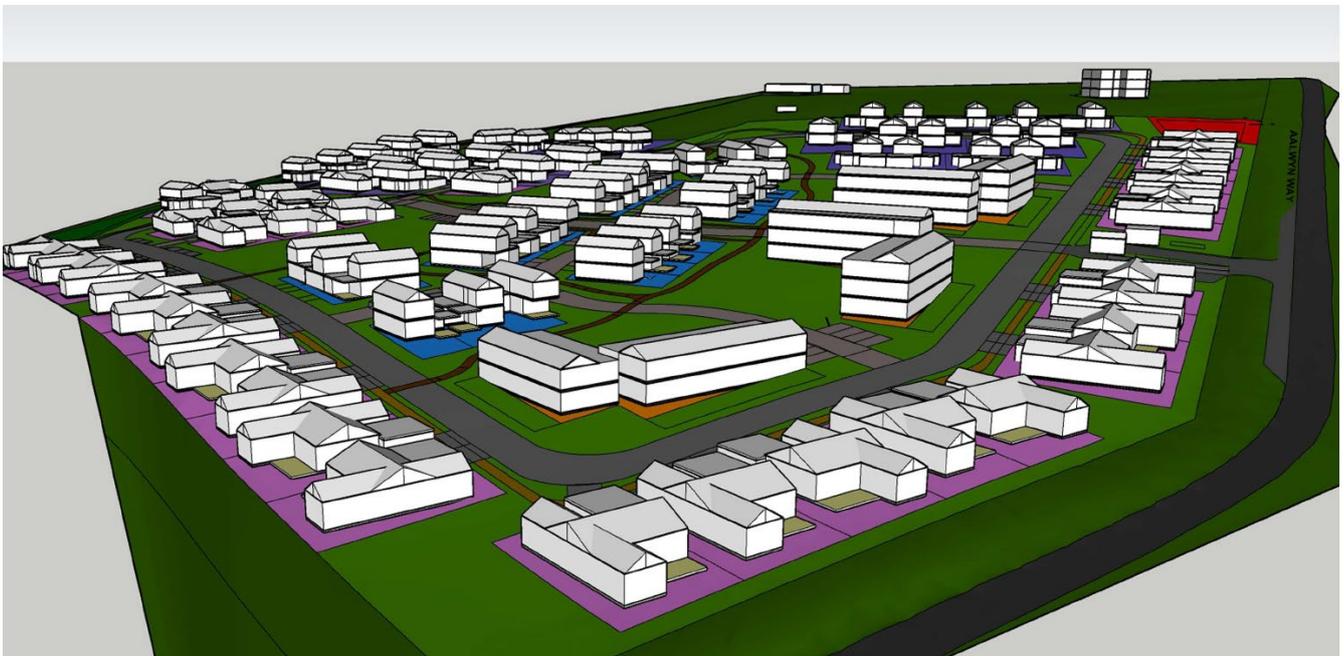


TRAFFIC IMPACT ASSESSMENT

PROPOSED DEVELOPMENT OF AALWYNDAL ERF 23731, MOSSEL BAY, WESTERN CAPE

Report Number 25-015_TIA



Date: August 2025

Revision (1)

EXECUTIVE SUMMARY

This report evaluates the potential traffic impacts of the proposed residential development on Erf 23731, Aalwyndal, Mossel Bay. The development comprises 70 single residential erven, 26 duplex erven, and 59 apartments. Our analysis considers the existing road network, specifically Aalwyn Road (currently classified as a Class 2 Major Arterial, but potentially to be downward classified as a Class 3 Minor Arterial pending a biodiversity study's outcome), and its interaction with the proposed development.

The projected peak-hour trip generation is estimated at approximately 155 vehicle trips. To mitigate potential congestion on Aalwyn Road, we recommend at least 30m throat length to prevent queue spill-back. Our assessment of sight distances indicates that the proposed access design adequately caters for safe vehicular movements, but ongoing monitoring is recommended.

Overall, the proposed development is considered feasible, contingent upon the implementation of the recommended mitigation measures and design considerations outlined in this report.

COVER LETTER

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

This Traffic Assessment was undertaken by:

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LIST OF ABBREVIATIONS

TIA	Traffic Impact Assessment
WCG	Western Cape Government
GLA	Gross Leasable Area
SATGRM	South African Trip Generation Rates Manual
LOS	Level of Service
DoT	Department of Transport
RDE	Roadside Development Environment
RNIS	Road Network Information System
GRZ1	General Residential Zone 1
SRZ1	Single Residential Zone 1
du/ha	Dwelling Units per hectare
MBIZSBL	Mossel Bay Integrated Zoning Scheme By-Law

1 INTRODUCTION

Urban Engineering Consultants (Pty) Ltd was appointed by Aalwynbaai 21250 Properties (Pty) Ltd to undertake a Transportation Investigation pertaining to the proposed development of Erf 23731 in Aalwyndal, suburb of Mossel Bay in the Western Cape.

1.1 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.

1.2 PRIMARY OBJECTIVES OF THIS REPORT

This study will look at the effect of the additional traffic generated by the proposed development, 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.

1.3 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.

1.4 SITE INVESTIGATION

The site was visited by Frans van Aardt of Urban Engineering Consultants (Pty) Ltd on 31 January 2025. 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.



Figure 1-1 - Status Quo

2 LOCALITY

Before subdivision, Erf 23731 was part of erf 21250, which is situated within the suburb of Aalwyndal in Mossel Bay and has approximate WGS 84 coordinates of 34° 8'27.83"S and 22° 4'38.90"E. A basic locality plan has been included as Figure 2-1.

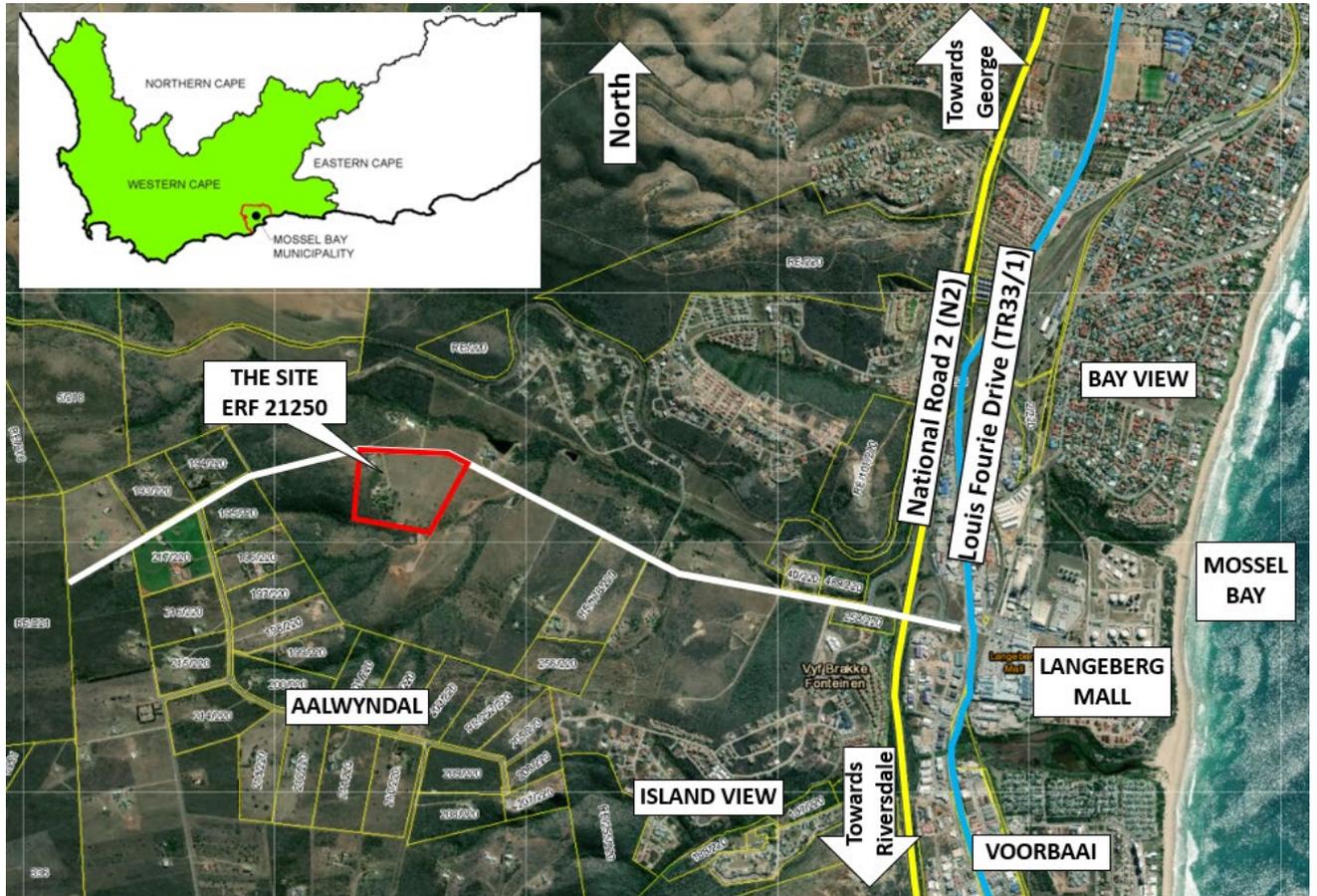


Figure 2-1 - Basic Locality Plan

The position of the original erf 21250 in relation to the surrounding road network, is indicated in Figure 2-2.

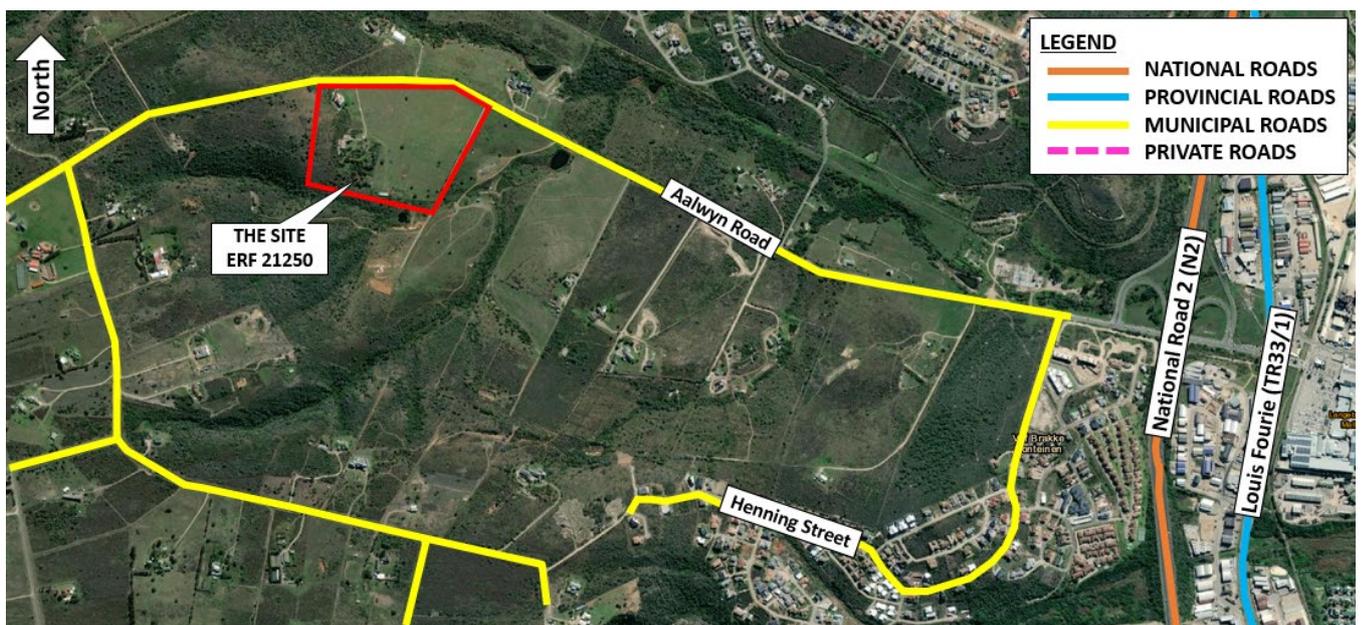


Figure 2-2 - Site Position in Relation to Surrounding Road Network

The site is approximately 14.49ha in extent and is currently zoned as Single Residential Zone I (SRZ1) as indicated in the extract of the Mossel Bay GIS Viewer below (Figure 2-3). There is currently one (1) residential dwelling on the site.



Figure 2-3 - Zoning and Property Information

3 SPATIAL PLANNING

Based both on Mossel Bay Municipality’s Spatial Development Framework and Environmental Management Framework Document (Section B, Dated May 2022), the Aalwyndal area has been earmarked as an intensification area to bring residential opportunities closer to the main economic activity areas. The Aalwyndal Precinct plan guides development of Aalwyndal area and an estimated 15 000 families could be accommodated in Aalwyndal if all sites could be developed without significant limitations due to vegetation that needs to be conserved. An extract of the Hartenbos Spatial Proposal diagram has been included as Figure 3-1 below.



Figure 3-1 - Hartenbos Spatial Proposal Diagram from MB SDF (Section B)

4 SURROUNDING ROAD NETWORK

Depending on which guideline 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 4-1 - 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 4-1.

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.

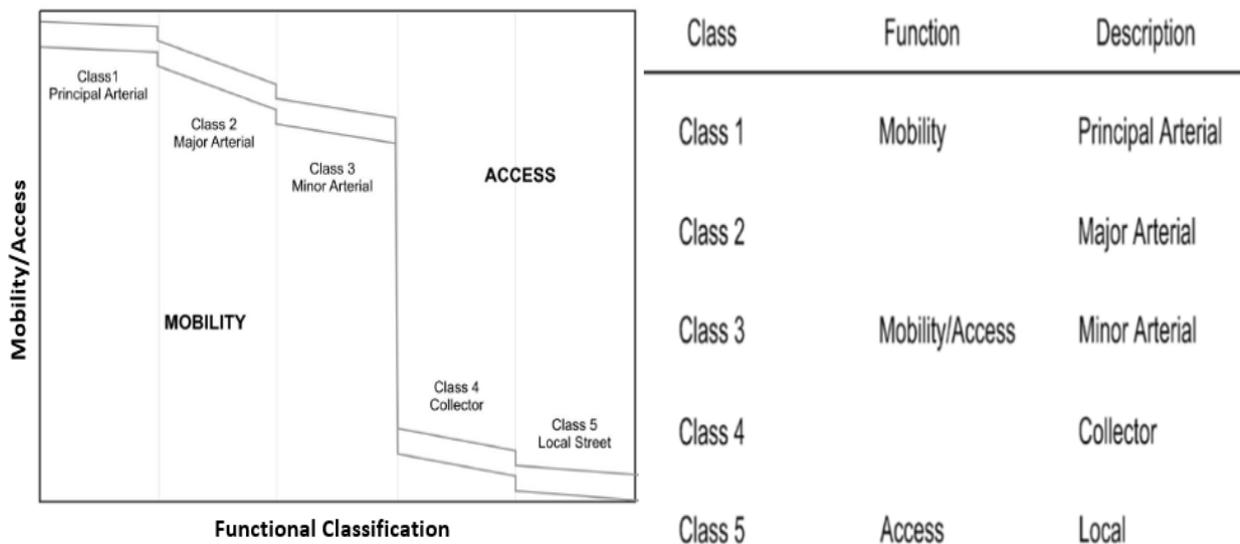


Figure 4-1 - Relationship Between Access and Mobility

4.1 AALWYN ROAD

In 2014, the Western Cape Government commissioned Goba Hatch to classify the Mossel Bay road network. Aalwyn Road was classified as a Class 2 Major Arterial (refer to **ANNEXURE B** and Figure 4-2 below).

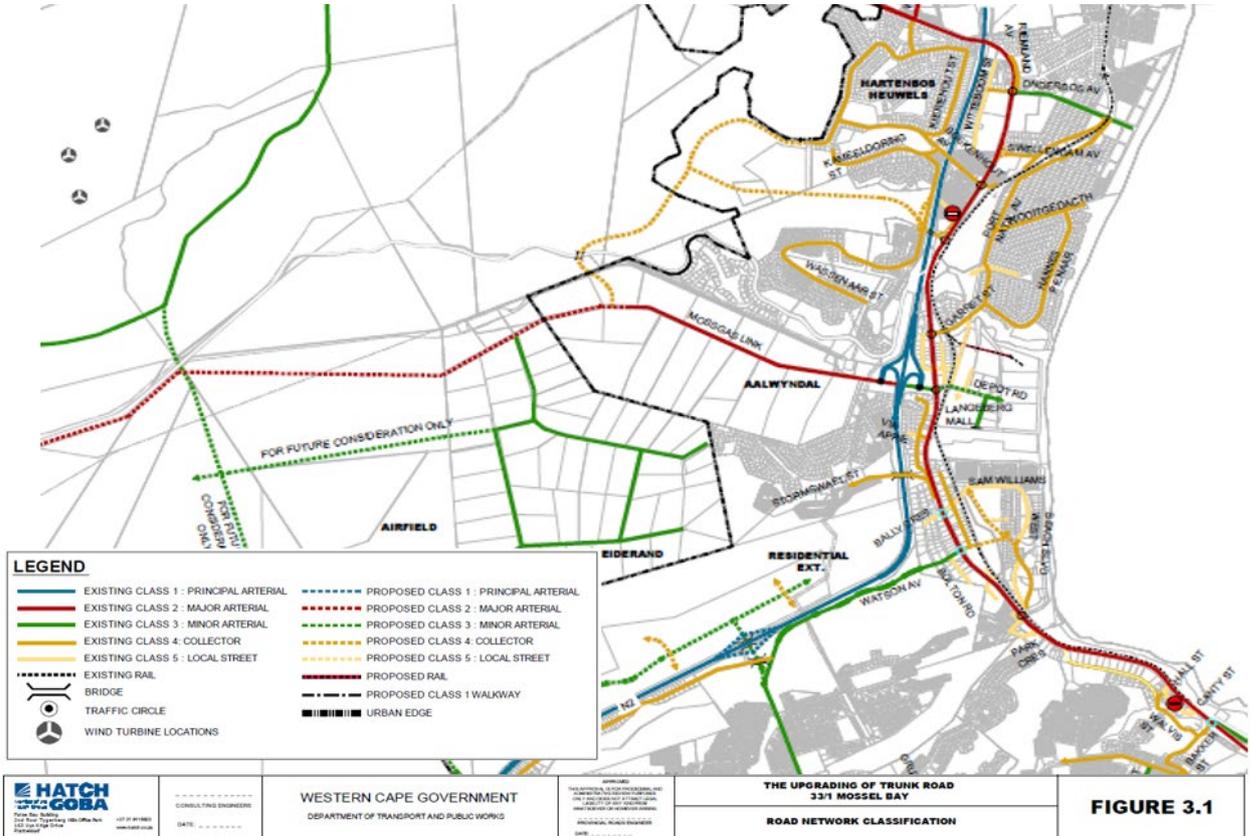


Figure 4-2 - Goba Hatch Proposed MB Roads Master Plan (2014)

In August 2023 SMEC Consulting Engineers were appointed by Mossel Bay Municipality to prepare the Mossel Bay Transport Plan and Contribution Model. The SMEC report once again classified Aalwyn Road as a Class 2 Major Arterial. (refer to Figure 4-3 below)

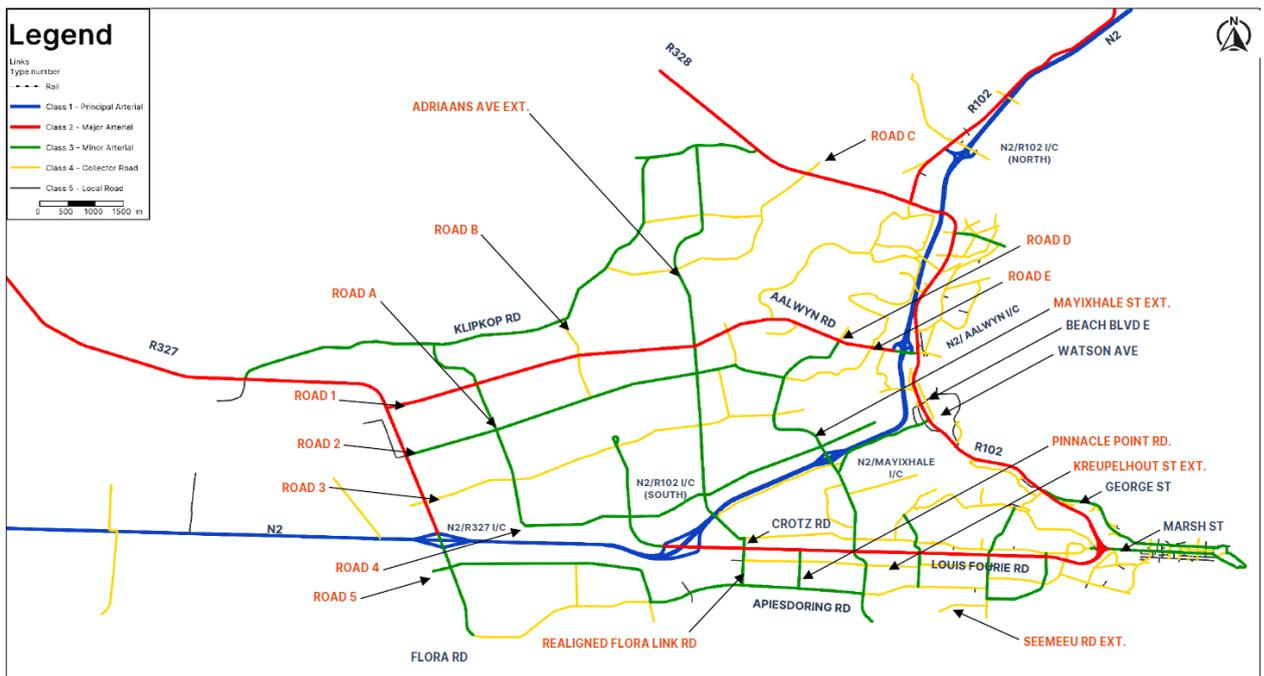


Figure 4-3 - SMEC Proposed MB Roads Master Plan (2023)

Both the SMEC and Hatch plans indicate that Aalwyn Road needs to extend towards the west, providing an alternative future link to the PetroSA/Mossdustry area. The relevant section of Aalwyn Road consists of a 6m wide, bitumen-based surfacing. The cross section includes grassed verges but no kerbing or other forms of formal delineation. The road is constructed with a camber and stormwater simply runs off the road surface into the grassed verge where it is collected in grassed lined stormwater channels. This section of Aalwyn Road has a 60km/h posted speed limit.



Figure 4-4 - Aalwyndal Road

Aalwyn Road Lane Capacity

Using the Highway Capacity Manual (HCM) formula below, the lane capacity of Aalwyn Road can be estimated at 1,609 vehicles per hour. (lane width = 3m; posted speed limit = 60km/h).

$$C = 1900 \times \left(\frac{W}{3.7}\right) \times (1 + 0.0045 (S - 50))$$

Where:

W = Lane Width in Meter = (3m)

S = Speed Limit in km/h = 60km/h

Road Classification

According to the TRH 26 Road Classification Guideline, Class 2 Urban Major Arterials are defined as follows:

Class U2 urban major arterials

Urban major arterials would typically be required to serve traffic in metropolitan areas, cities and medium to large towns (population typically greater than about 25 000).

In metropolitan areas and larger cities, the Class U2 arterials would be used to provide connections between larger regions of the city. In smaller cities and towns, they would be used to provide general overall mobility to the whole city or town. The arterials would also be used to serve important economic activity centres that are not served by Class 1 arterials.

The Class U2 arterials should also be used to serve as connectors to rural Class 2 routes. They should preferably start and stop at arterials of equal or higher Class (1 or 2).

Major arterials should be continuous routes with a minimum length of about 10 km. The arterial would typically carry large volumes of traffic of about 20 000 to 60 000 vehicles per day.

The following criteria apply to parallel Class 1 and 2 urban arterials:

Land development density	Class 1 and 2 parallel spacing
High density (e.g. CBD)	1.5 km
Medium density (e.g. suburban)	3.0 km
Low density (e.g. urban fringe)	5.0 km

4.2 ROADSIDE DEVELOPMENT ENVIRONMENT

The concept of roadside development environment is described in detail in the Western Cape Government's Access Management Guidelines (AMG 2020). The guidelines recognises that operating speeds of vehicles are lower in denser developed environments for the same class of road and that drivers can react in a shorter distance. Thus, it is appropriate in the denser development environments for access spacing to be shorter than in less dense environments.

The Access Management Guidelines have identified five different roadside development environments to recognise that the implementation of access management should vary according to the nature of the urban or rural environment through which a particular road passes. The primary factor used to distinguish between the different types of roadside development environment is development density, measured in square metres of floor space per hectare of land. This reflects the intensification of the development of land use of retail, commercial and residential activities. These generally vary in direct proportion to the overall intensity of urban development. The paragraphs below set out the three roadside development environments specific to urban areas and their main distinguishing features. These are based on a bulk factor (floor area ratio). The use of bulk factors to describe intensification of development has been extended to indicate a bulk square metre per hectare and building height as well as an equivalent dwelling unit density for when this land use is being considered. The terms used to describe the roadside development environments are aligned with generally understood terms to describe different types of urban development by urban management practitioners. Furthermore, the thresholds distinguishing between the three urban roadside development environments are aligned with recognised development density thresholds. The three urban related roadside development environment categories are described below.

CBD Roadside Development Environment: The CBD roadside development environment density threshold considerably exceeds 400pp/ha (100 du/ha) above which research has found there is generally sufficient support to make bus transit, business and community facilities viable.

Intermediate Roadside Development Environment: The lower end of the intermediate roadside development environment range, 0.3 bulk, coincides with the bulk factor generally achieved in most new developments in South Africa when currently accepted parking ratios of 4 bays/100 m² for office and 6 bays/100 m² for retail are applied. It only just achieves the minimum gross density of 100 pp/ha (25 du/ha) necessary for efficient, convenient and pleasant urban environments. In most large urban settlements that require public transport for access, this is the minimum average gross density that needs to be achieved for them to perform efficiently, conveniently and equitably.

Suburban Roadside Development Environment: Suburban is used to refer to roadside development environments that are less dense than "Intermediate", i.e. have lower levels of activity and generally require private motor vehicles for their transport needs. The density of

suburban roadside development environments is between 10 du/ha and 25 du/ha. Most suburban areas built since the 1960s were designed with a density under 25 du/ha. At these low densities it is difficult to achieve the thresholds necessary to support public transport, community facilities and viable small businesses. To overcome these deficiencies, those who live in the suburbs and can afford them predominantly, use private motor vehicles for their transport needs. The suburbs are also the main component of urban sprawl. This results in other environmental and urban problems, including pressure to convert valuable agricultural land close to urban settlements and the need for excessively long urban services reticulation networks.

Based on the various environmental restrictions in the Aalwyndal area, it can conservatively assumed that the future Roadside Development Environment of Aalwyn Road will be **Suburban**.

5 PROPOSED DEVELOPMENT PARTICULARS

FC Holm Architects prepared the proposed Site Development Plan (**ANNEXURE C**). The proposal is to convert the site into a residential development consisting of the following:

- 70 x Single Res 1 Erven (320m² to 360m²)
- 26 x General Residential Zone 1 (Duplex) Erven (average size 160m²)
- 59 x General Residential Zone 3 Apartments (65m² to 80m²)

For ease of reference an extract of the SDP has been included as Figure 5-1 below.



Figure 5-1 - Site Development Plan

6 OTHER PROPOSED AALWYNDAL DEVELOPMENTS

There have been various other traffic investigations for proposed developments within the Aalwyndal precinct over the last couple of years. Some of the relevant developments are listed below:

6.1 AALWYNDAL FARM 220/209

It is the intention of the owner to convert the current undeveloped farm 220/209 in Aalwyndal into a mixed use residential/retail development that can accommodate 138 residential units as well as a 1,630m² retail component. According to Urban Engineering's TIA (Report Number 22-085_TIA Rev 5) the development has a max trip generation potential of 226 trips during the Friday PM Peak hour and 118 trips during the Weekday AM Peak hour.

6.2 AALWYNDAL ERF 21248

It is the intention of the owner to convert the erf 21248 in Aalwyndal into a mixed-use development consisting of 44 single residential erven, 90 general residential erven, approximately 120 flats, and a neighbourhood business center. The development is situated "downstream" of the proposed erf 23731 development and will be implemented in five phases. According to Urban Engineering's TIA (Report Nr 24-056_TIA Rev 0) the completed development will have the potential to generate 202 trips during the AM Peak Hour and 196 trips during the PM Peak Hour Periods.

7 TRIP GENERATION POTENTIAL

Trip generation was calculated using TMH 17 guidelines (South African Trip Data Manual, COTO May 2018) with land uses defined according to COTO classifications. The corresponding COTO definitions and trip rates are provided below:

210 Single Dwelling Unit

Dwelling Unit

Single Dwelling Units are detached houses on individual erven. The units usually have individual access to streets.

The peak-hour trip generation rates and parameters of Single Dwelling Units are listed below:

210 Single Dwelling Units	1D/Unit				
Description	AM Peak	PM Peak	Friday PM	Saturday	Sunday
Trip Rate	1.00	1.00	-	0.50	0.50
IN/OUT	25:75	70:30	-	50:50	50:50

220 Apartments and Flats

Dwelling Unit

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

The peak-hour trip generation rates and parameters of Apartments and Flats are listed below:

220 Apartments and Flats	Dwelling Units				
Description	AM Peak	PM Peak	Friday PM	Saturday	Sunday
Trip Rate	0.65	0.65	-	0.35	0.35
IN/OUT	25:75	70:30	-	50:50	50:50

For trip generation calculation purposes, the proposed development can be classified as follow:

COTO Nr	COTO Description	Number of	Proposed Land Use
COTO 210	Single Dwelling Units	96	70 x Single Residential Zone I 26 x General Residential Zone I
COTO 220	Apartments and Flats	59	59 x General Residential Zone III

Table 7-1 - COTO Trip Generation Potential

Based on the above, the trip generation potential of the site was determined in Table 7-2

Description	Nr	AM Peak		PM Peak		Saturday		Sunday	
		In	Out	In	Out	In	Out	In	Out
Single Dwelling Units	96	24	72	67	29	24	24	24	24
Apartments + Flats	59	14	44	40	18	15	15	15	15
Total	155	38	116	107	47	39	39	39	39

Table 7-2 - Trip Generation Potential per Phase (IN and OUT)

8 DEVELOPMENT ACCESS

Aalwyn Road has been the subject of several transportation studies over the past few years. The most recent, the Mossel Bay Transport Plan and Contribution Model (SMEC, August 2023), provides an overarching assessment. However, these studies generally lack detail regarding intersection spacing and geometric design specifics, hindering developers' ability to plan for future access points.

The SMEC report confirms Aalwyn Road's classification as a Class 2 Major Arterial. According to the Western Cape Government's Access Management Guidelines (Figure 8-1), the recommended spacing between signalized full intersections for Class 2 arterials in Suburban Roadside Development Environments (RDEs) is 800 meters.

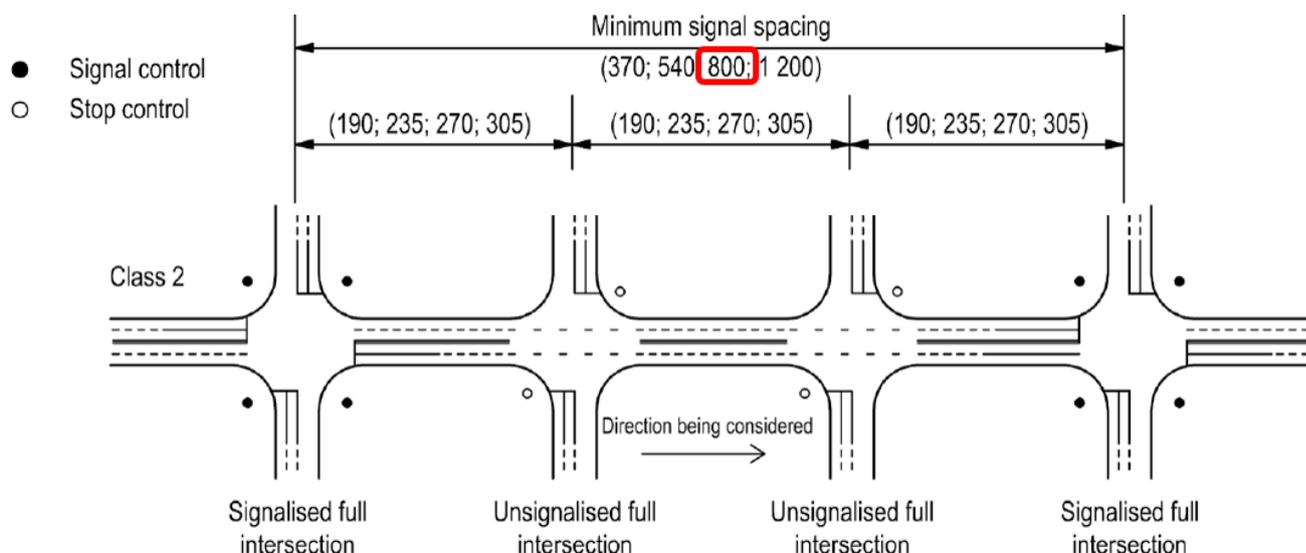


Figure 8-1 - Class 2 Minimum Spacing Distance (WCG, 2020 AMG)

At the time of writing this report, the only other full intersection, is the proposed future N2/Aalwyn Road off-ramp junction (See Hatch Goba Layout Plan attached as ANNEXURE D and extract of drawing included as Figure 8-2). This junction is in the form of a roundabout and should therefore (according to 2020 AMG) be treated the same as a Signalized Full Intersection when it comes to intersection spacing.



Figure 8-2 - Hatch Goba Road Master Plan Extract

According to Section 12.2.1 of the Western Cape Access Management Guidelines, **driveways should not be permitted on Class 2 roads** and only intersections with Class 3 or Class 4 roads should be considered for Class 2 roads.

However, subsequent to the release of the SMEC report, an in-depth biodiversity study was started in May 2024. The aim of the study is to identify areas within Aalwyndal which, due to environmental sensitivities cannot be developed or offset, and for the areas which can potentially be developed via offset to "exchange" environmentally sensitive land for development in Aalwyndal, with conservation worthy land at a different location. An extract of the map indicating the Site ecological important has been included as Figure 8-3 below.

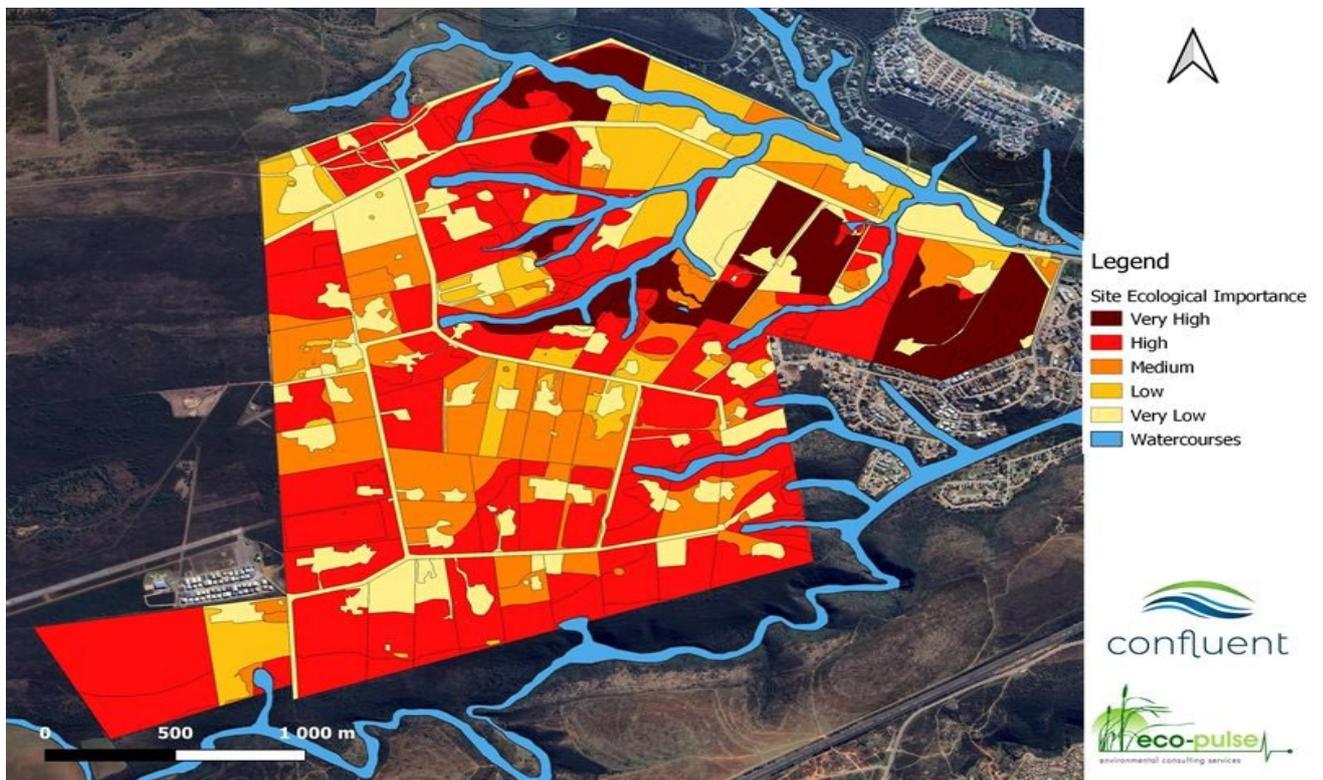


Figure 8-3 - Site Ecological Map

At the time of writing this report, the Ecological study has not been completed and/or published for public review, but it is evident from Figure 8-3 that the initial planned densities for Aalwyndal will not be achieved. It therefore follows that the expected volumes along Aalwyn Road will possibly result in a reclassification of Aalwyn Road from Class 2 Major Arterial to a Class 3 Minor Arterial.

The consequence of this classification is that High Volume Driveways (30-60 vehicles per hour) are permitted on Class 3 roads as indicated in the figure below.

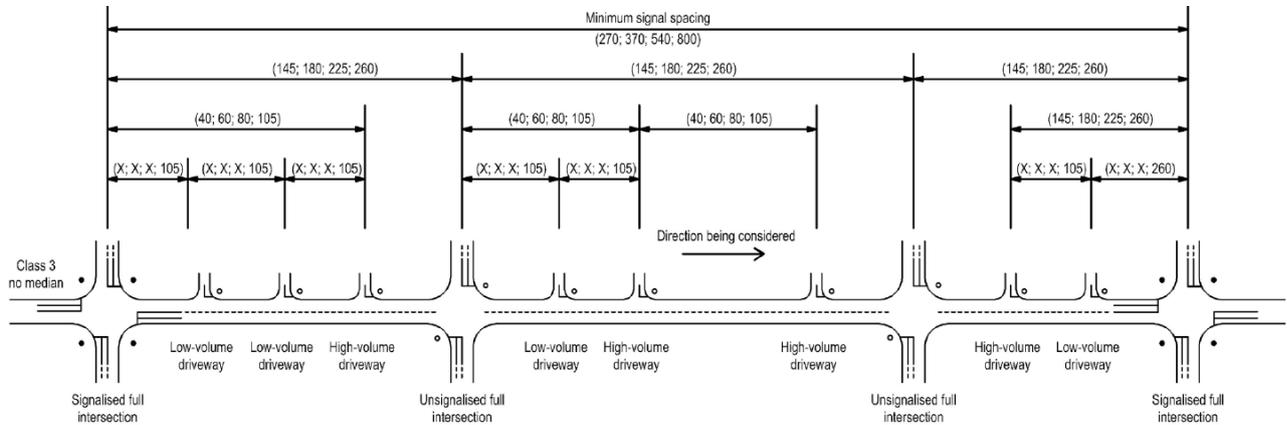


Figure 8-4 - Class 3 minimum spacing - without median

9 SHOULDER SIGHT DISTANCE

9.1 SHOULDER SIGHT DISTANCE BASED ON AMG 2020

Shoulder sight distance is generally described in detail in geometric design manuals, but since it plays such an integral part in access management it is also mentioned in the 2020 Western Cape Government Access Management Guidelines (AMG) where it is defined as follows:

“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.

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 9-1. 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.”

Since Aalwyn Road has a posted speed limit of 60km/h limit and is 6m wide, it follows that a minimum shoulder sight distance of 120m (refer to Figure 9-1) is required for passenger vehicles.

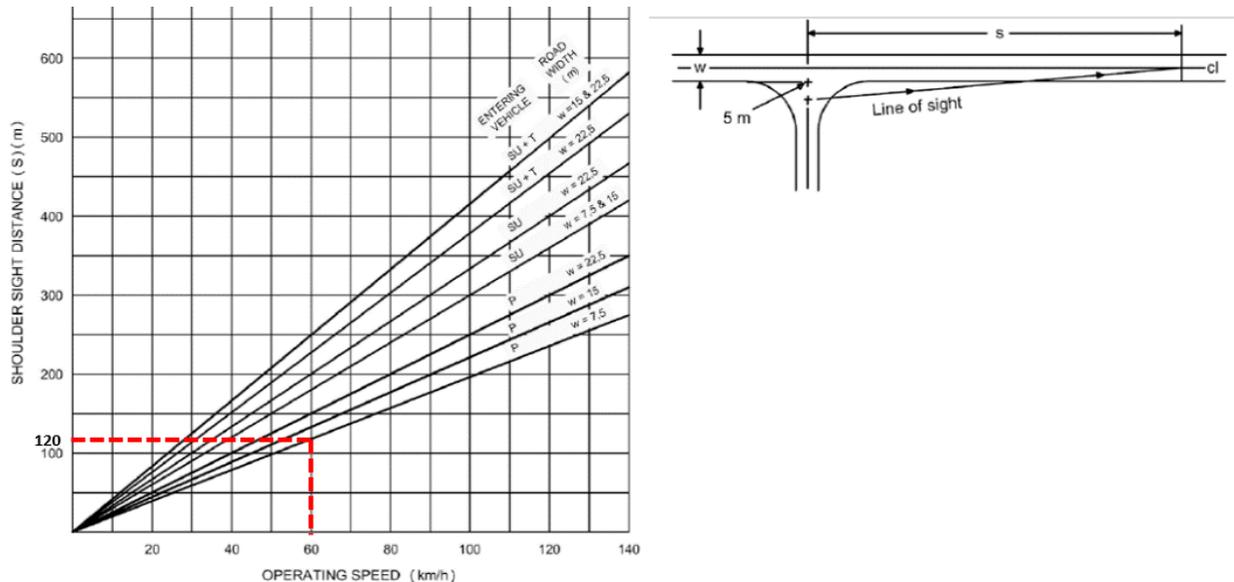


Figure 9-1 - Shoulder Sight Distance Requirement

It is important to note that the AMG specifically refers to the above graph as a “convenient” solution to determining Shoulder Sight Distance. The downside of the convenience is that this graph is fairly conservative as it caters for most situations but does not make provision for site specific factors such as road gradient.

9.2 STOPPING SIGHT DISTANCE (SSD) BASED ON UTG 1

The UTG 1 (Guidelines for the Geometric Design of Urban Arterial Roads) was published by the Department of Transport and reprinted in 1998. It forms part of a set of documents that was particularly written for practicing transportation engineers and they describe recommended practices in selected aspects of urban transportation. They are based on South African experience and research and has the full support and approval of the Committee of Urban Transport Authorities.

According to the UTG 1, stopping sight distance involves the capability of a driver to bring his vehicle safely to a standstill and is thus based on speed, driver reaction time and skid resistance.

The total distance travelled in bringing the vehicle to a stop comprises two components:

- the distance covered during the driver's reaction period
- the distance required to decelerate to 0 km/h

The stopping distance is expressed as

$$s = .0,7v + v^2/254f$$

where s = total distance travelled (m)

v = speed (km/h)

f = brake-force coefficient

Stopping sight distances for a range of design speeds and appropriate brakeforce coefficients are given in Table 3.4.

Stopping sight distance on level roads

Design speed (km/h)	v (km/h)	Stopping sight distance (m)
40	40	45
50	50	65
60	58	80
70	64	95
80	72	115
90	78	135
100	85	155
110	92	180
120	101	210

Table 9-1 - SSD on Level Roads (Source UTG 1)

Stopping sight distance is measured from an eye height of 1,05 m to an object height of 0,15m. This object height is used because an obstacle of a lower height would not normally represent a significant hazard. Object height is taken into account because measuring the sight distance to the road surface would substantially increase the length of the vertical curve and hence the earthworks required.

The gradient has a marked effect on the stopping sight distance requirements. Gradient (G) modifies the stopping sight distance formula to:

$$s = 0,7v + \frac{v^2}{254(f \pm G)}$$

Figure 3.4 is a graphical representation of the formula to show stopping sight distance on grades between -10 per cent and + 10 per cent for running speeds v between 40 km/h and 130 km/h.

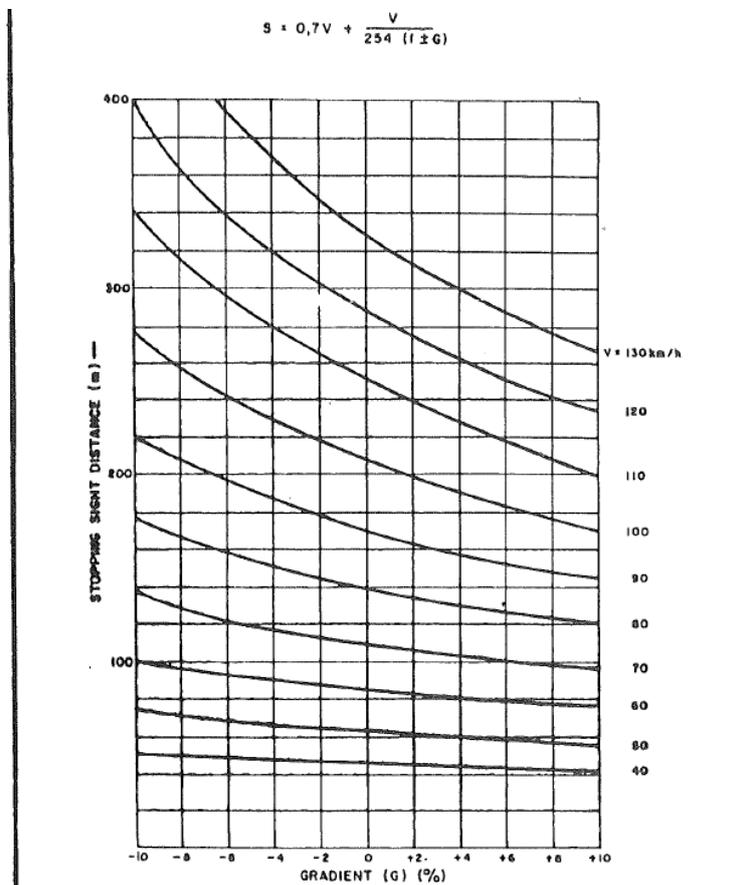


Figure 9-2 - Stopping Sight Distance on Grades (source UTG 1)

Based on previous investigations done by Urban Engineering in the Aalwyndal area, it follows that the longitudinal slope of Aalwyn Road in the vicinity of erf 23731 is approximately 13% as indicated in Figure 9-3.

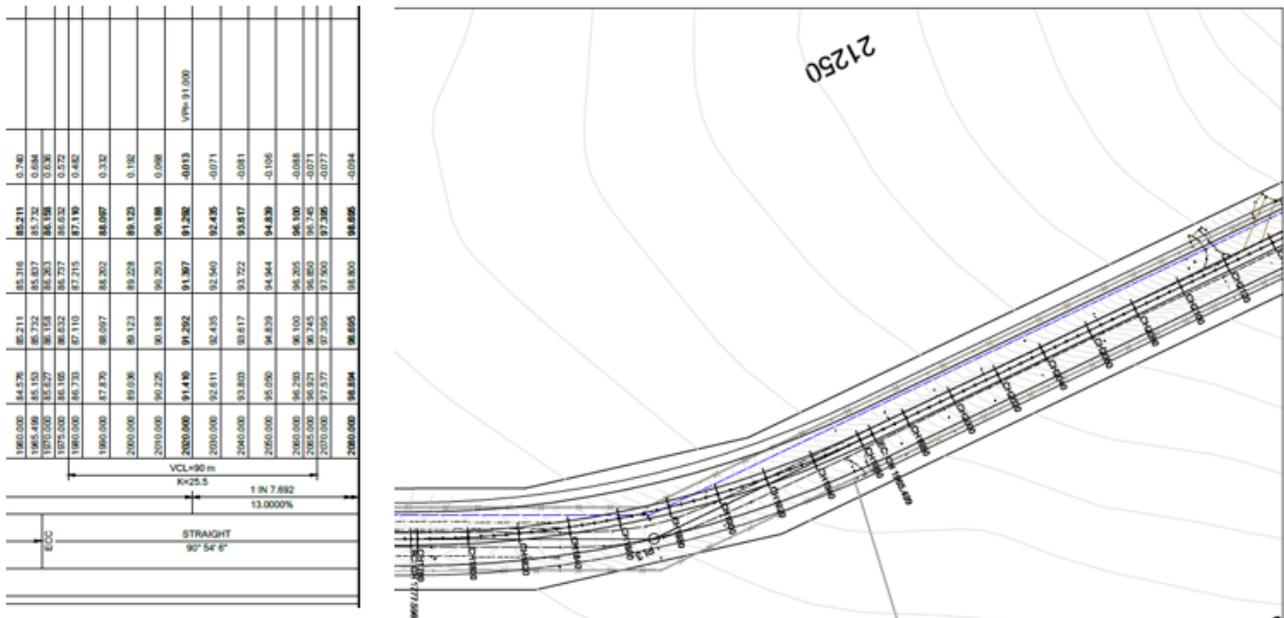


Figure 9-3 - Longitudinal Slope of Aalwyn Road next to Erf 23731

The minimum SSD (based on Figure 9-2) for vehicles travelling (both uphill and downhill) along Aalwyn Road at 60km/h and 80km/h is listed below:

Road Longitudinal Slope	Speed	Direction of travel	Min Sight Distance Required
13%	60km/h	Uphill	80m
		Downhill	120m
	80km/h	Uphill	120m
		Downhill	220m

During the site investigation SSD in the region of 250m (towards the left) and 106m (towards the right) were visible.



It follows that the proposed access point provides sufficient stopping sight distance and/or shoulder sight distance for a vehicle travelling downhill at 80km/h or uphill at the posted 60km/h.

10 THROAT LENGTHS

As indicated in the SDP, access to development will be controlled by means of an Access Control Structure. Access control structures usually regulate access to the development by means of a boom or gate and/or security guard. Where some form of access control is provided, the ingress throat must be of sufficient length to prevent queue spillback onto the surrounding public road or street system. The 90th percentile queue length (for a gate/boom) can be estimated as follows:

$$Traffic\ Ratio = \frac{Total\ Traffic\ Volume/PHF}{Service\ Flow\ Rate} \times 100$$

The Peak Hour Factor (PHF), is the factor required to convert the hourly volume to a peak 15-minute volume. Peak-hour factors in urban areas generally range between 0.80 and 0.98. Lower values signify greater variability of flow within the subject hour, and higher values signify little flow variation. Peak hour factors over 0.95 are often indicative of high traffic volumes, sometimes with capacity constraints on flow during the peak hour. Service Flow Rates for various types of access control are indicated in Table 10-1

Service flow rates (veh/h) fo different control types	
Control type	Service flow (vph)
Swipe magnetic card	480
Remote controlled gates	450
Ticket dispenser: Automatic	390-450
Ticket dispenser: Push button	220-360
Pin number operated gates	150
Pay fee on entry	120
Cell-phone operated gates(gate opens when a call is receieved)	100
Manual recording, Visitor completes form	80
Intercom operated gates(visitor contacts resident by intercom)	50

Table 10-1 - Service Flow Rates for Different Control Types

Since the SDP makes provision for a security house/structure, it is assumed that access will be controlled by some sort of manual recording system where visitors need to sign in with the security officer on duty, while residents will be able to control the access gate by means of a remote control. A very conservative service flow rate of 80vph will therefore be used for the calculation.

From Table 7-2 it follows that the worst-case scenario from a site ingress point of view will take place during the Weekday PM period when a total of 107 vehicles can be expected to enter the site via the security gate. It is assumed that of the 107 vehicles, 85% will enter the development by means of manual recording and 15% will enter by means of remote controlled access.

Using a PHF of 0.85, the corresponding minimum throat lengths are therefore calculated as follows:

$$Traffic\ Ratio(visitors) = \frac{90}{\frac{0.85}{80}} \times 100 = 132$$

$$Traffic\ Ratio(residents) = \frac{17}{\frac{0.85}{450}} \times 100 = 4$$

The maximum Traffic Ratio of the two scenarios above is 132. The 95th percentile queue length based on the calculated traffic ratios are indicated in Table 10-2.

95 th Percentile queue length (vehicles per channel) at controlled accesses						
Storage (Vehs)	Traffic ratio (Percentage) for different Numbers of Channels					
N _{Que}	1 Channel	2 Channel	3 Channel	4 Channel	5 Channel	6 Channel
1	23	58	97	140	188	235
2	39	94	155	220	292	363
3	49	115	186	261	341	421
4	56	128	205	283	367	449
5	61	137	216	297	382	466
6	65	143	22	306	392	476
7	68	147	229	312	399	484
8	70	151	233	317	403	489
9	71	153	236	321	407	493
10	73	155	239	324	410	496

Table 10-2 - 95th Percentile Queue Length at Controlled Accesses

From Table 10-2, the gatehouse needs to make provision for the following:

- Two (2) Ingress lanes (1 x lane for residents plus 1 x lane for visitors)
- Sufficient Storage for an expected queue length of 5 vehicles (5 x 6m = 30m)

Note: Queue length is measured from the point of control (Boom/Gate) to the cadastral boundary. Road reserve may not be included in queue length calculation.

11 INTERNAL (SITE) TRAFFIC ASSESSMENT

The current Site Development Plan (SDP) is a high-level planning document which does not include details such as parking bays, road widths, sweep paths and provisions for non motorized transport (NMT). It is therefore not possible to comment regarding these issues at this stage of the project. However, in order to guide the planning consultants towards sustainable development and layouts, some of the general Site Traffic Guidelines are discussed below:

11.1 INTERNAL ROAD WIDTHS

Based on the guideline document UTG 7, Guidelines for the Geometric Design of Urban Local Residential Streets (Department of Transport, 1989), it is important to ensure that the widths and alignment of roadways are appropriate to the expected speed, volume and frequency with which various types of vehicles pass each other. The document defines three types of opposing vehicle movements:

Case I – will allow free passage for a heavy vehicle and a passenger car, but still allow two heavy vehicles to pass at crawl speeds

Case II – will allow relatively free passage for two passenger cars and will enable a passenger car to pass a heavy vehicle which is stationary or travelling at crawl speed.

Case III – will accommodate the free passage of a heavy vehicle and a motorcycle or pedal cycle.

The road width requirements for the three cases are dependent on the function (Major Residential Link Road or Local Residential Street) of the road as indicated schematically in the figures below.

ROADWAY WIDTHS RECOMMENDED FOR MAJOR RESIDENTIAL ACCESS LINK ROADS

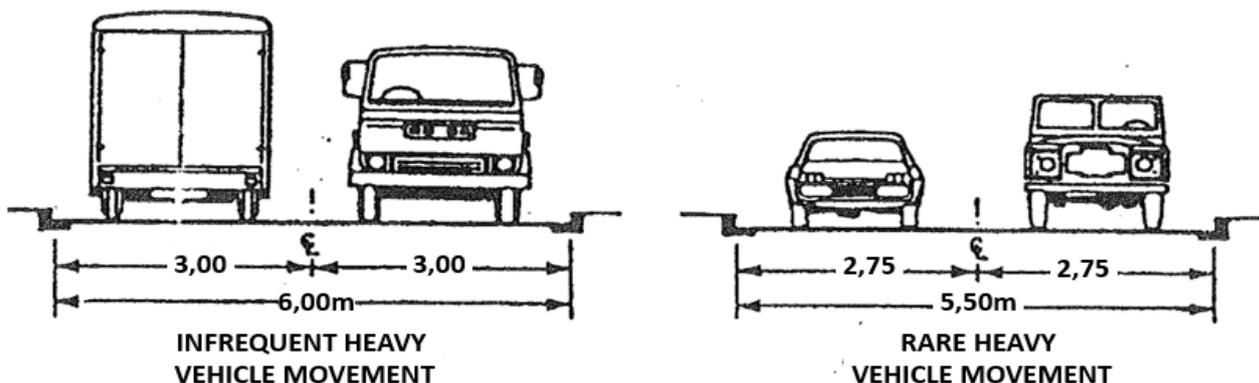


Figure 11-1 - Road Widths Recommended for Major Residential Access Link Roads

ROADWAY WIDTHS RECOMMENDED FOR OTHER LOCAL RESIDENTIAL STREETS

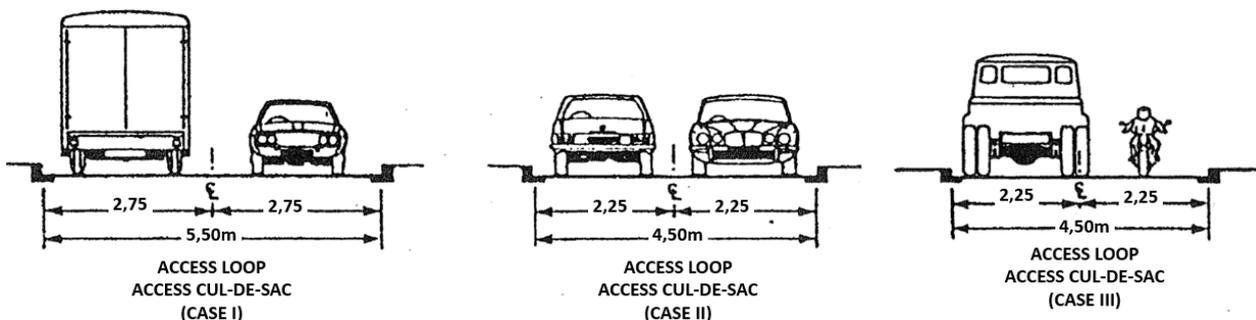


Figure 11-2 - Roadway Widths Recommended for Major Residential Access Link Roads

The recommended and absolute minimum roadway width for various types of internal residential roads are indicated in Table 11-1.

Road Class	Roadway Width (m)	
	Recommended	Absolute Minimum
a) Major Residential Access Link	6,0	5.5
b) Access Loop	5,5	4.5
c) Access Cul-de-sac	5,5	4.5
d) Access Way	3,0 minimum with passing bays where necessary	
e) Access Court	3,0 at pinch points	
f) Access Strip	4,0 (shared)	3,0 (single erf)

* These figures do not include variations for cyclists, pedestrians or widening on curves

Table 11-1 - UTG 7 Advisory Roadway Widths

11.2 DRIVEWAY WIDTHS

Driveway widths should preferably adhere to the general guideline below.

Type of carriageway crossing	Minimum Width	Maximum Width
Single entrance or exit way	3,0m	6,0
Combined entrance and exit way	5,0m	8,0m

Table 11-2 – Recommended Driveway Widths

11.3 GARAGE OFFSET

Clause (f) on page 73 of the Mossel Bay Integrated Zoning Scheme By-Law (MBIZSBL) specifies that “any garage door facing the road must be set back at least 5m from the kerb of such internal road”. The SDP not nor provide details regarding the position of the garage door in relation to the road edge, but it is important that this requirement be adhered to during design stage.

11.4 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 11-3, is proposed.

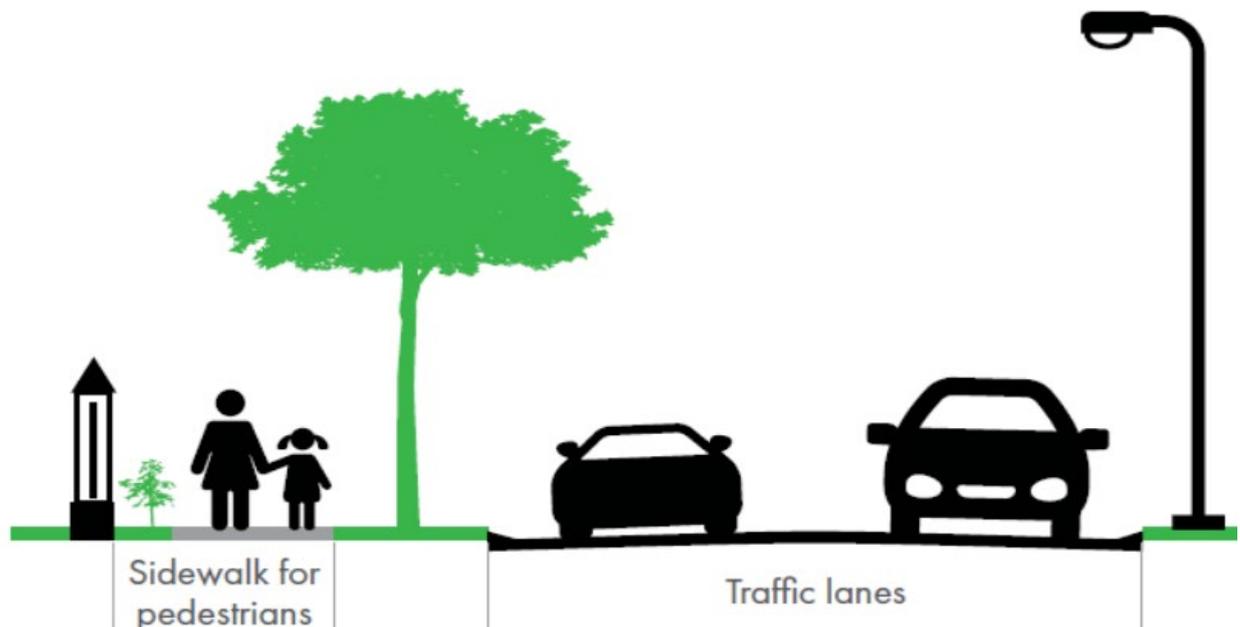


Figure 11-3 - Proposed Roadside Environment Cross Section

12 PARKING

The parking requirements are based on the requirements specified by the Mossel Bay Municipality Integrated Zoning Scheme By-Law (dated November 2021). The guidelines make a clear distinction between the following three zones:

“Normal Areas” refers to standard requirements which apply to areas where public transport is not being specifically promoted.

“PT1 Areas” refers to areas where the use of public transport is to be promoted, but where the Council considers the provision of public transport to be inadequate.

“PT2 Areas” refers to areas where the use of public transport is to be promoted and the Council considers the provision of public transport sufficient enough to justify the reduced parking requirements.

The By-Law then continues and specifies that “if an area has not been specifically identified by Council as a PT1 or PT2 area, then the parking requirements for Normal areas shall apply”

Since there are no formal public transport zones in the immediate vicinity of the site, the parking requirements of *Normal Areas* (refer to Table 12-1) shall therefore be used.

Land Use		Normal Areas	PT1 Areas	PT2 Areas
Dwelling house / Double dwelling house		2 bays per dwelling Erven <350m ² : 1 bay per dwelling Erven < 100m ² : Nil per dwelling	1 bay per dwelling	1 bay per dwelling
Group housing/Town Housing		2 bays per dwelling unit	1 bay per dwelling unit plus 0.25 bays per unit for visitors	1 bay per dwelling unit plus 0.25 bays per unit for visitors
Retirement resort	Dwelling unit	2 bays per dwelling	1 bay per dwelling plus 0.25 bays per unit for visitors	1 bay per dwelling plus 0.25 bays per unit for visitors
	Home for the aged	0,5 bays per bedroom	0,5 bays per bedroom	0,5 bays per bedroom
	Frail Care	0,5 bays per bed	0,5 bays per bed	0,5 bays per bed
Orphanage		0,5 bays per bedroom	0,5 bays per bedroom	0,5 bays per bedroom
Flats		1 bay per dwelling plus 0,25 bay per unit for visitors	1.25 bays per dwelling plus 0.25 bays per unit for visitors	0.5 bays per dwelling plus 0.25 bays per unit for visitors

Table 12-1 - Parking Requirements

13 SUMMARY

This Traffic Impact Assessment (TIA) was commissioned to assess the potential traffic impacts associated with the proposed residential development on Erf 23731, Aalwyndal, Mossel Bay. The assessment adheres to relevant national and local guidelines.

Locality

The site is located in Aalwyndal, Mossel Bay, with precise coordinates provided. Its proximity to existing infrastructure and its zoning (Single Residential Zone I) are detailed in the full report.

Spatial Planning

The development aligns with the Mossel Bay Municipality's Spatial Development Framework, contributing to the intensification of residential areas within the Aalwyndal precinct.

Surrounding Road Network

Aalwyn Road, the primary access route, is classified as a Class 2 Major Arterial (subject to potential reclassification to Class 3 Minor Arterial following a biodiversity study). This classification significantly influences the design and mitigation recommendations. The roadside development environment is characterized as suburban.

Proposed Development Particulars

The development plan encompasses 70 single residential erven, 26 duplex erven, and 59 apartments. The proposed SDP is attached as **ANNEXURE C**.

Trip Generation Potential

Based on COTO trip generation rates, the development is projected to generate approximately 155 peak-hour vehicle trips.

Development Accesses

Given the high volume of traffic on Aalwyn Road, the report strongly recommends controlled access via a gatehouse and detailed junction design to minimize disruption and ensure safety. The spacing between intersections is analyzed considering the road's classification and the Suburban Roadside Development Environment.

Shoulder Sight Distance

Analysis of shoulder sight distance, based on the Western Cape Government's Access Management Guidelines and UTG 1, demonstrates that the proposed access design satisfies visibility requirements for safe vehicle entry and exit, but ongoing monitoring is advised.

Throat Lengths

To prevent queuing onto Aalwyn Road, the report recommends a minimum throat length of 30 meters at the access point to accommodate anticipated traffic volumes.

Internal (Site) Traffic Assessment

Internal road and driveway widths must meet UTG 7 guidelines, ensuring safe passage for different vehicle types.

Parking

The SDP does not provide sufficient details regarding provision of parking bays and layout of parking areas.

14 RECOMMENDATIONS

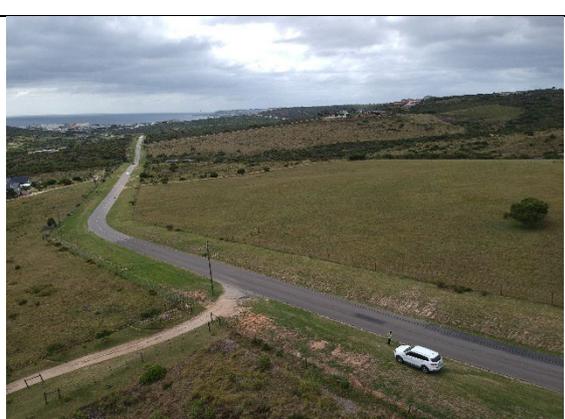
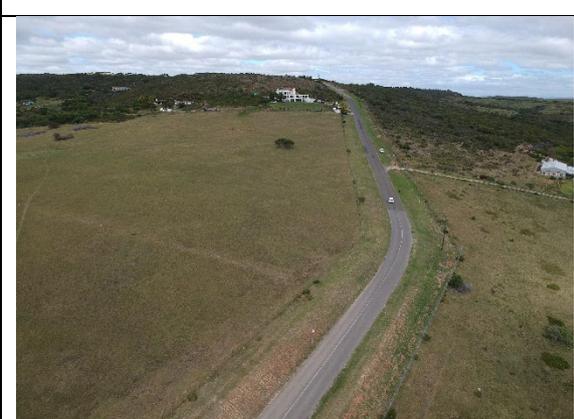
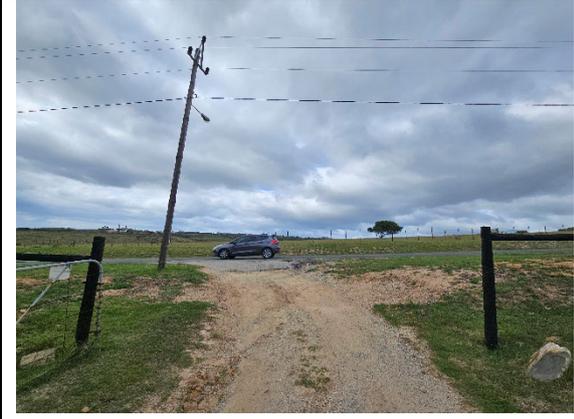
Based on the findings of this report, the proposed development of Erf23731 Aalwyndal (Mossel Bay) is supported, subject to the following recommendations:

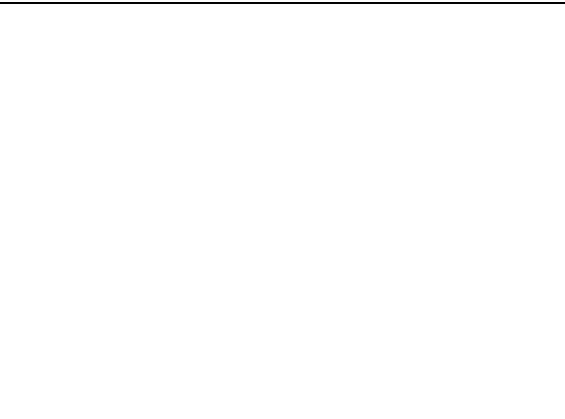
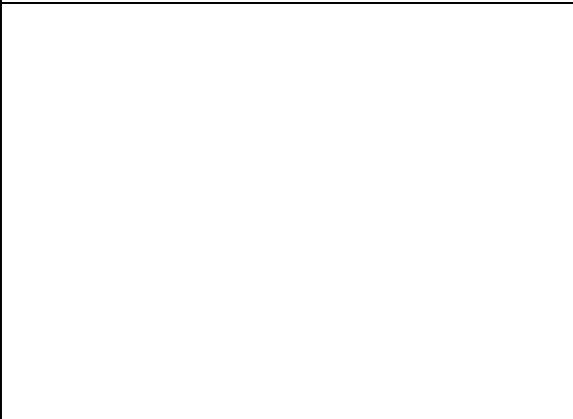
- a) The current Aalwyn Road Classification (Class 2) does not allow High Volume Driveways (such as the one proposed for this development) to have direct access onto Aalwyn Road. However, since it seems as if the current biodiversity study will greatly reduce the area of developable land within the Aalwyndal Precinct, the reduction in traffic volumes could possibly lead to a downward classification of Aalwyn Road from Class 2 to Class 3. This downward classification will provide the opportunity for gated development to gain direct access of Aalwyn Road. It is therefore important that the local authorities make a decision regarding the future development of Aalwyndal.
- b) Development Contributions pertaining to erf 23731 should be used to implement the Aalwyn Road Master Planning Initiatives.
- c) The gate house should make provision for 2 ingress lanes with sufficient stacking distance to accommodate 5 parked vehicles (30m stacking distance) without spilling back into the main road reserve.
- d) The road verge at the proposed site access should be kept clear of any obstructions to the shoulder sight distance. This could possibly include earthworks to shape the existing embankment within the verge to allow to clear line of sight. This includes future boundary walls along Aalwyn Road.
- e) The width of the site access must be restricted to a maximum of 8m as specified in Table 11-2.
- f) Internal parking must adhere to the minimum specification of the Mossel Bay By-Law for *off-street* parking requirements in Normal Areas. On-street parking bays (both 90 degree and

- parallel) should be avoided as far as possible. Access to communal parking area (For the Flats/apartments) should have a clearly defined (bellmouth) ingress and egress point
- g) Internal roads should ideally be 6m wide, but where this is not practically feasible, this requirement can be reduced to an absolute minimum surfaced width of 5.5m.
 - h) The position of garages should allow for at least 5m (ideally 6m) between the garage door and road edge as specified in the MBIZS By-Law (refer to Section 11.3 of this report)
 - i) The future design of Aalwyn Road should make provision for Non Motorised Transportation (NMT) by providing safe surfaced sidewalks as a minimum.
 - j) Where practically possible, pedestrian walkways (both internal and public) should not be placed directly up against the road edge, but a 1.5m wide furniture zone should be created between the walkway and road edge, increasing the safety of those making use of the walkways.
 - k) Due to the relatively low background traffic volumes currently on Aalwyn Road, a pass by lane for vehicles travelling down Aalwyn Road towards the N2 will not be warranted at this stage. However, due to the steep gradient on the western approach, a pass by lane will greatly increase safety of road users, (both from the development as well as coming down Aalwyn Road from the west.
 - l) The geometric design of the junction between the site access and Aalwyn Road, as well as the road leading up to the gatehouse, must be design by a registered professional engineer with experience in road design and geometry. This geometric engineer needs to reconsider the relevancy of both the deceleration (Left-In) and Acceleration (Left-Out) lanes indicated on the architect's proposed SDP.

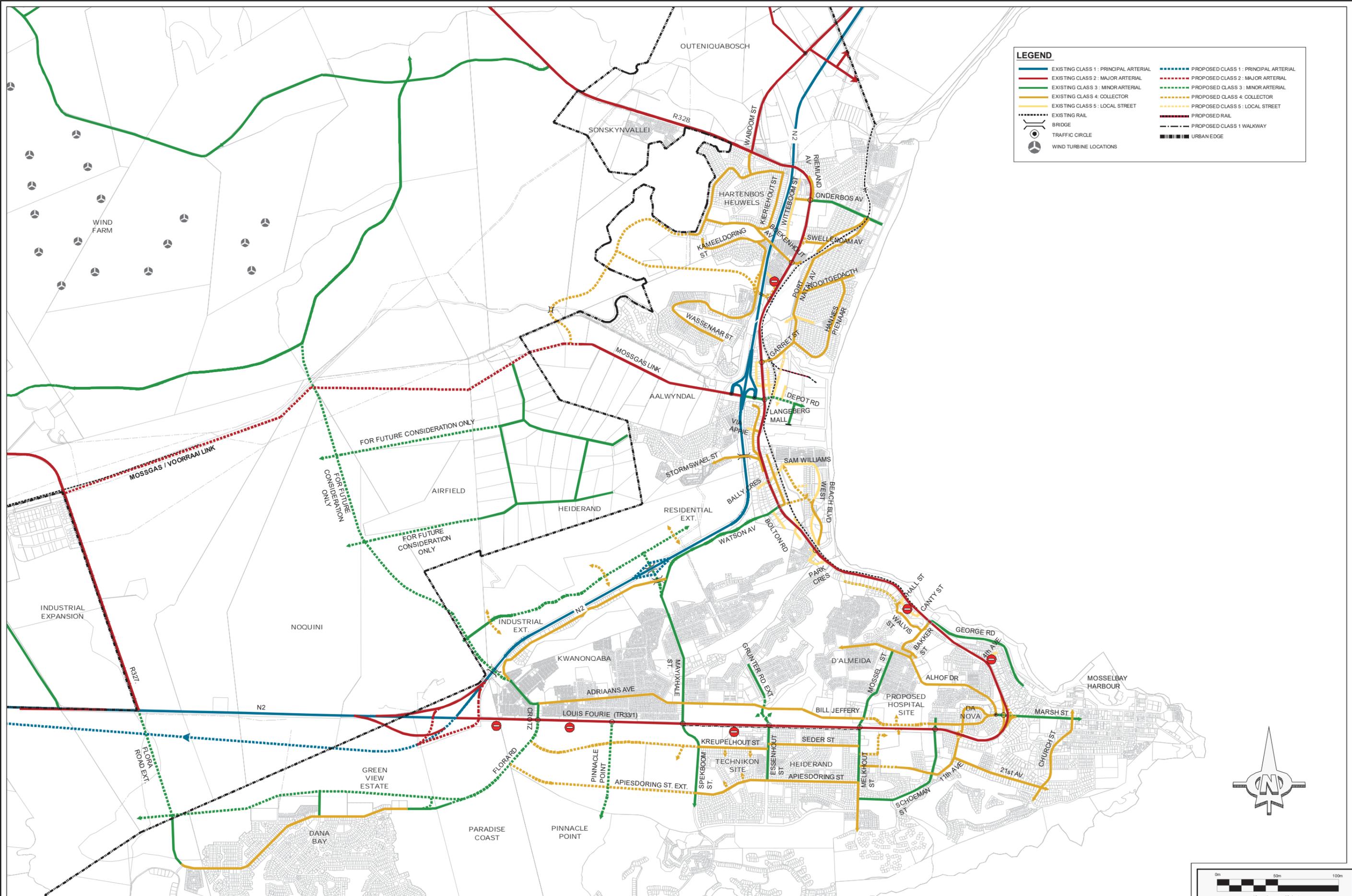
ANNEXURE A

SITE PHOTOGRAPHS



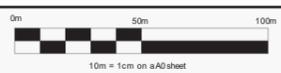


ANNEXURE B
MOSSEL BAY ROADS
MASTER PLAN



LEGEND

	EXISTING CLASS 1 : PRINCIPAL ARTERIAL		PROPOSED CLASS 1 : PRINCIPAL ARTERIAL
	EXISTING CLASS 2 : MAJOR ARTERIAL		PROPOSED CLASS 2 : MAJOR ARTERIAL
	EXISTING CLASS 3 : MINOR ARTERIAL		PROPOSED CLASS 3 : MINOR ARTERIAL
	EXISTING CLASS 4 : COLLECTOR		PROPOSED CLASS 4 : COLLECTOR
	EXISTING CLASS 5 : LOCAL STREET		PROPOSED CLASS 5 : LOCAL STREET
	EXISTING RAIL		PROPOSED RAIL
	BRIDGE		PROPOSED CLASS 1 WALKWAY
	TRAFFIC CIRCLE		URBAN EDGE
	WIND TURBINE LOCATIONS		



NO.	DATE	ADDITIONS AND AMENDMENTS	APPROVED	DESIGNED BY:
			CONS.	C. HENDRICKS
			PRE	CHECKED BY: C.MANCHIP
				DRAWN BY: S.SSTRANACK
				CHECKED BY: C. MANCHIP

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 CONSULTING ENGINEERS
 DATE: -----

WESTERN CAPE GOVERNMENT
 DEPARTMENT OF TRANSPORT AND PUBLIC WORKS

APPROVED
 THIS APPROVAL IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATRACT LEGAL LIABILITY OF ANY KIND FROM WHATSOEVER OR HOWEVER ARISING
 PROVINCIAL ROADS ENGINEER
 DATE: -----

THE UPGRADING OF TRUNK ROAD 33/1 MOSSEL BAY
 ROAD NETWORK CLASSIFICATION

FIGURE 3.1

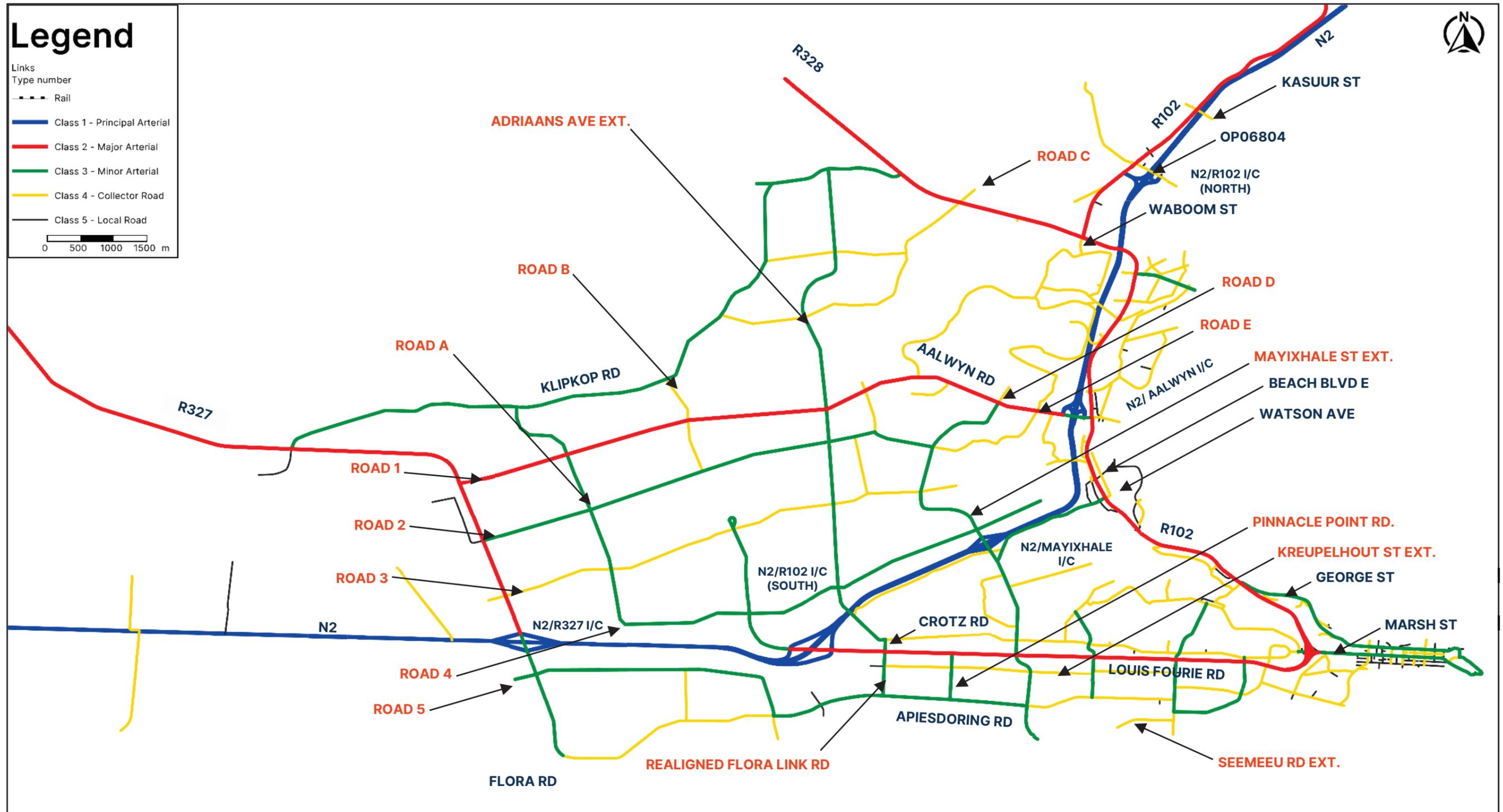


Figure 2-1: 2023 Proposed Mossel Bay Roads Master Plan

ANNEXURE C

SITE DEVELOPMENT PLAN



CONCEPT SITE DEVELOPMENT PLAN
SCALE 1:500 on A0 paper size



ARCHITECTS | LANDSCAPE ARCHITECTS
FC HOLM

- RES I ERVEN:
70 ERVEN (320 + 360M²)
- GR I ERVEN (DUPEX):
26 ERVEN (160M²)
- RES III (APARTMENTS):
59 (65 - 80M²)

- 360M² ERF Ground + First
- 320M² ERF Ground + First/loft
- 320M² ERF Ground

DEVELOPMENT ON ERF 21250
AALWYNDAL
MOSSELBAY

22 November 2024
Drawing no. 24022/0003 rev 004



EAST PERSPECTIVE



NORTH EAST PERSPECTIVE



SOUTH EAST PERSPECTIVE



NORTH PERSPECTIVE

ARCHITECTS | LANDSCAPE ARCHITECTS
FC HOLM

- RES I ERVEN:
70 ERVEN (320 + 360M²)
- GR I ERVEN (DUPEX):
26 ERVEN (160M²)
- RES III (APARTMENTS):
59 (65 - 80M²)

- 360M² ERF Ground + First
- 320M² ERF Ground + First/loft
- 320M² ERF Ground

DEVELOPMENT ON ERF 21250
 AALWYNDAL
 MOSSELBAY

22 November 2024
 Drawing no. 24022/0003 rev 004

ANNEXURE D

PROPOSED LOUIS FOURIE UPGRADES

