

Road A / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: E [Road A / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Road A / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
2	T1	198	2.1	198	2.1	0.216	6.4	LOS A	1.4	9.8	0.60	0.62	42.0
3	R2	4	0.0	4	0.0	0.216	11.0	LOS B	1.4	9.8	0.60	0.62	40.9
Approach		202	2.1	202	2.1	0.216	6.5	LOS A	1.4	9.8	0.60	0.62	41.9
East: Road A													
4	L2	6	0.0	6	0.0	0.333	4.4	LOS A	2.2	15.5	0.51	0.68	24.8
6	R2	362	2.0	362	2.0	0.333	9.2	LOS A	2.2	15.5	0.51	0.68	24.8
Approach		368	2.0	368	2.0	0.333	9.1	LOS A	2.2	15.5	0.51	0.68	24.8
North: Harbour Boulevarde													
7	L2	516	2.0	423	2.0	0.387	3.2	LOS A	3.5	25.1	0.06	0.43	23.3
8	T1	284	1.9	233	1.8	0.387	3.4	LOS A	3.5	25.1	0.06	0.43	36.9
Approach		800	2.0	656 N1	2.0	0.387	3.3	LOS A	3.5	25.1	0.06	0.43	25.7
All Vehicles		1371	2.0	1226 N1	2.2	0.387	5.6	LOS A	3.5	25.1	0.29	0.54	29.0

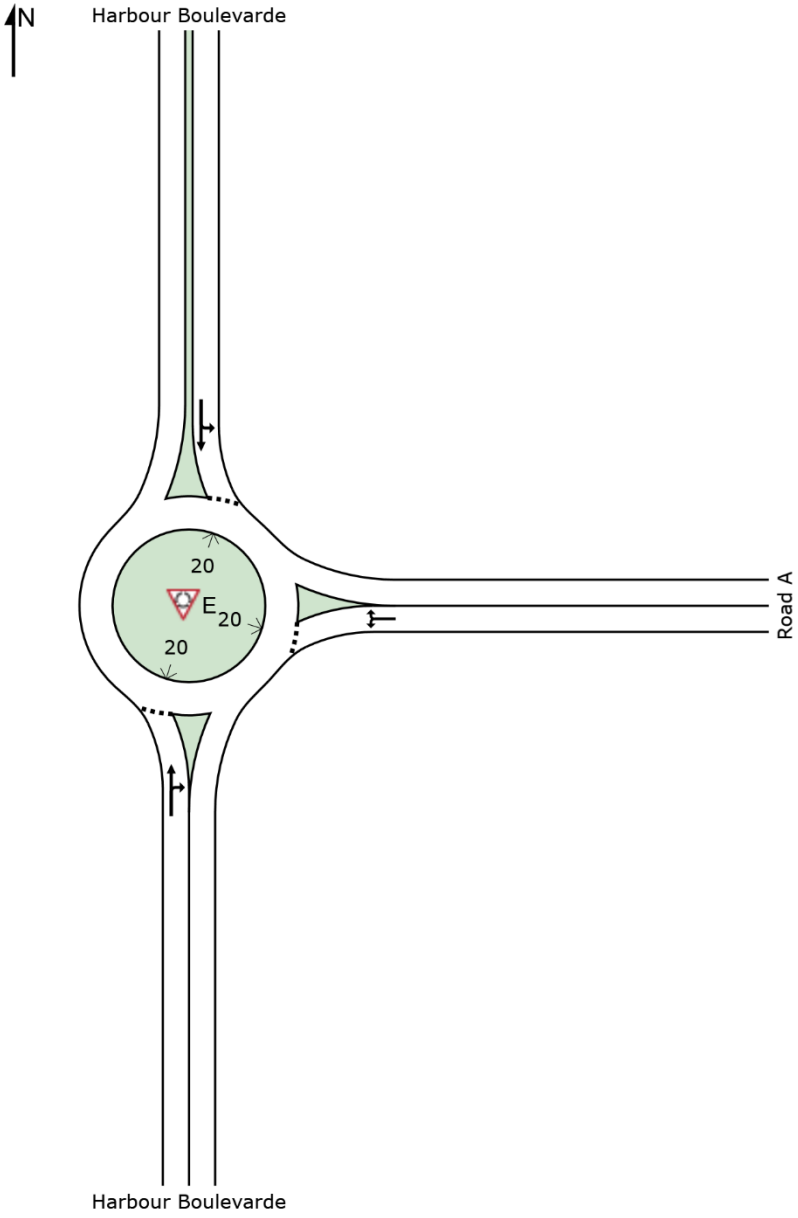
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 72.6 %
Number of Iterations: 20 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: E [Road A / Harbour Boulevarde_2018 PM Peak]

Road A / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: E [Road A / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Road A / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
2	T1	296	2.1	296	2.1	0.382	8.3	LOS A	2.7	19.1	0.78	0.78	40.3
3	R2	6	0.0	6	0.0	0.382	12.8	LOS B	2.7	19.1	0.78	0.78	39.6
Approach		302	2.1	302	2.1	0.382	8.4	LOS A	2.7	19.1	0.78	0.78	40.3
East: Road A													
4	L2	4	0.0	4	0.0	0.443	4.0	LOS A	3.4	23.8	0.47	0.64	25.0
6	R2	543	1.9	543	1.9	0.443	8.7	LOS A	3.4	23.8	0.47	0.64	25.0
Approach		547	1.9	547	1.9	0.443	8.7	LOS A	3.4	23.8	0.47	0.64	25.0
North: Harbour Boulevarde													
7	L2	344	1.8	286	1.8	0.268	3.2	LOS A	2.2	15.7	0.07	0.43	23.3
8	T1	191	2.2	158	2.2	0.268	3.4	LOS A	2.2	15.7	0.07	0.43	36.7
Approach		535	2.0	444 N1	2.0	0.268	3.3	LOS A	2.2	15.7	0.07	0.43	25.6
All Vehicles		1384	2.0	1293 N1	2.1	0.443	6.8	LOS A	3.4	23.8	0.41	0.60	30.1

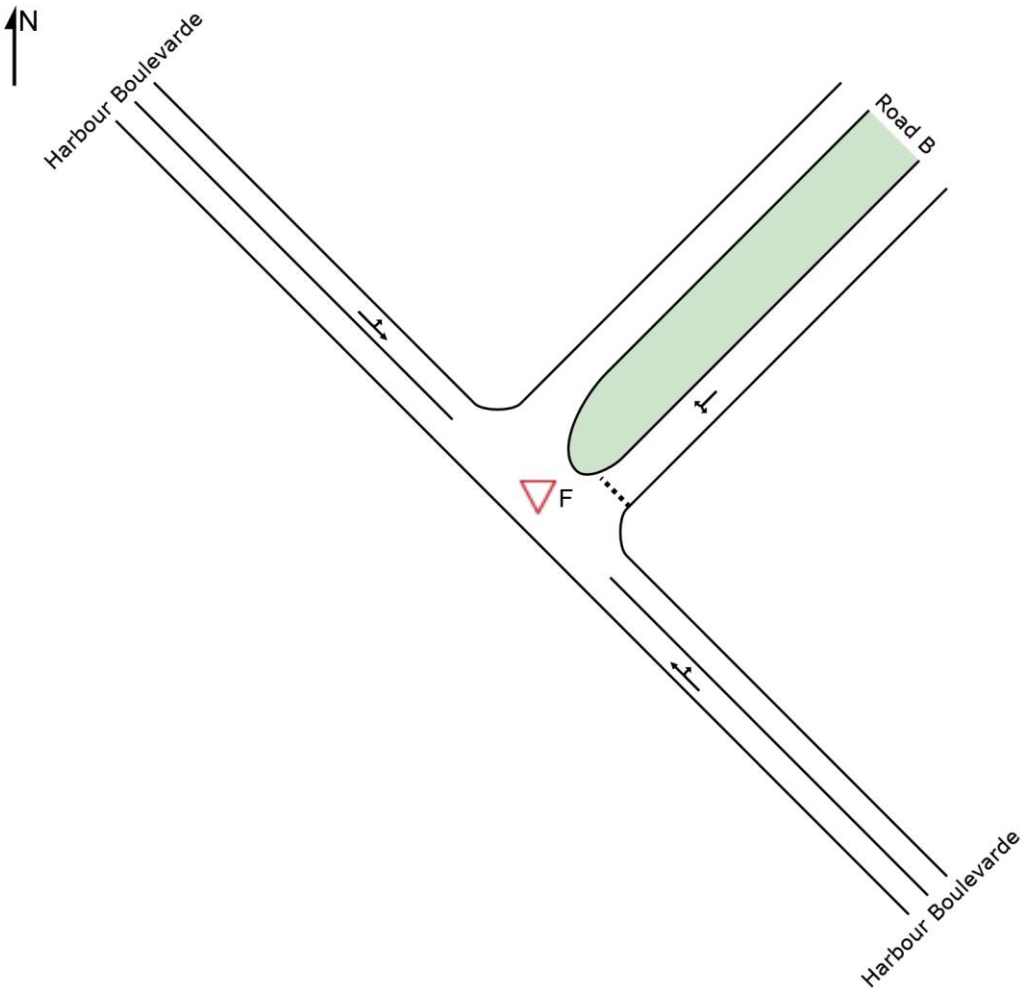
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.6 %
Number of Iterations: 19 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: F [Road B / Harbour Boulevarde_2018 AM Peak]

Road B / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: F [Road B / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Road B / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Harbour Boulevarde													
5	T1	149	2.1	149	2.1	0.081	0.0	LOS A	0.0	0.3	0.03	0.02	59.2
6	R2	5	0.0	5	0.0	0.081	6.3	LOS A	0.0	0.3	0.03	0.02	57.5
Approach		155	2.0	155	2.0	0.081	0.3	NA	0.0	0.3	0.03	0.02	59.1
NorthEast: Road B													
7	L2	5	0.0	5	0.0	0.061	6.1	LOS A	0.2	1.4	0.35	0.63	49.0
9	R2	53	2.0	53	2.0	0.061	7.0	LOS A	0.2	1.4	0.35	0.63	49.0
Approach		58	1.8	58	1.8	0.061	6.9	LOS A	0.2	1.4	0.35	0.63	49.0
NorthWest: Harbour Boulevarde													
10	L2	76	1.4	62	1.4	0.126	5.6	LOS A	0.0	0.0	0.00	0.16	56.1
11	T1	215	2.0	177	1.9	0.126	0.0	LOS A	0.0	0.0	0.00	0.16	55.1
Approach		291	1.8	239 N1	1.8	0.126	1.5	NA	0.0	0.0	0.00	0.16	55.6
All Vehicles		503	1.9	452 N1	2.1	0.126	1.7	NA	0.2	1.4	0.06	0.17	55.6

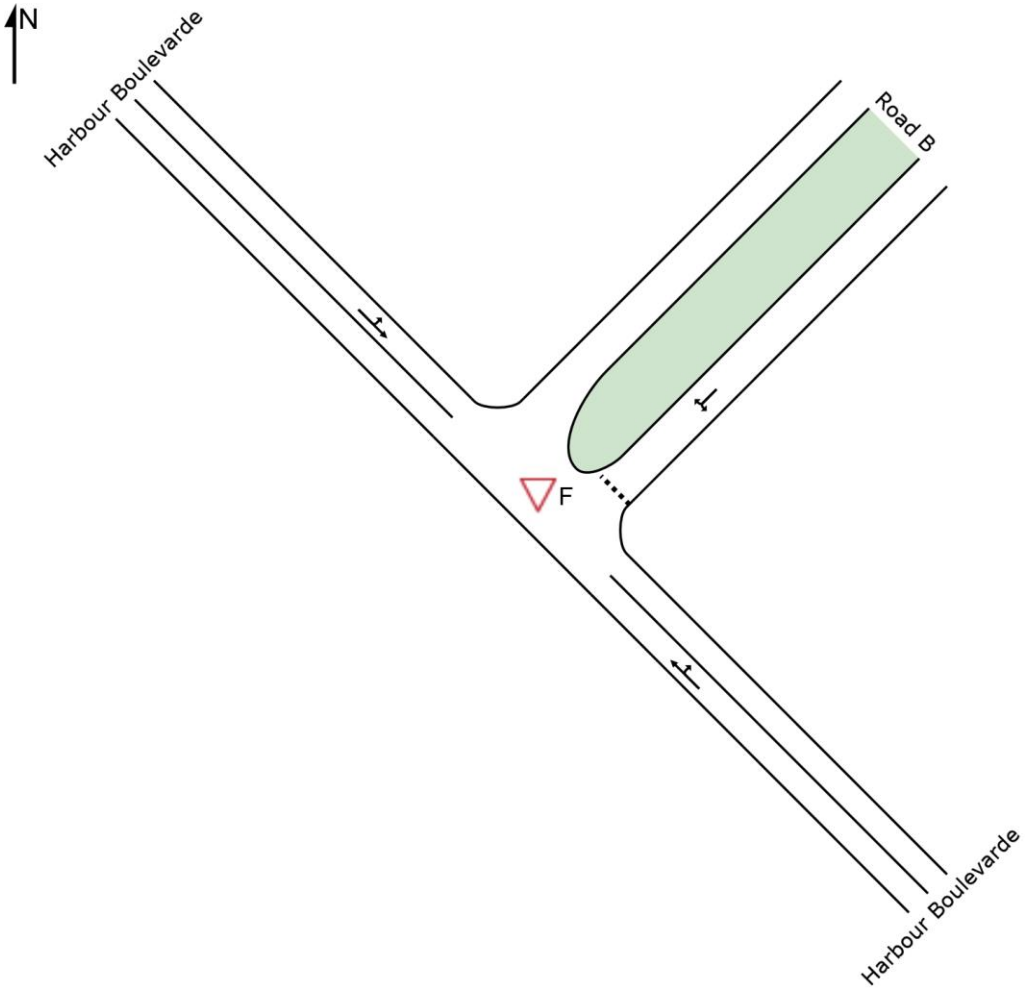
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 72.6 %
Number of Iterations: 20 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: F [Road B / Harbour Boulevarde_2018 PM Peak]

Road B / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: F [Road B / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Road B / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Harbour Boulevarde													
5	T1	224	2.3	224	2.3	0.120	0.0	LOS A	0.0	0.3	0.02	0.01	59.5
6	R2	5	0.0	5	0.0	0.120	6.0	LOS A	0.0	0.3	0.02	0.01	57.7
Approach		229	2.3	229	2.3	0.120	0.2	NA	0.0	0.3	0.02	0.01	59.4
NorthEast: Road B													
7	L2	5	0.0	5	0.0	0.092	5.9	LOS A	0.3	2.2	0.36	0.65	48.9
9	R2	80	2.6	80	2.6	0.092	7.1	LOS A	0.3	2.2	0.36	0.65	48.9
Approach		85	2.5	85	2.5	0.092	7.0	LOS A	0.3	2.2	0.36	0.65	48.9
NorthWest: Harbour Boulevarde													
10	L2	51	2.1	42	2.1	0.085	5.6	LOS A	0.0	0.0	0.00	0.16	56.1
11	T1	143	2.2	119	2.2	0.085	0.0	LOS A	0.0	0.0	0.00	0.16	55.1
Approach		194	2.2	161 N1	2.2	0.085	1.5	NA	0.0	0.0	0.00	0.16	55.6
All Vehicles		508	2.3	476 N1	2.4	0.120	1.8	NA	0.3	2.2	0.07	0.18	55.7

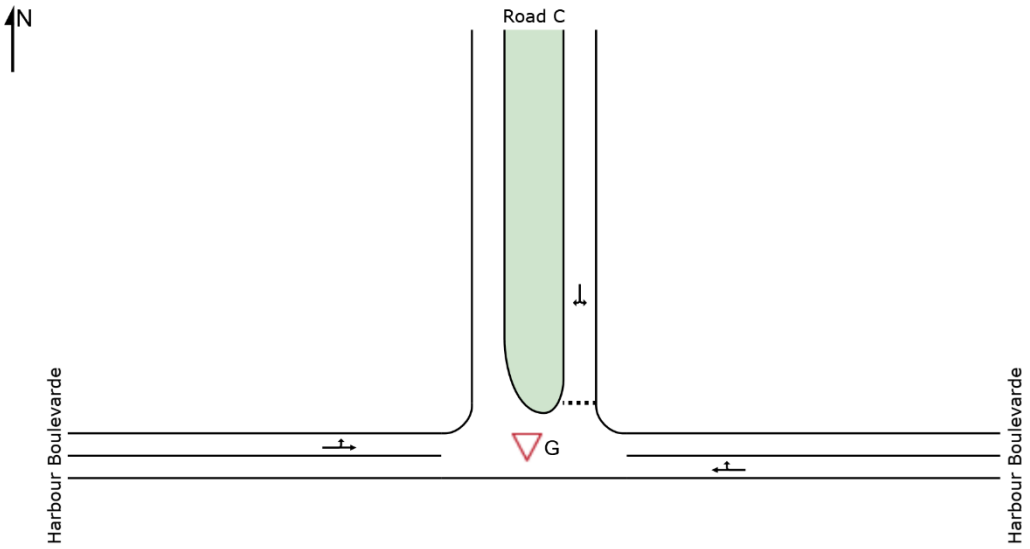
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.6 %
Number of Iterations: 19 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: G [Road C / Harbour Boulevarde_2018 AM Peak]

Road C / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: G [Road C / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Road C / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Harbour Boulevarde													
5	T1	74	1.4	74	1.4	0.042	0.1	LOS A	0.0	0.3	0.04	0.04	56.8
6	R2	5	0.0	5	0.0	0.042	6.0	LOS A	0.0	0.3	0.04	0.04	56.4
Approach		79	1.3	79	1.3	0.042	0.5	NA	0.0	0.3	0.04	0.04	56.7
North: Road C													
7	L2	5	0.0	5	0.0	0.073	5.8	LOS A	0.2	1.7	0.26	0.59	49.5
9	R2	74	1.4	74	1.4	0.073	6.3	LOS A	0.2	1.7	0.26	0.59	49.5
Approach		79	1.3	79	1.3	0.073	6.3	LOS A	0.2	1.7	0.26	0.59	49.5
West: Harbour Boulevarde													
10	L2	107	2.0	89	1.9	0.095	5.6	LOS A	0.0	0.0	0.00	0.30	55.4
11	T1	107	2.0	89	1.9	0.095	0.0	LOS A	0.0	0.0	0.00	0.30	54.1
Approach		215	2.0	178 N1	1.9	0.095	2.8	NA	0.0	0.0	0.00	0.30	55.0
All Vehicles		373	1.7	336 N1	1.9	0.095	3.1	NA	0.2	1.7	0.07	0.30	53.8

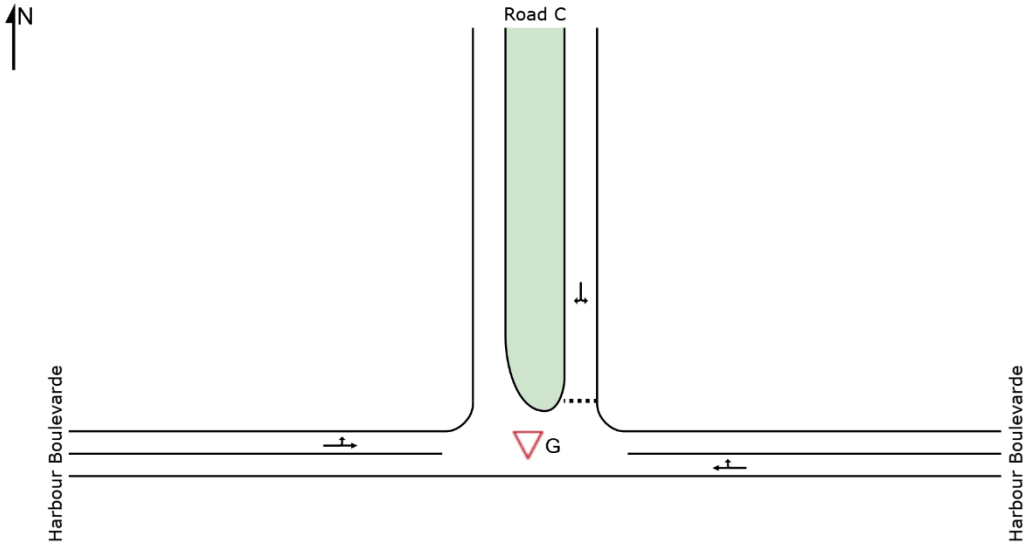
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 72.6 %
Number of Iterations: 20 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: G [Road C / Harbour Boulevarde_2018 PM Peak]

Road C / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: G [Road C / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Road C / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Harbour Boulevarde													
5	T1	112	1.9	112	1.9	0.061	0.0	LOS A	0.0	0.2	0.02	0.03	58.0
6	R2	5	0.0	5	0.0	0.061	5.9	LOS A	0.0	0.2	0.02	0.03	56.6
Approach		117	1.8	117	1.8	0.061	0.3	NA	0.0	0.2	0.02	0.03	57.8
North: Road C													
7	L2	5	0.0	5	0.0	0.108	5.7	LOS A	0.4	2.6	0.26	0.60	49.5
9	R2	112	1.9	112	1.9	0.108	6.3	LOS A	0.4	2.6	0.26	0.60	49.5
Approach		117	1.8	117	1.8	0.108	6.3	LOS A	0.4	2.6	0.26	0.60	49.5
West: Harbour Boulevarde													
10	L2	71	1.5	59	1.5	0.063	5.6	LOS A	0.0	0.0	0.00	0.29	55.5
11	T1	72	1.5	60	1.5	0.063	0.0	LOS A	0.0	0.0	0.00	0.29	54.1
Approach		142	1.5	119 N1	1.5	0.063	2.8	NA	0.0	0.0	0.00	0.29	55.0
All Vehicles		376	1.7	353 N1	1.8	0.108	3.1	NA	0.4	2.6	0.09	0.31	53.2

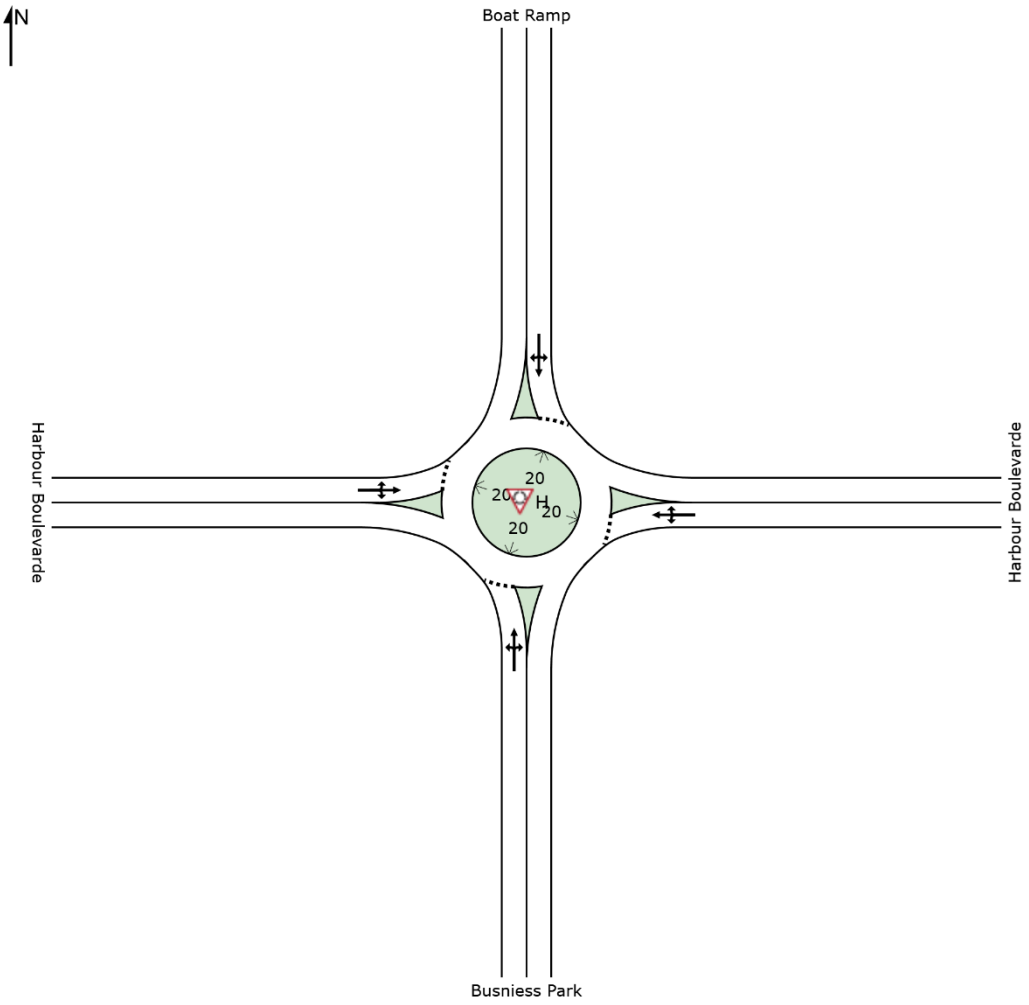
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.6 %
Number of Iterations: 19 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: H [Boat Ramp / Business Park / Harbour Boulevarde_2018 AM Peak]

Boat Ramp / Business Park / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: H [Boat Ramp / Business Park / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Boat Ramp / Business Park / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Busniess Park													
1	L2	61	1.7	61	1.7	0.050	3.9	LOS A	0.2	1.7	0.09	0.48	52.3
2	T1	5	0.0	5	0.0	0.050	4.1	LOS A	0.2	1.7	0.09	0.48	56.3
3	R2	5	0.0	5	0.0	0.050	8.7	LOS A	0.2	1.7	0.09	0.48	52.3
Approach		72	1.5	72	1.5	0.050	4.3	LOS A	0.2	1.7	0.09	0.48	52.8
East: Harbour Boulevarde													
4	L2	5	0.0	5	0.0	0.017	4.2	LOS A	0.1	0.5	0.21	0.48	50.7
5	T1	11	0.0	11	0.0	0.017	4.3	LOS A	0.1	0.5	0.21	0.48	34.9
6	R2	5	0.0	5	0.0	0.017	9.0	LOS A	0.1	0.5	0.21	0.48	52.4
Approach		21	0.0	21	0.0	0.017	5.5	LOS A	0.1	0.5	0.21	0.48	47.4
North: Boat Ramp													
7	L2	5	0.0	5	0.0	0.011	4.2	LOS A	0.0	0.3	0.22	0.48	50.5
8	T1	5	0.0	5	0.0	0.011	4.4	LOS A	0.0	0.3	0.22	0.48	55.1
9	R2	3	0.0	3	0.0	0.011	9.0	LOS A	0.0	0.3	0.22	0.48	50.5
Approach		14	0.0	14	0.0	0.011	5.4	LOS A	0.0	0.3	0.22	0.48	52.9
West: Harbour Boulevarde													
10	L2	4	0.0	4	0.0	0.061	3.9	LOS A	0.3	2.0	0.08	0.61	49.3
11	T1	15	0.0	12	0.0	0.061	4.0	LOS A	0.3	2.0	0.08	0.61	36.1
12	R2	87	1.2	73	1.2	0.061	8.7	LOS A	0.3	2.0	0.08	0.61	50.8
Approach		106	1.0	89 N1	1.0	0.061	7.9	LOS A	0.3	2.0	0.08	0.61	49.8
All Vehicles		213	1.0	195 N1	1.1	0.061	6.1	LOS A	0.3	2.0	0.11	0.54	50.9

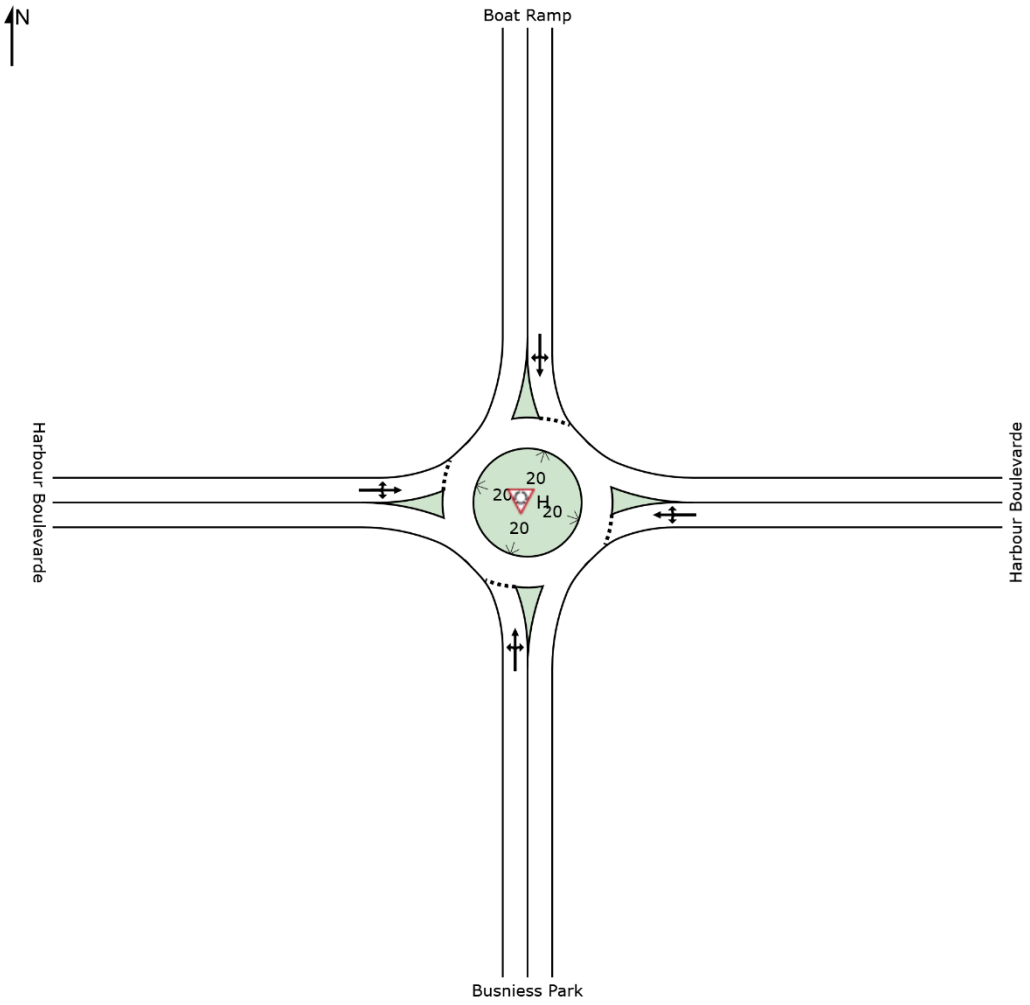
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 72.6 %
Number of Iterations: 20 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: H [Boat Ramp / Business Park / Harbour Boulevarde_2018 PM Peak]

Boat Ramp / Business Park / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: H [Boat Ramp / Business Park / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Boat Ramp / Business Park / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Busniess Park													
1	L2	92	2.3	92	2.3	0.072	4.0	LOS A	0.4	2.5	0.11	0.47	52.3
2	T1	5	0.0	5	0.0	0.072	4.1	LOS A	0.4	2.5	0.11	0.47	56.3
3	R2	5	0.0	5	0.0	0.072	8.7	LOS A	0.4	2.5	0.11	0.47	52.3
Approach		102	2.1	102	2.1	0.072	4.2	LOS A	0.4	2.5	0.11	0.47	52.7
East: Harbour Boulevarde													
4	L2	5	0.0	5	0.0	0.020	4.1	LOS A	0.1	0.6	0.17	0.47	51.1
5	T1	16	0.0	16	0.0	0.020	4.2	LOS A	0.1	0.6	0.17	0.47	35.7
6	R2	5	0.0	5	0.0	0.020	8.9	LOS A	0.1	0.6	0.17	0.47	52.8
Approach		26	0.0	26	0.0	0.020	5.1	LOS A	0.1	0.6	0.17	0.47	46.7
North: Boat Ramp													
7	L2	5	0.0	5	0.0	0.011	4.1	LOS A	0.1	0.4	0.18	0.49	50.4
8	T1	5	0.0	5	0.0	0.011	4.2	LOS A	0.1	0.4	0.18	0.49	55.1
9	R2	4	0.0	4	0.0	0.011	8.9	LOS A	0.1	0.4	0.18	0.49	50.4
Approach		15	0.0	15	0.0	0.011	5.5	LOS A	0.1	0.4	0.18	0.49	52.7
West: Harbour Boulevarde													
10	L2	3	0.0	3	0.0	0.042	3.9	LOS A	0.2	1.4	0.08	0.60	49.4
11	T1	11	0.0	9	0.0	0.042	4.0	LOS A	0.2	1.4	0.08	0.60	36.2
12	R2	58	1.8	49	1.8	0.042	8.7	LOS A	0.2	1.4	0.08	0.60	50.8
Approach		72	1.5	61 N1	1.4	0.042	7.8	LOS A	0.2	1.4	0.08	0.60	49.8
All Vehicles		215	1.5	204 N1	1.5	0.072	5.5	LOS A	0.4	2.5	0.11	0.51	51.1

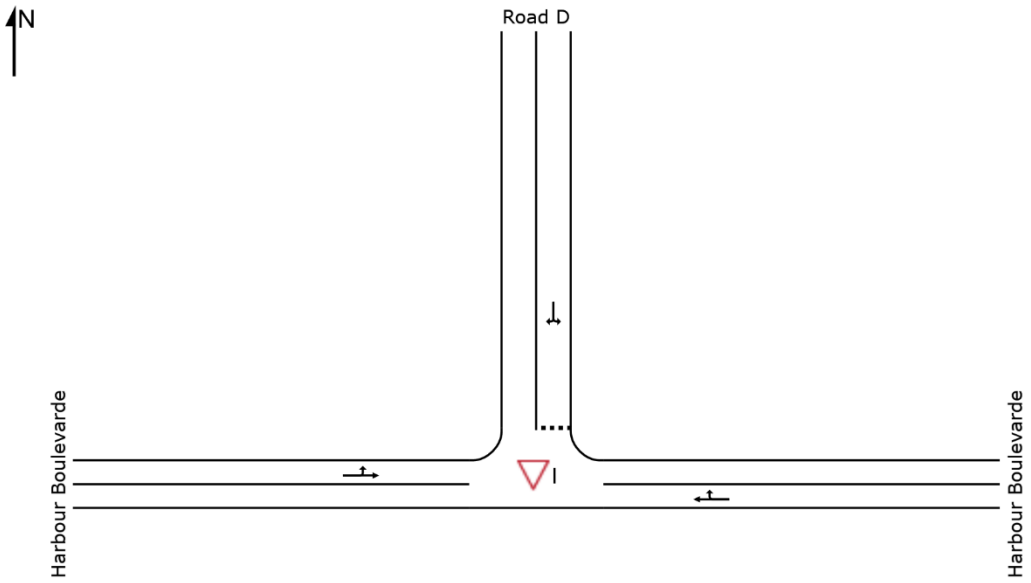
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.6 %
Number of Iterations: 19 (maximum specified: 20)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

SITE LAYOUT

Site: I [Road D / Harbour Boulevarde_2018 AM Peak]

Road D / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: I [Road D / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Road D / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

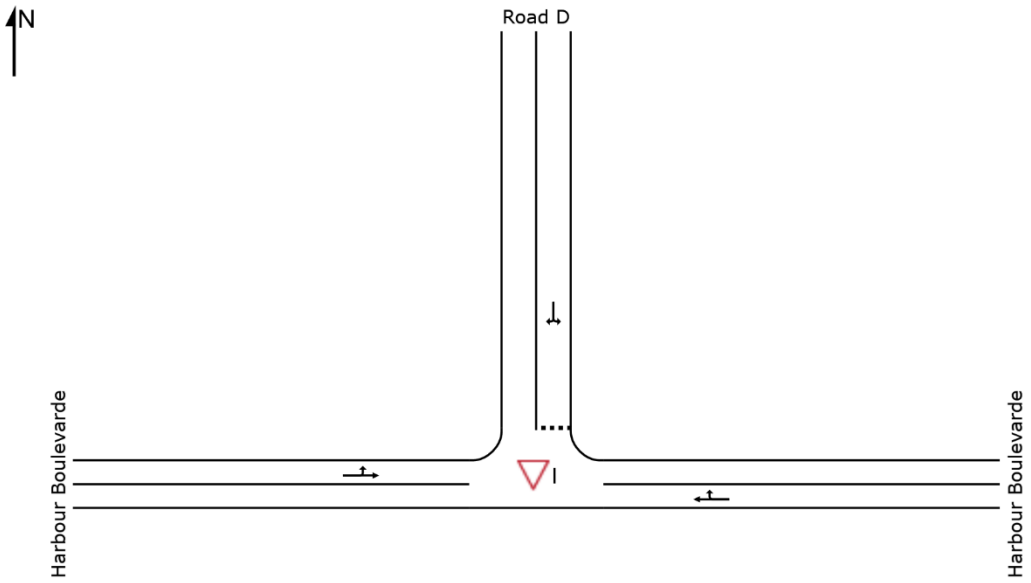
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Harbour Boulevarde													
5	T1	5	0.0	5	0.0	0.006	0.0	LOS A	0.0	0.2	0.06	0.29	42.6
6	R2	5	0.0	5	0.0	0.006	5.5	LOS A	0.0	0.2	0.06	0.29	52.9
Approach		11	0.0	11	0.0	0.006	2.8	NA	0.0	0.2	0.06	0.29	50.9
North: Road D													
7	L2	5	0.0	5	0.0	0.012	5.6	LOS A	0.0	0.3	0.04	0.57	50.1
9	R2	11	0.0	11	0.0	0.012	5.6	LOS A	0.0	0.3	0.04	0.57	50.7
Approach		16	0.0	16	0.0	0.012	5.6	LOS A	0.0	0.3	0.04	0.57	50.5
West: Harbour Boulevarde													
10	L2	15	0.0	13	0.0	0.010	5.5	LOS A	0.0	0.0	0.00	0.43	52.0
11	T1	5	0.0	5	0.0	0.010	0.0	LOS A	0.0	0.0	0.00	0.43	46.5
Approach		20	0.0	18 N1	0.0	0.010	4.1	NA	0.0	0.0	0.00	0.43	51.3
All Vehicles		46	0.0	44 N1	0.0	0.012	4.3	NA	0.0	0.3	0.03	0.45	50.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 72.6 %
Number of Iterations: 20 (maximum specified: 20)

SITE LAYOUT

Site: I [Road D / Harbour Boulevarde_2018 PM Peak]

Road D / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: I [Road D / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Road D / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Harbour Boulevarde													
5	T1	5	0.0	5	0.0	0.006	0.0	LOS A	0.0	0.2	0.05	0.29	42.8
6	R2	5	0.0	5	0.0	0.006	5.5	LOS A	0.0	0.2	0.05	0.29	52.9
Approach		11	0.0	11	0.0	0.006	2.8	NA	0.0	0.2	0.05	0.29	50.9
North: Road D													
7	L2	5	0.0	5	0.0	0.016	5.6	LOS A	0.1	0.4	0.04	0.57	50.1
9	R2	16	0.0	16	0.0	0.016	5.6	LOS A	0.1	0.4	0.04	0.57	50.7
Approach		21	0.0	21	0.0	0.016	5.6	LOS A	0.1	0.4	0.04	0.57	50.5
West: Harbour Boulevarde													
10	L2	11	0.0	10	0.0	0.008	5.5	LOS A	0.0	0.0	0.00	0.39	52.5
11	T1	5	0.0	5	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.39	47.5
Approach		16	0.0	15 N1	0.0	0.008	3.7	NA	0.0	0.0	0.00	0.39	51.6
All Vehicles		47	0.0	46 N1	0.0	0.016	4.3	NA	0.1	0.4	0.03	0.45	50.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.6 %
Number of Iterations: 19 (maximum specified: 20)

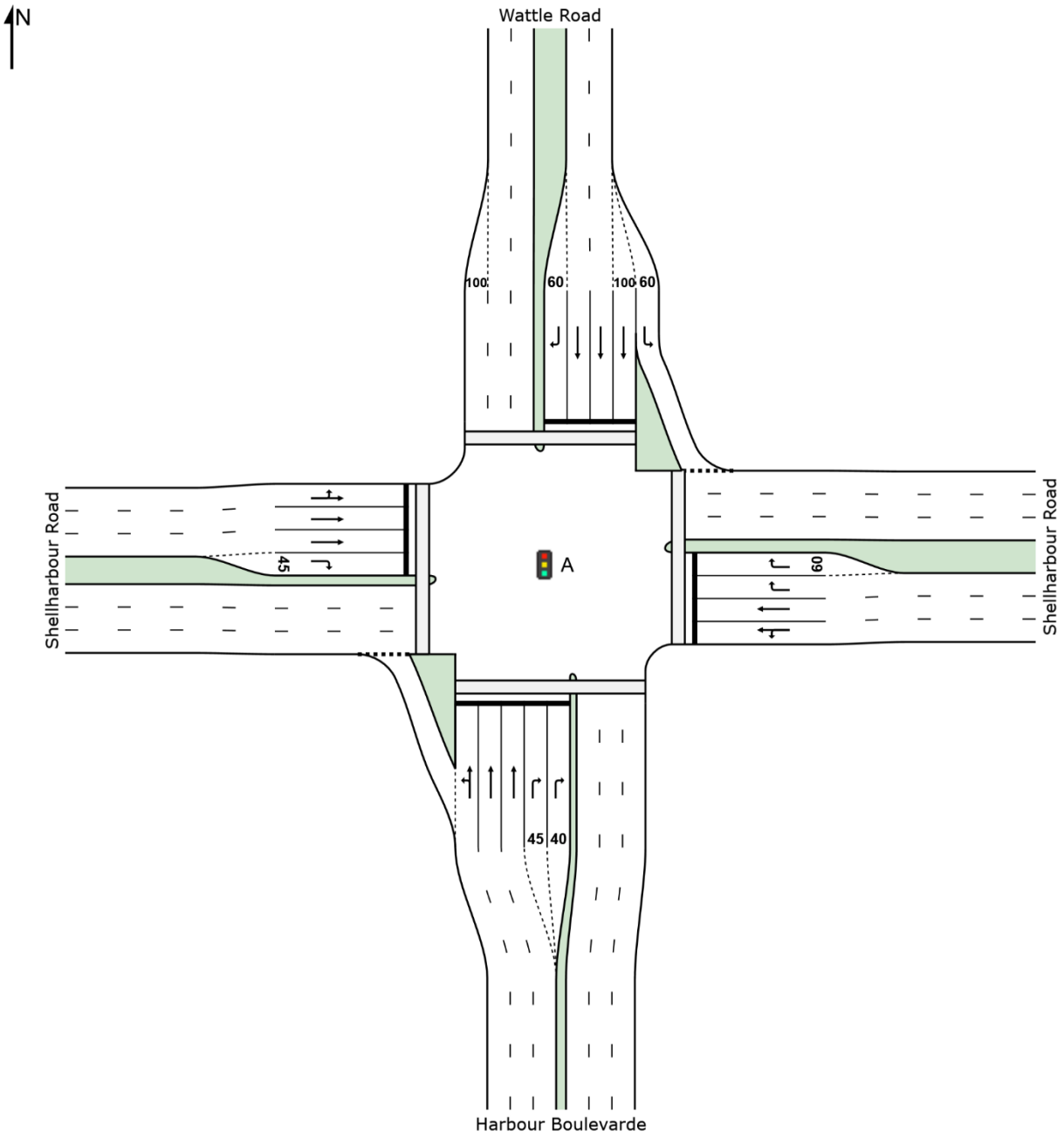
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

With Mitigation

SITE LAYOUT

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 AM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 AM Peak]

Network: N101 [2018 AM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Isolated Cycle Time = 150 seconds (User-Given Cycle Time)
Common Control Group: CCG1 [TCS2455]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	6	0.0	6	0.0	0.550	54.5	LOS D	11.4	81.6	0.76	0.68	24.2
2	T1	1383	3.0	1383	3.0	0.898	58.1	LOS E	11.4	81.6	0.92	0.90	22.4
3	R2	164	2.6	164	2.6	0.334	68.4	LOS E	5.3	38.1	0.92	0.76	19.9
Approach		1554	2.9	1554	2.9	0.898	59.2	LOS E	11.4	81.6	0.92	0.88	22.1
East: Shellharbour Road													
4	L2	104	3.0	104	3.0	0.528	66.1	LOS E	11.4	82.2	0.96	0.80	19.7
5	T1	237	3.1	237	3.1	0.528	61.6	LOS E	11.5	82.4	0.96	0.79	29.8
6	R2	564	3.0	564	3.0	0.883	77.4	LOS E	21.9	156.9	0.98	0.96	26.5
Approach		905	3.0	905	3.0	0.883	72.0	LOS E	21.9	156.9	0.97	0.90	26.8
North: Wattle Road													
7	L2	512	3.1	512	3.1	0.381	8.1	LOS A	7.7	55.6	0.32	0.66	52.3
8	T1	1138	3.1	1138	3.1	0.757	47.0	LOS D	26.0	186.7	0.91	0.80	24.2
9	R2	141	3.0	141	3.0	0.576	72.6	LOS E	9.9	70.9	0.99	0.81	27.4
Approach		1791	3.1	1791	3.1	0.757	37.9	LOS D	26.0	186.7	0.74	0.76	31.6
West: Shellharbour Road													
10	L2	242	3.0	242	3.0	0.613	48.4	LOS D	13.8	99.2	0.84	0.80	32.9
11	T1	356	3.0	356	3.0	0.552	62.3	LOS E	12.1	86.5	0.97	0.80	29.9
12	R2	4	0.0	4	0.0	0.010	53.7	LOS D	0.2	1.6	0.80	0.64	22.3
Approach		602	3.0	602	3.0	0.613	56.6	LOS E	13.8	99.2	0.91	0.80	31.0
All Vehicles		4852	3.0	4852	3.0	0.898	53.4	LOS D	26.0	186.7	0.87	0.83	27.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	50.5	LOS E	0.2	0.2	0.82	0.82
P3	North Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	50.5	LOS E	0.2	0.2	0.82	0.82
All Pedestrians		211	59.9	LOS E			0.89	0.89

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.

PHASING SUMMARY

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 AM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Isolated Cycle Time = 150 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

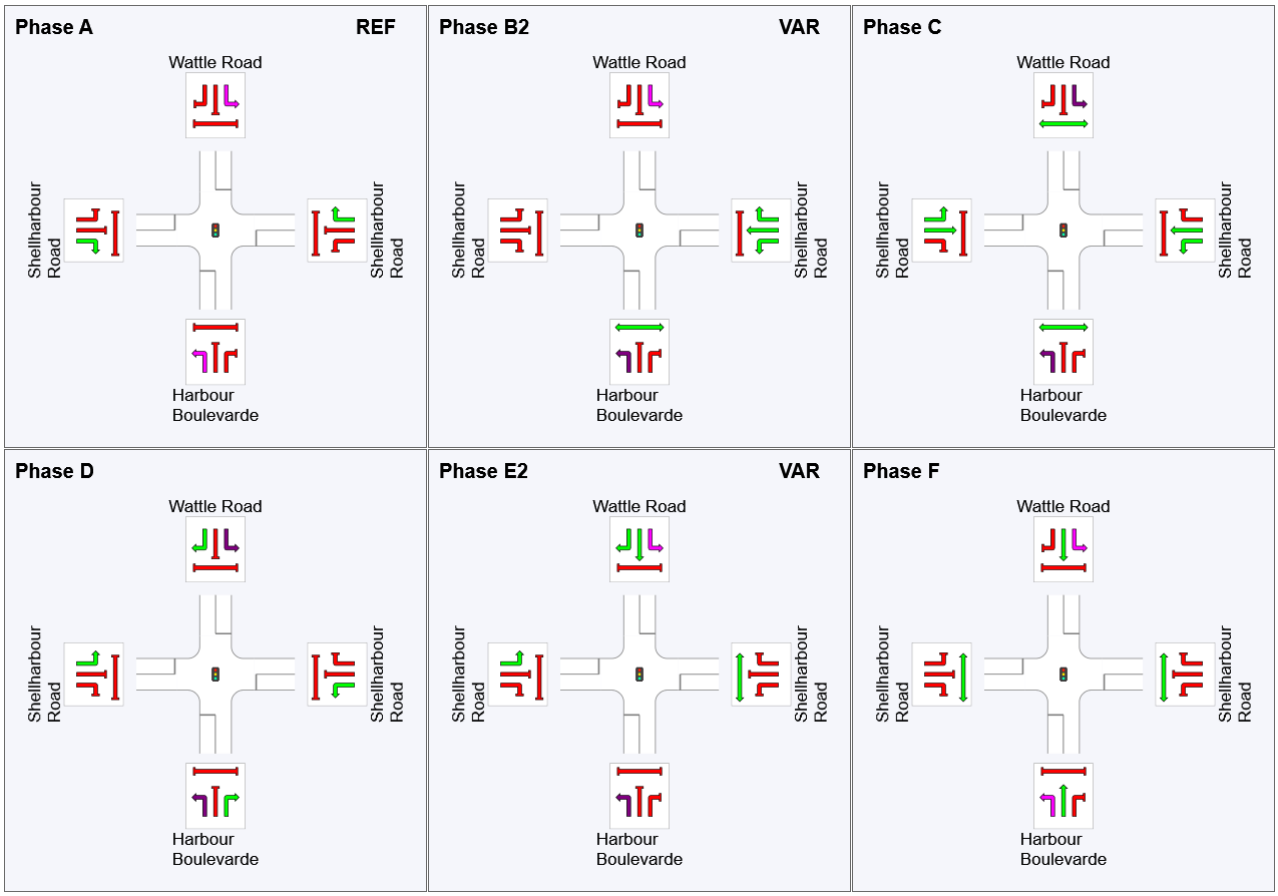
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B1*, B2*, C, D, E1*, E2*, F
Output Phase Sequence: A, B2*, C, D, E2*, F
(* Variable Phase)

Phase Timing Results

Phase	A	B2	C	D	E2	F
Phase Change Time (sec)	0	19	41	71	88	91
Green Time (sec)	13	16	24	11	***	53
Phase Time (sec)	19	22	30	17	3	59
Phase Split	13%	15%	20%	11%	2%	39%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

*** No green time has been calculated for this phase because the next phase starts during its intergreen time. This occurs with overlap phasing where there is no single movement connecting this phase to the next, or where the only such movement is a dummy movement with zero minimum green time specified.
If a green time is required for this phase, specify a dummy movement with a non-zero minimum green time.

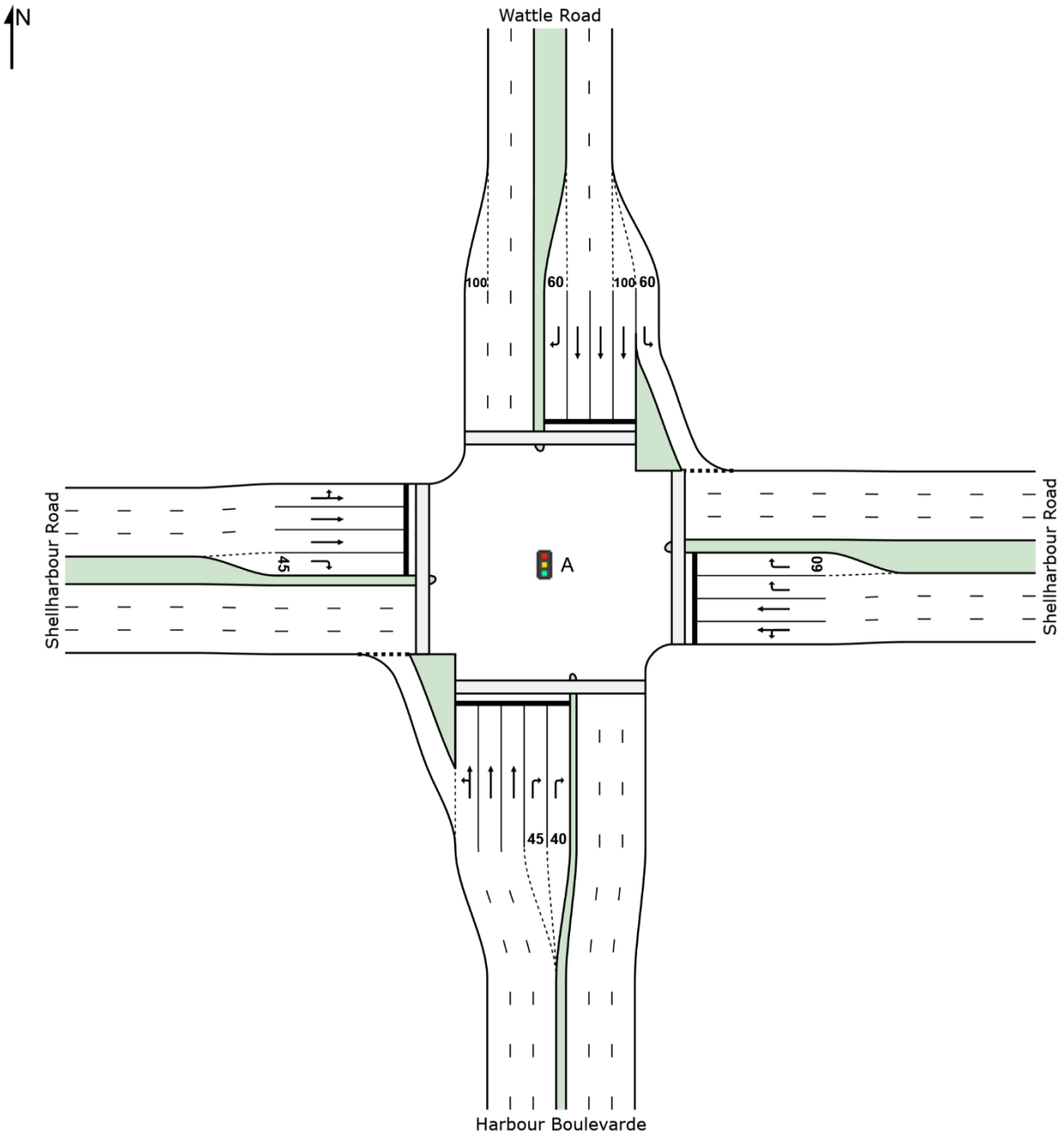


REF: Reference Phase
VAR: Variable Phase

SITE LAYOUT

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 PM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 PM Peak]

Network: N101 [2018 PM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Cycle Time - Program)
Common Control Group: CCG1 [TCS2455]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	4	0.0	4	0.0	0.427	55.6	LOS E	11.4	81.6	0.88	0.75	23.9
2	T1	876	3.0	876	3.0	0.698	52.9	LOS D	11.4	81.6	0.95	0.82	23.8
3	R2	105	2.9	105	2.9	0.714	87.6	LOS F	4.2	29.8	1.00	0.80	16.8
Approach		985	2.9	985	2.9	0.714	56.6	LOS E	11.4	81.6	0.96	0.81	22.8
East: Shellharbour Road													
4	L2	148	2.7	148	2.7	0.455	52.5	LOS D	14.2	102.1	0.87	0.79	23.0
5	T1	337	3.0	337	3.0	0.455	47.4	LOS D	14.8	106.0	0.88	0.75	33.6
6	R2	358	3.1	358	3.1	0.914	93.6	LOS F	15.0	108.0	1.00	1.00	23.8
Approach		843	3.0	843	3.0	0.914	67.9	LOS E	15.0	108.0	0.93	0.86	27.2
North: Wattle Road													
7	L2	324	3.1	324	3.1	0.237	7.3	LOS A	3.4	24.3	0.24	0.63	52.9
8	T1	1621	3.0	1621	3.0	0.928	62.5	LOS E	46.0	330.0	0.88	0.97	20.2
9	R2	201	3.0	201	3.0	0.713	42.2	LOS D	9.0	64.7	1.00	0.84	35.3
Approach		2146	3.0	2146	3.0	0.928	52.3	LOS D	46.0	330.0	0.80	0.91	25.6
West: Shellharbour Road													
10	L2	153	3.3	153	3.3	0.204	20.4	LOS C	4.6	32.8	0.64	0.72	44.0
11	T1	225	3.1	225	3.1	0.204	43.3	LOS D	6.1	43.9	0.80	0.65	35.3
12	R2	7	0.0	7	0.0	0.035	70.5	LOS E	0.5	3.2	0.92	0.66	18.6
Approach		385	3.1	385	3.1	0.204	34.7	LOS C	6.1	43.9	0.74	0.68	37.9
All Vehicles		4359	3.0	4359	3.0	0.928	54.7	LOS D	46.0	330.0	0.85	0.86	26.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	57.3	LOS E	0.2	0.2	0.88	0.88
P2	East Full Crossing	53	39.7	LOS D	0.2	0.2	0.73	0.73
P3	North Full Crossing	53	55.6	LOS E	0.2	0.2	0.86	0.86
P4	West Full Crossing	53	58.2	LOS E	0.2	0.2	0.88	0.88
All Pedestrians		211	52.7	LOS E			0.84	0.84

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.

PHASING SUMMARY

Site: A [Shellharbour Road / Harbour Boulevarde / Wattle Road_2018 PM Peak]

Shellharbour Road / Harbour Boulevarde / Wattle Road
Signals - Fixed Time Isolated Cycle Time = 95 seconds (Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

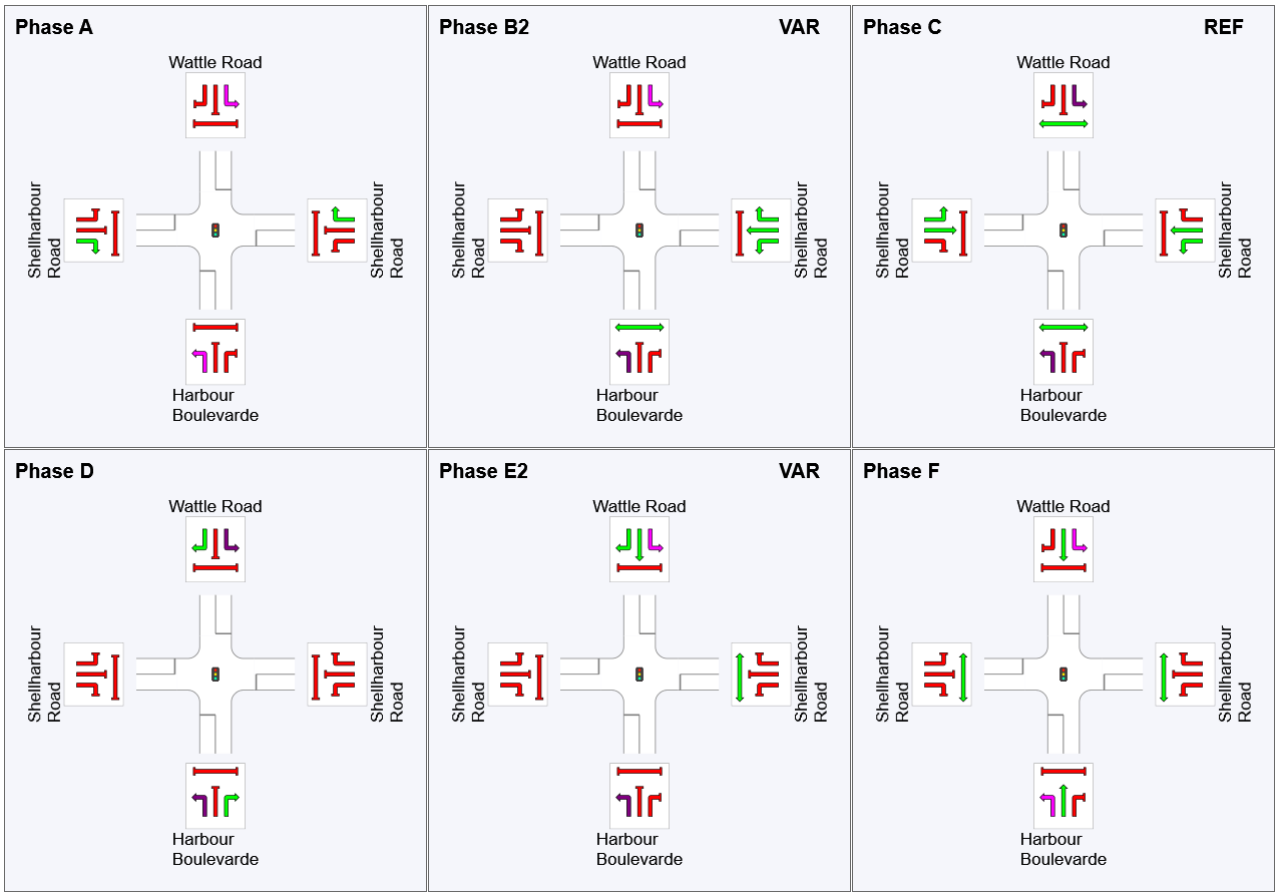
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase C
Input Phase Sequence: A, B1*, B2*, C, D, E1*, E2*, F
Output Phase Sequence: A, B2*, C, D, E2*, F
(* Variable Phase)

Phase Timing Results

Phase	A	B2	C	D	E2	F
Phase Change Time (sec)	78	91	0	25	37	47
Green Time (sec)	7	***	19	6	4	25
Phase Time (sec)	13	4	25	12	10	31
Phase Split	14%	4%	26%	13%	11%	33%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

*** No green time has been calculated for this phase because the next phase starts during its intergreen time. This occurs with overlap phasing where there is no single movement connecting this phase to the next, or where the only such movement is a dummy movement with zero minimum green time specified.
If a green time is required for this phase, specify a dummy movement with a non-zero minimum green time.

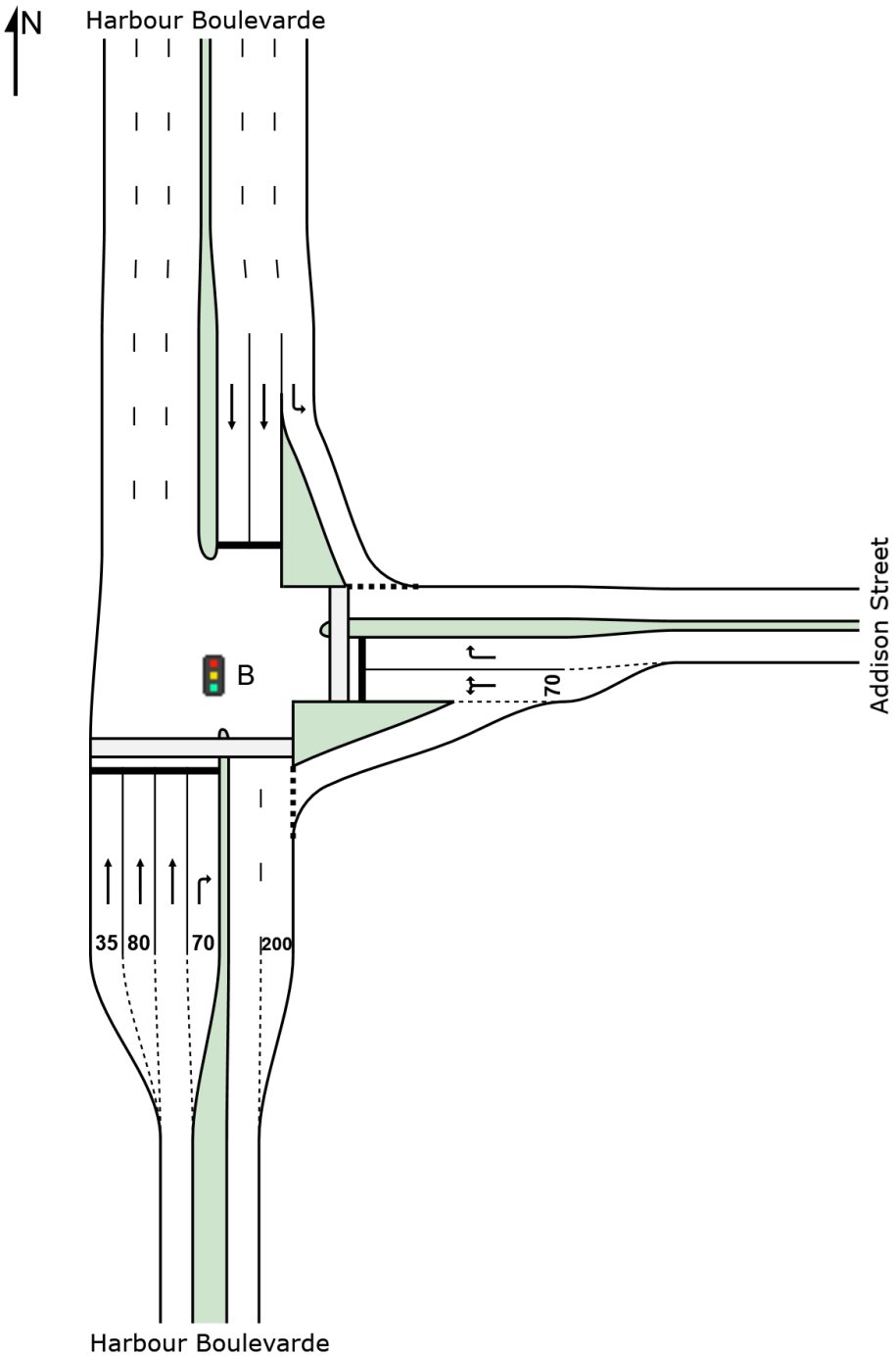


REF: Reference Phase
VAR: Variable Phase

SITE LAYOUT

Site: B [Addison Street / Harbour Boulevarde_2018 AM Peak]

Addison Street / Harbour Boulevarde
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: B [Addison Street / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Addison Street / Harbour Boulevarde
Signals - Fixed Time Isolated Cycle Time = 150 seconds (User-Given Cycle Time)
Common Control Group: CCG1 [TCS2455]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
2	T1	1127	3.0	1127	3.0	0.494	5.9	LOS A	9.5	68.2	0.38	0.34	49.0
3	R2	104	2.9	104	2.9	0.339	65.4	LOS E	6.8	48.6	0.93	0.78	27.5
Approach		1231	3.0	1231	3.0	0.494	11.0	LOS B	9.5	68.2	0.42	0.38	43.4
East: Addison Street													
4	L2	51	2.0	51	2.0	0.862	81.1	LOS F	10.8	77.5	1.00	0.96	16.7
6	R2	192	3.1	192	3.1	0.862	86.6	LOS F	10.8	77.5	1.00	0.97	15.9
Approach		243	2.9	243	2.9	0.862	85.4	LOS F	10.8	77.5	1.00	0.97	16.0
North: Harbour Boulevarde													
7	L2	123	3.3	123	3.3	0.082	4.2	LOS A	0.1	1.0	0.02	0.54	52.1
8	T1	717	3.1	717	3.1	0.320	2.8	LOS A	4.1	29.7	0.10	0.09	34.9
Approach		840	3.1	840	3.1	0.320	3.0	LOS A	4.1	29.7	0.09	0.16	43.6
All Vehicles		2314	3.0	2314	3.0	0.862	15.9	LOS B	10.8	77.5	0.36	0.36	34.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	17.8	LOS B	0.1	0.1	0.49	0.49
All Pedestrians		105	43.5	LOS E			0.72	0.72

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.

PHASING SUMMARY

Site: B [Addison Street / Harbour Boulevarde_2018 AM Peak]

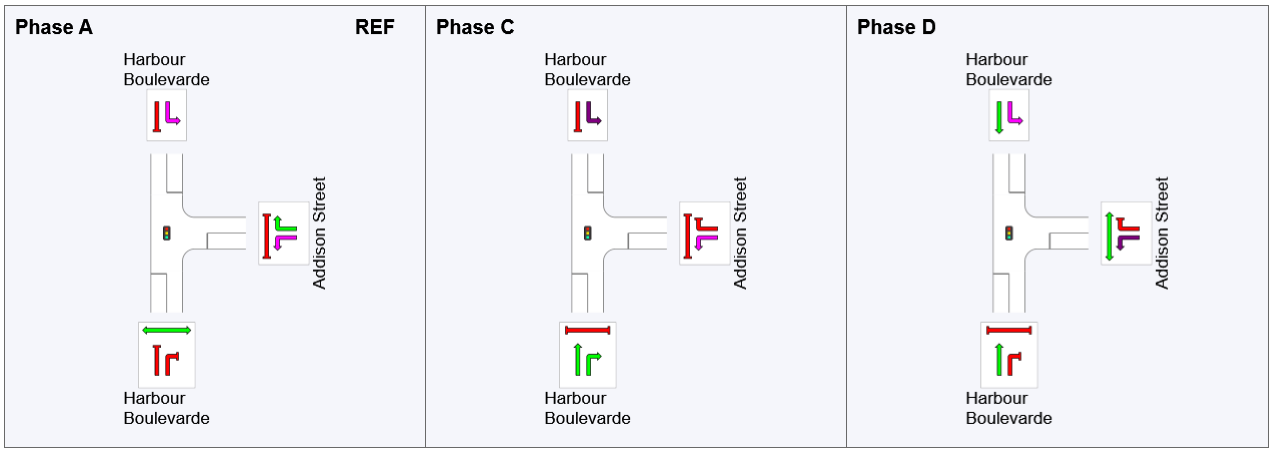
Addison Street / Harbour Boulevarde
Signals - Fixed Time Isolated Cycle Time = 150 seconds (User-Given Cycle Time)

Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, C, D
Output Phase Sequence: A, C, D

Phase Timing Results

Phase	A	C	D
Phase Change Time (sec)	0	34	65
Green Time (sec)	28	25	79
Phase Time (sec)	34	31	85
Phase Split	23%	21%	57%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

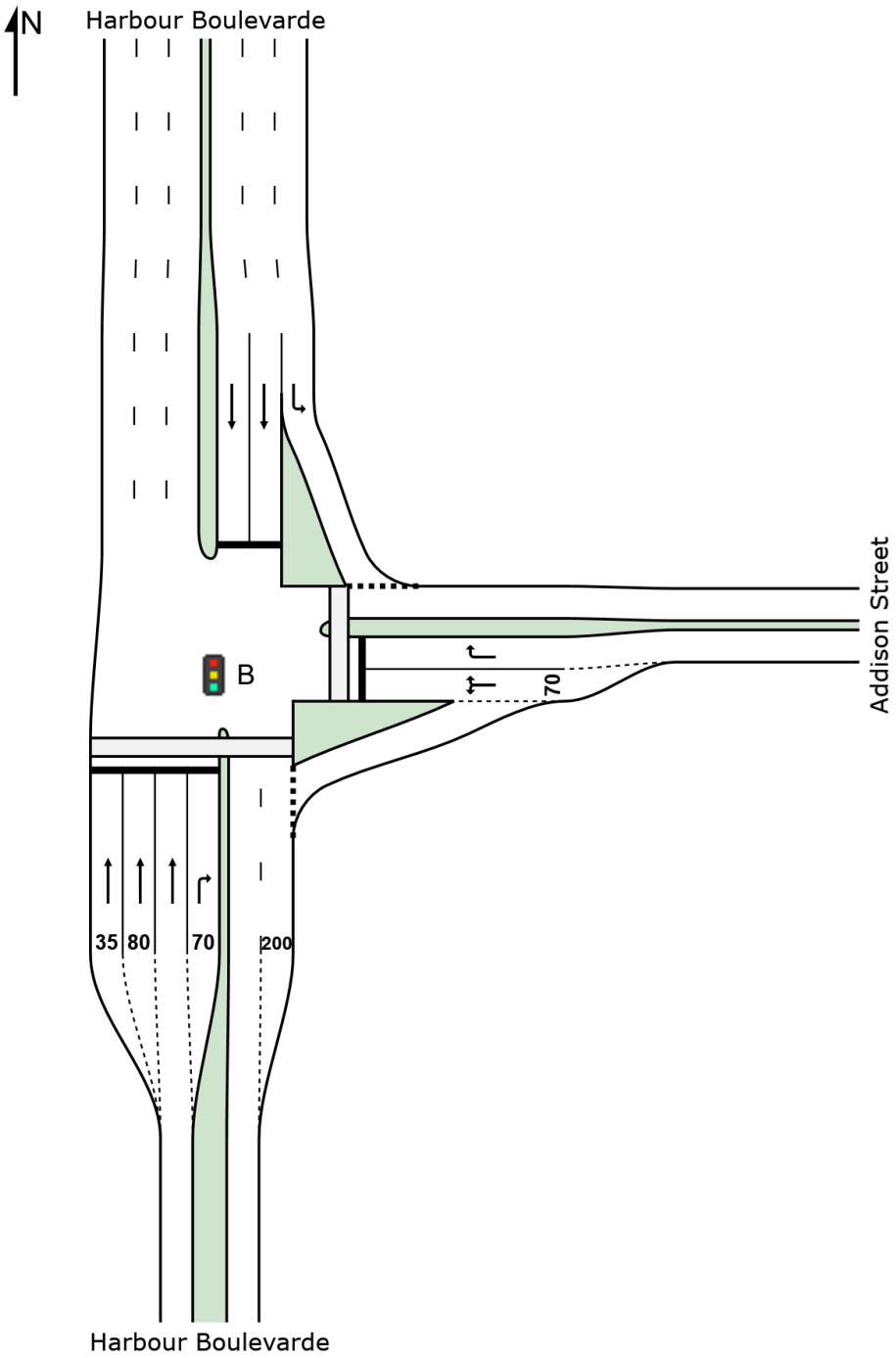


REF: Reference Phase
VAR: Variable Phase

SITE LAYOUT

Site: B [Addison Street / Harbour Boulevarde_2018 PM Peak]

Addison Street / Harbour Boulevarde
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: B [Addison Street / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Addison Street / Harbour Boulevarde
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Cycle Time - Program)
Common Control Group: CCG1 [TCS2455]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
2	T1	751	3.1	751	3.1	0.432	9.1	LOS A	5.3	38.0	0.58	0.50	44.7
3	R2	68	1.5	68	1.5	0.452	51.3	LOS D	3.9	27.5	0.98	0.78	31.1
Approach		819	2.9	819	2.9	0.452	12.6	LOS B	5.3	38.0	0.61	0.52	41.8
East: Addison Street													
4	L2	78	3.8	78	3.8	0.365	33.5	LOS C	5.9	42.7	0.81	0.78	29.0
6	R2	128	3.1	128	3.1	0.365	37.6	LOS D	5.9	42.7	0.85	0.78	27.2
Approach		206	3.4	206	3.4	0.365	36.0	LOS D	5.9	42.7	0.83	0.78	27.9
North: Harbour Boulevarde													
7	L2	185	3.2	185	3.2	0.133	4.7	LOS A	0.9	6.4	0.10	0.56	51.4
8	T1	1074	3.0	1074	3.0	0.534	2.2	LOS A	4.9	35.4	0.17	0.15	37.9
Approach		1259	3.0	1259	3.0	0.534	2.6	LOS A	4.9	35.4	0.16	0.21	45.1
All Vehicles		2284	3.0	2284	3.0	0.534	9.2	LOS A	5.9	42.7	0.38	0.37	39.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	14.6	LOS B	0.1	0.1	0.61	0.61
All Pedestrians		105	41.9	LOS E			0.79	0.79

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.

PHASING SUMMARY

Site: B [Addison Street / Harbour Boulevarde_2018 PM Peak]

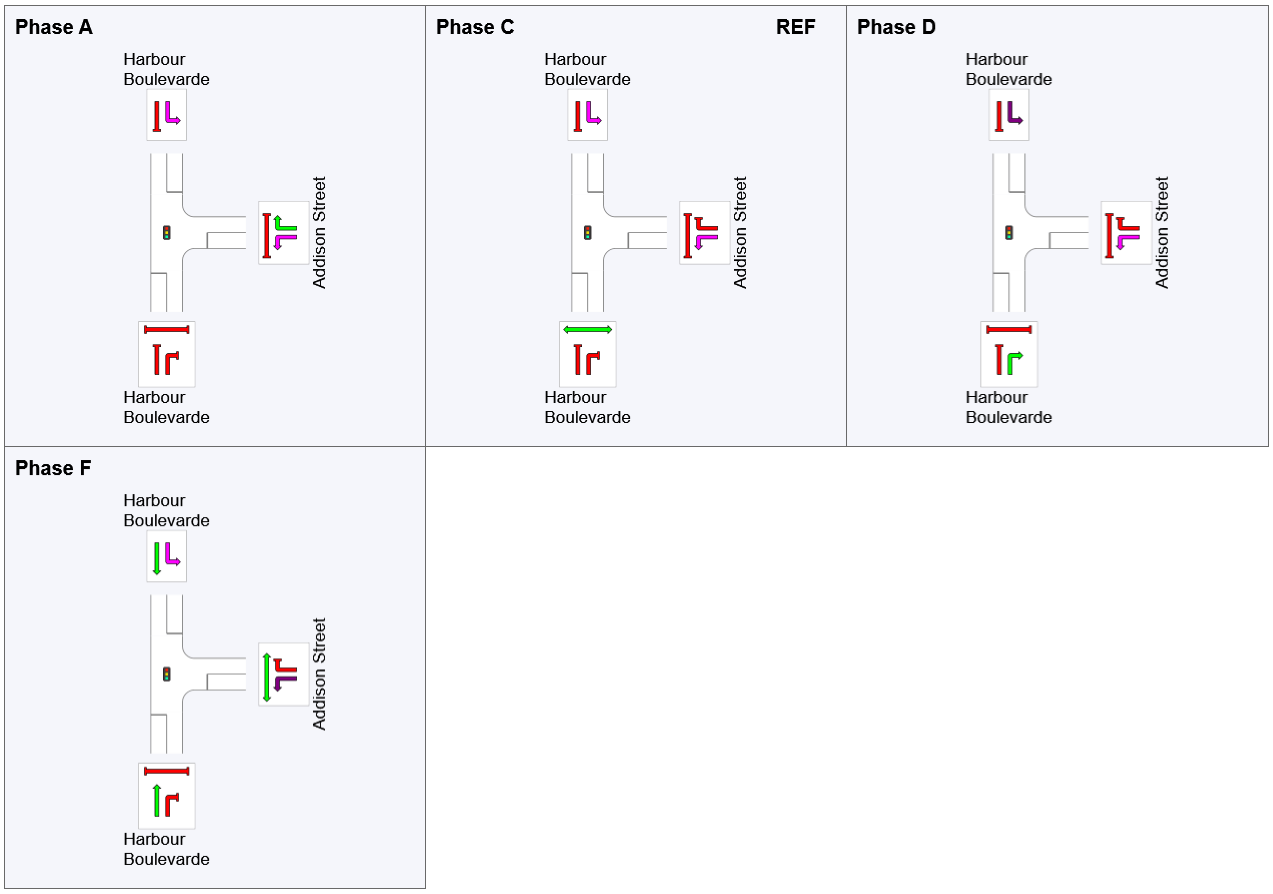
Addison Street / Harbour Boulevarde
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase C
Input Phase Sequence: A, B1*, B2*, C, D, E1*, E2*, F
Output Phase Sequence: A, C, D, F
(* Variable Phase)

Phase Timing Results

Phase	A	C	D	F
Phase Change Time (sec)	58	0	18	30
Green Time (sec)	6	14	6	22
Phase Time (sec)	10	20	12	28
Phase Split	14%	29%	17%	40%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.



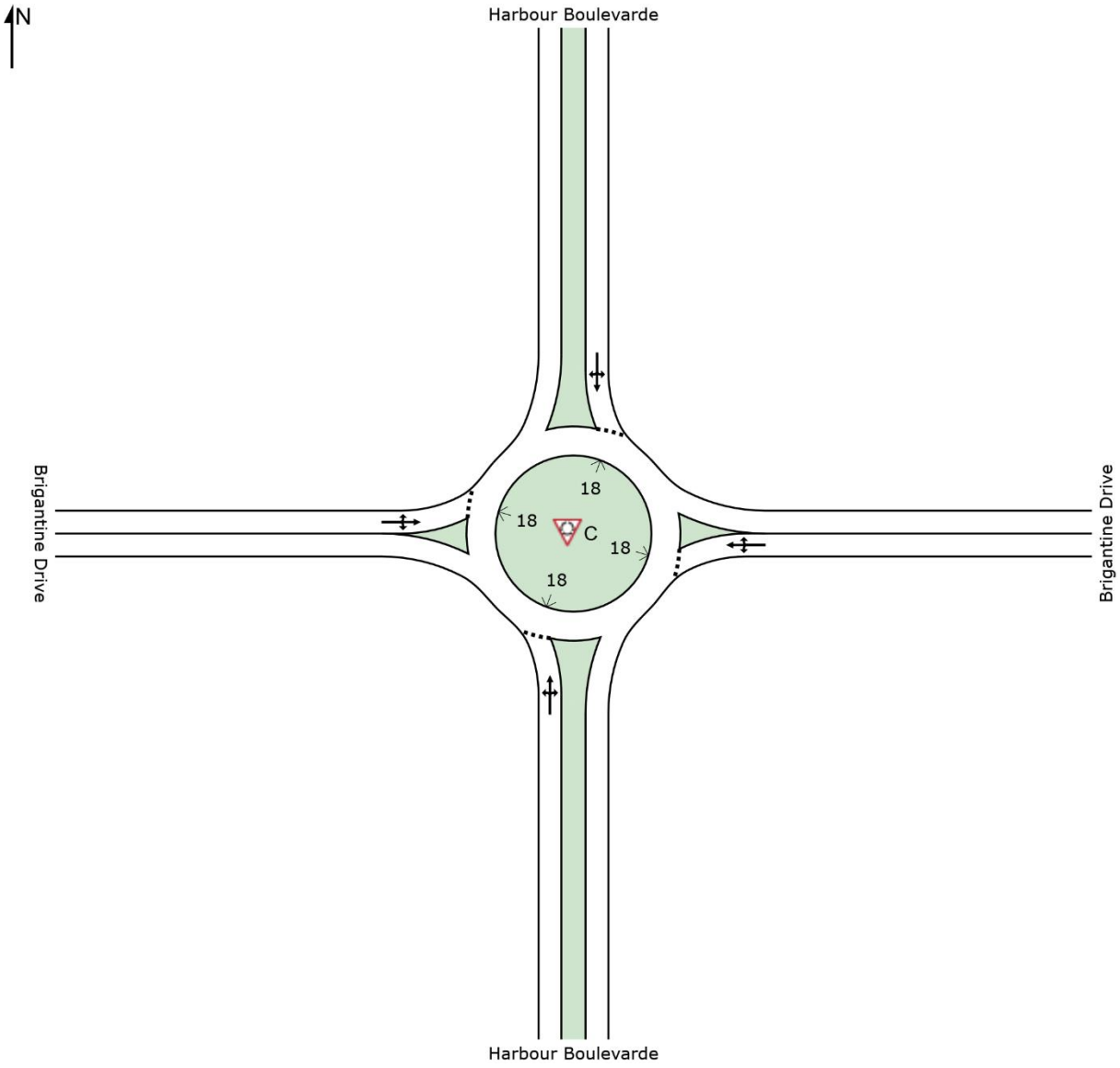
REF: Reference Phase
VAR: Variable Phase

Normal Movement Permitted/Opposed

SITE LAYOUT

Site: C [Brigantine Drive / Harbour Boulevarde_2018 AM Peak]

Brigantine Drive / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: C [Brigantine Drive / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Brigantine Drive / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

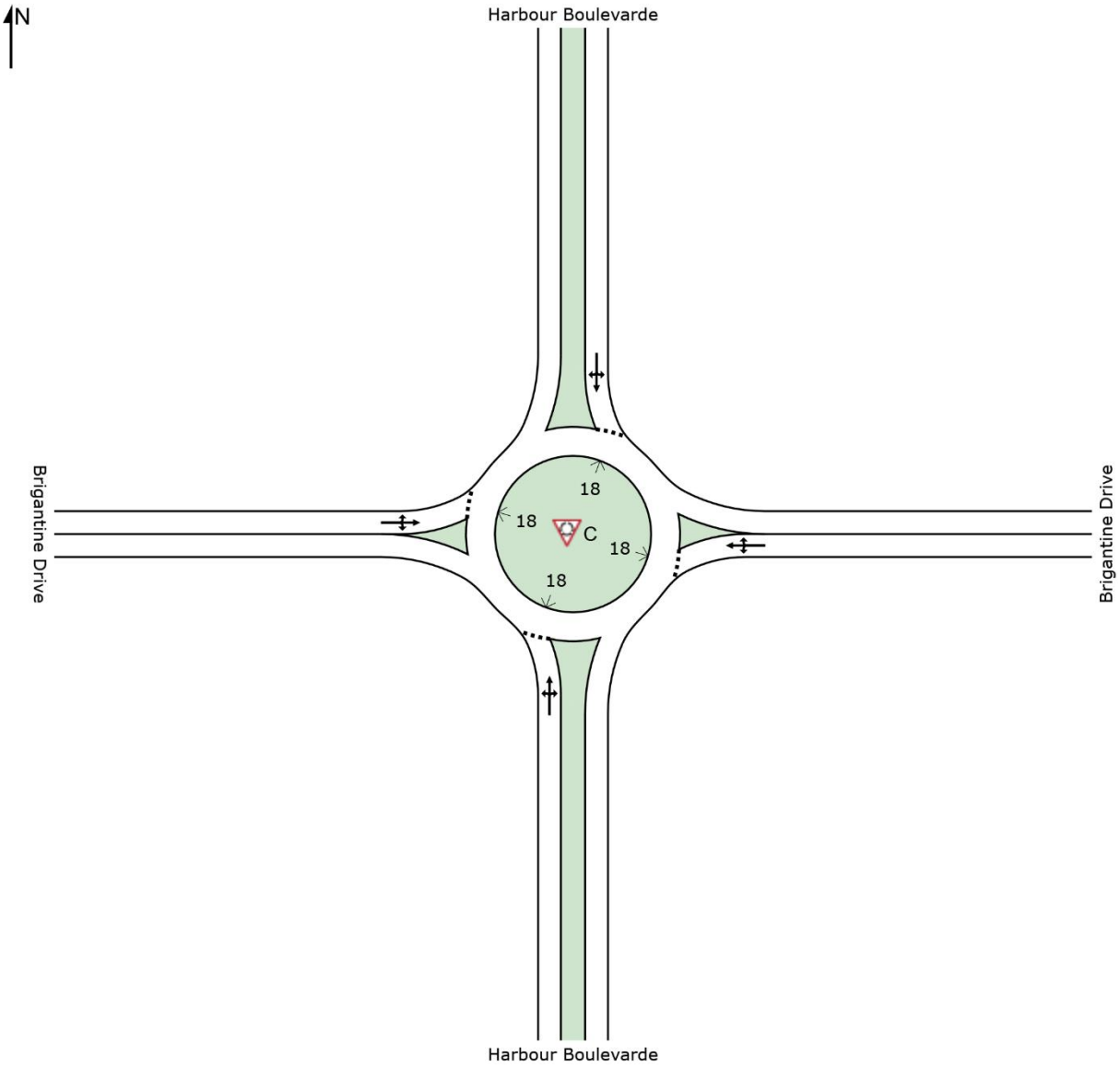
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	5	0.0	5	0.0	0.477	5.9	LOS A	3.9	27.8	0.62	0.60	35.2
2	T1	517	3.1	517	3.1	0.477	6.2	LOS A	3.9	27.8	0.62	0.60	43.9
3	R2	1	0.0	1	0.0	0.477	10.5	LOS B	3.9	27.8	0.62	0.60	52.4
Approach		523	3.0	523	3.0	0.477	6.2	LOS A	3.9	27.8	0.62	0.60	43.8
East: Brigantine Drive													
4	L2	1	0.0	1	0.0	0.213	9.7	LOS A	1.4	10.1	0.81	0.84	42.6
5	T1	36	2.9	36	2.9	0.213	10.1	LOS B	1.4	10.1	0.81	0.84	38.4
6	R2	98	2.2	98	2.2	0.213	14.5	LOS B	1.4	10.1	0.81	0.84	42.6
Approach		135	2.3	135	2.3	0.213	13.3	LOS B	1.4	10.1	0.81	0.84	41.3
North: Harbour Boulevarde													
7	L2	24	4.3	24	4.3	0.560	4.7	LOS A	6.2	44.4	0.45	0.47	52.4
8	T1	653	3.1	653	3.1	0.560	4.9	LOS A	6.2	44.4	0.45	0.47	47.7
9	R2	97	3.3	97	3.3	0.560	9.3	LOS A	6.2	44.4	0.45	0.47	35.3
Approach		774	3.1	774	3.1	0.560	5.5	LOS A	6.2	44.4	0.45	0.47	45.7
West: Brigantine Drive													
10	L2	113	2.8	113	2.8	0.262	8.1	LOS A	1.8	12.5	0.77	0.78	25.1
11	T1	69	3.0	69	3.0	0.262	8.3	LOS A	1.8	12.5	0.77	0.78	49.1
12	R2	7	0.0	7	0.0	0.262	12.7	LOS B	1.8	12.5	0.77	0.78	25.1
Approach		189	2.8	189	2.8	0.262	8.3	LOS A	1.8	12.5	0.77	0.78	40.4
All Vehicles		1621	3.0	1621	3.0	0.560	6.7	LOS A	6.2	44.4	0.57	0.58	44.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: C [Brigantine Drive / Harbour Boulevarde_2018 PM Peak]

Brigantine Drive / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: C [Brigantine Drive / Harbour Boulevarde_2018 PM Peak]

Brigantine Drive / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

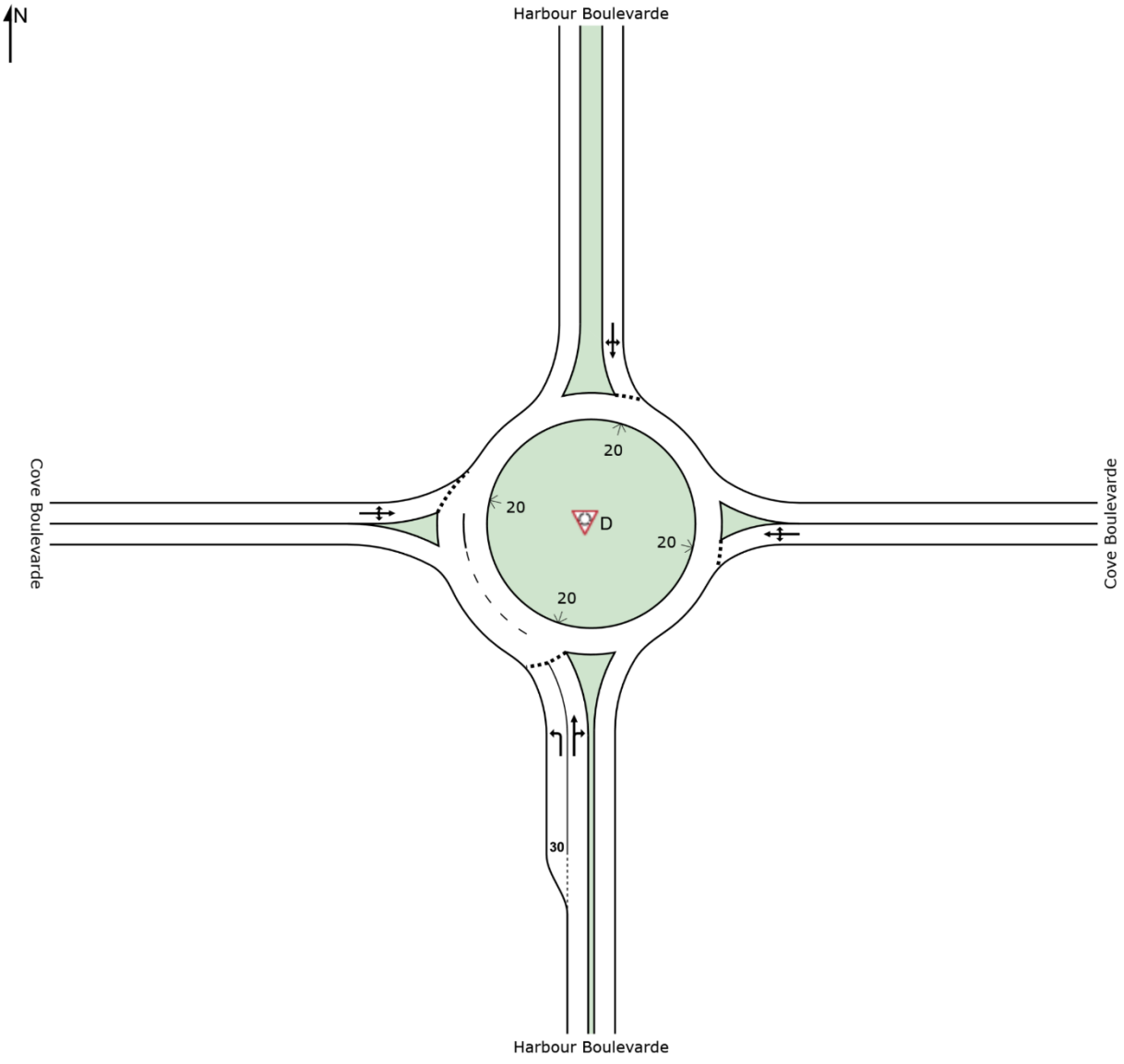
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde											
1	L2	7	0.0	0.798	12.9	LOS A	13.2	94.8	0.97	1.00	31.3
2	T1	776	3.0	0.798	13.3	LOS A	13.2	94.8	0.97	1.00	47.0
3	R2	2	0.0	0.798	17.5	LOS B	13.2	94.8	0.97	1.00	47.8
Approach		785	2.9	0.798	13.3	LOS A	13.2	94.8	0.97	1.00	46.9
East: Brigantine Drive											
4	L2	1	0.0	0.265	8.2	LOS A	1.7	12.3	0.73	0.80	48.1
5	T1	54	3.9	0.265	8.6	LOS A	1.7	12.3	0.73	0.80	39.4
6	R2	149	3.5	0.265	13.0	LOS A	1.7	12.3	0.73	0.80	50.0
Approach		204	3.6	0.265	11.8	LOS A	1.7	12.3	0.73	0.80	47.6
North: Harbour Boulevarde											
7	L2	16	0.0	0.417	4.3	LOS A	4.0	28.8	0.32	0.47	52.8
8	T1	435	3.1	0.417	4.6	LOS A	4.0	28.8	0.32	0.47	52.7
9	R2	144	2.9	0.417	9.0	LOS A	4.0	28.8	0.32	0.47	29.5
Approach		595	3.0	0.417	5.7	LOS A	4.0	28.8	0.32	0.47	46.1
West: Brigantine Drive											
10	L2	75	2.8	0.290	11.9	LOS A	2.1	15.4	0.96	0.94	42.2
11	T1	46	2.3	0.290	12.1	LOS A	2.1	15.4	0.96	0.94	45.2
12	R2	5	0.0	0.290	16.4	LOS B	2.1	15.4	0.96	0.94	40.8
Approach		126	2.5	0.290	12.2	LOS A	2.1	15.4	0.96	0.94	43.3
All Vehicles		1711	3.0	0.798	10.4	LOS A	13.2	94.8	0.72	0.79	46.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: D [Cove Boulevarde / Harbour Boulevarde_2018 AM Peak]

Cove Boulevarde / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: D [Cove Boulevarde / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Cove Boulevarde / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

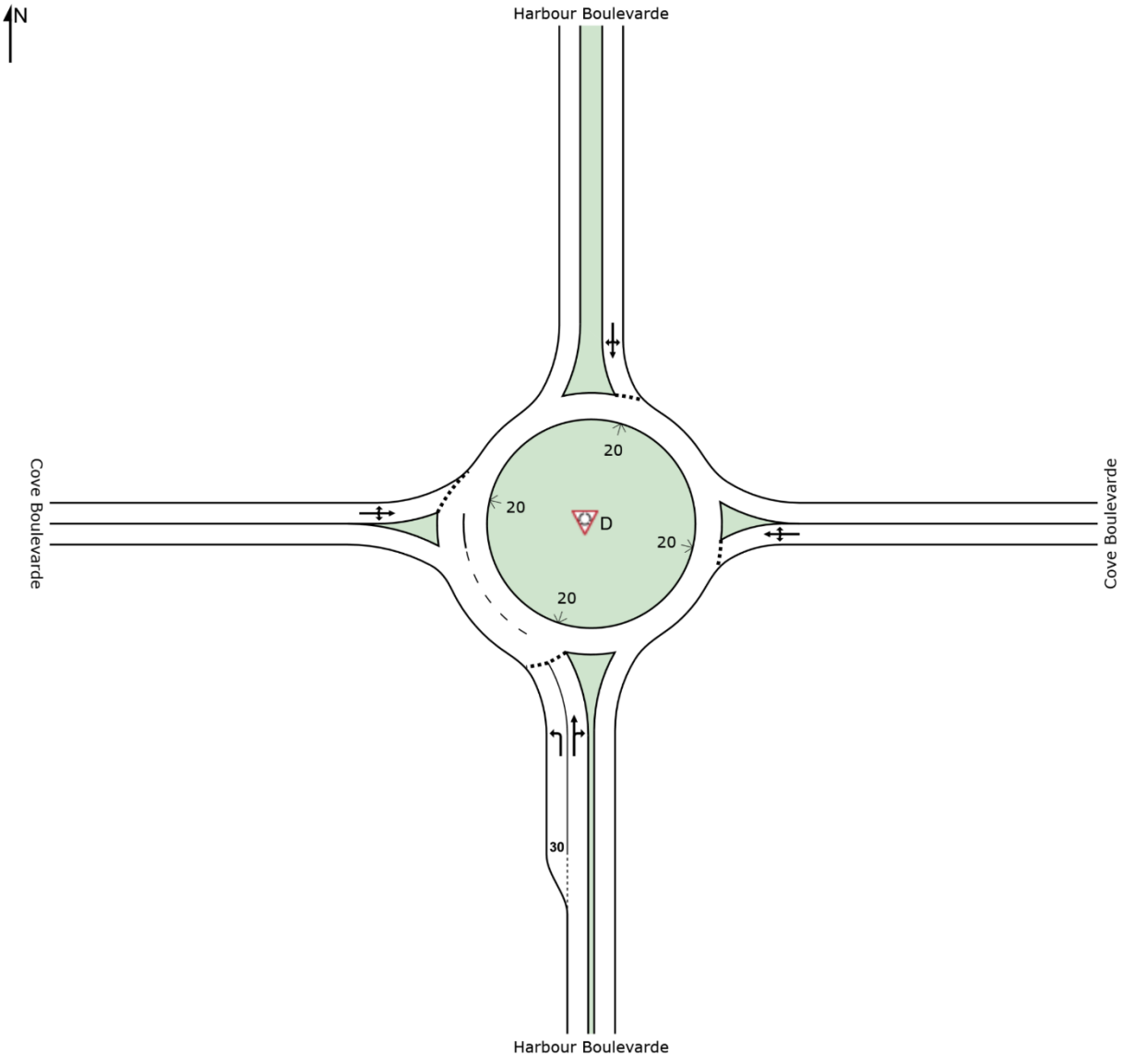
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	195	3.2	195	3.2	0.175	4.5	LOS A	1.1	8.0	0.41	0.52	47.5
2	T1	361	2.9	361	2.9	0.260	4.3	LOS A	1.9	13.4	0.41	0.47	31.9
3	R2	4	0.0	4	0.0	0.260	8.8	LOS A	1.9	13.4	0.41	0.47	36.4
Approach		560	3.0	560	3.0	0.260	4.4	LOS A	1.9	13.4	0.41	0.49	40.7
East: Cove Boulevarde													
4	L2	2	0.0	2	0.0	0.106	11.0	LOS B	0.7	5.1	0.87	0.81	23.7
5	T1	39	2.7	39	2.7	0.106	11.3	LOS B	0.7	5.1	0.87	0.81	41.3
6	R2	14	0.0	14	0.0	0.106	15.8	LOS B	0.7	5.1	0.87	0.81	23.7
Approach		55	1.9	55	1.9	0.106	12.4	LOS B	0.7	5.1	0.87	0.81	38.1
North: Harbour Boulevarde													
7	L2	1	0.0	1	0.0	0.645	9.2	LOS A	7.3	52.3	0.88	0.87	42.5
8	T1	487	3.0	487	3.0	0.645	9.5	LOS A	7.3	52.3	0.88	0.87	40.5
9	R2	103	3.1	103	3.1	0.645	14.2	LOS B	7.3	52.3	0.88	0.87	47.6
Approach		592	3.0	592	3.0	0.645	10.3	LOS B	7.3	52.3	0.88	0.87	42.2
West: Cove Boulevarde													
10	L2	194	3.3	194	3.3	0.663	9.7	LOS A	6.7	47.9	0.80	0.91	37.2
11	T1	61	3.4	61	3.4	0.663	9.9	LOS A	6.7	47.9	0.80	0.91	39.5
12	R2	311	3.1	311	3.1	0.663	14.5	LOS B	6.7	47.9	0.80	0.91	37.2
Approach		565	3.2	565	3.2	0.663	12.4	LOS B	6.7	47.9	0.80	0.91	37.5
All Vehicles		1772	3.0	1772	3.0	0.663	9.2	LOS A	7.3	52.3	0.71	0.76	40.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: D [Cove Boulevarde / Harbour Boulevarde_2018 PM Peak]

Cove Boulevarde / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: D [Cove Boulevarde / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Cove Boulevarde / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

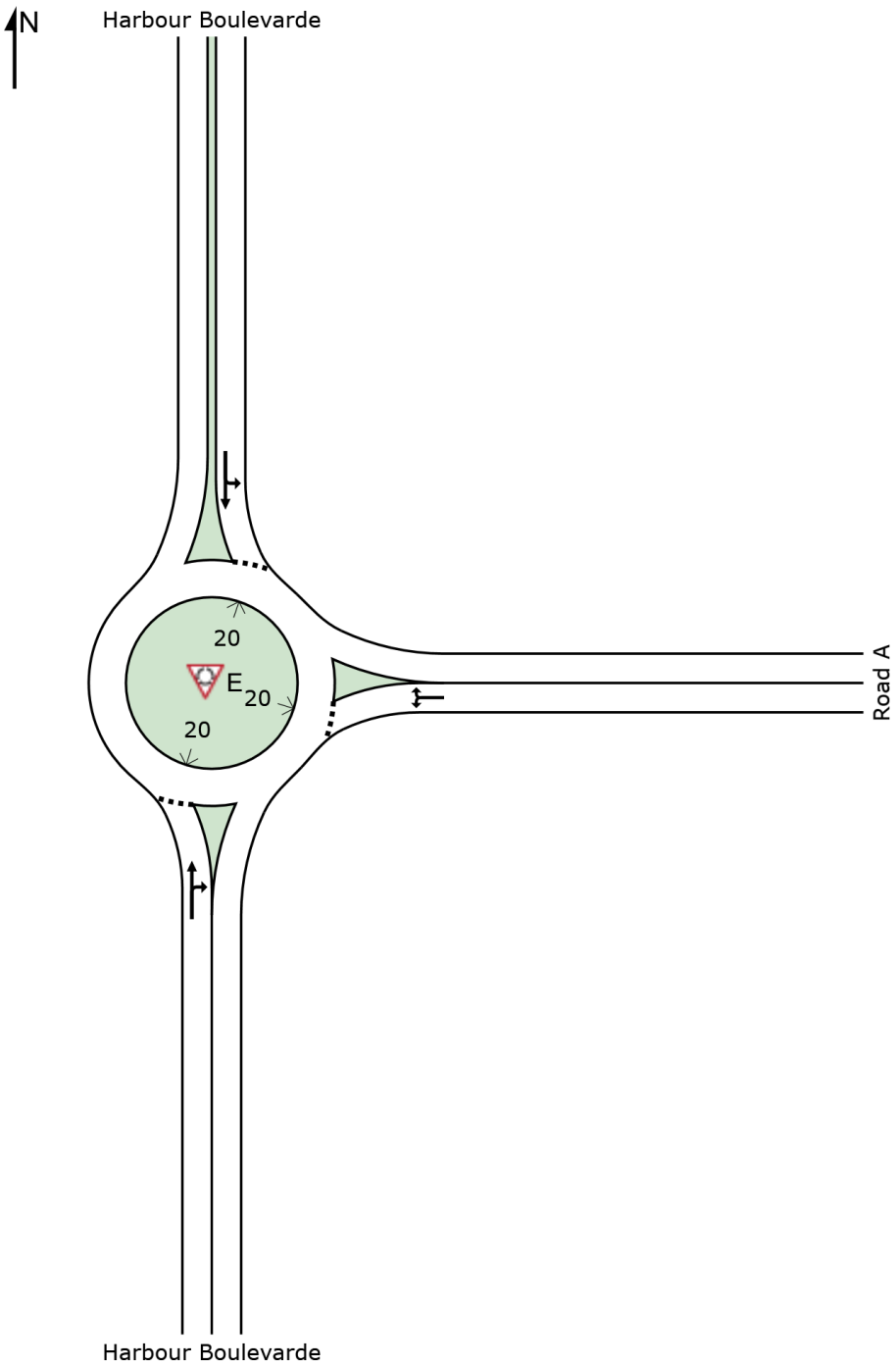
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
1	L2	294	3.2	294	3.2	0.282	5.2	LOS A	1.9	13.5	0.52	0.59	46.8
2	T1	542	3.1	542	3.1	0.412	4.9	LOS A	3.2	23.3	0.55	0.54	30.1
3	R2	3	0.0	3	0.0	0.412	9.4	LOS A	3.2	23.3	0.55	0.54	35.2
Approach		839	3.1	839	3.1	0.412	5.0	LOS A	3.2	23.3	0.54	0.56	39.4
East: Cove Boulevarde													
4	L2	3	0.0	3	0.0	0.117	8.5	LOS A	0.7	5.3	0.75	0.74	27.0
5	T1	57	3.7	57	3.7	0.117	8.8	LOS A	0.7	5.3	0.75	0.74	44.1
6	R2	20	5.3	20	5.3	0.117	13.5	LOS B	0.7	5.3	0.75	0.74	27.0
Approach		80	3.9	80	3.9	0.117	10.0	LOS A	0.7	5.3	0.75	0.74	41.2
North: Harbour Boulevarde													
7	L2	1	0.0	1	0.0	0.456	5.8	LOS A	3.8	27.3	0.66	0.65	44.3
8	T1	325	3.2	325	3.2	0.456	6.1	LOS A	3.8	27.3	0.66	0.65	42.6
9	R2	155	3.4	155	3.4	0.456	10.8	LOS B	3.8	27.3	0.66	0.65	49.1
Approach		481	3.3	481	3.3	0.456	7.6	LOS A	3.8	27.3	0.66	0.65	45.4
West: Cove Boulevarde													
10	L2	128	2.5	128	2.5	0.541	10.3	LOS B	4.3	31.1	0.82	0.96	36.4
11	T1	40	2.6	40	2.6	0.541	10.6	LOS B	4.3	31.1	0.82	0.96	38.8
12	R2	206	3.1	206	3.1	0.541	15.2	LOS B	4.3	31.1	0.82	0.96	36.4
Approach		375	2.8	375	2.8	0.541	13.0	LOS B	4.3	31.1	0.82	0.96	36.7
All Vehicles		1775	3.1	1775	3.1	0.541	7.6	LOS A	4.3	31.1	0.64	0.68	40.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: E [Road A / Harbour Boulevarde_2018 AM Peak]

Road A / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: E [Road A / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Road A / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

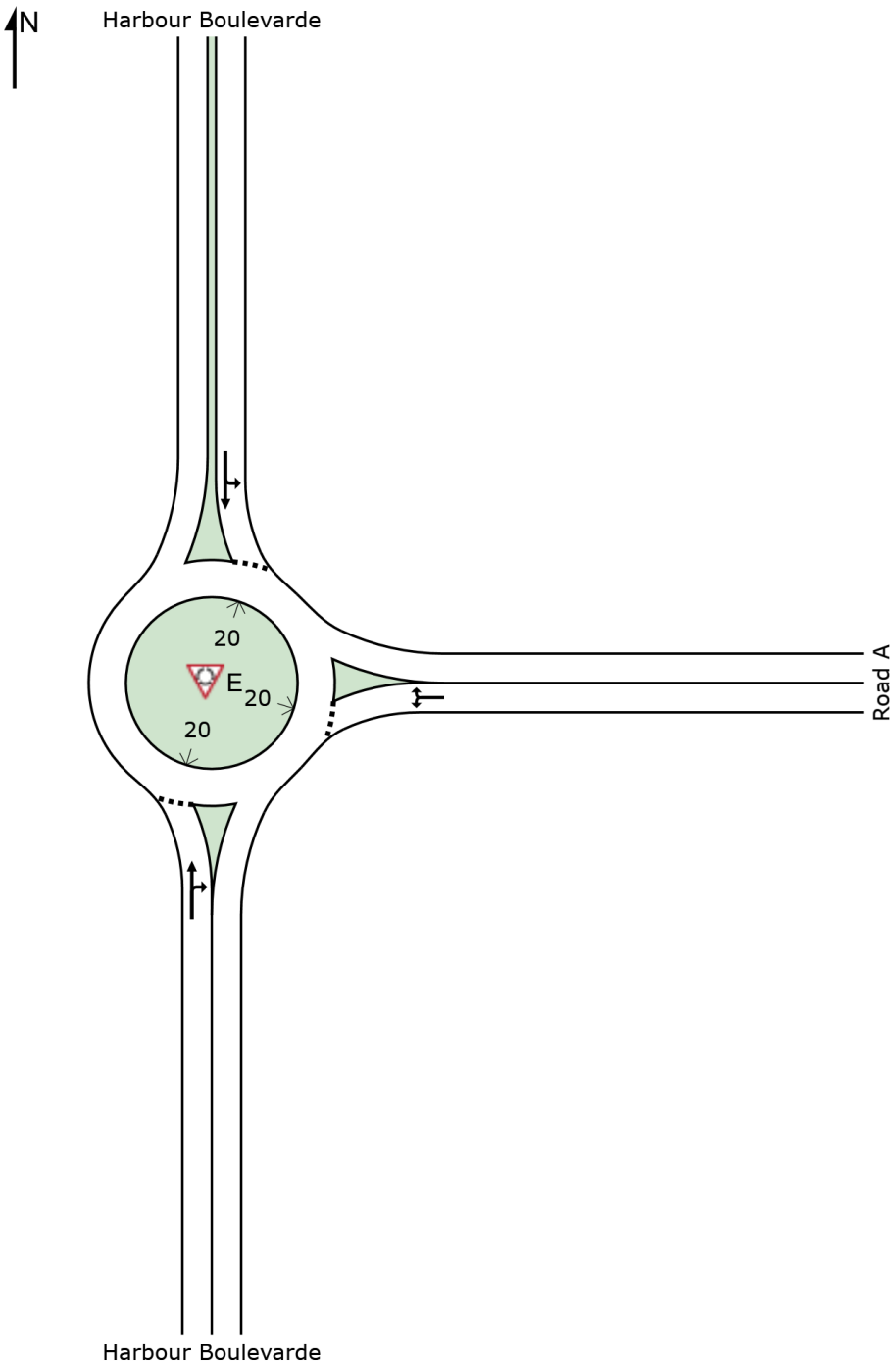
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
2	T1	198	2.1	198	2.1	0.217	6.4	LOS A	1.4	9.9	0.61	0.62	41.9
3	R2	4	0.0	4	0.0	0.217	11.0	LOS B	1.4	9.9	0.61	0.62	40.9
Approach		202	2.1	202	2.1	0.217	6.5	LOS A	1.4	9.9	0.61	0.62	41.9
East: Road A													
4	L2	6	0.0	6	0.0	0.352	4.9	LOS A	2.3	16.5	0.56	0.71	24.3
6	R2	362	2.0	362	2.0	0.352	9.6	LOS A	2.3	16.5	0.56	0.71	24.3
Approach		368	2.0	368	2.0	0.352	9.5	LOS A	2.3	16.5	0.56	0.71	24.3
North: Harbour Boulevarde													
7	L2	516	2.0	516	2.0	0.471	3.2	LOS A	4.8	34.5	0.07	0.43	23.3
8	T1	284	1.9	284	1.9	0.471	3.4	LOS A	4.8	34.5	0.07	0.43	36.7
Approach		800	2.0	800	2.0	0.471	3.3	LOS A	4.8	34.5	0.07	0.43	25.6
All Vehicles		1371	2.0	1371	2.0	0.471	5.4	LOS A	4.8	34.5	0.28	0.53	28.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: E [Road A / Harbour Boulevarde_2018 PM Peak]

Road A / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: E [Road A / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Road A / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

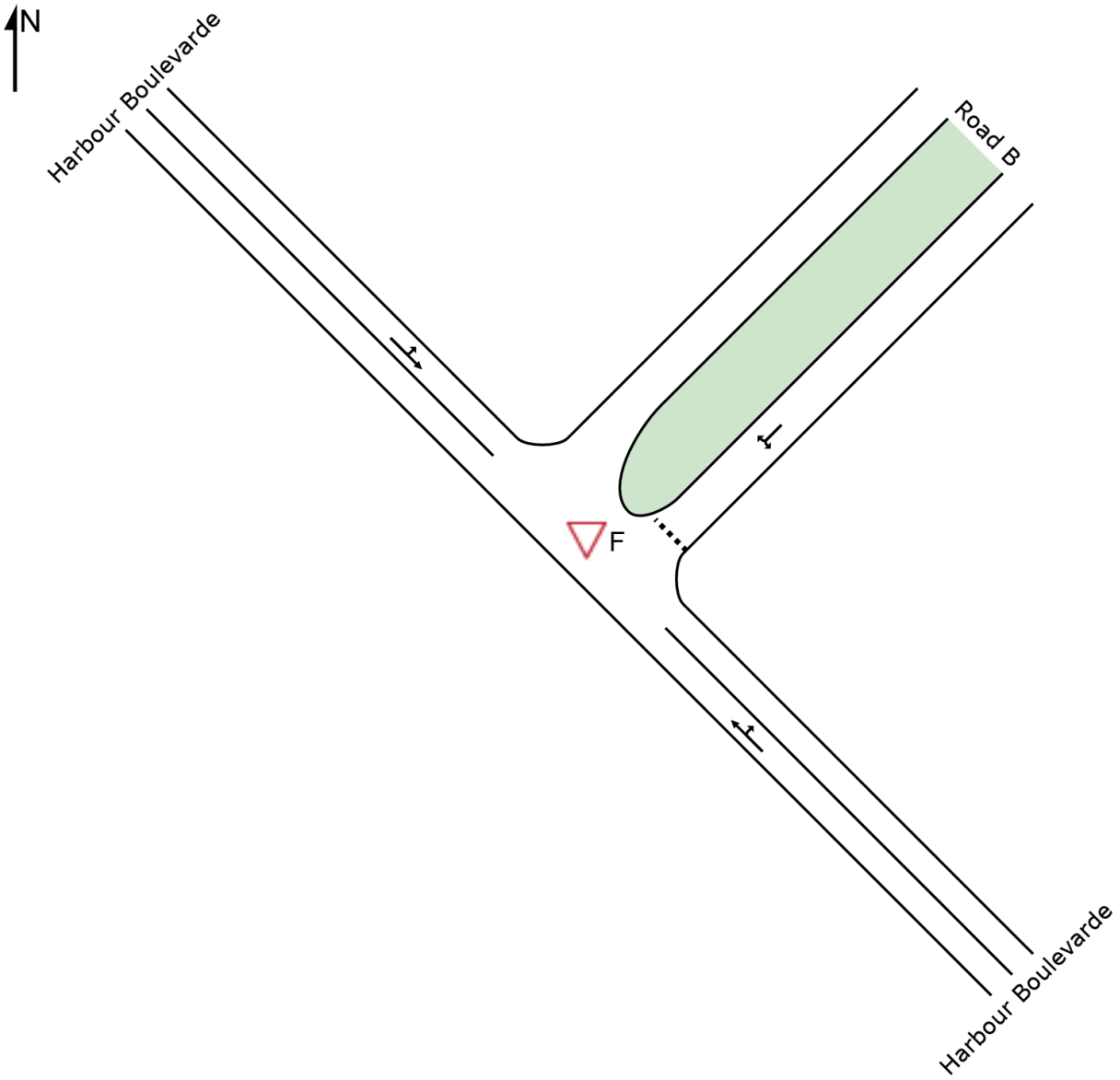
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour Boulevarde													
2	T1	296	2.1	296	2.1	0.385	8.3	LOS A	2.7	19.5	0.78	0.78	40.3
3	R2	6	0.0	6	0.0	0.385	12.8	LOS B	2.7	19.5	0.78	0.78	39.6
Approach		302	2.1	302	2.1	0.385	8.4	LOS A	2.7	19.5	0.78	0.78	40.3
East: Road A													
4	L2	4	0.0	4	0.0	0.461	4.3	LOS A	3.5	25.0	0.52	0.66	24.7
6	R2	543	1.9	543	1.9	0.461	9.0	LOS A	3.5	25.0	0.52	0.66	24.7
Approach		547	1.9	547	1.9	0.461	9.0	LOS A	3.5	25.0	0.52	0.66	24.7
North: Harbour Boulevarde													
7	L2	344	1.8	344	1.8	0.321	3.2	LOS A	2.8	20.1	0.08	0.43	23.2
8	T1	191	2.2	191	2.2	0.321	3.4	LOS A	2.8	20.1	0.08	0.43	36.6
Approach		535	2.0	535	2.0	0.321	3.3	LOS A	2.8	20.1	0.08	0.43	25.6
All Vehicles		1384	2.0	1384	2.0	0.461	6.7	LOS A	3.5	25.0	0.41	0.60	29.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: F [Road B / Harbour Boulevarde_2018 AM Peak]

Road B / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: F [Road B / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Road B / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

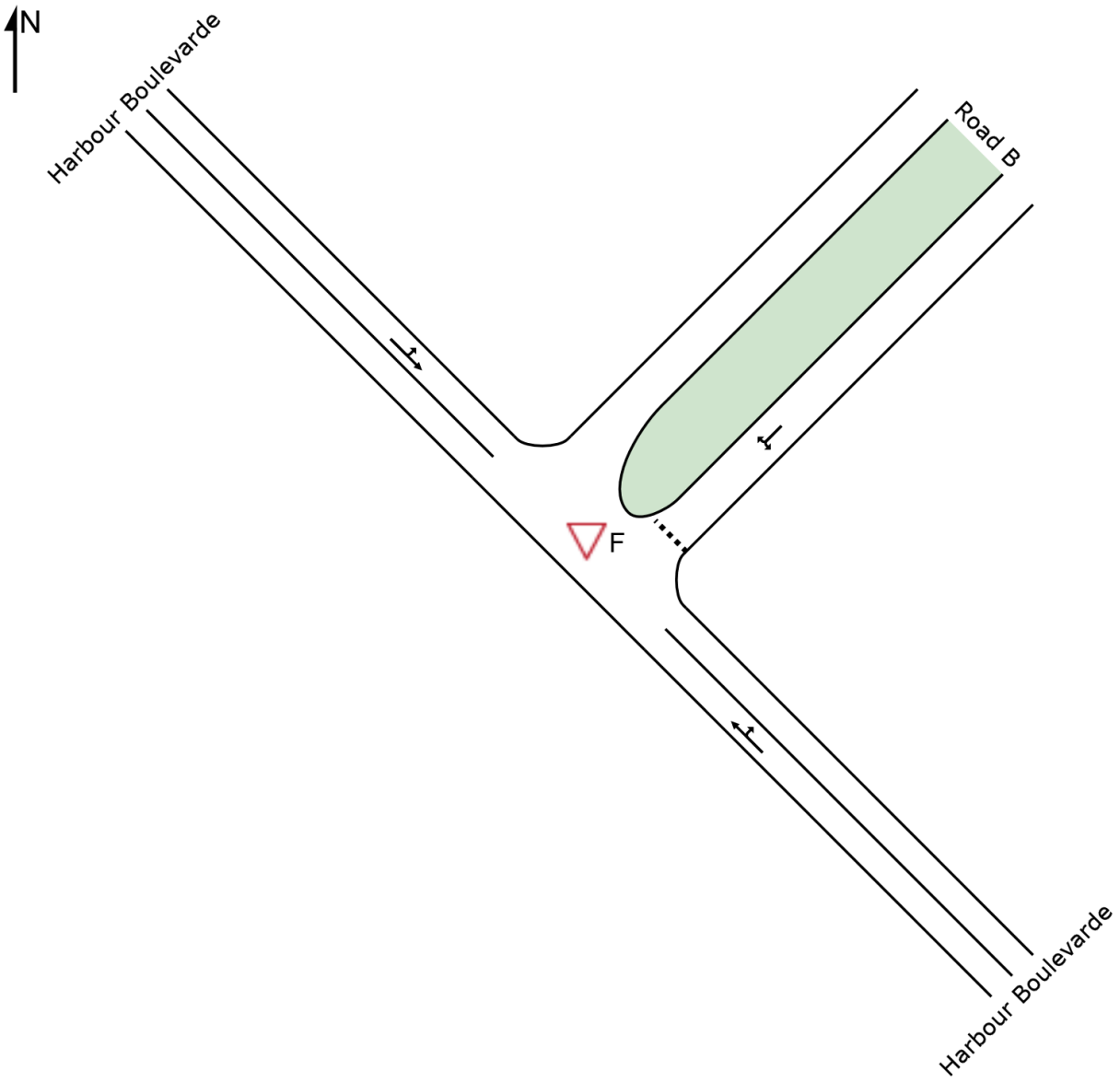
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Harbour Boulevarde													
5	T1	149	2.1	149	2.1	0.082	0.1	LOS A	0.0	0.3	0.03	0.02	59.2
6	R2	5	0.0	5	0.0	0.082	6.5	LOS A	0.0	0.3	0.03	0.02	57.5
Approach		155	2.0	155	2.0	0.082	0.3	NA	0.0	0.3	0.03	0.02	59.1
NorthEast: Road B													
7	L2	5	0.0	5	0.0	0.064	6.2	LOS A	0.2	1.5	0.38	0.65	48.7
9	R2	53	2.0	53	2.0	0.064	7.2	LOS A	0.2	1.5	0.38	0.65	48.7
Approach		58	1.8	58	1.8	0.064	7.1	LOS A	0.2	1.5	0.38	0.65	48.7
NorthWest: Harbour Boulevarde													
10	L2	76	1.4	76	1.4	0.153	5.6	LOS A	0.0	0.0	0.00	0.16	56.1
11	T1	215	2.0	215	2.0	0.153	0.0	LOS A	0.0	0.0	0.00	0.16	55.1
Approach		291	1.8	291	1.8	0.153	1.5	NA	0.0	0.0	0.00	0.16	55.6
All Vehicles		503	1.9	503	1.9	0.153	1.7	NA	0.2	1.5	0.05	0.17	55.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: F [Road B / Harbour Boulevarde_2018 PM Peak]

Road B / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: F [Road B / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Road B / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

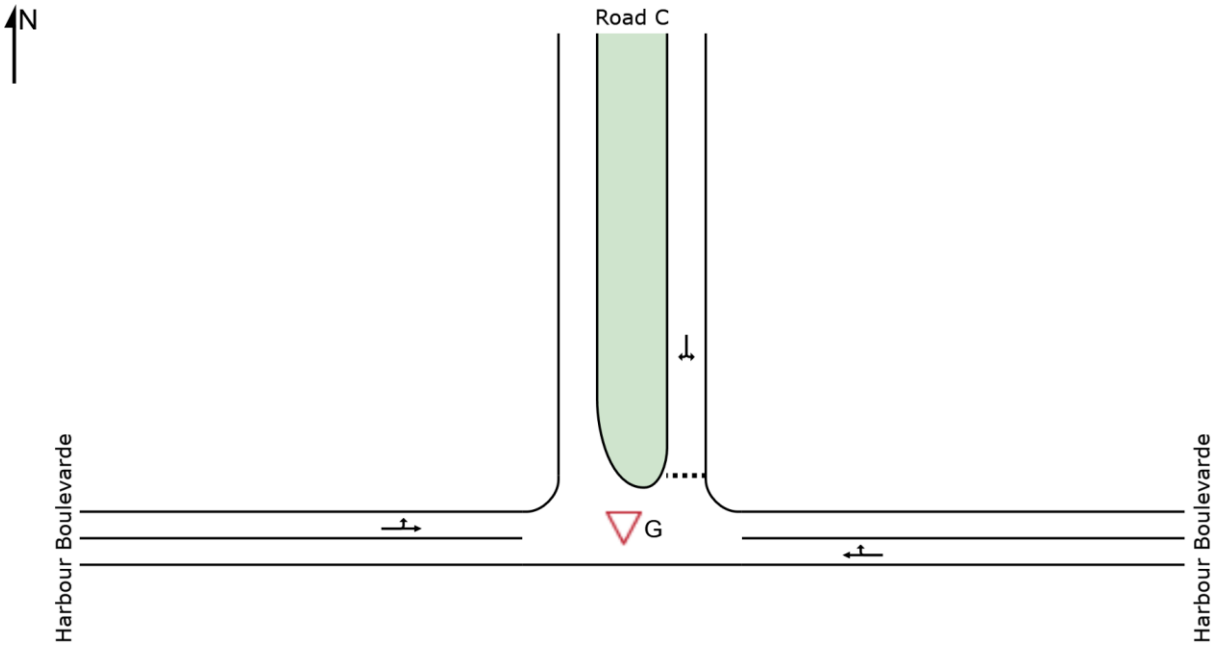
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Harbour Boulevarde													
5	T1	224	2.3	224	2.3	0.120	0.0	LOS A	0.0	0.3	0.02	0.01	59.5
6	R2	5	0.0	5	0.0	0.120	6.2	LOS A	0.0	0.3	0.02	0.01	57.7
Approach		229	2.3	229	2.3	0.120	0.2	NA	0.0	0.3	0.02	0.01	59.4
NorthEast: Road B													
7	L2	5	0.0	5	0.0	0.095	6.0	LOS A	0.3	2.3	0.38	0.66	48.7
9	R2	80	2.6	80	2.6	0.095	7.3	LOS A	0.3	2.3	0.38	0.66	48.7
Approach		85	2.5	85	2.5	0.095	7.2	LOS A	0.3	2.3	0.38	0.66	48.7
NorthWest: Harbour Boulevarde													
10	L2	51	2.1	51	2.1	0.102	5.6	LOS A	0.0	0.0	0.00	0.16	56.0
11	T1	143	2.2	143	2.2	0.102	0.0	LOS A	0.0	0.0	0.00	0.16	55.1
Approach		194	2.2	194	2.2	0.102	1.5	NA	0.0	0.0	0.00	0.16	55.6
All Vehicles		508	2.3	508	2.3	0.120	1.8	NA	0.3	2.3	0.07	0.18	55.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: G [Road C / Harbour Boulevarde_2018 AM Peak]

Road C / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: G [Road C / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Road C / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

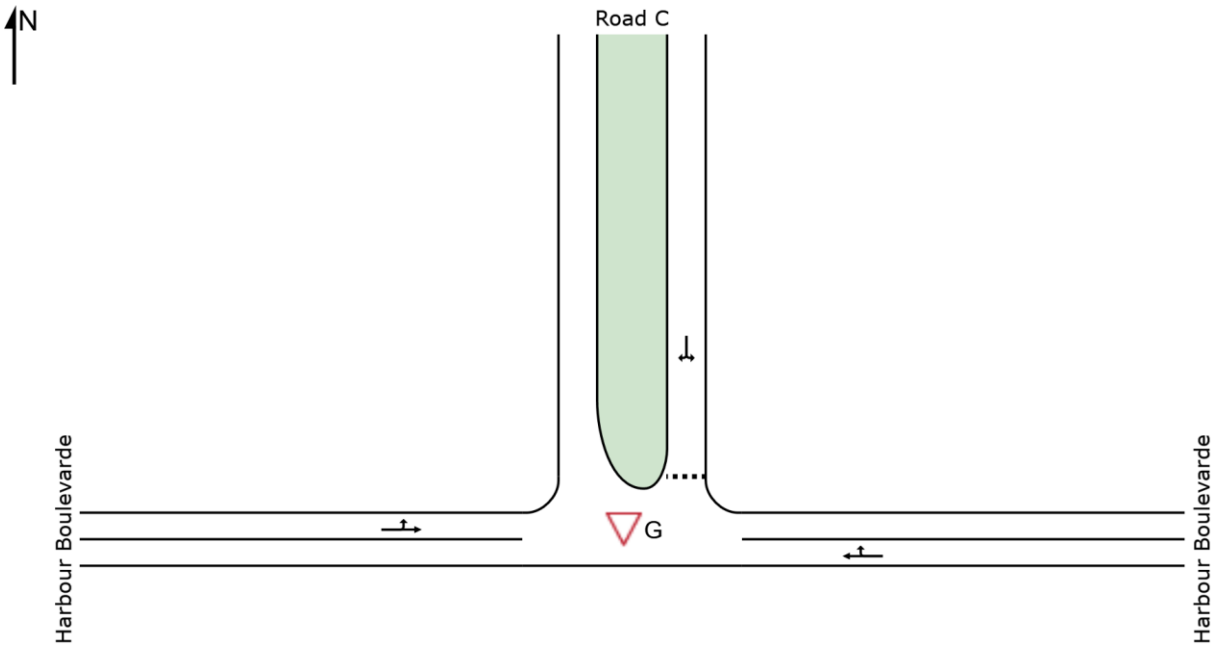
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Harbour Boulevarde													
5	T1	74	1.4	74	1.4	0.042	0.1	LOS A	0.0	0.3	0.05	0.04	56.7
6	R2	5	0.0	5	0.0	0.042	6.2	LOS A	0.0	0.3	0.05	0.04	56.3
Approach		79	1.3	79	1.3	0.042	0.5	NA	0.0	0.3	0.05	0.04	56.6
North: Road C													
7	L2	5	0.0	5	0.0	0.075	5.9	LOS A	0.2	1.8	0.28	0.60	49.4
9	R2	74	1.4	74	1.4	0.075	6.4	LOS A	0.2	1.8	0.28	0.60	49.4
Approach		79	1.3	79	1.3	0.075	6.4	LOS A	0.2	1.8	0.28	0.60	49.4
West: Harbour Boulevarde													
10	L2	107	2.0	107	2.0	0.114	5.6	LOS A	0.0	0.0	0.00	0.30	55.4
11	T1	107	2.0	107	2.0	0.114	0.0	LOS A	0.0	0.0	0.00	0.30	54.1
Approach		215	2.0	215	2.0	0.114	2.8	NA	0.0	0.0	0.00	0.30	55.0
All Vehicles		373	1.7	373	1.7	0.114	3.1	NA	0.2	1.8	0.07	0.31	53.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: G [Road C / Harbour Boulevarde_2018 PM Peak]

Road C / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: G [Road C / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Road C / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

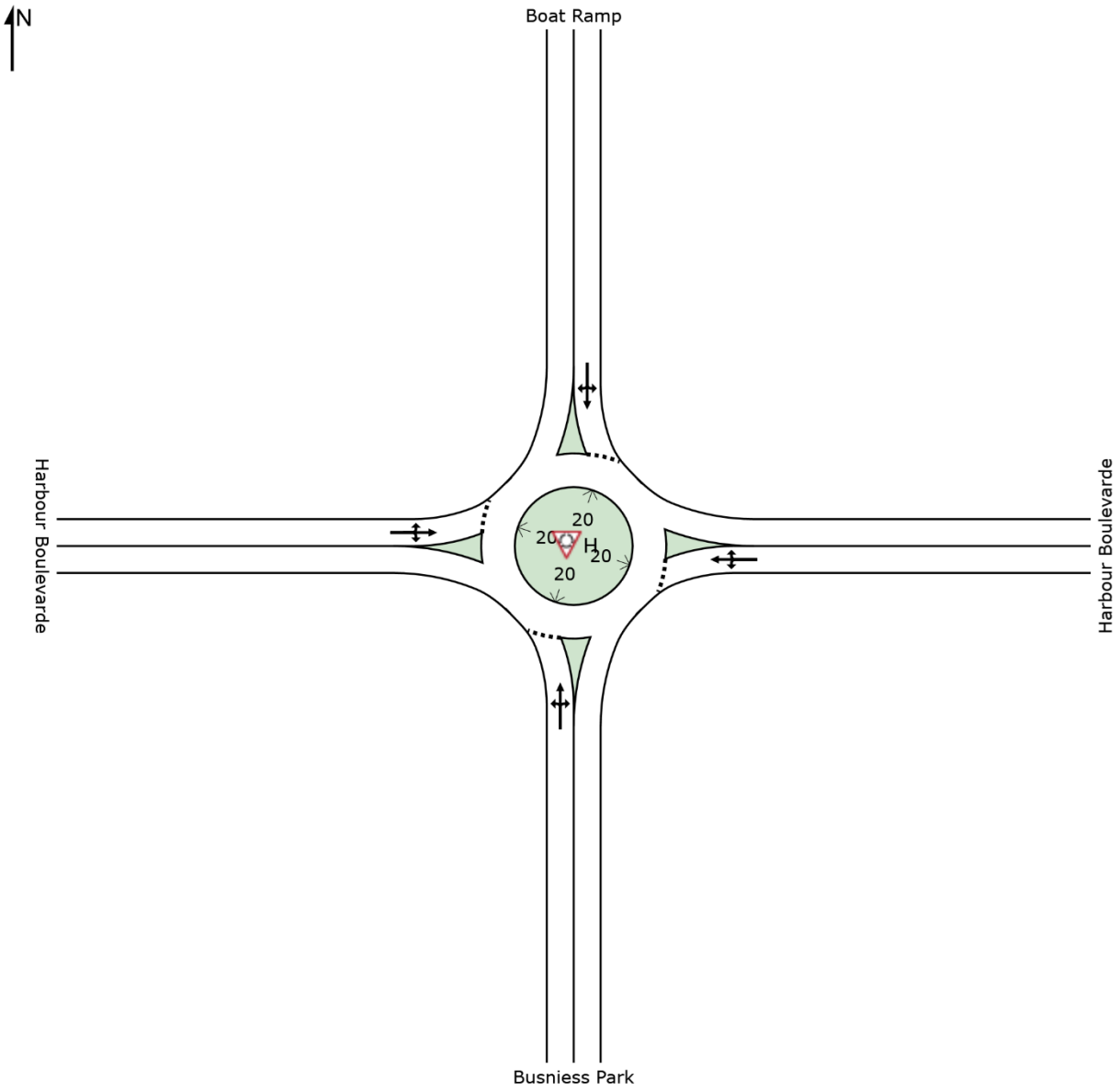
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Harbour Boulevarde													
5	T1	112	1.9	112	1.9	0.061	0.0	LOS A	0.0	0.3	0.03	0.03	57.9
6	R2	5	0.0	5	0.0	0.061	5.9	LOS A	0.0	0.3	0.03	0.03	56.6
Approach		117	1.8	117	1.8	0.061	0.3	NA	0.0	0.3	0.03	0.03	57.7
North: Road C													
7	L2	5	0.0	5	0.0	0.110	5.8	LOS A	0.4	2.7	0.28	0.60	49.5
9	R2	112	1.9	112	1.9	0.110	6.4	LOS A	0.4	2.7	0.28	0.60	49.5
Approach		117	1.8	117	1.8	0.110	6.4	LOS A	0.4	2.7	0.28	0.60	49.5
West: Harbour Boulevarde													
10	L2	71	1.5	71	1.5	0.075	5.6	LOS A	0.0	0.0	0.00	0.29	55.5
11	T1	72	1.5	72	1.5	0.075	0.0	LOS A	0.0	0.0	0.00	0.29	54.1
Approach		142	1.5	142	1.5	0.075	2.8	NA	0.0	0.0	0.00	0.29	55.0
All Vehicles		376	1.7	376	1.7	0.110	3.1	NA	0.4	2.7	0.09	0.31	53.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: H [Boat Ramp / Business Park / Harbour Boulevarde_2018 AM Peak]

Boat Ramp / Business Park / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: H [Boat Ramp / Business Park / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Boat Ramp / Business Park / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

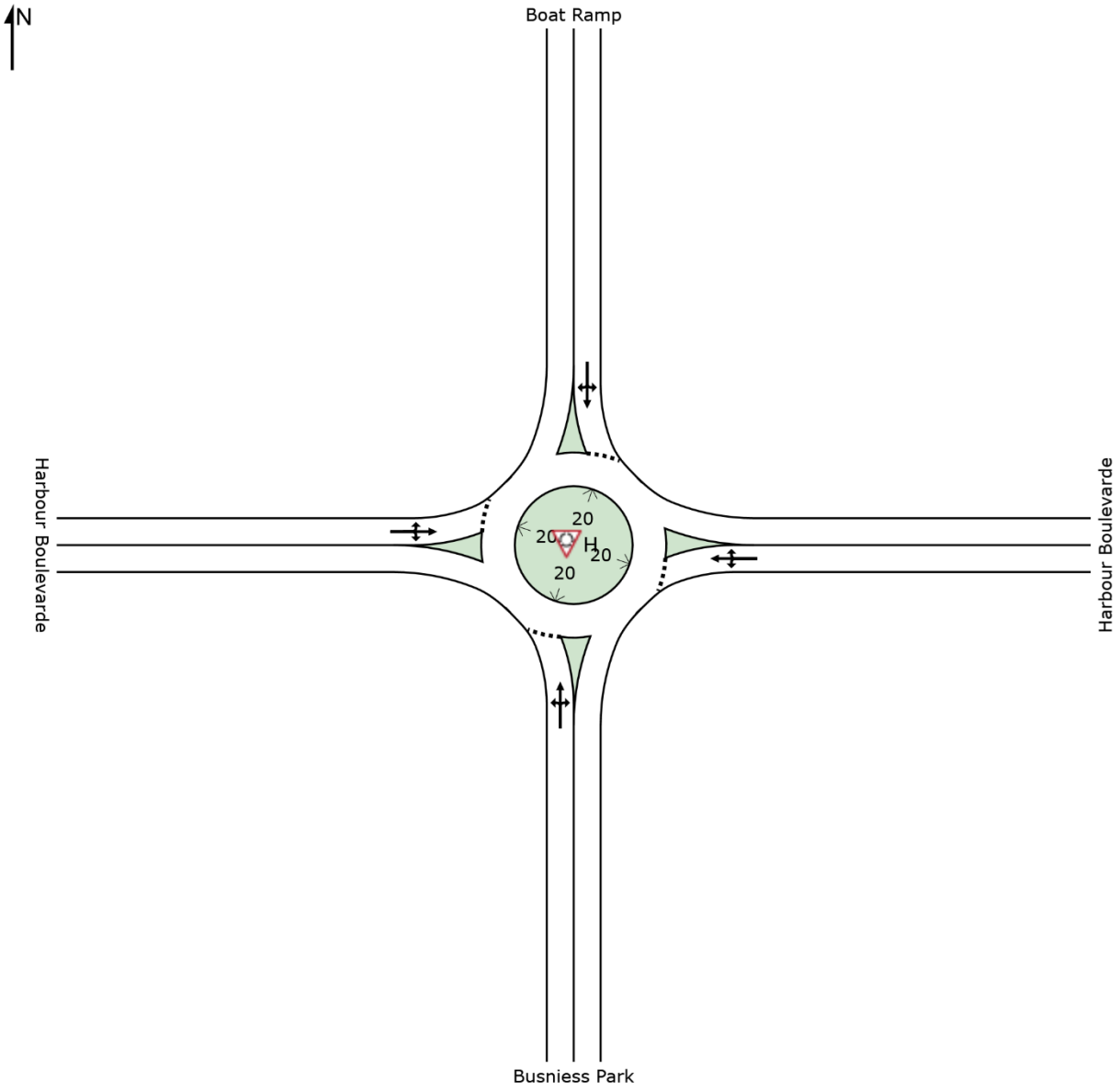
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Busniess Park													
1	L2	61	1.7	61	1.7	0.050	3.9	LOS A	0.2	1.7	0.09	0.48	52.2
2	T1	5	0.0	5	0.0	0.050	4.1	LOS A	0.2	1.7	0.09	0.48	56.3
3	R2	5	0.0	5	0.0	0.050	8.7	LOS A	0.2	1.7	0.09	0.48	52.2
Approach		72	1.5	72	1.5	0.050	4.3	LOS A	0.2	1.7	0.09	0.48	52.8
East: Harbour Boulevarde													
4	L2	5	0.0	5	0.0	0.017	4.3	LOS A	0.1	0.5	0.23	0.48	50.6
5	T1	11	0.0	11	0.0	0.017	4.4	LOS A	0.1	0.5	0.23	0.48	34.7
6	R2	5	0.0	5	0.0	0.017	9.0	LOS A	0.1	0.5	0.23	0.48	52.3
Approach		21	0.0	21	0.0	0.017	5.5	LOS A	0.1	0.5	0.23	0.48	47.3
North: Boat Ramp													
7	L2	5	0.0	5	0.0	0.011	4.3	LOS A	0.1	0.4	0.24	0.48	50.3
8	T1	5	0.0	5	0.0	0.011	4.4	LOS A	0.1	0.4	0.24	0.48	55.1
9	R2	3	0.0	3	0.0	0.011	9.1	LOS A	0.1	0.4	0.24	0.48	50.3
Approach		14	0.0	14	0.0	0.011	5.5	LOS A	0.1	0.4	0.24	0.48	52.8
West: Harbour Boulevarde													
10	L2	4	0.0	4	0.0	0.072	3.9	LOS A	0.3	2.4	0.08	0.61	49.3
11	T1	15	0.0	15	0.0	0.072	4.0	LOS A	0.3	2.4	0.08	0.61	36.1
12	R2	87	1.2	87	1.2	0.072	8.7	LOS A	0.3	2.4	0.08	0.61	50.7
Approach		106	1.0	106	1.0	0.072	7.9	LOS A	0.3	2.4	0.08	0.61	49.8
All Vehicles		213	1.0	213	1.0	0.072	6.3	LOS A	0.3	2.4	0.11	0.54	50.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: H [Boat Ramp / Business Park / Harbour Boulevarde_2018 PM Peak]

Boat Ramp / Business Park / Harbour Boulevarde
Roundabout



MOVEMENT SUMMARY

Site: H [Boat Ramp / Business Park / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Boat Ramp / Business Park / Harbour Boulevarde
Roundabout

Movement Performance - Vehicles

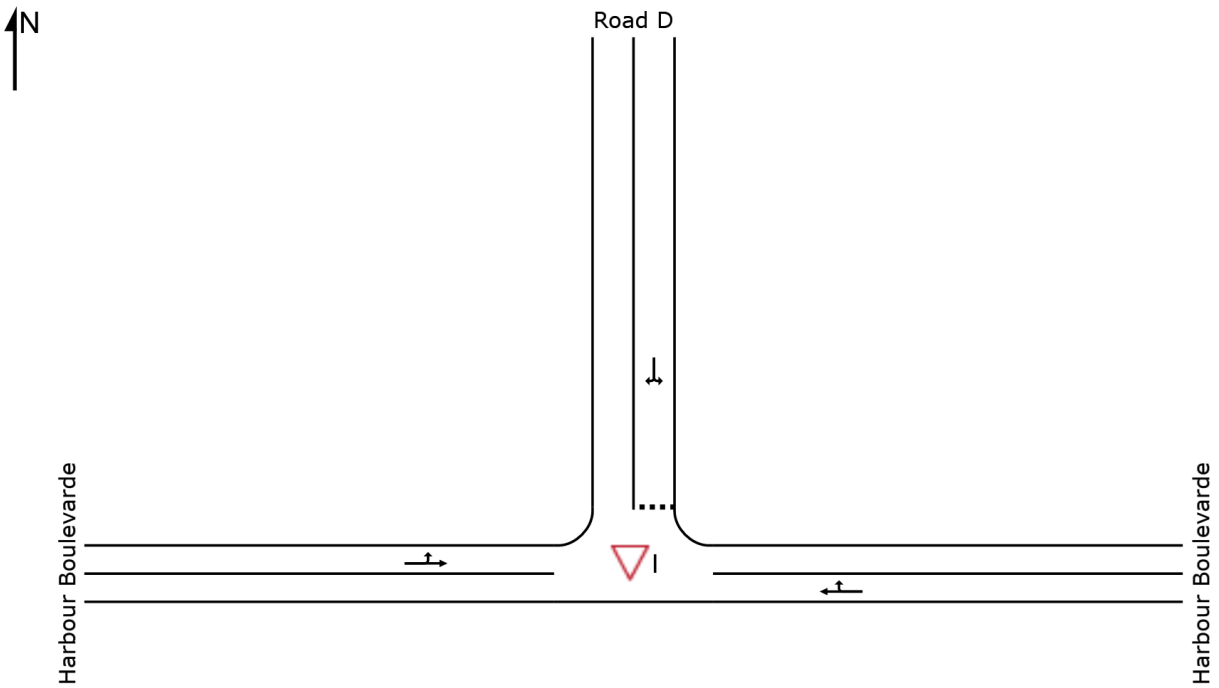
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Busniess Park													
1	L2	92	2.3	92	2.3	0.072	4.0	LOS A	0.4	2.5	0.11	0.47	52.3
2	T1	5	0.0	5	0.0	0.072	4.1	LOS A	0.4	2.5	0.11	0.47	56.3
3	R2	5	0.0	5	0.0	0.072	8.7	LOS A	0.4	2.5	0.11	0.47	52.3
Approach		102	2.1	102	2.1	0.072	4.2	LOS A	0.4	2.5	0.11	0.47	52.7
East: Harbour Boulevarde													
4	L2	5	0.0	5	0.0	0.020	4.1	LOS A	0.1	0.7	0.19	0.47	51.0
5	T1	16	0.0	16	0.0	0.020	4.3	LOS A	0.1	0.7	0.19	0.47	35.6
6	R2	5	0.0	5	0.0	0.020	8.9	LOS A	0.1	0.7	0.19	0.47	52.7
Approach		26	0.0	26	0.0	0.020	5.2	LOS A	0.1	0.7	0.19	0.47	46.6
North: Boat Ramp													
7	L2	5	0.0	5	0.0	0.011	4.2	LOS A	0.1	0.4	0.20	0.49	50.3
8	T1	5	0.0	5	0.0	0.011	4.3	LOS A	0.1	0.4	0.20	0.49	55.0
9	R2	4	0.0	4	0.0	0.011	8.9	LOS A	0.1	0.4	0.20	0.49	50.3
Approach		15	0.0	15	0.0	0.011	5.6	LOS A	0.1	0.4	0.20	0.49	52.7
West: Harbour Boulevarde													
10	L2	3	0.0	3	0.0	0.050	3.9	LOS A	0.2	1.6	0.08	0.60	49.4
11	T1	11	0.0	11	0.0	0.050	4.0	LOS A	0.2	1.6	0.08	0.60	36.2
12	R2	58	1.8	58	1.8	0.050	8.7	LOS A	0.2	1.6	0.08	0.60	50.8
Approach		72	1.5	72	1.5	0.050	7.8	LOS A	0.2	1.6	0.08	0.60	49.8
All Vehicles		215	1.5	215	1.5	0.072	5.6	LOS A	0.4	2.5	0.12	0.52	51.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: I [Road D / Harbour Boulevarde_2018 AM Peak]

Road D / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: I [Road D / Harbour Boulevarde_2018 AM Peak]

Network: N101 [2018 AM Peak]

Road D / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

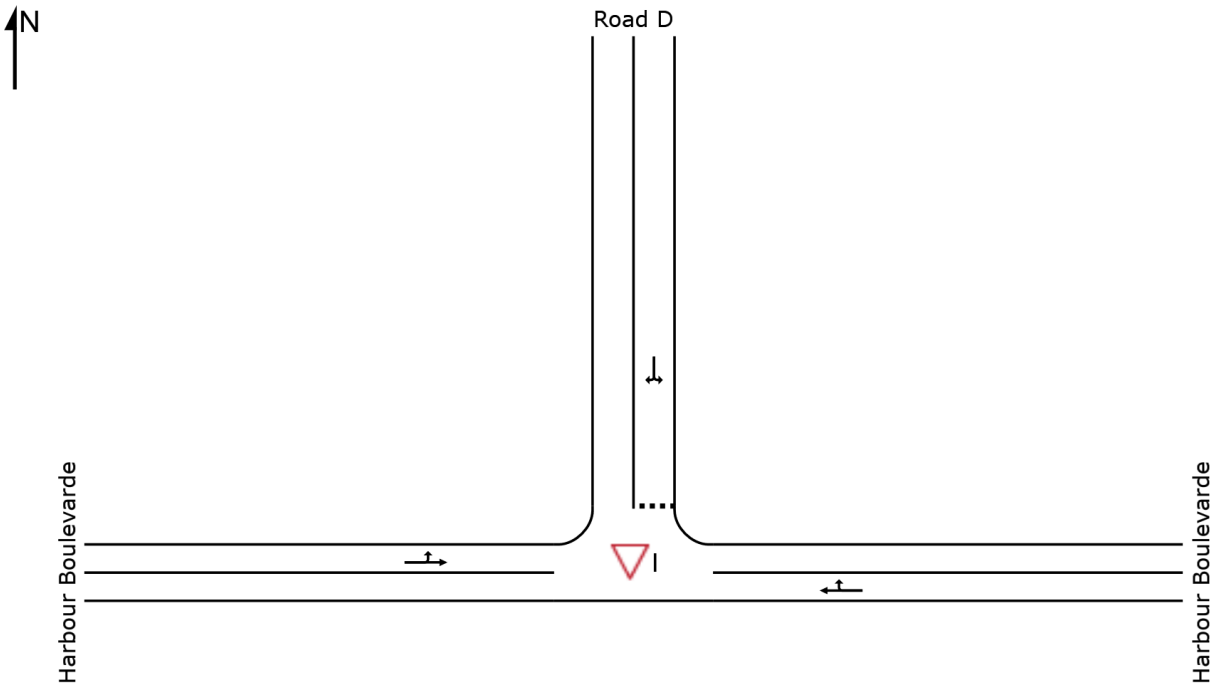
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Harbour Boulevarde													
5	T1	5	0.0	5	0.0	0.006	0.0	LOS A	0.0	0.2	0.07	0.29	42.6
6	R2	5	0.0	5	0.0	0.006	5.5	LOS A	0.0	0.2	0.07	0.29	52.8
Approach		11	0.0	11	0.0	0.006	2.8	NA	0.0	0.2	0.07	0.29	50.8
North: Road D													
7	L2	5	0.0	5	0.0	0.012	5.6	LOS A	0.0	0.3	0.04	0.57	50.1
9	R2	11	0.0	11	0.0	0.012	5.6	LOS A	0.0	0.3	0.04	0.57	50.7
Approach		16	0.0	16	0.0	0.012	5.6	LOS A	0.0	0.3	0.04	0.57	50.5
West: Harbour Boulevarde													
10	L2	15	0.0	15	0.0	0.011	5.5	LOS A	0.0	0.0	0.00	0.43	52.0
11	T1	5	0.0	5	0.0	0.011	0.0	LOS A	0.0	0.0	0.00	0.43	46.5
Approach		20	0.0	20	0.0	0.011	4.1	NA	0.0	0.0	0.00	0.43	51.3
All Vehicles		46	0.0	46	0.0	0.012	4.3	NA	0.0	0.3	0.03	0.45	50.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

SITE LAYOUT

Site: I [Road D / Harbour Boulevarde_2018 PM Peak]

Road D / Harbour Boulevarde
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: I [Road D / Harbour Boulevarde_2018 PM Peak]

Network: N101 [2018 PM Peak]

Road D / Harbour Boulevarde
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Harbour Boulevarde													
5	T1	5	0.0	5	0.0	0.006	0.0	LOS A	0.0	0.2	0.06	0.29	42.7
6	R2	5	0.0	5	0.0	0.006	5.5	LOS A	0.0	0.2	0.06	0.29	52.9
Approach		11	0.0	11	0.0	0.006	2.8	NA	0.0	0.2	0.06	0.29	50.9
North: Road D													
7	L2	5	0.0	5	0.0	0.016	5.6	LOS A	0.1	0.4	0.04	0.57	50.1
9	R2	16	0.0	16	0.0	0.016	5.6	LOS A	0.1	0.4	0.04	0.57	50.7
Approach		21	0.0	21	0.0	0.016	5.6	LOS A	0.1	0.4	0.04	0.57	50.5
West: Harbour Boulevarde													
10	L2	11	0.0	11	0.0	0.008	5.5	LOS A	0.0	0.0	0.00	0.39	52.5
11	T1	5	0.0	5	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.39	47.5
Approach		16	0.0	16	0.0	0.008	3.7	NA	0.0	0.0	0.00	0.39	51.6
All Vehicles		47	0.0	47	0.0	0.016	4.3	NA	0.1	0.4	0.03	0.45	50.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 17 (maximum specified: 20)

APPENDIX E – SWEPT PATH AND SIGHT DISTANCE DIAGRAMS

NOTE

REFER TO DRAWINGS C-A-412 TO C-A-416 FOR TURNING PATHS.

EXISTING HARBOUR

FUTURE PRECINCT B2&C2

EXISTING PRECINCT B1&C1

FUTURE BOAT MAINTENANCE FACILITY

FUTURE BOAT RAMP CAR PARK

SHEET 1

SHEET 2

SHEET 3

SHEET 4

SHEET 5

SHEET 6

SHEET 7

SHEET 8

SHEET 9

SHEET 10

SHEET 11

SHEET 12

BASS POINT TOURIST ROAD

HARBOUR BOULEVARD

HARBOUR BOULEVARD

FUTURE BUSINESS PARK

FUTURE SPORTING FIELDS

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

100mm on Original

0 5 10 15 20 25m

1 : 250

KEY PLAN

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn	M.FORTU
Original Size	A1	Designed	G.EVERETT
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-430-10006310-nsd-SightDistanceLayoutPlan.dwg

Project: SHELL COVE PRECINCT A

Title: SIGHT DISTANCE PLANS LAYOUT PLAN

ARCADIS
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Level 16, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
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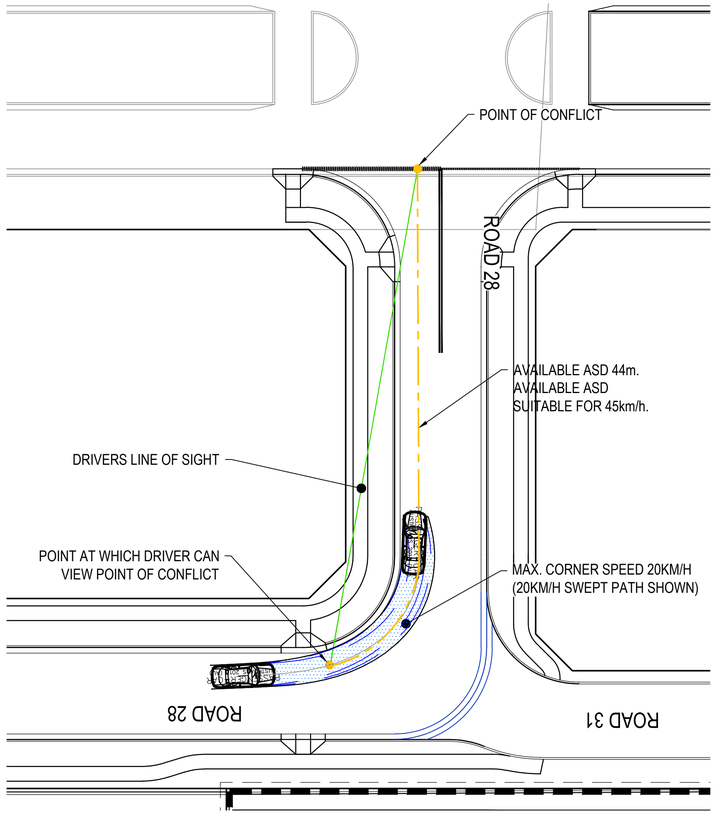
Fax No: +61 2 8907 9001
arcadis.com

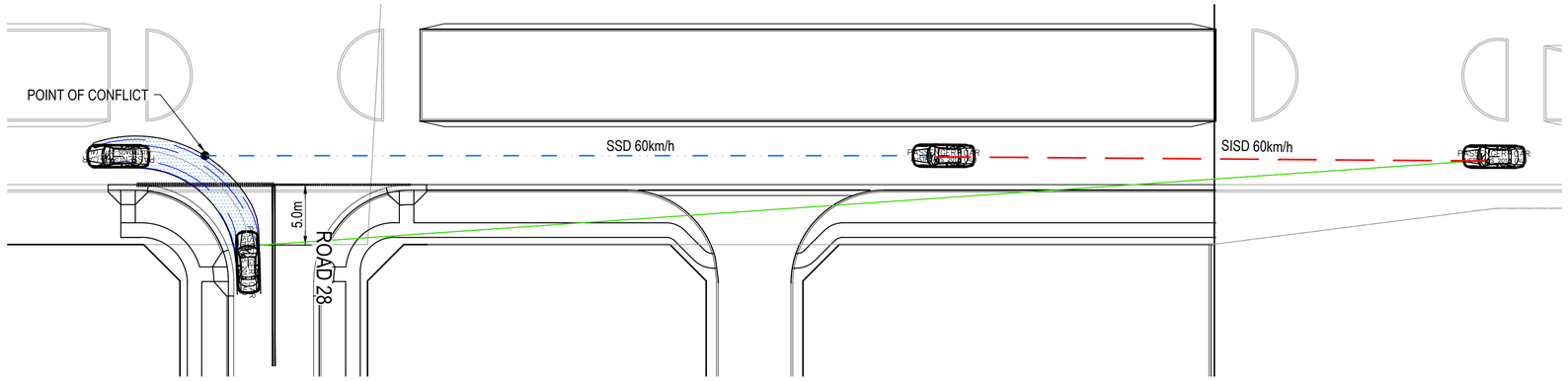
Drawing No.	Project No.	Issue
C-A-430	10006310	01

Date Plotted: 13 Nov 2017 - 11:54AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-430-10006310-nsd-SightDistanceLayoutPlan.dwg



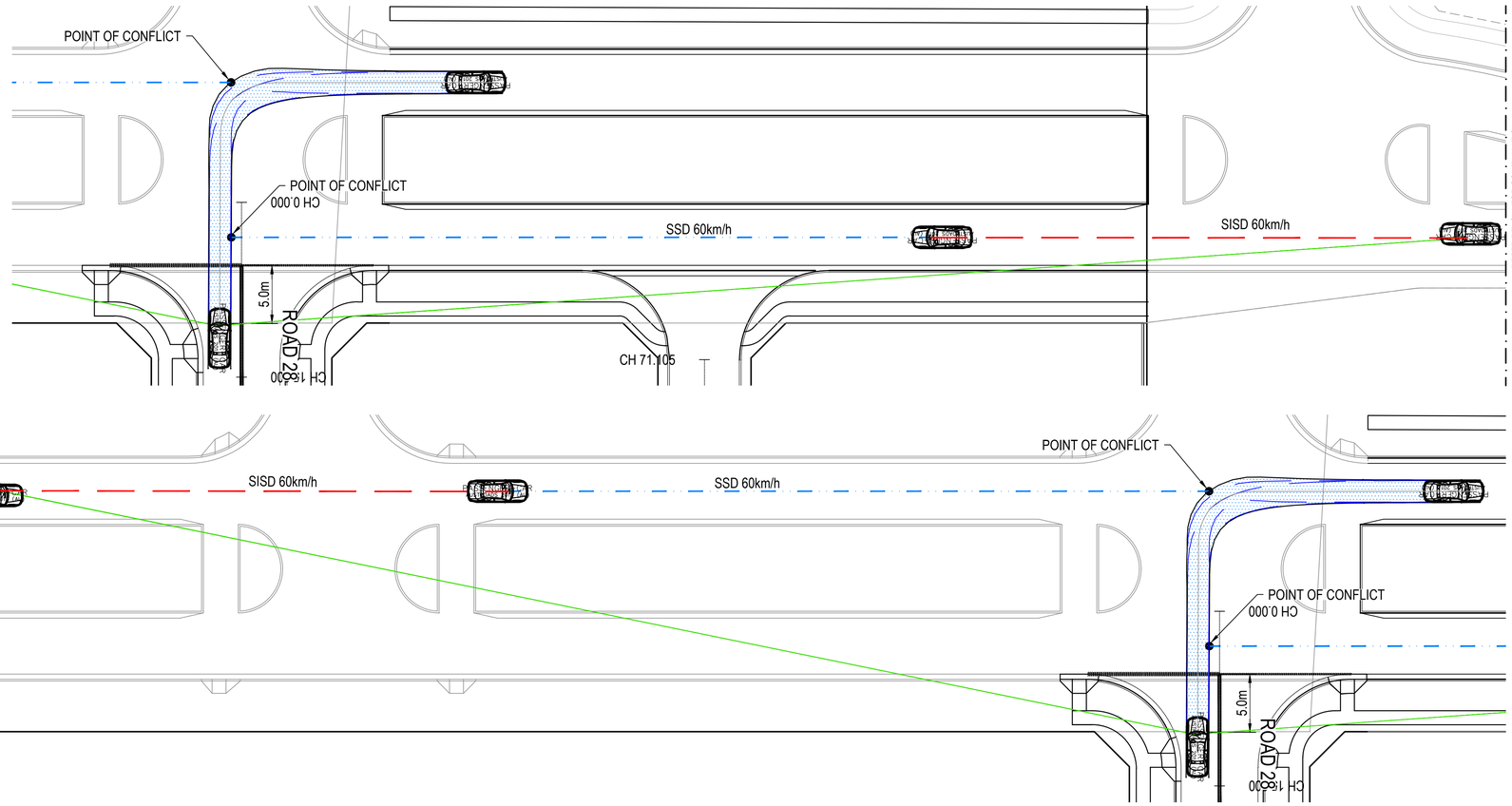
PROMONTORY DRIVE - ROAD 28
INTERSECTION APPROACH SIGHT DISTANCE

SCALE 1 : 250



ROAD 28 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE

SCALE 1 : 250



ROAD 28 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE

SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	45km/h
LONGITUDINAL GRADE	-2.95%
SAFE INTESECTION SITE DISTANCE (ASD)	42.7m

SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 (P B1&C1) SOUTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	60km/h
LONGITUDINAL GRADE	-1.33%
SAFE INTESECTION SITE DISTANCE (SISD)	106.73m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 (P B1&C1) SOUTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	60km/h
LONGITUDINAL GRADE	-1.33%
SAFE INTESECTION SITE DISTANCE (SISD)	106.73m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 (P B1&C1) NORTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	60km/h
LONGITUDINAL GRADE	1.33%
SAFE INTESECTION SITE DISTANCE (SISD)	104.95m

SISD
SSD

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

100mm on Original

0 5 10 15 20 25m

1 : 250

KEY PLAN

Client

FRASERS PROPERTY

Status
PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	
Filename:	C-a-431-10006310-nsd-SightDistancePlansSheet1.dwg		

Project
SHELL COVE
PRECINCT A

Title
SIGHT DISTANCE PLANS
SHEET 1

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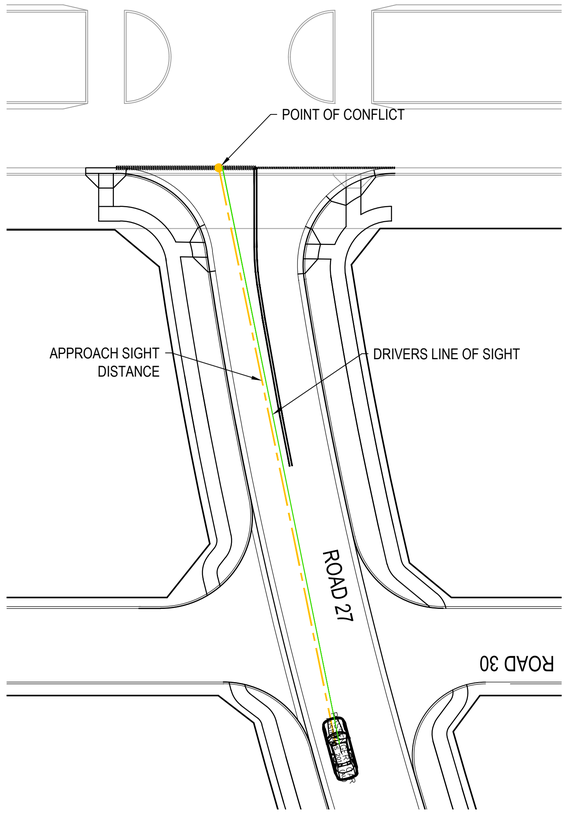
arcadis.com

Drawing No.	Project No.	Issue
C-A-421	10006310	01

Date Plotted: 13 Nov 2017 - 11:51AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-431-10006310-nsd-SightDistancePlansSheet1.dwg



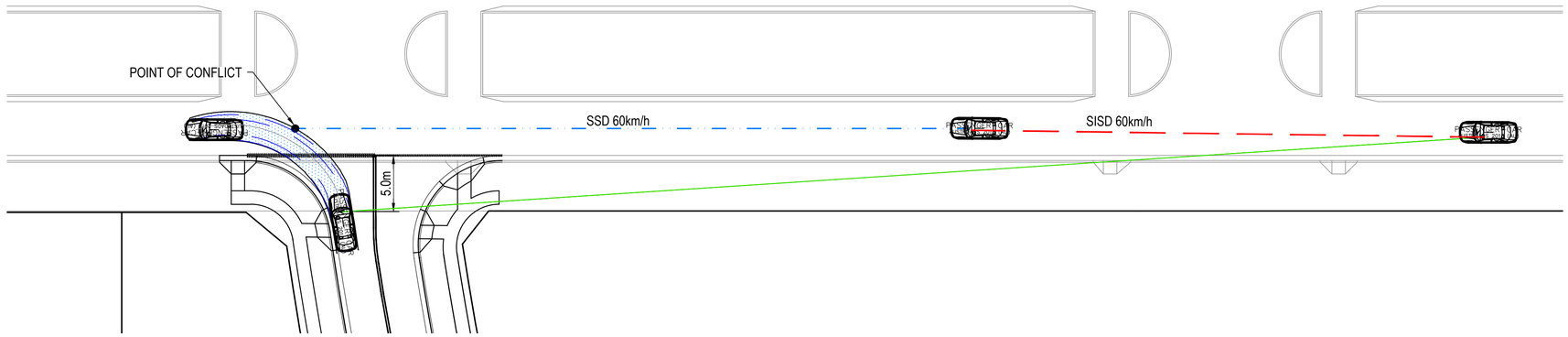
PROMONTORY DRIVE - ROAD 27
INTERSECTION APPROACH SIGHT DISTANCE
SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

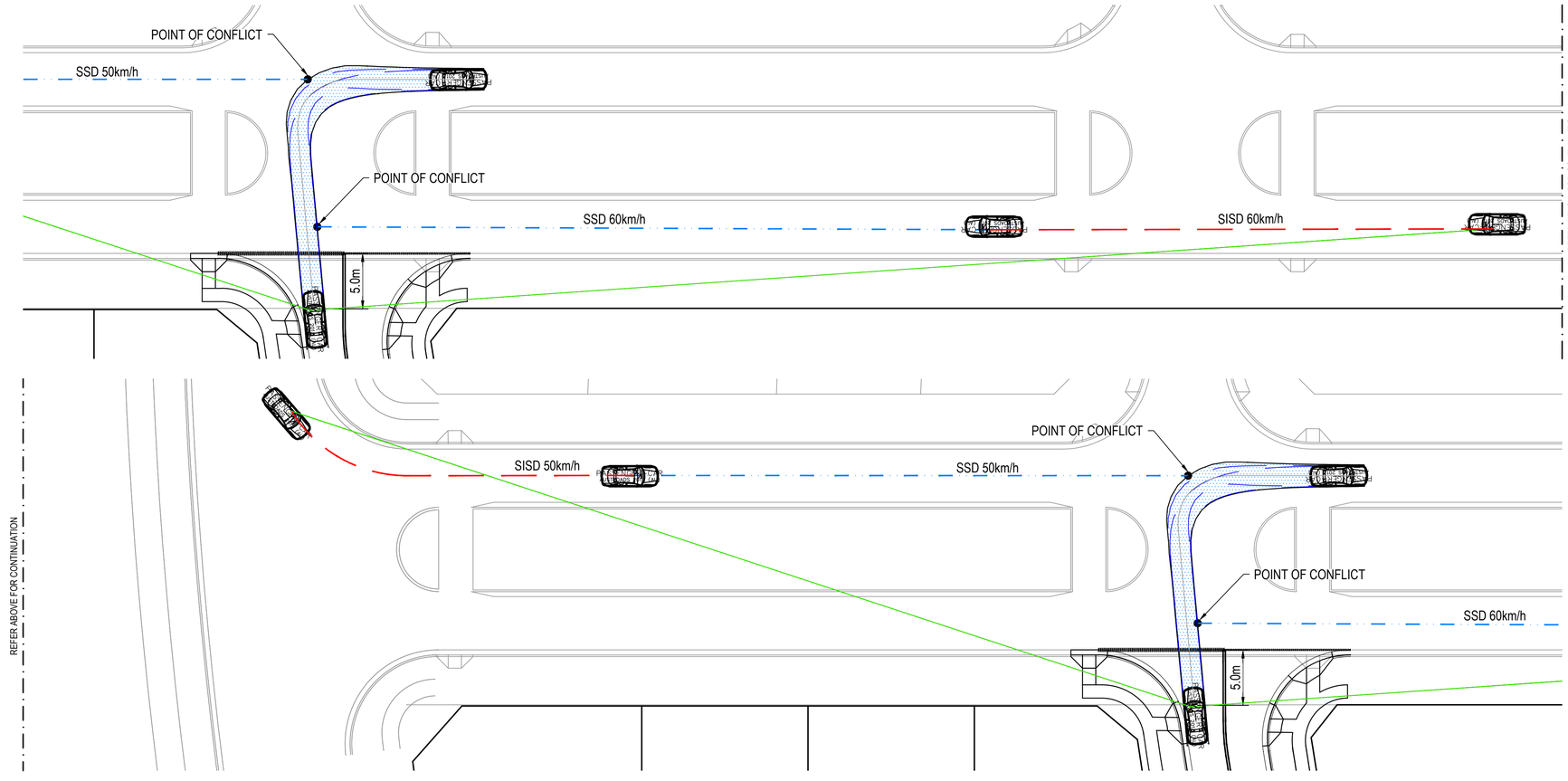
REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	-0.85%
SAFE INTESECTION SITE DISTANCE (ASD)	48.68m

SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 (P B1&C1) SOUTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	60km/h
LONGITUDINAL GRADE	-1.33%
SAFE INTESECTION SITE DISTANCE (SISD)	106.73m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 (P B1&C1) SOUTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	60km/h
LONGITUDINAL GRADE	-1.33%
SAFE INTESECTION SITE DISTANCE (SISD)	106.73m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 (P B1&C1) NORTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	1.33%
SAFE INTESECTION SITE DISTANCE (SISD)	83m



ROAD 27 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250



ROAD 27 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m
1 : 250

KEY PLAN

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-432-10006310-nsd-SightDistancePlansSheet2.dwg

Project: SHELL COVE PRECINCT A

Title: SIGHT DISTANCE PLANS SHEET 2

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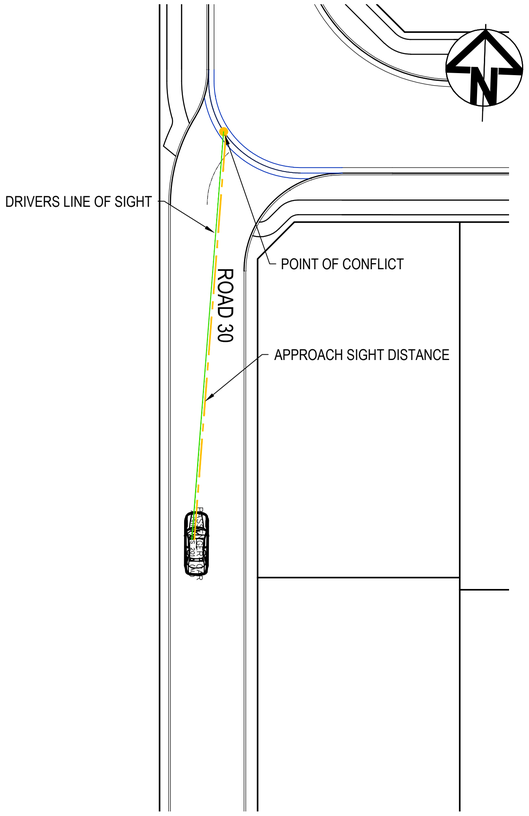
arcadis.com

Drawing No.	Project No.	Issue
C-A-432	10006310	01

100mm on Original

Date Plotted: 13 Nov 2017 - 11:47AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-432-10006310-nsd-SightDistancePlansSheet2.dwg



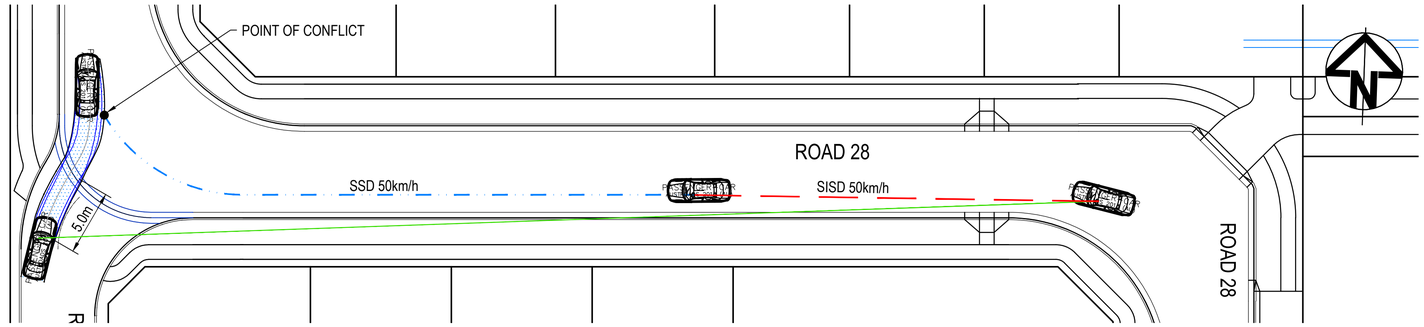
ROAD 28 - ROAD 30
INTERSECTION APPROACH SIGHT DISTANCE
SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

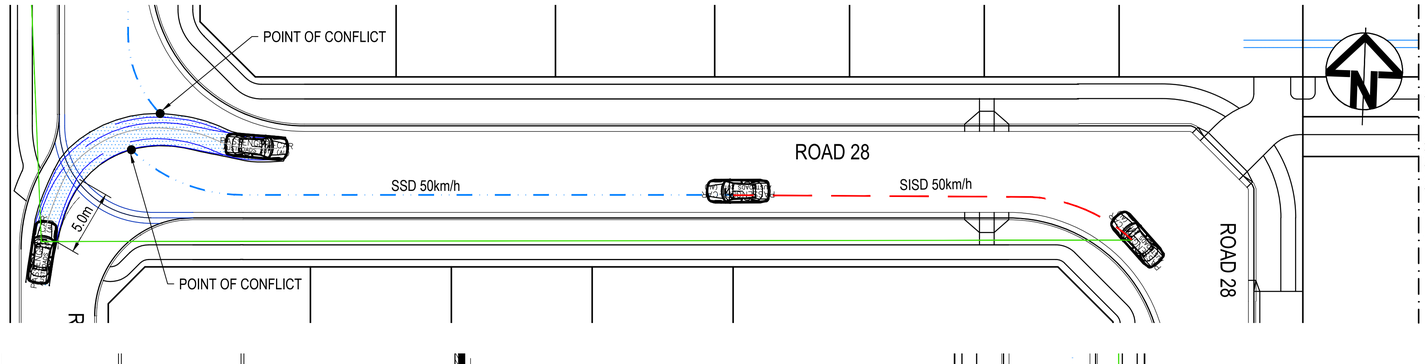
REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	40km/h
LONGITUDINAL GRADE	-1.5%
SAFE INTESECTION SITE DISTANCE (ASD)	33m

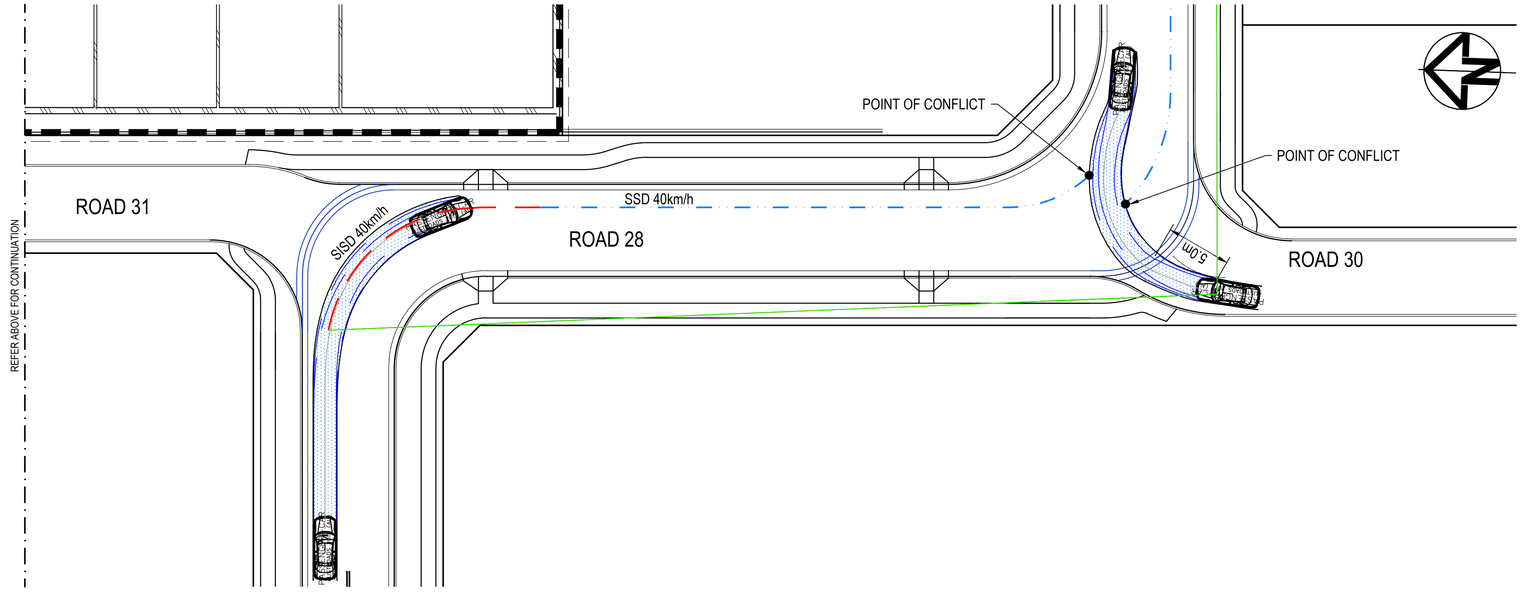
SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC01 WEST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	-0.97%
SAFE INTESECTION SITE DISTANCE (SISD)	84.36m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC01 WEST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	-0.97%
SAFE INTESECTION SITE DISTANCE (SISD)	84.36m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC01 SOUTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	40km/h
LONGITUDINAL GRADE	0.97%
SAFE INTESECTION SITE DISTANCE (SISD)	63.3m



ROAD 30 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250





ROAD 30 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

100mm on Original

0 5 10 15 20 25m
1 : 250

KEY PLAN

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-433-10006310-nsd-SightDistancePlansSheet3.dwg

Project: SHELL COVE PRECINCT A

Title: SIGHT DISTANCE PLANS SHEET 3

ARCADIS
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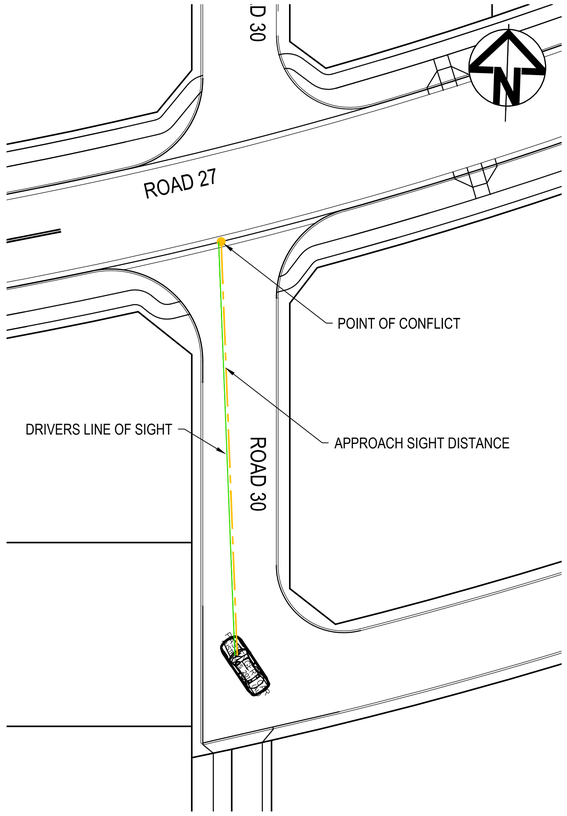
Drawing No.	Project No.	Issue
C-A-423 –	10006310 –	01

Date Plotted: 13 Nov 2017 - 11:45AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-433-10006310-nsd-SightDistancePlansSheet3.dwg



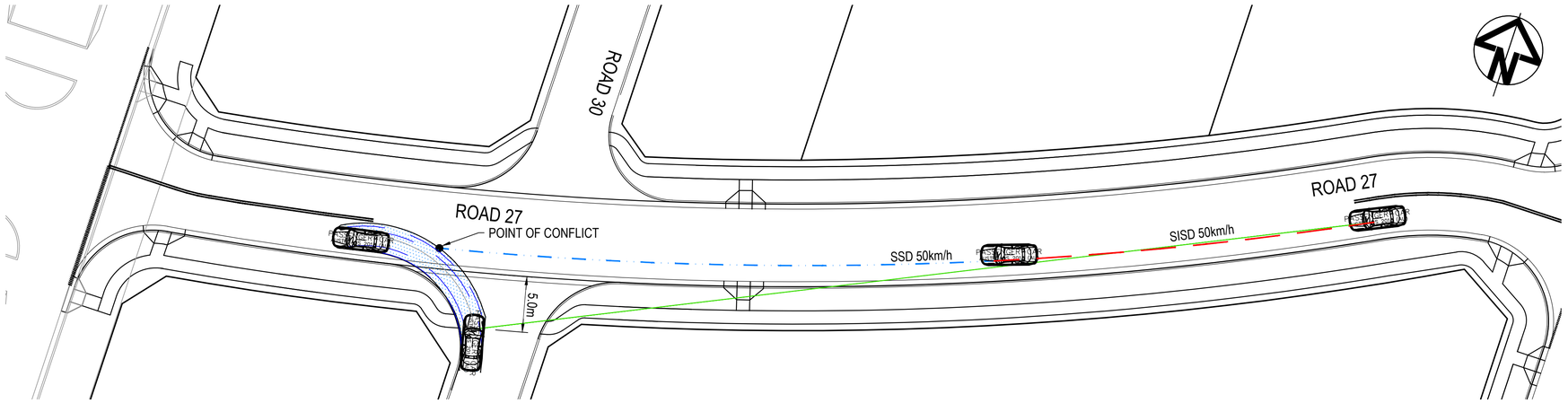
ROAD 27 - ROAD 30
INTERSECTION APPROACH SIGHT DISTANCE
SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

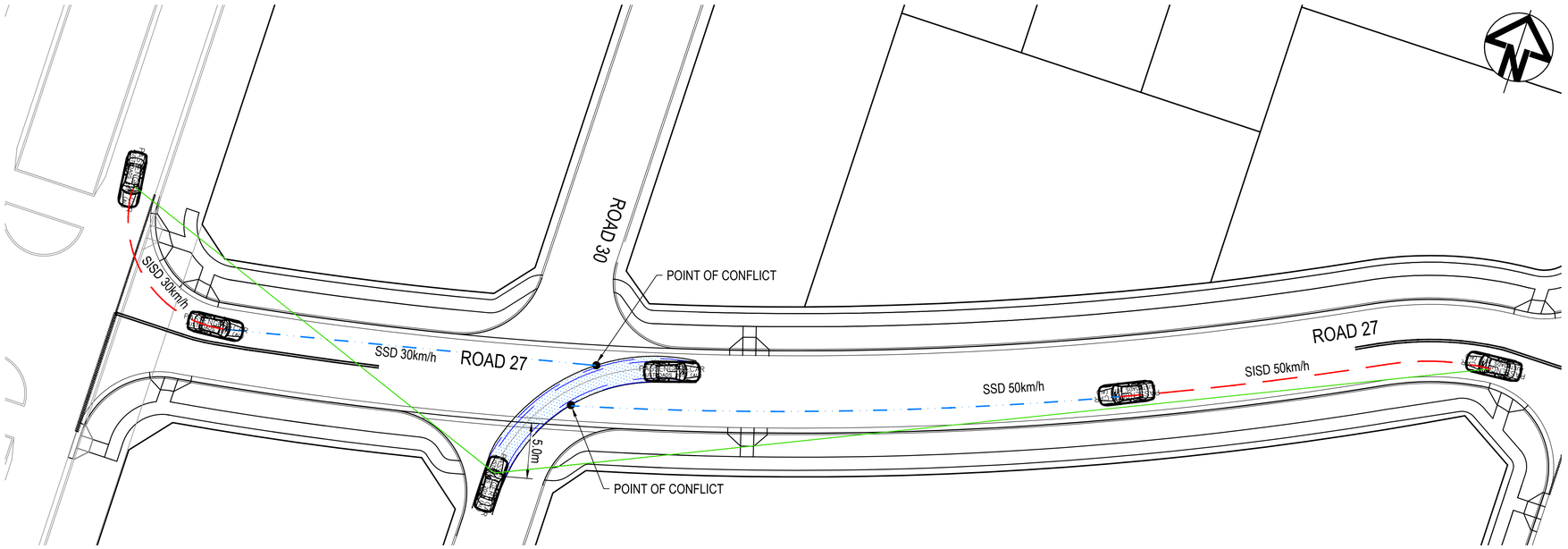
REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	40km/h
LONGITUDINAL GRADE	1%
SAFE INTESECTION SITE DISTANCE (ASD)	33.60m

SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC02 WEST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	-1%
SAFE INTESECTION SITE DISTANCE (SISD)	85m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC02 WEST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	-1%
SAFE INTESECTION SITE DISTANCE (SISD)	85m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC02 EAST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	30km/h
LONGITUDINAL GRADE	1%
SAFE INTESECTION SITE DISTANCE (SISD)	45.04m



ROAD 30 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

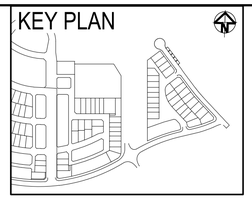


ROAD 30 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m
1 : 250

KEY PLAN



Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-434-10006310-nsd-SightDistancePlansSheet4.dwg

Project: SHELL COVE PRECINCT A

Title: SIGHT DISTANCE PLANS SHEET 4

ARCADIS
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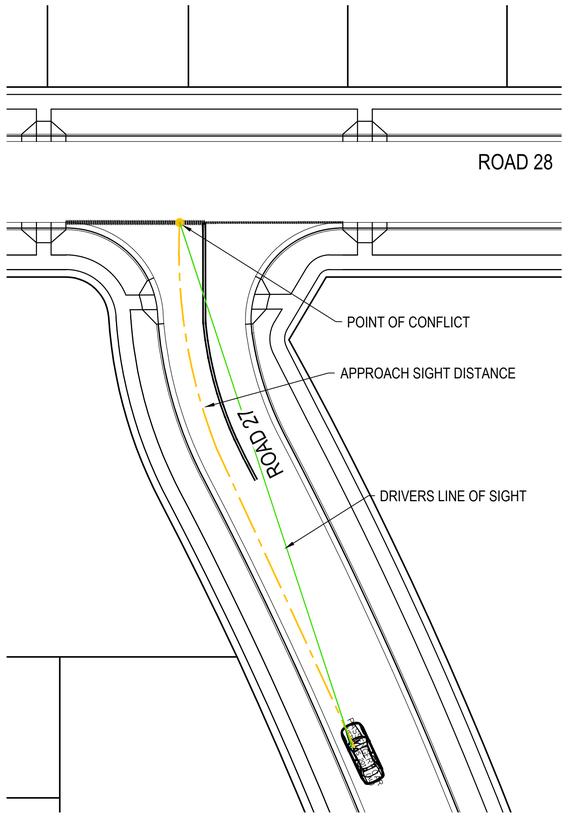
Fax No: +61 2 8907 9001
arcadis.com

Drawing No.	Project No.	Issue
C-A-434	10006310	01

100mm on Original

Date Plotted: 13 Nov 2017 - 11:43AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-434-10006310-nsd-SightDistancePlansSheet4.dwg



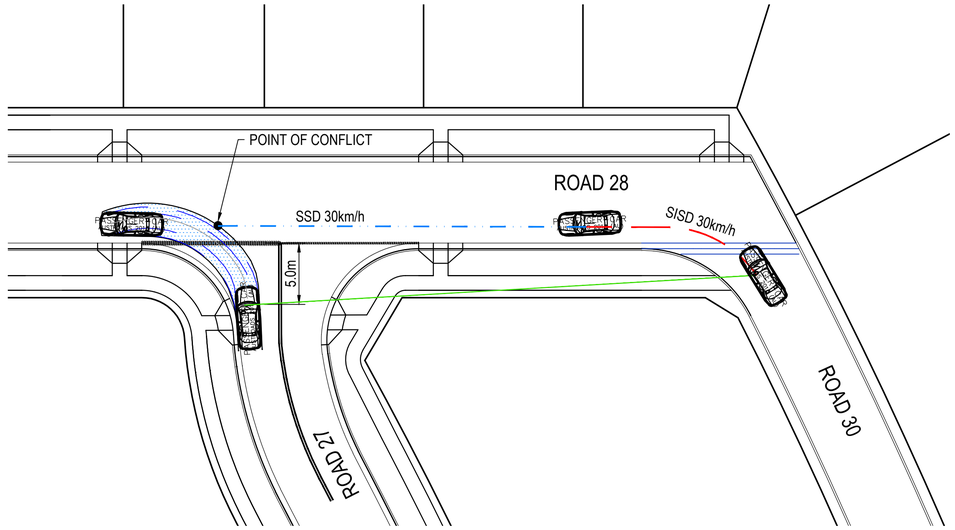
ROAD 27 - ROAD 28
INTERSECTION APPROACH SIGHT DISTANCE
SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

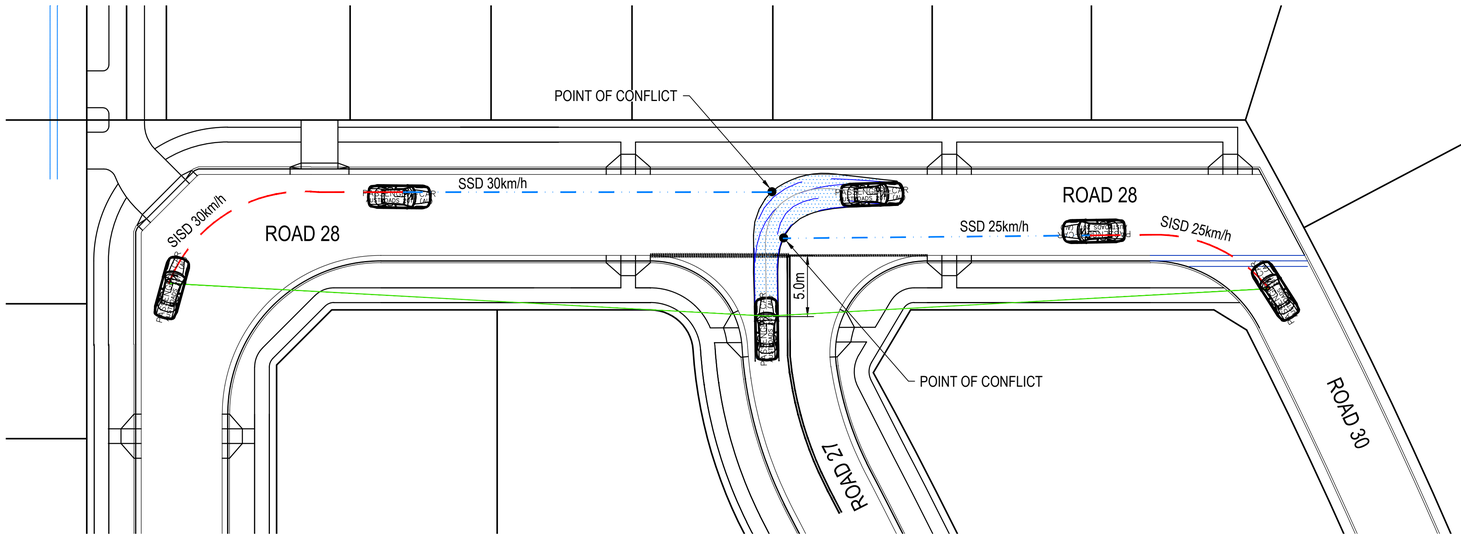
REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	3%
SAFE INTESECTION SITE DISTANCE (ASD)	45.94m

SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC01 NORTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	30km/h
LONGITUDINAL GRADE	-0.97%
SAFE INTESECTION SITE DISTANCE (SISD)	45.37m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC01 NORTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	25km/h
LONGITUDINAL GRADE	-0.97
SAFE INTESECTION SITE DISTANCE (SISD)	36.71m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC01 SOUTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	30km/h
LONGITUDINAL GRADE	0.97
SAFE INTESECTION SITE DISTANCE (SISD)	45.04m



ROAD 27 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250



ROAD 27 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

100mm on Original

0 5 10 15 20 25m
1 : 250

KEY PLAN

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	
Filename:	C-a-435-10006310-nsd-SightDistancePlansSheet5.dwg		

Project: SHELL COVE
PRECINCT A

Title: SIGHT DISTANCE PLANS
SHEET 5

ARCADIS
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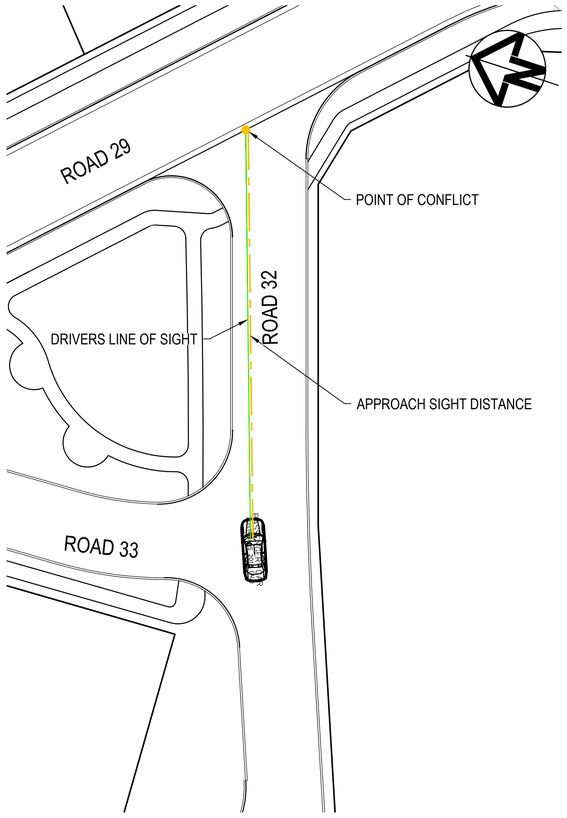
Drawing No.	Project No.	Issue
C-A-435	10006310	01

Date Plotted: 13 Nov 2017 - 11:40AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-435-10006310-nsd-SightDistancePlansSheet5.dwg



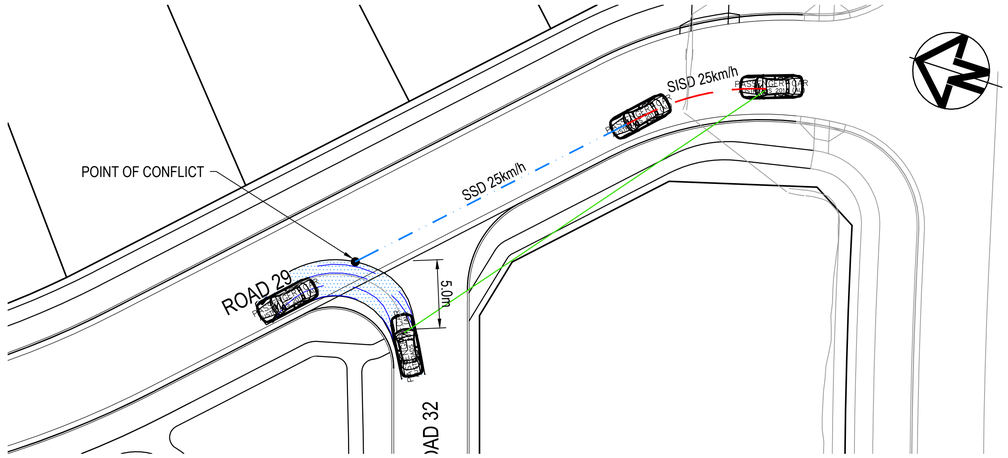
ROAD 29 - ROAD 32
INTERSECTION APPROACH SIGHT DISTANCE
SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

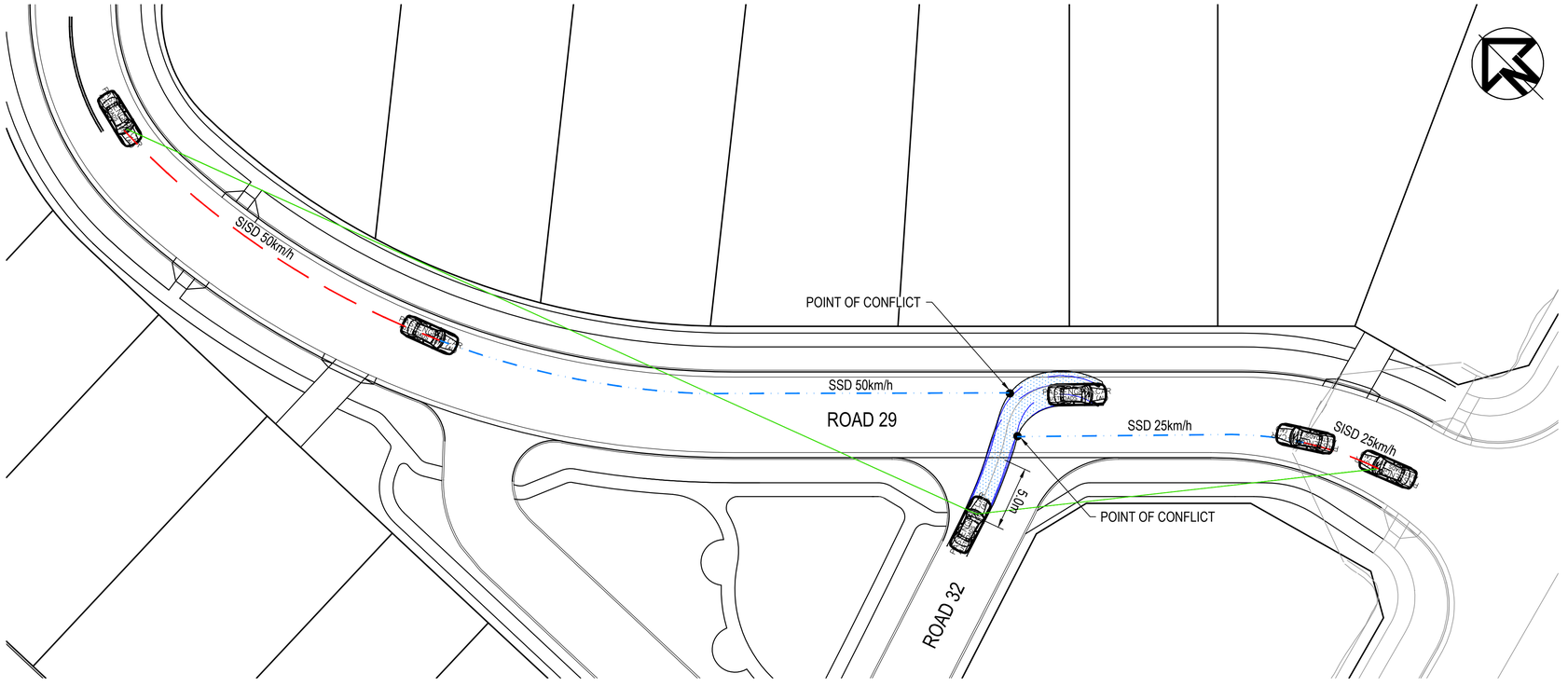
REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	40km/h
LONGITUDINAL GRADE	3%
SAFE INTESECTION SITE DISTANCE (ASD)	32.7m

SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 NORTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	25km/h
LONGITUDINAL GRADE	-2.6%
SAFE INTESECTION SITE DISTANCE (SISD)	37m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 NORTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	25km/h
LONGITUDINAL GRADE	-2.6
SAFE INTESECTION SITE DISTANCE (SISD)	37m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 SOUTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	1.1%
SAFE INTESECTION SITE DISTANCE (SISD)	83.40m



ROAD 32- LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250



ROAD32 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m
1 : 250

KEY PLAN

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-436-10006310-nsd-SightDistancePlansSheet6.dwg

Project: SHELL COVE PRECINCT A

Title: SIGHT DISTANCE PLANS SHEET 6

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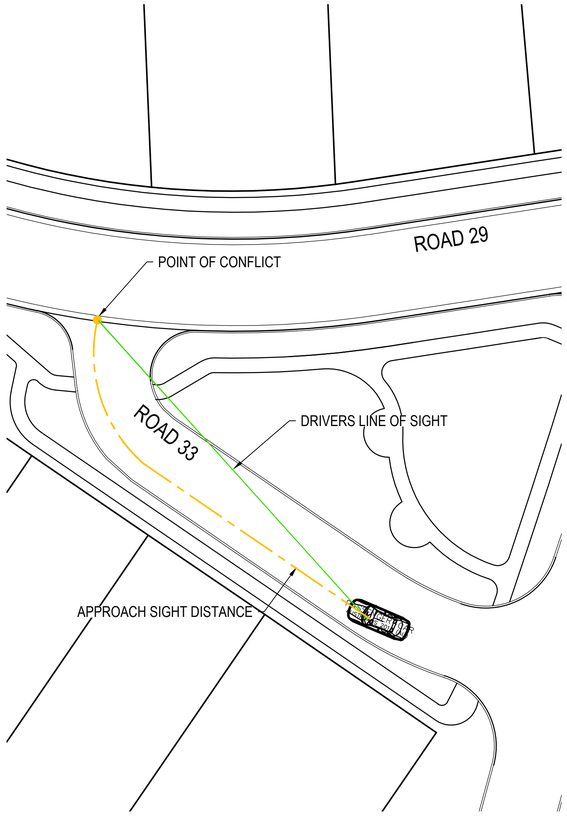
Drawing No.	Project No.	Issue
C-A-436	10006310	01

100mm on Original

Date Plotted: 13 Nov 2017 - 11:36AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-436-10006310-nsd-SightDistancePlansSheet6.dwg



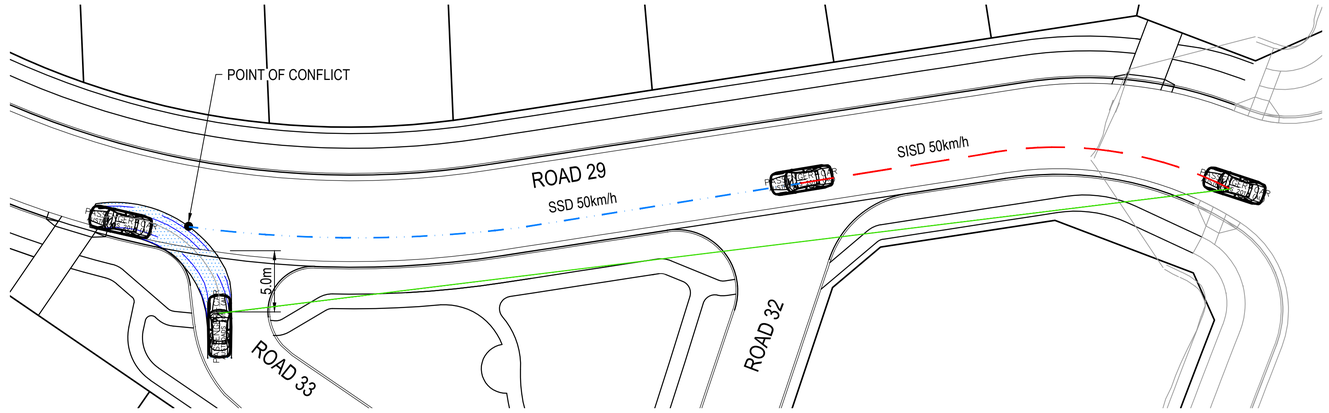
ROAD 29 - ROAD 33
INTERSECTION APPROACH SIGHT DISTANCE
SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

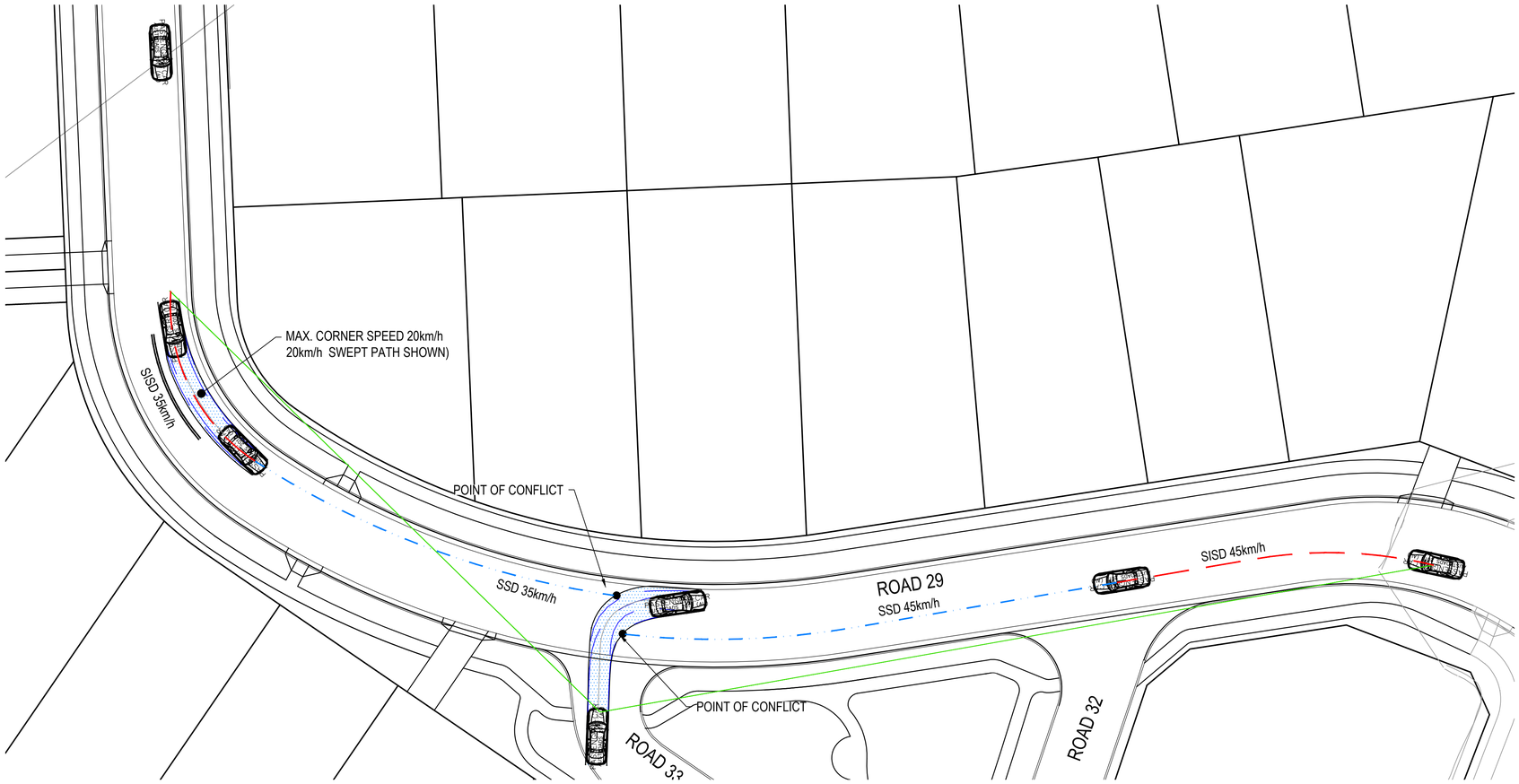
REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	40km/h
LONGITUDINAL GRADE	3%
SAFE INTESECTION SITE DISTANCE (ASD)	32.74m

SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 NORTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	-2.6%
SAFE INTESECTION SITE DISTANCE (SISD)	85.17m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 NORTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	45km/h
LONGITUDINAL GRADE	-2.6
SAFE INTESECTION SITE DISTANCE (SISD)	74.62m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 SOUTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	35km/h
LONGITUDINAL GRADE	2.6%
SAFE INTESECTION SITE DISTANCE (SISD)	53.67m



ROAD 33 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250



ROAD 33 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

100mm on Original

0 5 10 15 20 25m
1 : 250

KEY PLAN

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-437-10006310-nsd-SightDistancePlansSheet7.dwg

Project: SHELL COVE
PRECINCT A

Title: SIGHT DISTANCE PLANS
SHEET 7

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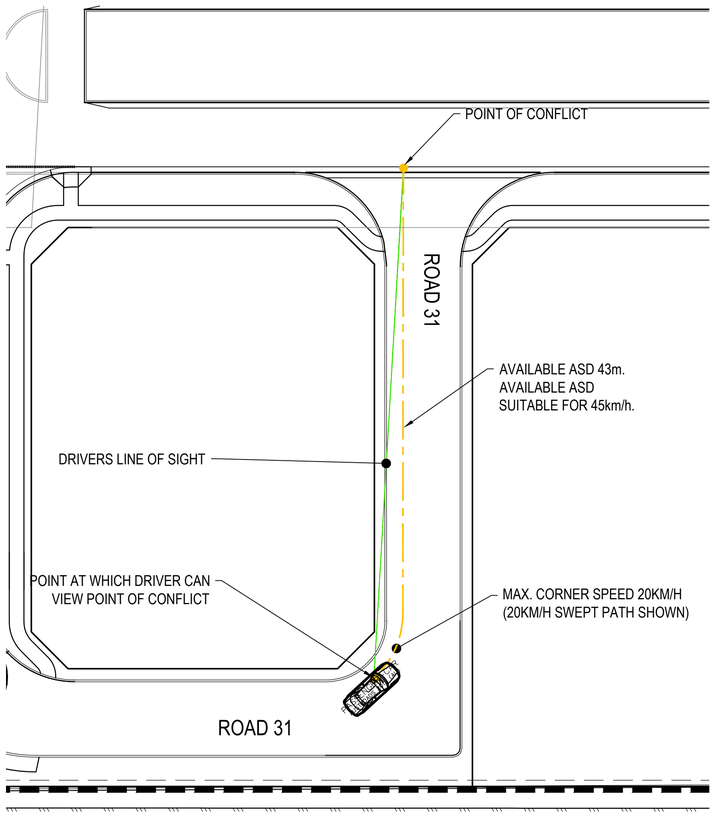
arcadis.com

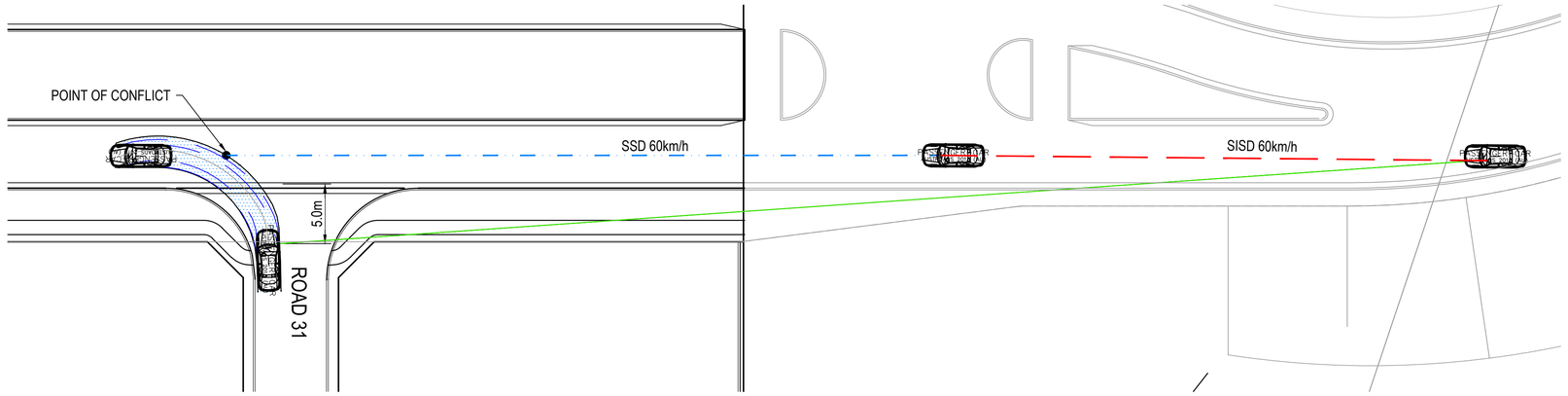
Drawing No.	Project No.	Issue
C-A-437 –	10006310 –	01

Date Plotted: 13 Nov 2017 - 11:33AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-437-10006310-nsd-SightDistancePlansSheet7.dwg



PROMONTORY DRIVE - ROAD 31
INTERSECTION APPROACH SIGHT DISTANCE

SCALE 1 : 250



ROAD 31 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE

SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	45km/h
LONGITUDINAL GRADE	-2.95%
SAFE INTESECTION SITE DISTANCE (ASD)	42.7m

SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC03 (P B1&C1) SOUTH BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	60km/h
LONGITUDINAL GRADE	-1.33%
SAFE INTESECTION SITE DISTANCE (SISD)	106.73m

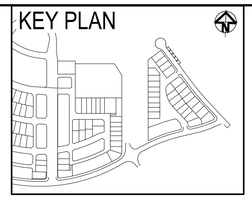
SISD
SSD

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m

1 : 250

KEY PLAN



Client

FRASERS PROPERTY

Status
PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-438-10006310-nsd-SightDistancePlansSheet8.dwg

Project
SHELL COVE
PRECINCT A

Title
SIGHT DISTANCE PLANS
SHEET 8

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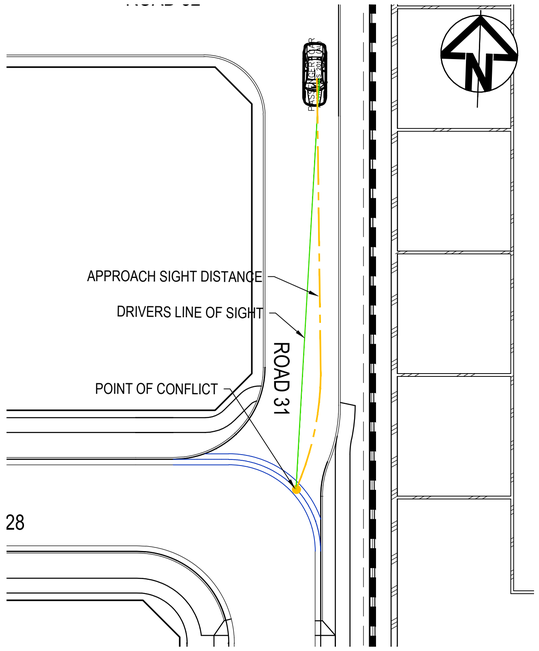
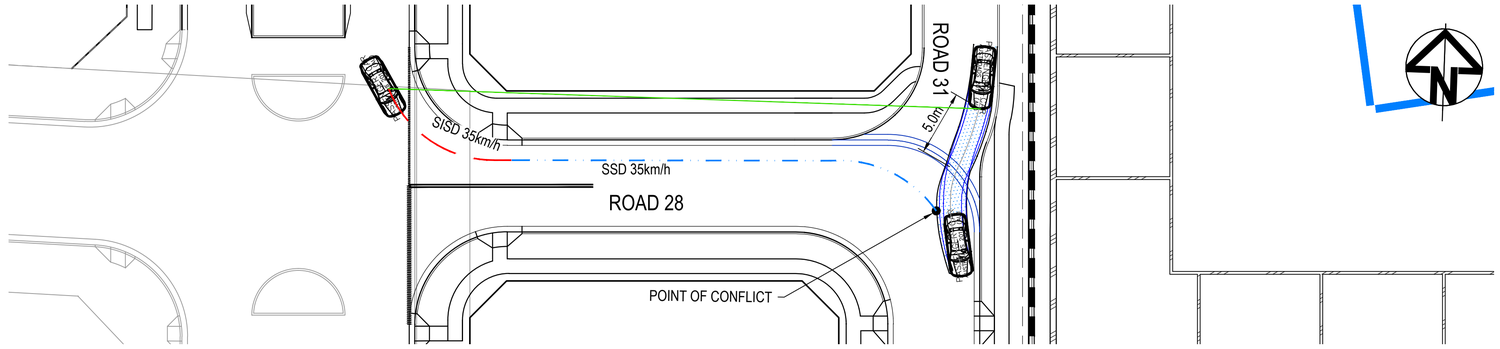
Drawing No.	Project No.	Issue
C-A-431	10006310	01

100mm on Original

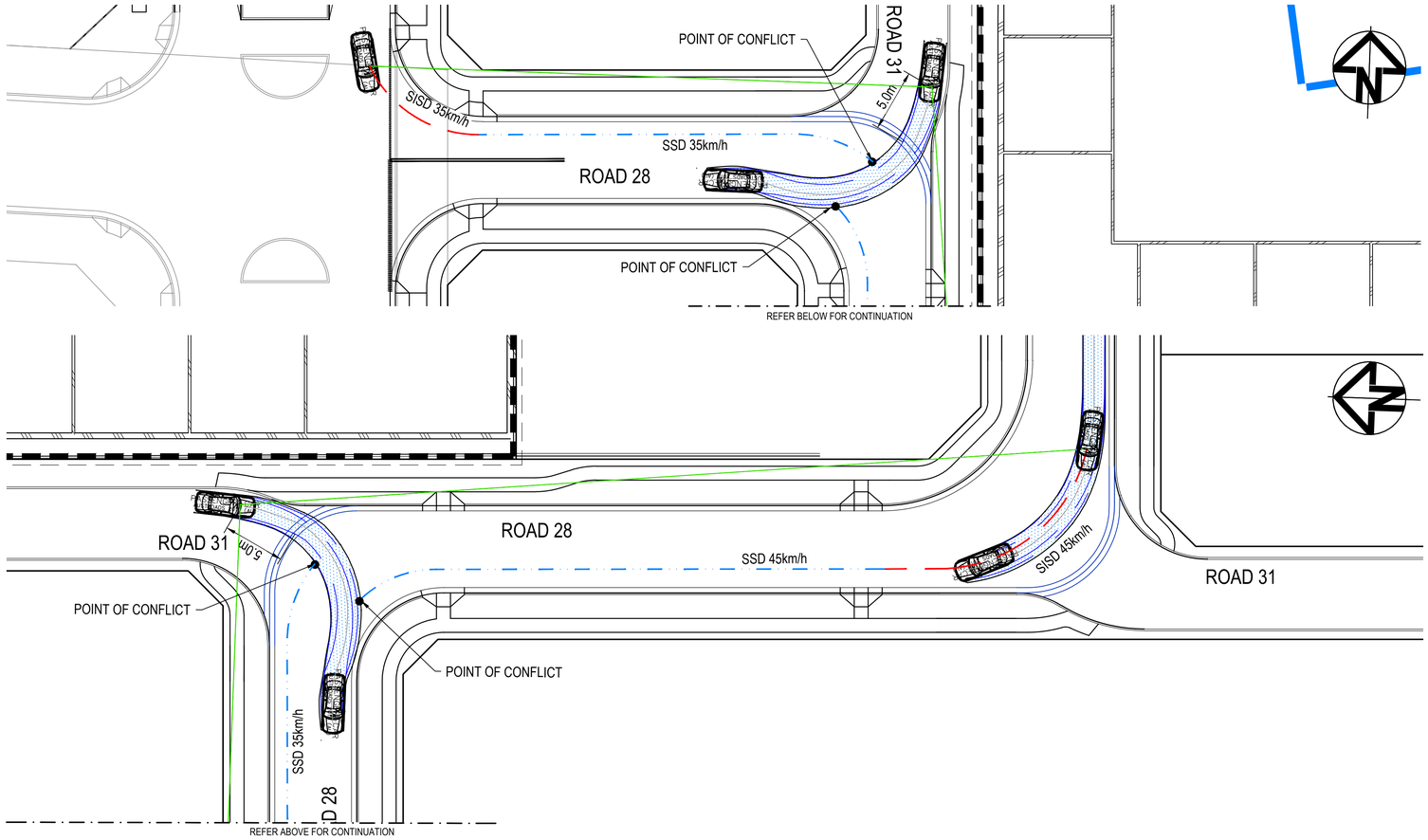
Date Plotted: 13 Nov 2017 - 11:17AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-438-10006310-nsd-SightDistancePlansSheet8.dwg



ROAD 28 - ROAD 31
INTERSECTION APPROACH SIGHT DISTANCE
SCALE 1 : 250



ROAD 31 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250



ROAD 31 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	40km/h
LONGITUDINAL GRADE	-1.5%
SAFE INTESECTION SITE DISTANCE (ASD)	33m

SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC01 EAST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	35km/h
LONGITUDINAL GRADE	-0.97%
SAFE INTESECTION SITE DISTANCE (SISD)	55m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC01 EAST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	35km/h
LONGITUDINAL GRADE	-0.97%
SAFE INTESECTION SITE DISTANCE (SISD)	55m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC01 WEST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	45km/h
LONGITUDINAL GRADE	0.97%
SAFE INTESECTION SITE DISTANCE (SISD)	73m

SISD
SSD

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

100mm on Original

0 5 10 15 20 25m
1 : 250

KEY PLAN

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-439-10006310-nsd-SightDistancePlansSheet9.dwg

Project: SHELL COVE PRECINCT A

Title: SIGHT DISTANCE PLANS SHEET 9

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Fax No: +61 2 8907 9001
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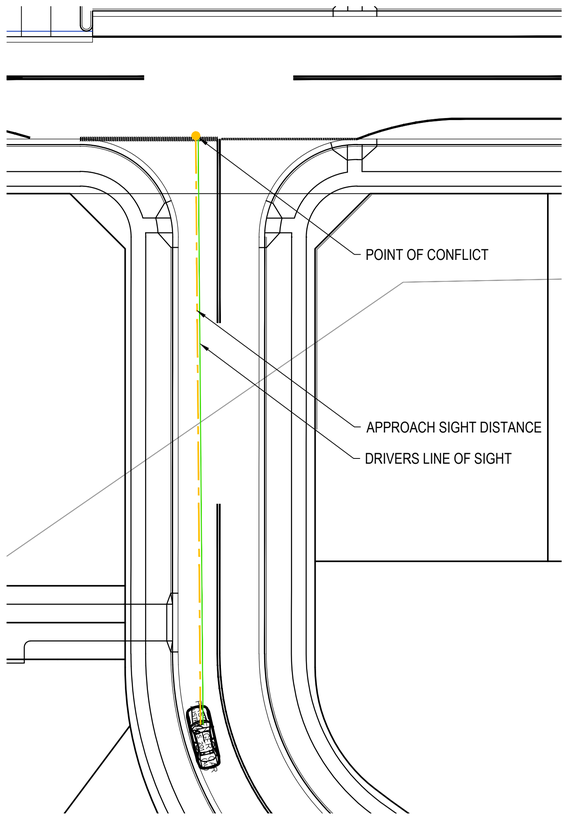
Drawing No.	Project No.	Issue
C-A-439	10006310	01

Date Plotted: 13 Nov 2017 - 11:13AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-439-10006310-nsd-SightDistancePlansSheet9.dwg



ROAD 29 - BASS POINT TOURIST ROAD
INTERSECTION APPROACH SIGHT DISTANCE

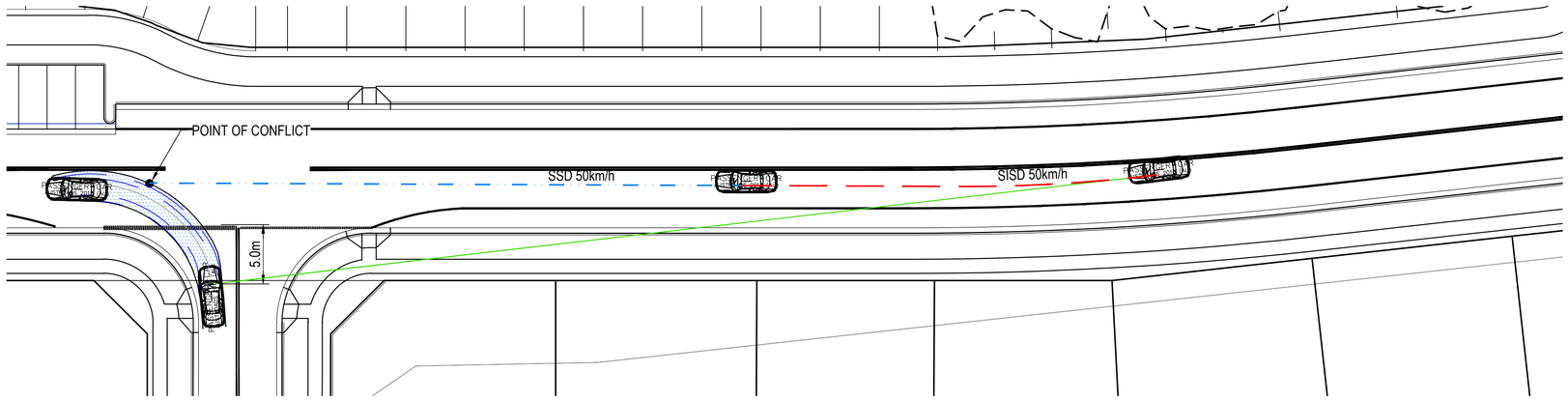
SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	3%
SAFE INTESECTION SITE DISTANCE (ASD)	48.00m

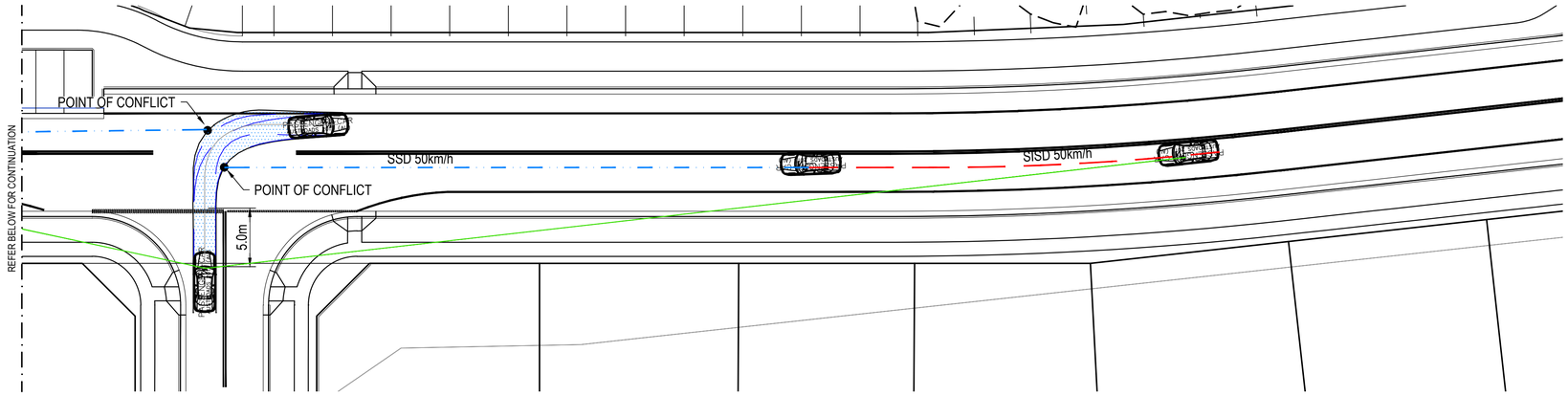
SAFE INTERSECTION SIGHT DISTANCES (SISD)

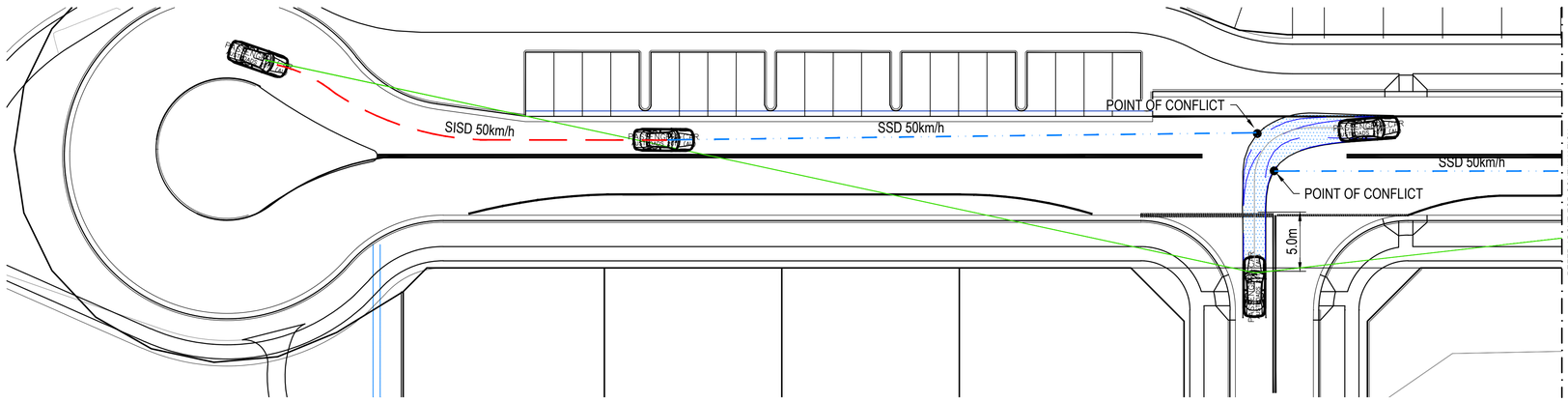
DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	BASS POINT TOURIST ROAD WEST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	-0.8%
SAFE INTESECTION SITE DISTANCE (SISD)	84.27m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	BASS POINT TOURIST ROAD WEST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	-0.8%
SAFE INTESECTION SITE DISTANCE (SISD)	84.27m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	BASS POINT TOURIST ROAD EAST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	0.8%
SAFE INTESECTION SITE DISTANCE (SISD)	83.53m



ROAD 29 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE

SCALE 1 : 250





ROAD 29 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE

SCALE 1 : 250

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m

1 : 250

KEY PLAN

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-440-10006310-nsd-SightDistancePlansSheet10.dwg

Project: SHELL COVE
PRECINCT A

Title: SIGHT DISTANCE PLANS
SHEET 10

ARCADIS
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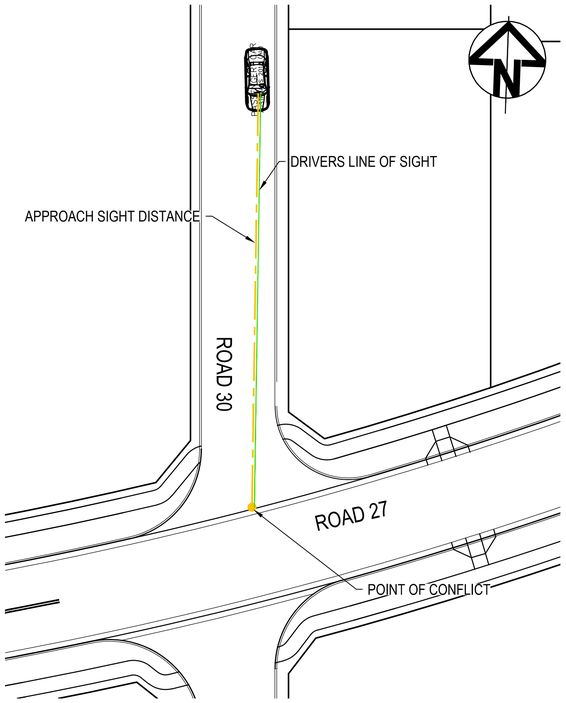
arcadis.com

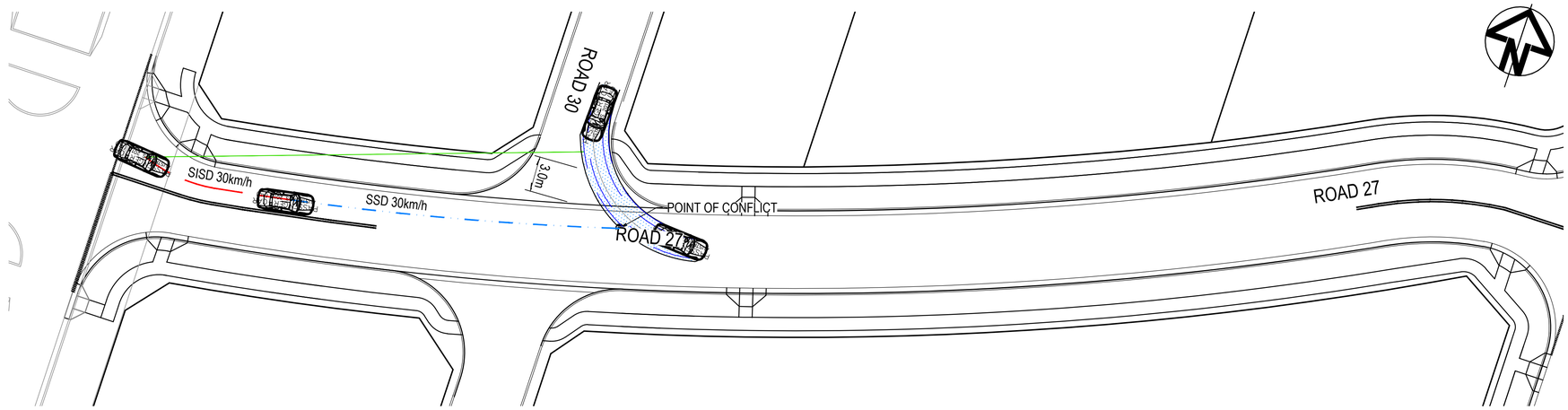
Drawing No.	Project No.	Issue
C-A-440	10006310	01

100mm on Original

Date Plotted: 13 Nov 2017 - 11:06AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-440-10006310-nsd-SightDistancePlansSheet10.dwg



ROAD 27 - ROAD 30
INTERSECTION APPROACH SIGHT DISTANCE
SCALE 1 : 250



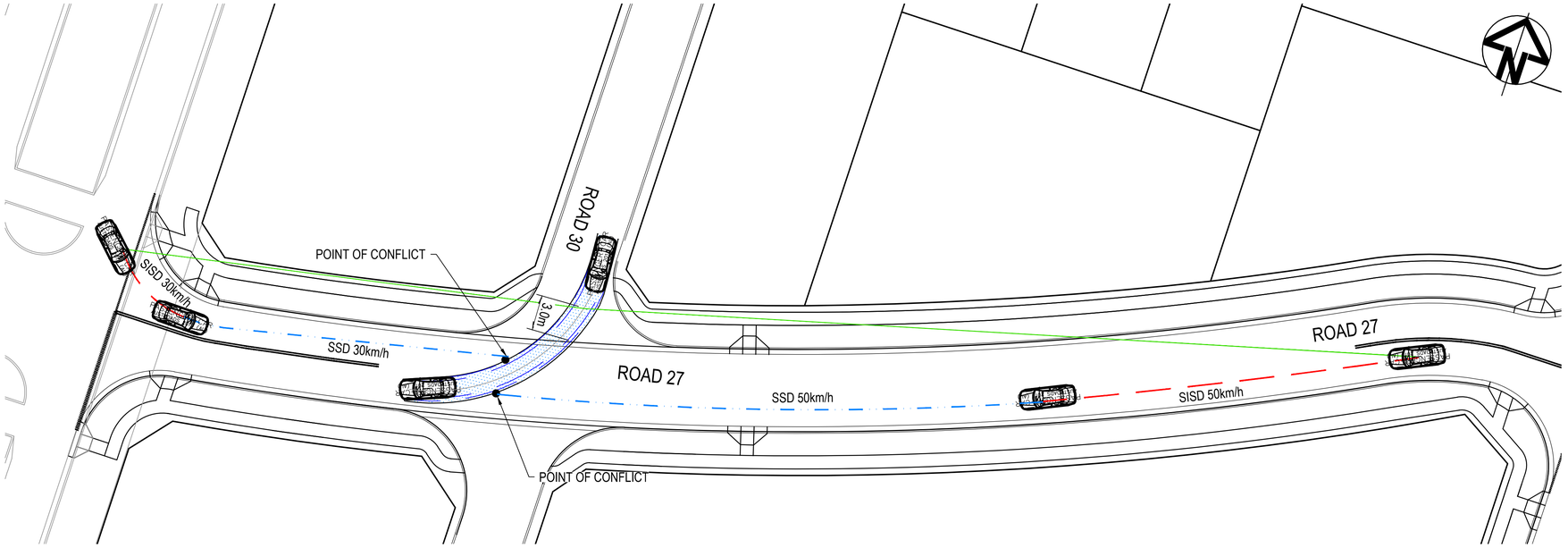
ROAD 30 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	40km/h
LONGITUDINAL GRADE	1%
SAFE INTESECTION SITE DISTANCE (ASD)	33.60m

SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC02 EAST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	30km/h
LONGITUDINAL GRADE	-1%
SAFE INTESECTION SITE DISTANCE (SISD)	45m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC02 EAST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	30km/h
LONGITUDINAL GRADE	-1%
SAFE INTESECTION SITE DISTANCE (SISD)	45m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD MC02 WEST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	50km/h
LONGITUDINAL GRADE	1%
SAFE INTESECTION SITE DISTANCE (SISD)	83.4m



ROAD 30 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m
1 : 250

KEY PLAN

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-441-10006310-nsd-SightDistancePlansSheet11.dwg

Project: SHELL COVE PRECINCT A

Title: SIGHT DISTANCE PLANS SHEET 11

ARCADIS
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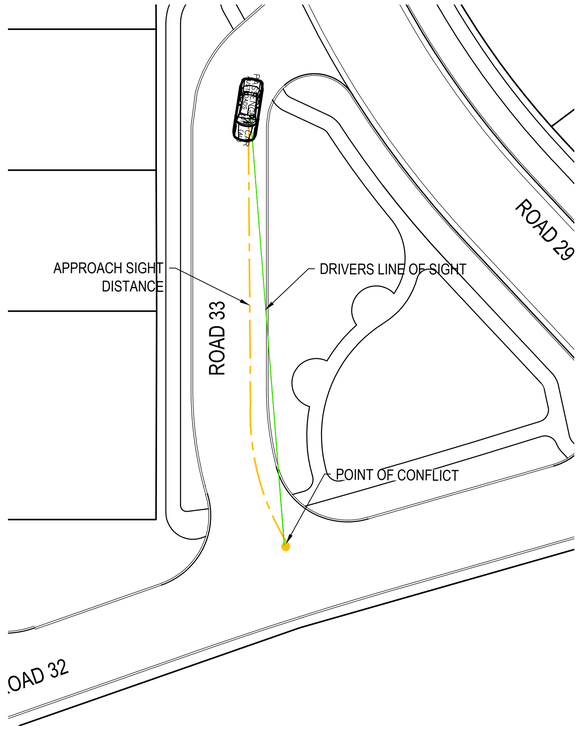
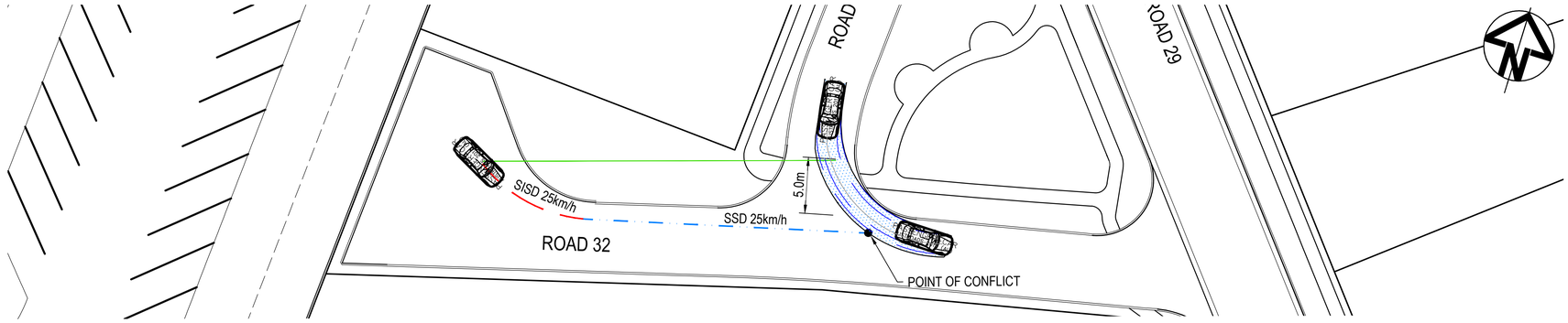
Drawing No.	Project No.	Issue
C-A-441	10006310	01

100mm on Original

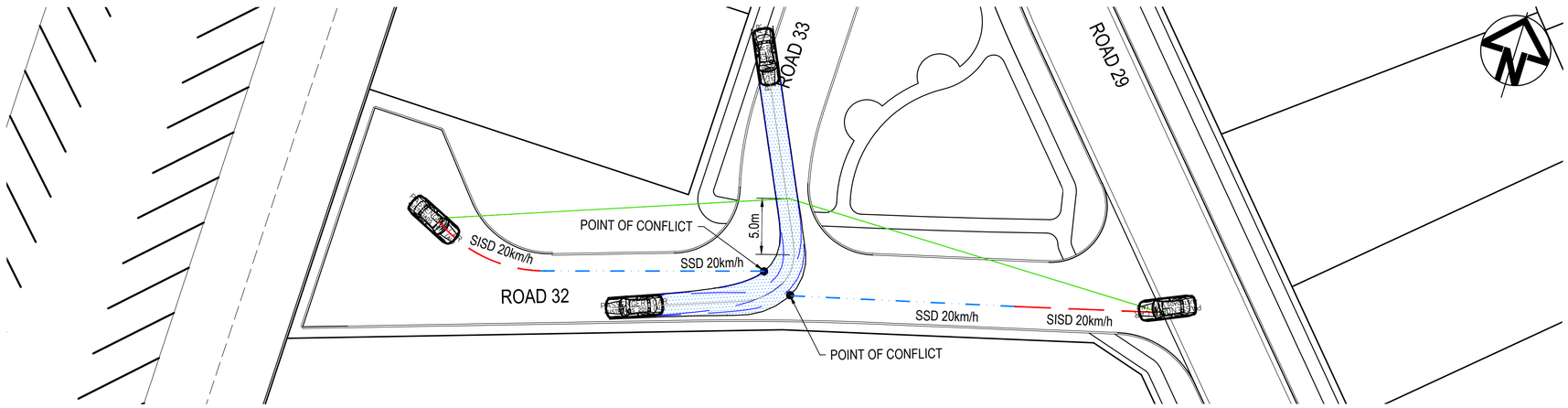
Date Plotted: 13 Nov 2017 - 11:03AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-441-10006310-nsd-SightDistancePlansSheet11.dwg



ROAD 32 - ROAD 33
INTERSECTION APPROACH SIGHT DISTANCE
SCALE 1 : 250



ROAD 33 - LEFT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250



ROAD 33 - RIGHT TURN OUT
SAFE INTERSECTION SIGHT DISTANCE
SCALE 1 : 250

INTERSECTION APPROACH SIGHT DISTANCE (ASD)

REACTION TIME	1.5s
COEFFICIENT OF DECELERATION	0.362
OPERATING SPEED	40km/h
LONGITUDINAL GRADE	-0.85%
SAFE INTESECTION SITE DISTANCE (ASD)	33m

SAFE INTERSECTION SIGHT DISTANCES (SISD)

DIRECTION OF EXIT FROM INTERSECTION	LEFT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD ML03 EAST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	25km/h
LONGITUDINAL GRADE	-1.33%
SAFE INTESECTION SITE DISTANCE (SISD)	36.9m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD ML03 EAST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	20km/h
LONGITUDINAL GRADE	-1.33%
SAFE INTESECTION SITE DISTANCE (SISD)	28.6m
DIRECTION OF EXIT FROM INTERSECTION	RIGHT OUT
DIRECTION OF APPROACHING TRAFFIC	ROAD ML03 WEST BOUND
DECISION TIME	4.5s
COEFFICIENT OF DECELERATION	0.46
OPERATING SPEED	20km/h
LONGITUDINAL GRADE	1.33%
SAFE INTESECTION SITE DISTANCE (SISD)	28.24m

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

100mm on Original

0 5 10 15 20 25m
1 : 250

KEY PLAN

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	
Filename:	C-a-442-10006310-nsd-SightDistancePlansSheet12.dwg		

Project: SHELL COVE PRECINCT A

Title: SIGHT DISTANCE PLANS SHEET 12

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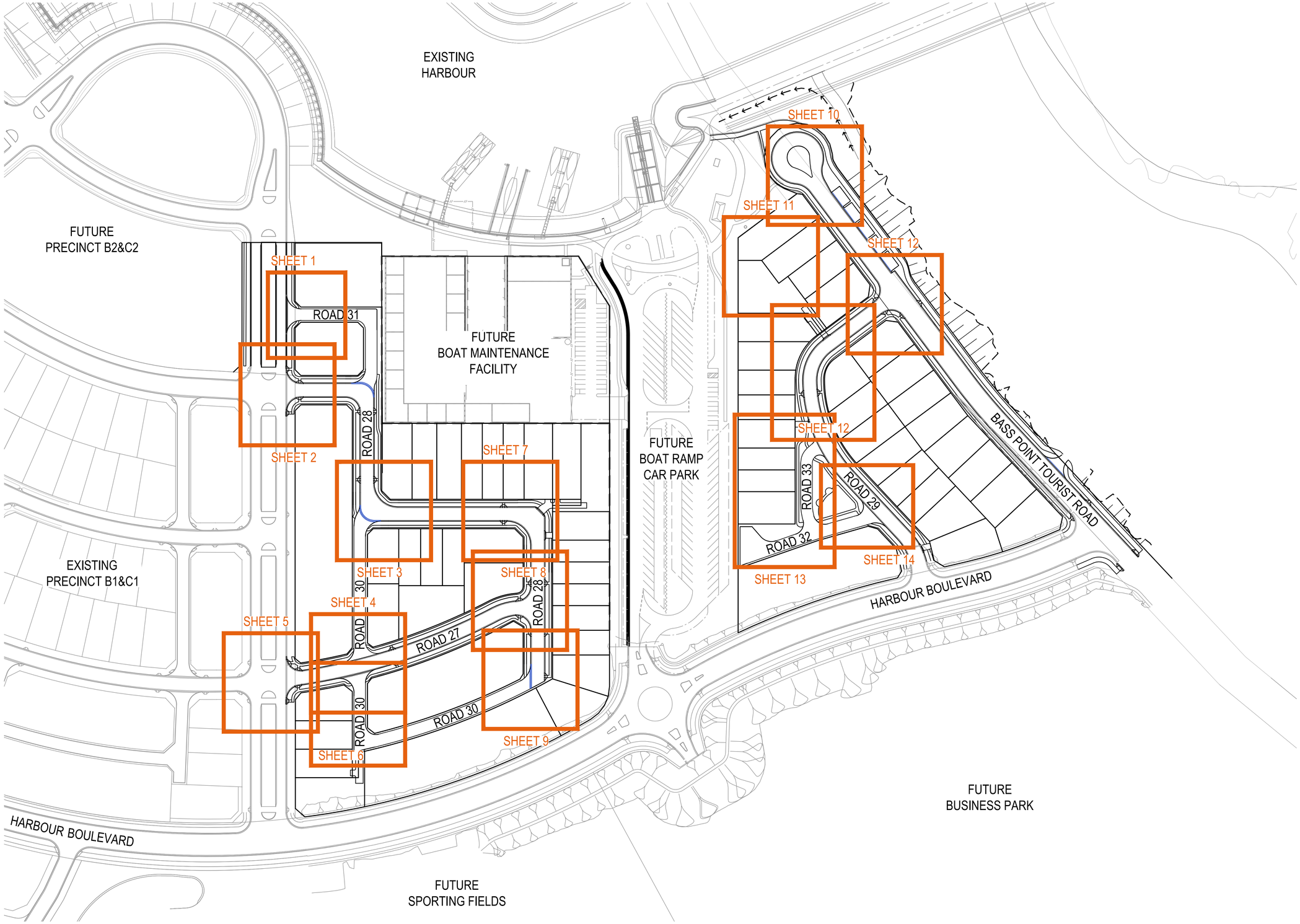
Drawing No.	Project No.	Issue
C-A-442	10006310	01

Date Plotted: 13 Nov 2017 - 11:57AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-442-10006310-nsd-SightDistancePlansSheet12.dwg

NOTE

REFER TO DRAWINGS C-A-412 TO C-A-416 FOR TURNING PATHS.



Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 20 40 60 80 100m

1 : 1000

100mm on Original

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 1000	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-411-10006310-nsd-TurningPathsLayoutPlan.dwg

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS KEY PLAN

ARCADIS
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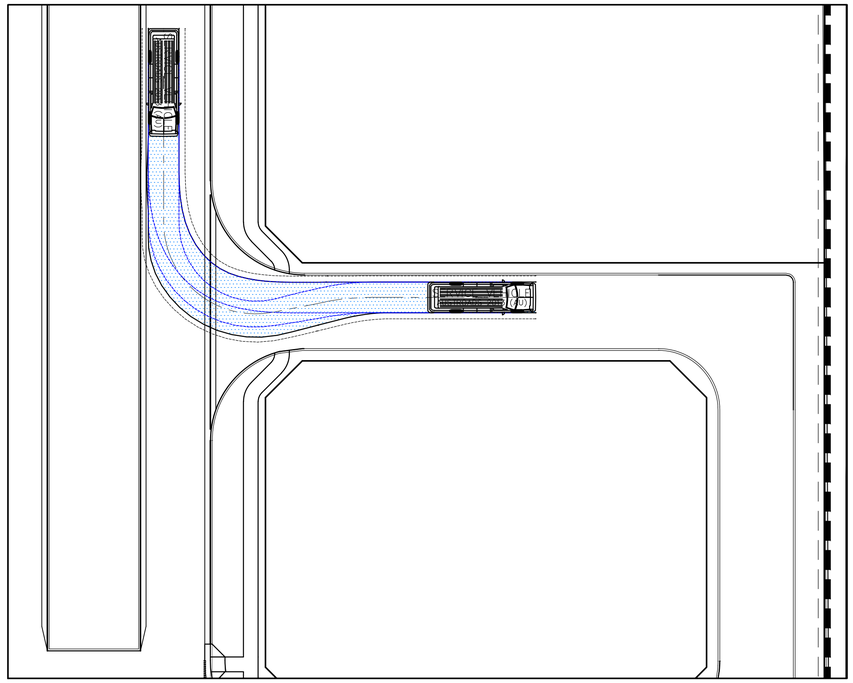
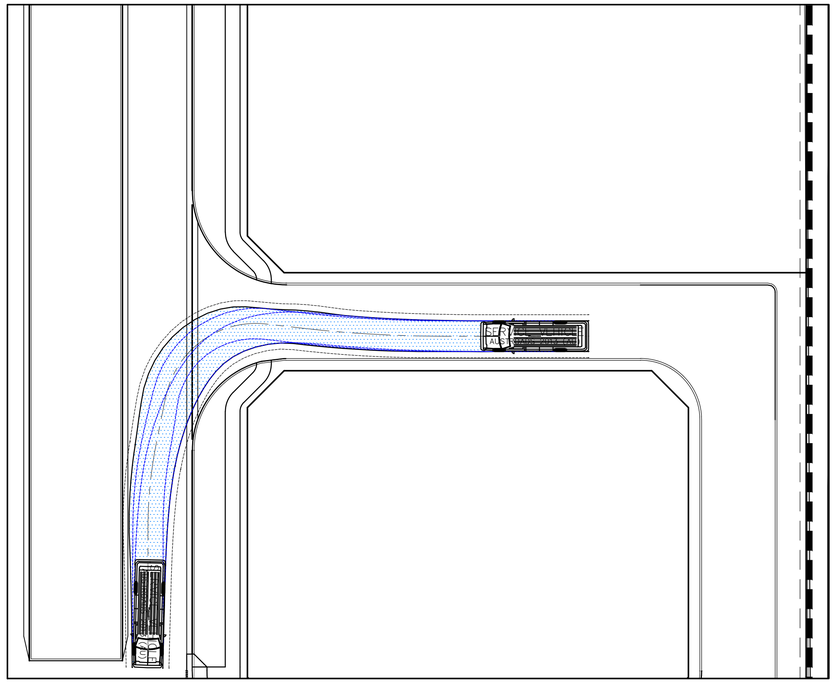
Drawing No.	Project No.	Issue
C-A-411	10006310	01

Date Plotted: 14 Nov 2017 - 11:30AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-411-10006310-nsd-TurningPathsLayoutPlan.dwg



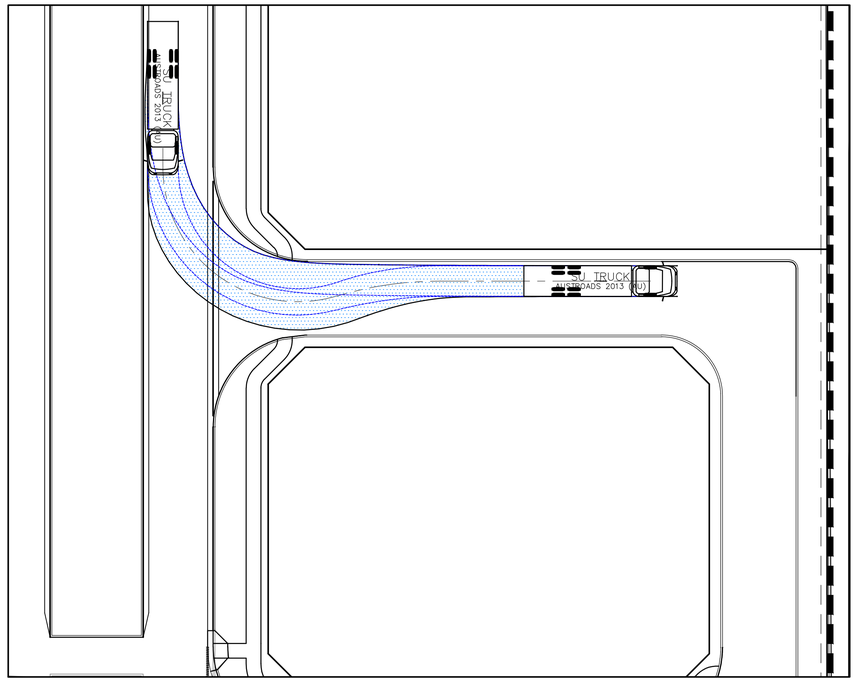
8.8 SERVICE VEHICLE - LEFT IN AT 5 km/h

SCALE 1 : 250



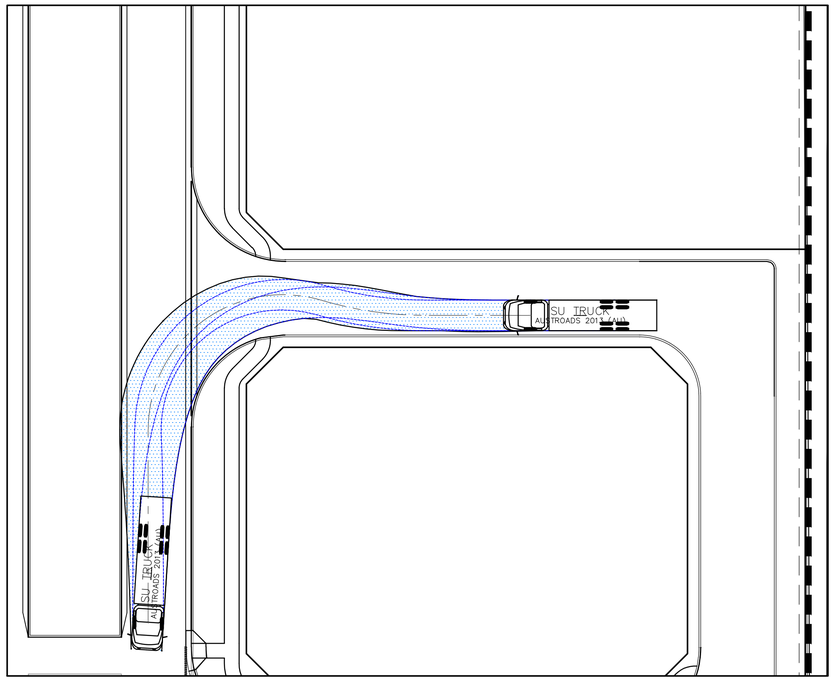
8.8 SERVICE VEHICLE - LEFT OUT AT 5 km/h

SCALE 1 : 250



12.5 SU TRUCK - LEFT IN AT 5 km/h

SCALE 1 : 250

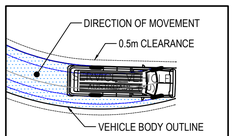


12.5 SU TRUCK - LEFT IN OUT 5 km/H

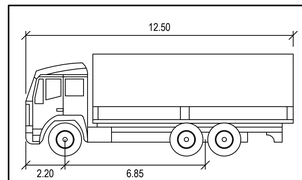
SCALE 1 : 250

NOTE

REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.



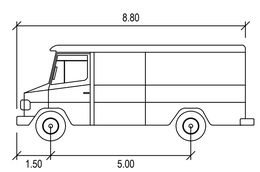
VEHICLE SPEED ON ROAD : 50 km/H
VEHICLE SPEED ON PARKING : 5 KM/H



SU TRUCK

meters

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



SERVICE VEHICLE

meters

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m

1 : 250

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	
Filename:	C-a-412-10006310-nsd-TurningPathsSheet1.dwg		

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 1

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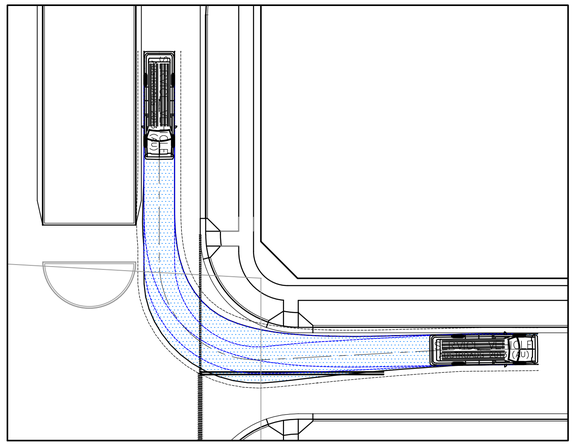
arcadis.com

Drawing No.	Project No.	Issue
C-A-412	10006310	01

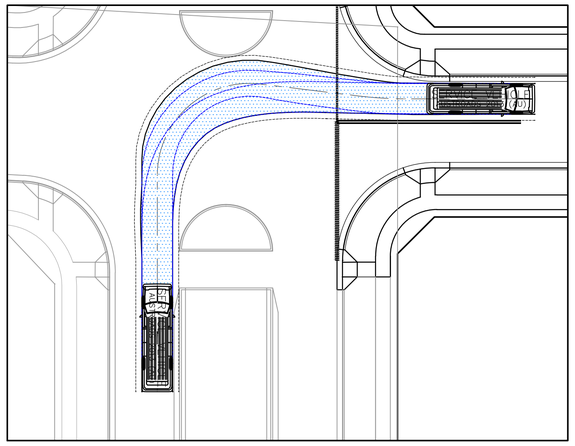
100mm on Original

Date Plotted: 13 Nov 2017 - 02:35PM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-412-10006310-nsd-TurningPathsSheet1.dwg



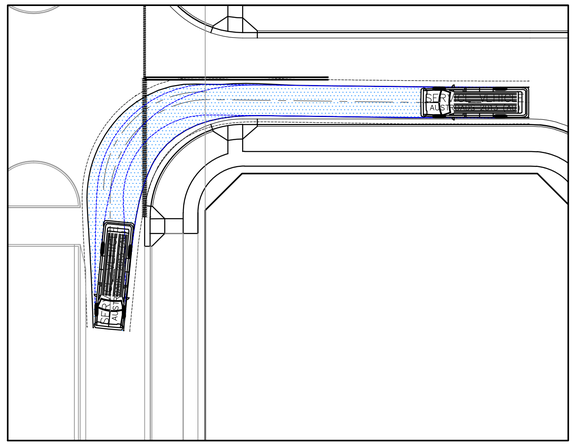
8.8 SERVICE VEHICLE - LEFT IN AT 5 km/h

SCALE 1 : 250



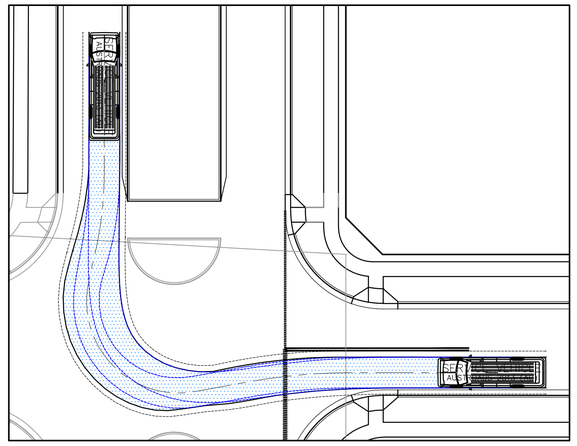
8.8 SERVICE VEHICLE - RIGHT IN AT 5 km/h

SCALE 1 : 250



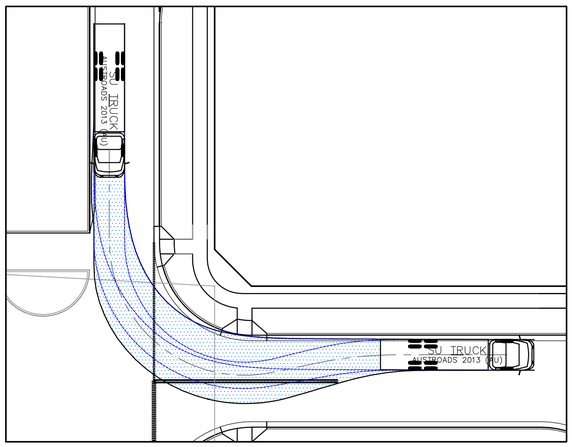
8.8 SERVICE VEHICLE - LEFT OUT AT 5 km/h

SCALE 1 : 250



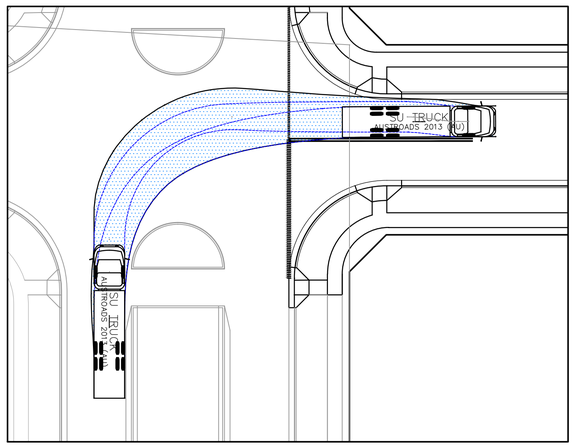
8.8 SERVICE VEHICLE - RIGHT OUT AT 5 km/h

SCALE 1 : 250



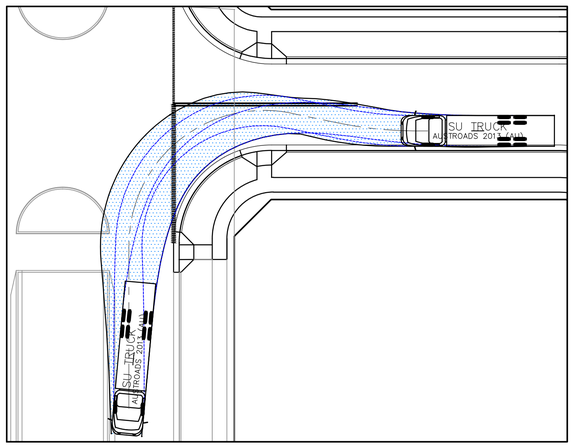
12.5 SU TRUCK - LEFT IN AT 5 km/h

SCALE 1 : 250



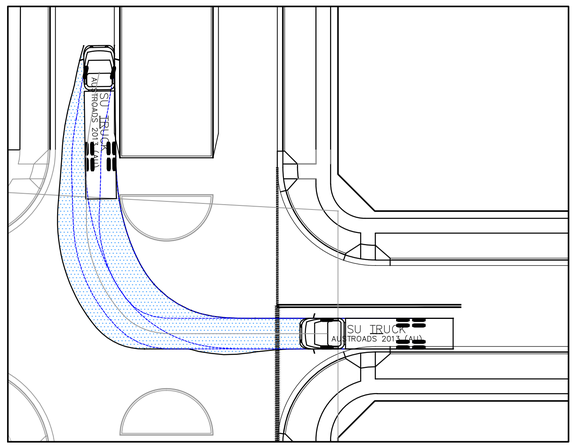
12.5 SU TRUCK - RIGHT IN AT 5 km/h

SCALE 1 : 250



12.5 SU TRUCK - LEFT OUT AT 5 km/h

SCALE 1 : 250

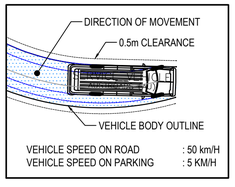


12.5 SU TRUCK - RIGHT OUT AT 5 km/h

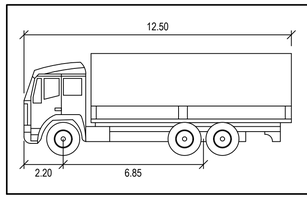
SCALE 1 : 250

NOTE

REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.



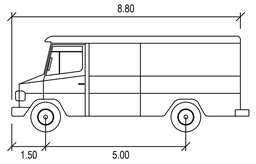
VEHICLE SPEED ON ROAD : 50 km/H
VEHICLE SPEED ON PARKING : 5 KM/H



SU TRUCK

meters

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



SERVICE VEHICLE

meters

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m

1 : 250

Client

FRASERS PROPERTY

Status

PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-413-10006310-nsd-TurningPathsSheet2.dwg

Project

SHELL COVE
PRECINCT A

Title

TURNING PATHS
SHEET 2

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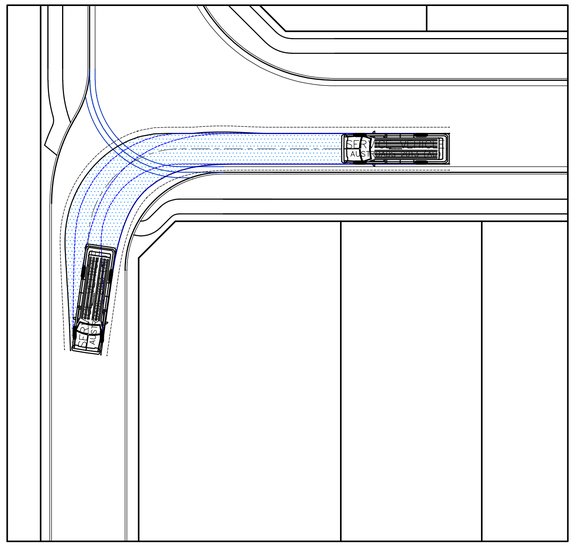
Fax No: +61 2 8907 9001
arcadis.com

Drawing No.	Project No.	Issue
C-A-413	10006310	01

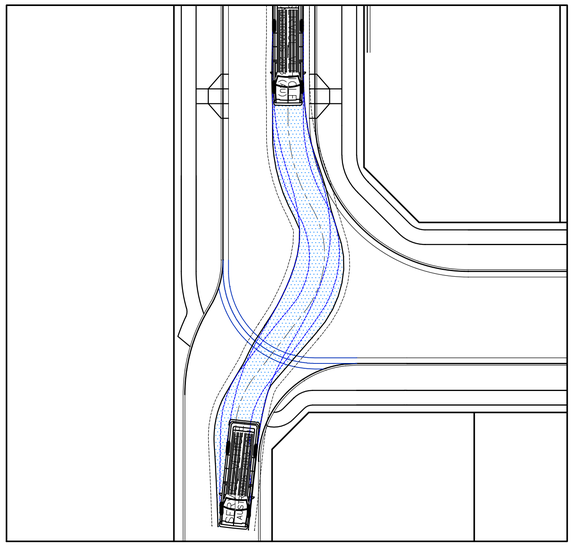
100mm on Original

Date Plotted: 13 Nov 2017 - 02:47PM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-413-10006310-nsd-TurningPathsSheet2.dwg



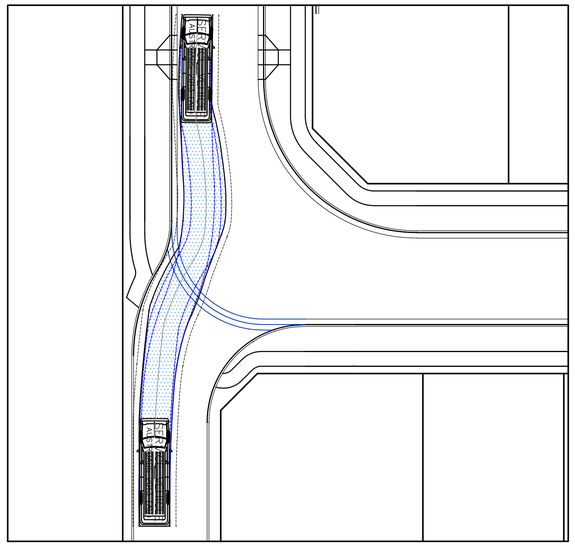
8.8 SERVICE VEHICLE - LEFT IN AT 5 km/h

SCALE 1 : 250



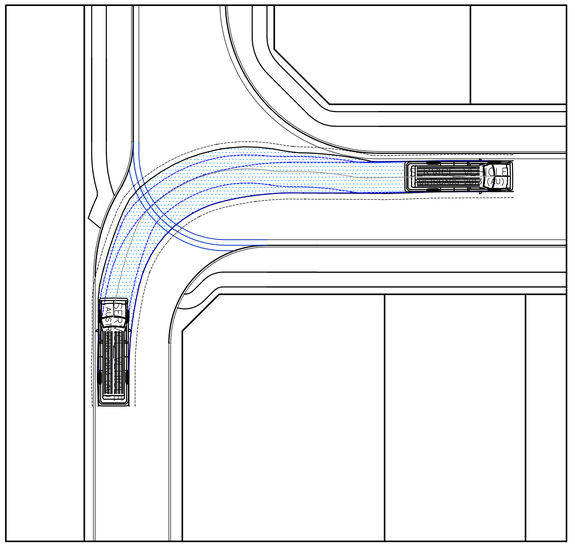
8.8 SERVICE VEHICLE - RIGHT IN AT 5 km/h

SCALE 1 : 250



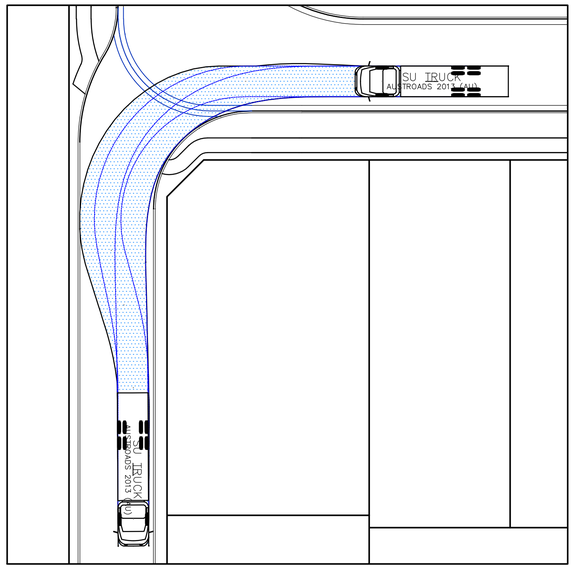
8.8 SERVICE VEHICLE - LEFT OUT AT 5 km/h

SCALE 1 : 250



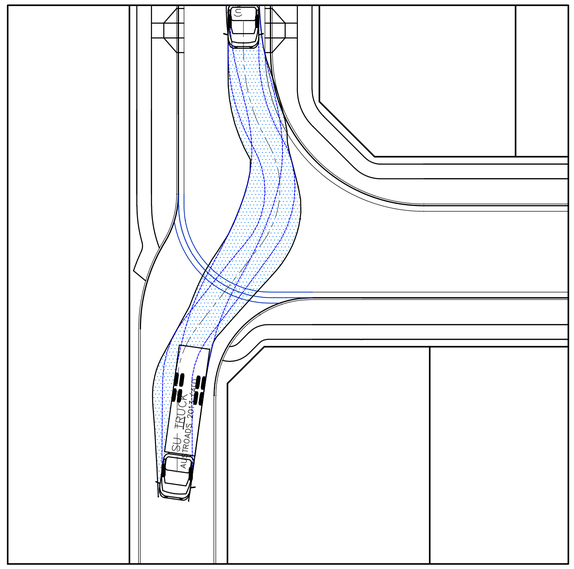
8.8 SERVICE VEHICLE - RIGHT OUT AT 5 km/h

SCALE 1 : 250



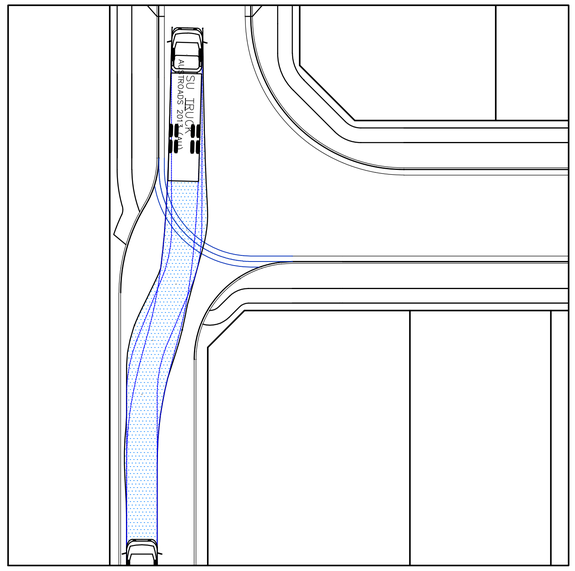
12.5 SU TRUCK - LEFT IN AT 5 km/h

SCALE 1 : 250



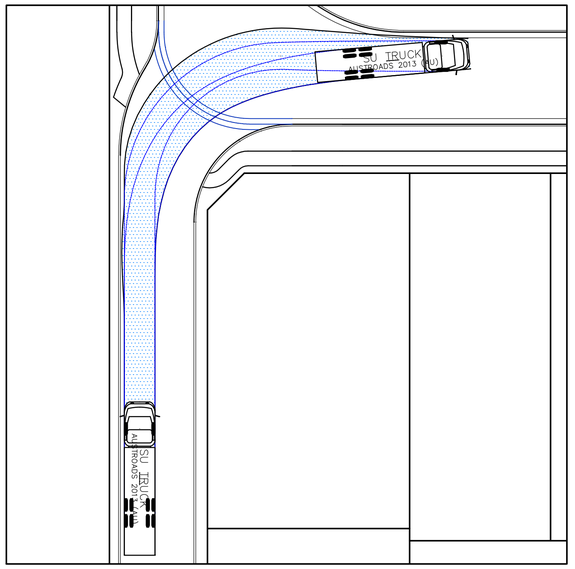
12.5 SU TRUCK - RIGHT IN AT 5 km/h

SCALE 1 : 250



12.5 SU TRUCK - LEFT OUT AT 5 km/h

SCALE 1 : 250

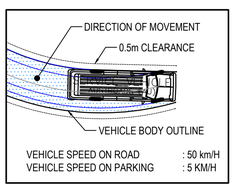


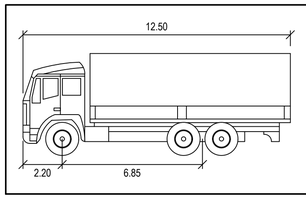
12.5 SU TRUCK - RIGHT OUT AT 5 km/h

SCALE 1 : 250

NOTE

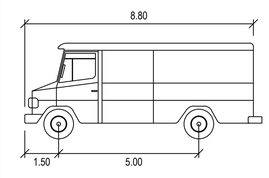
REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.





SU TRUCK

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



SERVICE VEHICLE

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m

1 : 250

100mm on Original

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-414-10006310-nsd-TurningPathsSheet3.dwg

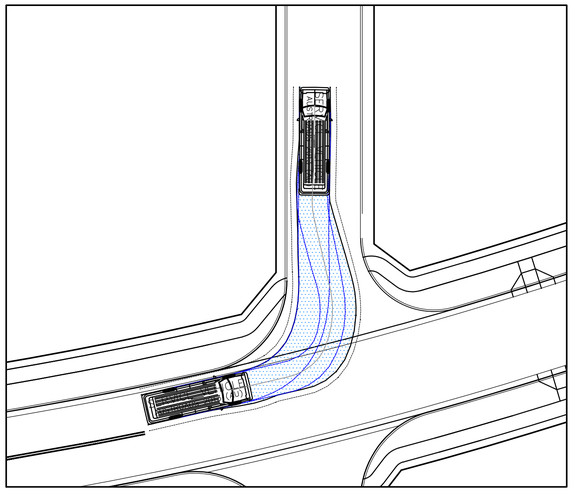
Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 3

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 16, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
Tel No: +61 2 8907 9000
Fax No: +61 2 8907 9001
arcadis.com

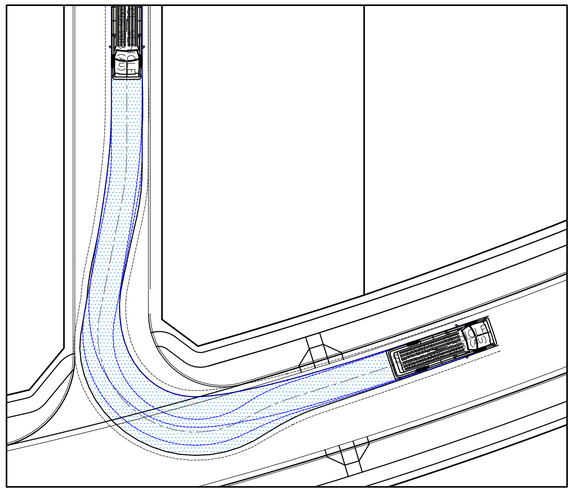
Drawing No.	Project No.	Issue
C-A-414	10006310	01

Date Plotted: 13 Nov 2017 - 03:13PM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-414-10006310-nsd-TurningPathsSheet3.dwg



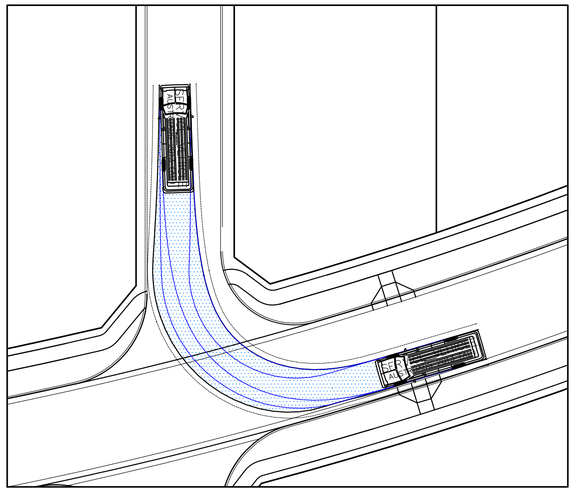
8.8 SERVICE VEHICLE - LEFT IN AT 5 km/h

SCALE 1 : 250



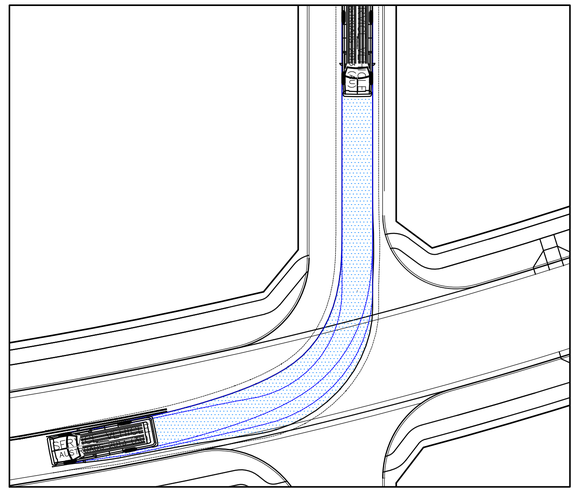
8.8 SERVICE VEHICLE - LEFT OUT AT 5 km/h

SCALE 1 : 250



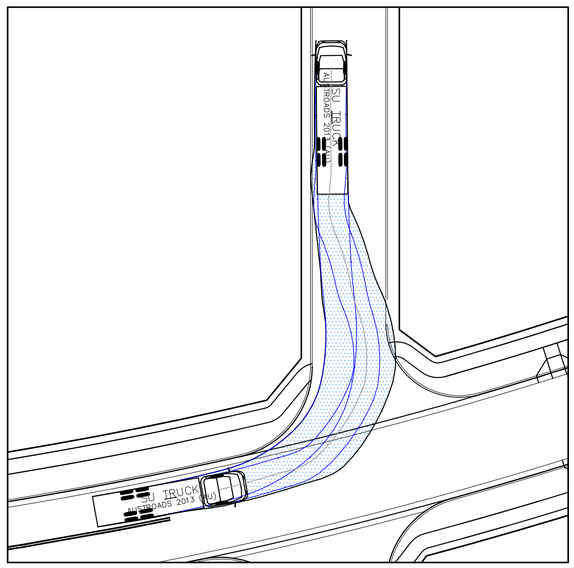
8.8 SERVICE VEHICLE - RIGHT IN AT 5 km/h

SCALE 1 : 250



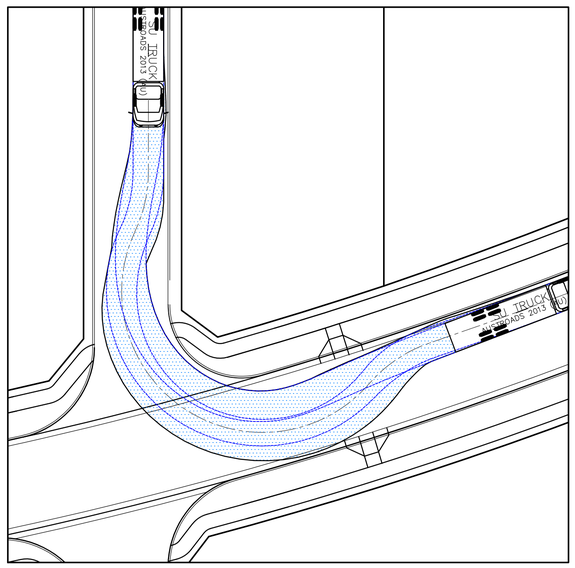
8.8 SERVICE VEHICLE - RIGHT OUT AT 5 km/h

SCALE 1 : 250



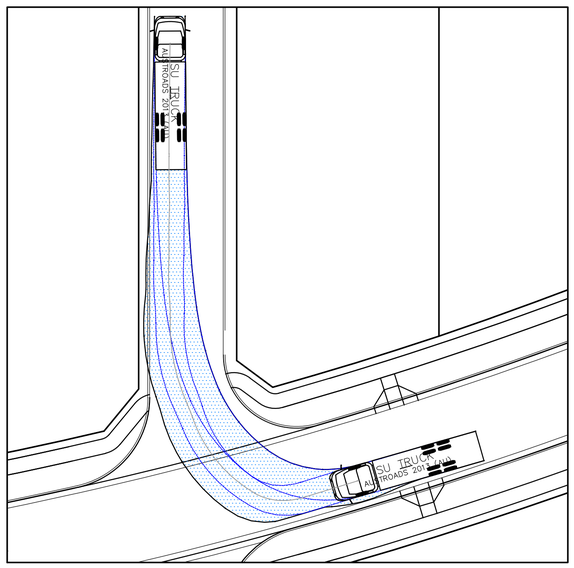
12.5 SU TRUCK - LEFT IN AT 5 km/h

SCALE 1 : 250



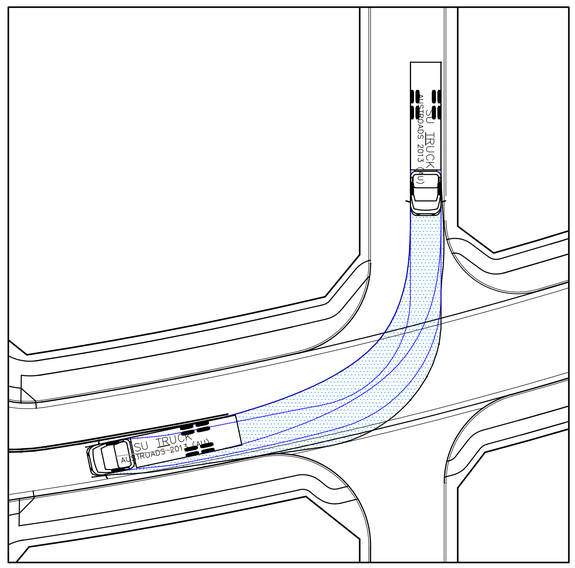
12.5 SU TRUCK - LEFT OUT AT 5 km/h

SCALE 1 : 250



12.5 SU TRUCK - RIGHT IN AT 5 km/h

SCALE 1 : 250

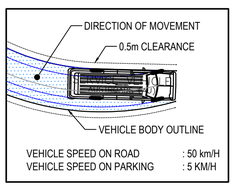


12.5 SU TRUCK - RIGHT OUT AT 5 km/h

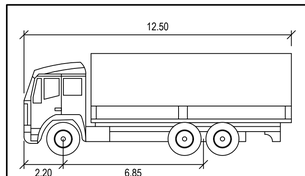
SCALE 1 : 250

NOTE

REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.

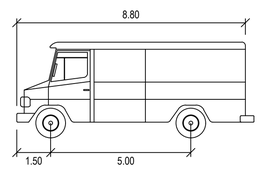


VEHICLE SPEED ON ROAD : 50 km/H
VEHICLE SPEED ON PARKING : 5 KM/H



SU TRUCK

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



SERVICE VEHICLE

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m

1 : 250

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-415-10006310-nsd-TurningPathsSheet4.dwg

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 4

ARCADIS
Arcadis Australia Pacific Pty Limited
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SYDNEY NSW 2000
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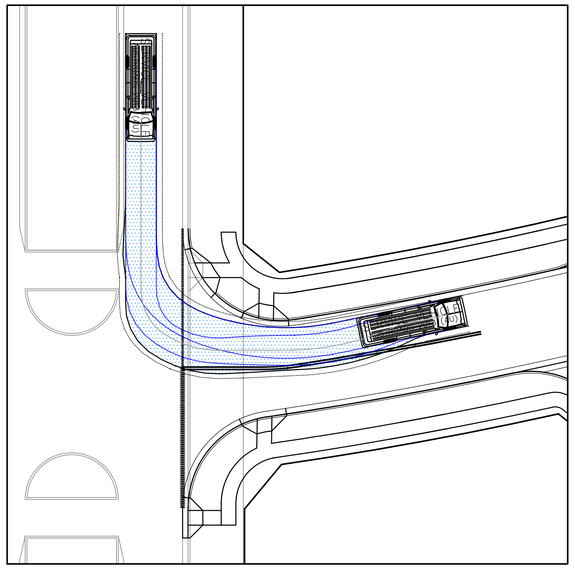
Fax No: +61 2 8907 9001
arcadis.com

Drawing No.	Project No.	Issue
C-A-415	10006310	01

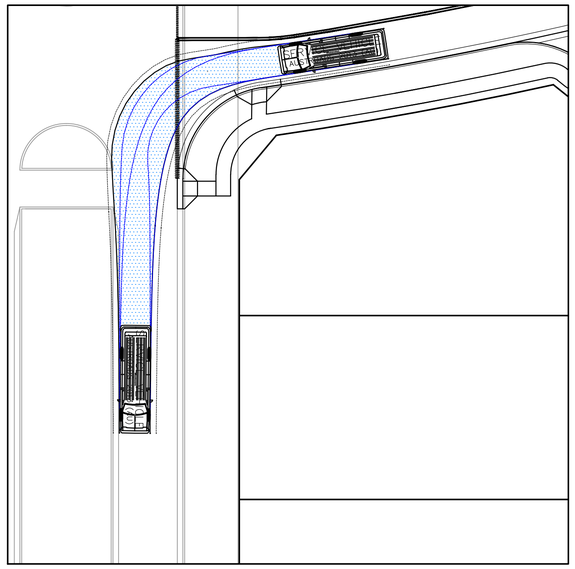
100mm on Original

Date Plotted: 13 Nov 2017 - 03:41PM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-415-10006310-nsd-TurningPathsSheet4.dwg



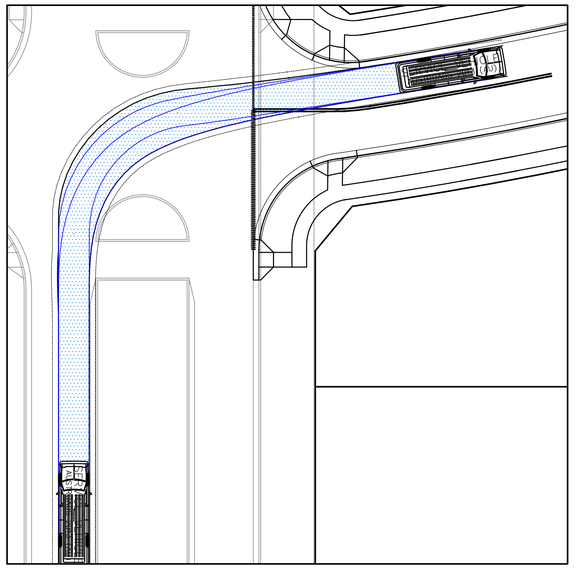
8.8 SERVICE VEHICLE - LEFT IN AT 5 km/h

SCALE 1 : 250



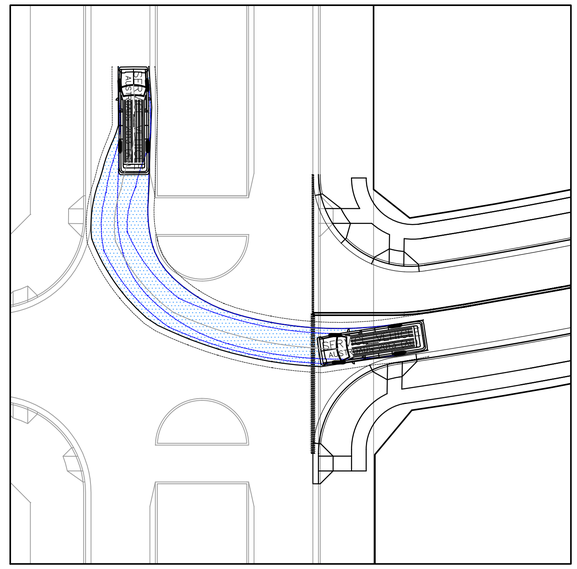
8.8 SERVICE VEHICLE - LEFT OUT AT 5 km/h

SCALE 1 : 250



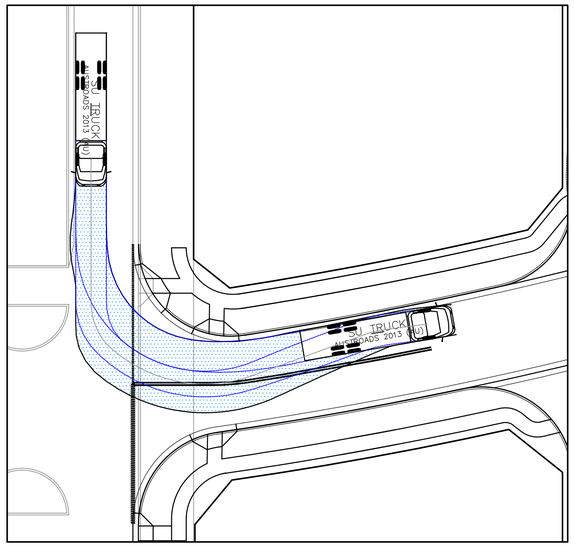
8.8 SERVICE VEHICLE - RIGHT IN AT 5 km/h

SCALE 1 : 250



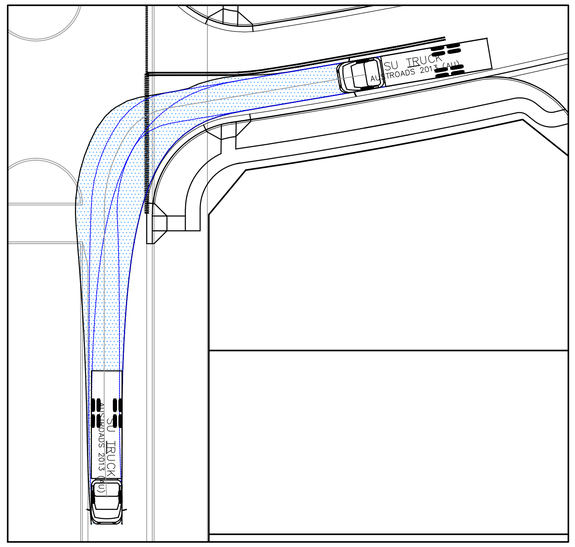
8.8 SERVICE VEHICLE - RIGHT OUT AT 5 km/h

SCALE 1 : 250



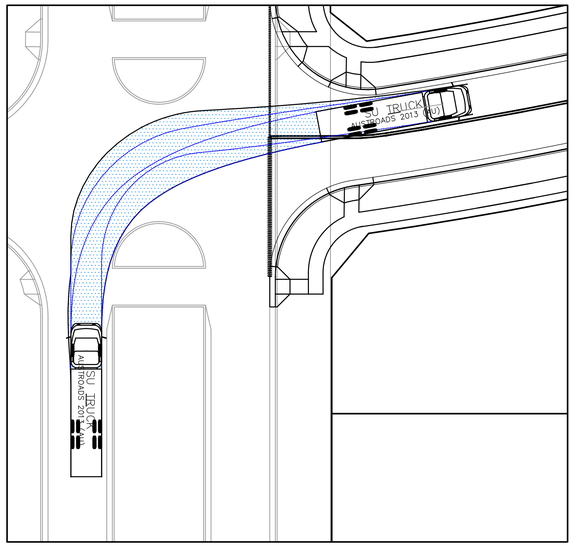
12.5 SU TRUCK - LEFT IN AT 5 km/h

SCALE 1 : 250



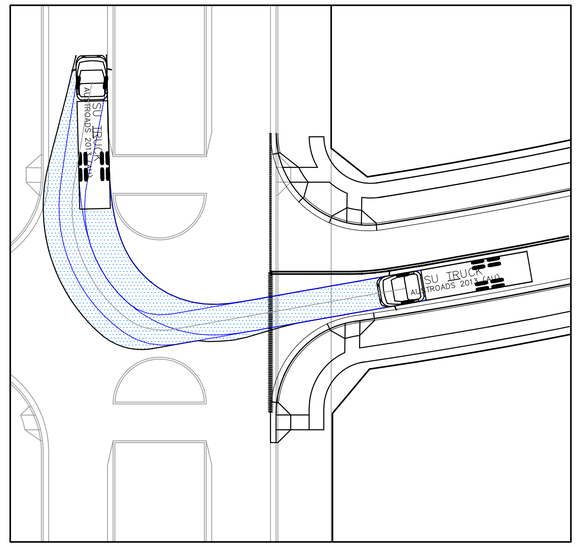
12.5 SU TRUCK - LEFT OUT AT 5 km/h

SCALE 1 : 250



12.5 SU TRUCK - RIGHT IN AT 5 km/h

SCALE 1 : 250

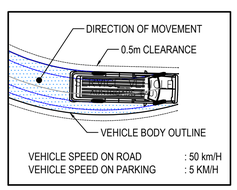


12.5 SU TRUCK - RIGHT OUT AT 5 km/h

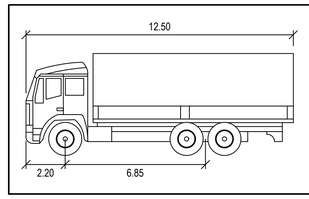
SCALE 1 : 250

NOTE

REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.

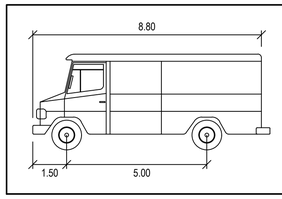


VEHICLE SPEED ON ROAD : 50 km/H
VEHICLE SPEED ON PARKING : 5 KM/H



SU TRUCK

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



SERVICE VEHICLE

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m

1 : 250

100mm on Original

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-416-10006310-nsd-TurningPathsSheet5.dwg

Project: SHELL COVE PRECINCT A

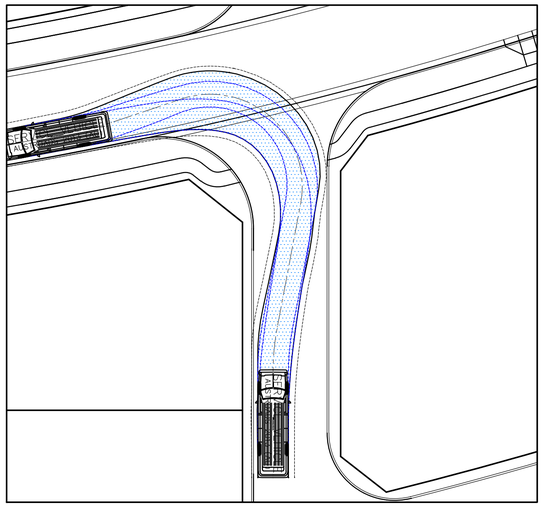
Title: TURNING PATHS SHEET 5

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 16, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289

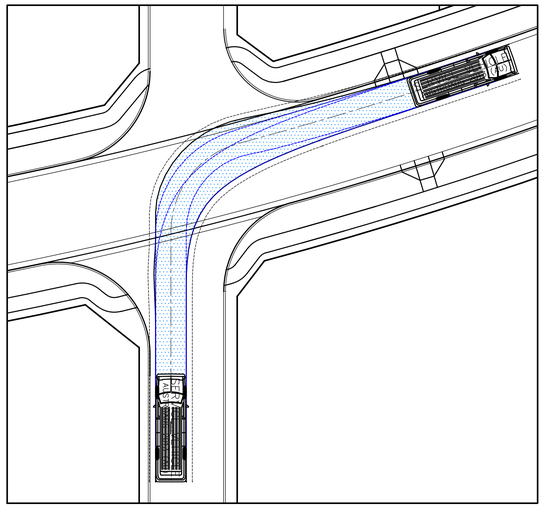
Tel No: +61 2 8907 9000
Fax No: +61 2 8907 9001
arcadis.com

Drawing No.	Project No.	Issue
C-A-416 —	10006310 —	01

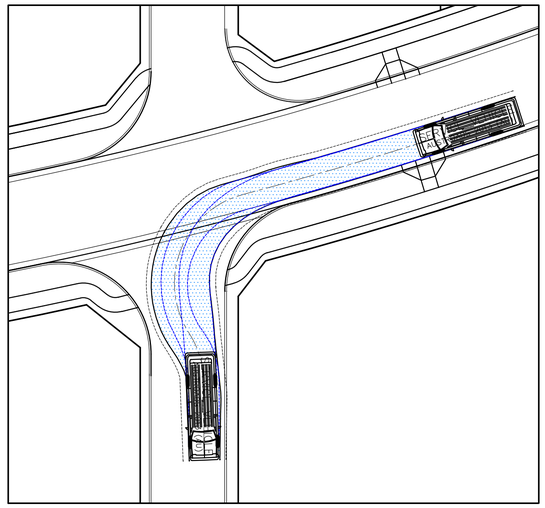
Date Plotted: 13 Nov 2017 - 03:46PM File Name: F:\AA006310\E-CAD\C-Civil\D-FinalID-Precinct A\c-a-416-10006310-nsd-TurningPathsSheet5.dwg



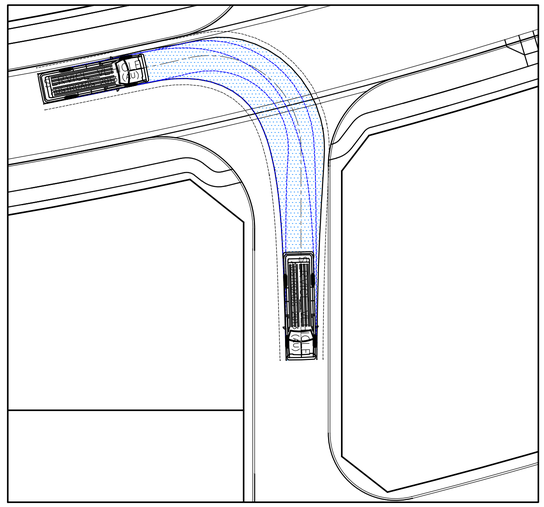
ROAD 30 - ROAD 27
8.8m SERVICE VEHICLE - LEFT OUT AT 5 km/h
SCALE 1 : 250



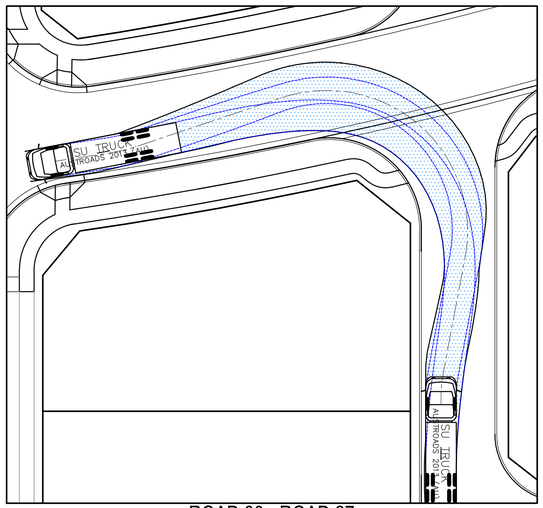
ROAD 30 - ROAD 27
8.8m SERVICE VEHICLE - RIGHT OUT AT 5 km/h
SCALE 1 : 250



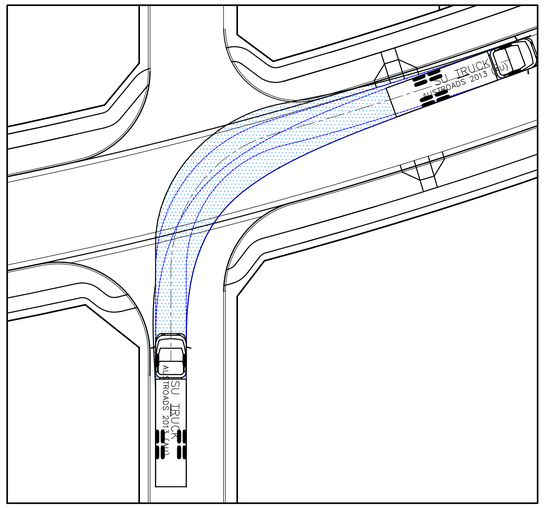
ROAD 30 - ROAD 27
8.8m SERVICE VEHICLE - LEFT IN AT 5 km/h
SCALE 1 : 250



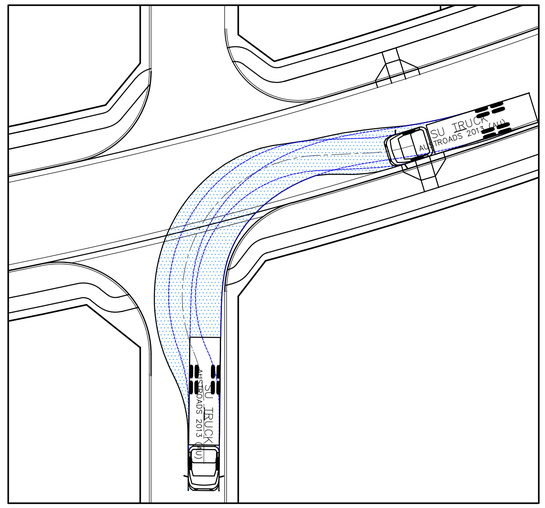
ROAD 30 - ROAD 27
8.8m SERVICE VEHICLE - RIGHT IN AT 5 km/h
SCALE 1 : 250



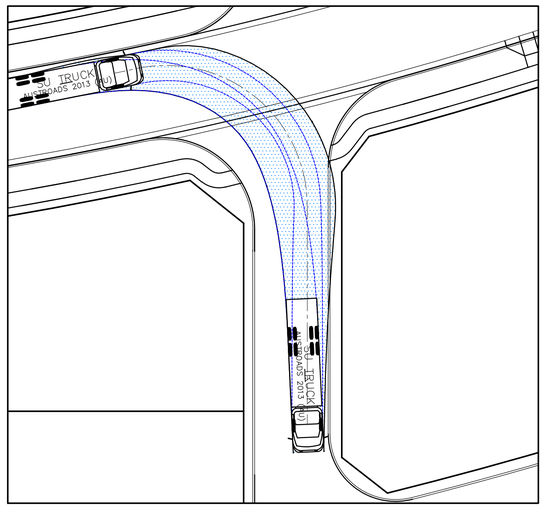
ROAD 30 - ROAD 27
12.5m SERVICE VEHICLE - LEFT OUT AT 5 km/h
SCALE 1 : 250



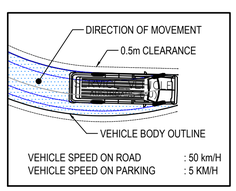
ROAD 30 - ROAD 27
12.5m SERVICE VEHICLE - RIGHT OUT AT 5 km/h
SCALE 1 : 250



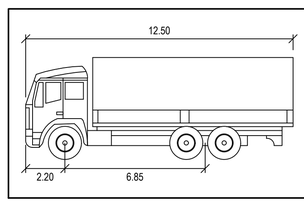
ROAD 30 - ROAD 27
12.5m SERVICE VEHICLE - LEFT IN AT 5 km/h
SCALE 1 : 250



ROAD 30 - ROAD 27
12.5m SERVICE VEHICLE - RIGHT IN AT 5 km/h
SCALE 1 : 250

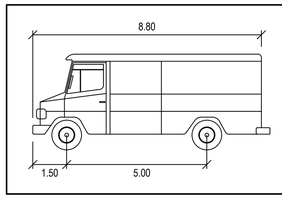


NOTE
REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.



SU TRUCK

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



SERVICE VEHICLE

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

100mm on Original

0 5 10 15 20 25m
1 : 250

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	
Filename:	C-a-417-10006310-nsd-TurningPathsSheet6.dwg		

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 6

ARCADIS
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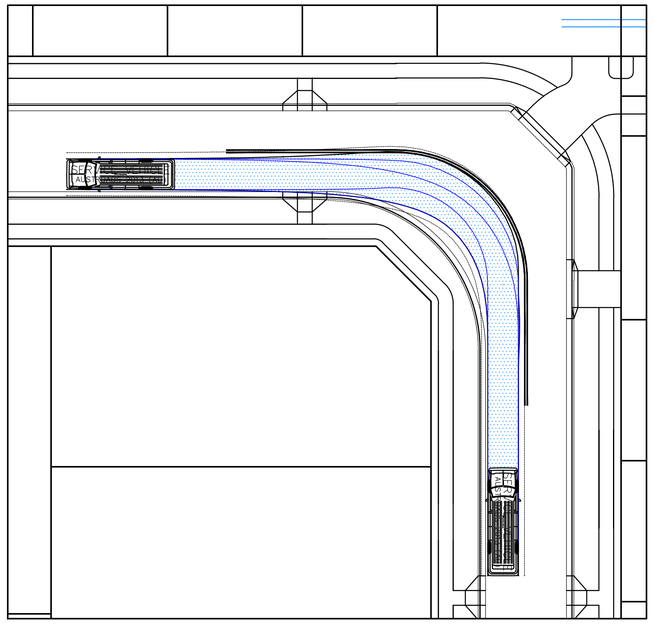
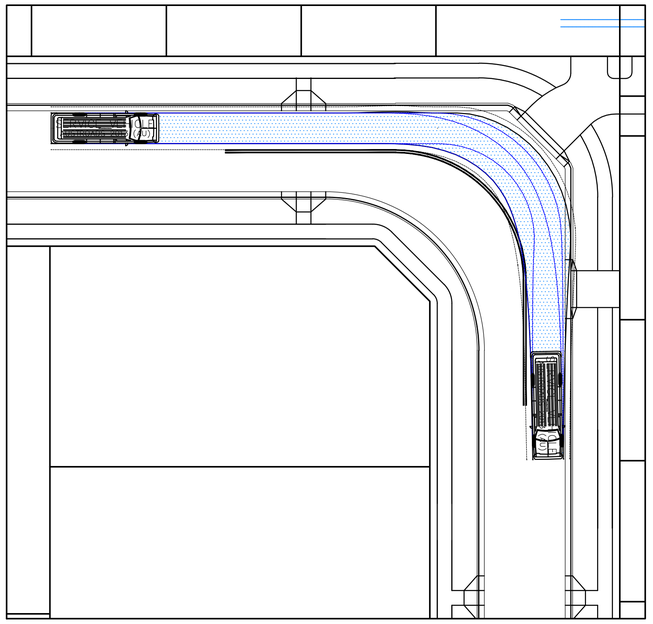
Fax No: +61 2 8907 9001
arcadis.com

Drawing No.	Project No.	Issue
C-A-417 —	10006310 —	01

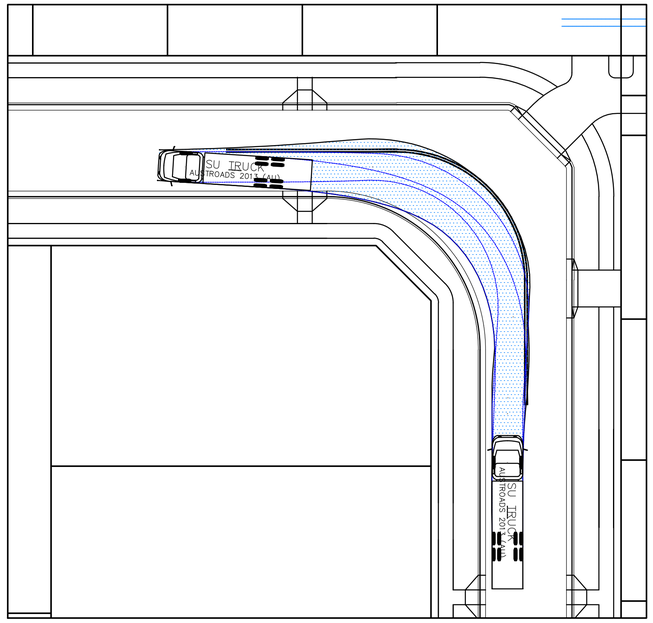
Date Plotted: 14 Nov 2017 - 11:21AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-417-10006310-nsd-TurningPathsSheet6.dwg



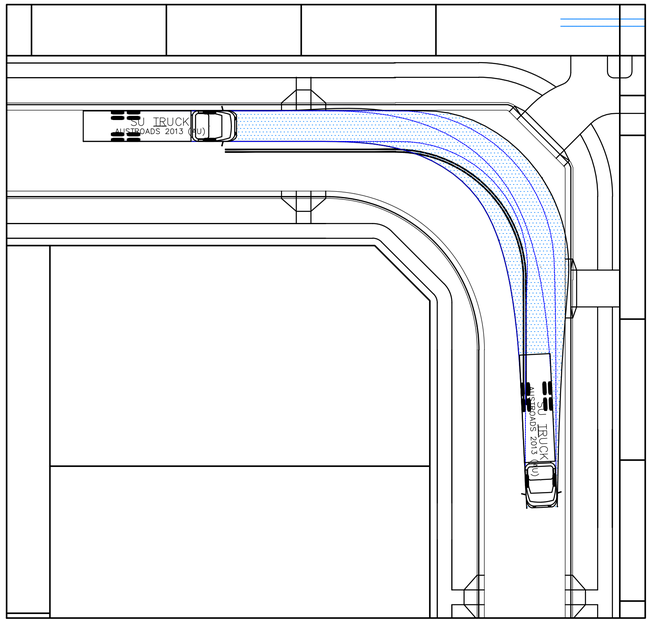
INTERSECTION 7 - ROAD 28
8.8 SERVICE VEHICLE - LEFT TURN AT 5 km/h
SCALE 1 : 250



INTERSECTION 7 - ROAD 28
8.8 SERVICE VEHICLE - RIGHT TURN AT 5 km/h
SCALE 1 : 250



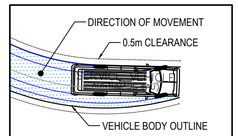
INTERSECTION 7 - ROAD 28
12.5 SU TRUCK - LEFT TURN AT 5 km/h
SCALE 1 : 250



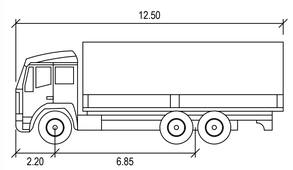
INTERSECTION 7 - ROAD 28
12.5 SU TRUCK - RIGHT TURN AT 5 km/h
SCALE 1 : 250

NOTE

REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.



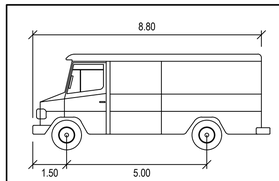
VEHICLE SPEED ON ROAD : 50 km/H
VEHICLE SPEED ON PARKING : 5 KM/H



SU TRUCK

meters

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



SERVICE VEHICLE

meters

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m

1 : 250

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-418-10006310-nsd-TurningPathsSheet7.dwg

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 7

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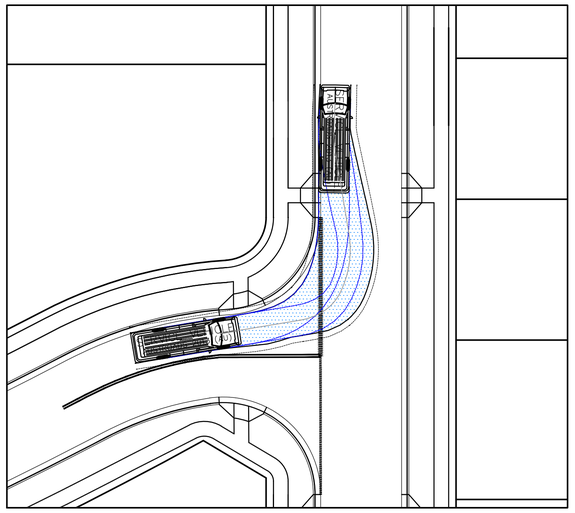
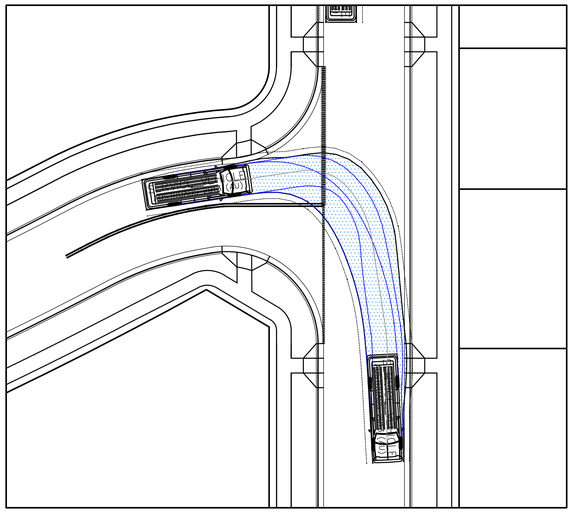
Drawing No.	Project No.	Issue
C-A-418	10006310	01

100mm on Original

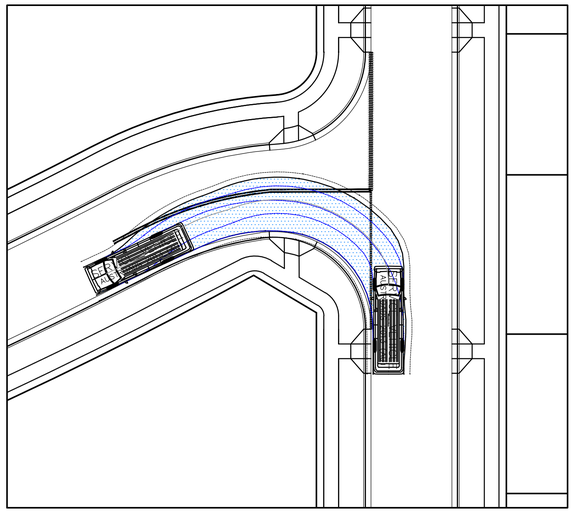
Date Plotted: 13 Nov 2017 - 04:14PM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-418-10006310-nsd-TurningPathsSheet7.dwg



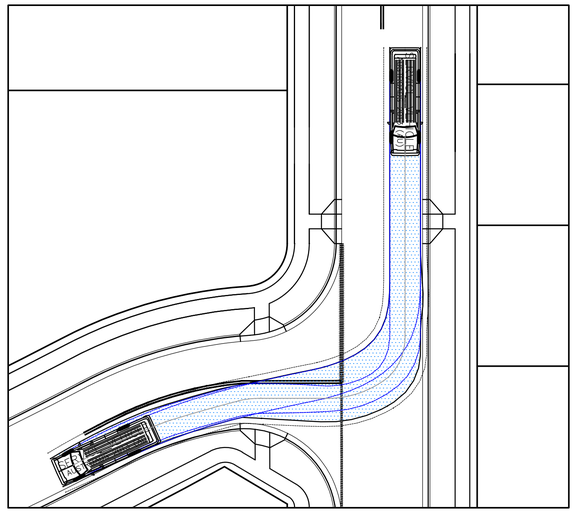
INTERSECTION 8 - ROAD 27 - ROAD 28
8.8 SERVICE VEHICLE - LEFT OUT AT 5 km/h
SCALE 1 : 250



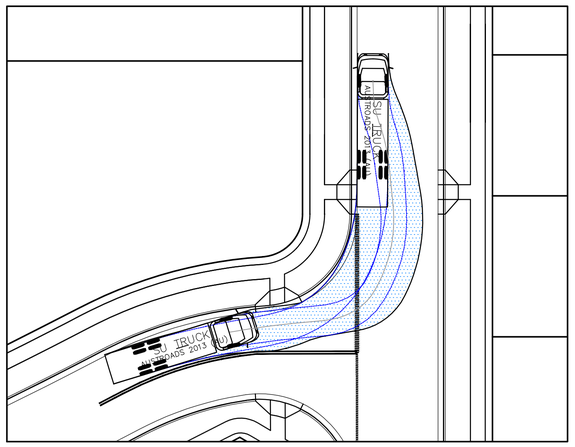
INTERSECTION 8 - ROAD 27 - ROAD 28
8.8 SERVICE VEHICLE - RIGHT OUT AT 5 km/h
SCALE 1 : 250



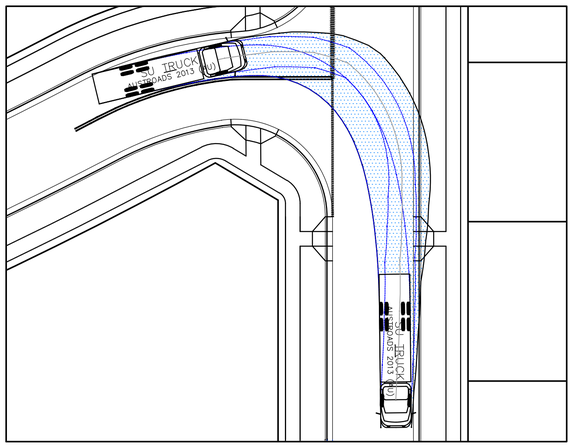
INTERSECTION 8 - ROAD 27 - ROAD 28
8.8 SERVICE VEHICLE - LEFT IN AT 5 km/h
SCALE 1 : 250



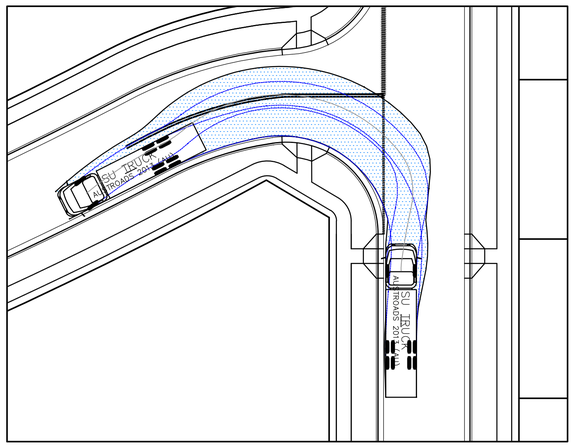
INTERSECTION 8 - ROAD 27 - ROAD 28
8.8 SERVICE VEHICLE - RIGHT IN AT 5 km/h
SCALE 1 : 250



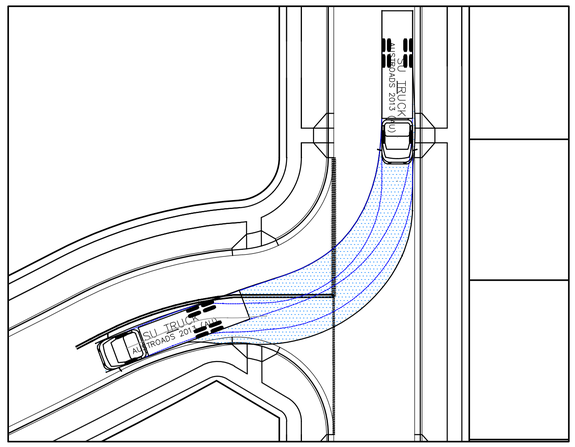
INTERSECTION 8 - ROAD 27 - ROAD 28
12.5 SU TRUCK - LEFT OUT AT 5 km/h
SCALE 1 : 250



INTERSECTION 8 - ROAD 27 - ROAD 28
12.5 SU TRUCK - RIGHT OUT AT 5 km/h
SCALE 1 : 250



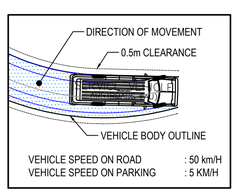
INTERSECTION 8 - ROAD 27 - ROAD 28
12.5 SU TRUCK - LEFT IN AT 5 km/h
SCALE 1 : 250

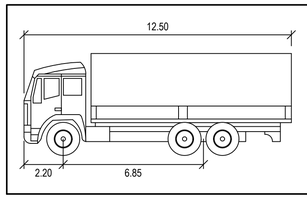


INTERSECTION 8 - ROAD 27 - ROAD 28
12.5 SU TRUCK - RIGHT IN AT 5 km/h
SCALE 1 : 250

NOTE

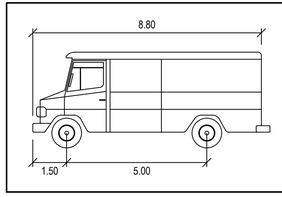
REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.





SU TRUCK

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



SERVICE VEHICLE

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m
1 : 250

100mm on Original

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn	M.FORTU
Original Size	A1	Designed	G.EVERETT
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-419-10006310-nsd-TurningPathsSheet8.dwg

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 8

ARCADIS
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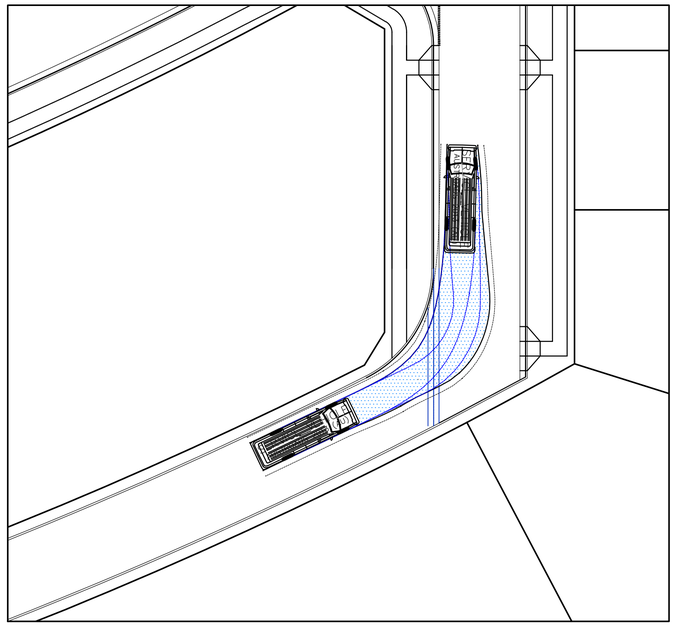
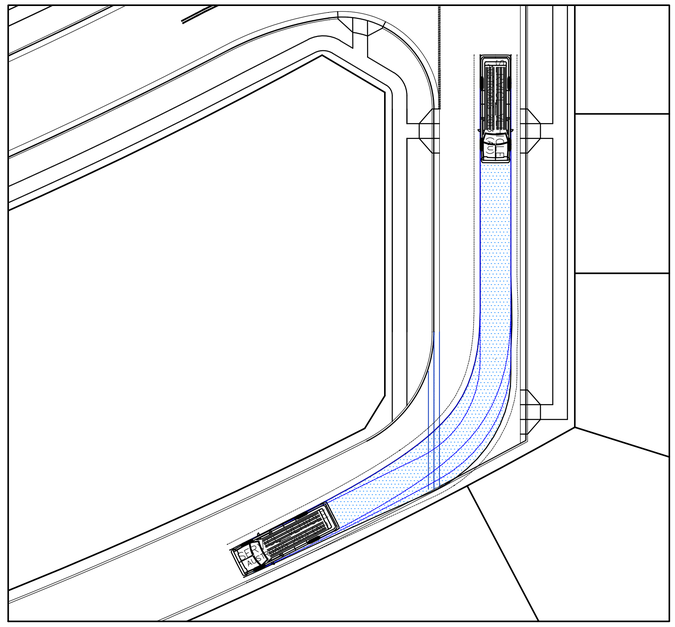
Fax No: +61 2 8907 9001
arcadis.com

Drawing No.	Project No.	Issue
C-A-419	10006310	01

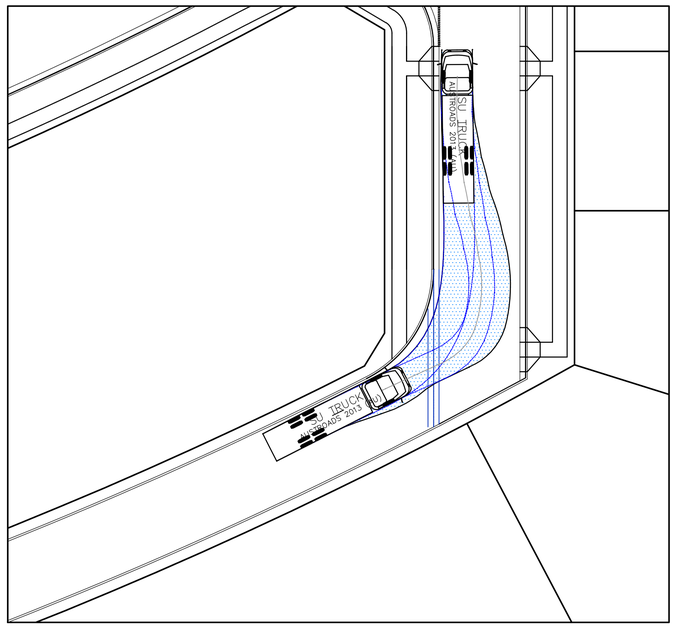
Date Plotted: 14 Nov 2017 - 07:48AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-419-10006310-nsd-TurningPathsSheet8.dwg



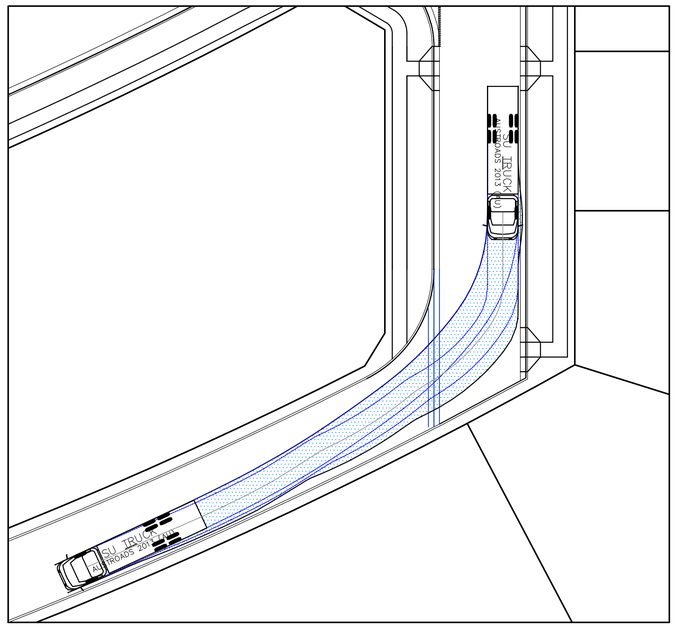
INTERSECTION 9 - ROAD 28 - ROAD 30
8.8 SERVICE VEHICLE - LEFT TURN AT 5 km/h
SCALE 1 : 250



INTERSECTION 9 - ROAD 28 - ROAD 30
8.8 SERVICE VEHICLE - RIGHT TURN AT 5 km/h
SCALE 1 : 250

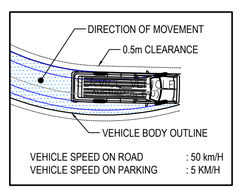


INTERSECTION 9 - ROAD 28 - ROAD 30
12.5 SU TRUCK - LEFT TURN AT 5 km/h
SCALE 1 : 250

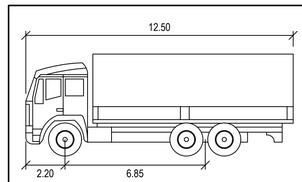


INTERSECTION 9 - ROAD 28 - ROAD 30
12.5 SU TRUCK - RIGHT TURN AT 5 km/h
SCALE 1 : 250

NOTE
REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.



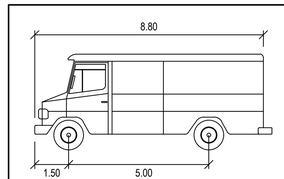
VEHICLE SPEED ON ROAD : 50 km/H
VEHICLE SPEED ON PARKING : 5 KM/H



SU TRUCK

meters

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



SERVICE VEHICLE

meters

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m
1 : 250

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	
Filename:	C-a-420-10006310-nsd-TurningPathsSheet9.dwg		

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 9

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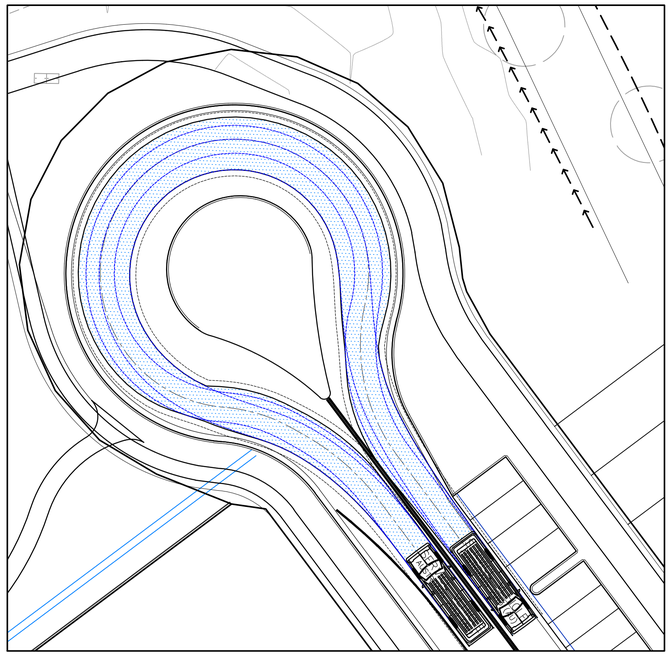
Fax No: +61 2 8907 9001
arcadis.com

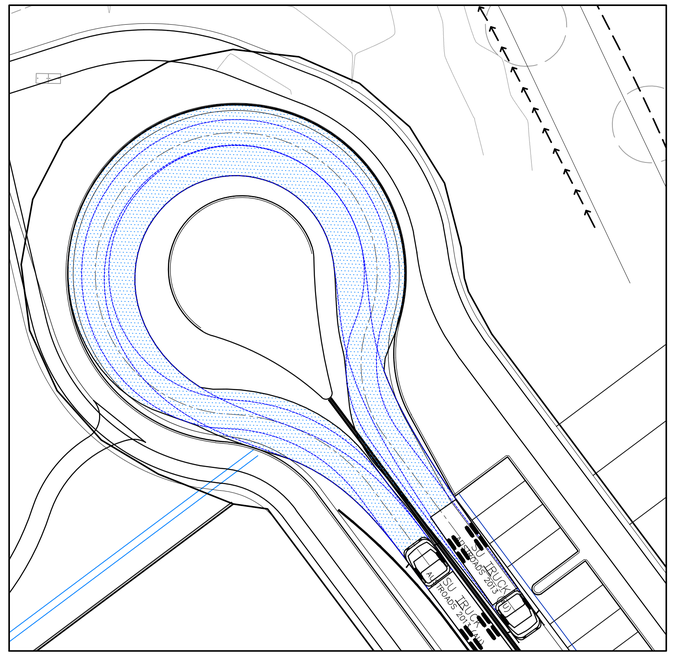
Drawing No.	Project No.	Issue
C-A-420	10006310	01

100mm on Original

Date Plotted: 14 Nov 2017 - 08:46AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-420-10006310-nsd-TurningPathsSheet9.dwg

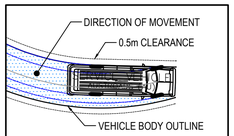


INTERSECTION 10 - BASS POINT TOURIST ROAD
8.8 SERVICE VEHICLE - ROUNDABOUT AT 5 km/h
SCALE 1 : 250

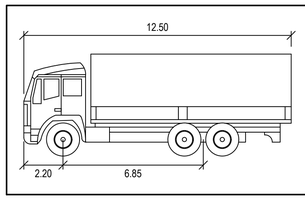


INTERSECTION 10 - BASS POINT TOURIST ROAD
12.5 SU TRUCK - ROUNDABOUT AT 5 km/h
SCALE 1 : 250

NOTE
REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.

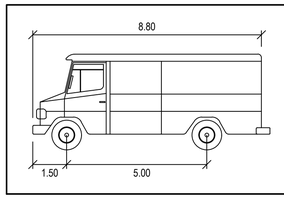


VEHICLE SPEED ON ROAD : 50 km/H
VEHICLE SPEED ON PARKING : 5 KM/H



SU TRUCK

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



SERVICE VEHICLE

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m
1 : 250

100mm on Original

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-421-10006310-nsd-TurningPathsSheet10.dwg

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 10

ARCADIS
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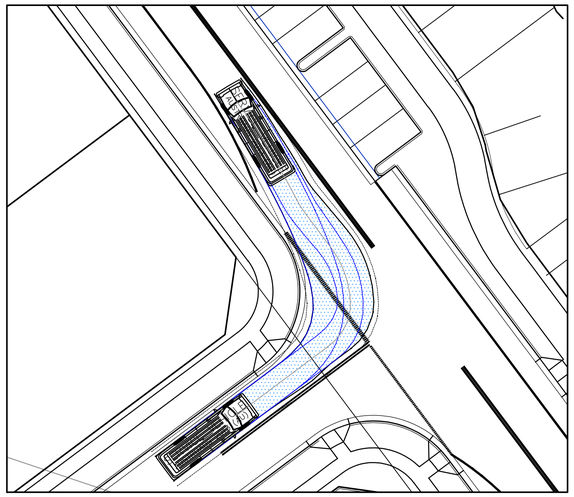
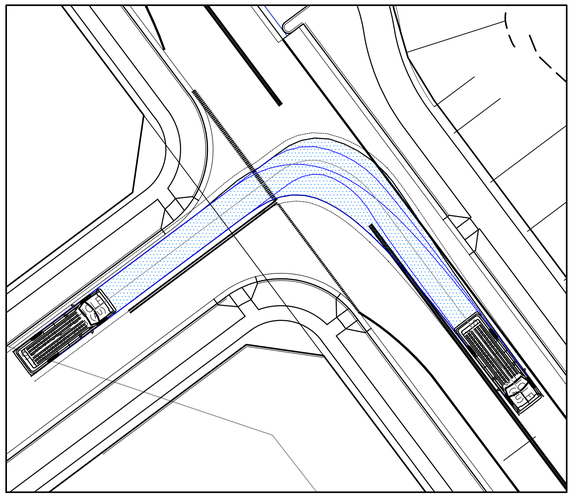
Drawing No.	Project No.	Issue
C-A-421	10006310	01

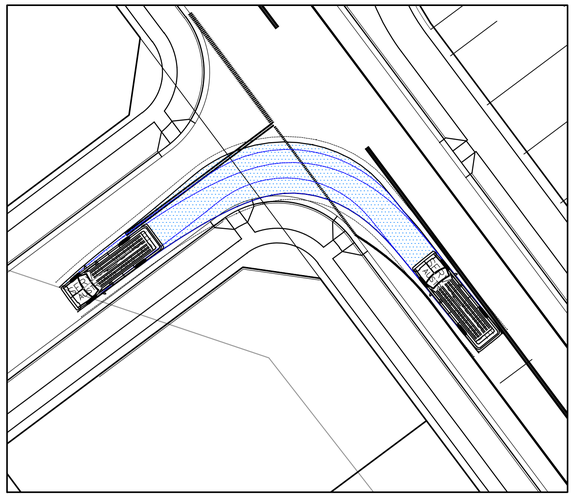
Date Plotted: 14 Nov 2017 - 09:06AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-421-10006310-nsd-TurningPathsSheet10.dwg



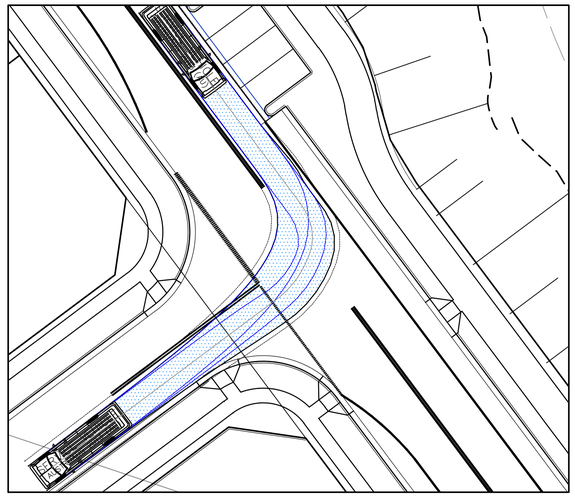
INTERSECTION 12 - ROAD 29 - BASS POINT TOURIST ROAD
8.8 SERVICE VEHICLE - LEFT OUT AT 5 km/h
SCALE 1 : 250



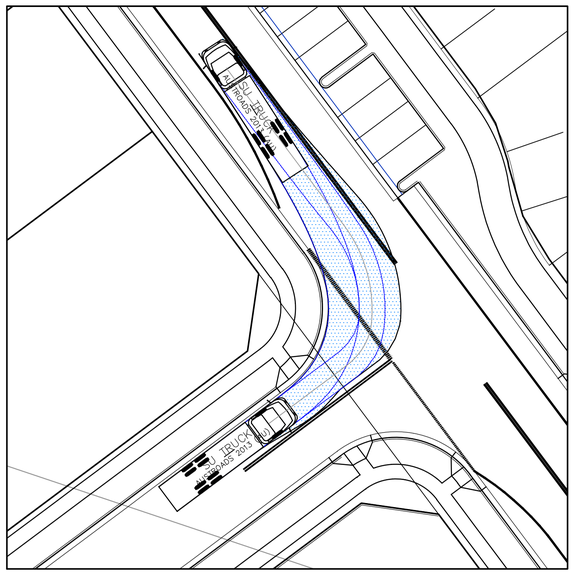
INTERSECTION 12 - ROAD 29 - BASS POINT TOURIST ROAD
8.8 SERVICE VEHICLE - RIGHT OUT AT 5 km/h
SCALE 1 : 250



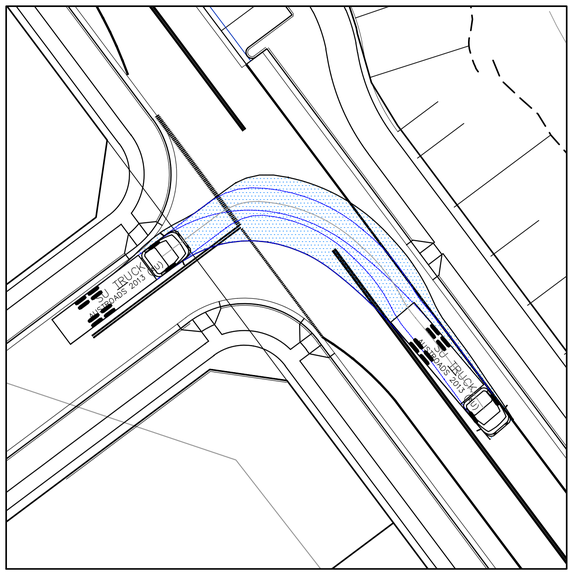
INTERSECTION 12 - ROAD 29 - BASS POINT TOURIST ROAD
8.8 SERVICE VEHICLE - LEFT IN AT 5 km/h
SCALE 1 : 250



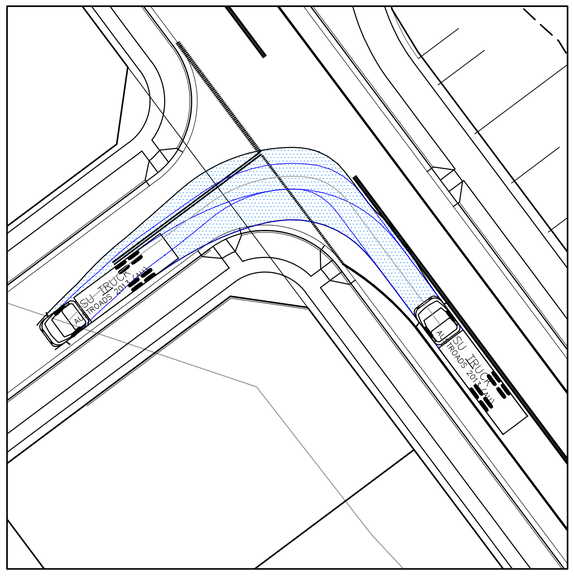
INTERSECTION 12 - ROAD 29 - BASS POINT TOURIST ROAD
8.8 SERVICE VEHICLE - RIGHT IN AT 5 km/h
SCALE 1 : 250



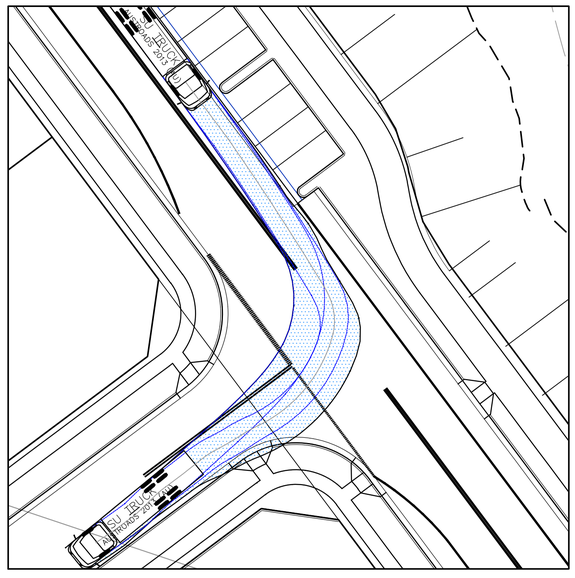
INTERSECTION 12 - ROAD 29 - BASS POINT TOURIST ROAD
12.5 SU TRUCK - LEFT OUT AT 5 km/h
SCALE 1 : 250



INTERSECTION 12 - ROAD 29 - BASS POINT TOURIST ROAD
12.5 SU TRUCK - RIGHT OUT AT 5 km/h
SCALE 1 : 250

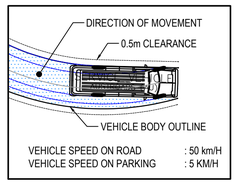


INTERSECTION 12 - ROAD 29 - BASS POINT TOURIST ROAD
12.5 SU TRUCK - LEFT IN AT 5 km/h
SCALE 1 : 250

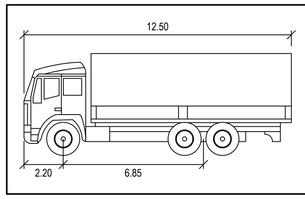


INTERSECTION 12 - ROAD 29 - BASS POINT TOURIST ROAD
12.5 SU TRUCK - RIGHT IN AT 5 km/h
SCALE 1 : 250

NOTE
REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.

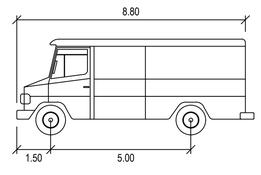


VEHICLE SPEED ON ROAD : 50 km/H
VEHICLE SPEED ON PARKING : 5 KM/H



SU TRUCK

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



SERVICE VEHICLE

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m
1 : 250

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-422-10006310-nsd-TurningPathsSheet11.dwg

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 11

ARCADIS
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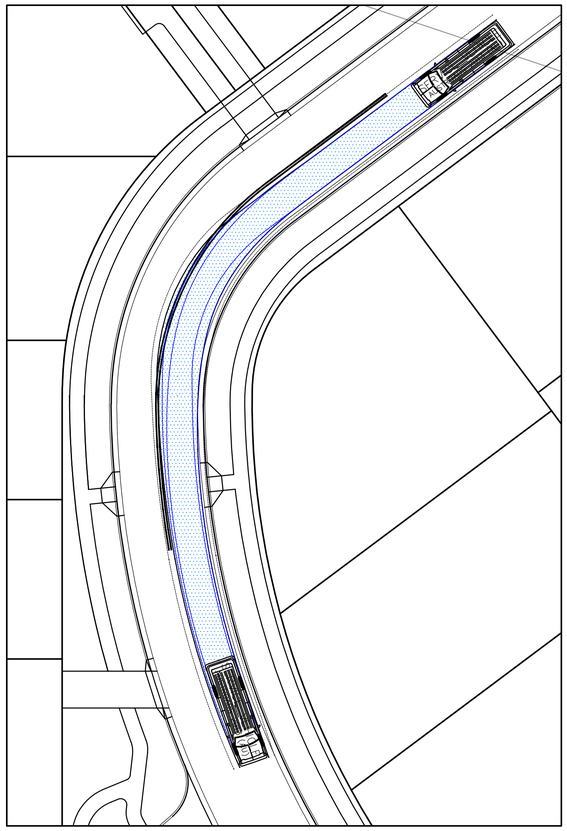
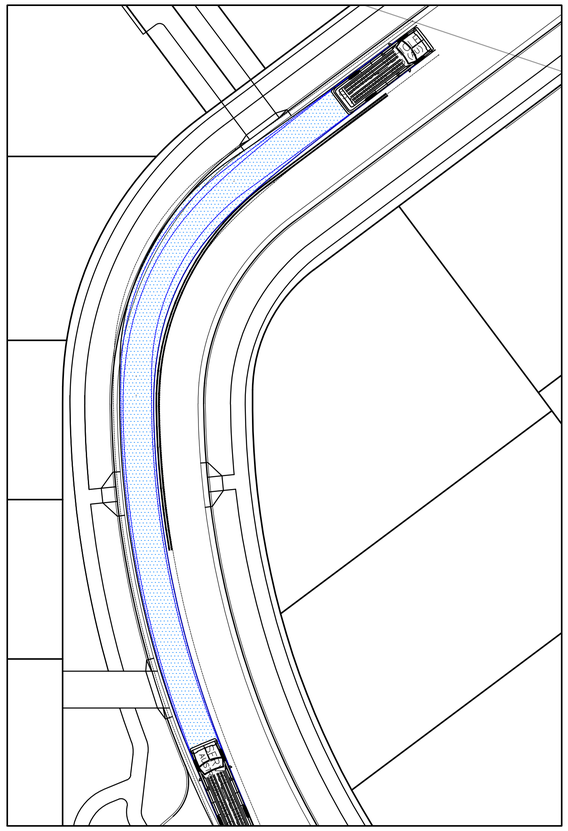
Drawing No.	Project No.	Issue
C-A-422	10006310	01

100mm on Original

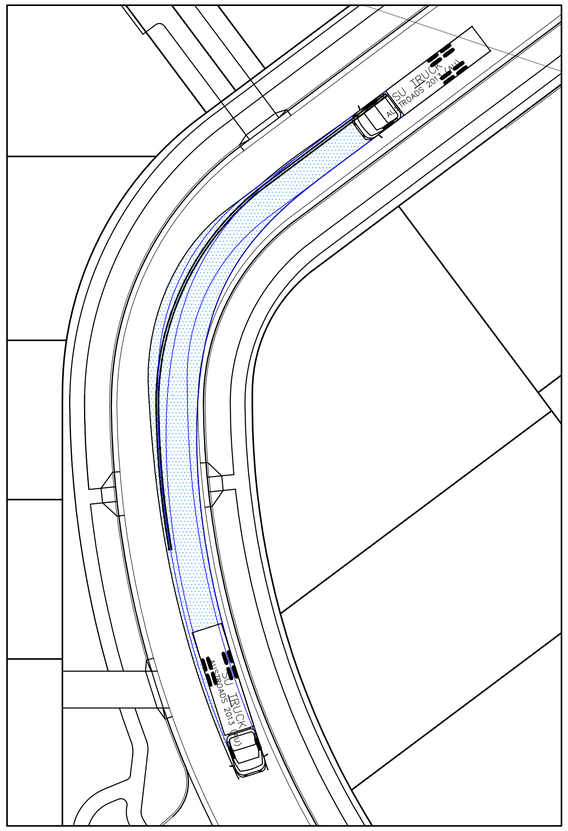
Date Plotted: 14 Nov 2017 - 09:14AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-422-10006310-nsd-TurningPathsSheet11.dwg



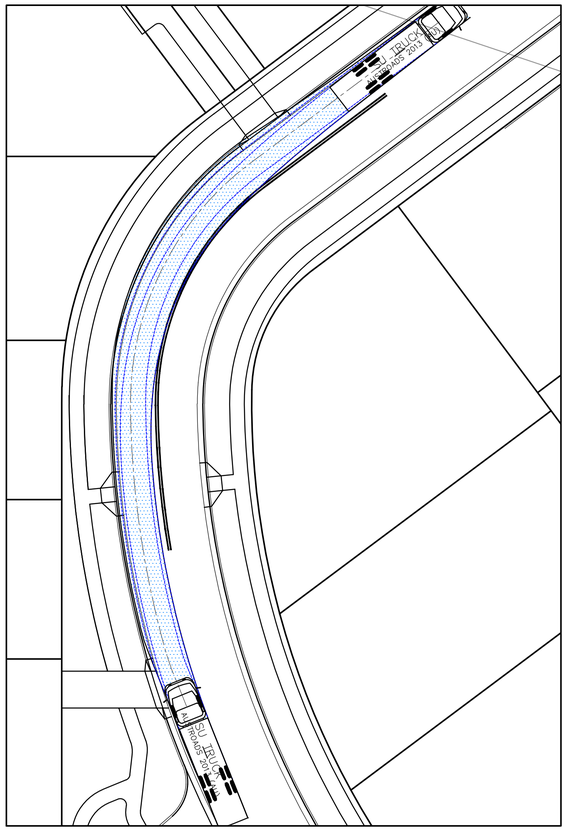
INTERSECTION 13 - ROAD 29
8.8 SERVICE VEHICLE - LEFT TURN AT 5 km/h
SCALE 1 : 250



INTERSECTION 13 - ROAD 29
8.8 SERVICE VEHICLE - RIGHT TURN AT 5 km/h
SCALE 1 : 250

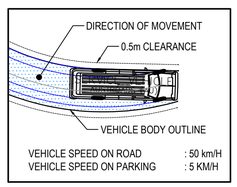


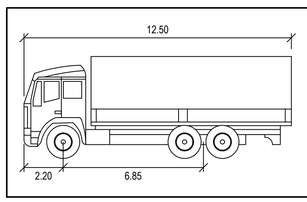
INTERSECTION 13 - ROAD 29
12.5 SU TRUCK - LEFT TURN AT 5 km/h
SCALE 1 : 250



INTERSECTION 13 - ROAD 29
12.5 SU TRUCK - RIGHT TURN AT 5 km/h
SCALE 1 : 250

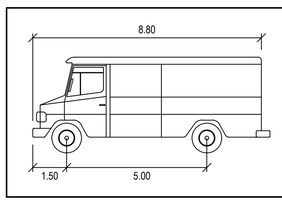
NOTE
REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.





SU TRUCK

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



SERVICE VEHICLE

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m
1 : 250

100mm on Original

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	
Filename:	C-a-423-10006310-nsd-TurningPathsSheet12.dwg		

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 12

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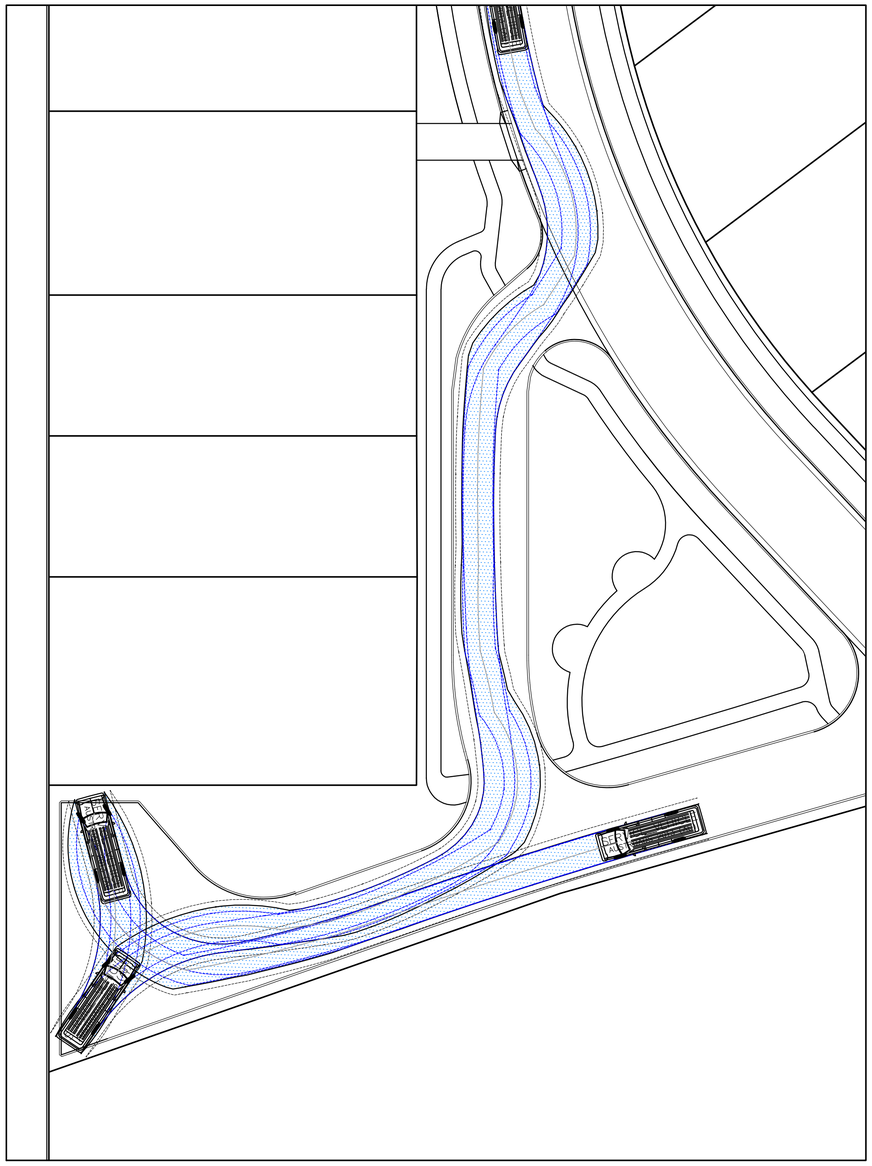
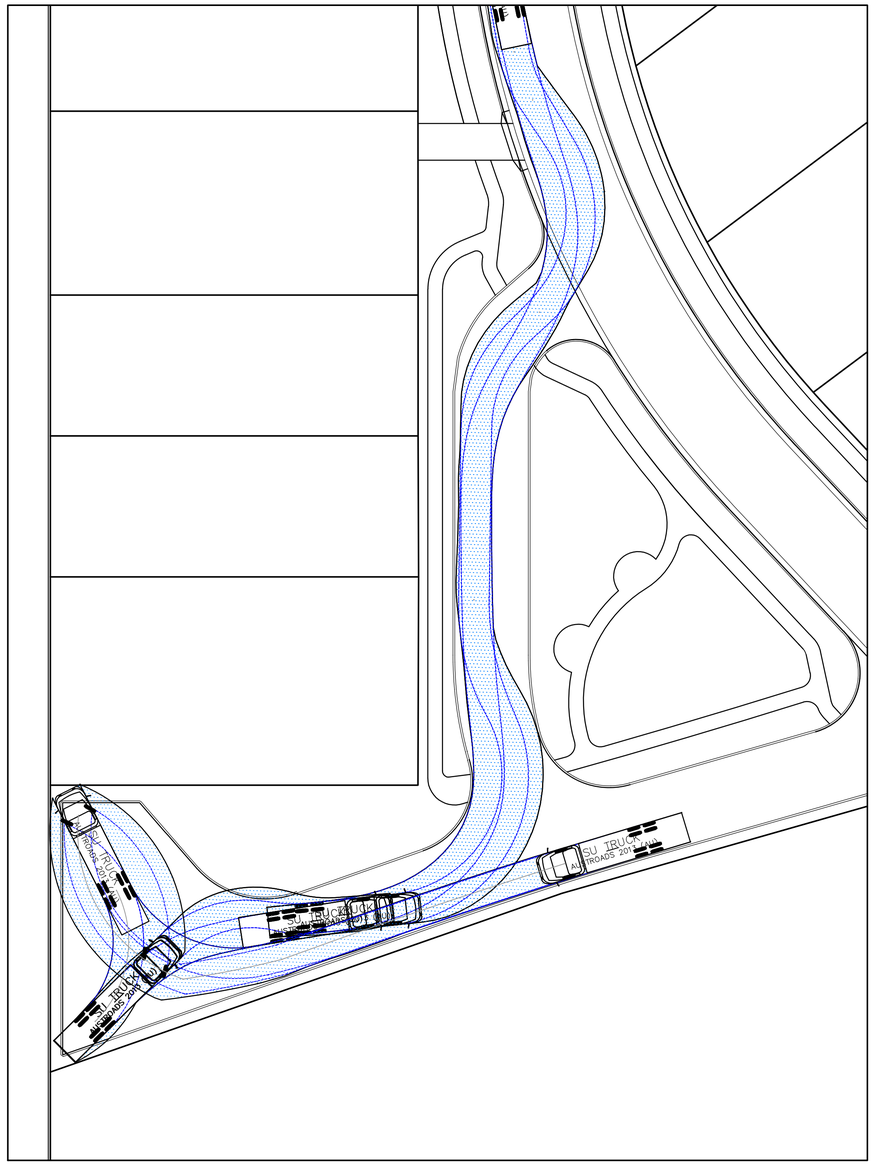
Drawing No.	Project No.	Issue
C-A-423 —	10006310 —	01

Date Plotted: 14 Nov 2017 - 09:57AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-423-10006310-nsd-TurningPathsSheet12.dwg



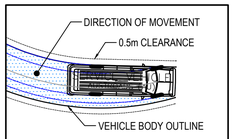
INTERSECTION 14 - ROAD 32 - ROAD 29
12.5 SU TRUCK - LEFT OUT AT 5 km/h
SCALE 1 : 250



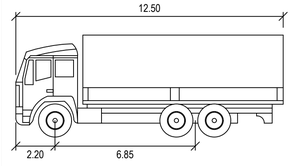
INTERSECTION 14 - ROAD 32 - ROAD 29
8.8 SERVICE VEHICLE - LEFT OUT AT 5 km/h
SCALE 1 : 250

NOTE

REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.

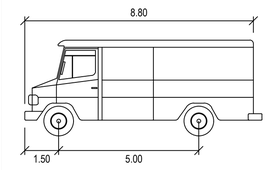


VEHICLE SPEED ON ROAD : 50 km/H
VEHICLE SPEED ON PARKING : 5 KM/H



SU TRUCK

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



SERVICE VEHICLE

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m

1 : 250

100mm on Original

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 250	Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-424-10006310-nsd-TurningPathsSheet13.dwg

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 13

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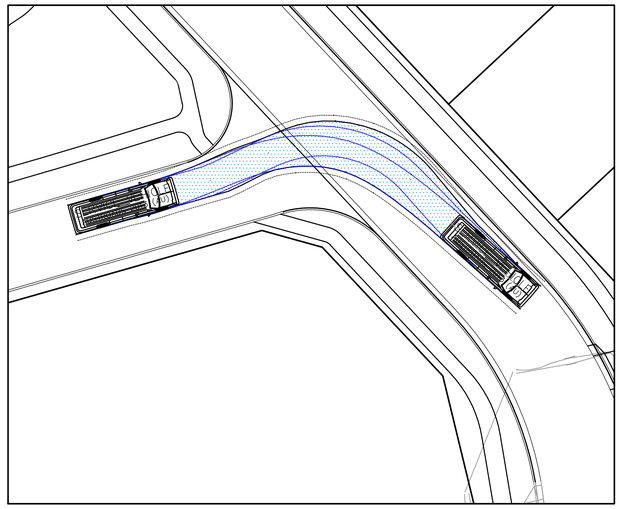
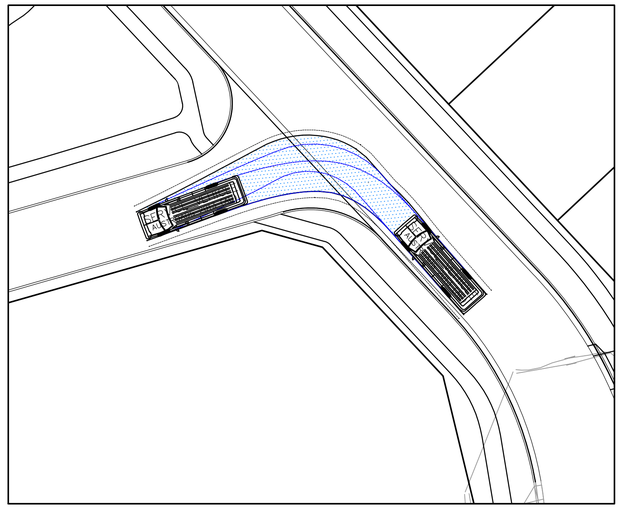
Drawing No.	Project No.	Issue
C-A-424	10006310	01

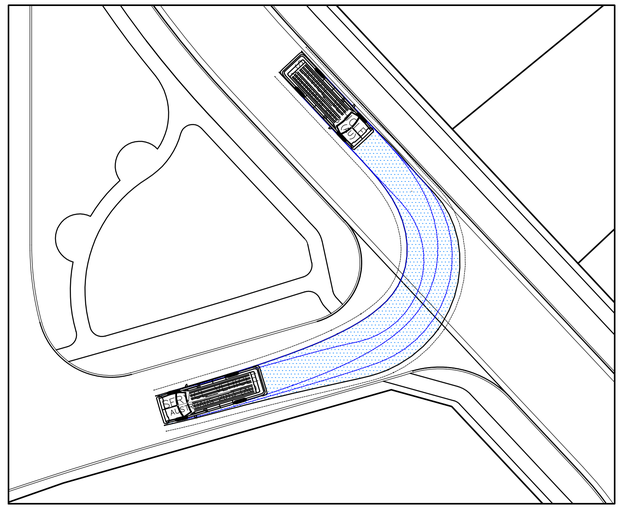
Date Plotted: 14 Nov 2017 - 10:21AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-424-10006310-nsd-TurningPathsSheet13.dwg



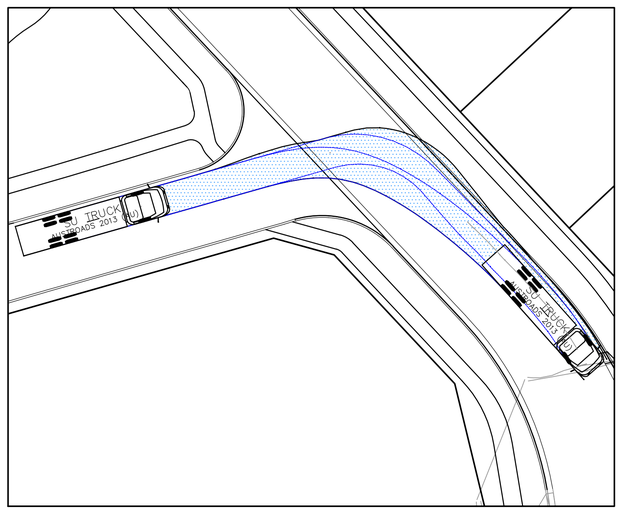
INTERSECTION 15 - ROAD 29 - ROAD 32
8.8 SERVICE VEHICLE - RIGHT OUT AT 5 KM/H
SCALE 1 : 250



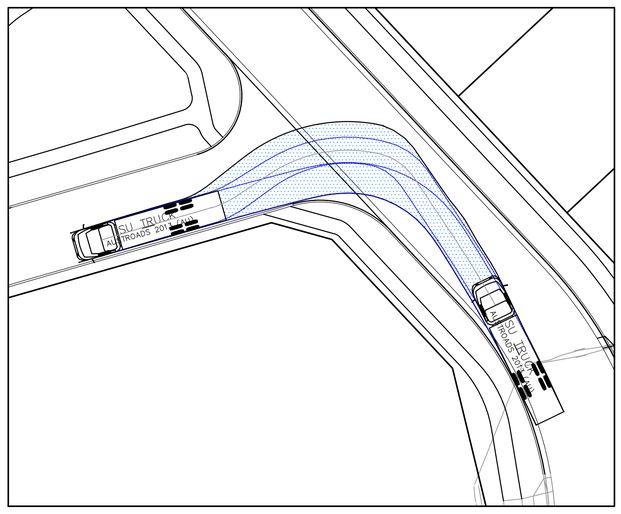
INTERSECTION 15 - ROAD 29 - ROAD 32
8.8 SERVICE VEHICLE - LEFT IN AT 5 KM/H
SCALE 1 : 250



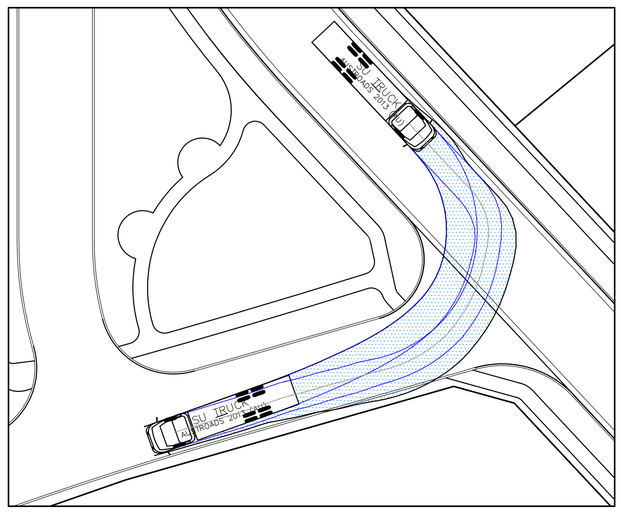
INTERSECTION 15 - ROAD 29 - ROAD 32
8.8 SERVICE VEHICLE - RIGHT IN AT 5 KM/H
SCALE 1 : 250



INTERSECTION 15 - ROAD 29 - ROAD 32
12.5 SU TRUCK - RIGHT OUT AT 5 KM/H
SCALE 1 : 250

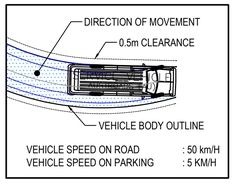


INTERSECTION 15 - ROAD 29 - ROAD 32
12.5 SU TRUCK - LEFT IN AT 5 KM/H
SCALE 1 : 250

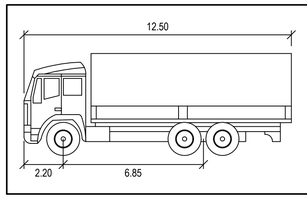


INTERSECTION 15 - ROAD 29 - ROAD 32
12.5 SU TRUCK - RIGHT IN AT 5 KM/H
SCALE 1 : 250

NOTE
REFER TO DRAWING C-A-411 FOR LAYOUT PLAN.

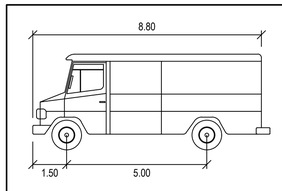


VEHICLE SPEED ON ROAD : 50 km/H
VEHICLE SPEED ON PARKING : 5 KM/H



SU TRUCK

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



SERVICE VEHICLE

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

Issue	Description	Date
01	ISSUED FOR CLIENT REVIEW	XX/XX/2017

0 5 10 15 20 25m
1 : 250

Client: FRASERS PROPERTY

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 250	Current Issue Signatures	
		Drawn M.FORTU	
Original Size	A1	Designed G.EVERETT	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Filename: C-a-425-10006310-nsd-TurningPathsSheet14.dwg

Project: SHELL COVE PRECINCT A

Title: TURNING PATHS SHEET 14

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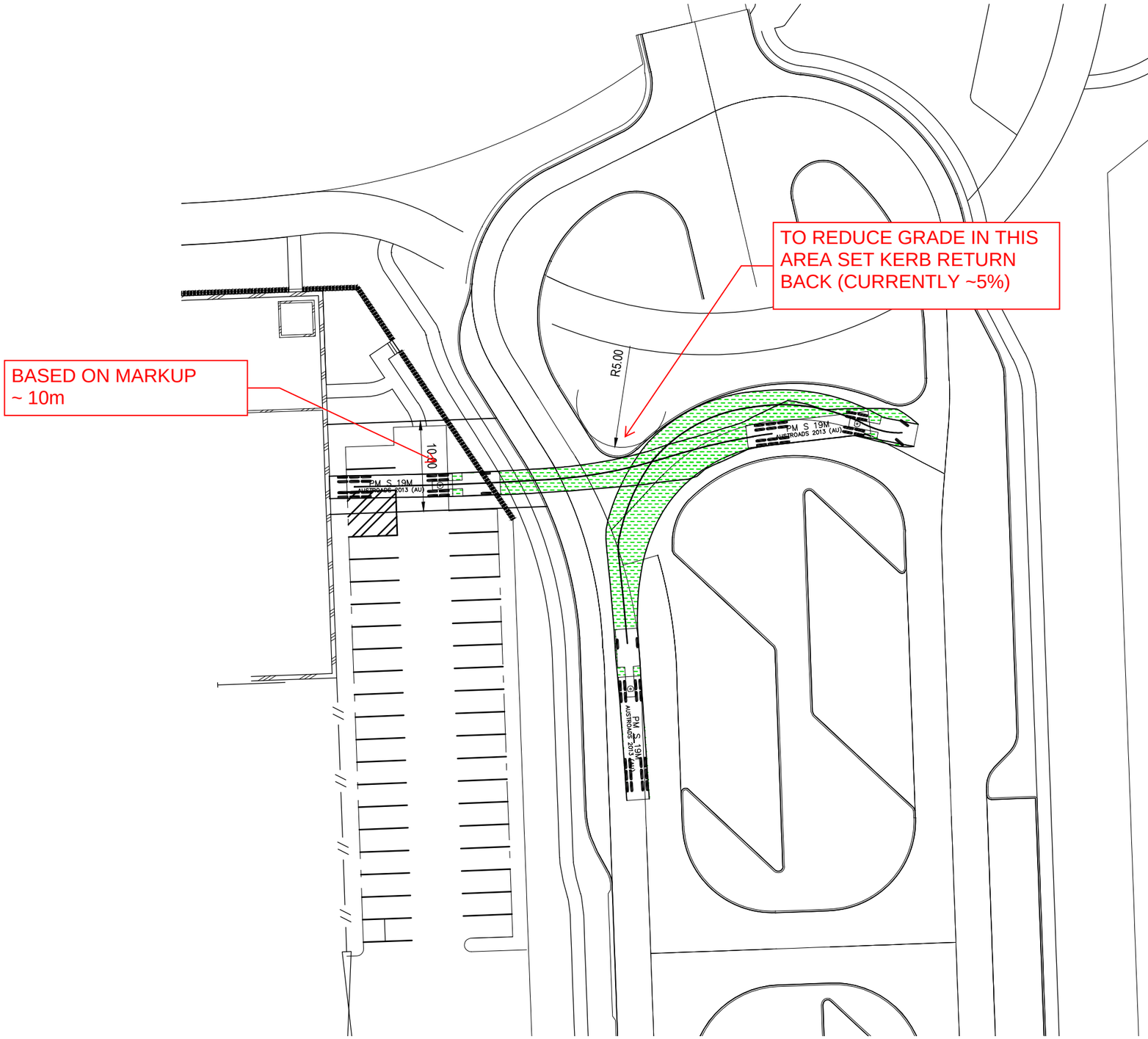
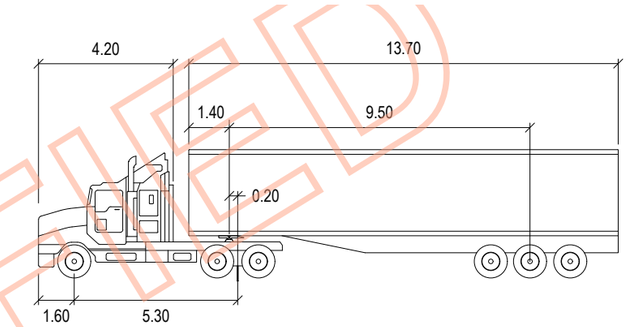
Drawing No.	Project No.	Issue
C-A-425	10006310	01

100mm on Original

Date Plotted: 14 Nov 2017 - 10:25AM File Name: F:\AA006310\E-CAD\C-Civil\D-Final\D-Precinct A\c-a-425-10006310-nsd-TurningPathsSheet14.dwg





PM S 19M

Tractor Width	:	2.50 m	Lock to Lock Time	:	6.0
Trailer Width	:	2.50 m	Steering Angle	:	27.8
Tractor Track	:	2.50 Second	Articulating Angle	:	70.0
Trailer Track	:	2.50 Degree			

APPENDIX F– LOT LAYOUT FOR OUTER HARBOUR DEVELOPMENT

LEGEND

- LANDSCAPING
- GRASS PARKING
- ASPHALT
- CONCRETE
- FOOTPATH / SHARED PATH
- TOE OF REVETMENT
- MODELLED INCOMING WAVE CRESTS
- NAVIGATIONAL CHANNEL
- LOWEST ASTRONOMICAL TIDE (LAT) RL-0.925m

PRECINCT A2
(UNDER REVISION)

PRELIMINARY SUBJECT TO DESIGN PRIOR TO OUTER HARBOUR LAND FACILITY DA SUBMISSION

RESIDENTIAL

STORAGE / AMENITIES

TRIPLE BAYS 10m 10m 10m

WASH DOWN AREA

20.5

4.6

TRIPLE BAYS

DRY BOAT STORAGE FACILITY

DOOR

TRIPLE BAYS 10m 10m 10m

RAMP

WASH DOWN AREA

WORKSHOP

RETAINING WALL

DOOR OR ENTRY

BUNDED FUELLING AREA

PUBLIC PROMENADE

OFFICE OR WORKSHOP

OFFICE

11.0

1 21 5.8 CARPARKING 1 20

1.6 6

30 m 30 m 16 m 16 m

10 m

FENCE AND GATE ARRANGEMENT TO ISOLATE TRAVEL LIFT OPERATIONS

MULTI USE HEAVY DUTY PLATFORM

TRAVEL LIFT

FENCE AND GATE ARRANGEMENT TO ISOLATE TRAVEL LIFT OPERATIONS

FUEL AND PUMP OUT

MULTIPURPOSE PONTOON

PATHWAY AND BOAT RIGGING
AREA TO BE CONFIRMED

BOAT RAMP

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. 40 OUTER HARBOUR FACILITY CAR PARKING SPACES AT 90° (TO BE CONFIRMED).
3. 1 OUTER HARBOUR FACILITY DISABLED CAR PARKING SPACES AT 90°.

BOAT RAMP PARKING

REFER ARCADIS DRAWINGS FOR GENERAL ARRANGEMENT PEDESTRIAN AND VEHICLE ACCESS TO, FROM AND AROUND OUTER HARBOUR FACILITY TO BE REVIEWED

GENERAL ARRANGEMENT PLAN

1:400 (A1) 1:800 (A3)

8 0 8 16 24 32 40m
1:400 (A1) 1:800 (A3)

Advisian
WorleyParsons Group

OneWay
to zero harm

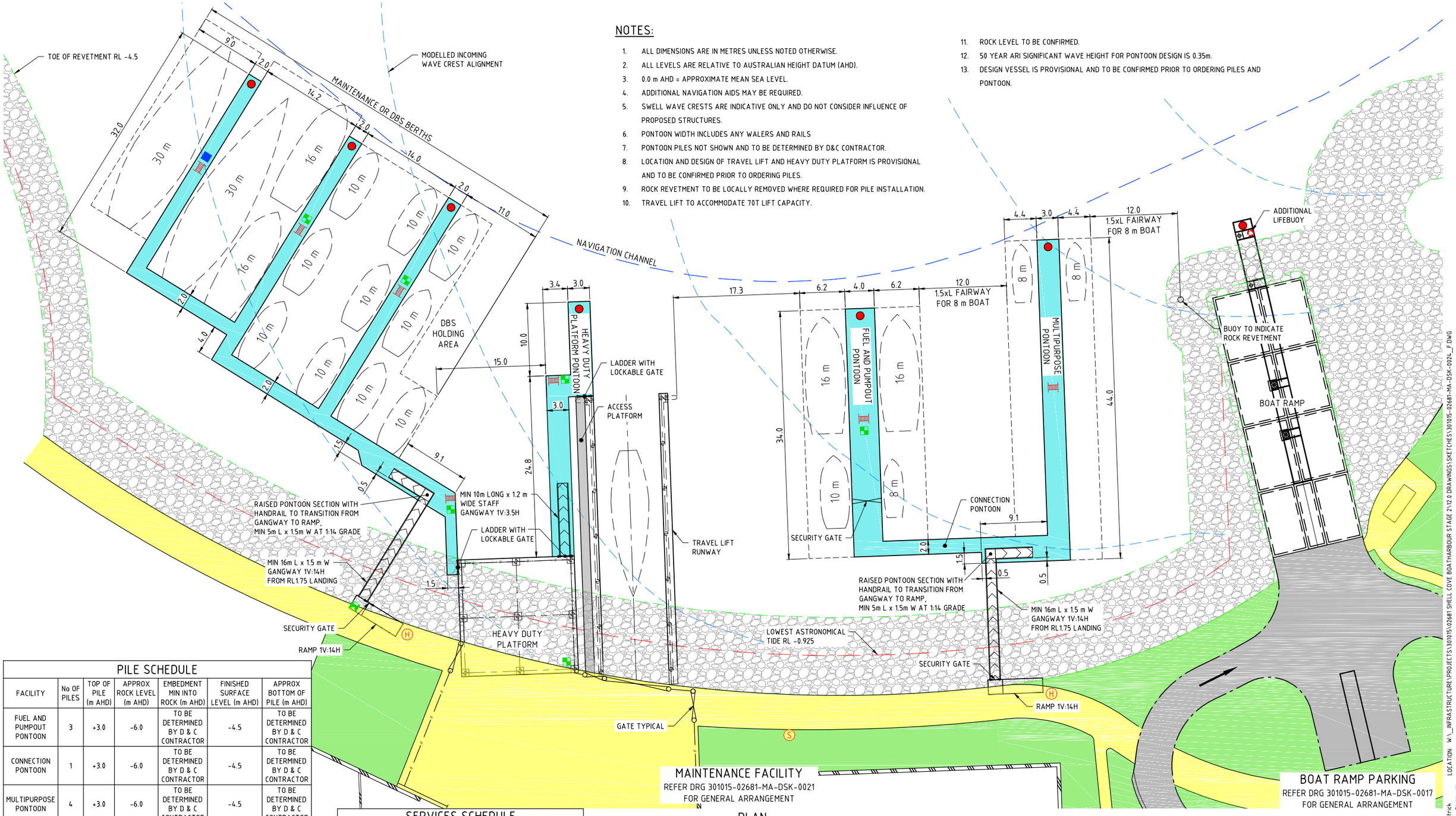
ISSUE	DATE	ISSUE DESCRIPTION	DRAWN
E	16.08.18	MINOR AMENDMENTS	VIP
D	15.08.18	LAYOUT REVISED	VIP
C	24.04.18	CARPARKING REVISED	TJR
B	24.10.17	FORKLIFT TURNING MOVEMENT ADDED	KM
A	16.10.17	ISSUED FOR INFORMATION	TJR

NORTH

SHELL COVE BOAT HARBOUR
OUTER HARBOUR FACILITY
GENERAL ARRANGEMENT

301015-02681-MA-DSK-0021

PLOT DATE & TIME 16/8/2018 2:40:51 PM
SAVE DATE & TIME 16/8/2018 2:33:33 PM
USER NAME: vaughan.patrick LOCATION: W:_INFRASTRUCTUREVPROJECTS\301015\02681 SHELL COVE BOATHARBOUR STAGE 2\12.0 DRAWINGS\SKETCHES\301015-02681-MA-DSK-0021_D.DWG
CTB FILE: Worley-Full.ctb Plotter-None



NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE RELATIVE TO AUSTRALIAN HEIGHT DATUM (AHD).
3. 0.0 m AHD = APPROXIMATE MEAN SEA LEVEL.
4. ADDITIONAL NAVIGATION AIDS MAY BE REQUIRED.
5. SWELL WAVE CRESTS ARE INDICATIVE ONLY AND DO NOT CONSIDER INFLUENCE OF PROPOSED STRUCTURES.
6. PONTOON WIDTH INCLUDES ANY WALERS AND RAILS
7. PONTOON PILES NOT SHOWN AND TO BE DETERMINED BY D&C CONTRACTOR.
8. LOCATION AND DESIGN OF TRAVEL LIFT AND HEAVY DUTY PLATFORM IS PROVISIONAL AND TO BE CONFIRMED PRIOR TO ORDERING PILES.
9. ROCK REVETMENT TO BE LOCALLY REMOVED WHERE REQUIRED FOR PILE INSTALLATION.
10. TRAVEL LIFT TO ACCOMMODATE 70T LIFT CAPACITY.
11. ROCK LEVEL TO BE CONFIRMED.
12. 50 YEAR ARI SIGNIFICANT WAVE HEIGHT FOR PONTOON DESIGN IS 0.35m.
13. DESIGN VESSEL IS PROVISIONAL AND TO BE CONFIRMED PRIOR TO ORDERING PILES AND PONTOON.

PILE SCHEDULE

FACILITY	No OF PILES	TOP OF PILE (m AHD)	APPROX ROCK LEVEL (m AHD)	EMBEDMENT MIN INTO ROCK (m AHD)	FINISHED SURFACE LEVEL (m AHD)	APPROX BOTTOM OF PILE (m AHD)
FUEL AND PUMPOUT PONTOON	3	+3.0	-6.0	TO BE DETERMINED BY D & C CONTRACTOR	-4.5	TO BE DETERMINED BY D & C CONTRACTOR
CONNECTION PONTOON	1	+3.0	-6.0	TO BE DETERMINED BY D & C CONTRACTOR	-4.5	TO BE DETERMINED BY D & C CONTRACTOR
MULTIPURPOSE PONTOON	4	+3.0	-6.0	TO BE DETERMINED BY D & C CONTRACTOR	-4.5	TO BE DETERMINED BY D & C CONTRACTOR
HEAVY DUTY PLATFORM	9	+2.2	-6.0	1.5	VARIES	-7.5
HEAVY DUTY PLATFORM PONTOON	4	+3.0	-6.0	TO BE DETERMINED BY D & C CONTRACTOR	-4.5	TO BE DETERMINED BY D & C CONTRACTOR
MAINTENANCE OR DBS PONTOON	11	+3.0	-6.0	TO BE DETERMINED BY D & C CONTRACTOR	-4.5	TO BE DETERMINED BY D & C CONTRACTOR
TRAVEL LIFT	16	+2.2	-6.0	1.5	VARIES	-7.5

SERVICES SCHEDULE

SYMBOL	DESCRIPTION	NUMBER
Ⓢ	SERVICES CONNECTION POINT	1
●	NAVIGATION LIGHT	7
Ⓗ	FIRE HYDRANT	2
▬	FIRE HOSE REEL (C/W 9kg DRY CHEMICAL EXTINGUISHER) EVERY SECOND REEL AND LIFEBUOY	7

PLAN

1:250 (A1) 1:500 (A3)

SERVICES PEDESTAL SCHEDULE

SYMBOL	PEDESTAL TYPE	POWER SUPPLY	No OF PEDESTALS	REFERENCE
▣	TYPE 1B	2 x 15A	1	DWG-0811
▣	TYPE 1C	4 x 15A	6	DWG-0811
■	TYPE 4B	2 x 15A + 4 x 32A-3 PH + 2 x 125A-3PH	1	DWG-0811

5 0 5 10 15 20 25m
1:250 (A1) 1:500 (A3)

ISSUE	DATE	ISSUE DESCRIPTION	DRAWN
E	07.03.18	MINOR AMENDMENTS	KM
D	27.02.18	SERVICES ADDED	VIP
C	15.02.18	ISSUED FOR INFORMATION	TJR
G	16.08.18	MINOR AMENDMENTS	VIP
F	15.08.18	MINOR AMENDMENTS	VIP

WorleyParsons
resources & energy

OneWay to zero harm

FOR INFORMATION ONLY

NORTH

SHELL COVE BOAT HARBOUR
OUTER HARBOUR FACILITIES
WATERSIDE OPTION 1

301015-02681-MA-DSK-0024

PLOT DATE & TIME: 16/8/2018 2:08:20 PM
SAVE DATE & TIME: 16/8/2018 1:56:28 PM
USER NAME: vaughan.patrick CTB FILE: Worley-Full.ctb Plotter:None
LOCATION W:_INFRASTRUCTURE\PROJECTS\301015\02681 SHELL COVE BOATHARBOUR STAGE 2\12.0 DRAWINGS\SKETCHES\301015-02681-MA-DSK-0024_F.DWG