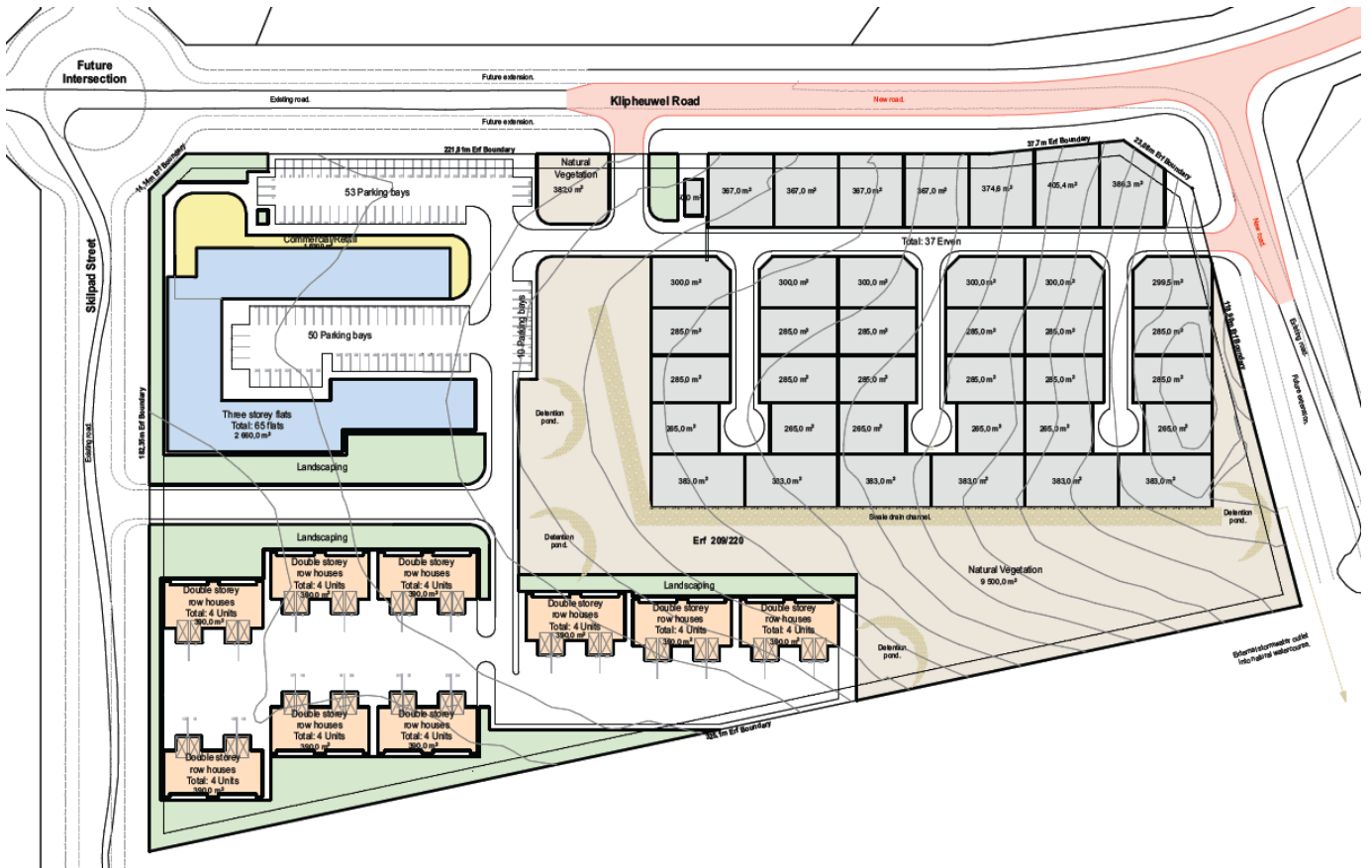


TRAFFIC IMPACT ASSESSMENT

AALWYNDAL FARM 220/209, MOSSEL BAY, WESTERN CAPE

Report Number 22-085_TIA



Date: September 2023

Revision (3)

EXECUTIVE SUMMARY

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.

At the time of this report, the greater Aalwyndal Road network still catered mainly for the surrounding agricultural land uses, but an Aalwyndal Roads Master has been prepared which indicates a future transportation link from Klipheuwel Way, through farm 205/220 towards Henning Street.

The site accesses indicated on the proposed site development plan conforms to the requirements specified in the Western Cape Government's Access Management Guidelines document.

Due to the lack of background traffic on the surrounding road network at the moment, traffic counts were not included in the scope of this investigation.

It is recommended that any road contributions payable by the developer should be used to construct relevant and applicable road infrastructure as indicated in the Aalwyndal Road Master Plan.

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:

<u>Name:</u>	Frans Rudolf van Aardt
<u>Telephone number:</u>	044 204 6834
<u>Address:</u>	18 Varing Avenue, Dormehlsdrift George 6529
<u>ECSA Registration:</u>	Professional Engineer (Pr.Eng)
<u>ECSA Registration Number:</u>	20090271
<u>Academic Qualifications:</u>	B. Ing (RAU 2002) M. Ing (UJ 2011)

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Prepared by:

Frans Rudolf van Aardt (B.Ing, M.Ing, Pr.Eng)

(on behalf of Urban Engineering (Pty) Ltd)

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LIST OF ABBREVIATIONS

TIA	Traffic Impact Assessment
WCG	Western Cape Government
AMP	Access Management Plan
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
BZIII	Business Zone 3

1 INTRODUCTION

Urban Engineering (Pty) Ltd was appointed by NN Busdiens (Pty) Ltd to undertake a Transportation Investigation pertaining to the proposed development of Farm 209/220 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 from Urban Engineering (Pty) Ltd on 02 June 2022. 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 site (Farm 220/209) is situated within the suburb of Aalwyndal in Mossel Bay and has approximate WGS 84 coordinates of 34° 9'7.49"S and 22° 4'47.46"E. A basic locality plan has been included as Figure 2-1.

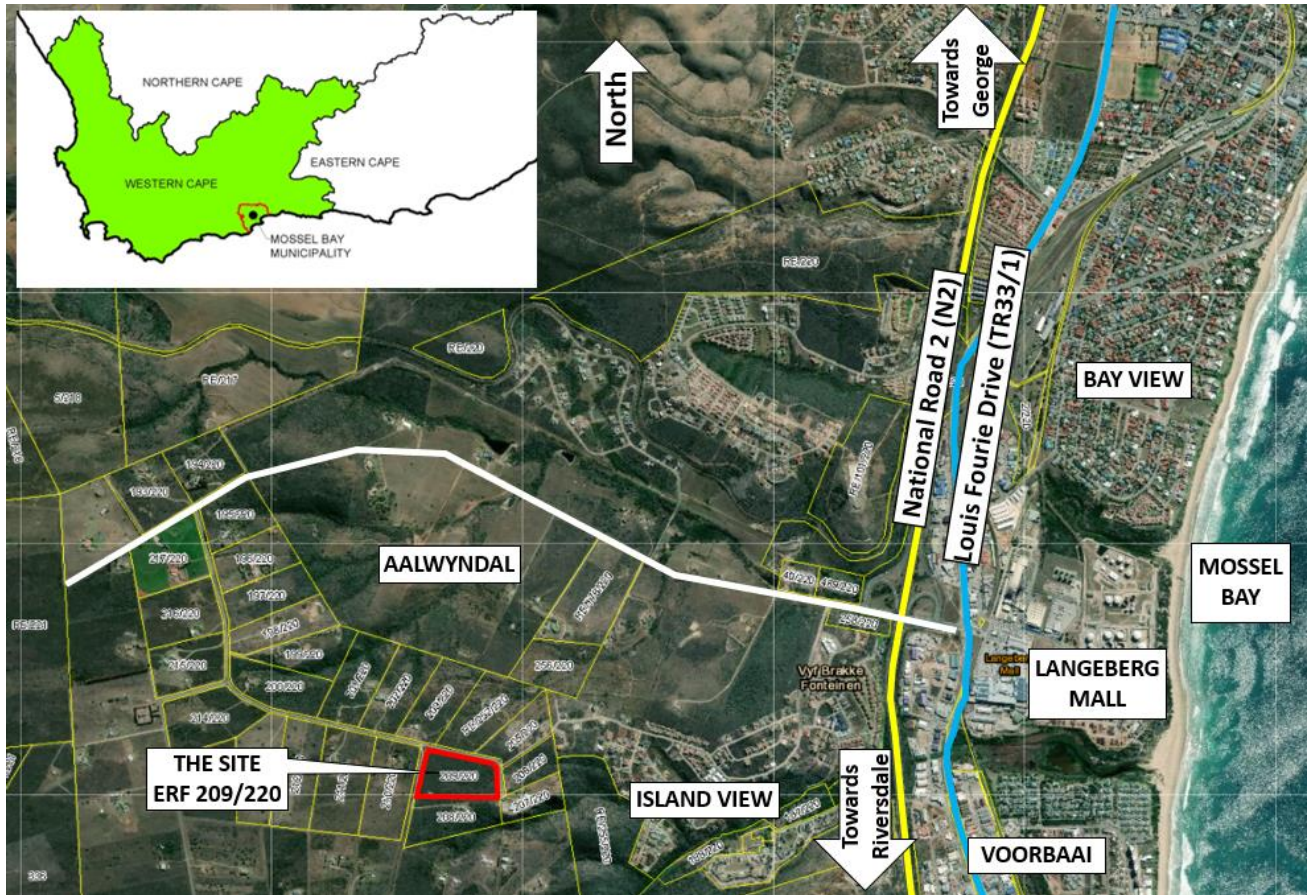


Figure 2-1 - Basic Locality Plan

The position of the Farm 209/220 (the site) in relation to the surrounding road network, is indicated in Figure 2-2.

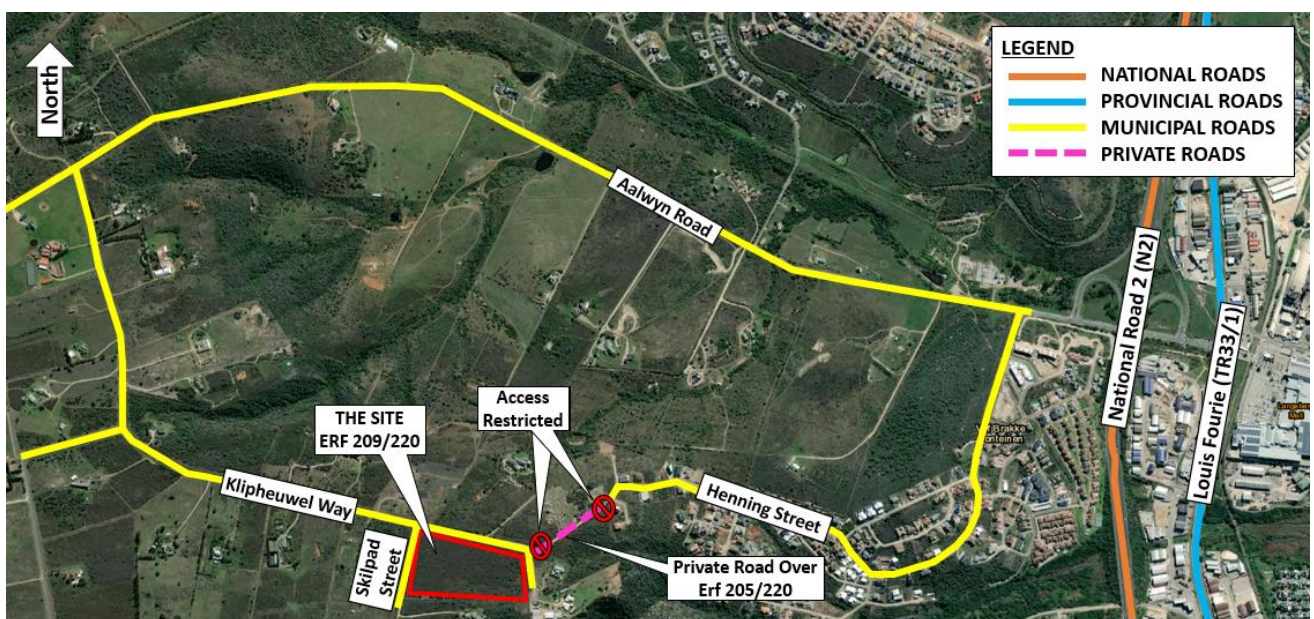


Figure 2-2 - Site Position in Relation to Surrounding Road Network

The site is currently undeveloped and covered mainly with fynbos as indicated in Figure 2-3 below.



Figure 2-3 - Status Quo Land Use

3 SPATIAL PLANNING

Based both on Mossel Bay Municipality’s Spatial Development Framework (SDF) and the Integrated Development Plan (2019/2020 IDP), Aalwyndal has been identified as the future location for urban expansion. This is further indicated in the extract of the Mossel Bay Municipality concept SDF (prepared by CNdV) attached as Figure 3-1 below.

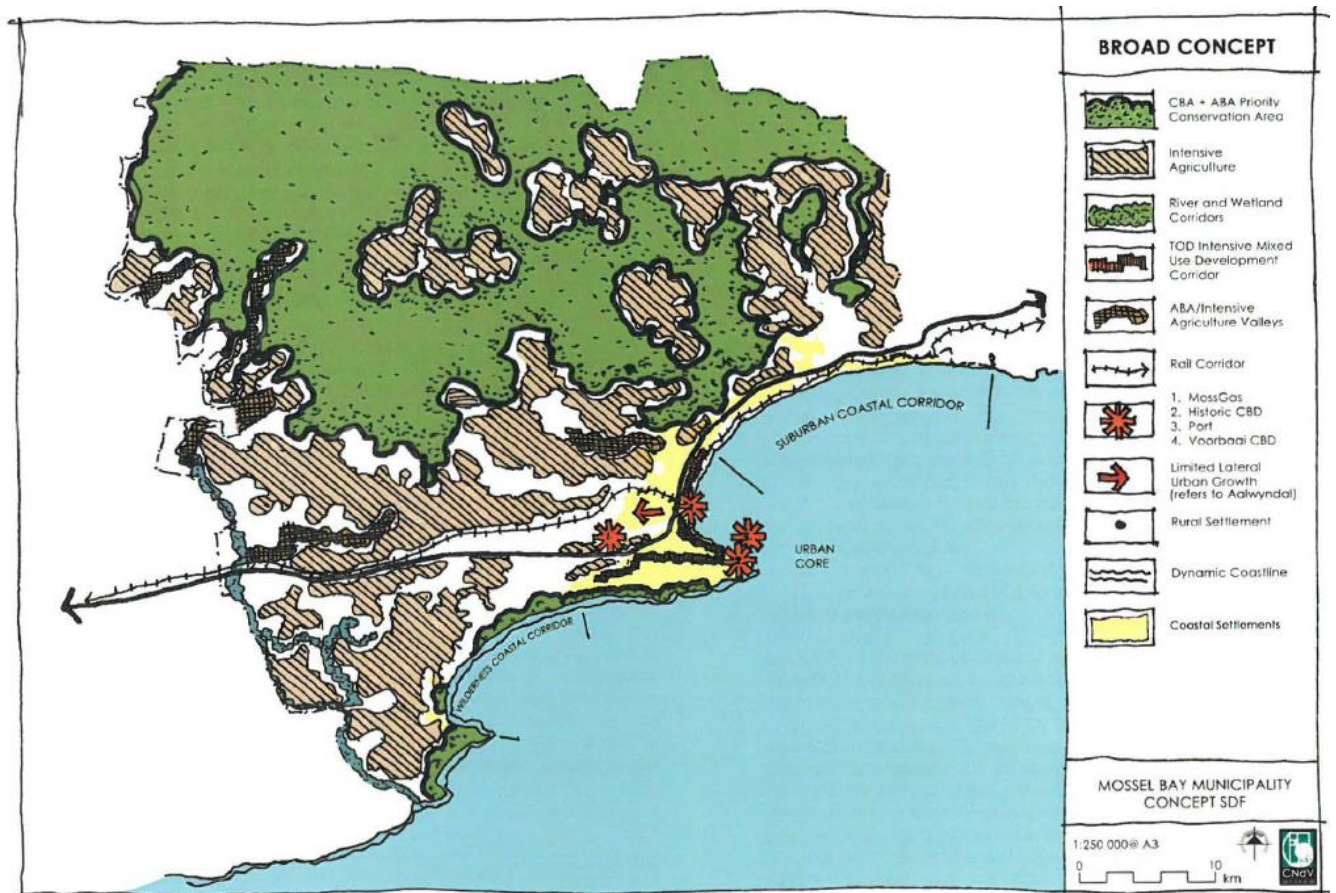


Figure 3-1 - Concept SDF as prepared by CNdV in the 2018 SDF

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.

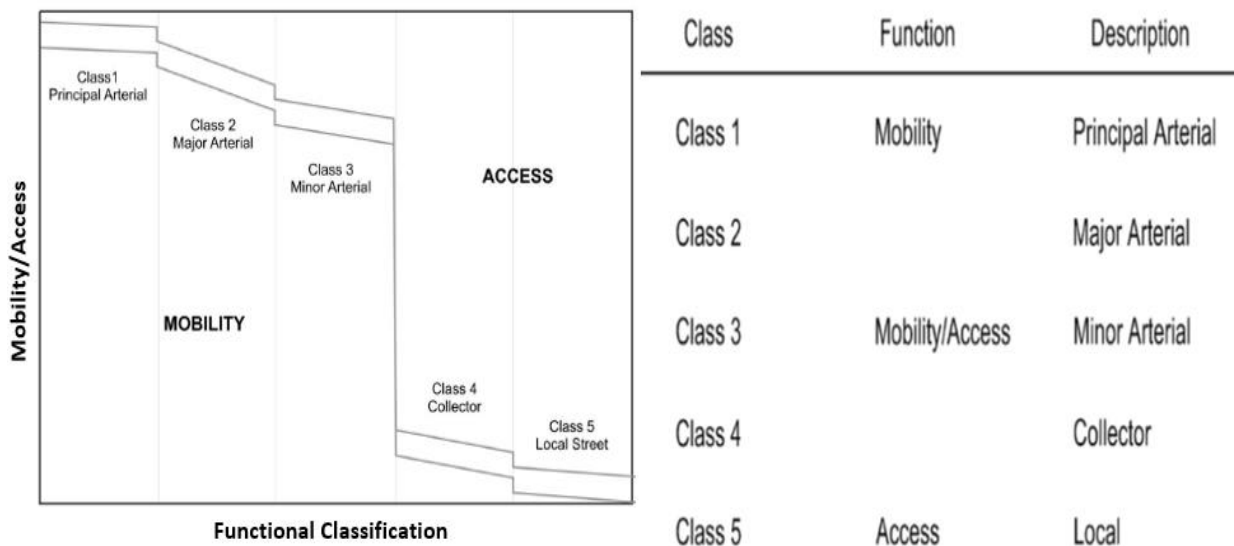


Figure 4-1 - Relationship Between Access and Mobility

For ease of reference, a diagram indicating the relevant surrounding road network has been included as Figure 4-2 below.

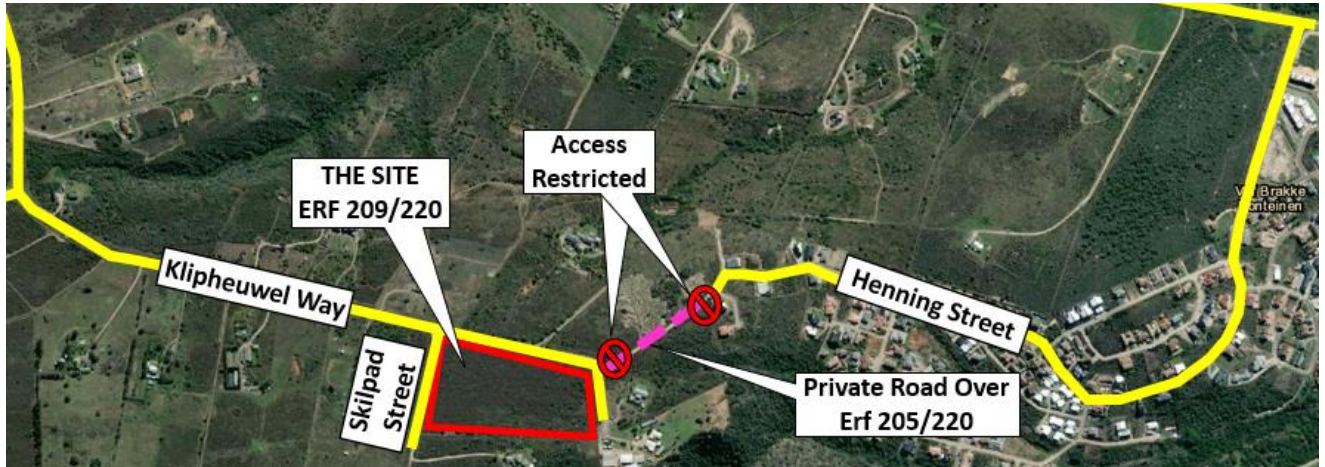


Figure 4-2 - Surrounding Road Network

4.1 KLIPHEUWEL WAY

The relevant section of Klipheuwel Way is typical of a low order rural street used as collector between agricultural plots in the countryside. The road reserve is between 18m and 20m wide and the road surface is between 5.5m and 6m wide. The road is surfaced with a Cape Seal and the cross section does not include kerbing or any other forms of formal delineation. Stormwater simply runs off the surface into the grassed verge where it is collected in grassed lined stormwater channels.



Figure 4-3 - Klipheuwel Street in front of plot 209/220

4.2 SKILPAD STREET

Skilpad Street is a winding, informal, gravel road situated within what seems to be a 20m wide, formal road reserve.



Figure 4-4 - Skilpad Street

4.3 HENNING WAY (ISLAND VIEW)

Henning Way does not technically link up with Farm 209/220 at the moment, as it terminates at the boundary with Farm 205/220 as indicated in Figure 4-5.

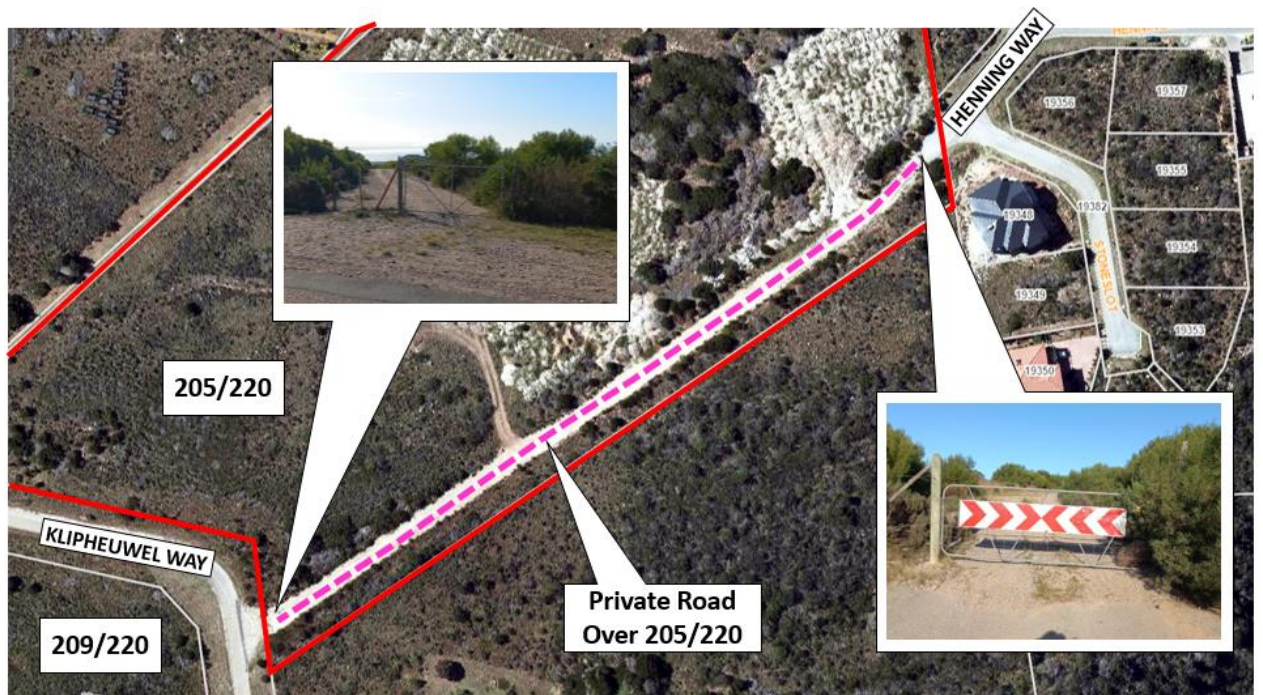


Figure 4-5 - Private Road over 205/220

However, Henning Way plays an important role in the future Aalwyndal Master Road planning. It is recommended that the future road network will include the extension of Henning Way through 205/220 up to Klipheuwel Way, in order to create a formal transportation link between Island View and Aalwyndal.

Henning way is a typical Class 5 Local Street. It is approximately 6m wide and provides direct access to the various residential properties situated directly next to Henning Way. The road surface varies between asphalt and interlocking paving blocks. The cross section includes mountable edge kerbs and formal stormwater structures.



Figure 4-6 - Henning Way

Based on its function and hierarchy within the road network, Henning Way can be classified as a Class 5 Local Residential Street. The COTO TRH 26 Guidelines specify the following with regards to Class 5 streets.

Class 5 Urban Local Streets:

Class 5 streets provide access to individual properties. As they must provide exclusively an access or activity function, both traffic volumes and trip lengths must be significantly limited. They must not be continuous between roads of an order higher than Class 4.

Local streets should not carry any through traffic but only traffic with an origin or destination along the street, i.e. all the traffic using the local street will have a destination in the street itself.

Local streets are found in residential areas and almost exclusively serve residential traffic and possibly some public transport, as well as refuse and small delivery trucks.

Residential local streets should not carry more than about 1 000 vehicles per day or 100 vehicles during peak hours. If Class 5b residential local street volumes exceed 5 000 per day, this is a criterion to classify the road as a Class 4b residential collector.

Local residential streets should be short blocks of less than 0.5 km, with one kilometer being the maximum for safety reasons.

5 MOSSEL BAY ROADS MASTER PLAN

The Mossel Bay Road Master Plan was compiled by Hatch Goba in February 2015. The master plan has been attached as **ANNEXURE B**, but an extract of the relevant section has been included as Figure 5-1 below.

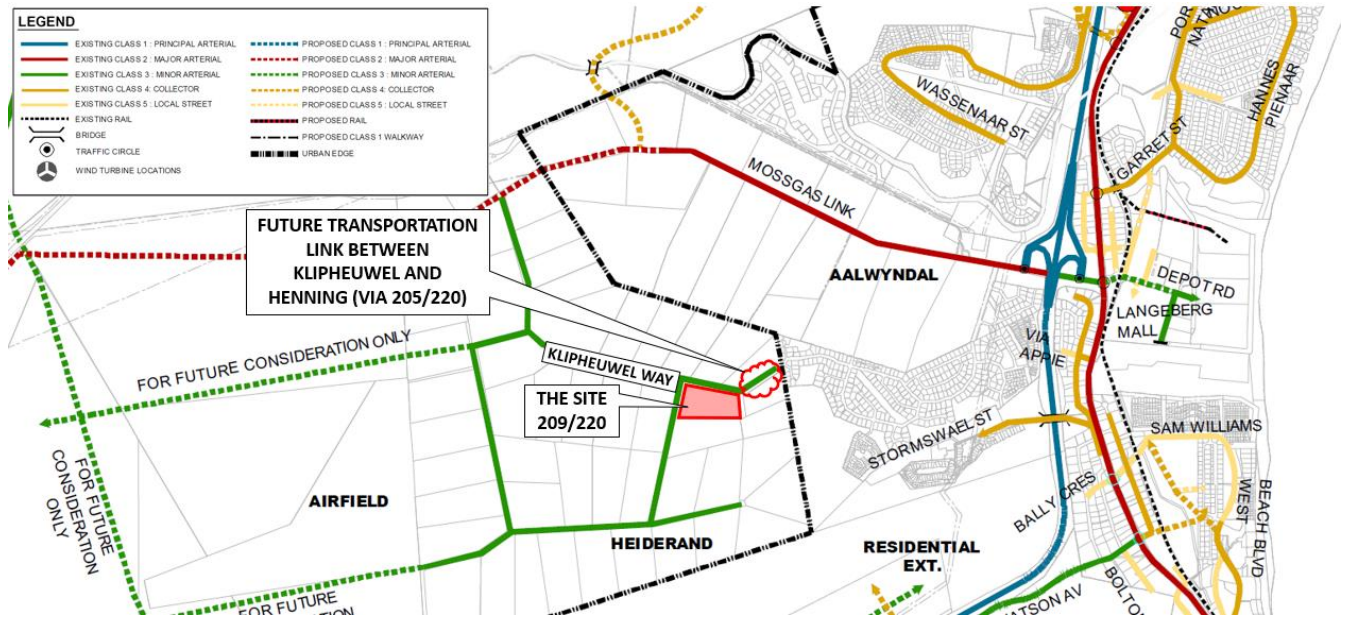


Figure 5-1 - MBM Roads Master Plan

From the Master plan it is evident that the extension of Henning Way through Farm 205/220, forms part of the greater Mossel Bay Road Master Plan.

6 AALWYNDAL ROADS MASTER PLAN

In August 2021, Urban Engineering prepared a concept Master Road Layout plan for the Aalwyndal area. The Aalwyndal Master plan provided more detailed horizontal and vertical alignments for the proposed road layout. An extract of the relevant section of the master plan has been included as Figure 6-1 below.

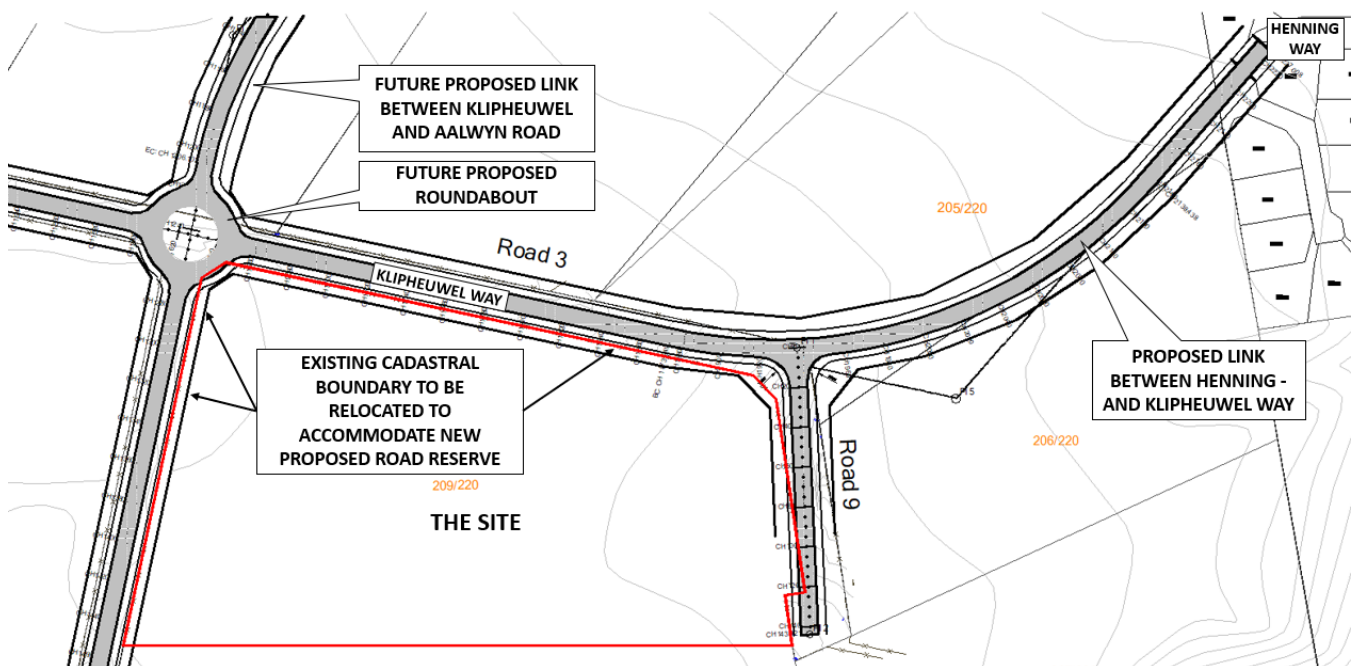


Figure 6-1 - Extract of Aalwyndal Road Master Plan

7 PROPOSED DEVELOPMENT PARTICULARS

The Site Development Plan (SDP) was prepared by Hamilton Wessels Architects and has been attached as **ANNEXURE C** to this report. In short, the proposed development will consist of the following:

- 1,630m² x Commercial/Retail Development
- 65 x Flats/Apartments
- 36 x Double Storey Row Houses
- 37 x Group Housing Units

For ease of reference, an extract of the SDP has been attached as Figure 7-1 below.

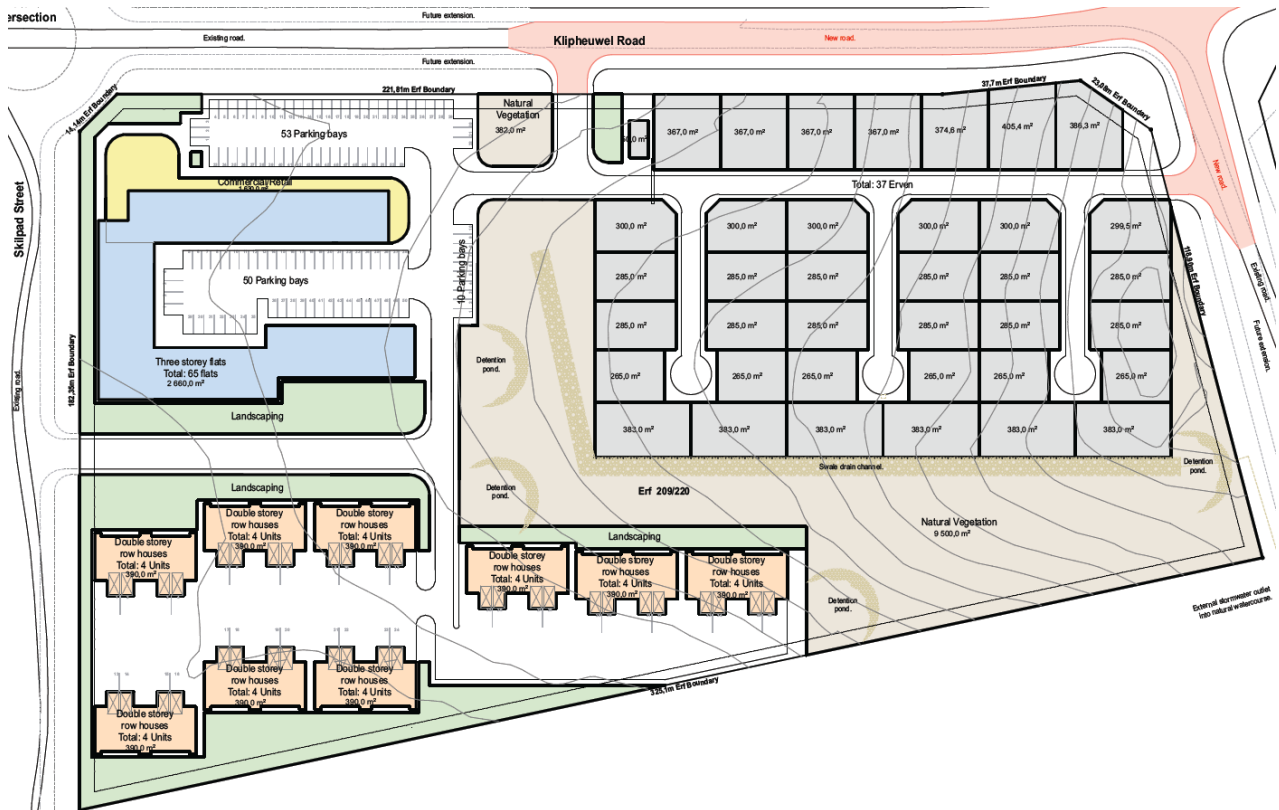


Figure 7-1 - Extract of SDP

7.1 ASSUMPTIONS

The following assumptions regarding the various land uses have been made.

Commercial Development

The proposed commercial development will cover an area of approximately 1,630m². Assuming a GLA factor of 0.85, the actual GLA of the commercial development is estimated at 1,386m².

The GLA (Gross Leasable Footprint) of a development is the total floor area designed for tenant occupancy and exclusive use. It is the area for which tenants pay rent and which produces income for the owner of the development. The GLA is normally measured in m²

(square meters) and is typically measured between the centrelines of the inner and outside walls. Generally, the following areas are excluded from the definition of GLA:

- Open roof areas, verandas, balconies or canopies erected on the street frontage of a shop.
- Parking areas.
- Malls, entrance halls and foyers at shopping centres.
- Accommodation for the lift room and other mechanical or electrical equipment required for the functioning of the building.
- Areas reasonably used in connection with building cleaning, maintenance and care.
- Accommodation for the supervisor.

Flats/Apartments

The 65 flats/apartments will be housed in a triple storey building which makes provision for 15 garages below the first-floor flats.

Double Storey row houses

The 36 row houses are typically multi-level dwellings that shares one or two common walls and a roof with its neighbouring buildings. Each unit will have access to a single garage and an uncovered parking bay. The two parking areas will be in tandem (uncovered bay in front of single garage).

Group Housing Units

The proposed development makes provision for 37 group housing units situated on erven ranging between 260m² and 360m² in size. Access to the units will be controlled by means of a security gate. Each unit will have access to a single garage and an uncovered parking bay. The two parking areas will be in tandem (uncovered bay in front of single garage).

8 DEVELOPMENT ACCESSES

Driveways connect public roadways to both private and public properties. Geometric design details of driveways vary considerably in relation to traffic demand and vehicle type. In locating and designing driveway connections to the public street system, attention should be given to the town planning scheme or regulations applying for the local area. The guideline document UTG 7, *Guidelines for the Geometric Design of Urban Local Residential Streets* (Department of Transport, 1989), defines five different types of driveways:

- **Low-volume, motor-car driveways** refer to the normal driveway serving low density residential properties, up to approximately 20 residential units per driveway.
- **High-volume, motor-car driveways** refer to access roads to parking lots and garages related to shopping centres, major residential complexes or offices.
- **Low-volume, truck driveways** refer to accesses which require the free flow of large trucks, even though the traffic demand is relatively low. Driveways to service areas of shopping centres and industrial driveways are typical.
- **High Volume mixed driveways** are major driveways to shopping centres and industrial plants which carry motor cars and trucks.

Since the proposed development consists of a mixture of 138 residential dwelling units plus a 1630m² commercial site it follows that the various development accesses classify as high-volume driveways. The proposed Aalwyndal Master Road Plan makes provision for a new roundabout at the intersection of Klipheuwel Way and Skilpad Street. From an intersection spacing point of view, the Western Cape Government’s Access Management Guideline recommends that roundabouts be treated to the same spacing requirements as signalised full intersections. This allows the flexibility of converting the roundabouts into signalised intersections should the need arise in the future.

Currently Henning Way classifies as a Class 5 Local Street. It is however envisaged that once the full Aalwyndal Roads Network has been completed, residents currently residing next to the top section of Henning Way, will rather make use of the new Aalwyndal road network instead, instead of driving down the undulating and meandering Henning Street. The future Aalwyndal road classification indicated in Figure 8-1 is proposed:

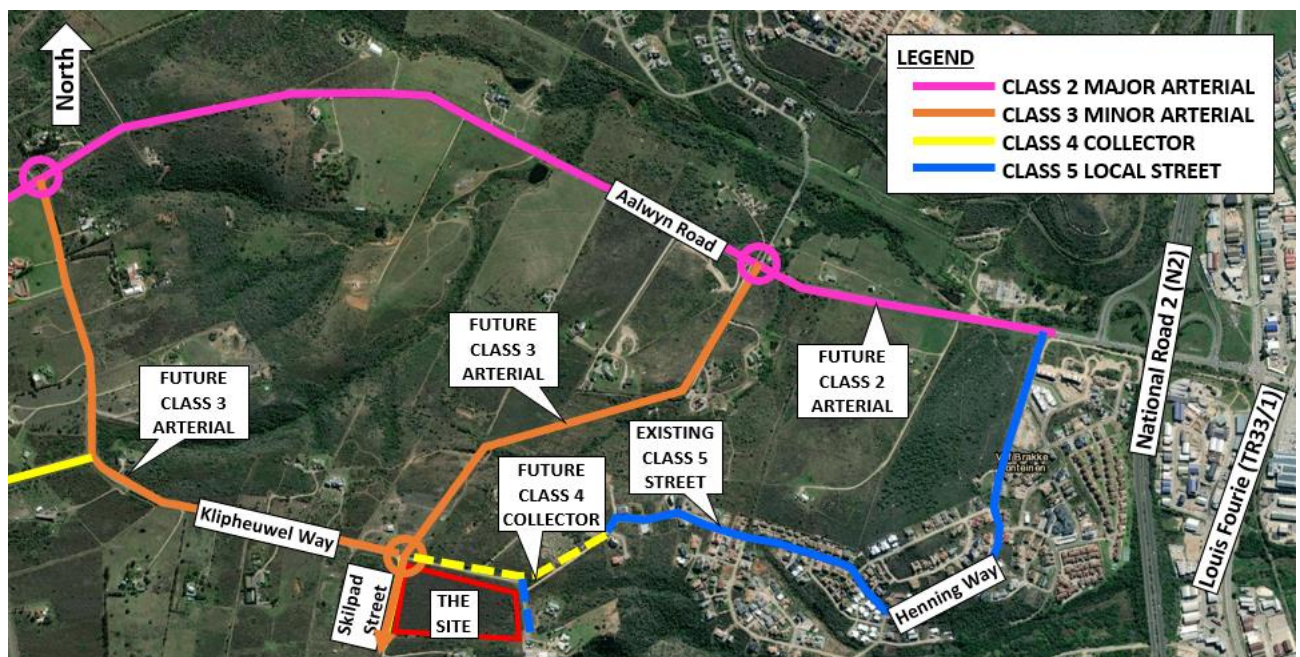


Figure 8-1 - Proposed Aalwyndal Road Classification

The WCG’s Access Management Guidelines for minimum intersection spacings on Class 3, 4 and 5 roads are indicated schematically in Figure 8-2, Figure 8-3 and Figure 8-4. (The relevant spacing for Suburban Roadside Development Environment has been circled in red.)

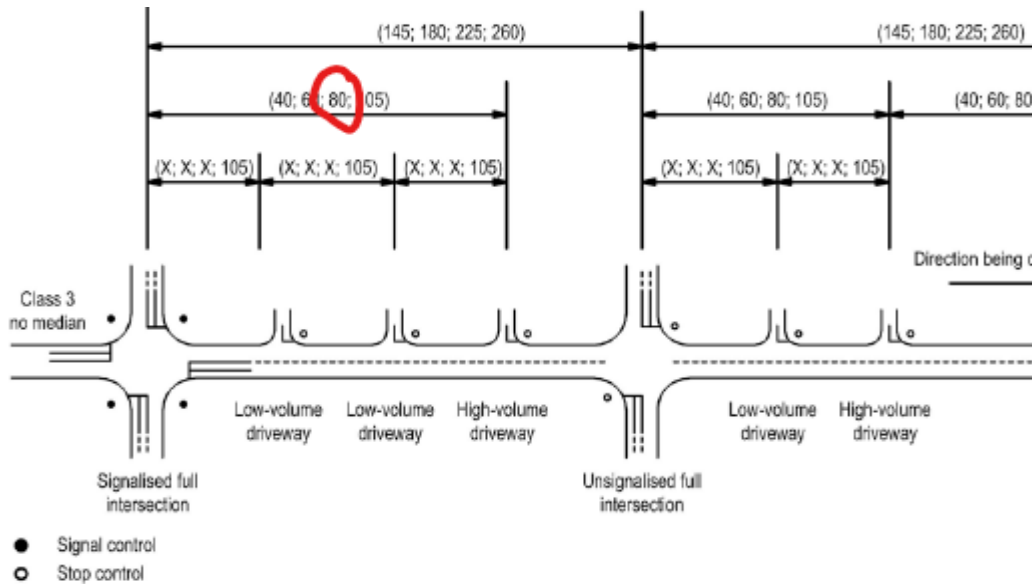


Figure 8-2 - Class 3 Minimum Spacing Distances (without Median)

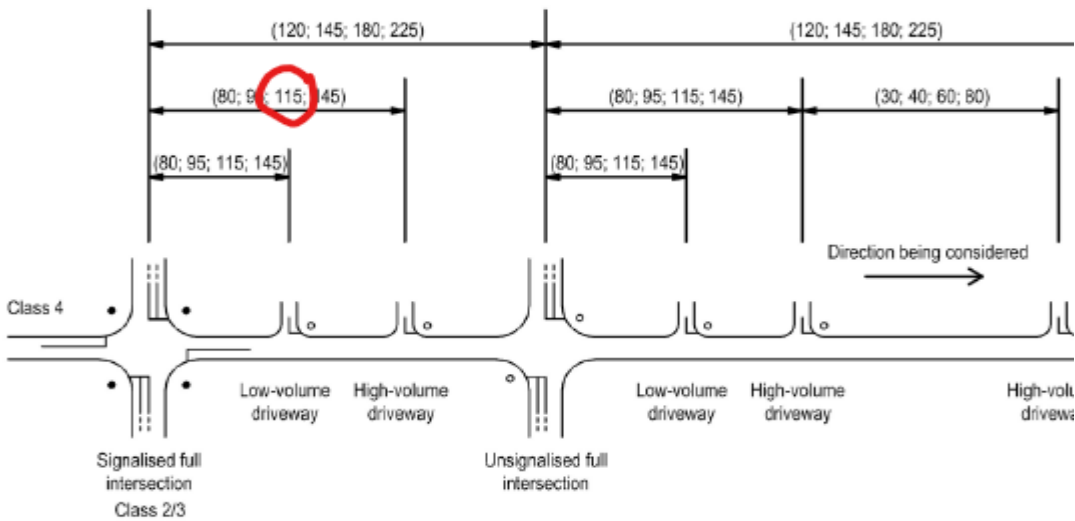


Figure 8-3 - Class 4 Minimum Spacing Distances

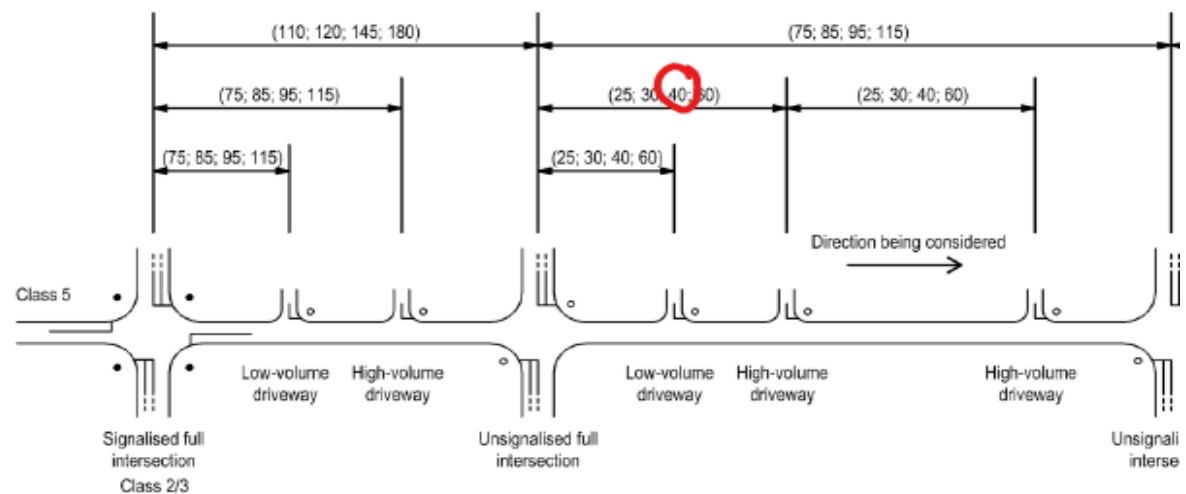


Figure 8-4 - Class 5 Minimum Spacing Distances

By plotting the spacing guidelines of the WCG’s Access Guideline Manual onto the actual surrounding Aalwyndal (Future) road network (based on the classifications indicated in Figure 8-1 and the

Suburban Roadside Development Environment), the allowable position of high-volume driveways is clearly visible in Figure 8-5.

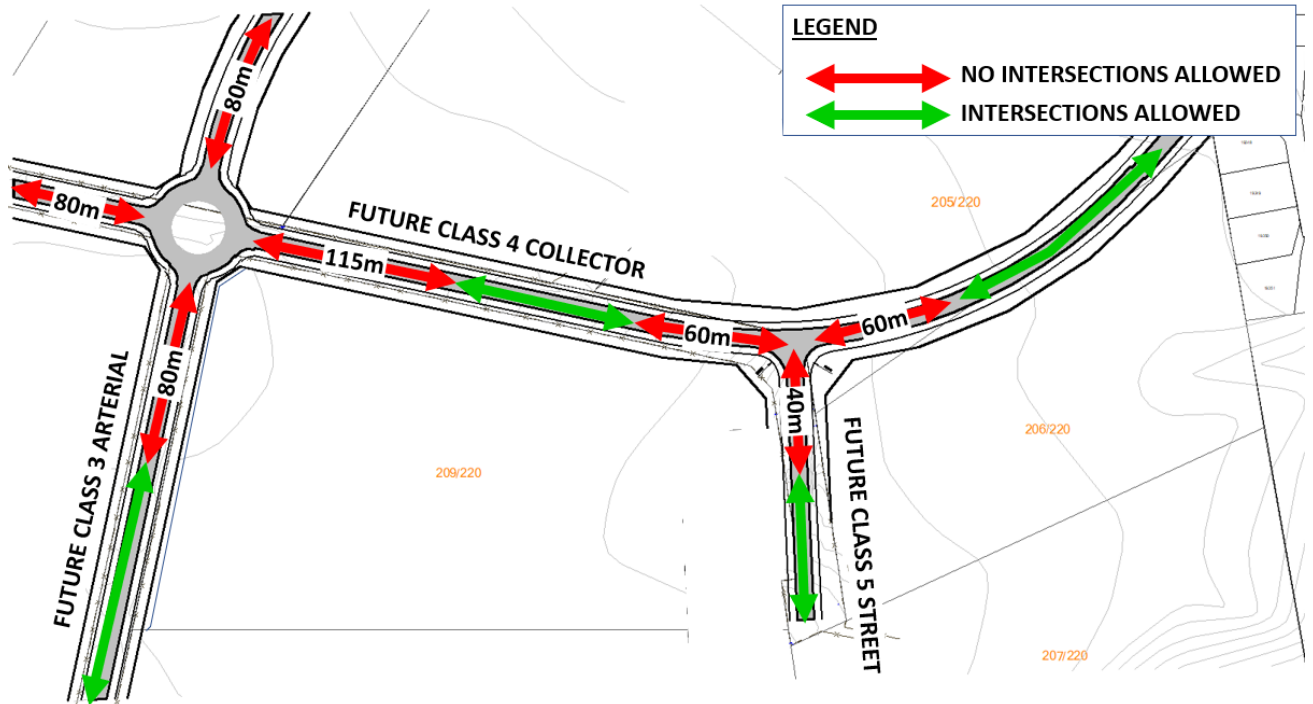


Figure 8-5 - Allowable Access Positions

As indicated in Figure 8-6, measurements from the site plan reveals that all the spacing comply to the guidelines published in the WCG’s Access Management Guidelines for high volume driveways in the Suburban Roadside Environment.

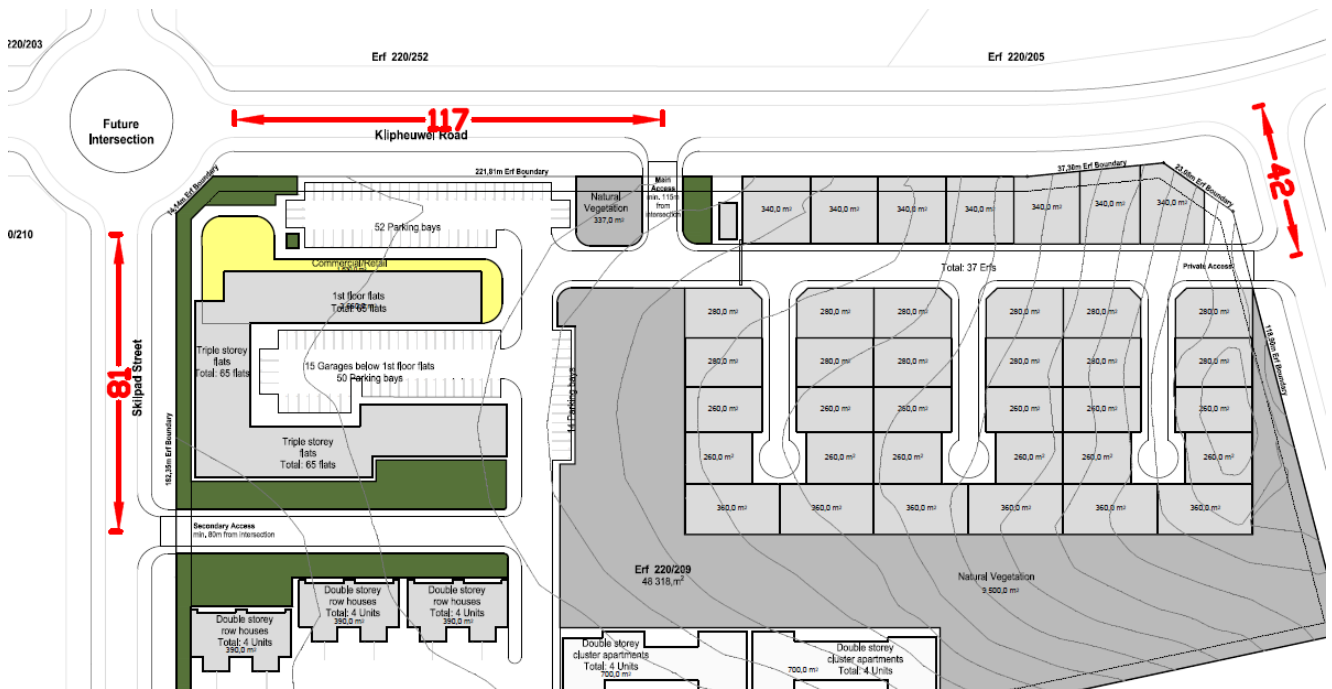


Figure 8-6 – Proposed Development Access Spacing

8.1 THROAT LENGTHS

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 current SDP only makes provision for one point of access control that could possibly have an impact on the surrounding public road network. This access control is in the form of the gatehouse situated at the entrance to the 37 Group Housing units.

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 8-1

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 8-1 - 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.

Assuming a trip generation rate of 1trip/Du it follows that the worst-case scenario from a site access point of view will take place during the Weekday PM period when a total of 37 vehicles can be expected to enter the site via the security gate.

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

$$Traffic\ Ratio = \frac{37/0.85}{80} \times 100$$

The above equation returns a Traffic Ratio of 54.

The 95th percentile queue length based on the calculated traffic ratios are indicated in Table 8-2.

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 8-2 - 95th Percentile Queue Length at Controlled Accesses

From Table 8-2, the following options are available:

Option 1 – Indicated in Green

Singe Ingress Lane Gate House with sufficient stacking distance to safely accommodate at least four (4) stationary vehicles (+ 24m) between the gate/boom and the surrounding road network.

Option 2 – Indicated in Blue

Dual Ingress Lane Gate House with sufficient stacking distance to safely accommodate one (1) stationary vehicle (+ 5m) between the gate/boom and the surrounding road network.

9 TRIP GENERATION POTENTIAL

9.1 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 various TMH land-uses that best fit the ethos of the proposed development are listed below:

210 Single Dwelling Unit **Dwelling Unit**

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

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.

710 Shopping Centre**100 sqm GLA**

A shopping center is an integrated (mixed-use) group of commercial establishments that operate as a unit. May include small components of other land uses, such as restaurants, hardware and paint shops, etc.

The various proposed land uses have been allocated according to the COTO definitions as follows:

- 1,630m² x Commercial/Retail Development = 1,630m² “Shopping Centre”
- 65 x Flats/Apartments = 65 x “Apartments and Flats”
- 36 x Double Storey row Houses = 36 x “Town Houses”
- 37 x Group Housing Units = 37 x “Single Dwelling Units”

The resultant trip generation calculation has been attached as **ANNEXURE D** to this report. From the calculation it follows that the biggest trip generator will be the retail component which has the potential to generate up to 173 trips (IN and OUT) during the Saturday Peak Hour Period. The largest trip generation is expected to take place during the Friday PM peak Hour period, when the development has the potential to generate up to 226 (IN and OUT) trip.

The split between residential and retail trips are summarised in tabular format below:

Land Use	Trip Generation Potential				
	Weekday AM Peak	Weekday PM Peak	Friday PM Peak	Saturday Peak	Sunday Peak
Residential (all units combined)	95	95	95	49	50
Retail (Based on 1,630m² GLA)	23	0	130	173	0
Total	118	92	226	222	50

Table 9-1 - Envisaged Trip Generation

It is important to note the following:

1. The above calculations are based on the long-term future scenario after the Aalwyndal area has reach full development potential. For the next 5-10 years the trip generation of specifically the retail component is expected to be only a fraction of the full development potential.
2. The trip generation potential of the shopping/retail component is based on the building footprint and not on the GLA and hence the calculation can be seen as conservative. In reality the GLA should be less that the footprint which will lead to a reduction in peak hour trip generation volumes.

10 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:

10.1 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.

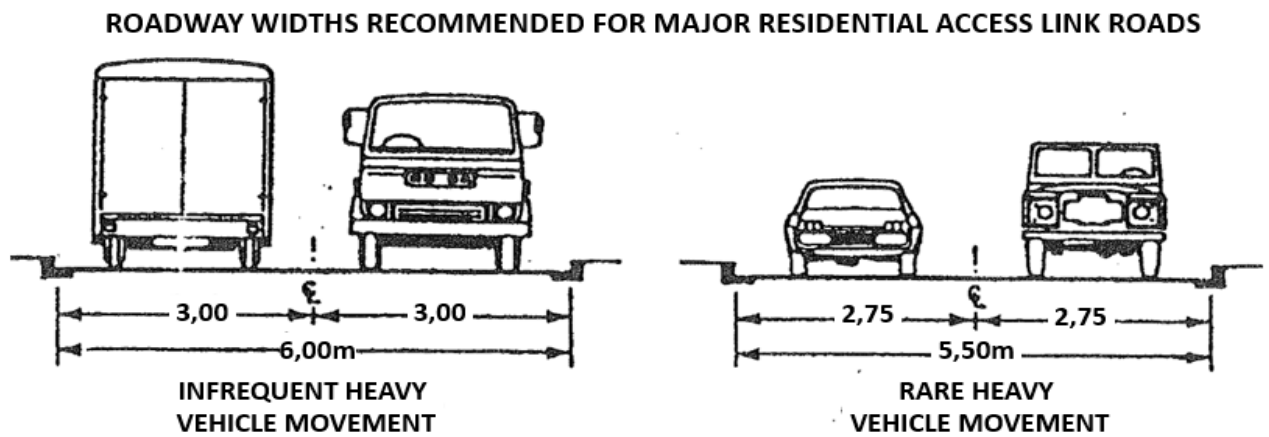


Figure 10-1 - Road Widths Recommended for Major Residential Access Link Roads

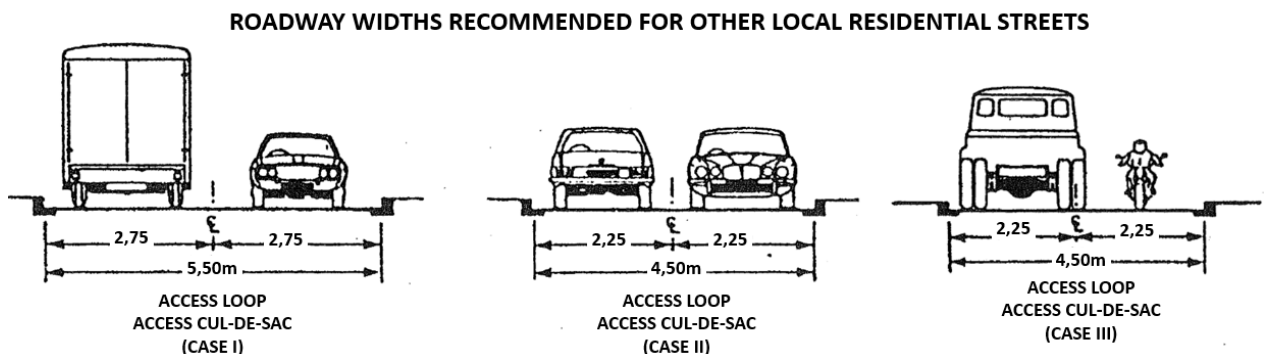


Figure 10-2 - Roadway Widths Recommended for Major Residential Access Link Roads

The recommended and absolute minimum roadway width for various types of internal residential roads are indicated in Table 10-1.

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 10-1 - UTG 7 Advisory Roadway Widths

10.2 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	2,7m	4,0m
Combined entrance and exit way	5,0m	8,0m

Table 10-2 – Recommended Driveway Widths

10.3 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 Neighborhood Planning and Design Guide (Department of Human Settlements, July 2019) also known as “The Red Book” in which the cross section included as Figure 10-3, is proposed.

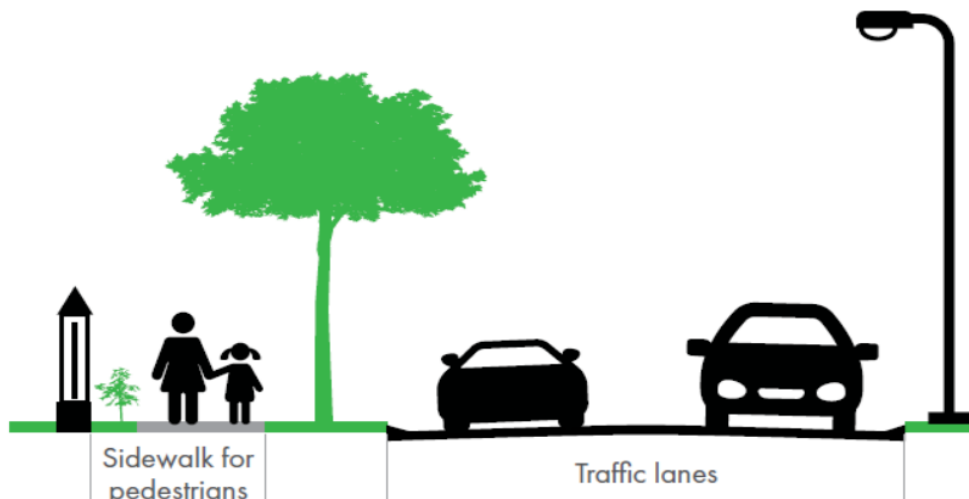


Figure 10-3 - Proposed Roadside Environment Cross Section

11 PARKING

The parking requirements are based on the requirements specified by the Mossel Bay Municipality Integrated Zoning Scheme By-Law (dated January 2018). 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 11-1) shall therefore be used.

Land Use		Normal Areas	PT1 Areas	PT2 Areas
Dwelling house / Double dwelling house		2 bays per dwelling Erven <350m²: 1 bay per dwelling Erven < 100m²: 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 0.25 bays/unit for visitors	1 bay per dwelling unit 0.25 bays/unit for visitors
Retirement resort	Dwelling unit	2 bays per dwelling	1 bay per dwelling 0.25 bays/unit for visitors	1 bay per dwelling 0.25 bays/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 0,25 bay per unit for visitors	1.25 bays per dwelling 0.25 bays/unit for visitors	0.5 bays per dwelling 0.25 bays/unit for visitors
Second dwelling		1 additional bay	1 additional bay	Nil
Boarding house/ Guest House/ Guest Lodge/ Bed and Breakfast Establishment		1 bay per bedroom 2 bays per owner’s home / manager’s flat	1 bay per bedroom	1 bay per bedroom
Backpackers Lodge		1 bay per 3 beds 2 bays per owner’s home / manager’s flat	1 bay per 3 beds	1 bay per 3 beds
Hotel (excluding other facilities, specific ratios apply to each use)		1.25 bays per bedroom	1 bay per bedroom	0.75 bays per bedroom
Hospital (general and private)		1 bay per bed 4 bays per consulting room	1 bay per bed 4 bays per consulting room	1 bay per bed 3 bays / consulting room
Frail care facility		1 bay per 2 beds	1 bay per 2 beds	1 bay per 2 beds
Home care facility		1 bay per 2 beds	1 bay / 2 beds or part thereof (e.g. 2 bays per 3 beds)	1 bay / 2 beds or part thereof (e.g. 2 bays per 3 beds)
Clinic/Medical consulting rooms		4 bays per consulting room	4 bays per consulting room	3 bays per consulting room
Funeral parlour		1 bay per 4 seats 4 bays per 100 m² office GLA	1 bay per 4 seats 2 bays / 100 m² office GLA	1 bay per 4 seats 1 bay / 100 m² office GLA

Table 11-1 - Parking Requirements

12 SUMMARY

In short, the various components of this Transportation Investigation can be summarised as follows:

1. It is the owner's intention to develop Farm 220/209 in Aalwyndal into a mixed-use estate that comprises various types of residential dwelling units, as well as a commercial/retail component. The proposed development has the potential to kick start the development of the of the rest of the Aalwyndal area.
2. The Site Development Plan was prepared by Hamilton Wessels Architects and the town planning application is handled by Marlize de Bruyn Planning.
3. Urban Engineering (Pty) Ltd was appointed by NN Busdiens (Pty) Ltd to undertake the relevant Transportation Investigation pertaining to the development.
4. The proposed development will consist of the following:
 - a. 65 x Flats/Apartments
 - b. 36 x Double Storey Row Houses
 - c. 37 x Group Housing Units
 - d. $\pm 1,630\text{m}^2$ x Commercial/Retail Development
5. Once the future Aalwyndal Road network has been fully constructed the site will have three (3) full accesses.
6. The position of the three (3) proposed site accesses, complies to the requirements of the Western Cape Government's Access Management Guidelines (2020) document in terms of access spacing.
7. Based on the COTO guidelines, the development has the potential to generate up to 225 trips (IN and OUT) during the Friday PM Peak Hour Period. Since the supporting road network has not yet been constructed, background traffic counts have not been recorded.

13 RECOMMENDATIONS

Based on the findings of this report, the proposed development of Aalwyndal Farm 220/209 is supported from a traffic and transportation point of view, subject to the following recommendations:

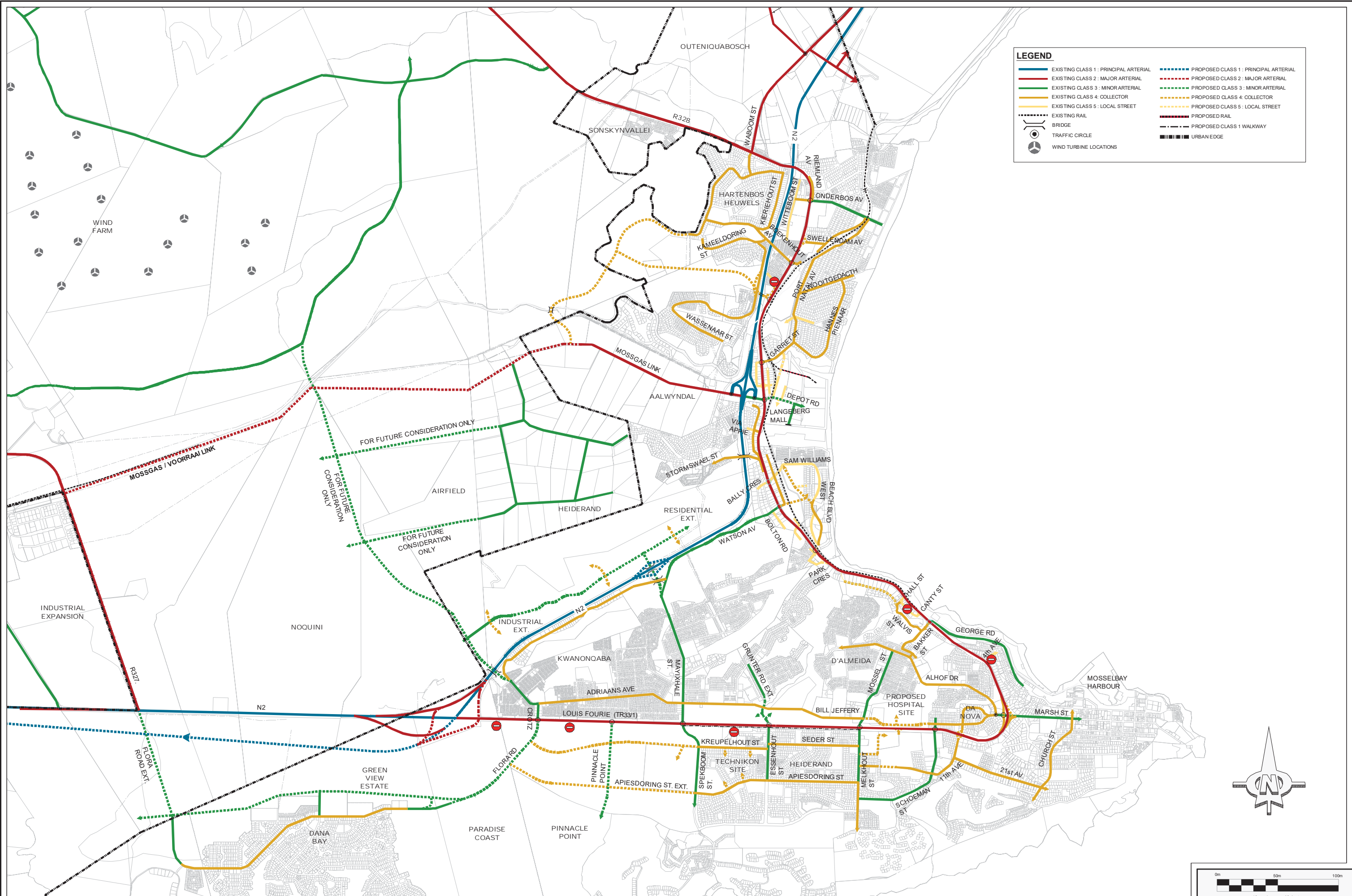
1. Road Contributions should be used to develop the relevant sections of the Aalwyndal Road network. It is envisaged that the first priority will probably be the relatively short link road between Klipheuwel Way and Henning Street (through Farm 220/205.) However, since access to farm 220/209 is not dependant on the future link through farm 220/205, the construction of the link road is not deemed a prerequisite for the development of erf 220/209.
2. Internal parking must adhere to the minimum specification of the Mossel Bay By-Law for *off-street* parking requirements in Normal Areas.
3. Internal roads should ideally be approximately 6m wide, but where this is not practically feasible, this requirement can be reduced to an absolute minimum surfaced width of 5.5m.
4. In order to promote NMT, the Developer should provide and maintain surfaced sidewalks at least along the Klipheuwel Way property boundary.
5. 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, increasing the safety of those making use of the walkways.

ANNEXURE A

SITE PHOTOGRAPHS

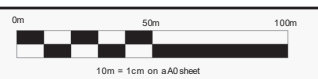
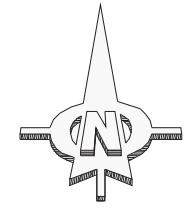


ANNEXURE B
MOSSEL BAY ROADS
MASTER PLAN



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:	C. HENDRICKS
			CONS.	CHECKED BY:	C.MANCHIP
			PRE	DRAWN BY:	S.SSTRANACK
				CHECKED BY:	C. MANCHIP

HATCH GOBA
 Member of the
 Vardag Group
 False Bay Building
 2nd floor Tygerberg Hills Office Park
 163 Uys Krige Drive
 Paarl 7100
 +27 21 9115823
 www.hatch.co.za

 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: -----

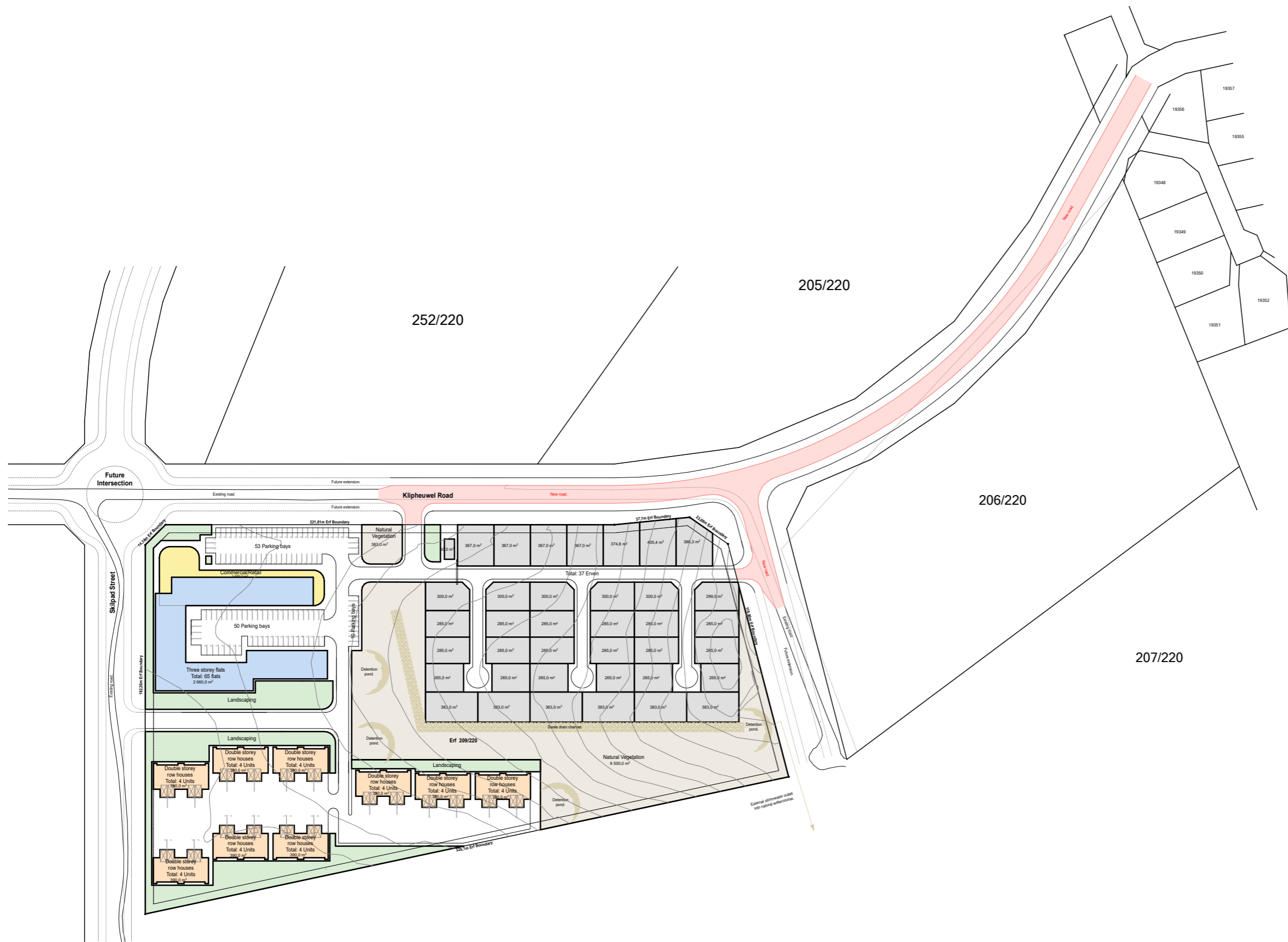
THE UPGRADING OF TRUNK ROAD
 33/1 MOSSEL BAY
 ROAD NETWORK CLASSIFICATION

FIGURE 3.1

ANNEXURE C

SITE DEVELOPMENT PLAN

Outeniquasig, Aalwyndal, Mossel Bay Erf 220/209, 4,83 hectares	
Legend	Area/Quantity
	Commercial/Retail ± 1 630m ²
	Flats ± 65
	Row houses 36 Units
	Erven 37
	Natural vegetation
	Landscaping
	Detention pond
	Swale drain
	New access road.



DEVELOPMENT DATA		
Erf / Portion	209/220	Site Area 4,83 Hectare
Township	Aalwyndal	Title Deed No -
Town Planning Scheme & Year	Mossel Bay Zoning Scheme By-Law 2021	Amendment Scheme No -
ZONING	Annexure	
Business Zone I (BZ), General Residential I (GRZI), General Residential II (GRZII), Transport Zone I, Transport Zone II, Open Space II.	A - Engineering service report. B - Traffic impact study. C - Stormwater Management. D - Planning statement.	
	PERMISSIBLE	ACTUAL
F.S.R. (sqm)	3	TBC
Business Zone I (BZ),		
COVERAGE (sqm)	100%	TBC
Business Zone I (BZ),	60%	TBC
General Residential I (GRZI),	60%	TBC
General Residential II (GRZII),		
HEIGHT	12m	3 STOREYS
Business Zone I (BZ),	8m	2 STOREYS
General Residential I (GRZI),	8m	2 STOREYS
General Residential II (GRZII),		
DENSITY	35 Units/hectare.	TBC
General Residential I (GRZI),	60 Units/hectare.	TBC
General Residential II (GRZII),		
	REQUIRED	ENCROACH TO
BUILDING LINES		
Business Zone I (BZ),	0m	N/A
Street boundary	0m	N/A
Side & Rear		
General Residential I (GRZI),	4m	N/A
Public street boundary	2m	N/A
Internal street boundary	3m	1m
Side & Rear along perimeter	1m	N/A
Side & Rear		
General Residential II (GRZII),	4m	N/A
Public street boundary	2m	N/A
Street boundary	0m	N/A
Side & Rear		
TOTAL G.L.A. (GENERAL LETTABLE AREA)		AREA
GROUND FLOOR COMMERCIAL		- sqm
CIRCULATION & ABUSIONS		- sqm
G.L.A. (GROUND FLOOR)		- sqm
GROSS G.L.A.		-sqm
TOTAL G.B.A (GENERAL BUILDING AREA)		AREA
TOTAL GROUND FLOOR		- sqm
TOTAL FIRST FLOOR		- sqm
GROSS G.B.A.		- sqm
PARKING		QUANTITY
REQUIRED FOR SHOP ± 1300 @ 4/100sqm		52
REQUIRED FOR DWELLING HOUSE (GRZI) 9 @ 1,25/FLAT		18
REQUIRED FOR FLATS 65 @ 1,25/FLAT		81
TOTAL REQUIRED		151
TOTAL PROVIDED		131

SITE PLAN scale 1:2 000



Date: Friday, 08 September 2023
 Scale: --
 DrawingNo: --
 RevisionNo: --



HAMILTON WESSELS ARCHITECTS (PTY)LTD
 88 Montagu Street, Mossel Bay.
 Western Cape | South Africa | 0040
 PO Box 260 | Mossel Bay

Outeniquasig

ANNEXURE D

TRIP GENERATION CALCULATIONS

Development	Size/Number of Units	Unit	AM Peak	PM Peak	Friday PM	Midday	Evening	Saturday	Sunday	Size Adj. Factor	Mixed-Use Development?	Low Car Ownership?	Very Low Car Ownership?	Transit Nodes / Corridors?	AM Peak	PM Peak	Friday PM	Midday	Evening	Saturday	Sunday
Service Industry		100 m ² GLA	0,9	0,9		0,9		0,15		1	N	N	N	N	0	0	0	0	0	0	0
Heavy Industry/Manufacturing		100 m ² GLA	0,5	0,7						1	N	N	N	N	0	0	0	0	0	0	0
Mining		1 Employee								1	N	N	N	N	0	0	0	0	0	0	0
Industrial Area (Park)		100 m ² GLA	0,8	0,8				0,4		1	N	N	N	N	0	0	0	0	0	0	0
Manufacturing		100 m ² GLA	0,6	0,6				0,3		1	N	N	N	N	0	0	0	0	0	0	0
Warehousing and Distribution		100 m ² GLA	0,5	0,5				0,15		1	N	N	N	N	0	0	0	0	0	0	0
Mini-Warehousing		100 m ² GLA	0,15	0,25		11,75		0,4	0,3	1	N	N	N	N	0	0	0	0	0	0	0
Single Dwelling Units	37	1 D/Unit	1	1				0,5	0,5	1	Y	N	N	N	33	33	0	0	0	17	17
Apartments and Flats	65	1 D/Unit	0,65	0,65				0,35	0,35	1	Y	N	N	N	36	36	0	0	0	19	19
Student Apartments and Flats		1 D/Unit	0,2	0,3				0,15	0,15	1	N	N	N	N	0	0	0	0	0	0	0
Townhouses (Simplexes & Duplexes)	36	1 D/Unit	0,85	0,85				0,45	0,45	1	Y	N	N	N	26	26	0	0	0	14	14
Multi-Level Townhouses		1 D/Unit	0,75	0,75				0,4	0,4	1	N	N	N	N	0	0	0	0	0	0	0
Retirement Village		1 D/Unit	0,35	0,35		0,4		0,2	0,2	1	N	N	N	N	0	0	0	0	0	0	0
Old-Age Home		1 D/Unit	0,15	0,2		0,35		0,3	0,35	1	N	N	N	N	0	0	0	0	0	0	0
Recreational Homes		1 D/Unit	0,15	0,25				0,35	0,35	1	N	N	N	N	0	0	0	0	0	0	0
Hotel, Residential		1 Unit	0,5	0,5		0,25		0,7	0,55	1	N	N	N	N	0	0	0	0	0	0	0
Hotel, Resort		1 Room	0,3	0,4						1	N	N	N	N	0	0	0	0	0	0	0
Guest House		1 Room	0,45	0,45				0,25	0,25	1	N	N	N	N	0	0	0	0	0	0	0
Golf Course		1 Course	40	50				80	80	1	N	N	N	N	0	0	0	0	0	0	0
Casino		100 m ² GLA	0,85	5		3,25	6,25	3		1	N	N	N	N	0	0	0	0	0	0	0
Amusement Park		1 Ha	0,5	10				47	44	1	N	N	N	N	0	0	0	0	0	0	0
Sport Stadium		1000 Seat		150			270	170		1	N	N	N	N	0	0	0	0	0	0	0
Health & Fitness Centre		100 m ² GLA	5	9,5						1	N	N	N	N	0	0	0	0	0	0	0
Public Primary School		1 Student	0,85	0,3		0,35				1	N	N	N	N	0	0	0	0	0	0	0
Public Secondary School		1 Student	0,75	0,25		0,35				1	N	N	N	N	0	0	0	0	0	0	0
Private School		1 Student	0,8	0,3		0,35				1	N	N	N	N	0	0	0	0	0	0	0
University/College		1 Student	0,2	0,2		0,25				1	N	N	N	N	0	0	0	0	0	0	0
Places of Public Worship (Weekend)		1 Seat	0,05	0,05					0,65	1	N	N	N	N	0	0	0	0	0	0	0
Places of Public Worship (Weekday)		1 Seat	0,05	0,05						1	N	N	N	N	0	0	0	0	0	0	0
Pre-School (Day Care)		1 Student	1	0,8		0,3				1	N	N	N	N	0	0	0	0	0	0	0
Cemetery		1 Ha	0,2	0,2		4		8		1	N	N	N	N	0	0	0	0	0	0	0
Public Hospital		1 Bed	1,5	1,45		1,5		1	1	1	N	N	N	N	0	0	0	0	0	0	0
Private Hospital		100 m ² GLA	1,65	1,5		1,6	1,7			1	N	N	N	N	0	0	0	0	0	0	0
Nursing Home		1 Bed	0,2	0,2		0,3		0,4	0,35	1	N	N	N	N	0	0	0	0	0	0	0
Medical Clinic		100 m ² GLA	6	6		4,2		7,8		1	N	N	N	N	0	0	0	0	0	0	0
Offices		100 m ² GLA	2,1	2,1				0,45	0,15	1	N	N	N	N	0	0	0	0	0	0	0
Home Offices & Undertakings		1 House	6,5	6,5		7				1	N	N	N	N	0	0	0	0	0	0	0
Medical Consulting Rooms		100 m ² GLA	8	8		8		3,9	0,45	1	N	N	N	N	0	0	0	0	0	0	0
Business Centre (Park)		100 m ² GLA	1,5	1,5						1	N	N	N	N	0	0	0	0	0	0	0
Conference Centre		1 Seat	0,5							1	N	N	N	N	0	0	0	0	0	0	0
Building Materials		100 m ² GLA	2,8			5,5		11	5	1	N	N	N	N	0	0	0	0	0	0	0
Hardware and Paint Store		100 m ² GLA	1,15			5,2		12	10	1	N	N	N	N	0	0	0	0	0	0	0
Nursery (Garden Centre)		100 m ² GLA	1,4	3		4,1		4		1	N	N	N	N	0	0	0	0	0	0	0
Shopping Centre	1630	100 m ² GLA	0,6			3,4		4,5		2,615	Y	N	N	N	23	0	130	0	0	173	0
Bulk Trade Centre		100 m ² GLA	1,1			1,5	0,9	3,9		1	N	N	N	N	0	0	0	0	0	0	0
Motor Dealership		100 m ² GLA	2,2			2,3	5,1	2,2		1	N	N	N	N	0	0	0	0	0	0	0
Furniture Store		100 m ² GLA	0,2	2,1		0,5	1,3	2,5	1	1	N	N	N	N	0	0	0	0	0	0	0
Restaurant, Quality (Sit-Down)		100 m ² GLA	0,75	11,8		9,8	9	11	9	1	N	N	N	N	0	0	0	0	0	0	0
Restaurant, Family (Sit-Down)		100 m ² GLA		8			10	20	25	1	N	N	N	N	0	0	0	0	0	0	0
Fast Food		100 m ² GLA	45	50		30	55			1	N	N	N	N	0	0	0	0	0	0	0
Filling Station		1 Station								1	N	N	N	N	0	0	0	0	0	0	0
Vehicle Fitment Centre		100 m ² GLA	3	4,3				5,2		1	N	N	N	N	0	0	0	0	0	0	0
TOTAL TRIPS GENERATED															118	95	130	0	0	222	50
																226					