URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

TRAFFIC IMPACT ASSESSMENT

PROPOSED CONSOLIDATION, REZONING AND SUBDIVISION OF ERF 998 TERGNIET AND PTN 5 OF FARM ZANDHOOGTE NO. 139, MOSSEL BAY

Report Number 22-160_TIA

Date: April 2024 Revision 1

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COVER LETTER

It is herewith certified that this Traffic Impact Investigation has been prepared according to requirements of the TMH 16 (Committee Draft 2.0 – May 2018) South African Traffic Impact and Site Traffic Assessment Manual.

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(on behalf of Urban Engineering (Pty) Ltd)

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LIST OF ABBREVIATIONS

TIA	Traffic Impact Assessment
SANRAL	South African National Roads Agency SOC Limited
RNIS	Road Networks Information System
PGWC	Provincial Government of the Western Cape
AMP	Access Management Plan
AMG	Access Management Guidelines (2016)
RAG	Road Access Guidelines (2002)
RDE	Roadside Development Environment
GLA	Gross Leasable Area
SATGRM	South African Trip Generation Rates Manual
LOS	Level of Service
DoT	Department of Transport
RDE	Roadside Development Environment
MR	Main Road
DR	Divisional Road
RNIS	Road Network Information System

1 INTRODUCTION

Urban Engineering (Pty) Ltd was appointed by 3MP Sales and Education Services Cc to undertake a Transportation Investigation pertaining to the proposed consolidation, rezoning and subdivision of Erf 998, Tergniet and PTN 5 of Farm Zandhoogte No. 139 Mossel Bay, Western Cape. The project is referred to as the Dolphin Circle Development.

1.1 PROJECT BENEFIT AND CONTEXT

The client has identified the need / opportunity for the creation of a mixed-use development consisting of both residential and business zones in the Tergniet/Groot Brak River area. In order to meet this demand, 3MP Sales and Education Services Cc is proposing the Dolphin Circle Development, which consists of the consolidation, rezoning and subdivision of Erf 998, Tergniet and PTN 5 of Farm Zandhoogte No. 139 Mossel Bay.

1.2 TERMS OF REFERENCE

Transportation investigations essentially need to be undertaken in accordance with the following guidelines:

- National Land Transport Act, 2009 (Government Gazette No. 32110)
- South African Traffic Impact & Site Traffic Assessment Manual (TMH 16 Volume 1, COTO)
- Access Management Guidelines (WCG Dept. Transport and Public Works, 2020)
- Manual for Traffic Impact Studies RR 93/635 (DoT, 1995)

To better align with the recommendations of the TMH16, the Access Management Guidelines recommends that when a development is likely to generate a minimum of 50 additional vehicular trips in a highest hour of its traffic generation, (including passer-by trips) a TIA is required.

1.3 PRIMARY OBJECTIVES OF THIS REPORT

This study will look at the effect of the additional traffic generated by the proposed operation on the surrounding road network. Where necessary, the report will aim to introduce mitigation measures to reduce this impact at the site, as well as on the surrounding transportation network.

1.4 STUDY OBJECTIVES

The study objectives are:

i. Assess the traffic conditions on the existing road network.
ii. Assess the traffic generation effects of the proposal (if any)
iii. Assess the interface conditions between the road network and the proposed development.
iv. Highlight any traffic concerns resulting from the proposed development (including parking and non-motorised transport)
v. Make recommendations.

1.5 SITE INVESTIGATION

The site was visited by Frans van Aardt from Urban Engineering (Pty) Ltd on 11 March 2023. Relevant measures and inspections were taken during the site visit. A record of some of the photos taken during the site visit has been attached as **ANNEXURE A** to this report.

2 LOCALITY

The future area of the combined erven will be approximately 10.3ha. The site is situated between National Road 2 (N2) and MR344. DR1578 defines the property's Western boundary and provides the only access onto the site. The site centre has approximate WGS 84 coordinates of 34° 3'49.05"S and 22°11'22.03"E. A basic locality plan has been included as Figure 2-1.

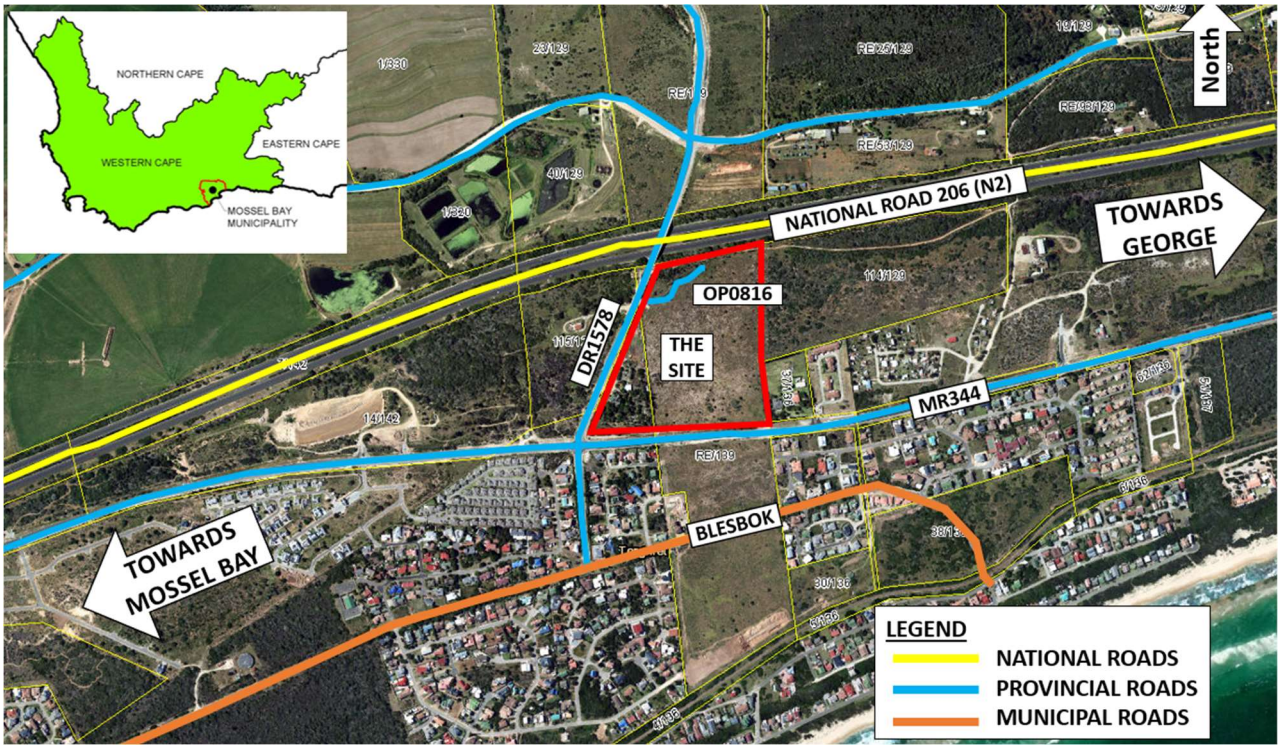


Figure 2-1 - Basic Locality Plan

3 STATUS QUO

The site consists of two erven with a frontal dimension of 370m and a width of 290m. There are currently structures on Erf 998, access onto both Erven from DR1578 (Sorgfontein Road), and a secondary access to the portion of RE/1578 from the MR344. The vegetation of the site is dry grasslands with some small shrubs. The structures on Erf 998 were used as a nursery in the past.

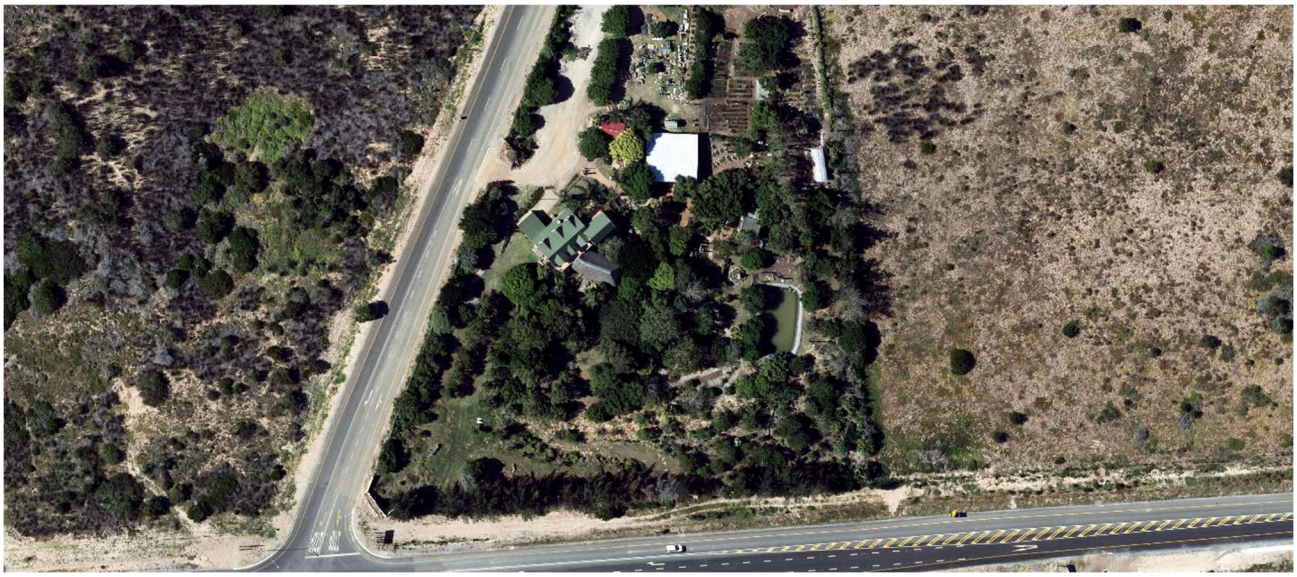


Figure 3-1 - Status Quo Photo

The site is currently zoned Agriculture Zone I as indicated in the extract of Mossel Bay Municipality's GIS database.

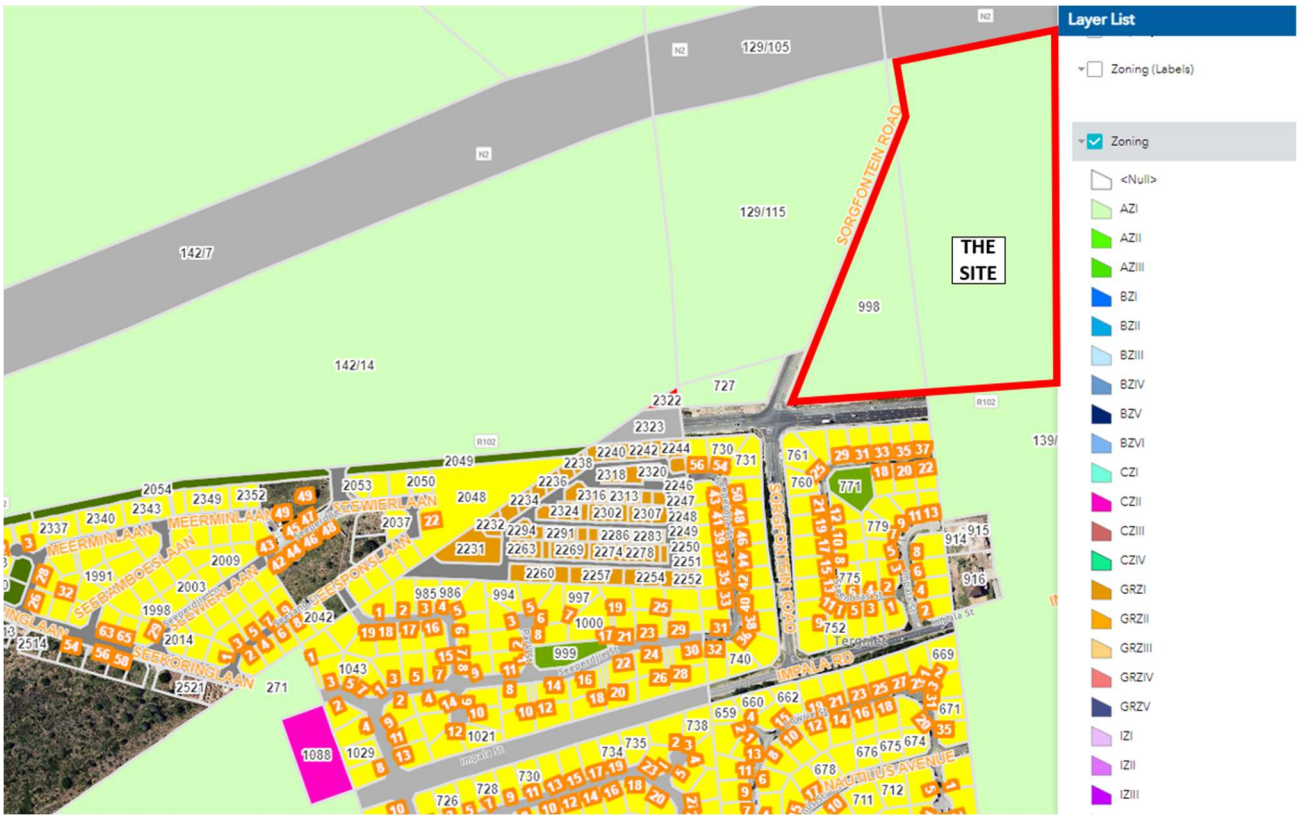


Figure 3-2 - Current Zoning

The 2018 Mossel Bay SDF prepared by CNdV planners identifies the site for future "Urban Expansion" potential (refer to Figure 3-3)

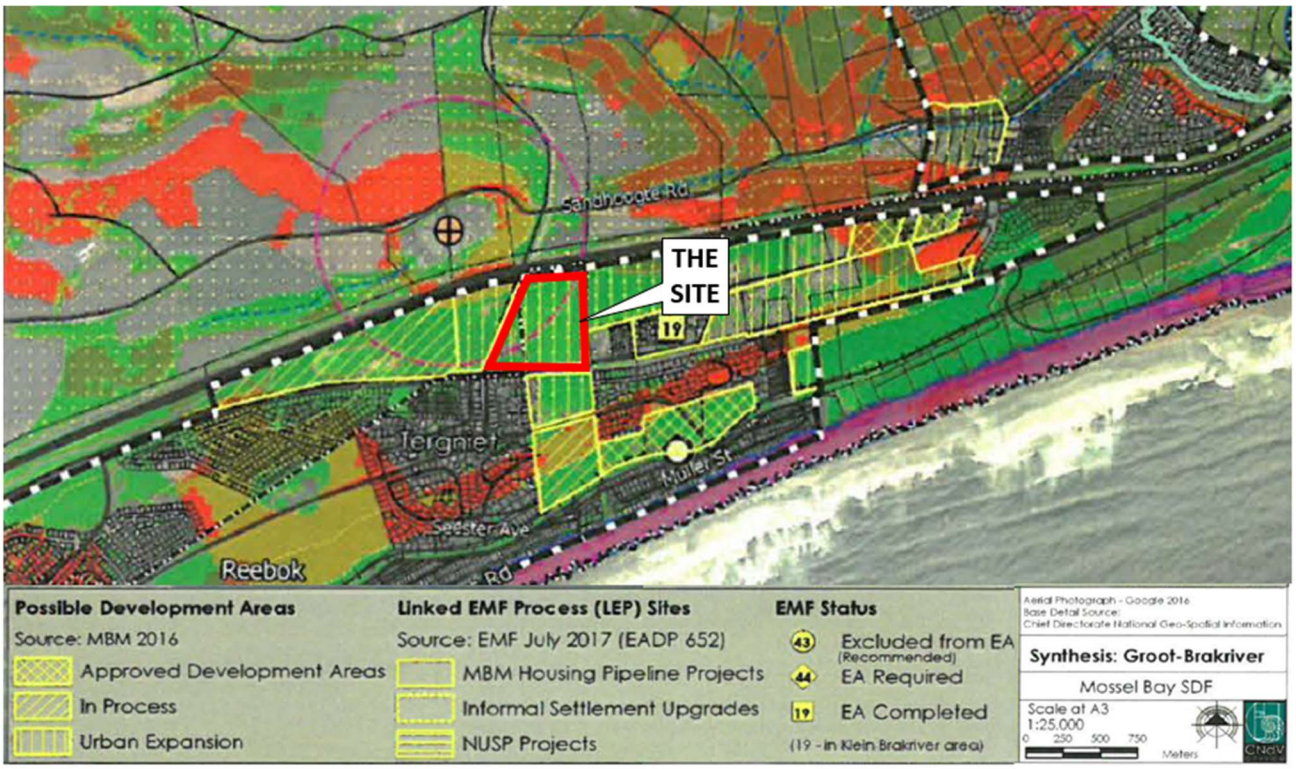


Figure 3-3 – Extract of Local Spatial Development Framework

4 PROPOSED DEVELOPMENT PARTICULARS

It is the intention of the landowner to demolish the existing nursery site and develop the site into a new residential and commercial node. The main site access will remain on DR1578 but will be moved to the most optimum position along the DR1578.

The existence of a 500m "sewer works" radius, limits the development of the site as no residential development is allowed within the "sewer works" radius area. Working within this limitation, the proposed development will consist of the following:

LAND USE DESCRIPTION	ABREVIATION	SIZE (ha)
Business Zone I	BZI	3.604
Business Zone IV	BZIV	0.268
Community Zone III	CZIII	0.527
Mixed Zone II	MZII	0.902
Open Space II	OSZII	2.225
General Residential Zone II	GRZII	0.697
General Residential Zone III	GRZIII	0.653
Transport Zone II	TZII	1.360
TOTAL		**10.236**

A subdivision plan was prepared by Pieter Brown of *Design Centre and Associates* and has been attached as **ANNEXURE B** to this report. For ease of reference, an extract of the SDP has been included as Figure 4-1 below.

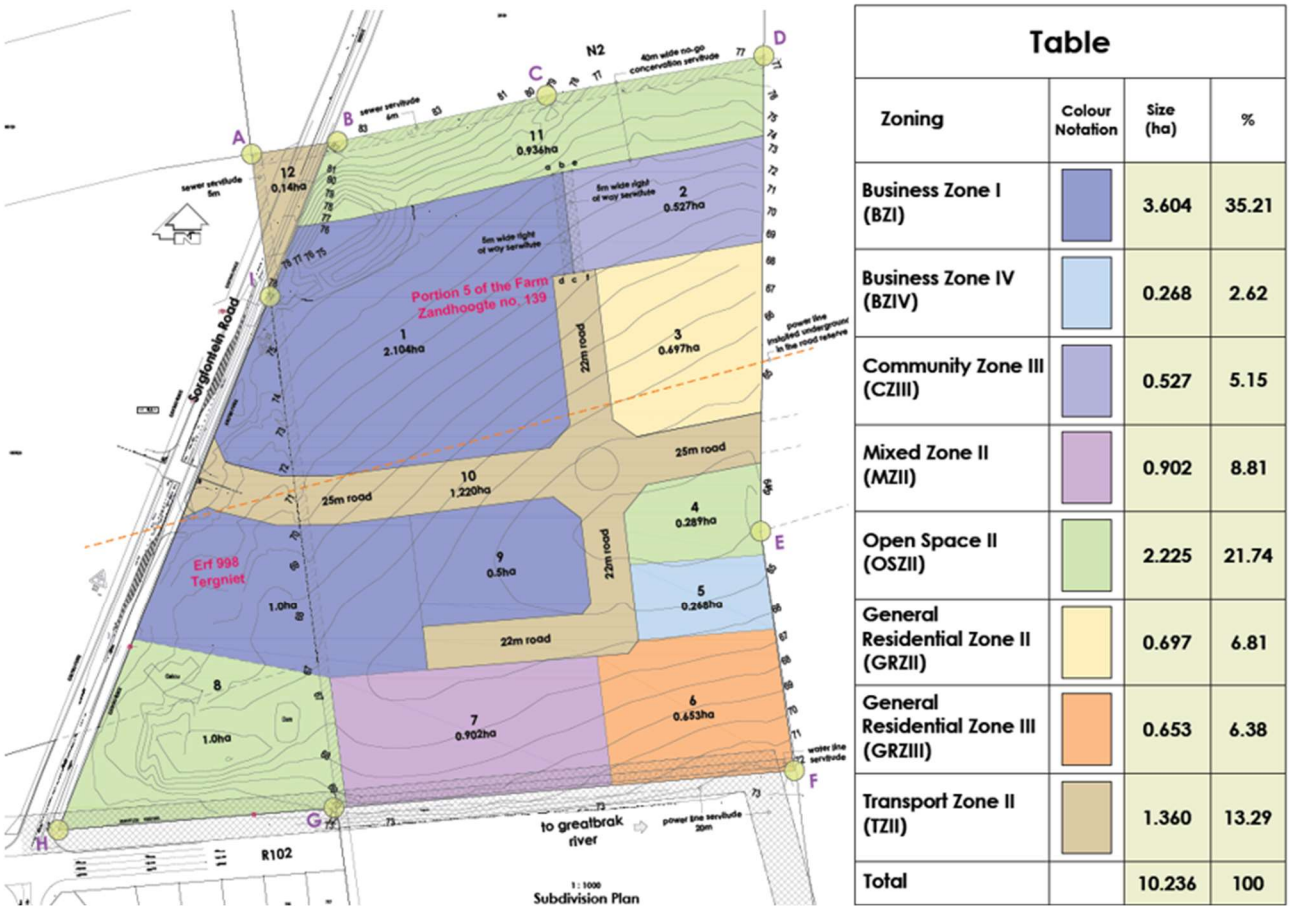


Figure 4-1 - Proposed Site Development Plan

5 SURROUNDING ROAD NETWORK

Depending on which guidelines is being used, the nomenclature used in road classification varies slightly. The differences between the terms used in the 2006 Department of Transport (DoT) Guidelines and those specified in the South African Road Classification and Access Management Manual (COTO TRH 26, May 2018), are listed below:

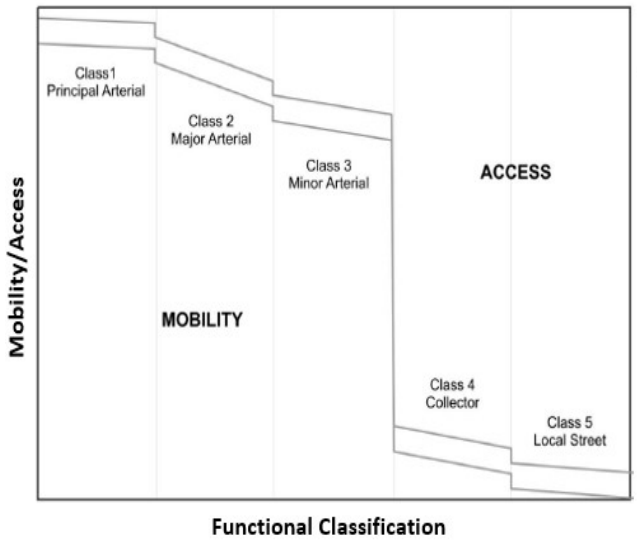
Road Class	Function	DoT 2006 Guidelines	COTO 2012 (TRH 26 Manual)
Class 1	Mobility	Primary Distributor	Principal Arterial
Class 2		Regional Distributor	Major Arterial
Class 3		District Distributor	Minor Arterial
Class 4	Access	District Collector	Collector
Class 5		Access Road	Local Street
Class 6		Non-motorised access way	Walkway

Table 5-1 - Road Classification Nomenclature

Roadways are classified by function on the basis of the priority given to land access versus through-traffic movement. Class 1 and 2 arterial roads provide a predominantly “mobility” function and Classes 4 and 5 roads perform a collector and local “access” function.

The functions of “mobility” and “access” overlap on minor arterials (Class 3 roads). This relationship between access and mobility has been indicated schematically in Figure 5-1.

Access Management is particularly important along Principal, Major and Minor Arterials and other primary roads that are expected to provide safe and efficient movement of traffic as well as limited access to property. However, Access Management is also necessary on lower-order roadways, such as Collector Streets and Local Streets, to address safety considerations, such as sight distance and corner clearance.



Class	Function	Description
Class 1	Mobility	Principal Arterial
Class 2		Major Arterial
Class 3	Mobility/Access	Minor Arterial
Class 4		Collector
Class 5	Access	Local

Figure 5-1 - Relationship Between Access and Mobility

5.1 DR1578 (SORGFONTEIN ROAD)

DR1578 is a provincial road that runs predominantly north/south and connects the Tergniet area in the south, with the Wolwedans area in the North. The relevant section of DR1578 consists of a 10m surfaced road which was recently upgraded as part of the MR344 upgrade.

Figure 5-2 - DR1578 Characteristics

Kantey and Templer Consulting Engineers was appointed by the Provincial Government of the Western Cape to prepare an Arterial Management Plan relating to the MR344 & MR348 between Hartenbos and Glentana. The Final (Draft 3) version of this document was issued in January 2012. Based on the findings of this document, Kantey and Templer was appointed for the subsequent rehabilitation and upgrade of the MR344 as well as a portion of DR1578. Construction started in January 2018 and was completed in 2020/21. Relevant Kantey and Templer DR1578 design drawings have been attached as **ANNEXURE C** and as Figure 5-3 below.

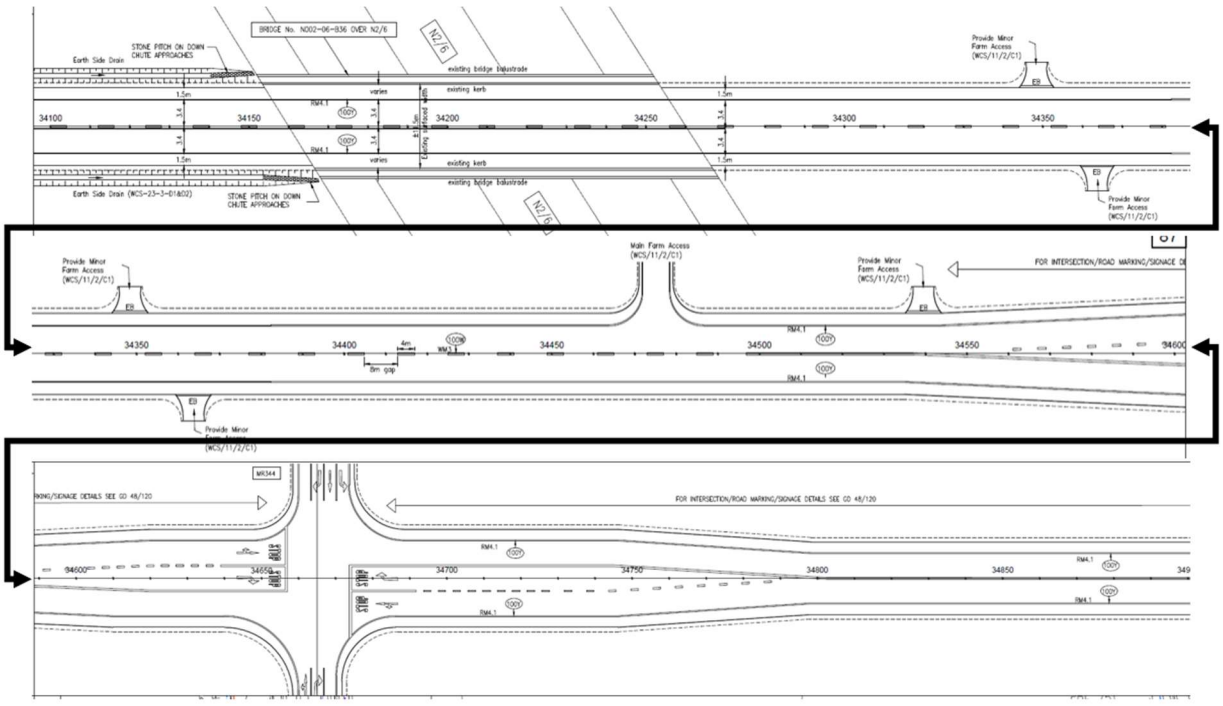


Figure 5-3 - Kantey and Templer DR1578 Layout Plans

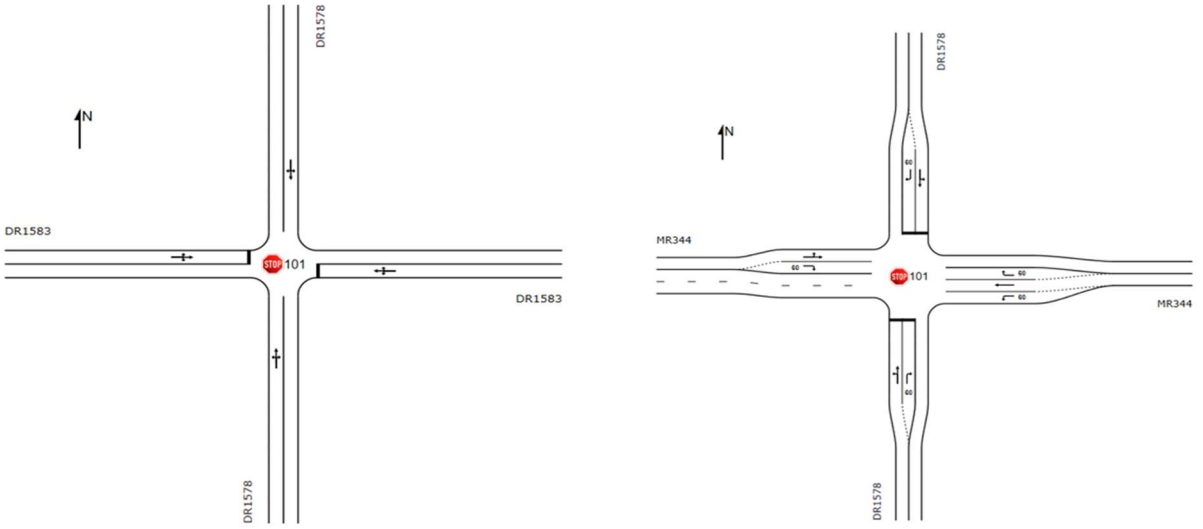
5.2 INTERSECTION LAYOUT

Recent aerial photographs of the relevant intersections have been included below.

Figure 5-4 - DR1578/DR1583 Intersection Layout

Figure 5-5 - DR1578/MR344 Intersection Layout

For analysis purposes, the above intersection layout has been simplified as indicated in Figure 5-6



DR1578/DR1583 SCHEMATIC INTERSECTION LAYOUT DR1578/MR344 SCHEMATIC INTERSECTION LAYOUT

Figure 5-6 - SIDRA Intersection Layout

6 DR1578 SITE ACCESS

The new site access is proposed directly of the DR1578. This access will also have to provide future access to the neighbouring developable property situated east of DR1578 as indicated schematically in Figure 6-1.

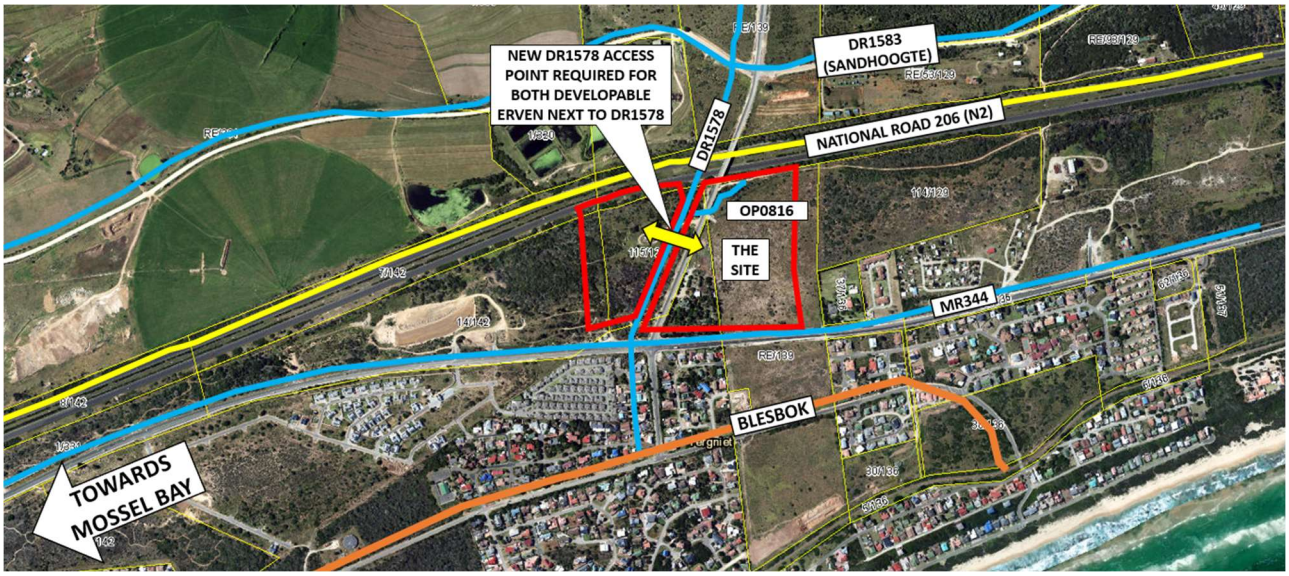


Figure 6-1 - New DR1578 Access

In order to protect mobility along DR1578, the proposed future junction layout should include dedicated right turning lanes as indicated schematically in Figure 6-2.

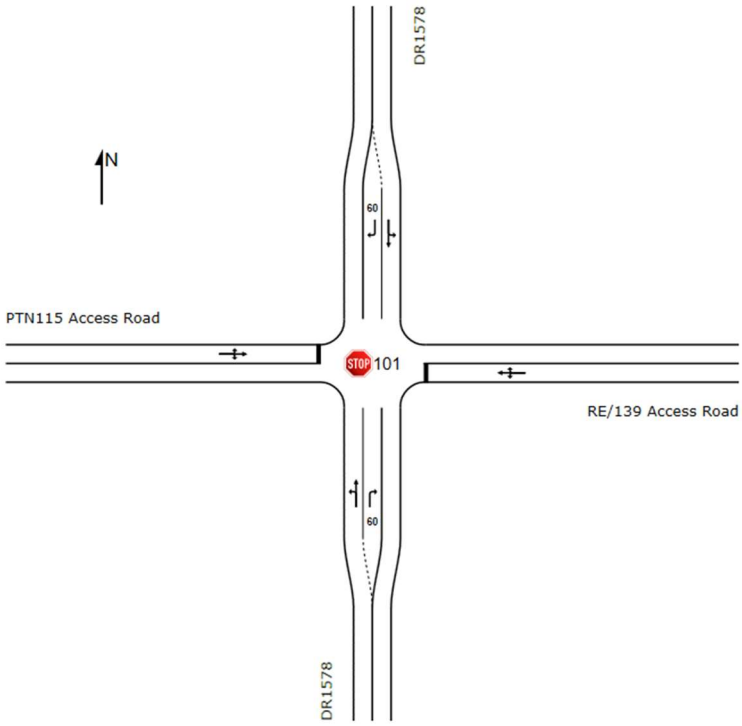
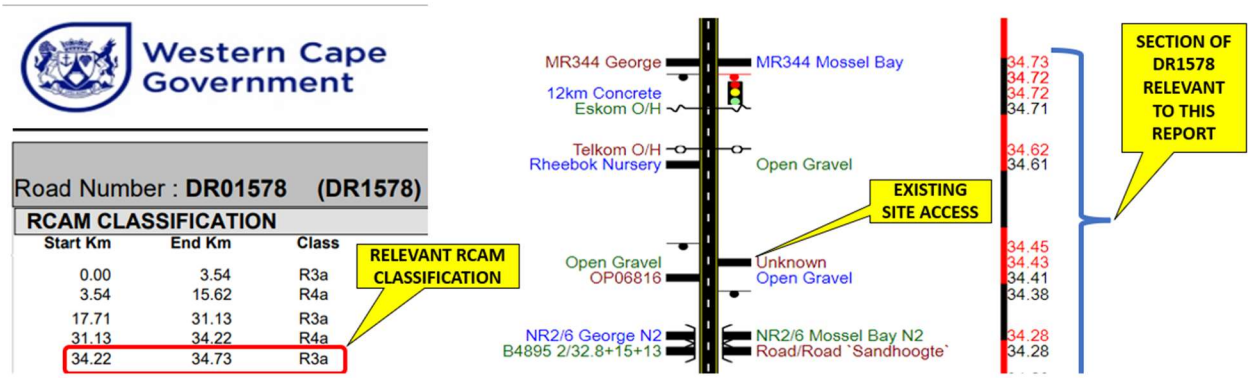


Figure 6-2 - Proposed Schematic Layout of new DR1578 intersection.

Due to physical constraints (MR344 intersection and N2 overpass) the position of this new proposed junction is a function of three parameters:

6.1 INTERSECTION SPACING

According to the WCPG's RNIS Website, the section of DR1578 that is relevant to this report is classified as a Class 3 Minor Arterial.



Since the adjacent land has been identified in the Mossel Bay Spatial Development framework as suitable for "urban expansion" (refer to Figure 3-3 – Extract of Local Spatial Development Framework) it follows that the future roadside development environment can be classified as suburban to intermediate. Due to the development restriction placed by the sewer treatment area (500m radius) it is not very likely that the densities required for intermediate RDE will be achieved and hence it is assumed that the future RDE will satisfy that of *Suburban*.

Based on the Western Cape Government's Access Management Guidelines 2020, a minimum spacing of 225m is required between two full intersections for a Class 3 road in the Suburban Roadside Development Environment.

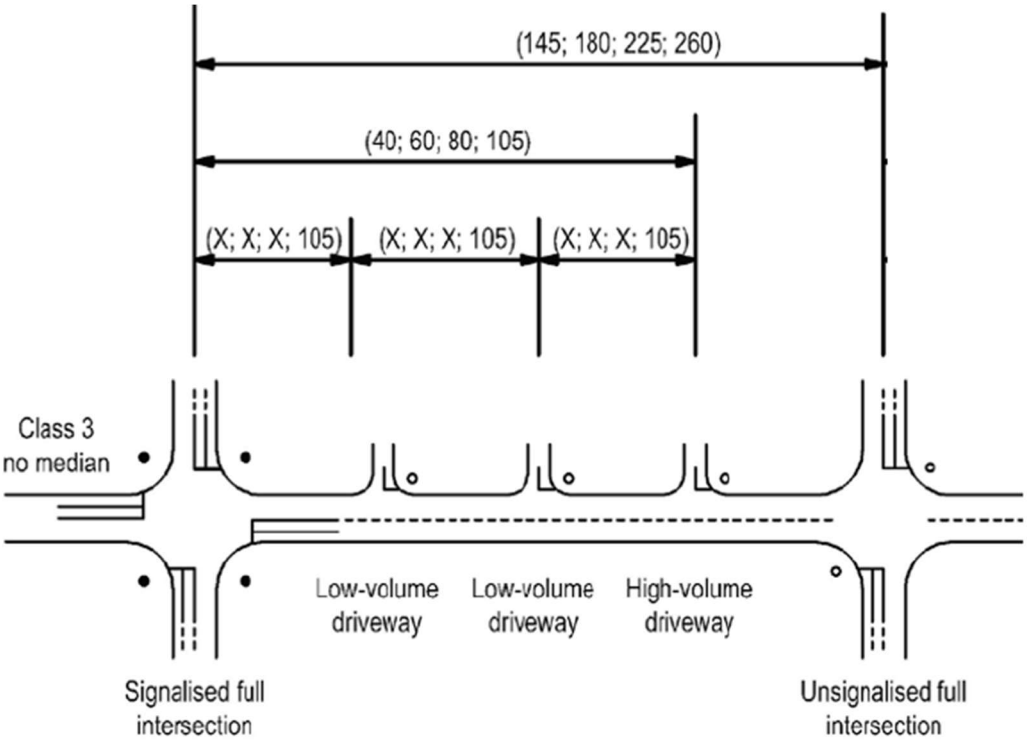


Figure 6-3 - AMG 2020 Class 3 minimum spacing requirements (without median)

6.2 SIGHT DISTANCE

According to the WCG's AMG (2020) shoulder sight distance relates to the visibility for a driver of a vehicle entering a through road from an access or side road to see a vehicle approaching along the through route. If the intersection or access has a yield control, the sight distance is measured from a point 45 m back from the edge of the road to be entered. In the case of stop control, the shoulder sight distance is measured from 5 m back from the road edge on the access or side road approach.

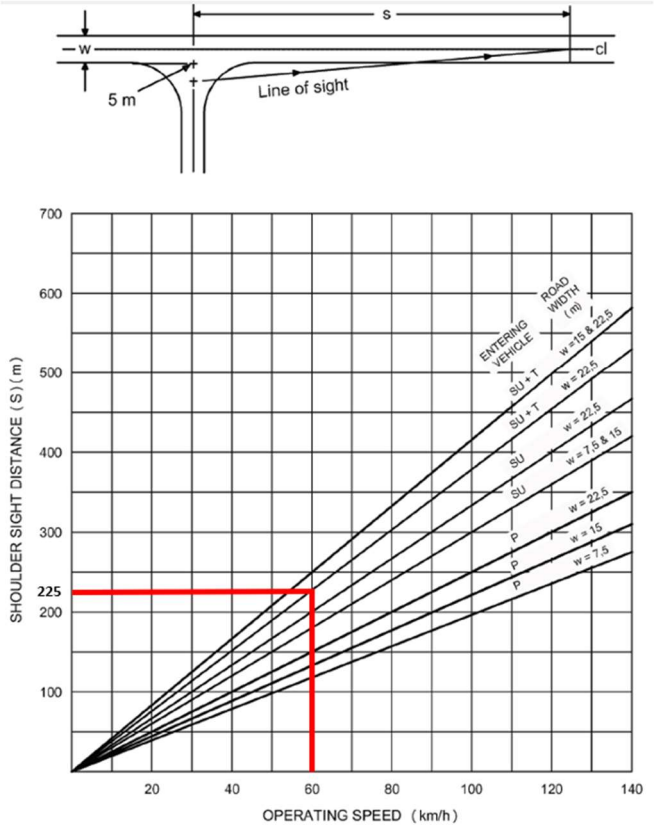


Figure 6-4 - SSD from WCG's AMG 2020

Shoulder sight distance is a critical determinant of suitable points for side roads or accesses to intersect with through roads. On a winding road, an access on the outside of a curve is more likely to achieve the required sight distance than one on the inside of a curve. Crest vertical curves can also play a significant part in determining available shoulder sight distance, while overhanging tree branches can restrict visibility in sag curves. In urban areas, street furniture, sidewalk shade trees and/or vehicles in parking or loading zones can limit shoulder sight distance.

For convenience, the graph showing shoulder sight distances for different through road operating speeds, entering vehicle types and road widths at a stop-controlled access or intersection is included as Figure 14-529. Eye height is taken to be 1,05 m for cars and 1,8 m for heavy vehicles, while object height is taken to be 1,3 m.

Line of Sight was measured from the Kantey and Templer DR1578 design drawings. The relevant drawings have been attached as **ANNEXURE C**, but an extract of the long section has been included below.

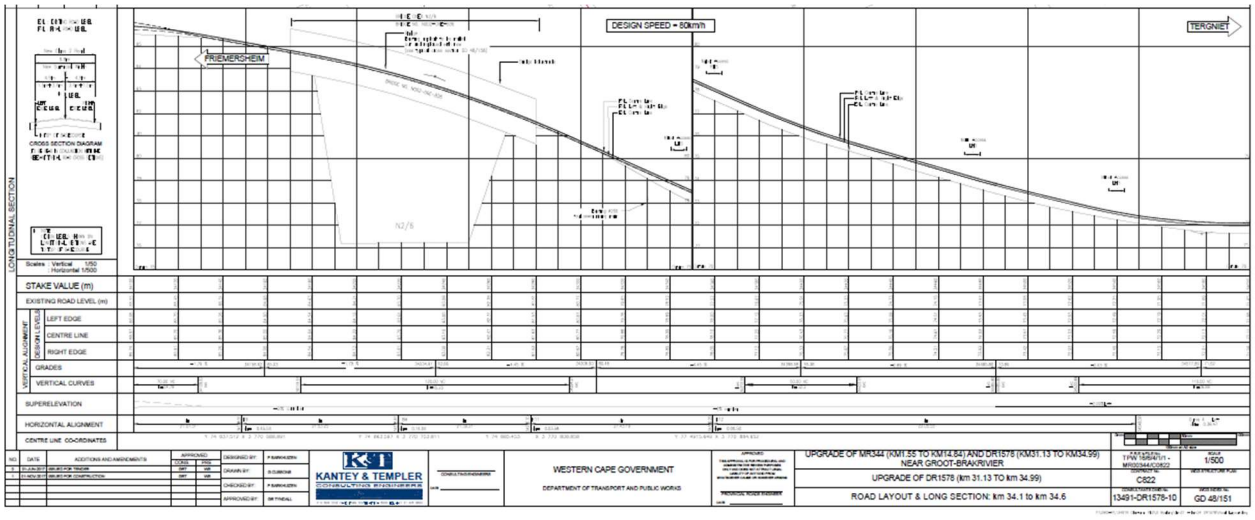


Figure 6-5 - Kantey and Templer Long section extract

6.3 GEOMETRIC DESIGN

The proposed geometric design places various constraints on the position of the access. Requirements in terms of taper rates and lengths of turning lanes, results in minimum requirements for the two approach lanes. Since the future intersection will be in the form of a 4-legged intersection, the standard taper rates specified in the WCG' Drawing WCS/11/2/D4 (Sheet 4 of 4) from their book of standard plans, was used to create a preliminary intersection layout.

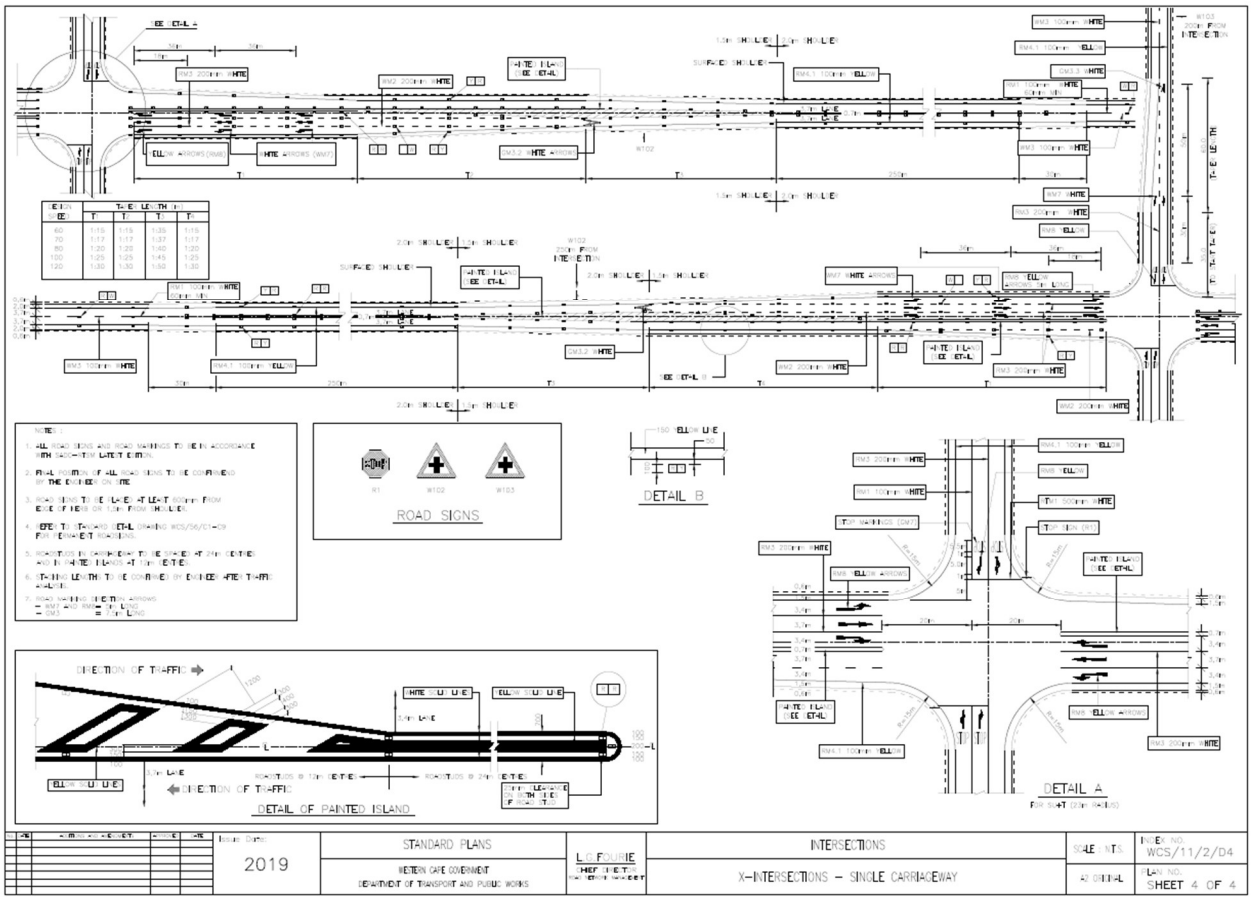


Figure 6-6 - WCG Standard Plan for 4-Legged Intersection

6.4 PROPOSED INTERSECTION POSITION

Applying the various constraints above, the preliminary intersection layout was drawn and positioned as indicated in Figure 6-7 below and attached as **ANNEXURE G.**

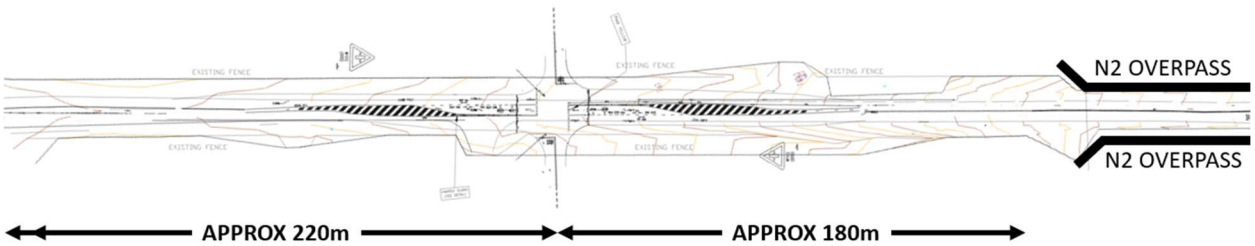


Figure 6-7 - Preliminary 4-Legged Site Access

The above preliminary design was provided to Pieter Brown of Design Centre from where it was used as the basis of the proposed Site Development Plan (**ANNEXURE B**)

7 EXISTING TRAFFIC VOLUMES

To determine the existing (background) traffic volumes in the vicinity of the site, traffic counts were recorded at the intersections of DR1578/MR344 and DR1578/DR1583(Sandhoogte Rd) on Tuesday 14 March 2023. Counts were recorded over a 12-hour (06:00 to 18:00) period and vehicles were classified as either light or heavy. The traffic count intersections are indicated in Figure 7-1 below:

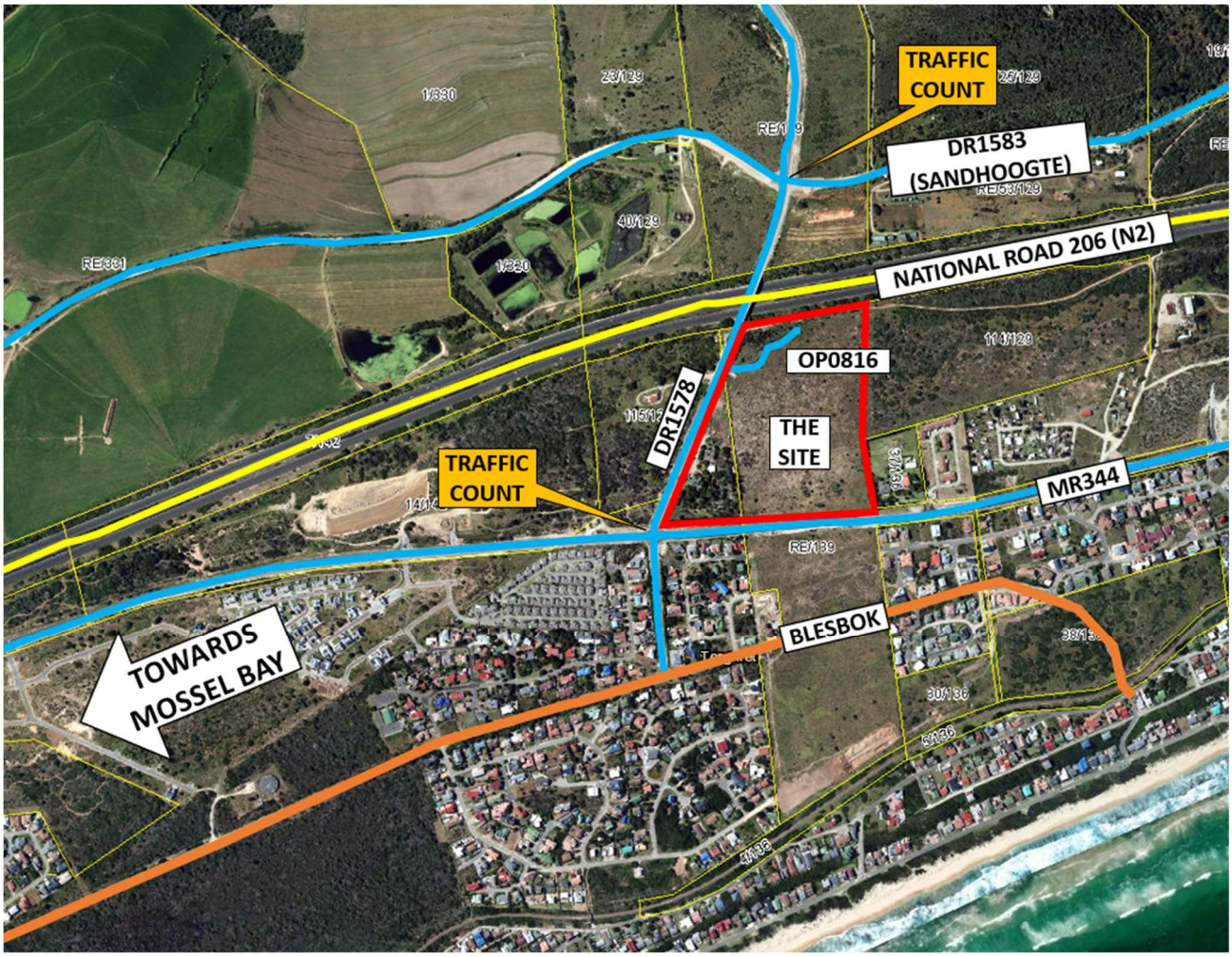


Figure 7-1 - Traffic Count Positions

The raw traffic count data has been attached as **ANNEXURE D** to this report. The data was analysed, and the flow profiles extracted for the various approaches to the two intersections.

The traffic count revealed the following at the volumes moving through the two intersections:

	DR1578/DR1583	DR1583/MR344
Total vehicles Counted	2287	6945
Light Vehicles (% of total)	1958 (85.6%)	6479 (93.2%)
Heavy Vehicles (% of total)	329 (14.4%)	466 (6.7%)

The flow profiles for the two intersections have been attached as Figure 7-2 and Figure 7-3.

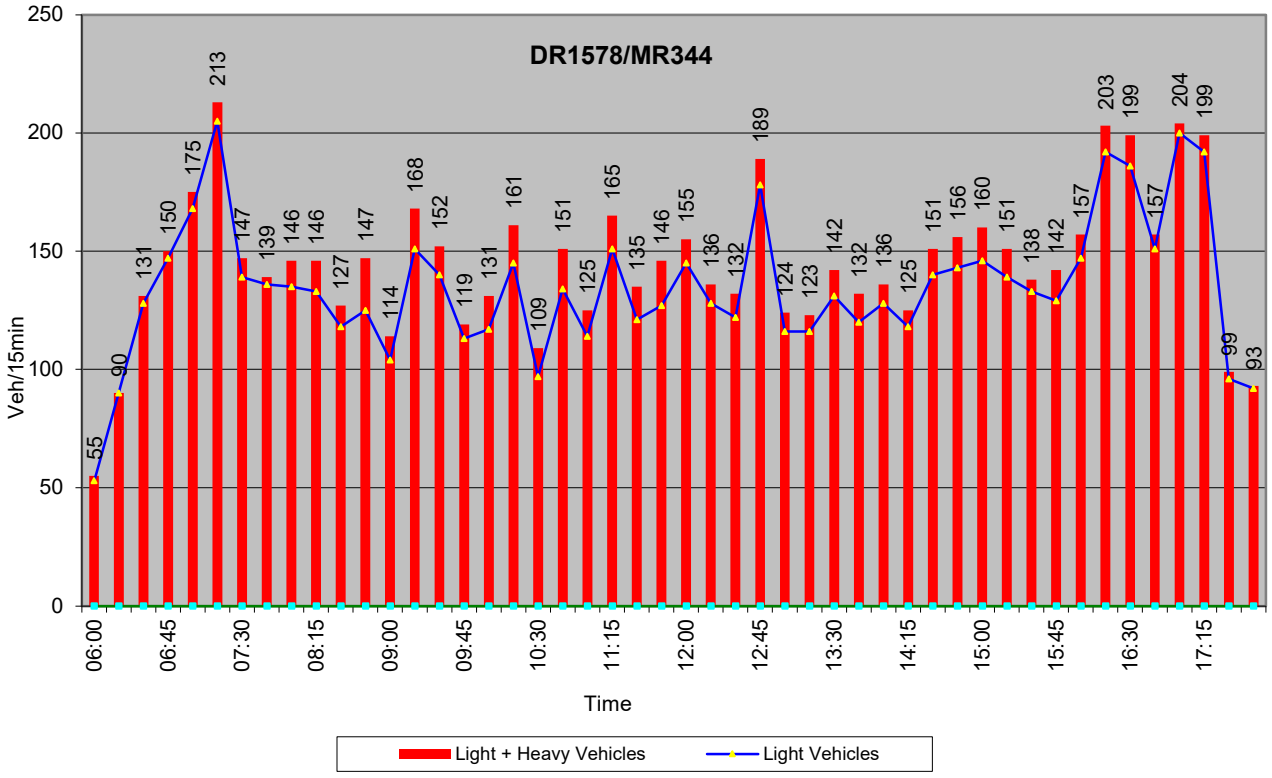


Figure 7-2 - Traffic Flow Analysis - DR1578/MR344 Intersection

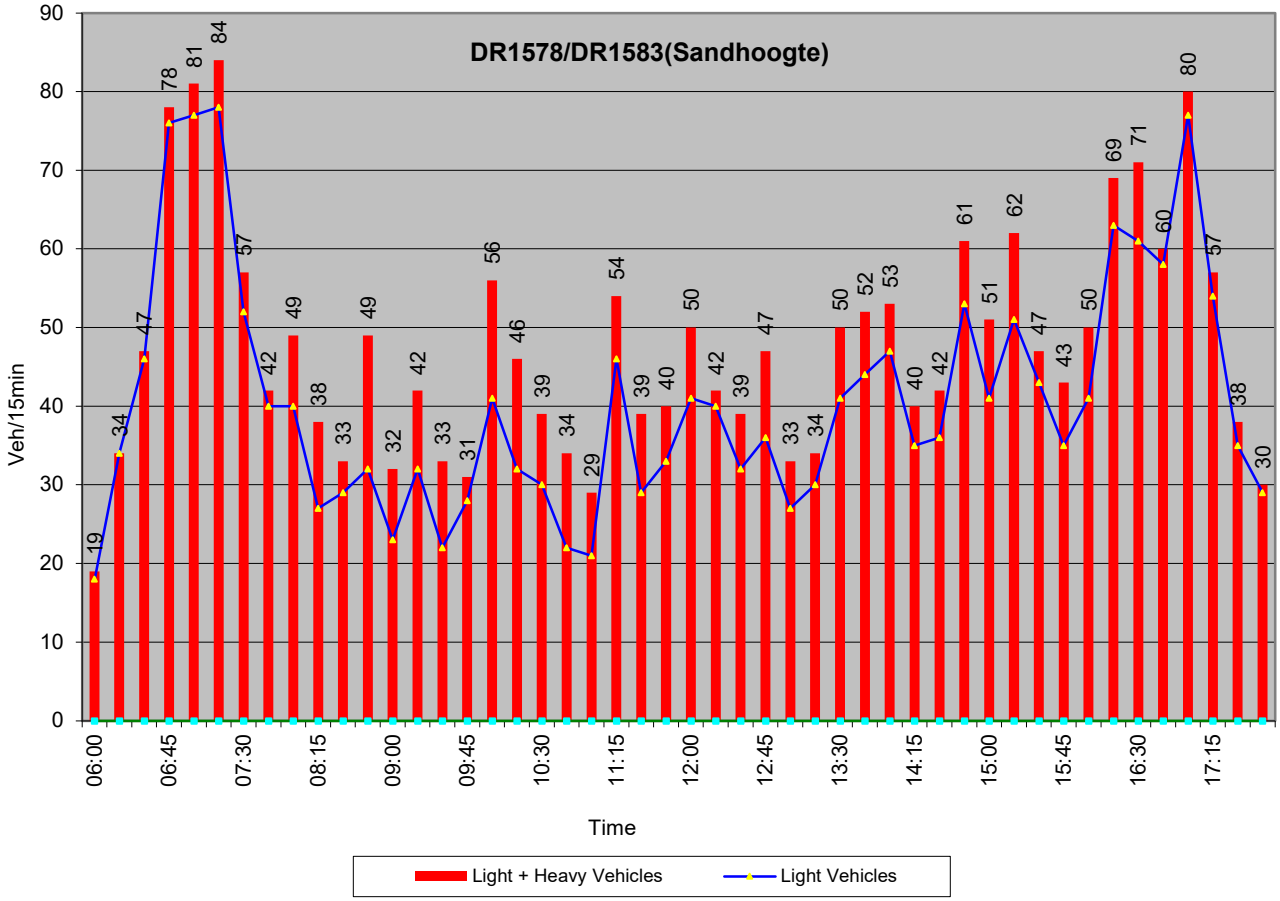


Figure 7-3 - Traffic Flow Analysis - DR1578/DR1583 Intersection

8 TRIP GENERATION POTENTIAL

8.1 TRIP GENERATION

The trip generation potential of the site has been calculated based on the guidelines published in TMH 17 (South African Trip Data Manual, COTO May 2018). The trip generation potential of the various land uses has been defined below

BUSINESS ZONE I

Based on the Mossel Bay Municipality Integrated Zoning Scheme By-Law, Business Zone I is mainly used for Business Premises. The MBIZSBL then defines "Business Premises" as follows:

Land use description: "*business premises*" means a property from which business is conducted and—

a. includes a shop, big box retail, supermarket, restaurant, sale of alcoholic beverages, plant nursery, office, funeral parlour, financial institution and building for similar uses, place of assembly, place of leisure, hotel, conference facility, rooftop base telecommunication station, and multiple parking garage;
b. includes also the following land uses above ground floor:
    i. flats and caretaker's quarters;
    ii. backpackers' lodge and youth hostel;
    iii. boarding houses; and
c. does not include an industry, noxious trade, or risk activity.

Since the land use definition includes a wide range of development types, the THM 17 "Business Park" land use was allocated towards these erven. The THM17 defines Business Park as follows:

770 Business Center (Park) 100 sqm GLA

Business centres are facilities serving a range of mixed land-uses, such as offices, banking facilities, light industries and warehousing.

The specified trip generation rates have been indicated in the table below.

770 Business Centre (Park)					**100 sqm GLA**
Description	AM Peak	PM Peak	Friday PM	Saturday	Sunday
Trip Rate	1.50	1.50	0	0	0
IN/OUT	85:15	20:80	0	0	0

Note: The following assumptions were applied:

1. Since the eventual land uses for the Business erven have not yet been finalised, reduction factors for mixed-use developments (or any other possible reduction factors) are not applied.
2. Business Zone GLA's were estimated as 70% of the erf footprint. (i.e., BZI GLA = 36,040m^2 x 70% = 25,228m^2)

BUSINESS ZONE IV

Based on the Mossel Bay Municipality Integrated Zoning Scheme By-Law, Business Zone IV is primarily used for offices. The MBIZSBL defines BZIV as follows:

"The objective of this zone is to provide an intermediate zone that may, if required, act as a buffer or interface between high- and medium-intensity business zones, and residential zones. Retail activities are limited to those which are ancillary to the dominant permitted uses, namely offices and flats. In order to protect the amenity of adjacent residential areas, appropriate levels of landscaping and environmental management are required."

Since the land use definition includes a wide range of development types, the THM 17 "Offices" land use was allocated towards these erven. The THM17 defines Offices as follows:

710 Offices 100 sqm GLA

This land-use includes developments at which affairs of businesses, commercial or industrial organisations are conducted.

The specified trip generation rates have been indicated in the table below.

710 Offices					**100 sqm GLA**
Description	AM Peak	PM Peak	Friday PM	Saturday	Sunday
Trip Rate	2.1	2.1	0	0.45	0.15
IN/OUT	85:15	20:80	0	55:45	55:45

Note: The following assumptions were applied:

1. Since the eventual land uses for the BZIV erven have not yet been finalised, reduction factors for mixed-use developments (or any other possible reduction factors) were not applied.
2. Office GLA's were estimated as 70% of the erf footprint. (i.e., BZIV GLA = 2,680m^2 x 70% = 1,879m^2)

COMMUNITY ZONE III

Based on the Mossel Bay Municipality Integrated Zoning Scheme By-Law, the objective of Community Zone III is to provide for a wide range of health facilities. The primary use is listed as "*Institution"*. The MBIZSBL defines "*Institution*" as follows:

Land use description: "*institution*" -

a. means a property used as a facility that renders services to the community including—
    i. hospital or clinic;
    ii. home for the aged, retired, indigent or handicapped, frail care facility;
    iii. a social facility including a counselling centre, orphanage and rehabilitation centre;
    iv. ancillary accommodation, administrative, health care, training and support services and facilities; and
    v. rooftop base telecommunications station.

Since the land use definition includes a wide range of health facilities, the THM 17 "Private Hospital" land use was allocated towards these erven. The THM17 defines Private Hospital as follows:

612 Private Hospital 100 sqm GLA

An institution where private medical care is provided. The land-use includes related facilities normally associated with hospitals, including doctor consulting rooms, pharmacies and other medical services. The consulting rooms are those used by doctors whose primary duty is to provide health care at the hospital. Other rooms must be treated as medical consulting rooms.

The specified trip generation rates have been indicated in the table below.

612 Private Hospital					**100 sqm GLA**
Description	AM Peak	PM Peak	Friday PM	Saturday	Sunday
Trip Rate	1.65	1.50	0	0	0
IN/OUT	85:15	20:80	0	0	0

Note: The following assumptions were applied:

1. No reduction factors were applied.
2. GLA's were estimated as 70% of the erf footprint. (i.e., CZIII GLA = 5,270m^2 x 70% = 3,689m^2)

MIXED ZONE II

Based on the Mossel Bay Municipality Integrated Zoning Scheme By-Law, Mixed Zone II is primarily used for light industry and Business premises. The MBIZSBL defines MZII as follows:

"The objective of this zone is to accommodate compatible land uses in previously light industrial areas situated along major corridors and activity nodes."

The THM 17 land use "*Industrial Park*" was allocated towards these erven. The THM17 defines Industrial Parks as follows:

130 Industrial Area (Park) 100 sqm GLA

The industrial land-use includes industries that do not generally provide services directly to the general public. The industrial area or park may also contain related facilities such as services and warehousing. A small amount of retail may be included.

The specified trip generation rates have been indicated in the table below.

130 Industrial Area (Park)					**100 sqm GLA**
Description	AM Peak	PM Peak	Friday PM	Saturday	Sunday
Trip Rate	0.80	0.80	0	0.40	
IN/OUT	70:30	25:75	0	30:70	

Note: The following assumptions were applied:

1. No reduction factors were applied.
2. GLA's were estimated as 70% of the erf footprint. (i.e., MZII GLA = 9,020m^2 x 70% = 6,314m^2)

GENERAL RESIDENTIAL II

Based on the Mossel Bay Municipality Integrated Zoning Scheme By-Law, General Residential Zone II is mainly used for town housing developments and is defined as follows:

> *"The objective of this zone is to encourage residential development of a greater density than for General Residential Zone II, while retaining the emphasis on design coordination and a modest scale in terms of height. This zone has particular location requirements, including proximity to transport and amenities, and should not be randomly located without due consideration of the availability of open space and community facilities. Town housing may be located in and around central business areas, near high density nodes and along activity axis including railway lines and main traffic routes, where flats are often found."*

The TMH land-uses that best fit the ethos of the proposed development is that of "Townhouses". The relevant TMH 17 definition of the land use is listed below:

231 Townhouses (Simplexes and Duplexes) Dwelling Units

Dwelling Units typically provided in clusters or in complexes. Units can be detached or provided within one building structure. Parking is often provided within a communal area.

The resultant trip generation calculation has been indicated in the table below.

231 Townhouses					**1D/Unit**
Description	AM Peak	PM Peak	Friday PM	Saturday	Sunday
Trip Rate	0.85	0.85	0	0.45	0.45
IN/OUT	25:75	70:30	0	50:50	50:50

Note: The following assumptions were applied:

1. No reduction factors were applied.
2. Development density of 35DU/ha was applied to the erf footprint, thus 0.697ha = 24Du

GENERAL RESIDENTIAL III

Based on the Mossel Bay Municipality Integrated Zoning Scheme By-Law, General Residential Zone III is mainly used for flats and is defined as follows:

> *"The objective of this zone is to promote higher density residential development. The dominant use within this zone must be residential, but limited mixed-use development is possible with the Municipality's consent. This zone has particular location requirements, including proximity to transport and amenities, and should not be randomly located without due consideration of the availability of open space and community facilities."*

The TMH land-uses that best fit the ethos of the proposed development is that of "Apartments and Flats". The relevant TMH 17 definition of the land use is listed below:

220 Apartments and Flats Dwelling Units

Dwelling units located in one building. Buildings are normally multi-storied while dwelling units are relatively small in size.

The resultant trip generation calculation has been indicated in the table below.

220 Apartments and Flats					**1D/Unit**
Description	AM Peak	PM Peak	Friday PM	Saturday	Sunday
Trip Rate	0.20	0.30	0	0.15	0.15
IN/OUT	25:75	65:35	0	50:50	50:50

Note: The following assumptions were applied:

1. No reduction factors were applied.
2. Development density of 50 DU/ha was applied to the erf footprint, thus 0.653ha = 33Du

The trip generation potential of the total development can therefore be estimated as indicated in Table 8-1.

Description	TMH 17	Size (m^2 or DU)	Weekday AM		Weekday PM		Saturday	
			In	Out	In	Out	In	Out
BZI Zone	770 Business Centre	25228	322	57	76	303	0	0
BZIV Zone	710 Office	1879	34	6	8	32	5	4
CZIII Zone	612 Private Hospital	3689	37	24	22	33	0	0
MXII Zone	130 Industrial Area (Park)	6314	35	15	13	38	8	18
GRII Zone	231 Townhouses (simplex and Duplex)	24	5	15	14	6	5	5
GRIII Zone	220 Apartments and Flats	33	5	16	15	6	6	6
Sub Total			438	134	148	418	23	33
Total			571		566		56	

Table 8-1 - Trip Generation Potential

8.2 EXISTING LAND USE

The current impact of the exist single residential dwelling unit was ignored in the new trip generation calculations.

8.3 TRAFFIC DISTRIBUTION

Traffic distribution has been determined based on the actual traffic volumes counted at the various intersections. The AM and PM peak hour distributions and volume calculations have been indicated schematically in Figure A and Figure B in **ANNEXURE E**

9 INTERSECTION OPERATIONAL ANALYSES

The operational analysis was done with the "SIDRA INTERSECTION 9.1" (version 9.1.3) computer aided software that is developed specifically for traffic engineering capacity analysis. When elements of a road network such as intersections are analysed, their operating conditions are described in terms of Level of Service (LOS). The six letters from A to F are used to indicate different LOS. LOS A indicates very low traffic flows with correspondingly low delays. LOS E reflects capacity conditions, with high delays and unstable flow. LOS F reflects conditions where traffic demand exceeds capacity and traffic experiences congestion and delays. Generally, LOS A to D is considered acceptable in accordance with international standards. LOS E and F on the other hand are considered to be unacceptable.

The Average Delay is the delay (in seconds) that a motorist is likely to experience on an approach to the junction, while waiting for the junction to clear or other vehicles to manoeuvre. A further measure of the operating conditions at any point in a road network is the volume to capacity ratio (v/c). As the name implies it is the traffic demand volume divided by the available capacity of the road element. Generally, ratios of up to approximately 0.9 are internationally considered acceptable. Values exceeding 1.0 implies saturation of the facility.

It is important to note that trip reduction or SIDRA calibration factors were not applied to help improve the LOS of any of the analysed intersections. Vehicle Movement Data for heavy and light vehicles were left as per the default SDIRA default settings.

From South to Exit:	W	N	E
	L2	T1	R2
Queue Space	7,0 m	7,0 m	7,0 m
Vehicle Length	4,5 m	4,5 m	4,5 m
Vehicle Occupancy (pers/veh)	1,2	1,2	1,2
Extra Midblock Delay			
Turning Vehicle Effect	Factor	Factor	Factor
Turning Vehicle Factor	1,05	1,0	1,05
Turn Radius			
Gap Acceptance Factor	1,0	1,0	1,0
Opposing Vehicle Factor	1,0	1,0	1,0
Prac. Deg. of Saturation	Program	Program	Program

CALIBRATION FACTORS - LIGHT VEHICLES

From South to Exit:	W	N	E
	L2	T1	R2
Queue Space	13,0 m	13,0 m	13,0 m
Vehicle Length	10,0 m	10,0 m	10,0 m
Vehicle Occupancy (pers/veh)	1,2	1,2	1,2
Extra Midblock Delay			
Turning Vehicle Effect	Factor	Factor	Factor
Turning Vehicle Factor	1,09	1,0	1,09
Turn Radius			
Gap Acceptance Factor	1,5	1,5	1,5
Opposing Vehicle Factor	1,5	1,5	1,5
Prac. Deg. of Saturation	Program	Program	Program

CALIBRATION FACTORS - HEAVY VEHICLES

Figure 9-1 - SDIRA Default Calibration Settings

The SIDRA analysis was performed for the following scenarios:

- **Status Quo:** The background traffic volumes were determined by means of manual traffic counting. These represent the actual volumes that are present on the road network.

- **No-Go Scenario:** A growth factor was applied to account for regional growth and the volumes were escalated up to the year 2028. This analysis indicates the traffic situation 5 years from now, but without the inclusion of the proposed development.

- **Operational Traffic** were estimated for the proposed development. The operational traffic volumes were added to the 2028 future traffic volumes to form the basis of the analysis, should the development be allowed to continue.

The "Status Quo" and "No-Go" analysis that follows, were based on the intersection layouts indicated in Section 5.2 of this report. The intersections were linked in SIDRA to create a network layout as indicated in Figure 9-2

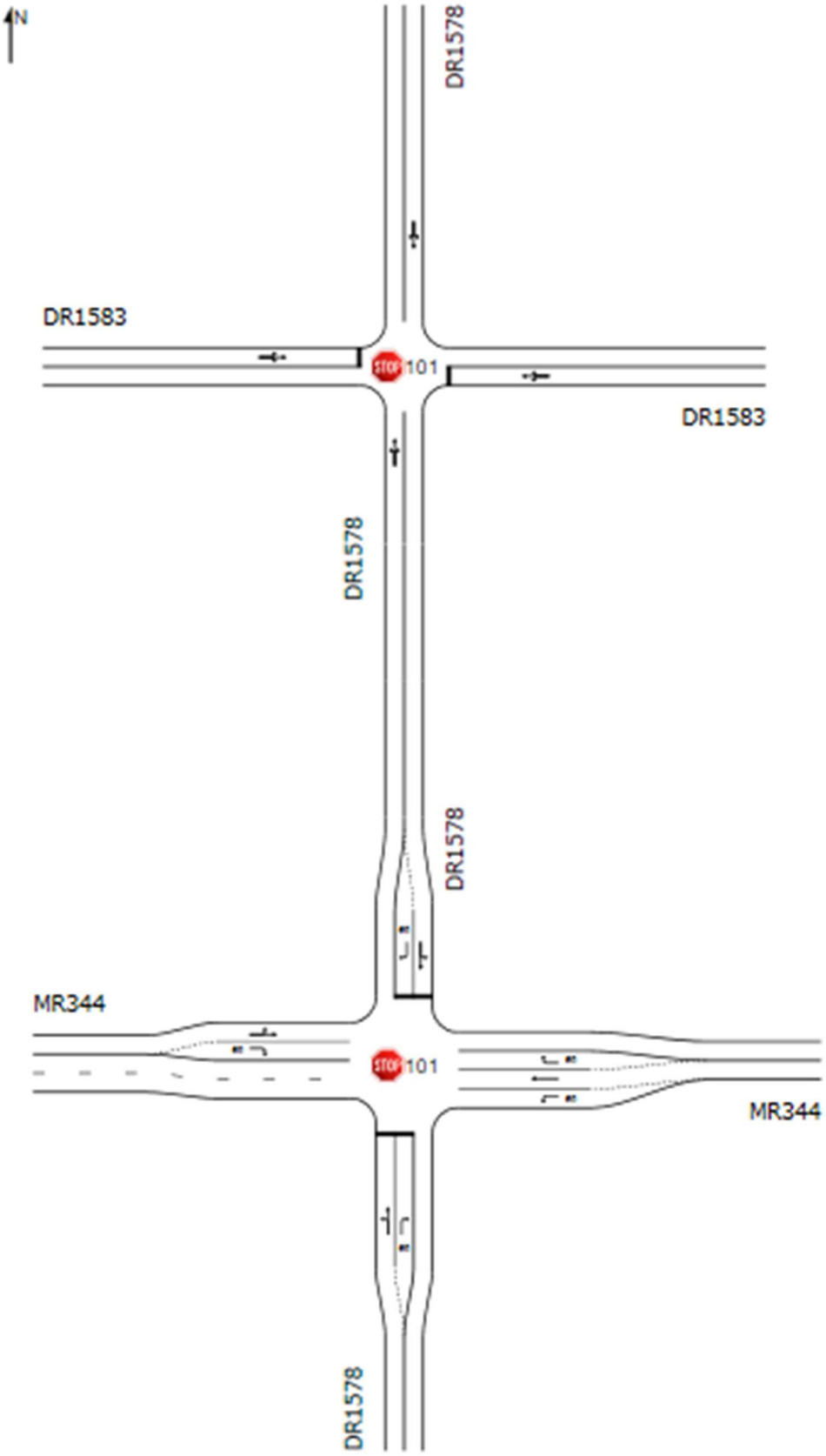


Figure 9-2 - Network Layout for Status Quo Analysis

9.1 STATUS QUO

The current Weekday AM and PM Peak hour traffic volumes were used to calculate the Status Quo operational analysis. The results of the SIDRA Analysis have been attached as **ANNEXURE F** to this report, but has been summarised in the tables below:

INTERSECTION	APPROACH	MOVEMENT	2023 WEEKDAY AM				2023 WEEKDAY PM			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/DR1583	DR1578 (Southern Approach)	Left	A	5.8	0.077	0.2	A	5.5	0.073	0.1
		Through	A	0.0			A	0.0		
		Right	A	6.5			A	6.4		
	DR1583 (Eastern Approach)	Left	A	8.5	0.017	0.1	A	8.4	0.023	0.1
		Through	A	9.0			A	8.9		
		Right	A	9.0			A	8.9		
	DR1578 (Northern Approach)	Left	A	5.5	0.073	0.0	A	5.7	0.063	0.0
		Through	A	0.0			A	0.0		
		Right	A	5.8			A	5.9		
	DR1583 (Western Approach)	Left	A	8.4	0.010	0.0	A	8.4	0.005	0.0
		Through	A	9.0			A	8.8		
		Right	B	12.3			A	8.9		

Table 9-1 - DR1578/DR1583 LOS (Status Quo)

INTERSECTION	APPROACH	MOVEMENT	2023 WEEKDAY AM				2023 WEEKDAY PM			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/MR344	DR1578 (Southern Approach)	Left	A	8.3	0.253	1.0	A	9.7	0.150	0.5
		Through	B	12.2			B	14.3		
		Right	B	12.7			B	14.2		
	MR344 (Eastern Approach)	Left	A	5.5	0.035	0.1	A	5.6	0.081	0.1
		Through	A	0.0			A	0.0		
		Right	A	6.3			A	6.3		
	DR1578 (Northern Approach)	Left	A	9.9	0.209	0.8	A	8.4	0.241	0.9
		Through	B	12.3			B	14.2		
		Right	B	13.7			C	15.6		
	MR344 (Western Approach)	Left	A	5.6	0.112	0.1	A	5.7	0.092	0.1
		Through	A	0.0			A	0.0		
		Right	A	5.9			A	7.0		

Table 9-2 - DR1578/MR344 LOS (Status Quo)

9.2 NO GO SCENARIO (ESCALATED 2028 TRAFFIC VOLUMES)

In order to estimate the future (2028) traffic volumes for the No-Go Scenario, the 2023 Status Quo Peak Hour traffic volumes were further increased with an annual growth factor. Reference is made to the South African Department of Transport's Manual for Traffic Impact Studies (DoT, October 1995) which provides a table with typical growth rates. This document recognises that the method for determining traffic growth is important, but also states that there are a number of factors which influence the traffic growth rate. The approach is therefore to classify the study area with a low, average, high or extremely high growth rate. The typical growth rates are indicated in Table 9-3.

Category	Yearly Growth Rate (%)
Low	0-2.5
Average	2.5-3.5
High	3.5-6
Exceptionally high	>6

Table 9-3 - Typical Traffic Growth Rates

Based on the growth within the Western Cape region, it was decided to apply a fairly conservative 3% annual growth rate to the Status Quo traffic volumes.

The estimated 2028 traffic volumes (for the No-Go Scenario) were calculated according to the equation below:

$$F = P \times (1 + i)^n$$

Where: F = Future Trips
P = Present Trips
n = 5 years
i = 3% Growth

The escalated (2028) background traffic volumes have been attached as **Figure C** in **ANNEXURE E**. This scenario was tested and analysed in SIDRA to determine the Level of Service (both AM and PM peak hour periods) of the various intersections, should the proposed development not take place.

The results of the analyses have been attached as **ANNEXURE F**, but a summary of the findings has been included in Table 9-4 and Table 9-5.

INTERSECTION	APPROACH	MOVEMENT	2028 WEEKDAY AM				2028 WEEKDAY PM			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/DR1583	DR1578 (Southern Approach)	Left	A	5.8	0.091	0.2	A	5.5	0.085	0.1
		Through	A	0.0			A	0.0		
		Right	A	6.7			A	6.5		
	DR1583 (Eastern Approach)	Left	A	8.6	0.021	0.1	A	8.5	0.028	0.1
		Through	A	9.3			A	9.1		
		Right	A	9.3			A	9.2		
	DR1578 (Northern Approach)	Left	A	5.5	0.084	0.0	A	5.7	0.073	0.0
		Through	A	0.0			A	0.0		
		Right	A	5.9			A	6.0		
	DR1583 (Western Approach)	Left	A	8.4	0.013	0.0	A	8.5	0.005	0.0
		Through	A	9.2			A	9.0		
		Right	B	12.9			A	9.2		

Table 9-4 - DR1578/DR1583 LOS (2028 NO-GO)

INTERSECTION	APPROACH	MOVEMENT	2028 WEEKDAY AM				2028 WEEKDAY PM			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/MR344	DR1578 (Southern Approach)	Left	A	8.4	0.321	1.5	A	9.9	0.197	0.7
		Through	B	13.3			C	16.1		
		Right	B	14.6			C	15.8		
	MR344 (Eastern Approach)	Left	A	5.5	0.040	0.1	A	5.6	0.094	0.1
		Through	A	0.0			A	0.0		
		Right	A	6.4			A	6.5		
	DR1578 (Northern Approach)	Left	B	10.1	0.269	1.1	A	8.5	0.317	1.4
		Through	B	13.2			C	15.9		
		Right	C	15.6			C	18.5		
	MR344 (Western Approach)	Left	A	5.6	0.131	0.1	A	5.7	0.107	0.1
		Through	A	0.0			A	0.0		
		Right	A	6.0			A	7.3		

Table 9-5 - DR1578/MR344 LOS (2028 NO-GO)

9.3 OPERATIONAL PHASE TRAFFIC

In order to determine the impact of the proposed development on the surrounding road network, the trip generation potential of the proposed development was added to the future 2028 background traffic volumes. The final traffic volumes can be seen in **Figure E** in **ANNEXURE F**. The results of the SIDRA analysis have been summarized below.

INTERSECTION	APPROACH	MOVEMENT	2028 + GENERATED WEEKDAY AM				2028 + GENERATED WEEKDAY PM			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/DR1583	DR1578 (Southern Approach)	Left	A	5.8	0.121	0.3	A	5.5	0.168	0.3
		Through	A	0.0			A	0.0		
		Right	A	8.1			A	6.9		
	DR1583 (Eastern Approach)	Left	A	9.2	0.039	0.1	A	8.6	0.052	0.2
		Through	B	10.7			B	10.5		
		Right	B	11.0			B	10.7		
	DR1578 (Northern Approach)	Left	A	5.5	0.153	0.0	A	5.7	0.088	0.0
		Through	A	0.0			A	0.0		
		Right	A	5.9			A	7.4		
	DR1583 (Western Approach)	Left	A	8.6	0.030	0.1	A	9.0	0.011	0.0
		Through	B	10.5			B	10.2		
		Right	B	14.6			B	10.9		

Table 9-6 - DR1578/DR1583 LOS (Development + Escalated 2028 Volumes)

INTERSECTION	APPROACH	MOVEMENT	2028 + GENERATED WEEKDAY AM				2028 + GENERATED WEEKDAY PM			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/MR344	DR1578 (Southern Approach)	Left	B	11.2	0.466	19.6	B	10.3	0.274	1.2
		Through	C	22.6			C	18.6		
		Right	C	18.6			C	19.0		
	MR344 (Eastern Approach)	Left	A	5.5	0.091	4.4	A	5.6	0.094	0.2
		Through	A	0.0			A	0.0		
		Right	A	6.9			A	6.5		
	DR1578 (Northern Approach)	Left	B	10.0	0.674	4.1	A	8.6	1.021	28.9
		Through	C	16.0			C	18.3		
		Right	D	32.9			F	121.9		
	MR344 (Western Approach)	Left	A	5.6	0.179	0.1	A	5.7	0.125	0.1
		Through	A	0.0			A	0.0		
		Right	A	6.0			A	7.2		

Table 9-7 - DR1578/MR344 LOS (Development + Escalated 2028 Volumes)

9.4 SUMMARY OF ANALYSIS

Status Quo

Intersection analysis based on the status quo traffic count revealed that both intersections operate at acceptable Level of Service during both the AM and PM Peak Hour Periods. The turning movement with the worst LOS is the right turn movement from DR1578 into MR344. This movement returned a LOS of C due to a delay of 15.6s and average queue length of 0.9 vehicles. This is mainly attributed to the fairly large percentage heavy vehicles (8% of AADT at DR1578/MR344 intersection and 16,8% of AADT at DR1578/DR1583 intersection) competing with the existing MR344 background traffic volumes.

No Go

The No-Go Scenario was simulated by increasing the Status Quo volumes with a fairly conservative 3% growth rate over a 5-year period. Analysis of the scenario indicates LOS of both intersections remain at an acceptable LOS, but once again the PM peak hour period indicated possible restrictions on the North and South approaches to the DR1578/MR344 intersection. These delays are worse on the Through and Right turn movement of the DR1578 South Bound approach to the MR344 intersection.

Operational Phase

The operational phase analysis made provision for the increase in traffic volumes generated by the proposed Dolphin Circle development. The addition of the new generated traffic to the future background volumes, results in a further reduction in LOS of the DR1578 Northern approaches to the DR1578/MR344 intersection. The worst LOS is expected for the right turn movement of the DR1578 Northern approach to the intersection.

The results of the 2028 (No-Go) and 2028 (Operational Phase) analyses are indicated schematically in Figure 9-3 below. From the comparison it is clear that the LOS of the right turn movement on the Northern Approach to the DR1578/MR344 intersection, reduced to an unacceptable poor LOS F.

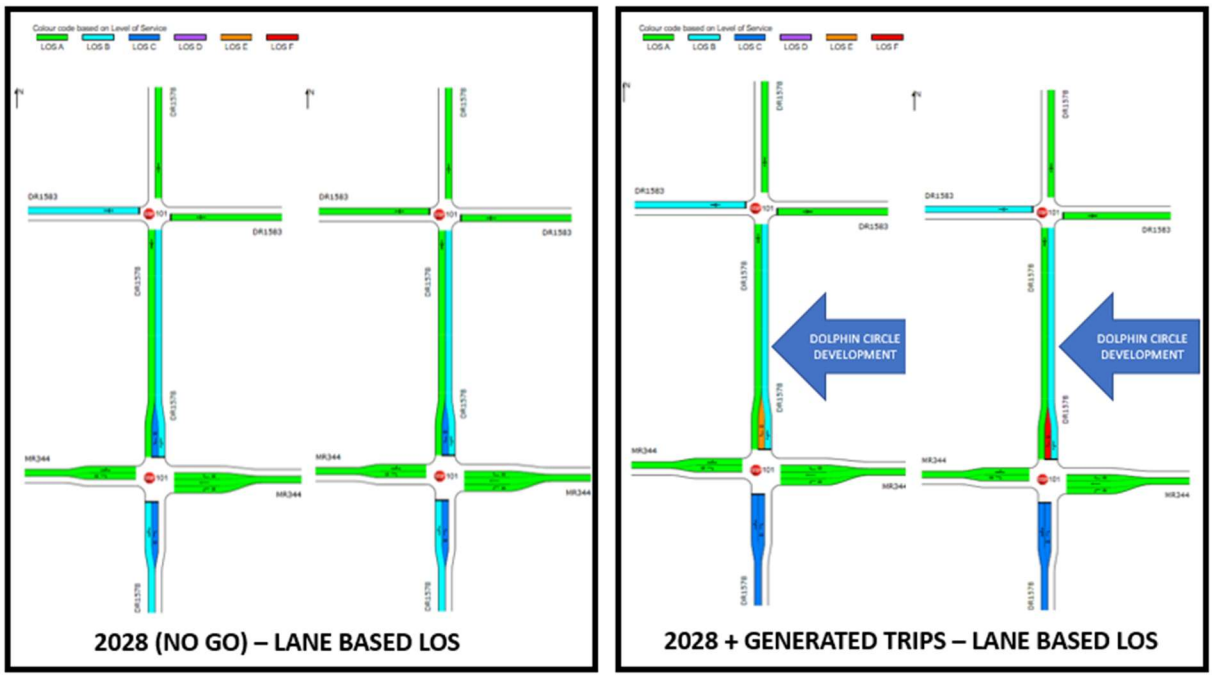


Figure 9-3 - LOS comparison between 2028 (No Go) and 2028 Operational Phase

9.5 SITE ACCESS

The proposed site access layout (refer to Paragraph 6 of this report) was also analyses in SIDRA to evaluate the performance of the proposed intersection layout. Since it is assumed that only access to the West (Dolphin Circle Development) will be required at this stage, the analyses was based on a T-Junction (refer to Figure 9-4).

The results of the AM and PM Peak hour analysis have been attached to **ANNEXURE F**, but a summary of the findings have been included in Table 9-8.

INTERSECTION	APPROACH	MOVEMENT	2021 WEEKDAY NM				2021 SATURDAY PEAK			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/DOLPHIN WAY	**DR1578** (South)	Through	A	0.0	0.224	1.1	A	0.0	0.080	0.3
		Right	A	6.8			A	6.2		
	Dolphin Way (East)	Left	A	8.9	0.214	0.9	A	9.8	0.417	3.6
		Right	C	16.3			B	14.2		
	DR1578 (North)	Left	A	5.6	0.169	0.0	A	5.6	0.107	0.0
		Through	A	0.0			A	0.0		

Table 9-8 - DR1578/PTN115 Access Road LOS (Development + Escalated 2028 Volumes)

The above results are indicated schematically in Figure 9-4.

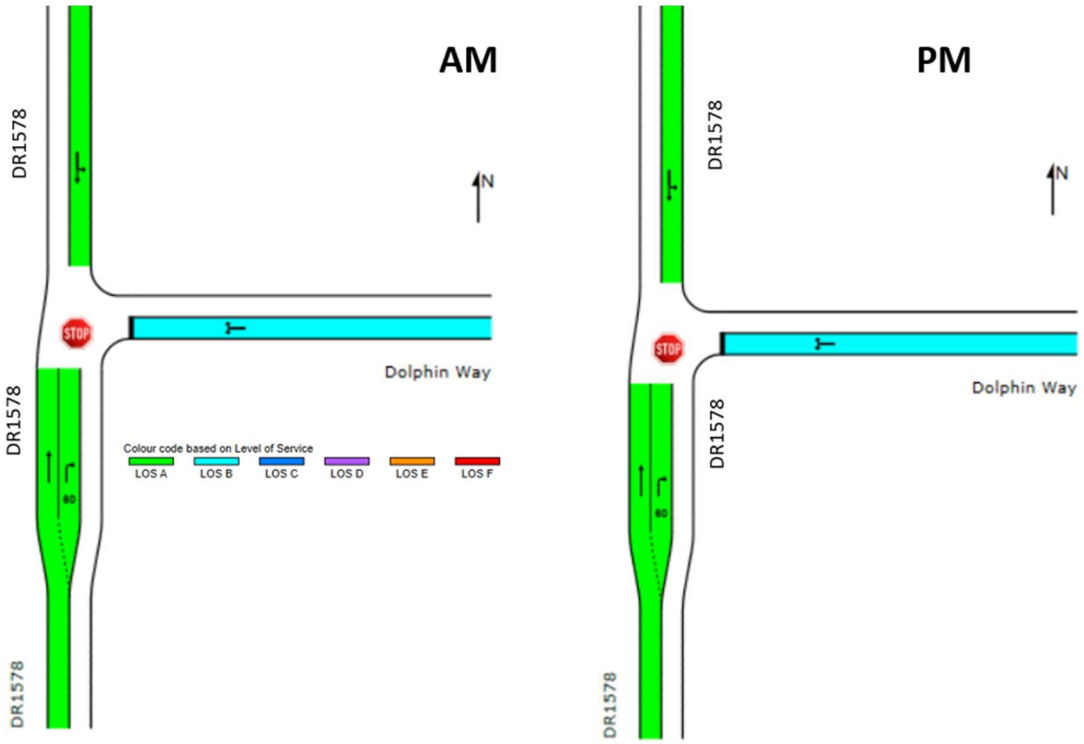


Figure 9-4 - DR1578/Dolphin Way LOS Schematic Representation

10 DEVELOPMENT OF PTN 115 OF FARM 129

The neighbouring erf (PTN115 of Farm 129) has also recently started with the process to obtain approvals for rezoning and development. It is important to align the traffic studies for both developments, in order to provide a complete and holistic view of the future traffic impact.

The development of PTN115 of Farm 129 has been documented in Traffic Impact Assessment Report Number 23-033. Based on report 23-033, the trip generation potential of the neighbouring site can be summarised as follows:

Description	Size	Weekday AM		Weekday PM		Saturday	
		In	Out	In	Out	In	Out
Residential Erven	58 Units	12	37	34	15	13	13
Business Erven	14,017	179	31	42	168	0	0
Sub Total		191	68	76	183	13	13
Total		259		259		26	

Figure 10-1 - PTN115 of Farm 129, Trip Generation Potential

SIDRA Intersection analysis was used to analyse the relevant intersections, taking the future trip trips from both developments into account. Once again, the outputs are included in **ANNEXURE F** but the results have been summarised below:

INTERSECTION	APPROACH	MOVEMENT	2028 + GENERATED WEEKDAY AM				2028 + GENERATED WEEKDAY PM			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/DR1583	**DR1578** (Southern Approach)	Left	A	5.8	0.136	0.3	A	5.5	0.203	0.4
		Through	A	0.0			A	0.0		
		Right	A	8.9			A	7.1		
	DR1583 (Eastern Approach)	Left	A	9.5	0.049	0.2	A	8.6	0.064	0.2
		Through	B	11.4			B	11.2		
		Right	B	11.9			B	11.6		
	DR1578 (Northern Approach)	Left	A	5.5	0.183	0.0	A	5.7	0.095	0.0
		Through	A	0.0			A	0.0		
		Right	A	6.0			A	8.3		
	DR1583 (Western Approach)	Left	A	8.7	0.042	0.1	A	9.2	0.014	0.0
		Through	B	11.3			B	10.9		
		Right	C	16.1			B	11.9		

Figure 10-2 - DR1578/DR1583 LOS (Dolphin Circle + PTN115)

INTERSECTION	APPROACH	MOVEMENT	2028 + GENERATED WEEKDAY AM				2028 + GENERATED WEEKDAY PM			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/MR344	DR1578 (Southern Approach)	Left	C	17.9	0.699	7.0	B	11.2	0.351	1.7
		Through	D	34.1			C	20.8		
		Right	C	20.9			C	20.9		
	MR344 (Eastern Approach)	Left	A	5.5	0.125	4.2	A	5.6	0.094	0.2
		Through	A	0.0			A	0.0		
		Right	A	7.1			A	6.6		
	DR1578 (Northern Approach)	Left	B	10.3	0.977	14.5	A	8.9	1.426	154.1
		Through	C	18.1			C	20.0		
		Right	D	105.7			F	799.4		
	MR344 (Western Approach)	Left	A	5.6	0.200	0.1	A	5.7	0.134	0.1
		Through	A	0.1			A	0.0		
		Right	A	6.0			A	7.2		

Figure 10-3 - DR1578/MR344 LOS (Dolphin Circle + PTN115)

From the above, it follows that the worst LOS is experienced for the right turn movement during the PM peak hour period at the at the DR1578/MR344 intersection (see figure below)

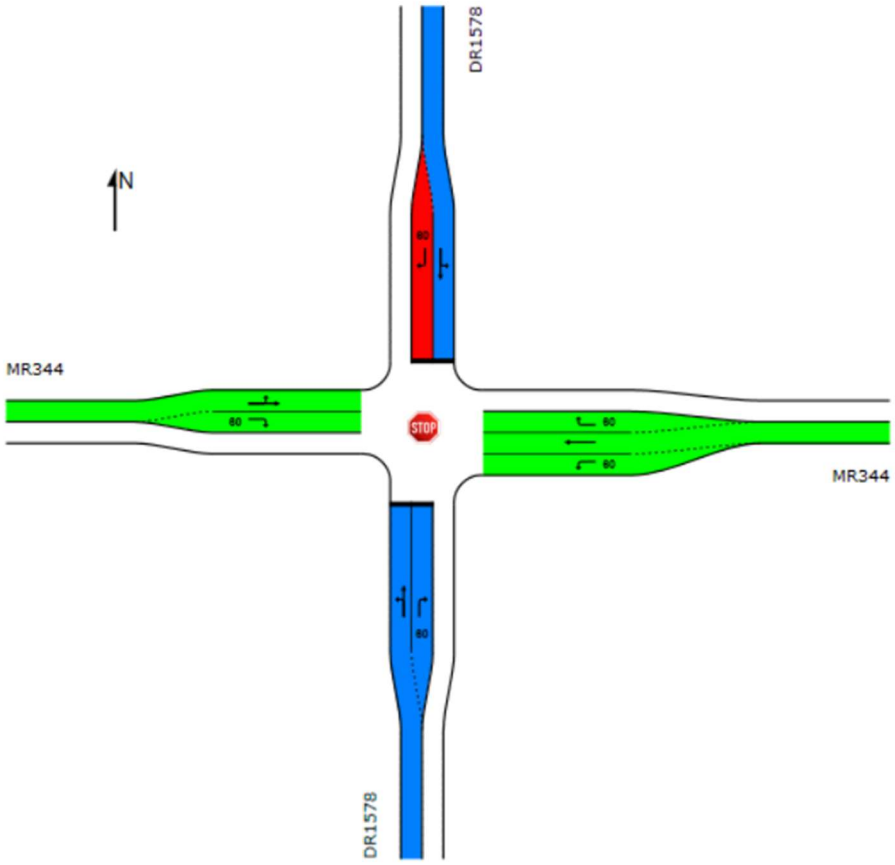


Figure 10-4 - Lane based LOS for DR1578/MR344 during PM Peak hour period

The intersection that will provide access into both PTN115 and Dolphin circle was also analysed as indicated below:

INTERSECTION	APPROACH	MOVEMENT	2028 + GENERATED WEEKDAY AM				2028 + GENERATED WEEKDAY PM			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/SITE ACCESS (DOLPHIN + PTN115)	DR1578 (Southern Approach)	Left	A	5.6	0.226	1.1	A	5.6	0.110	0.3
		Through	A	0.0			A	0.0		
		Right	A	6.9			A	6.2		
	Dolphin Way (Eastern Approach)	Left	B	10.2	0.344	1.7	B	14.5	0.678	9.3
		Through	D	28.9			D	25.3		
		Right	D	28.7			D	28.4		
	DR1578 (Northern Approach)	Left	A	5.6	0.172	0.2	A	5.6	0.109	0.1
		Through	A	0.0			A	0.0		
		Right	A	6.5			A	6.1		
	PTN115 (Western Approach)	Left	A	10.0	0.263	1.0	B	14.2	0.562	3.9
		Through	D	26.8			C	21.4		
		Right	D	29.1			D	32.1		

Figure 10-5 - Site Access LOS (Dolphin Circle + PTN115)

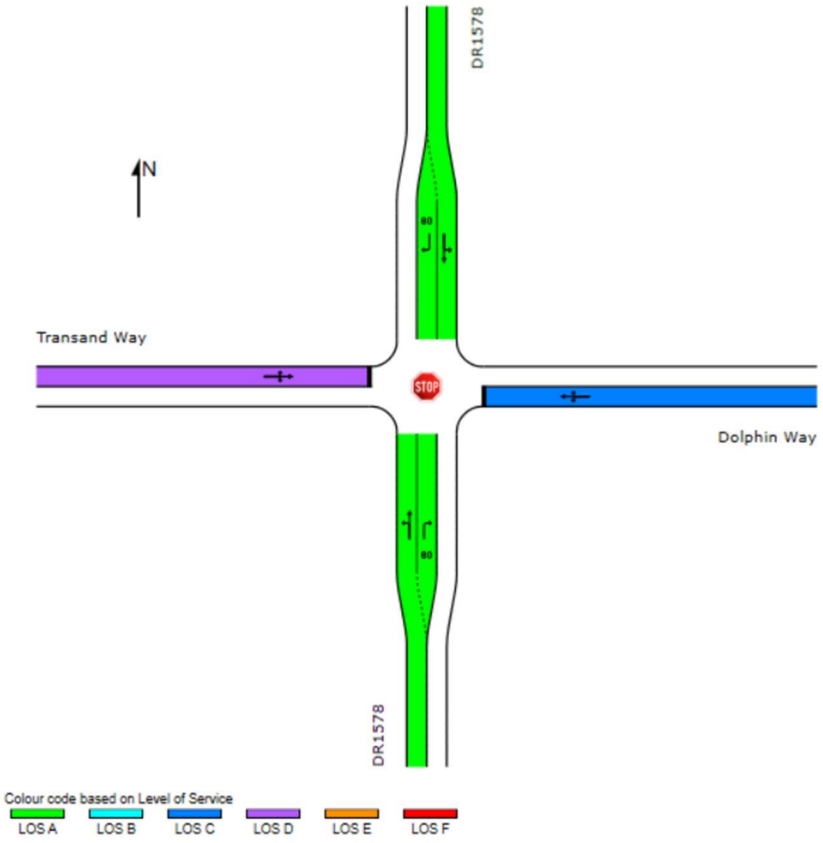


Figure 10-6 - Site Access Lane Based LOS (Dolphin Circle + PTN115)

11 MITIGATION MEASURES

11.1 DR1578/MR344

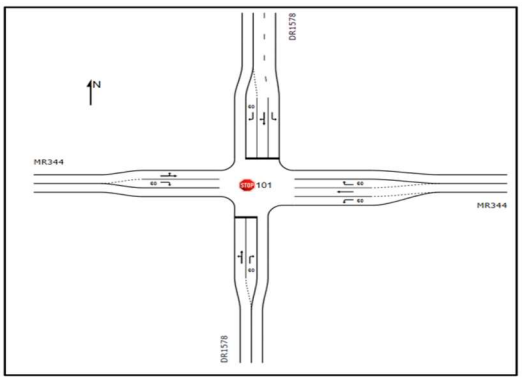
In order to improve the expected LOS of the MR344/DR1578 intersection for the future 2028 scenario, two possible alternative intersection layouts were analysed. All analyses were based on the PM Peak hour period and included generate traffic from both PTN115 and Dolphin Circle.

ADDITIONAL RIGHT TURN CAPACITY ON DR1578

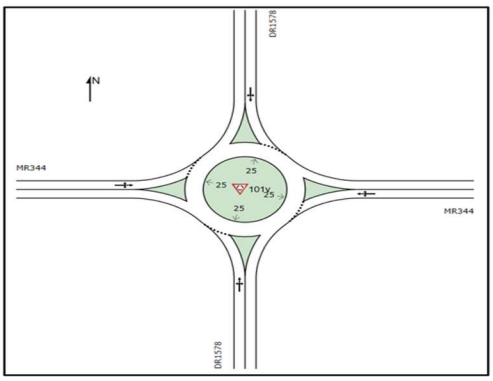
Since the LOS is a function of the relatively large number of heavy vehicles making the right turn movement at the intersection, the introduction of an additional turning lane was simulated.

CONVERSION TO ROUNDABOUT

The future conversion of the MR344/DR1578 intersection into a roundabout. The two options are indicated schematically below.



ADDITIONAL RIGHT TURN CAPACITY ON DR1578



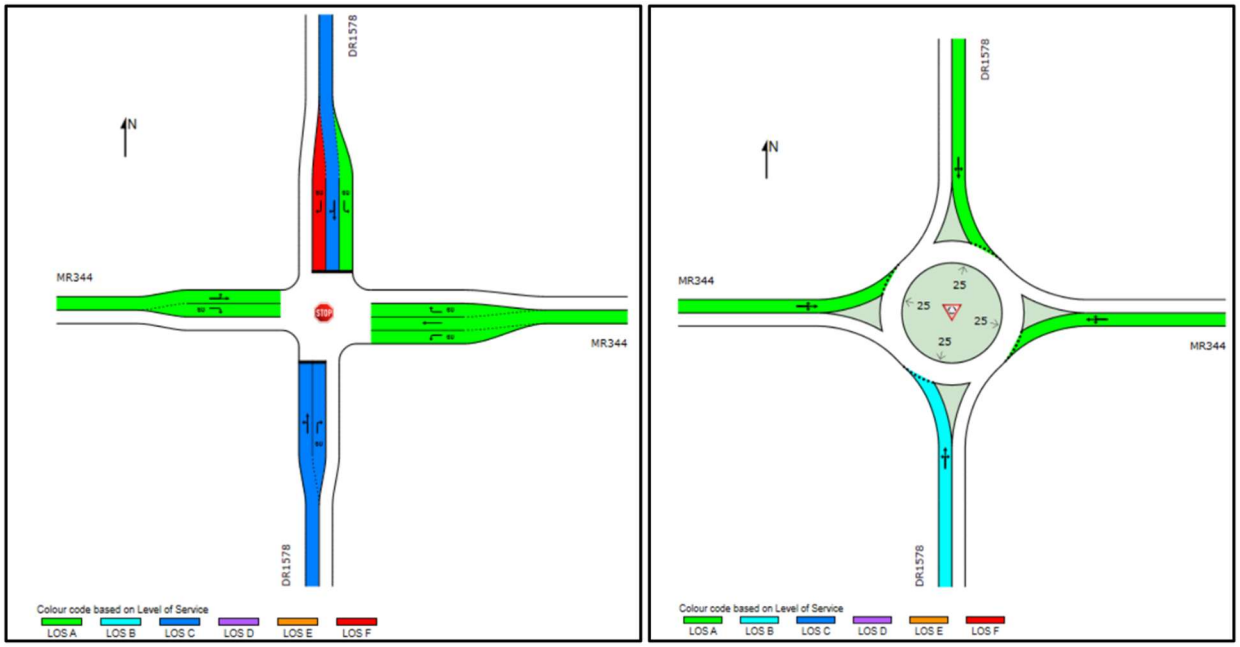
CONVERSION TO ROUNDABOUT

The two above options were analysed based on the future PM peak hour period volumes and the results summarised in Table 11-1 below:

INTERSECTION	APPROACH	MOVEMENT	Additional Turning Lanes				Circle Conversion			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)	LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/MR344	DR1578 (Southern Approach)	Left	B	11.2	0.351	1.7	A	9.1	0.276	1.9
		Through	C	20.8			A	8.6		
		Right	C	21.1			B	13.9		
	MR344 (Eastern Approach)	Left	A	5.6	0.094	0.2	A	9.1	0.516	4.6
		Through	A	0.0			A	9.0		
		Right	A	6.6			B	14.9		
	DR1578 (Northern Approach)	Left	A	8.5	1.396	143.9	A	5.3	0.473	3.9
		Through	C	19.1			A	5.3		
		Right	F	730.8			B	10.8		
	MR344 (Western Approach)	Left	A	5.7	0.134	0.1	A	5.4	0.264	1.8
		Through	A	0.0			A	5.2		
		Right	A	7.2			B	10.8		

Table 11-1 - Comparison of SIDRA results for Mitigation Measures

The results from Table 11-1 have been indicated schematically in Figure 11-1 below.



ADDITIONAL RIGHT TURN CAPACITY ON DR1578 **CONVERSION TO ROUNDABOUT**

Figure 11-1 - Mitigation Measures - Lane LOS

11.2 SITE ACCESS

To improve the LOS of the proposed site access, dedicated turning lanes were introduced as indicated below.

INTERSECTION	APPROACH	MOVEMENT	Dolphin Circle + PTN115 FUTURE WEEKDAY PM			
			LEVEL OF SERVICE (LOS)	AVE DELAY (seconds)	V / C RATIO	AVE QUEUE (veh)
DR1578/SITE ACCESS (DOLPHIN + PTN115)	**DR1578** (Southern Approach)	Left	A	5.6	0.110	0.3
		Through	A	0.0		
		Right	A	6.2		
	Dolphin Way (Eastern Approach)	Left	A	9.1	0.402	2.0
		Through	C	15.9		
		Right	C	18.9		
	DR1578 (Northern Approach)	Left	A	5.6	0.109	0.1
		Through	A	0.0		
		Right	A	6.2		
	PTN115 (Western Approach)	Left	A	8.9	0.498	2.4
		Through	B	14.1		
		Right	D	28.6		

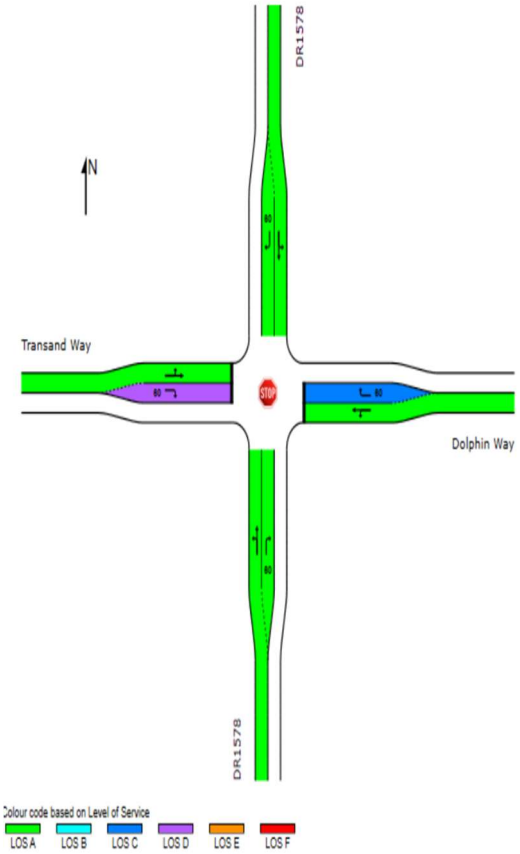
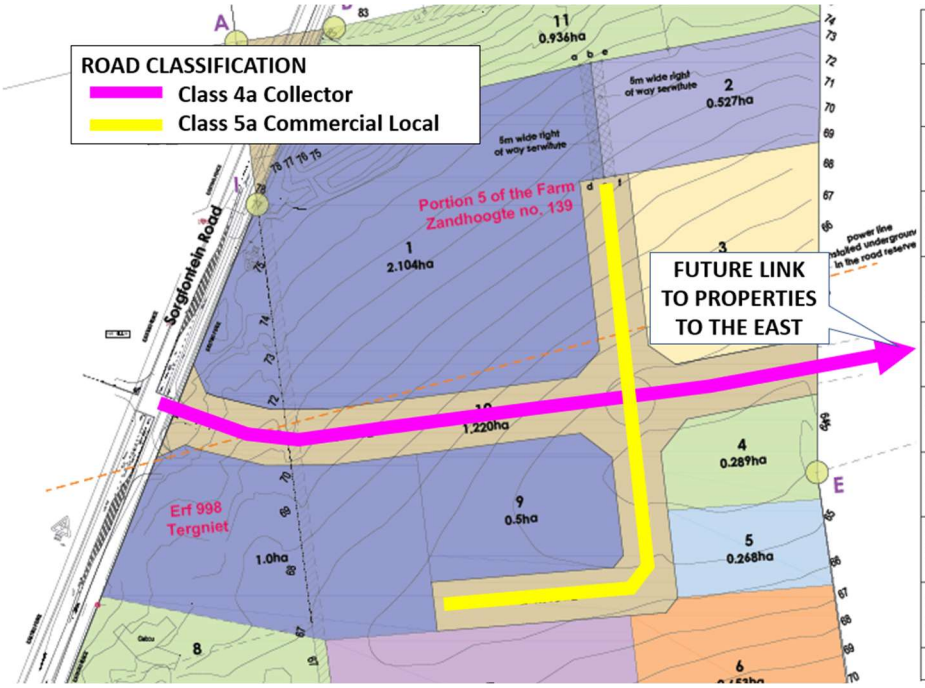


Figure 11-2 - Mitigation Measures for Site Access

12 INTERNAL ROAD NETWORK

12.1 FUNCTIONAL CLASSIFICATION

Based on their intended function, the internal road network can be classified as per Figure 12-1.



Table

Zoning	Colour Notation	Size (ha)	%
Business Zone I (BZI)		3.604	35.21
Business Zone IV (BZIV)		0.268	2.62
Community Zone III (CZIII)		0.527	5.15
Mixed Zone II (MZII)		0.902	8.81
Open Space II (OSZII)		2.225	21.74
General Residential Zone II (GRZII)		0.697	6.81
General Residential Zone III (GRZIII)		0.653	6.38
Transport Zone II (TZII)		1.360	13.29
Total		10.236	100

Figure 12-1 - Proposed Internal Road Classification

The proposed road classifications are defined in the TMH 26 (Road Classification and Access Management Manual) as follows:

Class 4a Commercial (major) collector street

These collectors are found in areas with commercial, business, industrial, shopping and mixed-use residential developments. The streets carry a high percentage of heavy vehicle traffic and public transport. Typical commercial collectors are CBD streets (whether two-way or one-way), shopping centre streets, activity spines and industrial distributors.

Traffic volumes on the collectors vary greatly depending on their location. In busy shopping areas, the collectors can carry up to 25 000 vehicles or even more per day. The lengths of the roads should be limited to a maximum of about 2 km or 3 km if no through traffic is present.

Class 5a Commercial local street

These local streets are found in areas with commercial, business, industrial, shopping and mixed-use residential developments. The streets often carry a high percentage of heavy vehicle traffic which uses the street to access loading areas or bus stops.

Commercial local streets should not carry volumes of more than about 5 000 vehicles per day. The length of the street should be limited to a maximum of about 1 km.

The typical road reserves indicated in TMH26 have been included as Figure 12-2 below.

Class	Rural		Urban	
	Typical	Range	Typical	Range
Class 1	62	60 – 80	60	60 – 120
Class 2	48	40 – 70	40	38 – 62
Class 3	30	30 – 50	30	25 – 40*
Class 4a	25	-	25	20 – 40
Class 4b			20	16 – 30
Class 5a	20	-	22	15 – 25
Class 5b			14**	10 – 16

* Reserve up to 62 m is required to allow for Strategic Bus Rapid Transit (BRT).

** Reserve of 10.5 m is typical if street is less than 100 m long.

Figure 12-2 - Typical Road Reserve widths according to TMH26

12.2 VERTICAL CURVES

The minimum rate of vertical curvature is determined by sight distance as well as by considerations of comfort of operation and aesthetics. The sight distance most frequently employed is the stopping sight distance measured from an eye height of 1.05m to an object height of 0.15m. In the case of sag curves, the sight distance is replaced by headlight illumination distance of the same magnitude, assuming headlight height of 0.6m and a divergence angle equal to 1 degree above the longitudinal axis of the headlights. Based on both the UTG 1 (Geometric Design of Urban Arterial Roads) and UTG 5 (Geometric Design of Urban Collector Roads) guidelines, values of K (based on stopping sight distance in the case of crest curves and headlight illumination distance in the case of sag curves) are given in Table 12-1

Minimum Values of K for Vertical Curves				
Design Speed (Km/h)	Stopping sight Distance (m)	Crest	K	
			Sag	
			Headlight	Comfort
60	80	16	17	8
80	115	33	31	16
100	155	60	52	25
120	210	110	60	30

Table 12-1 - Minimum Values of K for Vertical Curves

The minimum lengths of vertical curves are indicated in Table 12-2 below:

Minimum lengths of vertical curves	
Design Speed (km/h)	Length of Curve (m)
60	100
80	140
100	180
120	220

Table 12-2 - Minimum lengths of vertical curves

12.3 HORIZONTAL CURVATURE

Based on both the UTG 1 (Geometric Design of Urban Arterial Roads) and UTG 5 (Geometric Design of Urban Collector Roads) guidelines, the recommended design practice is to use large radius curves without superelevation as far as possible. However, where large radius curves are not possible, superelevation can be introduced to offset the side friction forces of smaller radius curves. The following table should be used as guideline:

Minimum Radius for Horizontal Curves (m)						
Design Speed (Km/h)	Side Friction Factor (f)	Minimum radius for maximum superelevation rates (e)				
		-0.02	0	+0.02	+0.04	+0.06
60	0.15	220	190	170	150	135
80	0.14	425	365	315	280	255
100	0.13	-	610	530	465	420

Table 12-3 - Minimum Radius for Horizontal Curves

12.4 MAXIMUM AND MINIMUM GRADIENTS

The speed of passenger cars is relatively unaffected by gradient and the horizontal alignment will tend to govern the selection of speed. Truck speeds are however markedly affected by gradient. Based on both the UTG 1 (Geometric Design of Urban Arterial Roads) and UTG 5 (Geometric Design of Urban Collector Roads) guidelines, maximum gradients for different speeds and types of topography are suggested in Table 12-4. It must be stressed that these are guidelines only and factors such as provision of auxiliary lanes and whole life economy of the road may suggest some other gradient.

Where two roads intersect, the numerical sum of the gradients should not exceed 8% with a maximum gradient of 6% on either roadway.

Maximum Gradients in %			
Design Speed (Km/h)	Topography		
	Flat	Rolling	Mountainous
50	8	9	11
60	7	8	10
80	6	7	9
100	4	5	6

Table 12-4 - Maximum Gradients in %

In order to ensure effective stormwater flow, a minimum gradient of 1:200 (0.5%) should be adhered to as far as possible.

12.5 PARKING PROVISION

The Mossel Bay Integrated Zoning Scheme By-Law should be used to determine the parking requirements of the various land uses. It is important to note that the MBIZSBL does not make provision for on-street parking and parking should be provided on the property for which parking is required.

SITE ACCESS AND EXIT

Based on the MBIZSBL, vehicle entrances and exit ways to and from a property must conform to the following requirements:

a) motor vehicle carriageway crossings must be limited to one per site per public street or road abutting the site;

b) despite paragraph *(a)*, where the total length of any street boundary of a site exceeds 30 metres in length, one additional carriageway crossing may be permitted, provided that no two carriageway crossings are closer than 12 metres to each other; and

c) the minimum and maximum widths of motor vehicle carriageway crossings must be in accordance with the table, titled "Width of motor vehicle carriageway crossings".

d) the minimum width of a panhandle access may not be less than 4 metres wide.

Width of motor vehicle carriageway crossing must comply to the table below:

Type of carriageway crossing	Minimum width	Maximum width
Single entrance or exit way	2,7 metres	4,0 metres
Combined entrance and exit way	5,0 metres	8,0 metres

PARKING LAYOUT REQUIREMENTS

The following parking layout requirements apply unless otherwise stated in the zoning scheme:

a) parking layout configurations, minimum dimensions and ramps to a parking area must be in accordance with this zoning scheme or an approved site development plan;

b) the layout of any parking area, except for parking in Single Residential Zone I, Single Residential Zone III and General Residential Zone I, must ensure that vehicles can readily leave the site without reversing across the sidewalk, unless otherwise approved by the Municipality;

c) a tandem bay accommodating two motor vehicles is regarded as one bay for the purposes of this zoning scheme, except for single residential zones, where a tandem bay is regarded as two bays;

d) visitor parking bays must be clearly demarcated, readily visible and accessible to visitors, and preferably grouped together;

e) parking areas must be used for the parking of vehicles which are lawfully allowed on them, and any activity which causes an obstruction for vehicular traffic or pedestrian use of the sidewalk is prohibited;

f) parking areas must be constructed and maintained in a state suitable for the parking and movement of vehicles;

g) control of access to and reservation of parking bays and / or areas is not permitted unless written approval has been obtained from the Municipality, either through an approved site development plan or other written approval

12.6 PEDESTRIAN WALKWAYS AND FURNITURE ZONES

Where practically possible, the walkway should not be placed directly up against the road edge, but a furniture zone should be created between the road edge and the sidewalk, increasing the safety of those making use of the walkways. This notion is further advocated in The Neighbourhood Planning and Design Guide (Department of Human Settlements, July 2019) also known as "The Red Book" in which the cross section included as Figure 12-3 is proposed.

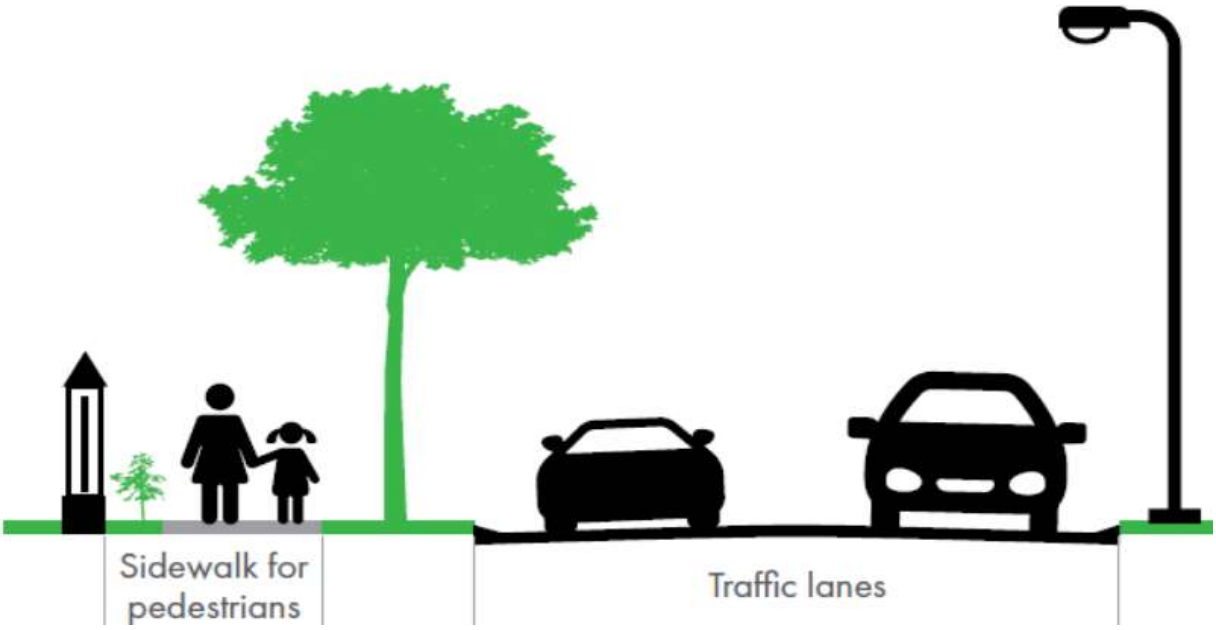


Figure 12-3 - Proposed Cross Section

13 SUMMARY

The various components of this Transportation Investigation can be summarised as follows:

1. It is the intention of 3MP Sales and Services to consolidate, sub-divide and rezone Erf 998 Tergniet and PTN 5 of Farm Zandhoogte No. 139, Mossel Bay in order to create a new mixed-use development. The development is known as the Dolphin Circle Development.
2. The proposed SDP makes provision for various land uses as summarised in the table below.

LAND USE DESCRIPTION	ABREVIATION	SIZE (ha)
Business Zone I	BZI	3.604
Business Zone IV	BZIV	0.268
Community Zone III	CZIII	0.527
Mixed Zone II	MZII	0.902
Open Sace II	OSZII	2.225
General Residential Zone II	GRZII	0.697
General Residential Zone III	GRZIII	0.653

3. Ste access is proposed directly via DR1578, which also forms the Western Property boundary.
4. The position of the new DR1578 site access is a function of intersection spacing, Shoulder Sight distance and geometric design requirements. The site is constraint by the existing N2 overpass

to the north and the existing MR344 intersection to the south. An investigation into the position for the new Site Access Road revealed that the best suited position is approximately 220m north of the existing MR344 intersection.

5. The new Dolphin Circle site access will also have to provide access to the neighbouring erven (PTN115) towards the west of DR1578. To protect mobility along DR1578, the future intersection layout must include dedicated right turn lanes for both DR1578 approaches.
6. Background traffic counts were recorded at both the DR1578/DR1583 and DR1578/MR334 intersection. Counts were recorded over a 12-hour period on Tuesday 14 March 2023. Traffic count data has been attached as **ANNEXURE D** to this report. The traffic count revealed relatively large percentages of heavy traffic (8% of AADT at DR1578/MR344 intersection and 16,8% of AADT at DR1578/DR1583 intersection) passing through the intersections.
7. Based on the COTO TMH17 guidelines, the development has the potential to generate up to 571 trips (IN and OUT) during the Weekday AM- and 566 trips during the Weekday PM Peak Hour Periods. Since the exact development particulars are not yet know, no reduction factors were applied to the trip generation rates. The trip distributions are based on the actual traffic count data and has been attached as **ANNEXURE E** to this report.
8. Due to the relatively large percentage of heavy vehicles, the SIDRA analysis returned lower than expected LOS specifically for the South Bound approaches to the two intersections.
9. Analysis of the future "No-Go" scenario indicates that at a fairly conservative 3% growth rate, the right turn movement of the South Bound approach to the DR1578/MR344 intersection will reduce to a LOS C even without the proposed Dolphin Circle development.
10. The addition of the newly generated Dolphin Circle traffic reduced the LOS of the Right turn movement at the DR1578/MR344 (South Bound approach) to an unacceptable poor level F (average delay 121s with 28 vehicle queue length) during the Weekday PM peak hour period.
11. Urban Engineering TIA (Report 23-033) indicate that the future development of PTN115 will add an additional 259 trip during the weekday Peak hour periods.
12. Trips from both Dolphin Circle and PTN115 were added to the future traffic volumes, resulting in a further reduction in the LOS of the south bound approach to the DR1578/MR344 intersection. (Average delay reduced from 121s to 799s. Queue length increased from 28 to 154 vehicles).
13. The following mitigation measures at the DR1578/MR344 intersection were analysed:

    a. Introduction of an additional right turn lane for the DR1578 south bound lane:

    SIDRA analysis returned a slight improvement, in the overall LOS, but the dedicated right turn lane remained at LOS D.

    b. Conversion of the DR1578/MR344 intersection to a roundabout:

    This conversion proved to be the most effective in improving overall LOS of the intersection.

14 RECOMMENDATIONS

Based on the findings of this report, the proposed consolidation, rezoning and subdivision of Erf 998 Tergniet and PTN 5 of Farm Zandhoogte 139 is supported from a traffic and transportation point of view, subject to the following conditions:

1. NEW DR1578 SITE ACCESS

a. The proposed position and design (refer to Section 6) of the DR1578 site access into Dolphin Circle (East) and PTN 115 (West) should be confirmed by the Provincial Road Authority.

b. The new site access should be constructed in full to provide access to both Dolphin Circle and PTN115

c. The cost for the design and construction of the DR1578 Site Access should be divided in a fair and equitable way between the two developers (Dolphin Circle and PTN115) both sides of the DR1578.

d. Minor Road OP6816 should be closed.

2. INTERNAL ROAD NETWORK

a. No driveway access should be allowed along the new proposed Class 4 Collector (see figure below).

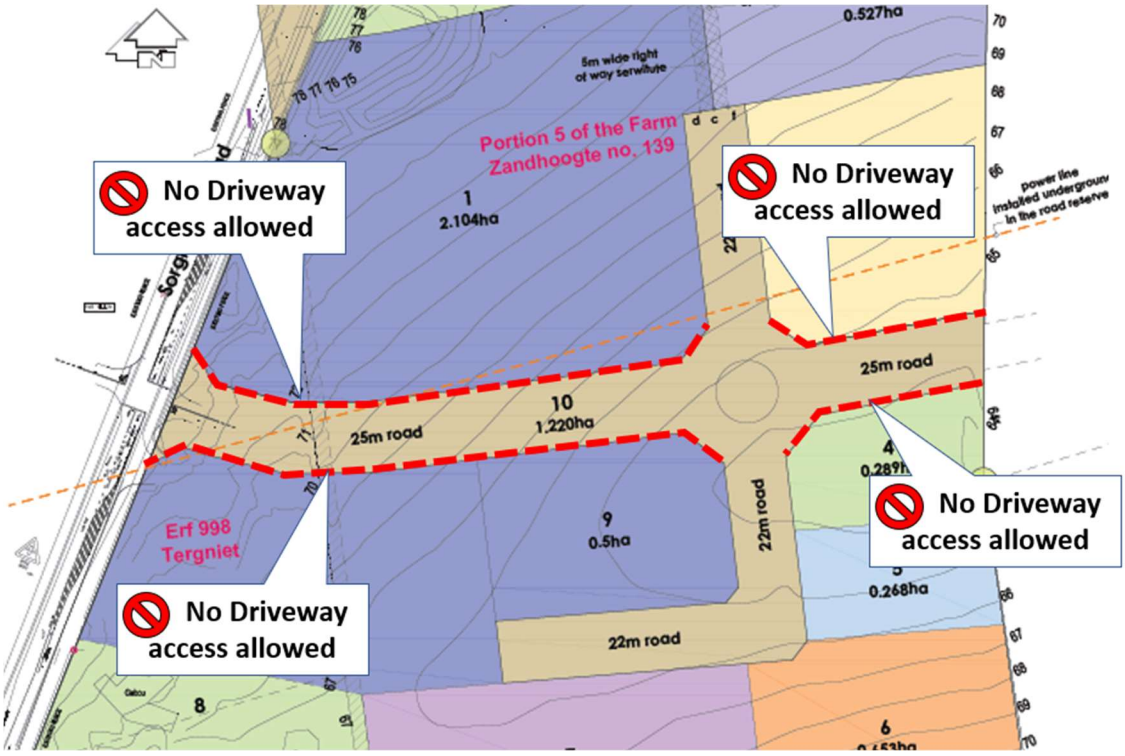


Figure 14-1 - Driveways Management Plan

b. To comply with the requirements of the TMH 26, the road reserve widths should be as indicated below (refer to Figure 12-1 for road classifications):

a) Class 4 Road = 25m

b) Class 5a Road = 22m

3. EXISTING DR1578/MR344 INTERSECTION

a. In order to improve the LOS of the South Bound right turn movement for this intersection, it is recommended that the intersection be converted to a traffic circle (roundabout).
b. A preliminary design of the traffic circle must be undertaken to ensure that there is sufficient road reserve to accommodate the new proposed circle. It is envisaged that this new circle can be based on the design parameters (ICD and lane widths) of the traffic circle recently constructed at the intersection of MR344/TR209/MR348 in Groot Brak River.
c. The cost for the design and construction of the new proposed traffic circle should be divided in a fair and equitable way between the two developers (Dolphin Circle and PTN115) both sides of the DR1578.

4. GENERAL

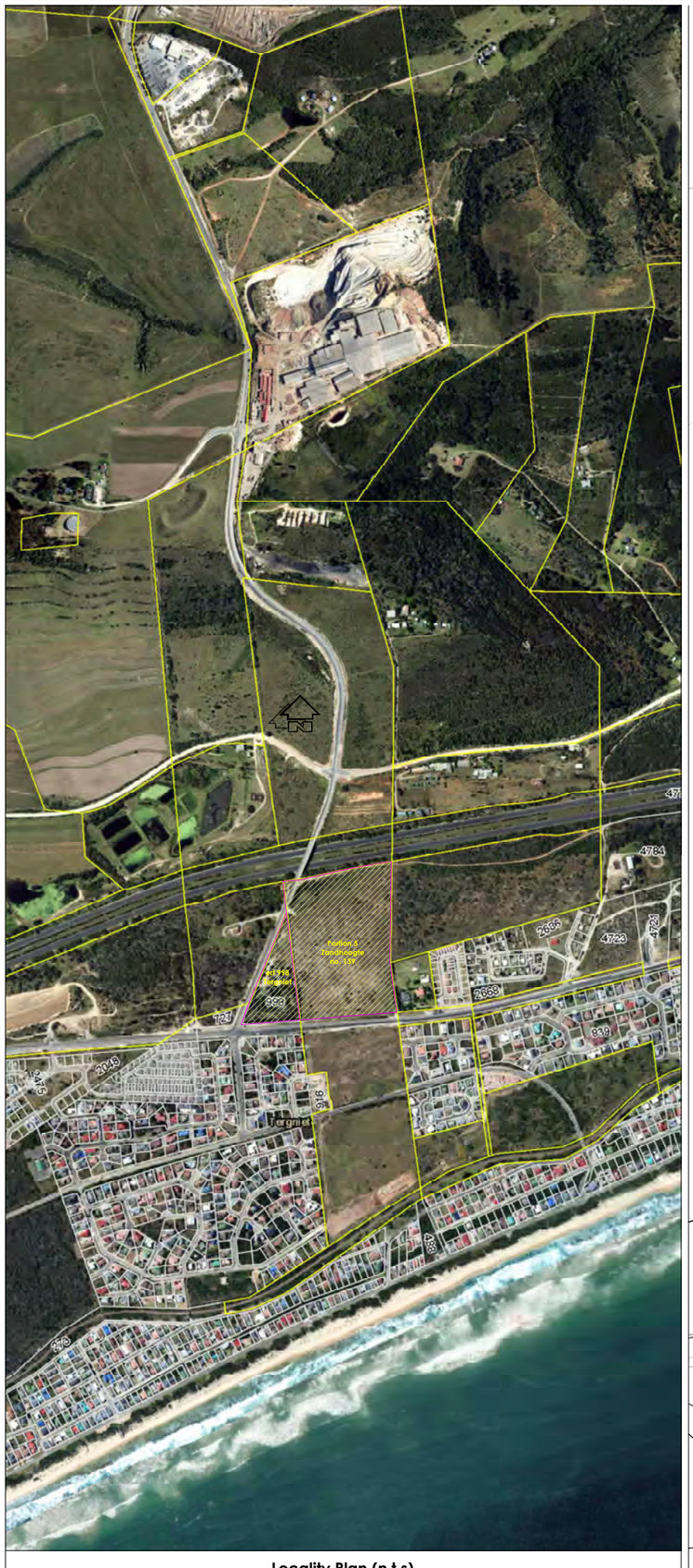
a. All Geometric and Pavement designs should be according to the standards and requirements of the Provincial Government of The Western Cape and must be undertaken by a professionally registered Civil Engineer.
b. Detailed “Site Impact Assessments” must be prepared for the various internal erven. These SIA should check inter alia sweep paths, parking provisions, positions of driveways and sight distances.
c. All internal road cross sections must make provision for universally accessible pedestrian sidewalks.

ANNEXURE A

SITE PHOTOGRAPHS

ANNEXURE B

SITE DEVELOPMENT PLAN



Locality Plan (n.t.s)

1 : 1000

Subdivision Plan

Consolidation of erf 998 and
Portion 5 of the Farm Zandhoogte no. 139

Application for Consolidation, Rezoning and Subdivision

1. Application is made in terms of Article 15 (2)(e) of the Mossel Bay Municipality Zoning Scheme By-Law, 2021, to **consolidate Portion 5 of the Farm Zandhoogte no. 139** (figure A, B,C,D,E,F & G), **8.3676ha** in size and **Erf 998, Tergniet** (figur G,H en I), **1.8684ha** in size.

2. Application is made in terms of Article 15(2) (a) for **rezoning** of the consolidated erf from Argiculture Zone I (AZI) to a subdivisional area to allow the following:

- **3 Business Zone I (BZI)** erven with a total size of 2.604 ha.
- **1 Business Zone IV (BZIV)** erf with a size of 0.268 ha.
- **1 Community Zone III (CZIII)** erf with a size of 0.527 ha.
- **1 Mixed Use Zone II (MZII)** erf with a size of 0.902 ha.
- **2 Open Space Zone II (OSZII)** erf with a size of 1.225 ha.
- **1 General Residential Zone II (GRZII)** erf with a size of 0.697 ha.
- **1General Residential Zone III (GRZII)** erf with a size of 0.653ha.
- **2 Transport Zone II (TZII)** one erf with a size of 1.220 ha and Remainder erf 998, Tergniet - size 0.140ha
- **1 Split zone erf** consisting of a portion **Business Zone I (BZI)** with a size of 1.0ha and a portion **Open Space Zone II (OSZII)** with a size of 1.0ha.

3. Application is made in terms of Article 15 (2) (d) for the **subdivision** of the subdivisional area into the following erven:

- **portions 1 & 9:** Business Zone I (BZI) erven.
- **portion 5:** Business Zone IV (BZIV) erf
- **portion 2:** Community Zone III (CZIII) erf
- **portion 7:** Mixed Use Zone II (MZII) erf
- **portion 4 & 11:** Open Space Zone II (OSZII) erf
- **portion 3:** General Residential Zone II (GRZII) erf
- **portion 6:** General Residential Zone III (GRZII) erf
- **portion 10 & 12:** Transport Zone II (TZII)
- **portion 8:** Split zone erf consisting of a portion Business Zone I (BZI) and a portion Open Space Zone II (OSZII)

4. Site survey:

4.1 Site survey done by WJ Marais (Reg no. S0691) Topographic and Engineer's Surveyor, 13 Cypress, Street, George.
4.2 Contour intervals: 1.0m

5. Servitudes:

5.1 Water line servitude - 5m wide northern side of the southern erf boundary (of the consolidated erf.
5.2 Sewer line servitude - 6m wide - south of the northern erf boundary (of the consolidated erf)
5.3 Sewer line servitute - 5m wide - eastern boundary of the line A, I and G.
5.4 Power line servitude - 20m wide - along the southern boundary - partly inside an partly outside the boundary line.
5.5 Power line (orange line) across the middle of the consolidated erf east to west - installed underground in the 25m road reserve.
5.6 A **40m wide no-go conservation buffer area** - portion 11.
5.7 A **5m wide right of way serwitude**, shown as **figure a,b, c& d**, to be registered over **portions 1** and a **5m wide right of way serwitude**, shown as **figure b, e, f & c**, to be registered over **portions 2** to give future access to portion 11.

Table

Zoning	Colour Notation	Size (ha)	%
Business Zone I (BZI)		3.604	35.21
Business Zone IV (BZIV)		0.268	2.62
Community Zone III (CZIII)		0.527	5.15
Mixed Zone II (MZII)		0.902	8.81
Open Space II (OSZII)		2.225	21.74
General Residential Zone II (GRZII)		0.697	6.81
General Residential Zone III (GRZIII)		0.653	6.38
Transport Zone II (TZII)		1.360	13.29
Total		10.236	100

8	portion number
0.687ha	portion size (ha)

Amendments:

Date:	Description:
5-11-2022	* changes - erf sizes and road layout
25-01-2023	* power line servitute - removed - change notes
26-11-2023	* changes - erf sizes and road reserves * changes - 5m wide right of way servitute * changes to all the tables and notes added
04-03-2024	* new layout + subdivision plan
30-03-2024	* changed to subdivision plan

Owner:
Signature:
Design Centre and Associates: Design:
Checked:
Reference no.: 2213 Scale: 1:1000 & n.t.s.
Date: 30 - 03 - 2024 Drawing no.: 2213-01
Stage:

Client: 3M Sales and Education Services CC

Project Description: Proposed Consolidation of erf 998, Tergniet and Portion 5 of the Farm Zandhoogte no. 139 Rezoning and Subdivision

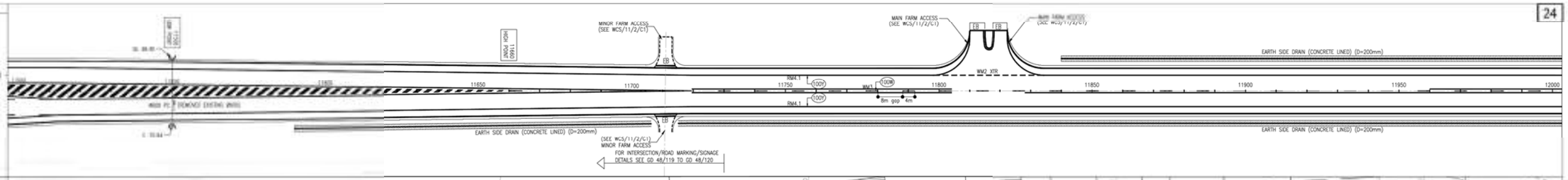
Project name: Dolfin Circle

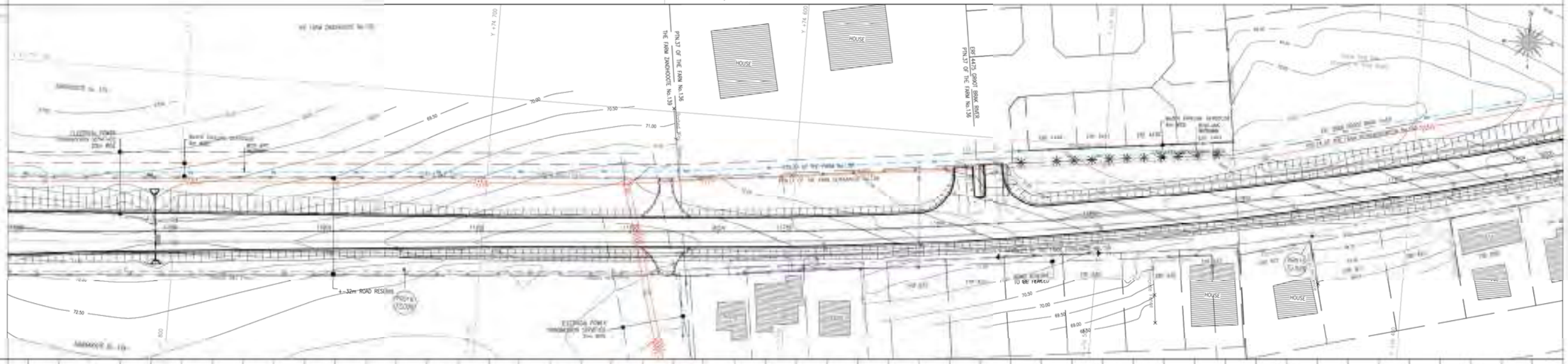
Drawing Description: Consolidation, Rezoning and Subdivision Plan Locality Plan

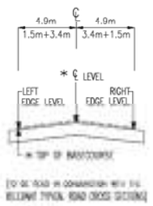
Design Centre
creating meaningful work
Design Centre and Associates
Architecture, Interior Design, Town Planning & Landscape Design
p.o. box 7 mckenzie 6537 - cell no.: 083 899 2882
Email: pieterdesigncentre@gmail.com

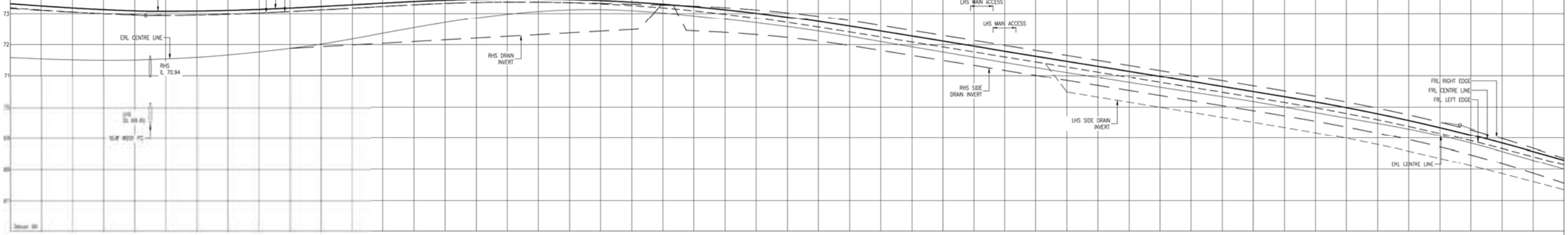
ANNEXURE C

KANTEY AND TEMPLER DR1578 DESIGN DRAWINGS









STAKE VALUE (m)	EXISTING ROAD LEVEL (m)	LEFT EDGE	CENTRE LINE	RIGHT EDGE
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11620	72.36	73.23	73.34	73.23
11640	72.72	73.34	73.44	73.34
11660	73.00	73.38	73.48	73.38
11680	73.15	73.36	73.46	73.36
11700	73.12	73.27	73.38	73.30
11720	72.93	73.10	73.23	73.25
11740	72.70	72.86	73.02	73.13
11760	72.45	72.56	72.75	72.93
11780	72.09	72.24	72.43	72.61
11800	71.76	71.92	72.11	72.29
11820	71.42	71.60	71.78	71.97
11840	71.10	71.28	71.46	71.65
11860	70.79	70.95	71.14	71.33
11880	70.47	70.63	70.82	71.00
11900	70.19	70.31	70.49	70.68
11920	69.81	69.98	70.17	70.35
11940	69.48	69.60	69.79	69.97
11960	69.11	69.16	69.35	69.53
11980	68.58	68.67	68.85	69.01
12000	68.00	68.14	68.29	68.35

VERTICAL ALIGNMENT

GRADES: 0.52 % — 11698.32 | 73.75 — -1.61 % — 11966.51 | 69.42 — -3.28 %

VERTICAL CURVES: bvc 11630.82 — 135.00 VC K=63.36 — 11765.82 evc; bvc 11911.51 — 110.00 VC K=65.81

SUPERELEVATION: 3.80 / -3.80%

HORIZONTAL ALIGNMENT: 11728.63 bc — Curve 4 Left Radius=1500.00 do= 10.01.06 — ec 11990.91 dir. 255.24.35

CENTRE LINE CO-ORDINATES

K&T
KANTEY & TEMPLER
CONSULTING ENGINEERS

WESTERN CAPE GOVERNMENT
DEPARTMENT OF TRANSPORT AND PUBLIC WORKS

UPGRADE OF MR344 (KM1.55 TO KM14.84) AND DR1578 (KM31.13 TO KM34.99)
NEAR GROOT-BRAKRIVIER

UPGRADE OF MR344 (km 1.55 TO km 14.84)

ROAD LAYOUT & LONG SECTION : km 11.5 TO km 12.0

TPW 16/6/4/1/1 - MR00344/C0822	SCALE 1:500
CONTRACT No. C822	
CONSULTANTS DWG No. 13491-MR344-24	GD 48/088

DIAGRAMMATIC STRIP PLAN

LEGEND: DIAGRAMMATIC PLAN

- Centreline / Distance
- Edge surfacing
- Earth side drain (unlined)
- Earth side drain (lined) – See SD 48/116 for depth detail
- Concrete Side drain
- Stormwater pipe/line
- Stormwater headwall
- Box inlet (Type 1)
- Rock chute
- Guardrail
- Road marking

1:500 ROAD LAYOUT PLAN

LEGEND: SURVEY

- FENCES AND GATES
- Road Edge
- CONTOURS (1m)
- BUILDING
- ROAD SIGN
- SURVEY BEACON (SEE TABLE)

LEGEND: SERVICES

- TELKOM
- TELKOM - SECURITY ROUTE
- OTHER - LIGHT - RELOCATED
- OTHER - LIGHT - BACKFED ROUTE

OL 140.580

IL 141.091

GI (TYPE 1)

1:40 TAPER

Concrete Side Drain (MCS-23-3-C1)

See Outlet detail (MCS 23-3-C11)

New Guardrail

FREMERSHEIM

Construct link to existing entrance

WOLVEDANS NO:129 PNT 1

WOLVEDANS NO:130 PNT 33

WOLVEDANS No: 120 PNT 23

RIVERLINE SERVITUDE AREA

WATER WORKS

Riverlands Dairy

New road reserve fence line (see cross-section)

LHS side drain to discharge onto slope

Coordinate Table		
ID	Y	X
RRR 11	75042.777	3769703.924
RRR 12	75054.545	3769713.871
RRR 13	75081.425	3769716.711
RRR 18	75096.075	3769750.681
RRR 19	75077.325	3769741.143
RRR 20	75060.818	3769739.985
RRR 21	75002.767	3769751.086
RRR 22	75087.165	3769931.903
RRR 23	75064.532	3769990.652
RRR 24	75047.986	3770041.474
RRR 25	75019.367	3770099.365
RRR 26	74998.778	3770134.089

NO.	DATE	AGENCIES AND AMENDMENTS	APPROVED: CDBM	APPROVED: DBM
B	16.AUG.2021	ISSUED FOR TENDER	DBM	MJB
A	16.AUG.2021	ISSUED FOR CONSTRUCTION	DBM	MJB

DESIGNED BY:	D.BOSMAN
DRAWN BY:	S.LOUBSER
CHECKED BY:	M.BARNARD
APPROVED BY:	M.TEMMERS

KANTEY & Ttempler CONSULTING ENGINEERS

WESTERN CAPE GOVERNMENT

DEPARTMENT OF TRANSPORT AND PUBLIC WORKS

UPGRADE OF MR344 (KM1.55 TO KM14.84) AND DR1578 (KM31.13 TO KM34.99) NEAR GROOT-BRAKRIVIER

UPGRADE OF DR1578 (km 31.13 TO km 34.99)

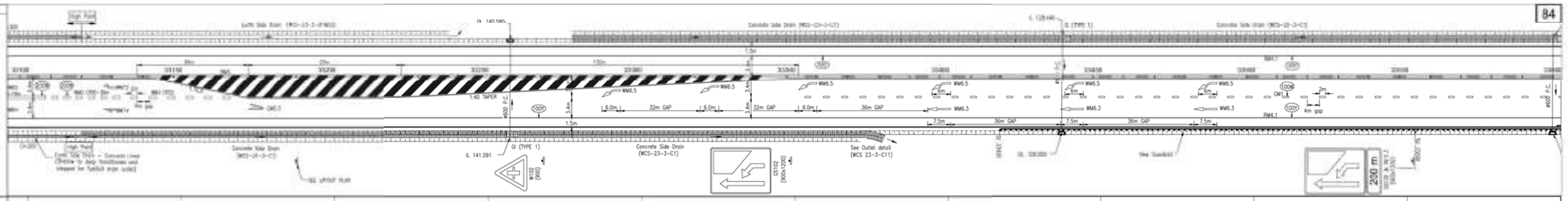
ROAD LAYOUT: km 33.1 TO km 33.6

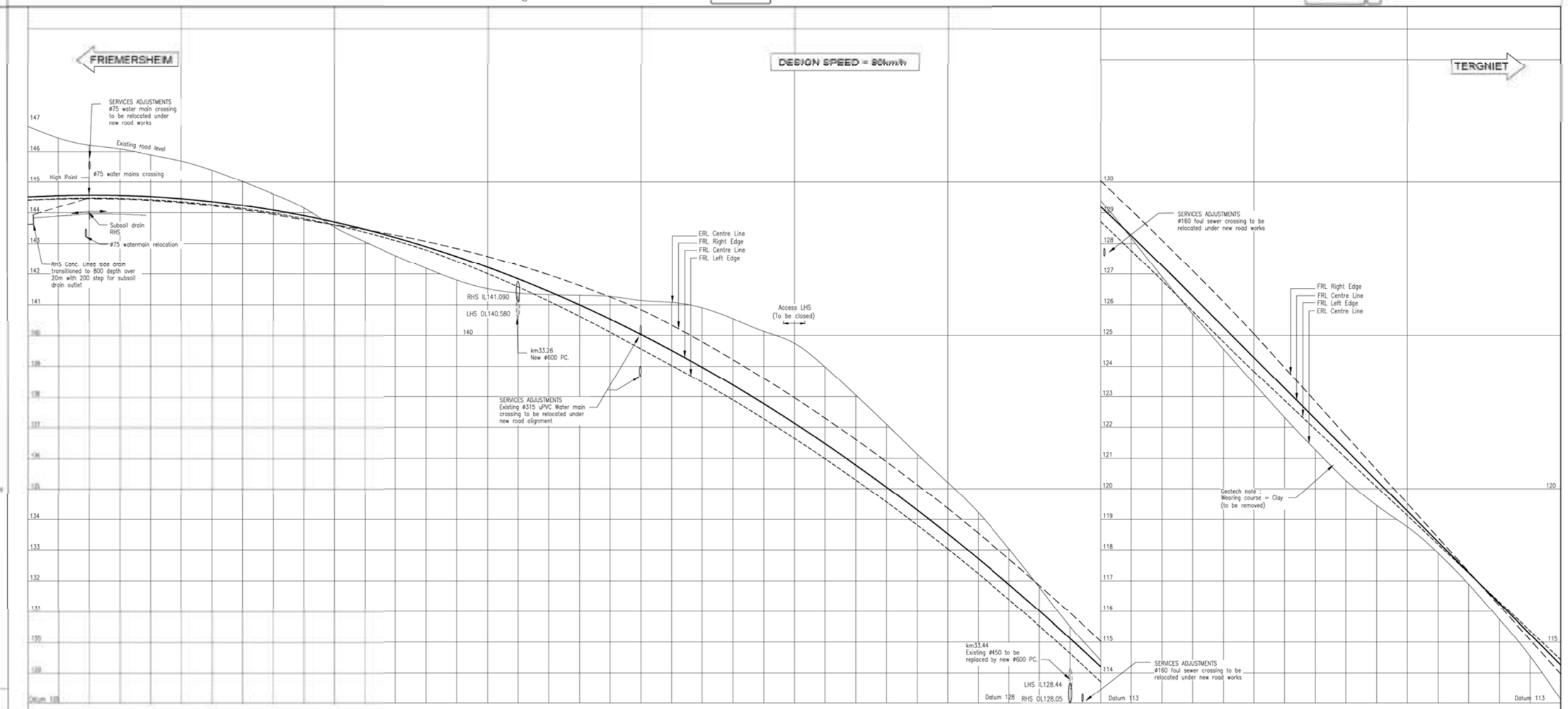
PROJECT NO.	TPW 18/6/6/511 - MR00344/C922
CONTRACT NO.	C922
DRAWING / DWG REV. NO.	13491-DR1578-05
SCALE	1/500
SIZE	
NCD REF. NO.	GD 48/147

DIAGRAMMATIC STRIP PLAN

LEGEND: DIAGRAMMATIC PLAN

- Centreline / Distance
- Edge surfacing
- Earth side drain (unlined)
- Earth side drain (lined) – See SD 48/118 for depth detail
- Concrete Side drain
- Stormwater pipe/line
- Stormwater headwall
- Sand vlei (Type 1)
- Rivet chute
- Guardrail
- Road marking





New Class 2 Road * Existing Line
*9.8m *13.2m
New Surfaced Width
4.9m *4.9m *8.3m
1.5m+3.4m 3.4m+1.5m
* ℄ LEVEL
LEFT EDGE LEVEL
RIGHT EDGE LEVEL
* TOP OF BASECOURSE

CROSS SECTION DIAGRAM
(TO BE READ IN CONJUNCTION WITH THE RELEVANT TYPICAL ROAD CROSS SECTIONS)

* NOTE:
DESIGN LEVELS SHOWN ON LONGITUDINAL SECTIONS ARE TO TOP OF BASECOURSE

EXL. : EXISTING ROAD LEVEL
FRL. : FINAL ROAD LEVEL

Scales : Vertical 1/50
Horizontal 1/500

LONGITUDINAL SECTION

VERTICAL ALIGNMENT

STAKE VALUE (m)	33220 33240 33260 33280 33300 33320 33340 33360 33380 33400 33420 33440 33460 33480 33500 33520 33540 33560 33580 33600
EXISTING ROAD LEVEL (m)	145.82 145.78 145.74 145.69 145.65 145.61 145.57 145.53 145.49 145.46 145.42 145.38 145.34 145.30 145.26 145.22 145.18 145.14 145.10 145.06
DESIGN LEVELS – LEFT EDGE	144.93 144.89 144.85 144.81 144.77 144.73 144.69 144.65 144.61 144.57 144.53 144.49 144.45 144.41 144.37 144.33 144.29 144.25 144.21 144.17
DESIGN LEVELS – CENTRE LINE	144.62 144.58 144.54 144.50 144.46 144.42 144.38 144.34 144.30 144.26 144.22 144.18 144.14 144.10 144.06 144.02 143.98 143.94 143.90 143.86
DESIGN LEVELS – RIGHT EDGE	144.31 144.27 144.23 144.19 144.15 144.11 144.07 144.03 143.99 143.95 143.91 143.87 143.83 143.79 143.75 143.71 143.67 143.63 143.59 143.55
GRADES	4.78 % −10.02 %
VERTICAL CURVES	520.00 VC K=35.15
SUPERELEVATION	10% RHS −10% LHS
HORIZONTAL ALIGNMENT	str 6.13.24 Curve 6 Left Radius=240.00 da= 62.52.48 str 303.20.36
CENTRE LINE CO-ORDINATES	

NO.	DATE	AMENDMENT AND REMARKS	APPROVED CODES	INITIALS	DESIGNED BY	Graeme Mark
2	16.AUG.2013	ANGELITA TRAKER	DPE	GM	TRACED BY	G Goosen
1	16.AUG.2013	ANGELITA CONSTRUCTION	DPE	GM	CHECKED BY	H Strydom
					APPROVED BY	G Templer

KANTEY & TEMPLER CONSULTING ENGINEERS

WESTERN CAPE GOVERNMENT

DEPARTMENT OF TRANSPORT AND PUBLIC WORKS

UPGRADE OF MR344 (KM1.55 TO KM14.84) AND DR1578 (KM31.13 TO KM34.99) NEAR GROOT-BRAKRIVIER

UPGRADE OF DR1578 (km 31.13 TO km 34.99)

LONG SECTION: km 33.1 TO km 33.6

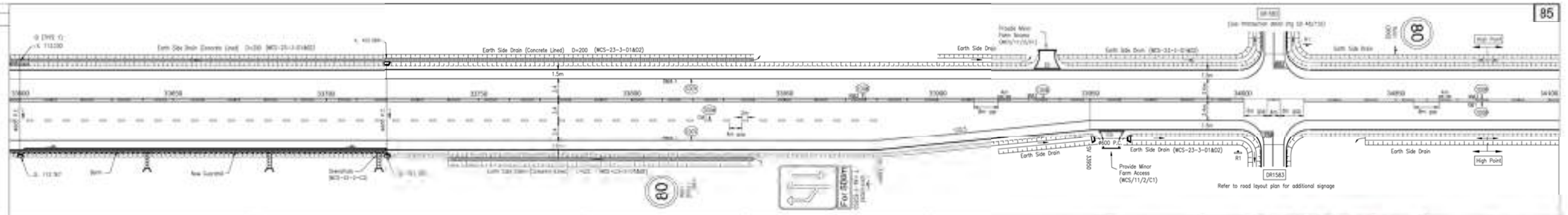
PROJECT NO.	TPW 16/16/511 - MR00344/C0922
SCALE	1/500
CONTRACT NO.	C822
DRAWING NO.	13491-DR1578-07
SIZE	GD 48/148

Road Layout.dwg
29/08/2014 02:40 PM
Roads

DIAGRAMMATIC STRIP PLAN

LEGEND: DIAGRAMMATIC PLAN

- Centreline / Distance
- Filter surfacing
- Earth side drain (unlined)
- Earth side drain (lined) – See SD 46/116 for depth detail
- Concrete Side drain
- Ø600 P.C. Stormwater pipe/size
- Stormwater headwall
- Grid inlet (Type 1)
- Drain chute
- Guardrail
- Road marking



1:500 ROAD LAYOUT PLAN

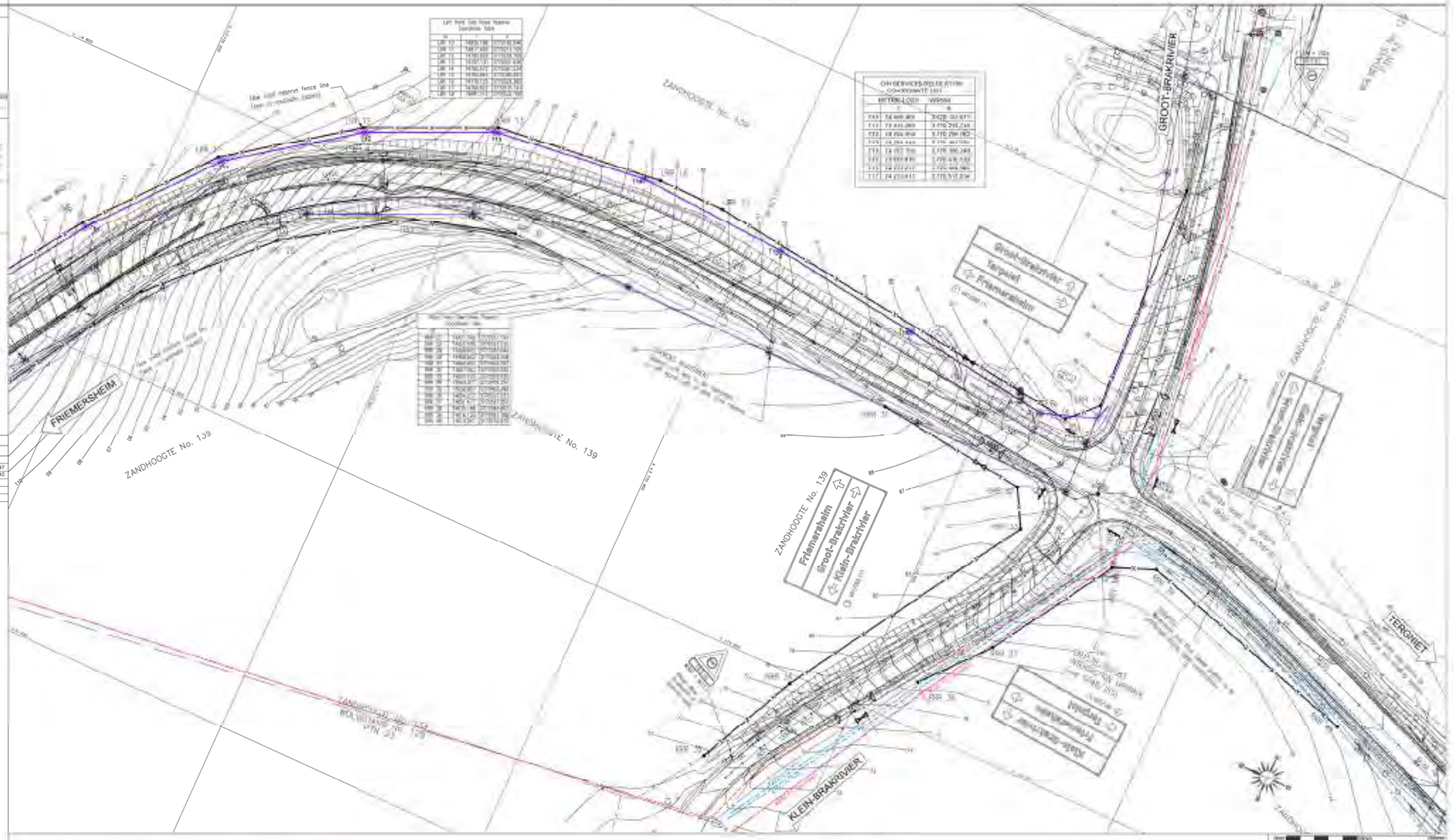
LEGEND: SURVEY

- FENCES AND GATES
- ROAD EDGE
- CONTOURS (1m)
- BUILDING

LEGEND: SERVICES

SURVEY CONTROL BEACONS

STATION	Y WGS 23	X	Z
PRO 112	74795.385	3770259.000	105.197
PRO 113	74784.737	3770537.309	86.140



NO.	DATE	AMENDMENTS AND REMARKS	APPROVED: CONSULTANT	APPROVED: DPW	DESIGNED BY:	Grootbrakrivier
2	16.AUG.2021	ORIGINAL FOR TENDER	CPC	HOD	TRACED BY:	C Lombard
1	26.AUG.2021	ORIGINAL FOR CONSTRUCTION	CPC	HOD	CHECKED BY:	H Hendricks
					APPROVED BY:	M Mahlaka

KANTEY & TEMPLER CONSULTING ENGINEERS

CONSULTANT'S REF. NO.: _____

WESTERN CAPE GOVERNMENT

DEPARTMENT OF TRANSPORT AND PUBLIC WORKS

PROFESSIONAL SERVICE PROVIDER

UPGRADE OF MR344 (KM1.55 TO KM14.84) AND DR1578 (KM31.13 TO KM34.99) NEAR GROOT-BRAKRIVIER

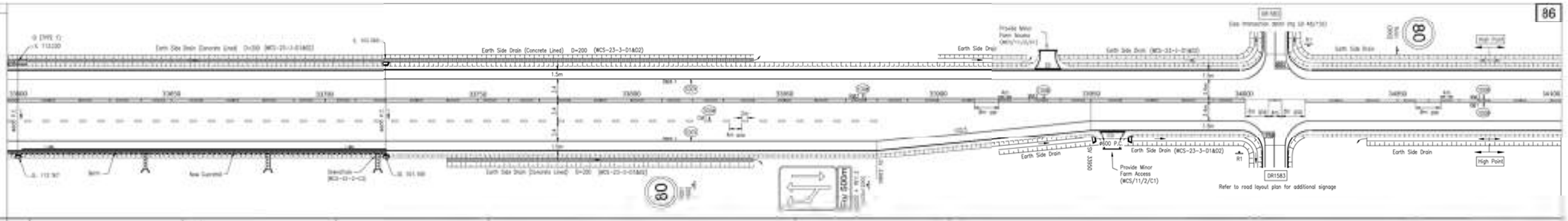
UPGRADE OF DR1578 (km 31.13 TO km 34.99)

ROAD LAYOUT: km 33.6 TO km 34.1

PROJECT NO.	SCALE
TPW 18/6/6/5/15 - MR00344/C0922	1/500
CONTRACT NO.	SIZE DIRECTION IN MM
C922	
CONSULTANTS DRG NO.	REG NO.
13491-DR1578-08	GD 48/149

DIAGRAMMATIC STRIP PLAN

LEGEND DIAGRAMMATIC PLAN



LONGITUDINAL SECTION

EXL : EXISTING ROAD LEVEL
FXL : FINAL ROAD LEVEL

FRIEMERSHEIM

DESIGN SPEED – 80km/h

DESIGN SPEED – 60km/h (VERTICAL CURVE)

TERGNIET

LHS EL113.23
RHS EL112.77

Existing to be demolished

FRL Left Edge
FRL Centre Line
FRL Right Edge
ERL Centre Line

Dam RHS lev 96m

Minor Access LHS

Minor Access RHS

DR1583 INTERSECTION UPGRADE (SEE GD 48/155)

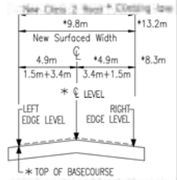
Buildings on LHS

Existing ø160/ø200 watermain to be protected during construction

Existing ø250 f.sewer to be protected during construction

Datum 93

Datum 83



CROSS SECTION DIAGRAM

TO BE READ IN CONJUNCTION WITH THE RELEVANT TYPICAL ROAD CROSS SECTIONS

* NOTE
DESIGN LEVELS SHOWN ON LONGITUDINAL SECTIONS ARE TO TOP OF BASECOURSE

Scales : Vertical 1/500
Horizontal 1/500

VERTICAL ALIGNMENT

STAKE VALUE (m)	33600 33620 33640 33660 33680 33700 33720 33740 33760 33780 33800 33820 33840 33860 33880 33900 33920 33940 33960 33980 34000 34020 34040 34060 34080 34100
EXISTING ROAD LEVEL (m)	113.13 113.84 113.91 114.19 114.20 114.51 114.26 113.78 103.35 102.41 101.21 99.55 98.49 98.38 94.59 93.01 91.68 90.63 89.47 88.42 87.10 86.24 85.32 85.05 85.15 85.42 85.56 85.55
DESIGN LEVELS – LEFT EDGE (3.4m)	113.41 113.42 113.90 114.19 114.20 114.51 114.26 113.78 104.56 103.91 101.46 100.01 98.55 97.04 95.45 93.90 92.39 90.95 89.68 88.46 87.38 86.61 86.22 86.08 86.12 86.28 86.30 86.08
DESIGN LEVELS – CENTRE LINE	113.27 113.27 113.90 114.19 114.20 114.51 114.26 113.78 103.88 102.42 100.97 99.52 98.06 96.61 95.16 93.74 92.37 91.05 89.78 88.56 87.48 86.65 86.08 85.75 85.68 85.83 85.95 85.91
DESIGN LEVELS – RIGHT EDGE (3.4m)	113.07 113.11 113.90 114.19 114.20 114.51 114.26 113.78 103.65 101.53 100.11 98.66 97.22 95.88 94.66 93.42 92.21 90.9 89.66 88.45 87.38 86.54 85.94 85.41 85.24 85.39 85.61 85.74
GRADES	-10.01 % -7.27 % 33885.27 91.87 -6.05% 33995.98 85.17 1.03% 34094.02 86.18
VERTICAL CURVES	100.00 VC K=36.56 100.00 VC K=82 113.00 VC K=16 70.00 VC K=24.8
SUPERELEVATION	+10% LHS −10% RHE −2% camber +9% LHS −9% RHS
HORIZONTAL ALIGNMENT	Curve 7 Right Radius=210.00 da= 63.22.46 dir. 6.43.22 Curve 8 Right Radius=260.00 da= 14.24.09 dir. 21.07.31
CENTRE LINE CO-ORDINATES	Y 16 850.788 X 3 718 593.844

NO.	DATE	ADDITIONS AND AMENDMENTS	APPROVED	
			CDM	RRD
2	16.04.2014	ORIGINAL PLOT	CDM	RRD
1	16.04.2014	ORIGINAL CONSTRUCTION	CDM	RRD

DESIGNED BY: [illegible]
TRACED BY: [illegible]
CHECKED BY: [illegible]
APPROVED BY: [illegible]

KANTEY & Ttempler
CONSULTING ENGINEERS

WESTERN CAPE GOVERNMENT
DEPARTMENT OF TRANSPORT AND PUBLIC WORKS

UPGRADE OF MR344 (KM1.55 TO KM14.84) AND DR1578 (KM31.13 TO KM34.99) NEAR GROOT-BRAKRIVIER

UPGRADE OF DR1578 (km 31.13 TO km 34.99)

LONG SECTION: km 33.6 TO km 34.1

PROJECT No.	TPW 18/14/5/11 - MR00344/C922
CONTRACT No.	C922
DRAWING / DWG No.	13491-DR1578-09
SCALE	1/500
DRG REFERENCE No.	
ROD REFERENCE	GD 48/150

Road Layout.dwg
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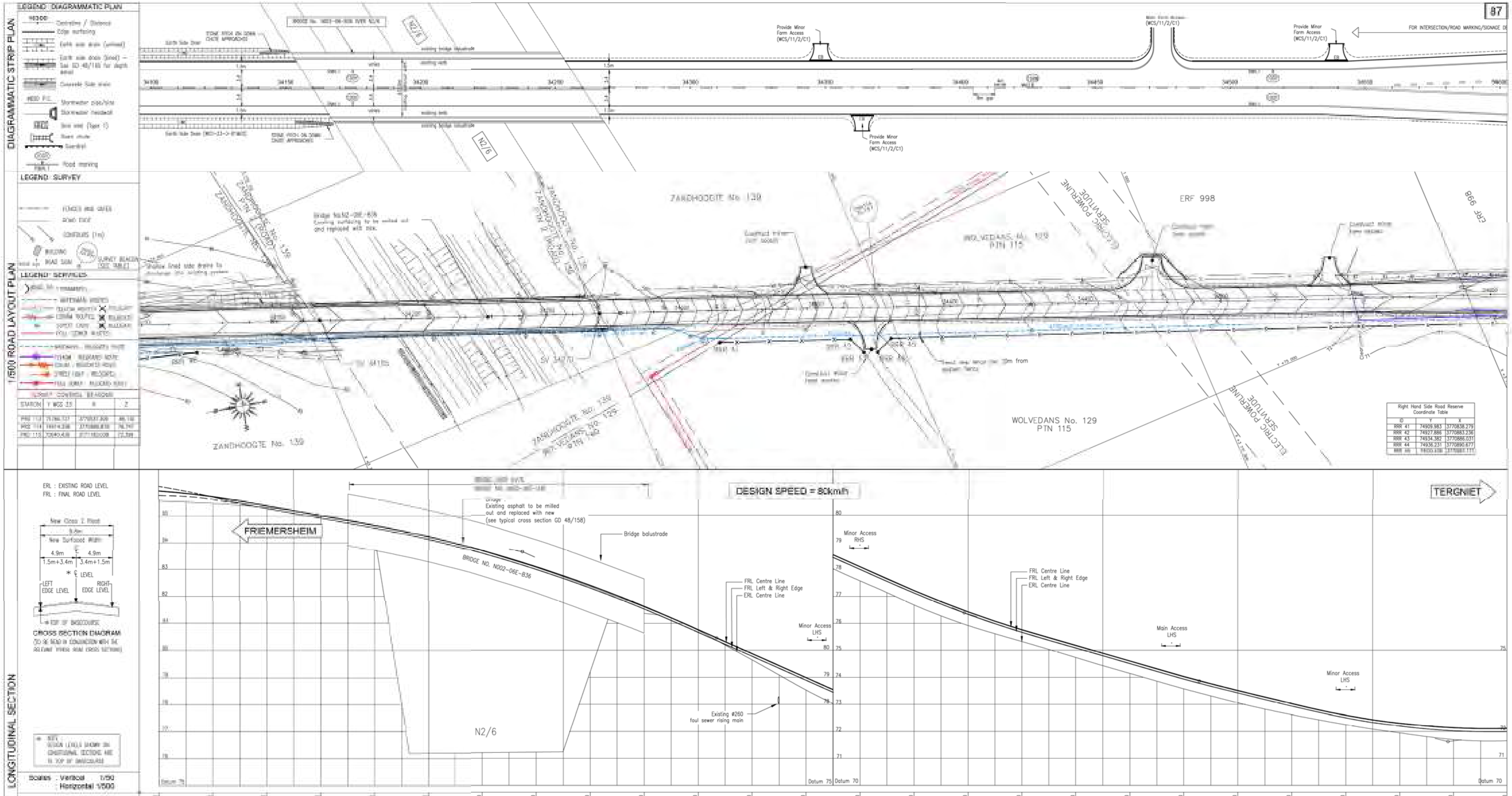
Robert



STAKE VALUE (m)	34100	34120	34140	34160	34180	34200	34220	34240	34260	34280	34300	34320	34340
EXISTING ROAD LEVEL (m)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	83.70	83.08	82.36	81.61	80.77	79.65	78.52
DESIGN LEVELS LEFT EDGE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	83.61	83.00	82.31	81.53	80.67	79.78	78.89
DESIGN LEVELS CENTRE LINE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	83.70	83.10	82.41	81.63	80.77	79.88	78.99
DESIGN LEVELS RIGHT EDGE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	83.61	83.00	82.31	81.53	80.67	79.78	78.89

STAKE VALUE (m)	34360	34380	34400	34420	34440	34460	34480	34500	34520	34540	34560	34580	34600
EXISTING ROAD LEVEL (m)	77.57	76.67	75.91	75.33	74.73	74.15	73.57	73.06	72.62	72.25	71.95	71.69	71.65
DESIGN LEVELS LEFT EDGE	78.00	77.12	76.33	75.67	75.09	74.51	73.93	73.42	72.93	72.49	72.19	72.01	71.98
DESIGN LEVELS CENTRE LINE	78.10	77.22	76.43	75.77	75.19	74.61	74.03	73.51	73.03	72.59	72.29	72.13	72.11
DESIGN LEVELS RIGHT EDGE	78.00	77.12	76.33	75.67	75.09	74.51	73.93	73.42	72.93	72.49	72.19	72.01	71.98

VERTICAL ALIGNMENT

GRADES: −1.79 % | [illegible] | −1.79 % | 34234.91 83.66 | −4.45 % | 34306.90 80.46 | −4.45 % | 34398.59 76.38 | −2.89 % | 34485.80 73.86 | −2.43 % | 34577.89 71.62

VERTICAL CURVES: [illegible] VC K=[illegible] | 120.00 VC K=45.23 | 34294.91 evc | bvc 34373.59 | 50.00 VC K=32.2 | 34423.59 evc | bvc 34485.80 34485.80 evc | bvc 34522.89 | 110.00 VC K=28.89

SUPERELEVATION: −2% camber | −2% camber | −2.00%Left

HORIZONTAL ALIGNMENT: dir. [illegible] | dir. [illegible] | BM do= 0.14.04 | dir. 21.39.21 | K11 do= 0.03.58 | dir. 21.43.19 | K12 do= 0.00.50 | dir. 22.05.55 | 34548.58 | Curve 4 Left do= 0.38.47

CENTRE LINE CO-ORDINATES: [illegible]

No.	DATE	ADDITIONS AND AMENDMENTS	APPROVED	
2	[illegible]	ISSUED FOR TENDER	[illegible]	[illegible]
1	[illegible]	ISSUED FOR CONSTRUCTION	[illegible]	[illegible]

DESIGNED BY [illegible]
DRAWN BY [illegible]
CHECKED BY [illegible]
APPROVED BY [illegible]

KANTEY & TEMPLER
CONSULTING ENGINEERS

WESTERN CAPE GOVERNMENT
DEPARTMENT OF TRANSPORT AND PUBLIC WORKS

UPGRADE OF MR344 (KM1.55 TO KM14.84) AND DR1578 (KM31.13 TO KM34.99)
NEAR GROOT-BRAKRIVIER

UPGRADE OF DR1578 (km 31.13 TO km 34.99)

ROAD LAYOUT & LONG SECTION: km 34.1 to km 34.6

FILE REF No. TPW 16/6/4/1/1 - MR00344/C0822
SCALE 1/500
CONTRACT No. C822
CONSULTANTS DWG No. 13491-DR1578-10
DTPW REF No. GD 48/151

Road Layout.dwg

DIAGRAMMATIC STRIP PLAN

LEGEND DIAGRAMMATIC PLAN

- Centreline / Clearance
- Edge marking
- Earth side drain (unlined)
- Earth side drain (lined) – See SD 05/154 for depth detail
- Concrete Side drain
- Stormwater pipe/culvert
- Stormwater manhole/pit
- Grid inlet (Type 1)
- Rain chute
- Guardrail
- Road marking

FOR INTERSECTION/ROAD MARKING/SIGNAGE DETAILS SEE GD 48/120

LIMIT OF CONSTRUCTION CHARLES KEEN

1/500 ROAD LAYOUT PLAN

LEGEND SURVEY

LEGEND SERVITUDE

GROOT-BRAKRIVIER

KLEIN-BRAKRIVIER

TERGNIET

PEERBOOM

ERF 763 · ERF 762 · ERF 761 · ERF 760 · ERF 759 · ERF 758 · ERF 757 · ERF 756 · ERF 754 · ERF 753 · ERF 752 · ERF 864 · ERF 863 · ERF 862 · ERF 861 · ERF 860 · ERF 859 · ERF 858 · ERF 751 · ERF 750 · ERF 749 · ERF 748 · ERF 747 · ERF 746 · ERF 745 · ERF 744 · ERF 743 · ERF 742 · ERF 741 · ERF 740 · ERF 739 · ERF 738 · ERF 737 · ERF 736 · ERF 735 · ERF 734 · ERF 733 · ERF 732 · ERF 731 · ERF 730

LONGITUDINAL SECTION

FRIEMERSHEIM

TERGNIET

MR344

MR344 INTERSECTION

REFER TO GD 48/087 FOR MR344 LONG SECTION

FRL Centre Line
FRL Left & Right Edge
ERL Centre Line

Existing Ø150

Existing Telkom fibre optic cable crossing

Existing u/g electrical cable crossing

Tie inot existing road edge levels

T–Junction Charles Keen

Existing Ø150/Ø200 watermains & Telkom fibre optic cable crossings

73 · 70 · 69 · Datum 68

New Dose 2 Road
9.8m
New Surfaced Width
4.3m | 4.3m
1.5m+3.4m | 3.4m+1.5m
℄ LEVEL
LEFT EDGE LEVEL | RIGHT EDGE LEVEL
TOP OF SUBGRADE

CROSS SECTION DIAGRAM

(TO BE READ IN CONJUNCTION WITH THE RELEVANT TYPICAL ROAD CROSS SECTIONS)

* NOTE
DESIGN LEVELS SHOWN ON LONGITUDINAL SECTIONS ARE TO TOP OF SUBGRADE

Scales : Vertical 1/50
: Horizontal 1/500

		34740	34760	34780	34800	34820	34840	34860	34880	34900	34920
STAKE VALUE (m)											
EXISTING ROAD LEVEL (m)		71.08	70.77	70.47	70.20	70.05	69.97	69.93	69.90	69.80	69.78
VERTICAL ALIGNMENT DESIGN LEVELS	LEFT EDGE	71.15	70.80	70.53	70.33	70.19	70.07	69.95	69.83	69.77	69.65
	CENTRE LINE	71.29	70.92	70.64	70.42	70.29	70.17	70.05	69.93	69.81	69.78
	RIGHT EDGE	71.15	70.86	70.55	70.33	70.19	70.07	69.95	69.83	69.86	69.9
	GRADES	1.27 %					-0.10 %		-0.59 %		
	VERTICAL CURVES			34774.75 70.55 80.00 VC K=52.87		34814.749 evc				34914.12 69.73 evc 34920.00 69.78 L=105.883 K=177.617	
SUPERELEVATION							-2.00%Left			1.00% Right	-1.00%Left
HORIZONTAL ALIGNMENT		dir. 354.48.57				0.000 Curve 8 Left R=-0.000 dco= 0.06.41		dir. 354.40.17		Curve 9 Left R=60.00	dir. 144.02.44
CENTRE LINE CO-ORDINATES										5.580	

NO.	DATE:	ADDITIONS AND AMENDMENTS:	APPROVED: CHECK	APPROVED: PSG
2	16.AUG.2021	PRELIMINARY TENDER	CPC	HDP
1	06.AUG.2021	PRELIMINARY CONSTRUCTION	CPC	HDP

DESIGNED BY:	PRAMESHNEE
DRAWN BY:	D GOVENDER
CHECKED BY:	PRAMESHNEE
APPROVED BY:	CP TEMPLE

KANTEY & TEMPLER CONSULTING ENGINEERS

WESTERN CAPE GOVERNMENT

DEPARTMENT OF TRANSPORT AND PUBLIC WORKS

UPGRADE OF MR344 (KM1.55 TO KM14.84) AND DR1578 (KM31.13 TO KM34.99) NEAR GROOT-BRAKRIVIER

UPGRADE OF DR1578 (km 31.13 TO km 34.99)

ROAD LAYOUT & LONG SECTION: km 34.6 to km 34.99

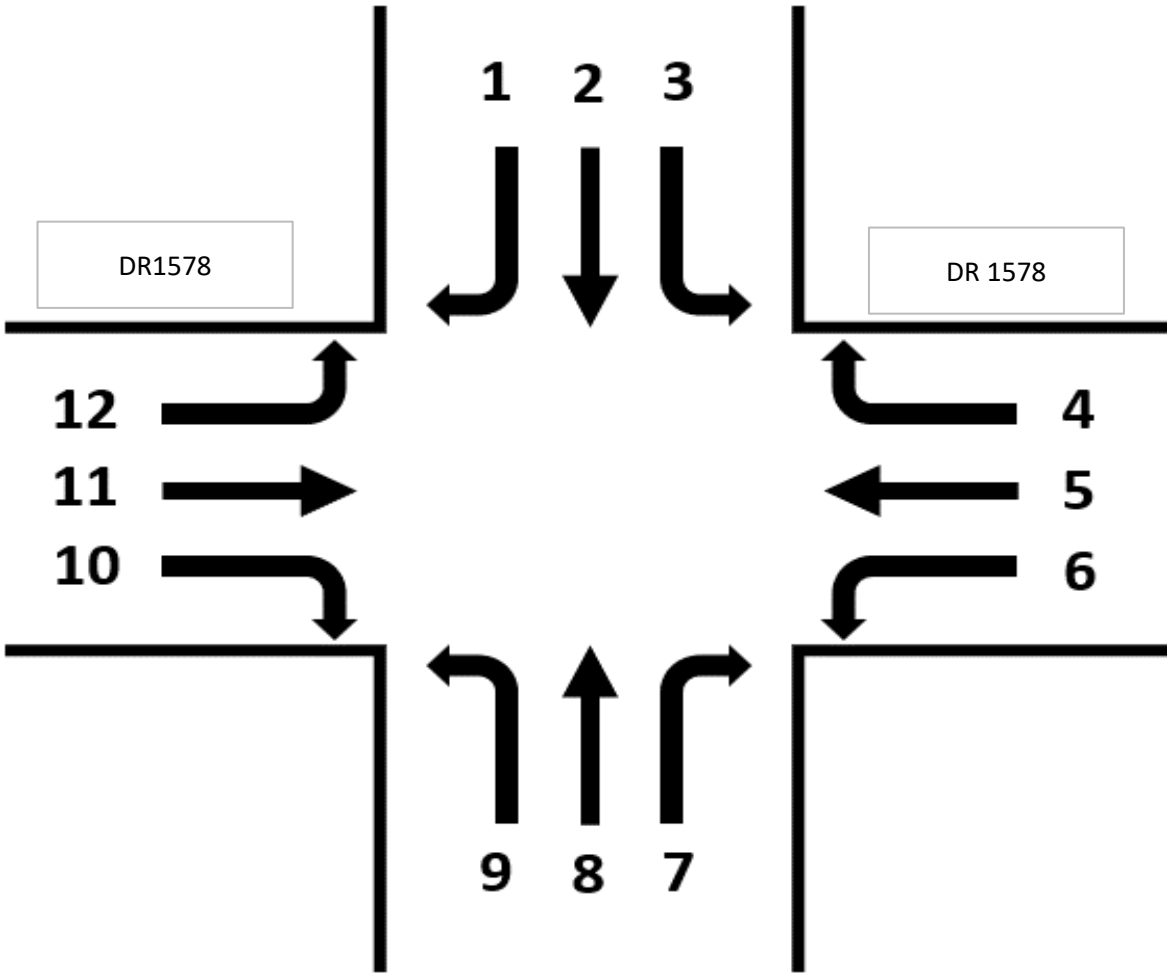
F.P.S. TENDER No.	SCALE
TPW 19/16/C/515 – MR00344/C0922	1/500
CONTRACT No.	SHEET NUMBER OF NO.
C922	
CONSULTANTS DWG No.	WCG DRAWING
13491-DR1578-11	GD 48/152

Road Layout.dwg
2021/08/24 02:40 PM

ANNEXURE D

TRAFFIC COUNT DATA

Sandhoogte St



Sandhoogte RD

Verkeerstelling/Traffic Count

Projek Naam: TIA Transand
Plek/Location: Tergniet - DR1578 / Sandhoogte Road
Datum/Date: 14/03/2023
Teller/Counter: JE Giewelaar

URBAN ENGINEERING

Tyd	Sandhoogte Road						DR1578 (vanaf Tergniet)					
	1		2		3		4		5		6	
	L	S	L	S	L	S	L	S	L	S	L	S
06:00 - 06:15	0	0	0	0	1	0	0	0	4	1	1	0
06:15 - 06:30	0	0	1	0	1	0	1	0	17	1	1	0
06:30 - 06:45	1	0	1	0	3	0	2	0	29	1	5	0
06:45 - 07:00	4	0	2	0	6	0	7	0	50	2	9	0
07:00 - 07:15	5	0	2	0	8	0	16	0	79	2	14	0
07:15 - 07:30	5	0	2	0	13	0	29	0	109	2	14	0
07:30 - 07:45	5	0	2	0	17	0	31	0	125	3	15	3
07:45 - 08:00	6	0	2	0	21	0	36	0	140	4	17	3
08:00 - 08:15	6	0	2	0	24	0	39	1	158	9	18	3
08:15 - 08:30	7	0	2	0	26	0	41	1	167	13	18	5
08:30 - 08:45	8	0	3	0	27	0	43	1	176	15	18	5
08:45 - 09:00	11	0	4	0	30	0	45	2	189	25	18	7
09:00 - 09:15	13	0	6	1	31	0	46	2	196	26	20	9
09:15 - 09:30	13	0	6	1	32	0	49	2	210	29	20	9
09:30 - 09:45	14	0	7	1	37	0	50	2	214	36	20	9
09:45 - 10:00	16	0	7	1	39	0	54	2	225	38	20	9
10:00 - 10:15	16	0	9	1	43	0	56	2	239	42	20	11
10:15 - 10:30	16	0	9	1	45	0	56	2	252	48	20	12
10:30 - 10:45	17	0	9	1	49	0	61	2	262	51	20	12
10:45 - 11:00	17	0	10	1	49	0	63	2	270	55	20	15
11:00 - 11:15	17	0	10	1	51	0	63	2	275	55	20	16
11:15 - 11:30	20	0	12	1	57	0	66	2	288	60	20	16
11:30 - 11:45	20	0	12	1	60	0	71	2	295	61	20	18
11:45 - 12:00	21	0	12	1	64	0	77	2	303	66	20	19
12:00 - 12:15	22	0	14	1	65	0	79	5	318	68	21	19
12:15 - 12:30	25	0	14	1	71	0	86	5	327	69	21	20
12:30 - 12:45	26	0	15	1	74	0	90	5	334	71	21	21
12:45 - 13:00	26	0	15	1	76	0	94	5	349	73	21	24
13:00 - 13:15	27	0	16	1	76	0	94	5	361	73	21	27

13:15 - 13:30	28	0	18	1	77	0	94	5	372	76	22	27
13:30 - 13:45	28	0	18	1	80	0	96	5	391	80	22	28
13:45 - 14:00	29	0	20	1	83	0	100	5	410	86	22	28
14:00 - 14:15	29	0	20	1	88	1	108	5	423	88	23	28
14:15 - 14:30	31	0	20	1	92	1	111	5	434	93	23	28
14:30 - 14:45	31	0	20	1	94	2	112	5	446	96	23	28
14:45 - 15:00	32	0	20	1	96	2	114	5	473	99	24	28
15:00 - 15:15	32	0	21	1	99	2	116	5	488	102	24	28
15:15 - 15:30	33	0	21	1	99	4	118	5	512	106	30	28
15:30 - 15:45	33	0	21	1	99	4	121	5	532	107	30	28
15:45 - 16:00	33	0	21	1	104	5	124	5	539	111	33	28
16:00 - 16:15	34	0	21	1	105	5	127	5	556	116	37	28
16:15 - 16:30	35	0	21	1	112	5	130	5	576	118	44	28
16:30 - 16:45	35	0	22	1	116	5	131	5	602	125	44	28
16:45 - 17:00	36	0	22	1	121	5	139	5	630	125	46	28
17:00 - 17:15	38	0	22	1	127	5	143	5	652	127	46	28
17:15 - 17:30	38	0	22	1	132	5	146	5	680	128	47	28
17:30 - 17:45	39	0	22	1	137	5	150	5	694	130	47	28
17:45 - 18:00	40	0	22	1	139	5	150	5	717	131	47	28

Verkeerstelling/Traffic Count

Projek Naam: TIA Transand
Plek/Location: Tergniet - DR1578 / Sandhoogte Road
Datum/Date: 14/03/2023
Teller/Counter: JE Giewelaar

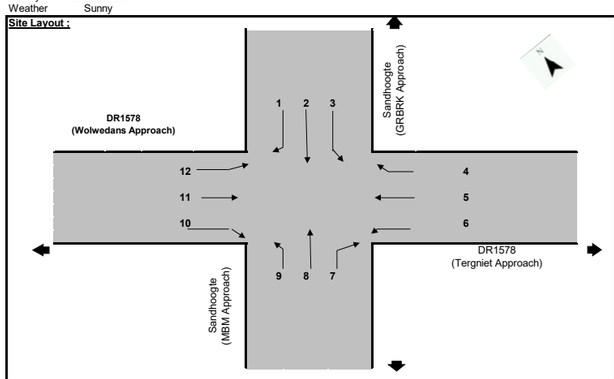
URBAN ENGINEERING

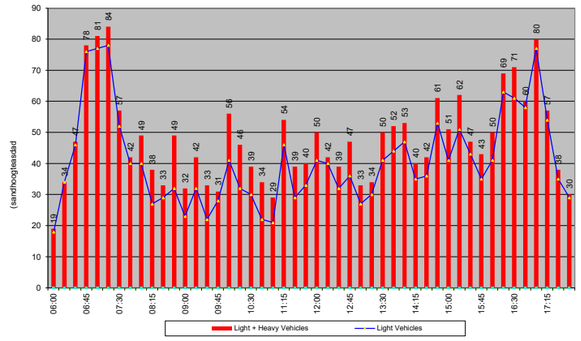
Tyd	Sandhoogte Road						DR 1578 (vanaf Friemersheim)					
	7		8		9		10		11		12	
	L	S	L	S	L	S	L	S	L	S	L	S
06:00 - 06:15	1	0	0	0	0	0	0	0	11	0	0	0
06:15 - 06:30	1	0	0	0	0	0	0	0	30	0	0	0
06:30 - 06:45	4	0	0	0	0	0	0	0	53	1	0	0
06:45 - 07:00	4	0	1	0	1	0	2	0	87	2	1	0
07:00 - 07:15	4	2	1	0	1	0	2	0	118	4	1	0
07:15 - 07:30	6	2	1	0	1	0	3	0	141	10	5	0
07:30 - 07:45	6	2	1	0	2	0	3	0	168	11	6	0
07:45 - 08:00	6	2	1	0	2	0	4	0	179	12	7	0
08:00 - 08:15	6	2	2	0	2	2	4	0	193	13	7	0
08:15 - 08:30	6	2	3	0	2	3	5	0	203	17	8	0
08:30 - 08:45	6	2	3	1	3	3	5	0	216	18	9	0
08:45 - 09:00	6	2	4	1	4	3	5	1	222	21	11	0
09:00 - 09:15	6	4	5	1	4	3	5	1	228	24	12	0
09:15 - 09:30	6	5	6	1	6	4	5	1	238	29	13	0
09:30 - 09:45	6	5	6	1	6	4	6	1	246	33	14	0
09:45 - 10:00	6	5	7	1	7	4	6	1	253	34	14	0
10:00 - 10:15	6	7	8	1	9	5	7	1	267	40	15	0
10:15 - 10:30	6	9	8	1	9	7	7	1	282	43	17	0
10:30 - 10:45	6	12	8	1	11	7	8	1	289	46	17	0
10:45 - 11:00	6	12	8	1	11	8	8	1	300	50	17	0
11:00 - 11:15	6	14	8	1	11	8	9	1	313	55	17	0
11:15 - 11:30	6	14	8	1	13	8	11	3	327	56	18	0
11:30 - 11:45	6	14	9	1	14	10	12	3	338	61	18	0
11:45 - 12:00	6	14	11	1	14	10	12	3	350	62	18	0
12:00 - 12:15	6	14	13	1	16	11	14	3	362	64	19	1
12:15 - 12:30	6	14	14	1	16	11	14	3	375	64	20	1

12:30 - 12:45	6	14	14	1	17	11	15	6	387	65	22	1
12:45 - 13:00	6	15	14	3	17	11	15	6	401	68	23	1
13:00 - 13:15	6	16	15	3	18	11	16	6	410	70	24	1
13:15 - 13:30	6	17	15	3	18	11	16	6	424	70	24	1
13:30 - 13:45	6	17	17	3	18	11	16	6	437	74	26	1
13:45 - 14:00	6	17	17	3	19	11	16	6	450	76	27	1
14:00 - 14:15	6	17	17	3	19	13	17	6	468	77	28	1
14:15 - 14:30	6	17	18	3	20	13	17	6	480	77	29	1
14:30 - 14:45	6	17	19	3	23	13	21	6	492	79	30	1
14:45 - 15:00	6	17	19	3	23	13	23	6	510	84	30	1
15:00 - 15:15	6	17	19	3	24	13	23	6	528	91	31	1
15:15 - 15:30	6	17	20	3	24	13	24	6	542	96	33	1
15:30 - 15:45	7	17	20	4	24	13	25	6	559	98	34	1
15:45 - 16:00	7	17	21	4	25	14	25	6	572	100	36	1
16:00 - 16:15	8	17	22	4	26	14	25	8	583	102	37	1
16:15 - 16:30	8	17	22	4	27	14	27	8	603	106	39	1
16:30 - 16:45	9	17	23	4	28	14	27	8	625	109	43	1
16:45 - 17:00	9	17	23	4	29	14	28	8	637	110	43	2
17:00 - 17:15	9	17	23	4	29	14	28	8	677	111	46	2
17:15 - 17:30	9	17	25	4	30	14	28	8	691	113	46	2
17:30 - 17:45	9	17	25	4	30	14	28	8	704	114	49	2
17:45 - 18:00	9	17	26	4	30	14	28	8	708	114	49	2

Site Tergniet - DR1578 / Sandhoogte Road
Date 14/03/2023
Surveyor JE Giewelaar
Weather Sunny

Site Layout :





Time Period			Light Vehicles													Taxis/Minibus-taxis													Bus													Heavy Vehicles												
Start	End	Total	1	2	3	4	5	6	7	8	9	10	11	12	Total	1	2	3	4	5	6	7	8	9	10	11	12	Total	1	2	3	4	5	6	7	8	9	10	11	12	Total	1	2	3	4	5	6	7	8	9	10	11	12	Total
06:00	06:15	**19**	0	0	1	0	4	1	1	0	0	0	11	0	**18**													**0**													**0**	0	0	0	0	1	0	0	0	0	0	0	0	**1**
06:15	06:30	**34**	0	1	0	1	13	0	0	0	0	0	19	0	**34**													**0**													**0**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
06:30	06:45	**47**	1	0	2	1	12	4	3	0	0	0	23	0	**46**													**0**													**0**	0	0	0	0	0	0	0	0	0	0	1	0	**1**
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07:00	07:15	**81**	1	0	2	9	29	5	0	0	0	0	31	0	**77**													**0**													**0**	0	0	0	0	0	0	2	0	0	0	2	0	**4**
07:15	07:30	**84**	0	0	5	13	30	0	2	0	0	1	23	4	**78**													**0**													**0**	0	0	0	0	0	0	6	0	0	0	0	0	**6**
07:30	07:45	**57**	0	0	4	2	16	1	0	0	1	0	27	1	**52**													**0**													**0**	0	0	0	0	1	3	0	0	0	0	1	0	**5**
07:45	08:00	**42**	1	0	4	5	15	2	0	0	0	1	11	1	**40**													**0**													**0**	0	0	0	0	1	0	0	0	0	0	1	0	**2**
08:00	08:15	**49**	0	0	3	3	18	1	0	1	0	0	14	0	**40**													**0**													**0**	0	0	0	1	5	0	0	0	2	0	1	0	**9**
08:15	08:30	**38**	1	0	2	2	9	0	0	1	0	1	10	1	**27**													**0**													**0**	0	0	0	0	4	2	0	0	1	0	4	0	**11**
08:30	08:45	**33**	1	1	1	2	9	0	0	0	1	0	13	1	**29**													**0**													**0**	0	0	0	0	2	0	0	1	0	0	1	0	**4**
08:45	09:00	**49**	3	1	3	2	13	0	0	1	1	0	6	2	**32**													**0**													**0**	0	0	0	1	10	2	0	0	0	1	3	0	**17**
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09:15	09:30	**42**	0	0	1	3	14	0	0	1	2	0	10	1	**32**													**0**													**0**	0	0	0	0	3	0	1	0	1	0	5	0	**10**
09:30	09:45	**33**	1	1	5	1	4	0	0	0	0	1	8	1	**22**													**0**													**0**	0	0	0	0	7	0	0	0	0	0	4	0	**11**
09:45	10:00	**31**	2	0	2	4	11	0	0	1	1	0	7	0	**28**													**0**													**0**	0	0	0	0	0	0	0	0	0	1	0	0	**1**
10:00	10:15	**56**	0	2	4	2	14	0	0	1	2	1	14	1	**41**													**0**													**0**	0	0	0	0	4	2	2	0	1	0	6	0	**15**
10:15	10:30	**46**	0	0	2	0	13	0	0	0	0	0	15	2	**32**													**0**													**0**	0	0	0	0	6	1	2	0	2	0	3	0	**14**
10:30	10:45	**39**	1	0	4	5	10	0	0	0	2	1	7	0	**30**													**0**													**0**	0	0	0	0	3	0	3	0	0	0	3	0	**9**
10:45	11:00	**34**	0	1	0	2	8	0	0	0	0	0	11	0	**22**													**0**													**0**	0	0	0	0	4	3	0	0	1	0	4	0	**12**
11:00	11:15	**29**	0	0	2	0	5	0	0	0	0	1	13	0	**21**													**0**													**0**	0	0	0	0	0	1	2	0	0	0	5	0	**8**
11:15	11:30	**54**	3	2	6	3	13	0	0	0	2	2	14	1	**46**													**0**													**0**	0	0	0	0	5	0	0	0	0	2	1	0	**8**
11:30	11:45	**39**	0	0	3	5	7	0	0	1	1	1	11	0	**29**													**0**													**0**	0	0	0	0	1	2	0	0	2	0	5	0	**10**
11:45	12:00	**40**	1	0	4	6	8	0	0	2	0	0	12	0	**33**													**0**													**0**	0	0	0	0	5	1	0	0	0	0	1	0	**7**
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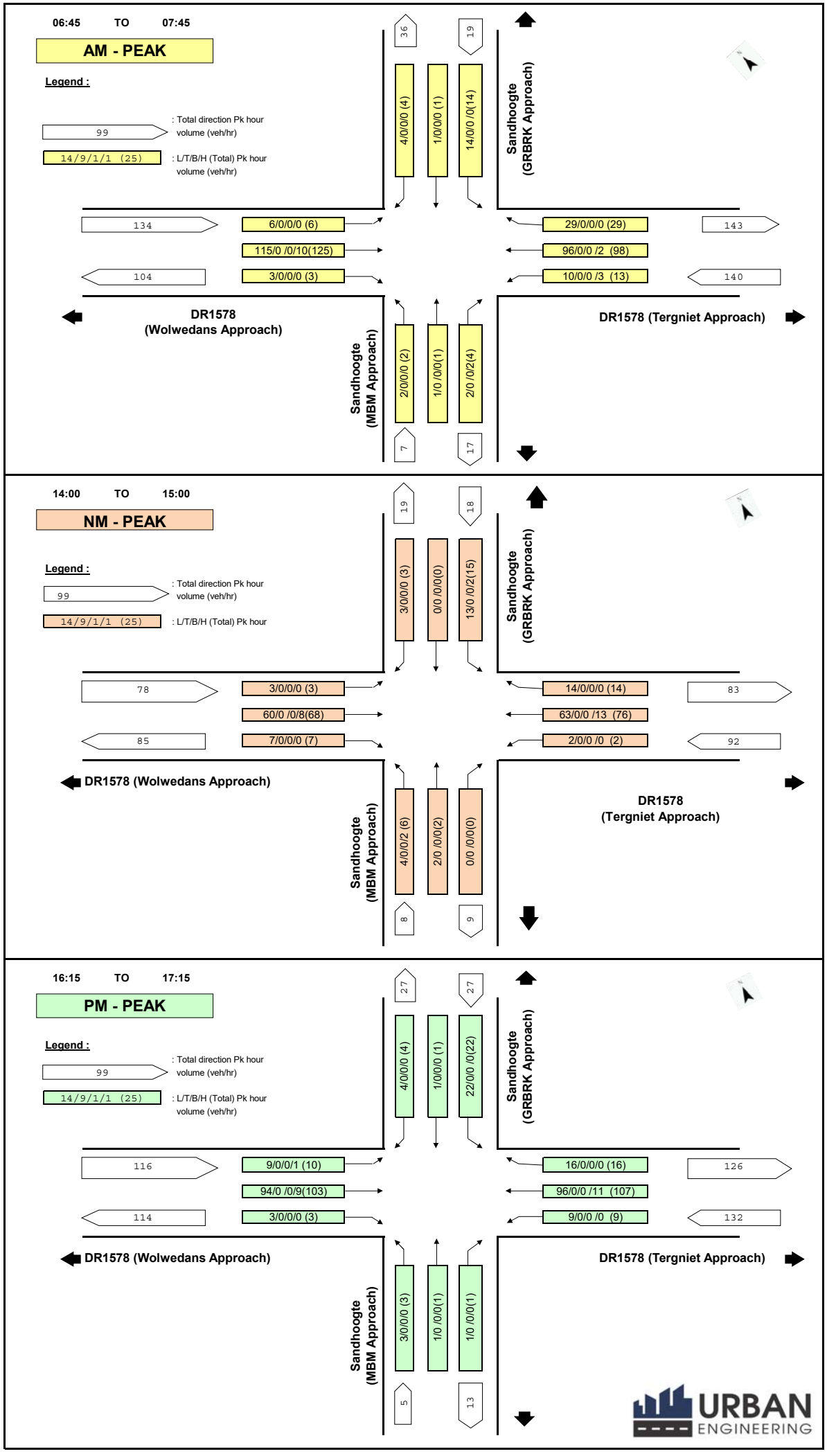
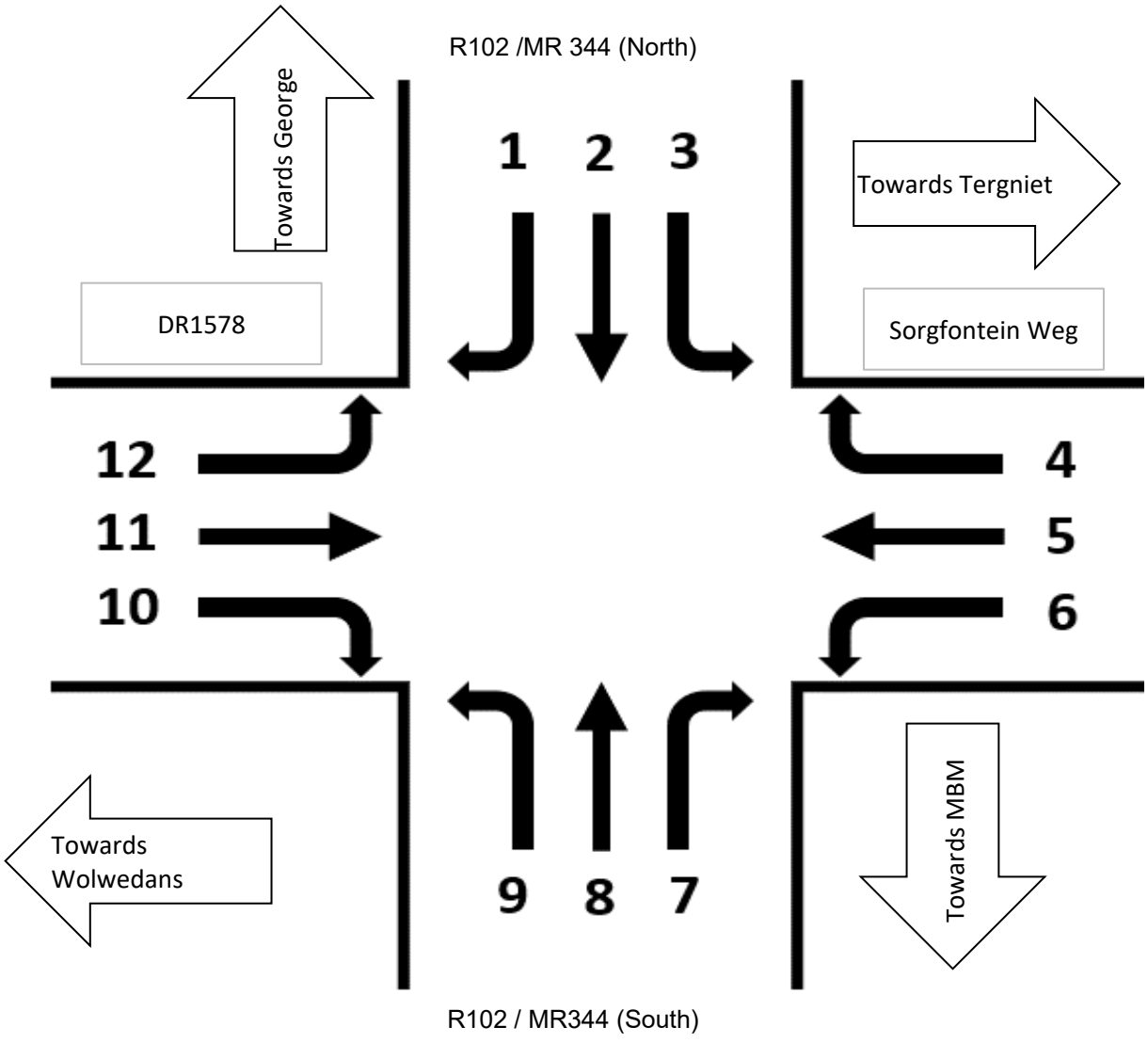
12:30	12:45	**39**	1	1	3	4	7	0	0	0	1	1	12	2	**32**													**0**													**0**	0	0	0	0	2	1	0	0	0	3	1	0	**7**
12:45	13:00	**47**	0	0	2	4	15	0	0	0	0	0	14	1	**36**													**0**													**0**	0	0	0	0	2	3	1	2	0	0	3	0	**11**
13:00	13:15	**33**	1	1	0	0	12	0	0	1	1	1	9	1	**27**													**0**													**0**	0	0	0	0	0	3	1	0	0	0	2	0	**6**
13:15	13:30	**34**	1	2	1	0	11	1	0	0	0	0	14	0	**30**													**0**													**0**	0	0	0	0	3	0	1	0	0	0	0	0	**4**
13:30	13:45	**50**	0	0	3	2	19	0	0	2	0	0	13	2	**41**													**0**													**0**	0	0	0	0	4	1	0	0	0	0	4	0	**9**
13:45	14:00	**52**	1	2	3	4	19	0	0	0	1	0	13	1	**44**													**0**													**0**	0	0	0	0	6	0	0	0	0	0	2	0	**8**
14:00	14:15	**53**	0	0	5	8	13	1	0	0	0	1	18	1	**47**													**0**													**0**	0	0	1	0	2	0	0	0	2	0	1	0	**6**
14:15	14:30	**40**	2	0	4	3	11	0	0	1	1	0	12	1	**35**													**0**													**0**	0	0	0	0	5	0	0	0	0	0	0	0	**5**
14:30	14:45	**42**	0	0	2	1	12	0	0	1	3	4	12	1	**36**													**0**													**0**	0	0	1	0	3	0	0	0	0	0	2	0	**6**
14:45	15:00	**61**	1	0	2	2	27	1	0	0	0	2	18	0	**53**													**0**													**0**	0	0	0	0	3	0	0	0	0	0	5	0	**8**
15:00	15:15	**51**	0	1	3	2	15	0	0	0	1	0	18	1	**41**													**0**													**0**	0	0	0	0	3	0	0	0	0	0	7	0	**10**
15:15	15:30	**62**	1	0	0	2	24	6	0	1	0	1	14	2	**51**													**0**													**0**	0	0	2	0	4	0	0	0	0	0	5	0	**11**
15:30	15:45	**47**	0	0	0	3	20	0	1	0	0	1	17	1	**43**													**0**													**0**	0	0	0	0	1	0	0	1	0	0	2	0	**4**
15:45	16:00	**43**	0	0	5	3	7	3	0	1	1	0	13	2	**35**													**0**													**0**	0	0	1	0	4	0	0	0	1	0	2	0	**8**
16:00	16:15	**50**	1	0	1	3	17	4	1	1	1	0	11	1	**41**													**0**													**0**	0	0	0	0	5	0	0	0	0	2	2	0	**9**
16:15	16:30	**69**	1	0	7	3	20	7	0	0	1	2	20	2	**63**													**0**													**0**	0	0	0	0	2	0	0	0	0	0	4	0	**6**
16:30	16:45	**71**	0	1	4	1	26	0	1	1	1	0	22	4	**61**													**0**													**0**	0	0	0	0	7	0	0	0	0	0	3	0	**10**
16:45	17:00	**60**	1	0	5	8	28	2	0	0	1	1	12	0	**58**													**0**													**0**	0	0	0	0	0	0	0	0	0	0	1	1	**2**
17:00	17:15	**80**	2	0	6	4	22	0	0	0	0	0	40	3	**77**													**0**													**0**	0	0	0	0	2	0	0	0	0	0	1	0	**3**
17:15	17:30	**57**	0	0	5	3	28	1	0	2	1	0	14	0	**54**													**0**													**0**	0	0	0	0	1	0	0	0	0	0	2	0	**3**
17:30	17:45	**38**	1	0	0	4	14	0	0	0	0	0	13	3	**35**													**0**													**0**	0	0	0	0	2	0	0	0	0	0	1	0	**3**
17:45	18:00	**30**	1	0	0	0	23	0	0	1	0	0	4	0	**29**													**0**													**0**	0	0	0	0	1	0	0	0	0	0	0	0	**1**
Total (5-19)		**2287**	**40**	**22**	**132**	**150**	**717**	**47**	**9**	**26**	**30**	**28**	**708**	**49**	**1958**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**5**	**131**	**28**	**17**	**4**	**14**	**8**	**114**	**2**	**329**
AM Pk hour vol		300	4	1	14	29	96	10	2	1	2	3	115	6	283	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	2	0	0	0	10	0	17
06:45	to	07:45											**Total AM Pk hour vol (Light + Heavy)**		**4**	**1**	**14**	**29**	**96**	**10**	**2**	**1**	**2**	**3**	**115**	**6**	**283**	**4**	**1**	**14**	**29**	**96**	**10**	**2**	**1**	**2**	**3**	**115**	**6**	**283**	**4**	**1**	**14**	**29**	**98**	**13**	**4**	**1**	**2**	**3**	**125**	**6**	**300**
NM Pk hour vol		196	3	0	13	14	63	2	0	2	4	7	60	3	171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	13	0	0	0	2	0	8	0	25
14:00	to	15:00											**Typical NM Pk hour vol (Light + Heavy)**		**3**	**0**	**13**	**14**	**63**	**2**	**0**	**2**	**4**	**7**	**60**	**3**	**171**	**3**	**0**	**13**	**14**	**63**	**2**	**0**	**2**	**4**	**7**	**60**	**3**	**171**	**3**	**0**	**15**	**14**	**76**	**2**	**0**	**2**	**6**	**7**	**68**	**3**	**196**
PM Pk hour vol		280	4	1	22	16	96	9	1	1	3	3	94	9	259	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	9	1	21
16:15	to	17:15											**Total PM Pk hour vol (Light + Heavy)**		**4**	**1**	**22**	**16**	**96**	**9**	**1**	**1**	**3**	**3**	**94**	**9**	**259**	**4**	**1**	**22**	**16**	**96**	**9**	**1**	**1**	**3**	**3**	**94**	**9**	**259**	**4**	**1**	**22**	**16**	**107**	**9**	**1**	**1**	**3**	**3**	**103**	**10**	**280**


06:45 TO 07:45
AM - PEAK
Legend :
99
: Total direction Pk hour volume (veh/hr)
14/9/1/1 (25)
: L/T/B/H (Total) Pk hour volume (veh/hr)
36
19
4/0/0/0 (4)
1/0/0/0 (1)
14/0/0 /0(14)
Sandhoogte (GRBRK Approach)
134
6/0/0/0 (6)
115/0 /0/10(125)
104
3/0/0/0 (3)
29/0/0/0 (29)
96/0/0 /2 (98)
10/0/0 /3 (13)
143
140
DR1578 (Wolwedans Approach)
DR1578 (Tergniet Approach)
Sandhoogte (MBM Approach)
2/0/0/0 (2)
1/0 /0/0(1)
2/0 /0/2(4)
7
17
14:00 TO 15:00
NM - PEAK
Legend :
99
: Total direction Pk hour volume (veh/hr)
14/9/1/1 (25)
: L/T/B/H (Total) Pk hour
19
18
3/0/0/0 (3)
0/0 /0/0(0)
13/0 /0/2(15)
Sandhoogte (GRBRK Approach)
78
3/0/0/0 (3)
60/0 /0/8(68)
85
7/0/0/0 (7)
14/0/0/0 (14)
63/0/0 /13 (76)
2/0/0 /0 (2)
83
92
DR1578 (Wolwedans Approach)
DR1578 (Tergniet Approach)
Sandhoogte (MBM Approach)
4/0/0/2 (6)
2/0 /0/0(2)
0/0 /0/0(0)
8
9
16:15 TO 17:15
PM - PEAK
Legend :
99
: Total direction Pk hour volume (veh/hr)
14/9/1/1 (25)
: L/T/B/H (Total) Pk hour volume (veh/hr)
27
27
4/0/0/0 (4)
1/0/0/0 (1)
22/0/0 /0(22)
Sandhoogte (GRBRK Approach)
116
9/0/0/1 (10)
94/0 /0/9(103)
114
3/0/0/0 (3)
16/0/0/0 (16)
96/0/0 /11 (107)
9/0/0 /0 (9)
126
132
DR1578 (Wolwedans Approach)
DR1578 (Tergniet Approach)
Sandhoogte (MBM Approach)
3/0/0/0 (3)
1/0 /0/0(1)
1/0 /0/0(1)
5
13
URBAN ENGINEERING


R102 /MR 344 (North)
Towards George
DR1578
1
2
3
Towards Tergniet
Sorgfontein Weg
12
11
10
4
5
6
Towards
Wolwedans
9
8
7
Towards MBM
R102 / MR344 (South)

Verkeerstelling/Traffic Count

Projek Naam: TIA Transand
Plek/Location: Tergniet - DR1578 / Sandhoogte Road
Datum/Date: 14/03/2023
Teller/Counter: JE Giewelaar

URBAN ENGINEERING

Tyd	R102 (MR344) / vanaf Gr/Brak						DR 1578 (vanaf Tergniet)					
	1		2		3		4		5		6	
	L	S	L	S	L	S	L	S	L	S	L	S
06:00 - 06:15	1	0	5	0	3	1	10	0	0	0	3	0
06:15 - 06:30	2	0	12	0	12	1	32	0	2	0	8	0
06:30 - 06:45	3	0	20	1	15	1	68	0	8	0	22	0
06:45 - 07:00	9	0	26	2	23	1	99	0	14	0	28	0
07:00 - 07:15	19	0	35	3	25	1	138	0	23	0	37	0
07:15 - 07:30	21	0	64	3	45	1	166	0	34	0	48	0
07:30 - 07:45	25	2	81	5	52	1	191	0	37	0	55	0
07:45 - 08:00	27	2	103	5	63	1	217	0	42	0	64	0
08:00 - 08:15	28	5	116	6	85	2	234	0	47	0	69	1
08:15 - 08:30	32	4	135	8	107	5	263	0	51	1	77	2
08:30 - 08:45	34	7	151	8	121	6	287	0	56	1	88	2
08:45 - 09:00	35	12	162	10	142	7	314	0	60	4	92	3
09:00 - 09:15	35	13	185	11	157	7	334	0	62	4	100	3
09:15 - 09:30	42	14	218	14	173	8	363	1	64	5	106	4
09:30 - 09:45	42	15	243	15	201	8	388	1	66	5	116	4
09:45 - 10:00	47	16	268	15	220	8	404	2	69	5	124	4
10:00 - 10:15	50	19	291	15	229	8	425	2	73	6	127	4
10:15 - 10:30	51	21	319	18	254	8	450	2	77	8	133	4
10:30 - 10:45	56	21	331	19	273	8	471	4	80	8	137	4
10:45 - 11:00	58	25	357	21	298	11	493	4	83	10	140	4
11:00 - 11:15	59	26	389	21	319	13	508	4	85	10	144	4
11:15 - 11:30	62	27	418	22	346	17	538	4	91	12	150	6
11:30 - 11:45	66	30	441	23	366	19	559	5	93	12	154	6
11:45 - 12:00	73	33	469	26	392	23	578	5	96	12	158	7
12:00 - 12:15	75	33	507	28	421	23	598	6	101	12	163	8
12:15 - 12:30	75	33	536	30	444	23	616	7	106	13	168	10
12:30 - 12:45	76	34	558	30	469	26	631	8	106	13	173	10
12:45 - 13:00	77	35	591	32	502	27	664	8	115	14	181	11
13:00 - 13:15	80	35	601	32	516	27	681	8	116	14	182	11

13:15 - 13:30	80	36	634	32	542	28	690	9	121	15	191	11
13:30 - 13:45	82	37	662	32	569	28	702	10	128	16	194	11
13:45 - 14:00	83	41	687	34	591	30	713	10	141	16	202	11
14:00 - 14:15	85	41	709	36	617	30	725	12	147	16	205	11
14:15 - 14:30	88	44	734	36	640	30	742	13	150	16	212	11
14:30 - 14:45	90	46	762	36	667	30	766	14	152	17	221	12
14:45 - 15:00	92	46	781	38	691	30	781	15	160	17	227	13
15:00 - 15:15	97	46	799	40	716	30	808	15	166	17	231	13
15:15 - 15:30	101	47	821	41	737	30	821	15	175	17	232	13
15:30 - 15:45	105	47	844	41	762	30	839	15	178	17	235	14
15:45 - 16:00	106	49	867	42	786	31	856	16	183	17	239	15
16:00 - 16:15	109	52	899	44	810	32	874	16	191	17	245	15
16:15 - 16:30	114	52	934	46	856	33	890	17	199	18	251	16
16:30 - 16:45	118	55	977	46	892	33	907	17	212	18	255	16
16:45 - 17:00	120	55	1006	47	924	33	921	17	222	18	261	19
17:00 - 17:15	122	55	1052	47	957	33	934	17	225	18	265	19
17:15 - 17:30	127	56	1097	47	1008	33	947	18	236	18	273	19
17:30 - 17:45	129	56	1123	47	1037	33	960	19	241	19	278	19
17:45 - 18:00	131	56	1157	47	1067	33	967	19	243	19	280	19

Verkeerstelling/Traffic Count

Projek Naam: TIA Transand
Plek/Location: Tergniet - DR1578 / Sandhoogte Road
Datum/Date: 14/03/2023
Teller/Counter: JE Giewelaar

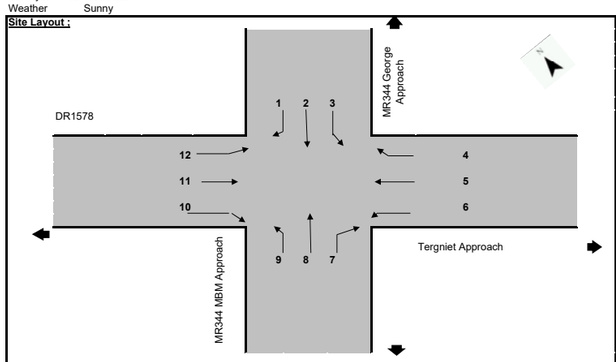
URBAN ENGINEERING

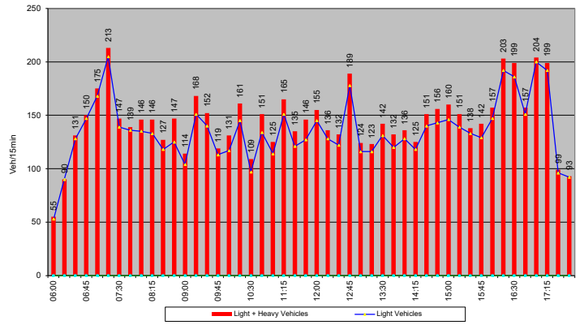
Tyd	R102 (MR344) / vanaf Mosselbaai						DR 1578 (vanaf Friemersheim)					
	7		8		9		10		11		12	
	L	S	L	S	L	S	L	S	L	S	L	S
06:00 - 06:15	3	0	11	0	4	1	7	0	3	0	3	0
06:15 - 06:30	3	0	27	0	13	1	20	0	5	0	7	0
06:30 - 06:45	4	0	46	1	25	1	45	1	8	0	7	0
06:45 - 07:00	7	0	72	1	43	2	70	2	17	0	10	0
07:00 - 07:15	9	0	103	3	67	2	92	4	26	0	12	2
07:15 - 07:30	16	0	140	5	97	2	111	7	35	1	14	4
07:30 - 07:45	24	1	165	5	109	4	129	7	44	2	18	4
07:45 - 08:00	26	2	194	5	124	5	137	8	47	2	22	4
08:00 - 08:15	35	2	224	6	140	8	143	9	51	2	29	4
08:15 - 08:30	42	2	249	6	143	11	148	13	53	2	34	4
08:30 - 08:45	51	3	268	7	147	13	154	13	57	2	38	5
08:45 - 09:00	56	3	301	9	157	18	157	16	59	2	42	5
09:00 - 09:15	61	4	317	9	165	20	162	18	61	3	42	7
09:15 - 09:30	66	4	350	11	173	21	172	19	62	3	43	12
09:30 - 09:45	72	4	377	11	178	27	178	20	65	5	46	13
09:45 - 10:00	77	4	395	13	183	28	183	21	69	5	46	13
10:00 - 10:15	81	4	418	13	192	30	190	27	71	5	55	15
10:15 - 10:30	89	4	441	14	200	33	200	31	72	5	61	16
10:30 - 10:45	91	4	458	14	203	36	206	34	75	7	63	17
10:45 - 11:00	100	4	482	15	212	37	216	37	76	7	63	18
11:00 - 11:15	104	5	500	15	214	37	227	41	80	7	63	21
11:15 - 11:30	105	5	522	16	221	39	236	42	83	7	71	21
11:30 - 11:45	107	5	547	18	227	39	243	45	85	8	76	22
11:45 - 12:00	110	6	564	19	231	42	253	48	89	8	78	22
12:00 - 12:15	115	6	581	20	242	47	253	48	100	8	80	22
12:15 - 12:30	118	7	596	20	253	48	267	48	105	8	80	22

12:30 - 12:45	121	7	622	22	263	50	277	48	107	9	83	22
12:45 - 13:00	128	7	651	22	272	53	290	50	109	9	84	22
13:00 - 13:15	131	7	701	22	280	56	293	55	115	9	84	22
13:15 - 13:30	133	7	711	23	287	57	303	56	119	9	85	22
13:30 - 13:45	138	7	730	24	299	60	313	60	123	9	87	22
13:45 - 14:00	142	7	741	24	308	62	326	61	124	10	89	22
14:00 - 14:15	143	7	759	24	323	64	342	63	127	10	93	22
14:15 - 14:30	145	7	774	25	330	66	349	63	132	10	97	22
14:30 - 14:45	151	8	793	27	339	66	353	66	139	10	100	22
14:45 - 15:00	158	9	815	27	359	69	368	71	141	10	103	22
15:00 - 15:15	164	10	843	28	365	72	381	76	148	10	104	24
15:15 - 15:30	173	10	870	28	384	75	388	82	153	10	106	25
15:30 - 15:45	177	11	889	28	400	76	399	84	157	10	109	25
15:45 - 16:00	185	11	911	30	407	78	407	86	164	10	112	26
16:00 - 16:15	191	11	935	30	420	80	413	86	170	10	113	28
16:15 - 16:30	196	11	962	30	437	81	424	90	177	10	122	28
16:30 - 16:45	204	14	986	30	447	85	444	93	183	10	123	28
16:45 - 17:00	209	14	996	31	473	85	452	94	188	10	127	28
17:00 - 17:15	217	14	1021	32	494	87	495	95	189	10	128	28
17:15 - 17:30	220	15	1041	33	510	88	511	96	192	10	129	29
17:30 - 17:45	228	15	1049	33	521	88	525	96	195	10	130	30
17:45 - 18:00	234	15	1063	33	540	89	531	96	195	10	130	30

Site Tergniet - DR1578 / Sandhoogte Road
Date 14/03/2023
Surveyor JE Giewelaar
Weather Sunny

Site Layout :





URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

Time Period			Light Vehicles													Taxis/Minibus-taxis													Bus													Heavy Vehicles												
Start	End	Total	1	2	3	4	5	6	7	8	9	10	11	12	Total	1	2	3	4	5	6	7	8	9	10	11	12	Total	1	2	3	4	5	6	7	8	9	10	11	12	Total	1	2	3	4	5	6	7	8	9	10	11	12	Total
06:00	06:15	**55**	1	5	3	10	0	3	3	11	4	7	3	3	**53**													**0**													**0**	0	0	1	0	0	0	0	0	1	0	0	0	**2**
06:15	06:30	**90**	1	7	9	22	2	5	0	16	9	13	2	4	**90**													**0**													**0**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
06:30	06:45	**131**	1	8	3	36	6	14	1	19	12	25	3	0	**128**													**0**													**0**	0	1	0	0	0	0	0	1	0	1	0	0	**3**
06:45	07:00	**150**	6	6	8	31	6	6	3	26	18	25	9	3	**147**													**0**													**0**	0	1	0	0	0	0	0	0	1	1	0	0	**3**
07:00	07:15	**175**	10	9	2	39	9	9	2	31	24	22	9	2	**168**													**0**													**0**	0	1	0	0	0	0	0	2	0	2	0	2	**7**
07:15	07:30	**213**	2	29	20	28	11	11	7	37	30	19	9	2	**205**													**0**													**0**	0	0	0	0	0	0	0	2	0	3	1	2	**8**
07:30	07:45	**147**	4	17	7	25	3	7	8	25	12	18	9	4	**139**													**0**													**0**	2	2	0	0	0	0	1	0	2	0	1	0	**8**
07:45	08:00	**139**	2	22	11	26	5	9	2	29	15	8	3	4	**136**													**0**													**0**	0	0	0	0	0	0	1	0	1	1	0	0	**3**
08:00	08:15	**146**	1	13	22	17	5	5	9	30	16	6	4	7	**135**													**0**													**0**	3	1	1	0	0	1	0	1	3	1	0	0	**11**
08:15	08:30	**146**	4	19	22	29	4	8	7	25	3	5	2	5	**133**													**0**													**0**	-1	2	3	0	1	1	0	0	3	4	0	0	**13**
08:30	08:45	**127**	2	16	14	24	5	11	9	19	4	6	4	4	**118**													**0**													**0**	3	0	1	0	0	0	1	1	2	0	0	1	**9**
08:45	09:00	**147**	1	11	21	27	4	4	5	33	10	3	2	4	**125**													**0**													**0**	5	2	1	0	3	1	0	2	5	3	0	0	**22**
09:00	09:15	**114**	0	23	15	20	2	8	5	16	8	5	2	0	**104**													**0**													**0**	1	1	0	0	0	0	1	0	2	2	1	2	**10**
09:15	09:30	**168**	7	33	16	29	2	6	5	33	8	10	1	1	**151**													**0**													**0**	1	3	1	1	1	1	0	2	1	1	0	5	**17**
09:30	09:45	**152**	0	25	28	25	2	10	6	27	5	6	3	3	**140**													**0**													**0**	1	1	0	0	0	0	0	6	1	2	1	**12**
09:45	10:00	**119**	5	25	19	16	3	8	5	18	5	5	4	0	**113**													**0**													**0**	1	0	0	1	0	0	0	2	1	1	0	0	**6**
10:00	10:15	**131**	3	23	9	21	4	3	4	23	9	7	2	9	**117**													**0**													**0**	3	0	0	0	1	0	0	0	2	6	0	2	**14**
10:15	10:30	**161**	1	28	25	25	4	6	8	23	8	10	1	6	**145**													**0**													**0**	2	3	0	0	2	0	0	1	3	4	0	1	**16**
10:30	10:45	**109**	5	12	19	21	3	4	2	17	3	6	3	2	**97**													**0**													**0**	0	1	0	2	0	0	0	0	3	3	2	1	**12**
10:45	11:00	**151**	2	26	25	22	3	3	9	24	9	10	1	0	**134**													**0**													**0**	4	2	3	0	2	0	0	1	1	3	0	1	**17**
11:00	11:15	**125**	1	32	21	15	2	4	4	18	2	11	4	0	**114**													**0**													**0**	1	0	2	0	0	0	1	0	0	4	0	3	**11**
11:15	11:30	**165**	3	29	27	30	6	6	1	22	7	9	3	8	**151**													**0**													**0**	1	1	4	0	2	2	0	1	2	1	0	0	**14**
11:30	11:45	**135**	4	23	20	21	2	4	2	25	6	7	2	5	**121**													**0**													**0**	3	1	2	1	0	0	0	2	0	3	1	1	**14**
11:45	12:00	**146**	7	28	26	19	3	4	3	17	4	10	4	2	**127**													**0**													**0**	3	3	4	0	0	1	1	1	3	3	0	0	**19**
12:00	12:15	**155**	2	38	29	20	5	5	5	17	11	0	11	2	**145**													**0**													**0**	0	2	0	1	0	1	0	1	5	0	0	0	**10**
12:15	12:30	**136**	0	29	23	18	5	5	3	15	11	14	5	0	**128**													**0**													**0**	0	2	0	1	1	2	1	0	1	0	0	0	**8**
12:30	12:45	**132**	1	22	25	15	0	5	3	26	10	10	2	3	**122**													**0**													**0**	1	0	3	1	0	0	0	2	2	0	1	0	**10**
12:45	13:00	**189**	1	33	33	33	9	8	7	29	9	13	2	1	**178**													**0**													**0**	1	2	1	0	1	1	0	0	3	2	0	0	**11**
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13:15	13:30	**123**	0	33	26	9	5	9	2	10	7	10	4	1	**116**													**0**													**0**	1	0	1	1	1	0	0	1	1	1	0	0	**7**
13:30	13:45	**142**	2	28	27	12	7	3	5	19	12	10	4	2	**131**													**0**													**0**	1	0	0	1	1	0	0	1	3	4	0	0	**11**
13:45	14:00	**132**	1	25	22	11	13	8	4	11	9	13	1	2	**120**													**0**													**0**	4	2	2	0	0	0	0	0	2	1	1	0	**12**
14:00	14:15	**136**	2	22	26	12	6	3	1	18	15	16	3	4	**128**													**0**													**0**	0	2	0	2	0	0	0	0	2	2	0	0	**8**
14:15	14:30	**125**	3	25	23	17	3	7	2	15	7	7	5	4	**118**													**0**													**0**	3	0	0	1	0	0	0	1	2	0	0	0	**7**
14:30	14:45	**151**	2	28	27	24	2	9	6	19	9	4	7	3	**140**													**0**													**0**	2	0	0	1	1	1	1	2	0	3	0	0	**11**
14:45	15:00	**156**	2	19	24	15	8	6	7	22	20	15	2	3	**143**													**0**													**0**	0	2	0	1	0	1	1	0	3	5	0	0	**13**
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15:15	15:30	**151**	4	22	21	13	9	1	9	27	19	7	5	2	**139**													**0**													**0**	1	1	0	0	0	0	0	0	3	6	0	1	**12**
15:30	15:45	**138**	4	23	25	18	3	3	4	19	16	11	4	3	**133**													**0**													**0**	0	0	0	0	0	0	1	1	0	1	2	0	0	**5**
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16:15	16:30	**203**	5	35	46	16	8	6	5	27	17	11	7	9	**192**													**0**													**0**	0	2	1	1	1	1	0	0	1	4	0	0	**11**
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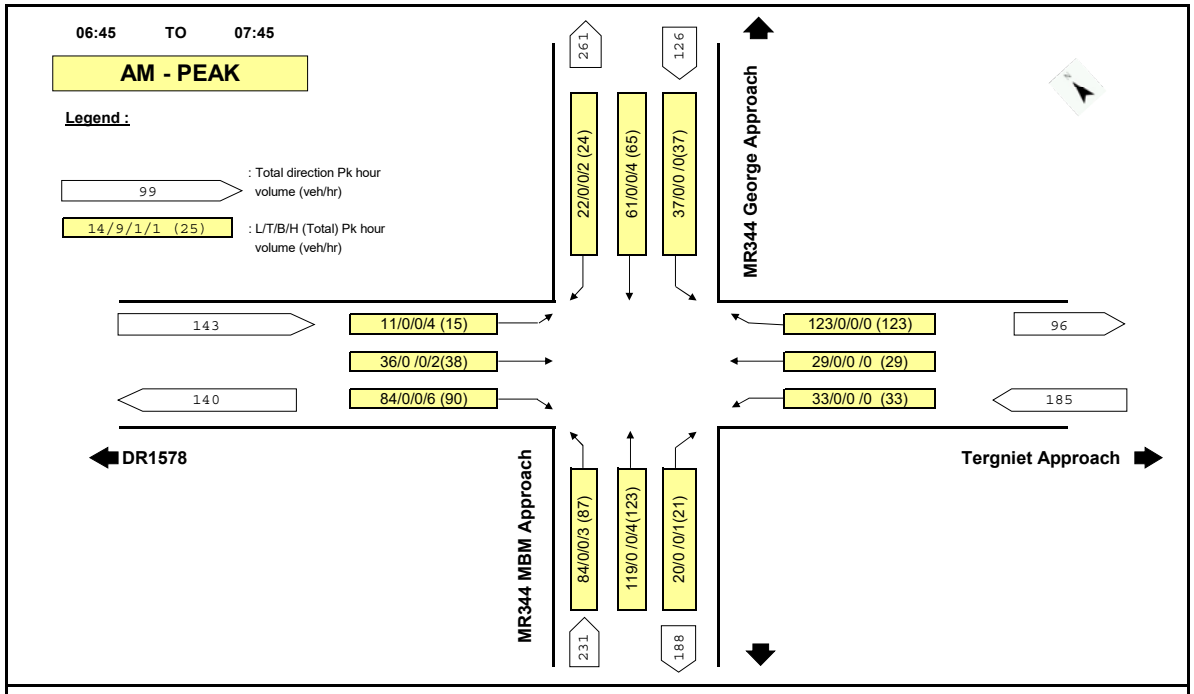
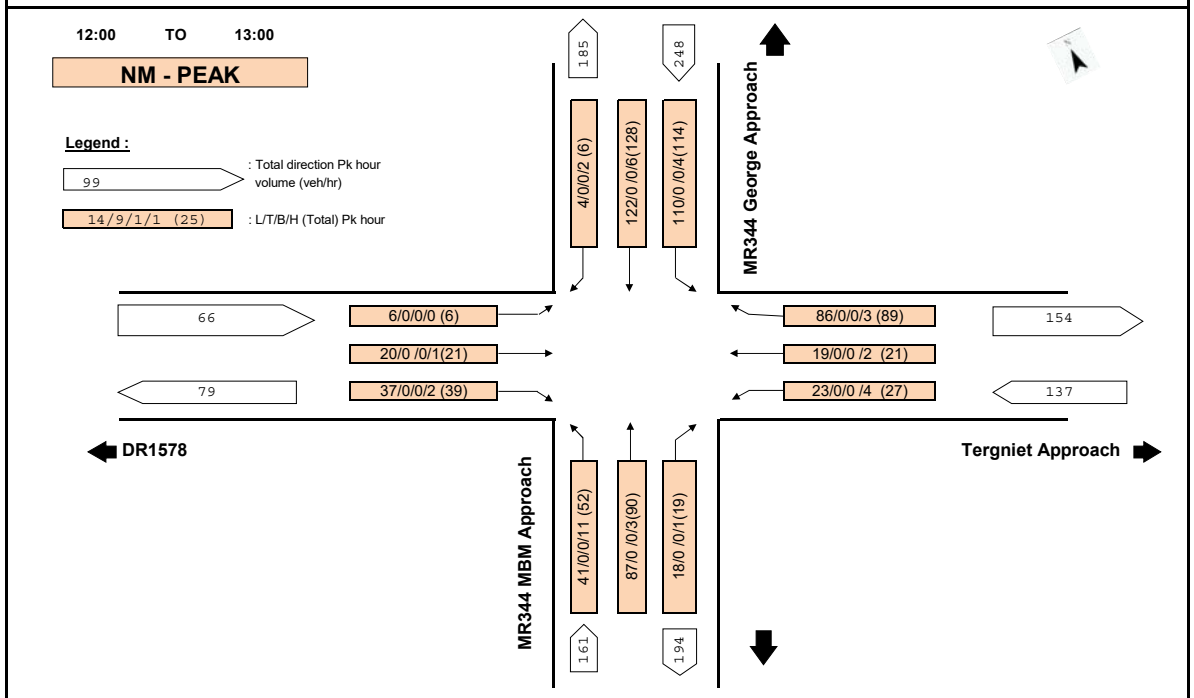
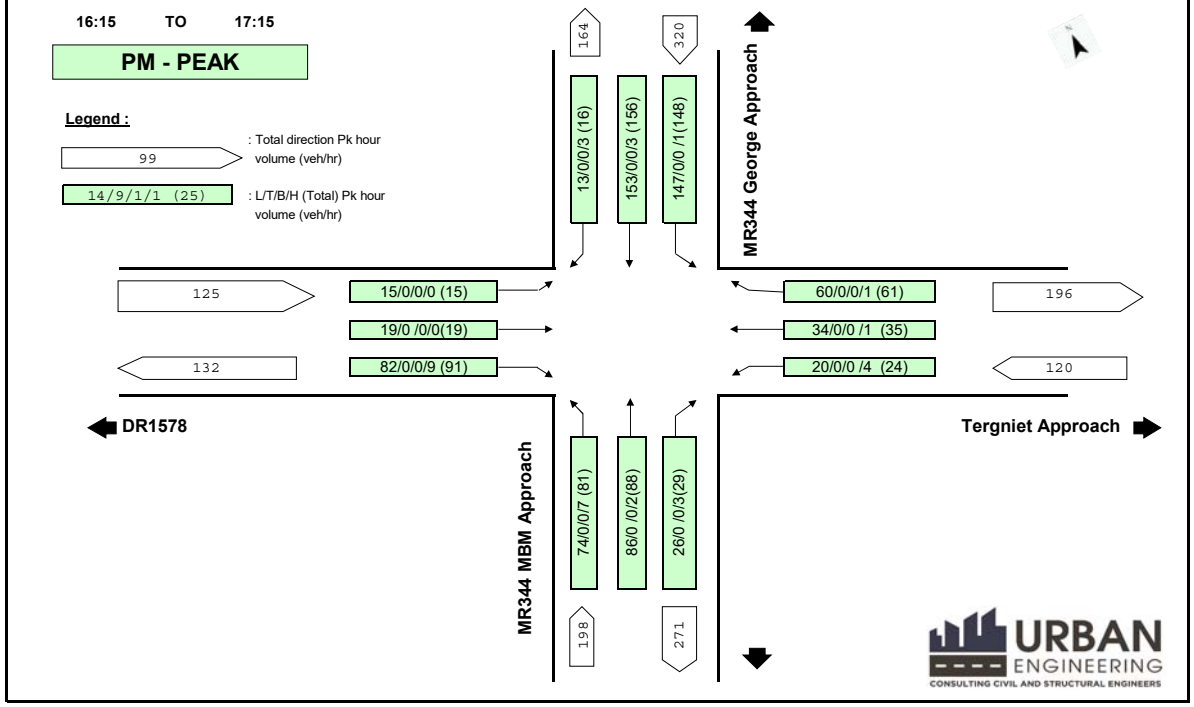
16:45	17:00	**157**	2	29	32	14	10	6	5	10	26	8	5	4	**151**													**0**													**0**	0	1	0	0	0	3	0	1	0	1	0	0	**6**
17:00	17:15	**204**	2	46	33	13	3	4	8	25	21	43	1	1	**200**													**0**													**0**	0	0	0	0	0	0	0	1	2	1	0	0	**4**
17:15	17:30	**199**	5	45	51	13	11	8	3	20	16	16	3	1	**192**													**0**													**0**	1	0	0	1	0	0	1	1	1	1	0	1	**7**
17:30	17:45	**99**	2	26	0	13	5	5	8	8	11	14	3	1	**96**													**0**													**0**	0	0	0	1	1	0	0	0	0	0	0	1	**3**
17:45	18:00	**93**	2	34	0	7	2	2	6	14	19	6	0	0	**92**													**0**													**0**	0	0	0	0	0	0	0	0	1	0	0	0	**1**
Total (5-19)		**6945**	**131**	**1157**	**1008**	**967**	**243**	**280**	**234**	**1063**	**540**	**531**	**195**	**130**	**6479**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**56**	**47**	**33**	**19**	**19**	**19**	**15**	**33**	**89**	**96**	**10**	**30**	**466**
AM Pk hour vol		685	22	61	37	123	29	33	20	119	84	84	36	11	659	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	1	4	3	6	2	4	26
06:45	to 07:45													Total AM Pk hour vol (Light + Heavy)		**22**	**61**	**37**	**123**	**29**	**33**	**20**	**119**	**84**	**84**	**36**	**11**	**659**	**22**	**61**	**37**	**123**	**29**	**33**	**20**	**119**	**84**	**84**	**36**	**11**	**659**	**24**	**65**	**37**	**123**	**29**	**33**	**21**	**123**	**87**	**90**	**38**	**15**	**685**
NM Pk hour vol		612	4	122	110	86	19	23	18	87	41	37	20	6	573	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	4	3	2	4	1	3	11	2	1	0	39
12:00	to 13:00													Typical NM Pk hour vol (Light + Heavy)		**4**	**122**	**110**	**86**	**19**	**23**	**18**	**87**	**41**	**37**	**20**	**6**	**573**	**4**	**122**	**110**	**86**	**19**	**23**	**18**	**87**	**41**	**37**	**20**	**6**	**573**	**6**	**128**	**114**	**89**	**21**	**27**	**19**	**90**	**52**	**39**	**21**	**6**	**612**
PM Pk hour vol		763	13	153	147	60	34	20	26	86	74	82	19	15	729	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	1	1	1	4	3	2	7	9	0	0	34
16:15	to 17:15													Total PM Pk hour vol (Light + Heavy)		**13**	**153**	**147**	**60**	**34**	**20**	**26**	**86**	**74**	**82**	**19**	**15**	**729**	**13**	**153**	**147**	**60**	**34**	**20**	**26**	**86**	**74**	**82**	**19**	**15**	**729**	**16**	**156**	**148**	**61**	**35**	**24**	**29**	**88**	**81**	**91**	**19**	**15**	**763**



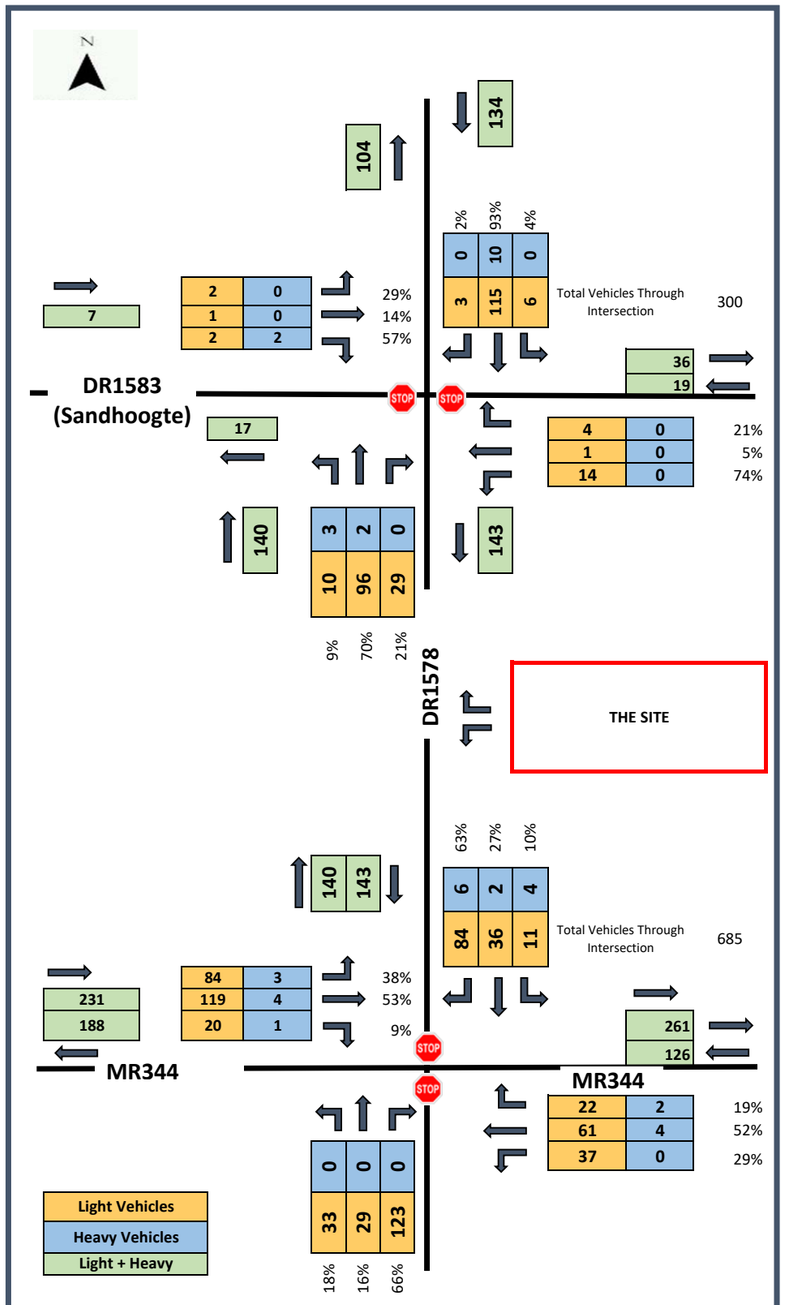


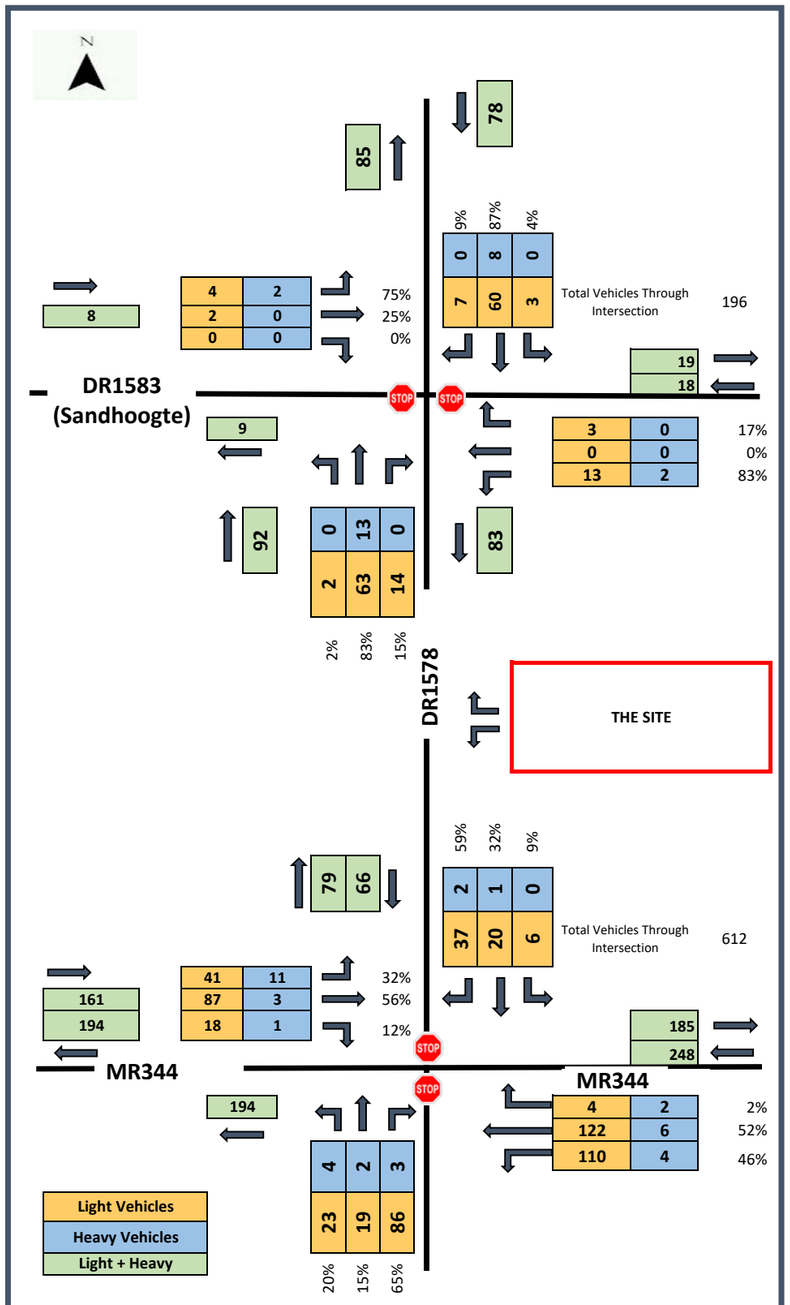


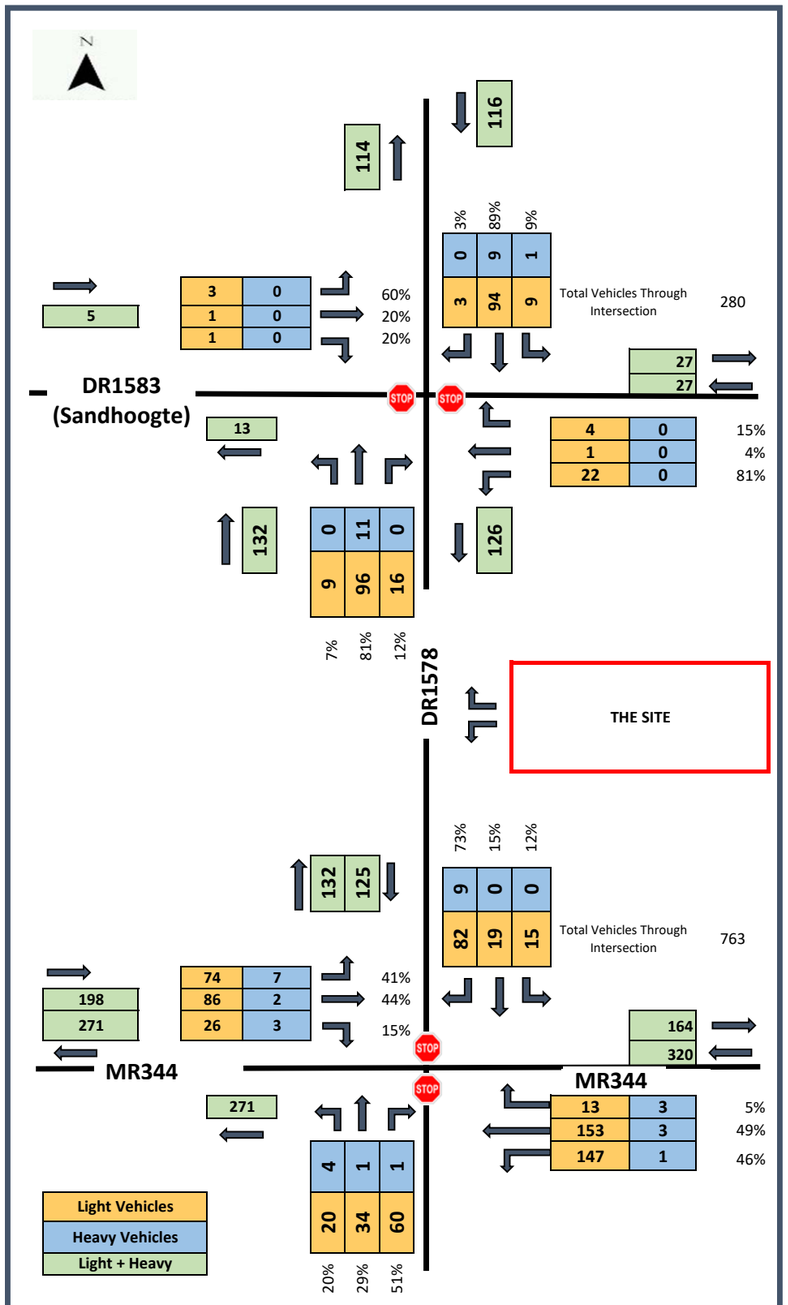
URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

ANNEXURE E

TRAFFIC VOLUME CALCULATIONS







URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

Project:

22-160 DOLPHIN CIRCLE DEVELOPMENT

Description:

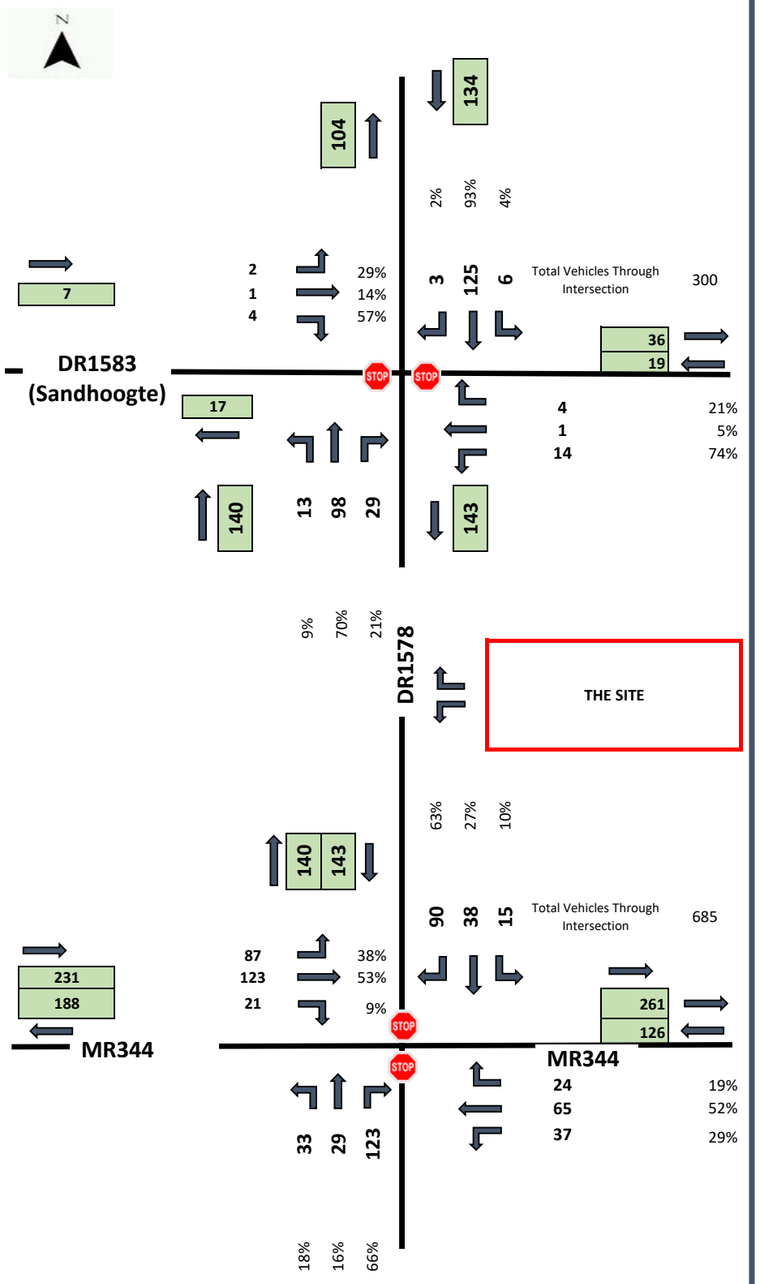
PEAK HOUR VOLUMES (TUESDAY 14 MARCH 2023)

Legend

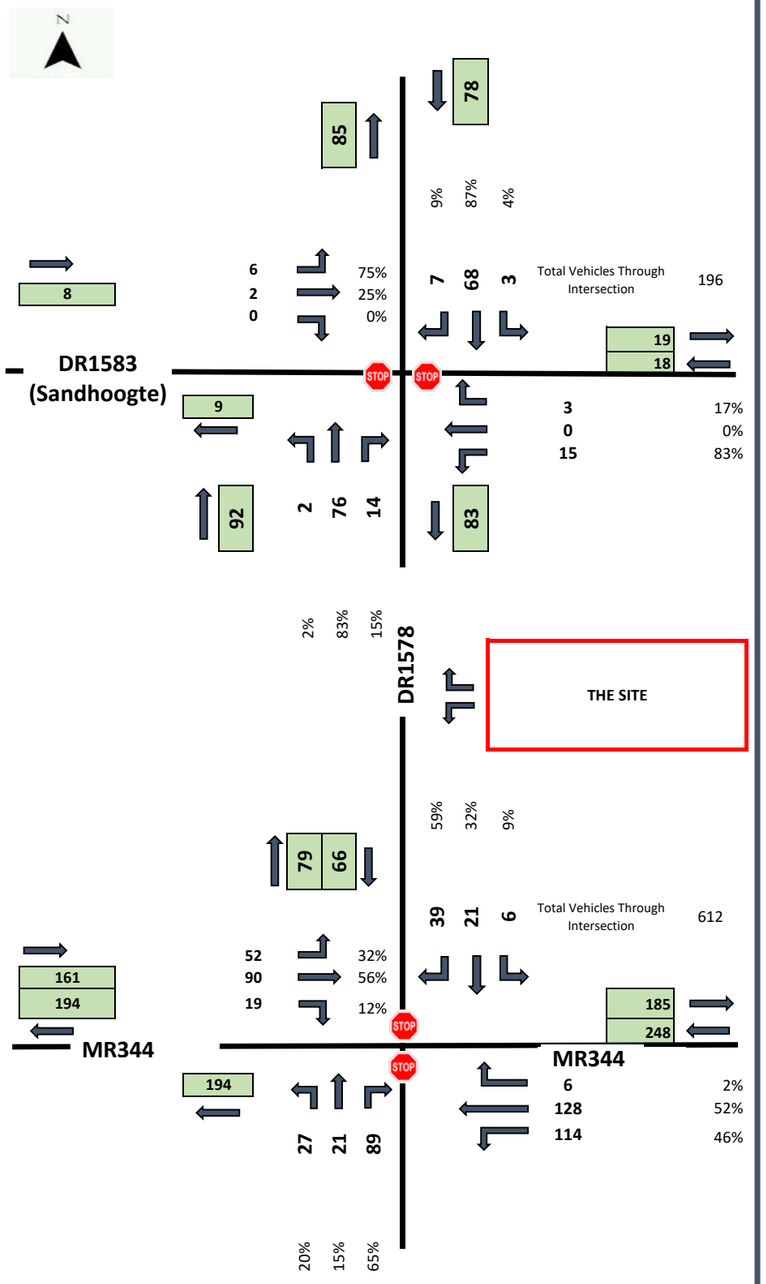
STOP CONTROLLED INTERSECTION

Title

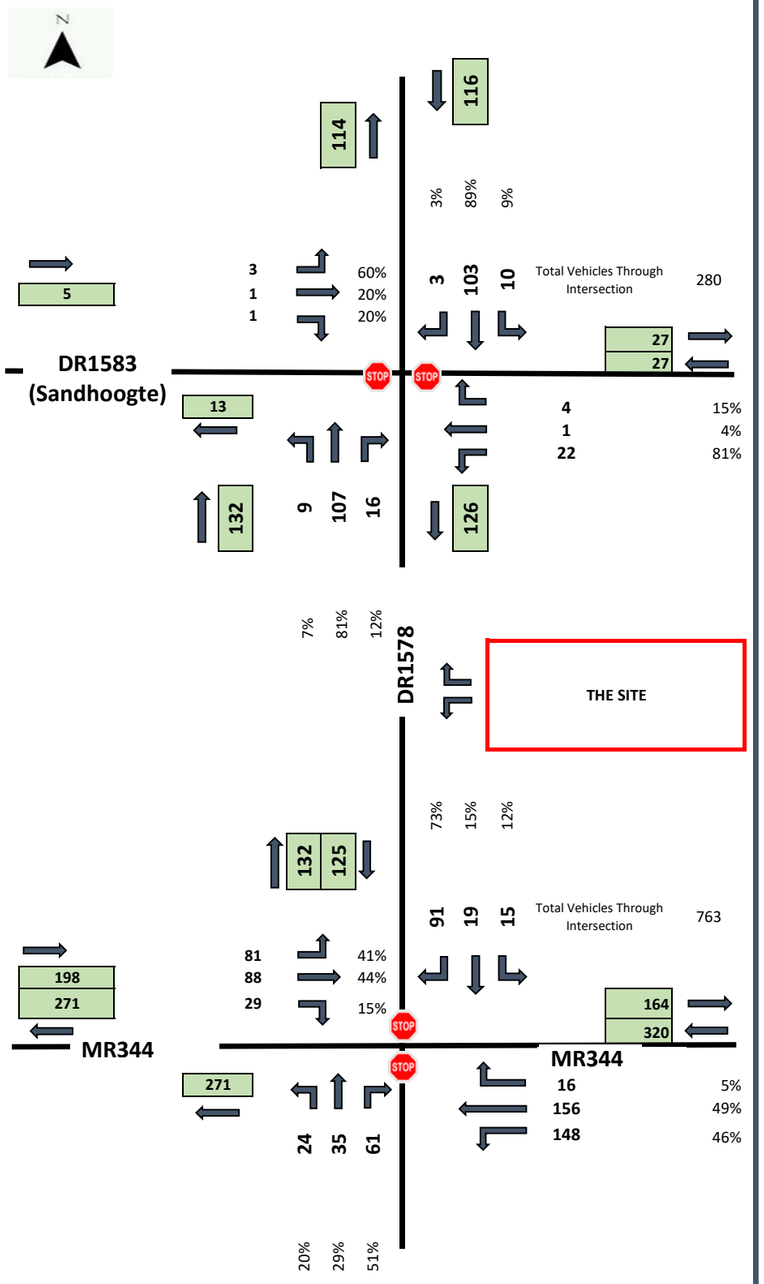
FIGURE A



AM PEAK HOUR VOLUMES
06:45 - 07:45



NM PEAK HOUR VOLUMES
12:00 - 13:00



PM PEAK HOUR VOLUMES
16:15 - 17:15

URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

Project:

22-160 DOLPHIN CIRCLE DEVELOPMENT

Description:

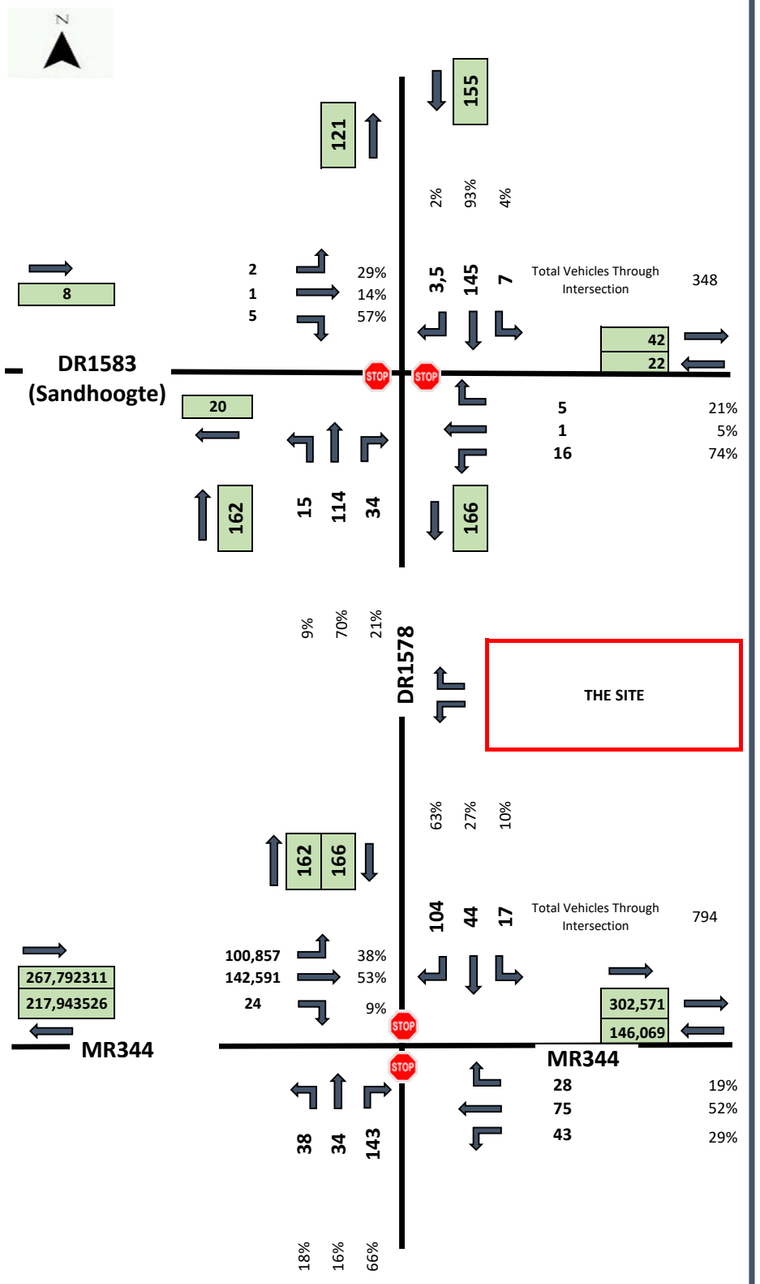
STATUS QUO PEAK HOUR VOLUMES(COMBINED)

Legend

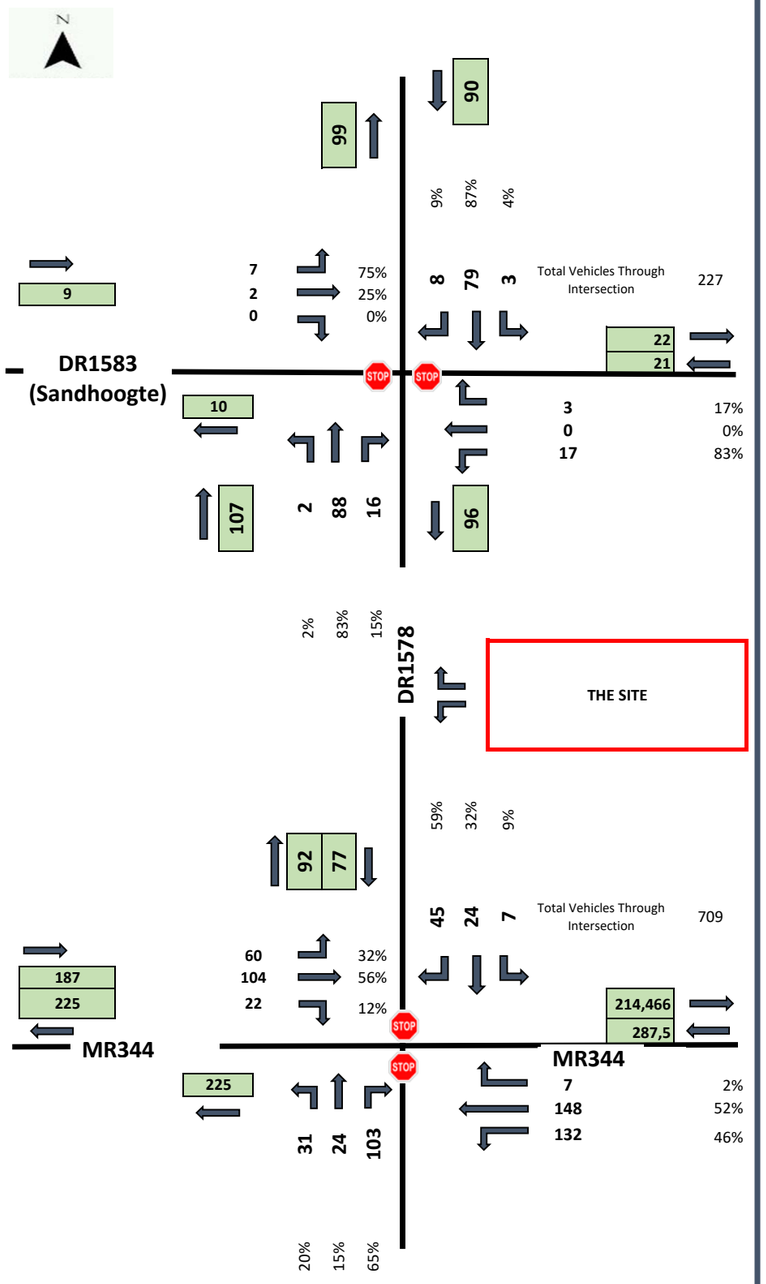
STOP **STOP CONTROLLED INTERSECTION**

Title

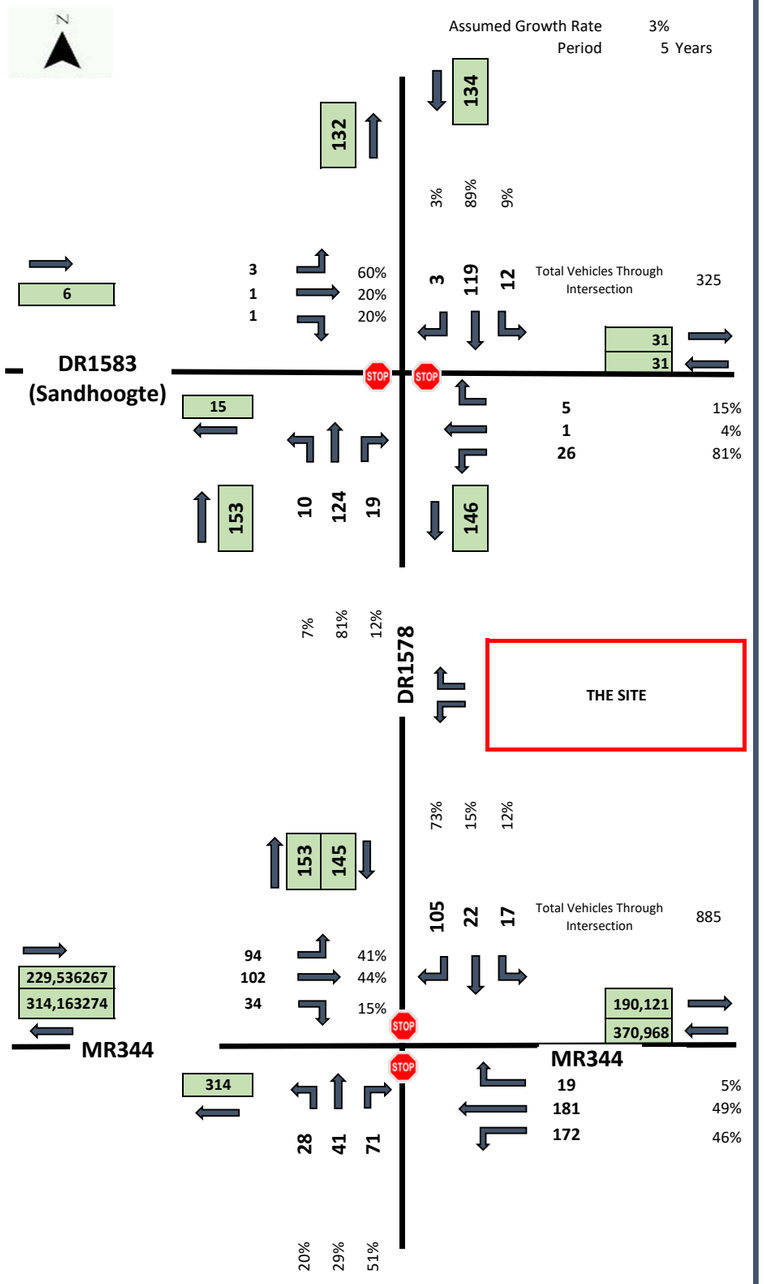
FIGURE B



AM PEAK HOUR VOLUMES
06:45 - 07:45



NM PEAK HOUR VOLUMES
12:00 - 13:00



PM PEAK HOUR VOLUMES
16:15 - 17:15

URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

Project:

22-160 DOLPHIN CIRCLE DEVELOPMENT

Description:

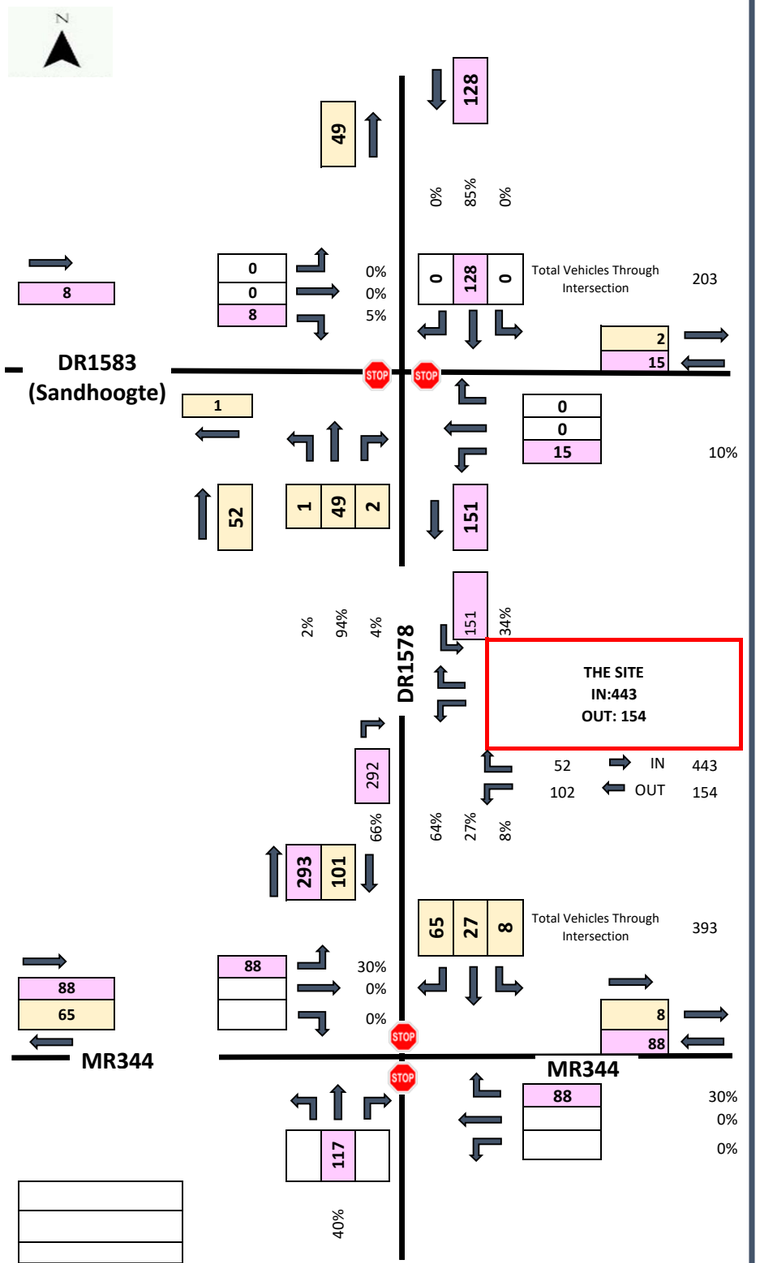
ESTIMATED 2028 BACKGROUND VOLUMES (3%, 5 YEARS)

Legend

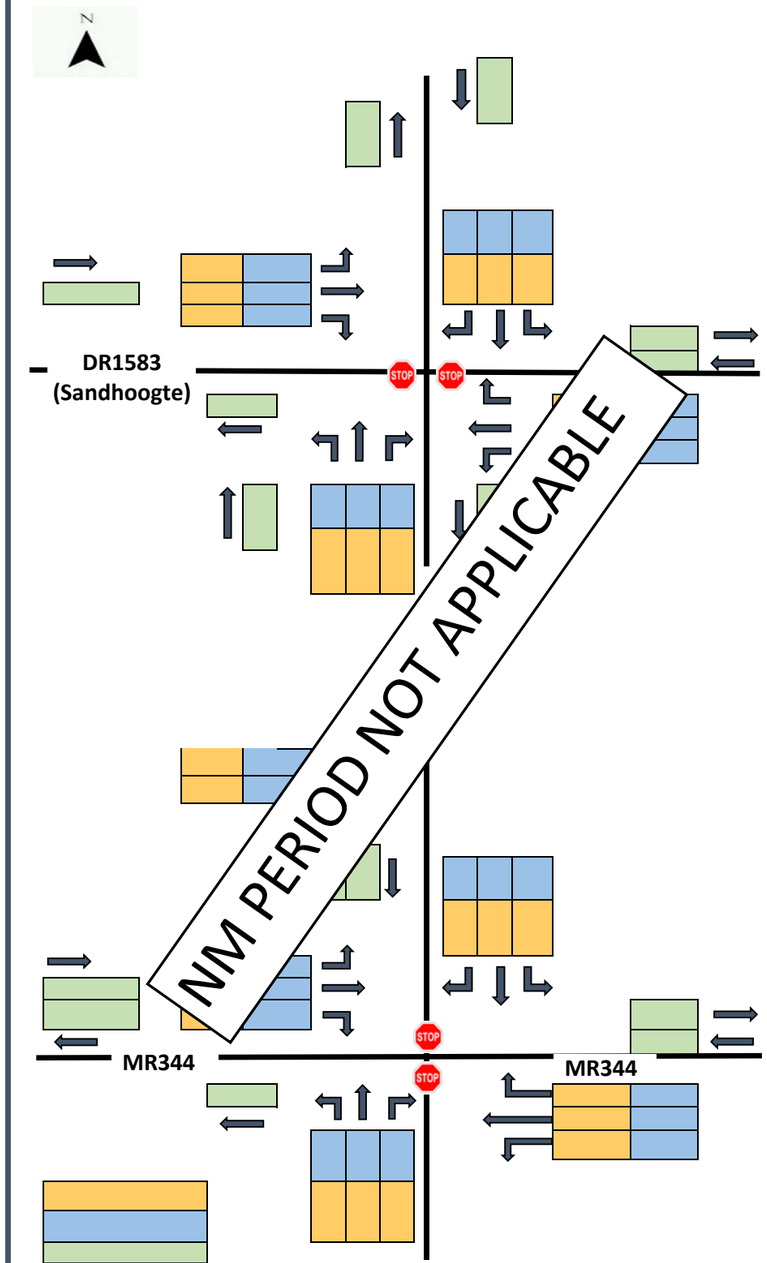
STOP CONTROLLED INTERSECTION

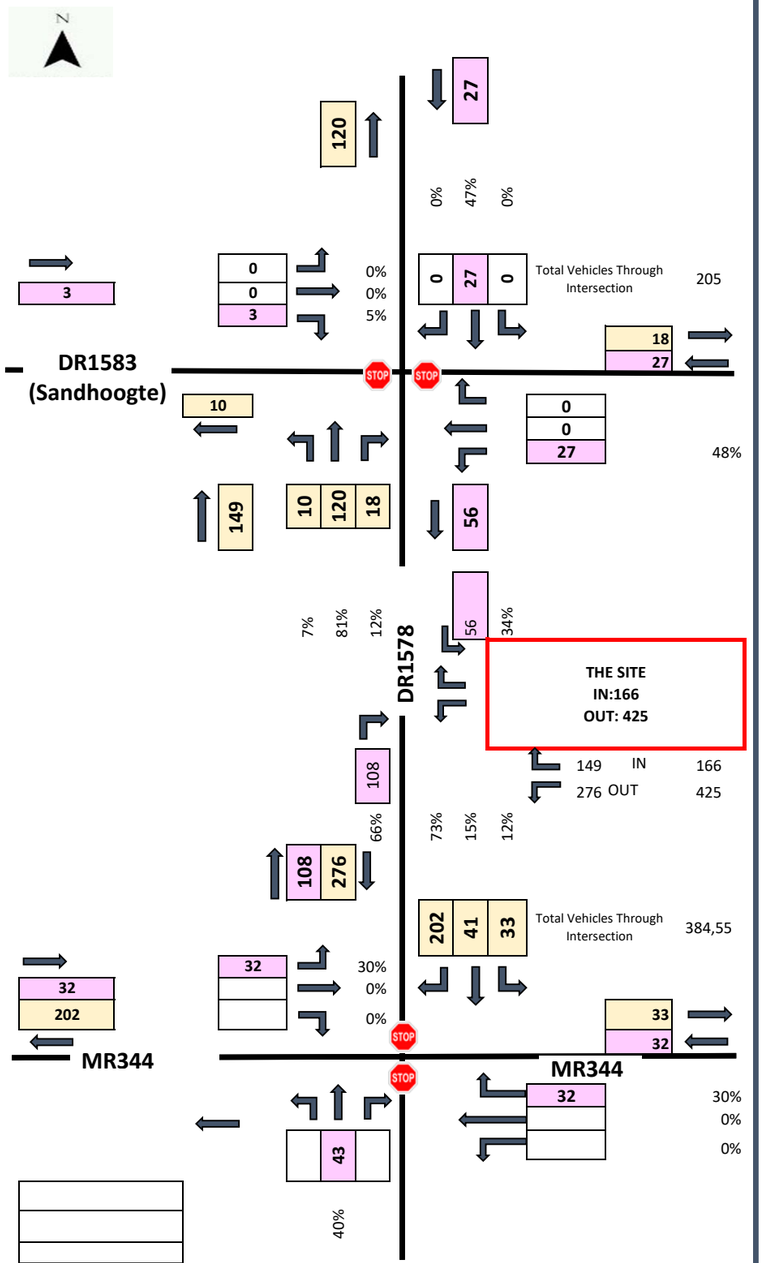
Title

FIGURE C



AM PEAK HOUR VOLUMES
06:45 - 07:45





PM PEAK HOUR VOLUMES
16:15 - 17:15

URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

Project:

22-160 DOLPHIN CIRCLE DEVELOPMENT

Description:

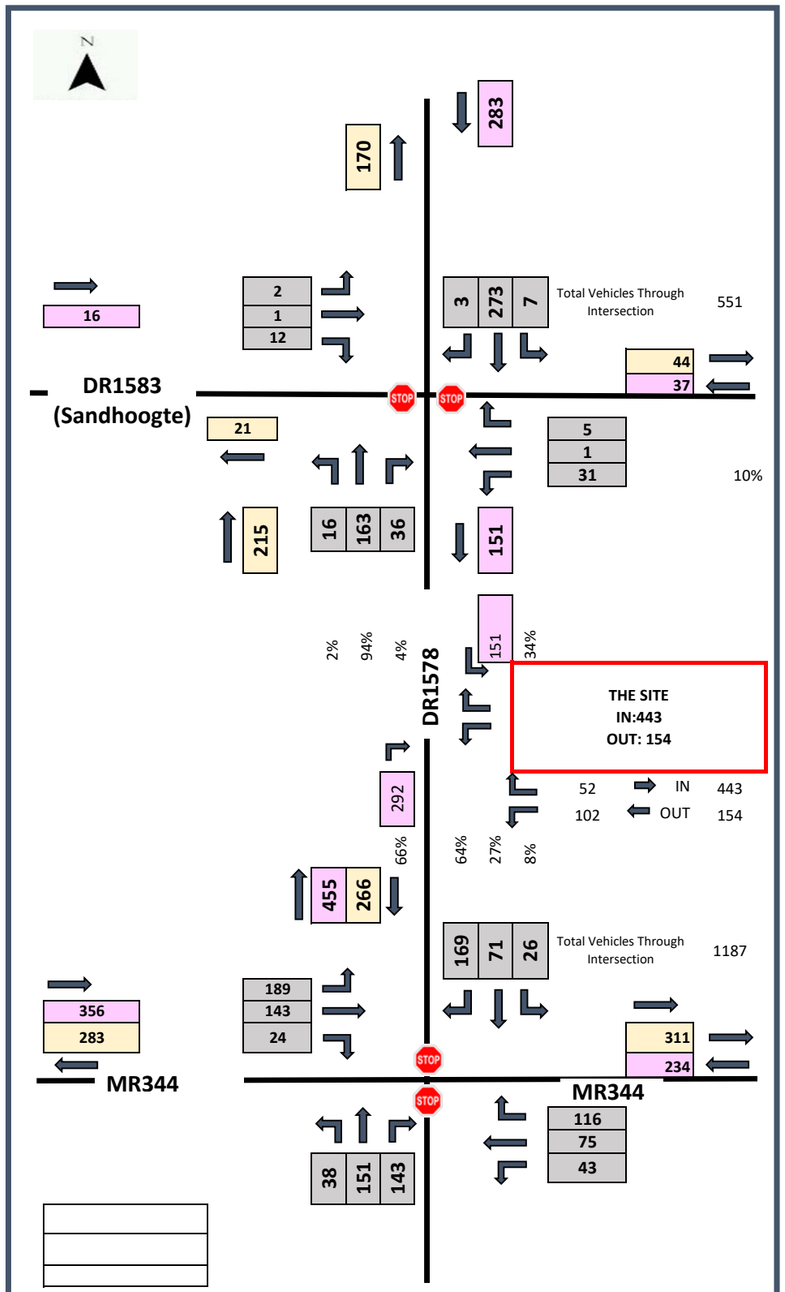
DEVELOPMENT TRIP GENERATION AND DISTRIBUTION

Legend

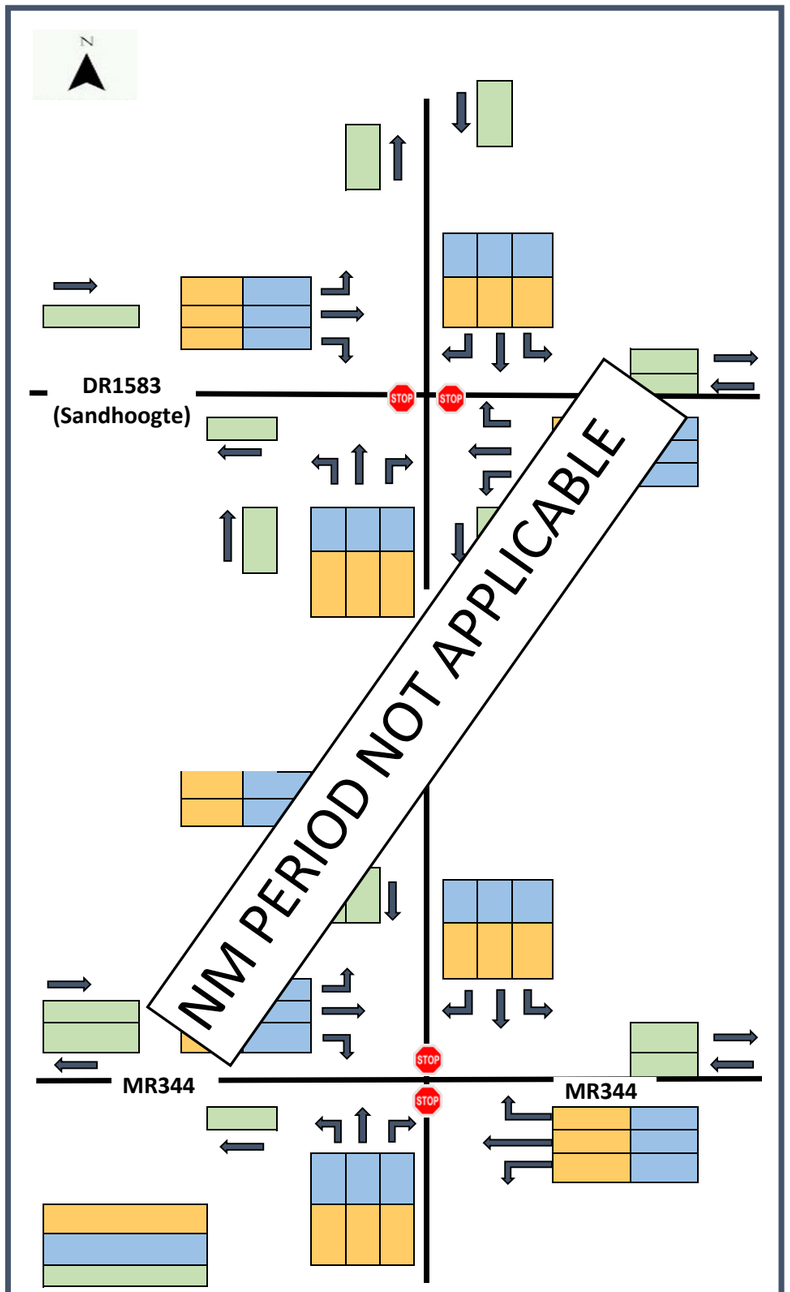
STOP CONTROLLED INTERSECTION

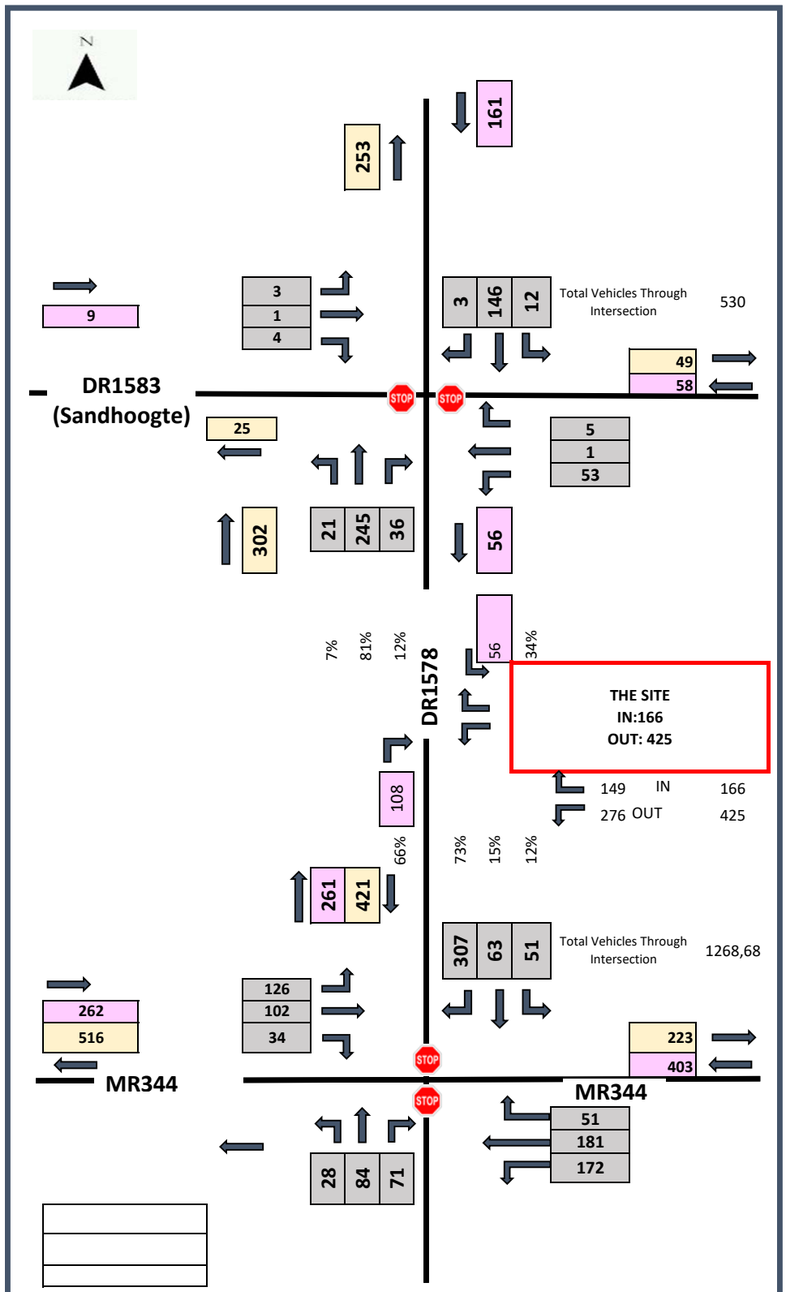
Title

FIGURE D



AM PEAK HOUR VOLUMES
06:45 - 07:45





PM PEAK HOUR VOLUMES
16:15 - 17:15

URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

Project:

22-160 DOLPHIN CIRCLE DEVELOPMENT

Description:

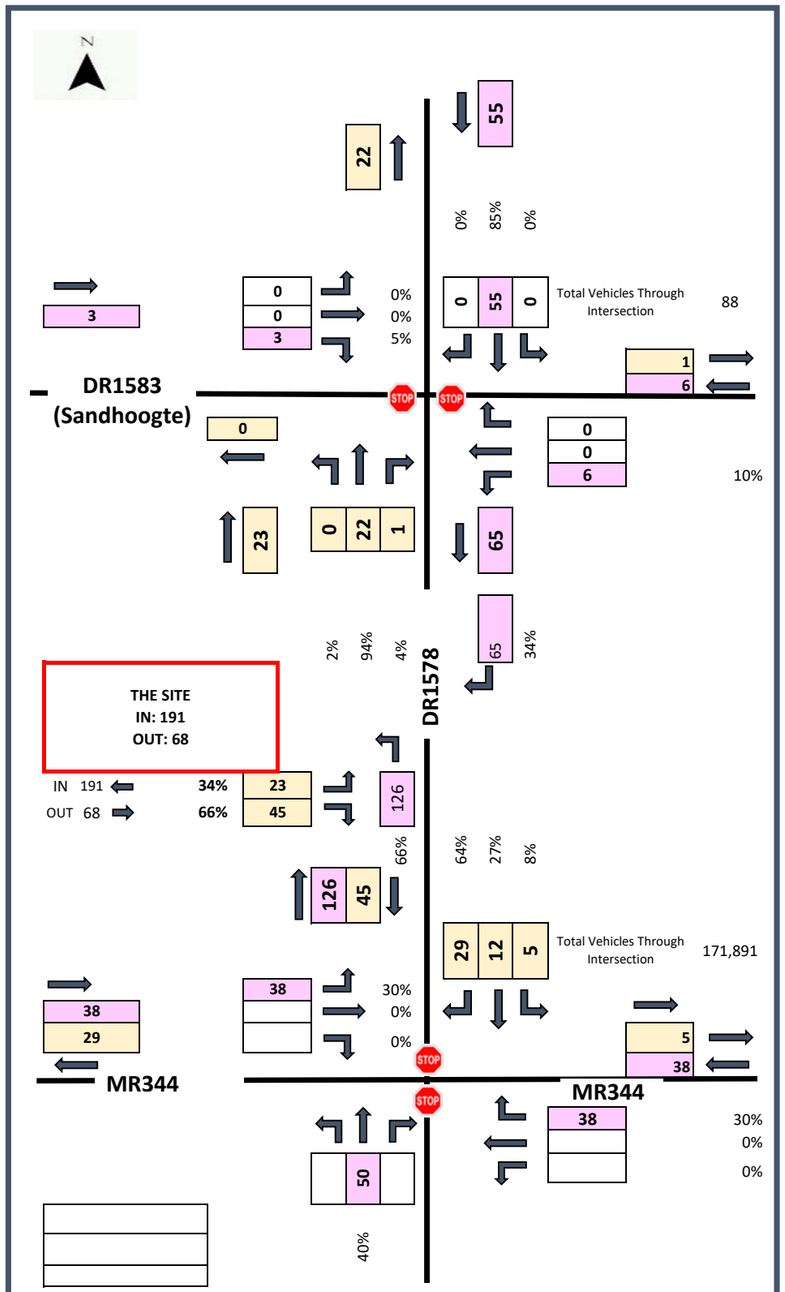
DOLPHIN CIRCLE TRAFFIC + 2028 BACKGROUND

Legend

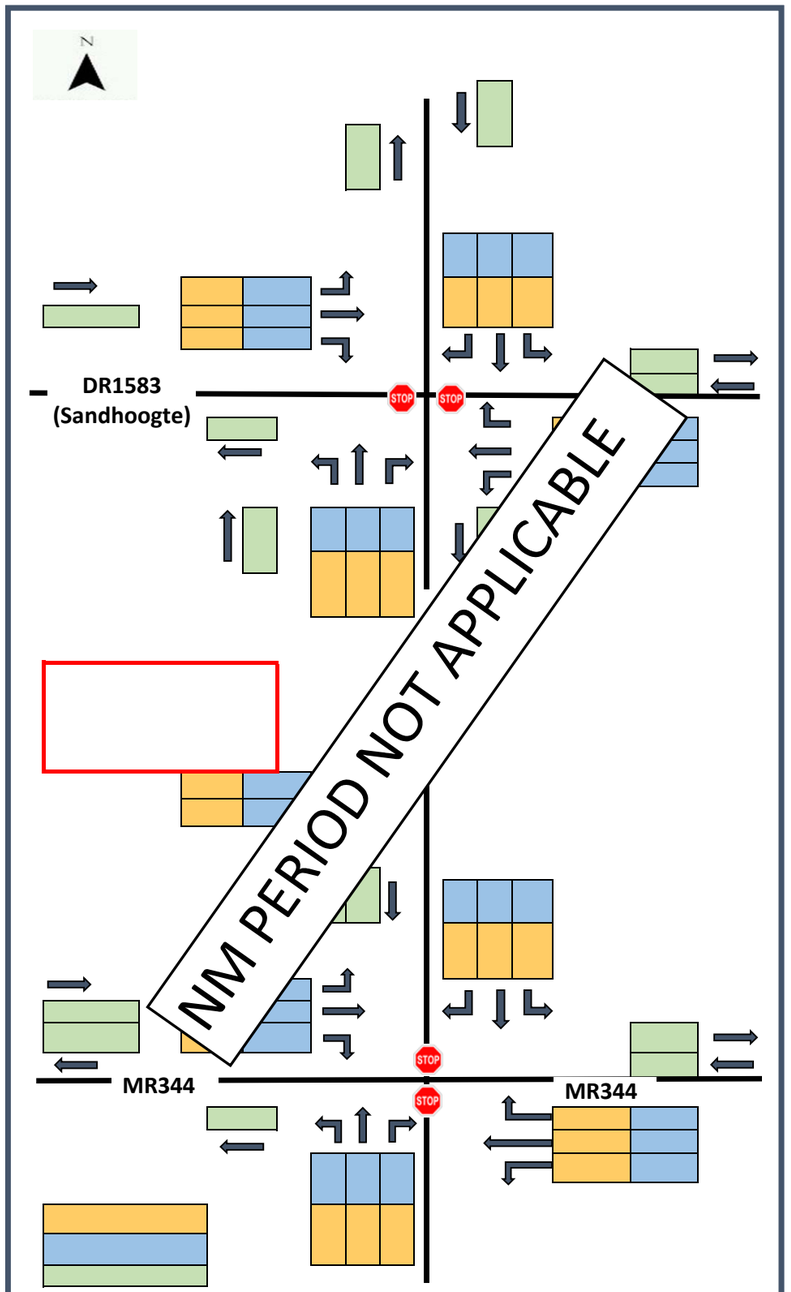
STOP CONTROLLED INTERSECTION

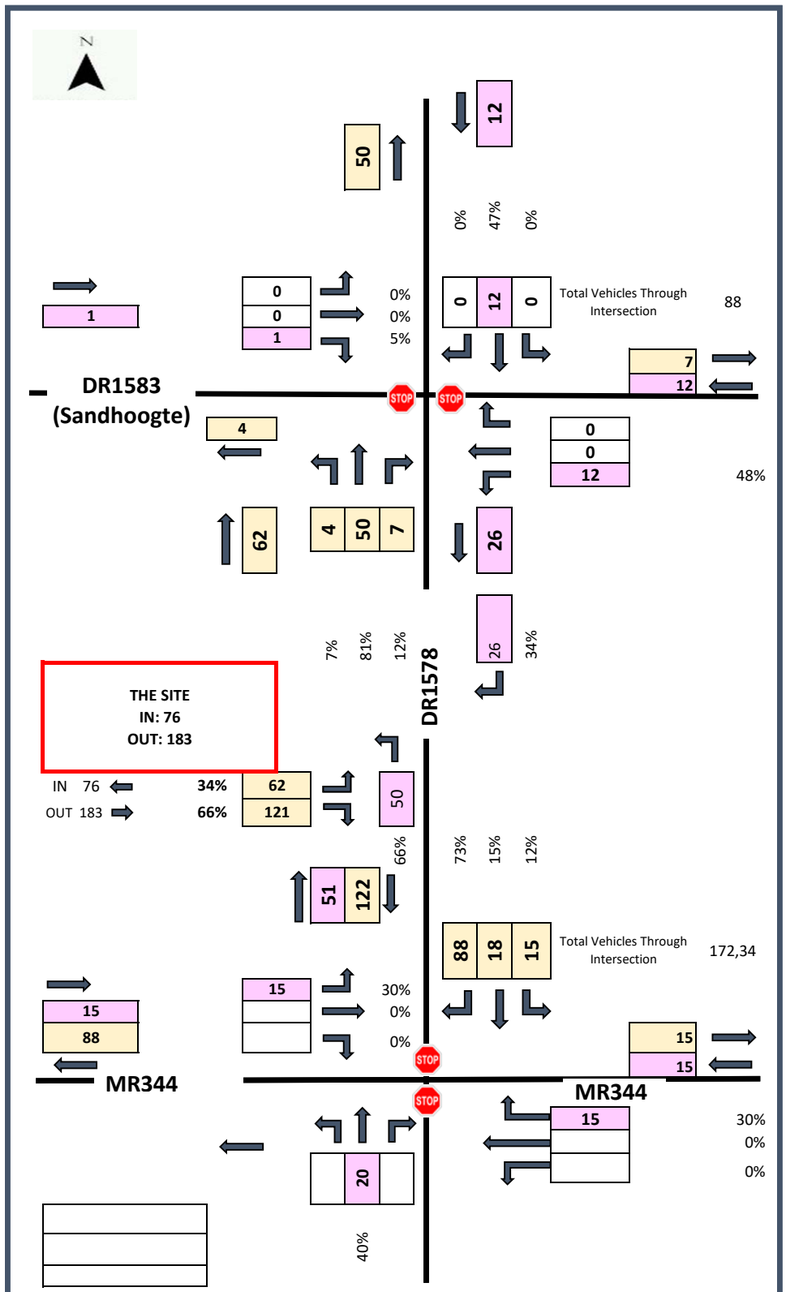
Title

FIGURE E



AM PEAK HOUR VOLUMES
06:45 - 07:45





PM PEAK HOUR VOLUMES
16:15 - 17:15

URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

Project:

22-160 DOLPHIN CIRCLE DEVELOPMENT

Description:

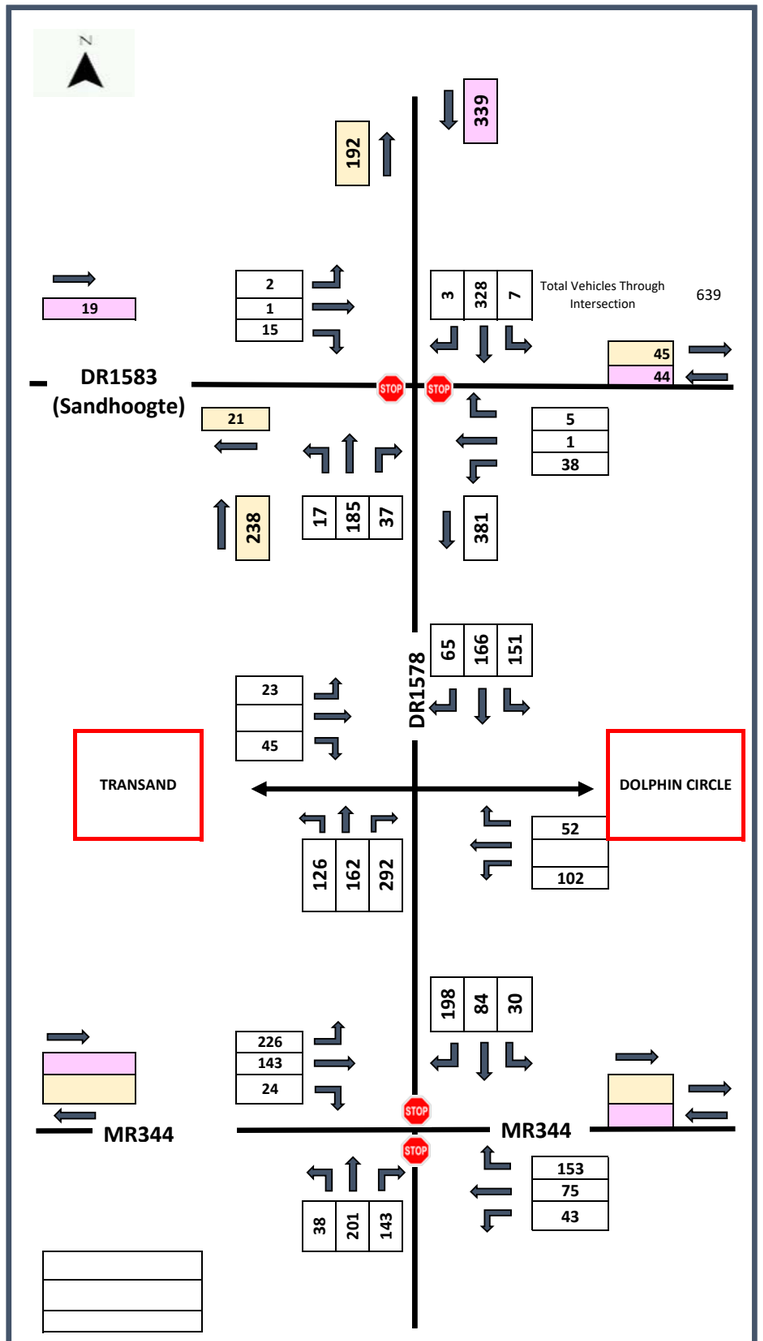
TRANSAND (NEIGBOURING SITE) TRIP GENERATION

Legend

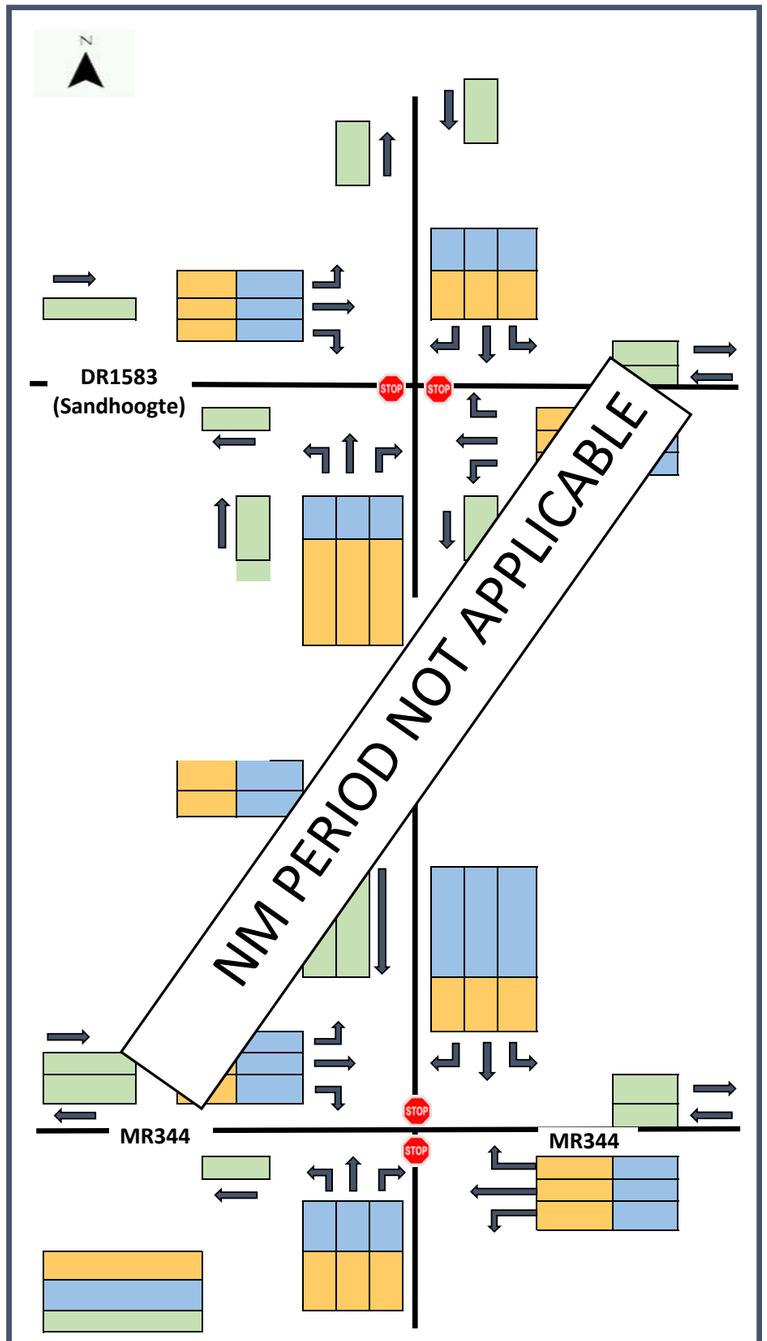
STOP CONTROLLED INTERSECTION

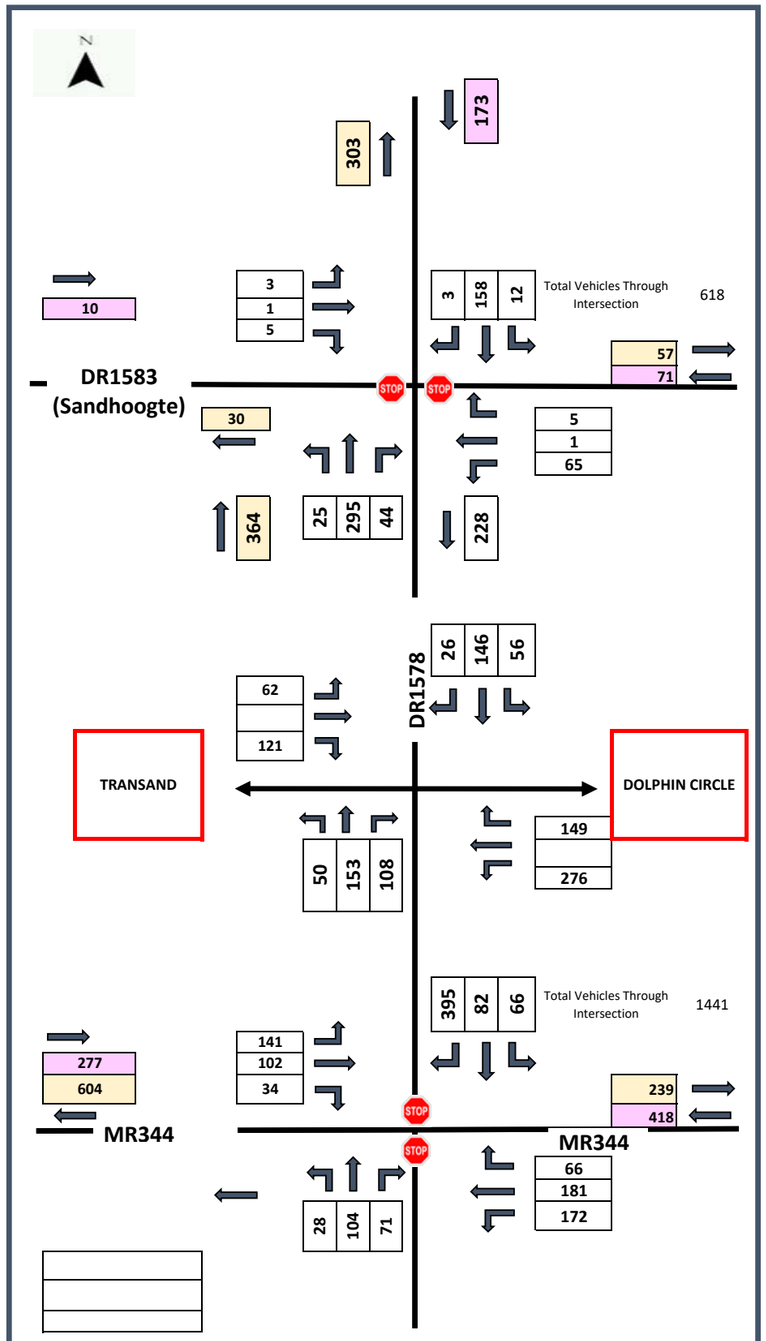
Title

FIGURE F



AM PEAK HOUR VOLUMES





PM PEAK HOUR VOLUMES

URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

Project:

22-160 DOLPHIN CIRCLE DEVELOPMENT

Description:

DOLPHIN CIRCLE + TRANSAND + 2028 BACKGROUND

Legend

STOP CONTROLLED INTERSECTION

Title

FIGURE G

ANNEXURE F

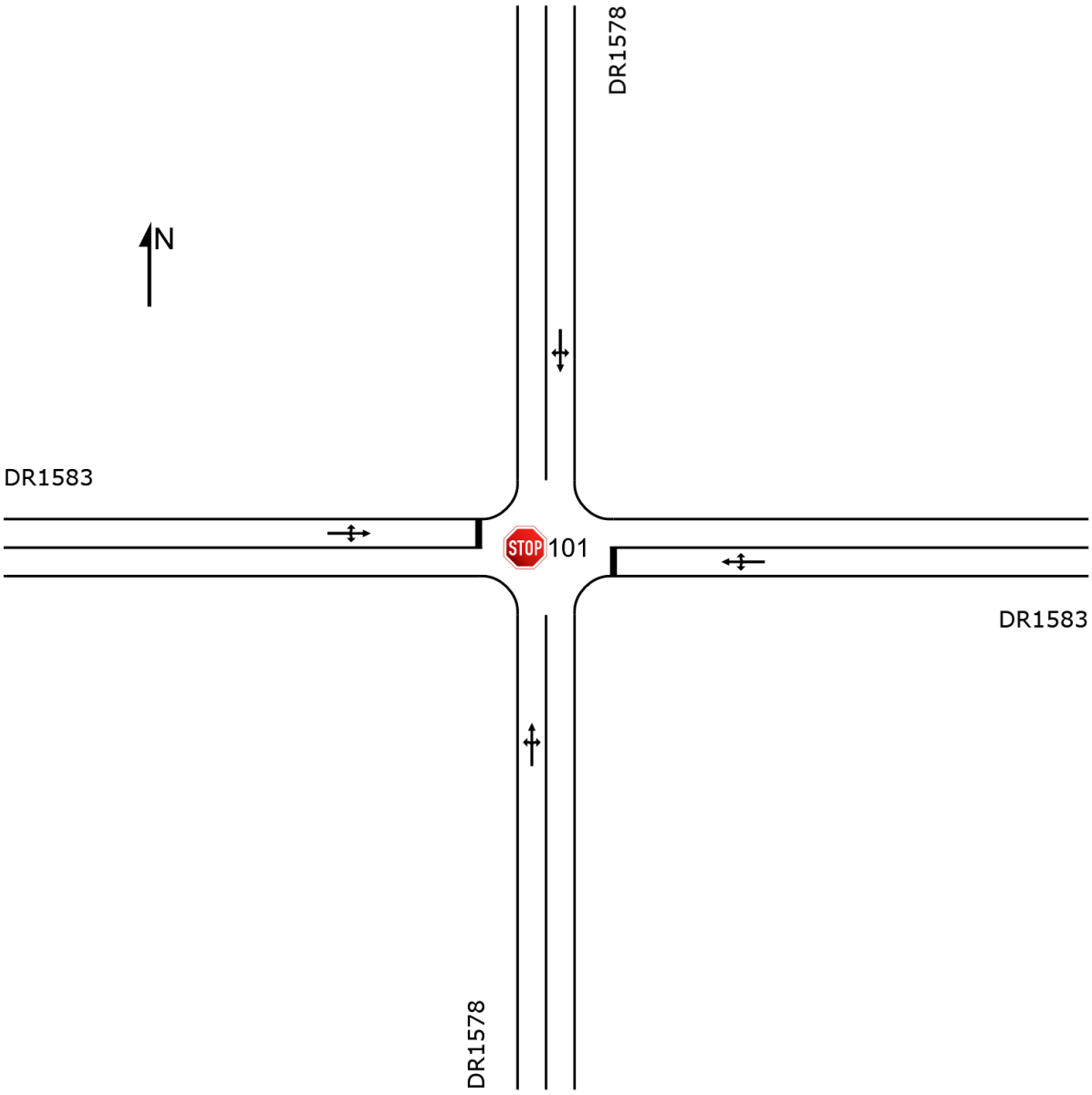
SIDRA RESULTS

SITE LAYOUT

Site: 101 [2023 DR1578/DR1583 (AM) (Site Folder: 2023 AM)]

New Site
Site Category: Base Year
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 101 [DR1578/DR1583 (AM) (Site Folder: 2023 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	13	23,1	13	23,1	0,077	5,8	LOS A	0,2	1,5	0,13	0,21	0,13	54,6
2	T1	All MCs	98	2,0	98	2,0	0,077	0,0	LOS A	0,2	1,5	0,13	0,21	0,13	58,0
3	R2	All MCs	29	0,0	29	0,0	0,077	6,5	LOS A	0,2	1,5	0,13	0,21	0,13	55,3
Approach			140	3,6	140	3,6	0,077	1,9	NA	0,2	1,5	0,13	0,21	0,13	57,1
East: DR1583															
4	L2	All MCs	14	0,0	14	0,0	0,017	8,5	LOS A	0,1	0,4	0,26	0,86	0,26	51,0
5	T1	All MCs	1	0,0	1	0,0	0,017	9,0	LOS A	0,1	0,4	0,26	0,86	0,26	51,0
6	R2	All MCs	4	0,0	4	0,0	0,017	9,0	LOS A	0,1	0,4	0,26	0,86	0,26	50,8
Approach			19	0,0	19	0,0	0,017	8,6	LOS A	0,1	0,4	0,26	0,86	0,26	51,0
North: DR1578															
7	L2	All MCs	6	0,0	6	0,0	0,073	5,5	LOS A	0,0	0,2	0,01	0,04	0,01	57,1
8	T1	All MCs	125	8,0	125	8,0	0,073	0,0	LOS A	0,0	0,2	0,01	0,04	0,01	59,5
9	R2	All MCs	3	0,0	3	0,0	0,073	5,8	LOS A	0,0	0,2	0,01	0,04	0,01	56,8
Approach			134	7,5	134	7,5	0,073	0,4	NA	0,0	0,2	0,01	0,04	0,01	59,4
West: DR1583															
10	L2	All MCs	2	0,0	2	0,0	0,010	8,4	LOS A	0,0	0,3	0,33	0,89	0,33	50,4
11	T1	All MCs	1	0,0	1	0,0	0,010	9,0	LOS A	0,0	0,3	0,33	0,89	0,33	50,4
12	R2	All MCs	4	50,0	4	50,0	0,010	12,3	LOS B	0,0	0,3	0,33	0,89	0,33	48,2
Approach			7	28,6	7	28,6	0,010	10,7	LOS B	0,0	0,3	0,33	0,89	0,33	49,1
All Vehicles			300	5,7	300	5,7	0,077	1,8	NA	0,2	1,5	0,09	0,19	0,09	57,4

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

MOVEMENT SUMMARY

Site: 101 [DR1578/DR1583 (PM) (Site Folder: 2023 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	9	0,0	9	0,0	0,073	5,5	LOS A	0,1	0,9	0,07	0,13	0,07	56,2
2	T1	All MCs	107	10,3	107	10,3	0,073	0,0	LOS A	0,1	0,9	0,07	0,13	0,07	58,6
3	R2	All MCs	16	0,0	16	0,0	0,073	6,4	LOS A	0,1	0,9	0,07	0,13	0,07	55,9
Approach			132	8,3	132	8,3	0,073	1,1	NA	0,1	0,9	0,07	0,13	0,07	58,1
East: DR1583															
4	L2	All MCs	22	0,0	22	0,0	0,023	8,4	LOS A	0,1	0,6	0,23	0,87	0,23	51,1
5	T1	All MCs	1	0,0	1	0,0	0,023	8,9	LOS A	0,1	0,6	0,23	0,87	0,23	51,0
6	R2	All MCs	4	0,0	4	0,0	0,023	8,9	LOS A	0,1	0,6	0,23	0,87	0,23	50,8
Approach			27	0,0	27	0,0	0,023	8,5	LOS A	0,1	0,6	0,23	0,87	0,23	51,0
North: DR1578															
7	L2	All MCs	10	10,0	10	10,0	0,063	5,7	LOS A	0,0	0,2	0,02	0,07	0,02	56,4
8	T1	All MCs	103	8,7	103	8,7	0,063	0,0	LOS A	0,0	0,2	0,02	0,07	0,02	59,3
9	R2	All MCs	3	0,0	3	0,0	0,063	5,9	LOS A	0,0	0,2	0,02	0,07	0,02	56,5
Approach			116	8,6	116	8,6	0,063	0,6	NA	0,0	0,2	0,02	0,07	0,02	59,0
West: DR1583															
10	L2	All MCs	3	0,0	3	0,0	0,005	8,4	LOS A	0,0	0,1	0,25	0,86	0,25	51,0
11	T1	All MCs	1	0,0	1	0,0	0,005	8,8	LOS A	0,0	0,1	0,25	0,86	0,25	51,0
12	R2	All MCs	1	0,0	1	0,0	0,005	8,9	LOS A	0,0	0,1	0,25	0,86	0,25	50,8
Approach			5	0,0	5	0,0	0,005	8,6	LOS A	0,0	0,1	0,25	0,86	0,25	51,0
All Vehicles			280	7,5	280	7,5	0,073	1,8	NA	0,1	0,9	0,07	0,19	0,07	57,5

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

MOVEMENT SUMMARY

Site: 101 [DR1578/DR1583 (AM) (Site Folder: 2028 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 No Go
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	15	23,1	15	23,1	0,091	5,8	LOS A	0,2	1,8	0,14	0,22	0,14	54,5
2	T1	All MCs	114	2,0	114	2,0	0,091	0,0	LOS A	0,2	1,8	0,14	0,22	0,14	57,9
3	R2	All MCs	34	0,0	34	0,0	0,091	6,7	LOS A	0,2	1,8	0,14	0,22	0,14	55,3
Approach			163	3,6	163	3,6	0,091	1,9	NA	0,2	1,8	0,14	0,22	0,14	57,0
East: DR1583															
4	L2	All MCs	16	0,0	16	0,0	0,021	8,6	LOS A	0,1	0,5	0,28	0,86	0,28	50,9
5	T1	All MCs	1	0,0	1	0,0	0,021	9,3	LOS A	0,1	0,5	0,28	0,86	0,28	50,9
6	R2	All MCs	5	0,0	5	0,0	0,021	9,3	LOS A	0,1	0,5	0,28	0,86	0,28	50,7
Approach			22	0,0	22	0,0	0,021	8,8	LOS A	0,1	0,5	0,28	0,86	0,28	50,9
North: DR1578															
7	L2	All MCs	7	0,0	7	0,0	0,084	5,5	LOS A	0,0	0,3	0,02	0,05	0,02	57,0
8	T1	All MCs	145	8,0	145	8,0	0,084	0,0	LOS A	0,0	0,3	0,02	0,05	0,02	59,5
9	R2	All MCs	4	0,0	4	0,0	0,084	5,9	LOS A	0,0	0,3	0,02	0,05	0,02	56,7
Approach			156	7,4	156	7,4	0,084	0,4	NA	0,0	0,3	0,02	0,05	0,02	59,3
West: DR1583															
10	L2	All MCs	2	0,0	2	0,0	0,013	8,4	LOS A	0,0	0,4	0,37	0,89	0,37	50,1
11	T1	All MCs	1	0,0	1	0,0	0,013	9,2	LOS A	0,0	0,4	0,37	0,89	0,37	50,1
12	R2	All MCs	5	50,0	5	50,0	0,013	12,9	LOS B	0,0	0,4	0,37	0,89	0,37	47,9
Approach			8	31,3	8	31,3	0,013	11,3	LOS B	0,0	0,4	0,37	0,89	0,37	48,7
All Vehicles			349	5,7	349	5,7	0,091	1,9	NA	0,2	1,8	0,10	0,20	0,10	57,3

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

MOVEMENT SUMMARY

Site: 101 [DR1578/DR1583 (PM) (Site Folder: 2028 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 No Go
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	10	0,0	10	0,0	0,085	5,5	LOS A	0,1	1,1	0,08	0,14	0,08	56,2
2	T1	All MCs	124	10,3	124	10,3	0,085	0,0	LOS A	0,1	1,1	0,08	0,14	0,08	58,6
3	R2	All MCs	19	0,0	19	0,0	0,085	6,5	LOS A	0,1	1,1	0,08	0,14	0,08	55,9
Approach			153	8,3	153	8,3	0,085	1,2	NA	0,1	1,1	0,08	0,14	0,08	58,1
East: DR1583															
4	L2	All MCs	26	0,0	26	0,0	0,028	8,5	LOS A	0,1	0,7	0,25	0,87	0,25	51,0
5	T1	All MCs	1	0,0	1	0,0	0,028	9,1	LOS A	0,1	0,7	0,25	0,87	0,25	51,0
6	R2	All MCs	5	0,0	5	0,0	0,028	9,2	LOS A	0,1	0,7	0,25	0,87	0,25	50,8
Approach			32	0,0	32	0,0	0,028	8,6	LOS A	0,1	0,7	0,25	0,87	0,25	51,0
North: DR1578															
7	L2	All MCs	12	10,0	12	10,0	0,073	5,7	LOS A	0,0	0,2	0,02	0,07	0,02	56,4
8	T1	All MCs	119	8,7	119	8,7	0,073	0,0	LOS A	0,0	0,2	0,02	0,07	0,02	59,3
9	R2	All MCs	3	0,0	3	0,0	0,073	6,0	LOS A	0,0	0,2	0,02	0,07	0,02	56,6
Approach			134	8,7	134	8,7	0,073	0,6	NA	0,0	0,2	0,02	0,07	0,02	59,0
West: DR1583															
10	L2	All MCs	3	0,0	3	0,0	0,005	8,5	LOS A	0,0	0,1	0,28	0,85	0,28	51,0
11	T1	All MCs	1	0,0	1	0,0	0,005	9,0	LOS A	0,0	0,1	0,28	0,85	0,28	50,9
12	R2	All MCs	1	0,0	1	0,0	0,005	9,2	LOS A	0,0	0,1	0,28	0,85	0,28	50,7
Approach			5	0,0	5	0,0	0,005	8,7	LOS A	0,0	0,1	0,28	0,85	0,28	50,9
All Vehicles			324	7,5	324	7,5	0,085	1,8	NA	0,1	1,1	0,07	0,19	0,07	57,5

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

MOVEMENT SUMMARY

Site: 101 [DR1578/DR1583 (AM) (Site Folder: 2028 AM + Generated)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	16	23,1	16	23,1	0,104	5,8	LOS A	0,3	2,0	0,16	0,22	0,16	54,6
2	T1	All MCs	135	2,0	135	2,0	0,104	0,0	LOS A	0,3	2,0	0,16	0,22	0,16	58,0
3	R2	All MCs	35	0,0	35	0,0	0,104	7,3	LOS A	0,3	2,0	0,16	0,22	0,16	55,3
Approach			186	3,5	186	3,5	0,104	1,9	NA	0,3	2,0	0,16	0,22	0,16	57,2
East: DR1583															
4	L2	All MCs	23	0,0	23	0,0	0,029	8,8	LOS A	0,1	0,7	0,33	0,86	0,33	50,8
5	T1	All MCs	1	0,0	1	0,0	0,029	9,9	LOS A	0,1	0,7	0,33	0,86	0,33	50,8
6	R2	All MCs	5	0,0	5	0,0	0,029	10,0	LOS B	0,1	0,7	0,33	0,86	0,33	50,6
Approach			29	0,0	29	0,0	0,029	9,1	LOS A	0,1	0,7	0,33	0,86	0,33	50,8
North: DR1578															
7	L2	All MCs	7	0,0	7	0,0	0,114	5,5	LOS A	0,0	0,3	0,02	0,03	0,02	57,2
8	T1	All MCs	200	8,0	200	8,0	0,114	0,0	LOS A	0,0	0,3	0,02	0,03	0,02	59,6
9	R2	All MCs	4	0,0	4	0,0	0,114	6,0	LOS A	0,0	0,3	0,02	0,03	0,02	56,8
Approach			211	7,6	211	7,6	0,114	0,3	NA	0,0	0,3	0,02	0,03	0,02	59,5
West: DR1583															
10	L2	All MCs	2	0,0	2	0,0	0,021	8,5	LOS A	0,1	0,6	0,45	0,90	0,45	49,3
11	T1	All MCs	1	0,0	1	0,0	0,021	9,8	LOS A	0,1	0,6	0,45	0,90	0,45	49,3
12	R2	All MCs	8	50,0	8	50,0	0,021	14,3	LOS B	0,1	0,6	0,45	0,90	0,45	47,2
Approach			11	36,4	11	36,4	0,021	12,9	LOS B	0,1	0,6	0,45	0,90	0,45	47,7
All Vehicles			437	6,1	437	6,1	0,114	1,9	NA	0,3	2,0	0,11	0,19	0,11	57,5

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

MOVEMENT SUMMARY

Site: 101 [DR1578/DR1583 (PM) (Site Folder: 2028 PM + Generated)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	15	0,0	15	0,0	0,120	5,5	LOS A	0,2	1,5	0,09	0,14	0,09	56,2
2	T1	All MCs	174	10,3	174	10,3	0,120	0,0	LOS A	0,2	1,5	0,09	0,14	0,09	58,5
3	R2	All MCs	26	0,0	26	0,0	0,120	6,7	LOS A	0,2	1,5	0,09	0,14	0,09	55,8
Approach			215	8,3	215	8,3	0,120	1,2	NA	0,2	1,5	0,09	0,14	0,09	58,0
East: DR1583															
4	L2	All MCs	38	0,0	38	0,0	0,039	8,5	LOS A	0,1	1,0	0,26	0,87	0,26	51,0
5	T1	All MCs	1	0,0	1	0,0	0,039	9,7	LOS A	0,1	1,0	0,26	0,87	0,26	50,9
6	R2	All MCs	5	0,0	5	0,0	0,039	9,8	LOS A	0,1	1,0	0,26	0,87	0,26	50,7
Approach			44	0,0	44	0,0	0,039	8,7	LOS A	0,1	1,0	0,26	0,87	0,26	50,9
North: DR1578															
7	L2	All MCs	12	10,0	12	10,0	0,081	5,7	LOS A	0,0	0,3	0,03	0,07	0,03	56,4
8	T1	All MCs	132	8,7	132	8,7	0,081	0,0	LOS A	0,0	0,3	0,03	0,07	0,03	59,3
9	R2	All MCs	4	0,0	4	0,0	0,081	6,8	LOS A	0,0	0,3	0,03	0,07	0,03	56,5
Approach			148	8,6	148	8,6	0,081	0,6	NA	0,0	0,3	0,03	0,07	0,03	59,0
West: DR1583															
10	L2	All MCs	3	0,0	3	0,0	0,007	8,7	LOS A	0,0	0,2	0,35	0,84	0,35	50,7
11	T1	All MCs	1	0,0	1	0,0	0,007	9,5	LOS A	0,0	0,2	0,35	0,84	0,35	50,7
12	R2	All MCs	2	0,0	2	0,0	0,007	9,9	LOS A	0,0	0,2	0,35	0,84	0,35	50,4
Approach			6	0,0	6	0,0	0,007	9,2	LOS A	0,0	0,2	0,35	0,84	0,35	50,6
All Vehicles			413	7,4	413	7,4	0,120	1,9	NA	0,2	1,5	0,09	0,20	0,09	57,4

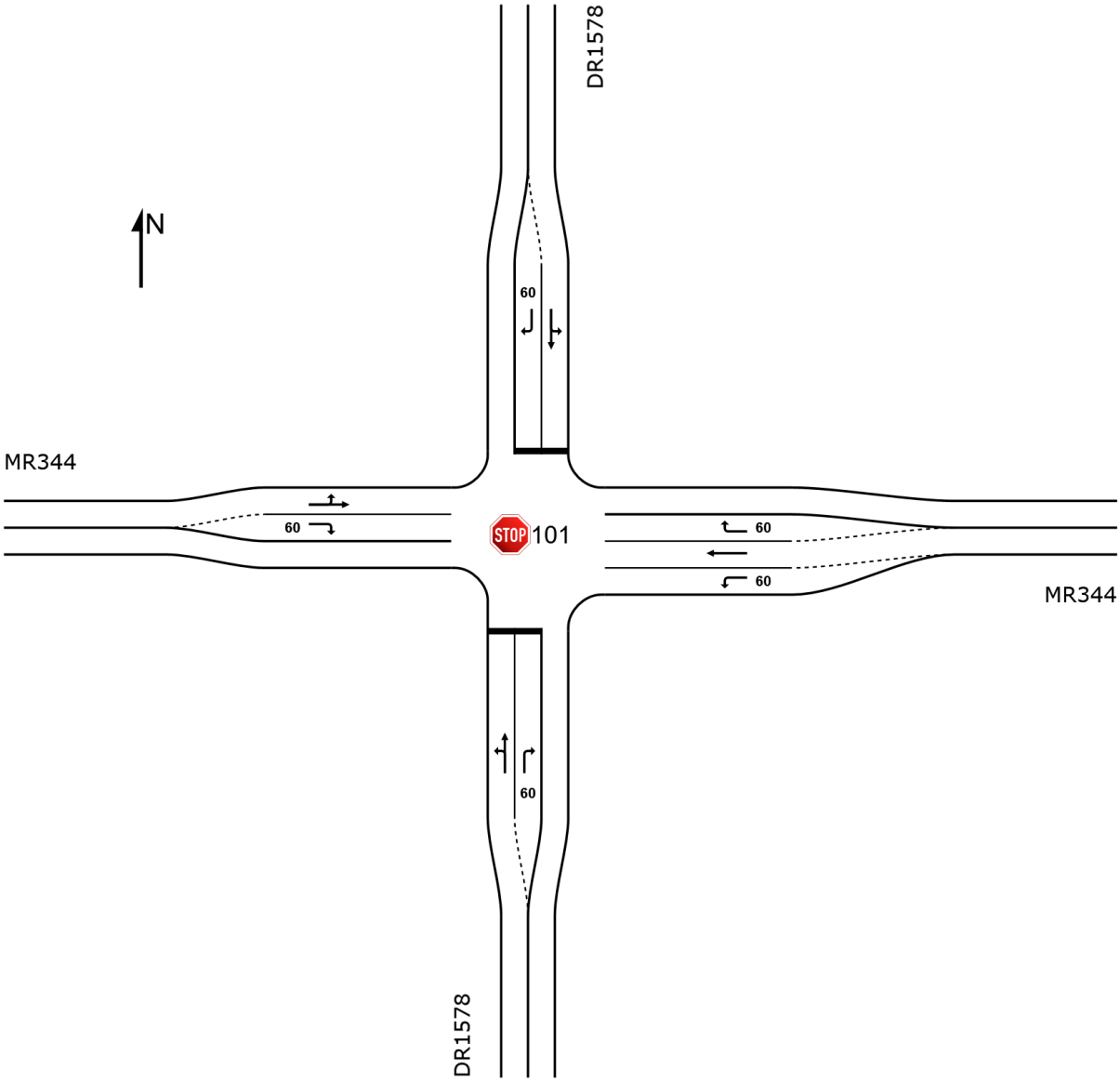
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of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

SITE LAYOUT

Site: 101 [2023 DR1578/MR344 (AM) (Site Folder: 2023 AM)]

New Site
Site Category: Base Year
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 101 [DR1578/MR344 (AM) (Site Folder: 2023 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	33	0,0	33	0,0	0,084	8,3	LOS A	0,3	2,2	0,29	0,86	0,29	50,0
2	T1	All MCs	29	0,0	29	0,0	0,084	12,2	LOS B	0,3	2,2	0,29	0,86	0,29	50,0
3	R2	All MCs	123	0,0	123	0,0	0,253	12,7	LOS B	1,0	7,1	0,53	0,94	0,53	48,7
Approach			185	0,0	185	0,0	0,253	11,9	LOS B	1,0	7,1	0,45	0,91	0,45	49,1
East: MR344															
4	L2	All MCs	37	0,0	37	0,0	0,020	5,5	LOS A	0,0	0,0	0,00	0,58	0,00	52,9
5	T1	All MCs	65	6,2	65	6,2	0,035	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
6	R2	All MCs	24	8,3	24	8,3	0,017	6,3	LOS A	0,1	0,6	0,32	0,55	0,32	51,5
Approach			126	4,8	126	4,8	0,035	2,8	NA	0,1	0,6	0,06	0,27	0,06	56,0
North: DR1578															
7	L2	All MCs	15	26,7	15	26,7	0,089	9,9	LOS A	0,3	2,6	0,42	0,89	0,42	48,6
8	T1	All MCs	38	5,3	38	5,3	0,089	12,3	LOS B	0,3	2,6	0,42	0,89	0,42	49,3
9	R2	All MCs	90	6,7	90	6,7	0,209	13,7	LOS B	0,8	5,9	0,54	0,96	0,54	47,8
Approach			143	8,4	143	8,4	0,209	12,9	LOS B	0,8	5,9	0,50	0,93	0,50	48,3
West: MR344															
10	L2	All MCs	87	3,4	87	3,4	0,112	5,6	LOS A	0,0	0,0	0,00	0,25	0,00	55,3
11	T1	All MCs	123	3,3	123	3,3	0,112	0,0	LOS A	0,0	0,0	0,00	0,25	0,00	57,8
12	R2	All MCs	21	4,8	21	4,8	0,017	5,9	LOS A	0,1	0,5	0,20	0,55	0,20	52,0
Approach			231	3,5	231	3,5	0,112	2,7	NA	0,1	0,5	0,02	0,27	0,02	56,3
All Vehicles			685	3,8	685	3,8	0,253	7,3	NA	1,0	7,1	0,24	0,58	0,24	52,3

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

MOVEMENT SUMMARY

Site: 101 [DR1578/MR344 (PM) (Site Folder: 2023 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	24	16,7	24	16,7	0,107	9,7	LOS A	0,4	3,0	0,47	0,89	0,47	48,4
2	T1	All MCs	35	2,9	35	2,9	0,107	14,3	LOS B	0,4	3,0	0,47	0,89	0,47	48,8
3	R2	All MCs	61	1,6	61	1,6	0,150	14,2	LOS B	0,5	3,9	0,55	0,98	0,55	47,7
Approach			120	5,0	120	5,0	0,150	13,3	LOS B	0,5	3,9	0,51	0,93	0,51	48,2
East: MR344															
4	L2	All MCs	148	0,7	148	0,7	0,080	5,6	LOS A	0,0	0,0	0,00	0,58	0,00	52,8
5	T1	All MCs	156	1,9	156	1,9	0,081	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
6	R2	All MCs	16	18,8	16	18,8	0,012	6,3	LOS A	0,1	0,4	0,29	0,54	0,29	51,2
Approach			320	2,2	320	2,2	0,081	2,9	NA	0,1	0,4	0,01	0,29	0,01	56,0
North: DR1578															
7	L2	All MCs	15	0,0	15	0,0	0,058	8,4	LOS A	0,2	1,5	0,40	0,84	0,40	49,1
8	T1	All MCs	19	0,0	19	0,0	0,058	14,2	LOS B	0,2	1,5	0,40	0,84	0,40	49,1
9	R2	All MCs	91	9,9	91	9,9	0,241	15,6	LOS C	0,9	7,1	0,58	1,00	0,61	46,7
Approach			125	7,2	125	7,2	0,241	14,5	LOS B	0,9	7,1	0,53	0,95	0,55	47,3
West: MR344															
10	L2	All MCs	81	8,6	81	8,6	0,092	5,7	LOS A	0,0	0,0	0,00	0,28	0,00	54,8
11	T1	All MCs	88	2,3	88	2,3	0,092	0,0	LOS A	0,0	0,0	0,00	0,28	0,00	57,5
12	R2	All MCs	29	10,3	29	10,3	0,029	7,0	LOS A	0,1	0,9	0,38	0,60	0,38	51,3
Approach			198	6,1	198	6,1	0,092	3,4	NA	0,1	0,9	0,06	0,33	0,06	55,4
All Vehicles			763	4,5	763	4,5	0,241	6,6	NA	0,9	7,1	0,19	0,51	0,19	52,9

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

MOVEMENT SUMMARY

Site: 101 [DR1578/MR344 (AM) (Site Folder: 2028 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 No Go
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	38	0,0	38	0,0	0,105	8,4	LOS A	0,4	2,8	0,34	0,85	0,34	49,7
2	T1	All MCs	34	0,0	34	0,0	0,105	13,3	LOS B	0,4	2,8	0,34	0,85	0,34	49,7
3	R2	All MCs	143	0,0	143	0,0	0,321	14,6	LOS B	1,5	10,4	0,58	0,99	0,68	47,6
Approach			215	0,0	215	0,0	0,321	13,3	LOS B	1,5	10,4	0,50	0,94	0,56	48,3
East: MR344															
4	L2	All MCs	43	0,0	43	0,0	0,023	5,5	LOS A	0,0	0,0	0,00	0,58	0,00	52,9
5	T1	All MCs	75	6,2	75	6,2	0,040	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
6	R2	All MCs	28	8,3	28	8,3	0,021	6,4	LOS A	0,1	0,7	0,35	0,56	0,35	51,4
Approach			146	4,8	146	4,8	0,040	2,9	NA	0,1	0,7	0,07	0,28	0,07	56,0
North: DR1578															
7	L2	All MCs	17	26,7	17	26,7	0,111	10,1	LOS B	0,4	3,2	0,47	0,90	0,47	48,1
8	T1	All MCs	44	5,3	44	5,3	0,111	13,2	LOS B	0,4	3,2	0,47	0,90	0,47	48,9
9	R2	All MCs	104	6,7	104	6,7	0,269	15,6	LOS C	1,1	8,2	0,59	1,01	0,65	46,7
Approach			165	8,4	165	8,4	0,269	14,4	LOS B	1,1	8,2	0,55	0,97	0,58	47,4
West: MR344															
10	L2	All MCs	102	3,4	102	3,4	0,131	5,6	LOS A	0,0	0,0	0,00	0,25	0,00	55,3
11	T1	All MCs	143	3,3	143	3,3	0,131	0,0	LOS A	0,0	0,0	0,00	0,25	0,00	57,8
12	R2	All MCs	24	4,8	24	4,8	0,019	6,0	LOS A	0,1	0,5	0,22	0,55	0,22	51,9
Approach			269	3,5	269	3,5	0,131	2,7	NA	0,1	0,5	0,02	0,27	0,02	56,2
All Vehicles			795	3,8	795	3,8	0,321	8,0	NA	1,5	10,4	0,27	0,60	0,29	51,9

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

MOVEMENT SUMMARY

Site: 101 [DR1578/MR344 (PM) (Site Folder: 2028 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 No Go
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	28	16,7	28	16,7	0,140	9,9	LOS A	0,5	3,9	0,53	0,91	0,53	47,7
2	T1	All MCs	41	2,9	41	2,9	0,140	16,1	LOS C	0,5	3,9	0,53	0,91	0,53	48,2
3	R2	All MCs	71	1,6	71	1,6	0,197	15,8	LOS C	0,7	5,1	0,60	1,00	0,60	46,8
Approach			140	5,0	140	5,0	0,197	14,7	LOS B	0,7	5,1	0,56	0,96	0,56	47,4
East: MR344															
4	L2	All MCs	172	0,7	172	0,7	0,093	5,6	LOS A	0,0	0,0	0,00	0,58	0,00	52,8
5	T1	All MCs	181	1,9	181	1,9	0,094	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
6	R2	All MCs	19	18,8	19	18,8	0,014	6,5	LOS A	0,1	0,5	0,31	0,55	0,31	51,1
Approach			372	2,2	372	2,2	0,094	2,9	NA	0,1	0,5	0,02	0,29	0,02	56,0
North: DR1578															
7	L2	All MCs	17	0,0	17	0,0	0,075	8,5	LOS A	0,3	1,9	0,45	0,84	0,45	48,6
8	T1	All MCs	22	0,0	22	0,0	0,075	15,9	LOS C	0,3	1,9	0,45	0,84	0,45	48,6
9	R2	All MCs	105	9,9	105	9,9	0,317	18,5	LOS C	1,4	10,3	0,64	1,05	0,78	45,0
Approach			144	7,2	144	7,2	0,317	16,9	LOS C	1,4	10,3	0,59	0,99	0,69	45,9
West: MR344															
10	L2	All MCs	94	8,6	94	8,6	0,107	5,7	LOS A	0,0	0,0	0,00	0,28	0,00	54,8
11	T1	All MCs	102	2,3	102	2,3	0,107	0,0	LOS A	0,0	0,0	0,00	0,28	0,00	57,5
12	R2	All MCs	34	10,3	34	10,3	0,036	7,3	LOS A	0,1	1,1	0,42	0,62	0,42	51,1
Approach			230	6,1	230	6,1	0,107	3,4	NA	0,1	1,1	0,06	0,33	0,06	55,4
All Vehicles			886	4,5	886	4,5	0,317	7,2	NA	1,4	10,3	0,21	0,52	0,22	52,5

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

MOVEMENT SUMMARY

Site: 101 [DR1578/DR1583 (AM) (Site Folder: 2028 AM + Dolphin)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	16	23,1	16	23,1	0,121	5,8	LOS A	0,3	2,2	0,17	0,22	0,17	54,7
2	T1	All MCs	163	2,0	163	2,0	0,121	0,0	LOS A	0,3	2,2	0,17	0,22	0,17	58,1
3	R2	All MCs	36	0,0	36	0,0	0,121	8,1	LOS A	0,3	2,2	0,17	0,22	0,17	55,4
Approach			215	3,3	215	3,3	0,121	1,8	NA	0,3	2,2	0,17	0,22	0,17	57,4
East: DR1583															
4	L2	All MCs	31	0,0	31	0,0	0,039	9,2	LOS A	0,1	1,0	0,39	0,87	0,39	50,6
5	T1	All MCs	1	0,0	1	0,0	0,039	10,7	LOS B	0,1	1,0	0,39	0,87	0,39	50,6
6	R2	All MCs	5	0,0	5	0,0	0,039	11,0	LOS B	0,1	1,0	0,39	0,87	0,39	50,4
Approach			37	0,0	37	0,0	0,039	9,4	LOS A	0,1	1,0	0,39	0,87	0,39	50,6
North: DR1578															
7	L2	All MCs	7	0,0	7	0,0	0,153	5,5	LOS A	0,0	0,2	0,01	0,02	0,01	57,3
8	T1	All MCs	273	8,0	273	8,0	0,153	0,0	LOS A	0,0	0,2	0,01	0,02	0,01	59,7
9	R2	All MCs	3	0,0	3	0,0	0,153	5,9	LOS A	0,0	0,2	0,01	0,02	0,01	56,9
Approach			283	7,7	283	7,7	0,153	0,2	NA	0,0	0,2	0,01	0,02	0,01	59,7
West: DR1583															
10	L2	All MCs	2	0,0	2	0,0	0,030	8,6	LOS A	0,1	0,9	0,49	0,93	0,49	49,0
11	T1	All MCs	1	0,0	1	0,0	0,030	10,5	LOS B	0,1	0,9	0,49	0,93	0,49	49,0
12	R2	All MCs	12	50,0	12	50,0	0,030	14,6	LOS B	0,1	0,9	0,49	0,93	0,49	46,9
Approach			15	40,0	15	40,0	0,030	13,5	LOS B	0,1	0,9	0,49	0,93	0,49	47,3
All Vehicles			550	6,3	550	6,3	0,153	1,8	NA	0,3	2,2	0,11	0,18	0,11	57,6

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

MOVEMENT SUMMARY

Site: 101 [DR1578/MR344 (AM) (Site Folder: 2028 AM + Dolphin)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	38	0,0	38	0,0	0,466	11,2	LOS B	3,2	22,4	0,71	0,95	1,05	44,4
2	T1	All MCs	151	0,0	151	0,0	0,466	22,6	LOS C	3,2	22,4	0,71	0,95	1,05	44,4
3	R2	All MCs	143	0,0	143	0,0	0,396	18,6	LOS C	1,9	13,6	0,67	1,07	0,90	45,3
Approach			332	0,0	332	0,0	0,466	19,6	LOS C	3,2	22,4	0,69	1,00	0,99	44,8
East: MR344															
4	L2	All MCs	43	0,0	43	0,0	0,023	5,5	LOS A	0,0	0,0	0,00	0,58	0,00	52,9
5	T1	All MCs	75	6,2	75	6,2	0,040	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
6	R2	All MCs	116	8,3	116	8,3	0,091	6,9	LOS A	0,4	3,0	0,42	0,63	0,42	51,2
Approach			234	6,1	234	6,1	0,091	4,4	NA	0,4	3,0	0,21	0,42	0,21	54,1
North: DR1578															
7	L2	All MCs	26	26,7	26	26,7	0,207	10,0	LOS B	0,8	6,3	0,56	0,91	0,56	47,0
8	T1	All MCs	71	5,3	71	5,3	0,207	16,0	LOS C	0,8	6,3	0,56	0,91	0,56	47,7
9	R2	All MCs	169	6,7	169	6,7	0,674	32,9	LOS D	4,1	30,4	0,87	1,23	1,68	38,4
Approach			266	8,2	266	8,2	0,674	26,2	LOS D	4,1	30,4	0,76	1,12	1,27	41,3
West: MR344															
10	L2	All MCs	189	3,4	189	3,4	0,179	5,6	LOS A	0,0	0,0	0,00	0,33	0,00	54,6
11	T1	All MCs	143	3,3	143	3,3	0,179	0,0	LOS A	0,0	0,0	0,00	0,33	0,00	57,0
12	R2	All MCs	24	4,8	24	4,8	0,019	6,0	LOS A	0,1	0,5	0,22	0,55	0,22	51,9
Approach			356	3,5	356	3,5	0,179	3,4	NA	0,1	0,5	0,01	0,35	0,01	55,3
All Vehicles			1188	4,1	1188	4,1	0,674	13,2	NA	4,1	30,4	0,41	0,72	0,61	48,3

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

MOVEMENT SUMMARY

Site: 101 [DR1578/DR1583 (PM) (Site Folder: 2028 PM + Dolphin)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	21	0,0	21	0,0	0,168	5,5	LOS A	0,3	2,2	0,09	0,15	0,09	56,1
2	T1	All MCs	245	10,3	245	10,3	0,168	0,0	LOS A	0,3	2,2	0,09	0,15	0,09	58,5
3	R2	All MCs	36	0,0	36	0,0	0,168	6,9	LOS A	0,3	2,2	0,09	0,15	0,09	55,8
Approach			302	8,3	302	8,3	0,168	1,2	NA	0,3	2,2	0,09	0,15	0,09	58,0
East: DR1583															
4	L2	All MCs	53	0,0	53	0,0	0,052	8,6	LOS A	0,2	1,4	0,28	0,87	0,28	50,9
5	T1	All MCs	1	0,0	1	0,0	0,052	10,5	LOS B	0,2	1,4	0,28	0,87	0,28	50,9
6	R2	All MCs	5	0,0	5	0,0	0,052	10,7	LOS B	0,2	1,4	0,28	0,87	0,28	50,7
Approach			59	0,0	59	0,0	0,052	8,8	LOS A	0,2	1,4	0,28	0,87	0,28	50,9
North: DR1578															
7	L2	All MCs	12	10,0	12	10,0	0,088	5,7	LOS A	0,0	0,2	0,02	0,06	0,02	56,5
8	T1	All MCs	146	8,7	146	8,7	0,088	0,0	LOS A	0,0	0,2	0,02	0,06	0,02	59,4
9	R2	All MCs	3	0,0	3	0,0	0,088	7,4	LOS A	0,0	0,2	0,02	0,06	0,02	56,6
Approach			161	8,7	161	8,7	0,088	0,6	NA	0,0	0,2	0,02	0,06	0,02	59,1
West: DR1583															
10	L2	All MCs	3	0,0	3	0,0	0,011	9,0	LOS A	0,0	0,3	0,43	0,85	0,43	50,2
11	T1	All MCs	1	0,0	1	0,0	0,011	10,2	LOS B	0,0	0,3	0,43	0,85	0,43	50,2
12	R2	All MCs	4	0,0	4	0,0	0,011	10,9	LOS B	0,0	0,3	0,43	0,85	0,43	49,9
Approach			8	0,0	8	0,0	0,011	10,1	LOS B	0,0	0,3	0,43	0,85	0,43	50,0
All Vehicles			530	7,4	530	7,4	0,168	2,0	NA	0,3	2,2	0,10	0,21	0,10	57,3

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

MOVEMENT SUMMARY

Site: 101 [DR1578/MR344 (PM) (Site Folder: 2028 PM + Dolphin)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	28	16,7	28	16,7	0,274	10,3	LOS B	1,2	8,7	0,64	0,96	0,70	46,0
2	T1	All MCs	84	2,9	84	2,9	0,274	18,6	LOS C	1,2	8,7	0,64	0,96	0,70	46,5
3	R2	All MCs	71	1,6	71	1,6	0,236	19,0	LOS C	0,9	6,3	0,68	1,02	0,74	45,1
Approach			183	4,5	183	4,5	0,274	17,5	LOS C	1,2	8,7	0,65	0,98	0,72	45,9
East: MR344															
4	L2	All MCs	172	0,7	172	0,7	0,093	5,6	LOS A	0,0	0,0	0,00	0,58	0,00	52,8
5	T1	All MCs	181	1,9	181	1,9	0,094	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
6	R2	All MCs	51	18,8	51	18,8	0,037	6,5	LOS A	0,2	1,3	0,34	0,57	0,34	51,0
Approach			404	3,5	404	3,5	0,094	3,2	NA	0,2	1,3	0,04	0,32	0,04	55,5
North: DR1578															
7	L2	All MCs	51	0,0	51	0,0	0,231	8,6	LOS A	0,9	6,6	0,52	0,83	0,52	47,8
8	T1	All MCs	63	0,0	63	0,0	0,231	18,3	LOS C	0,9	6,6	0,52	0,83	0,52	47,8
9	R2	All MCs	307	9,9	307	9,9	1,021	121,9	LOS F	28,9	219,6	1,00	2,90	7,22	19,9
Approach			421	7,2	421	7,2	1,021	92,7	LOS F	28,9	219,6	0,87	2,34	5,41	23,6
West: MR344															
10	L2	All MCs	126	8,6	126	8,6	0,125	5,7	LOS A	0,0	0,0	0,00	0,32	0,00	54,5
11	T1	All MCs	102	2,3	102	2,3	0,125	0,0	LOS A	0,0	0,0	0,00	0,32	0,00	57,2
12	R2	All MCs	34	10,3	34	10,3	0,035	7,2	LOS A	0,1	1,0	0,41	0,62	0,41	51,2
Approach			262	6,4	262	6,4	0,125	3,7	NA	0,1	1,0	0,05	0,36	0,05	55,0
All Vehicles			1270	5,5	1270	5,5	1,021	35,0	NA	28,9	219,6	0,41	1,09	1,92	37,5

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

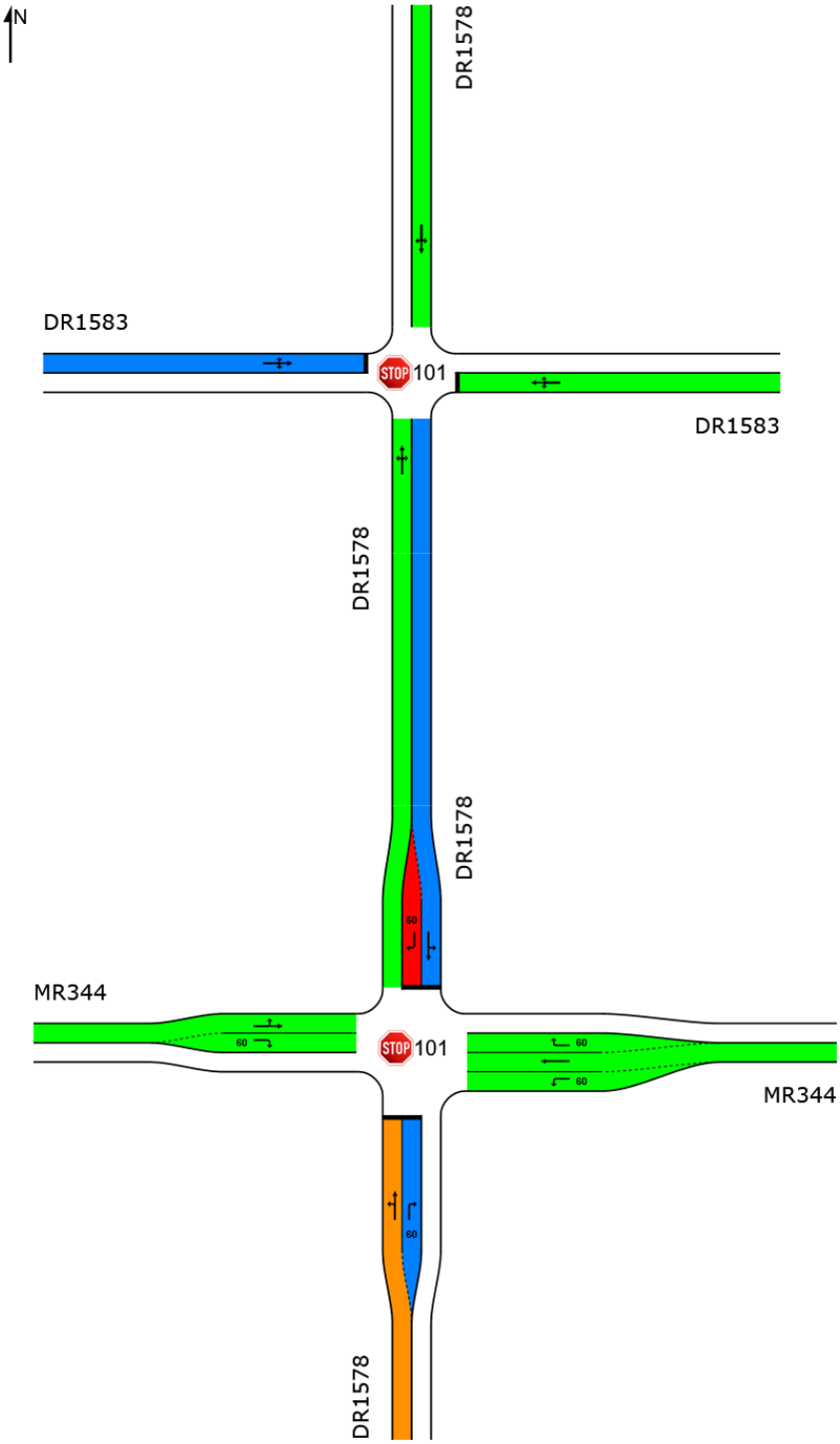
LEVEL OF SERVICE

Lane Level of Service

Network: N101 [2028 Dolphin + Transand AM (Network Folder: 2028 Dolphin + Transand)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Network
Network Category: (None)



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

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

MOVEMENT SUMMARY

Site: 101 [DR1578/DR1583 (AM) Dolp + Trans (Site Folder: 2028 AM + Dolphin + Transand)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	17	23,1	17	23,1	0,136	5,8	LOS A	0,3	2,5	0,18	0,23	0,18	54,7
2	T1	All MCs	185	2,0	185	2,0	0,136	0,0	LOS A	0,3	2,5	0,18	0,23	0,18	58,1
3	R2	All MCs	37	0,0	37	0,0	0,136	8,9	LOS A	0,3	2,5	0,18	0,23	0,18	55,5
Approach			239	3,2	239	3,2	0,136	1,8	NA	0,3	2,5	0,18	0,23	0,18	57,4
East: DR1583															
4	L2	All MCs	38	0,0	38	0,0	0,049	9,5	LOS A	0,2	1,3	0,43	0,88	0,43	50,4
5	T1	All MCs	1	0,0	1	0,0	0,049	11,4	LOS B	0,2	1,3	0,43	0,88	0,43	50,4
6	R2	All MCs	5	0,0	5	0,0	0,049	11,9	LOS B	0,2	1,3	0,43	0,88	0,43	50,2
Approach			44	0,0	44	0,0	0,049	9,8	LOS A	0,2	1,3	0,43	0,88	0,43	50,4
North: DR1578															
7	L2	All MCs	7	0,0	7	0,0	0,183	5,5	LOS A	0,0	0,2	0,01	0,02	0,01	57,3
8	T1	All MCs	328	8,0	328	8,0	0,183	0,0	LOS A	0,0	0,2	0,01	0,02	0,01	59,8
9	R2	All MCs	3	0,0	3	0,0	0,183	6,0	LOS A	0,0	0,2	0,01	0,02	0,01	57,0
Approach			338	7,8	338	7,8	0,183	0,2	NA	0,0	0,2	0,01	0,02	0,01	59,7
West: DR1583															
10	L2	All MCs	2	0,0	2	0,0	0,042	8,7	LOS A	0,1	1,3	0,54	0,96	0,54	48,1
11	T1	All MCs	1	0,0	1	0,0	0,042	11,3	LOS B	0,1	1,3	0,54	0,96	0,54	48,1
12	R2	All MCs	15	50,0	15	50,0	0,042	16,1	LOS C	0,1	1,3	0,54	0,96	0,54	46,1
Approach			18	41,7	18	41,7	0,042	15,0	LOS B	0,1	1,3	0,54	0,96	0,54	46,5
All Vehicles			639	6,5	639	6,5	0,183	1,9	NA	0,3	2,5	0,12	0,18	0,12	57,7

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

MOVEMENT SUMMARY

Site: 101 [DR1578/MR344 (AM) Dolp + Trans (Site Folder: 2028 AM + Dolphin + Transand)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	38	0,0	38	0,0	0,699	17,9	LOS C	7,0	49,1	0,90	1,17	1,94	39,2
2	T1	All MCs	201	0,0	201	0,0	0,699	34,1	LOS D	7,0	49,1	0,90	1,17	1,94	39,2
3	R2	All MCs	143	0,0	143	0,0	0,438	20,9	LOS C	2,2	15,3	0,72	1,09	1,02	44,1
Approach			382	0,0	382	0,0	0,699	27,5	LOS D	7,0	49,1	0,83	1,14	1,59	40,9
East: MR344															
4	L2	All MCs	43	0,0	43	0,0	0,023	5,5	LOS A	0,0	0,0	0,00	0,58	0,00	52,9
5	T1	All MCs	75	6,2	75	6,2	0,040	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
6	R2	All MCs	153	8,3	153	8,3	0,125	7,1	LOS A	0,6	4,2	0,45	0,65	0,45	51,1
Approach			271	6,4	271	6,4	0,125	4,9	NA	0,6	4,2	0,26	0,46	0,26	53,6
North: DR1578															
7	L2	All MCs	30	26,7	30	26,7	0,268	10,3	LOS B	1,1	8,7	0,61	0,92	0,66	46,1
8	T1	All MCs	84	5,3	84	5,3	0,268	18,1	LOS C	1,1	8,7	0,61	0,92	0,66	46,8
9	R2	All MCs	198	6,7	198	6,7	0,977	105,7	LOS F	14,5	107,2	0,99	2,13	5,13	21,8
Approach			312	8,2	312	8,2	0,977	73,0	LOS F	14,5	107,2	0,85	1,69	3,50	27,1
West: MR344															
10	L2	All MCs	226	3,4	226	3,4	0,200	5,6	LOS A	0,0	0,0	0,00	0,36	0,00	54,4
11	T1	All MCs	143	3,3	143	3,3	0,200	0,1	LOS A	0,0	0,0	0,00	0,36	0,00	56,7
12	R2	All MCs	24	4,8	24	4,8	0,019	6,0	LOS A	0,1	0,5	0,22	0,55	0,22	51,9
Approach			393	3,5	393	3,5	0,200	3,6	NA	0,1	0,5	0,01	0,37	0,01	55,0
All Vehicles			1358	4,2	1358	4,2	0,977	26,5	NA	14,5	107,2	0,49	0,91	1,31	41,1

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

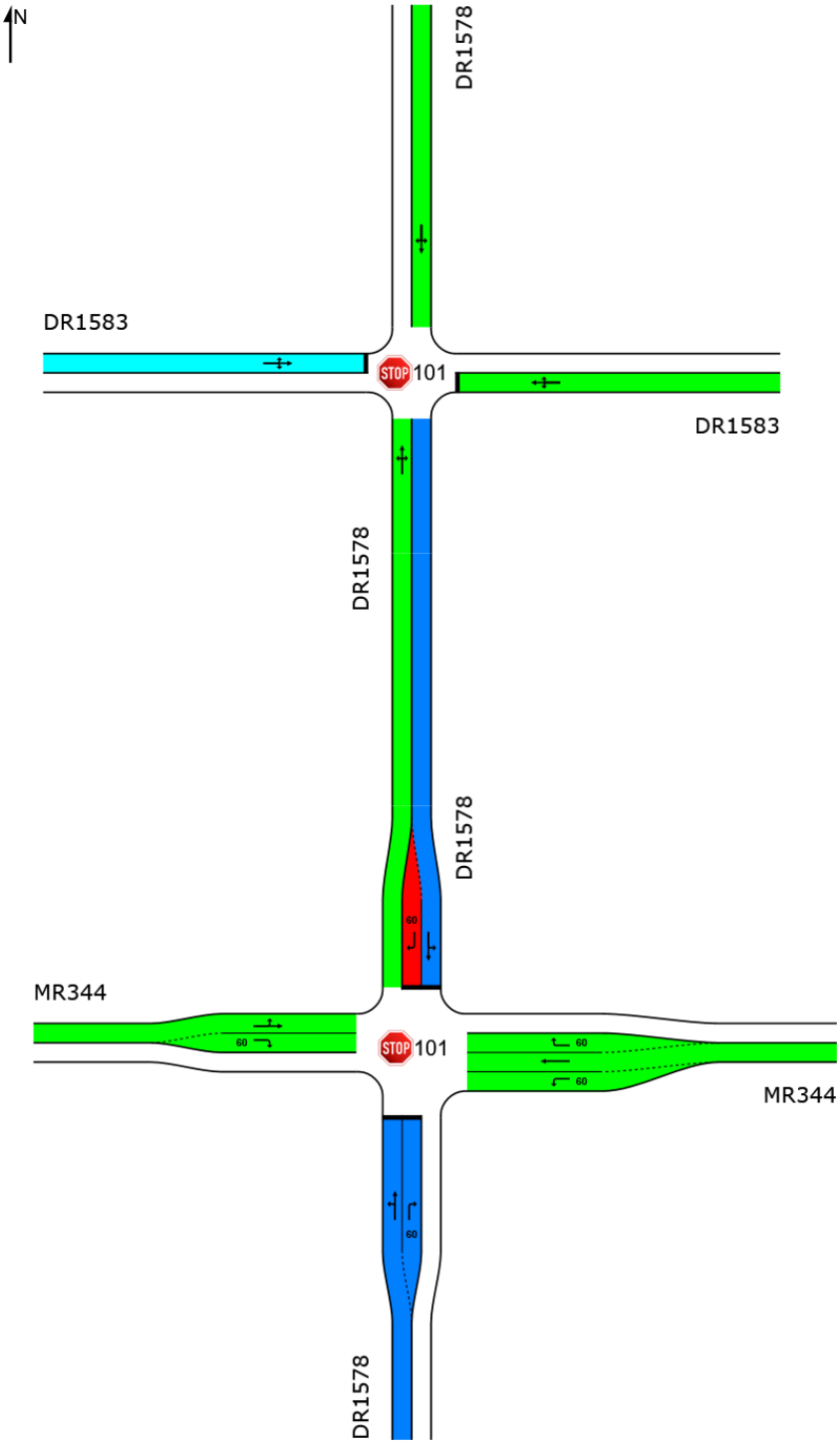
LEVEL OF SERVICE

Lane Level of Service

Network: N101 [2028 Dplhin + Transand PM (Network Folder: 2028 Dolphin + Transand)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Network
Network Category: (None)



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

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

MOVEMENT SUMMARY

Site: 101 [DR1578/DR1583 (PM) Dolp + Trans (Site Folder: 2028 PM + Dolphin + Transand)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	25	0,0	25	0,0	0,203	5,5	LOS A	0,4	2,8	0,10	0,15	0,10	56,1
2	T1	All MCs	295	10,3	295	10,3	0,203	0,0	LOS A	0,4	2,8	0,10	0,15	0,10	58,5
3	R2	All MCs	44	0,0	44	0,0	0,203	7,1	LOS A	0,4	2,8	0,10	0,15	0,10	55,8
Approach			364	8,3	364	8,3	0,203	1,2	NA	0,4	2,8	0,10	0,15	0,10	58,0
East: DR1583															
4	L2	All MCs	65	0,0	65	0,0	0,064	8,6	LOS A	0,2	1,7	0,29	0,87	0,29	50,9
5	T1	All MCs	1	0,0	1	0,0	0,064	11,2	LOS B	0,2	1,7	0,29	0,87	0,29	50,9
6	R2	All MCs	5	0,0	5	0,0	0,064	11,6	LOS B	0,2	1,7	0,29	0,87	0,29	50,6
Approach			71	0,0	71	0,0	0,064	8,9	LOS A	0,2	1,7	0,29	0,87	0,29	50,9
North: DR1578															
7	L2	All MCs	12	10,0	12	10,0	0,095	5,7	LOS A	0,0	0,2	0,02	0,06	0,02	56,5
8	T1	All MCs	158	8,7	158	8,7	0,095	0,0	LOS A	0,0	0,2	0,02	0,06	0,02	59,4
9	R2	All MCs	3	0,0	3	0,0	0,095	8,3	LOS A	0,0	0,2	0,02	0,06	0,02	56,6
Approach			173	8,7	173	8,7	0,095	0,5	NA	0,0	0,2	0,02	0,06	0,02	59,2
West: DR1583															
10	L2	All MCs	3	0,0	3	0,0	0,014	9,2	LOS A	0,0	0,3	0,48	0,87	0,48	49,7
11	T1	All MCs	1	0,0	1	0,0	0,014	10,9	LOS B	0,0	0,3	0,48	0,87	0,48	49,7
12	R2	All MCs	5	0,0	5	0,0	0,014	11,9	LOS B	0,0	0,3	0,48	0,87	0,48	49,5
Approach			9	0,0	9	0,0	0,014	10,9	LOS B	0,0	0,3	0,48	0,87	0,48	49,6
All Vehicles			617	7,3	617	7,3	0,203	2,1	NA	0,4	2,8	0,11	0,22	0,11	57,2

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

MOVEMENT SUMMARY

Site: 101 [DR1578/MR344 (PM) Dolp + Trans (Site Folder: 2028 PM + Dolphin + Transand)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	28	16,7	28	16,7	0,351	11,2	LOS B	1,7	12,5	0,68	1,01	0,87	44,8
2	T1	All MCs	104	2,9	104	2,9	0,351	20,8	LOS C	1,7	12,5	0,68	1,01	0,87	45,2
3	R2	All MCs	71	1,6	71	1,6	0,260	20,9	LOS C	1,0	7,0	0,72	1,03	0,81	44,1
Approach			203	4,3	203	4,3	0,351	19,5	LOS C	1,7	12,5	0,70	1,02	0,85	44,8
East: MR344															
4	L2	All MCs	172	0,7	172	0,7	0,093	5,6	LOS A	0,0	0,0	0,00	0,58	0,00	52,8
5	T1	All MCs	181	1,9	181	1,9	0,094	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
6	R2	All MCs	66	18,8	66	18,8	0,049	6,6	LOS A	0,2	1,7	0,35	0,58	0,35	51,0
Approach			419	4,1	419	4,1	0,094	3,3	NA	0,2	1,7	0,06	0,33	0,06	55,4
North: DR1578															
7	L2	All MCs	66	0,0	66	0,0	0,310	8,9	LOS A	1,4	10,0	0,57	0,83	0,60	47,2
8	T1	All MCs	82	0,0	82	0,0	0,310	20,0	LOS C	1,4	10,0	0,57	0,83	0,60	47,2
9	R2	All MCs	395	9,9	395	9,9	1,426	799,4	LOS F	154,1	1170,0	1,00	8,47	26,08	4,2
Approach			543	7,2	543	7,2	1,426	585,6	LOS F	154,1	1170,0	0,88	6,39	19,14	5,6
West: MR344															
10	L2	All MCs	141	8,6	141	8,6	0,134	5,7	LOS A	0,0	0,0	0,00	0,34	0,00	54,4
11	T1	All MCs	102	2,3	102	2,3	0,134	0,0	LOS A	0,0	0,0	0,00	0,34	0,00	57,0
12	R2	All MCs	34	10,3	34	10,3	0,035	7,2	LOS A	0,1	1,0	0,41	0,62	0,41	51,2
Approach			277	6,5	277	6,5	0,134	3,8	NA	0,1	1,0	0,05	0,37	0,05	54,9
All Vehicles			1442	5,7	1442	5,7	1,426	225,0	NA	154,1	1170,0	0,46	2,72	7,35	12,7

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

LEVEL OF SERVICE

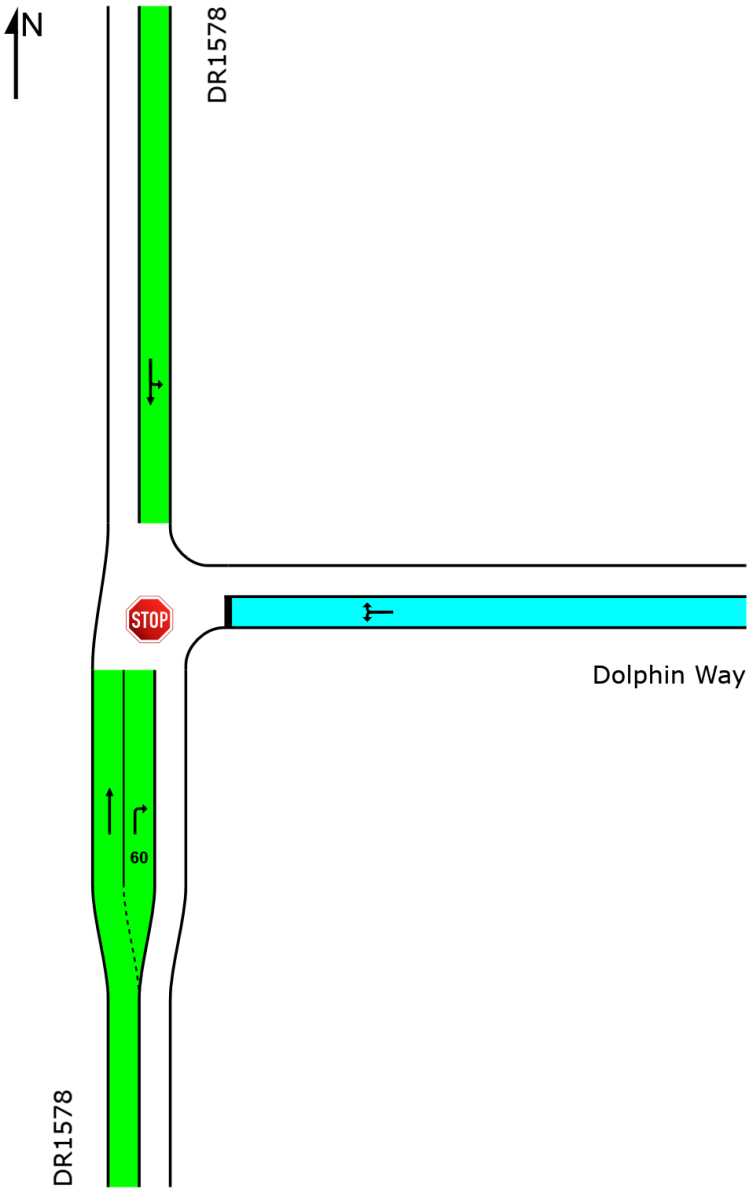
Lane Level of Service

Site: 101 [Site Access Dolphin PM (Site Folder: Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

	Approaches			Intersection
	South	East	North	
LOS	NA (TWSC)	B	NA (TWSC)	NA (TWSC)



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

MOVEMENT SUMMARY

Site: 101 [Site Access Dolphin AM (Site Folder: Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
2	T1	All MCs	163	3,0	163	3,0	0,085	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
3	R2	All MCs	292	3,0	292	3,0	0,224	6,8	LOS A	1,1	7,9	0,45	0,65	0,45	51,3
Approach			455	3,0	455	3,0	0,224	4,4	NA	1,1	7,9	0,29	0,42	0,29	54,1
East: Dolphin Way															
4	L2	All MCs	102	3,0	102	3,0	0,214	8,9	LOS A	0,9	6,4	0,47	0,85	0,47	49,3
6	R2	All MCs	52	3,0	52	3,0	0,214	16,3	LOS C	0,9	6,4	0,47	0,85	0,47	49,1
Approach			154	3,0	154	3,0	0,214	11,4	LOS B	0,9	6,4	0,47	0,85	0,47	49,3
North: DR1578															
7	L2	All MCs	151	3,0	151	3,0	0,169	5,6	LOS A	0,0	0,0	0,00	0,28	0,00	55,0
8	T1	All MCs	165	3,0	165	3,0	0,169	0,0	LOS A	0,0	0,0	0,00	0,28	0,00	57,4
Approach			316	3,0	316	3,0	0,169	2,7	NA	0,0	0,0	0,00	0,28	0,00	56,2
All Vehicles			925	3,0	925	3,0	0,224	5,0	NA	1,1	7,9	0,22	0,44	0,22	53,9

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

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Project: C:\Users\Frans van Aardt\Urban Engineering (Pty) Ltd\UE - Projects\22-160 Dolphin Circle\3_Working\SIDRA\23-033 Dolphin Circle Calibrated.sip9

MOVEMENT SUMMARY

Site: 101 [Site Access Dolphin PM (Site Folder: Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
2	T1	All MCs	153	3,0	153	3,0	0,080	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
3	R2	All MCs	108	3,0	108	3,0	0,074	6,2	LOS A	0,3	2,4	0,32	0,58	0,32	51,7
Approach			261	3,0	261	3,0	0,080	2,6	NA	0,3	2,4	0,13	0,24	0,13	56,2
East: Dolphin Way															
4	L2	All MCs	276	3,0	276	3,0	0,471	9,8	LOS A	3,6	25,8	0,50	0,87	0,60	49,4
6	R2	All MCs	149	3,0	149	3,0	0,471	14,2	LOS B	3,6	25,8	0,50	0,87	0,60	49,2
Approach			425	3,0	425	3,0	0,471	11,4	LOS B	3,6	25,8	0,50	0,87	0,60	49,3
North: DR1578															
7	L2	All MCs	56	3,0	56	3,0	0,107	5,6	LOS A	0,0	0,0	0,00	0,16	0,00	56,0
8	T1	All MCs	146	3,0	146	3,0	0,107	0,0	LOS A	0,0	0,0	0,00	0,16	0,00	58,5
Approach			202	3,0	202	3,0	0,107	1,6	NA	0,0	0,0	0,00	0,16	0,00	57,8
All Vehicles			888	3,0	888	3,0	0,471	6,6	NA	3,6	25,8	0,28	0,52	0,33	53,0

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

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Project: C:\Users\Frans van Aardt\Urban Engineering (Pty) Ltd\UE - Projects\22-160 Dolphin Circle\3_Working\SIDRA\23-033 Dolphin Circle Calibrated.sip9

LEVEL OF SERVICE

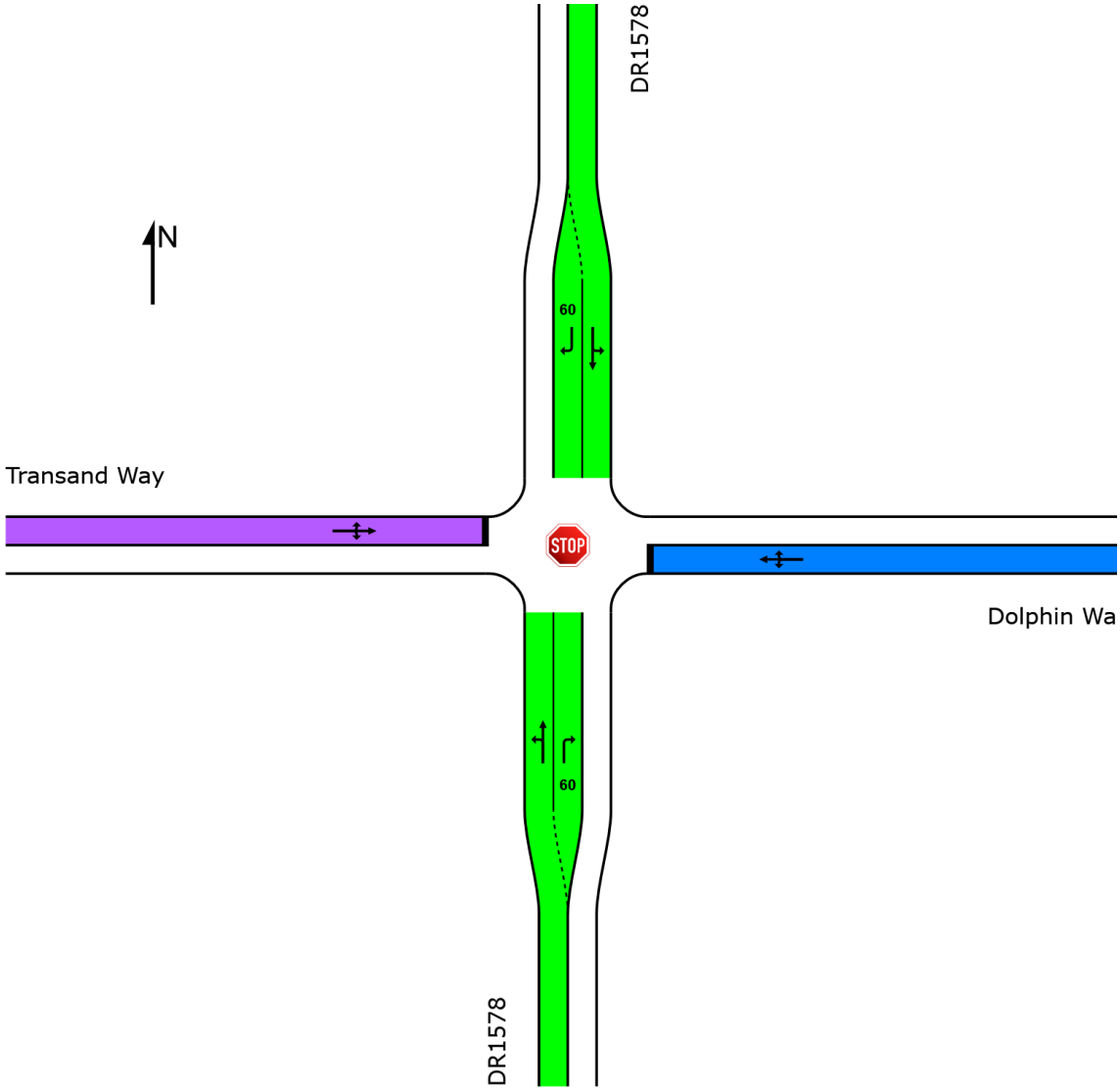
Lane Level of Service

Site: 101 [Site Access - Dolphin + Transand PM (Site Folder: Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

	Approaches				Intersection
	South	East	North	West	
LOS	NA (TWSC)	C	NA (TWSC)	D	NA (TWSC)



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

MOVEMENT SUMMARY

Site: 101 [Site Access - Dolphin + Transand AM (Site Folder: Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	126	3,0	126	3,0	0,156	5,6	LOS A	0,0	0,0	0,00	0,26	0,00	55,1
2	T1	All MCs	162	7,0	162	7,0	0,156	0,0	LOS A	0,0	0,0	0,00	0,26	0,00	57,6
3	R2	All MCs	292	3,0	292	3,0	0,226	6,9	LOS A	1,1	7,9	0,45	0,65	0,45	51,3
Approach			580	4,1	580	4,1	0,226	4,7	NA	1,1	7,9	0,23	0,46	0,23	53,8
East: Dolphin Way															
4	L2	All MCs	102	3,0	102	3,0	0,344	10,2	LOS B	1,7	12,5	0,63	0,88	0,75	46,4
5	T1	All MCs	1	3,0	1	3,0	0,344	28,9	LOS D	1,7	12,5	0,63	0,88	0,75	46,4
6	R2	All MCs	52	3,0	52	3,0	0,344	28,7	LOS D	1,7	12,5	0,63	0,88	0,75	46,3
Approach			155	3,0	155	3,0	0,344	16,5	LOS C	1,7	12,5	0,63	0,88	0,75	46,3
North: DR1578															
7	L2	All MCs	151	3,0	151	3,0	0,172	5,6	LOS A	0,0	0,0	0,00	0,28	0,00	55,0
8	T1	All MCs	166	7,0	166	7,0	0,172	0,0	LOS A	0,0	0,0	0,00	0,28	0,00	57,4
9	R2	All MCs	65	3,0	65	3,0	0,049	6,5	LOS A	0,2	1,5	0,38	0,60	0,38	51,5
Approach			382	4,7	382	4,7	0,172	3,3	NA	0,2	1,5	0,06	0,34	0,06	55,3
West: Transand Way															
10	L2	All MCs	23	3,0	23	3,0	0,263	10,0	LOS A	1,0	7,4	0,74	0,94	0,84	43,1
11	T1	All MCs	1	3,0	1	3,0	0,263	26,8	LOS D	1,0	7,4	0,74	0,94	0,84	43,1
12	R2	All MCs	45	3,0	45	3,0	0,263	29,1	LOS D	1,0	7,4	0,74	0,94	0,84	43,0
Approach			69	3,0	69	3,0	0,263	22,7	LOS C	1,0	7,4	0,74	0,94	0,84	43,0
All Vehicles			1186	4,1	1186	4,1	0,344	6,8	NA	1,7	12,5	0,26	0,50	0,28	52,4

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

MOVEMENT SUMMARY

Site: 101 [Site Access - Dolphin + Transand PM (Site Folder: Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	50	3,0	50	3,0	0,110	5,6	LOS A	0,0	0,0	0,00	0,15	0,00	56,1
2	T1	All MCs	153	7,0	153	7,0	0,110	0,0	LOS A	0,0	0,0	0,00	0,15	0,00	58,6
3	R2	All MCs	108	3,0	108	3,0	0,074	6,2	LOS A	0,3	2,4	0,32	0,58	0,32	51,7
Approach			311	5,0	311	5,0	0,110	3,1	NA	0,3	2,4	0,11	0,30	0,11	55,6
East: Dolphin Way															
4	L2	All MCs	276	3,0	276	3,0	0,678	14,5	LOS B	9,3	66,9	0,74	1,02	1,36	44,9
5	T1	All MCs	1	3,0	1	3,0	0,678	25,3	LOS D	9,3	66,9	0,74	1,02	1,36	44,8
6	R2	All MCs	149	3,0	149	3,0	0,678	28,4	LOS D	9,3	66,9	0,74	1,02	1,36	44,8
Approach			426	3,0	426	3,0	0,678	19,4	LOS C	9,3	66,9	0,74	1,02	1,36	44,8
North: DR1578															
7	L2	All MCs	56	3,0	56	3,0	0,109	5,6	LOS A	0,0	0,0	0,00	0,16	0,00	55,9
8	T1	All MCs	146	7,0	146	7,0	0,109	0,0	LOS A	0,0	0,0	0,00	0,16	0,00	58,4
9	R2	All MCs	26	3,0	26	3,0	0,018	6,1	LOS A	0,1	0,6	0,31	0,56	0,31	51,7
Approach			228	5,6	228	5,6	0,109	2,1	NA	0,1	0,6	0,04	0,21	0,04	57,0
West: Transand Way															
10	L2	All MCs	62	3,0	62	3,0	0,562	14,2	LOS B	3,9	27,8	0,82	1,07	1,42	41,5
11	T1	All MCs	1	3,0	1	3,0	0,562	21,4	LOS C	3,9	27,8	0,82	1,07	1,42	41,5
12	R2	All MCs	121	3,0	121	3,0	0,562	32,1	LOS D	3,9	27,8	0,82	1,07	1,42	41,4
Approach			184	3,0	184	3,0	0,562	26,0	LOS D	3,9	27,8	0,82	1,07	1,42	41,5
All Vehicles			1149	4,0	1149	4,0	0,678	12,6	NA	9,3	66,9	0,44	0,67	0,77	48,8

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

LEVEL OF SERVICE

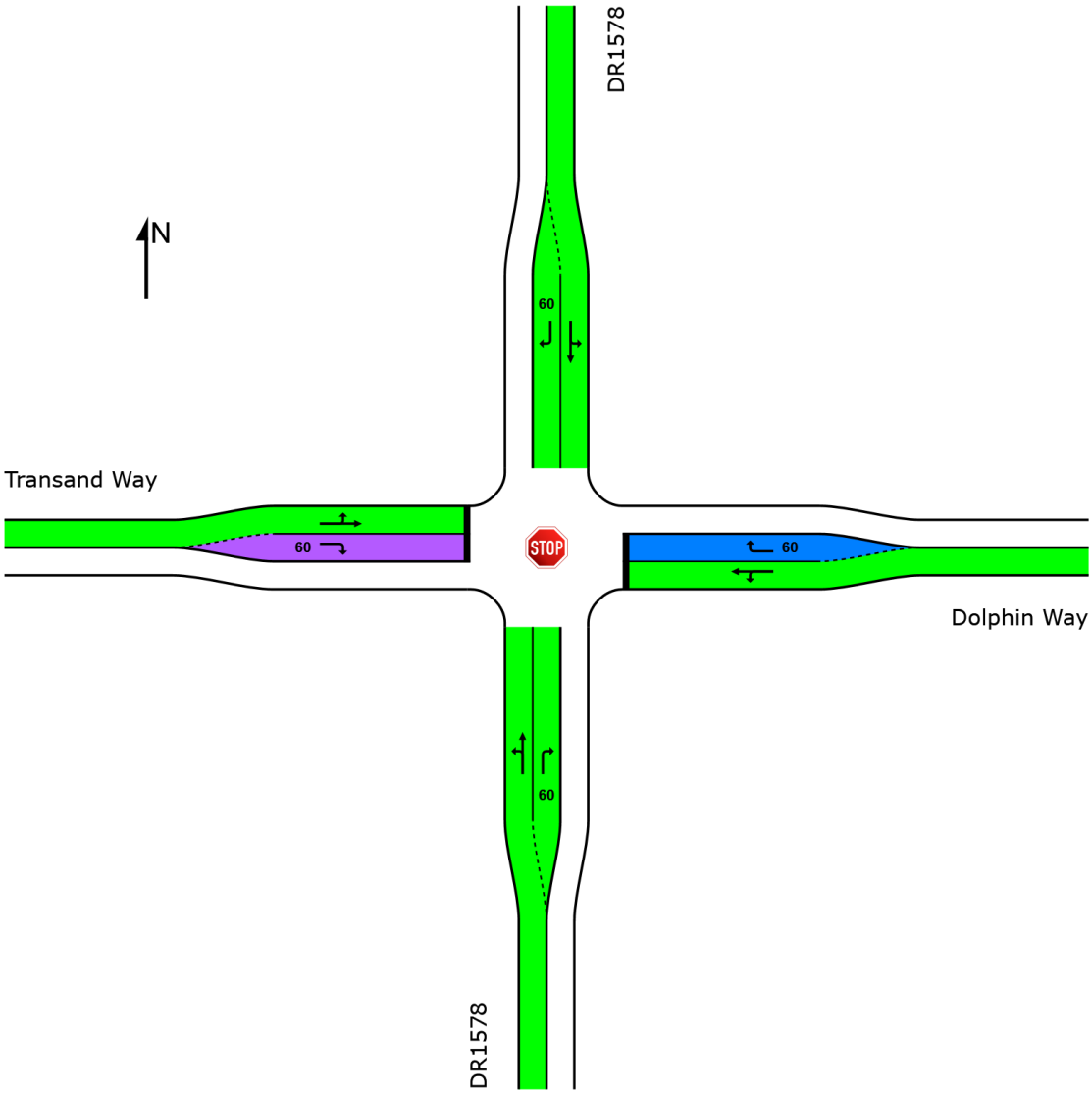
Lane Level of Service

Site: 101 [Site Access - RT LANE ADDED (Site Folder: Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

	Approaches				Intersection
	South	East	North	West	
LOS	NA (TWSC)	B	NA (TWSC)	C	NA (TWSC)



Colour code based on Level of Service

LOS A | LOS B | LOS C | LOS D | LOS E | LOS F

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

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Project: C:\Users\Frans van Aardt\Urban Engineering (Pty) Ltd\UE - Projects\22-160 Dolphin Circle\3_Working\SIDRA\23-033 Dolphin Circle Calibrated.sip9

MOVEMENT SUMMARY

Site: 101 [Site Access - RT LANE ADDED (Site Folder: Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	50	3,0	50	3,0	0,110	5,6	LOS A	0,0	0,0	0,00	0,15	0,00	56,1
2	T1	All MCs	153	7,0	153	7,0	0,110	0,0	LOS A	0,0	0,0	0,00	0,15	0,00	58,6
3	R2	All MCs	108	3,0	108	3,0	0,074	6,2	LOS A	0,3	2,4	0,32	0,57	0,32	51,7
Approach			311	5,0	311	5,0	0,110	3,1	NA	0,3	2,4	0,11	0,29	0,11	55,6
East: Dolphin Way															
4	L2	All MCs	276	3,0	276	3,0	0,276	9,1	LOS A	1,2	8,7	0,32	0,88	0,32	50,7
5	T1	All MCs	1	3,0	1	3,0	0,276	15,9	LOS C	1,2	8,7	0,32	0,88	0,32	50,7
6	R2	All MCs	149	3,0	149	3,0	0,402	18,9	LOS C	2,0	14,5	0,69	1,08	0,95	45,0
Approach			426	3,0	426	3,0	0,402	12,6	LOS B	2,0	14,5	0,45	0,95	0,54	48,5
North: DR1578															
7	L2	All MCs	56	3,0	56	3,0	0,109	5,6	LOS A	0,0	0,0	0,00	0,16	0,00	55,9
8	T1	All MCs	146	7,0	146	7,0	0,109	0,0	LOS A	0,0	0,0	0,00	0,16	0,00	58,4
9	R2	All MCs	26	3,0	26	3,0	0,018	6,2	LOS A	0,1	0,6	0,31	0,55	0,31	51,8
Approach			228	5,6	228	5,6	0,109	2,1	NA	0,1	0,6	0,04	0,21	0,04	57,0
West: Transand Way															
10	L2	All MCs	62	3,0	62	3,0	0,064	8,9	LOS A	0,2	1,7	0,28	0,88	0,28	50,7
11	T1	All MCs	1	3,0	1	3,0	0,064	14,1	LOS B	0,2	1,7	0,28	0,88	0,28	50,7
12	R2	All MCs	121	3,0	121	3,0	0,498	28,6	LOS D	2,4	17,0	0,84	1,12	1,25	40,3
Approach			184	3,0	184	3,0	0,498	21,9	LOS C	2,4	17,0	0,65	1,04	0,92	43,3
All Vehicles			1149	4,0	1149	4,0	0,498	9,4	NA	2,4	17,0	0,31	0,64	0,38	50,8

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

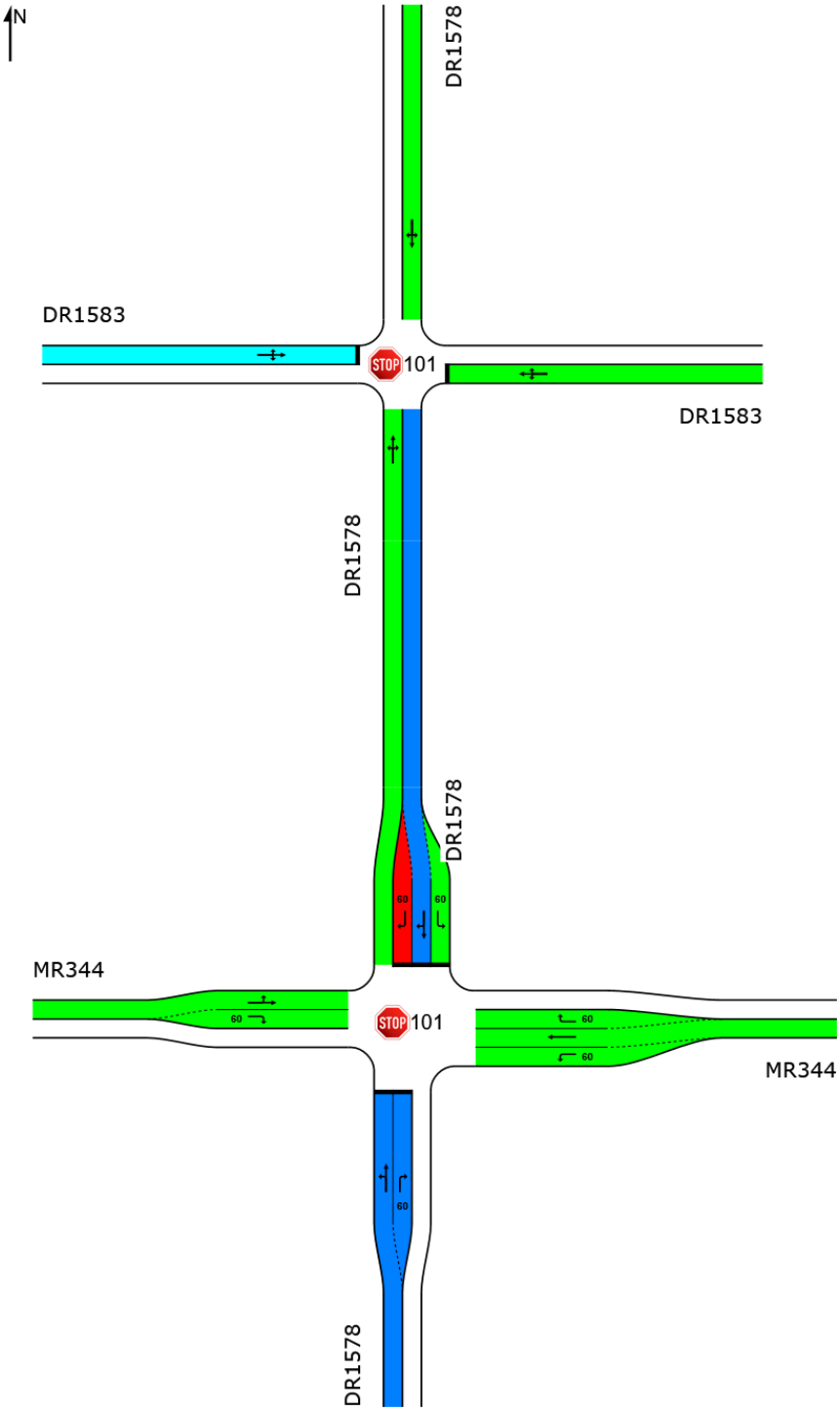
LEVEL OF SERVICE

Lane Level of Service

Network: N101 [Mitigation RT Lane (Network Folder: 2028 Dolphin + Transand)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Network
Network Category: (None)



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

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

MOVEMENT SUMMARY

Site: 101 [Mitigation 1 (Site Folder: Mitigation Measures)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	28	16,7	28	16,7	0,351	11,2	LOS B	1,7	12,5	0,68	1,01	0,87	44,8
2	T1	All MCs	104	2,9	104	2,9	0,351	20,8	LOS C	1,7	12,5	0,68	1,01	0,87	45,2
3	R2	All MCs	71	1,6	71	1,6	0,262	21,1	LOS C	1,0	7,1	0,72	1,03	0,82	44,0
Approach			203	4,3	203	4,3	0,351	19,6	LOS C	1,7	12,5	0,70	1,02	0,85	44,7
East: MR344															
4	L2	All MCs	172	0,7	172	0,7	0,093	5,6	LOS A	0,0	0,0	0,00	0,58	0,00	52,8
5	T1	All MCs	181	1,9	181	1,9	0,094	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
6	R2	All MCs	66	18,8	66	18,8	0,049	6,6	LOS A	0,2	1,7	0,35	0,57	0,35	51,1
Approach			419	4,1	419	4,1	0,094	3,3	NA	0,2	1,7	0,06	0,33	0,06	55,4
North: DR1578															
7	L2	All MCs	66	0,0	66	0,0	0,061	8,5	LOS A	0,2	1,6	0,21	0,89	0,21	51,0
8	T1	All MCs	82	0,0	82	0,0	0,279	19,1	LOS C	1,2	8,1	0,71	1,03	0,82	45,0
9	R2	All MCs	395	9,9	395	9,9	1,396	730,8	LOS F	143,9	1092,9	0,99	7,97	24,40	4,6
Approach			543	7,2	543	7,2	1,396	535,5	LOS F	143,9	1092,9	0,86	6,06	17,90	6,1
West: MR344															
10	L2	All MCs	141	8,6	141	8,6	0,134	5,7	LOS A	0,0	0,0	0,00	0,34	0,00	54,4
11	T1	All MCs	102	2,3	102	2,3	0,134	0,0	LOS A	0,0	0,0	0,00	0,34	0,00	57,0
12	R2	All MCs	34	10,3	34	10,3	0,035	7,2	LOS A	0,1	1,0	0,41	0,62	0,41	51,2
Approach			277	6,5	277	6,5	0,134	3,8	NA	0,1	1,0	0,05	0,37	0,05	54,9
All Vehicles			1442	5,7	1442	5,7	1,396	206,1	NA	143,9	1092,9	0,45	2,59	6,89	13,6

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

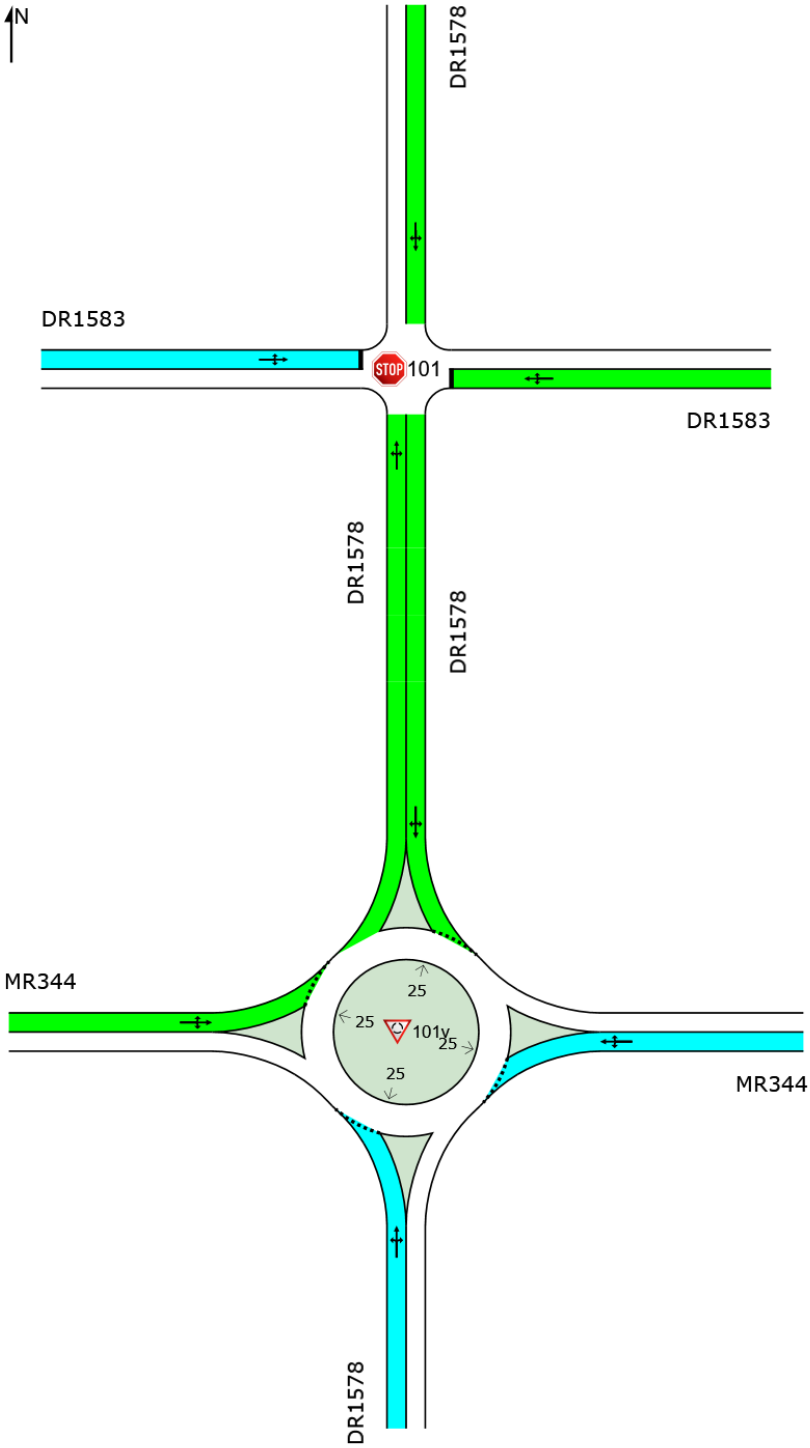
LEVEL OF SERVICE

Lane Level of Service

Network: N101 [Mitigation Circle (Network Folder: 2028 Dolphin + Transand)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Network
Network Category: (None)



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

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

MOVEMENT SUMMARY

Site: 101v [DR1578/MR344 (PM) Dolp + Trans - Conversion (Site Folder: Mitigation Measures)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: 2028 + Generated
Roundabout

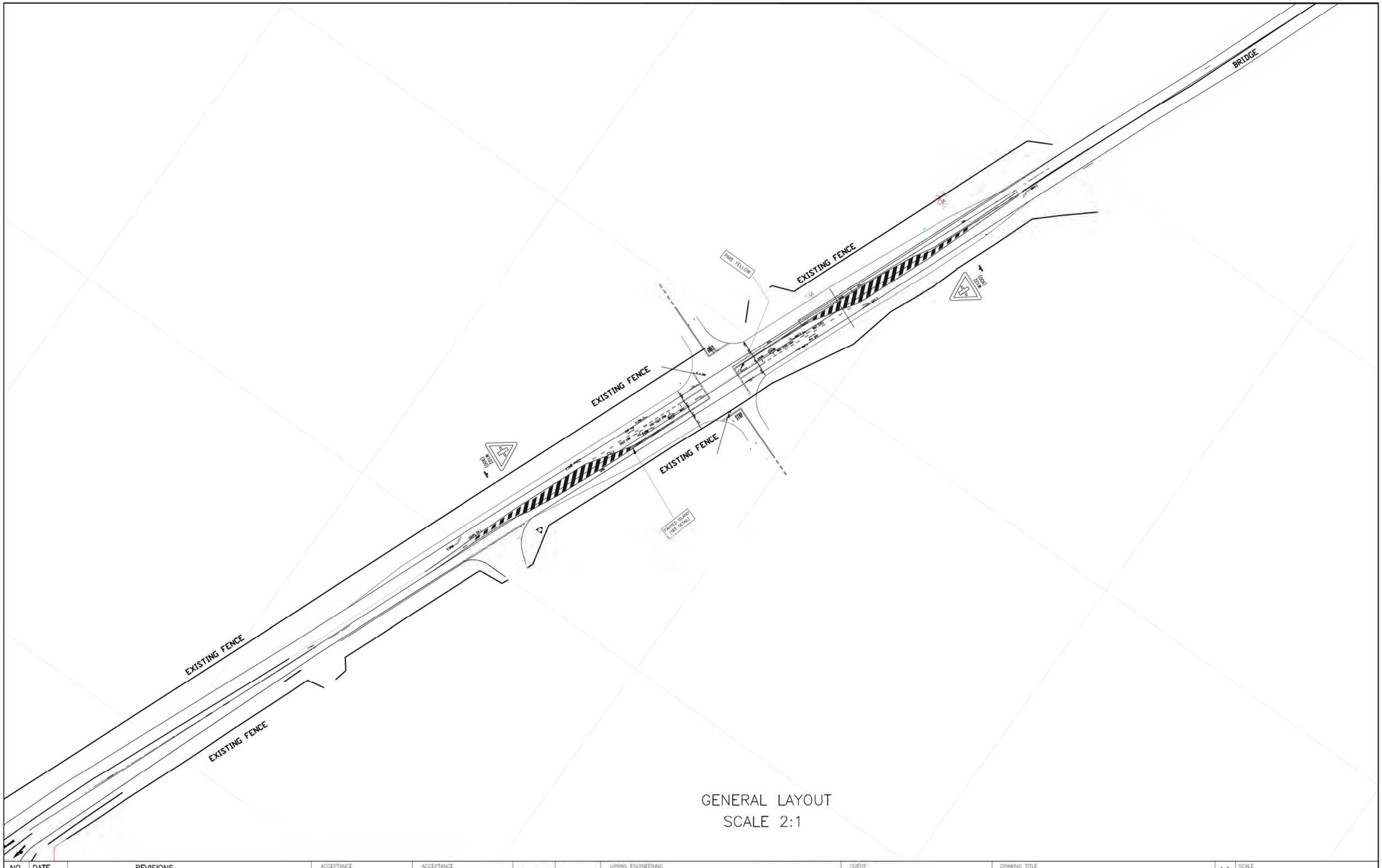
Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: DR1578															
1	L2	All MCs	28	16,7	28	16,7	0,276	9,1	LOS A	1,9	13,6	0,78	0,71	0,78	49,9
2	T1	All MCs	104	2,9	104	2,9	0,276	8,6	LOS A	1,9	13,6	0,78	0,71	0,78	50,6
3	R2	All MCs	71	1,6	71	1,6	0,276	13,9	LOS B	1,9	13,6	0,78	0,71	0,78	49,7
Approach			203	4,3	203	4,3	0,276	10,5	LOS B	1,9	13,6	0,78	0,71	0,78	50,2
East: MR344															
4	L2	All MCs	172	0,7	172	0,7	0,516	9,1	LOS A	4,6	33,1	0,85	0,75	0,94	50,7
5	T1	All MCs	181	1,9	181	1,9	0,516	9,0	LOS A	4,6	33,1	0,85	0,75	0,94	51,0
6	R2	All MCs	66	18,8	66	18,8	0,516	14,9	LOS B	4,6	33,1	0,85	0,75	0,94	49,5
Approach			419	4,1	419	4,1	0,516	10,0	LOS A	4,6	33,1	0,85	0,75	0,94	50,6
North: DR1578															
7	L2	All MCs	66	0,0	66	0,0	0,473	5,3	LOS A	3,9	29,2	0,59	0,60	0,59	50,9
8	T1	All MCs	82	0,0	82	0,0	0,473	5,3	LOS A	3,9	29,2	0,59	0,60	0,59	51,2
9	R2	All MCs	395	9,9	395	9,9	0,473	10,8	LOS B	3,9	29,2	0,59	0,60	0,59	50,0
Approach			543	7,2	543	7,2	0,473	9,3	LOS A	3,9	29,2	0,59	0,60	0,59	50,3
West: MR344															
10	L2	All MCs	141	8,6	141	8,6	0,264	5,4	LOS A	1,8	13,5	0,55	0,54	0,55	52,7
11	T1	All MCs	102	2,3	102	2,3	0,264	5,2	LOS A	1,8	13,5	0,55	0,54	0,55	53,3
12	R2	All MCs	34	10,3	34	10,3	0,264	10,8	LOS B	1,8	13,5	0,55	0,54	0,55	52,0
Approach			277	6,5	277	6,5	0,264	6,0	LOS A	1,8	13,5	0,55	0,54	0,55	52,8
All Vehicles			1442	5,7	1442	5,7	0,516	9,0	LOS A	4,6	33,1	0,68	0,65	0,71	50,8

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

ANNEXURE G

PRELIMINARY DR1578 ACCESS DRAWINGS



GENERAL LAYOUT
SCALE 2:1

NO.	DATE	REVISIONS
A	08-04-2022	FOR INFORMATION

ACCEPTANCE
URBAN ENGINEERING (PTY) LTD
DATE:

ACCEPTANCE
CLIENT
DATE:

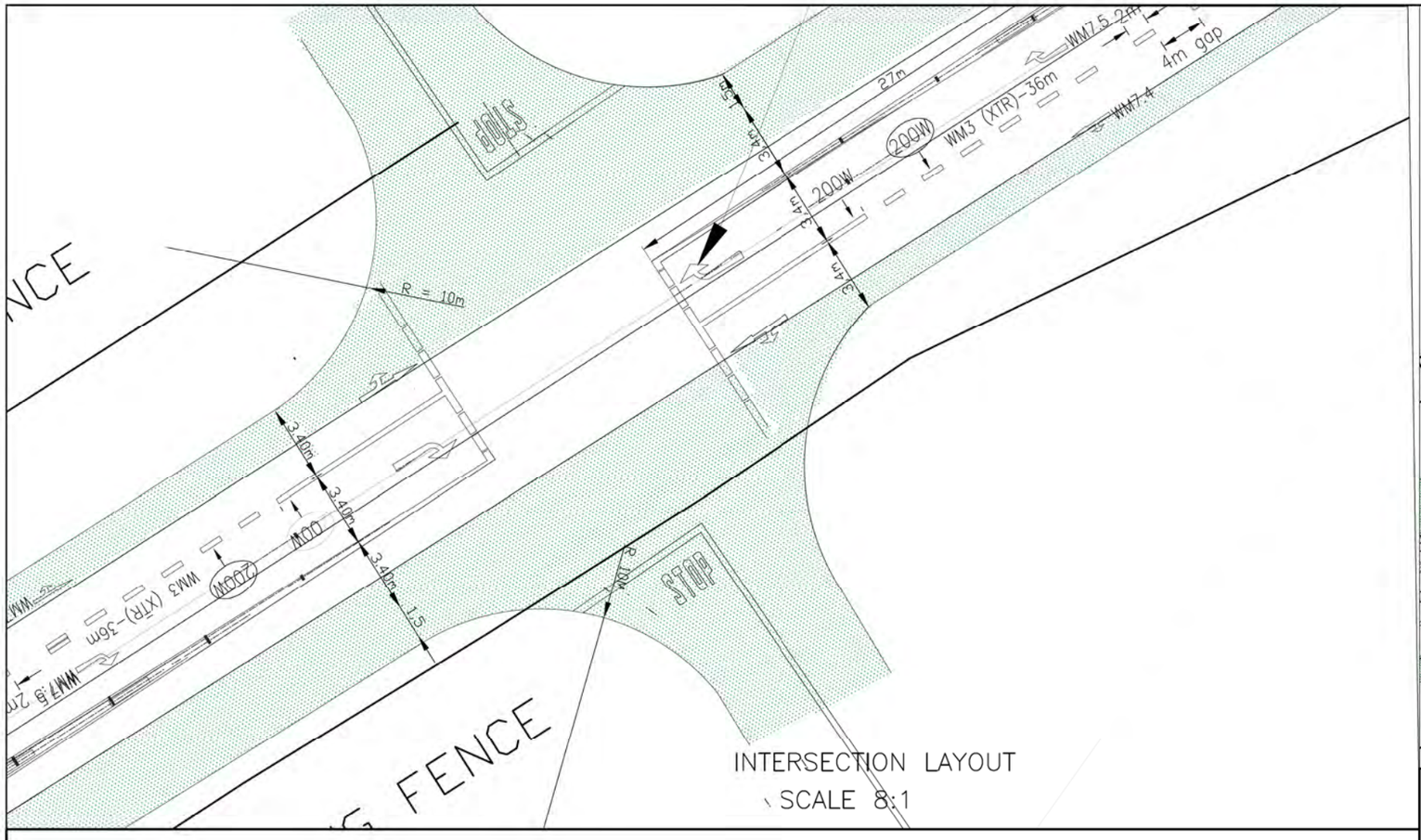
DESIGNED BY	E WITBOOI
CHECKED BY	FRANS v AARDT
DRAWN BY	E WITBOOI
CHECKED BY	FRANS v AARDT

URBAN ENGINEERING
URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

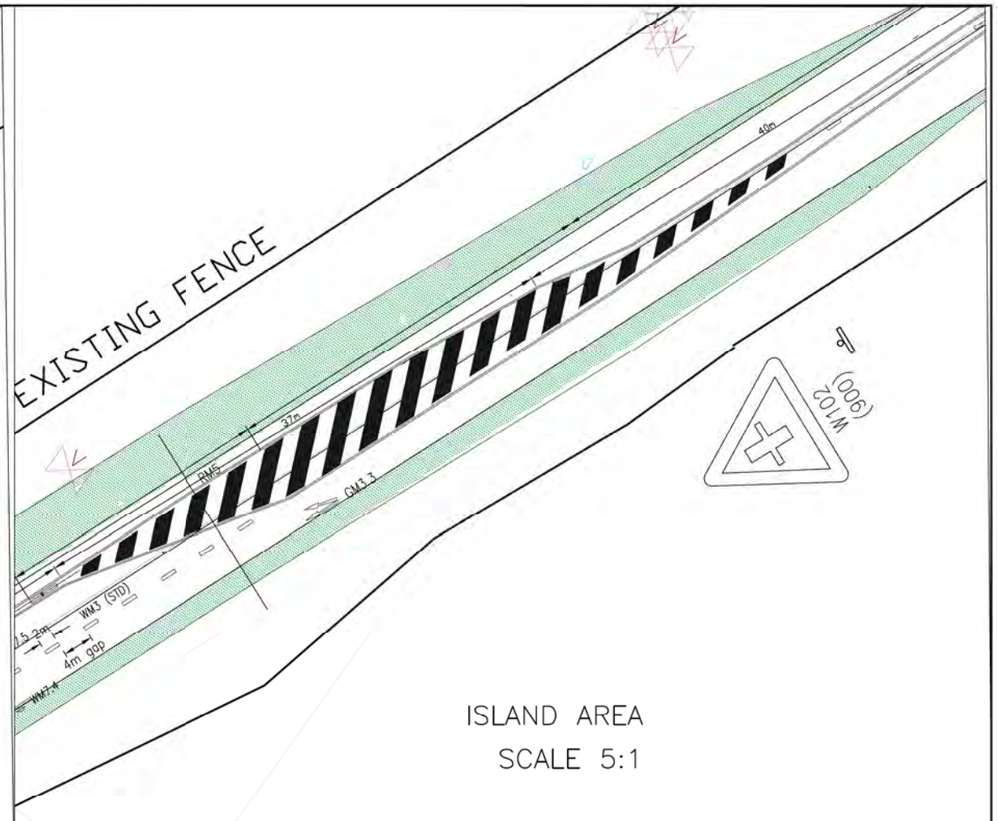
CLIENT

DRAWING TITLE
DR1578
GEOMETRIC ROAD DESIGN

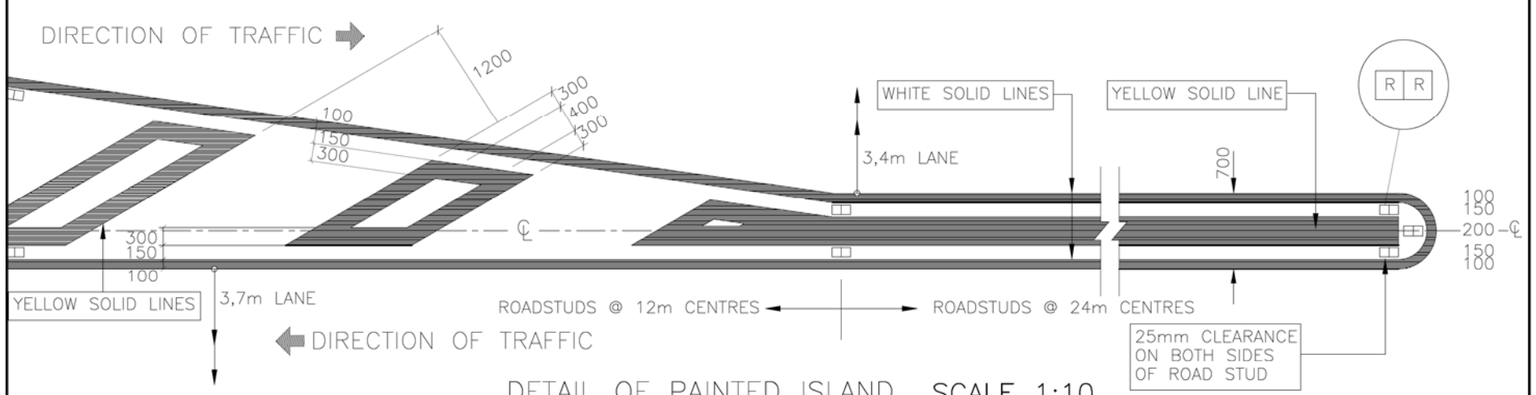
A1 SCALE AS SHOWN
URBAN ENGINEERING DWG NO. 21-102-100
CLIENT DWG NO.
REVISION NO. A



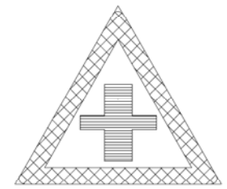
INTERSECTION LAYOUT
SCALE 8:1



ISLAND AREA
SCALE 5:1



DETAIL OF PAINTED ISLAND SCALE 1:10



W102

ROAD SIGNS

NO.	DATE	REVISIONS
A	08-04-2022	FOR INFORMATION

ACCEPTANCE
URBAN ENGINEERING (PTY) LTD
DATE:

ACCEPTANCE
CLIENT
DATE:

DESIGNED BY	E WITBOOI
CHECKED BY	FRANS v AARDT
DRAWN BY	E WITBOOI
CHECKED BY	FRANS v AARDT

URBAN ENGINEERING
URBAN ENGINEERING
CONSULTING CIVIL AND STRUCTURAL ENGINEERS

CLIENT

DRAWING TITLE
DR1578
GEOMETRIC ROAD DESIGN
DETAILS

A1 SCALE AS SHOWN
URBAN ENGINEERING DWG NO. 21-102-102
CLIENT DWG NO.
REVISION NO. A